



# **QueueMetrics**

**call center suite**

## **QUEUOMETRICS USER MANUAL**

2018/04/20

# QUEUEMETRICS USER MANUAL

Loway

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# Chapter 1. What is QueueMetrics?

The balancing of all internal elements that shape the ecosystem of an Asterisk PBX based call center relies on accuracy of measurements and precision of analytical reports. An efficient call center management can improve performances by 100% or more, while also significantly improving customers' satisfaction. Monitoring, reporting and improving performances is the bread and butter of QueueMetrics software.

The functional field of QueueMetrics call center suite divides into four major categories: Reporting, the Supervisor page, the Agent page and the Quality assessment.

## Reporting

QueueMetrics collects Asterisk data and generates analytical reports for over 150 metrics, including:

- when did the call come in and who answers
- who initiates the call, process it and on which queue
- waiting time before the caller was connected to an agent and time needed to process the call
- number of attempts that caller has made before being connected
- how and why the call ends
- what number was dialed
- amount of successful and failed calls
- maximum, minimum, average and total waiting time and call processing time, as well as related data on service quality
- call breakdown by agents, by dialed numbers, transferred calls by internal numbers, by queues, by direction, by position number in a queue, by choices taken in IVR
- time on hold stats after connection, by agent, by country, region codes of calling and dialed subscribers
- starting and finishing times of agent sessions, time of entering or leaving the pause and the reason of it.

## Supervisor page

With QueueMetrics a supervisor tracks data on queues, calls and agents' performance in real time, including:

- incoming calls with phone numbers, waiting times, conversation time and engaged agents
- agents online status (available, busy, on pause), time of last connection to a queue, last call and name of it
- add and remove agents from queues
- listen to agents conversations

- send instant messages to agents
- open and view an agent's desktop via remote access.

## Agent page

QueueMetrics Icon agent page is a workstation where agents track incoming calls, connect to queues, disconnect for a break, and enter any information about calls using CRM and applications (contractor card, client reference, etc.), including:

- call starting, waiting and conversation time
- caller and internal number where the call was transferred.
- automatically or manually open a connected interface page in the local CRM system
- join or leave a queue, switch to pause mode, select a pause indicator (Lunch, Service Break, etc.), initiate an outgoing call, dial a number using a built-in soft-phone, as well as view his or her current status.

## Quality Assessment

QueueMetrics allows for a full-scale automated quality control of agents' workflow and set of metrics definition for call grading. Supervisors create forms containing adjustable control criteria for subjective quality control, like for example:

- how friendly an agent was with a client
- how useful the agent's answers were
- agent follow up of corporate standards while processing a call
- amount and duration of processed calls
- number of missed calls
- call results And many other criteria.

QueueMetrics is designed for call centers built on cluster servers and employing over one thousand agents, easily integrating with all Asterisk distributions (including FreePBX, Elastix etc.) and includes English, Spanish, Portuguese, German, Brazilian, Arabian, Chinese, French, Dutch, Italian, Japanese, Hebrew, Polish, Slovak, Greek and more languages localization.

---

# Chapter 2. Installing QueueMetrics

QueueMetrics is able to operate in various server configurations in order to meet all your needs.

Depending on how big is your system you might want to have a single-server solution (Asterisk and QueueMetrics on the same server), a separated-server solution (Asterisk and QueueMetrics reside on two different servers) and a cluster solution (one QueueMetrics server monitoring many Asterisk servers).

## Understanding How QueueMetrics Works

All the data which QueueMetrics works on are stored in Asterisk's `queue_log` file. In a single-server configuration, QueueMetrics is able to read directly from this file, though this is not an efficient approach.

The Qloader script provides an effective way to retrieve information from the `queue_log` file without overloading the Asterisk server(s) and it's essential in a cluster-server configuration.

It reads the new data from the `queue_log` file and sends it to the QueueMetrics database wherever it is. We always suggest to use the Qloader script whatever configuration you have.

## Installing QueueMetrics with Espresso

If you are setting up a single-server solution on an Asterisk-ready Linux distribution (eg. Elastix, AsteriskNOW, FreePBX, etc) you can get a working QueueMetrics system in a few minutes.



Check if the Espresso installer supports your distribution version in the *Supported PBXs* section at [http://queuemetrics.com/manuals/QM\\_Espresso-chunked](http://queuemetrics.com/manuals/QM_Espresso-chunked).

Just add our repository and install the package:

```
wget -P /etc/yum.repos.d http://yum.loway.ch/loway.repo
yum install queuemetrics-espresso
```

It will detect your operating system and your Asterisk versions and configure QueueMetrics to work with them. It will also install and configure all the other software needed (Tomcat, MySQL, Qloader script) and creates a working AMI connection to Asterisk.

Now you can point your browser to `http://hostname:8080/queuemetrics` and start working.



The default username is 'demoadmin' and the password is 'demo'.

## Installing QueueMetrics manually

With this step we are going to install QueueMetrics on a server, though it still need to be configured in order to work.

### On a RPM-based distribution

Just add our repository and install the package:

```
wget -P /etc/yum.repos.d http://yum.loway.ch/loway.repo
yum install queuemetrics
```

Now, install the Uniloader in each of your Asterisk boxes.

```
wget -P /etc/yum.repos.d http://yum.loway.ch/loway.repo
yum install uniloader
```

## Installing QueueMetrics using Docker (for any distro and OS)

Docker is an infrastructure-management tool that lets you run software "as-if" it was running on a dedicated VM, without the administrative and technical overhead of running a separate VM.

Docker makes your life very easy if you need to manage multiple copies of QueueMetrics - you just run them. Docker makes it very easy to install QueueMetrics, no matter what the underlying OS is - the Docker image contains QueueMetrics with all its dependencies, a MySQL server and all the needed tooling.

And when you need to upgrade, you just terminate the old instance and start a new one pointing to the same data - it just works.



Even if Docker makes your life easier, you need to familiarize yourself with it before you consider running a production service on it.

## Installing the official QueueMetrics Docker image

### Create a data container

The first thing you have to do is to create a place to store persistent data - this might be a directory on your disk or what Docker calls a "persistent data-only volume".

The easiest way to get started is to use a local directory. Let's say you create a directory called */opt/qmldata* for QM to store its data in.

### Start the QueueMetrics image

You can easily start QueueMetrics with the syntax:

```
docker run --name=QM1 --volume=/opt/qmldata:/data -P -d loway/queuemetrics
```

If you do, Docker will download the current version of QueueMetrics from Docker Hub and will run it. The process typically takes only a few seconds.

When done, you can issue a "docker ps" to see what is happening:

```
# docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED
7c2920e8e28f       loway/queuemetrics "/ww/run"           12 seconds ago
```

This means that if you connect to your server as *http://server:32770/queuemetrics* (as written under the PORTS column) you will access your new QueueMetrics instance. You can see that the MySQL database and QueueMetrics configuration and license are visible under */opt/qmldata*.



If you want, you can run multiple instances of QueueMetrics on the same machine:

```
# docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS
7c2920e8e28f       loway/queuemetrics "/ww/run"          12 seconds ago     Up                  0.0.0.0:80->80
c152da318fe2       loway/queuemetrics "/ww/run"          17 seconds ago     Up                  0.0.0.0:80->80
6fef35c26c6d       loway/queuemetrics "/ww/run"          48 seconds ago     Up                  0.0.0.0:80->80
```

as long as each of them points to a separate data volume and has a proper license key.

## Accessing an instance using the shell

You can enter the QM1 instance by running:

```
docker exec -it QM1 bash
```

This will run a bash shell, and you can do whatever you want - install RPM packages, inspect the system, check error logs, make backups using mysqldump. Only keep in mind that all data that is not stored under `/data` is stored in the main image, and the main image will be removed on restart/upgrades.

## Terminating an instance

To terminate one instance:

```
docker stop QM1
docker rm QM1
```

Everything will be removed, but the contents of your data folder.

## Using a data-only volume

If you prefer, you can run QueueMetrics using a named data-only volume:

```
docker run --name=MYQM loway/data true
docker run --volumes-from MYQM -P -d loway/queuemetrics
```

This is very similar to using the local directory, though it makes your life harder to just check what is on the volume.

If you do not start QueueMetrics with a data container, it will create one within the current disk image - but when you throw away the image, all data created will be lost.

## Upgrading QueueMetrics

In order to do an upgrade, you must have started the original instance using a data volume or a shared folder.

If you did, you first download the new QueueMetrics image, then you stop (and remove) the current version and then run the image again using the same data folder:

```
docker pull loway/queuemetrics:latest
docker stop QM1
docker rm QM1
docker run --name=QM1 --volume=/opt/qmldata:/data -P -d loway/queuemetrics
```



At this point, it will just work.

Please note that system logs, the compilation cache and everything else that is not in your persistent data folder will be deleted.

## Tips and tricks

### Defining a fixed QM port

If you want an instance to use a fixed port (e.g. because you have a proxy in front), you can easily do that using the syntax:

```
docker run --name=QM1 -p 12345:8080 -P -d loway/queuemetrics
```

This will use local port 12345 and redirect it to the instance's port 8080.

### Configuring memory and time zones

The default QueueMetrics instance runs with just 128M of Java heap - not enough to run a large production server. You can tune the amount of memory the Java machine is to use by setting the "memory" parameter as shown below:

```
docker run -e CFG='{ "memory":400,"timezone":"GMT"}' --name=QM5 -P -d loway/queuemetrics
```

As you can see, the same works to set the instance's time zone, if it were to be different from the one your server is using.

### Configuring QueueMetrics properties

You can configure a QueueMetrics instance in many ways:

- Accessing it through your browser and configuring it
- Editing the contents of the data directory
- Using the QueueMetrics JSON services to create users and queues, and deploy a valid license

Though the third option is the most practical if you need to deploy a large number of instances, all three options are quite feasible.

## Configuring QueueMetrics

Now that you have got QueueMetrics running you need to configure it in order to retrieve data from Asterisk.

### Qloader configuration

On the Asterisk systems edit the `/etc/sysconfig/qloaderd` file; you need to set the following values in order to tell Qloaderd to work with the QueueMetrics database:

```
MYSQLHOST=  
MYSQLUSER=  
MYSQLPASS=
```

If you're running an Asterisk server cluster you also have to modify the PARTITION value, giving to each of them a different name (usually P001, P002, P003, etc). This is fundamental to avoid any possible concurrent writing issue.



Each Asterisk server's Qloader script have to use a different partition.

Now restart qloaderd:

```
service qloaderd restart
```

If Qloader is on a different machine than QueueMetrics (and MySQL) you will need to create a new database user able to connect remotely.

Log in MySQL as *root*:

```
# mysql -uroot -p
```

Once you're in create a new remote user and give it all grants on the *queuemetrics* database:

```
mysql> CREATE USER 'queuemetrics'@'%' IDENTIFIED BY 'javadude';
mysql> GRANT ALL PRIVILEGES ON queuemetrics . * TO 'queuemetrics'@'%%';
mysql> FLUSH PRIVILEGES;
```

## QueueMetrics configuration

If you have a single Asterisk server and have not modified the PARTITION value in the Qloader configuration add (or, if exists, modify), in the configuration.properties file, the following values:

```
default.queue_log_file=sql:P001
callfile.dir=tcp:admin:password@ip-address
# user:pass are the credentials for the Asterisk's AMI interface.
# You might have to configure a user in each of the
# Asterisk servers' /etc/manager.conf file.
# serverhost is the IP address of that server.
```

QueueMetrics is now already able to retrieve information from Asterisk. Instead, if you have a server cluster add or modify these values as follows:

```
default.queue_log_file=cluster:*

# Put here the server names (A, B, C, etc could be a choice) separated
# by a pipe.
cluster.servers=A|B|C

# For each of them put these values, replacing 'servername' with
# the name chosen above
cluster.servername.manager=tcp:user:pass@serverhost
# user:pass are the credentials for the Asterisk's AMI interface.
# You might have to configure a user in each of the
# Asterisk servers' /etc/manager.conf file.
# serverhost is the IP address of that server.
cluster.servername.queuelog=sql:partition-name
# partition-name is the value of PARTITION in the Qloader's
# configuration file in that server.
```

## Include QueueMetrics dialplan in Asterisk

Now, to enable QueueMetrics to place calls and log the agents on and off the queues you need to include the QueueMetrics dialplan in Asterisk. If you installed QueueMetrics with *yum*, you can find it in `/usr/local/queuemetrics/qm-current/WEB-INF/mysql-utils/extensions-examples/extensions_queuemetrics_18.conf`.

Copy the file under `/etc/asterisk/` then add the following line at the end of your `extensions.conf`, or `extensions_custom.conf` if your PBX has this file:

```
#include extensions_queuemetrics_18.conf
```

Then open the Asterisk CLI and reload the dialplan:

```
Asterisk CLI> dialplan reload
```

## Does it work?

QueueMetrics has some test tools to check if all is running the right way and for troubleshooting. The System Diagnostic Tools page offers a number of tools that check database and AMI connections and more (see Troubleshooting).

## Does it work?

Now, to check that everything works you can open your browser and point it to `http://hostname:8080/queuemetrics`, the first time you run it you might get an error, it will disappear in a few seconds and QueueMetrics will guide you through the database configuration; probably you'll just need to confirm without make any change. After that you will be able to log in with the default username *demoadmin* and password *demo*. Obviously, at the the moment, no data is shown.

## Applying a License

If you have a QueueMetrics license key you can apply it from the license page by clicking on Install new license key. You have to be logged as an administrator user. Alternatively you can modify the `LICENZA_ARCHITETTURA` parameter in the `/usr/local/queuemetrics/tomcat/webapps/queuemetrics/WEB-INF/tpf.properties` file.

## Troubleshooting

### QueueMetrics is not available

Often this is a firewall problem. First of all, check if QueueMetrics is running:

```
lsof -i -P | grep 8080
```

If it returns something then QueueMetrics is running; if so, do try temporarily stopping the firewall:

```
service iptables stop
```

Now retry pointing your browser to `http://hostname:8080/queuemetrics`.

If it works now, you should setup your firewall in order to accpet incoming connections to port 8080.

## Editing the configuration.properties file

The configuration.properties file is located in the system path but you can edit it from QueueMetrics interface clicking on *Edit system parameters*. When you modify this file, always remember to log out and log again in QueueMetrics to reload the configuration.

## The System Diagnostic Tools

QueueMetrics has some tools that help you to solve most of the possible issues. You can find them clicking on System Diagnostic Tools or pointing your browser to <http://hostname:8080/queuemetrics/dbtest/>.

- *View configuration*: this page lets you know what configuration properties are used by QueueMetrics and the JVM.
- *AMI tester*: it's useful to test to have a working AMI connection with the Asterisk server(s).
- *Live DB Inspector*: use it if you want to check QueueMetrics is receiving the correct data from the Asterisk server(s).
- *RAM caching*: it allows you to look at the QueueMetrics caching stats and to clean the cache when necessary.

## Version numbering scheme

Since January 2012, QueueMetrics uses a numbering system that is based on when a major release is built. The version is then year plus the month of the release. So 12.01.1 is the first in the family that was released in January 2012. See how easy that is? It is also nice because then you know exactly how old or new the version you are dealing with is.

Older versions of QueueMetrics had a "classical" numbering scheme, as per 1.2.3. There is no change on the licensing keys or anything else from the old to the new numbering scheme.

## Updating from a previous version of QueueMetrics

If you choose to update from a previous working version of QueueMetrics:

- Make a backup of the files *tpf.properties*, *agaw.properties* and *configuration.properties* that are found in WEB-INF/. To be extra-safe, make a backup of the whole working webapp and of the database being used.
- Unpack the new version of QueueMetrics
- Copy the old files *tpf.properties*, *agaw.properties* and *configuration.properties* so your licence and preferences are preserved
- Restart the servlet container
- Run the DB tester
- From the DB tester, run the database update utility
- Once the database update utility reports a success, you're ready to log-in to QueueMetrics

## Automatic update using yum

If you originally installed QueueMetrics using yum, you can upgrade your system using yum as well.

- Make a backup copy of the files *tpf.properties*, *agaw.properties* and *configuration.properties* that are found in WEB-INF/. To be extra-safe, make a backup of the whole working webapp and of the database being used.
- Type the following command:

```
yum update queuemetrics
```

and follow the update process. Yum will check if a newer version is available and will install it. - Restart QueueMetrics by entering:

```
/etc/init.d/queuemetrics restart
```

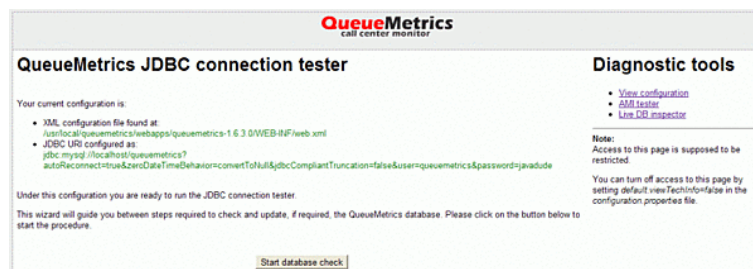
- Point your browser to <http://127.0.0.1:8080/queuemetrics/dbtest> and check if the database is consistent. If there are changes that need to be made to the old database schema, the database update utility (see below) will handle them automatically.
- If some configuration is missing, manually copy the files *tpf.properties*, *agaw.properties* and *configuration.properties* as needed.

See also Making settings permanent when upgrading through yum the section called “Manual installation of a license key” [12].

## The database update utility

QueueMetrics ships with an utility that makes it very easy to check and upgrade an existing database to the latest version used by newer versions QueueMetrics. *Before running the update utility, make sure you have a backup of the QM database!*

You can access it directly pointing your browser to <http://127.0.0.1:8080/queuemetrics/dbtest/>



Once you access the DB updater, it will check and update the database and then optimize it for maximum access performance. This may take a while if you have a lot of queue\_log data loaded into it.

From this very page, you can also check a number of system properties through the so-called DbTest Diagnostic Tools:

- The current QueueMetrics configuration.properties settings
- The Java environment used
- The Java memory and CPU settings
- Whether the AMI connection to the Asterisk is working

- The current Asterisk configuration
- The current MySQL storage data (with search ability)

For further details, see the complete description the section called “Using the DbTest Diagnostic Tools” [262] of the DBTEST module.



As this page lets you access the inner configuration of QueueMetrics, it should be turned off on publicly accessed systems. This can be obtained by setting a configuration parameter as detailed on the DBTEST page itself.

## Installing a licence key

QueueMetrics ships with a limited evaluation key that lets you use the system freely with up to two agents. If you need to evaluate with a larger call center, you will be sent a temporary key that will process as many agents as needed. The same happens when you decide to buy the product.

The key is a single long hexadecimal sequence with minuses in the middle and looks like the following string:

```
012345678-0987564D-3C082EF8-012345678-0987564D-3C082EF8
```

The length of the key may vary according to the features needed.

Once Loway sends you the temporary or official key, you can install it either through the graphical interface or manually through a shell.

## Installing a new key

Log on to QueueMetrics as "demoadmin" and click on the License page, if you have the correct grants you should see a label called "Install new license key"; click on it.

The screenshot shows the QueueMetrics web interface. At the top, there is a header with "Your Logo" and "Demo Admin | Administrator". The main content area is titled "Licence information" and displays the following details:

- Software release: Loway QueueMetrics - 1.7.1.0
- B: 3550 2011-05-26 09:36
- Firefox client version: 0.2.2 - [Install now](#)
- Licensed to: Demo-1.7.1.0 - [Install new license key](#)
- Maximum licenced agents: 2 [S:1]
- Licence expires on: 2012-05-24
- [Show end-user licence agreement](#)

A modal window titled "Install a new QueueMetrics key" is open, prompting the user to "Copy and paste your new activation code here:" into a text input field. Below the input field is a "Run »" button. At the bottom of the page, there is a footer with "Language pack: V:2011-05-18 12:17" and "System time: Java Time: 2011-05-27 12:19:56".

Copy the activation code you received by e-mail into the license box and press "Install". The system will restart in a few seconds (you may see a blank page - if you do, just try and reload). Log off and on again. On the License page you should see the new key.

If you see any errors, follow the manual installation procedure detailed below.

## Manual installation of a license key

- Locate the file WEB-INF/tpf.properties within the QM webapp
- Edit the file with a text editor
- Locate the LICENZA\_ARCHITETTURA variable and uncomment it if needed
- Insert your license key as value of the LICENZA\_ARCHITETTURA variable.
- Save the modified file
- Restart your servlet container
- Login to QM as usual using your browser
- Click on the "Licence" label to see your current licence.

When installing using yum, the *tpf.properties* file is automatically copied from the current version to the new one, without the need to do this manually. We anyway suggest that you make a backup of your existing configuration and database before upgrading, just to be on the safe side.

## License expiration notification

QueueMetrics will notify users on the Home Page when the license is about to expire; this helps preventing downtime in case a license actually expires without renewal.



It is possible to turn off this additional notification by setting a configuration property.

## Monitoring clusters with QueueMetrics

QueueMetrics is able to monitor clusters of Asterisk servers, in order to monitor large call centres that are spread over a number of physical machines. This setting is often used for large deployments, as it leads to a number of advantages:

- The overall call center is safer, as the failure of one single Asterisk box leads to a down of only part of the call center and not its entirety
- The call center can easily grow to hundreds of seats simply by adding more Asterisk servers, without special optimizations or weird configurations
- There is less risk of a deadlock on one single Asterisk instance, as the load on each box is kept low enough not to be a problem

In order to implement this, QueueMetrics has been extended to support the notion of *cluster*, that is a set of Asterisk servers working together as if they were one single box. The cluster can be set up as is better fit, for example:

- Different queues for each Asterisk box, or
- The same queues on more than one Asterisk box
- Some boxes are used for inbound and some for outbound



When QueueMetrics runs in cluster mode, the whole call center is monitored as if it were a big single Asterisk box, and the basic unit for reporting remains the set of selected queues. QueueMetrics will internally query the different servers or *queue\_log* files as needed, and will automatically dispatch events to the correct Asterisk box.

## Setting up a cluster

To set up a cluster, you should define the following configuration variables in configuration.properties:

```
cluster.servers=aleph|trix
```

This statement tells QM that the current cluster has two members, that are called "aleph" and "trix". We suggest using a short name for each server, as it will appear in many different screenshots. One option would be using the capital letters, like "'A", "B", "C" etc for different members of the cluster.

For each server (in our case "aleph", but we'll have to repeat it for all members of the cluster), we will define the following properties:

```
cluster.aleph.manager=tcp:user:pass@10.10.3.5
```

This tells QueueMetrics that the manager interface for aleph can be found at 10.10.3.5, logging in as "user" with password "pass". The manager interface is needed to run Live monitoring and can be used to run commands to Asterisk (like logging agents on and off, starting chanspy sessions, etc).

```
cluster.aleph.queue_log=sql:P001
```

This tells QM that the queue\_log file (or its contents) can be downloaded from partition P001 of the QM database. You must use MySQL storage in order for clustering to work at all.

```
cluster.aleph.monitored_calls=/share/aleph/calls/
```

This tells QM where to look for recorded calls on each Asterisk server. This is used by QueueMetrics in order to click-and-listen to recorded calls. A NFS or SMB share is usually a good starting point. As an alternative, you can enter the URL of an XML-RPC server that will return information about the recorded call (for more information on this topic, see the section called "Enabling XML-RPC call listening and streaming" [352]).

```
cluster.aleph.callfilesdir=/share/aleph/callfiles/
```

If you do not want to connect to your Asterisk servers using the manager interface, you still need a way to send it commands (e.g. to start a chanspy session). In order to do this, you should give QM a directory to write callfiles to. If you use the manager interface, leave this entry blank. (We strongly suggest doing so and using the manager interface instead).

```
cluster.aleph.audioRpcServer=http://myserver/xmlRpcServer
```

If you use an XML-RPC "broker" in order to used live calls listening using a third-party software like Orecx, you should enter its URL here. This must be activated at once for all servers by not leaving blank in the property default.audioRpcServer. In all other cases, just leave this property blank. (for more information on this topic, see the section called "Enabling XML-RPC call listening and streaming" [352]).

```
cluster.aleph.agentSecurityKey=AAA
```

When using the agent's page in cluster mode, you must make sure that each agent "points" to the correct server, as this server will be used for both pulling agent's data and sending logon/logoff commands. This is obtained on the agent's page through a pull-down menu where the agent must select the correct server he's logged on to. In order to avoid mistakes, it is possible to protect a server by adding a security key,

so that only agents having that security key will see that server. If an agent has only one possible server, that server will be automatically selected. In practice, this means that you could create two agent classes, we call them AGENT\_A and AGENT\_B. They have the same keys, but in class AGENT\_A there is the key SERVER\_A, and in the other SERVER\_B. We protect each server entry with SERVER\_A for the first and SERVER\_B for the other. Then we assign users to classes AGENT\_A (for agents working on the first server) and AGENT\_B (for agents working on the second server). If you want agents to manually switch servers, or your cluster is made up of only one machine, leave this blank.

## Setting up the members of the cluster

On each box that is a member of the cluster, you should set up the following items:

- *Call recording*: if calls are recorded to be played back through QueueMetrics, you should store them all in a directory that is accessible through the QueueMetrics server, or set up an external XML-RPC call broker.
- *Commands*: if commands are to be sent to each Asterisk box, you should set up the `[queuemetrics]` context in the dial plan, and make sure the manager interface is set up or the `/vars/spool/asterisk/callfiles` directory is shared and accessible to the QueueMetrics server. A sample `[queuemetrics]` context can be found under `WEB-INF/mysql-utils` in the directory `extensions-examples`.
- *Logs*: you should use `qloaderd` to upload data to a partition on the main QueueMetrics database. Make sure that each server uploads data to a different partition in the same database.
- *Clock*: make sure the clocks on all members of the cluster is synchronized, and the same goes for the clock used on the QueueMetrics box and on the MySQL database. An utility that sync your machine's clock to an external timing source like `ntpdate` will take care of this problem if run periodically through `cron`.

## Setting up QueueMetrics to access the cluster

First thing, you should make sure that you have a clustered license for QueueMetrics and that your license is big enough in terms of agents to support all agents that are present in the call-center. Older licenses are valid for one Asterisk server only and QueueMetrics will complain they are not correct. The first releases of QueueMetrics 1.4 will anyway allow accessing a cluster up to a specified future date (likely October 2007).

To report on all members of a cluster, you should set the property:

```
default.queue_log_file=cluster:*
```

This means that all boxes defined as members of this cluster will be used as a data source.

To report on a subset of the members of the cluster, you will use a syntax like:

```
default.queue_log_file=cluster:A|B|C
```

This way you will be reporting on boxes A, B and C.

If you want to report only on a single box, the syntax:

```
default.queue_log_file=cluster:C
```

Will be appropriate.

You can then change this property on-the-fly by going to the "Custom reports" page and editing as needed under the "File" text box.

If you have agents using QueueMetrics's Agent's pages, you should set them up so that each agents points to its correct server.

## Using the Agent's page with a clustered environment

The agent's page on QueueMetrics acts as a kind of portal for an agent; she can use it to log on, log off, go to pause, enter pause codes, launch external apps linked to a call (e.g. CRM apps) and enter call codes (see *The real-time agent page*).

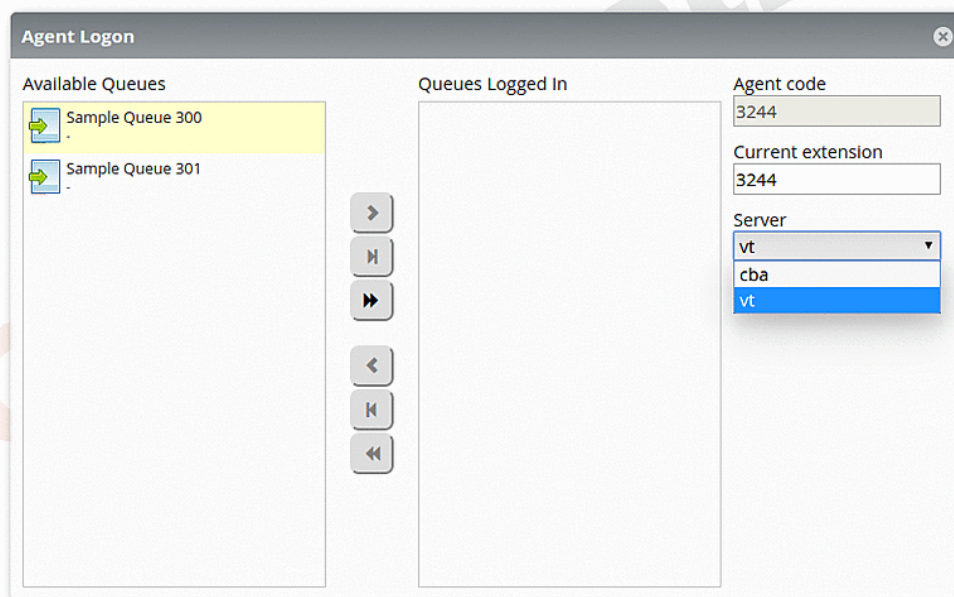
As the number of agents can be very high if compared to the number of supervisors who run reports or monitor the call center, QM uses a "minimal impact" policy: the page must be refreshed manually by each agent in order to avoid hammering the server with repeated page hits and the analysis run is a stripped-down, low-fat version of the full analysis QueueMetrics is able to perform. When coming to clusters, this means that to avoid useless load, calls for an agent will be searched only on the server the agent is working on and not on the entire cluster.

Also, we have the problem of defining where an agent is supposed to work: as QM can issue commands to Asterisk on behalf of an agent, it needs to know to which Asterisk server those commands must go. This is obtained by using the Server selection that will appear on the agent's page if QueueMetrics is running in clustered mode. If more than one server is selectable, the combo box will let the agent switch server as she best sees fit (if only one server is selectable, QueueMetrics will use that server immediately and will make the combo locked).

As a QM installer, you can control which servers are selectable to which agents by setting the properties `cluster.---.agentSecurityKey` correctly for each Asterisk server in the cluster.

## Logging into a server from the Icon Agent's Page

When working on a clustered environment, an agent is allowed to access only one server at a time. The server selection is usually done through the Agent Logon Panel, where you choose the queues to log on to, the server to use and the agent extension.



The screenshot shows the 'Agent Logon' window. On the left, under 'Available Queues', there are two entries: 'Sample Queue 300' and 'Sample Queue 301', each with a green arrow icon. In the center, there are five buttons: a right arrow, a double right arrow, a double left arrow, a left arrow, and a double left arrow. On the right, under 'Queues Logged In', there is an empty box. To the right of this box, there are three input fields: 'Agent code' with the value '3244', 'Current extension' with the value '3244', and a 'Server' dropdown menu. The dropdown menu is open, showing three options: 'vt', 'cba', and 'vt' (highlighted in blue).

the first time an agent logs into the Icon Agent's Page though, a special panel will appear that will ask the agent for the preferred server. This can be changed later on from the Agent Logon Panel.



There are some rules that QueueMetrics enforces, that must be understood:

- An agent can log onto only one server at a time.
- When the agent is logged onto a queue of a particular server, the server selection will be disabled.
- If a default server is set for the agent, QueueMetrics will disable the server selection for the agent, therefore the agent will not be able to use a server different from the default server.

To sum it up, an agent will be able to choose a server only if three conditions are met:

- QueueMetrics is working in Cluster Mode.
- The agent is not logged onto any queue in any server.
- There is no specified default server for the Agent.

## Understanding QueueMetrics memory requirements

To understand QueueMetrics' memory needs, you must consider that the memory requirements are roughly proportional to the width of the analysis and to the number of required events to track. You may think of it as the number of calls plus the number of agent events, i.e. agents logging on and off and setting pauses on and off.

Calls can be restricted by the queue filter, but all agent events in the required time window are tracked. This gives you an idea of the memory usage.

Though the actual memory requirements depend considerably on the actual content of your analysis and the exact brand and version of Java virtual machine that you are running, you should expect to be possible to track about 80,000 calls and 40,000 agent events with a standard 64 megabyte Java VM and Tomcat running.

You can of course start your servlet container with more memory in order to allow more room for larger analyses. The standard way in Tomcat is to pass additional Java parameters is to store them in the environment variable `JAVA_OPTS` before starting Tomcat.

Typing:

```
JAVA_OPTS="-Xms256M -Xmx512M -server"
export JAVA_OPTS
```

And then starting Tomcat will start up a Java virtual machine that has 256 megabytes of available memory and can use up to 512 megabytes, and runs in server mode. Consider that this memory is shared between all QueueMetrics users and all Java web-apps, so the more the better. Those opts are stored in a file called `/etc/sysconfig/qm-tomcat` when QueueMetrics is installed using `yum`.

Consider also that Java will never return this memory to the system free memory pool, even when it stops using it. The only way to have this memory returned to the system memory pool is to stop the Java VM and restart it. Therefore, it's a good idea to perform a scheduled restart of the servlet container, to avoid possible memory leaks and to reclaim now-unused memory to the main pool.

As a last note, the memory footprint of a Java VM may be quite larger than the memory you give it as Java heap space, as it will need RAM space for the VM itself and all its required libraries. Overheads of 50-100 megabytes are not unheard of, depending on the Java Virtual Machine in use.

A more in-depth discussion of QueueMetrics memory usage and live monitoring can be found on the "Advanced Configuration Manual", chapter "Tuning QueueMetrics memory settings".

A real-life example for a large call-center with about 400 agents logged on and running on a dedicated server may be like:

```
-Xms4096M -Xmx4096M -server -XX:+UseParallelGC -XX:PermSize=512M -XX:MaxPermSize=512M
```

But the actual optimal configuration on a large system should be determined by running the system for a while under the required workload and monitoring the actual resource consumption.

## Understanding basic security mechanisms

Each user accessing QM should have his own **user** and **password**. The administrator can easily setup multiple accounts from the administrative interface. All user activity is tagged to the user performing it, so it's a good idea to give an account to each person accessing the system. Accounts can be created, blocked and revoked in a matter of minutes.

Each feature that QM offers is enabled by a special **key**, as if there was a padlock protecting it from unauthorized access. The administrator gives each user a key ring that specifies which locks the user can open, and therefore what the user can do. A list of keys used in QM is available in Appendix A, *Security keys* [374].

To ease the burden of administering multiple users, keys can be grouped into **classes**. Each class offers the additional advantage of giving the key ring a label, so that it's easier to see whether an user is an Administrator, a User or an Agent by looking at the label and not at the very keys s/he holds.

Individual keys can be granted or revoked individually to handle special cases, in addition to the ones anyway present in the user's class. For more information, see Chapter 11, *Editing QueueMetrics settings* [207].

A list of default users provided with the standard QM installation and their default passwords can be found in the section called "Default users" [202].

Just to be on the safe side, QueueMetrics keeps an *Audit Log* of all activities that may have security implications; see The Audit log the section called “System audit log inspector” [265] for more details.

---

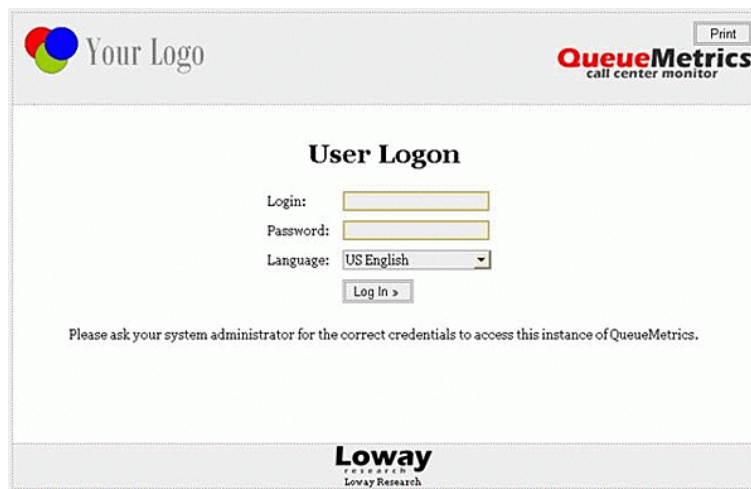
# Chapter 3. Logging on to QueueMetrics

To log on to QueueMetrics, you have to point your browser to the address of the server where you installed QM. As servlet containers are often installed on ports different than the standard HTTP one, it might be necessary to specify the port address.

For example, if you install Tomcat 5 on the same server you're accessing QM from, you may end up pointing your browser to: `http://localhost:8080/queuemetrics`.

Ask your system administrator for the correct web address of your instance of QueueMetrics.

If all goes well, you will see a page like the following one:



The screenshot shows the QueueMetrics user login interface. At the top left is a placeholder for 'Your Logo' with a colorful circular icon. At the top right is the 'QueueMetrics call center monitor' logo and a 'Print' button. The main heading is 'User Logon'. Below it are three input fields: 'Login:', 'Password:', and 'Language: US English' (with a dropdown arrow). A 'Log In >' button is positioned below the language field. A message below the button reads: 'Please ask your system administrator for the correct credentials to access this instance of QueueMetrics.' The footer features the 'Loway' logo and 'Loway Research' text.

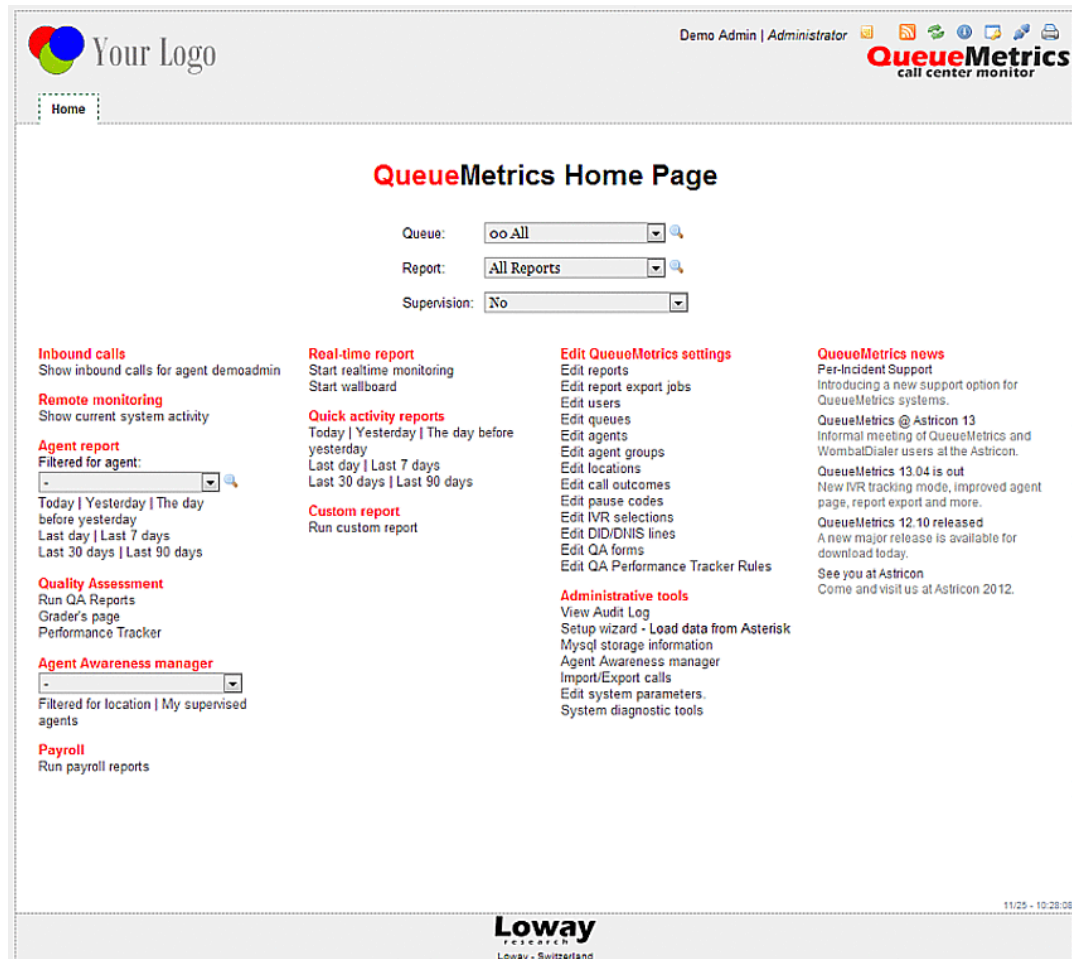
This and the following screenshots are taken using Opera 8 on Windows; other environments may present minor discrepancies from what is shown here.

If your system administrator has already configured QM, you might see your firm's logo on the top left part of the screen and a different welcome message.

To enter the system as a user, enter the standard credentials **demouser** with password **demo** and click on the "Log in" button, or use the credentials your administrator has provided.

If you prefer to use a different language from the default English, you can choose one of the other supported languages from the drop-down box. After choosing the language, the main page will be reloaded.





The user is presented with the Home Page, that is the starting point of QM. The name of the user and the current class for the user are shown on the top-right corner of the window.

To end the current session, you have to press the "Log off" icon or close the browser window.

To print the current page in a printer-friendly format, you just press the "Print" icon.

To see more details on the current user and change its access password, click on the "Info" icon.

To reset queue search parameter (time period, offset, multi-stint mode...) to the defaults without logging off and on again, press the Reload icon.

As of QueueMetrics 12.10 it is possible to view the *configuration.properties* file from the Home page. This is achieved by adding the key `EDIT_CFG` to the admin user, which will enable a link on the Home page, within the *Administrative Tools*, that will allow access to the file. It is possible to edit it either in unstructured format (as a text file), or for the most common options, a GUI interface is available as explained in the section called "Configuring system preferences" [257] .

## License information

Pressing the "Licence information" label, a page like the one below is shown.







The screenshot shows the QueueMetrics web interface. At the top left is a logo with three colored circles (red, green, blue) and the text "Your Logo". At the top right, it says "Demo Admin | Administrator" with some icons, and the "QueueMetrics call center monitor" logo. Below the logo is a "Home" button. The main content area is titled "Licence information". It displays the following details:

Software release:	<b>Loway QueueMetrics - 1.4.0-beta2</b>
Licensed to:	<b>SvilInternoQM13</b>
Maximum licenced agents:	<b>9999</b>
Licence expires on:	<b>2007-08-25</b>
Operating System:	O.S.: Windows XP - Ver: 5.1 - x86
Java Runtime:	Version: 1.4.2 Vendor: Sun Microsystems Inc. Class Version: 48.0 Java Home: C:\Programmi\j2sdk_nb\j2sdk1.4.2\jre
Loway TPF:	Version: \$Revision: 1.38 \$ #Build: 1169#D
Language pack:	\$Id: queuemetrics_en_US.properties,v 1.11 2007/06/11 20:52:29 lenz Exp \$

Below this, it states: "The official QueueMetrics website is located at <http://queuemetrics.com>."

Next is a section titled "Contributors". It says: "QueueMetrics would not be possible without the joint efforts of the following people:"

- Italian localization: Lorenzo Emilriti, Loway Research
- German localization: Thomas Dreiling, Tel2Web GmbH
- French localization: Vincent Nonnemacher, AgentSpace
- Latin America Spanish localization: Carlos Julio Moya, Colombia

Below this, it says: "The following high quality Free Software libraries and components are used by this work:"

- [Redstone XML-RPC library](#)  
Distributed under the LGPL, as of paragraph 6.0 of said licence.
- [The Silk icon set](#) by Mark James  
Licensed under a Creative Commons Attribution 2.5 License.

At the bottom, it says: "We offer all interested parties the opportunity to download said components sources at no cost from our web site at <https://www.loway.it/third-party>."

This page shows the current release of the software and the current license information.

If you are running a free demo version, you will see that the maximum number of licensed agents is 2 and an additional text will remind you on how to register.

You can also see some information being shown on the Operating System and Java version being used. Such information is very useful to in the case of errors and should be sent to Loway in the case you think you have found a bug.

If QueueMetrics is to be run on a publicly-accessible box, it is possible to hide all technical information from the user by setting a configuration property.

## Automatic URL login

It is possible to use a direct link to log in into QueueMetrics from an external browser application.

If you click on an URL like the following:



---

```
http://my.qm:8080/queuemetrics/qm_authentica.do?AUTH_logon=demoadmin&AUTH_password=
```

then the user will be implicitly logged in as "demoadmin" password "demo". Auth parameters can be passed in either HTTP GET or POST, with the advantage of POST of making them invisible to the calling user.

# Chapter 4. Running a report

To successfully run a report, your system administrator must have configured the correct queues in use on your system. You will find them in the drop-down menu on top of the page. See the section called "Configuring queues" [211] for details on how to do it.

## Quick activity reports

The quickest way to obtain an analysis is by selecting the queue and the report you want to analyze and then click on the appropriate time frame below the "Quick activity reports" title on the home page.

The defined time frames are the following:

- *Today, Yesterday, The day before yesterday* The day in question, starting from midnight to midnight
- *Last day, Last 7 days, Last 30 days, Last 90 days* The exact time period, starting from the current hour backwards.



QueueMetrics implements an extended dropdown that allows easy access to queues and reports. Extended options could be reached clicking on the magnifier glass located on the right side of the dropdown.

The system will then show the "Answered calls" page, like here below.

**Report Details:**

Atomic queue(s) considered:	00 All
Period start date:	June 22 2007, 0:00
Period end date:	June 22 2007, 23:59
Total calls processed:	1,702
	75.0% ans / 25.0% unans

### Answered calls

All calls:	
N. calls answered by operators:	1,277
Average call length:	60.0 s.
Min call length:	0:20
Max call length:	2:30
Total call length:	21.3 H
Average call waiting time:	13.3 s.
Min waiting time:	0:10
Max waiting time:	0:20
Total waiting time:	4.7 H

Calls fully within the given time interval:	
N. calls answered by operators:	1,276
Average call length:	60.0 s.
Min call length:	0:20
Max call length:	2:30
Total call length:	21.3 H
Average call waiting time:	13.3 s.
Min waiting time:	0:10
Max waiting time:	0:20
Total waiting time:	4.7 H

### Agents on queue

Agent	N. Calls	...
John Doe (101)	213	16.7%
Mike Boo (102)	425	33.3%
agent/103	213	16.7%
agent/104	426	33.4%

Export as...

On top of the page, you can see a multi-tab menu; by clicking on it you can select which part of the report you are going to see. To go back to the home page, click on the "Home" tab. You can also see all the analyses at once by clicking on the "All" label (this is mostly useful when printing the results to paper).

## Agent report

If the user has the appropriate grants, s/he can restrict the analysis to a single agent. This way one can see exactly what one agent did.

To use this feature, select the agent you want to filter by and click on the desired time period in the "Agent report" section of the Home Page.

If you are running an agent-restricted report, you should know that:

- For inbound traffic, no calls are shown in the "Lost calls" page. This is because an inbound call that has been lost has never been connected to any agent, so there is no way to attribute them to one single agent.
- All outbound calls placed by the agent (answered or not) are shown
- Agent statistics are shown only for the given agent
- As always, activity is restricted by queue - no activity but the one happening on selected queues is shown.

## Custom reports

Custom reports are available by clicking on "Run custom report" from the Home Page.

A new menu will appear, asking for custom report parameters:

## Custom report analysis

### Report Details:

Queue:

Report:

Time period:

Call start date:

Call end date:

File:

### Call filtering criteria

Agent:

Location:

Agent Group:

Outcome:

Call features:

Call tags:

### Preferences

Hourly slot (minutes):

SLA: initial period:

SLA: initial interval:

SLA: max period:

SLA: interval:

### Variables

Skill set: 

Skill	Threshold
<input type="text" value="-"/>	<input type="text" value=""/>

Variables:

Asterisk call-id:

Caller:

Wait duration: Between  and  s.

Call duration: Between  and  s.

Disconnection cause:

Enter position: Between  and

Number of attempts: Between  and

DNIS:

IVR choice:

Server:

Time zone offset:

Join multi-stint calls:

Non-contiguous time: 

SUN	MON	TUE	WED	THU	FRI	SAT
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Between <input type="text" value=""/> and <input type="text" value=""/> (hh:mm)						
Between <input type="text" value=""/> and <input type="text" value=""/> (hh:mm)						

The meaning is as follows:

- *Queue* is the queue or composite queue you want to analyze;
- *Call filtering criteria* can be specified by clicking on the title to open it (see below);
- *Start* and *end date* let you select the period you want to analyze, with five-minute resolution or, optionally
- *Time period* a fixed time period in the past you want to analyze.
- *File* is the queue\_log file you want to analyze. You may want to change it to run reports on a different Asterisk server or on an older archived version of your queue\_log. If you run QM on the same machine as Asterisk, the file name should be already correct. Make sure the file is readable to your servlet container. If you use MySQL storage or clusters, the file will look something like "sql:P001" or "cluster:\*"
  - *Time zone offset* is to be set if the Asterisk server that created the queue\_log file was in a different time zone from the one you are using.



- *Join multi-stint calls* lets you join together the pieces of the same call if it has been processed by more than one Asterisk queue (see the section called “Multi-stint calls” [49] ).

By clicking on the "Run custom report" button, you can run the analysis, which output is the same as the "Quick activity report" and will be explained below.

## Call search criteria

A number of criteria can be specified to better zoom in on a given set of calls.

- *Agent* is a specific agent code
- *Location* is a given location
- *Supervision* lets you search only for agents that have the current user as their supervisor
- *Outcome* lets you select a call outcome
- *Call features* lets you select a call feature code
- *Call tags* lets you filter by call tag
- *Variables* lets you filter by a generic variable associated to a call
- *Asterisk call-id* search by substring on the Asterisk's UniqueID of the call
- *Caller* search by substring on the Caller-ID
- *Wait duration* lets you specify the call waiting duration
- *Call duration* lets you specify a minimum and maximum for the call duration
- *Disconnection cause* lets you pick a disconnection reason for the call
- *Enter position* lets you enter a minimum and maximum enter position (note: this is not tracked for every call)
- *Number of attempts* lets you select a given number of attempts
- *DNIS* lets you select calls that have a specific DNIS (if tracked)
- *IVR choice* lets you select calls that have a specific IVR choice (if tracked)
- *Server* for clustered systems, lets you select only calls that were processed on a given server
- *Non-contiguous reports* let you choose the day(s) of the week and the time periods that you want to include in the reports.

Note that:

- Criteria involving a full-text search (e.g. Caller) can optionally support full Regular Expressions; if they start by "^" they will be processed as Regular Expressions. E.g. entering "^d+\$" means "find all fields which value is made up only of numeric characters, having at least one character".
- Criteria involving a time-range require you to enter both time values as *HH:MM:SS* or *HH:MM*. Invalid values cause the time-range to be ignored.
- Criteria involving an integer range can optionally be left blank; leaving the minimum value blank is the same as entering "0", while leaving the maximum value blank equals to "any number".

- Invalid criteria are discarded and are not used as restriction. The list of applied criteria is shown on the "Common header" that is available on every page.
- If multiple criteria are input at the same time, they are AND-ed together - that is only calls that suit all given criteria will be shown.
- Running criteria with multi-stint calls may or may not lead to the results you are expecting. See the section called "Multi-stint calls" [49] for more information on this issue.

Search criteria are ignored for real-time reports.

When a report is run with criteria set, all statistics are computed "as if" those were the only calls available; so e.g. agent sessions may yield different results from what you would get with no criteria.

## Persistent user properties

Per-user persistence settings allow user search configuration to be stored and kept even after log off and can be changed and re-stored at any stage.

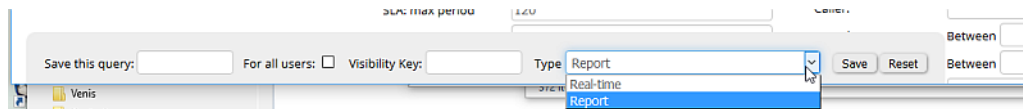
Custom Reports maintain the latest query parameters entered, even when a user logs off and logs back in, in order to facilitate the work-flow of a user requiring the same reports on a daily basis. The Refresh button allows to clear the input query parameters at any stage.

## Preferences

The value set in *default.hourly\_slot* acts as a default for a drop down box that is available within the Preferences of the Custom Reports page. User that edit this value basically override the default and can change it to a set of predefined durations: 1, 2, 3, 5, 10, 15, 20, 30, 60, 90, 120, 240 and 480 minutes. Once this value is edited, it stays the same until the user logs off or changes it again. This option adds persistence (per user) to the options set in Custom Reports. This makes the user-accessible customisation options of QM persistent.

## Saving queries

Users holding SQUERY\_ADD security keys are allowed to save queries for later usage. If holding also SQUERY\_FORALL, saved queries will be visible for all users if required, otherwise query visibility is restricted to that specific user. Queries can be saved from the custom report page, where a bottom line is shown, as reported below.



Saved queries are listed on the home page, grouped between historical reports and realtime reports.



Last day | Last 7 days  
Last 30 days | Last 90 days

**Custom report**  
Run custom report



**Saved report queries**  
A300 QuickAgents

**Saved real-time queries**  
00All\_SK1 | A400 SK2 | A400 SK3\_33 |  
All Queues SK3\_33

Users can run the saved queries by clicking on it. If holding the SQUERY\_ADD security keys, users can edit already saved queries through the pencil icon shown when flying over the query link, as reported below:

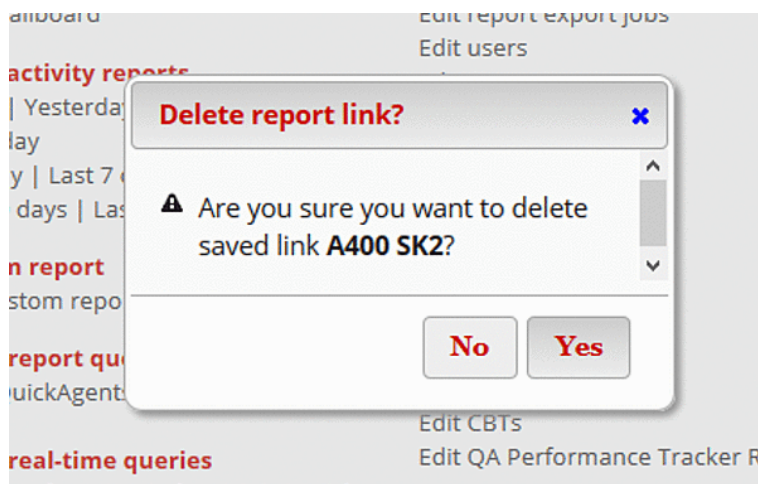
**Saved real-time queries**  
00All\_SK1 | A400 SK2 | A400 SK3\_33 |  
All Queues  

Users can delete their own keys by clicking on the proper key shown when flying over the query link:

**Saved real-time queries**  
00All\_SK1 | A400 SK2 | A400 SK3\_33 |  
All Queues  

A popup will be shown asking for confirmation





## Understanding results: Common header

On the top of each report, a box will be shown showing:

- Which queue or queues were considered for the analysis
- The time period the analysis refers to
- Whether the report is about the whole of the queue or is filtered by some criteria
- The total number of calls processed for this analysis, divided into answered and unanswered ones.
- If running in multi-stint mode, the total number of calls that were joined together

There is also a box showing a number of analyses you can export in CSV format.

When running in report mode, QM distinguishes between calls or agent sessions that are complete and calls or agent sessions that are "ongoing" at the moment the report was taken.

Ongoing calls or sessions are usually marked in red and counted separately, as data for them is not definitive and will appear differently if you run further reports.

You should also note that a call that has not been answered yet will be counted as "Ongoing unanswered", though it may well be answered in the nearest future by one of your agents.

In any case, if you need to see calls in progress or whether an agent is logged in, you should rely on the Real-time panels and not on the reports.

TIP: The number of decimals is usually set to 1 but can be changed to 2 via the property:  
*default.decimalDigits=1*

## Exporting data from reports

It is possible to export data in Microsoft Excel, Comma-Separated Values (CSV) or XML right from most QueueMetrics panels.

Agent	M. Calls	%
John Doe (100)	215	10.7%
Jane Doe (100)	428	20.7%
Agent101	215	10.7%
Agent102	428	20.7%

By clicking on the Excel, CSV or XML icons below each report, it is possible to save exactly the same report as seen on screen and then edit it using your favourite number-crunching software.

You must be logged in to download the reports, as you see them on screen.

Users holding the key USR\_REPORTS\_EXPORT could export the whole analysis to a PDF or XLS files by mean of the two buttons located on the report header, as shown below:



If you are looking for an automatic way to export a full analysis to one file, you should probably have a look at the section called “Automating statistics download: the ROBOT profile” [203].

## Understanding results: Answered calls

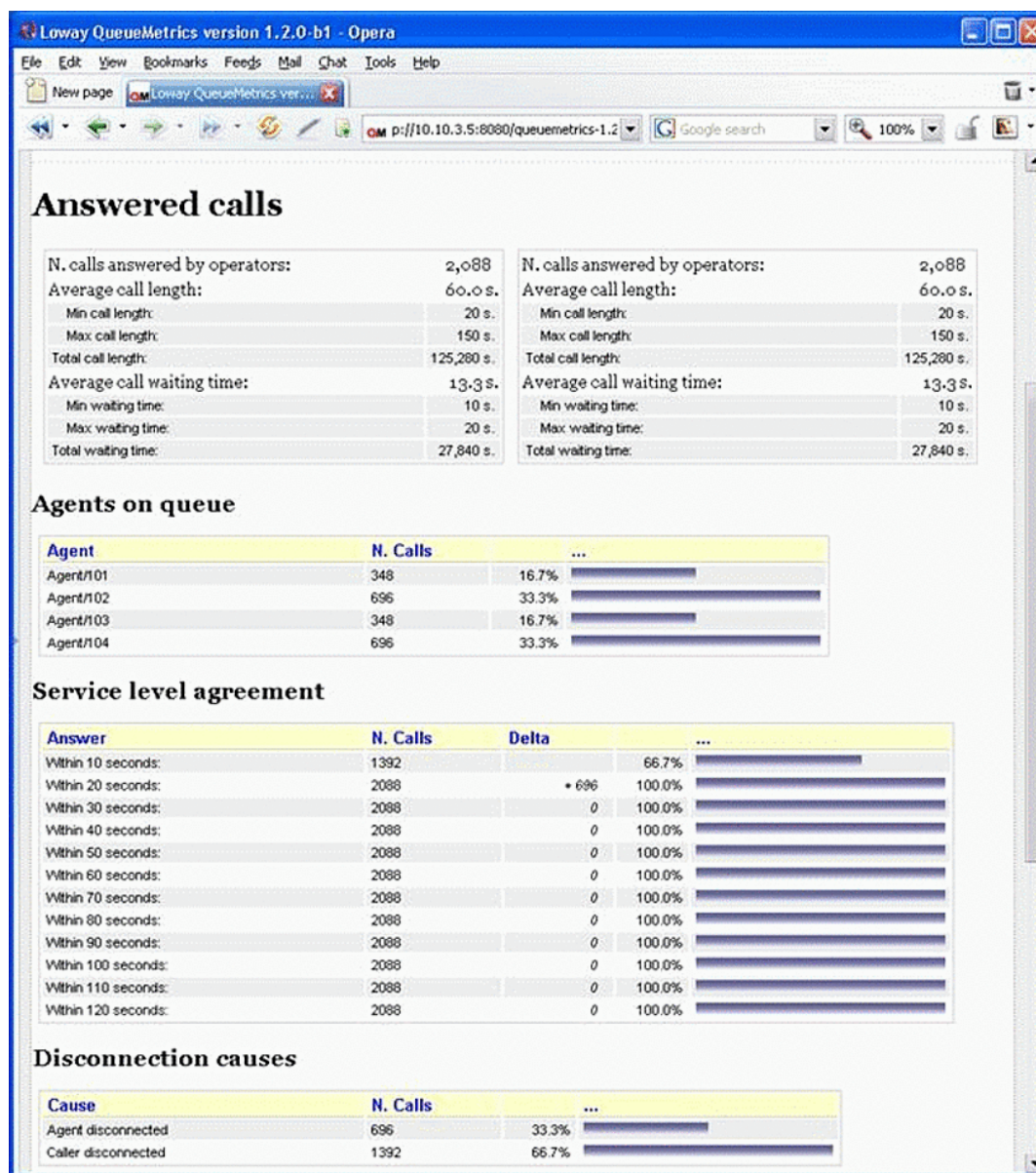
The answered calls section deals with calls that were correctly handled by agents.

The top panel shows:

- How many calls were handled;
- The average call length (i.e. time the caller spends talking to an operator);
- The maximum and minimum call lengths recorded for the given time period;
- The total call length (for all calls on all operators);
- The average call waiting time (i.e. the time a caller was waiting on a queue before being connected to an operator).
- The minimum and maximum call waiting times on record
- The total waiting time for all handled calls.
- The average initial position of the call in the queue
- The minimum and maximum initial queue positions that have been detected

- The queue position coverage: as this information is not tracked for all calls, this ratio shows the average number of calls that had queue position record.

You can see that the information above is reported twice: on the left for all calls, including incomplete ones, and on the right for complete calls only, i.e. excluding calls that were started before or terminated after the given time frame.



## Agents on queue

This report shows which agents have been available for the given queue, how many calls each one handled and the percentage of all calls that each one handled.

If calls are connected directly to a phone terminal, QM tries its best to show the corresponding terminal, usually in the format used by Asterisk, like "SIP/303" to signify a SIP phone whose number is 303.

If you connect to H.323 telephones via the OH323 module, the recorded channel names have no meaning and do not refer to a specific terminal; that's why all OH323 calls are grouped together under the label "OH323/-".

## Service level agreement

This report shows the distribution of call waiting times. It shows how many calls were answered within a given time frame, usually 120 seconds in 10 second increments (the time frame and increment can be modified by the administrator, if needed - see the section called "Configuring system preferences" [257] ).

It is also possible to have two time frames in order to have a higher granularity for shorter time periods - e.g. having SLA computed in intervals of 5 seconds up to 20 seconds, and in intervals of 10 seconds up to 120 seconds.

You get a percentage of how many calls were answered within X seconds; the percentage includes calls answered in a shorter time frame and therefore grows with time.

The "delta" value you see is the absolute increment, expressed in number of calls, between each time frame.

This metric is computed only on answered calls, i.e. ignoring lost calls . If your SLA is defined in terms of taken and lost calls, see the corresponding metrics "Inclusive SLA" on the section called "Inclusive Service Level Agreement" [36].

## Disconnection causes

This report shows the reason why calls were terminated; this means that:

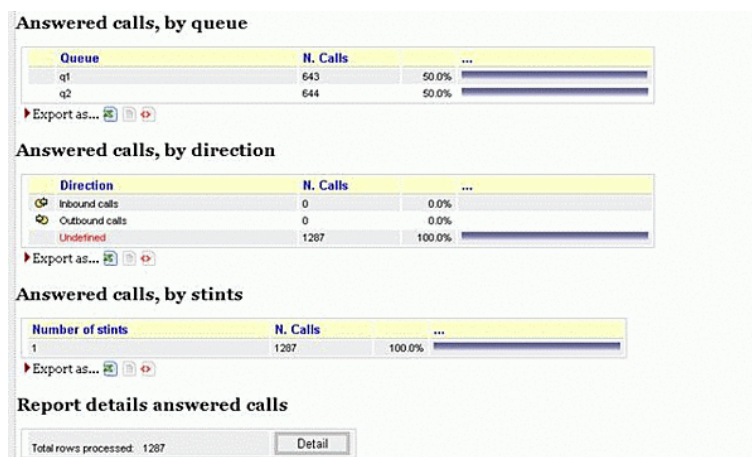
- The agent hung up, or
- The caller hung up, or
- The call was transferred outside the queue and the agent was freed again, or
- The call was ongoing at the time the report was run.

## Transfers

This graph shows how many calls were transferred to each extension in the given time frame. This lets you know who is handling exception calls.



when a call is transferred outside the queue system, its length is no more recorded by the queue subsystem; therefore you only get to see the length of the call while the agent was on line.



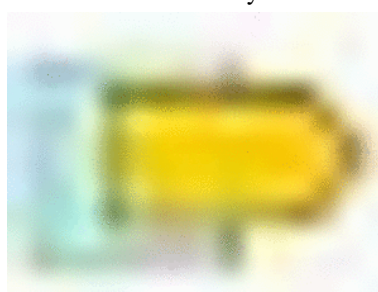
## Answered calls by queue

If more than one queue is in use for the report, this graph shows the relative magnitude of each queue.



Inbound queues are marked with the symbol

while outbound queues



use the symbol

## Answered calls by direction

If more than one queue is in use for the report, this graph shows the relative magnitude of inbound versus outbound calls made.

## Answered calls, by stints

This graph counts the distribution of multi-stint calls on selected queues. If multi-stint mode is not enable, all calls will have only one stint.

## Queue position

This graph shows the initial queue position that the calls had when they joined the queue. For example, a queue position of 1 means that a call was first in line, of 5 means that a call had four other calls in



line before being answered. As the logging of queue positions is a bit inconsistent, some calls might be missing it ("Untracked")

## IVR selection

This graph shows the distribution of IVR selections available in the calls processed.

This must be tracked manually in Asterisk - See "Configuring Asterisk for QueueMetrics" below.

## DNIS used

This graph shows the distribution of DNIS lines available in the calls processed.

This must be tracked manually in Asterisk - See "Configuring Asterisk for QueueMetrics" below.

## Detail of answered calls

This page shows the detail of answered calls. See Chapter 5, *Showing call details* [59].

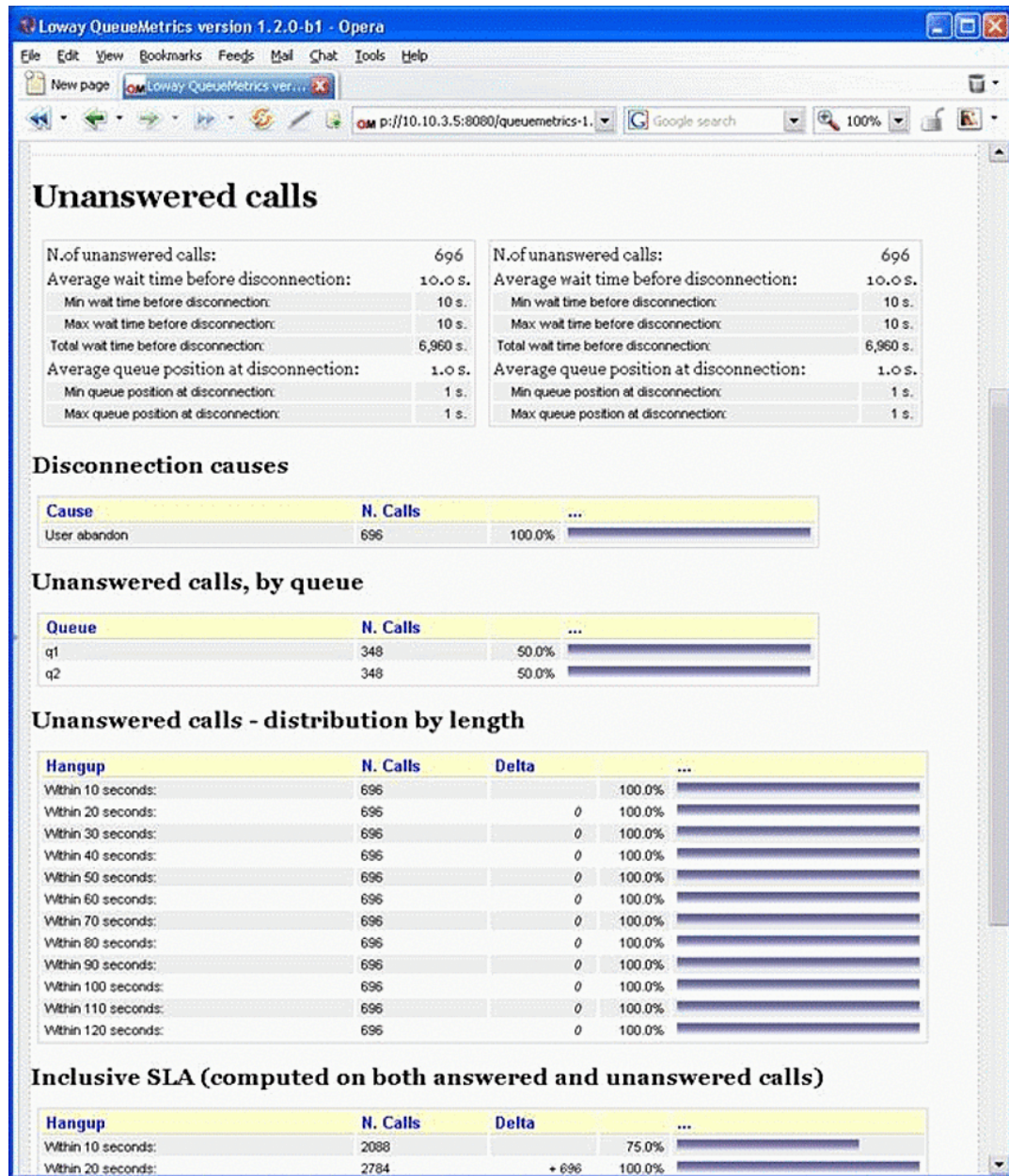
## Understanding results: Unanswered calls

Unanswered calls are calls that were lost, i.e. the caller could not connect to an agent. This usually means that either the caller hung up, fed up with waiting, or the queue system decided to discharge the caller, maybe sending him to voicemail or another queue.



if you run a report with an agent filter, or a supervisor filter, or a location filter, the number of lost calls in the report is usually zero, showing just outgoing calls, if any. This is because the agent is specified only for taken calls and not lost ones, so not deleting them all would show, e.g., the taken call data for one single agent and the lost calls for all of the queue. You can override this behaviour through a configuration switch if you feel this is not correct for you.

The Unanswered calls page looks like the following picture:



The report shows:

- How many calls were lost;
- The average waiting time before disconnection;
- The average queue position at disconnection (i.e. how many calls the queue had to dispatch before connecting the caller to an operator).
- The minimum and maximum wait times
- The minimum and maximum queue position at disconnect.
- The average, minimum and maximum initial queue position, and the coverage given for this computation

As with answered calls, this report is computed twice; the version on the left is for all calls monitored, while the version on the right only holds data for calls that were complete at the moment the analysis was run.

## Disconnection causes

This report shows the relative magnitude of disconnection causes, that are:

- The caller hung up, or
- The queue timed out and discharged the caller (if this feature is enabled by the queue configuration - see Chapter 18, *Configuring Asterisk for QueueMetrics* [345]), or
- The caller exited the queue by pressing a key (if this feature is enabled by the queue configuration).

## Unanswered calls, by queue

If more than one queue is in use for the report, this graph shows the relative magnitude of each queue.

## Unanswered calls - distribution by length

This report is functionally equivalent to "Service level agreement" in the Answered calls section (see the section called "Service level agreement" [32]), but is computed on lost calls. It shows how many calls were hung up within a given time frame, usually 120 seconds in 10 second increments (the time frame and increment can be modified by the administrator, if needed - see the section called "Configuring system preferences" [257]).

You get a percentage of how many calls were lost within X seconds; the percentage includes calls lost in a shorter time frame and therefore grows with time.

The "delta" value you see is the absolute increment, expressed in number of calls, between each time frame.

## Inclusive Service Level Agreement

The inclusive SLA corresponds to the Service Level Agreement metrics shown on the section called "Service level agreement" [32], with the difference that it is computed taking into consideration both answered and unanswered calls.

## Unanswered calls by key press

If there are any calls that were set unanswered because the caller pressed a key to exit the queue, this graph shows which keys were pressed and how many calls were terminated for that reason.

## Unanswered calls, by stints

This graph tells the stint distribution of unanswered calls. It corresponds to the graph called "Answered calls, by stints".

## All calls, by stints

This graph tells the stint distribution of all processed calls. It corresponds to the sum of the graphs called "Answered calls, by stints" and "Unanswered calls, by stints"



## Enter queue positions

This graph shows the initial queue position that the calls had when they joined the queue. For example, a queue position of 1 means that a call was first in line, of 5 means that a call had four other calls in line before being answered. As the logging of queue positions is a bit inconsistent, some calls might be missing it ("Untracked")

## Enter queue positions for all calls

This graph shows the initial queue positions for both answered and unanswered calls.

## IVR selection

This graph shows the distribution of IVR selections available for lost calls.

This must be tracked manually in Asterisk - See "Configuring Asterisk for QueueMetrics" below.

## IVR selection for all calls

This graph shows the distribution of IVR selections for all calls (taken and lost) available in the report.

## DNIS used

This graph shows the distribution of DNIS lines that lead to lost calls.

This must be tracked manually in Asterisk - See "Configuring Asterisk for QueueMetrics" below.

## DNIS used, for all calls

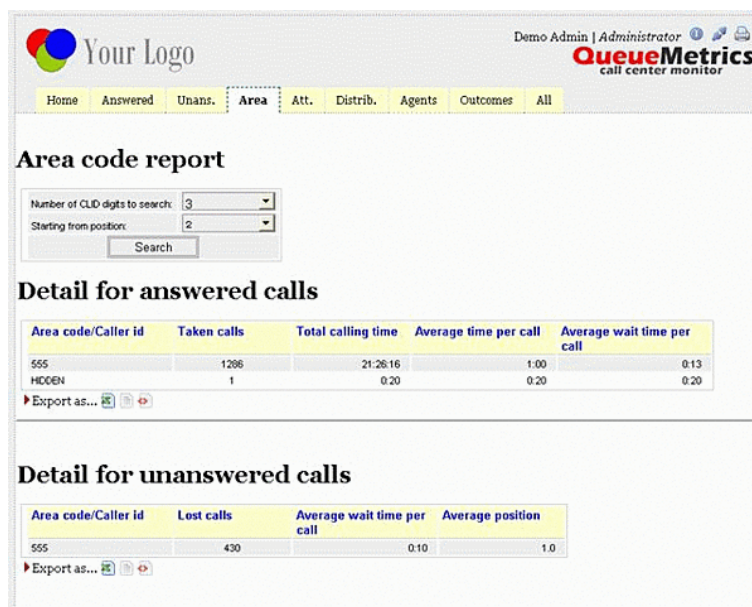
This graph shows the distribution of DNIS lines for all calls (taken and lost) available in the report.

## Details of unanswered calls

This page shows full details of unanswered calls the section called "Detail of unanswered calls" [63].

## Understanding results: Area code report

If the Caller\*ID is present, it is possible to break down both answered and unanswered calls to specific area codes by clicking on the "Area code analysis" button.



By selecting a number of caller id digits to search upon and a starting digit position, you get a number of statistics grouped by area codes.

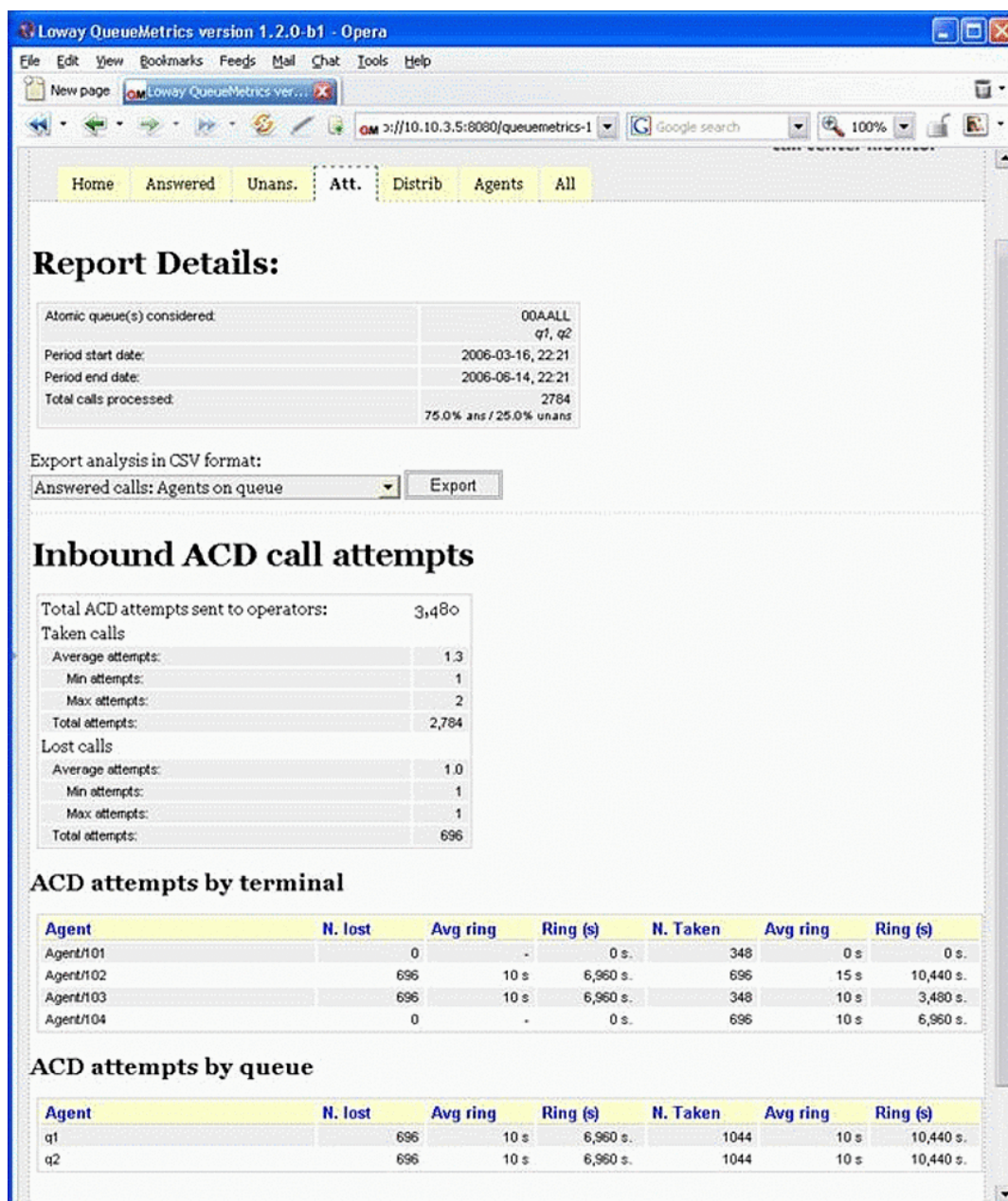
This report gives an immediate check of the geographical origin of calls handled by your call center.

It is possible to export all the reports as needed.

## Understanding results: Inbound ACD call attempts

When running an inbound call center, it is very important to determine the reason why a call is delayed: are your clients refusing to answer? Did they forget to log off before leaving their workplace? The inbound ACD call attempts metrics try to answer to these questions.

As these metrics are not usually recorded by Asterisk, you'll have to patch and recompile your Asterisk system in order to gather them - see the section the section called "Enabling ACD call attempts recording on Asterisk 1.0 and 1.2" [349]. If you do not do so, the metrics presented here will always appear zeroed out. With Asterisk 1.4, this feature should be automatically enabled with no need to patch the source code.



This page shows the following pieces of information:

- How many agent attempts were made, i.e. how many times the agent's telephones were rung in total
- The average number of attempts that were necessary for a taken call; the minimum, maximum and total attempts made that resulted in a taken call
- The average number of attempts that were necessary for a lost call; the minimum, maximum and total attempts made that resulted in a lost call

## ACD attempts by terminal

This graph breaks down agent attempts by the agent that was called. The following pieces of information are extracted for each agent:

- N. of lost agent attempts (i.e. the agent was called but not responding)
- The average ring time for lost attempts
- The total ringing time for lost calls
- The number of taken agent attempts (i.e. calls answered)
- The average ring duration for taken calls
- The total ring time for taken calls

## ACD attempts by queue

The following metrics are extracted and broken down by queue:

- N. of lost agent attempts (i.e. the agent was called but not responding)
- The average ring time for lost attempts
- The total ringing time for lost calls
- The number of taken agent attempts (i.e. calls answered)
- The average ring duration for taken calls
- The total ring time for taken calls

## Understanding results: Call distribution

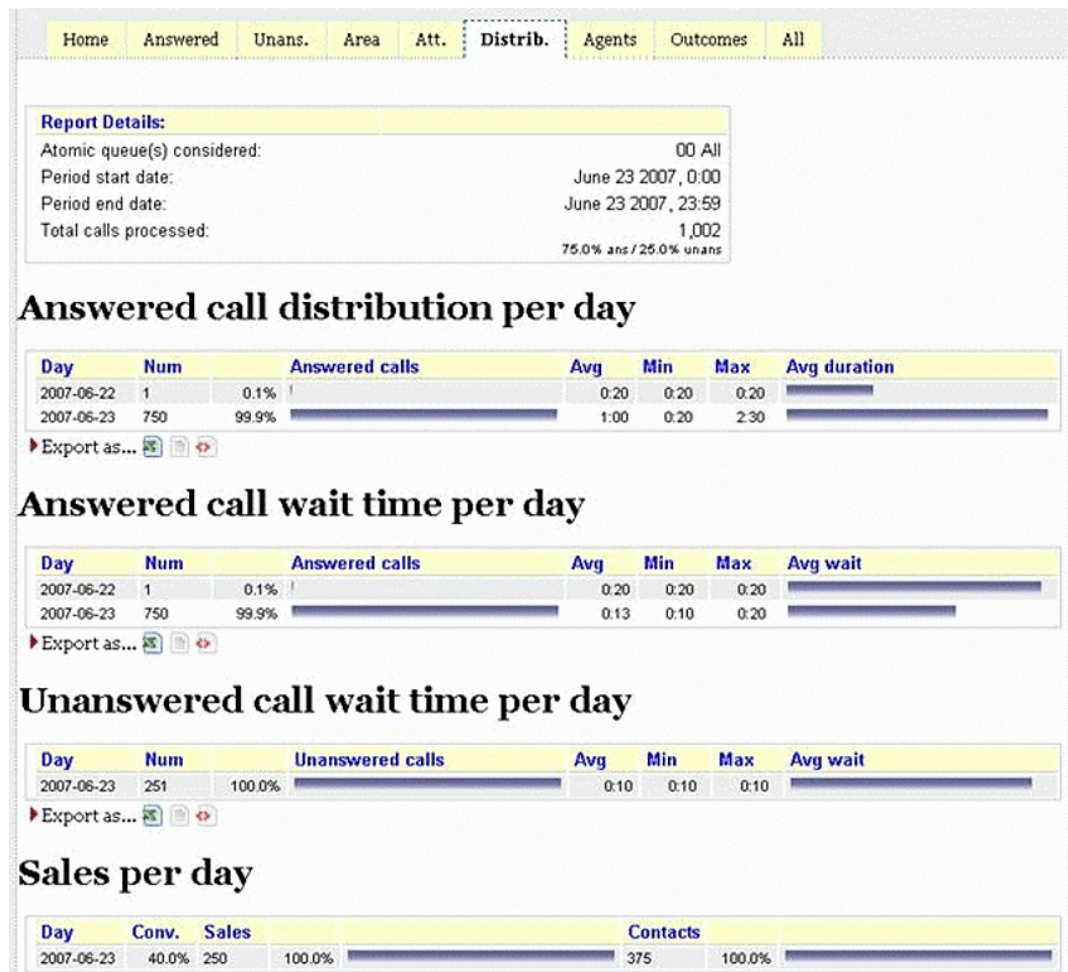
The call distribution report shows when calls were handled, when calls were lost and the average wait times broken down by period.

All percentages are calculated on the call class they belong to, i.e. a 50% of "Unanswered calls" on one day means that 50% of all unanswered calls for the period happened during that day, not that 50% of calls were lost.

For each metrics, the total number of calls is shown, together with average, minimum and maximum times. Graphs are plotted on the total number of calls broken down and on the averages.

It is possible to change the interval in the Hourly graphs, so that you can have reports break down calls e.g. by half-hours or hour quarters, by changing a value in the QueueMetrics master configuration file.



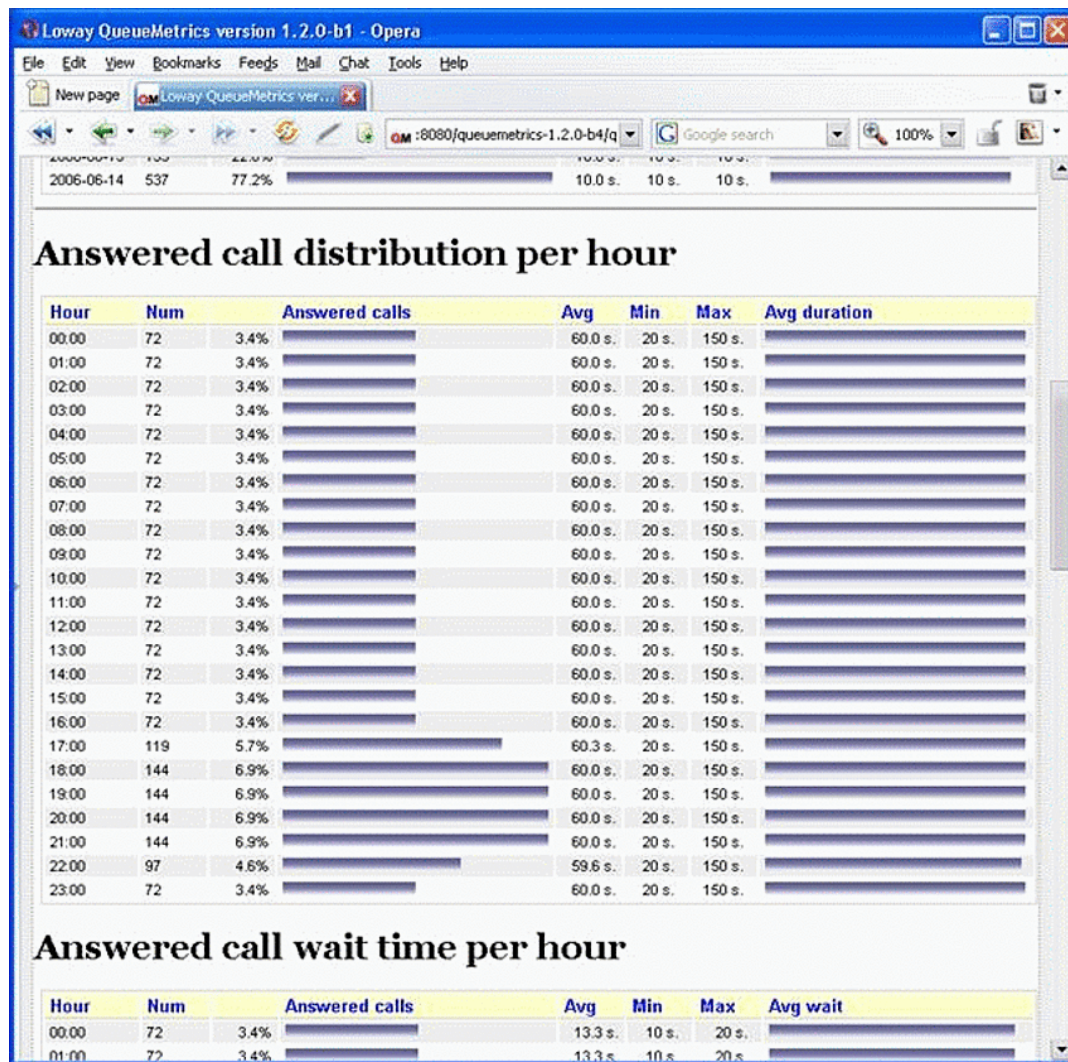


## Call distribution per day

Calls, both taken and lost, are shown per specific day. Days with no events are not shown. The total numbers of call lengths, wait time for answered calls and wait time for unanswered calls are plotted for each day. Sales and contacts are also shown on a daily basis.

The Schedule Adherence report shows the number of distinct agents that were detected during the given period. This makes it possible to detect the number of different people that had been working on a given moment.

The Queue Length report shows the average length of the queue for each period, giving minimums and maximums. The Steps computation shows how fast each queue progresses during the period, expresses in steps per hour. Note: giving a meaning to the Queue Length reports may be hard in the case of composite queues.

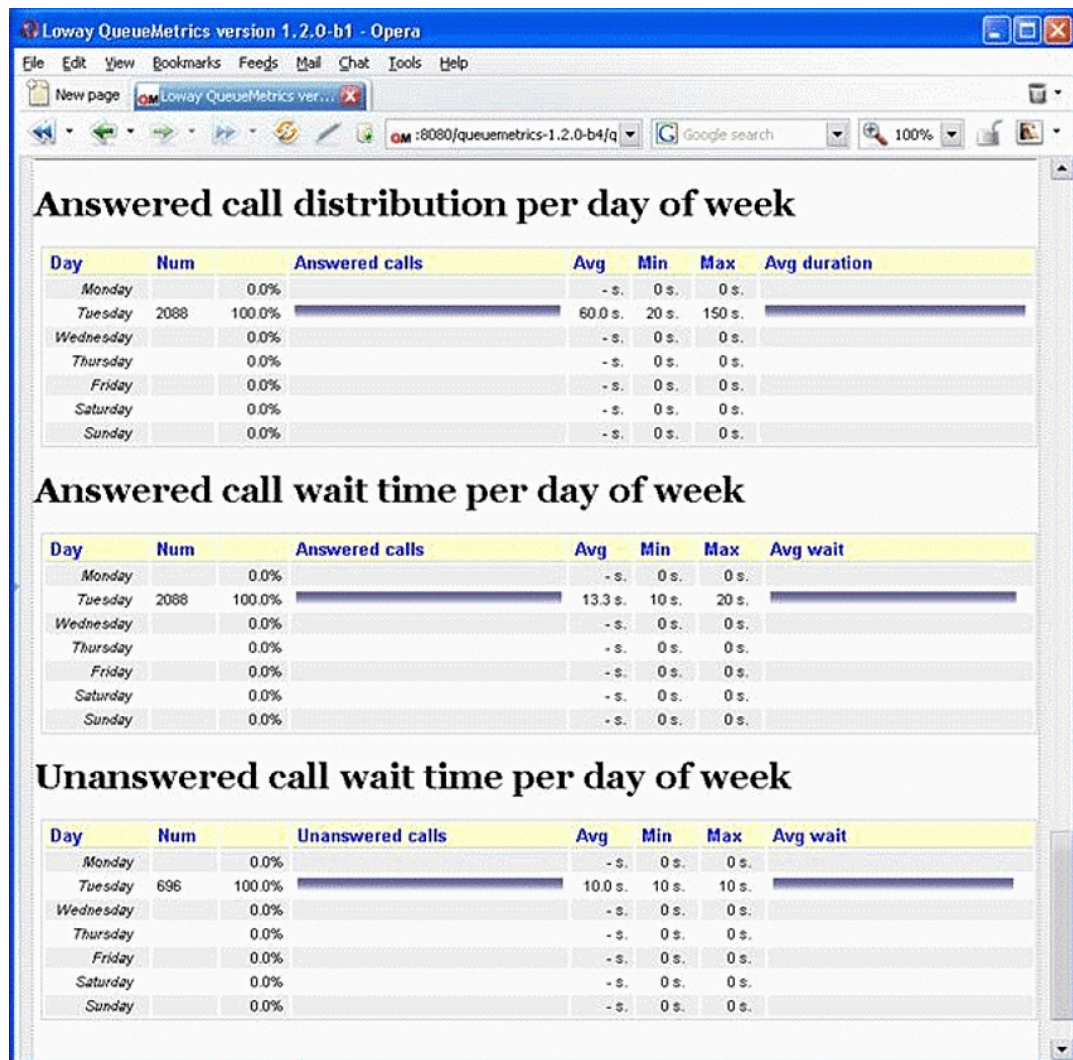


## Call distribution per hour

Events are shown on a 24-hour distribution. If this graph appears to be incorrect, you have to run a "Custom report" setting the time zone accordingly (see the section called "Custom reports" [24]).

The total numbers of call lengths, wait time for answered calls and wait time for unanswered calls, together with sales and contacts, are plotted for each hourly interval. The size of hourly intervals can be controlled by the *default.hourly\_slot* configuration property, making it possible to run this reports based on 30-minute, 20-minute or 15-minute intervals.





## Call distribution per day of week

This report shows the weekly behaviour of your queues. The longer the analysis period, the more significant its results will be.

The total numbers of call lengths, wait time for answered calls and wait time for unanswered calls are plotted for each day of the week.

## Understanding results: Agent activity

Agent activity refers to the behaviour of Asterisk defined agents. If you connect your queues straight to telephone terminals, this section will always be empty.

Each agent may be flagged as being a member of four priority groups:

- *Main*: the agents usually answering the queue
- *Spill*: the agents answering the queue if all "Main" agents are busy or unavailable

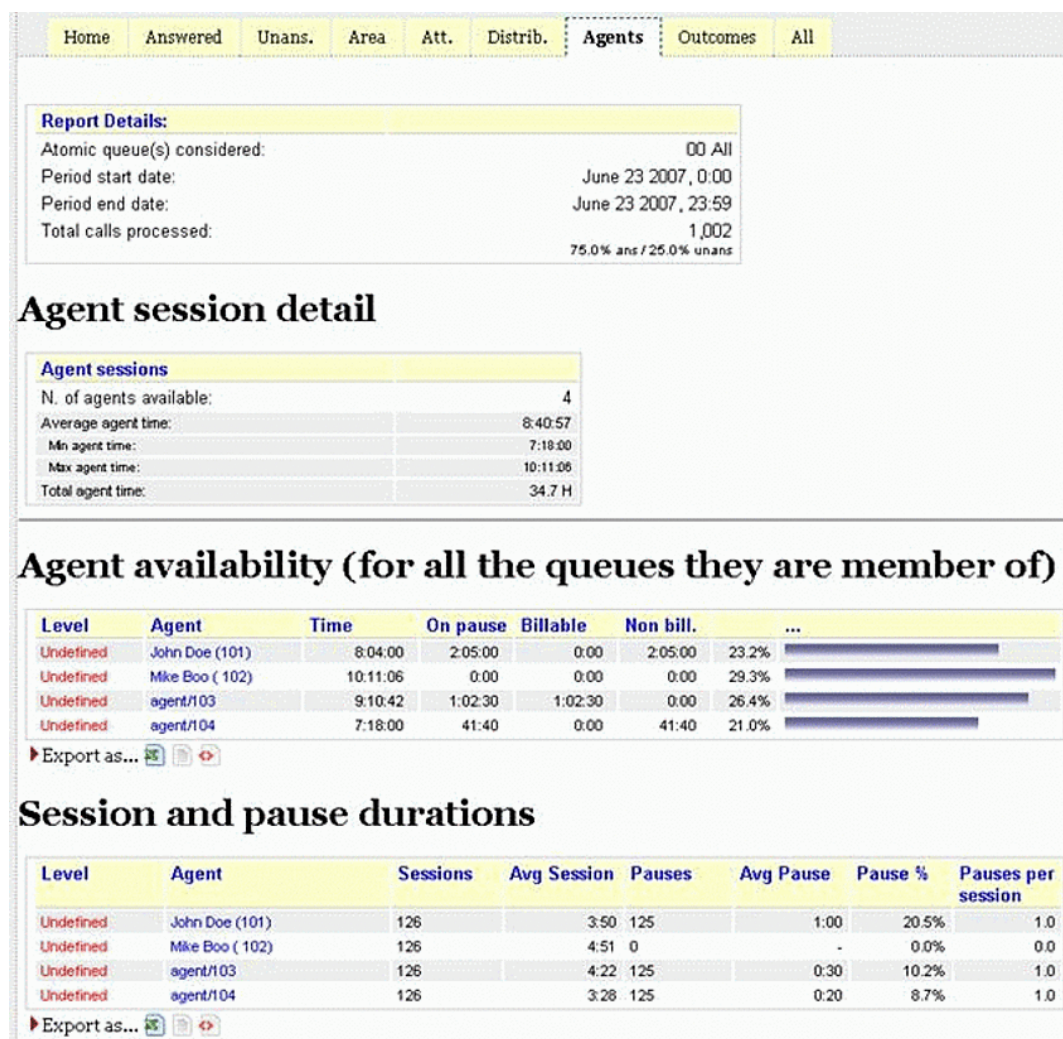
- *Wrap*: the agents answering the queue if all "Main" and "Spill" agents are busy or unavailable
- *Undefined*: this agent is not a member of any priority group for this queue

This feature is useful if priority groups are used in the queue configuration. If they are not used, just assign all agents to "Main" for each queue.

If an unknown agent appears on a queue, it will be marked as "Undefined", written in red.

Agent names are written in blue and are clickable, if you click on them in any of the graphs, you will be lead to a popup that detail the logon and pause history for that agent.

As a default, QueueMetrics will show and count an agent session if and only if the agent handled at least one call during this session. This may not be what you want when you use pause codes - an agent may log on and immediately go on pause to do some back-end activities. If this is the case, you should set the configuration option *default.useRawAgentSessions* to *true* to see all agent sessions.



The report shows:

- How many agents were available for the queue. To be considered available, an agent must have logged in and taken at least one call.



- How much time all agents have been available
- The average agent available time
- The minimum and maximum agent session durations
- The total billable and not billable pause times

## Agent availability

This graph shows which agents were available during the specified time frame and the percentage of agents' available time each one cumulated.

This time is calculated per all queues any agent is a member of, as the act of logging on is in general for the whole system and not specific to one single queue.

For each agent, the total time on pause - if any - is computed and broken down as "Billable" or "Not billable" - see the section on Pause Codes.

The "overlapping" is the amount of time that an agent was paused BUT taking calls. As you can pause in the middle of a call (maybe your system doesn't allow this, but it is conceivable) you could have a period where you are paused BUT on conversation as well.

The % written next to the graph is the percentage of the pause time.

## Session and pause duration

For each agent, the total number of sessions and pauses is computed (session time is already deducted of pause time). For both sessions and pauses, an average length is computed.




The "Pause percentage" is how much time an agent was on pause compared to available time.

The "Pauses per session" computes how many pauses - on average - each agent makes for each log-in session.

These metrics should be considered according to your call center rules on pauses and time-out.




### Answered calls (for selected queues)

Level	Agent	N. calls	Total call time	Avg call time	Avg wait time	% of queue
Undefined	John Doe (101)	125	5:12:30	2:30	0:10	16.6%
Undefined	Mike Boo ( 102)	250	2:25:50	0:35	0:15	33.3%
Undefined	agent/103	125	2:05:00	1:00	0:10	16.6%
Undefined	agent/104	251	2:47:00	0:39	0:15	33.4%

Export as...   




### Answered calls by service group

Level	N. calls	Total call time	Avg call time	% of queue
Main	0	0:00	-	0.0%
Wrap	0	0:00	-	0.0%
Spill	0	0:00	-	0.0%
Undefined	751	12:30:20	0:59	100.0%

Export as...   

### Answered calls by location

Location	N. calls	Total call time	Avg call time	Avg wait time	% of queue
Main Location	125	5:12:30	2:30	0:10	16.6%
Secondary location	250	2:25:50	0:35	0:15	33.3%
-	376	4:52:00	0:46	0:13	50.1%

Export as...   

### Session details

Total sessions: 504

Total pause activity detail

## Answered calls for selected queues

This graph shows who of your agents answered calls for the queues you selected. The number of calls, together with total and average call durations are computed accordingly.

## Answered calls by service groups

This graph show which priority levels handled calls for your queue. This shows whether your main line is staffed enough to handle the load of incoming calls.

## Session details

By clicking on the "Detail" button, a new page is shown, detailing each agent session that was recorded.

# Detail of agent sessions

Report Details:

Atomic queue(s) considered:

00 All

Period start date:

June 23 2007, 0:00

Period end date:

June 23 2007, 23:59

Total calls processed:

1,002

75.0% ans / 25.0% unans

Return

## Session agent detail

Export as...

Agent	Start hour	End hour	Duration	Ext.	Termination	Pause	P.Time	Srv
agent/104	06/23 - 0:00:01	06/23 - 0:00:31	0:30			0	0:00	
John Doe (101)	06/22 - 23:56:01	06/23 - 0:00:51	4:50	123		0	0:00	
Mike Boo (102)	06/22 - 23:56:01	06/23 - 0:00:52	4:51	345		0	0:00	
agent/103	06/22 - 23:56:01	06/23 - 0:00:53	4:52	456		0	0:00	
agent/104	06/23 - 0:01:41	06/23 - 0:05:31	3:50	789		1	0:20	
John Doe (101)	06/23 - 0:01:01	06/23 - 0:05:51	4:50	123		1	1:00	
Mike Boo (102)	06/23 - 0:01:01	06/23 - 0:05:52	4:51	345		0	0:00	
agent/103	06/23 - 0:01:01	06/23 - 0:05:53	4:52	456		1	0:30	
agent/104	06/23 - 0:06:41	06/23 - 0:10:31	3:50	789		1	0:20	
John Doe (101)	06/23 - 0:06:01	06/23 - 0:10:51	4:50	123		1	1:00	
Mike Boo (102)	06/23 - 0:06:01	06/23 - 0:10:52	4:51	345		0	0:00	

For each agent session, the start and end times are recorded, together with the total duration in seconds.

If the agent logs on via the call back function, the designated call back extension is shown.

The number of pauses and the total pause time in seconds is shown.

The "Srv" column tells you on which server an agent was working in case you set up a cluster of Asterisk servers.

It is possible to sort the table for each title, in either descending and ascending order. To do this, click once on the desired title for descending sort, and twice for ascending sort. Once the table is sorted, an arrow symbol will appear close to the title, so you know on which column it was sorted last. As the sorting is done on the client machine, it may take a while with very large tables.

## Pause activity details

This table shows the specific pauses that each agent took and the pause code that was entered for each pause. It also shows whether the pause taken was considered to be billable or non-billable.

Pause activities detail							
<a href="#">Export as...</a>							
Agent	Ext.	Code	Activity	Billable?	Start hour	End hour	Duration
agent/104	789	30	Lunch	No	06/23 - 0:02:01	06/23 - 0:02:21	0:20
John Doe (101)	123	30	Lunch	No	06/23 - 0:04:11	06/23 - 0:05:11	1:00
agent/103	456	31	Back Office	Yes	06/23 - 0:04:31	06/23 - 0:05:01	0:30
agent/104	789	30	Lunch	No	06/23 - 0:07:01	06/23 - 0:07:21	0:20
John Doe (101)	123	30	Lunch	No	06/23 - 0:09:11	06/23 - 0:10:11	1:00
agent/103	456	31	Back Office	Yes	06/23 - 0:09:31	06/23 - 0:10:01	0:30
agent/104	789	30	Lunch	No	06/23 - 0:12:01	06/23 - 0:12:21	0:20
John Doe (101)	123	30	Lunch	No	06/23 - 0:14:11	06/23 - 0:15:11	1:00
agent/103	456	31	Back Office	Yes	06/23 - 0:14:31	06/23 - 0:15:01	0:30
agent/104	789	30	Lunch	No	06/23 - 0:17:01	06/23 - 0:17:21	0:20
John Doe (101)	123	30	Lunch	No	06/23 - 0:19:11	06/23 - 0:20:11	1:00
agent/103	456	31	Back Office	Yes	06/23 - 0:19:31	06/23 - 0:20:01	0:30
agent/104	789	30	Lunch	No	06/23 - 0:22:01	06/23 - 0:22:21	0:20

## Agent history popup

If you click on an agent's name, a new popup will appear with full history for that agent. You can scroll in it as needed by using arrow keys or the wheel of your mouse.

Detail: agent/101							Close
Total session time	334:23:16						
Total pause time	2:08:42						
Total billable time	332:32:38						
Total pauses billable	18:04						
Total payable time	333:52:09						
Total pauses payable	1:37:35						
Agent	Ext.	Duration	On pause	Activity	Start hour	End hour	
John Doe (101)	104	331:53:10		-	09/07 - 15:53:40	09/21 - 11:46:50	
				0:16 -	09/07 - 15:53:40	09/07 - 15:53:56	
				14:48 Backoffice	BP 09/07 - 15:55:00	09/07 - 16:09:48	
				21:48 Lunch	NBNP 09/07 - 16:10:00	09/07 - 16:31:48	
				0:56 Lunch	NBNP 09/07 - 16:31:49	09/07 - 16:32:45	
John Doe (101)	104	12:59		1:20:49 Hourly break	NBNP 09/21 - 10:08:26	09/21 - 11:29:15	
				-	09/21 - 11:47:00	09/21 - 11:59:59	
				6:49 -	09/21 - 11:47:10	09/21 - 11:53:59	
John Doe (101)	100	8:25		1:58 Backoffice	BP 09/21 - 11:56:08	09/21 - 11:58:06	
				1:18 Email	BNP 10/04 - 11:32:00	10/04 - 11:40:25	
					10/04 - 11:36:16	10/04 - 11:37:34	

A complete description of the popup is available in the Report Details: the section called "Popup of agent activity" [127] .

## Understanding results: Call outcomes

If your agents are entering Pause codes or Call outcomes, the "Outcomes" tab will let you report on the information they just entered.

Home	Answered	Unans.	Area	Alt.	Distrib.	Agents	Outcomes	All
------	----------	--------	------	------	----------	--------	----------	-----

Report Details:

Atomic queue(s) considered: QT

Period start date: Queue 1 [q1], Queue 2 [q2]

Period end date: September 05 2008, 10 19

Total calls processed: December 04 2008, 10 19

4,475

75.0% ans / 25.0% unans

Outcomes

General outcomes

Total billable time: 154:17:43

Total agent available time: 154:17:43

Total agent pause activities: 0:00

Total nonbillable time: 17:05:10

Number of Sales: 0

Number of Qualified Contacts: 0

Number of Contacts: 0




Sales per Hour (SPH): 0.0

Qualified Contacts per Hour (QCPH): 0.0

Contacts per Hour (CPH): 0.0




Conversion index: 0.0%

Qualified conversion index: 0.0%

Export as   

Call results, by outcomes

Call outcome	Type	Total	Taken	Lost	%	
21	Unknown	1677	1677	0	37.5%	<div></div>
20	Unknown	1120	1120	0	25.0%	<div></div>
-	None	1678	559	1119	37.5%	<div></div>

Export as   

The top panel will display an overview of the situation, showing:

- How much billable time there has been on this system, broken down by ACD/call time ("agent available time") and billable activities (agent on pause)
- The total non billable time (e.g. lunch, breaks)
- The total number of Contacts, Qualified Contacts and Sales, as defined by call outcome codes
- The *Sales per Hour* (SPH), *Qualified Contacts per hour* (QCPH) and *Contacts per Hour* (CPH) ratios
- The *Conversion index*, that is the percentage of sales over the total number of sales and contacts.

Further down the page, you can find details explaining Billable and Non-billable activities, with average, minimum and maximum session durations, and a percentage on all activities of the same kind.

**Call results, by outcomes**

Call outcome	Type	Total	Taken	Lost	%
21	Unknown	1677	1677	0	37.5%
20	Unknown	1120	1120	0	25.0%
-	None	1678	559	1119	37.5%

Export as...

**Billable activities**

Activity	N. Times	Tot. Time	Avg.	Min.	Max.	%
30	1119	12:25:40	0:39	0:20	1:00	72.7%
31	559	4:39:30	0:30	0:30	0:30	27.3%

Export as...

**Non billable activities**

Activity	N. Times	Tot. Time	Avg.	Min.	Max.	%
30	1119	12:25:40	0:39	0:20	1:00	72.7%
31	559	4:39:30	0:30	0:30	0:30	27.3%

Export as...

**Detailed agent report**

Agent name	Avail.	Bill.	NonB.	Sales	QC.	Cont.	SPH	QCPH	CPH	CONV	QCONV
Mike Boo (102)	45:12:58	100.0%	0:00	0.0%	0.00	0.0%	0	0	0.0	0.0	-
A 103	40:42:47	100.0%	0:00	0.0%	4:39:30	11.4%	0	0	0.0	0.0	-
John Doe (101)	35:44:39	100.0%	0:00	0.0%	9:19:00	26.1%	0	0	0.0	0.0	-
A 104	32:37:19	100.0%	0:00	0.0%	3:06:40	9.5%	0	0	0.0	0.0	-

Export as...

The Detailed Agent Report will show, for each agent:

- The Available (ACD) time, as an absolute value and a percentage of its total time logged on
- The Billable time, as an absolute value and a percentage of its total time logged on
- The Non-Billable time, as an absolute value and a percentage of its total time logged on
- The number of Sales And Contacts the agent had (if a sale is counted as both a Sale and a Contact, it's counted only once as a Sale)
- The *Sales per Hour* (SPH) and *Contacts per Hour* (CPH) ratios for this agent
- The *Conversion ratio*, that is the percentage of sales over the total number of sales and contacts.

## How are Call Outcomes calculated?

The idea is that a call can be a Contact, or a specialized contact that is a Qualified Contact, or a specialized Qualified Contact that is a Sale

This is needed because all the SPH, CPH and QCPH are calculated not on the totals of each class, but on sums of that class and generic types, like:

S = Number of Sales

C = Number of Contacts

Q = Number of Qualified Contacts

CPH = C / (logon time - not billable pause time)

QCPH = Q / (logon time - not billable pause time)

SPH = S / (logon time - not billable pause time)

Conversion indexes are calculated as:

CO% = S / C

QC% = S / Q

## Multi-stint calls

In QueueMetrics, we define a multi-stint call as a call that was processed on more than one queue, with one or more queue terminating it for timeout, transfers or key exits.



In the standard QueueMetrics reporting mode, this call would be seen as a series of "lost calls" on one or more queues, possibly followed by a taken call if the call was answered at all; the system does not notice that those events happened on the same call.

Running QueueMetrics in multi-stint mode, calls will be grouped together based on the call's Unique-ID, and a single call will be rebuilt as a multi-stint call so that:

- The call looks like it was handled on the first queue it was presented on; the queue enter time and queue position are those of the first queue.
- The call will be considered "answered" if the last stint is an answered call, "lost" in all other cases
- The wait time will be the sum of the wait times on different queues (if there are intermediate wait times, like those for IVR menus, they will not be counted)
- The talking time and agent taken the call will be taken from the last taken call
- All stats (number of call, call distribution, etc) will be counted on the new multi-stint calls.

## Limitations and side-effects

Multi-stint calls aren't for everyone. There are a number of limitations and side effects you should be aware of before attempting to run QueueMetrics in this mode:

- Calls are grouped by the Asterisk Unique-ID code; this means that if different call stints happen on different servers in a cluster, they will not be grouped together
- All queues the call passed on must be included in the report. If you include only the master queue, stints on other queues will not be seen.
- Because of the previous bullet, it is usually better to configure separate "wrap up" or "timeout" queues, that is, instead of having both a Sales and a Support queue that will send people to the General queue on timeout, it would be better to have "Sales" → "General-sales" and "Support" → "General-support", even if "General-sales" and "General-support" are actually aliases of the same queue.
- All stints of all calls must be included between the starting and ending report times. Stints that start before the start date or end after it will be ignored.
- Run time and memory will be comparatively more than a standard analysis, as the grouping and additional data stored take their toll on the system
- Stint-grouping does not work for real-time analysis.



On versions of QueueMetrics up to 1.6.3, calls are filtered by search criteria before being aggregated in multi-stint mode. This may lead to problems when you want to use filtering criteria in multi-stint mode, where only some stints match the criteria while others does not. To avoid this issue, on newer versions of QueueMetrics calls are joined together in multi-stint mode before criteria are applied to the aggregated results.

## Multi-stint calls in QueueMetrics

If you run calls with multi-stint mode enabled, the string "Multi-stint calls joined together" will appear on the top panel, and the number of joined together calls will be shown.

Period start date:	May 01 2007, 0:00
Period end date:	May 30 2007, 10:00
Total calls processed:	15,316
Multi-stint calls joined together	89.5% and 1115% more 173

The distribution of taken calls by stints will be shown in the "Answered calls" tab:

Answered calls, by stints

Number of stints	N. Calls	...
1	12427	88.1%
2	124	0.9%
3	3	0.0%

Export as...

The distribution of lost calls by stints will be shown in the "Lost calls" tab; aggregate calls by stints will also be shown in the "Lost Calls" page:

Unanswered calls, by stints

Number of stints	N. Calls	...
1	1716	97.4%
2	43	2.4%
3	3	0.2%

Export as...

All calls, by stints

Number of stints	N. Calls	...
1	15143	98.9%
2	167	1.1%
3	6	0.0%

Export as...

Details of multi-stints calls are displayed in the call details pop-up, in a separate tab. See Chapter 5, *Showing call details* [59].

## Exporting call sets from QueueMetrics

There is a need to make it possible for external parties to review the call processing as done on QueueMetrics or do an external QA monitoring on them; and similarly, there is an opportunity for a QueueMetrics to do the same thing for external third-parties.

In order to make this possible, we need to have a way for QueueMetrics to import/export both call records (with associated audio/video recordings where present) and related QA data.

## Exporting calls - an overview

The main problems that arise from exporting calls are:

- Selecting the set of calls that have to be exported, and
- Retrieving all audio calls for export

We need to be able to select freely a number of calls for export, given one or more export criteria; we want to be able to review the results before they are final, and we want to exclude specific calls when reviewing.

The retrieval of audio causes a similar problem; first, audio retrieval was not really made for batch access, so seek times for individual files may be in the order of one per seconds; secondarily, those files may well require a large disk space when preparing the batch.

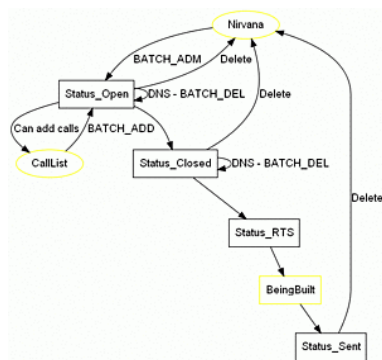
The call export feature works in batches, that is, at any given time there are a set of batches that an administrator creates and that are to be exported. Each of them has a name and a status.

This is the life-cycle of a batch:

- An administrator creates a batch for a given data export needed and gives it a meaningful name, e.g. "Client X week 02/10". The batch is now in state Open.

- Users holding the correct key will be able to add calls to the batch, that is, when they run a report in QM, on the "Taken calls" page they see a button that invites them to add the selected set of calls to the open batches. They can repeat this process as many times as it is needed. If the same call is added multiple times to the batch, it only appears once.
- When the batch is ready, the administrator closes it. When the state is Closed, it is not possible anymore to add calls to that batch.
- When the batch is Open or Closed, it is possible for the administrators to see the list of calls in the batch and to listen to their audio/video attachments. Individual calls may be flagged as "Do not send" - those calls will appear in the batch but will not be show in the outgoing records.
- When the batch is finalized, the administrator will flag it as "Ready to send". Batches that are "Ready to send" are actually being built by QM - it may take a while to create them and download the audio files required.
- When the batch is finished processing, it will appear as "Sent".
- A batch can be deleted at any time by the administrator, unless it is in status "Ready To Send".

The graph provides a visual representation of the whole process:



The process of building a batch may take a while - therefore there is a transaction that simply keeps displaying a page in a browser that shows a progress bar while the project is being exported.

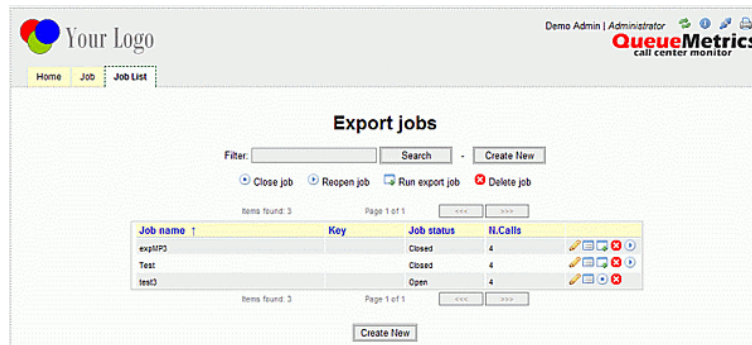
## Exporting calls in practice

In order to export calls, an administrator must first create a batch. To do this, they go to the Home Page → Import/Export calls:



From here you select List Export Jobs.





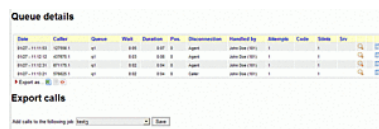
You can then create a new job.

When configuring the job, you have to specify:

- A **name** for the job. This will be the name of the folder that will be created including the call details and the audio files.
- A **security key** so that only some agents can add calls to this job.
- An **export folder** - it can be the same for all jobs, and be on the server QM is on. It should be writable by the java process that runs QM,.
- An **implementor**, that is, a data format for Manifest file of the job. See below for more details.
- If the implementor requires them, you can specify a set of **parameters**.

These properties can be changed through the lifetime of the job.

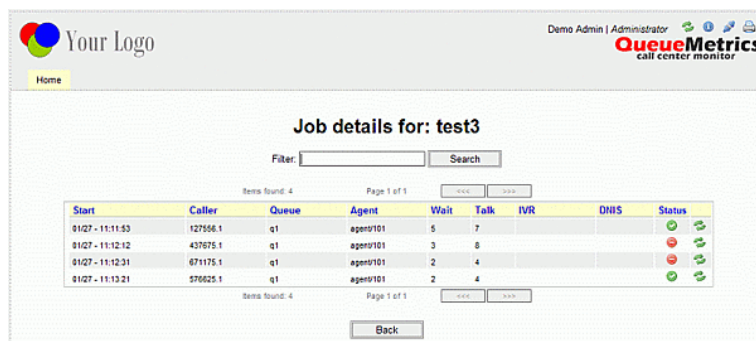
From now on, users accessing the Detail of Taken Calls will see a gadget by the end of the page like the one shown here:



This basically lets you add all the calls above to the export job you select. If the export gadget should not be visible, you have to add it manually to the current report (its code is OD02 - see Block OD02 the section called “OD02 - Add to export job” [75] ).

After you add some calls to a job, the import transaction will confirm the add through a popup screen that displays the number of calls imported and the number of calls rejected (because they were already a member of this job). Only jobs in state Open will be available for adding calls.

You can now see a list of calls from the Export Jobs page:



The screenshot shows the QueueMetrics call center monitor interface. At the top, there is a header with 'Your Logo' and 'QueueMetrics call center monitor'. Below the header, the main content area is titled 'Job details for: test3'. There is a search bar with a 'Filter:' label and a 'Search' button. Below the search bar, there is a table with columns: Start, Caller, Queue, Agent, Wait, Talk, IVR, DNIS, and Status. The table contains four rows of call data. Below the table, there is a 'Back' button.

Start	Caller	Queue	Agent	Wait	Talk	IVR	DNIS	Status
8/12/27 - 11:11:53	127556.1	q1	agent101	5	7			
8/12/27 - 11:12:12	437675.1	q1	agent101	3	8			
8/12/27 - 11:12:31	671175.1	q1	agent101	2	4			
8/12/27 - 11:13:21	576625.1	q1	agent101	2	4			

You can search calls within the current job and toggle their inclusion in the exported list by clicking on the reload icon next to each call.

When the job is ready for shipment, the administrator first has to Close it and then to Export it. This will take a while. Audio files will be retrieved through the currently configured Pluggable Module for audio records and will be saved in the job folder.

## Output format

Though the actual attributes used are based on the Implementor module used, the following are common attributes.

### Batch attributes

- Name
- Disk path (must be accessible to Java)
- Created by, on date
- Closed by, on date
- Sent by, on date
- Video (yes/no)
- QA (yes/no)

Each call in the batch has the following attributes:

- Type: "T" taken "L" lost (initially we will only have Taken calls)
- Cluster-ID
- Server-ID
- Entered at
- Wait time
- Talk time
- Caller
- Agent

- Queue
- Call status
- Call status type (e.g Sale)
- N. of audio pieces
- Names of the audio pieces, comma-separated ( a single call may have multiple recordings)

**Batch disk format**

A call batch appears on disk as a folder under the system call batch folder. The folder is created if not present (it must be in a Java-writable location). When the batch is in status "Ready to send", the audio files are copied to this folder; at the end of it all, a manifest file that includes the details is written. Each downloaded audio file is renamed in order to be unique and coherent, typical file names may be:

```
0000123-1.wav  
0000123-2.mov
```

Both files are about the 123rd call, the first one being an audio recording and the second one a video recording.

When the batch is in status "Sent" QM no longer cares about the disk representation - it can be moved, sent as FTP, compressed and encrypted, whatever.

**Manifest file format**

The manifest file format should be chosen by the sysadmin - it is implemented as an abstract class for ease of change.

- It will be called Manifest.xml
- It will include a set of <call> entries including all data as per the previous section "Batch attributes"

## Available implementors

**HTTP file transfer**

This is the basic implementor and produces an XML file.

**HTTP MP3 file transfer**

This implementor does two things:

- produces a basic manifest
- retrieves QA valuation data if present
- if audio files are in MP3, will insert or set ID3v2 tags so that the title of the MP3 contains information about the call.

The following ID3 tags are created:

- Call details
  - caller id

- queue
- dnis
- call lenght
- start time
- lenght
- agent
- Call status
- Date of Grading
- Time of Grading
- Grader ID and/or Name
- Overall Grade
- Graders Comment



this implementor DOES NOT transcode files to MP3 - they must already be in MP3 format or you should provide an external batch script to do the conversion. More details are provided in the following paragraph.

## MP3 conversions on the fly

QueueMetrics lets you able to perform an external batch script call in order to convert call files to different format like, for example, wav files in mp3s. This feature is applied only for export jobs implemented with the "HTTP MP3 File Transfer" object. No external calls will be made for "HTTP File Transfer" enabled export jobs.

Assuming to have this type of export job parameters: Job name: MyJob Export folder (on server): /var/spool Implementor: HTTP MP3 File Transfer

the work flow followed by QueueMetrics, for HTTP MP3 File Transfer enabled jobs, will be like depicted below.

For each call in the job and for each file associated to a specific call:

1. The file will be stored on server folder /var/spool/MyJob folder
2. A new temporary folder will be created on /var/spool/MyJob folder
3. An external bash script will be called. The script will receive, as parameters:
  - The full file name of the file to be converted
  - The full name of the temporary folder created
  - The name of the job as defined in the job definition page
  - The parameters string as defined in the job definition page

4. The script should convert the file in the preferred format and should place the result in the provided temporary folder. QueueMetrics will wait for the conversion termination
5. QueueMetrics will move (not copy) the full conversion result it will find in the temporary folder to the original destination folder (in this case /var/spool/MyJob). Please note that there should be more than one file resulting in the conversion (like, for example, a preview quality and a hi-res quality .mp3 files) and QueueMetrics will copy all of that.
6. The temporary directory will be removed by QueueMetrics
7. QueueMetrics will publish in the manifest all the files found in the temporary folder. These files will be associated to the specific call and the number of chunks published in the manifest will reflect this.

When all files in the job are properly downloaded and converted, QueueMetrics will add all relevant QA information only to files with name ending with .mp3

Please note that:

1. The external script to be called by QueueMetrics should be specified in the configuration.properties files through the key "export.conversionCommand". It should be executable by TomCat. If no key was defined, the HTTP MP3 File Transfer will skip all actions specified in the 2, 3, 4, 5, 6 steps above described (i.e. it will simply download the files and apply QA informations to eventually present .mp3 files)
2. If the external script is not present in the server and/or QueueMetrics is not able to run it, this will be signaled in the <errors> field present in the manifest (one for each call). In this case QueueMetrics will publish in the manifest the original file name.
3. QueueMetrics will not delete the original file from the /var/spool/MyJob folder. If you need to have it deleted, your conversion script should do it.
4. QueueMetrics will not publish the original file name in the manifest, unless if exceptions were raised in the conversion/move process. If you need to have the original file published in the manifest, your script should move (not copy) it to the temporary folder.
5. If some exception is raised when moving files or calling the external bash script, QueueMetrics will publish the original file name in the manifest.
6. If the conversion script generates a (set) of filename with name(s) already present in the /var/spool/MyJob folder, QueueMetrics will rename it (them) prepending the name(s) with a random 5 digit number followed by an underscore sign. The new name(s) will be published in the manifest

To summarize the overall process, a simple example of working environment is provided:

In the configuration.properties is the key:

```
export.conversionCommand=/usr/local/apache-tomcat-5.5.25/webapps/ROOT/testbatch
```

and in the /usr/local/apache-tomcat-5.5.25 is an executable testbatch script:

```
[root@qmmachine ROOT]# ls -la testbatch
-rwxr-xr-x 1 root root 87 Mar 10 05:17 testbatch
```

In this simple example, the batch script copies the original file in the temporary folder (with a not unique name in this example)

```
#!/bin/bash
```

```
# $1 is the source file
# $2 is the output directory
# $3 is the job name
# $4 is the parameter field defined in the job definition page
```

```
cp $1 $2/testresult
```

The resulting working folder will contain something like:

```
....
-rw-r--r--  1 root root  408516 Mar 10 05:18 17619_testresult
-rw-r--r--  1 root root   50110 Mar 10 05:18 18542_testresult
-rw-r--r--  1 root root  884372 Mar 10 05:18 18795_testresult
-rw-r--r--  1 root root    4740 Mar 10 05:19 20110304_084640-99.wav
-rw-r--r--  1 root root  419784 Mar 10 05:19 20110304_084640.wav-99-1.avi
....
```

And the manifest something like:

```
....
<call>
<files>testresult,2071_testresult</files>
<errors></errors>
<chunks>2</chunks>
<uniqueid>3033212900899824</uniqueid>
<videocall>true</videocall>
<callid>4006</callid>
....
```

# Chapter 5. Showing call details

As shown above, QM lets you see the very detail of calls handled by Asterisk.

## Detail of answered calls

The screenshot shows a Mozilla Firefox browser window displaying a call detail popup. The popup is titled "Call Detail - Mozilla Firefox" and has a URL bar showing "http://localhost:8084/queuemetrics/qm/popup\_call.jsp". The popup contains a table with the following information:

Field	Value
Asterisk Call ID:	1415271119.20
Date and time:	11/06 - 11:51:59
Queue:	A300 [300]
Caller ID:	204
Handled by:	John Doe (101)
Duration:	12 sec.
Time in IVR before queueing:	0 sec.
Waiting time:	2 sec.
Original position	# 1
Disconnection cause:	Agent disconnected
Transferred to:	
Attempts:	1
Last Failed Attempt:	-
Bridged Channel:	1415271119.21
Stints:	1
URL:	
Status code:	dc: Disconnected
Srv	
DNIS	
IVR selection	

For each answered call, the following information is shown:

- Date and time for the call;
- The Caller-ID, if available (the Caller-ID format may differ according to your local Telco - in some countries it include the full name of the caller, in others it might be a number and in others it may be unavailable at all);
- The queue that handled the call;

- The total waiting time before the agent was connected;
- The duration of the call, talking to an agent;
- The initial position of the call
- The cause of disconnection;
- Which agent or terminal handled the call.
- How many agent attempts were made before this call was answered
- The call completion code your agents entered
- How many stints make up this call
- The server that handled this call (in the case of clusters)

Optionally other information could be shown:

- The asterisk unique ID associated to each call
- An icon that opens a new web page with an URL user customizable (useful for proprietary CRM integrations). To enable these two columns, the keys *default.crmapp* and *default.showAstClid* have to be correctly set. Please read the section called “Configuring system preferences” [257] and Appendix C, *System preferences* [383] for further details.

It is possible to sort the table for each title, in either descending and ascending order. To do this, click once on the desired title for descending sort, and twice for ascending sort. Once the table is sorted, an arrow symbol will appear close to the title, so you know on which column it was sorted last. As the sorting is done on the client machine, it may take a while with very large tables.

If you click on the small icon on the right, it will be possible to see the details of the call, including:

- Asterisk’s internal Call-ID code
- The call date and time
- The caller-id (if any)
- The agent handling the call
- The call duration
- The wait time
- The disconnection cause
- The extension the call was transferred to
- The URL that was linked to this call through the Queue() command, if any
- The call status code
- The server that handled this call



- The sound files (one or more) that were recorded for this call (see below).

If the call is ongoing and you have the special grants to do so, a red scissor icon might appear next to the call status to allow for brute-force call closure. See the section the section called “Closing ongoing calls” [357] for further details.

The call may also display:

- If the call has more than one stint - that is was rebuilt through multi-stint mode - then a list of stints is visible. If a call has only one stint, then the Stints tab is not needed and appears disabled. See the section called “Multi-stint calls” [49]
- If a call has events on it - that is specific items happening at points in time that go beyond what is displayed for the main call - they are shown in the Events tab. If not, they are disabled. The ones currently tracked are IVR traversal events, failed call connection attempts and music-on-hold events.
- A set of markers (Note: QueueMetrics till release 14.10.4 shows "tags" instead of markers).
- A link to open the QA form(s) available for that call

## Listening to answered calls

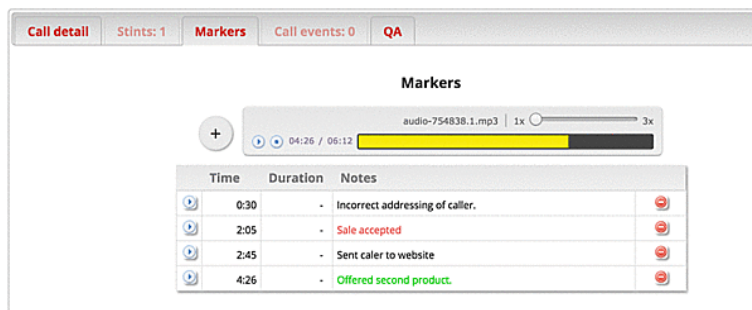
If there are audio recordings, they will be shown by the bottom of the call details page. If the call was monitored, i.e. recorded to disk, a number of sound files may be shown. By clicking on a sound file you can listen to it straight from your browser.

You can optionally have other types of media linked to a specific call, for example chat transcripts, free text or documents. They will be opened in the browser.

Please note that:

- The recorded file name must contain the Asterisk Call ID for QM to relate it to the call - see the section called “Listening to recorded calls using QM” [346] for tips on how to configure Asterisk correctly to implement this feature;
- The audio storage on the Asterisk server must be readable by the servlet container;
- You must have the correct sound codecs to listen to the sound file on your PC. WAV files usually work out of the box but are comparatively quite big, while GSM files require an additional codec pack on most Windows machines but consume disk storage much more efficiently. The best compromise is usually to use the WAV49 format on Asterisk, that is played natively by Windows machines but has a compression and sound quality comparable to the GSM format. The HTML5 player requires WAV or MP3 files.
- Asterisk will usually record two different sound files - one for the caller and the other for the agent and will then mix them together at the end of the call. If this does not happen automatically, you might find two different sound files, named "-in" and "-out", each of which contains the voice of one of the parties. If your call is a multi-stint call, you may find a number of different sound files for it.
- It is possible to use different PMs to handle different audio needs - see the section called “Listening to calls using Pluggable Modules (PM)” [276].
- If generated by Asterisk, QueueMetrics can display a variety of other file type call attachments, ie. calls that are shown with a file extension that is not necessarily a sound file (image, video, audio, text or application files).

It is also possible to add markers in order to keep notes about "points of interest" for the call at hand, as shown in the example below:



By clicking on the Play icon next to a marker, the correct audio recording is loaded in the embedded player and it is started at the point in time specified in the marker.



Until release 14.10.4, QueueMetrics used the name "tags" instead of "markers".

## The HTML5 Audio Player and Markers

Since QueueMetrics 15.02, it is possible to play audio straight in the browser using an HTML5-enabled audio player.

This has many advantages:

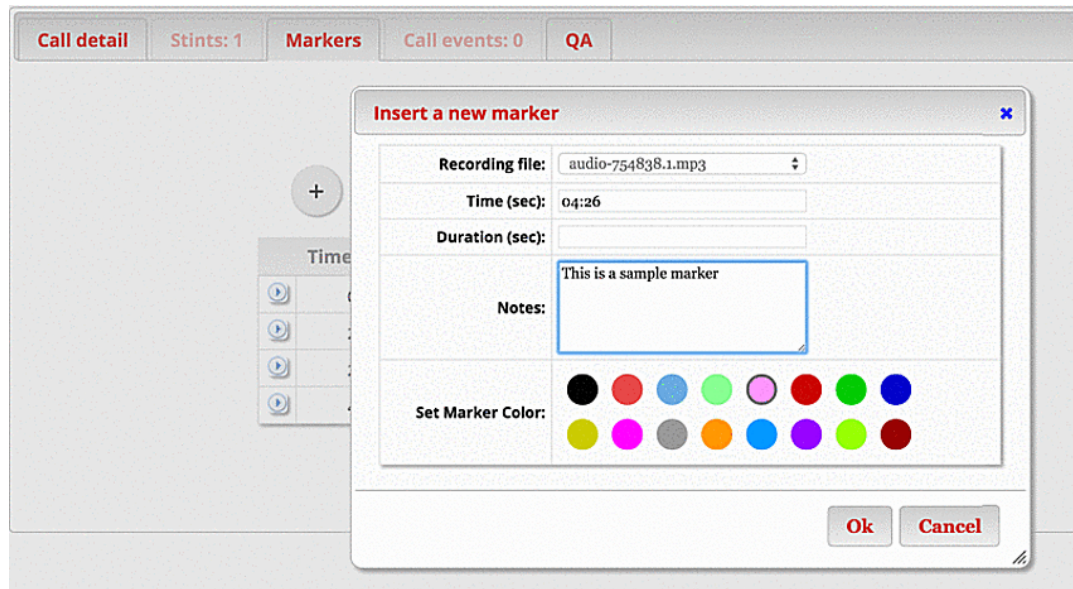
- You can play the audio straight in the browser, jumping back and forth as needed
- You can speed-up the audio playing, in order to take less time to listen to calls
- It integrates with the Markers editor, so you can add a comment at a specific point in time and see it later. When you click on a comment, the audio editor starts playing at that very point in time.

This is extremely powerful, and can be done either on the Call Details panel (under the Markers tab) or on the QA form.

In order for this to work, you need:

- A modern browser supporting HTML5 audio playback
- The system property '*audio.html5player*' must be set to true.
- If audio files are hosted outside of QueueMetrics, your HTTP server must support Http-Range requests. QueueMetrics supports Http-Range file streaming natively.
- Files must be stored in a format that is compatible with the browser. Presently this means that your audio files should either be saved as WAV or MP3. GSM and WAV49 files will likely not work.
- Streaming is not supported for encoded audio recordings.

Users having the capacity of adding and removing markers should hold the keys CALLMONITOR\_ADDTAGS and CALLMONITOR\_DELTAGS respectively.





The following pieces of information are tracked through the Markers page:

- System ID and Asterisk unique-id; marker author and time
- Time offset and duration (in seconds). You can leave the duration field blank. Values can be input as an integer number of seconds or as MM:SS
- A title (max 200 characters). Newline characters are allowed.
- A color for display (this may be used to set, say, all sales in red, all issues in blue, etc).

## Detail of unanswered calls

The unanswered calls detail is quite similar to that of answered calls.



Demo Admin | Administrator 

Home Answered Unans. Area Att. Distrib. Agents Outcomes All

## Detail of unanswered calls

**Report Details:**

Atomic queue(s) considered: 00 All  
10321, q1, q2, Q DPS [queue-dps], Q Test [queue-test]




Period start date: February 19 2009, 00:00

Period end date: February 19 2009, 23:59

Total calls processed: 5  
0.0% ans / 100.0% unans

Area analysis Return

### Queue details

Export as...   

Date	Agent	Caller	Queue	Disconnection	Position	Wait	Pos.	Attempts	Code	Key	Stints	Srv
02/19 - 16:15:46	John Doe (101)	885577.1	q1	Abandon	0	0:10	0	0			1	
02/19 - 16:15:59		457284.1	q1	Abandon	0	0:10	0	0			1	
02/19 - 16:16:10		458623.1	q2	Abandon	0	0:10	0	0			1	
02/19 - 16:16:28	Mike Boo (102)	242167.1	q1	Abandon	0	0:05	0	0			1	
02/19 - 16:17:25		571416.1	q1	Unanswered yet	0	0:22	0	0			1	

The following data are shown:

- Date and time of the lost call;
- The Agent that placed the call (if it's outbound) or blank if inbound;
- Caller-ID;
- Queue that handled the call;
- Disconnection cause;
- Position at disconnection, if available;
- Waiting time before disconnection, if available;
- The initial position of the call when it joined the queue, if available;
- The number of Agent attempts made before disconnection;
- The call code, if entered (this might be added automatically, e.g. by outbound diallers marking unsuccessful attempts as "unanswered" versus "fax" or "voicemail")
- The key pressed on disconnection (if any)
- The number of stints this call has
- The server that handled the call

Optionally other information could be shown:

- The asterisk unique ID associated to each call
- An icon that opens a new web page with an URL user customizable (useful for proprietary CRM integrations). To enable these two columns, the keys *default.crmapp* and *default.showAstClid* have to be correctly set. Please read the section called “Configuring system preferences” [257] and Appendix C, *System preferences* [383] for further details.

Please note that on a queue timeout, Asterisk will not report the waiting time, as it is fixed and same as the queue timeout.

It is possible to sort the table for each column, in either descending and ascending order. To do this, click once on the desired title for descending sort, and twice for ascending sort. Once the table is sorted, an arrow symbol will appear close to the title, so you know on which column it was sorted last. As the sorting is done on the client machine, it may take a while with very large tables.

If the call is ongoing and you have the special grants to do so, a red scissor icon might appear next to the call status to allow for brute-force call closure. See the section the section called “Closing ongoing calls” [357] for further details.

## Detail of IVR calls

IVR calls, that is calls that were handled without being queued, can be displayed through the pop-up linked to the the section called “OD04 - IVR details (paged)” [76] data block. The contents are very similar to the information displayed for taken or lost calls, though the only information currently tracked are call IVR events, DID and caller-id.

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# Chapter 6. Report Details

Reports can be fully configured by deciding which of the following blocks shall be included in each - see Configuring reports the section called “Configuring reports” [239]. The default report already includes all common blocks.

## Historical reports - Answered calls

### OK01 - All calls



**All calls**

<b>All calls</b>	
N. calls answered by operators:	811
Average call length:	60.0 s.
Min call length:	0:20
Max call length:	2:30
Total call length:	13.5 H
Average call waiting time:	13.3 s.
Min waiting time:	0:10
Max waiting time:	0:20
Total waiting time:	3.0 H
Average initial position	0.0
Min initial position	0
Max initial position	0
Coverage	0.0%
Export as...	

The answered calls section deals with calls that were correctly handled by agents.

The top panel shows:

- How many calls were handled;
- The average call length (i.e. time the caller spends talking to an operator);
- The maximum and minimum call lengths recorded for the given time period;
- The total call length (for all calls on all operators);
- The average call waiting time (i.e. the time a caller was waiting on a queue before being connected to an operator).
- The minimum and maximum call waiting times on record
- The total waiting time for all handled calls.
- The average initial position of the call in the queue
- The minimum and maximum initial queue positions that have been detected
- The queue position coverage: as this information is not tracked for all calls, this ratio shows the average number of calls that had queue position record.

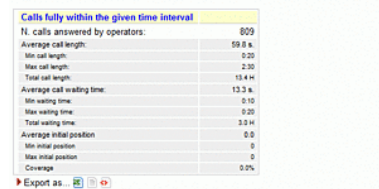
Available since	1.6.0
Default page	Answered calls
Shortcut code	OK01
API block name	OkDO.RiassAllCalls



Parameters	-
See also	

## OK02 - Calls fully within the given time interval

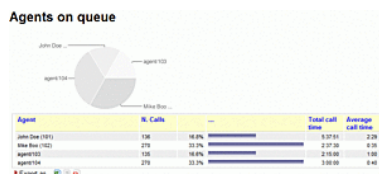
### Calls fully within the given time interval



The answered completed calls section deals with calls that were correctly handled by agents. This is similar to what's reported on previous panel but may exclude calls that were started before or terminated after the given time frame.

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK02
API block name	OkDO.RiassFullyWithin
Parameters	-
See also	OK01 - All calls

## OK03 - Agents on queue



This report shows which agents have been available for the given queue, how many calls each one handled and the percentage of all calls that each one handled.

If calls are connected directly to a phone terminal, QM tries its best to show the corresponding terminal, usually in the format used by Asterisk, like "SIP/303" to signify a SIP phone whose number is 303.

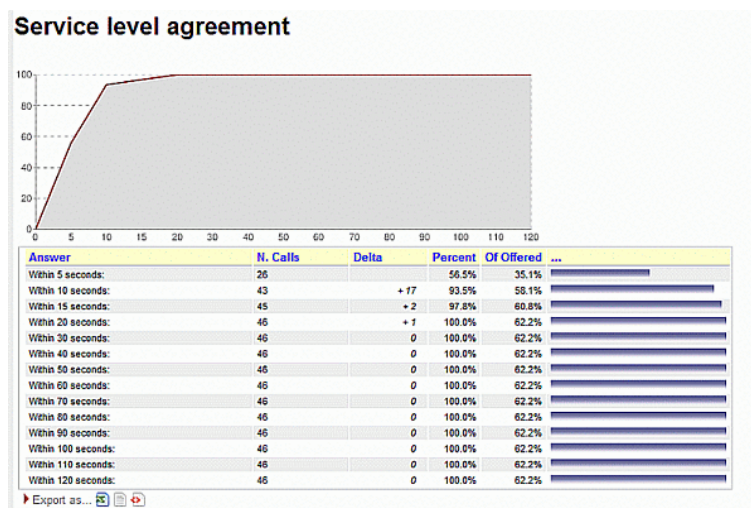
If you connect to H.323 telephones via the OH323 module, the recorded channel names have no meaning and do not refer to a specific terminal; that's why all OH323 calls are grouped together under the label "OH323/-".

The pie graph shows which agents have been available for the given queue representing the percentage of all calls that each one handled.

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK03

API block name	OkDO.AgentsOnQueue
Parameters	-
See also	

## OK04 - Service level agreement



This report shows the distribution of call waiting times. It shows how many calls were answered within a given time frame, usually 120 seconds in 10 second increments (the time frame and increment can be modified by the administrator, if needed - see below).

You get a percentage of how many calls were answered within X seconds; the percentage includes calls answered in a shorter time frame and therefore grows with time.

The "delta" value you see is the absolute increment, expressed in number of calls, between each time frame, while the "Offered" column displays the result of the taken calls divided by the total taken plus the total lost.

This metric is computed only on answered calls, i.e. ignoring lost calls . If your SLA is defined in terms of taken and lost calls, see the corresponding metrics "Inclusive SLA" on the section called "Inclusive Service Level Agreement" [36].

The graph reports the percentage of how many calls were answered within X seconds, as reported in the table.

Since 1.6.2, it is possible to configure the time frame and increment separately for an initial period and the rest of the interesting period; in this way it is possible to have different breakdowns, e.g. every 5 seconds up to 20 seconds and every 10 seconds up to 120 seconds. See the section called "Configuring system preferences" [257].

For example, by setting:

- initial\_interval=5 and max\_initial\_interval=20
- interval=10 and max\_monitored\_delay=60

You get the following cutoff points: 5, 10, 15, 20, 30, 40, 50, 60 seconds

By setting:

- initial\_interval=3 and max\_initial\_interval=3
- interval=5 and max\_monitored\_delay=60

You get the following cutoff points: 3, 5, 10, 15, 20, 25,... seconds

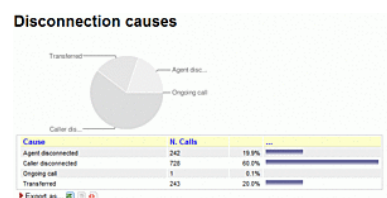
By setting

- initial\_interval=0 and max\_initial\_interval=0
- interval=10 and max\_monitored\_delay=120

You get the default cutoff points: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110 and 120 seconds

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK04
API block name	OkDO.ServiceLevelAgreement
Parameters	-
See also	UN18 UN07 UN06

## OK05 - Disconnection causes



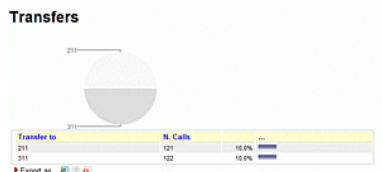
This report shows the reason why calls were terminated; this means that:

- The agent hung up, or
- The caller hung up, or
- The call was transferred outside the queue and the agent was freed again, or
- The call was ongoing at the time the report was run.

The graph reports the percentage values associated to the reason of why calls were terminated, as calculated in the table.

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK05
API block name	OkDO.DisconnectionCauses
Parameters	-
See also	

## OK06 - Transfers



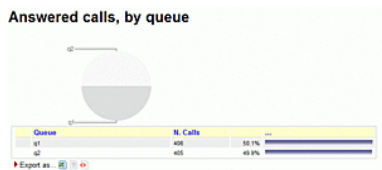
This graph shows how many calls were transferred to each extension in the given time frame. This lets you know who is handling exception calls.



when a call is transferred outside the queue system, its length is no more recorded by the queue subsystem; therefore you only get to see the length of the call while the agent was on line.

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK06
API block name	OkDO.Transfers
Parameters	-
See also	

## OK07 - Answered calls, by queue



If more than one queue is in use for the report, this table shows the relative magnitude of each queue.

The graph reports the percentage associated to each queue in the table.

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK07
API block name	OkDO.AnsweredcallsByQueue
Parameters	-
See also	

## OK08 - Answered calls, by direction

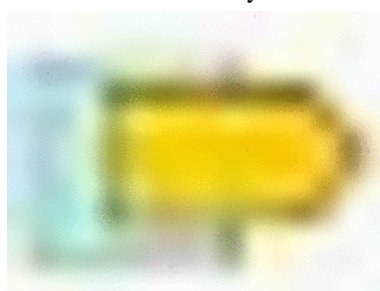


If more than one queue is in use for the report, this table shows the relative magnitude of each queue.



Inbound queues are marked with the symbol

while outbound queues



use the symbol

The graph reports the percentage associated to each queue in the table.

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK08
API block name	OkDO.AnsweredcallsByDirection
Parameters	-
See also	

## OK09 - Answered calls, by stints

Answered calls, by stints



This graph counts the distribution of multi-stint calls on selected queues. If multi-stint mode is not enable, all calls will have only one stint.

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK09
API block name	OkDO.StintsOk
Parameters	-
See also	

## OK10 - Queue position

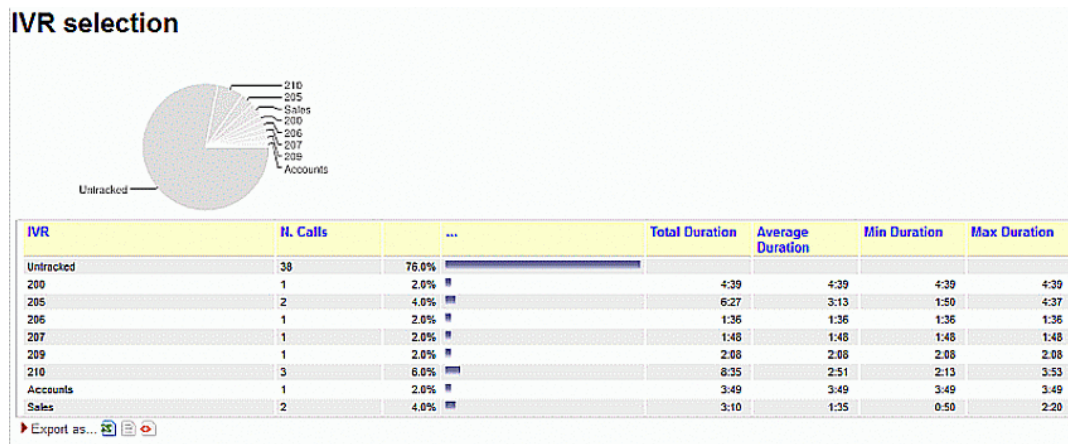
Queue position



This graph shows the initial queue position that the calls had when they joined the queue. For example, a queue position of 1 means that a call was first in line, of 5 means that a call had four other calls in line before being answered. As the logging of queue positions is a bit inconsistent, some calls might be missing it ("Untracked")

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK10
API block name	OkDO.QPosOk
Parameters	-
See also	

## OK11 - IVR selection

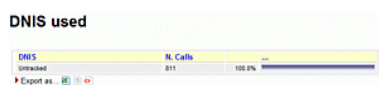


This graph shows the distribution of IVR selections available in the calls processed. We can also see the IVR duration values, which is related to the time that the call was within the IVR before entering the queue.

This must be tracked manually in Asterisk - See "Configuring Asterisk for QueueMetrics" below.

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK11
API block name	OkDO.IvrOk
Parameters	-
See also	

## OK12 - DNIS used









This graph shows the distribution of DNIS lines available in the calls processed.



This must be tracked manually in Asterisk - See "Configuring Asterisk for QueueMetrics" below.

Available since	1.6.0
Default page	Answered calls
Shortcut code	OK12
API block name	OkDO.DnisOk
Parameters	-
See also	

## OK13 - Music On Hold by Agent





Music-on-Hold by Agent				
Agent	Total Events	Events per Call	Total Duration	Average Duration
 John Doe (101)	4	2.0	0:53	0:13
 Bob Smith (102)	2	2.0	0:25	0:12
 Export as...   				

This allows to see the total number of Music on Hold (MOH) events per agent, how many MOH instances took place throughout a call, the average and total duration of MOH events.

This must be tracked manually in Asterisk - See "Configuring Asterisk for QueueMetrics" below.

Available since	12.2.0
Default page	Answered calls
Shortcut code	OK13
API block name	OkDO.MOHOk
Parameters	-
See also	

## OK14 - Report Header

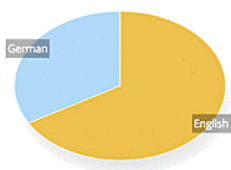
Report Header	
Report Details:	
Report generated on:	October 21 2013, 11:24
Atomic (search) considered:	00:48
Period start date:	July 23 2012, 11:21
Period end date:	October 21 2013, 11:21
Total calls processed:	92 ans / 44 users
Ratio:	67.8% ans / 32.1% users
 Export as...   	

This is the report header and will be added automatically on each tab on the screen and at the beginning of each session in the PDF and Excel report export.

Available since	13.04.9
Default page	Beginning of each page
Shortcut code	OK14

API block name	OkDO.HDRRpT
Parameters	-
See also	HDRRpT

## OK15 - Required Skills for Taken Calls



Skill Required	N. Calls	Percent	Avg Wait	Avg Talk	Min lvl	Avg lvl	Max lvl
English	2	100.0%	0:06	0:20	60	65	70
German	1	50.0%	0:02	0:10	90	90	90

This data block displays the skills that were required for taken calls in the current reports.

As multiple skills may be required for the same call, or some calls may have no required skill, the sum of all skills may be significantly different from the number of calls.

For each skill, the average wait and talk duration of all calls having that specific skill is computed. Plus, the minimum, average and maximum level at which this skill was requested for the specific set of calls is displayed.

Available since	15.10
Default page	Answered calls
Shortcut code	OK15
API block name	OkDO.SkillsOk
Parameters	-
See also	UN19, UN20

## Historical reports - Details of answered calls

### OD01 - Queue details

#### Queue details

Date	Caller	Queue	IVR	Wait	Duration	Pos.	Disconnection	Handled by	Attempts	Code	Stints	Srv	Tag	Feat	Vars	Asterisk UID
06/03-11:52:46	204	A300	0:00	0:03	37:40	1	Caller	John Doe (020)	1					0	0	143325166.1179
06/03-14:20:57	202	A300	0:07	0:04	0:22	1	Caller	John Doe (020)	1	143			TV AD copy 2	2	0	1433234057.1183
06/03-14:21:40	200	A300	0:03	0:10	0:25	1	Caller	John Doe (020)	2				TV AD copy 3	0	0	1433234099.1185
06/03-14:45:48	208	A300	0:08	0:04	1:02	1	Caller	John Doe (020)	1					2	0	1433135548.1200

Export data

This page shows the detail of answered calls. See Chapter 5, *Showing call details* [59].

When running a report, it is advisable to use block the section called “OD03 - Queue details (paged)” [75] instead.

Available since	1.6.0
-----------------	-------

Default page	Details of answered calls
Shortcut code	OD01
API block name	DetailsDO.CallsOK
Parameters	-
See also	the section called “OD03 - Queue details (paged)” [75]

## OD02 - Add to export job



This is a pseudo-block that is used to display a button for call export. The button may not be displayed if the user does not have the correct grants. As it does not actually contain data, it cannot be queried over XML-RPC.

Available since	1.7.0
Default page	Details of answered calls
Shortcut code	OD02
API block name	-
Parameters	-
See also	

## OD03 - Queue details (paged)

### Details of answered calls

Date	Caller	Queue	IVR	Wait	Duration	Pos.	Disconnection	Handled by	Attempts	Code	Stints	Srv	Tag	Feat	Vars
04/01 - 10:31:41	204	A300	0:00	0:17	0:38	1	Agent	John Doe (101)	1	ni				0	0
04/01 - 10:34:19	204	A300	0:00	0:03	0:30	1	Agent	John Doe (101)	1	safe				2	0
04/01 - 10:39:46	204	A300	0:00	0:51	1:06	1	Agent	John Doe (101)	3					3	0
04/01 - 14:55:04	205	A300	0:05	0:01	0:17	1	Agent	John Doe (101)	1	safe			TV AD copy 2	1	0
04/01 - 14:56:42	205	A300	0:03	0:02	0:31	1	Agent	John Doe (101)	1	dnc			TV AD copy 3	1	0
04/01 - 15:08:37	204	A400	0:00	0:12	0:22	1	Agent	John Doe (101)	1					0	0
04/01 - 15:10:54	204	A400	0:00	0:10	2:43	1	Caller	Bob Smith (102)	1					0	0
04/01 - 15:52:44	204	A300	0:00	0:01	0:47	1	Agent	slp/204	1					0	0
04/01 - 15:57:40	204	A300	0:00	0:03	0:30	1	Caller	Bob Smith (102)	1					0	0

This page shows the paged detail of answered calls. See Chapter 5, *Showing call details* [59].

The details of calls are paged - so you can move back and forth - and you can control which columns will appear on screen. The paged mode uses way less memory and is quicker to use than the full list as in the section called “OD01 - Queue details” [74].

When accessing the data source through XML-RPC or printing a report, it is mandatory to use the OD01 block, as this block is interactive and will not render correctly.

Available since	13.03
-----------------	-------

Default page	Details of answered calls
Shortcut code	OD03
API block name	-
Parameters	-
See also	the section called “OD01 - Queue details” [74] and the section called “Configuring paged call lists” [247]

## OD04 - IVR details (paged)

This block shows the paged detail of IVR calls. These are calls that did not hit a queue in the current report and therefore are reported as neither answered nor unanswered.

The details of calls are paged - so you can move back and forth - and you can control which columns will appear on screen. The paged mode uses way less memory and is quicker to use than the full list as in the section called “OD05 - IVR details (full list)” [76].

When accessing the data source through XML-RPC or printing a report, it is mandatory to use the OD05 block, as this block is interactive and will not render correctly.

Available since	13.03
Default page	Details of answered calls
Shortcut code	OD04
API block name	-
Parameters	-
See also	the section called “OD05 - IVR details (full list)” [76]

## OD05 - IVR details (full list)

This block shows the paged detail of IVR calls. These are calls that did not hit a queue in the current report and therefore are reported as neither answered nor unanswered.

This block prints a complete list and should be used only for printing and XML-RPC querying.

Available since	13.03
Default page	Details of answered calls
Shortcut code	OD05
API block name	DetailsDO.CallsIVR

Parameters	-
See also	the section called “OD04 - IVR details (paged)” [76]

## OD06 - Executive Summary

# Executive Summary

### *Executive Summary*

Executive Summary	
General Statistics	
Taken Calls	46
Avg. elapsed time	34
Lost Calls	4
Total Calls	50
Total elapsed time	1594
Caller Statistics	
Short Calls	7
Unique Callers	19
Unique First Taken	16
Unique First Lost	3
Unique Final Lost	2
Lost Calls Statistics	
A	4

► Export as...



This report provides a wealth of information regarding the situation in general. With a final focus on lost calls and disconnection reasons. The information is the following:

#### General Statistics

- Taken Calls
- Avg. Elapsed Time
- Lost Calls
- Total Calls
- Total Elapsed Time

#### Caller Statistics

- Short Calls
- Unique Callers
- Unique First Taken
- Unique First Lost
- Unique Final Lost

**Lost Calls Statistics** A list of disconnection reasons and the number of lost calls with each disconnection reason

#### Notes:

- the number of seconds needed for a call to be classified as long is dictated by the following configuration property: `default.shortcall_treshold = 30` If the property is not specified, it will default at 30.

Available since	17.06.16
Default page	Executive Summary
Shortcut code	OD06
API block name	DetailsDO.ExecutiveSummary
Parameters	-
See also	the section called "OD06 - Executive Summary" [77]

## Historical reports - Unanswered calls

Unanswered calls are calls that were lost, i.e. the caller could not connect to an agent. This usually means that either the caller hung up, fed up with waiting, or the queue system decided to discharge the caller, maybe sending him to voicemail or another queue.



if you run a report with an agent filter, or a supervisor filter, or a location filter, the number of lost calls in the report is usually zero, showing just outgoing calls, if any. This is



because the agent is specified only for taken calls and not lost ones, so not deleting them all would show, e.g., the taken call data for one single agent and the lost calls for all of the queue. You can override this behaviour through a configuration switch if you feel this is not correct for you.

## UN01 - All calls

### All calls

All calls	
N of unanswered calls:	296
Average wait time before disconnection:	10.0 s.
Min wait time before disconnection:	0.10
Max wait time before disconnection:	0.10
Total wait time before disconnection:	0.8 H
Average initial position	1.0
Min initial position	1
Max initial position	1
Coverage	100.0%
Average queue position at disconnection:	1.0
Min queue position at disconnection:	1
Max queue position at disconnection:	1

Export as...

The report shows:

- How many calls were lost;
- The average waiting time before disconnection;
- The average queue position at disconnection (i.e. how many calls the queue had to dispatch before connecting the caller to an operator).
- The minimum and maximum wait times
- The minimum and maximum queue position at disconnect.
- The average, minimum and maximum initial queue position, and the coverage given for this computation

Available since	1.6.0
Default page	Unans.
Shortcut code	UN01
API block name	KoDO.ReportKoAll
Parameters	-
See also	

## UN02 - Calls fully within the given time interval

### Calls fully within the given time interval

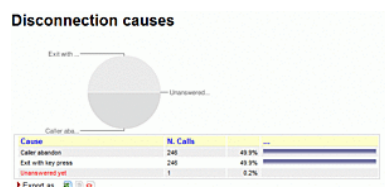
Calls fully within the given time interval	
N of unanswered calls:	296
Average wait time before disconnection:	10.0 s.
Min wait time before disconnection:	0.10
Max wait time before disconnection:	0.10
Total wait time before disconnection:	0.8 H
Average initial position	1.0
Min initial position	1
Max initial position	1
Coverage	100.0%
Average queue position at disconnection:	1.0
Min queue position at disconnection:	1
Max queue position at disconnection:	1

Export as...

The unanswered completed calls section deals with calls that were lost. This is similar to what's reported on previous panel but may exclude calls that were started before or terminated after the given time frame.

Available since	1.6.0
Default page	Unans.
Shortcut code	UN02
API block name	KoDO.ReportKoFully
Parameters	-
See also	

## UN03 - Disconnection causes

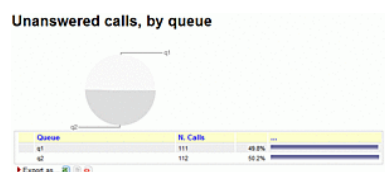


This report shows the relative magnitude of disconnection causes, that are:

- The caller hung up, or
- The queue timed out and discharged the caller (if this feature is enabled by the queue configuration - see Chapter 18, *Configuring Asterisk for QueueMetrics* [345]), or
- The caller exited the queue by pressing a key (if this feature is enabled by the queue configuration).

Available since	1.6.0
Default page	Unans.
Shortcut code	UN03
API block name	KoDO.DiscCauses
Parameters	-
See also	

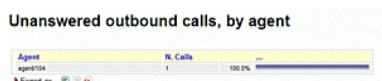
## UN04 - Unanswered calls, by queue



If more than one queue is in use for the report, this graph shows the relative magnitude of each queue, either in a numerical than in a graphical form.

Available since	1.6.0
Default page	Unans.
Shortcut code	UN04
API block name	KoDO.UnansByQueue
Parameters	-
See also	

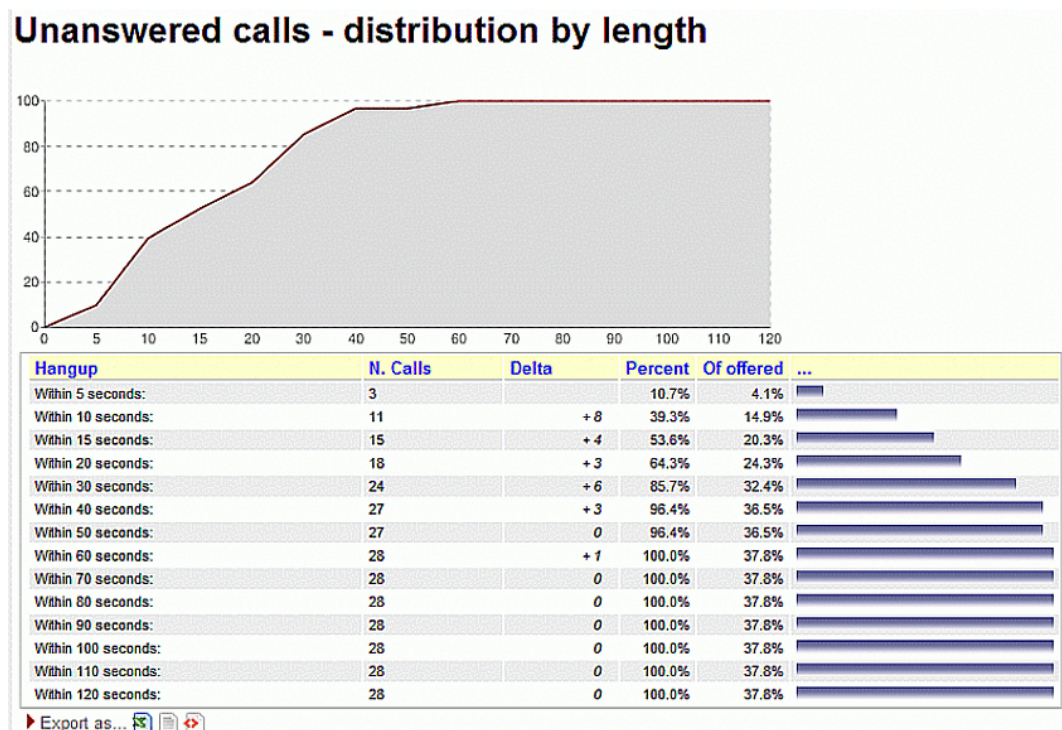
## UN05 - Unanswered outbound calls, by agent



This graph shows the relative magnitude of unanswered outbound calls, grouped by agent.

Available since	1.6.0
Default page	Unans.
Shortcut code	UN05
API block name	KoDO.OutboundKo
Parameters	-
See also	

## UN06 - Unanswered calls - distribution by length



This report is functionally equivalent to "Service level agreement" in the Answered calls section (see the section called "Service level agreement" [32]), but is computed on lost calls. It shows how many calls were hung up within a given time frame, usually 120 seconds in 10 second increments (the time frame and increment can be modified by the administrator, if needed - see the section called "OK04 - Service level agreement" [68]).

You get a percentage of how many calls were lost within X seconds; the percentage includes calls lost in a shorter time frame and therefore grows with time.

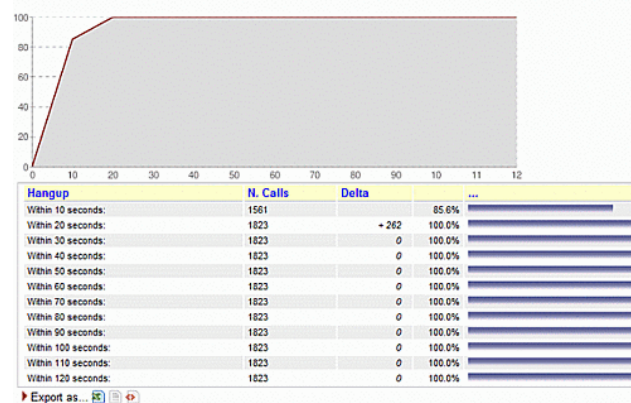
The "delta" value you see is the absolute increment, expressed in number of calls, between each time frame, while the "Offered" column displays the result of the taken calls divided by the total taken plus the total lost.

The graph reports the percentage of how many calls were not answered within X seconds, as reported in the table.

Available since	1.6.0
Default page	Unans.
Shortcut code	UN06
API block name	KoDO.UnansByLen
Parameters	-
See also	UN07 UN18 OK04

## UN07 - Inclusive SLA (computed on both answered and unanswered calls)

**Inclusive SLA (computed on both answered and unanswered calls)**



The inclusive SLA corresponds to the Service Level Agreement metrics shown on the section called "Service level agreement" [32], with the difference that it is computed taking into consideration both answered and unanswered calls.

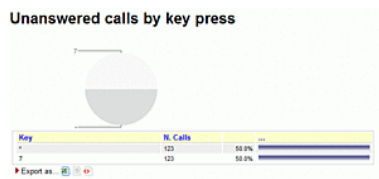
The difference between UN07 and UN18 is that the number of calls in UN18 is only the number of taken calls within the given answer period, while in UN07 it is the total number of taken and lost calls within the time period.

The graph reports the same information found in the table, but in a graphical way.

The time frame and increment can be modified by the administrator, if needed - see the section called "OK04 - Service level agreement" [68].

Available since	1.6.0
Default page	Unans.
Shortcut code	UN07
API block name	KoDO.InclusiveSLA
Parameters	-
See also	OK04 UN06 UN18 (Inclusive Answered SLA)

## UN08 - Unanswered calls by key press



If there are any calls that are were set unanswered because the caller pressed a key to exit the queue, this graph shows which keys were pressed and how many calls were terminated for that reason.

Available since	1.6.0
Default page	Unans.
Shortcut code	UN08
API block name	KoDO.ReportKoKeyPress
Parameters	-
See also	

## UN09 - Unanswered calls, by stints



This graph tells the stint distribution of unanswered calls. It corresponds to the graph called "Answered calls, by stints".

Available since	1.6.0
Default page	Unans.
Shortcut code	UN09
API block name	KoDO.StintsKo
Parameters	-
See also	

## UN10 - All calls, by stints

All calls, by stints

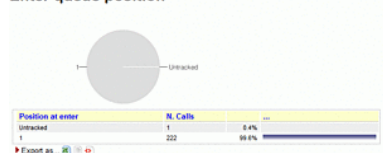


This graph tells the stint distribution of all processed calls. It corresponds to the sum of the graphs called "Answered calls, by stints" and "Unanswered calls, by stints"

Available since	1.6.0
Default page	Unans.
Shortcut code	UN10
API block name	KoDO.StintsOkKo
Parameters	-
See also	

## UN11 - Enter queue position

Enter queue position

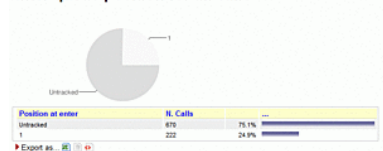


This graph shows the initial queue position that the calls had when they joined the queue. For example, a queue position of 1 means that a call was first in line, of 5 means that a call had four other calls in line before being answered. As the logging of queue positions is a bit inconsistent, some calls might be missing it ("Untracked")

Available since	1.6.0
Default page	Unans.
Shortcut code	UN11
API block name	KoDO.QPosKo
Parameters	-
See also	

## UN12 - Enter queue position for all calls

Enter queue position for all calls

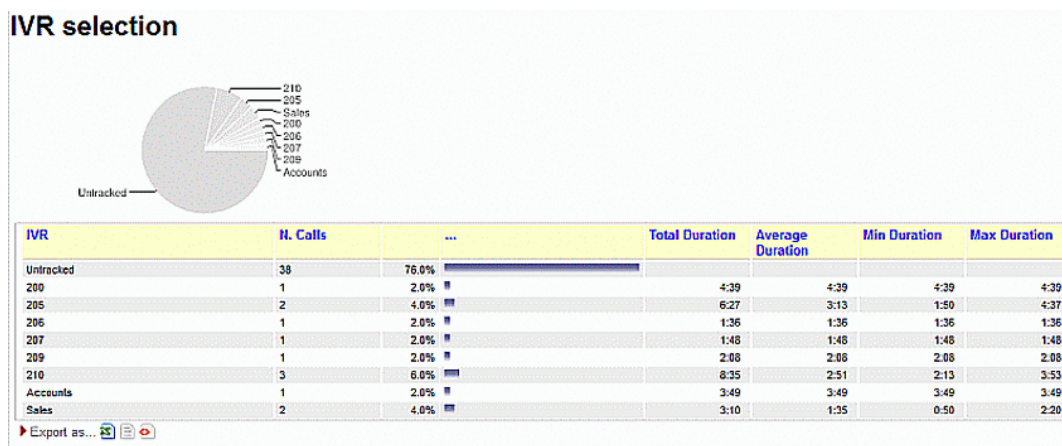


This graph shows the initial queue positions for both answered and unanswered calls.



Available since	1.6.0
Default page	Unans.
Shortcut code	UN12
API block name	KoDO.QPosOkKo
Parameters	-
See also	

## UN13 - IVR selection



This graph shows the distribution of IVR selections available for lost calls.

We can also see the IVR duration values, which is related to the time that the call was within the IVR before entering the queue.

This must be tracked manually in Asterisk - See "Configuring Asterisk for QueueMetrics" below.

Available since	1.6.0
Default page	Unans.
Shortcut code	UN13
API block name	KoDO.IvrKo
Parameters	-
See also	

## UN14 - IVR selection, for all calls

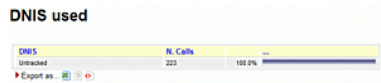


This graph shows the distribution of IVR selections for all calls (taken and lost) available in the report.

Available since	1.6.0
-----------------	-------

Default page	Unans.
Shortcut code	UN14
API block name	KoDO.IvrOkKo
Parameters	-
See also	

## UN15 - DNIS used



This graph shows the distribution of DNIS lines that lead to lost calls.

This must be tracked manually in Asterisk - See "Configuring Asterisk for QueueMetrics" below.

Available since	1.6.0
Default page	Unans.
Shortcut code	UN15
API block name	KoDO.DnisKo
Parameters	-
See also	

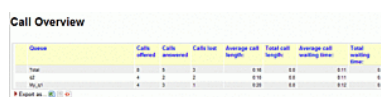
## UN16 - DNIS used, for all calls



This graph shows the distribution of DNIS lines for all calls (taken and lost) available in the report.

Available since	1.6.0
Default page	Unans.
Shortcut code	UN16
API block name	KoDO.DnisOkKo
Parameters	-
See also	

## UN17 - Call Overview



The answered calls section deals with calls that were correctly handled by agents.

For each queue included in the report, the following data will be shown:

- Calls offered: total number of calls in the period to hit that queue
- Calls answered: total number of answered calls
- Lost calls: total number of calls that have not been answered
- Average call length: it computed only on the talk time of answered calls, expressed as MM:SS
- Total call length: the total cumulate speak time for each queue, expressed as decimalized hours
- Average wait Q: the average wait time for both answered and lost calls
- Total wait Q: total cumulate wait time for answered and unanswered calls, expressed as decimalized hours

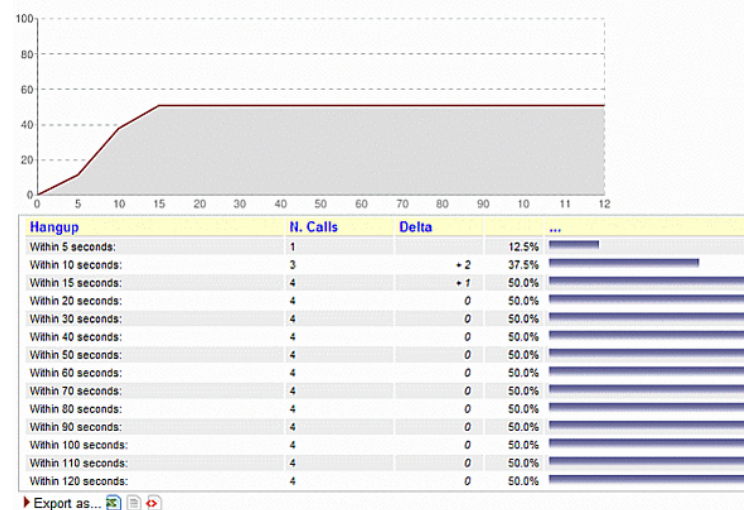
In the first line, there is a "Total" line, that sums up the values shown in previous lines.

The following lines are sorted according to the number of offered calls.

Available since	1.6.1.1
Default page	Unanswered calls
Shortcut code	UN17
API block name	KoDO.OverviewOkKo
Parameters	-
See also	

## UN18 - Inclusive Answered SLA

### Inclusive Answered SLA



The inclusive SLA corresponds to the Service Level Agreement metrics shown on the section called “Service level agreement” [32], with the difference that it is computed taking into consideration both answered and unanswered calls.

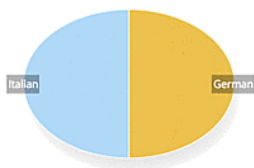
The difference between UN07 and UN18 is that the number of calls in UN18 is only the number of taken calls within the given answer period, while in UN07 it is the total number of taken and lost calls within the time period.

The graph reports the same information found in the table, but in a way that is easier to read.

The time frame and increment can be modified by the administrator, if needed - see the section called “OK04 - Service level agreement” [68].

Available since	1.6.1.2
Default page	Unans.
Shortcut code	UN18
API block name	KoDO.InclusiveAnswSLA
Parameters	-
See also	UN07 (Inclusive SLA) UN06 OK04

## UN19 - Required Skills for Lost Calls



Skill Required	N. Calls	Percent	Avg Wait	Avg Talk	Min lvl	Avg lvl	Max lvl
German	1	100.0%	0:20	0:00	30	30	30
Italian	1	100.0%	0:20	0:00	70	70	70

This data block displays the skills that were required for lost calls in the current reports.

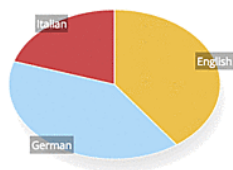
As multiple skills may be required for the same call, or some calls may have no required skill, the sum of all skills may be significantly different from the number of calls.

For each skill, the average wait duration of all calls having that specific skill is computed. As lost calls never have any talk time, it always appears as 0:00 and is displayed for symmetry with blocks OK15 and UN20.

The minimum, average and maximum level at which this skill was requested for the specific set of calls is displayed.

Available since	15.10
Default page	Unans.
Shortcut code	UN19
API block name	KoDO.SkillsKo
Parameters	-
See also	UN20, OK15

## UN20 - Required Skills for All Calls



Skill Required	N. Calls	Percent	Avg Wait	Avg Talk	Min lvl	Avg lvl	Max lvl
English	2	66.7%	0:06	0:20	60	65	70
German	2	66.7%	0:11	0:05	30	60	90
Italian	1	33.3%	0:20	0:00	70	70	70

This data block displays the skills that were required for all calls in the current reports.

As multiple skills may be required for the same call, or some calls may have no required skill, the sum of all skills may be significantly different from the number of calls.

For each skill, the average wait and talk duration of all calls having that specific skill is computed. Plus, the minimum, average and maximum level at which this skill was requested for the specific set of calls is displayed.

Available since	15.10
Default page	Unans.
Shortcut code	UN20
API block name	KoDO.SkillsOkKo
Parameters	-
See also	UN19, OK15

## Historical reports - Details of unanswered calls

### UD01 - Detail of unanswered calls

Detail of unanswered calls

Date	Agent	Caller	Queue	Disconnection	Position	IVR	Wait	Pos.	Attempts	Code	Key	Stints	Srv	Tag	Feat	Vars	Asterisk UID
Gd01-101804		204	A330	Abandon	1	0:09	0:16	1	0						0	0	1427816154.383
Gd01-102544		204	A330	Abandon	1	0:09	0:20	1	0						0	0	14278161744.384
Gd01-103355		204	A330	Abandon	1	0:09	0:16	1	1						0	0	1427817235.389
Gd01-143417		203	A330	Abandon	1	0:19	0:15	1	0					TV AD way 2	0	0	1427892837.0
Gd01-143546		203	A330	Abandon	1	0:04	0:14	1	0					TV AD way 3	0	0	1427892846.4
Gd01-143617		200	A330	Abandon	1	0:03	0:00	1	0					TV AD way 2	0	0	1427892877.6

This page shows full details of unanswered calls the section called “Detail of unanswered calls” [63].

In general this data block should not be used in reports but block the section called “UD02 - Lost calls (paged)” [90] should be preferred.

Available since	1.6.0
Default page	Details of unanswered calls
Shortcut code	UD01

API block name	DetailsDO.CallsKO
Parameters	-
See also	the section called “UD02 - Lost calls (paged)” [90]

## UD02 - Lost calls (paged)

### Details of unanswered calls

Date	Agent	Caller	Queue	Disconnection	Position	IVR	Wait	Pos.	Attempts	Code	Key	Stints	Srv	Tag	Feat	Vars
04/01 - 10:16:04		204	A300	Abandon	1	0:00	0:16	1	0						0	0
04/01 - 10:25:44		204	A300	Abandon	1	0:00	0:28	1	0						0	0
04/01 - 10:33:55		204	A300	Abandon	1	0:00	0:16	1	1						0	0
04/01 - 14:54:17		203	A300	Abandon	1	0:10	0:15	1	0					TV AD copy 2	0	0
04/01 - 14:55:46		203	A300	Abandon	1	0:04	0:14	1	0					TV AD copy 3	0	0
04/01 - 14:56:17		200	A300	Abandon	1	0:03	0:08	1	0					TV AD copy 3	0	0
04/01 - 15:02:31		204	A400	Abandon	1	0:00	0:30	1	0						0	0
04/01 - 15:55:23		200	A300	Abandon	1	0:03	3:50	1	0					TV AD copy 3	0	0
05/02 - 11:46:40		204	A300	Abandon	1	0:00	0:09	1	0						0	0

This page shows the paged detail of unanswered calls. See Chapter 5, *Showing call details* [59].

The details of calls are paged - so you can move back and forth - and you can control which columns will appear on screen. The paged mode uses way less memory and is quicker to use than the full list as in the section called “UD01 - Detail of unanswered calls” [89].

When accessing the data source though XML-RPC or printing a report, it is mandatory to use the UD01 block, as this block is interactive and will not render correctly.




Available since	13.03
Default page	Details of unanswered calls
Shortcut code	UD02
API block name	-
Parameters	-
See also	the section called “UD01 - Detail of unanswered calls” [89] and the section called “Configuring paged call lists” [247]

## Historical reports - Area code analysis

### AC01 - Area code report

#### Area code report

Number of CLID digits to search:	3
Starting from position:	1
<input type="button" value="Search"/>	

Export as...   

If the Caller\*ID is present, it is possible to break down both answered and unanswered calls to specific area codes by clicking on the "Area code analysis" button.

By selecting a number of caller id digits to search upon and a starting digit position, you get a number of statistics grouped by area codes.

This report gives an immediate check of the geographical origin of calls handled by your call center.

Available since	1.6.0
Default page	Area code analysis
Shortcut code	AC01
API block name	AreaAnDO.Setup
Parameters	-
See also	

## AC02 - Detail for answered calls

**Detail for answered calls**

Area code/Caller id	Taken calls	Total calling time	Average time per call	Average wait time per call
05	908	11:08:14	0:08	0:13
-	1	2:30	2:30	0:10

Export as:

This report shows the answered calls grouped following the rules defined in AC01 - Area code report.

Available since	1.6.0
Default page	Area code analysis
Shortcut code	AC02
API block name	AreaAnDO.CallsOK
Parameters	-
See also	AC01 - Area code report

## AC03 - Detail for unanswered calls

**Detail for unanswered calls**

Area code/Caller id	Lost calls	Average wait time per call	Average position
05	223	0:09	1:0

Export as:

This report shows the unanswered calls grouped following the rules defined in AC01 - Area code report.

Available since	1.6.0
Default page	Area code analysis
Shortcut code	AC03
API block name	AreaAnDO.CallsKO
Parameters	-



See also

AC01 - Area code report

## AC04 - Frequent Area Codes

### Frequent Area Codes

Frequent Area Codes

Prefix	N. of Callers	Total Calls	Taken calls	% of Taken Calls	Lost calls	Total Duration	Avg. Duration
011	1	15	15	100.0%	0	10:03	0:41
020	1	3	3	100.0%	0	0:45	0:15
074	2	17	15	88.0%	2	9:20	0:37
079	1	1	1	100.0%	0	0:14	0:14
123	1	1	1	100.0%	0	0:08	0:08
and	1	13	11	84.0%	2	6:04	0:34

Export as...

This report shows detailed information regarding different Area Codes. We take into account the quantity and quality of calls related to different areas, by calculating the following information:

- Prefix
- N. of Callers
- Totale Calls
- Taken Calls
- % of Taken Calls
- Lost Calls
- Total Duration
- Avg. Duration

Available since	17.06.16
Default page	Area code analysis
Shortcut code	AC04
API block name	AreaAnDO.FrequentAreaCodes
Parameters	-
See also	AC01 - Area code report

## Historical reports - Distributions

When running an inbound call center, it is very important to determine the reason why a call is delayed: are your clients refusing to answer? Did they forget to log off before leaving their workplace? The inbound ACD call attempts metrics try to answer to these questions.

As these metrics are not usually recorded by Asterisk, you'll have to patch and recompile your Asterisk system in order to gather them - see the section the section called "Enabling ACD call attempts recording on Asterisk 1.0 and 1.2" [349]. If you do not do so, the metrics presented here will always appear zeroed out. With Asterisk 1.4, this feature should be automatically enabled with no need to patch the source code.

## AT01 - Inbound ACD call attempts

### Inbound ACD call attempts

Total ACD attempts sent to operators:	1,113
Taken calls	
Average attempts:	1.3
Min attempts:	1.0
Max attempts:	2.0
Total attempts:	890.0
Lost calls	
Average attempts:	1.0
Min attempts:	1.0
Max attempts:	1.0
Total attempts:	223.0
Export as...	

This page shows the following pieces of information:

- How many agent attempts were made, i.e. how many times the agent's telephones were rung in total
- The average number of attempts that were necessary for a taken call; the minimum, maximum and total attempts made that resulted in a taken call
- The average number of attempts that were necessary for a lost call; the minimum, maximum and total attempts made that resulted in a lost call

Available since	1.6.0
Default page	Distrib.
Shortcut code	AT01
API block name	DistrDO.ReportAcid
Parameters	-
See also	

## AT02 - ACD attempts by queue

### ACD attempts by queue

Queue	N. Lost	Avg ring	Ring (s)	N. Taken	Avg ring	Ring (s)
Q1	200	0:10	37:00	204	0:10	38:00
Q2	200	0:10	37:00	204	0:10	38:00

The following metrics are extracted and broken down by queue:

- N. of lost agent attempts (i.e. the agent was called but not responding)
- The average ring time for lost attempts
- The total ringing time for lost calls
- The number of taken agent attempts (i.e. calls answered)
- The average ring duration for taken calls
- The total ring time for taken calls

Available since	1.6.0
Default page	Distrib.
Shortcut code	AT02

API block name	DistrDO.AcdByQueue
Parameters	-
See also	

## AT03 - ACD attempts by terminal

ACD attempts by terminal

Agent	N. lost	Avrg ring	Ring (s)	N. Taken	Avrg ring	Ring (s)
Agent-1001	0	0:00	0:00	111	0:00	0:00
Agent-1002	222	0:10	0:00	222	0:10	0:00
Agent-1003	222	0:10	0:00	222	0:10	0:00
Agent-1004	1	0:00	0:00	222	0:10	0:00

This graph breaks down agent attempts by the agent that was called. The following pieces of information are extracted for each agent:

- N. of lost agent attempts (i.e. the agent was called but not responding)
- The average ring time for lost attempts
- The total ringing time for lost calls
- The number of taken agent attempts (i.e. calls answered)
- The average ring duration for taken calls
- The total ring time for taken calls

Available since	1.6.0
Default page	Distrib.
Shortcut code	AT03
API block name	DistrDO.AcdByTerminals
Parameters	-
See also	

## Historical reports - Call distribution by day

The call distribution report shows when calls were handled, when calls were lost and the average wait times broken down by period.

All percentages are calculated on the call class they belong to, i.e. a 50% of "Unanswered calls" on one day means that 50% of all unanswered calls for the period happened during that day, not that 50% of calls were lost.

For each metrics, the total number of calls is shown, together with average, minimum and maximum times. Graphs are plotted on the total number of calls broken down and on the averages.

It is possible to change the interval in the Hourly graphs, so that you can have reports break down calls e.g. by half-hours or hour quarters, by changing a value in the QueueMetrics master configuration file.

## DD01 - Answered call distribution per day

Answered call distribution per day

Day	Num	Answered calls	Avrg	Min	Max	Avrg duration
2010-03-01	1	0.1%	0:00	0:00	0:00	0:00
2010-03-02	0	0.0%	0:00	0:00	0:00	0:00

Taken calls are shown per specific day. Days with no events are not shown.

Available since	1.6.0
Default page	Call distribution, by day
Shortcut code	DD01
API block name	CallDistrDO.AnsDistrPerDay
Parameters	-
See also	

## DD02 - Answered call wait time per day

Answered call wait time per day

Day	Num	Answered calls	Avg	Min	Max	Avg wait
2016-03-31	1	0.0%	0.00	0.00	0.00	0.00
2016-04-01	888	100.0%	0.13	0.10	0.20	0.10

Export as: [CSV](#) [Excel](#) [PDF](#)

The total numbers of call wait time for answered calls are plotted for each day.

Available since	1.6.0
Default page	Call distribution, by day
Shortcut code	DD02
API block name	CallDistrDO.AnsWaitPerDay
Parameters	-
See also	

## DD03 - Unanswered call wait time per day

Unanswered call wait time per day

Day	Num	Unanswered calls	Avg	Min	Max	Avg wait
2016-03-31	0	0.0%	-	0.00	0.00	0.00
2016-04-01	233	100.0%	0.00	0.00	0.10	0.00

Export as: [CSV](#) [Excel](#) [PDF](#)

The total numbers of lost wait time for lost calls are plotted for each day.

Available since	1.6.0
Default page	Call distribution, by day
Shortcut code	DD03
API block name	CallDistrDO.UnansWaitPerDay
Parameters	-
See also	

## DD04 - Sales per day

Sales per day

Day	Conts	QConts	Sales	QCont	Contacts
2016-03-31	-	-	-	-	-
2016-04-01	-	0	0	0	0

Export as: [CSV](#) [Excel](#) [PDF](#)

Sales and contacts are shown on a daily basis.

Available since	1.6.0
-----------------	-------

Default page	Call distribution, by day
Shortcut code	DD04
API block name	CallDistrDO.SalesPerDay
Parameters	-
See also	

## DD05 - Schedule Adherence per day

Schedule Adherence per day

Day	Agents	
2010-03-31	1	20.0%
2010-04-01	4	80.0%

The Schedule Adherence report shows the number of distinct agents that were detected during the given period. This makes it possible to detect the number of different people that had been working on a given moment.

Available since	1.6.0
Default page	Call distribution, by day
Shortcut code	DD05
API block name	CallDistrDO.StaffPerDay
Parameters	-
See also	

## DD06 - Queue length per day

Queue length per day

Day	Avg	Min	Max	Count	Steps
2010-03-31	0.0	0	0	0%	0.0
2010-04-01	1.0	0	1	20%	0.0

The Queue Length report shows the average length of the queue for each period, giving minimums and maximums. The Steps computation shows how fast each queue progresses during the period, expresses in steps per hour. Note: giving a meaning to the Queue Length reports may be hard in the case of composite queues.

Available since	1.6.0
Default page	Call distribution, by day
Shortcut code	DD06
API block name	CallDistrDO.QPosPerDay
Parameters	-
See also	

## DD07 - Inclusive SLA per day

Inclusive SLA per day

Day	Avg	Min	Max	Count	Steps	Count	Steps	Count	Steps	Count	Steps	Count	Steps	Count	Steps
2010-03-31	0.0	0	0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2010-04-01	0.0	0	1	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0

The inclusive SLA corresponds to the Service Level Agreement metrics shown on the section called “Service level agreement” [32], grouped by day.

Available since	1.6.0
Default page	Call distribution, by day
Shortcut code	DD07
API block name	CallDistrDO.InclSlaPerDay
Parameters	-
See also	

## DD08 - Traffic Analysis by period - per day

Traffic Analysis by period - per day

Date	Avg Ag	Calld Ag	SLA %	Unans Short	Unans Lost	Avg Wait Ans	Avg Wait Lost	Avg Talk Time	Max Wait Ans	Max Wait Lost	Max Talk Time	Out/In	N. Offered	N. Answered	N. Answered Out
2016-01-01	1.2	100	100%	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0
2016-01-02	1.2	100	100%	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0
2016-01-03	1.2	100	100%	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0
2016-01-04	1.2	100	100%	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0
2016-01-05	1.2	100	100%	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0

This report shows aggregate inbound/outbound activity per day.

- Date: the date, hour or day of week used for the report.
- Avg agents: the average number of agents, as calculated by agents logged in for each period versus the total period. E.g. if an agent logs in at 10:00 and logs off at 11:30, and a second agent logs in at 10:15 and logs off at 11:00, the period for 10:00 to 10:30 will show 1.5 available agents.
- Avg calls/agent: number of INCOMING calls (answered+unanswered) per period versus average available agents
- Service level: the SLA (see below), computed on INCOMING calls only
- Unans: Lost calls (INCOMING only)
- Unans short: Lost calls below X seconds (INCOMING only, as a percentage of all calls)
- Avg out: number of OUTGOING calls (completed and lost) per period versus number of available agents
- Out/in: ratio of outbound to inbound
- Avg ans. Average answer time (for INCOMING only)
- Avg talk time: Average talk time (for INCOMING only)
- Max wait ans: Maximum answer time in period (for INCOMING only)
- Max wait lost: Maximum wait time for lost calls in period (for INCOMING only)
- Max duration: Maximum talk time in period (for INCOMING only)
- Max duration OUT: Maximum talk time in period (for OUTGOING only)
- N. offered: Total number of INCOMING calls
- N Answered: Total number of answered INCOMING calls
- N Answered out: Total number of answered OUTGOING calls

- Min Agents: minimum number of agents logged on for the period
- Max Agents: maximum number of agents logged on in the period

The Service Level is measured against a time period that is specified in the *default.secondsServiceLevel* parameter (default is 20, as to say "percentage of calls answered within 20 seconds").

Short calls are defined as being shorter than the *default.shortCallsLimit* parameter - default is 5 seconds.

Available since	1.6.0.4
Default page	Call distribution, by day
Shortcut code	DD08
API block name	CallDistrDO.TrafficAnPerDay
Parameters	-
See also	DH08, DW08

## DD09 - Skill sets per day

This reports shows the unique sets of skills during a specified time period.

### Skills per Day

Day	Ans.	Unans.	Num	Within SLA: 10s.	Product1 english internet technical	Product1 english invoice land	Product1 english invoice mobile	Product1 english land others	Product1 english mobile others	Product1 english mobile technical
2016-12-04	0	0	0	-	0	0	0	0	0	0
2016-12-05	2,505	223	2,728	45.3%	0	2	8	7	4	8
2016-12-06	1,737	133	1,870	50.9%	0	0	4	2	4	5
2016-12-07	1,656	55	1,711	58.1%	1	0	3	0	4	3
2016-12-08	1,488	50	1,538	56.7%	1	2	5	0	2	1
2016-12-09	1,745	40	1,785	56.8%	3	0	9	0	6	0
2016-12-10	711	26	737	53.9%	0	0	0	0	4	0

The report is computed out of all calls in the current analysis. Time bands are set as for the current report (system property that can be overridden and is "remembered" across sessions; can be reset through the Custom Reports page). The SLA is set for a queue (or set of queues to be reported on at once) though the parameter "Service Level Agreement" on the Queue configuration page; if missing, the default value is taken from the property *sla.max\_initial\_delay*.

Each call is grouped into a "bucket" based on skills found; skills are sorted by **Skill Sort Weight** in order to create unique buckets for each permutation. Only buckets with at least one call are added to the report. Buckets are displayed with codes correctly decoded. To change the order of how the skills appear inside each bucket, make sure to adjust the **Skill Sort Weight** field in the **Agents Skill** editor. Skills with a lower sort weight are positioned before skills with higher sort weight. If two skills have the same sort weight, they are sorted alphabetically based on their description.

For example, a call with skills "inv en fix" is set to a bucket "en fix inv", that is a separate bucket from e.g. "en fix" but is the same as "en inv fix". Such a call is displayed in a column named "English Fix Invoice", where the names are based on the descriptions used for skills, sorted by the skills' sort weight.



The report shows the following columns:

- Time Slot: a call is banded in a time slot based on the time it is queued
- Answered calls: Total number of answered calls for this slot
- Unanswered calls: total number of lost calls for this slot
- Num: Total Answered + Unanswered
- Within SLA X sec: the number of calls answered within X seconds divided the total number of calls offered (answered+lost)
- "bucket": the total number of calls (taken+lost) that belong to this bucket



As the report may be very large, if you export it to PDF it may be cut on the right side. XLS report works without problems instead.

Available since	16.10.11
Default page	Call distribution, by day
Shortcut code	DD09
API block name	CallDistrDO.SkillsPerDay
Parameters	-
See also	DH09, DW09

## DD10 - Detail Summary

This reports shows the number of taken and lost call by day.

### Detail Summary Dom

*Detail Summary Dom*

Day	Taken Calls	Lost Calls	N. of Calls
2018-01-15	7	1	8
2018-01-16	4	0	4
2017-11-14	5	0	5
2018-01-10	27	3	30
2018-01-12	3	0	3

► Export as...

This report comes in three version, that show the number of calls in different time slices. The available period of times are:

- Hourly [DH10]
- Days of the week [DW10]

- Days (with date) [DD10]

The information is the following

- Taken Calls
- Lost Calls
- N. of Calls

Available since	17.06.16
Default page	Detail Summary, by day
Shortcut code	DD10
API block name	CallDistrDO.DetailSummaryDom
Parameters	-
See also	DH10, DW10

## Historical reports - Call distribution by hour

Events are shown on a 24-hour distribution. If this graph appears to be incorrect, you have to run a "Custom report" setting the time zone accordingly (see the section called "Custom reports" [24]).

### DH01 - Answered call distribution per hour

#### Answered call distribution per hour

Hour	Num	Answered calls	Avg	Min	Max	Avg duration
00:00	36	4.5%	1:00	0:20	2:30	
00:30	36	4.5%	1:00	0:20	2:30	
01:00	36	4.5%	1:00	0:20	2:30	
01:30	36	4.5%	1:00	0:20	2:30	
02:00	36	4.5%	1:00	0:20	2:30	
02:30	36	4.5%	1:00	0:20	2:30	
03:00	36	4.5%	1:00	0:20	2:30	
03:30	36	4.5%	1:00	0:20	2:30	
04:00	36	4.5%	1:00	0:20	2:30	
04:30	36	4.5%	1:00	0:20	2:30	
05:00	36	4.5%	1:00	0:20	2:30	
05:30	36	4.5%	1:00	0:20	2:30	
06:00	36	4.5%	1:00	0:20	2:30	
06:30	36	4.5%	1:00	0:20	2:30	
07:00	36	4.5%	1:00	0:20	2:30	
07:30	36	4.5%	1:00	0:20	2:30	
08:00	36	4.5%	1:00	0:20	2:30	
08:30	36	4.5%	1:00	0:20	2:30	
09:00	36	4.5%	1:00	0:20	2:30	
09:30	36	4.5%	1:00	0:20	2:30	
10:00	36	4.5%	1:00	0:20	2:30	
10:30	35	4.4%	0:57	0:20	2:30	

The total numbers of call lengths for answered calls are plotted for each hourly interval. The size of hourly intervals can be controlled by the *default.hourly\_slot* configuration property, making it possible to run this reports based on 30-minute, 20-minute or 15-minute intervals.

Available since	1.6.0
Default page	Call distribution, by hour
Shortcut code	DH01
API block name	CallDistrDO.AnsDistrPerHr
Parameters	-
See also	

## DH02 - Answered call wait time per hour

Answered call wait time per hour

Hour	Num	Answered calls	Avg	Min	Max	Avg wait
00:00	36	4.5%	0:13	0:10	0:20	
00:30	36	4.5%	0:13	0:10	0:20	
01:00	36	4.5%	0:13	0:10	0:20	
01:30	36	4.5%	0:13	0:10	0:20	
02:00	36	4.5%	0:13	0:10	0:20	
02:30	36	4.5%	0:13	0:10	0:20	
03:00	36	4.5%	0:13	0:10	0:20	
03:30	36	4.5%	0:13	0:10	0:20	
04:00	36	4.5%	0:13	0:10	0:20	
04:30	36	4.5%	0:13	0:10	0:20	
05:00	36	4.5%	0:13	0:10	0:20	
05:30	36	4.5%	0:13	0:10	0:20	
06:00	36	4.5%	0:13	0:10	0:20	
06:30	36	4.5%	0:13	0:10	0:20	
07:00	36	4.5%	0:13	0:10	0:20	
07:30	36	4.5%	0:13	0:10	0:20	
08:00	36	4.5%	0:13	0:10	0:20	
08:30	36	4.5%	0:13	0:10	0:20	
09:00	36	4.5%	0:13	0:10	0:20	
09:30	36	4.5%	0:13	0:10	0:20	
10:00	36	4.5%	0:13	0:10	0:20	
10:30	35	4.4%	0:13	0:10	0:20	

The total numbers of call wait time for answered calls are plotted for each hourly interval. The size of hourly intervals can be controlled by the *default.hourly\_slot* configuration property, making it possible to run this reports based on 30-minute, 20-minute or 15-minute intervals.

Available since	1.6.0
Default page	Call distribution, by hour
Shortcut code	DH02
API block name	CallDistrDO.AnsWaitPerHr
Parameters	-
See also	

## DH03 - Unanswered call wait time per hour

Unanswered call wait time per hour

Hour	Num	Unanswered calls	Avg	Min	Max	Avg wait
00:00	12	4.5%	0:10	0:10	0:10	
00:30	12	4.5%	0:10	0:10	0:10	
01:00	12	4.5%	0:10	0:10	0:10	
01:30	12	4.5%	0:10	0:10	0:10	
02:00	12	4.5%	0:10	0:10	0:10	
02:30	12	4.5%	0:10	0:10	0:10	
03:00	12	4.5%	0:10	0:10	0:10	
03:30	12	4.5%	0:10	0:10	0:10	
04:00	12	4.5%	0:10	0:10	0:10	
04:30	12	4.5%	0:10	0:10	0:10	
05:00	12	4.5%	0:10	0:10	0:10	
05:30	12	4.5%	0:10	0:10	0:10	
06:00	12	4.5%	0:10	0:10	0:10	
06:30	12	4.5%	0:10	0:10	0:10	
07:00	12	4.5%	0:10	0:10	0:10	
07:30	12	4.5%	0:10	0:10	0:10	
08:00	12	4.5%	0:10	0:10	0:10	
08:30	12	4.5%	0:10	0:10	0:10	
09:00	12	4.5%	0:10	0:10	0:10	
09:30	12	4.5%	0:10	0:10	0:10	
10:00	12	4.5%	0:10	0:10	0:10	
10:30	12	4.5%	0:10	0:10	0:10	
11:00	12	4.5%	0:10	0:10	0:10	

The total numbers of call lengths for unanswered calls are plotted for each hourly interval. The size of hourly intervals can be controlled by the *default.hourly\_slot* configuration property, making it possible to run this reports based on 30-minute, 20-minute or 15-minute intervals.

Available since	1.6.0
Default page	Call distribution, by hour

Shortcut code	DH03
API block name	CallDistrDO.UnansWaitPerHr
Parameters	-
See also	

## DH04 - Sales per hour

Sales per hour

Hour	Comm.	Unans.	Sales	Unans.	Comm.
00:00	-	-	-	-	-
01:00	-	-	-	-	-
02:00	-	-	-	-	-
03:00	-	-	-	-	-
04:00	-	-	-	-	-
05:00	-	-	-	-	-
06:00	-	-	-	-	-
07:00	-	-	-	-	-
08:00	-	-	-	-	-
09:00	-	-	-	-	-
10:00	-	-	-	-	-
11:00	-	-	-	-	-
12:00	-	-	-	-	-
13:00	-	-	-	-	-
14:00	-	-	-	-	-
15:00	-	-	-	-	-
16:00	-	-	-	-	-
17:00	-	-	-	-	-
18:00	-	-	-	-	-
19:00	-	-	-	-	-
20:00	-	-	-	-	-
21:00	-	-	-	-	-
22:00	-	-	-	-	-
23:00	-	-	-	-	-

The total numbers sales and contacts, are plotted for each hourly interval. The size of hourly intervals can be controlled by the *default.hourly\_slot* configuration property, making it possible to run this reports based on 30-minute, 20-minute or 15-minute intervals.

Available since	1.6.0
Default page	Call distribution, by hour
Shortcut code	DH04
API block name	CallDistrDO.SalesPerHr
Parameters	-
See also	

## DH05 - Schedule Adherence per hour

Schedule Adherence per hour

Hour	Agents	
00:00	4	4.5%
00:30	4	4.5%
01:00	4	4.5%
01:30	4	4.5%
02:00	4	4.5%
02:30	4	4.5%
03:00	4	4.5%
03:30	4	4.5%
04:00	4	4.5%
04:30	4	4.5%
05:00	4	4.5%
05:30	4	4.5%
06:00	4	4.5%
06:30	4	4.5%
07:00	4	4.5%
07:30	4	4.5%
08:00	4	4.5%
08:30	4	4.5%
09:00	4	4.5%
09:30	4	4.5%
10:00	4	4.5%
10:30	4	4.5%

The Schedule Adherence report shows the number of distinct agents that were detected during the given period. This makes it possible to detect the number of different people that had been working on a given moment.

Available since	1.6.0
Default page	Call distribution, by hour
Shortcut code	DH05
API block name	CallDistrDO.StaffPerHr
Parameters	-

See also	
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## DH06 - Queue length per hour

### Queue length per hour

Hour	Avg	Min	Max	Cover.	Steps
00:00	1.0	1	1	25%	0
00:30	1.0	1	1	25%	0
01:00	1.0	1	1	25%	0
01:30	1.0	1	1	25%	0
02:00	1.0	1	1	25%	0
02:30	1.0	1	1	25%	0
03:00	1.0	1	1	25%	0
03:30	1.0	1	1	25%	0
04:00	1.0	1	1	25%	0
04:30	1.0	1	1	25%	0
05:00	1.0	1	1	25%	0
05:30	1.0	1	1	25%	0
06:00	1.0	1	1	25%	0
06:30	1.0	1	1	25%	0
07:00	1.0	1	1	25%	0
07:30	1.0	1	1	25%	0
08:00	1.0	1	1	25%	0
08:30	1.0	1	1	25%	0
09:00	1.0	1	1	25%	0
09:30	1.0	1	1	25%	0
10:00	1.0	1	1	25%	0
10:30	1.0	1	1	25%	0

The Queue Length report shows the average length of the queue for each period, giving minimums and maximums. The Steps computation shows how fast each queue progresses during the period, expresses in steps per hour. Note: giving a meaning to the Queue Length reports may be hard in the case of composite queues.

Available since	1.6.0
Default page	Call distribution, by hour
Shortcut code	DH06
API block name	CallDistrDO.QPosPerHr
Parameters	-
See also	

## DH07 - Inclusive SLA per hour

### Inclusive SLA per hour

Day	Ans.	Unans.	Num	< 10	< 20	< 30	< 40	< 50	< 60	< 70	< 80	< 90	< 100	< 110	< 120
00:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
00:30	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
01:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
01:30	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
02:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
02:30	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
03:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
03:30	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
04:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
04:30	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
05:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
05:30	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
06:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
06:30	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
07:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
07:30	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
08:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
08:30	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
09:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
09:30	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
10:00	36	12	48	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
10:30	35	12	47	74.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The inclusive SLA corresponds to the Service Level Agreement metrics shown on the section called “Service level agreement” [32], grouped each hour.

Available since	1.6.0
Default page	Call distribution, by hour
Shortcut code	DH07

API block name	CallDistrDO.InclSlaPerHr
Parameters	-
See also	

## DH08 - Traffic Analysis by period - per hour

Traffic Analysis by period - per hour																		
Day	Avg ag	Calls/Ag	Svc Lvl	Unans	Unans short	Avg out	Out/in	Avg ans	Avg talk	Max wait ans	Max wait lost	Max dur	Max dur out	Off.	Ans.	Ans. out	Min Ag.	Max Ag.
00:00	1.0	0.0	0.0%	0	0	0.0	0.0%	0:00	0:00	0:00	0:00	0:00	0:00	0	0	0	1	1
00:15	1.0	0.0	0.0%	0	0	0.0	0.0%	0:00	0:00	0:00	0:00	0:00	0:00	0	0	0	1	1
00:30	1.0	0.0	0.0%	0	0	0.0	0.0%	0:00	0:00	0:00	0:00	0:00	0:00	0	0	0	1	1
00:45	1.0	0.0	0.0%	0	0	0.0	0.0%	0:00	0:00	0:00	0:00	0:00	0:00	0	0	0	1	1
01:00	1.0	0.0	0.0%	0	0	0.0	0.0%	0:00	0:00	0:00	0:00	0:00	0:00	0	0	0	1	1
01:15	1.0	0.0	0.0%	0	0	0.0	0.0%	0:00	0:00	0:00	0:00	0:00	0:00	0	0	0	1	1
01:30	1.0	0.0	0.0%	0	0	0.0	0.0%	0:00	0:00	0:00	0:00	0:00	0:00	0	0	0	1	1

Distribution of calls and agent availability per hour (or interval you specified). The whole 24h are mapped out for ease of comparison.

For a complete description of parameters, see DD08 - Traffic Analysis by period - per day the section called “DD08 - Traffic Analysis by period - per day” [97]

Available since	1.6.0.4
Default page	Call distribution, by hour
Shortcut code	DH08
API block name	CallDistrDO.TrafficAnPerHr
Parameters	-
See also	DD08, DW08

## DH09 - Skill sets per hour

This reports shows the unique sets of skills during a specified time period.

### Skills per Hour

Day	Ans.	Unans.	Num	Within SLA: 10s.	Product1 english internet technical	Product1 english invoice land	Product1 english invoice mobile	Product1 english land others	Product1 english mobile others	Product1 english mobile technical	Product1 english movie technical
01:00	0	0	0	-	0	0	0	0	0	0	
05:00	7,921	457	8,378	51.8%	13	1	10	5	17	15	
09:00	42,610	2,213	44,823	52.1%	39	10	103	42	160	78	
13:00	41,431	1,880	43,311	53.0%	40	17	83	49	129	64	
17:00	18,609	2,603	21,212	41.1%	27	10	39	17	67	38	
21:00	6	14	20	15.0%	0	0	0	0	0	0	

► Export as...



For a complete description of parameters and behavior, see DD09 - Skill sets per day the section called “DD09 - Skill sets per day” [98]

Available since	16.10.11
Default page	Call distribution, by day
Shortcut code	DH09
API block name	CallDistrDO.SkillsPerHour



Parameters	-
See also	DD09, DW09




## DH10 - Detail Summary

This reports shows the number of taken and lost call by hour.

### Detail Summary

*Detail Summary*

Hour	Taken Calls	Lost Calls	N. of Calls
0:00	0	0	0
1:00	0	0	0
2:00	0	0	0
3:00	0	0	0
4:00	0	0	0
5:00	0	0	0
6:00	0	0	0
7:00	0	0	0
8:00	0	0	0
9:00	0	0	0
10:00	0	0	0
11:00	7	0	7
12:00	2	0	2
13:00	2	0	2
14:00	10	0	10
15:00	17	3	20
16:00	6	1	7
17:00	1	0	1
18:00	1	0	1
19:00	0	0	0
20:00	0	0	0
21:00	0	0	0
22:00	0	0	0
23:00	0	0	0

► Export as...   



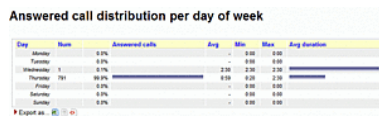
For a complete description of parameters and behavior, see DD10 - Detail Summary by day the section called “DD10 - Detail Summary” [99]

Available since	17.06.16
Default page	Detail Summary, by hour
Shortcut code	DH10
API block name	CallDistrDO.DetailSummary
Parameters	-
See also	DD10, DW10

## Historical reports - Call distribution by day of week

This report shows the weekly behaviour of your queues. The longer the analysis period, the more significant its results will be.

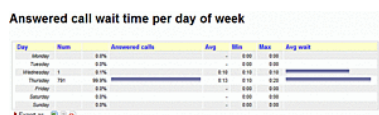
### DW01 - Answered call distribution per day of week



The total numbers of call lengths for answered calls are plotted for each day of the week.

Available since	1.6.0
Default page	Call distribution, by day of week
Shortcut code	DW01
API block name	CallDistrDO.AnsDistrPerDOW
Parameters	-
See also	

### DW02 - Answered call wait time per day of week



The total numbers of call wait time for answered calls are plotted for each day of the week.

Available since	1.6.0
Default page	Call distribution, by day of week

Shortcut code	DW02
API block name	CallDistrDO.AnsWaitPerDOW
Parameters	-
See also	

## DW03 - Unanswered call wait time per day of week

Unanswered call wait time per day of week



The total numbers of call wait time for unanswered calls are plotted for each day of the week.

Available since	1.6.0
Default page	Call distribution, by day of week
Shortcut code	DW03
API block name	CallDistrDO.UnansWaitPerDOW
Parameters	-
See also	

## DW04 - Sales per day of week

Sales per day of week

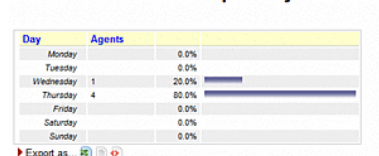


The total numbers sales and contacts, are plotted for each day of the week.

Available since	1.6.0
Default page	Call distribution, by day of week
Shortcut code	DW04
API block name	CallDistrDO.SalesPerDOW
Parameters	-
See also	

## DW05 - Schedule Adherence per day of week

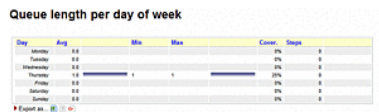
Schedule Adherence per day of week



The Schedule Adherence report shows the number of distinct agents that were detected during the given period. This makes it possible to detect the number of different people that had been working on a given moment.

Available since	1.6.0
Default page	Call distribution, by day of week
Shortcut code	DW05
API block name	CallDistrDO.StaffPerDOW
Parameters	-
See also	

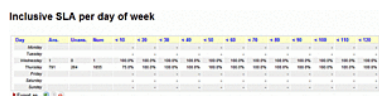
## DW06 - Queue length per day of week



The Queue Length report shows the average length of the queue for each period, giving minimums and maximums. The Steps computation shows how fast each queue progresses during the period, expresses in steps per hour. Note: giving a meaning to the Queue Length reports may be hard in the case of composite queues.

Available since	1.6.0
Default page	Call distribution, by day of week
Shortcut code	DW06
API block name	CallDistrDO.QPosPerDOW
Parameters	-
See also	

## DW07 - Inclusive SLA per day of week



The inclusive SLA corresponds to the Service Level Agreement metrics shown on the section called “Service level agreement” [32], grouped for each day of week.

Available since	1.6.0
Default page	Call distribution, by day of week
Shortcut code	DW07
API block name	CallDistrDO.InclSlaPerDOW

Parameters	-
See also	

## DW08 - Traffic Analysis by period - per day of week

**Traffic Analysis by period - per DOW**

Day	Avg ag	Calls/ Ag	Sec Lvl	Unans	Unans short	Avg out	Outlin	Avg ans	Avg talk	Max wait ans	Max wait lost	Max dur	Max dur out	OR	Ans. out	Ans. out	Min Ag	Max Ag
Monday	0.7	1.3	100.0%	0	0	0.0	0.0%	0.10	0.20	0.10	0.00	0.20	0.00	1	1	0	0	1
Tuesday	1.0	0.0	0.0%	0	0	0.0	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	1	1
Wednesday	1.0	0.0	0.0%	0	0	0.0	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	1	1
Thursday	1.0	0.0	0.0%	0	0	0.0	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	1	1
Friday	0.0	0.0	0.0%	0	0	0.0	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0
Saturday	0.0	0.0	0.0%	0	0	0.0	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0
Sunday	0.0	0.0	0.0%	0	0	0.0	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0

Export as...

Distribution of calls and agent availability per day of week.

For a complete description of parameters, see DD08 - Traffic Analysis by period - per day the section called “DD08 - Traffic Analysis by period - per day” [97]

Available since	1.6.0.4
Default page	Call distribution, by day of week
Shortcut code	DW08
API block name	CallDistrDO.TrafficAnPerDOW
Parameters	-
See also	DD08, DH08

## DW09 - Skill sets per day of week

This reports shows the unique sets of skills during a specified time period.

### Skills per Day of Week

Day	Ans.	Unans.	Num	Within SLA: 10s.	Product1 english internet technical	Product1 english invoice land	Product1 english invoice mobile	Product1 english land others	Product1 english mobile others	Product1 english mobile technical	Prod engl mov tech
Monday	23,301	1,487	24,788	49.9%	32	5	54	33	94	46	
Tuesday	20,826	1,622	22,448	48.7%	23	11	54	21	73	30	
Wednesday	20,556	1,327	21,883	48.7%	23	1	38	17	61	42	
Thursday	18,479	911	19,390	54.9%	16	11	24	22	49	22	
Friday	18,754	892	19,646	54.4%	14	8	52	14	67	39	
Saturday	8,661	927	9,588	42.2%	11	2	13	6	29	16	
Sunday	0	1	1	0.0%	0	0	0	0	0	0	

Export as...

For a complete description of parameters and behavior, see DD09 - Skill sets per day the section called “DD09 - Skill sets per day” [98]

Available since	16.10.11
Default page	Call distribution, by day
Shortcut code	DW09

API block name	CallDistrDO.SkillsPerHour
Parameters	-
See also	DD09, DH09



## DW10 - Detail Summary by Day of the week

This reports shows the number of taken and lost call by day of the week.

### Detail Summary Dow

*Detail Summary Dow*

Day of week	Taken Calls	Lost Calls	N. of Calls
<i>Monday</i>	7	1	8
<i>Tuesday</i>	9	0	9
<i>Wednesday</i>	27	3	30
<i>Thursday</i>	0	0	0
<i>Friday</i>	3	0	3
<i>Saturday</i>	0	0	0
<i>Sunday</i>	0	0	0

► Export as...   

For a complete description of parameters and behavior, see DD10 - Detail Summary by day the section called "DD10 - Detail Summary" [99]

Available since	17.06.16
Default page	Detail Summary by day of the week
Shortcut code	DW10
API block name	CallDistrDO.DetailSummaryDow
Parameters	-
See also	DD10, DH10

## Historical reports - Agents and Sessions

Agent activity refers to the behaviour of Asterisk defined agents. If you connect you queues straight to telephone terminals, this section will always be empty.

Each agent may be flagged as being a member of four priority groups:

- *Main*: the agents usually answering the queue
- *Spill*: the agents answering the queue if all "Main" agents are busy or unavailable
- *Wrap*: the agents answering the queue if all "Main" and "Spill" agents are busy or unavailable

- *Undefined*: this agent is not a member of any priority group for this queue

This feature is useful if priority groups are used in the queue configuration. If they are not used, just assign all agents to "Main" for each queue.

If an unknown agent appears on a queue, it will be marked as "Undefined", written in red.

Agent names are written in blue and are clickable, if you click on them in any of the graphs, you will be lead to a popup that detail the logon and pause history for that agent.

As a default, QueueMetrics will show and count an agent session if and only if the agent handled at least one call during this session. This may not be what you want when you use pause codes - an agent may log on and immediately go on pause to do some back-end activities. If this is the case, you should set the configuration option *default.useRawAgentSessions* to *true* to see all agent sessions.

## AG01 - Agent session detail

### Agent session detail

Agent sessions	
N. of agents available:	4
Average agent time:	9:05:30
Min agent time:	7:42:00
Max agent time:	10:38:07
Total agent time:	36.4 H
Export as...   	

This report shows:

- The number of available agents in the considered period
- The average agent time availability
- The mininum agent time availability
- The maximum agent time availability
- The cumulated agents time availability

Available since	1.6.0
Default page	Agents and Sessions
Shortcut code	AG01
API block name	AgentsDO.ReportAgents
Parameters	-
See also	

## AG02 - Session and pause durations

Session and pause durations							
Level	Agent	Sessions	Avg Session	Pauses	Avg Pause	Pause %	Pauses per session
Root	John Doe (101)	100	2:00	100	1:00	20.0%	1.0
Root	John Doe (102)	100	1:00	0	-	0.0%	0.0
Undefined	Agent103	100	4:20	100	0:30	10.0%	1.0
Undefined	Agent104	100	2:00	100	0:20	6.7%	1.0
Export as...   							

This report shows:

- The number of sessions for each available agent

- The number of pauses for each available agent
- The average pause time
- The percentage between the pause time and the availability time for each agent
- The number of pauses for each session, for each available agent

Available since	1.6.0
Default page	Agents and Sessions
Shortcut code	AG02
API block name	AgentsDO.SessionPauseDur
Parameters	-
See also	

## AG03 - Agent availability (for all the queues they are member of)

Agent availability (for all the queues they are member of)

Agent	Time	On pause	Available	Not in	% of agent
Agent 1	10:00	10:00	10:00	10:00	100%
Agent 2	10:00	10:00	10:00	10:00	100%
Agent 3	10:00	10:00	10:00	10:00	100%
Agent 4	10:00	10:00	10:00	10:00	100%
Agent 5	10:00	10:00	10:00	10:00	100%

This report shows:

- The agent available time
- The total billable and not billable pause times

In the latest release a new column has been added (Paused on Conversation), which displays occupancy values.

Available since	1.6.0
Default page	Agents and Sessions
Shortcut code	AG03
API block name	AgentsDO.AgentAvail
Parameters	-
See also	

## AG04 - Answered calls (for selected queues)

Answered calls (for selected queues)

Agent	Time	On pause	Available	Not in	% of agent
Agent 1	10:00	10:00	10:00	10:00	100%
Agent 2	10:00	10:00	10:00	10:00	100%
Agent 3	10:00	10:00	10:00	10:00	100%
Agent 4	10:00	10:00	10:00	10:00	100%
Agent 5	10:00	10:00	10:00	10:00	100%

This report shows:

- The number of answered calls for each agent
- The cumulated call time for each agent



- The average call time for each agent
- The average wait time for each call taken
- The percentage of taken calls, related to the total queue calls, for each agent

Available since	1.6.0
Default page	Agents and Sessions
Shortcut code	AG04
API block name	AgentsDO.AnsCallsQueues
Parameters	-
See also	

## AG05 - Answered calls by custom group

Answered calls by custom group

Agent groups	N. calls	Total call time	Avg call time	% of queue
-	306	0:04:00	0:13	10.0%
Default	0	0:00	-	0.0%
Undefined	306	0:04:00	0:13	10.0%

This report shows:

- The number of answered calls for each defined agent group
- The cumulated call time for each defined agent group
- The average call time for each defined agent group
- The percentage of taken calls, related to the total queue calls, for each defined agent group

The report displays separately the following cases:

- Agents that are known to QueueMetrics but have no custom group, are counted under the group "-"
- Agents that are not known to QueueMetrics but found in the analysis are counted under "Undefined".

Available since	1.6.0
Default page	Agents and Sessions
Shortcut code	AG05
API block name	AgentsDO.AnsCallsCG
Parameters	-
See also	

## AG06 - Answered calls by location

Answered calls by location

Location	N. calls	Total call time	Avg call time	% of queue
Main Location	110	0:10:00	0:10	10.0%
Secondary location	204	0:10:00	0:10	10.0%
-	306	0:10:00	0:10	10.0%

This report shows:

- The number of answered calls for each defined location
- The cumulated call time for each defined location
- The average call time for each defined location
- The average wait time for each defined location
- The percentage of taken calls, related to the total queue calls, for each defined location

Available since	1.6.0
Default page	Agents and Sessions
Shortcut code	AG06
API block name	AgentsDO.AnsCallsLocation
Parameters	-
See also	

## AG07 - Answered calls by service group

Answered calls by service group

Level	N. calls	Total call time	Avg call time	% of queue
Man	396	0:04:00	1:13	50.0%
Woman	0	0:00	-	0.0%
Spk	0	0:00	-	0.0%
Unanswered	396	0:00:00	0:48	50.0%

This report shows:

- The number of answered calls for each defined service group
- The cumulated call time for each defined service group
- The average call time for each defined service group
- The percentage of taken calls, related to the total queue calls, for each defined service group

Available since	1.6.0
Default page	Agents and Sessions
Shortcut code	AG07
API block name	AgentsDO.AnsCallsSG
Parameters	-
See also	

## AG08 - Agent Performance by ACD Group

Level	Agent	Login	Out	Calls In	Calls Out	Ans	Wait	Avg	Avail	On Hold	On Call	Perf	Perf %
Man	John Doe (101)	08:00	0:00	1	0	1	0:00	0:00	0:00	0:00	0:00	100%	100%
Man	John Doe (101)	08:00	0:00	0	1	1	0:00	0:00	0:00	0:00	0:00	100%	100%

One entry is presented for each agent session. What makes this report different from most is that inbound and outbound activity for the agent is aggregated.

Items are computed as:

- Level: the agent level this agent belongs to
- Agent: agent name (if present) or Asterisk internal code if unknown. By clicking on it, the session details open.
- Login: Session login time
- Duration: Session duration
- N.calls in: Number of calls taken for this queue(s)
- N calls out: Number of calls outbound made for these campaign(s)
- Tot calls: calls in + calls out
- Average duration IN
- Average duration OUT
- Average duration for all (weighted)
- Available: percentage of idle time
- On call IN: percentage of time on call inbound
- On call OUT: percentage of time on call outbound
- Pause Billable: percentage of time on a pause code marked as billable
- Pause Unbillable: percentage of time on a pause code marked as unbillable, or not specified, or unknown. (a.k.a. Clerical time)

Available since	1.6.0.4
Default page	Agents and Sessions
Shortcut code	AG08
API block name	AgentsDO.PerformanceAcdGroups
Parameters	-
See also	

## AG09 - Agent Occupancy Report

Agent Occupancy Report

Level	Agent	Session	Pos	BIT	Pos	WBR	Pause	Total call time	Occupancy %
all		12:40:00	0.00	0.00	0.00	0.00	0.00	2.40	0.0%
all	agent101	12:40:00	0.00	0.00	0.00	0.00	0.00	1.00	20.7%
all	agent102	12:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
all	agent103	12:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.0%

The report details the occupancy rate for each and all agents in the current analysis.

- The Agent column contains the decoded name, level and current group of the agent (if defined, expressed as an icon like elsewhere in QM). By clicking on the agent name, it is possible to open a popup with the session details for that agent.
- Total session time is the sum of the duration of all sessions in the current analysis, from start to end.

- Pause Billable is the total time on Billable pauses, for all sessions considered.
- Pause Non Billable is the total time on Non-Billable pauses, for all sessions considered.
- Total pause time is the sum of all pauses for all sessions considered.
- Total talk time is the sum of all time that the specified agent spent in conversation during the sessions considered.
- Occupancy is computed as: Talk time / (Total session - Total Pause) and expressed as a percentage, as per the numeric examples show in the table above.

In the latest release a new column has been added (Paused Conversation) which is subtracted from the total pauses time; this way Occupancy will never be able to be over 100%.

The first line is labeled "All agents" and is computed according to the following rules:

- Total session time, Pause billable, Pause non billable, Pause wrap, Total pause, Total talk time are computed as sums of the rest of data in each column
- Occupancy is computed as: Sum talk time / (Sum Total session - Sum Total Pause)

The Occupancy report allows you to define custom calculations by entering one or more custom formulas in the Parameters field when editing your report.

### Report: All Reports » Agents and Sessions » Item details

Title:	#clage_agent_occupancy# Agent Occupancy Report
Subtitle:	
Visibility key:	
Data Blocks:	AG09 - Agent Occupancy Report
Parameters:	Productivity = ( TALKTIME + PAUSEBILL ) / (SESSION - \$PAUSETIME[AAA])
Sort order:	80
Visible in "All reports"?	Yes
Created by:	-, 27/10/2011, 15:37
Last update:	demoadmin, 03/03/2016, 16:01

Save Back New Clone Delete

For example, if you add the formula:

$$\text{Productivity} = ( \text{TALKTIME} + \text{PAUSEBILL} ) / ( \text{SESSION} - ( \$\text{PAUSETIME}[\text{AAA}] + \$\text{PAUSETIME}[\text{AAA}] ) )$$

A new column "Productivity" will be computed based on the formula supplied. At the moment, the formula will always be displayed as a percentage.

New columns can be programmed as explained in User-Programmable reports the section called "User-Programmable Reports" [142]



A version of this data block meant to be completely customized is available as AG18.

Available since	1.6.2.4 - Formulas available since 15.10.5
-----------------	--

Default page	Agents and Sessions
Shortcut code	AG09
API block name	AgentsDO.AgentOccupancy
Parameters	Agent parameters - See Variables bound for Agent blocks the section called “Variables bound for Agent blocks” [143]
See also	AG18 the section called “AG18 - Programmable Agent Performance” [124]

## AG10 - Agent Session Time by Hour

Agent	16	17	18	19	20	21	22	Total
John Doe (101)	34:22	1:00:00	1:00:00	1:00:00	1:00:00	1:00:00	11:00	5:45:22

The report details the total presence time of each agent over the 24h for which you are running the current analysis.

- The Agent column contains the agent’s decoded name, level and current group (if defined, expressed as an icon like elsewhere in QM).
- Total time is the sum of the duration of all sessions included in the current analysis, from start to end.
- One or more columns are present for each hour’s timeframe where total session information is present

Available since	1.7.2
Default page	Agents and Sessions
Shortcut code	AG10
API block name	AgentsDO.AgentBillableTimeByHour
Parameters	-
See also	

## AG11 - Agent Payable Time by Hour

Agent	16	17	18	19	20	21	22	Total
John Doe (101)	34:22	1:00:00	1:00:00	1:00:00	1:00:00	1:00:00	11:00	5:45:22

The report details the payable presence time of each agent over the 24h for which you are running the current analysis.

- The Agent column contains the agent’s decoded name, level and current group (if defined, expressed as an icon like elsewhere in QM).
- Total time is the sum of the duration of payable session time within the current analysis, from start to end.

- One or more columns are present for each hour's timeframe where payable session information is present

Available since	1.7.2
Default page	Agents and Sessions
Shortcut code	AG11
API block name	AgentsDO.AgentPayableTimeByHour
Parameters	-
See also	

## AG12 - Agent Billable Time by Hour

Agent	16	17	18	19	20	21	22	Total
John Doe (101)	34.22	1.00.00	1.00.00	1.00.00	1.00.00	1.00.00	1.00	5.45.22

The report details the billable presence time of each agent over the 24h for which you are running the current analysis.

- The Agent column contains the agent's decoded name, level and current group (if defined, expressed as an icon like elsewhere in QM).
- Total time is the sum of the duration of billable session time within the current analysis, from start to end.
- One or more columns are present for each hour's timeframe where billable session information is present

Available since	1.7.2
Default page	Agents and Sessions
Shortcut code	AG12
API block name	AgentsDO.AgentBillableTimeByHour
Parameters	-
See also	

## AG13 - Agent Session View

Agent	Presence	Talk	Idle	Billable	Not Billable	Sales	S PH	QC	QC PH	Cont.	C PH	Offered	Answered	Conv.	QConv.	Goal Firs	Firs	Avg	T	L
John Doe (101)	5001707	15:10:32	454:22:01	33:43	0:49	9	0:02	18	0:04	21	0:04	73	42	42.88%	50.00%	5	12	14:48		
Bak Smith (102)	359:21:12	15:17:53	343:27:21	29:28	0:18	9	0:03	18	0:05	21	0:06	59	59	42.88%	50.00%	5	12	15:33		

This report shows a set of calls aggregated by agents. It reports session information and shows, for each agent, the main figures for aggregated calls related to that agent. The first row reports the overall aggregated values.

Each row in the report shows:

- The agent name (the first line contains all agents information)
- Presence, calculated as sum of all agent sessions (so including pauses time)
- Talk time
- Idle time, calculated by subtracting pauses and talk time from the presence figure
- Billable time
- Not billable time
- Sales: the number of taken calls flagged "sales"
- S PH (Sales per hour): the number of sales per hour ratio
- QC: the number of taken calls flagged as qualified contacts
- QC PH: Qualified contacts per hour
- Cont: number of taken calls flagged as "contacts"
- CPH: Contacts per hour
- Offered: Overall taken + lost calls
- Answered: taken calls
- Conv: conversion ratio
- QConv: qualified conversion ratio
- Goal Ftrs: number of goal flagged feature codes found in the call dataset
- Ftrs: number of feature codes found in the call dataset
- Avg: average talk time
- T: by clicking on that icon, a popup with the taken call list (used to count the aggregated) is shown
- L: by clicking on that icon, a popup with the lost call list (used to count the aggregated) is shown



Regarding inbound calls, when looking at a single agent, the concept of "offered call" will coincide with the concept of "answered call". This is because this report does not keep track of the various attempts for agent, but only registers the call as an answered call for the agent that actually answered the call. This will eventually result in the first row containing a number of offered calls that is higher than the number of answered calls, while on the single agents rows the offered and answered calls will be the same.

Available since	15.9
Default page	Agents and Sessions
Shortcut code	AG13
API block name	AgentsDO.AgentSessionsView
Parameters	-
See also	



## AG14 - Queue Session View

Queue Sessions View

Queue	Presence	Talk	Idle	Billable	Not Billable	Sales	S PH	QC	QC PH	Cont.	CPH	Offered	Answered	Conv.	QConv.	Goal Ftrs	Ftrs	Avg	T	L
	55017:07	15:18:32	484:22:01	35:45	0:49	9	0.02	18	0.04	21	0.04	73	42	42.86%	50.00%		5	12	14.48	
A300	498:30:21	15:15:16	442:39:39	35:37	0:48	9	0.02	18	0.04	21	0.04	68	39	42.86%	50.00%		5	10	15.20	
A400	1:48:45	2:16	1:43:21	0:07	0:00	0	0.00	0	0.00	0	0.00	5	3	0.00%	0.00%		0	2	1.05	

Export as...

This report shows a set of calls aggregated by queue. It reports queue information and shows, for each queue, the main figures for aggregated calls related to that queue. The first row reports the overall aggregated values.

Each row in the report shows:

- The queue name (the first line contains all queues information)
- Presence, calculated as sum of all agent sessions in the queue
- Talk time
- Idle time, calculated by subtracting pauses and talk time from the presence figure
- Billable time
- Not billable time
- Sales: the number of taken calls flagged "sales"
- S PH (Sales per hour): the number of sales per hour ratio
- QC: the number of taken calls flagged as qualified contacts
- QC PH: Qualified contacts per hour
- Cont: number of taken calls flagged as "contacts"
- CPH: Contacts per hour
- Offered: Overall taken + lost calls
- Answered: taken calls
- Conv: conversion ratio
- QConv: qualified conversion ratio
- Goal Ftrs: number of goal flagged feature codes found in the call dataset
- Ftrs: number of feature codes found in the call dataset
- Avg: average talk time
- T: by clicking on that icon, a popup with the taken call list (used to count the aggregated) is shown
- L: by clicking on that icon, a popup with the lost call list (used to count the aggregated) is shown



QueueMetrics uses an approach where it does not exactly track sessions per queue. If an agent joins and leaves multiple queues during the same session, QueueMetrics does not track where each session starts and ends. Therefore, while we may get accurate details of

the time an agent was available, if an agent may cherry pick queues or work on multiple queues at once, we will have to find a way to estimate when its time was spent. In order to do this QueueMetrics counts the local time an agent was available per session, then it multiplies this value by the percentage of talk time that happened on each queue.

Available since	15.9
Default page	Agents and Sessions
Shortcut code	AG14
API block name	AgentsDO.QueueSessionsView
Parameters	-
See also	

## AG15 - Agents by Hour

Agents by Hour

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
2016-11-09	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2016-11-10	1	1	1	1	1	3	3	4	4	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6
2016-11-11	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
2016-11-12	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	-	-	-	-	-	-	7

Export as...

The report details the number of agents available on the selected queues each hour for each day in the report.

- The first column (Day) reports the date who the line is referred to
- The next 24 columns report the number of agents found for at least one second in the associated hour. Numbers are reported black if the timeband has been covered completely by the agents, are reported red if at least one agent is not present for the whole hour. In this case, by flying over the red number the user can have an idea on what's the coverage percentage for the timeband. The coverage is counted as the sum of periods, in seconds, the agents cumulated in that timeband, divided by 3600 seconds.
- The last column reports the agents seen, for at least one second, during the day

Available since	14.10.5-938
Default page	Agents and Sessions
Shortcut code	AG15
API block name	AgentsDO.AgentByHour
Parameters	-
See also	

## AG16 - Tag Session View

Tag Sessions View

Tag	Presence	Talk	Idle	Billable	Not Billable	Sales	S PH	QC	QC PH	Cont.	C PH	Offered	Answered	Conv.	QConv.	Goal Firs	Ftrs	Avg	T	L
-	50017.07	15:15:32	484:22:01	\$5.43	0.49	9	0.02	18	0.04	21	0.04	73	62	42.85%	50.00%	5	12	14.48		
-	499:54.40	15:16:19	483:11:52	\$5.39	0.48	8	0.02	17	0.03	20	0.04	68	58	40.90%	47.00%	2	11	15.47		
TrAD copy 2	39:30	0:56	29:31	0:02	0:00	1	1.97	1	1.97	1	1.97	2	2	100.00%	100.00%	3	1	0.28		
TrAD copy 3	41:56	1:17	40:36	0:02	0:00	0	0.00	0	0.00	0	0.00	2	2	0.00%	0.00%	0	0	0.38		

This report shows a set of calls aggregated by tag. It reports tags information and shows, for each tag, the main figures for aggregated calls related to that tag. The first row reports the overall aggregated values.

Each row in the report shows:

- The tag name (the first line contains all tags information)
- Presence, calculated as sum of all agent sessions for agents taking calls with related tag
- Talk time
- Idle time, calculated by subtracting pauses and talk time from the presence figure
- Billable time
- Not billable time
- Sales: the number of taken calls flagged "sales"
- S PH (Sales per hour): the number of sales per hour ratio
- QC: the number of taken calls flagged as qualified contacts
- QC PH: Qualified contacts per hour
- Cont: number of taken calls flagged as "contacts"
- CPH: Contacts per hour
- Offered: Overall taken + lost calls
- Answered: taken calls
- Conv: conversion ratio
- QConv: qualified conversion ratio
- Goal Ftrs: number of goal flagged feature codes found in the call dataset
- Ftrs: number of feature codes found in the call dataset
- Avg: average talk time
- T: by clicking on that icon, a popup with the taken call list (used to count the aggregated) is shown
- L: by clicking on that icon, a popup with the lost call list (used to count the aggregated) is shown



QueueMetrics uses an approach where it does not exactly track sessions per tag. If an agent joins and leaves multiple queues during the same session, QueueMetrics does not track where each session starts and ends. Therefore, while we may get accurate details of the time an agent was available, if an agent may cherry pick queues or work on multiple queues at once, we will have to find a way to estimate when its time was spent. In order to do this QueueMetrics counts the local time an agent was available per session, then it multiplies this value by the percentage of talk time that happened on each queue.

Available since	15.09
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Default page	Agents and Sessions
Shortcut code	AG16
API block name	AgentsDO.TagSessionsView
Parameters	-
See also	

## AG17 - Cumulated sessions by Queue, Tag

Cumulated sessions by Queue, Tag

Queue	Tag	Presence	Talk	Idle	Billable	Not Billable	Sales	S PH	QC	QC PH	Cont.	CPH	Offered	Answered	Conv.	QConv.	Goal Ftrs	Ftrs	Avg	T	L
		5001707	151932	4802201	2545	049	9	002	18	004	21	004	73	42	428%	5000%	5	12	1448		
A200	-	4851755	151932	4812831	2532	048	8	002	17	003	20	004	63	35	4900%	4700%	2	9	1636		
A200	TfAD-may2	2320	096	2931	002	000	1	197	1	197	1	197	2	2	10000%	10000%	3	1	028		
A200	TfAD-may3	4106	117	4035	002	000	0	000	0	000	0	000	2	2	000%	000%	0	0	038		
A200	-	14845	216	14821	007	000	0	000	0	000	0	000	5	3	000%	000%	0	2	105		

This report shows a set of calls aggregated by queue and tag. It reports queue and tags information and shows, for each queue/tag pair, the main figures for aggregated calls related to that pair. The first row reports the overall aggregated values.

Each row in the report shows:

- The queue name (the first line contains all queues information)
- The tag name (the first line contains all tags information)
- Presence, calculated as sum of all agent sessions for agents taking calls with related tag
- Talk time
- Idle time, calculated by subtracting pauses and talk time from the presence figure
- Billable time
- Not billable time
- Sales: the number of taken calls flagged "sales"
- S PH (Sales per hour): the number of sales per hour ratio
- QC: the number of taken calls flagged as qualified contacts
- QC PH: Qualified contacts per hour
- Cont: number of taken calls flagged as "contacts"
- CPH: Contacts per hour
- Offered: Overall taken + lost calls
- Answered: taken calls
- Conv: conversion ratio
- QConv: qualified conversion ratio

- Goal Ftrs: number of goal flagged feature codes found in the call dataset
- Ftrs: number of feature codes found in the call dataset
- Avg: average talk time
- T: by clicking on that icon, a popup with the taken call list (used to count the aggregated) is shown
- L: by clicking on that icon, a popup with the lost call list (used to count the aggregated) is shown



QueueMetrics uses an approach where it does not exactly track sessions per queue/tag. If an agent joins and leaves multiple queues during the same session, QueueMetrics does not track where each session starts and ends. Therefore, while we may get accurate details of the time an agent was available, if an agent may cherry pick queues or work on multiple queues at once, we will have to find a way to estimate when its time was spent. In order to do this QueueMetrics counts the local time an agent was available per session, then it multiplies this value by the percentage of talk time that happened on each queue.

Available since	15.09
Default page	Agents and Sessions
Shortcut code	AG17
API block name	AgentsDO.SessionByQueueTagReport
Parameters	-
See also	

## AG18 - Programmable Agent Performance

Programmable Agent Performance

Level	Agent	Session	Fru	Bill	NSR	Talk	Tot Avail	Occupancy	CallHr	ACL	ACW
AB		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0%	0.0	0.00

This block just includes the first two columns: Level and Agent. All other columns are to be programmed by the user as explained in User-Programmable reports the section called “User-Programmable Reports” [142] .

This block is meant as a completely configurable version of block AG09.


Available since	15.10.8
Default page	Agents and Sessions
Shortcut code	AG18
API block name	AgentsDO.ProgAgPerf
Parameters	Agent parameters - See Variables bound for Agent blocks the section called “Variables bound for Agent blocks” [143]
See also	AG09 the section called “AG09 - Agent Occupancy Report” [115]

## AG19 - Detailed Pause Tracking

### Detailed Pause Tracking

*Detailed Pause Tracking*

Level	Agent	Pause	Pause Type	Total Time	Min	Max	Avg	Num
Main	John Doe (501)	-	NBP	122:05:40	0:09	1:22:04:54	40:41:33	3
Main	John Doe (501)	Lunch	NBP	39:22	0:04	1:01	0:37	35
Main	John Doe (501)	Hourly break	NBP	0:40	0:11	0:29	0:20	2
Main	John Doe (501)	Email	BNP	1:22	0:16	0:44	0:28	3
Main	John Doe (501)	Backoffice	BNP	0:21	0:21	0:21	0:21	1
Main	Sally Erni (110)	Lunch	NBP	1:13	0:15	0:29	0:24	3

► Export as...   

This block shows detailed information about agent pauses, including total pause time, average duration, maximum duration, minimum duration and number of pauses. This information is aggregated by agent and pause. For each agent/pause pair the agent's name and the pause code are displayed, together with the information described above.




Available since	16.10.10
Default page	Agents and Sessions
Shortcut code	AG19
API block name	AgentsDO.DetailedPauses
Parameters	-
See also	

## AG20 - Agent Talk Time Per Hour

# Agent Talk Time Per Hour

### Agent Talk Time Per Hour

Level	Agent	0:00	1:00	2:00	3:00	4:00	5:00
Main	5001 - TestQM1_01	0:00	0:00	0:00	0:00	0:00	0:00
Main	5002- TestQM1_02	0:00	0:00	0:00	0:00	0:00	0:00

► Export as...   

This block breaks down all the agents' talk times in one-hour long timeslots. This information is aggregated by agent, so you can keep track of how many minutes or hours of conversation your agents are having during the course of the day, across a given period of time. The name of the agent and the agent's level are displayed as well as the information listed above.

Available since	16.10.13
Default page	Agents and Sessions
Shortcut code	AG20
API block name	AgentsDO.AgentTTPerHour
Parameters	-
See also	

## Historical reports - Details of agent sessions and pauses

### AD01 - Detail of agent sessions

Detail of agent sessions

Agent	Start hour	End hour	Duration	Ext.	Termination	Pause	P.Time	Srv
agent/104	04/01 - 00:00:07	04/01 - 00:03:57	3:50	789		1	0:20	
John Doe (101)	03/31 - 23:59:27	04/01 - 00:04:17	4:50	123		0	0:00	
Mike Boo (102)	04/01 - 00:01:17	04/01 - 00:04:18	3:01			0	0:00	
agent/103	04/01 - 00:00:27	04/01 - 00:04:19	3:52			1	0:30	
agent/104	04/01 - 00:05:07	04/01 - 00:08:57	3:50	789		1	0:20	
John Doe (101)	04/01 - 00:04:27	04/01 - 00:09:17	4:50	123		1	1:00	
Mike Boo (102)	04/01 - 00:04:27	04/01 - 00:09:18	4:51	345		0	0:00	
agent/103	04/01 - 00:04:27	04/01 - 00:09:19	4:52	456		1	0:30	
agent/104	04/01 - 00:10:07	04/01 - 00:13:57	3:50	789		1	0:20	
John Doe (101)	04/01 - 00:09:27	04/01 - 00:14:17	4:50	123		1	1:00	
Mike Boo (102)	04/01 - 00:09:27	04/01 - 00:14:18	4:51	345		0	0:00	
agent/103	04/01 - 00:09:27	04/01 - 00:14:19	4:52	456		1	0:30	
agent/104	04/01 - 00:15:07	04/01 - 00:18:57	3:50	789		1	0:20	
John Doe (101)	04/01 - 00:14:27	04/01 - 00:19:17	4:50	123		1	1:00	
Mike Boo (102)	04/01 - 00:14:27	04/01 - 00:19:18	4:51	345		0	0:00	
agent/103	04/01 - 00:14:27	04/01 - 00:19:19	4:52	456		1	0:30	
agent/104	04/01 - 00:20:07	04/01 - 00:23:57	3:50	789		1	0:20	
John Doe (101)	04/01 - 00:19:27	04/01 - 00:24:17	4:50	123		1	1:00	
Mike Boo (102)	04/01 - 00:19:27	04/01 - 00:24:18	4:51	345		0	0:00	
agent/103	04/01 - 00:19:27	04/01 - 00:24:19	4:52	456		1	0:30	
agent/104	04/01 - 00:25:07	04/01 - 00:28:57	3:50	789		1	0:20	

For each agent session, the start and end times are recorded, together with the total duration in seconds.

If the agent logs on via the call back function, the designated call back extension is shown.

The number of pauses and the total pause time in seconds is shown.

The "Srv" column tells you on which server an agent was working in case you set up a cluster of Asterisk servers.

It is possible to sort the table for each title, in either descending and ascending order. To do this, click once on the desired title for descending sort, and twice for ascending sort. Once the table is sorted, an arrow symbol will appear close to the title, so you know on which column it was sorted last. As the sorting is done on the client machine, it may take a while with very large tables.

Available since	1.6.0
Default page	Details of Agent sessions and pauses
Shortcut code	AD01
API block name	DetailsDO.AgentSessions
Parameters	-
See also	



## AD02 - Detail of agent pauses

### Detail of agent pauses

Agent	Ext.	Code	Activity	Billable?	Start hour	End hour	Duration
agent/104	789	30	-	No	04/01 - 00:00:27	04/01 - 00:00:47	0:20
agent/103		31	-	No	04/01 - 00:02:57	04/01 - 00:03:27	0:30
agent/104	789	30	-	No	04/01 - 00:05:27	04/01 - 00:05:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:07:37	04/01 - 00:08:37	1:00
agent/103	456	31	-	No	04/01 - 00:07:57	04/01 - 00:08:27	0:30
agent/104	789	30	-	No	04/01 - 00:10:27	04/01 - 00:10:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:12:37	04/01 - 00:13:37	1:00
agent/103	456	31	-	No	04/01 - 00:12:57	04/01 - 00:13:27	0:30
agent/104	789	30	-	No	04/01 - 00:15:27	04/01 - 00:15:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:17:37	04/01 - 00:18:37	1:00
agent/103	456	31	-	No	04/01 - 00:17:57	04/01 - 00:18:27	0:30
agent/104	789	30	-	No	04/01 - 00:20:27	04/01 - 00:20:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:22:37	04/01 - 00:23:37	1:00
agent/103	456	31	-	No	04/01 - 00:22:57	04/01 - 00:23:27	0:30
agent/104	789	30	-	No	04/01 - 00:25:27	04/01 - 00:25:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:27:37	04/01 - 00:28:37	1:00
agent/103	456	31	-	No	04/01 - 00:27:57	04/01 - 00:28:27	0:30
agent/104	789	30	-	No	04/01 - 00:30:27	04/01 - 00:30:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:32:37	04/01 - 00:33:37	1:00
agent/103	456	31	-	No	04/01 - 00:32:57	04/01 - 00:33:27	0:30
agent/104	789	30	-	No	04/01 - 00:35:27	04/01 - 00:35:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:37:37	04/01 - 00:38:37	1:00
agent/103	456	31	-	No	04/01 - 00:37:57	04/01 - 00:38:27	0:30
agent/104	789	30	-	No	04/01 - 00:40:27	04/01 - 00:40:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:42:37	04/01 - 00:43:37	1:00
agent/103	456	31	-	No	04/01 - 00:42:57	04/01 - 00:43:27	0:30
agent/104	789	30	-	No	04/01 - 00:45:27	04/01 - 00:45:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:47:37	04/01 - 00:48:37	1:00
agent/103	456	31	-	No	04/01 - 00:47:57	04/01 - 00:48:27	0:30
agent/104	789	30	-	No	04/01 - 00:50:27	04/01 - 00:50:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:52:37	04/01 - 00:53:37	1:00
agent/103	456	31	-	No	04/01 - 00:52:57	04/01 - 00:53:27	0:30
agent/104	789	30	-	No	04/01 - 00:55:27	04/01 - 00:55:47	0:20
John Doe (101)	123	30	-	No	04/01 - 00:57:37	04/01 - 00:58:37	1:00

This table shows the specific pauses that each agent took and the pause code that was entered for each pause. It also shows whether the pause taken was considered to be billable or non-billable.

Available since	1.6.0
Default page	Details of Agent sessions and pauses
Shortcut code	AD02
API block name	DetailsDO.AgentPauses
Parameters	-
See also	

## Popup of agent activity

Detail: agent/101							Close
Total session time		334:23:16					
Total pause time		2:08:42					
Total billable time		332:32:38					
Total pauses billable		18:04					
Total payable time		333:52:09					
Total pauses payable		1:37:35					
Agent	Ext.	Duration	On pause	Activity	Start hour	End hour	
John Doe (101)	104	331:53:10	-	-	09/07 - 15:53:40	09/21 - 11:46:50	
			0:16	-	09/07 - 15:53:40	09/07 - 15:53:56	
			14:48	Backoffice	BP 09/07 - 15:55:00	09/07 - 16:09:48	
			21:48	Lunch	NBNP 09/07 - 16:10:00	09/07 - 16:31:48	
			0:56	Lunch	NBNP 09/07 - 16:31:49	09/07 - 16:32:45	
			1:20:49	Hourly break	NBNP 09/21 - 10:08:26	09/21 - 11:29:15	
John Doe (101)	104	12:59	-	-	09/21 - 11:47:00	09/21 - 11:59:59	
			6:49	-	09/21 - 11:47:10	09/21 - 11:53:59	
			1:58	Backoffice	BP 09/21 - 11:56:08	09/21 - 11:58:06	
John Doe (101)	100	8:25	-	-	10/04 - 11:32:00	10/04 - 11:40:25	
			1:18	Email	RNP 10/04 - 11:36:16	10/04 - 11:37:34	

This is not a normal data block but it is the popup that is displayed whenever you click on an agent's name.

- The top table reports session, pause, billable and payable time
- The bottom table shows the details of all agent sessions, with a break-up of all pauses that were made during that session. For each pause with a known pause code, their billable-payable status is displayed:
  - **BP**: Pause is Billable and Payable
  - **BNP**: Pause is Billable but not payable (be careful!)
  - **NBP**: Pause is not billable but Payable
  - **NBNP**: Pause is neither billable nor payable

In the latest release a new "Conversation" column has been added on, to the right of the "On Pause" column, which displays the pause time there may have been while actually in conversation.

You can close the popup by clicking on the Close button.

## Historical reports - Call outcomes

If your agents are entering Pause codes or Call outcomes, the "Outcomes" tab will let you report on the information they just entered.

### OU01 - Outcomes

**Outcomes**

<b>General outcomes</b>	
Total billable time:	36:22:01
Total agent available time:	36:22:01
Total agent billable activities:	0:00
Total nonbillable time:	4:01:00
Number of Sales:	0
Number of Qualified Contacts:	0
Number of Contacts:	0
Sales per Hour (SPH):	0.0
Qualified Contacts per Hour (QCPH):	0.0
Contacts per Hour (CPH):	0.0
Conversion index:	0.0%
Qualified conversion index:	0.0%

Export as...   

This report shows:

- How much billable time there has been on this system, broken down by ACD/call time ("agent available time") and billable activities (agent on pause)
- The total non billable time (e.g. lunch, breaks)
- The total number of Contacts, Qualified Contacts and Sales, as defined by call outcome codes
- The *Sales per Hour* (SPH), *Qualified Contacts per hour* (QCPH) and *Contacts per Hour* (CPH) ratios
- The *Conversion index*, that is the percentage of sales over the total number of sales and contacts.

Available since	1.6.0
Default page	Call outcomes
Shortcut code	OU01

API block name	OutcomesDO.GeneralRep
Parameters	-
See also	

## OU02 - Call results, by outcomes

Call results, by outcomes

Call outcomes	Type	Total	Answered	Lost	%
20	answered	300	300	0	100.0%
20	unanswered	200	200	0	100.0%
20	total	500	500	0	100.0%

This report shows:

- The number of total calls grouped by outcome
- The number of answered calls grouped by outcome
- The number of unanswered calls grouped by outcome
- The percentage of calls related to each outcome
- The percentage of taken calls related to each outcome (available since 16.10.13)

Available since	1.6.0
Default page	Call outcomes
Shortcut code	OU02
API block name	OutcomesDO.CallResByOutcome
Parameters	-
See also	

## OU03 - Billable activities

Billable activities

Activity	N. Times	Total Time	Avg	Min	Max	%
Search	100	2:00:00	0:02	0:01	1:00	100.0%

In this report you can find details explaining Billable activities, with average, minimum and maximum session durations, and a percentage on all activities of the same kind.

Available since	1.6.0
Default page	Call outcomes
Shortcut code	OU03
API block name	OutcomesDO.ActivBillable
Parameters	-
See also	

## OU04 - Non billable activities

Non billable activities

Activity	N. Times	Total Time	Avg	Min	Max	%
Search	100	2:00:00	0:02	0:01	1:00	100.0%

In this report you can find details explaining Non billable activities, with average, minimum and maximum session durations, and a percentage on all activities of the same kind.

Available since	1.6.0
Default page	Call outcomes
Shortcut code	OU04
API block name	OutcomesDO.ActivNotBillable
Parameters	-
See also	

## OU05 - Detailed agent report

Detailed agent report

Agent name	Start	End	Time	Sum	UC	Cont	SPH	QCPH	CPH	CONF	QCDW
agent001	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent002	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent003	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent004	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent005	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent006	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent007	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent008	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent009	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent010	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent011	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent012	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent013	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent014	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent015	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent016	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent017	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent018	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent019	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent020	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent021	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent022	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent023	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent024	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent025	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent026	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent027	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent028	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent029	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent030	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent031	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent032	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent033	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent034	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent035	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent036	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent037	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent038	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent039	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent040	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent041	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent042	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent043	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent044	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent045	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent046	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent047	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent048	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent049	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent050	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent051	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent052	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent053	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent054	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent055	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent056	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent057	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent058	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent059	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent060	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent061	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent062	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent063	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent064	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent065	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent066	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent067	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent068	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent069	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent070	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent071	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent072	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent073	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent074	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent075	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent076	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent077	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent078	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent079	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent080	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent081	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent082	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent083	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent084	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent085	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent086	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent087	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent088	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent089	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent090	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent091	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent092	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent093	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent094	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent095	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent096	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent097	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent098	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent099	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
agent100	7:42:50	100:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00

If a call has no associated status code, then it is counted under a special status code called "-".

The columns show:

- The agent name. As an agent might have multiple status codes, the agent name will appear multiple times. If the agent belongs to an agent group, the proper icon is displayed.
- The call outcome, specified both as a code and a description (if it is present)
- The type currently associated with the status code
- The total number of calls for that agent under that status code

All columns are client-sortable.

Available since	13.04.3
Default page	Call outcomes
Shortcut code	OU06
API block name	OutcomesDO.AgentOutcomes
Parameters	-
See also	

## OU07 - Call results, by tag

Call results, by tag

Tag	Total	Taken	Avg. Talk	Avg. Wait	Sales	Cont.	QC	CONV	QCONV	Lost	Avg. Wait	IVR	IVR timing	%
-	168	132	10:07	0:05	22	31	33	57.83%	66.67%	34	0:15	2	0:00	55.00%
TVAD copy 2	155	125	10:29	0:05	19	34	29	55.82%	63.52%	29	0:08	1	0:00	46.12%
TVAD copy 3	6	3	0:24	0:02	2	2	2	100.00%	100.00%	2	0:14	1	0:00	1.79%
TVAD copy 3	7	4	0:40	0:07	1	2	2	50.00%	50.00%	3	1:24	0	-	2.56%

This data block displays calls aggregated by tag code. The first line reports the figures for all aggregated call. The second row, marked with the *dash* code as tag, counts aggregates for all calls with no tag code assigned.

The columns show:

- The tag code name
- Total number of calls aggregated
- Taken calls
- Average talk time
- Average wait time on taken calls
- Number of calls flagged as sales
- Number of calls flagged as contact
- Number of calls flagged as qualified contact
- Conversion ratio

- Qualified conversion ratio
- Number of lost calls
- Average wait on lost calls
- Average wait on IVR calls
- Time spent on IVR
- Ratio and histogram for total calls the row is reporting, compared with the overall total call in the report

All columns are client-sortable. Clicking on the lens icons present in the report will open a popup with call details (taken, lost and IVR) counted in the aggregation.

Available since	15.09
Default page	Call outcomes
Shortcut code	OU07
API block name	CallTagDO.CallResByTag
Parameters	-
See also	

## OU08 - Call results, by feature code

Call results, by feature code

Feature	Goal	Total	Ftr. Conv.	Taken	Avg. Talk	Avg. Wait	Sales	Cont.	QC	CONV	QCONV	Lost	Avg. Wait	%
-		166	436%	132	10:07	0:05	22	38	33	57.83%	66.67%	34	0:15	47.03%
-		143	381%	111	8:48	0:05	11	24	19	40.52%	57.29%	34	0:15	41.05%
Householder		10	26%	10	0:57	0:08	0	0	0	100.00%	100.00%	0	-	2.83%
Not sales rep.		11	28%	11	1:10	0:12	0	0	0	100.00%	100.00%	0	-	3.12%
Sales Target		1	2%	1	0:22	0:04	1	1	1	100.00%	100.00%	0	-	0.28%
Cross too much		13	34%	13	2:06	0:10	5	0	0	42.50%	62.50%	0	-	3.06%
Reply later		7	18%	7	5:33	0:17	4	4	4	100.00%	100.00%	0	-	1.04%

This data block displays calls aggregated by feature code. The first line reports the figures for all aggregated call. The second row, marked with the *dash* code as feature, counts aggregates for all calls with no feature code assigned.

The columns show:

- The feature code name
- Goal/Not goal flag for feature code
- Total number of calls aggregated
- Feature conversion factor, counted as ratio between the total calls and the call flagged as contact
- Taken calls
- Average talk time
- Average wait time on taken calls
- Number of calls flagged as sales

- Number of calls flagged as contact
- Number of calls flagged as qualified contact
- Conversion ratio
- Qualified conversion ratio
- Number of lost calls
- Average wait on lost calls
- Ratio and histogram for total calls the row is reporting, compared with the overall total call in the report

All columns are client-sortable.

Available since	15.09
Default page	Call outcomes
Shortcut code	OU08
API block name	OutcomesDO.CallResByFeature
Parameters	-
See also	

## Historical reports - IVR tracking

The following reports let you track information about IVR calls and goals. A detailed explanation of IVR can be found in: the section called “Tracking IVR data” [366]

### IV01 - IVR Traversals

IVR Traversals

Path	N calls	IVR goal report	Success rate	Success rate	Abandon rate
no path	0	0	0.0%	0.0%	0.0%
#1	0	0	0.0%	0.0%	0.0%
#2	0	0	0.0%	0.0%	0.0%
#3	0	0	0.0%	0.0%	0.0%
#4	0	0	0.0%	0.0%	0.0%
#5	0	0	0.0%	0.0%	0.0%
#6	0	0	0.0%	0.0%	0.0%
#7	0	0	0.0%	0.0%	0.0%
#8	0	0	0.0%	0.0%	0.0%
#9	0	0	0.0%	0.0%	0.0%
#10	0	0	0.0%	0.0%	0.0%
#11	0	0	0.0%	0.0%	0.0%
#12	0	0	0.0%	0.0%	0.0%
#13	0	0	0.0%	0.0%	0.0%
#14	0	0	0.0%	0.0%	0.0%
#15	0	0	0.0%	0.0%	0.0%
#16	0	0	0.0%	0.0%	0.0%
#17	0	0	0.0%	0.0%	0.0%
#18	0	0	0.0%	0.0%	0.0%
#19	0	0	0.0%	0.0%	0.0%
#20	0	0	0.0%	0.0%	0.0%
#21	0	0	0.0%	0.0%	0.0%
#22	0	0	0.0%	0.0%	0.0%
#23	0	0	0.0%	0.0%	0.0%
#24	0	0	0.0%	0.0%	0.0%
#25	0	0	0.0%	0.0%	0.0%
#26	0	0	0.0%	0.0%	0.0%
#27	0	0	0.0%	0.0%	0.0%
#28	0	0	0.0%	0.0%	0.0%
#29	0	0	0.0%	0.0%	0.0%
#30	0	0	0.0%	0.0%	0.0%
#31	0	0	0.0%	0.0%	0.0%
#32	0	0	0.0%	0.0%	0.0%
#33	0	0	0.0%	0.0%	0.0%
#34	0	0	0.0%	0.0%	0.0%
#35	0	0	0.0%	0.0%	0.0%
#36	0	0	0.0%	0.0%	0.0%
#37	0	0	0.0%	0.0%	0.0%
#38	0	0	0.0%	0.0%	0.0%
#39	0	0	0.0%	0.0%	0.0%
#40	0	0	0.0%	0.0%	0.0%
#41	0	0	0.0%	0.0%	0.0%
#42	0	0	0.0%	0.0%	0.0%
#43	0	0	0.0%	0.0%	0.0%
#44	0	0	0.0%	0.0%	0.0%
#45	0	0	0.0%	0.0%	0.0%
#46	0	0	0.0%	0.0%	0.0%
#47	0	0	0.0%	0.0%	0.0%
#48	0	0	0.0%	0.0%	0.0%
#49	0	0	0.0%	0.0%	0.0%
#50	0	0	0.0%	0.0%	0.0%
#51	0	0	0.0%	0.0%	0.0%
#52	0	0	0.0%	0.0%	0.0%
#53	0	0	0.0%	0.0%	0.0%
#54	0	0	0.0%	0.0%	0.0%
#55	0	0	0.0%	0.0%	0.0%
#56	0	0	0.0%	0.0%	0.0%
#57	0	0	0.0%	0.0%	0.0%
#58	0	0	0.0%	0.0%	0.0%
#59	0	0	0.0%	0.0%	0.0%
#60	0	0	0.0%	0.0%	0.0%
#61	0	0	0.0%	0.0%	0.0%
#62	0	0	0.0%	0.0%	0.0%
#63	0	0	0.0%	0.0%	0.0%
#64	0	0	0.0%	0.0%	0.0%
#65	0	0	0.0%	0.0%	0.0%
#66	0	0	0.0%	0.0%	0.0%
#67	0	0	0.0%	0.0%	0.0%
#68	0	0	0.0%	0.0%	0.0%
#69	0	0	0.0%	0.0%	0.0%
#70	0	0	0.0%	0.0%	0.0%
#71	0	0	0.0%	0.0%	0.0%
#72	0	0	0.0%	0.0%	0.0%
#73	0	0	0.0%	0.0%	0.0%
#74	0	0	0.0%	0.0%	0.0%
#75	0	0	0.0%	0.0%	0.0%
#76	0	0	0.0%	0.0%	0.0%
#77	0	0	0.0%	0.0%	0.0%
#78	0	0	0.0%	0.0%	0.0%
#79	0	0	0.0%	0.0%	0.0%
#80	0	0	0.0%	0.0%	0.0%
#81	0	0	0.0%	0.0%	0.0%
#82	0	0	0.0%	0.0%	0.0%
#83	0	0	0.0%	0.0%	0.0%
#84	0	0	0.0%	0.0%	0.0%
#85	0	0	0.0%	0.0%	0.0%
#86	0	0	0.0%	0.0%	0.0%
#87	0	0	0.0%	0.0%	0.0%
#88	0	0	0.0%	0.0%	0.0%
#89	0	0	0.0%	0.0%	0.0%
#90	0	0	0.0%	0.0%	0.0%
#91	0	0	0.0%	0.0%	0.0%
#92	0	0	0.0%	0.0%	0.0%
#93	0	0	0.0%	0.0%	0.0%
#94	0	0	0.0%	0.0%	0.0%
#95	0	0	0.0%	0.0%	0.0%
#96	0	0	0.0%	0.0%	0.0%
#97	0	0	0.0%	0.0%	0.0%
#98	0	0	0.0%	0.0%	0.0%
#99	0	0	0.0%	0.0%	0.0%
#100	0	0	0.0%	0.0%	0.0%

This block shows:

- The IVR paths examined, in total (as the sum of all choices)
- For each IVR path, the choices made on that path (prepended by #)

For each path, the following information is computed:

- The number of calls traversing that path
- The number of IVR goals reached immediately after that path (a goal can be a queue or an activity expressly earmarked as a goal)
- The success rate, as the percentage of goals on all calls that entered the menu



- The number of hang-ups made in that IVR menu
- The attrition rate, as the number of hang-ups versus total number of calls

Available since	13.03
Default page	IVR
Shortcut code	IV01
API block name	IvrDO.IvrReport
Parameters	-
See also	

## IV02 - IVR Timing

IVR Timing

IVR path	N. calls	Average time	Total time	Minimum time	Maximum time
ivr2	5	0.22	0.10	0.20	0.10
ivr2	5	0.10	0.10	0.00	0.10
ivr2 - ivr3	5	0.10	0.10	0.00	0.10
ivr3	2	0.10	0.20	0.00	0.10
ivr3	2	0.10	0.10	0.00	0.10
ivr3	1	0.20	0.20	0.20	0.20
ivr3	1	0.20	0.20	0.20	0.20
ivr3	1	0.20	0.20	0.20	0.20
ivr3 - ivr4	2	0.10	0.10	0.10	0.10
ivr4	1	0.10	0.10	0.10	0.10
ivr4	1	0.10	0.10	0.10	0.10
ivr4	1	0.10	0.10	0.10	0.10

This block shows:

- The IVR paths examined, in total (as the sum of all choices)
- For each IVR path, the choices made on that path (prepended by #)

For each path, the following information is computed:

- The number of calls traversing that path
- The average traversal time for that IVR menu
- The total traversal time (as the sum of all times for each call)
- The maximum and minimum traversal times

Available since	13.03
Default page	IVR
Shortcut code	IV02
API block name	IvrDO.IvrTiming
Parameters	-
See also	

## IV03 - IVR Goals

IVR Goals

Goal	IVR path	Selection	N. calls	Average time	Minimum time	Maximum time
Goal 1	ivr2 - ivr3	1	1	0.10	0.10	0.10
Goal 2	ivr2 - ivr3	2	1	0.10	0.10	0.10
Goal 3	ivr2 - ivr3	3	1	0.10	0.10	0.10

This block shows:

- For each goal, all the paths that lead to that goal and their selection (the digit that was pressed in order to reach the goal)
- The number of calls that reached each goal
- The average, minimum and maximum traversal time to reach the goal. The time is computed since the call is first tracked, and not only on the final IVR menu.

Available since	13.03
Default page	IVR
Shortcut code	IV03
API block name	IvrDO.IvrGoals
Parameters	-
See also	

## Historical reports - First Call Resolution (FCRs)

First Call Resolution lets you track cases that are not resolved in a single call and so the customer ends up calling multiple times in a specified time frame.

## Repeated callers and clusters

At the basis of FCR, there is a definition of "repeated call". A call is considered "repeated" if:

- the caller-id is the same for multiple calls; e.g. if some user calls from a different number, we do not consider this a repeated call.
- the same caller-id is calling multiple times that are separated by less than a given time period, called "margin".
- the margin is controlled by a configuration property called *default.groupingMargin*, that can be changed in the system configuration and which default value is 168 hours (7 days).
- the caller-id is considered the same if after a normalization process (stripping of whitespaces and non-numeric characters) the same caller-ids match
- the caller-id is skipped (not clustered) if after the normalization it is blank – e.g. caller-ids like "" or "anonymous" will be skipped. Any calls with a blank caller-id will be counted as a single-call, as we do not have further information to cluster it.
- the normalized caller-id appears at least twice

For example, given the following set of calls and a margin of one week

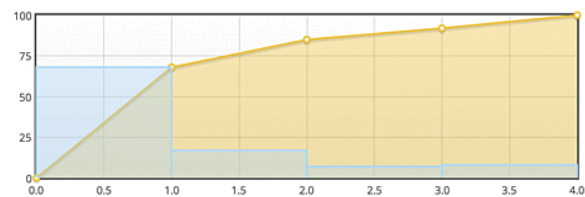
The data blocks are computed in three different flavors:

- Taken calls
- Lost calls
- All calls

## FC01/2/3 - Break-down of recalls

### Recalls on answered calls

	Clusters	Delta	%	Total calls	Total %
FCRs - 1	43		68.3%	43	44.3%
Up to attempts: 2	54	+ 11	85.7%	65	67.0%
Up to attempts: 3	58	+ 4	92.1%	77	79.4%
Up to attempts: 4	63	+ 5	100.0%	97	100.0%



Export as...

This report aims at letting you know how many calls were clustered.

This report is built to have a “shape” that is familiar for users used to SLAs, and is completed by a similar graph.

In detail:

- FCRs are calls that appear only once; while the other "classes" will be calls "up to" so many attempts
- "Up-to" lines will be present up to the maximum present in the report; considering all integers from 2 to the maximum included
- Clusters is the number of clusters that are "up to", so clusters that belong to the current class plus all previous ones
- Delta is the number of clusters that belong to the current class
- Percentage is the number of calls of the current class
- Total is the growing percentage of sorted classes, and always ends at 100%
- Total Calls is the number of calls that are "up to", so belong to the current class plus all previous ones

Available since	15.10.11
Default page	FCRs
Shortcut code	FC01
API block name	FcrDO.RecallsOk
Parameters	-
See also	Taken calls

Available since	15.10.11
Default page	FCRs
Shortcut code	FC02
API block name	FcrDO.RecallsKo
Parameters	-
See also	Lost calls

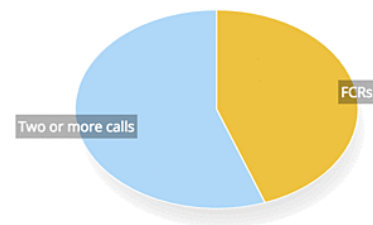
Available since	15.10.11
-----------------	----------

Default page	FCRs
Shortcut code	FC03
API block name	FcrDO.RecallsAll
Parameters	-
See also	All calls

## FC04/5/6 - Recall details

### Recall details on answered calls

	Total calls	Total %
FCRs	43	44.3%
Two or more calls	54	55.7%
Average calls per caller-id	1.5	-
Empty Caller-Ids	0	-



► Export as...   

This report shows the total number of FCRs, clusters and calls with an empty IDs.

It has a pie chart showing FCRs vs clusters.

Available since	15.10.11
Default page	FCRs
Shortcut code	FC04
API block name	FcrDO.ClidsOk
Parameters	-
See also	Taken calls

Available since	15.10.11
Default page	FCRs
Shortcut code	FC05
API block name	FcrDO.ClidsKo
Parameters	-
See also	Lost calls

Available since	15.10.11
Default page	FCRs
Shortcut code	FC06
API block name	FcrDO.ClidsAll
Parameters	-
See also	All calls

## FC07/8/9 - Cluster details

### List of recall clusters

N attempts	Number	First calls	End of last call	Taken calls	Lost calls
6 09'	7	06/09 - 08:54:02	06/22 - 13:23:22	3	3
5 09'	5	05/11 - 14:05:14	05/16 - 14:07:44	4	1
5 09'	5	05/31 - 11:29:20	06/03 - 13:45:12	3	2
4 00'	8010	06/07 - 05:58:12	06/07 - 07:39:19	3	1
4 00'	30000	04/20 - 15:07:26	04/28 - 15:52:54	4	0
4 09'	5	06/24 - 09:12:51	06/30 - 07:35:10	4	0
4 09'	0	06/13 - 09:15:38	06/24 - 08:24:07	4	0
4 09'	0	06/20 - 07:33:35	06/30 - 13:19:21	4	0
3 00'	212	04/19 - 14:11:52	04/19 - 14:47:47	1	2
3 00'	61261	05/12 - 08:39:01	05/13 - 12:09:29	3	0
3 09'	5	06/10 - 16:01:12	06/17 - 07:09:07	2	1
3 09'	0	05/04 - 09:14:48	05/10 - 06:20:35	2	1

This block is a list of all clusters, sorted by the number of attempts and showing the cluster's first and last call. Only clustered calls are included.

For all clusters including "taken" calls, the "Taken" column appears showing how many of those calls were counted and offering a link to a pop-up from which you can access the calls. The same goes for "Lost" calls. If both are counted, both columns are present.

Notes:

- When clicking on the icon to see calls, you will see all calls with the same caller-id belonging to the current report, whether they belong to the current cluster or not; so that you can have a general overview of all recalls in the current report

Available since	15.10.11
Default page	FCRs
Shortcut code	FC07
API block name	FcrDO.ClustersOk
Parameters	-
See also	Taken calls

Available since	15.10.11
Default page	FCRs
Shortcut code	FC08
API block name	FcrDO.ClustersKo
Parameters	-
See also	Lost calls

Available since	15.10.11
Default page	FCRs
Shortcut code	FC09

API block name	FcrDO.ClustersAll
Parameters	-
See also	All calls

## FC10 - Retry Rate and Lost Caller Behaviour

### Retry Rate and Lost Caller Behaviour

Retry Rate and Lost Caller Behaviour

Customer Attempts	Total Attempts	Long Calls	Short Calls	Taken Calls	Lost Calls
# 1	19	16	3	16	3
# 2	4	4	0	4	0
# 3	4	4	0	4	0
# 4	3	3	0	3	0
# 5	3	2	1	3	0
# 6	3	2	1	3	0
# 7	3	2	1	2	1
# 8	3	3	0	3	0
# 9	2	2	0	2	0
# 10	1	1	0	1	0
# 11	1	1	0	1	0
# 12	1	1	0	1	0
# 13	1	1	0	1	0
# 14	1	0	1	1	0
# 15	1	1	0	1	0

Export as...

This report shows information about customers retry behaviour. We can see how many calls are registered as being the n-th attempt, based on the Customer Attempt number in the first column. The information is the following:

- Customer Attempts
- Total Attempts
- Long Calls
- Short Calls
- Taken Calls
- Lost Calls

Notes:

- the number of seconds needed for a call to be classified as long is dictated by the following configuration property: `default.shortcall_treshold = 30` . If the property is not specified, it will default at 30.

Available since	17.06.16
Default page	FCRs
Shortcut code	FC10
API block name	FcrDO.RetryRate
Parameters	-
See also	NA

## FC11 - Most Frequent Called-Calling Number

### Most Frequent Number

Most Frequent Number

Number	N. of Calls	Taken Calls	Lost Calls	% of Taken Calls	Total Duration	Avg. Duration
01179158235	15	15	0	100.0%	10:03	0:40
02089407422	3	3	0	100.0%	0:45	0:15
07428378687	8	7	1	87.0%	0:43	0:06
07473881370	9	8	1	88.0%	8:37	1:04
anonymous	13	11	2	84.0%	6:21	0:34
-	2	2	0	100.0%	0:36	0:18

Export as...

This report shows aggregated data by caller/called number. We can deduce by looking at this report, the most frequent callers and the duration of their calls. A special icon is also present to inspect the singular calls that make up the aggregated data.

The information is the following:

- Number
- N. of Calls
- Taken Calls
- Lost Calls
- % of Taken Calls
- Total Duration
- Avg. Duration

Notes:

- Calls that show "anonymous" as caller number are calls which have an empty or undeterminable caller id. these calls are all evaluated together. Similarly, calls that show "~" as caller id, are calls coming from caller numbers that have only called once, we can refer to them as FCR (First Call Resolution).

Available since	17.06.16
Default page	FCRs
Shortcut code	FC11
API block name	FcrDO.MostFrequentNumber
Parameters	-
See also	NA

## Externally generated reports

QueueMetrics is able to fetch and display data blocks generated by external systems. This may be used to enhance the standard QueueMetrics reports with data that is handled outside of QueueMetrics - for example, data from a CRM application or order tracking systems or anything else that makes sense to display together with queue data.



In order to use these blocks, you need to create external data providers that will generate the data that QueueMetrics is to display. Details on how to do this can be found in the *XML-RPC Manual* in the section called *Dynamic blocks in QueueMetrics*.

## XS01 - Plain HTML

This data block includes a block of HTML right into the QueueMetrics report page.

For example, in order to include an HTML fragment generated by a server located at `http://server/page.php` you would set:

```
url=http://server/page.php
```

in the data block's parameter field.

Available since	13.12
Default page	None
Shortcut code	XS01
API block name	ExtSourceDO.HTML
Parameters	<i>url</i> : The URL that points to the page generating HTML
See also	

## XS02 - XML-RPC data source

This data block includes a formatted table of data into the QueueMetrics report page. The data must be generated in a specified format by an XML-RPC server, as described on the *XML-RPC Manual*.

Available since	13.12
Default page	None
Shortcut code	XS02
API block name	ExtSourceDO.XMLRPC
Parameters	<i>url</i> : The URL that points to the XML-RPC server
See also	XS01

## XS03 - JSON data source

This data block includes a formatted table of data into the QueueMetrics report page. The data must be generated in a given format by a JSON server, as described on the *XML-RPC Manual*.

Available since	13.12
Default page	None
Shortcut code	XS03
API block name	ExtSourceDO.JSON
Parameters	<i>url</i> : The URL that points to the page generating a JSON document

See also

XS01

## User-Programmable Reports

*User Programmable Reports* are meant to be completely customized by the end-user. As such, they usually include a fixed set of columns that will be displayed, plus a set of facilities for creating new columns.

Those columns are defined through the "Parameters" field of the data block, where new columns are to be configured. For example, in order to add a column that displays the time an agent was available, you could enter a definition like:

```
Tot Avail [hms]= SESSION - (PAUSETIME + (TALKTIME + OOSCALL))
```

This definition is made up of three parts:

- A *column name*: how the column's title will appear in the reports;
- A *formatter*: how the resulting value is to be displayed. Formatting is expressed as a token between square brackets just before the equal sign;
- A *formula*: how the value is to be computed.

The *column name* is a free string; you may put anything you want in it.

The *formatter* must be one of the following values:

- *hms* - a number of seconds displayed as "[hours:]minutes:seconds"
- *%* - prints a float number into a percentage, es .365 is displayed as 36.5%
- *n* - prints an integer, right-aligned
- *f* - prints a float number

If no formatter is specified, the *percent* formatter is used. All numbers are printed according to the current rules set by your current language and locale (e.g. number of decimal digits, decimal separators, etc.)

The *formula* lets you insert an algebraic formula. This formula works on a set of bound variables (as specified below) that the block will replace with the correct values for each row.

- The following operators are supported, with natural precedence rules:
  - Addition:  $2 + 2$
  - Subtraction:  $2 - 2$
  - Multiplication:  $2 * 2$
  - Division:  $2 / 2$
  - Exponentiation:  $2 ^ 2$
  - Unary Minus and Plus:  $+2 - (-2)$
  - Modulo:  $2 \% 2$

- Rounded brackets are supported to force the order of evaluation. Use them freely.
- The following functions are supported:
  - abs: absolute value
  - acos: arc cosine
  - asin: arc sine
  - atan: arc tangent
  - cbrt: cubic root
  - ceil: nearest upper integer
  - cos: cosine
  - cosh: hyperbolic cosine
  - exp: exponent ( $e^x$ )
  - floor: nearest lower integer
  - log: logarithmus naturalis (base e)
  - log10: logarithm (base 10)
  - log2: logarithm (base 2)
  - sin: sine
  - sinh: hyperbolic sine
  - sqrt: square root
  - tan: tangent
  - tanh: hyperbolic tangent
- Specific data blocks may implement custom functions. Those are prefixed by the dollar sign and depend on the agent block.
- Any error in the formula (e.g. division by zero, incorrect formula, missing parentheses, referencing an unbound variable) will cause the formula to return zero. An error will be printed on the system log.

You can have multiple columns defined; it is also valid to have empty lines in the parameters block and comments, prefixed by "#".



When creating new formulas, it is often useful to print all referenced items by themselves, so you can double-check them, and comment them out when you don't need them anymore.

## Variables bound for Agent blocks

The following variables are automatically bound and therefore usable in formulas:

- TALKTIME: The total conversation time
- SESSION: The total session time
- OVERLAPPING: The total overlapping conversation time
- OOSCALL: Out-of-session call time
- PAUSETIME: The total pause time
- PAUSEBILL: The total time of billable pauses
- PAUSENBILL: The total time of non-billable pauses
- PAUSEPAY: The total time of payable pauses
- PAUSENPAY: The total time of non-payable pauses
- NCALLS: The total number of calls for this agent
- NCALLSIN: The total number of inbound calls for this agent
- NCALLSOUT: The total number of outbound calls for this agent

The following custom functions are implemented:

- \$PAUSETIME[X]: returns the total duration of all pauses with the pause code "X" for the current agent

All times are expressed in seconds.

## JSON and XML-RPC access

As Programmable blocks often do not include much interesting information by themselves, when referenced though their own block code will only return fixed columns.

It is still possible to access them as they are configured in a report by referencing their direct code; this will be displayed by the Reports editor as soon as you enter parameters for an existing data block. The format will usually be "DRI.num", where *num* depends on your QueueMetrics install (different QueueMetrics systems will report different DRI codes for a block defined in the same way).

Data Blocks: AG18 - Programmable Agent Performance

Parameters:

```

Session [hms]= SESSION
Pau [hms]= PAUSETIME
Bill [hms]= PAUSEBILL
NBill [hms]= PAUSENBILL
Talk [hms]= TALKTIME + OOSCALL
Tot Avail [hms]= SESSION - ( PAUSETIME + (TALKTIME + OOSCALL))
Occ = TALKTIME / (SESSION - PAUSETIME)
CPH [f]=3600 / ((SESSION-PAUSETIME)/NCALLSIN)
ACL [hms]=(TALKTIME + OOSCALL) / NCALLSIN
ACW [hms]=((SESSION-PAUSETIME)-(TALKTIME + OOSCALL)) / NCALLSIN
C. In [n] = NCALLSIN
C. Out [n]= NCALLSOUT
Cx [n]=NCALLS

```

This block can be referenced directly as: DRI.131

Sort order: 110



As accessing a data block that is a part of a report requires the accessing used to have the correct grants to access the report, screen and block, these security rules will be also

enforced on "robot" users doing data queries. Make sure that, if you key-protect reports or elements in them, the "robot" user has all needed grants.

# Chapter 7. The real-time status panel

The real time status panel can be accessed by clicking the "Start real-time monitoring" label from the home page. It will show a page similar to the one below:

**QueueMetrics** Demo Admin | Administrator

Home Realtime Broadcast

Reload Add Member

Filters Parameters

Queue(s): 00 All

Update: 17:11:45

Alarms: 4

Reload: 5s

Queues: All

Agents: Members

Location: -

Group: -

Superv.: No

Reports

Recap ☒

Calls ☒

Agents ☒

By Queue View ☒

By Tag View ☒

Agents and Outcomes ☒

Queue	N. agents	Ready agents	On pause	Unk	Bsy	N. Calls waiting	On phone inbound	On phone outbound
00 All	2	1	0	0	0	1	1	0
A300	1	0	0	0	0	1	1	0
A400	1	0	0	0	1	0	0	0
8401	0	0	0	0	0	0	0	0

Export as...

**Calls being processed:**

Queue	Caller	Entered	IVR	Waiting	Duration	Agent	MOH	Srv
A300	200	17:09:16	0:00	0:22	2:00	John Doe		
A300	201	17:09:17	0:00	2:29	-	John Doe		

Export as...

**Agents currently logged in:**

Agent	Last login	Queue(s)	Extension	On pause	Srv	Free Since	On queue	Caller	Last call	IVR	Waiting	Duration
John Doe	09/08 - 17:08:34	A300		-		-	A300	200	17:08:10	-	0:24	0:29
Bob Smith (102)	09/08 - 17:10:04	A400	exp/203	-		-	00 All			-	-	-

Export as...

**Aggregated by queue view**

Queue	Tot time	Offered	Answered	Avg wait	Avg talk	Sales	SPH	QC	QCPH	Cont.	CPH	Conv.	QConv.	SLA	Goal Ftrs	Feature
00 All	0:00	1	1	0:24	0:29	0	0:00	0	0:00	0	0:00	0:00%	0:00%	100:00%	0	0
A300	0:00	1	1	0:24	0:29	0	0:00	0	0:00	0	0:00	0:00%	0:00%	0:00%	0	0

Export as...

**Aggregated by tag view**

On the top of the page there is a control table showing the last update timestamp and other dropdown selectors as specified below:

- **Reload:** It defines the update period will be used to refresh the shown data
- **Agents:** Shows or hides the *Agents currently logged in* table
- **Queues:** Shows all queues or only active queues
- **Agents:** Toggle between all agents or *members only* agents
- **Location:** If granted by user permissions, defines which location is shown
- **Group:** Defines which agent group is shown
- **Superv.:** Filter out agents not supervised by current user

The page is able to auto-refresh in background at the period specified in the first dropdown but you can anyway force a faster reload by clicking the "Reload" button.

Next to the control table, there is the data section. Depending on the status of previously mentioned dropdown, three sections could be shown.

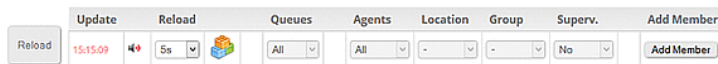
The first is a table showing a summary of all calls flowing through queues. Following that summary, there is a table showing which calls are currently handled by the queue system, then the agents logged in at the moment.

This page is invaluable because can tell you in a glimpse what's happening in the call center; it is meant to stay open in a window on the CC manager's workstation to have the exact feeling of what is going on at the moment.

On the sample page above, you can see two calls and two connected agents. Just like in the main analysis, you can choose which queues you want to monitor to avoid being overwhelmed by data.

You can also see that the current call environment has triggered a number of yellow and red alarms, as specified in the queue definition. You can configure red and yellow alarms for most numeric values that appear on screen - see the chapter the section called "Setting attention levels (Red and yellow alarms)" [215]. You can also set sounds linked to yellow or red alarms, that will be played if a red or yellow alarm is present.

Since the release of QueueMetrics 12.04, this panel has an added feature, which is the "Add Member" button, that allows an administrator or supervisor to add an agent to a queue, as required. Users holding the RT\_ADDMEMEBER key will be able to add agents directly from the Realtime page.

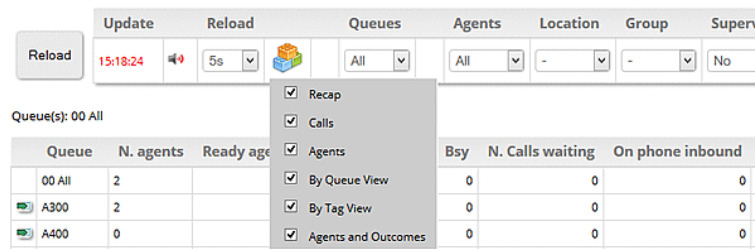


In order to change the default audio files, see "Appendix D: System Preferences". If you want to turn them off completely, just set them to blank.



The top menu bar shown in the above picture has been replaced by a left menu panel since QueueMetrics 15.10.

Since the release of QueueMetrics 15.09, the top panel contains a *three bricks* icon. Flying over with the mouse allows the user to select the report blocks will be shown in the realtime page. The number of available blocks is dependent by a set of configuration keys.



The *three bricks* icon has been replaced since QueueMetrics 15.10 by a checkbox list located on the new menu bar located on the left side, as reported below.



# QueueMetrics








Home **Realtime** Broadcast

Reload Add Member

**Filters**

**Parameters**



Queue(s): 00 All

Update	17:17:31
Alarms	
Reload	5s 
Queues	All 
Agents	Members 
Location	- 
Group	- 
Superv.	No 

**Reports**





Recap	<input checked="" type="checkbox"/>
Calls	<input checked="" type="checkbox"/>
Agents	<input checked="" type="checkbox"/>
By Queue View	<input checked="" type="checkbox"/>
By Tag View	<input checked="" type="checkbox"/>
Agents and Outcomes	<input checked="" type="checkbox"/>

**Queue**


	00 All
	A300
	A400
	8401

Export  
**Calls being**  
**Queue**

Export  
**Agents cu**

Export  
**Aggregat**  
**Queue**

	00 All
	A300

Export  
**Aggregat**  
**Tag**

---

The menu bar can be optionally collapsed clicking on the << button to best fit realtime panel blocks.

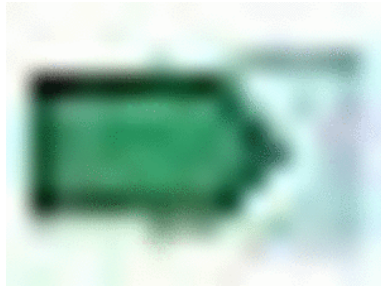
## Top status panel

The top status panel shows a quick status report for the current situation.

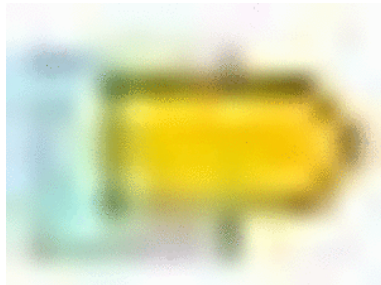
The first line shows information for all selected queues as a sum, while if there is relevant information for a specified queue it is displayed in a separate line. If an alarm is triggered for one of the numeric values displayed, the relevant cell turns either yellow or red.

The displayed fields have the following meanings:

- *Queue*: The name of the queue. Inbound queues are marked with the symbol



while outbound queues use the symbol



- *N. agents*: how many agents are logged on to the system, in total
- *Ready agents*: how many agents are ready to take calls, i.e. are logged on and are not in conversation or on pause
- *On pause*: how many agents are currently on pause
- *Unk*: how many agents are currently in conversation, but are not currently known as member of this queue
- *Bsy*: how many agents who are both members of the given queue and some other queue are currently busy because they are on call on the other queue.
- *N. Calls Waiting*: how many inbound calls are currently waiting in the selected queue. Outbound queues never have any call waiting.
- *On phone inbound*: how many agent are talking on the selected inbound queue
- *On phone outbound*: how many agents are talking on an outbound queue

Please note that, as agents are not linked to a specific queue save for the moment they are actually talking to a caller on the queue, the agent information is computed for all agents on the Asterisk server and not for specific queues, unless the "Members" option in the "Agents" dropdown is selected.

## Calls being processed

A list of calls flowing through the selected queues is presented on the middle table. If no call is present the table is displayed empty.

When a call is processed, the following fields are shown: - Queue: the queue that is handling the call; - Caller: The Caller\*ID, if available; - Entered: The date and time the call entered the queue system.

If the call is not answered yet, the "Waiting" field is displayed in red and is calculated according to the current date and time of the server. Depending on what type of information is present in the database (ATTEMPTS or RINGNOANSWER), is possible to have information about the last agent not picking up the call or the actual ringing agent's phone. The default configuration works with a standard Asterisk configuration and lets able to have RINGNOANSWER information. Please refer to Chapter 18, *Configuring Asterisk for QueueMetrics* [345] for the how to configure Asterisk generate ATTEMPTS information.

When a call is answered, the "Waiting" field tells the time that the caller had to answer; the "Agent" field shows the agent (or terminal) the caller is talking to and the "Duration", in red, is the current call duration.

If the call is ongoing and connected to an agent, moving the mouse on the *wizard* icon at the end of the line, some icons, like Call Monitor and VNC Monitor icons may be present. By clicking on one of these icons you activate the specified monitoring (see below).

If the call is ongoing and you have the special grants to do so, a red scissor icon might appear, moving the mouse on the *wizard* icon, to allow for brute-force call closure. See the section *Closing ongoing calls* for further details.

As soon as a call is completed or hung up, it exits the Calls panel.

This panel can be turned on or off through the "Calls" dropdown on the top of the page.

The "MOH" field shows the amount of time a customer is on hold with music, during a call. If multiple HOLD instances took place during the call, this field will show the total "on hold" time.

To implement this feature, it is necessary to have an Asterisk patch, which can be obtained by following this link:

<https://reviewboard.asterisk.org/r/1778/>

NOTE: The link to this Asterisk patch is provided by the Copyright holders and Contributors *as is* and any fitness for a particular purpose is Disclaimed. In no event shall Loway be liable for any direct, indirect, incidental, special, exemplary, or consequential damages (including Loss of use, data, profits or business interruption) however caused (including negligence or otherwise), arising in any way from the use of this Asterisk patch.

Queue	Caller	Entered	Waiting	Duration	Agent	MOH	Srv
Queue	Caller	Entered	Waiting	Duration	Agent	MOH	Srv

The "Srv" column is used only in cluster-based environments to tell you on which server the call is being handled.

The last field contains a "wand" that on mouse-over displays a drop-down menu which allows to perform the following actions:

Calls being processed:

Queue	Caller	Entered	Waiting	Duration	Agent	MOH	Srv
Inbound	201	16:16:41	0:04	0:05	John Doe (101)		

Export as...

Agents currently logged in:

Agent	Last logon	Queue(s)	Extension	On pause	Srv	Last call	On queue
John Doe (101)	05/07 - 15:40:43	Inbound	slp/203	-			Inbound

Export as...

**Loway**  
research  
Loway Research

VNC  
IM  
QA  
Close  
Hangup  
Transfer  
Monitor now

- *VNC*: Monitor agents via a VNC remote session
- *IM*: Begin an Instant Messaging session with an agent
- *QA*: Access the QA Form for the specific call (must have the QA\_TRACK key enabled)
- *Close*: Close the call in the QM log, but not in Asterisk (must have the CLOSECALLS key enabled)
- *Hangup*: Close the live call in the PBX (must have the RT\_HANGUPCALL key enabled)
- *Transfer*: Transfer the call to another extension (must have the RT\_TRANSFERCALL key enabled).
- *Monitor now*: Start a listen-in *chanspy* Asterisk session (must have the MON\_AUDIO key enabled)

To have precise realtime reporting a perfect clock synchronization is required. If your QM is on a different server, make sure the clocks are exactly aligned or you may see strange values in all fields. The NTP protocol offers excellent clock synchronization precision and is available on most operating systems.

## Agents currently logged in

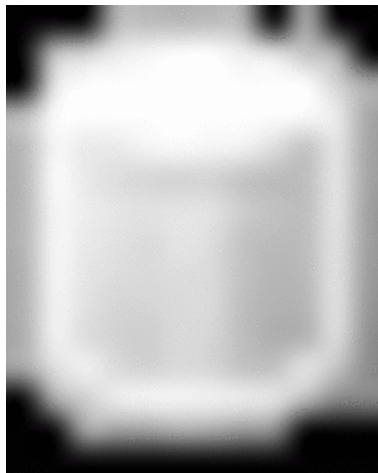
A list of available agents for all queues is displayed in this field. For each agent, the name, last log on and extension, if logged in via call-back, is provided.

A graphical indication of the status of each agent is shown using a coloured dot, where the following cases are possible:

- *Green dot*: the agent is ready to take calls
- *Yellow dot*: the agent is currently on a call
- *Red dot*: the agent is currently on pause

This panel can be turned on or off through the "Agents" dropdown on the top of the page.

The *Queue(s)* field shows the queues an agent is logged on to. This is meaningful only for agents who log-in on a queue-by-queue basis using the AddMember command in Asterisk. If an agent logs on to



all queues he's enabled to work on, a small database logo may be shown, telling the viewer that the agent is linked to queues through the Asterisk's configuration.

As the `queue_log` file usually contains no information on what queue(s) an agent is a member of, usually all agents are shown when they log on, no matter to what queue they will work on. This might be a problem for larger call centres, so it is possible to see only calls and log-ons of agents that are a member of the current queue. Membership is set by clicking on the "Agents" button of the queue settings page. Make sure your queue membership data is up-to-date before clicking this button!

If the "All" option was selected in the "Agents" dropdown, all agents logged in on Asterisk will be shown, no matter to which queue they belong. When "Members" is selected, instead, only agents defined for the selected queue will be displayed.

By turning on the property `"realtime.show_incorrect_queue_sets"`, the Queues field will display each queue with a different color code:

- *in black*: queues the agent is a known member of
- *in brown*: queues the agent is currently working on but he's not a known member of
- *as a down-arrow*: queues the agent is a known member on but he's not currently logged on to. In order to see the list of queues, fly over the down-arrow symbol with your cursor.

The *On Pause* field will contain the time the agent went on pause; if the agent is using a pause code to mark the reason for going on pause, the decoded pause code is shown as well. A switch can be used to show the pause start time either as an absolute hour or a time increment.

The *Srv* field will contain the server identifier for QueueMetrics running in cluster mode.

The *Free Since* field will contain the length of period since the last taken call.

The *Last call* and *On queue* fields show the start time of the last call the agent handled (which is latest) and on which queue the last call was. This can be useful to diagnose queue strategy problems that lead to unfair call distribution, or agents having problems with their telephones and therefore not taking calls correctly.

The *IVR* field shows the call time spent on the IVR process before the call enter in the queue.

*Waiting time* and *Duration* fields are related to the last call taken.

The "wand" icon mouse-over displays a drop-down menu which allows to perform the following actions:

Export as...

**Agents currently logged in:**

Agent	Last logon	Queue(s)	Extension	On pause	Srv	Free Since	On queue	Caller	Last call	IVR	Waiting	Duration
John Doe (101)	06/02 - 14:50:20	A300	sip/200	-		14:08	A300	204	14:50:42	-	0:06	23:39
Bob Smith (102)	06/02 - 14:50:30	A300	sip/201	-		-				-	-	-

Export as...

**Aggregated by queue view**

Queue	Tot time	Offered	Answered	Avg wait	Avg talk	Sales	SPH	QC	QCPH	Cont.	CPH	Conv.	QConv.	SLA	Goal Ftrs	Fea
All	0:00	2	1	0:06	2:1.19	-	0	0:00	0	0:00	0	0:00%	0:00%	100:00%	0	
A300	0:00	2	1	0:06	2:1.19	-	0	0:00	0	0:00	0	0:00%	0:00%	100:00%	0	

Export as...

**Aggregated by tag view**

Tag	Tot time	Offered	Answered	Avg wait	Avg talk	Sales	SPH	QC	QCPH	Cont.	CPH	Conv.	QConv.	SLA	Goal Ftrs	Fea
-----	----------	---------	----------	----------	----------	-------	-----	----	------	-------	-----	-------	--------	-----	-----------	-----

VNC  
IM  
Remove Member  
Pause Agent  
Unpause Agent  
Send Text Message

- **VNC:** Monitor agents via a VNC remote session
- **IM:** Begin an Instant Messaging session with an agent
- **Remove Member:** Remove an agent from a queue (must have the RT\_REMOVEMEMBER key enabled)
- **Pause Agent:** Put an agent in a Pause state (must have the RT\_PAUSEAGENT key enabled)
- **Unpause Agent:** Un-pause an agent so he/she is available to take calls (must have the RT\_UNPAUSEAGENT key enabled)
- **Send Text Message:** Send a text message to an agent (must have the RT\_SENDDTEXTAGENT key enabled). The SMS functionality works only with asterisk 10+ versions.

The last icon is a *direct link to reports*. Clicking on this icon will run an historical report by populating the query with parameters similar to what generated the realtime panel results.

Since QueueMetrics 16.10.17, a new optional field is available for the Agents Currently logged in table. This field is called *Paused For* and it shows the elapsed time of ongoing agent's pauses. To enable this field one needs to enable the realtime.relativePauseTimes System Preference. See Appendix C, *System preferences* [383].

## Aggregated by queue view

Aggregated by queue view

Queue	Tot time	Offered	Answered	Avg wait	Avg talk	Sales	SPH	QC	QCPH	Cont.	CPH	Conv.	QConv.	SLA	Goal Ftrs	Feature
All	0:00	6	2	0:51	0:41	1	1.87	1	1.87	1	1.87	100:00%	100:00%	50:00%	0	2
A300	0:00	6	2	0:51	0:41	1	1.87	1	1.87	1	1.87	100:00%	100:00%	50:00%	0	2

Export as...

This block reports realtime figures related to each selected queue. All values are aggregated by queue except for the first row where calls for the whole selected queue set is reported. On each column a user could find:

- An icon representing the queue direction (inbound/outbound)
- The queue name
- The total call time
- The number of calls feed by the queue
- The number of answered calls
- Average wait time for all calls in the queue



- Average talk time for answered calls
- Number of calls marked as sales
- SPH: Sales per hour figure
- Number of calls marked as qualified contact
- QCPH: Qualified contacts per hour figure
- Cont: number of calls marked as contact
- CPH: Contact per hour figure
- Conv: conversion ratio
- QConv: qualified conversion ratio
- SLA: percentage of calls matching the SLA time configured for the queue
- Goal Ftrs: number of goal marked feature codes found in the call set
- Feature: number of feature codes found in the call set

By clicking on the last icon, a user can start an historical report with query parameters matching the realtime page parameters that generated the selected row.

## Aggregated by tag view

Aggregated by tag view

Tag	Tot time	Offered	Answered	Avg wait	Avg talk	Sales	SPH	QC	QCPH	Cont.	CPH	Conv.	QConv.	Goal Ftrs	Feature
	0:00	6	2	0:51	0:41	1	1.09	1	1.09	1	1.09	100.00%	100.00%	0	2
-	0:00	2	0	-	-	0	0.00	0	0.00	0	0.00	0.00%	0.00%	0	0
TVAD copy 2	0:00	2	1	0:05	0:17	1	5.25	1	5.25	1	5.25	100.00%	100.00%	0	2
TVAD copy 3	0:00	2	1	1:38	1:05	0	0.00	0	0.00	0	0.00	0.00%	0.00%	0	0

Export as...

This block reports realtime figures related to tags associated to processed calls. All values are aggregated by tag except for the first row, where calls for the whole tag set is reported, and the second row, where only calls with no tag are counted. On each column a user could find:

- Tag name (empty for all call set, dash for calls with no associated tags)
- The total call time
- The number of calls with associated tag
- The number of answered calls with associated tag
- Average wait time for all calls with associated tag
- Average talk time for answered calls with associated tag
- Number of calls marked as sales with associated tag
- SPH: Sales per hour figure
- Number of calls marked as qualified contact with associated tag








- QCPH: Qualified contacts per hour figure
- Cont: number of calls marked as contact with associated tag
- CPH: Contact per hour figure
- Conv: conversion ratio
- QConv: qualified conversion ratio
- Goal Ftrs: number of goal marked feature codes found in the call set
- Feature: number of feature codes found in the call set

By clicking on the last icon, a user can start an historical report with query parameters matching the realtime page parameters that generated the selected row.

## Agent and outcome view

Agent and outcome view:

Agent	Status	Offered	Answered	Tot talk	Tot idle	Pause bill.	Pause non bill.	Avg talk	Sales	SPH	QC	QCPH	Cont.	CPH	Conv.	QConv.	Goal Ftrs	Feature
 Jara Doe (101)	Lost Calls	4	0	0:00	0:00	0:00	0:00	-	0	0:00	0	0:00	0	0:00	0:00%	0:00%	0	0
	Logged on - 21:57 Paused - 23:45 (Back to Me)	1	1	0:17	21:50	0:00	0:00	0:17	1	1.87	1	1.87	1	1.87	100.00%	100.00%	0	2
 Bob Smith (102)	Logged on - 21:45	1	1	1:05	30:41	0:00	0:00	1:05	0	0:00	0	0:00	0	0:00	0:00%	0:00%	0	0

Export status:   

This block reports realtime figures related agent sessions and calls. All values are aggregated agent except for the first row, where lost calls are shown. On each column a user could find:

- Agent status icon
- Agent name
- Agent status explained (Logged on time, pause status, pause time, pause code)
- Offered call number
- Answered call number
- Total talk time
- Total idle time (counted as session time purged from talk and pause time)
- Billable pause time
- Non billable pause time
- Average talk time
- Sales: number of calls marked as sale
- SPH: Sales per hour figure
- Number of calls marked as qualified contact
- QCPH: Qualified contacts per hour figure
- Cont: number of calls marked as contact

- CPH: Contact per hour figure
- Conv: conversion ratio
- QConv: qualified conversion ratio
- Goal Ftrs: number of goal marked feature codes found in the call set
- Feature: number of feature codes found in the call set

By clicking on the last icon, a user can start an historical report with query parameters matching the realtime page parameters that generated the selected row.

## Using Locations

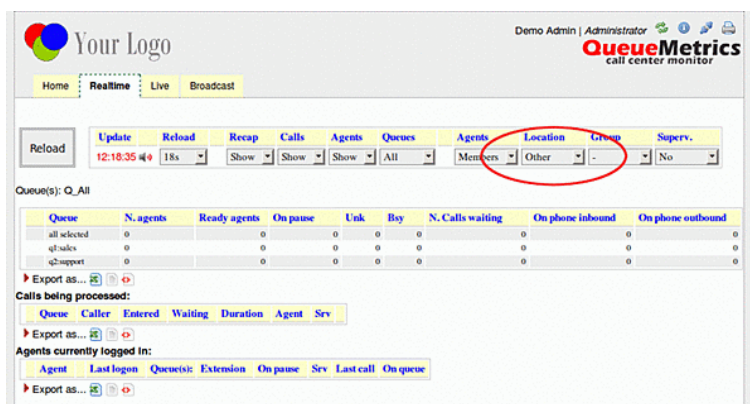
You can also assign each agent to a Location, i.e. a group of agents working together that you want to monitor as an unit. They might be a supervisor's team, or people working in the same building, or maybe in the same location for big multinational call-centres. This way you can avoid being cluttered with information about all agents working on the selected queue(s) and only see those you are actually interested in.

Note that when you filter by agents or locations you may see calls being queued and then disappear. This happens because all calls that wait to be answered on a queue are shown, but answered calls are shown only if the answering agents is a member of your defined filter conditions.

Imagine you have two groups of agents, one working in NY and the other one in LA. You are the supervisor of the NY group, so you are filtering by location. You see a call entering your queue and then disappear. The reason why might be that it was answered by someone in LA, so QueueMetrics filters it out for you.

It is also possible to have QM ask for a location to be selected in any case for Real-time reports. As locations can be key-protected, this is a handy way to determine which agents can be seen by which supervisors. In order to enable this feature, you must set the *realtime.assignedLocationsOnly* property. When this is set:

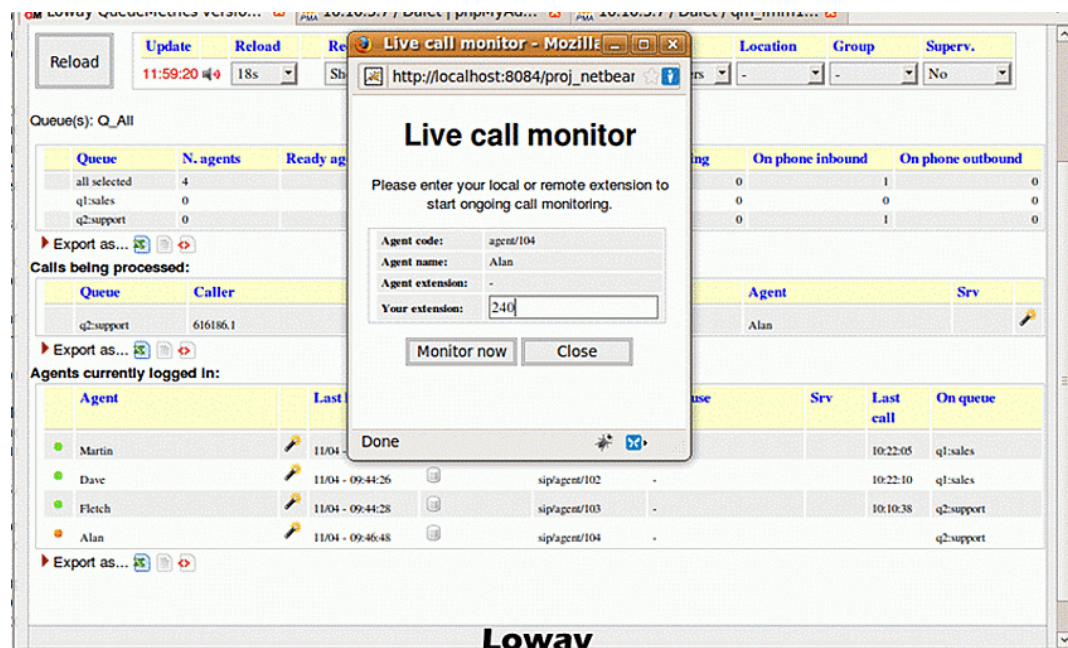
- When a user enters the real-time screen, the dash that means "Any location" is not shown anymore and the first location they have the grants to see is selected.
- If a user has no grants to see at least one location, an error message is raised and they are not able to enter the real-time screen



## Unattended call and VNC monitoring

It is possible for you to set up both Unattended Call Monitoring and VNC Monitoring.

Unattended Call Monitoring makes it possible to listen to an ongoing call from an agent; by clicking on the small telephone-shaped icon, that will appear moving the mouse under the *wizard* icon, a popup will be shown where you may enter your current extension or PSTN telephone number.



As soon as you confirm the entered data, your telephone will ring and you will start listening to the ongoing call between the selected agent and the caller.

In order to set up this behaviour, please see the section the section called “Listening to live calls: Unattended Call Monitoring” [350]. It is possible to use different PMs to handle different audio needs - see the section called “Listening to calls using Pluggable Modules (PM)” [276].

It is also possible to set up the system in order to allow the real-time monitoring of the agent’s screen using VNC. If this feature is enabled, a small screen will appear close to the agent’s name; by clicking on it, your selected VNC application will be launched and you will be monitoring the agent’s screen.

In order to set up this behaviour, please see the section the section called “Enabling VNC Monitoring” [351] of this manual.

## Real-time performance considerations

Running a large set of real-time pages / wallboards may impose a significant burden on a QueueMetrics system. But sometimes you have no choice. The best way to run them is to:

- Use SQL or CLUSTER storage types
- Set the beginning of the analysis to the minimum usable time. For example, QM usually runs the real-time report since the last midnight, but sometimes a sliding window of (say) 8 hours might be equally effective in your scenario and require a fraction of the load. You control this by setting the *realtime.startHour* property

- Turn on row caching - this allows QM to keep cached and pre-processed copies of objects it needs to run the Real-time and Agents Page. This may offer a significant speed up, often by an order of magnitude, and will reduce database load. You turn on this feature by setting *realtime.useRowCache* to true.
- Tune Java memory for maximum performance - see the **Advanced Configuration** manual.

## The real-time live page

The real-time live page can be accessed by clicking on the "Live" tab next to the "Realtime" tab.

Queue(s): 00 All

Reload now

Server	Queue	Tot.	Free	Pause	Talking	Other q.	Logoff	Length	Max wait
aleph	Q DPS	1	0	0	1	0	5	0	0.00
aleph	Q Test	1	0	0	0	1	3	0	0.00

Export as...

**Calls being processed:**

Server	Queue	Called ID	Wait	Talk	Q.Pos	Agent	Entered	Status
aleph	Q DPS	896	0.00	0.34		John Doe (101)	06/23 - 22:58:31	AG

Export as...

**Agents currently logged in:**

Server	Agent	Status	Logon	Queues
aleph	John Doe (101)	Call	8:52:56	queue-test queue-dps

Export as...

**Server status**

Server	Status	Time (ms)
aleph	OK	234
trix	OK	187

Export as...

In order to maintain session information, this page will reload automatically

This page is not built from the queue\_log data as all other information reported by QueueMetrics, but it's read right from each Asterisk box's Manager interface. So what you see in this page is the status of each Asterisk box, as reported by itself.

This feature is still less developed than the Realtime page, but still can be pretty useful.

## The top panel

On the top panel, for each queue on each server, you will see the following pieces of information:

- 
- *Tot*: the total number of agents available for this queue
  - *Free*: the number of free agents
  - *Pause*: the total number of agents on pause
  - *Talking*: the total numbers of agents who are in conversation at the moment
  - *Other q.*: the number of agents that are logged in to this queue and some other queue, and are at the moment busy on another queue.
  - *Logoff*: the number of possible agents that are defined for this queue but are not logged on at the moment.
  - *Length*: the current queue length, i.e. how many calls are waiting in line before being connected to an agent
  - *Max wait*: the current maximum wait time for this queue.

## Calls being processed

In the calls panel you see the following pieces of information, sorted from oldest to newest by call start-time:

- *Server*: the server that is handling this call
- *Queue*: the name of the queue
- *Caller-id*: the caller-id of this call, if any
- *Wait*: the wait time (if the call is not connected)
- *Talk*: the total duration (if the call is connected)
- *Q.Pos*: the queue position (if the call is waiting)
- *Agent*: the agent handling this call, if connected
- *Entered*: the time this call was queue
- *Status*: the call status
- *Info*: contains all the Feature Codes, Variables, Call Tags, IVR choices if present.

The Wait and Talk times cannot be distinguished at the moment.

## Agents currently logged in

In the agents panel you can see the following pieces of information:

- *Server*: the server your agent is logged on to
- *Agent*: the agent
- *Status*: if the agent is free, paused or on call
- *Logon*: the time this agent logged on

- 
- *Queues*: to which queues is this agent connected at the moment

## Server status

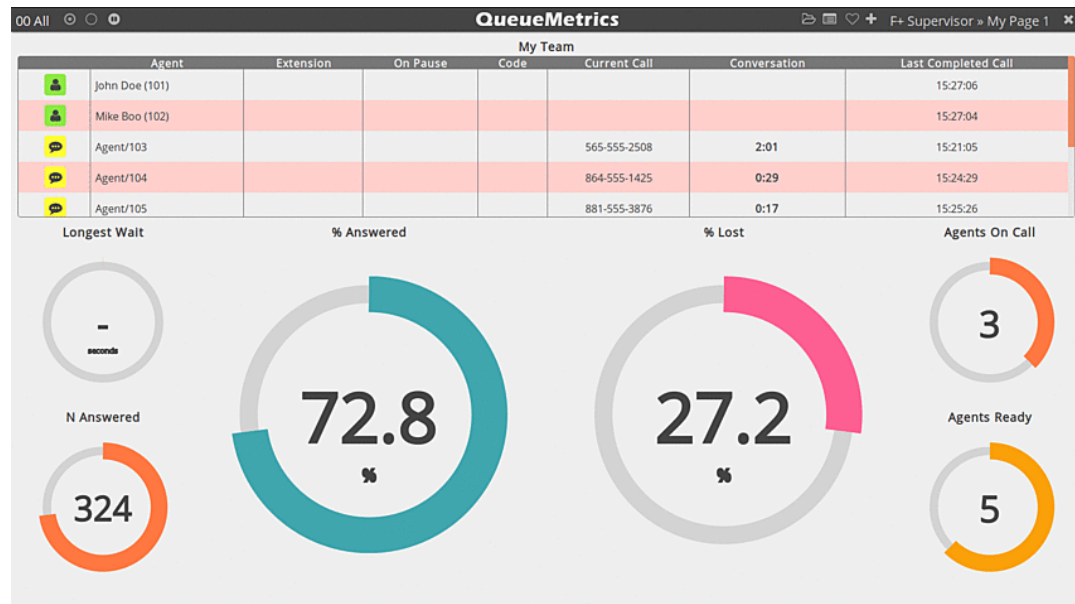
The last panel details the status of each server making up the cluster. If a server is not correctly set up, it will appear as KO.

- *Server*: the server that QM is polling
- *Status*: OK - the server answered correctly; KO - it was impossible to retrieve information from this server
- *Time*: how much querying this server took. If this value goes up all of a sudden, your server is likely experiencing overload.



# Chapter 8. The Wallboard

QueueMetrics includes user-definable wallboard facilities that allow you to design your own wallboards and run them either interactively or as proper stand-alone wallboards.



Wallboards are built as a series of rotating **views**, each of which includes a number of **widgets**. Widgets are positioned as items on a square grid that is meant to fill the screen, and you can control the number of columns that you want to use.

Wallboards are meant to be customized - you can change colors, set alarms on specific widgets, include text and images and in general customize them to suit your specific needs. Wallboards can be private or public, in which case they can be shared between different users and can be used to run automated stations (see "Kiosk mode" below).

## Understanding wallboards

A wallboard is controlled through the top bar. The top bar:

- Displays the **current queue** or queues that are being used as data sources.
- Displays a number of circles, one for each **view**. By clicking on a widget, you can jump to a specific view. The current view is displayed as a dotted circle.
- Displays a **Play/Pause** button that lets you decide whether views rotate in order according to their expected durations or the current view remains visible. If you do any change to the page, rotation stops automatically until manually reactivated.
- Displays a **Load** button that lets you load other wallboards that are visible to you or create a new, blank wallboard.
- If the wallboard has unsaved data (e.g. because you added some widgets or moved them around), a **Save** button appears in the top bar that lets you save the current wallboard. Switching view when you have unsaved data will lose any unsaved data.



- There is a **Reorder** button that lets you change the sequence of views in the current wallboard and add/remove views.
- There is a heart-shaped icon that displays whether the wallboard you are looking at is **public or private**. By clicking on that icon within a public wallboard, you get the URL that you need to run the wallboard in kiosk mode copied to your clipboard.
- There is an **Add Widget** button that lets you add new widgets to the current view.
- There is a **title**, showing the name of the current wallboard and of the current view. By clicking on it, you can customize some properties for both wallboard and view.
- There is an **Exit** button that gets you back to your QueueMetrics session.



In order to access the wallboard, you need the security key *REALTIME*. To edit a wallboard you need the key *WALLBOARD\_ADD* and to create a public wallboard you need the key *WALLBOARD\_FORALL*. You can easily add those keys through the User editor or by adding them to a security class.

## Saved Wallboards

The default wallboard is accessible through the link "Wallboard" on the home page of QueueMetrics, using the current queue(s) selected. From the wallboard itself you can load other wallboards through the **Load** button.

Your wallboards, and all public wallboards visible to you, will appear on the home page in the "Wallboards" section. By clicking on them, they will open with the current selected queue. You can also delete existing wallboards by clicking on the "Remove" icon hovering over their home page link.

## Settings

By clicking on the title of the wallboard, you can edit the following properties:

*For the whole wallboard:*

- **Name** that the wallboards appears under. You can have multiple wallboards with the same name
- **Comment** is a free text comment you may want to save
- **Public** controls whether the wallboard appears on every user's home page (as restricted by the security key) or is private for you
- **Security key** lets you protect this wallboard from users who do not hold the specified key

*For the current view:*

- **Name** is the name of the current view. Multiple views within a wallboard may have the same name, though it would be better to use different names
- **Duration** is the duration in seconds that a wallboard is displayed on the screen before the next wallboard. Data is updated live when a wallboard is being displayed.
- **Number of Columns** is the size of the grid that the screen is horizontally split into. This is the minimum size for a widget, though you can stretch a widget to use multiple grid cells as you best see fit.

## Editing Widgets

Widgets can be added, moved, cloned or removed freely within a view. You should position a widget in a way that makes sense for your use case, giving it enough room to display its data in a way that is easy to see.

Most widgets will resize automatically in the space they are given to offer a good readability and to make full use of the space they are assigned.

If you can edit a widget, when you fly over it with your mouse it will display an **Edit widget** icon and it will go in editor mode. Though the editor you can:

- Clone the widget
- Remove the widget
- Change the title
- ...and edit any special configuration it has (see below for a description of all available widgets)

As of QueueMetrics 17.06.11, most of the widgets can be filtered by queue. If you are using the wallboard to monitor multiple queues at the same time, you can use the queue filtering function to apply the widget to a single queue instead of applying it to the aggregation of all the queues data.

When you save a widget, the whole wallboard is saved automatically.

## Alarms

Most widgets have a set of possible **custom alarms** that you can use to display them in a different color when an alarm condition is met. Custom alarms are expressed as simple expressions, e.g. ">10" or "<15".

If QueueMetrics has a system alarm set on the queue shown and no custom alarm set, then the correct system alarm is used. Custom alarms always take precedence on system alarms.

## Running in kiosk mode

If you want to run a wallboard in kiosk mode, the first thing that you need is to get its kiosk URL. You can obtain this by clicking on the "heart" icon. The URL might appear like the one below:

```
http://127.0.0.1:8080/QM/qm_wab2.do?user=robot&pass=***  
&queues=300.301&wallboardId=21
```

As you can see, you can edit which (atomic) queues you want to use for your wallboard by separating them with a pipe "|" character.



The URL will always include a user called *robot* with password *\*\*\**; edit it as necessary given the current settings of your "robot" user. Make sure that the *robot* user is enabled, as it is usually present but disabled on new QueueMetrics installs.

If you connect a small-cost Linux box (e.g. a Raspberry PI or similar) to a large screen or a video beamer and set it in your call-center where it will be visible by your agents, you can set-up a wallboard at a very low cost using commodity hardware and requiring no human intervention but turning it on in the morning and turning it off at night.

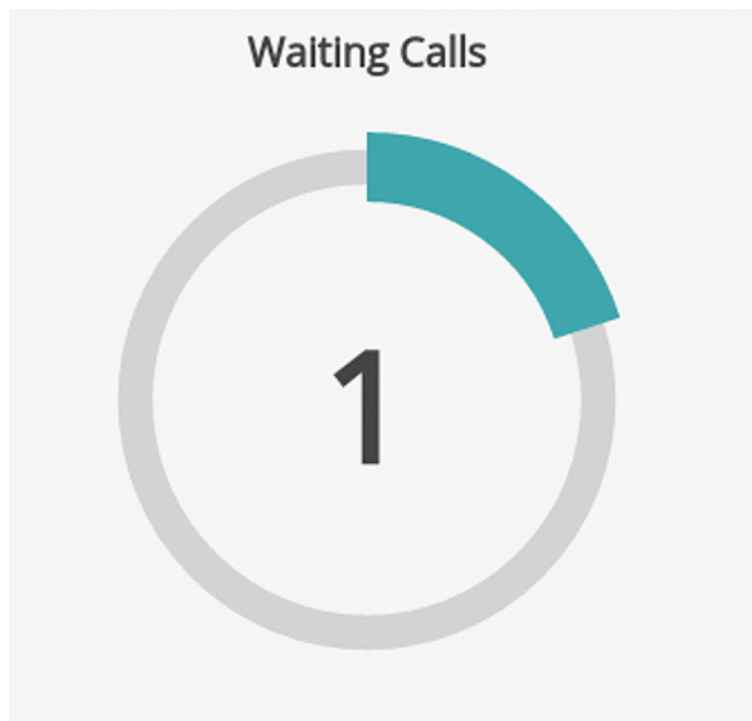
# Component Details

Here is an overview of the components currently available in Queuemetrics' Wallboard.

## Circular Panels

### PC01 - Waiting Calls

This Component displays how many calls are currently waiting to be answered.



The following properties can be modified:

- **Title:** The title of the component
- **Color:** The color of the stroke
- **Red alarm:** The expression used to trigger a **red alarm** (eg. >20)
- **Yellow alarm:** The expression used to trigger a **yellow alarm** (eg. >20)
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	Waiting calls
Shortcut code	PC01
Parameters	-

See also	
----------	--

## PC02 - Lost Calls

This Component displays the number of lost calls.



The following properties can be modified:

- **Title:** The title of the component
- **Color:** The color of the stroke
- **Red alarm:** The expression used to trigger a **red alarm** (eg. >20)
- **Yellow alarm** The expression used to trigger a **yellow alarm** (eg. >20)
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	Lost calls
Shortcut code	PC02
Parameters	-
See also	

## PC03 - Answered Calls

This Component displays the number of answered calls.



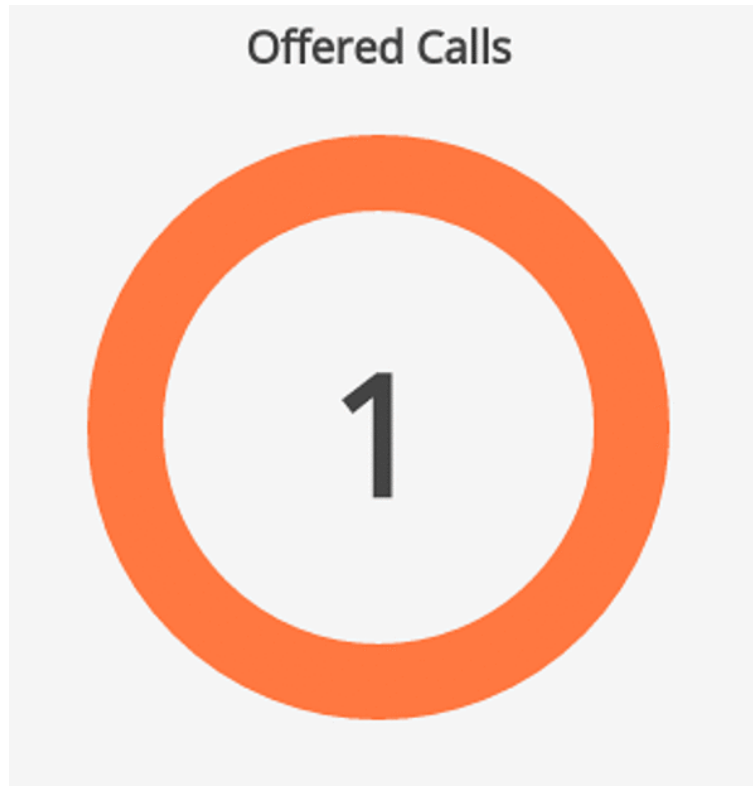
The following properties can be modified:

- **Title:** The title of the component
- **Color:** The color of the stroke
- **Red alarm:** The expression used to trigger a **red alarm** (eg. >20)
- **Yellow alarm** The expression used to trigger a **yellow alarm** (eg. >20)
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	Answered calls
Shortcut code	PC03
Parameters	-
See also	

## PC04 - Offered Calls

This Component displays the number of offered calls.



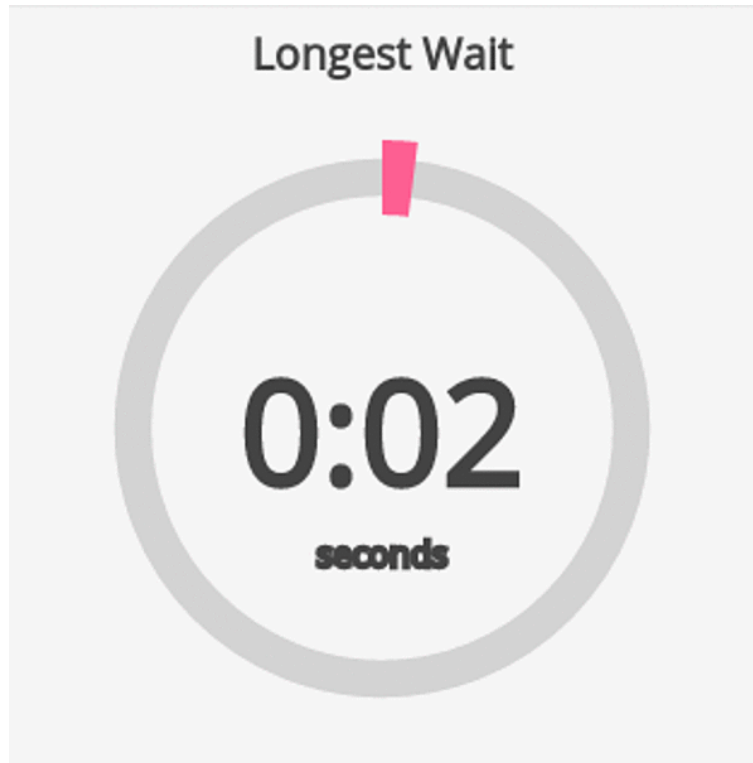
The following properties can be modified:

- **Title:** The title of the component
- **Color:** The color of the stroke
- **Red alarm:** The expression used to trigger a **red alarm** (eg. >20)
- **Yellow alarm** The expression used to trigger a **yellow alarm** (eg. >20)
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	Offered calls
Shortcut code	PC04
Parameters	-
See also	

## PC05 - Longest Wait

This Component displays the duration of the longest waiting time currently happening on the selected queues.



The following properties can be modified:

- **Title:** The title of the component
- **Color:** The color of the stroke
- **Red alarm:** The expression used to trigger a **red alarm** (eg. >20)
- **Yellow alarm** The expression used to trigger a **yellow alarm** (eg. >20)
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	Longest Wait
Shortcut code	PC05
Parameters	-
See also	

## PC06 - Agents On Call

This Component displays the number of agents on call on the selected queues.





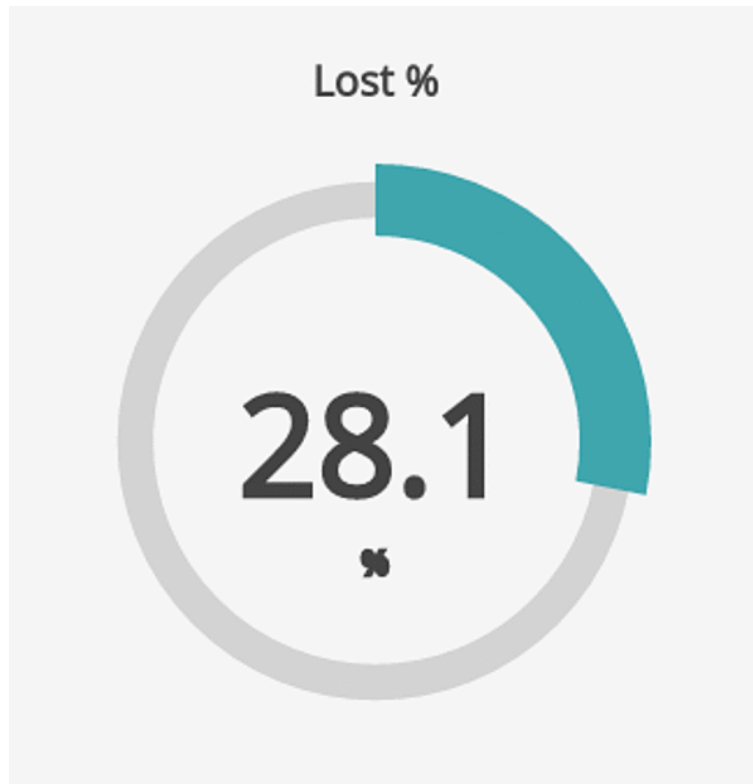
The following properties can be modified:

- **Title:** The title of the component
- **Color:** The color of the stroke
- **Red alarm:** The expression used to trigger a **red alarm** (eg. >20)
- **Yellow alarm** The expression used to trigger a **yellow alarm** (eg. >20)
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	Agents On Call
Shortcut code	PC06
Parameters	-
See also	

## PC07 - Lost Calls %

This Component displays the percentage of lost calls.



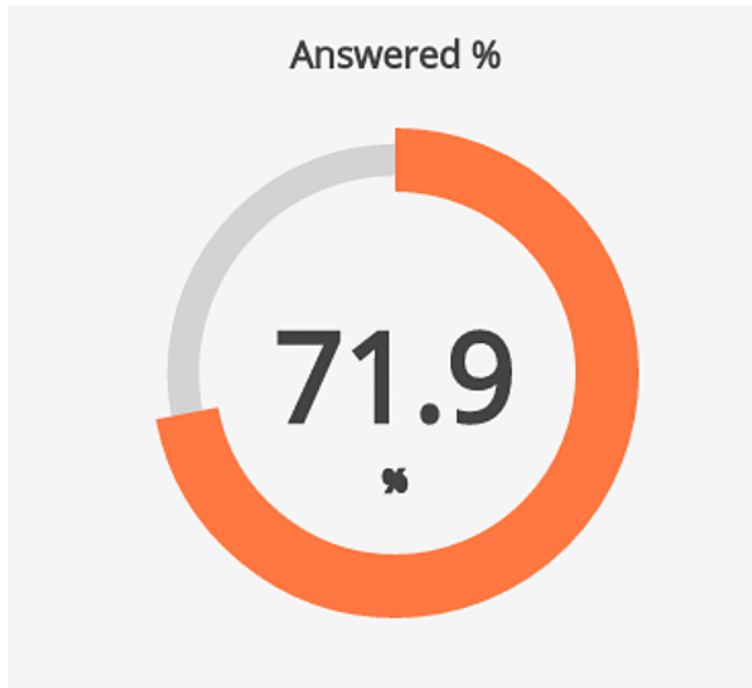
The following properties can be modified:

- **Title:** The title of the component
- **Color:** The color of the stroke
- **Red alarm:** The expression used to trigger a **red alarm** (eg. >20)
- **Yellow alarm** The expression used to trigger a **yellow alarm** (eg. >20)
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	Lost Calls %
Shortcut code	PC07
Parameters	-
See also	

## PC08 - Answered Calls %

This Component displays the percentage of answered calls.



The following properties can be modified:

- **Title:** The title of the component
- **Color:** The color of the stroke
- **Red alarm:** The expression used to trigger a **red alarm** (eg. >20)
- **Yellow alarm** The expression used to trigger a **yellow alarm** (eg. >20)
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	Answered Calls %
Shortcut code	PC08
Parameters	-
See also	

## PC09 - Agents Ready

This Component displays the number of agents ready on the selected queues.



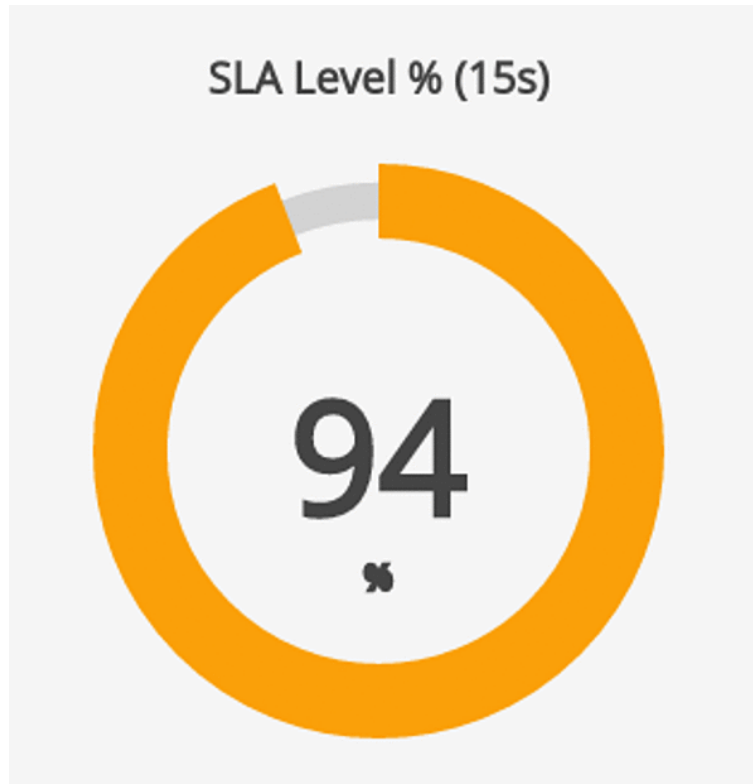
The following properties can be modified:

- **Title:** The title of the component
- **Color:** The color of the stroke
- **Red alarm:** The expression used to trigger a **red alarm** (eg. >20)
- **Yellow alarm** The expression used to trigger a **yellow alarm** (eg. >20)
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	Agents Ready
Shortcut code	PC09
Parameters	-
See also	

## PC10 - SLA Level %

This Component displays the percentage of calls answered within the selected SLA level.



The following properties can be modified:

- **Title:** The title of the component
- **SLA Level:** The SLA time interval
- **Color:** The color of the stroke
- **Red alarm:** The expression used to trigger a **red alarm** (eg. >20)
- **Yellow alarm** The expression used to trigger a **yellow alarm** (eg. >20)

Available since	17.06
Name	SLA Level %
Shortcut code	PC10
Parameters	-
See also	

## Tables

### TC01 - Live Agents

This Component displays a table showing all the agents logged in on the selected queues.

Live Agents						
	Agent	Extension	On Pause	Code	Current Call	Conversation
	Mike Ross 101					16:33:27
	Harvey Specter 102					16:35:18
	Donna Paulsen 103				382-555-9087	2:28
	Rachel Zane 104					16:33:59
	Jessica Pearson 105				390-555-8493	2:05
	Louis Litt 106					16:34:20
	Katrina Bennett 107				592-555-6353	0:07
	Harold Gunderson 108				288-555-8909	0:09

The following properties can be modified:

- **Title:** The title of the component
- **Pause Red alarm:** The expression used to trigger a **red alarm** on the pause time of an agent (eg. >20)
- **Pause Yellow alarm** The expression used to trigger a **yellow alarm** on the pause time of an agent (eg. >20)
- **Call Red alarm:** The expression used to trigger a **red alarm** on the conversation time of an agent (eg. >20)
- **Call Yellow alarm** The expression used to trigger a **yellow alarm** on the conversation time of an agent (eg. >20)
- **Queue:** The queue you want to filter the data for

The table will also be responsive to any **Red** or **Yellow alarm** that has been set in the **Edit Queues** page under the following fields:

- **Call talking duration**

Available since	17.06
Name	Live Agents
Shortcut code	TC01
Parameters	-
See also	

## TC02 - Live Calls

This Component displays a table showing all the calls in progress on the selected queues.

Live Calls					
	Queue	Caller	IVR	Wait	Talk
	Queue 301 - Sales	605-555-4357	0:03	0:01	4:12
	Queue 301 - Sales	957-555-1306	0:02	0:04	2:35
	Queue 300 - Customer Support	564-555-6920	0:02	0:02	2:31
	Queue 302 - Information	941-555-7922	0:02	0:02	0:42
	Queue 300 - Customer Support	515-555-4358	0:03	0:02	0:20

The following properties can be modified:

- **Title:** The title of the component
- **Wait Red alarm:** The expression used to trigger a **red alarm** on the waiting time of a call (eg. >20)
- **Wait Yellow alarm** The expression used to trigger a **yellow alarm** on the waiting time of a call (eg. >20)
- **Call Red alarm:** The expression used to trigger a **red alarm** on the conversation time of a call (eg. >20)
- **Call Yellow alarm** The expression used to trigger a **yellow alarm** on the conversation time of a call (eg. >20)
- **Queue:** The queue you want to filter the data for




The table will also be responsive to any **Red** or **Yellow alarm** that has been set in the **Edit Queues** page under the following fields:

- **Call wait duration**
- **Call talking duration**

Available since	17.06
Name	Live Calls
Shortcut code	TC02
Parameters	-
See also	

## TC03 - Live Queues

This Component displays a table showing all the selected queues, and their relative information.

Live Queues									
Direction	Queue	N. Of Agents	Ready	On Pause	Busy	Unknown	Calls Waiting	Agents on Inbound	Agents on Outbound
	00 All	8	5	0	0	0	1	1	2
	Queue 300 - Customer Support	2	1	0	0	0	0	1	0
	Queue 302 - Information	5	3	0	0	0	1	0	2

The following properties can be modified:

- **Title:** The title of the component
- **Agents On Queue Yellow Alarm:** The expression used to trigger a **red alarm** on the number of agents on queue (eg. >20)
- **Agents On Queue Red Alarm:** The expression used to trigger a **red alarm** on the number of agents on queue (eg. >20)
- **Agents Ready Yellow Alarm:** The expression used to trigger a **red alarm** on the number of agents ready (eg. >20)



- **Agents Ready Red Alarm:** The expression used to trigger a **red alarm** on the number of agents ready (eg. >20)
- **Agents On Pause Yellow Alarm:** The expression used to trigger a **red alarm** on the number of agents on pause (eg. >20)
- **Agents On Pause Red Alarm:** The expression used to trigger a **red alarm** on the number of agents on pause (eg. >20)
- **Agents Busy Yellow Alarm:** The expression used to trigger a **red alarm** on the number of busy agents (eg. >20)
- **Agents Busy Red Alarm:** The expression used to trigger a **red alarm** on the number of busy agents (eg. >20)
- **Agents Unknown Yellow Alarm:** The expression used to trigger a **red alarm** on the number of agents in an unknown status (eg. >20)
- **Agents Unknown Red Alarm:** The expression used to trigger a **red alarm** on the number of agents in an unknown status (eg. >20)
- **Waiting Calls Yellow Alarm:** The expression used to trigger a **red alarm** on the number of waiting calls (eg. >20)
- **Waiting Calls Red Alarm:** The expression used to trigger a **red alarm** on the number of waiting calls (eg. >20)
- **Inbound Agents Yellow Alarm:** The expression used to trigger a **red alarm** on the number of inbound agents (eg. >20)
- **Inbound Agents Red Alarm:** The expression used to trigger a **red alarm** on the number of inbound agents (eg. >20)
- **Outbound Agents Yellow Alarm:** The expression used to trigger a **red alarm** on the number of outbound agents (eg. >20)
- **Outbound Agents Red Alarm:** The expression used to trigger a **red alarm** on the number of outbound agents (eg. >20)
- **Queue:** The queue you want to filter the data for

The table will also be responsive to any **Red** or **Yellow alarm** that has been set in the **Edit Queues** page under the following fields:

- **Number of agents waiting**
- **Number of agents paused**
- **Number of agents on call**
- **Number of calls in queue**

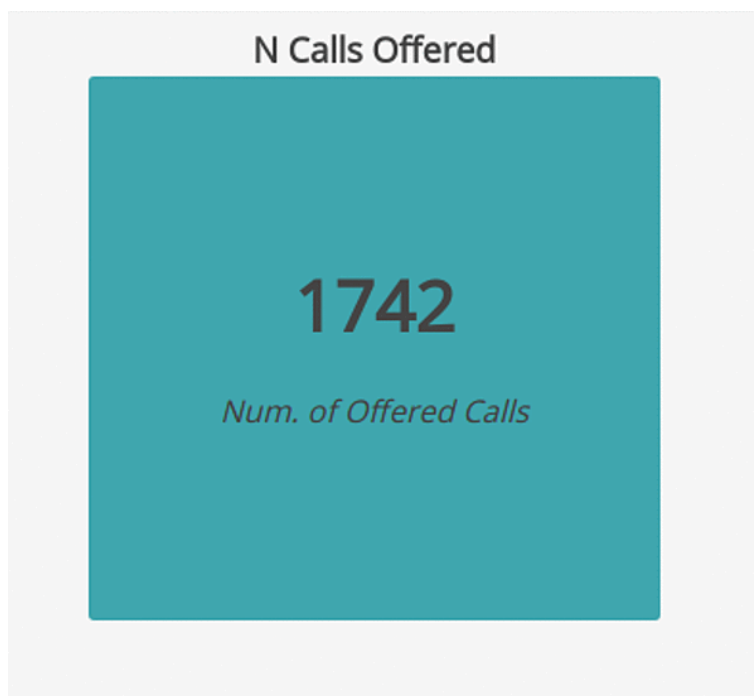
Available since	17.06
Name	Live Queues

Shortcut code	TC03
Parameters	-
See also	

## Items

### IT01 - N. of Calls Offered

This Component displays a text item showing the number of calls offered on the selected queues.



The following properties can be modified:

- **Title:** The title of the component
- **Red alarm:** The expression used to trigger a **red alarm** on the number of offered calls (eg. >20)
- **Yellow alarm:** The expression used to trigger a **yellow alarm** on the number of offered calls (eg. >20)
- **Color:** The color scheme for the background and text.
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	N. of Calls Offered
Shortcut code	IT01
Parameters	-

See also	
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## IT02 - Longest Wait

This Component displays a text item showing the longest wait time among the ongoing calls on the selected queues.



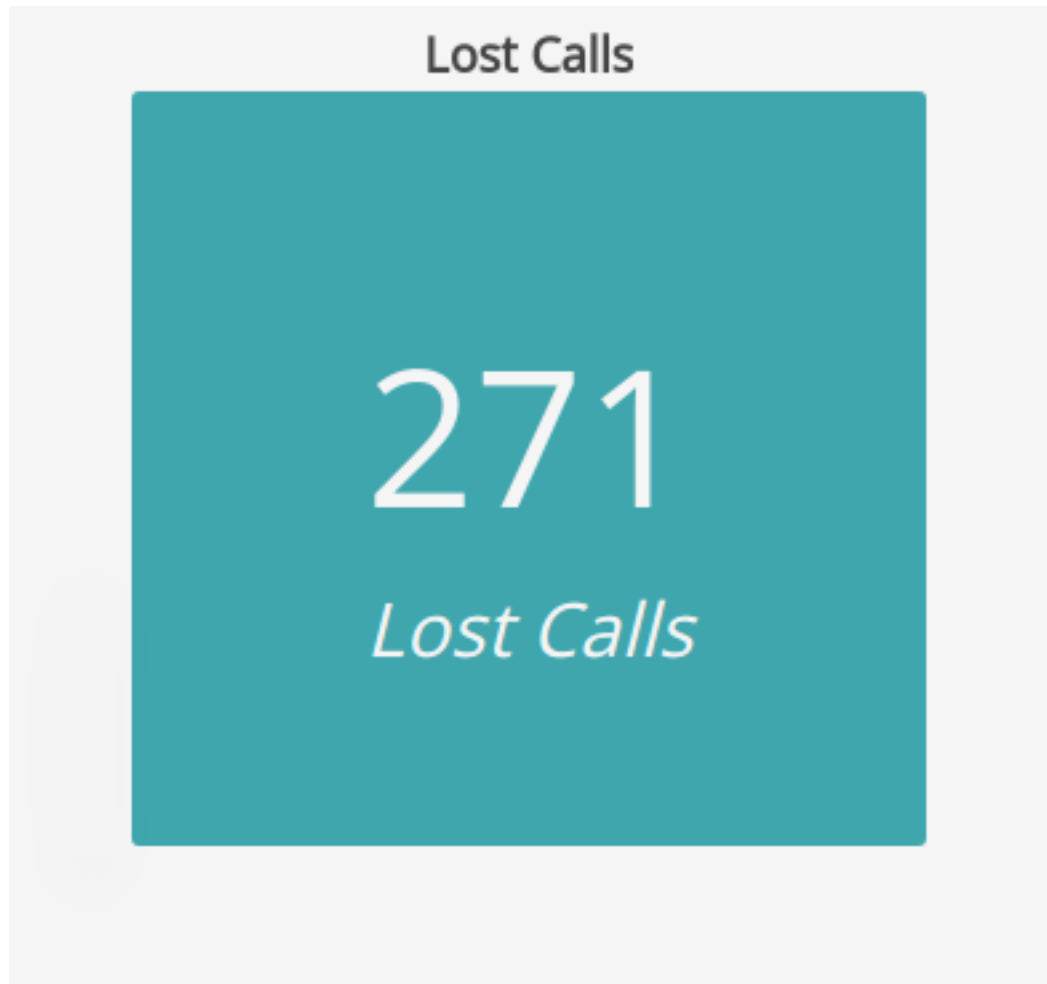
The following properties can be modified:

- **Title:** The title of the component
- **Red alarm:** The expression used to trigger a **red alarm** on the longest wait value (eg. >20)
- **Yellow alarm:** The expression used to trigger a **yellow alarm** on the longest wait value (eg. >20)
- **Color:** The color scheme for the background and text.
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	Longest Wait
Shortcut code	IT02
Parameters	-
See also	

## IT03 - N. of Calls Lost

This Component displays a text item showing the number of calls lost on the selected queues.



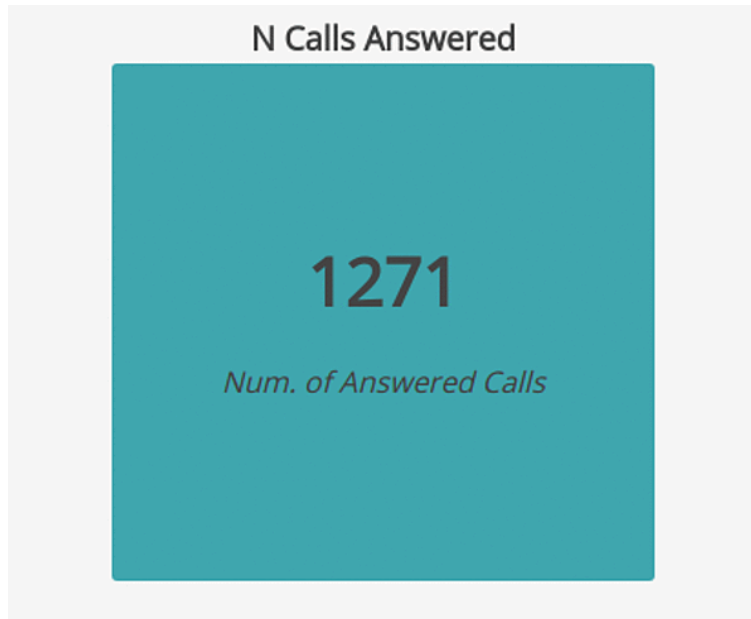
The following properties can be modified:

- **Title:** The title of the component
- **Red alarm:** The expression used to trigger a **red alarm** on the number of answered calls (eg. >20)
- **Yellow alarm:** The expression used to trigger a **yellow alarm** on the number of answered calls (eg. >20)
- **Color:** The color scheme for the background and text.
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	N of Calls Lost
Shortcut code	IT03
Parameters	-
See also	

## IT04 - N. of Calls Answered

This Component displays a text item showing the number of calls answered on the selected queues.



The following properties can be modified:

- **Title:** The title of the component
- **Red alarm:** The expression used to trigger a **red alarm** on the number of answered calls (eg. >20)
- **Yellow alarm:** The expression used to trigger a **yellow alarm** on the number of answered calls (eg. >20)
- **Color:** The color scheme for the background and text.
- **Queue:** The queue you want to filter the data for

Available since	17.06
Name	N of Calls Answered
Shortcut code	IT04
Parameters	-
See also	

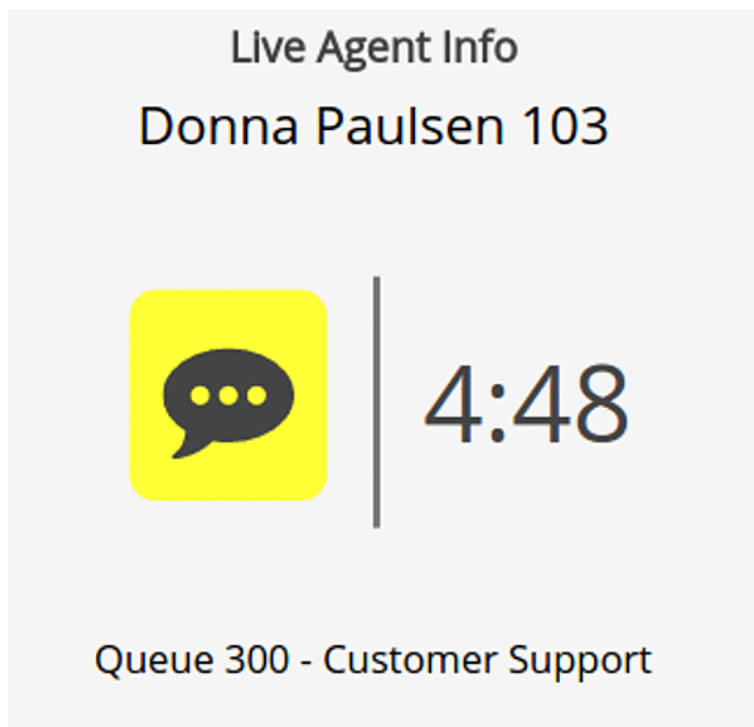
## Composite Items

### MI02 - Live Agent Info

This Component is composed of three sections, each detailing a different information about an agent.

- The **agent's name** is shown in the **uppermost part** of the component.
- The **agent's state** is shown in the **middle part** of the component. To represent the agent's status there are different status badges. To read a description of the status you can hover on the status badge. Together with the status badge you will see a time counter, detailing how long the agent has been in that particular state.

- The **bottom part** of the component will show the **name of the queue** the agent is receiving a call from, if the agent is in a BUSY status. If the agent is on PAUSE, the **pause name** will be shown.



The following properties can be modified:

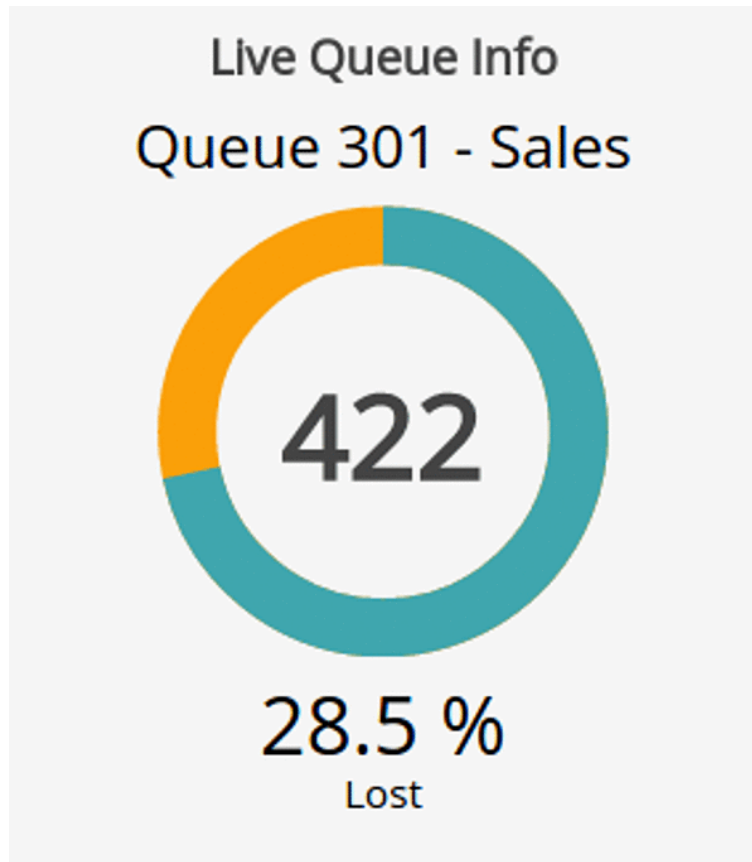
- **Title:** The title of the component
- **Pause Red alarm:** The expression used to trigger a **red alarm** on the pause time of an agent (eg. >20)
- **Pause Yellow alarm:** The expression used to trigger a **yellow alarm** on the pause time of an agent (eg. >20)
- **Call Red alarm:** The expression used to trigger a **red alarm** on the call time of an agent (eg. >20)
- **Call Yellow alarm:** The expression used to trigger a **yellow alarm** on the call time of an agent (eg. >20)
- **Idle Red alarm:** The expression used to trigger a **red alarm** on the idle time of an agent (eg. >20)
- **Idle Yellow alarm:** The expression used to trigger a **yellow alarm** on the idle time of an agent (eg. >20)

Available since	17.06
Name	Live Agent Info
Shortcut code	MI02
Parameters	-
See also	

## MI03 - Live Queue Info

This Component is composed of three sections, each detailing a different information about a queue.

- The **queue's name** is shown in the **uppermost part** of the component.
- The **middle part** of the component is comprised of a circular panel detailing the number of **answered calls** on the selected queue.
- The **bottom part** of the component will show the percentage of **lost calls** on the selected queue.



The following properties can be modified:

- **Title:** The title of the component
- **Red alarm:** The expression used to trigger a **red alarm** on the number of answered calls (eg. >20)
- **Yellow alarm:** The expression used to trigger a **yellow alarm** on the number of answered calls (eg. >20)
- **Color:** The color of the circular panel's stroke.
- **Secondary Color:** The secondary color for the circular panel's stroke.

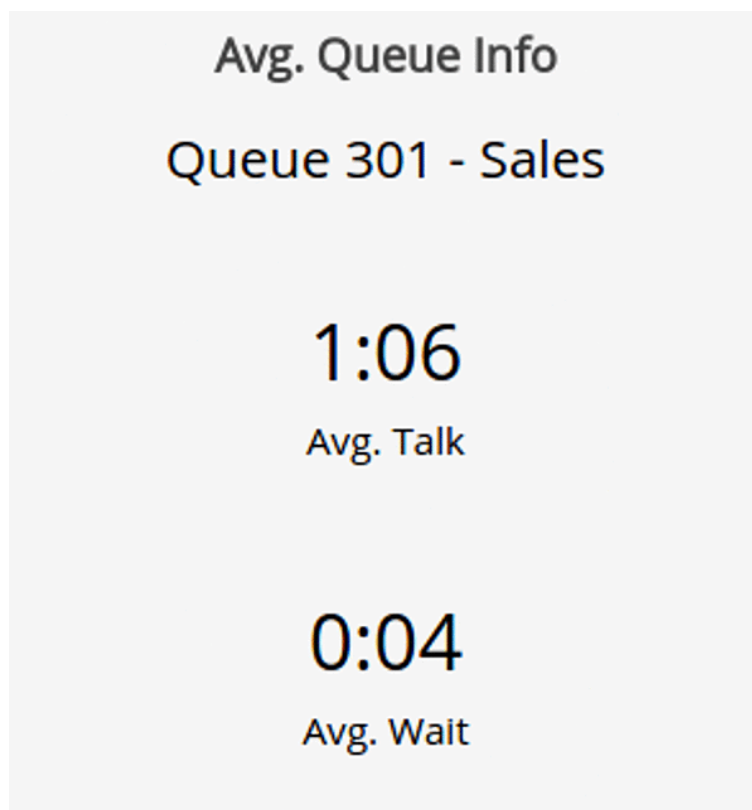
Available since	17.06
Name	Live Queue Info

Shortcut code	MI03
Parameters	-
See also	

## MI04 - Average Queue Info

This Component is composed of three sections, each detailing a different information about a queue.

- The **queue's name** is shown in the **uppermost part** of the component.
- The **middle part** of the component shows the **average talk** value for the selected queue.
- The **bottom part** of the component will show the **average wait time** for a call on the selected queue.



The following properties can be modified:

- **Title:** The title of the component
- **Talk Red alarm:** The expression used to trigger a **red alarm** on the average talk time (eg. >20)
- **Talk Yellow alarm:** The expression used to trigger a **yellow alarm** on the average talk time (eg. >20)
- **Wait Red alarm:** The expression used to trigger a **red alarm** on the average wait time (eg. >20)
- **Wait Yellow alarm:** The expression used to trigger a **yellow alarm** on the average wait time (eg. >20)



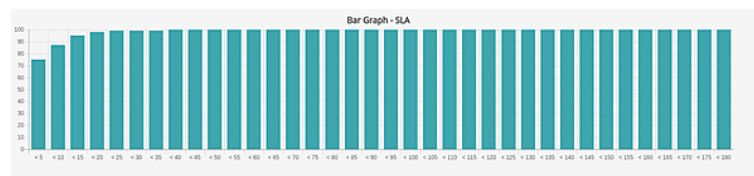
- **Color:** The color of the circular panel's stroke.
- **Secondary Color:** The secondary color for the circular panel's stroke.

Available since	17.06
Name	Average Queue Info
Shortcut code	MI04
Parameters	-
See also	

## Charts

### BC01 - Bar Graph SLA

This Component is a **Bar Chart** detailing the calls fulfilling of the setted SLA answering time requirements.



The following properties can be modified:

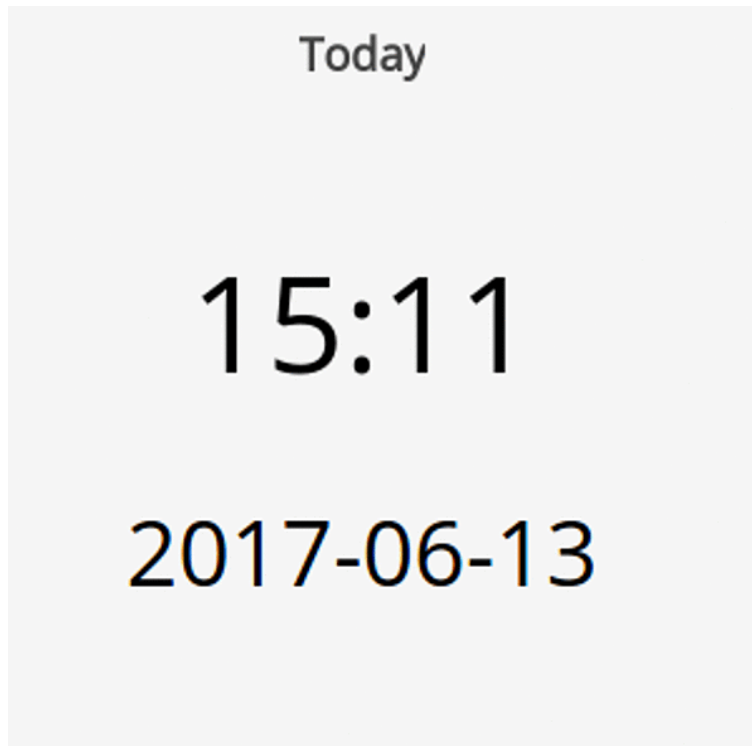
- **Title:** The title of the component
- **Color:** The color of the circular panel's stroke.
- **Yellow Line Limit:** A numerical value between 0-100 that set's the Y coordinates for a yellow limit line.
- **Red Line Limit:** A numerical value between 0-100 that set's the Y coordinates for a red limit line.

Available since	17.06
Name	Bar Graph SLA
Shortcut code	BC01
Parameters	-
See also	

## Other

### CL01 - Clock

This Component is a Clock component showing the current Date and Time.



The following properties can be modified:

- **Title:** The title of the component

Available since	17.06
Name	Clock
Shortcut code	CL01
Parameters	-
See also	

## TX01 - Text

This Component is a Text component showing a string of text. The string of text can be formatted in MD markup format, allowing the user to display images, gifs and links.



Visit [QueueMetrics Homepage](#)



The following properties can be modified:

- **Title:** The title of the component
- **Text:** The text to display

Available since	17.06
Name	Text
Shortcut code	TX01
Parameters	-
See also	

---

# Chapter 9. The real-time agent page

QM lets each agent have his/her own page, where they can see the current flow of calls they have just answered and launch external CRM web apps..

This is quite useful, because the agent can:

- see their own status, i.e. whether they're logged on or they've been disconnected;
- see their last calls, including information like Caller ID, duration and waiting times;
- see from which queue the call is coming, even if they lost the announcement message;
- launch external web apps - like CRM software - that might be automatically linked to the Caller-ID or other information input by the caller
- read the messages broadcasted to him
- start a new conversation calling a phone number
- have a subset of AGAW information
- track information about the current call on QA forms

Also, it is possible to use this page in order to:

- Log the agent on and off to Asterisk and/or a specific queue
- Pause and un-pause the agent, entering the pause activity code if needed
- Set the outcome code for each call

In order to use this feature, a user must be configured as having the same login as the Asterisk agent string (e.g., "Agent/101") and it must hold the key AGENT. Our suggestion is to use the same set of credentials the agent uses to login to the Asterisk system.

## The new Realtime Agents Page

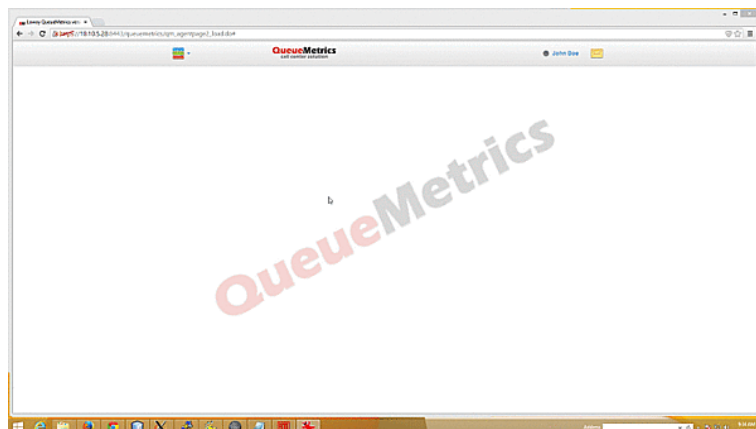
Since release 14.06 QueueMetrics includes a new real-time page based on movable resizable and draggable panels. The new page is available for agents holding the key NEWAGENTPAGE.

Using the new page has several advantages:

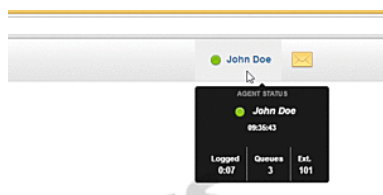
- Draggable and resizable panels for each main activity. This ensures only the options used by the agent are visible on the page.
- Integrated soft-phone, WebRTC enabled (currently working only on Chrome browsers and Asterisk11+WebRTC2sip or with Asterisk12) allows agents to receive and generate calls without an external SIP phone.
- Whole integration with an external CRM and/or other custom web pages.
- Easy login/logout and pause/unpause procedure.

- Per agent layout customization with sessions persistence.
- Keyboard shortcuts help to open/close most of the panels.

The first time an agent enters the real-time page he sees something similar to the below picture:



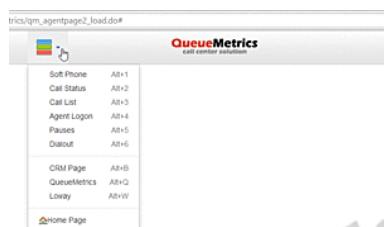
At the top of the page there is a menu bar. On the right side there is an icon representing a letterbox. By clicking on this icon the agent can show/hide a panel containing the most recent received messages. If the panel is not visible and the agent receives a new message, the icon starts blinking. The message panel could be accessed through Alt+9 keyboard shortcut



On the left side of the current agent name there's a tooltip, appearing via mouseover, that contains the agent session details. The agent status contains a bullet that defines the status of the agent with different colors, as per below scheme:

- black: the agent status is unknown. This could happen if the last agent activity is outside of the configurable analysis timer used by QueueMetrics to retrieve agent information.
- green: the agent is logged in on at least one queue
- purple: the agent is logged out from all queues
- red: the agent is currently paused

At the right side of the menu bar there's the dropdown menu shown in the below picture:



The dropdown menu allows the agent to access all the different panels:

- SoftPhone
- Call Status
- Call List
- Agent Logon
- Pauses
- Dialout

All the panels can be accessed by clicking on the associated menu row or through the keyboard shortcut combination key as specified in the menu (i.e. Alt+1 for softphone panel). If properly configured, the dropdown menu allows to select a web page that will be shown as background. This is the case, for example, of an external CRM page or Company intranet pages.

## CRM Integration

Each time the call history changes, and if there is an URL associated to the call shown on top of the list, a new window will automatically be opened pointing to the specifig URL. This feature could be disabled modifying the value associated to the configuration key *realtime.agent\_autoopenurl*.

URLs are passed to the Queue() command in Asterisk, or - if missing - they can defined in the QueueMetrics queue configuration as a default. If not present, the URL defined in the *default.crmapp* property will be used (make sure the *default.crmlabel* property is also defined). The URL can include a set of placeholders that are expanded with the details of the call being handled, as in the following table.

Placeholder	Meaning
[A]	The agent's numeric code, e.g. <i>101</i> for <i>Agent/101</i>
[X]	The agent's login extension
[U]	The call's Asterisk UniqueId
[S]	The Server ID (for clusters)
[Q]	The name of the queue
[T]	The timestamp of the call
[C]	The caller-id, if present
[D]	The DNIS, if present
[I]	The IVR Path, if present
[O]	The outcome code, if present
[P]	The position in the queue, if present
[M]	The attempts, if present
[TAG]	The call tag, if present
[F:x]	If the call has a feature called <i>x</i> , the text of feature <i>x</i> ; otherwise blank.
[FX:x]	If the call has a feature called <i>x</i> , it is set to <i>1</i> ; otherwise <i>0</i>

Placeholder	Meaning
[V:x]	If the call has a variable called <i>x</i> , the value of <i>x</i> ; otherwise blank.

## The integrated soft phone panel

Keyboard shortcut: Alt+1. The new real-time agents page integrates a softphone based on the sipml5 project. This softphone is proved running properly with Chrome browser and Asterisk11+webrtc2sip or Asterisk12. The softphone automatically registers to the SIP/WebRTC server with the SIP credentials specified in the user administration page and a green bullet is shown in the softphone panel. The agent can start calls typing the number to be dialed then clicking on the "Start Call" button.



Each time the agent receives a call from the queue, the softphone pops up and the "Start Call" button blinks red. Clicking on the "Start Call" the agent could answer to the call. During the call touch tones could be sent by clicking on the dial pad provided in the panel. Since QueueMetrics 15.02 the softphone shows the callerId SIP username (usually this information matches with the incoming caller ID).

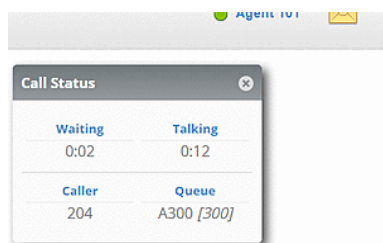
For more information on how to configure the softphone, please refer to the section called "Configuring the new Real-time Agents Page" [249] and the section called "Configuring agents" [218]



The softphone uses the local PC microphone. Chrome security policies allow permanent use of the local microphone only for sites secured with HTTPS. Please make sure your QueueMetrics instance is running over secured HTTP and relax all security policies for the QueueMetrics URLs. This could be done by clicking on the shield located in the Chrome URL bar and selecting "allow not secure scripts for this site". Be sure to allow microphone usage for the QueueMetrics URL at the very first call.

## The call status panel

Keyboard shortcut: Alt+2. This panel reports a summary of current ongoing call.



## The call list panel

Keyboard shortcut: Alt+3. It reports the list of most recent calls. Each row is associated with a call. The agent could find, for each call, a set of clickable icons useful to open the URL associated to the call (if any) or to open the outcome or the QA form panel (see below).

...	Start of call	Waiting	Talking	Caller	Queue	URL	Transfer to	Outcome	Tag	...	...
	14:45:56	0:04	0:39	209	A300 [300]						
	14:21:44	0:10	0:35	200	A300 [300]				TV AD copy 3		
	14:21:04	0:04	0:22	202	A300 [300]			Sale Sales Target - Householder	TV AD copy 2		
	11:52:46	0:03	37:40	204	A300 [300]			Sales Target Householder <i>Interested only on the basic solution</i>			
	15:32:38	0:06	1:00	204	A300 [300]						
	14:50:42	0:06	23:39	204	A300 [300]						

Calls are chronologically ordered and the first row is yellow marked for live calls. The icon shown in the first column reflects the queue direction (inbound or outbound calls). Since QueueMetrics 15.02 the list reports also outbound calls that are not answered by the calleed (like the second call in the example below where the talking period is null). Since QueueMetrics 15.04 agents can schedule a redial for a specific call through WombatDialer integration. To do this, a recall scheduler panel can be open by clicking on the icons at the very right side of each call reported in the list. Since QueueMetrics 15.09 the list reports call tags and feature codes. When flying over the outcome column, a popup with optional notes associated to feature codes is shown. Since QueueMetrics 18.04 the list shows a column containing a list of all the variables that are attached to the call. To view the whole list of variables the user must hover above the text in the table cell.

## Click & Copy to Clipboard

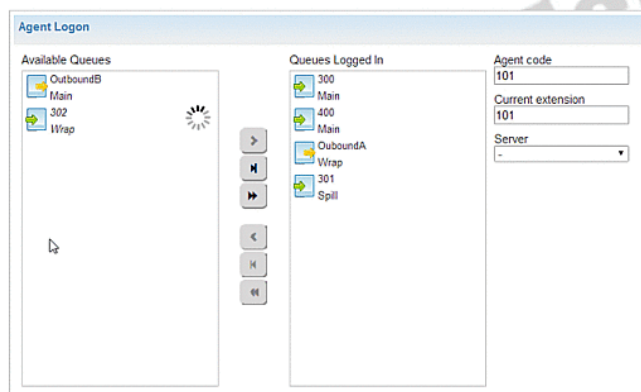
Since QueueMetrics 16.09 the agent page's call list supports clicking and copying caller IDs directly to the agent's clipboard. In order to do so, the agent must click on the caller field in his call list, a message should appear confirming the number has been copied to his clipboard.

...	Start of call	Waiting	Talking	Caller	Queue	URL	Transfer to	Outcome	Tag
	11:00:15	0:00	0:00	201	300 [300]				

## Agent logon panel

Keyboard shortcut: Alt+4. The Agent logon panel is used to handle the login and logout process. The panel reports two lists of queues. On the left side there is the list of queues where the agent could login; on the right side there is the list of queues where the agent is already logged in. To login/logout to a queue or a set of queues, the agent must select the queue(s) from the correct list then click on the proper button located in between the lists. Based on the direction defined by a set of arrows on each button, the login (from left to right) or logout (from right to left) process is performed. The agent can login/logout on all the assigned queueues or on all the available queues with a single click through the arrow/line or double arrows labeled buttons





In order to login/logout, the agent must compile the Agent Code and the Current Extension fields (available in hotdesking mode). If not properly specified, the fields will be marked red and no login/logout processes are triggered. The Agent cannot change their Agent Code and Current Extension fields if already logged on a queue (this feature may be disabled setting a specific configuration key, see Appendix C, *System preferences* [383] for realtime configuration parameters).

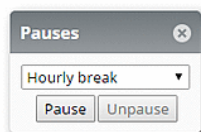
The Agent logon panel lets the agent able to switch between multiple servers (only for cluster mode).



Since QueueMetrics 16.09, if the system property `realtime.assertExtensionNotInUse` is set to "True", QueueMetrics will check if the selected extension is being already used on every queue the agent has visibility for, as opposed to checking only the queues where the agent was a member (previous versions).

## Pauses panel

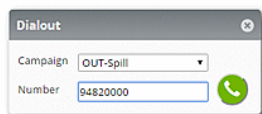
Keyboard shortcut: Alt+5. The Agent can pause and unpause itself by selecting the appropriate pause code from the dropdown list then clicking to the Pause button. The Agent can terminate the pause by clicking on the Unpause button.



A pause can be associated to an undefined code only if specified by a configuration key set, otherwise the agent must always specify an appropriate pause code before clicking the Pause button.

## Dialout panel

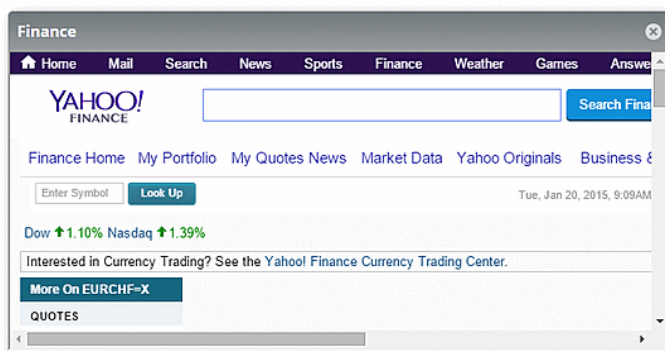
Keyboard shortcut: Alt+6. The dialout panel is used to start a call through an outbound queue. The dropdown in the panel reports only the outbound queues where the agent is already logged in.



An agent can start a call by typing the number in the text field, then selecting the appropriate outbound queue from the dropdown and clicking on the "Dial" button. If the softphone panel is enabled it will pop up with the "Start Call" button blinking red. The Agent must click on this button in order to start the call.

## Custom Web panel

Keyboard shortcut: Alt+7. The custom web panel is used to embed a user defined external website or custom intranet pages. The panel is refreshed each time it's selected and/or moved. Target for this panel is to allow integration with custom implemented indicators and/or messages. For complex external pages, or for pages where spurious refreshes should be avoided, please use the custom background (see below) instead of this panel.



The panel is optionally enabled by modifying the configuration keys `realtime.agent_webpanel1_url` and `realtime.agent_webpanel1_label` located in the `configuration.properties` file.



For technical reasons it is not possible to handle keyboard shortcuts if the current keyboard and mouse focus is associated with this panel. It's recommended to click on a different panel or the menu bar in order to take the focus before using again keyboard shortcuts.



When QueueMetrics is operating by an HTTPS secured server, be sure to provide the panel contents too over HTTPS, or instruct the Agent browsers to allow mixing unsecured HTTP contents on secured pages.

## QA Form panel

QA grading is available through the QA form panel by clicking on the proper icon associated to the call list for a specific call. This panel is the exact copy of the "old" QA form panel so the Agent can still perform every action available through the old form.

**QueueMetrics**  
call center solution

John Doe

### QA Form

Level	Range	Items
<b>Overall Performance</b>		
Engagement	0	0.0
Resolution	0	0.0
Business needs	0	0.0
Total score:	0/1500	
Avg:	0.0	

**Input form**  
Form: Quality Assurance  
Status: -  
**Call details**  
Start time: April 10 2014, 09:39  
Queue: 301  
Agent: John Doe (101)  
Agent Group: -  
Caller: 202  
AstCId: 1397115543.65  
**Audio recordings**

Close Notes Print Timer 0:00

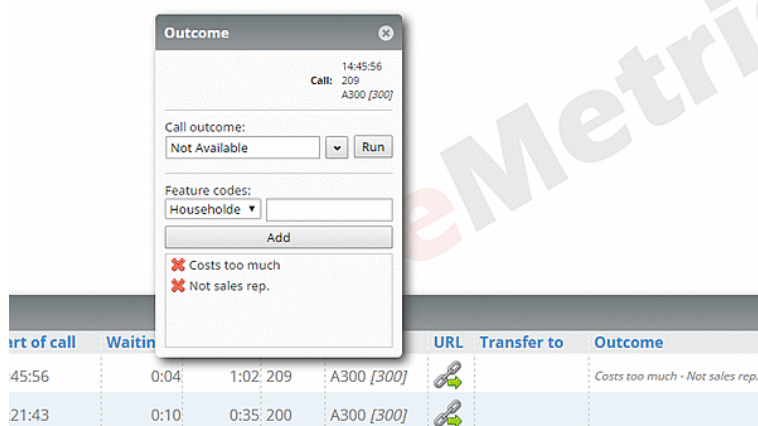
Code	Description	Status	N/A	Value
<b>Engagement</b>				
SCG	How positive clear and eager was the use of the Corporate greeting?	?		
COU	How well did the rep display courtesy?	?		
ENE	Rate rep's energy level throughout the call	?		
TON	How well did the rep vary the tone and speed of speech?	?		
CLE	How clear and concise was the rep's vocalization and pronunciation?	?		
HOL	Did the rep use the correct hold procedure?	?		
DEE	Did the rep avoid dead air?	?		
LIS	Did the rep display active listening skills?	?		
CLO	How positive and appropriate was the call closure phase?	?		
<b>Resolution</b>				
ASS	Was assurance given for client's assistance?	?		
REL	How accurate and relevant was the information provided?	?		
HEL	Was additional help offered with enthusiasm?	?		
PRO	Was the problem resolved on first contact?	?		
TIM	Did the rep manage time effectively?	?		



QA grading is enabled only for agents holding the security key QA\_TRACK

## Outcome code panel

Each call can be flagged by an outcome code and, if the enabled, by a set of feature codes. This could be done through the outcome panel reachable by clicking on the related icon in the call list panel. To assign an outcome code, the Agent should select it from the dropdown, then click on the *Run* pushbutton. If feature codes are enabled and available, they are shown in the lower part of the dialog. Available feature codes, associated with current assigned outcome, are shown in the dropdown. To add a feature code, a user should select it from the dropdown list, add an optional note on the textbox placed on the very right side, then press *Add* button. As soon as the feature code has been added, it will be shown in the list on the lowest part of the dialog. Each feature code has its own red cross mark that can be used to remove the specific feature code by clicking on it. Multiple feature codes can be added to a single call. If same feature code is added several time to a specific call, only the last version will be shown in the reports.



The feature code sub-panel is not shown if not enabled by system configuration. For more documentation, please see *Asterisk interactions* on Appendix IV Appendix C, *System preferences* [383]



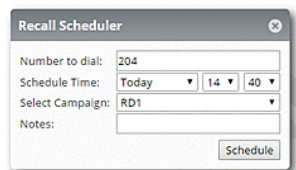
The outcome panel is enabled only for agents holding the security key USR\_OUTCOME



The outcome panel, if enabled, is available only for a certain amount of time. The default is 1800s (30 minutes) after the call is ended, but it can be edited by changing the value of default.callStatusTimeout in the configuration.properties file or in the "Edit system parameters" page in QueueMetrics.

## Recall Scheduler

If WombatDialer is available and the queue is properly configured, agents can ask for a redial on a specific call by mean of this dialog. Scheduling a recall is done by selecting the number to be dialed (this field is already populated when opening the dialog, but can be changed by the agent if needed), the scheduling time and the WombatDialer campaign. An optional note can also be added; notes will be sent to the WombatDialer together with the rescheduling information.



To setup the Recall Scheduler, QueueMetrics needs some information regarding the WombatDialer instance. They can be set in the system configuration as explained in Outbound dialer configuration the section called "Outbound dialer" [275] .

When these parameters are set, in the Edit Queue section, an administrator can specify the name of the WombatDialer campaigns that will take care of the scheduled recalls, under the "Recall Campaigns" field (multiple campaigns must be separated by the "|" pipe symbol).

Attention levels	Yellow alarm	Red alarm
Number of calls in queue:	<input type="text"/>	<input type="text"/>
Number of agents on call:	<input type="text"/>	<input type="text"/>
Number of agents waiting:	<input type="text"/>	<input type="text"/>
Number of agents paused:	<input type="text"/>	<input type="text"/>
Call wait duration:	<input type="text"/>	<input type="text"/>
Call talking duration:	<input type="text"/>	<input type="text"/>
Service Level Agreement:	<input type="text" value="60"/>	

#### WombatDialer settings




Recall Campaigns: <small>Separate with ' '</small>	<input type="text" value="Recall Campaign"/>
Recall Max Days:	<input type="text" value="365"/>

#### AGAW settings

Will AGAW be run for this queue?	<input type="text" value="Yes"/> ▼	Items defined: 4
AGAW enabled for this queue:	<input type="text" value="Yes"/> ▼	
AGAW lookback period (mins):	<input type="text" value="720"/>	

Created by:	<input type="text" value="demoadmin, 18/06/2007, 22:30"/>
Last update:	<input type="text" value="demoadmin, 18/10/2016, 14:37"/>

If everything has been set up correctly the agent will notice, on the call list panel, an alarm clock icon that, if clicked, will open the Recall Scheduler Panel.

Call List									
...	Start of call	Waiting	Talking	Caller	Queue	URL	Transfer to	Outcome	Tag ... ..
	14:39:48	0:02	0:14	201	Sample Queue 300 [300]				

## Custom Backgrounds

The background of the working area in new real-time page can be customized with up to three different URLs pointing to external websites. Each background can be selected by clicking on the left dropdown menu and/or through the keyboard shortcuts ALT+B (for the first background) or ALT+Q or ALT+W (for the second and the third background). The first background is something different from the other two backgrounds because it's aimed to be used by an external CRM subsystem. If properly configured, each time an Agent answers to a call, the first background is automatically selected reflecting the information associated to the new call. This is useful for retrieving information about the caller. The Agent can promote the first background to be placed on top of the panels through the keyboard shortcut ALT+0. Reverting to the normal operation is accomplished by clicking on the menu bar in the area located between the left menu icon and the QueueMetrics logo.



For technical reasons it is not possible to handle keyboard shortcuts if the current keyboard and mouse focus is not associated with a panel but with the background. It's recommended to click on a panel or the menu bar in order to take the focus before using keyboard shortcuts.



When QueueMetrics is operating by an HTTPS secured server, be sure to provide the background contents too over HTTPS, or instruct the Agent browsers to allow mixing unsecured HTTP contents on secured pages.



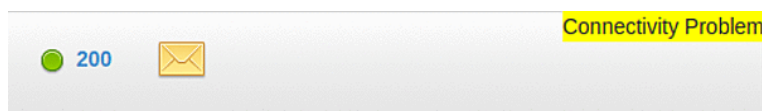
Since many Web Pages don't allow framing for security reasons, QueueMetrics can be set up so that it will load your CRM in another page or tab. To enable this feature set the `agent.openUrlInPopup` property to "true" in the `configuration.properties` file or in the "Edit System Parameters" page in QueueMetrics.

## Connectivity and Session Problems Warnings

Since QueueMetrics 16.09 the Agent Page will notify the agent if any Connectivity or Session issue arises.

The way this is done is by showing a warning message in the top-right of the screen, regarding the nature of the error.

Yellow Warning (Connectivity Problem):





If this message is displayed Icon may be experiencing connectivity problems with the QueueMetrics Server (e.g. lost internet connection). During this time Icon will try to restore the connectivity by polling the main server, If successful the warning will disappear on it's own.

Red Warning (Session Problem):



If this message is displayed the agent session has expired for some reason (e.g. a server restart). If this message is displayed Icon will let the agent finish any current calls but it won't allow him to perform any other action without logging in again first. This warning will not disappear on it's own, the only way to restore functionality in case of a Session error is by relogging into the server. Clicking on the warning Icon will prompt the agent to the login screen.

## Default Extension

Since QueueMetrics 16.09 the Agent Page keeps track of the last extension the agent was logged in with, regardless of any default extension (Current Terminal in the "Edit Agents" page) setting that has been specified. When an agent logs into Icon, the Queue Login Panel presents the agent with the last extension he used on a queue.

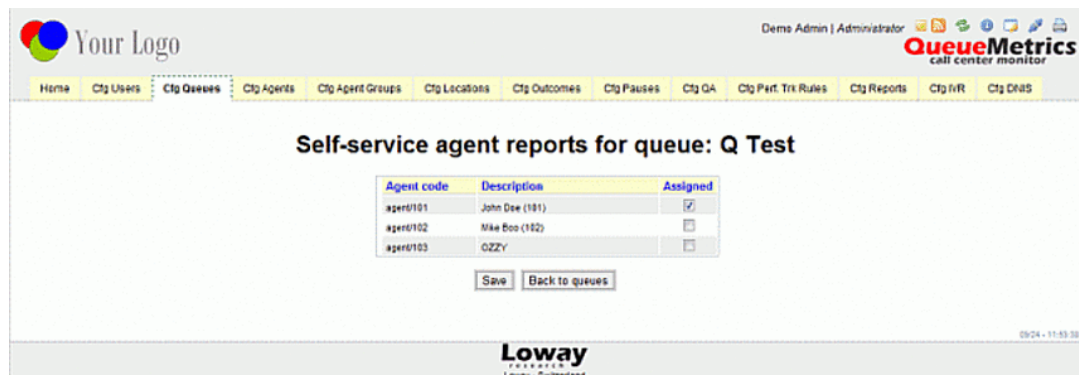
## Self-service agent reporting

It is now possible to allow agents to run specific reports directly from the agent page. These new features are available as of QueueMetrics version 12.10 and are already enabled for the included sample agents. In order to configure other agents having the same functionalities available, the following steps need to be implemented:

- Assign a queue (or a set of queues) to the agent
  - Assign a new report to the agent
  - Assign the SSAREPORT key to the agent
1. To assign a queue to an agent, select *Edit queues* from the Home page, select the *Assign reports to agents* icon, select the check-box next to the chosen agent. Save to confirm.
  2. To assign a report to the agent, select *Edit reports* from the Home page, select the *Assign reports to agents* icon, select the check-box next to the chosen agent. Save to confirm.
  3. To assign the SSAREPORT key to the agent, select *Edit users*, select the *pencil* icon, add the key to the *User keys* field. Alternatively, it is possible to assign the SSAREPORT key to all agents by editing the agents class by selecting *Edit users* from the Home page, select the *Show classes* button, select the *pencil* icon of the *Agents* class and add the SSAREPORT key in the *Keys* field.

This new block of reporting functions is made visible for agents by enabling the SSAREPORT key within the user configuration/administration page (*Cfg Users* tab), which can be reached by selecting the *Edit users* link from the main QueueMetrics administrator Home page. An agent can run a report based only on the queues and reports assigned to him/her. To assign queues to an agent you have to select the *Edit queues* link from the QueueMetrics administrator Home page and select the *Assign reports to*

*agents* icon next to the queue you want to assign. This will take you to the page where you can simply assign the queue to the chosen agents.



When assigning reports, the same criteria applies as assigning queues, where we access the report configuration page from the *Edit reports* link on the administrator Home page. Selecting the *Assign reports to agents* icon takes to the page where you assign the selected report to each agent.

An administrator can also assign the maximum amount of time that an agent can have available, when viewing historical reports from the agent web page. The key *default.ssarMaxReportPeriod* is defined within the *configuration.properties* file. If this key is not present within this file, then the default time is 15 (days).



The screenshot shows the QueueMetrics call center monitor interface. At the top, there's a header with a logo placeholder 'Your Logo', the user 'John Doe | Individual agents', and several social media icons. Below the header is a navigation bar with tabs: 'Home', 'Stats', 'Calls', and 'All'. The main content area is titled 'Quick reports » Statistics'. It features a 'Report Details' section with the following information:

Atomic queue(s) considered:	Inbound [300]
Filtered for agent:	John Doe (101)
Period start date:	June 26 2012, 15:19
Period end date:	September 24 2012, 15:19
Total calls processed:	0
	% ans / % unans
Multi-stint calls joined together	0

Below the report details is a section titled 'All calls' with a table showing call statistics:

<b>All calls:</b>	
N. calls answered by operators:	0
Average call length:	0.0 s.
Min call length:	0:00
Max call length:	0:00
Total call length:	0.0 H
Average call waiting time:	0.0 s.
Min waiting time:	0:00
Max waiting time:	0:00

When an agent runs a report, the agent does not have a *Search* button enabled, so s/he is not able to access any kind of Custom Reports.

## Gathering call information through agent-side QA forms

QA forms - described in detail in Chapter 14, *Advanced tracking of agent and grader performance* [305] - can be used on the agent's page in order to gather generic information about the current call. They may act as a kind of embedded database of calls that is accessible for reporting within QM itself.

In order to turn on the filling of QA forms by agents, you need to:

- Make sure your agents hold the QA\_TRACK security key. You might consider adding it to the Agents class.

- Create special QA forms to be used by agents. You can use security keys to make sure that your agents have access only to the forms they are supposed to see, versus forms used for "proper" QA tracking by QA specialists
- Create form items made of multiple-selection or "Yes/No" questions
- In agent's forms, all or most questions will be non-scoring, as you are gathering information and not evaluating an agent's behavior
- QA forms can have multiple sections that turn on or off based on the answers to other questions. Questions can also be made optional.
- You can associate free-text comments to QA items by clicking on the pencil icon on the right-hand side of the question

---

# Chapter 10. QueueMetrics Users

## Default users

The following users come pre-configured in the default database.

**Table 10.1. Default QueueMetrics Users**

Login	Password	Enabled by default?	Explanation
demoadmin	demo	Yes	The sample admin user
demouser	demo	Yes	The sample CC manager
demovisitor	demo	No	A sample visitor
demosupervisor	demo	No	A sample supervisor
robot	robot	No	A sample robot
webqloader	qloader	No	Access point for wqloaderd
Agent/101	999	Ye	A sample agent
Agent/102	998	Yes	Another sample agent

Make sure you change their default passwords before letting users access QM!

Please note that some users are present but NOT ENABLED by default with the default database schema supplied with QM. You need to enable them manually if you need them.

## Using Supervisors

A supervisor, for what QueueMetrics is concerned, is a user holding the key SUPERVISOR. One such user has the ability to be assigned to the known agents as their supervisor and to run a report with the additional criterion of filtering the results for all agents he is the supervisor of. This will work in much the same way as the current Location reporting.

On the main page and on the Custom report analysis, if a user is a Supervisor, he will have an additional option: "Run the analysis for my competency". This option will at the moment be mutually incompatible with Location filtering (if both are chosen, an error will be shown). The analysis will proceed as usual.

In the real-time page there will be a new toggle button "Competency" to filter agents by the competency. Even in this case the filter may not be used together with Location filtering.



For security reasons, this user must be manually enabled in the standard database.

# Automating statistics download: the ROBOT profile

It is sometimes desirable to obtain a snapshot of the reports QueueMetrics produces at a given moment in time for future access or for uniformity of comparison. You may, for example, want to store on disk a snapshot of the current daily activity every day at 19.00, for future reference.

The ROBOT profile was thought for this purpose: automating access to the wealth of statistics that QueueMetrics is able to provide.

To set this up, first make sure that you have at least one user holding the key ROBOT that is used for remote access. A sample user called *robot* password *robot* is provided in the sample database that ships with QueueMetrics.



For security reasons, this user is present in the default database but it must be manually enabled.

Point your browser to the QueueMetrics server with a URL like the following:

```
http://server/queuemetrics/qm_rep.do?
user=robot&pass=robot&queues=q1&period=t0
```

will download today's report - the full version - for queue "q1", while the following one

```
http://server/queuemetrics/qm_rt.do?user=robot&pass=robot&queues=q1 | q2
```

or, for the ajax based page version

```
http://server/queuemetrics/qm_rt_ajax.do?
user=robot&pass=robot&queues=q1 | q2
```

will download the realtime page for queues "q1" and "q2", and

```
http://server/queuemetrics/qm_wab.do?user=robot&pass=robot&queues=q1 |
q2
```

or, for the ajax based page version

```
http://server/queuemetrics/qm_wab_ajax.do?
user=robot&pass=robot&queues=q1 | q2
```

will download the realtime wallboard for queues "q1" and "q2".

It is then easy to automate this behaviour using an automated downloader, like for example the *wget* command in the Unix environment.

The following web parameters are accepted by the *qm\_rt* (realtime page) and *qm\_rep* (report page) generators:

Parameter	Notes	WAB	RT	REP
user	The user name. Mandatory.	X	X	X
pass	The user password. Mandatory.	X	X	X

Parameter	Notes	WAB	RT	REP
logfile	The log file to use ( with full path). If not defined, the default one will be used.	X	X	X
queues	One or more queues to be analyzed. Use the pipe symbol to separate multiple entries. Use the Asterisk name for each queue.	X	X	X
reportname	The wanted dynamic report name. If this parameter is not specified, the default report will be shown. If the report name contains special characters, they should be properly encoded (for example with %20 for spaces)			X
period	The time period to use. Composed by a single letter plus the number of days to report about. t0: today - t1: yesterday d1: last 24hrs - d2: last 48 hrs			X
filter	A single agent's name, like Agent/123, that will be used as a			X

Parameter	Notes	WAB	RT	REP
	filter for the analysis.			
t_from	Initial time, expressed in the format yyyy-MM-dd.HH:mm:ss, e.g. 2006-01-03.12:00:00.			X
t_to	Ending time, expressed in the format yyyy-MM-dd.HH:mm:ss, e.g. 2006-02-04.03:00:00.			X
reloads	Always set to 1 if the session is to generate a reloadable page. Do not use for general report extraction.	X	X	

If you run a report, a time interval must be specified, i.e. you have to supply either a "period" or a "t\_from"/"t\_to" couple.

In addition to the key ROBOT, your user will need the key QUEUE\_AN for reporting and REALTIME for realtime monitoring.

## Generate PDF and XLS reports and send them by e-mail

By using the ROBOT profile is possible to generate PDF and XLS reports and send them to a list of e-mail recipients. The report parameters, like queue, period, report set and the list of recipients should have been already defined in the Report ExportConfiguration pages the section called "Report ExportConfiguration pages" [243].



To generate the PDF and XLS reports the ROBOT user should hold the USR\_REPORTS\_EXPORT key and all optional security keys assigned to each export job.

Reports are generated by downloading the following URL (you will probably use wget or a similar tool, and will script this as a cron job so that it will be run daily or weekly):

```
http://server:8080/queuemetrics/qm_export_stats_run.do?
username=robot&password=robot&exportId=X
```

where the exportId X parameter is the job number identifier that could be found on the Report ExportConfiguration pages the section called "Report ExportConfiguration pages" [243]. The server generates the required report and send it to a list of recipients. It also returns a copy of the generated

document. If you don't want QueueMetrics to send e-mails but just need to retrieve the file, avoid configuring any e-mail recipients.

If there is an error during the document generation or e-mail sending phase, then an error message is returned instead.



Please note that the some configuration settings are required for QueueMetrics when sending e-mails. Further details could be found on the System Preferences Appendix C, *System preferences* [383]. We suggest turning on SMTP debug when sending your first e-mails to understand what is going on.



As QueueMetrics has no way to know which language you want to use for the report, and the character set to use in it, make sure that you set the parameters *default.language* and *default.country* to the correct values.

## Setting up a self-service wallboard



The information here is obsolete - see Running a wallboard in kiosk mode the section called "Running in kiosk mode" [163] instead.

By using the ROBOT profile in conjunction with `reloads=1`, it is quite simple to set-up an unattended wallboard for QueueMetrics.

First of all set up a low-cost Linux box to boot in its graphical environment, automatically launch a web browser and go to the following URL:

```
http://server/queuemetrics/qm_wab.do?  
user=robot&pass=xxx&reloads=1&queues=q1|q2
```

or, for the ajax based page version

```
http://server/queuemetrics/qm_wab_ajax.do?  
user=robot&pass=xxx&reloads=1&queues=q1|q2
```

This command will show an auto-reloading wallboard showing the real-time status of queues Q1 and Q2.

If you connect the new Linux box to a large screen or a video beamer and set it in your call-center where it will be visible by your agents, you have just set-up a wallboard at a very low cost using commodity hardware and requiring no human intervention but turning it on in the morning and turning it off in the afternoon.

You can do the same with the real-time screen by using the *qm\_rt.do* or the *qm\_rt\_ajax.do* commands to create a very simple real-time monitor running all day long for your supervisors.



Please note that there is a difference between results produced by the XML rpc realtime calls and the realtime statistics produced through the QueueMetrics GUI when the key *realtime.members\_only* is equal to true. The difference is related to the agents list shown. Being the list of queues, in the XML-RPC call, specified by a list of names instead of a list of queue unique identifiers, is not possible to correctly identify elementary queues from macro queues having the same name. In this situation the agent list will always be calculated as sum of all agents associated to all elementary queues composing the macro queue, even if the macro queue has directly assigned agent.

## Chapter 11. Editing QueueMetrics settings

System configuration must be done by the system administrator. Most configuration may be done straight from QM itself, while system wide preferences must be set editing a text file on the installation server.

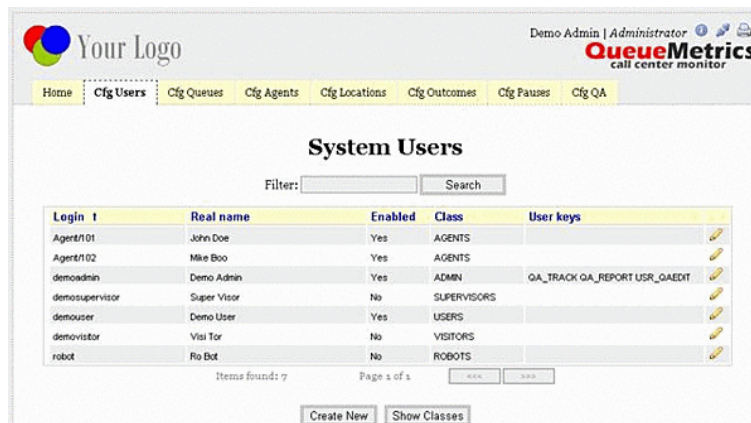
To log on as an administrator, you can use the supplied account **demoadmin**, password **demo**, that will bring you to a home page like the following one:



## Configuring users

Users and classes can be added, modified and deleted right from QM.

A list of users is presented and you can filter it by class or user name.



For each user, the login and full name are shown, together with the current class and any additional user keys. A user must be enabled in order to log on, so if you want to prevent somebody from logging on without deleting its user information, you can simply disable it. *A number of default users are shipped with Enable: No in order to prevent unauthorized access.*

The list of users is paged and you can use the top box named "Filter" in order to search for a specific user or a set of users that match the entered substring. You can also click on the column name to toggle ascending versus descending sort order.

The "Create new" button lets you add new users while the "Show classes" button leads to the class editor.



**QueueMetrics** **YourLogo** Demo Admin | Administrator

Home **Users** Queues Agents Locations Outcomes Features Call Tags Pauses QA PrfTrk Rules Reports Export

### User Detail

User Id: 5

Login: demoadmin

Password: demo

Real name: Demo Admin

Enabled: Yes

E-mail: demo@.....

Masterkey: No

Class: ADMIN

User keys: USR\_SKILLS QA\_PERF\_RULES USR\_IVR USR\_DNIS  
USR\_REPORTS USR\_REPORTS\_EXPORT\_EDIT EDIT\_CFG  
SQUERY\_ADD SQUERY\_FORALL RT\_ADDMEMBER  
RT\_REMOVEMEMBER RT\_PAUSEAGENT RT\_UNPAUSEAGENT  
RT\_SEMTEXTAGENT RT\_HANGUPCALL RT\_TRANSFERCALL

Number of logons: 19193

Last logon: 2015-09-15 09:38:40.0

Comment:

Token:

Creation: -, 29/10/2004, 10:09

Update: demoadmin, 11/09/2015, 9:46

Save Back New Clone Delete

09/15 - 11:59:04

## Loway

When you add or edit a user, you are presented with a list of fields to enter:

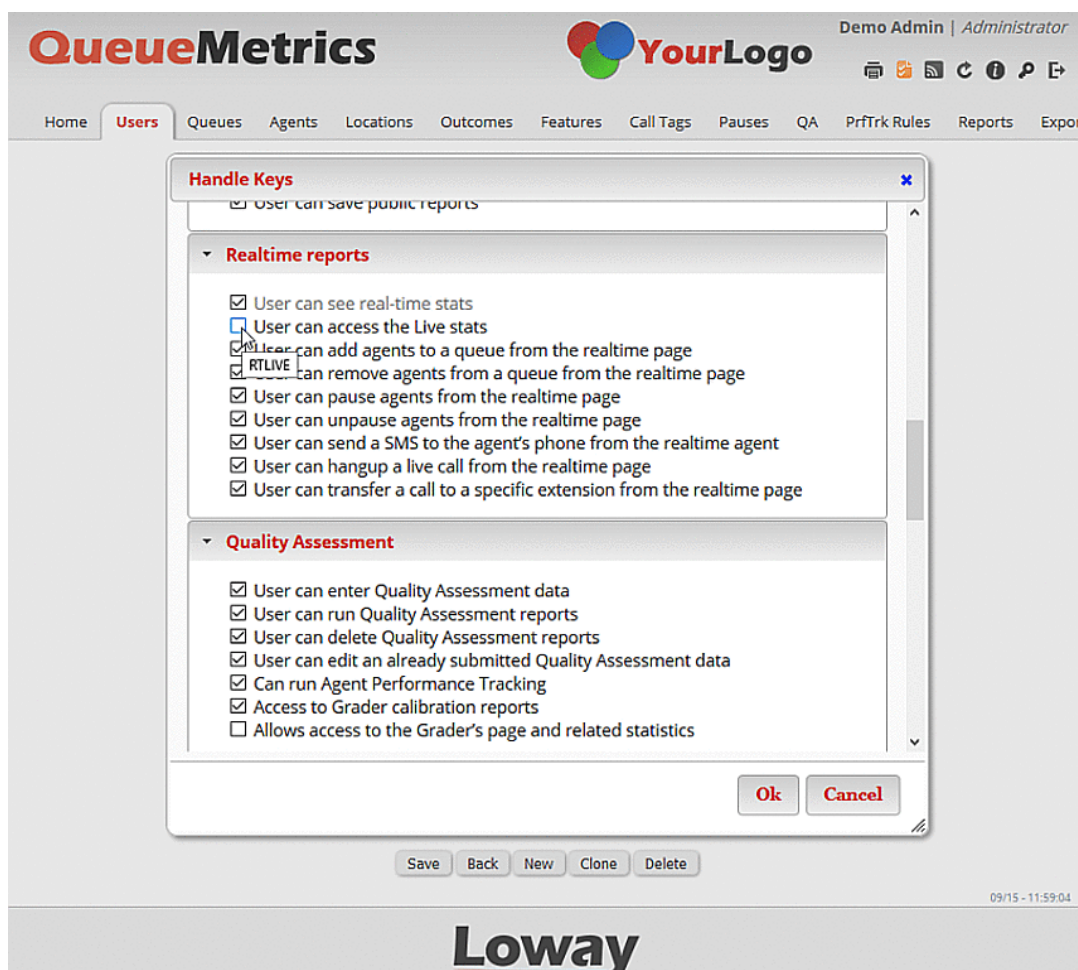
- *Userid* is a technical reference used internally. Read only.
- *Login* is the login string.
- *Password* is the password, shown in clear text.
- *Real name* is the name shown in the top part of the screen
- *Enabled* lets you temporarily disable somebody from using QM.
- *E-mail* is the user's e-mail address (Optional).
- *Masterkey*: if set to Yes, all security key checks are bypassed. **DO NOT SET UNLESS YOU KNOW WHAT YOU ARE DOING!**
- *Class* is the current user class
- *User keys* are additional keys the user holds. Separate each key with a space. If a key is preceded by the minus sign, it means it's revoked even if the class grants it. The pushbutton *HandleKeys* starts a wizard helping administrators to proper handle keys for users (see below).
- *Number of logons* tells how many times the user logged on in QM. Read only.

- *Comment* is an optional free comment.
- *Token* has no current use. Read only.
- *Creation and Update*: the user and date/time when the record was first created and then last updated. Read only.



**When you first log on to QueueMetrics, you must change the passwords to all default users. Failure to do so represents an important security breach!**

The wizard heat icon located under the User keys field opens a popup where all available pre-defined security keys are listed together with a description. By clicking on each checkbox is possible to assign/unassign the associated key to the user. The wizard helps the administrator to generate a valid keyset by computing key dependencies and/or uncompatibles key pairs and checking or unchecking keys accordingly.



Keys inherited from the class where the user is belonging to are greyed out. Is, moreover, possible to uncheck an inherited security key thus generating the proper negative definition for the edited user.

Flying over a checkbox with the mouse, a tooltip containing the associated security key value is shown.

Pressing *Save* closes the wizard and updates accordingly the *User key* list in the user definition page.

## Editing user classes

User classes can be configured freely; you can create individual key rings with special privileges to best suit your needs.

Class name	Description	Keys	User #
ADMIN	Administrator	USER QUEUE_AN USR_AGENT USR_QUEUE USRADMIN REALTIME AGREP CALLMONITOR USR_LOCATION USR_OUTCOME USR_POODE RTLIVE CHPASSWD MON_AUDIO MON_VNC USR_MYSQL	1
AGENTS	Individual agents	AGENT CHPASSWD	2
ROBOTS	Robot	USER QUEUE_AN USR_AGENT USR_QUEUE USRADMIN REALTIME AGREP CALLMONITOR USR_LOCATION	1
SUPERVISORS	Agent supervisors	USER SUPERVISOR REALTIME QUEUE_AN	1
SYSOP	IL Sysop	USER SYSOP	0
USERS	Normal users	USER QUEUE_AN REALTIME AGREP CALLMONITOR RTLIVE CHPASSWD	1
VISITORS	Visitors	VISITOR	1

Items found: 7 Page 1 of 1

Create New Show users

Each class has a set of keys that can be freely edited in much the same way as users by clicking on the "edit" icon (the pencil).

**User Detail**

Class Id: 3

Class name: ADMIN

Description: Administrator

Keys:

USER QUEUE\_AN USR\_AGENT USR\_QUEUE USRADMIN  
REALTIME AGREP CALLMONITOR USR\_LOCATION  
USR\_OUTCOME USR\_POODE RTLIVE CHPASSWD  
MON\_AUDIO MON\_VNC USR\_MYSQL

Created by: 129/10/2004, 10:08

Last update: demoadmin, 10/06/2007, 22:32

Number of users belonging to this class: 1

Save Back New Delete

No class can be deleted as long as there is at least one user that is member of it.

The default classes should be enough to get most systems started:

- ADMIN is for the system administrator only, and lets you do nearly everything, including system configuration;
- MANAGERS is for most QM users, the ones that have to run the reports and monitor real-time activity;
- AGENTS is for individual agents logging on to their web page.
- VISITORS is for visitors accessing the simplified real-time page
- ROBOTS is for automated data download



The administrator can start a security key wizard by clicking on the button *HandleKeys*. For more information on this wizard, please refer to the previous paragraph.

# Password Encryption

Since version 18.04, QueueMetrics allows for user passwords to be encrypted, in order to guarantee greater security.

To manage the process of password encryption, two new system parameters have been added to the system configuration.

- `pwd.minAllowedLevel`
- `pwd.defaultLevel`

The first parameter: `pwd.minAllowedLevel`, dictates if the system allows users with non encrypted passwords to access the system. The two different behaviours are associated with two different values for the system parameter:

- **`pwd.minAllowedLevel=1`** Users with non-encrypted passwords can login onto the system.
- **`pwd.minAllowedLevel=2`** Users with non-encrypted passwords cannot login onto the system.

The second parameter: `pwd.defaultLevel`, indicates if the new passwords that are set will be encrypted or not. When saving a new password for a user, this property decides if the password is to be encrypted:

- **`pwd.defaultLevel=1`** New User's passwords will NOT be encrypted.
- **`pwd.defaultLevel=2`** New User's passwords will be encrypted.

To encrypt a user's password, the system administrator should first set `pwd.defaultLevel` to a value of 2 then, by accessing the **Edit User** page, a new password for the user must be set. With QueueMetrics 18.04 the user editing page has been modified to include a password confirmation field.

When the new password is set, and the modifications are saved, the new password will be saved as an encrypted password.

## Configuring queues

A list of queues must be set before accessing QM. Each queue can be made visible to only a specific set of users by adding a key - this can be useful if, for example, each queue has a manager viewing data for it, while only a CC manager sees data for all queues in the center.

**Queues Configuration**

Filter:  Search

Items found: 5 Page 1 of 1 <<< >>>

Alias	Queue(s)	Wrap	Ann.	Key	F.P.	Agents
00 All	outbound, queue-test, q1, q2, 300, 400, 401	0 s.	0 s.		✓	2 - 0 - 0
Inbound	300	0 s.	0 s.		✓	2 - 0 - 0 - R(1)
Nfem-p12	K2852-0003	0 s.	0 s.		✓	2 - 0 - 0 - R(1)
outbound 301	outbound	0 s.	0 s.		✓	2 - 0 - 0
Q Test	queue-test	0 s.	0 s.		✓	2 - 0 - 0

Items found: 5 Page 1 of 1 <<< >>>

**Loway**  
RESEARCH  
Loway - Switzerland

09/10 - 12:03:47

You can search for a specific queue by entering data into the Filter box on top of the page, or change the default sort order for the list by clicking on one of the column names.

The default page shows:

- The queue Alias and Composition
- The Wrap and Announcement durations
- The key protecting the queue, if any
- FP - Front Page: Whether that queue will be visible from the queue selection boxes
- The number of known agents that are member of the queue, by service level (as Main - Wrap - Spill).

The pencil icon will let you edit the queue, while the "People with pencil" icon lets you change queue associations. The *pie chart* icon at the end allows to define/assign the set of queues on which agents can run reports. No specific key or property are required, but this feature is only available as of QueueMetrics version 12.10. For an administrator to make this feature available for the agent, it is necessary to have at least one queue and a report assigned to the agent. See also the section called "Configuring reports" [239] for further details.

QueueMetrics
YourLogo
Demo Admin | Administrator

Home
Cfg Users
**Cfg Queues**
Cfg Agents
Cfg Agent Groups
Cfg Locations
Cfg Outcomes
Cfg Pauses
Cfg QA
Cfg Perf. Trk Rules
Cfg Reports

### Queue Detail

Queue alias:	Q DPS	
Queue(s): <small>Separate with " "</small>	queue-dps	
Wrap-up time (sec.):	0	
Announcement (sec.):	0	
Visibility key:		
Call flow:	Inbound calls	
Shown on front page:	Yes	
Chat group:		
Default queue URL:		
Main agents:	agent/101, agent/102	
Wrap agents:		
Spill agents:		
<b>Attention levels</b>	<b>Yellow alarm</b>	<b>Red alarm</b>
Number of calls in queue:	>2	>5
Number of agents on call:		
Number of agents waiting:		
Number of agents paused:		
Call wait duration:		
Call talking duration:		

**WombatDialer settings**

Recall Campaigns:  
Separate with "|"
RD1|RD2

Recall Max Days:
50

**AGAW settings**

Will AGAW be run for this queue?
Yes
Items defined: 0

AGAW enabled for this queue:
No

AGAW lookback period (mins):
0

Created by:
demoadmin, 06/02/2012, 16:15

Last update:
demoadmin, 23/04/2015, 10:04

Save
Back
New
Clone
Delete
Agents
AGAW alarms

04/24 - 09:13:11

**Loway**

For each queue you have to define:

- An *Alias*, that is the name users will see in the queues combo box on the Home Page;

- A set of *Queues*, that can be the name of an Asterisk queue as seen from the Queue() command or a set of names separated by the pipe symbol, as in *queue1/queue2/queue3*. This lets you aggregate queues freely. You can also use the \* and ? wildcard symbols (see below).
- An optional *Wrap-up time*, i.e. how many seconds an agent stays idle after hanging up;
- An optional *Announcement* duration, that lets you deduce the duration of the queue announcement that is played to the agent from the actual metrics;
- An optional *Visibility key*, that makes the queue visible only to users holding that key.
- The *Call flow direction*, i.e. whether the queue is an inbound (classical) queue or an outbound queue (made to track individuals agents calling out or the activity of a full-fledged predictive dialler). Select "any call" when you aggregate queues with different call flow settings.
- If it's *Shown on front page*, that is, in the main Queue selector combo box (if not, the queue is said to be *invisible*).
- A *Chat group*, that is, the XMPP address of a queue manager
- A *Default URL* to be used on the Agent's page if no URL is passed in the queue log in order to open a third-party application.



since QueueMetrics 16.09 queue names can contain whitespaces (e.g. "example queue").

The rules followed by QueueMetrics when displaying the icon link (and the associated URL) are as follows.

On the report pages:

A: If the reporting queue is not a composed queue and the queue has an associated URL (coming from the queue definition page), then this URL is shown.

B: If the reporting queue is a composed queue and/or no URL is associated to that queue in the queue definition page, then:

B1: If the call has an associated URL in the queue\_log, this will be shown

B2: If the call has not an associated URL in the queue\_log then the URL specified in the configuration properties key *default.crmapp* will be shown. If no *default.crmapp* URL has been specified in the configuration properties file, the icon will not be shown.

On the live agent page:

A: If the queue where the call comes has an associated URL in the queue configuration page then this URL is shown for each call

B: If the queue where the call comes has not an associated URL in the queue configuration page then:

B1: If the call has an associated URL in the queue\_log, this will be shown

B2: If the call has not an associated URL in the queue\_log then the URL specified in the configuration properties key *default.crmapp* will be shown. If no *default.crmapp* URL has been specified in the configuration properties file, the icon will not be shown.



- A number of *Attention levels*, see below.
- The current known *Service groups* for that queue, i.e. which agents are linked to that queue
- The current *WombatDialer campaigns* for the queue (see below)
- The current *AGAW settings* for the queue (see below)

By clicking on the Agents icon, you can define the position of each agent as a member of the service groups for that key. An agent cannot be a member of more than one group per each queue s/he is a member of.

Agent code	Description	Main	Wrap	Spill
Agent#101	John Doe (101)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agent#102	Mike Doo (102)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Save Back to queues

It is of course perfectly legal for an agent defined not to be used in a specific queue.

## Setting attention levels (Red and yellow alarms)

It is possible - but not mandatory - to define all or some attention levels for the given queue. To do so, you have to fill in each queue attention levels parameter with an expression that will be matched to the current property's value in order to trigger a defined alarm.

QueueMetrics does currently allow to set two possible alarm thresholds; that is a "yellow" and a "red" alarm. You can define one or both of these properties, according to your preferences. Those values are used currently only to trigger alarms in the real-time panel.

For example, imagine we want to set a yellow alarm on the queue wait for each call; we want cells to turn yellow if the wait time exceeds 30 seconds, and to turn red if it is over one minute. To do so, we enter "> 30" in the yellow alarm box near to "Call wait duration", and "> 60" in the red alarm box on the same line.

In the case where both yellow and red conditions match, the red alarm prevails.

Currently, the following functions can be used to match a value "=", "<", ">", "!=" (different).

The possible alarms are the following:

- *Number of calls in queue*: how many calls are present in the queue.
- *Number of agents on call*: how many agents are on call
- *Number of agents waiting*: how many agents are idle
- *Number of agents paused*: how many agents are on pause
- *Call wait duration*: how much a call is waiting before being answered
- *Call talking duration*: the duration of the agent's conversation



## Using wildcards in queue names

QueueMetrics allows a limited use of wildcards to group together queue names. Wildcards work by matching the composition of known single queues, so if a queue is not defined in QueueMetrics (even if it is present on Asterisk) it will NOT be matched by a wildcard of "\*".

On the other side, a hidden single queue will be matched by a non-hidden front-page queue whose definition is "\*".

With wildcard matching:

- **"\*"** stands for any number of characters. E.g., **"open"** as the queue composition will match any atomic queue starting with "open". Just entering "\*" as a queue composition will match any atomic queue on the system.
- **"?"** stands for a single character - e.g. "open?" will stand for "openl" and "openq", but not for "open99". You can group together a number of question marks to match multi-character sequences of known length, e.g. "open??" will match "open99".

## Configuring redial services through WombatDialer

WombatDialer is highly scalable, multi-server, easy-to-use telecasting platform produced by Loway. Queues in QueueMetrics can be associated to dial campaigns in WombatDialer thus allowing easy implementation of recall services. By specifying a set of pipe separated campaigns and a maximum recall day period, an agent can schedule a recall by clicking on an icon on the call list in their own agent's page. For further clarifications, see section the section called "Recall Scheduler" [195]

## Configuring queues to be processed by the AGAW Runner

The AGAW Runner will use the following rules to decide which queues and agents to process:

- All queues that are "simple", i.e. not composite, are taken into consideration for processing by the runner. All queues that have the AGAW runner enabled will be actually processed (you must enable that manually in the queue config page).
- All agents that are linked to a queue are processed for that queue, even if there is no data for them; plus, any unknown agent that is detected working on a queue is processed for that queue..

In order for a queue to be processed by the runner, and show visible metrics to the user:

- The *"Will AGAW be run..."* must be set to "yes"
- The *Items defined* must be > 0 (or the agent will see no metrics)
- The *AGAW enabled* should be "Yes"
- The *AGAW look back* period can be left blank (default). This is the size of the look-back period the AGAW runner uses.

The set of metrics that is enabled and their alarms is defined in the AGAW queue configuration screen (click on the "AGAW alarms" button):

The screenshot shows the 'AGAW alarms for queue: Q DPS' configuration page. It features two main sections: 'Queue settings' and 'Agent settings'. Each section has a 'Show?' dropdown and three color-coded alarm levels (Yellow, Red). The metrics are as follows:

Metric	Queue settings Show?	Queue settings Yellow	Queue settings Red	Agent settings Show?	Agent settings Yellow	Agent settings Red
ACL - Average Call Length	No			Yes		
Average wrap time	No			No		
Average wait time (for waiting calls)	No					
Maximum wait time (for waiting calls)	No					
Number of calls	No			No		
CPH - Contacts per Hour	No			No		
QCPH - Qualified Contacts per Hour	No			No		
SPH - Sales per Hour	Yes	>1		No		
Qualified Conversions %	Yes	>15%	>30%	Yes	>0.7	
Conversions %	No			No		

At the bottom, there are fields for 'Created by:' (demoadmin, 18/08/2008, 14:41) and 'Last update:' (demoadmin, 03/09/2008, 11:19), along with 'Save', 'Back to queue', and 'Back to all queues' buttons.

As you can see, for each metric there are a couple of switches that decide:

- Whether that metrics is to be shown at all
- Red and yellow alarm levels for the whole queue (to be shown in AGAW, so they might differ from the ones used for the real-time page)
- Red and yellow alarm levels for each agent separately

These settings are applied from the next run of the AGAW runner, so they can be modified while the AGAW runner is active and will be picked up when the relevant queue is processed.

All values are always computed; you can toggle visibility of values on and off (if they are "Off" they are visible in the AGAW monitor but NOT to the user).

Alarms can be expressed as:

- Integers (for time periods and n. calls)
- Floating-point values ( e.g. > 3.7)
- Percentages (e.g. > 10%).

While percentages for the Queue part translate to the corresponding ratio (e.g. 10% means 0.1) in the Agent part they are anchored to the Queue metrics - that is if number of calls is at a given moment 1000 and there is an agent alarm at "< 1%", if the number of calls taken by that agent are less than 1% of the queue the alarm will be triggered.

If you need to express a fixed percentage in the Agent part, use the corresponding ratio, as in the Qualified Conversion example above.

# Configuring agents

Agents should be configured so that they:

- are decoded to their own name when they are found in reports
- can be set as members of service levels for queues.
- can be assigned an optional Location, that can also be used as a filter condition.
- can be assigned an optional User Group, that can also be used as a filter condition.
- can be assigned to a Supervisor
- can have a VNC URL defined
- can have a Current Terminal defined.

Agent code	Description	Location	Term.	Mon.	Supervisor
Agent/101	John Doe (101)	Main			demosupervisor
Agent/102	Mike Boo (102)	Other	12		

Items found: 2

Page 1 of 1

Create New

When editing an agent, the following screenshot appears:

**Agent Detail**

Asterisk agent code:

Agent description:

Agent location:

VNC monitoring URL:

Current terminal:

Instant messenger address:

Supervisor:

Created by:

Last update:

Save Back New Delete

Agent is a known member of the following queues:

Queue name	Direction	Level
Q AS	inbound	Main
Q DPS	inbound	Main
Q Test	inbound	Main

The Agent/Queue association can be edited from the Queue editor

For each agent in use, enter:

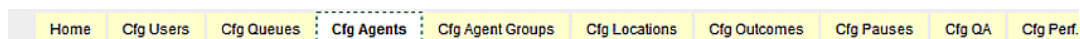
- *Agent code* as the Asterisk agent code, e.g. Agent/101;
- *Agent description* as the agent's own name.
- *Default server*: for cluster mode, the default server for the agent. This information is used to pre-populate the related field in the realtime agent page logon panel. Leave empty if the agent is not associated to a specific server.

- *Agent location* and *Agent group* can be selected from a drop-down list of defined locations. Leave blank if not needed.
- *VNC Monitoring URL*: the URL that will launch the VNC monitoring app for the given agent
- *Current terminal*: the current terminal for the given agent. If this field is left blank, unattended audio monitoring will not work. If you are using regular Asterisk agents, just enter "-" as the current terminal to make audio monitoring work. This field is used to pre-populate the "Current extension" field in the agent real-time logon panel.
- *Instant messenger address*: an XMPP address associated to the agent. Used in the real-time page for supervisors to initiate a chat with the agent.
- *WebPhone Username*: the SIP username used by the softphone in the realtime agent page to authenticate the agent
- *WebPhone Password*: the SIP password used by the softphone in the realtime agent page to authenticate the agent
- *WebPhone Realm*: The authentication SIP Realm used by the softphone in the realtime agent page to authenticate the agent
- *WebPhone SIP Uri*: An optional SIP URI used by the softphone. If blank, the username@sipserver [mailto:username@sipserver] is used
- *Supervisor*: the supervisor for this agent. This can be selected between all users holding the key SUPERVISOR.

If you want an agent to log on to their own page, you also have to create a user with the same name.

On the bottom of the page, the current association of that agent to a set of queues is shown.

It is now possible to add one or more "friendly names" for agents within the "Asterisk aliases" field, which can be found in the Agent Detail page. The Agent Detail page is accessed by selecting the "Edit agents" link on the QueueMetrics Home page and then clicking on the "Edit" icon for a specific agent.



## Agent Detail

Asterisk agent code: <small>E.g.: Agent/101</small>	<input type="text" value="Agent/102"/>
Agent description:	<input type="text" value="Mike Boo (102)"/>
Asterisk aliases: <small>Separate multiple aliases with a ";" symbol</small>	<input type="text" value="Mike Boo"/>
Agent location:	<input type="text" value="Other"/>
Agent group:	<input type="text" value="-"/>
VNC monitoring URL:	<input type="text" value="http://mike.boo.workstation/vnc"/> <input type="button" value="Test it"/>
Current terminal:	<input type="text" value="12"/>
Instant messenger address:	<input type="text"/> <input type="button" value="Test it"/>
Supervisor:	<input type="text" value="-"/>
Agent keys:	<input type="text"/>
Payroll Code:	<input type="text"/>
Created by:	<input type="text" value="demoadmin, 18/06/2007, 22:29"/>
Last update:	<input type="text" value="demoadmin, 04/12/2008, 14:59"/>

Agent is a known member of the following queues:

Queue name	Direction	Level
00 All	inbound	Main
Inbound	inbound	Main
Q DPS	inbound	Main
Q Test	inbound	Main

The Agent/Queue association can be edited from the Queue editor

## Configuring locations

The following configuration transaction lets you define locations for your agents. To access this page, a user must be holding the USR\_LOCATION key.

Location	Description	Key	N. Agents
Main	Main Location		1
Other	Secondary location		1

Items found: 2      Page 1 of 1      <<< >>>

Each location has a short name, a longer description, and a visibility key, so that only users holding that key may select that location as a source for reports.



**Edit location details**

Name:

Description:

Security key:

Created by:

Last update:

Number of agents belonging to this location: 1.

A location cannot be deleted if at least one agent is defined for that location.

## Configuring call outcomes

We define a *call outcome* as a flag to be added to a call, either when the call is ongoing or when the call has just finished, that will signal the result of the call from a business point of view. Such a flag is optional for QueueMetrics and can be added to both incoming and outgoing traffic.

The call outcome will be defined by a numeric sequence that the agent will either key in on their telephone terminal or report through QueueMetrics itself through the Agent's page. QueueMetrics will not consider how the sequence is entered, as long as it's present in the *queue\_log* data it runs on. Such records can be generated, for example, by an outbound dialler that is able to pre-screen answered traffic.

To minimize internal searching costs, the call activity must be entered either while the call is in progress or within one hour of its completion. If more than one call activity code is entered, the latest takes precedence over the previous ones.

**Call outcomes**

Filter:  Search

Items found: 9 Page 1 of 1

Outcome	Description	Key	Contact?	QC?	Sale?
a	Answering Machine		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b	Busy		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
dc	Disconnected		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
dnc	Do not call anymore		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
n	Not Available		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ni	Not Interested		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
nq	Not Qualified		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
sale	Sale		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
xfer	Transfer to IVR		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Items found: 9 Page 1 of 1

As you can see, each outcome can set two flags: a "This call qualifies as contact?", "The call qualifies as Qualified Contact" and a "This call qualifies as sale?" flag. This will be used in order to produce statistics on traffic (see section the section called "How are Call Outcomes calculated?" [49]).

If a call code is found but not defined through the configuration screen, QM will report on it and treat it as a "No contact" and "No sale" call.

The editor page lets you set:

- A numeric code for that outcome. The system will check that it will not be duplicated on the list (The code *should* be numeric so it may optionally be keyed-in using the rep's terminal)
- A text label for the outcome (e.g. "Contact")
- A flag telling the system whether that outcome counts as a "Contact"
- A flag telling the system whether that outcome counts as a "Sale"
- An optional security key for that outcome. This will be used only when displaying outcome choices for a given call in the Agent's page. The reporting engine will report on all outcomes present in its analysis.
- A *Queue visibility* list - you can list a set of atomic queues for which this code will be displayed. Queues are separated by whitespaces. The field accepts wildcards to match multiple queues and/or subqueues. If the field is left blank, then the code is displayed for all queues.




Outcome status codes **MUST** be defined only with numbers and lowercase letters. The following characters are also allowed: `_-.@/()=?^`. QueueMetrics will automatically delete wrong characters and change uppercase characters to their lowercase equivalent.

## Configuring Feature Codes

For call centers that require to analyze agent performances at a level below call outcome, the concept of *feature codes* has been added since QueueMetrics version 15.09. A user can think about feature code like a sub-outcomes. They can, optionally, have hierarchical relationships with the primary outcome code. A simple example of the feature code concept is the pair of outcome/feature like "Not Interested"/"costs too much". A call may have an unlimited number of features associated with. Some features may be flagged as *goal*. Goal features are counted separately and generate separated statistical figures in reports.

Editing feature codes requires holding the key `USR_OUTCOME`.

**rics** 















[Cfg Agents](#)
[Cfg Agent Groups](#)
[Cfg Locations](#)
[Cfg Outcomes](#)
[Cfg Features](#)
[Cfg Call Tags](#)
[Cfg Pauses](#)
[Cfg QA](#)
[Cfg Perf. Trk Rules](#)
[Cfg Reports](#)
[Cfg Exp](#)

### Call features

Filter:

-

Items found: 7 Page 1 of 1 <<< >>>

Feature ↑	Description	Key	Goal	Rel. Outcomes	
bad	Not good			Not Interested	
fc1	Householder			Sale - Busy - Not Interested - Not Available	
fc2	Not sales rep.				
fc3	Sales Target			Sale	
fc4	Feature code four				
fc5	Retry later			Busy - Disconnected - Not Qualified	
unu	Unuseful			Not Interested	

Items found: 7 Page 1 of 1 <<< >>>

**Loway**

By clicking on *Create New* button or on the pencil icon present on each feature code row in the list, a user can create or edit an already present feature code.

**Loway**



**ics**

Cfg Agents Cfg Agent Groups Cfg Locations Cfg Outcomes **Cfg Features** Cfg Call Tags Cfg Pauses Cfg QA Cfg Perf. Trk Rules Cfg

### Edit call features

Feature code:	fc1
Description:	Householder
Relevant Outcomes:	<div>[a] Answering Machine <span>▼</span> <span>Add</span> <span>Del</span></div> <div>[sale] Sale (C) (S) (Q)</div> <div>[b] Busy</div> <div>[ni] Not Interested (C)</div> <div>[n] Not Available</div>
Goal:	Yes <span>▼</span>
Security key:	
Queue visibility:	300
Created by:	demoadmin, 30/10/2014, 11:13
Last updated:	demoadmin, 02/06/2015, 16:24

Save Back New Clone Delete

## Loway

As told before, tag features can be linked with a specific outcome code set. To link a feature code with a specific outcome or set of outcomes, a user should select the outcome from the dropdown, then click on the *Add* button. The list of already associated outcomes are shown below the dropdown. To remove an outcome association, a user should select the proper outcome from the dropdown, then click on the *Del* button.

Clicking on *Save* updates the feature code on QueueMetrics database.



Feature status codes **MUST** be defined only with numbers and lowercase letters. The following characters are also allowed: `_-.@/()-=?^`. QueueMetrics will automatically delete wrong characters and change uppercase characters to their lowercase equivalent.

## Configuring Tag Codes

Some call centers require to report call set at the list level below campaign. This is frequently used for outbound campaigns. The idea is to add the concept of generic *tag* to calls, so that, if assigned to each calls, it could be used to create a new level of reporting, parallel to the queue. When each call is associated to a single tag, the queue would be the *physical* medium for handling calls, while the tag could be freely set. Imagine, for example, to set up a special number for a Tv Ad, or a printed advertising, that makes it possible to discriminate where the caller saw the Ad. Tags are set by the system (i.e. there is no way for QueueMetrics to add a tag on a specific call but is up to the PBX/dialplan to add a tag signature in the queue log); for more information on that, please refer to this

paragraph the section called “Adding TAG information to calls” [358]. Tags associated to a call will be shown by QueueMetrics and decoded following the tag list defined by the administration page, as reported below.

**Call tags**

Filter:   -

Items found: 5 Page 1 of 1 <<< >>>

Tag	Description	Key
camp10	TV AD copy 1	
camp5	TV AD copy 2	
camp8	TV AD copy 3	
tag1	NYT AD copy 1	TG1
tag2	NYT AD copy 2	TG2

Items found: 5 Page 1 of 1 <<< >>>



By clicking on *Create New* button or on the pencil icon present on each tag code row in the list, a user can create or edit an already present tag description.

Tags definition/listing is available only for users holding the USR\_CALLTAG security key.

## Configuring pause codes

The agent's time is defined in QueueMetrics as made up of different activities. The main activity for an agent will be "Available time", i.e. the time when an agent is ready taking or placing calls. When an agent pauses out of "Available time", they may want to flag the reason for the pausing, e.g. doing backend activities, lunch, etc. This way you can track agent activities punctually. If they don't flag a pause, it will be computed as simply "Pause" time.

Each pause code is written on the queue log while the pause in progress, i.e. after the agent goes on pause and before the agent stops that pause. The pause code will usually be defined by a numeric sequence that the agent will either key in on their telephone terminal or report through QueueMetrics itself through the Agent's page. QueueMetrics will not consider how the sequence is entered, as long as it's present in the *queue\_log* data it runs on.

**Pause codes**

Filter:  Search

Items found: 5 Page 1 of 1 <<< >>>

Pause code ↑	Description	Key	Billable?	Payable?	Type
10	Lunch		<input type="radio"/>	<input type="radio"/>	-
11	Hourly break		<input type="radio"/>	<input type="radio"/>	-
12	Email		<input checked="" type="radio"/>	<input checked="" type="radio"/>	-
13	Backoffice		<input checked="" type="radio"/>	<input checked="" type="radio"/>	-
20	Wrap		<input checked="" type="radio"/>	<input checked="" type="radio"/>	Wrap

Items found: 5 Page 1 of 1 <<< >>>

For each pause code, it is possible to tell QueueMetrics whether that time is:

- billable or non-billable - whether the pause will be counted for client billing
- payable or non-payable - whether the pause will be counted for payroll generation

All activities are optional and may be added or deleted at will. The following fields apply:

- A numeric code for that activity. The system will check that it will not be duplicated on the list (The code *should* be numeric so it may optionally be keyed-in using the rep's terminal. This is not a technical requirement anyway)
- A text label for the activity (e.g. "Lunch")
- A flag telling the system whether that activity is: Billable or Not Billable
- A flag telling the system whether that activity is: Payable or Not payable
- A flag showing the type of pause. A pause can be a standard pause, or a pause of the ACD made to produce outbound calls, or a call wrap-up pause (As of QueueMetrics 1.7.0, this is partially implemented only in the AGAW sub system) or an administration type pause.
- An optional security key for that activity. This will be used only when displaying activity choices in the Agent's page. The reporting engine will report on all activities present in its analysis.

**Edit Pause Codes**

Status code:

Description:

Security key:

Counts as Billable activity?

Counts as Payable activity?

Pause type:

Created by:

Last update:



pause status codes **MUST** be defined with no whitespaces. Apart from numbers, only lowercase letters and the following characters are also allowed: `_-.@/()=?^`. QueueMetrics will automatically delete wrong characters, change uppercase characters to their lowercase equivalent and trim the whitespaces.

## Configuring agent groups

An agent group is an attribute that is applied to an agent in order to keep track of their life-cycle. This is used as a filtering criterion in QM and is developed in the QA monitoring subsystem.

The idea here is that you can have e.g. "New hires", "Regular agents", "Expert agents"; each agent group has a different icon, that is displayed throughout QM whenever the agent name is displayed.

Group	Description	Icon	Key	N. Agents
AG	Standard agents			0
Default	Flat default group			1
NH	New Hires			0
P	Probation			0
XA	Expert agents			0

You can select different icons by clicking on them in the editor.



you can add more icons that better suit your liking by uploading them to the `/img/agent_groups` folder in QueueMetrics.

## Configuring skills

Skills are attributes that can be associated to a call and can be used to implement something useful like skill based routing on Asterisk queues. QueueMetrics reports can be filtered by a set of specific skills

through the custom report page. Skill codes can be associated to labels through the skill configuration page available to all users holding the *USR\_SKILLS* security key.

**Agent Skills**


[Create New](#) [Delete Selected](#)

Items found 5    <<< >>>    Page 1 of 1

<input type="checkbox"/>	Skill Code ↑	Description	Sort Weight	Visibility Key	
<input type="checkbox"/>	ciao	ciao	5		
<input type="checkbox"/>	en	English	10		
<input type="checkbox"/>	es	Spanish	10		
<input type="checkbox"/>	p1	Product 1	0		
<input type="checkbox"/>	p2	Product 2	0		

Items found 5    <<< >>>    Page 1 of 1

[Create New](#) [Delete Selected](#)



The list of available skills can be reached from the main page.

Clicking on the *Create New* button or the pencil icon on each skill reported in the table, is possible to create or edit a skill entry.

**Edit Agents Skill Details**

**Skill code:**

**Description**


**Sort Weight**

**Visibility key:**

**Created By**

**Last Update**

[Save](#) [Back](#) [New](#) [Clone](#) [Delete](#)



Apart from the skill code and the description for the skill that can be defined, a field named **Sort Weight** can be found. The weight field is used to define the order in which skills will be shown in report columns. Skills with a lower weight will always be placed before skills with a higher weight. If two skills have the same weight, they will be ordered based on the alphabetical order of their description.

The **Visibility key** field indicates that a user must possess the chosen key to use this particular skill.

## Configuring known numbers (VIP callers / blacklists)

Known numbers are phone numbers that are known to QueueMetrics and can have properties associated to them. They are meant to be used by the numberLookup API in order to implement strategies based on the calling number - see the section called “Using known numbers” [362]

At the moment, QueueMetrics will use "known numbers" to:



- Earmark specific calls as BLACKLIST or VIP, where at the dialplan level a proper function is implemented to route these numbers to specific high priority / low priority queues
- Store a known description for the number that can be used to set a caller-id for the number in a format that will make the number "stand out". It could be the name of a client, or their CRM IDs
- Store a known agent affinity for the number, where at the dialplan level there is an attempt to route the call to a specific agent before queuing the number on a "general purpose" queue

In order to access this page, users must hold the security key *USR\_KNUMBERS*.

Home	Users	Queues	Agents	Groups	Locations	Outcomes	Features	Pauses	QA	PrfTrk	Reports	Exports	IVR	DNIS	Nums
------	-------	--------	--------	--------	-----------	----------	----------	--------	----	--------	---------	---------	-----	------	------

Known Numbers							
Find: <input type="text"/>							
<input type="button" value="Search"/> <input type="button" value="Create New"/>							
Items found: 2      Page 1 / 1      <<<      >>>							
Number	Name	Expires	Description	Action	Affinity	N.Hits	Last hit
555-1234	Mr VIP		My VIP number	VIP caller	Agent/101	0	
555-1236	Nuisance caller	2015-09-25		Blacklist		0	

When editing a record, you see a form like the following one:

Known Numbers	
Number:	<input type="text" value="555-1236"/>
Action:	<input type="text" value="Blacklist"/>
Name:	<input type="text" value="Nuisance caller"/>
Description:	<input type="text"/>
Action valid until:	<input type="text" value="2015-09-25"/>
Agent affinity:	<input type="text"/>
Number of hits:	<input type="text" value="0"/>
Last hit:	<input type="text"/>
Created by:	<input type="text" value="demoadmin, 16/09/2015, 15:19"/>
Last update:	<input type="text"/>
<input type="button" value="Save"/> <input type="button" value="Back"/> <input type="button" value="New"/> <input type="button" value="Clone"/> <input type="button" value="Delete"/>	

The editor will track:

- A number. This can be input freely, es "(555) 555-5555", and will be internally normalized to the sequence of DTMF digits it uses.
- A name. This will be used by the service "name"
- An action, currently belonging to the set:
  - BLACKLIST
  - VIP
  - None (used in the case you just want affinity or name decoding)



- A free text description
- An agent id, to set the agent affinity for this number
- A record expiry date. When the record is expired, all associated attributes are inactive (action, name and affinity)

The editor will also display, in read-only mode:

- The total number of hits that were received for this number. A hit is a successful lookup.
- The time this number was last hit



Each number can only appear once (as per its normalized form) in the editor; attempts to have it listed multiple times will be rejected.

## Configuring QA forms

The set of current QA forms can be configured through the QA form editor. It shows the current set of defined forms and lets you perform the usual operations (search, filter, sorting, paged listing...).

Name	Key In	Key Rep	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7	Section 8	Section 9	Section 10	Items
Main Form			Politeness	Conversation rules	Customer Satisfaction	Other Customer Related							0
Quality Assurance			Engagement	Resolution	Business needs								0

The names of each section and the number of items that have been input for that form are shown on the front page. If a form has any number of items input, it is considered "locked" and cannot be modified anymore, though you can create a different form with the same set of items.

The form editor looks like the following page:

Home Cfg Users Cfg Queues Cfg Agents Cfg Agent Groups Cfg Locations Cfg Outcomes Cfg Pauses **Cfg QA** Cfg Perf. Trk Rules Cfg Reports

### QA : Forms Editor

Form name:

Security key for input:

Security key for reports:

Queue visibility:

Form locked?

N. calls graded:

#### Section names

Section 1:   
(SCG, COU, ENE, TON, CLE, HOL, DEE, LIS, CLO)

Section 2:   
(ASS, REL, HEL, PRO, TIM)

Section 3:   
(DBC)

Section 4:   
No items

Section 5:   
No items

Section 6:   
No items

Section 7:   
No items

Section 8:   
No items

Section 9:   
No items

Section 10:   
No items

#### Call Grading

Maximum value for  (  ):

Maximum value for  (  ):

Maximum value for  (  ):

Maximum value for  (  ):

Created by:

Last update:

You can enter:

- The form name
- The security key required (in addition to the basic one) to grade calls using this form
- The security key required (in addition to the basic one) to run reports on this form
- Whether the form allows new input or not; the total number of calls graded using this form is shown
- The names of the section. There can be up to five sections. Any section **MUST** have a name, and there must be at least one section.
- The threshold values for Call grading (the maximum for "Exceeds expectations" is fixed at 100).
- The labels associated to each level in the Call grading (defaults are "Issue", "Req.Impr.", "Meets exp.", "Exceeds exp."). Please note that a short label, used on the report pages, could be also defined (defaults are "Issue", "Impr.", "Meet", "Exc.").



- A *Queue visibility* list - you can list a set of atomic queues for which this form will be displayed. Queues are separated by whitespaces. The field accepts wildcards to match multiple queues and/or subqueues. If the field is left blank, then the form is displayed for all queues.

To edit the set of items that belong to a form, you should have no data reported for that form. If you



have no data, the item editor icon will show from the main form page.

The editor looks like the following page:

Section	Item	Active if...	Extra Score	Non Scoring
Section: Engagement	SCG: How positive clear and eager was the use of the Corporate greeting?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	COU: How well did the rep display courtesy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ENE: Rate rep's energy level throughout the call	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	TON: How well did the rep vary the tone and speed of speech?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	CLE: How clear and concise was the rep's vocalization and pronunciation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	HOL: Did the rep use the correct hold procedure?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DEE: Did the rep avoid dead air?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	LIS: Did the rep display active listening skills?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Section: Resolution	CLO: How positive and appropriate was the call closure phase?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	ASS: Was assurance given for client's assistance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	REL: How accurate and relevant was the information provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	HEL: Was additional help offered with enthusiasm?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Section: Business needs	PRO: Was the problem resolved on first contact?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	TIM: Did the rep manage time effectively?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

To add a new element, just select an element on the top form and a section it should be added to.

On the main part of the page, you can edit the elements by changing them, moving them up or down and removing them.

The "Active if..." field allows to enter a dependent rule, as described within the following chapter: "Handling dependent questions".

The Extra Score checkbox allows to give extra scoring to a particular question, in order to highlight an agent's higher performance within a specific section, or to balance his/her averages. The question in the form will have two main characteristics: it can have a score above the 100 standard value (up to a maximum of 120) and the score assigned to the question will not be calculated within the denominator part, when totalling averages for the specific section and the overall QA form.

The "Non Scoring" checkbox, if checked, forces the engine to ignore the inserted question score when calculating the section and form average. Questions flagged as "Non Scoring" are not classified as "under or over performing items" in the QA form. Non scoring questions are aggregated on reports based on the number of times a particular score is found in the query period.



When only one extra score question is within a section, the average will show as zero, given that within the denominator there are no values, but it is null.

## Handling dependent questions

Since QueueMetrics 1.7.0, it is possible to have **Dependent Questions**, i.e. questions that are enabled or disabled according to values input in a different question.

In order to enable this, a new input area is defined on the right side of each item. Here the administrator can insert a rule that associated the question to a particular parent question. There are several restrictions in the rule definitions:

- A rule should be defined with the sequence LABEL, OPERATOR and VALUE where:
  - LABEL is the short code associated to each item in the section
  - OPERATOR is a mathematical operator in the subset: <, >, <=, >=, ==, !=
  - VALUE is a numerical value in the interval 0 (included) to 100 (included)
- A rule cannot be composed by other rules

When the administrator saves the form, the server will parse each inserted rule and, if an invalid rule is found, an exception is raised specifying the first incorrect rule found. The administrator must then modify the wrong rule before submitting the form definition again.

QA: Items for Form: Test GUI items

Add new item:

Save

Section: Check section

Item	Label	Rule
-	NMYN: Not Mandatory Item Yes No	
-	MYN: Mandatory Item Yes No	NMYN == 0
-	NMNUM: Not Mandatory Numerical Item	NMNUM == 100
-	MNUM: Mandatory Numerical Item	
-	NMMUL: Not Mandatory Multioption Item	NMNUM > 50
-	MMUL: Mandatory Multioption Item	

Save Edit Form Back to list

When "Save" is pressed, all rules will be validated and an alert message will be shown if at least one rule could not be satisfied (i.e. the parent's code could not be found)

In this section could be defined rules for depend questions. When the rule is satisfied, the user will be able to answer the associated dependent question in QA Form

For example, a few rules are defined in the picture above:

- The item NMYN is parent of two items: MYN and NMNUM. The MYN item is enabled only if the value inserted is equal to 0; the NMNUM item is enabled only if the value associated to the NMYN question is equal to 100.
- The item NMMUL is related to the itemMNUM. This question is enabled only if the score given to the MNUM item is greater then 50.
- The question MMUL is a normal question and is always enabled.

A couple of rules govern the way values for dependent question are handled when the question is disabled:

- Dependent questions, when saved, receive a "N/A" value, so they behave like non-mandatory items when you check the "N/A" box. The value will be counted in the grading report statistics following the same rule.
- The "N/A" value works with the same rule even if the dependent question is a shortcut one: if it is disabled it is not considered a shortcut.

## Configuring QA items

The set of items that are selectable as members of a form can be configured by the user by clicking on the "Edit items" button at the bottom of the QA forms editor.

QA: Items list

Filter:  Search

Engagement Code	Description	Weight	Shortcut	Session Shortcut	Mandatory
ASS	Was assurance given for client's assistance?	1			
CLE	How clear and concise was the rep's vocalization and pronunciation?	1			
CLO	How positive and appropriate was the call closure phase?	1			
COU	How well did the rep display courtesy?	1			
DBC	Was DBC done?	1			
DEE	Did the rep avoid dead air?	1			
ENE	Rate rep's energy level throughout the call	1			
HEL	Was additional help offered with enthusiasm?	1			
HOL	Did the rep use the correct hold procedure?	1			
LIS	Did the rep display active listening skills?	1			
PRO	Was the problem resolved on first contact?	1			
REL	How accurate and relevant was the information provided?	1			
S3H	How well did the rep vary the tone and speed of speech?	0			
SCG	How positive clear and eager was the use of the Corporate greeting?	1			
TMI	Did the rep manage time effectively?	1			
TON	How well did the rep vary the tone and speed of speech?	1			

Items found: 24 Page 1 of 1

Create New Back to Forms

New items can be added and the description can be edited if needed.

The **weight** of an item is the number of times that an item must be counted in comparison to other items. All form level scores consider the item's weight.



If you average an item with a score of 50 and one with a score of 100, each weighting one item, you have an average of  $(50+100)/2 = 75$ . If you average an item with score 50 and weight 2 and one with score 100 and weight one, you get  $((50 + 50)+100)/3 = 66!$

A **shortcut** item is an item that, if failed, will fail the entire form. They are marked with a red icon when present.



If a shortcut item fails, the whole form will have an overall score of zero, no matter what other scores are. While averages at the form level are affected by shortcuts, averages at the item level are not affected.

A **session shortcut** item is an item that, if failed, will fail the entire section. They are marked with a red icon when present.



If a session shortcut item fails, the whole section will have an overall score of zero, no matter what other scores are.

A **mandatory** field requires you to select a valid value; if it is not checked, the user can optionally leave those items blank. Mandatory fields are marked with a green icon.

Different kinds of input can be accepted by the item - see below.

The Engagement code cannot be modified once input, and there can be no two items with the same engagement code.

Items cannot be deleted if they are in use by at least one form. You can see the set of forms that are using the chosen item at the bottom of the editor's page.

## Item value type: Numeric

A numeric value type must be an integer number between 0 and 100, extremes included.

## Item value type: Yes/No

A Yes/No value stores 0 when set to No and 100 if set to Yes.

## Item value type: Combo

This lets you create a drop-down selector, associating each entry with a given value.

You enter the list of values in "Multi value format" text box, with the format:

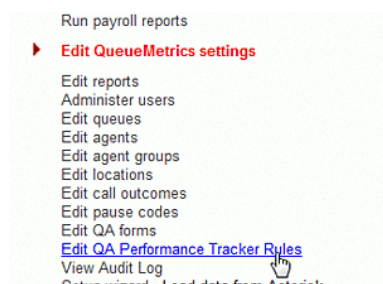
40:ToImprove | 80:Satisfying | 100:Good

Each option is made up of a numeric value plus the colon symbol ":" plus the text to be displayed. Multiple options are separated by the pipe "|" character.

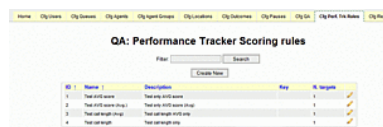
## Defining agent performance rules

As explained above, in order to track performance you first have to express a set of **business targets** that express what is expected from your agents and how much deviations from each rule are comparatively worth, expressed in **review points**. This is called a **ruleset**.

This can be done through the proper configuration page by users holding the key "QA\_PERF\_RULES"; they will see a new link from the home page:



Selecting the link, a new page is shown listing rulesets already defined. In order to define a new ruleset, you press the "Create New" button.



The "Create New" button opens a new page where an empty rule is shown, like in the picture below.

[Cfg Users](#)
[Cfg Queues](#)
[Cfg Agents](#)
[Cfg Agent Groups](#)
[Cfg Locations](#)
[Cfg Outcomes](#)
[Cfg Pauses](#)
[Cfg QA](#)
[Cfg Perf. Trk Ru](#)

### QA: Performance Tracker Scoring rules

Name:	Conv and QConv
Description:	Apply scores for Qualified and Not Qualified Conversions.
Queue:	00 All
Form:	JURreportForm
Security key:	

Target	Enabled	Yellow	Score	Red	Score
SPH (Avg.)	No				
QCPH (Avg.)	No				
CPH (Avg.)	No				
Sales (Avg.)	No				
QC (Avg.)	No				
Cont (Avg.)	No				
N Calls (Avg.)	No				
Call length (Avg.)	No				
Forms (Avg.)	No				
AVG Score (Avg.)	No				
Flunked (Avg.)	No				
Conv (Avg.)	Yes	<0.9	100	>=1	1000
QConv (Avg.)	Yes	<0.9	200	>=1	2000
Call length	No				
AVG Score	No				

[Save](#)
[Back](#)
[New](#)
[Clone](#)
[Delete](#)



Targets will not be displayed until you first save the ruleset.

The creator should assign to the new ruleset a name, a short description, and optionally a security key.

A rule is usually linked to a specific queue (or set of queues) and form. This is because we expect to have homogeneous statistic distributions in the same queue and form items. This might not be true outside a specific form and/or queue. The user should select a specific queue and form before pressing "Save".

## Available targets

When editing a ruleset, you see it is actually built out of a number of targets. It is important to understand that there are basically two different kinds of targets:

- "Aggregated" targets - identified by **AVG** - that are computed once per agent, and
- "Atomic" targets that are computed for each call handled by the agent

When computing the review score for an agent, first each call is checked against atomic targets and a first score is computed, then averages for the dataset are taken, and they are computed against aggregated targets and an aggregate score is computed; the final score is the sum of both scores.



You can use either type of target, or both as once, as you best see fit. Try and run some tests to make yourself familiar with the ruleset.



It is important to note that some targets are not available as atomic targets. Examples are the QCPH, Sales, Number of calls, (Qualified) Conversion etc. that are obviously associated to a set of calls and make no sense in relation to a single call.

## Setting targets

For each possible target within the rule set, you can:

- Enable or Disable a specific target rule
- Insert an algebraic expression defining the rule for the "yellow" threshold
- Specify a score that the engine will assign to the target when matching the "yellow" expression
- Insert an algebraic expression defining the rule for the "red" level
- Specify a score that the engine will assign to the target when matching the "red" expression

The algebraic expressions that can be used to define a threshold are:

- simple mathematical expressions formed by an operator (in the set of "<", ">", "#", ">=") and a value.
- $X << Y$ : defines the internal interval between the values X and Y (excluded)
- $X \Leftarrow Y$ : defines the internal interval between the values X and Y (included)
- $X >> Y$ : defines the external interval outside the values X and Y (excluded)
- $X \Rightarrow Y$ : defines the external interval outside the values X and Y (included)

Valid examples are:

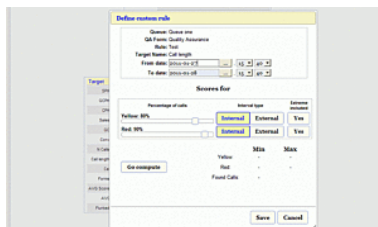
- "< 10" is triggered by a number lower than 10
- ">= 40" is triggered by a number greater or equalling 40
- "40 << 80" is triggered by a number between 40 and 80

For not-averaged rules the user can access a wizard that simplifies definition of interval-based rules.

## Dataset-based agent performance wizard

A rule set can be inferred from the measured properties of a given data set; this basically lets you express differences in terms of a percentage of outliers expressed on the total number of calls.

In order to access the wizard, you click on the "pencil" icon:





In this modal dialog you define a start and end time period and the "yellow" and "red" percentage of calls the user wants to include in the resulting rule, the type of interval (internal or external) and whether the interval extreme values should be included or not in the resulting rule.



Imagine you want to consider "yellow" the 10% of calls that are too long or too short and red the 5% of calls that are way too long or way too short in relation to the average length. You would set the "yellow" slider to "90% external" (meaning you want the external tails) and the "red" slider to "98% external".

The "Go compute" button runs an internal analysis that reports, in the lower right table present in the dialog, the minimum and maximum values representing the interval fulfilling the inserted parameters and the number of calls analyzed. You can repeat the calculation until satisfied, then press "Save" to insert the rule in the rule-set or press "Cancel" to forget it.

## Configuring reports

Since version 1.6, QueueMetrics allows for the configuration of reports. This makes it easy to tailor specific reports to specific users, instead of having all reports shown to all users. It also adds the flexibility to hide part of a report to users that do not have specific keys, and to edit the titles and subtitles for each reports.

In order to understand reports, it must be understood that a QueueMetrics **report** is made of a number of **screens** (the "pages" that the report is made of), each of which is in turn made of **items** (the actual tables containing data).

All elements (reports, screens and items) can be key-protected - so it is easy to make a full report, or just a part of it, visible to some users only.

As both screens and items have a display order you may want to control, they all have an numeric attribute called *Sort Order* that orders elements from the lower to the highest.

As QueueMetrics reports include an "All reports" page that in turn includes all elements in order, it is possible to control which elements are visible in it at the screen and item level; this is useful because you usually do not want extremely large items (like call lists, that may span over thousand lines) to appear in it.

One last word must be spent for *titles*; as QueueMetrics is an inherently multi-language application, titles may or may not be localized using QueueMetrics facilities.

- If a title starts and ends with the "#" symbol, it is looked up in QueueMetrics internal localization resources, so it changes according to the language the user has chosen. The string must be one of those defined in the localization files.
- In any other case, the string is displayed as-is.

## Editing reports

In order to access the reports editor, from the homepage click on *QueueMetrics settings* → *Edit reports*.



There will usually be only one report called "All reports" - this is an automatically-generated report that includes all available reports.

For each report, the number of associated screens is displayed.

Each report can be modified by clicking on the *edit icon* (the one that looks like a pencil) or the associated screens can be shown by clicking on the report title.



As creating a full report takes a while, it is possible to create multiple copies of the "All reports" items and then doing minor customizations by entering a new report name in the "Automatic report configuration" dialog. This is also handy when you upgrade QueueMetrics and want to test-drive new reports that were not previously available.

If you click on the edit icon, you will see the current report configuration:

- The *title* and *subtitle* can be chosen freely and will be shown to the users
- The *type* must be set to *QM Report*
- You can enter a *visibility key* to make this report accessible to some users only

If you click on the *pie chart* icon, you will access a table where you can assign one or more reports to each agent. No specific key or property are required, but this feature is only available as of QueueMetrics version 12.10. An administrator can also assign the maximum amount of time that

an agent can have available, when viewing historical reports from the agent web page. The key *default.ssarMaxReportPeriod* is defined within the *configuration.properties* file. If this key is not present within this file, then the default time is 15 (days).

## Editing screens

A report is made of a number of screens. They are the multiple selectable pages that are available when you run a report. As the space is limited, each screen has a Short title as well as a full title.

Short	Title	Key	Order	In All	Items
Answered	Answered calls		10	✓	12
Ans Dt.	Details of answered calls		20	✓	1
Unans.	Unans.		30	✓	16
Unans Dt.	Details of unanswered calls		40	✓	1
Area	Area code analysis		50	✓	3
Alt.	Distri.		60	✓	3
Day	Call distribution, by day		70	✓	7
Hr.	Call distribution, by hour		80	✓	7
DOW	Call distribution, by day of week		90	✓	7
Agents	Agents and Sessions		100	✓	7
Ag Dt.	Details of Agent sessions and pauses		110	✓	2
Outcomes	Call outcomes		120	✓	5

You can see that the items are sorted according to their Sort index, just as they will be displayed in the main reports. You can also see the number of associated items for each screen and whether the screen will appear in the "All reports" page.

Each screen can be modified by clicking on the *edit icon* (the one that looks like a pencil) or the associated items can be shown by clicking on the screen title.

If you click on the edit icon, you see the details, as shown here:

Report: All Reports » Screen details

Short name: #hdr\_answered#

Title: #clck\_answered\_calls#

Visibility key: Answered calls

Sort order: 10

Visible in "All reports?": Yes

Created by: j.15/01/2010, 12:32

Last update:

N related items: 12

Save Back New Clone Delete

- The *Short name* is the one displayed in the horizontal page menu, so it should be very short
- The *Title* is the one displayed at the top of the page
- The *Visibility key* lets you hide this screen and all its associated items from user that do not have the specified key

- The *Sort order* is an integer value that tells QueueMetrics how to position this element in respect to all other screens.
- The *Visible in All reports* toggle decides whether this screen and its associated elements are visible on the "All reports" page



Both the *Short name* and *Title* fields display a decoded, localized version of the string just below their input box. This is what the end-user will actually see.

## Editing items

When clicking on a screen title, you display the list of items that belong to that screen.

You can see the title for each item, the Data Object that actually creates data and its parameters.

Each item can be modified by clicking on the *edit icon* (the one that looks like a pencil).

- The *Title* field is the one displayed in bold on top of the table
- The optional *Subtitle* can be added as an explanation of the meaning of the graph.
- The *Visibility key* lets you hide this item from users that do not hold the given key.
- The *Data Object* is the routine that creates the requested table and/or graph. A list of available Data Objects is available here Chapter 6, *Report Details* [66].
- The *Parameters* field (if present) will let you add additional parameters that control the behavior of the Data Object.
- The *Sort order* is an integer value that tells QueueMetrics how to position this element in respect to all other screens.
- The *Visible in All reports* toggle decides whether this item is visible on the "All reports" page



The *Title* field displays a decoded, localized version of the string just below their input box. This is what the end-user will actually see.



You cannot have multiple copies of the same DataObject on the same page.

## Report ExportConfiguration pages

Users holding the key USR\_REPORTS\_EXPORT\_EDIT can edit the list of PDF and XLS export jobs.

**Reports Export Configuration**

Filter:  Search - Create New

Items found: 2 Page 1 of 1 <<< >>>

Title	Period	Queue	Report Set	Email List	Id
Last 30 days, to PDF, 00All, All Reports	Last 30 days	00 All	All Reports	bob@example.com;emily@example.com	1
Test export Last 90 days, to PDF, 00All, All Reps	Last 90 days	00 All	120		2

Items found: 2 Page 1 of 1 <<< >>>

Create New

Loway  
Loway - Switzerland

02/27 - 10:05:11

Each job is associated to a specific query period, queue and report set meaning that, each time the report is run, QueueMetrics calculates the results based on the input parameters and exports the whole report set to the required format. The generated document is sent to the recipients list specified for the job. Each job is identified by a numeric id generated by QueueMetrics and shown in the *Id* column.

As defined in the chapter Generate PDF and XLS reports and send them by e-mail the section called “Generate PDF and XLS reports and send them by e-mail” [205] this id has to be used to run the report by an external ROBOT profile.

The user can edit a specific job, by clicking on the pencil icon, or can run it immediately, by clicking on the blue button shown on the list.



The user is allowed to run the report only if holding the USR\_REPORTS\_EXPORT key.

Each time a user creates or edits a job, the next screen will be shown:

The screenshot shows a web application interface for QueueMetrics. At the top, there's a header with "Your Logo" and "Demo Admin | Administrator". Below the header is a navigation bar with tabs: Home, Cfg Users, Cfg Queues, Cfg Agents, Cfg Agent Groups, Cfg Locations, Cfg Outcomes, Cfg Pauses, and Cfg QA. The main content area is titled "Reports Export detail". It contains a form with the following fields: Title (text input), Period (dropdown menu set to "Today"), Queue (dropdown menu set to "All"), Report name (dropdown menu set to "All Reports"), Report Type (dropdown menu set to "Export to PDF"), Orientation (dropdown menu set to "Portrait"), Visibility key (text input), E-Mail(s) (text input with a note "Separate with ';'"), Created by (text input), and Last update (text input). Below the form are five buttons: Save, Back, New, Clone, and Delete. At the bottom right of the form area, the date and time "02/27 - 11:12:21" are displayed. The footer of the page features the "Loway research" logo and the text "Loway - Switzerland".

On this page the user is allowed to specify a title, needed to identify the job in the job list, and other relevant parameters like period, queue, report name (an already defined report set), report type (XLS or PDF) and the orientation (valid only for PDF documents). Each reports export job could be associated to optional visibility keys used to hide/show the job to a set of users. Finally, a list of e-mail recipients can be added - if present, on generation, the resulting report will be sent to them.

If an export job is included in a scheduled job, a clock icon will appear next to it in the export jobs list page. By clicking on the clock icon, the user will be taken to the scheduled jobs list where he can view the various scheduled jobs.

## Scheduled Jobs Configuration page

Users holding the key USR\_CRONJOBS\_EDIT can edit the list of available scheduled jobs.



**Scheduled Jobs**

Items Found: 1    [Create New](#)    [Delete Selected](#)    Page 1 of 1

Description	Name	Time	Day of Week	Day of Month	Run as User	Recurring	Enabled	Running	Last Run	Last Run State
Export pdf	ExportJobs -> Export_PDF	14:45:00	Monday, Wednesday, Friday	1, 15, 28	demoadmin				2017-11-08 14:45:11	OK

Items Found: 1    [Create New](#)    [Delete Selected](#)    Page 1 of 1

Each Job represents a specific task, chosen between those available, that will be executed automatically at a specific point in time, or regularly at set intervals of time. The user can also specify particular days of the week or days of the month as a requirement for executing the job.

The user can edit a specific job, by clicking on the pencil icon shown on the list.

Each time a user creates or edits a Scheduled Job, the next screen will be shown:

### Scheduled Jobs Details

Name	Export Jobs >> Sample_PDF																																			
Description	Export Pdf																																			
When	Cyclic																																			
Every	5m																																			
Day of Week	<div> <div>Mon</div> <div>Tue</div> <div>Wed</div> <div>Thu</div> <div>Fri</div> <div>Sat</div> <div>Sun</div> <div>All</div> </div>																																			
Day of Month	<table border="1" style="width: 100%; text-align: center;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr> <tr><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td></tr> <tr><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td></tr> <tr><td>29</td><td>30</td><td>31</td><td>All</td><td></td><td></td><td></td></tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	All			
1	2	3	4	5	6	7																														
8	9	10	11	12	13	14																														
15	16	17	18	19	20	21																														
22	23	24	25	26	27	28																														
29	30	31	All																																	
Enabled	Yes																																			
Run as User	Demo Admin																																			
Last Run																																				
Created By																																				
Last Update																																				

[Save](#)
[Back](#)
[New](#)
[Clone](#)
[Delete](#)

#### Most Recent Runs

There are no recent runs to show

On this page the user is allowed to choose a job type, and other relevant parameters like the time, the day requirements, and if the job is enabled or not.

One relevant parameter here is the "When" parameter. If this parameter is set to "Cyclical", the selected "Every" value will be intended as the interval between different executions of the Job. If "When" is set to "Once a day" instead, the "Time" value is intended as the actual time of intended execution.

So for example,

- If "When" is set to "Cyclical" and "Every" is set to "5m" the job will be executed every five minutes.
- If "When" is set to "Once a Day" and "Time" is set to "00:05", the job will be executed at five minutes past midnight.

Another relevant parameter is the "Day of Week" parameter. If we select only "Monday" for example, the Job will be executed only on Mondays.

The same goes for the "Day of Month" parameter. If we choose 2,5,13 for example, our Job will only be executed on the 2nd 5th and 13th day of the month.

The "Day of Week" and "Day of Month" conditions are mutually exclusive, so if we set "Monday" and then "5", our "Monday" choice will be deleted and the scheduled job will only consider the Month Day option "5".

The "As User" parameter indicates which user will be impersonated when the Job is executed automatically. The user can only set itself as the user or, if the user is editing a Scheduled Job created by another user, the creator of the Job.

## Configuring IVR and DID/DNIS names

Users holding the keys USR\_IVR and USR\_DNIS can edit the list of known IVR and DNIS names.



This list is used to decode the display of known IVR selections and DNIS numbers. Both configuration pages behave the same way.



If you know that your *Support* IVR selection is 1-3-4, you could create an IVR entry of *134* that decodes to *Support (1-3-4)*. This surely makes the display easier to read.

Elements that are not listed in the editor are displayed with the string they are recorded with at the Asterisk level.

IVR entries are also used to decorate IVR menus in IVR path traversal analysis. You simply add the name of the IVR menu and the decoded value.

## Configuring CBTs (Computer Based Training)

Users holding the key USR\_CBTs can edit the list of known CBT URLs and names.



**CS** YourLogo Demo Admin | Ad

[Cfg Agents](#)
[Cfg Agent Groups](#)
[Cfg Locations](#)
[Cfg Outcomes](#)
[Cfg Features](#)
[Cfg Call Tags](#)
[Cfg Pauses](#)
[Cfg QA](#)
[Cfg Perf. Trk Rules](#)
[Cfg Reports](#)
[Cfg Exports](#)
[Cfg IVR](#)
[Cfg CBTs](#)

### CBTs

Filter:  Search Create New

Items found: 3 Page 1 of 1 <<< >>>

Name	Description	Key	Sent	Deleted
cbt1	Sales Imp.		35	
cbt2	Greetings basics		13	
cbt3	Effective greetings		0	

Items found: 3 Page 1 of 1 <<< >>>

Create New

## Loway

This list is used to populate the selection of available CBTs and to define the common URLs will be used in the task detail for each CBT sent. The URL can be used to point to any kind of material, as appropriate (e.g. PDFs, videos, interactive courses...). The URL may include a [U] token field that will be substituted with the login of the agent filling in the CBT, so that an external CBT system may keep track of why is filling it in or personalize the courseware.



If you modify the URL of an existing CBT on the list, all CBT URLs matching the same URL on the tasks tables, for all tasks not completed, are updated as well. This means that you can create a post-hoc descriptive CBTs out of URLs that are already used on the system.

Each CBT includes a read-only field that tracks the number of times the CBT was sent; this value is reported in the CBTs list. CBTs can be set active or not, so it's possible to put CBTs off-line when they become obsolete.

## Configuring paged call lists

It is possible to view details of calls (answered, unanswered) in a paginated order, rather than as a long list of data on a single page, allowing better readability when running a large result set.

To set this up, from the Home page you select \93Edit Reports\94 which leads to the \93Configure QueueMetrics reports\94 page (Cfg Reports tab). Click on the \93All reports\94 link and you will be shown all current reports. At the bottom of the screen select \93Create New\94.

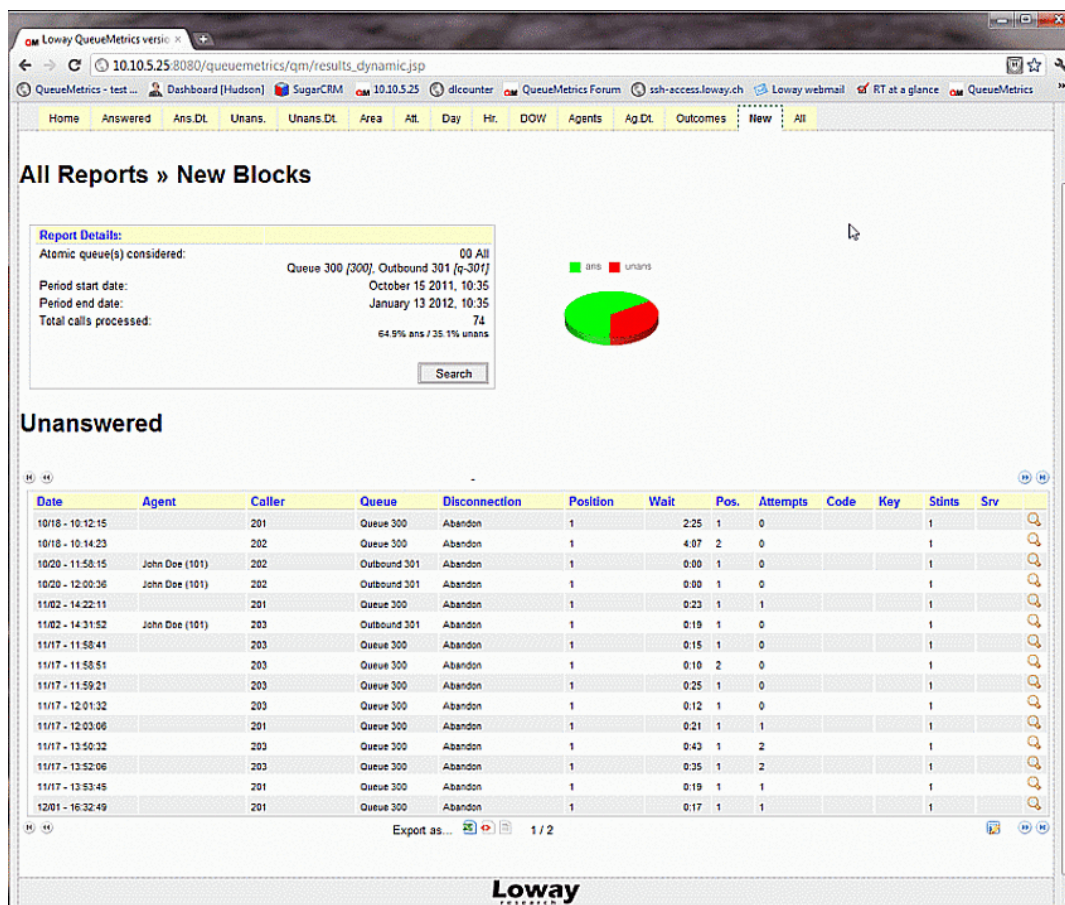
Enter a Short Name such as \93New\94 and a Title such as \93New Blocks\94 - you can choose different Name/Title if necessary. Also, the Visible in All Reports field should be set to \93Yes\94. Now Save it.

Go back and select \93New Blocks\94 which leads to the \93Report: All Reports >> New Blocks >> Items\94 screen. Select \93Create New\94.

The screenshot shows the Loway QueueMetrics web interface. The browser address bar displays the URL `10.10.5.25:8080/queuemetrics/qm_admin/cfg2_reports_13ite_edit.jsp`. The page header includes the Elastix logo and the QueueMetrics logo. A navigation menu at the top contains links for Home, Cfg Users, Cfg Queues, Cfg Agents, Cfg Agent Groups, Cfg Locations, Cfg Outcomes, Cfg Pauses, Cfg QA, Cfg Perf. Trk Rules, and Cfg Reports. The main content area is titled "Report: All Reports » New Blocks » Item details". It contains a form with the following fields: Title (Unanswered), Subtitle, Visibility key, Data Blocks (UD02 - Detail of unanswered calls), Sort order (110), Visible in "All reports"? (Yes), Created by, and Last update. At the bottom of the form are buttons for Save, Back, New, Clone, and Delete. The footer of the page displays the Loway Research logo.

Save it and select \93Back\94 - you will now see the newly-created item.

If we run a Report we will see a new tab called \93New\94, as shown below, where the calls are showing in pages, rather than as a listing (note the buttons to go forward/back and that the page is 1 of 2 pages)



In the image above, on the bottom right of the paginated list we can see a small icon just before the "next page" buttons. This icon allows us to add or remove columns within the displayed paginated listing. It is now possible to add the Music on Hold (MOH) columns "MOH events" and "MOH duration" which display the number of events where a caller was put on Hold with music and the total duration of such events. You can also add the columns "IVR duration/IVR path" which displays the time the caller spent within the IVR selections and the choices the caller made while going through the process. Adding the "DNIS" column allows to display the number dialed to reach the queue.

Date	Caller	Queue	Wait	Duration	Pos.	Disconnection	Handled by	Attempts	Code	Stints	Srv
10/18 - 10:12:15	201	Queue 300	0:00	0:07	1	Abandon	Agent	1		1	
10/18 - 10:14:23	201	Queue 300	0:00	0:07	1	Abandon	Agent	1		1	
10/20 - 11:58:15	John Doe (101)	202	Outbound 301	Abandon	1	0:00	1	0		1	
10/20 - 12:00:36	John Doe (101)	202	Outbound 301	Abandon	1	0:00	1	0		1	
11/02 - 14:22:11	201	Queue 300	Abandon	1	0:23	1	1			1	
11/02 - 14:31:52	John Doe (101)	203	Outbound 301	Abandon	1	0:19	1	0		1	
11/17 - 11:58:41	203	Queue 300	Abandon	1	0:15	1	0			1	
11/17 - 11:58:51	203	Queue 300	Abandon	1	0:10	2	0			1	
11/17 - 11:59:21	203	Queue 300	Abandon	1	0:25	1	0			1	
11/17 - 12:01:32	203	Queue 300	Abandon	1	0:12	1	0			1	
11/17 - 12:03:06	201	Queue 300	Abandon	1	0:21	1	1			1	
11/17 - 12:50:32	203	Queue 300	Abandon	1	0:43	1	2			1	
11/17 - 13:52:06	203	Queue 300	Abandon	1	0:35	1	2			1	
11/17 - 13:53:45	201	Queue 300	Abandon	1	0:19	1	1			1	
12/01 - 16:32:49	201	Queue 300	Abandon	1	0:17	1	1			1	

Available data columns

- ☒ Date
- ☒ Caller
- ☒ Queue
- ☒ Wait
- ☒ Duration
- ☒ Pos.
- ☒ Disconnections
- ☒ Handled by
- ☒ Attempts
- ☒ Code
- ☒ Stints
- ☒ Srv
- ☐ MOH events
- ☐ MOH duration
- ☐ IVR duration
- ☐ IVR path
- ☐ DNIS

OK

## Configuring the new Real-time Agents Page

Configuring the new realtime page involves to set some configuration keys that are inherited from the old agent realtime page and a new set of keys specifically designed to operate with the new realtime page. This chapter summarize the most relevant keys needed to properly configure the new realtime page and the integrated softphone. For more details on each key, please refer to the Appendix C, *System preferences* [383]

Enable/Disable the hotdesking:

```
default.hotdesking=86400
```

A value different than zero enables the hotdesking.

Defines a custom CRM page that will be open on each new taken call:

```
# Asterisk Unique ID visibility and related callback URL associated to the icon
default.crmapp=http://server/app?agent=[A]&unique=[U]&server=[S]&queue=[Q]&tst=[T]
default.crmlabel=CRM Page
default.showAstClid=true
realtime.agent_autoopenurl=true
```

Defines two other optional custom backgrounds:

```
# Custom web pages for the realtime agent page
realtime.agent_web1_url=http://www.queuemetrics.com/?agent=[A]
realtime.agent_web1_label=QueueMetrics
realtime.agent_web2_url=http://www.loway.ch/?agent=[a]
realtime.agent_web2_label=Loway
```

Optional backgrounds can be opened as popups by setting the property `agent.openUrlInPopup` to true in the Edit System Parameters page.

Custom background pages can also expand a set of placeholders that carry useful information.

Placeholder	Meaning
[A]	The agent's numeric code, e.g. <i>101</i> for <i>Agent/101</i>
[X]	The agent's extension, e.g. <i>300</i>

If CRM and/or custom backgrounds are not needed, it's possible to override the default background changing the key:

```
realtime.agent_background_url=http://serverurl/backgroundpage.htm
```

In order to use the integrated softphone, the steps required are: 1. Configure the SIP server and the WebRTC URL 2. Add, for each agent, a SIP username, password and SIP Realm authentication.

Depending on our setup (normal or clustered mode), the SIP server and the WebRTC urls are set by changing the below configuration keys. For a not clustered QueueMetrics install:

```
# Default keys for the sofphone definition
default.sipaddress=10.10.5.49
default.websocketurl=ws://10.10.5.49:8088/ws
default.rtcWebBreaker=true
```

For a clustered QueueMetrics install, be sure you're setting the following keys for each server in your setup:

```
cluster.serverX.sipaddress=10.10.5.49
cluster.serverX.websocketurl=ws://10.10.5.49:8088/ws
cluster.serverX.rtcWebBreaker=true
```

where `serverX` is the name of each server defined in the cluster configuration key.

Then, for each agent, set the SIP username, password and SIP Realm authentication through the Agent Configuration Pages, as explained in the section called “Configuring agents” [218]

The Logon Panel allows to pre-validate the agent code and the agent extension needed by the login/logout process. In order to validate these codes, a two set of keys have to be set:

```
# The regexp to validate agent codes
realtime.agentRegexp=1\\d\\d
```

```
#A regexp to validate extension codes
realtime.extensionRegexp=\\d\\d\\d
```

The Logon Panel allows to mark as read only the agent code field. This could be accomplished by setting the following key:

```
default.lockedAgentPopupCode=true
```

The list of available queues for each agent is defined by the following key:

```
realtime.dynamicLoginQueues=all
```

Relevant values for this key are:

- *assigned or registered*: the list of available queues shows only the queues where the agent plays a defined role (i.e. is a main/spill/wrap for these queues)
- *all*: the list of available queues shows all the defined queues, without taking care of the agent role (but filtered by visibility key)

Agents can insert pauses through the Pauses panel. Pauses without a specified pause codes can be rejected by setting the following key:

```
default.pausecoderequired=true
```

Agents can grade taken calls only if they hold the QA\_TRACK key.

## QueueMetrics configuration wizard

In order to save time and make sure that QM is always up-to-date with the underlying Asterisk configuration, it is possible to run a wizard that will load the following data straight from Asterisk configuration files:

- Which queues are in use, and their configuration
- Which agents are being referenced, their name and how they belong to the various queues

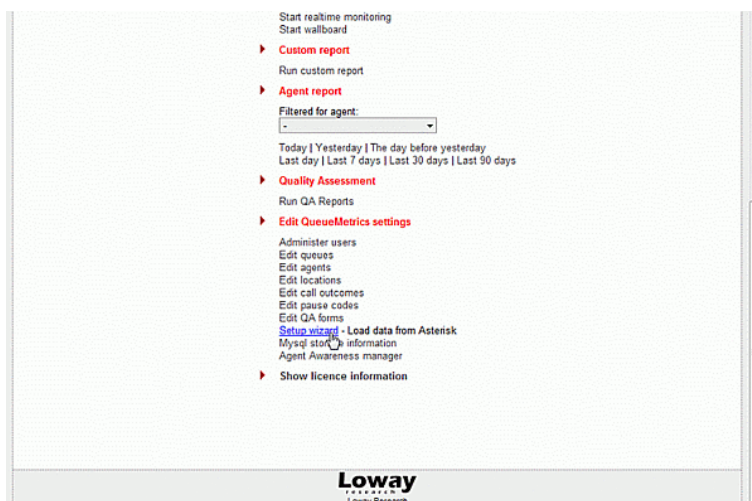
It is also possible to automatically create users out of the defined agents, so that they can log-on to QueueMetrics with the very same password they use to log-on to Asterisk.

In order for the wizard to be run, the user must hold the grants to administer users, edit queues, edit agents, and must hold the CONFIG key too.

If the user holds the required keys, the label "Setup wizard" will be shown on the front page:







By clicking on it, the administrator will be lead to the first step of the wizard.

At the top of this page is a dropdown menu that defines where asterisk configuration could be found. Actually the wizard is able to read information from:

- File
- Single machine Asterisk Manager Interface
- Clustered machines through Asterisk Manager Interface
- Asterisk realtime database
- Asterisk queue log file

By selecting the "File" source, the three edit boxes will let the administrator able to specify the local paths for the agents.conf, queues.conf and the users.conf file.

By selecting "Queue Log File" as source, the associated edit box will let the administrator able to specify the local path for the queue\_log file.

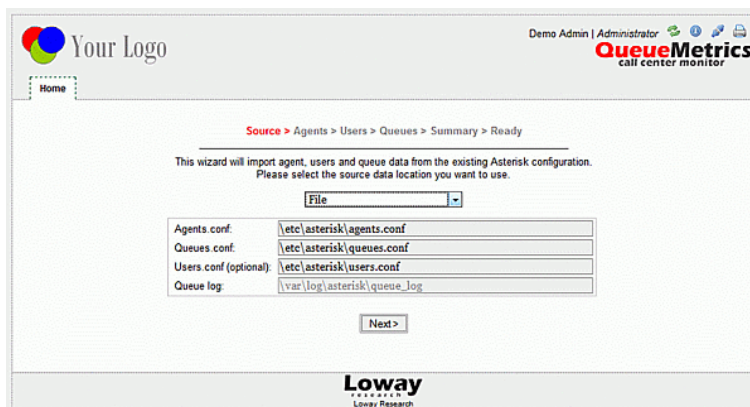


The users.conf file is optional and could integrate the information stored in the agents.conf file. The agents.conf file, instead, is not required only if the users.conf is present.



If you don't have the users.conf or the agents.conf file, you can leave in the edit boxes their default values and the system will be able to skip it if not found.

For sources different than "File", or "Queue Log File", the wizard will use some configuration options to know how to reach the required information. More details can be found in the section called "Configuring system preferences" [257] and in Appendix C, *System preferences* [383].



Source > Agents > Users > Queues > Summary > Ready

This wizard will import agent, users and queue data from the existing Asterisk configuration. Please select the source data location you want to use.

File

Agents conf:


Queues conf:

Users conf (optional):

Queue log:

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When you have selected the source you want to be read, click on *Next* button. You will be redirected on the validation page. This page will inform you if the provided sources were successfully read or, in the worst case, it will show you a message reporting an explanation of the error found.

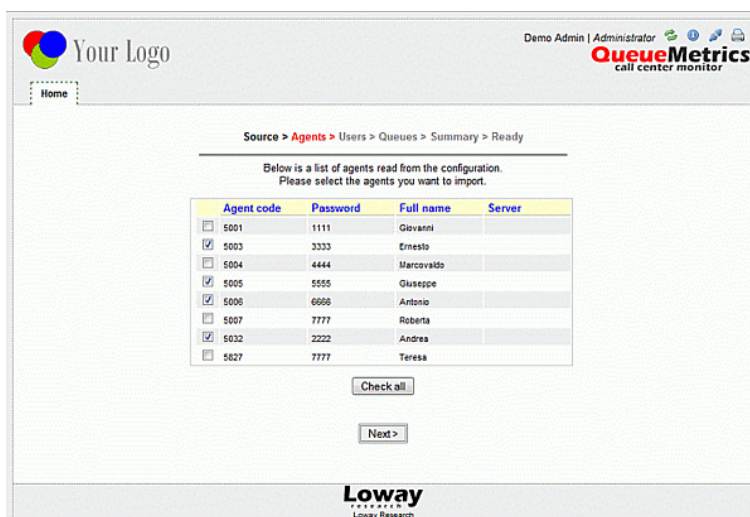


Source > Agents > Users > Queues > Summary > Ready

The specified sources have been successfully read.

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If the validation fails, clicking on *Next* button you'll be forwarded back to the first step, otherwise, you'll be redirected to the next step.



Source > Agents > Users > Queues > Summary > Ready

Below is a list of agents read from the configuration. Please select the agents you want to import.

Agent code	Password	Full name	Server
<input type="checkbox"/> 5001	1111	Giovanni	
<input checked="" type="checkbox"/> 5003	3333	Ernesto	
<input type="checkbox"/> 5004	4444	Marcovaldo	
<input checked="" type="checkbox"/> 5005	5555	Giuseppe	
<input checked="" type="checkbox"/> 5006	6666	Antonio	
<input type="checkbox"/> 5007	7777	Roberta	
<input checked="" type="checkbox"/> 5032	2222	Andrea	
<input type="checkbox"/> 5027	7777	Teresa	

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The wizard will scan the available agents and presents you a list of agents to be created or updated. By default, this wizard will try not to modify an agent or a queue that is already present in QM, that is the found data will be shown but unchecked. Check on the items to include/exclude them as needed.



If no agents will be selected, by clicking on *Next* button the wizard will skip the next step and will forward you directly to the queue selection step. If at least one agent was selected, instead, when you click on *Next* button you'll be redirected to the window shown below.

Agent code	Password	Full name	Server
<input checked="" type="checkbox"/> 5003	3333	Ernesto	
<input checked="" type="checkbox"/> 5005	5555	Giuseppe	
<input checked="" type="checkbox"/> 5006	6666	Antonio	
<input checked="" type="checkbox"/> 5032	2222	Andrea	

If the corresponding QM users, for selected agents only, are not present, they are created automatically by this mask.

Please note that if the wizard is not able to read the password associated to a specific user (because the password is not specified in the configuration files or because the wizard is reading information from AMI or realtime, or the queue log file, where password for agents are not shown) it will use the following rules:

- For each new user added, a default password will be forced to be equal to their agent code
- For each user to be updated (i.e. already present in the QueueMetrics database) a default password will be shown in the mask but it will never be used to overwrite the already present one.

Queue name	Wrap-up time	Server
<input checked="" type="checkbox"/> TechnicaSupport	50	
<input checked="" type="checkbox"/> Sales_Dep	20	

The queues will be created or updated as needed; existing queues will not usually be overwritten without explicit user permission.

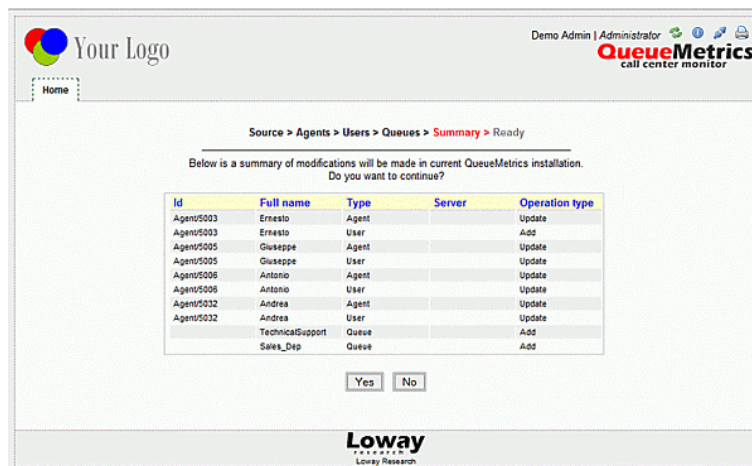


A queue will be automatically checked to be updated if at least one of its agent member was selected to be updated and/or added.

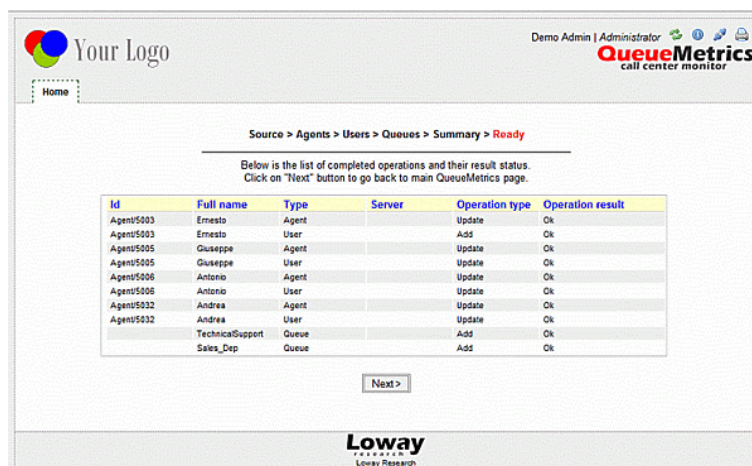


When updating a queue, the spilloff and queue members lists will be generated looking at the penalties associated to the agents read from the sources. If an agent is already present

in a member or spilloff list, but it was not selected to be updated, he will not removed and/or moved from any list.



If you click to the *Next* button you'll be redirected to the page above reported. This page will display a summary of the QueueMetrics database updates that have been scheduled to be performed. Clicking on the *Yes* button, the scheduled actions will be run and you will be redirected to the last page where a table listing the related operations results will be presented. Clicking on *No* button, instead, you'll be forwarded back to the first wizard step.



The QueueMetrics database is now updated with the information found in the selected sources. You can go back to the home page clicking on *Next* button.

## Unattended QueueMetrics configuration and update

QueueMetrics could be updated and configured by means of external http queries made in a known format. This is really interesting for setting up a cron job to be completed sometimes during the day. When QueueMetrics receives external http queries, it will perform all the configuration wizard steps together (see the section called "QueueMetrics configuration wizard" [251]) assuming default answers. This will result in a background synchronization between your asterisk boxes and the QueueMetrics database. To be able to run periodic QueueMetrics update, you need:

- A QueueMetrics user holding the CONFIG key
- A command line script able to perform http queries

The URL to be used to start the unattended configuration system has to be formatted as follow:

```
http://qmaddress/queuemetrics/autoconf_Robot.do?user=demoadmin&pass=demo \
&stype=0&agents=/etc/agenti.conf&queues=/etc/code.conf&users=/etc/users.conf
```

The meaning of specified parameters is below reported:

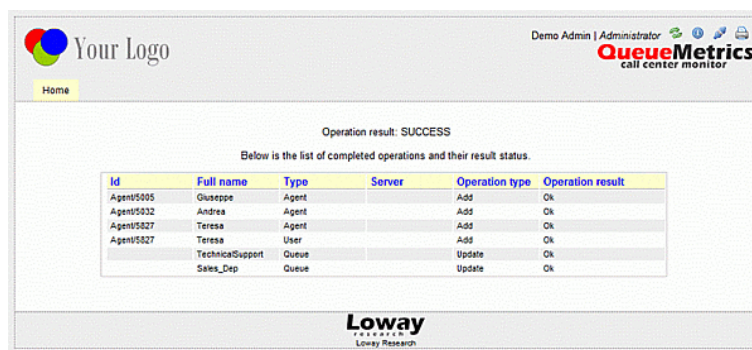
- *user*: the username to be responsible for the update process
- *pass*: the password associated to specified username
- *stype*: defines what type of source you want to use and it could assume the following values:
  - **0**: File. If no other parameters were specified, the wizard will read the files defined in the default configuration.
  - **1**: Single Machine Asterisk Manager Interface. The wizard will read information from the machine specified in callfile.dir key.
  - **2**: Clustered Machines Asterisk Manager Interface. The wizard will read information from the machines specified in the standard cluster definition.
  - **3**: Asterisk realtime. The wizard will read information from the database specified in the configuration.
  - **4**: Asterisk queue log file. The wizard will read information from the provided queue log file.

The *user*, *pass* and *stype* are mandatory; the other parameters are optional and have no meaning when the requested source is different from "file".

The other parameters are:

- *agents*: specifies the asterisk agents configuration file (and it's read only when the "File" source is specified)
- *queues*: specifies the asterisk queues configuration file (and it's read only when the "File" source is specified)
- *users*: specifies the asterisk users configuration file (and it's read only when the "File" source is specified)
- *qlog*: specifies the asterisk queue log file (and it's read only when the "Asterisk Queue Log" source is specified)

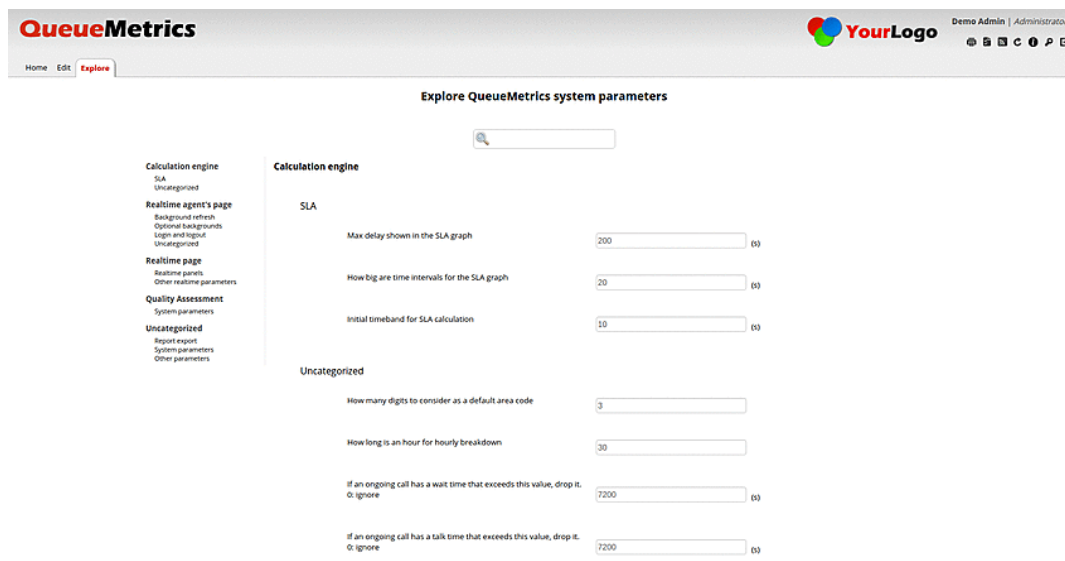
When QueueMetrics terminates the procedure, it will answer with a result page where the term "SUCCESS", or "FAIL", will be present reflecting the operation success status. In this page will be also present a list of the performed operation (and their result status). An example page is reported below:



## Configuring system preferences

System preferences can be edited by editing a text file called *configuration.properties* located in the WEB-INF directory of the QM webapp. The absolute path on your system can be found by looking at the **System path** property on the Licence page.

Since QueueMetrics 15.10 system preferences can be edited through the "Explore system parameters" page under the Administrative tools by users holding the EDIT\_CFG security key.



This page lists the most useful configuration options and allows an administrator to change their values through a set of GUI elements. Allowed values are already listed and default values are marked with an asterisk. Through the search box located on the top center side it is possible to limit the number of shown options to easily focus on the wanted options.

The system Parameters can be filtered by value, by the parameter description or by the actual parameter name. When searching for a parameter, QueueMetrics will filter out all the non-matching parameters, displaying only the ones relevant to the research.

The various settings are organized in a hierarchical fashion, with all the keys divided in categories and features. Categories are the most comprehensive groupings, they are written in bold and represent the different aspects of your QueueMetrics system. Each category is then divided in Features resembling the different functionalities that belong to a particular category

at the bottom of this hierarchy, we find the actual parameter keys and their linked current values.

There are three different types of Parameters:

- **Multiple Choice Values:** this type of parameter key can only accept a specific list of values, these will be listed in a drop-down menu.
- **Numeric Values:** this type of parameter key can only accept numerical values, sometimes even within a certain specific range.
- **Free-Text Values:** this type of parameter key can accept any value.

On the left side of the screen there is the System Parameters Sidebar. This sidebar is an overview of all the Categories and Features in the page. To jump to a specific category one can simply click on one of the different category names.

### Calculation engine

SLA  
Uncategorized

### Realtime agent's page

Background refresh  
Optional backgrounds  
Login and logout  
Uncategorized

### Realtime page

Realtime panels  
Other realtime parameters

### Quality Assessment

System parameters

### Uncategorized

Report export  
System parameters  
Other parameters

A complete list of preferences can be found in the chapter Appendix C, *System preferences* [383].

Once a preferences value is changed, it is enough for the user to log off and log on again; restarting the servlet container is not needed.



You can check the current set of system preferences from the the section called “Using the DbTest Diagnostic Tools” [262] page.

## Installing the AGAW runner

Once your copy of QueueMetrics is correctly installed, the Queue Runner can be run using a script that is available as `WEB-INF/mysql-utils/agaw-runner/agaw-runner.sh` under the QM directory.

This file must be edited to set its running parameters, that are:

```
JAVA=/usr/local/queuemetrics/java/bin/java
```

Path to the java virtual machine. Please point to a Java JDK version 8 or newer (OpenJDK is fine). The default path points to the default JDK that comes with the automatic QueueMetrics installation.

```
VMOPTS=-server -Xmx256M -Xms256M
```

The options for the Virtual Machine. Should be okay for most servers.

```
USER=demoadmin
```

```
PASS=demo
```

The username and password of a user the transactions will be run under. This should be a regular user or an administrator with visibility to all queues to be selected.

```
JDBC="jdbc:mariadb://127.0.0.1/qmueuemetrics?zeroDateTimeBehavior=convertToNull&am  
jdbcCompliantTruncation=false&user=queuemetrics&password=javadude"
```

The JDBC URL to connect to the same database as the main QueueMetrics instance (see your *web.xml* file).

```
QMPATH= /usr/local/queuemetrics/webapps/queuemetrics-1.5.0
```

The system path to the local QueueMetrics installation. You can find it on the local Licence page.

```
ITER=3
```

The number of iterations that will be run by the Java process before terminating and spawning a new Java process. This is done so that there is no problem with potential memory leaks, as the JVM is periodically rebuilt. A higher ITER count means more iterations using the same JVM and avoids the burden of reloading classes and libraries.

```
IDLE=2000
```

The idle time in milliseconds between one interaction and the other.

```
RUNLOG=false
```

```
RUNLOGDIR=/root/runlog
```

If RUNLOG is set to TRUE, a detailed run log will be created under the RUNLOGDIR. This directory must be writeable by the Java process and MUST be cleaned periodically - enabling this feature causes a lot of information to be written. See the section called “Debugging with Runlogs” [261].

```
QMARCH=$JARLIB/loway-tpf-155p.jar
```

```
QMJAR=$JARLIB/QueueMetrics-1.5.0.jar
```

```
REDRPC=$JARLIB/redstone-xmlrpc-1.0.jar
```

These are the names of the Java classes bundles that contain the local version of QM and of its TPF architecture. These must match the ones under WEB-INF/lib or you will get "Class not found" errors on startup. In a standard QueueMetrics release, QMARCH and QMJAR items are correctly set by the build system to match the current JARs.

```
SERVLET=/usr/local/queuemetrics/tomcat/common/lib/servlet-api.jar
```

This points to the servlet API used by your Tomcat installation. The default path is okay for a standard QM installation.



Once you set everything up, you can simply set the script executable and start it to see its output.

```
chmod a+x agaw-runner.sh
./agaw.runner.sh
```

Please note that **the script will loop indefinitely**, so it must be stopped through a **kill -9** command.

## Installing the database clean-up jobs

The AGAW subsystem produces a great number of old / obsolete / informative log data that is meant to help diagnosing problems, but that can end up filling your disks pointlessly.

There are currently two ways to run database purging jobs:

- There is a button from the main AGAW screen, and
- Through a modular HTTP call, meant to be run through scheduled cron jobs

In order to specify parameters for this activity, you should add the following lines to your *configuration.properties* file:

```
# Oldest obsolete run to keep when running an optimization, in minutes
dbmaint.agaw_oldestRun=30
```

```
# Oldest obsolete log to keep when running an optimization, in minutes
dbmaint.agaw_oldestLog=30
```

```
# Oldest obsolete broadcast entries to keep when running an optimization, in minutes
dbmaint.agaw_oldestBroadcast=180
```

Once you set up the parameters above as preferred (maybe starting with a couple of hours and then see if it is too much / too few) you add the following call to an hourly cron job:

```
wget http://server/qm/qm_sys_optimize.do?O_L=user&O_P=pass&O_C=AGC
```

Where *user* and *pass* belong to one administrative user.

The O\_C parameters takes one or more of the following parameters:

Parameter	Meaning	Warnings
AGC	Purge AGAW tables	Might block for a few seconds
AQL	Optimize queue_log table by reordering data	Will block; run daily or weekly when system not in use
OQL	Optimize queue_log table	Might block for a few seconds
OAG	Optimize AGAW tables	Might block for a few seconds
OTB	Optimize other QM tables	

The calls to the **qm\_sys\_optimize** transaction are made to be human- and machine-readable, so you might want to run the first time in a browser.



You might want to run an hourly cleanup job plus a nightly/weekly general cleanup and optimization job. They all will likely block the tables they are optimizing for a perceivable time, so do not run them at peak time when users are actually running QM.

## Installing the AGAW client facades

The client facades are installed with the main QueueMetrics app, so they will work if the main QM app is working. The only customization must be made in a file named *agaw.properties* that resides under WEB-INF/

```
client.refresh=7000
```

The timeout (in milliseconds) that will lead the client to refresh information on the page. 0 means no refreshing, or user-driven refreshes. The lower this value, the higher the load will be on the AGAW facade server.

```
client.sparkurl=http://chat.myserver:9090/webchat/jivelive.jsp
```

This is an absolute link to the jivelive.jsp page (a part of Spark Fatspath) that should live on the same server for security reasons. If no URL is passed, there is no "Chat now" section in the clients. To avoid cross-site scripting problems, this works best when both QM and FastPath are installed on the same server.

```
client.sparkuser=supervisors@workgroup.chat
```

The virtual user that will be used for Spark Fastpath "Chat Now" button.

As of version 1.5, there is only one available facade that "mimics" the behavior of the XUL facade and it is called Plain HTML. You can access it at the address [http://server:8080/queuemetrics/agaw/facades/plain\\_frame.jsp](http://server:8080/queuemetrics/agaw/facades/plain_frame.jsp)

Please note that accessing the facade when logged in QueueMetrics is likely to cause unexpected session termination of the QM session - if you must access it with QM open, use a separate browser.

## Setting up the AGAW activation key

The default version of the AGAW system comes with a default activation key that will let you test the system with two agents only. You can ask Loway for a time-limited, unlimited-agents demo activation key for the whole AGAW subsystem.

If you try to run the AGAW loader for more agents than the licensed ones, you get an error message on the system log.

The AGAW activation key can be installed in the *agaw.properties* file.

```
# License key for the Agaw Runner
runner.activation=.....
```

The AGAW activation key will be picked up immediately when the Runner restarts, and licensing information will be printed on the standard output.

## Debugging with Runlogs

Runlogs are text files that contain the very details calculations for each run are based upon, so they make it possible to spot from where the figures displayed in the AGAW browser come from.

In order to run this, it is necessary to:



- Enable this feature in the *agaw-runner.sh* script
- Create a cron job to delete the generated files, e.g. nightly or weekly, as the result is extremely verbose
- Make it possible for the administrative users to fetch the files remotely, e.g. via a WinSCP client

When this feature is turned on, when administrative uses happen to find some incorrect data, they should:

- Take a screenshot of the incorrect data
- Write down the run-id
- Fetch the text file called *agawrun\_XXXXX.txt* that is under the RUNLOGDIR directory, where XXXXX is the run-id

The run-id can be found as shown here:

The screenshot shows the QueueMetrics web interface. The title is "Agent Awareness: Run detail". Below the title is a "Back" button. The main content area contains two tables.

Run ID	Status	Queue	Start	End	Leader	Query (ms)	Insert (ms)
55	Current	Q OPS	09:03 - 11:19:50	09:03 - 11:19:51	0	250	109

N.Calls OK	N.Calls Lost	N.Calls On	N.Agents	N.Wait	Max wait	Avg wait	ACL	Avg wrap	SPH	OCPH	CPH	OCONV%	CONV%
8	0	9	2		0	0.00	0.00	0.15	0.05	22.5	33.8	79.8	56.7%

**Agent activity**

Agent	ACL	Avg Wrap	SPH	OCPH	CPH	OCONV%	CONV%	N. calls	Logon	Last	P.Code
John Doe (101)	0.20	0.13	22.5	45.0	67.5	50.0%	33.3%	3	Logged off	-	
Mike Boo (102)	0.12	0.09	22.5	22.5	90.0	100.0%	25.0%	5	Logged off	-	

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## Using the DbTest Diagnostic Tools

The DbTest page, available at the address <http://127.0.0.1:8080/queuemetrics/dbtest>, will not only let you update the database, but also check a number of QueueMetrics subsystems. It is invaluable for debugging QueueMetrics installations where you suspect some problem may be.

The screenshot shows the QueueMetrics JDBC connection tester page. The title is "QueueMetrics JDBC connection tester". Below the title is a "Diagnostic tools" section with links to "View configuration", "SQL tester", and "SQL DDL inspector".

Your current configuration is:

- XML configuration file found at: `/usr/local/queuemetrics/webapps/queuemetrics-1.6.3.0-WEB-INF/web.xml`
- JDBC URI configured as: `jdbc:mysql://localhost/queuemetrics?autoReconnect=true&zeroDateTimeBehavior=convertToNull&jdbcCompliantTruncation=false&user=queuemetrics&password=javadude`

Under this configuration you are ready to run the JDBC connection tester

This wizard will guide you between steps required to check and update, if required, the QueueMetrics database. Please click on the button below to start the procedure

[Start database check](#)

Note: Access to this page is supposed to be restricted. You can turn off access to this page by setting `default.viewTechInfo=false` in the configuration properties file.

It is possible to completely turn off the DbTester page when not needed by toggling the *default.viewTechInfo* system property.

As of QM release 12.10 it is possible to access this page directly from the QueueMetrics Home page by selecting the *System diagnostic tools* link, which can be found within the available Administrative tools.

## Checking the current system configuration

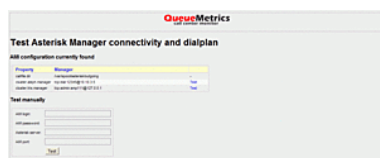


From this page, you can see:

- The current settings for all system configuration properties, as written in the configuration.properties file
- The current Java environment variables, usually defined at the JVM level
- The current memory and CPU settings for QueueMetrics, and the current memory usage. Note that Java will usually try to use all memory available before doing a cleanup, so seeing most memory in use does not necessarily mean that QM needs more.

## Checking an Asterisk Manager connection

It is possible to check an AMI connection to an Asterisk server.



As you can see, the AMI connections in your configuration.properties file are automatically read and can be configured at the touch of a button. As an alternative, you can manually enter the configuration parameters and see what happens.



In case the connection (like in the example above) displays an error, the complete stack trace is easily available for inspection. In case everything goes OK, QM will try to originate a call in order to check that the privileges are correct.

If the connection is possible, QueueMetrics will try to:

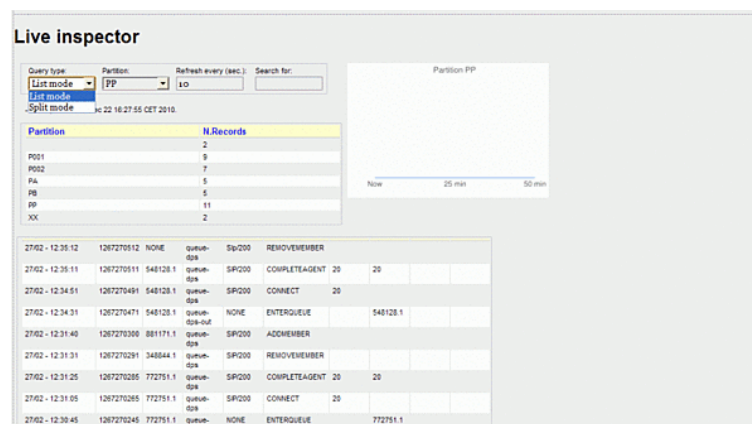
- Download and display the queuemetrics diplan, as displayed under "Configured Dialplan"

- Download and display the current queue configuration, as displayed under "Configured Queues". This shows the configuration as defined in queues.conf plus the current agent membership (static and dynamic).
- Download and display the current agent configuration (this only applies to agents as defined in agents.conf)

For further information on the AMI connection, see Configuring the AMI connection the section called "Configuring the AMI connection" [364] .

## Live inspector of the QueueMetrics database

It is possible to display the live status of the queue\_log table, to make it easy to see data as it is appended by Asterisk.



If you see "Partition null" in the graph, this means the queue\_log table is empty.

The last 20 lines of the queue\_log table for the given partition are displayed. In "Split mode" the last 10 lines of the queue\_log table about calls and the last 10 lines about agent status are displayed separately.

The display will reload automatically every 10 seconds.

It is possible also to search for a substring within a given partition, e.g. a uniqueid code, this may be very slow, and it usually requires a complete table scan. Do not do this repeatedly on a busy production box!

The Partition graph displays the number of events per minute in the last hour or so.

## RAM cache inspector

This page displays the current status of the different caching layers used within QueueMetrics.



The **log cache** is an object cache that stores, for each partition, event objects already processed. It must be turned on by setting `realtime.useRowCache=true`. For each partition the number of cached objects it is displayed as "Rows". If you use hotdesking you should see a number of objects in the "Hotd" section as well. All of your partitions should appear here.



the **log cache** will be used only if the storage type is SQL-based.

The **SQL cache** caches SQL results to some common queries. You can see the current cache size (it is usually quite small), the total number of requests, how many of them were answered ("Cached fresh"), how many of them had the query repeated ("Cached stale") and the overall cache efficiency. In a busy call center this should be around 70-90%.

The **String cache** counts the number of string instances that are currently cached. Values in the 100,000 - 1 million element range are not uncommon.

All caches are designed to be emptied when working in order to reclaim memory, so you can safely click on "Clear caches" even while QM is running.

## System audit log inspector

QueueMetrics keeps track of a number of activities that happen on the system; for example, every time a user logs on or off, this fact and the related IP address is added to the audit log.

Administrators who hold the key USR\_SYSLOG can access the audit log from *Home Page* → *View Audit Log*.

Date	User	Session Id	Action	Text 1	Text 2	Text 3	Text 4
2011-02-04 14:46:22	demoadmin	A6928A5903AF776E24422D28DC3F0A78	Logon	demoadmin	127.0.0.1		
2011-02-04 10:35:06	demoadmin	41FEFB0525BF2A2B417CD3B6D75B647B	Logoff	demoadmin	127.0.0.1		
2011-02-04 10:34:22	demoadmin	41FEFB0525BF2A2B417CD3B6D75B647B	Logon	demoadmin	127.0.0.1		
2011-02-04 10:34:16	demoadmin	9B2375D8901DDCCEA4CA6E94BBS1A4F	Logoff	demoadmin	127.0.0.1		
2011-02-04 10:31:45	demoadmin	9B2375D8901DDCCEA4CA6E94BBS1A4F	Logon	demoadmin	127.0.0.1		
2011-02-04 10:31:36	demoadmin	87457F59B001486CB0C0536387F65928	Logoff	demoadmin	127.0.0.1		
2011-02-04 10:19:55	demoadmin	87457F59B001486CB0C0536387F65928	Logon	demoadmin	127.0.0.1		
2011-02-04 10:19:50	demoadmin	526AD1483D058B8DDCF415FFAF3A3EF6	Logoff	demoadmin	127.0.0.1		
2011-02-04 10:19:21	demoadmin	526AD1483D058B8DDCF415FFAF3A3EF6	Logon	demoadmin	127.0.0.1		
2011-02-04 10:19:18	demoadmin	7DAD2EF17FF93D79FC0CB1EE7D2BBB17	Logoff	demoadmin	127.0.0.1		
2011-02-04 10:11:40	demoadmin	7DAD2EF17FF93D79FC0CB1EE7D2BBB17	Logon	demoadmin	127.0.0.1		
2011-02-04 10:11:27	demoadmin	83F06BABD07B1818DA2B953D08EBD7FF	Logoff	demoadmin	127.0.0.1		
2011-02-04 10:02:46	demoadmin	83F06BABD07B1818DA2B953D08EBD7FF	Logon	demoadmin	127.0.0.1		
2011-02-04 10:02:42	0	776685E4FA39E19D9C600BD320C90649	Logoff		127.0.0.1		
2011-02-04 10:02:40	demoadmin	776685E4FA39E19D9C600BD320C90649	Logoff	demoadmin	127.0.0.1		
2011-02-04 09:48:05	demoadmin	776685E4FA39E19D9C600BD320C90649	Logon	demoadmin	127.0.0.1		
2011-02-04 09:48:02	demoadmin	097D682CA984527DDF408DD8966C2163	Logoff	demoadmin	127.0.0.1		

The page displayed is very simple and only allows searching for a given time interval.



A number of different records are tracked throughout the system - see the Appendix Appendix D, *Audit log records* [406] for complete details.



On a busy system with 50+ agents, this log may get large fast; as it does not get deleted automatically, you should keep track of the *arch\_syslog* table size and delete it when it is too large.

## QueueMetrics configuration Synchronizer

The Synchronizer module is a functionality which goal is to assist the user in configuring QueueMetrics' queues and agents. What the module does is the following:

- Reads a QueueMetrics configuration from a defined source.
- Reads QueueMetrics' current configuration
- Compares the two configurations, producing a list of actions that, if executed, will change the current configuration into the desired one.
- Presents these actions to the user, who can then review them and eventually enable/disable them.
- Execute all the enabled actions at the end of the review process.

## Sources

The Synchronizer module can read configurations from the following sources:

- Queue log file.
- Agents.conf and queues.conf files.
- AMI connection with one or many Asterisk PBXs.

Source > Configuration > Actions > Result

---

The Synchronizer will read the existing Asterisk configuration, computing the actions needed to configure QueueMetrics accordingly.  
Please select the source data reader you want to use.

Queue Log File ▾

Create, Update, Delete, Cre ▾

**Asterisk configuration:**

Agents.conf:

Queues.conf:

Users.conf (optional):

**Queue log:**

Queue log:

Next >

## Read Configuration

Once a source is selected, the Synchronizer module will start analyzing it. When finished, it will present the user with the configuration data read from the source.



Source > Configuration > Actions > Result

This was the configuration read from the file

ID	NAME	INFO 1	INFO 2
		-	-
agent/101		Agent/101	
agent/200		Agent/200	
agent/201		Agent/201	
agent/32		Agent/32	
300		300	300
301		301	301

Next >

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The Synchronizer will then inspect QueueMetrics' Database and properties and determine the current QM configuration. When the reading is complete it will compare the new configuration with the current one, producing a series of actions that will transform the present configuration in the new one the user selected.

## Actions

These actions will then be presented to the user, who can decide to enable/disable some of these actions. When the user is done, the Synchronizer will start applying the actions that were allowed and QueueMetrics configuration will be transformed in the desired one.

Source > Configuration > Actions > Result

These are the actions that will be taken.

Enabled?	Type	Description
<input checked="" type="checkbox"/>	CREATE	Agent ID: agent/32
<input checked="" type="checkbox"/>	DELETE	Agent ID: agent/700
<input checked="" type="checkbox"/>	DELETE	Queue ID: 400

Next >

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## Result

Finally, after the actions are taken, the Synchronizer will show the result of it's actions by rendering the resulting configuration.

Source > Configuration > Actions > **Result**

This was the snychronization result.

ID	NAME	INFO 1	INFO 2
		-	-
agent/32		Agent/32	
agent/201		Agent/201	
agent/200		Agent/200	
agent/101		Agent/101	
300		300	300
301		301	301

Ok

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---

# Chapter 12. The QueueMetrics Platform model

Platforms are the way QueueMetrics is able to connect to different models of PBXs; each platform encapsulates the logic required to exchange data with the underlying PBX.

## Generic concepts

A Platform is composed of a number of swappable components that encapsulate all interaction with the underlying PBX.

Those components let you define the way QueueMetrics:

- pulls data from the PBX ("Ingestor")
- analyzes and stores data sent from the PBX ("Storage")
- interacts with the PBX ("PBX Actions")
- drives an outbound dialer ("Dialer")
- listens to stored recordings ("PM Recordings")
- listens to live calls ("PM Listen")

Each platform is defined through the *configuration.properties* file by setting the appropriate properties.

Platform feature	Main controlling property	Notes
Ingestor	-	Not yet implemented.
Storage	default.queue_log_file	
PBX Actions	platform.pbx	
Dialer	platform.dialer	
PM Recordings	audio.server	
PM Listen	audio.liveserver	

These components are meant to be "mix-and-match", so that you can e.g. use the same audio recordings mechanism with totally different storage engines.

## Defining system properties for members of a cluster

Unless otherwise specified, in the case you are running a clustered system, you can have "default" settings and then separate settings for each machine in the cluster.

For example, if you are trying to read a configuration property called "my.prop" and you are on a cluster server called "alpha":

- first, a property called *cluster.alpha.my.prop* is read
- if not found, the property *my.prop* is read

- if not found, the default value is used.

## Supported platforms

The following is a list of supported platforms.

### Classic

This is the "classic" locally-hosted QueueMetrics platform. Data can be stored on a flat-file, uploaded to the QueueMetrics database or read out Asterisk's own tables. In order to perform actions on the PBX, the custom QueueMetrics dial-plan is required for all actions (Actions: Classic) or only for outbound dialing (Actions: DirectAMI).

Platform feature	Suggested modules	Notes
Ingestor	Not needed (upload via qloader/uniloader)	
Storage	SQL, flat-file, Cluster	
PBX Actions	CLASSIC / DIRECT_AMI	Default
PM for recorded calls	LocalFilesByDay, Oreka, MultiListener	
PM for live calls	ClassicQMLListenerRT, Oreka	

### QueueMetrics-Live

This is the QueueMetrics-Live platform. Data is stored on the SQL database and is uploaded through Uniloader. Actions to be performed are sent back to Asterisk through the Uniloader and require custom dialplan added to the local PBX.

As there is no local audio storage, we suggest using the CallCabinet audio recording platform for audio storage.

Platform feature	Suggested modules	Notes
Ingestor	Not needed (upload via uniloader)	
Storage	SQL/Cluster	
PBX Actions	CLASSIC_LIVE	Also enabled if CLASSIC and default.webloaderpbx=true
PM for recorded calls	CallCabinet	
PM for live calls	ClassicQMLListenerRT	

### Enswitch

The Enswitch platform is able to receive data from an Integrics Enswitch 3.13+ system, perform actions on the system and listen to audio recordings.

The Enswitch platform requires separate licensing for its activation.

Platform feature	Suggested modules	Notes
Ingestor	Not needed (upload via native loader)	
Storage	SQL	
PBX Actions	ENSWITCH	
PM for recorded calls	EnswitchPlatformListener	
PM for live calls	ClassicQMLListenerRT	Will work.

## Ingestors

No ingestors are currently used.

## Storage models

At the moment, QueueMetrics only supports its classic storage model, either reading from the database or through a flat-file.

## PBX Actions

### Classic PBX Actions

This is the default platform for QueueMetrics and it is able to perform all QueueMetrics interactions to the PBX. Actions are executing by calling the *extensions\_queuemetrics.conf* dial-plan, that must be available on the target machine.

Depending on the target PBX, you may need to edit the supplied dialplan to

#### Configuration

To turn it on you need to set:

- *platform.pbx* to CLASSIC (or just leave blank).

Available actions are controlled in configuration.properties by setting:

- *default.hotdesking* to a number > 0 to enable hotdesking

Each action is controlled by a stanza in configuration.properties, for example to set call outcomes:

```
callfile.calloutcome.enabled=true
callfile.calloutcome.channel=Local/12@queuemetrics/n
callfile.calloutcome.extension=10
callfile.calloutcome.context=queuemetrics
```

More details are available in the section called “Enabling Agent’s page actions” [351].

### QMLive PBX Actions

In this mode, actions are performed by queueing them and waiting for *uniload* to fetch and perform them. Actions are expressed as calls to the *queuemetrics* dialplan, that needs to be available on the target PBX.

This platform is used in QueueMetrics Live to allow remote actions.

### Configuration

To turn it on you need to set:

- *platform.pbx* to CLASSIC\_LIVE
- or set *default.webloaderpbx* to *true* in Classic mode

## DirectAMI actions

In DirectAMI mode, actions performed on the PBX do not require a piece of dial-plan to be included; QueueMetrics will connect directly to the AMI port of your Asterisk system (as determined by *callfile.dir* and its *cluster.\*.manager* equivalents in cluster mode) and will perform the actions you require.

This mode is slightly less flexible than the dialplan-based Classic mode, but:

- It is way easier to set up, as you just need to specify once the channel formats for your PBX
- It is more efficient when you need to join or leave multiple queues, as actions are batched into a single transaction

### Tracking outbound

As it is not currently possible to originate outbound calls tracked by QueueMetrics without using the dialplan, if you need to do manual outbound you still need to include the custom *'extensions\_queuemetrics.conf'* dialplan; QueueMetrics will then dial extension 28@*queuemetrics* for manual outbound dialing.

Since Uniloader 0.4, it is possible to track outbound calls made by QueueMetrics without using the dialplan if you have outbound tracking enabled. This feature is not turned on by default and has to be set manually. This feature is at the moment experimental.



Outbound dialing is turned off by default and must be turned on manually if needed.

### Configuration

To turn it on you need to set:

- *platform.pbx* to DIRECTAMI

The following configuration options are available:

- *platform.directami.verbose* whether to dump all AMI interactions to the system log (default: false)
- *platform.directami.agent* the way an agent channel is supposed to be (default: "Agent/\${num}")
- *platform.directami.extension* the way an agent extension channel is supposed to be (default: "SIP/\${num}")
- *platform.directami.localext* the channel used for chanspy (default: "Local/\${num}@from-internal")

- *platform.directami.transfer* the transfer destination, in the form *ext@context* (default: "\${num}@from-internal")
- *platform.directami.outbound.enabled* whether outbound dialing, though dialplan or Uniloader, is enabled (Default: false)
- *platform.directami.outbound.stanza* the point in the dialplan that should be called when doing outbound (Default: "28@queuemetrics")
- *platform.directami.outbound.usetracker* will use the Uniloader to track outbound call. (Default: false)
- *platform.directami.outbound.trackerdialout* the point in the dial-plan that will be used to generate outbound calls with the Uniloader (Default: "\${num}@from-internal")
- *platform.directami.spyoptions* the options you want to use for the Asterisk application ChanSpy when listening to calls (Default: "b"). By changing these options, you can have whispers or barge instead of plain spy.
- *platform.directami.cmdseparator* the separator used for parameters in your Asterisk version. Defaults to comma (",") and should be changed to pipe ("|") for very old Asterisk systems (pre-1.8)
- *platform.directami.optimizedagentchannel* is the format of the agent channel when it is live and you want to spy on it. If blank, uses the same physical agent channel, based on the agent code or the extension code depending on whether you are in hotdesking mode or not. Defaults to blank.



In all channel configuration, the string `${num}` is replaced with the local agent code or extension, as appropriate.

When running in cluster mode, you can have configuration that is specific for one single cluster member and it will override the general one - see System Properties for Clustered Systems [269].

### Examples

Example for a FreePBX system running without hotdesking enabled. The agent is logged on to the queue as "Local/XXX@from-internal", that is rewritten by QueueMetrics as "Agent/XXX", and matches a SIP extension with the same code.

```
default.hotdesking=0
```

```
platform.pbx=DIRECTAMI
platform.directami.agent=Local/${num}@from-internal
platform.directami.transfer=${num}@from-internal
platform.directami.outbound.enabled=true
platform.directami.localext=Local/${num}@from-internal
platform.directami.optimizedagentchannel=SIP/${num}
platform.directami.verbose=false
```

This is an example for a FreePBX system running with hotdesking enabled. The agent is logged on to the queue as "SIP/YYY" but appears in QM as "Agent/XXX" and a proper hotdesking record is written to match the two entities.

```
default.hotdesking=86400
```

```
platform.pbx=DIRECTAMI
```

```
platform.directami.agent=Agent/${num}
platform.directami.extension=SIP/${num}
platform.directami.transfer=${num}@from-internal
platform.directami.outbound.enabled=true
platform.directami.localext=SIP/${num}
platform.directami.verbose=false
```

This is an example for a FreePBX system running with hotdesking enabled but without dialplan. Unloader must be running in "tracker" mode with "outbound" enabled.

```
default.hotdesking=86400
```

```
platform.pbx=DIRECTAMI
platform.directami.agent=Agent/${num}
platform.directami.extension=SIP/${num}
platform.directami.transfer=${num}@from-internal
platform.directami.outbound.enabled=true
platform.directami.outbound.usetracker=true
platform.directami.outbound.trackerdialout=${num}@from-internal
platform.directami.localext=SIP/${num}
platform.directami.verbose=false
```

### Some Notes on Spying

When spying, QueueMetrics always tries to connect the supervisor to the agent's channel. If the live agent channel appears under a different name from the one used to create it (e.g. if the agent channel was a Local/XXX@ctxt that has been optimized to SIP/XXX), then you need to supply the parameter *platform.directami.optimizedagentchannel* in order to let QueueMetrics find the correct agent channel to spy on.

When spying, you can try different settings of *platform.directami.spyoptions* to configure the behavior:

- *b* (spy): Supervisor is able to listen to the on-going call, but cannot talk. This is the default.
- *w* (whisper): Supervisor is able to listen to the on-going call and can talk to the agent; caller does not hear supervisor.
- *B* (barge): Supervisor is able to listen and speak to all parties on the on-going call

## Enswitch actions

The Enswitch actions module will connect over HTTP/HTTPS to an existing Enswitch 3.13+ system and perform actions.

The following actions are supported:

- Setting outcomes and call features
- Hanging up and transferring calls from the RT page
- Spying inbound calls from the RT page
- Logging-on and logging-off agents to queues

### Configuration



To turn it on you need to set:

- *platform.pbx* to ENSWITCH
- *default.hotdesking* to 0

You will also need to copy a special activation key under *WEB-INF/lib* and restart QueueMetrics.

The following configuration options are available:

- *platform.enswitch.http.baseurl* is the main URL for the Enswitch system
- *platform.enswitch.http.login* an API user log-in
- *platform.enswitch.http.password* an API user password
- *platform.enswitch.guiaddmember* whether ADDMEMBER/REMOVEMEMBER actions are available (default: false)
- *platform.enswitch.verbose* whether all Enswitch interactions should be logged in full to the standard log (default: false)
- *platform.enswitch.lookbackClosedCalls* for how long a recently-closed call should be searched on CDRs (default: 7200 seconds)
- *platform.enswitch.spyPrefix* the default prefix to use to initiate a chanspy (Default: \*91)
- *platform.enswitch.bargePrefix* the default prefix to use to initiate a barge-in (Default: \*92)
- *platform.enswitch.qpriority.main* the queue priority for an agent being logged in with priority MAIN (default: 8)
- *platform.enswitch.qpriority.wrap* the queue priority for an agent being logged in with priority WRAP (default: 6)
- *platform.enswitch.qpriority.spill* the queue priority for an agent being logged in with priority SPILL (default: 4)

To listen to audio recordings, you also need to configure the EnswitchPlatformListener (see PM Enswitch platform [286]).

### Selecting chanspy vs barge-in

As QueueMetrics has only one "spy" action available, the choice of whether it is a "normal" spy or a barge-in depends on the number you enter as your local extension.

If the extension is prefixed with a "!", then a barge is attempted using the default prefix defined in *platform.enswitch.bargePrefix*; otherwise the prefix specified in *platform.enswitch.spyPrefix* is used.

Prefixes are set as in the *Features -> Feature prefixes* menu of your Enswitch system.

## Outbound dialer

The outbound dialer is controlled through the *platform.dialer* configuration property.



Allowed values are:

- NONE - no dialer available
- WOMBATDIALER - Connects to an instance of WombatDialer. This parameter is inferred if the property `default.wombat.agent_recall_enabled` is set to true.

## None

No dialer is available, all dialer actions are turned off.

## WombatDialer

QueueMetrics is able to connect to a WombatDialer instance to schedule calls.

This must be provided in the form of four system parameters (that can be set in the Edit System Parameters page).

- `wombat.url`: The URL of our WombatDialer instance.
- `wombat.username`: A valid username associated with a user with the needed grants.
- `wombat.password`: The password for the user.

### Edit QueueMetrics system parameters

```
wombat.url=http://10.10.5.156:8080/wombat
wombat.username=demoadmin
wombat.password=demo
default.wombat.agent_recall_enabled=true

# This key is used only as a placeholder for CVS versioning information
00_version=SID: configuration.properties, v 1.83 2015/09/28 13:30:25 lenz Exp $

# This is the canonical URL for this QM installation - please set
url.qm=

# This is an ALIAS to the default URL for stateless sessions. Some features (AGAW, tasks) may not work if you don't set
this.
url.rss=

# This is the internal id (ex. 7, 49....) of the preselected default queue, leave blank for no default queue.
default.queue=1

# This is the default queue log file.
default.queue_log_file=sql:P001

#When the realtime page for an agent is computed, the queue log is NOT read in its entirety but only the last 'n' bytes.
realtime.max_bytes_agent=65000
```

Save Back

After saving, you need to log off and on again for the parameters to be loaded.



For more information of how to integrate WombatDialer within QueueMetrics, please see The Recall Scheduler the section called “Recall Scheduler” [195].

## Listening to calls using Pluggable Modules (PM)

Pluggable modules are used in two areas:

- Listening to recorded (closed) calls, i.e retrieving recordings
- Listening to live calls, i.e. setting up a channel "spy" feature.

In order to control which module is called, two configuration properties are set:

- *audio.server* controls the module to do find recorded calls
- *audio.liveserver* controls the module to set up live call listening

Each configuration property is set to the complete name of a Java class that implements the required server. *Such names must be set exactly as described, or an exception will be raised.* Each module can then have its own configuration properties to control its own behaviour.

## PMs to match Recorded Calls

These PMs are used to find audio recordings.

### Plain old recordings: LocalFiles

<b>Module name:</b>	<b>LocalFiles</b>
Full Java Path:	it.loway.app.queuemetrics.callListen.listeners.LocalFiles
Properties used:	<i>default.monitored_calls</i> in a single-server environment, or <i>cluster.SERVER.monitored_calls</i> in a cluster
Available since:	1.4.7

This is the standard search method that comes with QueueMetrics. Basically, all directories under *default.monitored\_calls* are explored recursively, and all audio files matching the Asterisk ID of the main call that was queued are retrieved. Therefore the call files found can be zero or more.

This PM is sub-optimal for very large call centres, where the cost of scanning through all recordings (maybe on remotely mounted disks) could take a significant time. If you are in such an environment, see the *LocalFilesByDay* entry.

This PM is used by default if no other server is specified in the *configuration.properties* file.

### Large storage with recordings: LocalFilesByDay

<b>Module name:</b>	<b>LocalFilesByDay</b>
Full Java Path:	it.loway.app.queuemetrics.callListen.listeners.LocalFilesByDay
Properties used:	<i>default.monitored_calls</i> in a single-server environment, or <i>cluster.SERVER.monitored_calls</i> in a cluster  <i>audio.lookBack</i> for how many hours before or after midnight is a call

<b>Module name:</b>	<b>LocalFilesByDay</b>
	considered a "borderline" case (default 4).
Available since:	1.4.7

This PM works exactly like the *LocalFiles* one, but allows using placeholders in the file path; this way, you can set the default recordings directory to handle only a subset of all recordings.

For example, if you set *default.monitored\_calls* to */var/myrecordings/%YY-%MM/* when trying to listen to a call that was made on Jan 9, 2007 will expand to */var/myrecordings/2007-01/* therefore making the directory scanning much more manageable.

Valid placeholders include:

- %YY → the 4-digit year when the call was made
- %MM → the 2-digit month when the call was made
- %DD → the 2-digit day of month when the call was made
- %SE → in a clustered environment, the server name (all lower case)
- %QU → the queue name (all lower case)

Though this is unlikely, it is possible that a call gets recorded on a given day and then gets queued on a different day, e.g. for calls that happen around midnight. QM handles this case by double-checking all calls within a boundary of *n* hours from the midnight in both the days that are divided by that midnight. This behaviour can be set using the *audio.lookBack* property.

Asterisk can easily adapt to recording files in a way that is compatible with this storage model, like e.g.:

```
. . . .
exten => 999,n,Set(MONITOR_FILENAME=/audio-nas/${STRFTIME(${EPOCH},,%Y-%m/%d)}/cal
exten => 999,n,Queue(778,t,,)
. . . .
```

Will store audio files as:

```
/audio-nas/2011-03/10/call-123456.7890.wav
```

The nice part is that Asterisk will automatically create missing directories, as needed.

## Using an external server: ClassicXmlRpcRecordings

<b>Module name:</b>	<b>ClassicXmlRpcRecordings</b>
Full Java Path:	it.loway.app.queuemetrics.callListen.listeners.ClassicXmlRpcRecordings
Properties used:	<i>default.audioRpcServer</i> (non-clustered) or <i>cluster.SERVER.audioRpcServer</i> : The address of the XML-RPC server implementing the QMAudio.findStoredFile interface.
Available since:	1.4.7

This is the standard XML-RPC implementation and makes it easy to create a completely custom scheme to handle recordings. The output of this function must be a single URL that can either stream the audio file or launch a player to stream that call. This is completely user-configurable.

The details of how to write an XML-RPC server for the *QMAudio.findStoredFile* interface can be found on the XML-RPC guide for QueueMetrics. We ship a sample implementation of such a server in the *xmlrpc\_audio\_server.php* server that comes with QueueMetrics.

See also section the section called “Enabling XML-RPC call listening and streaming” [352].

## External audio recorder: OrekaWeb

<b>Module name:</b>	<b>OrekaWeb</b>
Full Java Path:	it.loway.app.queuemetrics.callListen.listeners.OrekaWeb
Properties used:	<p>* <i>oreka.jdbcUrl</i> points to the server where the OrekaWeb database is stored. Firewalls and MySQL user setup must allow a JDBC connection coming from the QueueMetrics server.</p> <p>* <i>oreka.sipHeader</i> is the name of the tag to be tracked in the Oreka system. If missing, it's <i>X-Unique-ID</i>.</p> <p>* <i>oreka.web</i> is the URL of an OrekaWeb application - QM uses Oreka's applets for video playback.</p> <p>* <i>oreka.playersize</i> lets you set the size of the player, e.g. "1024x780"</p> <p>* <i>oreka.mode</i>: set to "1" if running Oreka up to minor build number 2494, to "2" if newer.</p>
Available since:	1.5.1

This PM lets you offline all the audio recording to an Oreka system - see <http://oreka.sourceforge.net/>

This PM lets you playback audio (and optionally video) of recorder calls stored in Oreka. In order to listen to live calls, it is possible to use either some Asterisk-based method, e.g. *ClassicQMListenerRT* below, or an Oreka-based method like *OrekaWebRT* below.

It needs the JDBC URI to point to the Oreka database; the database must contain the following tables: *orktag*, *orksegment*, *orktape*, *orkservice*, *orktagtype*.



In order to have QueueMetrics associate the Asterisk call-ids correctly, you must configure Asterisk and Oreka to store the call-id of the main leg of the call, the one upon which the Queue() command is called.

## Propagating the SIP header

As Oreka is a passive recording solution based on SIP, and the call's UniqueId is used to match a call in QueueMetrics, it is necessary for you to add the UniqueId information to the SIP headers.

If/how this can be done depends on the kind of channels you have as members of the queue.

If you have static or dynamic SIP phones as members of the queue, e.g.

```
[myQueue]
....
member => SIP/1234
member => SIP/1235
```

you can simply use the following piece of dialplan:

```
....
exten => s,n,SIPAddHeader(X-Unique-ID: ${UNIQUEID})
exten => s,n,Queue(myQueue|t|30)
....
```

If instead you have other types of channels as members of the queue, e.g.

```
[myQueue]
....
member => Agent/101
member => Local/102@agents
```

then you need to store the UniqueID in an inherited variable, e.g.

```
...
exten => 411,2,Set(__MASTERID=${UNIQUEID})
exten => 411,3,Queue(myQueue|t|30)

[agents]
exten => _XXX,1,SipAddHeader(X-Unique-ID: ${MASTERID})
exten => _XXX,2,Dial(SIP/${EXTEN}|300)
```

This makes it possible to use Oreka in all common usage scenarios.

## Configuring event capture in Oreka

You need to modify OrkAudio's *config.xml*, under the *<VoIpPlugin>* section:

```
<SipExtractFields>X-Unique-ID</SipExtractFields>
```

And restart OrkAudio.

## Which version of Oreka do I need?

The minimal software you can use seems to be the commercial version (Oreca TR). This includes G729 Codec and Live Monitoring.

## Video playback

Oreca is able to capture and store along with the audio recording of the call a screen capture of the agent's workstation while the call was made. The importance of such a feature is obvious.

If a video recording is present for a given call, then the audio file will be followed by the string "[vid]" to show that it's a joint audio and video recording.

In order to play it back, QM will not stream it through a browser but will open up the VNC player that ships with OrkWeb; therefore you must configure the *oreka.web* property. The applet is not used in case of audio-only recordings.

## Advanced Oreka support: OrekaEncrypted

Module name:	OrekaEncrypted
Full Java Path:	it.loway.app.queuemetrics.callListen.listeners.OrekaEncrypted
Properties used:	<p>* <i>oreka.jdbcUrl</i> points to the server where the OrekaWeb database is stored. Firewalls and MySQL user setup must allow a JDBC connection coming from the QueueMetrics server.</p> <p>* <i>oreka.sipHeader</i> is the name of the tag to be tracked in the Oreka system. If missing, it's <i>X-Unique-ID</i>.</p> <p>* <i>oreka.web</i> is the URL of an OrekaWeb application - QM uses Oreka's applets for video playback.</p> <p>* <i>oreka.playersize</i> lets you set the size of the player, e.g. "1024x780"</p> <p>* <i>oreka.username</i> and <i>oreka.password</i>: the account used to access OrekaWeb</p> <p>* <i>oreka.mode</i>: set to "1" if running Oreka up to minor build number 2494, to "2" if newer.</p>
Available since:	12.04
Requires:	OrkWeb 1.4-2178 or newer

This PM is an advanced version of the *OrekaWeb* module, and it offers the same functionalities plus a few additional ones:

- Support for encrypted Oreka calls: calls can be stored in an encrypted format and will be decrypted dynamically by Oreka. The PM may handle encrypted and unencrypted contents at the same time.
- Support for audio-only playback through the Oreka player (a new link will let you open the player as well as download the file as was possible in earlier versions)
- Support for tags: call tags are passed to the Oreka player, and you can use the player to move back and forth between them
- QM acts as a proxy for all OrekaWeb contents

The same set-up instruction apply as per the OrekaWeb PM.

## Secure access

The OrekaEncrypted PM has QM act as a secure proxy for all Oreka contents:





- The OrekaWeb server can be invisible to the user (e.g on a private network);
- There are no more limitation for cross-domain downloading
- There is a double security check; first, when a file is requested, the proxy checks that this file belongs to the list of audio files that the current user just searched; then, QM will authenticate to OrkWeb and, if successful, will try and stream the file back to the client.
- For additional security, any audio/video file is streamed through a small content buffer that is constantly overwritten and that is immediately cleaned after usage; it is never written to disk on the QM server.

If you turn on encryption and authenticated downloads on the Oreka system, and use HTTPS to connect to QM, the result is a very secure audio server for your Asterisk system.

## Using multiple PMs at once: MultiListener

<b>Module name:</b>	<b>MultiListener</b>
Full Java Path:	it.loway.app.queuemetrics.callListen.listeners.MultiListener
Properties used:	<p><i>audio.multi</i> lets you define a set of PMs to be queried for files (enter their names, separated by pipe)</p> <p><i>audio.multi.*</i> specifies the properties of each listener.</p>
Available since:	1.7.0

This PM lets you query multiple PMs in the order you specify to look for the call you are looking for. A common scenario may be the following one:

- All calls are recorded to a local volume, e.g. */queues/audio*. This is where files just recorded are held.
- A nightly process compresses the files to MP3 and moves them to a large NAS device mounted under */mnt/nas*, where they are stored separated by day.

In order to retrieve calls, we want QM to first check in */queues/audio*; if nothing is found, then we will look under */mnt/nas/2010-11-23*. This can be implemented with the following configuration:

```
# define the PM and the search order
audio.server=it.loway.app.queuemetrics.callListen.listeners.MultiListener
audio.multi=loc|nas

# first PM: local calls
audio.multi.loc=it.loway.app.queuemetrics.callListen.listeners.LocalFiles
audio.multi.loc.default.monitored_calls=/queues/audio

# second PM: NAS storage
audio.multi.nas=it.loway.app.queuemetrics.callListen.listeners.LocalFilesByDay
audio.multi.nas.default.monitored_calls=/mnt/nas/%YY-%MM-%DD
```

What we do here is the following:

- We first define a MultiListener and tell it via the *audio.multi* property to actually query a PM called "loc" first and one called "nas" if nothing is found. You can have as many PMs as you need and you can set their names as you best see fit.

- We specify the PM to be used for "loc" in the *audio.multi.loc* property. Properties to be set for it are appended to the *audio.multi.PMNAME*. hierarchy, as we do in this example to set the *default.monitored\_calls* property.
- As you can see, you can have multiple PMs of the same type as well as different, and each can have their own configuration properties.

## (Obsolete) Pluggable Listener for Enswitch Platform Integration



This module is obsolete. Please use PM Enswitch platform [286] instead.

<b>Module name:</b>	<b>Enswitch</b>
Full Java Path:	it.loway.app.queuemetrics.callListen.listeners.thirdparty.Enswitch
Properties used:	<i>enswitch.serverclass</i> is the full qualified name of an external class code implementing the interface specified on next paragraph. We expect to have an external implementation resulting in a .class files (IntegrationExample.java in this example) stored in a suitable jar and/or classpath available to QueueMetrics. <i>enswitch.server</i> used to provide authentication on the remote server. <i>enswitch.user</i> used to provide authentication on the remote server. <i>enswitch.password</i> used to provide authentication on the remote server.
Available since:	12.5.4-418

### Exposed Interface

QueueMetrics expects to have in his classpath an implementation of the following interface:

```
public interface EnswitchRecording {  
    public String[][] getUrls(String host, String username, String password, S  
}
```

The getUrls should return a matrix containing the list of URLs associated to the specified callID. Each row in the matrix specifies:

- The URL at column 0
- The name (usually shown as clickable link by QueueMetrics) at column 1

## Pluggable Listener for CallCabinet Platform Integration

<b>Module name:</b>	<b>CallCabinetForQm</b>
Full Java Path:	it.loway.app.queuemetrics.callListen.listeners.CallCabinetForQmListener

<b>Module name:</b>	<b>CallCabinetForQm</b>
Properties used:	* default.callcabinet.customer_id used to provide authentication on the remote server. * default.callcabinet.site_id used to provide authentication on the remote server. * default.callcabinet.api_key used to provide authentication on the remote server.
Available since:	18.04.1

To make sure QueueMetrics looks for your recordings on your CallCabinet online repository, five parameters must be set.

- Your CallCabinetForQmForQM Customer ID.
- Your CallCabinetForQm Site ID.
- The Valid CallCabinetForQm API Key.
- The CallCabinetForQm Listener
- The HTML5 Audio Player has to be enabled (optional)

And you must make sure that the recordings are saved on CallCabinet with the CustomerInternalRef field set to the Asterisk Unique ID of the call used by QueueMetrics.

Go to Edit System Parameters and edit the following parameters:

- audio.server=it.loway.app.queuemetrics.callListen.listeners.CallCabinetForQmListener
- default.callcabinet.customer\_id=xxxx
- default.callcabinet.site\_id=xxxx
- default.callcabinet.api\_key=xxxx

audio.html5player=true

Make sure you replace the "xxxx" characters with your Customer ID, Site ID and API Key. The audio.html5player=true parameter instead, enables us to listen to the recordings directly on our browser.

Go back to the HomePage and take a look at any report containing some of the calls that are recorded.

### Queue details


Date	Caller	Queue	IVR	Wait	Duration	Pos.	Disconnection	Handled by	Attempts	Code	Stints	Srv
10/24 - 11:13:14	201	300	0:00	0:02	0:06	1	Caller	200	1			Q
10/24 - 12:03:58	201	300	0:00	0:01	0:04	1	Agent	200	1			Q
10/24 - 12:04:42	201	300	0:00	0:01	0:06	1	Caller	200	1			Q
10/24 - 14:08:20	201	300	0:00	0:01	0:02	1	Agent	200	1			Q

Export as...   Current page: 1 / 1

Clicking on the Call Detail Icon (the magnifying glass icon on the right), will show at the bottom that QueueMetrics retrieves the recordings related to that call's Call ID (Asterisk Unique Call ID).



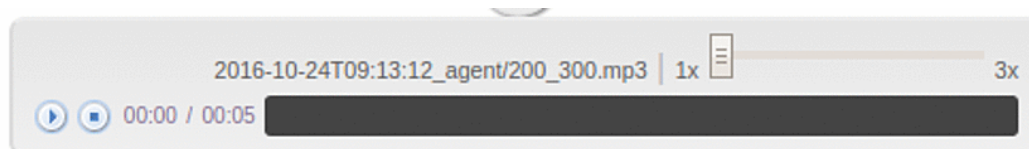
Caller ID:	201
Handled by:	agent/200
Duration:	6 sec.
Time in IVR before queueing:	0 sec.
Waiting time:	2 sec.
Original position	# 1
Disconnection cause:	Caller disconnected
Transferred to:	
Attempts:	1
Last Failed Attempt:	-
Bridged Channel:	1477300394.9
Stints:	1
URL:	
Status code:	
Tag:	
Srv	
DNIS	
IVR selection	

- 2016-10-24T09:13:12\_agent/200\_300.mp3 

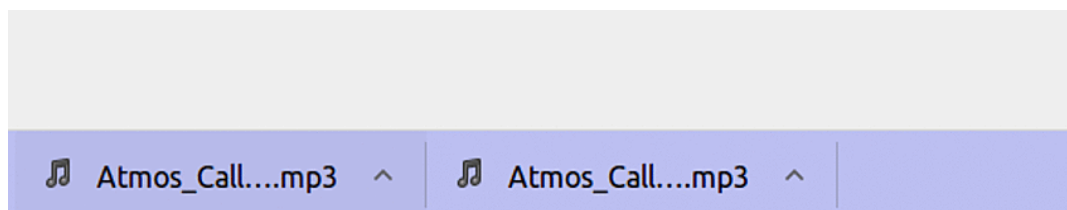
The name format QueueMetrics uses to represent a recording is the following:

DateTime\_agent\_queue.mp3

clicking on the Play icon just right of the recording name will stream the recording directly without downloading it.



To download it instead, one must click on the recording name.



## Cluster Mode

If QueueMetrics is working in Cluster Mode, it can manage recordings stored on different CallCabinet Sites.

This is because Cluster Mode allows the user to define different System Parameters for different PBXs.

we can define properties specific to each PBX Server, by using the following syntax:

- cluster.servername.callcabinet.customer\_id=xxxx
- cluster.servername.callcabinet.site\_id=xxxx
- cluster.servername.callcabinet.api\_key=xxxx

So, by using the prefix “cluster.ServerName.SystemParameter”, where ServerName is the name of the PBX (as defined in the cluster.servers system parameter) and SystemParameter is the name of the System Property to be set (e.g. “default.callcabinet.site\_id”), without the “default.” prefix, we can allow the same properties to have different values depending on the server we are currently monitoring.

## Pluggable Listener for the Enswitch platform

<b>Module name:</b>	<b>EnswitchPlatformListener</b>
<b>Full Java Path:</b>	it.loway.app.queuemetrics.callListen.listeners.EnswitchPlatformListener
<b>Properties used:</b>	The same properties used for the Enswitch PBX platform - see Enswitch PBX Actions [274]
<b>Available since:</b>	16.10.9

This listener is able to retrieve and download calls through the Enswitch 3.13+ API. Shares its configuration with the Enswitch Actions module.

## PMs to match Live Calls

These PMs are used to listen to live calls.

## Live calls through QueueMetrics: ClassicQMLListenerRT

<b>Module name:</b>	<b>ClassicQMLListenerRT</b>
<b>Full Java Path:</b>	it.loway.app.queuemetrics.callListen.RTlisteners.ClassicQMLListenerRT
<b>Properties used:</b>	<b>For listening to inbound calls:</b> callfile.monitoring.channel, callfile.monitoring.extension, callfile.monitoring.context;

<b>Module name:</b>	<b>ClassicQMLListenerRT</b>
	<b>For listening to outbound calls:</b> callfile.outmonitoring.channel, callfile.outmonitoring.extension, callfile.outmonitoring.context;  <b>In a single-server environment:</b> callfile.dir (points to a local call-file directory or a manager interface port);  <b>In a clustered environment:</b> cluster.SERVER.manager (points to each Asterisk server's manager interface port)
Available since:	1.4.7

This is the standard QM behaviour: when listening to inbound or outbound calls, a popup appears and asks for a local extension. That local extension is connected to the live channel so that the local user can listen to the ongoing call.

In order for this to work, the dial-plan on each Asterisk server must implement the correct logic - an example is given in the *[queuemetrics]* context that comes with QueueMetrics.

This PM is used by default if no other server is specified in the *configuration.properties* file.

## Live calls through an external module: ClassicXmlRpcListenerRT

<b>Module name:</b>	<b>ClassicXmlRpcListenerRT</b>
Full Java Path:	it.loway.app.queuemetrics.callListen.RTlisteners.ClassicXmlRpcListenerRT
Properties used:	<i>default.audioRpcServer</i> (non-clustered) or <i>cluster.SERVER.audioRpcServer</i> : The address of the XML- RPC server implementing the QMAudio.listenOngoingCalls interface.
Available since:	1.4.7

This is the standard XML-RPC implementation and makes it easy to create a completely custom scheme to handle live monitoring. The output of this function must be a single URL that will launch a player to stream that call. This is completely user-configurable.

The details of how to write an XML-RPC server for the *QMAudio.listenOngoingCalls* interface can be found on the XML-RPC guide for QueueMetrics. We ship a sample implementation of such a server in the *xmlrpc\_audio\_server.php* server that comes with QueueMetrics.

See also section the section called “Enabling XML-RPC call listening and streaming” [352]

## Live calls through Oreka: OrekaWebRT

<b>Module name:</b>	<b>OrekaWebRT</b>
Full Java Path:	it.loway.app.queuemetrics.callListen.RTlisteners.OrekaWebRT

<b>Module name:</b>	<b>OrekaWebRT</b>
Properties used:	<p><i>oreka.rtserver</i> is the master property that tells QM if Oreka is clustered or not</p> <p><i>oreka.web</i> is the URL of an OrekaWeb application - QM uses Oreka's applets for playback.</p> <p><i>oreka.rtserver.xxx</i> is used for clustered configurations.</p>
Available since:	1.5.2

This PM lets your supervisors monitor agents using a web-based interface provided by Oreka. The supervisors will simply click on a live call and it will be streamed to them through their browser (note: a window will open and will close immediately before the popup opens. This is expected behaviour).

In order for this PM to work, your system configuration must match these criteria:

- You should be using Callback agents, where the agent extension is correctly filled in at logon time
- Pop-up windows should be openable by QM - this feature is disabled by default in most modern browsers.
- You should also select a way for this PM to choose on which Oreka server the call must be listened on.

Do not forget to set the *oreka.web* property in any case in order to download the playback applet.

## Using only one Oreka server

If you are deploying only one Oreka server, you should set the address of the live listening port by setting *oreka.rtserver* to *fixed* and then entering the live streaming port as follows:

```
oreka.rtserver=fixed
oreka.rtserver.address=http://hostname:59120/?type=stream&localparty=#AGENTEXT#
```

This will work even on a clustered system, as long as there is only one Oreka server. Note how the agent extension is expanded in the string (see below for the full list of expansion tokens).

## Using a cluster of Oreka servers

If you have a set of Oreka servers (likely because you have a cluster of Asterisk servers), you can associate a separate Oreka server to each box in the cluster. You do so by setting *oreka.rtserver* to *cluster* and then entering the live streaming port for each member of the cluster, as follows:

```
oreka.rtserver=cluster
oreka.rtserver.aleph=http://ork_aleph:59120/?type=stream&localparty=#AGENTEXT#
oreka.rtserver.beth=http://ork_beth:59120/?type=stream&localparty=#AGENTEXT#
```

In this example, all calls processed on server "aleph" will be searched on server "ork\_aleph", while all calls processed on server "beth" will be processed on server "ork\_beth".

## Using multiple Oreka servers with UniqueID

If you have a set of Oreka servers that are not linked one-by-one to a set of Asterisk boxes, you can associate a separate Oreka server to each call in the cluster, by prepending a digit to the call's



UniqueID that will be used to know on which server each call is being handled. You do so by setting *oreka.rtserver* to *chandigit* and then entering the live streaming port for each member of the cluster, as follows:

```
oreka.rtserver=chandigit
oreka.rtserver.1=http://ork_aleph:59120/?type=stream&localparty=#AGENTEXT#
oreka.rtserver.2=http://ork_beth:59120/?type=stream&localparty=#AGENTEXT#
```

In this example, all calls which UniqueID starts with "1" will be handled by the "ork\_aleph" server, and all calls which UniqueID start with "2" will be queries on the "ork\_beth" server.

## Expanded properties

The following properties are expanded in the Oreka live listening URL:

- AGENTEXT is the numeric extension an agent is logged on from
- AGENTCODE is the code of the agent

---

# Chapter 13. Quality Assessment in QueueMetrics

QueueMetrics includes a Quality Assessment (QA) module that lets you:

- Define a set of metrics to be used for call grading
- Have the QA team grade calls while they're being processed or from historical recordings
- Run complete reports by queue and by agent

## Enabling QA monitoring

In order to use QA monitoring, you should have the following security keys assigned:

- **QA\_TRACK**: this key means that the person can input QA data. If this person has the keys to access historical calls or real-time calls, he will be able to fill-in QA forms. Individual forms can be further restricted by key-protecting them
- **QA\_REPORT**: this key means that the holder can access QA reports. Individual forms can be further restricted by protecting them with a reporting key as well.
- **USR\_QAEDIT**: this key means that the holder can modify and create QA reporting forms.

## Understanding Quality Assessment

The QA module in QueueMetrics was built in order for a specific QA supervisor to track the performance of agents on a given set of **metrics**. Each metric is expressed as a long description and has an unique **engagement code** (a short acronym up to 5 letters).

Metrics are user-definable and are clustered together in **forms**; a form can hold up to 130 metrics divided in up to 10 **metric groups**.

A single reporter can grade a call only once for each defined form; any attempt to grade a the same form for the same call multiple times will not be accepted.

For security reasons, **call grading data cannot be modified once input**, and forms with live data associated to them cannot be deleted from the system. In order to have a reduced set of metrics available if you use successive versions of a form over the period, it is possible to **close a form**, i.e. to avoid further input. Deletions, if any, will be performed at the database level by the system administrator.

Grading data is expressed as integer numbers between 0 and 100; grading all fields is mandatory, except for fields marked as "optional" in the form definition. The QA team can also input free text comments linked to a specific call.

It is possible to edit **thresholds** for different **levels** of QA grades, e.g. 0-25: *Issue*, 26-50: *Improvement required*, 51-75: *Meets expectations*, 76-100 *Exceeds expectations*. These values can be defined on a form-by-form basis, and make it possible to count the number of items that belong to each category and to use a colour code for immediate graphic representation.

# Grading calls

Grading data can be input while listening to the live call (Unattended monitoring) or while looking at the historical call details or through a particular formatted URL string.

## Grading calls on the real-time page

If an agent has the required grants, he will get the grading icon on the right of the "Calls being processed" table:

The screenshot shows the 'Realtime call center monitoring - 17:37:36' interface. It includes a top navigation bar with 'Home', 'Realtime', and 'Live' tabs. Below the title, there's a 'Queue(s): 00 All' section with buttons for 'Reload now', 'Hide calls', 'Hide agents', 'Show active queues', 'Show members only', and a 'Location' dropdown. The main content area features three tables:

Queue	N. agents	Ready agents	On pause	Unk	By	N. Calls waiting	On phone inbound	On phone outbound
all selected	1	0	0	0	0	0	1	0
Q DPS	1	0	0	0	0	0	1	0
Q Test	1	0	0	0	1	0	0	0

Below the first table is an 'Export as...' button. The second table is titled 'Calls being processed:'

Queue	Caller	Entered	Waiting	Duration	Agent	Srv
Q DPS	37	17:37:07	0:06	0:23	John Doe (101)	

Below the second table is another 'Export as...' button. The third table is titled 'Agents currently logged in:'

Agent	Last logon	Queue(s)	Extension	On pause	Srv	Last call	On queue
John Doe (101)	05/19 - 17:36:38			-			Q DPS

At the bottom, there is an 'Export as...' button.

The icon appears only when a call being processed is connected to an agent (as the point is rating the agent). By clicking on that icon, a popup will appear that lets you enter QA data. You should be listening to the call using the Unattended Monitoring icon in QueueMetrics or a different passive listening schedule as set up in your call center.

## Grading historical calls

In order to do the grading of historical calls, you proceed as is the case for audio recordings. If QA grading is enabled, the button "Track QA" will appear on the call detail popup, as in the picture below.

The screenshot shows a web application interface. At the top, there's a 'Report Details' section with fields for 'Atomic queue(s) considered', 'Period start', 'Period end', and 'Total calls p'. Below this is a 'Queue de' section with an 'Export as...' button. A 'Call detail' popup window is open, displaying call information: Asterisk Call ID: 1205769500.4, Date and time: 17/03/2008 - 16:58:26, Caller ID: 37, Handled by: agent/101, Duration: 1180 sec., Waiting time: 9 sec., Original position: # 1, Disconnection cause: Caller disconnected, Transferred to: http://www.pangea.va.it?ext=12. The popup has 'Close' and 'Track QA' buttons. In the background, a table lists call records with columns: Date, C, Q, DPS, 1.00, 1.21, 1, Caller, Handled by, Attempts, Code, Stints, Srv, and a magnifying glass icon.

Date	C	Q	DPS	1.00	1.21	1	Caller	Handled by	Attempts	Code	Stints	Srv	
03/17 - 16:58:26	37							John Doe (101)	0		1		
03/17 - 17:18:24	37							John Doe (101)	0		1		
03/17 - 19:42:49	37							John Doe (101)	0		1		
03/31 - 15:58:18	37	Q	DPS	1.00	1.21	1	Caller	John Doe (101)	0		1		
04/11 - 18:29:28	37	Q	DPS	0.03	0.03	1	Caller	John Doe (101)	0		1		
04/21 - 13:36:23	37	Q	DPS	0.06	4.42	1	Caller	John Doe (101)	0	lc	1		
04/21 - 13:41:31	37	Q	DPS	0.06	0.44	1	Caller	John Doe (101)	0	lq	1		
04/21 -	37	Q	DPS	0.03	0.26	1	Caller	John Doe	0	lq	1		

By clicking on the button, the call detail popup will close and a QA form will load.

## The input form

If multiple QA forms are available for this QA person, they will be able to select the correct form by selecting the "Input form" field on the top right.



QA Grading - Mozilla Firefox

http://localhost:8084/proj\_netbeans/qa/popup\_qa\_grade.jsp

Level	Max	Items
Issue	25	3
Req. Impr.	50	1
Meets exp.	75	0
Exceeds exp.	100	2

**Overall Performance**

Section 1 avg:	17.4
Section 4 avg:	0
Section 5 avg:	0
Total score:	0
Avg:	0

**Input form**

Form: Monitoring Form (2)

Status: -

**Call details**

Start time: June 26 2009, 18:02

Queue: Glasto\_nbury

Agent: Martin

Agent Group: Purple Flag

Caller: 834374.1

AsstClid: 834374.1

**Audio recordings**

Close

Notes

Print

0:00

Code	Description	Status	N/A	Value
	<b>Call Opening</b>			
ASS	Answer the call in a helpful tone / with energy	Issue		Option B
CLE	Built rapport With customer/courteous and friendly/used customers name	Req. Impr.		40
CLO	Conveyed empathy/sympathy/enthusiasm where appropriate	Issue		20
COU	Did rep mention his or her name clearly to customer?	Exceeds exp.		80
CH1	Did representative mention his/her name, obtain customer's name, and answer the call with enthusiasm?	Exceeds exp.		<input checked="" type="radio"/> Yes <input type="radio"/> No
CH2	Was representative polite and exhibit confidence?	Issue		10
CH3	Did representative empathise with the customer and avoid dead air?	?	<input checked="" type="checkbox"/>	
CH4	Did representative use the appropriate call outcome?	?		-
CH5	Did representative appreciate the customer for calling and use the appropriate call closing?	?		-
CR1	?Was accurate and relevant information provided to the customer?	?		Best
CR2	?Did representative collect/confirm correct customer information?	?		More
CR3	?Did representative take ownership/ express willingness to help and portray a positive company image	?		Less
CR4	?Was representative able to identify the customer's problem?	?		
CR5	?Was call resolved?	?		
DBC	Was assurance given to client for assistance?	?		
DEE	How accurate and relevant was all the information provided?	?		
ENE	Positive controlled conversation and conveyed confidence	?		
HEL	Created ownership/accepted responsibility avoid placing blame	?		
HOI	Reassured customer, concern/expect and reassured	?		

Done

The top-left box shows the current threshold values for each levels (please note that the label associated to each level is form customizable from the form configuration page. See the section called “Configuring QA forms” [230] for further information). While you input data into the form, you can see that the number of items that fall into each category and the average and total scores are updated in real-time.



For each section is reported the overall section score and average. Zero values are marked in red. This simplifies the discovering of session shortcuts (See the section called “Configuring QA items” [234] for further details) for already scored forms.

As soon as the form has been graded and saved, a set of checkboxes are shown on the right column of each level. These checkboxes could be used to show/hide questions falling in each specific range.

Level	Range	Items	
Issue	0 - 25	0	<input checked="" type="checkbox"/>
Req. Impr.	26 - 50	0	<input checked="" type="checkbox"/>
Meets exp.	51 - 75	2	<input checked="" type="checkbox"/>
Exceeds exp.	76 - 100	3	<input checked="" type="checkbox"/>
Overall Performance			

On the top-right box, after the Input form field, a form *Status* dropdown reports the current form status. Actually this dropdown is read only and their status could be changed modifying the dataset stored in the database with an external application. Following the form status you can see the call details: when it started, on which queue it was processed, the agent processing it, the caller-id and the Asterisk internal call-id.

On the top right there are three buttons:

- **Close** is used to exit the form without saving changes
- **Notes** is used to toggle between scores and notes associated to the call
- **Print** is used to start the print process. The print procedure will show scores and notes on the same page.

Then a general purpose "timer" widget is shown. You can use it, for example, to track the hold time when listening to a call conversation.

At the bottom of the form is the button **Save**, that is used to exit the form saving changes. This button will appear only when data are in a consistent state that allows saving.

If you load a saved form, it will be shown in read-only mode.

On the bottom part of the form there are the different items to be graded, grouped into a set of categories. If a box contains invalid data (i.e. something that is not a number between 0 and 100 included) it will be displayed in yellow and the form shall not be saved.

Following the form definition, items can be graded by:

- inserting a score value
- selecting the appropriate value from the dropdown menu
- checking the proper Yes/No options.

Items that are not mandatory have an associated **N/A** checkbox; when checked, it disables the related score value and lets the user save a form without specifying any score for that item. If all fields within a given section are defined as **N/As**, then the Overall Performance will display the entire section with an **N/A** Average total value.

Items reported in *italic* are **shortcut** items; that is, if a shortcut item totalizes a score that falls into the "Issue" category, the overall form score will be set to 0.

The value set in some items may control the set of items that are enabled for the current form; that's why the form is evaluated again after each user input.

Is possible to assign a free text note or a set of notes to each question in the form. We call this type of notes as "per-question" notes. Per-question notes could be added clicking on the icon on the right side of each question and typing the text in the shown popup. Questions with already associated per-question notes are marked with a different icon as per the following figure:

Level	Range	Items
Issue	0 - 25	0
Req. Impr.	26 - 50	0
Meets exp.	51 - 75	0
Exceeds exp.	76 - 100	0

Overall Performance	
Section 1 (Avg)	0.0
Section 2 (Avg)	0.0
Total score:	0/1300
Avg.	

Code	Description
Section 1	
S1I1	Section 1,
S1I2	Section 1,
Section 2	
S2I1	Section 2,
S2I3	Section 2,
S2I5	Section 2,

Date	User	Notes
2013-02-21 12:10:20.0	demoadmin	Too loud voice

For a thorough description of how Forms and Items can be set up, please see the chapter Configuring QA forms the section called "Configuring QA forms" [230] .

When a form is saved, it appears as per the following figure:



localhost:8084/qa/popup\_qa\_grade\_ajax.jsp

Level	Range	Items	
Issue	0 - 25	0	<input checked="" type="checkbox"/>
Req. Impr.	26 - 50	4	<input checked="" type="checkbox"/>
Meets exp.	51 - 75	2	<input checked="" type="checkbox"/>
Exceeds exp.	76 - 100	5	<input checked="" type="checkbox"/>

Overall Performance			
Engagement	440	73.3	
Resolution	200	50.0	
Business needs	90	90.0	
Total score:	730/1100		
Avg.	66.4		

Input form	
Form:	Quality Assurance
Status	-
Call details	
Start time:	March 13 2015, 12:20
Queue:	A300
Agent:	John Doe (101)
Agent Group:	NewHired
Caller:	204
ExtId:	1426245621.339
Input form:	Quality Assurance
QA Analyst:	Demo Admin
Date:	2015-06-02 14:11:14.0
Audio recordings	

Code	Description	Status	N/A	Value	
<b>Engagement</b>					
SCG	How positive clear and eager was the use of the Corporate greeting?			Very Clear	
COU	How well did the rep display courtesy?	Meets exp.		60	
ENE	Rate rep's energy level throughout the call			Sufficient	
TON	How well did the rep vary the tone and speed of speech?			Satisfying	
CLE	How clear and concise was the rep's vocalization and pronunciation?	Exceeds exp.		80	
HOL	Did the rep use the correct hold procedure?	Exceeds exp.		80	
DEE	Did the rep avoid dead air?	Exceeds exp.		80	
LIS	Did the rep display active listening skills?	Exceeds exp.		80	
CLO	How positive and appropriate was the call closure phase?	Meets exp.		60	
<b>Resolution</b>					
ASS	Was assurance given for client's assistance?			No	
REL	How accurate and relevant was the information provided?	Req. Impr.		50	
HEL	Was additional help offered with enthusiasm?	Req. Impr.		50	
PRO	Was the problem resolved on first contact?	Req. Impr.		50	
TIM	Did the rep manage time effectively?	Req. Impr.		50	
<b>Business needs</b>					
DBC	Was DBC done?	Exceeds exp.		90	

It basically shows the same data that was input, but it cannot be changed anymore (except for users holding specific keys as defined by Removing or Editing QA forms the section called "Removing or Editing QA forms" [298]) and the supervisor information is shown. If there are known audio recordings for this call, they are shown under the "Audio recordings" box.

The form now displays a **Toggle N/As** button which allows to show/hide the Non Applicable specified fields.

Pressing the **Notes** button, the form will change as per the following figure:

**QA Grading - Mozilla Firefox**  
localhost:8084/queuemetrics/qa/popup\_qa\_grade\_ajax.jsp

Level	Range	Items
Issue	0 - 25	0
Req. Impr.	26 - 50	0
Meets exp.	51 - 75	0
Exceeds exp.	76 - 100	0

**Overall Performance**

Section 1 (Avg)	0.0
Section 2 (Avg)	0.0
Total score:	0/1300
Avg.	0.0

**Input form**

Form::

Status:

**Call details**

Start time: December 13 2012, 10:46  
 Queue: 300  
 Agent: John Doe (101)  
 Agent Group: Default  
 Caller: 202  
 AstClid: 1355391890.77

**Audio recordings**

**Timer**  
0:00

This is a no

**Add**

User, Date	Question	Notes
2013-02-21 12:10:20.0 demoadmin	JUReportForm S213	Too loud voice
2013-02-21 12:09:32.0 demoadmin	JUReportForm S112	Seems not really relevant
2013-02-21 12:09:05.0 demoadmin		The customer was really satisfied at the end of the conversation
2013-02-21 12:08:53.0 demoadmin		3rd Comment
2013-02-21 12:08:48.0 demoadmin		2nd Comment
2013-02-21 12:08:41.0 demoadmin		1st Comment

**Delete All**

The user can insert one or more notes that will be saved by pressing the "Add" button; all comments already added are listed in chronological order together with the per-question notes inserted for a set of specific form. Per-question notes associated to the selected form are shown at the beginning of the comments list.

For each call it is possible to add markers which can be created and deleted as required, in order to keep further details regarding that specific call. This works best in conjunction with the HTML5 audio player as described on the HTML5 Player the section called "The HTML5 Audio Player and Markers" [62].



Is not possible to submit partial forms. If you compile a partial form, switch to the note view and submit a note, the scores already compiled will be lost.

## Grading over HTTP access

Is possible to grade a particular call through an HTTP request to the QueueMetrics server with an URL specifically formatted for this purpose.

When an URL is typed in the browser, QueueMetrics redirects its output to the login page (if required) where the user could log in to continue.

QueueMetrics shows the grading input form in the browser window and the user can grade the call and/or add notes to it.

The URL to be used to trigger the grading procedure should follow the syntax below:

```
http://qmserver.corp:8080/queuemetrics/qm_qa_jumptogradepage.do?  
    QAE_astclid=1286184814.122  
    &QAE_queue=queueName  
    &QAE_formName=FormToBeGraded  
    &QAE_CallStartDate=2010-10-04.11:00:00
```

(of course the URL should appear all on one line).

In the example, we trigger a grading procedure on the host *qmserver.corp* on port 8080 The context is queuemetrics (but could change based on local install). Then there are some parameters following:

- **QAE\_astclid** : specifies the Asterisk unique id for the call to be graded
- **QAE\_queue** : specifies the queue name where the call has been taken
- **QAE\_formName**: specifies the name of the form to be graded
- **QAE\_CallStartDate**: specifies the day where the call has been taken. The value should be formatted as YYYY-MM-DD.hh:mm:ss and should represent the time before the call (it's not important to specify the exact time where the call has been taken but it's important to specify a time near the period before the call).

## Removing or Editing QA forms

Users holding the key *QA\_REMOVE* can delete a form.

When a form is deleted, their content is dumped on the Audit Log.

All accesses on deleted forms are highlighted by a special message shown in the form.

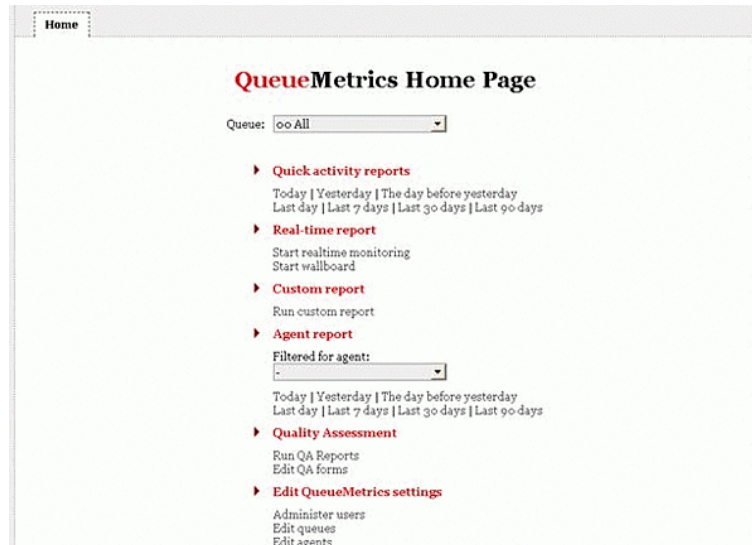
After deleting a form, it is again possible to grade a call as if it was never graded before.

Users holding the keys *QA\_REMOVE* and *QA\_REPLACE* can edit an already submitted form. By editing an already submitted form, QueueMetrics performs a normal delete action, then shows to the user a new editable form with pre-filled values in each row. Data are processed by following the usual procedure.

## Running QA reports

In order to run QA reports, you must go to the main page of QM and click on the "Run QA forms" label.





The system will show the following form:

The parameters have the following meanings:

- **Form** is the name of the form you want to run a report for
- **Queue** can be one or more queues. You can the run different reports for different queues, or use a catch-all queue
- **Agent** is an optional Agent filter
- **Location** is an optional Location filter
- **Agent Group** is an optional Agent Group filter
- **Grader** is an optional parameter that filters by the person who compiled the form
- **Supervision** is an optional Supervisor filter

- **Outcome** is an optional call outcome code filter
- **Start Date** and **End Date** are about the start time of the calls which QA forms that will be included in the report.

By clicking on "Calculate" or "Show Summary" the actual results are shown. If you have used Extra Scores (see Chapter 20.9 - *Configuring QA forms*) within the QA form, the "Calculate" or "Show Summary" will return averages that are higher than 100.

It is also possible to run a report that compares graders to each other - see the section called "Grader calibration reports" [313].

## The main QA report

The button "Calculate" shows a report like:

**Quality Assessment: Report data**

**Tracked calls per agent**

Agent	N.Calls	Avg	Exc.	Meet	Impr.	Issue
John Doe (101)	6	62	29	28	12	14

Export as...

**Tracked calls per queue**

Queue	N.Calls	Avg	Exc.	Meet	Impr.	Issue
Queue 300	5	58	16	28	12	12
Outbound 301	1	85	13	0	0	2

Export as...

**Tracked calls per agent group**

Agent groups	N.Calls	Avg	Exc.	Meet	Impr.	Issue
.	6	62	29	28	12	14

Export as...

**Analysts tracking calls**

Analyst	N.Calls	Avg
demoadmin	6	62

Export as...

**Section: Engagement**

Agent	N.Calls	SCG	COU	ENE	TON	CLE	HOL	DEE	LIS	CLO	Avg
John Doe (101)	6	44	42	83	73	57	67	65	67	51	60

Export as...

Queue	N.Calls	SCG	COU	ENE	TON	CLE	HOL	DEE	LIS	CLO	Avg
Outbound 301	1	10	10	90	100	100	90	80	100	100	76
Queue 300	5	51	48	81	68	48	62	62	59	41	57

Export as...

**Section: Resolution**

Agent	N.Calls	ASS	REL	HEL	PRO	TIM	Avg
John Doe (101)	6	68	67	60	62	70	65

Export as...

Queue	N.Calls	ASS	REL	HEL	PRO	TIM	Avg
Outbound 301	1	100	100	100	100	100	100
Queue 300	5	60	58	50	53	63	57

Export as...

The **Tracked calls per agent** report shows:

- The total number of calls that were tracked for each agent



- The average score for each agent
- The total number of items that fall into "Exceeds expectations", "Meets expectations", "Improvement required" and "Issue" for each agent.

As you can see, the names of each agent are clickable in order to obtain a detail of calls by agent.

All statistics that are computed per-agent are then recomputed per-queue and per-agent-group.

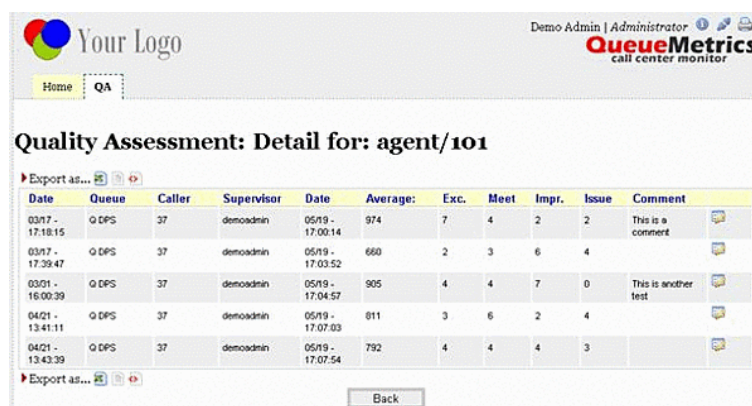
The **Analysts tracking calls** reports shows how many calls each supervisor graded and what was the average score that this supervisor gave.

Then, for each Section defined in the QA form, you will get the average scores for each item, plus an average of all average scores in order to point out problems.

If an item is shown in red, it means that such item has been assigned a zero-weight value. If an item is shown in gray, it means that such item has been set as non scoreable item. For further information on configuring items within the form, refer to the paragraph [xref:Configuring QA items\[\]](#).

All columns can be sorted by clicking on the item name and all data can be downloaded in Excel, CSV or XML format.

In order to have a better understanding of what is going on, you can click on an agent's name and get the details, as below:



The screenshot shows the QueueMetrics interface. At the top, there's a header with "Your Logo" and "QueueMetrics call center monitor". Below the header, there's a navigation bar with "Home" and "QA". The main title is "Quality Assessment: Detail for: agent/101". Below the title, there's an "Export as..." button. The table has columns: Date, Queue, Caller, Supervisor, Date, Average, Exc., Meet, Impr., Issue, and Comment. The data rows show call details for agent/101, including dates, queues, and scores.

Date	Queue	Caller	Supervisor	Date	Average	Exc.	Meet	Impr.	Issue	Comment
03/17 - 17:18:15	G DPS	37	demoadmin	05/19 - 17:00:14	974	7	4	2	2	This is a comment
03/17 - 17:39:47	G DPS	37	demoadmin	05/19 - 17:03:52	660	2	3	6	4	
03/01 - 16:00:39	G DPS	37	demoadmin	05/19 - 17:04:57	905	4	4	7	0	This is another test
04/01 - 13:41:11	G DPS	37	demoadmin	05/19 - 17:07:03	811	3	6	2	4	
04/01 - 13:43:39	G DPS	37	demoadmin	05/19 - 17:07:54	792	4	4	4	3	



This shows the details of all calls stored, the number of items for each call that fall into each grading category, the average rating for each call and the comment.



By clicking on the form icon on the right, you can access the QA form that was graded for this calls, so you can access individual scores and listen to audio recordings that are related to this form.

# The QA Summary report

The "Show Summary" button shows a report like:


Your Logo
Demo Admin | Administrator


[Home](#)
[QA](#)
[QA Summary](#)




Report Details:	
Filter by:	Quality Assurance
Selected queue:	00 All
Start period:	November 28 2012, 15:31
End period:	February 26 2013, 15:31
Date applied to:	Form Filing
Created by:	Demo Admin - February 26 2013, 16:01

Level	Range	
Issue	0 - 25	<input type="checkbox"/>
Req. Impr.	26 - 50	<input type="checkbox"/>
Meets exp.	51 - 75	<input type="checkbox"/>
Exceeds exp.	76 - 100	<input type="checkbox"/>

## Quality Assessment: Form summary




### Overall Form Summary

Form ID	Form Name	N Calls	Avg score
1	JUReportForm	3	44.67

Export as...   

### Scoring questions




Item code	Question	N Calls	Avg score	Exc. (*)	Meet (*)	Impr (*)	Issue (*)	Shortcuts (*)
<b>Engagement</b>								
COU	How well did the rep display courtesy?	10	54.23	20.0%	28.3%	43.3%	8.3%	0.0%
CLE	How clear and concise was the rep's vocalization and pronunciation?	10	50.50	30.0%	0.0%	60.0%	10.0%	0.0%
HOL	Did the rep use the correct hold procedure?	10	52.00	20.0%	20.0%	50.0%	10.0%	0.0%
DEE	Did the rep avoid deed air?	10	41.50	0.0%	30.0%	60.0%	10.0%	0.0%
LIS	Did the rep display active listening skills?	10	57.50	20.0%	40.0%	30.0%	10.0%	0.0%
CLO	How positive and appropriate was the call closure phase?	10	59.30	40.0%	10.0%	40.0%	10.0%	0.0%
<b>Resolution</b>								
REL	How accurate and relevant was the information provided?	10	61.50	10.0%	70.0%	20.0%	0.0%	0.0%
HEL	Was additional help offered with enthusiasm?	10	63.00	40.0%	30.0%	30.0%	0.0%	0.0%
PRO	Was the problem resolved on first contact?	10	64.10	30.0%	40.0%	30.0%	0.0%	0.0%
TMI	Did the rep manage time effectively?	10	61.40	40.0%	30.0%	20.0%	10.0%	0.0%
<b>Business needs</b>								
DBC	Was DBC done?	10	49.70	10.0%	20.0%	70.0%	0.0%	0.0%

Export as...   

(\*) Values counted with current item weights

### Non scoring questions

Item code	Question	N Calls	Avg score	Values
<b>Engagement</b>				
SCG	How positive clear and eager was the use of the Corporate greeting?	10	2.50	1: Insufficient 3: Normal 6: Very Clear
ENE	Rate rep's enery level throughout the call	10	2.50	1: Insufficient 3: Normal 6: Sufficient
TON	How well did the rep vary the tone and speed of speech?	10	92.00	4: Satisfying 6: Good
<b>Resolution</b>				
ASS	Was assurance given for client's assistance?	10	70.00	3: No 7: Yes
<b>Business needs</b>				

Export as...   

(\*) Values counted with current item weights

This report calculates, for each item and for each section in the form:

# Loway



- average for the whole form
- number of calls graded
- average score and cumulated percentage for each item and section that "Exceeds expectations" (the column marked "Best") or "Meet expectations" (Good) or "Improvement required" (Ok) or "Issue" (Req.Imp.) (only for scoreable item)
- average score and number of time each value is found in the reports (only for non scoring questions)
- cumulated percentage for each item marked as "shortcut"

All values are computed according to the current item weights (only for scoreable items), in case you use weighted items.

The data can be exported to Excel, CSV and XML formats.

On the top right of the report is a box containing the list of levels with related checkboxes. Values shown in the result table are coloured following the checkboxes status. This is useful to highlight questions where average values fall in a specific set of levels. The status of checkboxes are persisted through sessions.

## The Training And Coaching Page

Users holding the security key TASK\_PUSH\_TC will be able to access to the Training and Coaching Page. This page is the main access point for sending CBTs and Meeting (also named Coaching) tasks to an agent or a set of agents. It's based on a three steps wizard where the list of users are defined in the first two steps and the proper CBT or Meeting tasks are sent in the third step. Agents selection starts by several finding criterias, as depicted below:

The screenshot shows the QueueMetrics interface for pushing training and coaching tasks. At the top, there's a header with the QueueMetrics logo and a 'T&C' tab. Below this, the title 'Push Training and Coaching tasks' is centered. The main section is titled 'Search Agent by' and contains a form with the following fields:
 

- Queue: A dropdown menu with 'A300' selected.
- Include queue components: A checkbox that is currently unchecked.
- Agent: A dropdown menu with 'John Doe (101)' selected.
- Location: A dropdown menu with '-' selected.
- Agent Group: A dropdown menu with '-' selected.

 A 'Search' button is located at the bottom of the form. At the bottom of the screenshot, the Loway logo is visible.

- The queue dropdown
- If the finder should take care about queues components (this is useful when a composed queue is selected in the previous dropdown)
- An agent dropdown
- A location dropdown
- An agent group dropdown

Each agents matching the criterias are shown as soon as the user presses the "Search" button, as reported in the picture below.

**QueueMetrics** YourLogo Demo Admin | Administrator

Home T&C

### Push Training and Coaching tasks

**Search Agent by**

Queue: A300

Include queue components: ☐

Agent: John Doe (101)

Location: -

Agent Group: -

Search

Select the agents then complete the form on the right side

Agent Code	Name	
agent0101	John Doe (101)	<input type="checkbox"/>

**Send Tasks**

Valid from: 2015-05-26 . 0 50

Expires on: 2015-06-02 . 18 00

Note for agent:

Reason:

CBT: -

Send CBT

Title:

Message:

Date: 2015-05-26 . 0 50

Duration (s):

Send Coaching

26/02-10:11:11

**Loway**

Looking at the list of agents found in the center of the page, a single agent can be selected by clicking on their related checkbox whether all agents in the list can be selected by clicking on the checkbox placed on the header of the list.

As soon as agents are selected, the user can send a CBT or a Coaching task by properly filling the fields related to time and date validity and, optionally, a note that will be shown to the agents and a reason (hidden to the agents). Specific fields for CBTs and for Coaching tasks can be found on the most right-bottom side of the page. Tasks can be sent by pressing "Send CBT" or "Send Coaching" buttons.

At the end of process, QueueMetrics shows the number of CBT/Coaching tasks sent as reported by the following picture.

**QueueMetrics**

Home T&C

**Search Agent by**

Queue: A300

Include queue components: ☐

Agent: John Doe (101)

Location: -

Agent Group: -

Search

Num Of CBTs Sent: 1

**Loway**

---

# Chapter 14. Advanced tracking of agent and grader performance

Advanced tracking of agent performance lets you pinpoint those agents whose behavior can and should be improved. In order to do this, a **score** is created out of multiple items related to:

- their way each call is handled (e.g call duration)
- their call performance (e.g. number of sales)
- QA scores that were given to their calls

As the scoring is in itself quite complex and made up of multiple factors, scoring is based on a **rule set** that represent a business-specific set of targets that should be met. For each rule, you have two possible levels of non-compliance, that is a yellow and a red threshold. Each threshold can, in turn, have a peculiar score associated.



For example, you could say that the expected call duration is 100 seconds; calls that are between 100 and 150 seconds are "yellow" and worth 1 review point, calls that are over 150 seconds are "red" and worth 4 review points. The higher your review score, the more prominently the agent will be displayed.

When applying a rule set to a set of calls, you get a **score** expressed in **review points** for each agent selected that represents the sum of all anomalies as detected by the chosen ruleset.

The system then displays the agents involved in reverse score order, prompting the grader to investigate further by accessing the set of calls and the set of QA records and the relevant audio recordings.

The result of this activity is:

- In-depth knowledge of agent performance
- **Agent life cycle management:** the grader can move agents between agent groups, so that you can manage a process where an agent belongs to multiple skill groups during their lifetime
- Continuous improvement of agent performance through **agent tasks**, e.g. coaching sessions, or completing Computer Based Training to improve the agent's skills.

For example, an agent could start her life as member of the group *New Hires*. When reviewed after a while, she could be moved to *New Hires Probation* when she is found lacking in some subject. After a while she could be checked again and moved back to *New Hires*.

As collateral features, the system also offers facilities to:

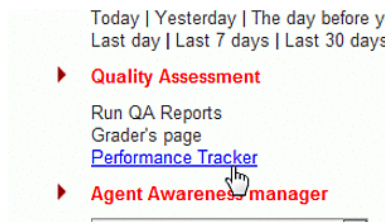
- Create rule sets based on the average properties of a set of calls. This makes it easy to have reference points that can then be manually edited.
- Track the lifecycle of agents. This is done by tracking the different agents groups each agent has been a member of and the time period they have been there.

Just like for agents, there is also the problem of comparing graders to each other, in order to have a "fair" view of what is going on and to make sure that grading happens under the company's guidelines

and not each grader's own preferences. **Grader calibration reports** fulfill this purpose by comparing graders to each other.

## Tracking agent performance

For users holding the key "QA\_PERF\_TRACK" a new link appears in the QueueMetrics home page, as shown below:



When clicking on it, you are lead to the main search page:

**Quality Assessment: Performance Tracking**

**Score targets**

Scoring rules:

Minimum calls/agent:

Minimum score:

Days in group:

Override queue and form selections: ☒

**Agent scoring**

Queues:

From date:

To date:

Today | Yesterday | The day before yesterday  
Last day | Last 7 days | Last 30 days | Last 50 days

**Agent selection**

Agent:

Agent group:

Location:

Supervised by:  Me

**QA Form**

Form:

This page lets the grader search for a set of agents to be reviewed. This requires setting three search dimensions:

- A queue (or set of queues) and a time period
- A way to search for a set of agents (a specific one, or a group, or a location, or all agents that have the same supervisor).
- A QA form to be graded
- A **rule set** that applies to the above search and defines scoring. You should define your own before you start this activity (see the section called “Defining agent performance rules” [236]).

The scoring rule is usually associated to a particular queue and form but the user can override this selection by checking the option "Override queue and form selections" and by specifying other parameters that affect the calculation, like:

- the minimum expected score,
- the minimum number of calls that should be analyzed,

- the minimum days the agent had to be in the group at the run period specified for the analysis.

These minimums are to avoid considering agents that are undersampled (e.g. if an agent has been scored only once, we can expect this score to be less meaningful compared to an agent whose score is based on 10 elements).

The button "Search" starts the calculation process and a new page will be displayed:

Home Perf. Track <b>Ag. Scoring</b>															
<b>Quality Assessment: Performance Tracking: Agent List</b>															
<div> <div>Queues:</div> <div>A300</div> </div> <div> <div>From date:</div> <div>January 01 2009, 08:50</div> </div> <div> <div>To date:</div> <div>August 08 2014, 18:00</div> </div> <div> <div>Scoring rules:</div> <div>Test AVG score (Avg.)</div> </div> <div> <div>QA Form:</div> <div>JUReportForm</div> </div>															
Agent	Score	SPH	QCPH	CPH	Sales	QC	Cont	Conv	QConv	N Calls	Call length	Forms	AVG Score	Flunked	
John Doe (101)	5678	0.0	0.0	0.0	24	24	26	0.9	1.0	227	1:56:22	20	75.9	4	
The following agents were filtered out from the report															
Agent	Days in group	Minimum calls/agent	Minimum score												
agent/200															
Frank Aaron															

The items shown here are **averages** on all the calls that were found in the current set. The selected score rule is used to compute the overall Score value, and agents are shown sorted by their score in descending order.

Flying with the mouse over the score value a detail rules contributing to the overall score are shown, as reported on the picture below:

Agent	Score	SPH	QCPH	CPH	Sales	QC	Conv
John Doe (101)	51232	0.0	0.0	0.0	0	0	0
Bob Smith (102)	222	0.0	0.0	0.0	0	0	0

N Calls (Avg.) (5555) Call length (Avg.) (7777) AVG Score (Avg.) (500000)

At the bottom of the main table result, a second table shows the agents (if any) that were not included in the report and the threshold that was not met.

Clicking on the agent name or the associated score value the user gives access to details. They are reported in a different page, like the one shown below.

Demo Admin | Administrator

Home
Perf. Track
Ag. Scoring
**Ag. Detail**

### Performance Tracking: Agent detail for agent/101

Queues:

00 All

From date:

May 26 2013, 08:50

To date:

June 02 2015, 18:00

Scoring rules:

Test AVG score

QA Form:

JUReportForm

Move to group

Send CBT

Send Coaching

Move to group

New group:

☐ Remind me in  days

OK

Reason:

Total calls found: 389 - Visible calls: 389

☐ 
☐ 
☐ 

Reload

Score	Date	Queue	Caller	Duration	Sales	QC	Cont	AVG Score	Flunked	Call outcome	Form	
123	02/02 - 11:41:23	A300	204	0:11				14.00				<input type="checkbox"/>
123	12/03 - 15:57:37	A300	204	0:46				62.00				<input type="checkbox"/>
123	09/09 - 09:57:34	A300	201	2:19:13				22.00		d045		<input type="checkbox"/>
0	08/22 - 10:56:23	A300	200	0:04				0.00				<input type="checkbox"/>
0	08/20 - 09:55:21	A300	201	8:55				0.00				<input type="checkbox"/>
0	08/20 - 12:14:36	A300	201	0:24				0.00		d045		<input type="checkbox"/>
0	01/10 - 11:30:14	A300	201	14:28				0.00		d045		<input type="checkbox"/>

The details page is split in two parts. The top part reports the score details for each call the agent answered. The bottom one shows the detailed history associated to that particular agent.

#### Agent History

Date	Analyst	Reason
06/02 - 10:35:10	Sent CBT: Training: Greetings basics	Demo Admin
03/11 - 12:53:04	Sent Coaching: Meeting: This is a coaching from the grader's page	Demo Admin
03/11 - 12:51:11	Sent CBT: Training: CBT with dynamic URL	Demo Admin
03/11 - 10:06:01	Joins group NewHired	Demo Admin
03/11 - 10:04:09	Joins group Default	Demo Admin
03/11 - 10:01:55	Joins group NewHired	Demo Admin
03/11 - 09:56:37		Demo Admin

Each line in the top table reports the score calculated by the rule selected in the search page **without being averaged**, and other relevant information for each call.

An icon representing a pencil is shown if the call has a QA form associated with it; by clicking it, the associated QA form will be shown in a separate pop-up dialog. Users allowed to grade calls could find a set of grayed out pencil icons to be used to score new calls from this page. After scoring each call they should press "Refresh" to have the page updated.

A special icon is assigned to *Flunked* calls. A call is defined as *Flunked* if the related QA Form has been graded but reached an average value below the Issue level.

## Dynamic drill down

To make the grader's life easier in case the set of calls to be analyzed is large, it is possible to use a set of dynamic criteria to reduce the data that is currently displayed.

The table on the top-right lets you add up to three drill-down rules being active at the same time. Rules can be quickly disabled by clicking on the "Turn off" checkbox on the left of each rule.



The title of the section shows the total number of calls found for the agent and the number that is actually displayed. The ones that are not are the ones that are filtered out. In order to see them all again, just clear or turn off all the filters.

The following rules are defined:

- Call length
- A form's average score
- The performance tracker score
- The call outcome
- Whether the call is a Flunked one, or a Sale, or a Qualified Contact, or a Contact

Special notes about rules:

- If you enter multiple rules at once, they are all active
- Rules expecting a time duration (e.g. call length) will accept input as H:MM:SS (e.g. 0:23) or an integer number of seconds.
- Rules working on a float value have the float value converted to the nearest integer and then the rule is applied.

It is always possible to sort data in the call list table by clicking on the title.

## Taking remedial actions

By the top of the page, the grader can take remedial actions using the form displayed below.

### Tracking: Agent detail for agent/101

### Move the agent to a different group

In order to move the agent to a different group, the grader has to select the new group through the dropdown; he can specify a reason in the lower text box then press the OK button on the right side of the dropdown group.

If the user checks the "Remind me" checkbox before pressing the OK button, QueueMetrics will send a reminder task to the grader himself that will be displayed after a specified number of days. (This can be used as a reminder and is optional).

A new row with the operation details will be inserted in the agent's history table after completion.



## Send a CBT to the selected agent

In order to send a CBT (Computer Based Training) to the specific agent the report is referring to, the grader should select an already known CBT from the dropdown list or manually specify a URL. An optional note (visible to the recipient agent) and an optional reason (hidden to the agent) can be added. Grader can optionally link a specific call with the CBT to be sent, so, the agent will be able to refer to that particular call in the task details. To link a specific call to the CBT, the grader should click on the checkbox he can find each row in the call list. Unlinking the call is done by clicking on the red icon in the list header.

A new *Teaching* task will be sent to the agent with the title and the inserted URL.

A new row with the operation details will be placed in the history table after completion.

## Send a Coaching (Meeting) task to the selected agent

A grader may want to send a Coaching/Meeting task to the specific agent the report is referring to. This can be done through the *Send Coaching* tab. A Coaching task is defined by a *Title*, a *Message* and a task date. The grader can optionally specify a coaching duration (in seconds), a note (visible to the agent) and a reason text (hidden to the agent). Pressing OK generates a new coaching task with the information provided. The task will be placed in the history table after completion.

## Finding calls to be graded

This is a separate page accessed by users holding the QA\_GRADER security key.

Last 30 days | Last 90 days

**Quality Assessment**

Run QA Reports

Grader's page

Performance Tracker

Training and Coaching

QA graders page is to provide graders with a tool that will help them in finding which calls are to be graded. Calls can be searched by specifying several targets: per client, per queue, per agent and per agent group. Each target can be expressed as an absolute minimum, a percentage or both.

Default targets are expressed:

- Per queue or set of queues
- Per location
- Per individual agents (that is, the minimum required for each agent)
- Per call outcome (see the section called “Configuring call outcomes” [221] )
- Per agent or agent groups (see the section called “Configuring agent groups” [227] )

Targets can be disabled as well, by leaving them empty.

All grading activity is done per form, that is, related to one specific form.

[Home](#)
[Grader](#)

## Quality Assessment: Grading page

**Form:**

**Queue:**

**Agent:**

**Agent Group:**

**Location:**

**Outcome:**

**Time period:**

**Call start date:**  ,  :

**Call end date:**  ,  :

[Today](#) | [Yesterday](#) | [The day before yesterday](#)  
[Last day](#) | [Last 7 days](#) | [Last 30 days](#) | [Last 90 days](#)


Call outcomes	Min %	Min #
Sales	<input type="text"/>	<input type="text"/>
QCont.	<input type="text"/>	<input type="text"/>
Contacts	<input type="text"/>	<input type="text"/>
-	<input type="text"/>	<input type="text"/>

Agent groups	Min %	Min #
Default	<input type="text"/>	<input type="text"/>
NewHired	<input type="text"/>	<input type="text"/>
Professional	<input type="text"/>	<input type="text"/>
All Calls	<input type="text"/>	<input type="text"/>
Individual agents	<input type="text"/>	<input type="text"/>

Run custom report

The QA personnel is supposed to input the right targets given the goal at hand (eg. daily or weekly, per client or per queue, etc).

When they do, QueueMetrics will run a report that displays the absolute numbers involved and the number of targets that are currently being hit. At the top of the page, QueueMetrics will then display a random selection of calls to be graded, weighted on the number of targets each call hits (i.e. the more targets a call hits, the more likely it is to appear in the list).



[Home](#)
[Grader](#)
[Grader Report](#)

## Quality Assessment: Grading search form

**Report Details:**

Form:	JUReportForm
Atomic queue(s) considered:	00 All
Period start date:	December 04 2014, 16:34
Period end date:	March 04 2015, 16:34

### Suggested calls

Time	Queue	Caller	Agent	Wait	Talk	Outcome	Audio	Forms	Cmpl
12/04 - 17:02:17	A300	204	John Doe (101)	0:02	0:17	n	1		[x]
12/04 - 17:09:29	A300	204	John Doe (101)	0:03	1:23		1		[x]
12/04 - 17:15:06	A300	204	John Doe (101)	0:13	13:23	n	1		[x]
12/09 - 11:21:13	A300	204	John Doe (101)	0:05	0:56	sale	1		[x]
12/10 - 10:28:47	A300	204	John Doe (101)	0:02	0:42		1		[x]
12/10 - 12:15:22	A300	204	John Doe (101)	0:03	2:23	ni	1		[x]

▶ Export as...

Run again
 Change search criteria

### Target statistics

		Found	%	% needed	#	# needed	# remaining
Call outcome	Sales	9					
Call outcome	QCont.	6					
Call outcome	Contacts	8					
Call outcome	-	98	1.0 %		1		
Agent Group	Default	105		20.0 %	1	80	79
Agent Group	NewHired	16					
Agent Group	Professional	0					
All calls		121			1		
Agent	John Doe (101)	105			1		
Agent	Bob Smith (102)	16					

▶ Export as...

The grader may do grading on some or all of the suggested calls, or may decide to do differently. When done, he clicks on "Run again"; all the form is computed again, targets are recomputed and so is the set of possible calls.

## Selecting which calls to grade

Each call included in the search criteria per time period or queue is first listed. The set of distinct agents involved in the queue is obtained.

Calls are then filtered off if they match the following rules:

- They have already been graded for this form
- They have no audio recording
- They will help no target

For each of the remaining calls, a score is computed by assigning one point to each of the criteria that are currently unmet absolute number and percentage are treated as distinct criteria). Calls are then weighted based on the square of their score (that is: if a call will help 10 targets, its relative score will be 100, while if it helps in 5 targets, the relative score will be 25), and extracted randomly, so that it's more likely for QueueMetrics to draw calls that match multiple criteria, but even a call matching one single criteria may appear. As the computations involved are quite heavy (mostly when deciding if a call has associated audio and QA scoring, as this might be repeated tens of thousands of times) each grader will have a small set to use before reloading.

## Grader calibration reports

This is a separate, one-page report that is only accessed by supervisors earmarked by the key "QA\_CALREP" only (in addition to "QA\_REPORT").

To access the page, you go to *Quality Assessment* → *Run QA Reports* and fill-in the form by the bottom of the page :



You will also use the form by the top of the page you usually use for QA reports.

On the input page you select:

- A date range (dual selector plus predefined periods)
- One Form (if we had an option for All, we'd get way too many)
- A queue or composite queue
- A call outcome, or none for all calls
- It is possible to select an agent group as an additional filter.
- It is possible to add a minimum threshold of graded calls per grader to be included

The analysis happens at three levels:

- The whole form

- The section level
- The question level

For each form/section/question, a table is computed for the general and for each agent that has graded at least X items:

[Home](#)
[QA](#)
[QA Calibration Report](#)

**Report Details:**  
Filter by: Quality Assurance  
Selected queue: 00 All  
Queue one [q1], q2, queue-dps, Q Test [queue-test]  
Start period: December 30 2010, 00:00  
End period: January 29 2011, 23:59  
Created by: Demo Admin - January 29 2011, 16:22  
Call threshold: 1

## Monitor calibration reports

### Form report

Form Name/Grader	Calls	Average
Quality Assurance	6	64
Demo Admin	3	73
Super Visor	3	55

### Form Sections report

Section Name/Grader	Average
Engagement	61
Demo Admin	66
Super Visor	53
Resolution	69
Demo Admin	80
Super Visor	58
Business needs	60
Demo Admin	78
Super Visor	41

Demo Admin
10
50
0.0%

### Form Items report

Code	Question/Grader	N.Items	Average	Delta
SCG	How positive clear and eager was the use of the Corporate greeting?	10	3	
	Demo Admin	10	3	0.0%
COU	How well did the rep display courtesy?	10	65	
	Demo Admin	10	65	0.0%
ENE	Rate rep's energy level throughout the call	10	3	
	Demo Admin	10	3	0.0%
TON	How well did the rep vary the tone and speed of speech?	10	92	
	Demo Admin	10	92	0.0%
CLE	How clear and concise was the rep's vocalization and pronunciation?	10	51	
	Demo Admin	10	51	0.0%
HOL	Did the rep use the correct hold procedure?	10	52	
	Demo Admin	10	52	0.0%
DEE	Did the rep avoid dead air?	10	42	
	Demo Admin	10	42	0.0%
LIS	Did the rep display active listening skills?	10	58	
	Demo Admin	10	58	0.0%
CLO	How positive and appropriate was the call closure phase?	10	59	
	Demo Admin	10	59	0.0%
ASS	Was assurance given for client's assistance?	10	70	
	Demo Admin	10	70	0.0%
REL	How accurate and relevant was the information provided?	10	62	
	Demo Admin	10	62	0.0%
HEL	Was additional help offered with enthusiasm?	10	63	
	Demo Admin	10	63	0.0%
PRO	Was the problem resolved on first contact?	10	64	
	Demo Admin	10	64	0.0%
TIM	Did the rep manage time effectively?	10	61	
	Demo Admin	10	61	0.0%
DBC	Was DBC done?	10	50	
	Demo Admin	10	50	0.0%

**Loway**  
research  
Loway - Switzerland

For each form/section/question, an average is computed and compared to the one of all graders who graded at least X calls in the specific area. This way it is easy to spot trends and anomalies on grading behavior. Values shown in gray refers to non scorable questions. Average for this type of questions is counted only for reference purposes.

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# Chapter 15. The Agent Awareness subsystem (AGAW)

QueueMetrics was designed primarily to be used by supervisors and administrators to keep track of what is going on in the Call Centre. In most Call-Centres, keeping track of the current activity level using a real-time wallboard and/or the agent's page is enough. In some high-performance setups, with large and geographically distributed agent groups, it is mandatory to have a better level of performance awareness by the agents, and to have "off band", live communication lines going from the supervisor to the agent and from the agent to the supervisor.

QueueMetrics addresses this issue using a module called Agent Awareness (AGAW), that is basically a Firefox or Chrome plug-in that each agent can use to see:

- A wealth of information about how the agent and/or the queue is performing; this information offers a large set of performance metrics so that the feedback on the agent's behaviour is immediate
- A way for the agent to get in touch with her supervisors using an "off-band" channel (chat) so that they can keep on working with no downtime when speaking to their supervisors or with second-line product experts
- A way for the supervisor to send targeted broadcast messages to his own agents, making it feasible to monitor geographically-dispersed agents

The choice of developing Firefox/Chrome plug-ins was because this way the agent can keep on working on a browser-based interface (CRM, data entry...) while keeping an eye on their own statistics in a non-obtrusive manner.

The AGAW implementation is divided into three logically distinct elements:

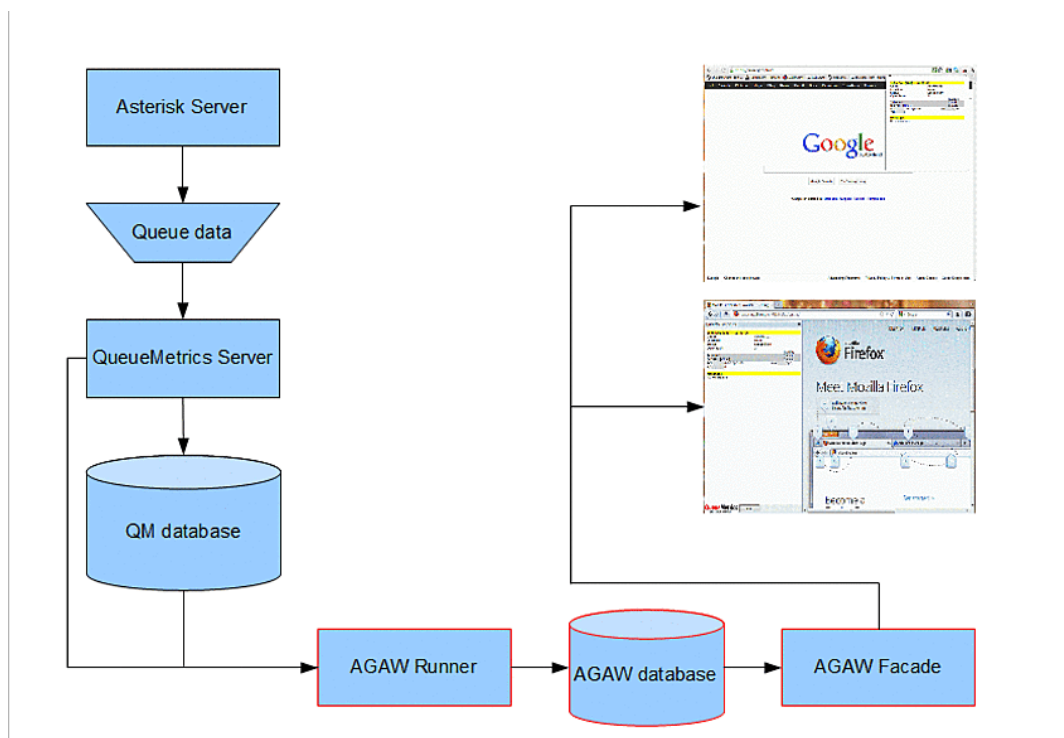
- *The configuration and supervisor access part, done through QueueMetrics:* Supervisors and managers can monitor the AGAW modules through the QueueMetrics program, when given the correct security keys to do so. They can also send and remove broadcast messages to agents through the main QueueMetrics interface.
- *The Queue Runner :* This is a command-line Java program that, in turn, runs statistics for all defined queues and agents. Though it leverages on QueueMetrics to run the analysis, it does not run within a servlet container and doesn't have any visible interface. The Queue Runner can reside on a separate server from the main QueueMetrics instance.
- *The AGAW facades:* The facades are the access points for each agent to log on and see their own statistics. They run in a servlet container and are positioned under the QueueMetrics webapp. The facades are not strictly speaking a part of QueueMetrics, and are thought of to be deployed on a separate server to handle very high load.

Each component can work separately on a separate server; the whole system is tied together by the usage of the same MySQL database. As the part that might be handling the highest load is the AGAW facades, that are constantly polled by hundreds or thousands of concurrent agents, they can be deployed on a plurality of separate servers and can even connect to multiple replicas of the main DB in order to handle the highest loads.

## The AGAW architecture

The AGAW architecture is composed of the basic QM architecture and a number of new modules, as displayed.





The new AGAW modules are drawn in red (AGAW Runner, AGAW database, AGAW Facade) while traditional QueueMetrics components are drawn in blue.

This is the way it works:

1. QueueMetrics receives data from one or more Asterisk servers and processes it
2. The AGAW Runner, a specialized, command-line script, runs periodically (e.g. every 5 minutes) and gather statistics for all selected queues. This is a time-consuming task where "hard real-time" is not necessary. Queues are processed in a sequential order.
3. Data processed by the Runner is stored in a specialized database
4. A set of cron scripts "purges" the database periodically from stale data.

On the client side:

1. A Firefox/Chrome extension polls the system every few seconds to gather new data and new broadcast messages
2. The AGAW facade component is able to retrieve the latest pre-processed data in a few milliseconds, allowing to have hundreds or thousands of clients fed without overloading the QueueMetrics server

Though it is a separate entity from the main QueueMetrics, all AGAW components ship within the same installation as QM - so there is no need for a separate installation.

In order to activate the AGAW subsystem, see the section called "Installing the AGAW runner" [258]. Full configuration information can be found in the section called "Configuring queues to be processed by the AGAW Runner" [216]. You will also need an AGAW licence key (or you can use the supplied, two-agent free key).

## Security keys used by the AGAW subsystem

The following security keys control the accessibility of the AGAW sub system.

**Table 15.1. AGAW Security Keys**

Key	Subsystem	Meaning
AGAW	Facades	This agent can access data through a facade (already set by default in class AGENTS)
AGAW_ADM	QM	Lets you access the AGAW administrator pages: seeing the logs, the runs in progress, etc.
AGAW_REP	QM	Lets you access per-supervision and per-location supervisor statistics
BRO_MSG	QM	Enables the Broadcast Messages page (from the Real-time page)
MON_IM	QM	This supervisor can start an IM chat to the given client (if the agent has an IM address defined on record)

## Installing the AGAW Licence

The installation of the AGAW licence requires a first step prior to installing the licence key, whereas we need to enable the AGAW profile that ships with QueueMetrics (which is usually disabled) by configuring the AGAW user. Choose "Edit Users" from the Home page and select the "Cfg Users" tab. Make sure that "Enabled" field is set to "Yes". Once you have filled out the required fields, as shown in the image below, select "Save".

**User Detail**

User Id	46
Login	agawrunner
Password	agaw123
Real name	AGAW runner
Enabled	Yes
E-mail	
Masterkey	No
Class	ADMIN
User keys	
Number of legends	26742
Last login	2012-04-10 12:51:27.0
Comment	
Token	
Creation	demoadmin, 02/04/2012, 11:23
Update	demoadmin, 02/04/2012, 11:24

Save Back New Clone Delete

You can now install the new AGAW licence key by selecting the "Agent Awareness manager" link from the Home page and clicking on the "Install new key" button at the bottom of the screen. This will open a popup that allows to enter/paste the new licence key. By clicking on the "Run" button, we will see that the AGAW runner is restarted.

To check the successful installation of the new key, select the "Logs" tab, where you should see that the Queue runner is currently running on a set of queues.

You now have to configure the queues on which AGAW will run. Select "Edit Queues" from the Home page and select one of the atomic queues (not a composite queues) amongst the displayed queues (ie. a queue that matches only one Asterisk queue).

## Queue Detail

Queue alias:	<input type="text" value="Q DPS"/>	
Queue(s): <small>Separate with  </small>	<input type="text" value="queue-dps"/>	
Wrap-up time (sec.):	<input type="text" value="0"/>	
Announcement (sec.):	<input type="text" value="0"/>	
Visibility key:	<input type="text"/>	
Call flow:	<input type="text" value="Inbound calls"/>	
Shown on front page:	<input type="text" value="Yes"/>	
Chat group:	<input type="text" value="chat@chatserver"/>	
Default queue URL:	<input type="text"/>	
Main agents:	Agent/101, Agent/102	
Wrap agents:		
Spill agents:		
<b>Attention levels</b>	<b>Yellow alarm</b>	<b>Red alarm</b>
Number of calls in queue:	<input type="text"/>	<input type="text"/>
Number of agents on call:	<input type="text"/>	<input type="text"/>
Number of agents waiting:	<input type="text"/>	<input type="text"/>
Number of agents paused:	<input type="text"/>	<input type="text"/>
Call wait duration:	<input type="text"/>	<input type="text"/>
Call talking duration:	<input type="text"/>	<input type="text"/>
<b>AGAW settings</b>		
Will AGAW be run for this queue?	<input type="text" value="Yes"/>	Items defined: 4
AGAW enabled for this queue:	<input type="text" value="Yes"/>	
AGAW lookback period (mins):	<input type="text" value="720"/>	
Created by:	<input type="text" value="demoadmin, 18/06/2007, 22:30"/>	
Last update:	<input type="text" value="demoadmin, 04/12/2008, 14:58"/>	



Make sure that the field "AGAW enabled for this queue" is set to "Yes" as shown in the image above. Set the "AGAW lookback period", which is the length of time (in minutes) in the past that is used for the realtime analysis.

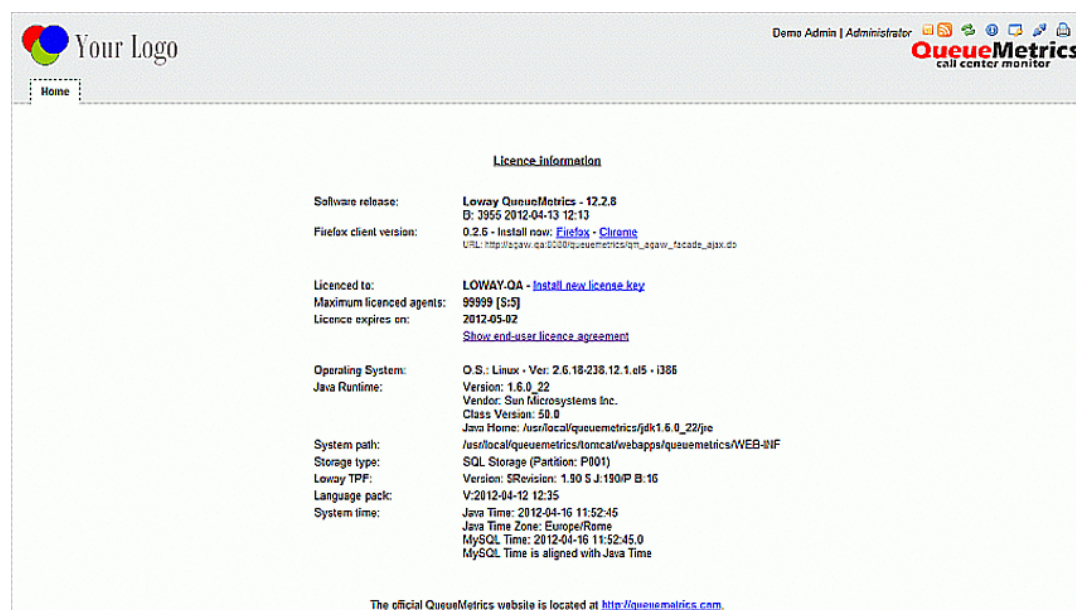
The AGAW "Attention Levels" are alarms that can be set as values in seconds, to trigger alarms for the queue or the agent. Once this form has been completed, select "Save" and proceed with the installation of the AGAW Client, as described in the following chapters.

## Agents: the AGAW client

The AGAW client is used by each agent taking part in the AGAW project and receiving statistics. It is currently deployed as a Firefox/Chrome extension; the facade component was meant to be modular, so it is well possible that other front-ends will be written in the future.

## Installing with Firefox

AGAW can be installed in Firefox by browsing the *Licence* page of QueueMetrics and clicking on the "Firefox" link. It will work both in Windows and Linux versions of Firefox.



**Licence information**

Software release:	Loway QueueMetrics - 12.2.8
Firefox client version:	0.2.6 - Install now: <a href="#">Firefox - Chrome</a>
	URL: <a href="http://agaw.qm500queuemetrics/qm_agaw_facade_ajax.do">http://agaw.qm500queuemetrics/qm_agaw_facade_ajax.do</a>
Licensed to:	LOWAY-OA - <a href="#">Install new license key</a>
Maximum licenced agents:	99999 [S:5]
Licence expires on:	2012-05-02
	<a href="#">Show end-user licence agreement</a>
Operating System:	O.S.: Linux - Ver: 2.6.18-238.12.1.el5 - i386
Java Runtime:	Version: 1.6.0_22 Vendor: Sun Microsystems Inc. Class Version: 50.0 Java Home: /usr/local/queuemetrics/jdk1.6.0_22/jre
System path:	/usr/local/queuemetrics/tomcat/webapps/queuemetrics/WEB-INF
Storage type:	SQL Storage (Partition: P001)
Loway TPF:	Version: 5Revision: 1.90 S J:190/P B:16
Language pack:	V:2012-04-12 12:35
System time:	Java Time: 2012-04-16 11:52:45 Java Time Zone: Europe/Rome MySQL Time: 2012-04-16 11:52:45.0 MySQL Time is aligned with Java Time

The official QueueMetrics website is located at <http://QueueMetrics.com>.

The link requires internet access, as the extension is downloaded from the Mozilla Add-on store.

After the installation, you will need to restart your browser. When you restart, you will notice a new entry called "QueueMetrics sidebar" in the "Tools" menu.



In recent FireFox versions, you have to manually enable the "Menu" bar, so that you can find the "Tools" menu. To do so, from the Menu button select "Customize" and then "Show/hide menu bar". Once the extension is active and running, you can disable the "Menu" bar if you do not want to see it.

The first time you open the sidebar, you will have to click on the "Setup" button.

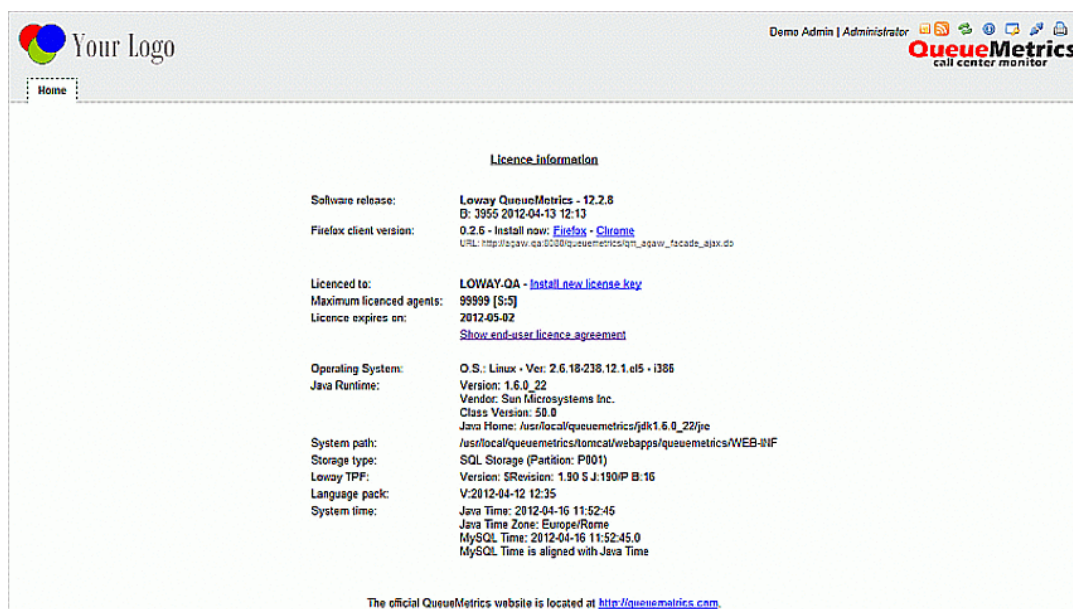
The screenshot displays the QueueMetrics web interface. On the left, a sidebar titled 'QueueMetrics Sidebar' shows agent information for 'John Doe (101)' at 12:17:37, including code, location, status, and open tasks. Below this is a 'Messages' section with 'No messages'. A 'Client setup' dialog box is overlaid on the sidebar, containing fields for 'Server URL' (http://agaw.qa:8080/queuem), 'Username' (agent/101), and 'Password' (masked with dots). The main content area features a header with 'Your Logo' and the QueueMetrics logo. Below the header, there is a 'Licence information' section with details about the software release, Firefox client version, and licence to: LOWAY-QA. Further down, system information is listed, including the operating system (Linux), Java runtime, and system path.

You should enter the following information:

- **Server URL:** [http://myserver:8080/queuemetrics/qm\\_agaw\\_facade\\_ajax.do](http://myserver:8080/queuemetrics/qm_agaw_facade_ajax.do) (take from the Licence page)
- **Username:** the agent code (or leave blank)
- **Password:** the agent's QM password (or leave blank)

## Installing with Chrome

AGAW can be installed in Chrome by browsing the *Licence* page of QueueMetrics and clicking on the "Chrome" link.



The screenshot shows the QueueMetrics web interface. At the top left is a logo with the text "Your Logo" and a "Home" link. At the top right is the "QueueMetrics call center monitor" logo and a user profile "Demo Admin | Administrator". The main content area is titled "Licence information" and displays the following details:

- Software release:** Lowway QueueMetrics - 12.2.8  
B: 3955 2012-04-13 12:13
- Firefox client version:** 0.2.6 - Install now: [Firefox - Chrome](#)  
URL: [http://agaw.qa:8080/queuemetrics/qm\\_agaw\\_facade\\_ajax.do](http://agaw.qa:8080/queuemetrics/qm_agaw_facade_ajax.do)
- Licensed to:** LOWAY-QA - [Install new license key](#)
- Maximum licenced agents:** 99999 (S:5)
- Licence expires on:** 2012-05-02  
[Show end-user licence agreement](#)
- Operating System:** O.S.: Linux - Ver: 2.6.18-238.12.1.el5 - i386
- Java Runtime:** Version: 1.6.0\_22  
Vendor: Sun Microsystems Inc.  
Class Version: 50.0  
Java Home: [/usr/local/queuemetrics/jdk1.6.0\\_22/jre](#)
- System path:** [/usr/local/queuemetrics/tomcat/webapps/queuemetrics/WEB-INF](#)
- Storage type:** SQL Storage (Partition: P001)
- Lowway TPF:** Version: SRRevision: 1.90 S.J:190/P.B:16
- Language pack:** V:2012-04-12 12:35
- System time:** Java Time: 2012-04-16 11:52:45  
Java Time Zone: Europe/Rome  
MySQL Time: 2012-04-16 11:52:45.0  
MySQL Time is aligned with Java Time

At the bottom, it states: "The official QueueMetrics website is located at <http://QueueMetrics.com>."

It is also possible to send the link via e-mail to other Chrome users that share the same QueueMetrics instance.

On older versions of Chrome, it is enough to click on the link to have the extension installed. On versions 21 and higher, the user must:

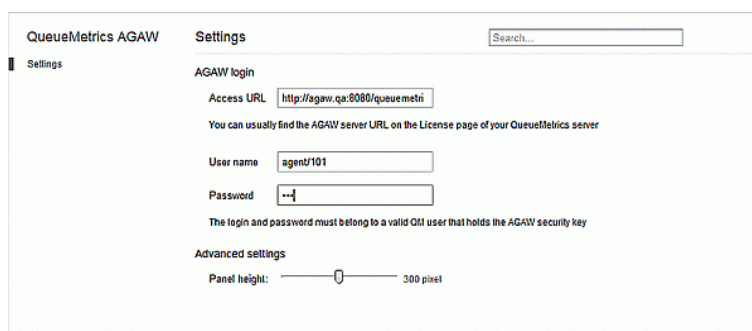
- Download the extension (agaw4chrome.crx) to their PC
- Click the wrench icon on the browser toolbar.
- Select "Tools" > "Extensions".
- Drag the file just downloaded onto the Extensions page.
- You will need to authorize the newly installed extension after reviewing its security settings

This will add the QM icon at the top right-hand corner of your browser page (next to the Chrome settings icon).



Sysadmins managing a large number of workstations may find it easier to simply add their QM instance to the list of safe servers users can add extensions from. See <http://www.chromium.org/administrators/policy-list-3#ExtensionInstallSources>

By clicking on the new icon, the QueueMetrics AGAW settings page will be displayed, as shown below:



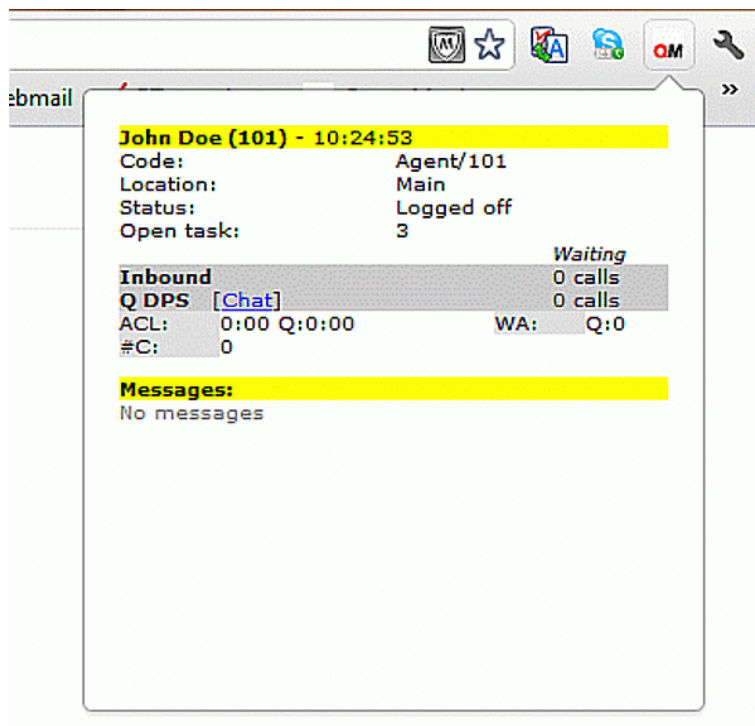
The screenshot shows the "QueueMetrics AGAW Settings" page. It has a sidebar with "Settings" selected. The main content area is titled "Settings" and includes a search bar. Under "AGAW login", there is an "Access URL" field with the value "http://agaw.qa:8080/queuemetri". Below this is a note: "You can usually find the AGAW server URL on the License page of your QueueMetrics server". There are fields for "User name" (containing "agent/101") and "Password" (containing "1234"). A note states: "The login and password must belong to a valid QM user that holds the AGAW security key". Under "Advanced settings", there is a "Panel height" slider set to 300 pixels.



You should enter the following information:

- **Server URL:** `http://myserver:8080/queuemetrics/qm_agaw_facade_ajax.do` (take from the Licence page)
- **Username:** the agent code
- **Password:** the agent's QM password

The "Panel height" Advanced setting allows to alter/adjust the size (in pixels) of the extension panel, as required.



If you ever need to remove the AGAW extension you can simply select the Chrome settings icon and choose Tools/Extensions - here you can click on the "Remove" button next to the extension name. Confirm the extension removal.

## AGAW Client usage

AGAW Client usage depends on the agent being able to login to QueueMetrics using the Agent's page and hold the AGAW key.

If the AGAW web-server processes crash, the client will become blank and it can be restarted by toggling the sidebar off and on again.

The client can be set up to require a manual authentication or to provide it by default, by entering or not entering the defaults in the Setup popup.

Once the agent logs in, he gets a display that shows the current situation. On the top of the section, the current name of the agent is displayed, as well as the system time when the page was last updated. Other agent information is shown, e.g. the current agent status, the Asterisk code, the current location and supervisor (if any).

Also, a list of queues is displayed, where:

- The agent is a known member, or
- The agent has data for it

For each queue a different set of parameters can be displayed. The only common parameter is the current number of waiting calls, that is always displayed. Each parameter can be shown at the agent level, or at the queue level, or both.

Each parameter can have its own alarm threshold - this is definable separately per-queue and per-agent.

At the bottom of the client section there is a space reserved for broadcast messages that are of interest for the current agent, and are shown in a "bulletin board" fashion, for a given period (a few hours) and showing only the latest ones.



At the moment, you can either use QueueMetrics or the AGAW client in the same browser, unless you use a different alias for the server in order to have two active, distinct user sessions.

## Which parameters can be displayed on the client?

A large set of metrics can be displayed on the client. We suggest to keep them to a minimum, to avoid cluttering the agent's view with information that is not currently critical to her work.

Code	Description	Available for queue?	Available for Agent?
ACL	Average Call Length	X	X
WR	Average wrap time	X	X
AW	Average wait time	X	
MW	Maximum wait time	X	
WA	Number of calls waiting	X	
N Calls	Absolute number of calls		X
CPH	Contacts per Hour	X	X
QCPH	Qualified Contacts per Hour	X	X
SPH	Sales per Hour	X	X
QCONV%	Qualified Conversions %	X	X
CONV%	Conversions %	X	X
#C	Answered calls for agent		X

For all metrics, red and yellow alarms can be set separately at the queue and agent level, and for each queue separately.

## Contacting supervisors

If this feature is enabled in the queue, agents can talk back to supervisors using an XMPP/Jabber client. This will happen by clicking on a link that points to the correct supervisor next to the queue name.

If you have FastPath installed, you can use FastPath to create a virtual supervisor queue that will be available through a "Chat Now" button that will appear on the bottom of the AGAW client.

## Supervisors: accessing AGAW statistics

By giving the key AGAW\_REP to your supervisors, you can have them monitor the statistics of their own agents, filtering by the locations they are allowed to see or their own supervision.

This will lead to a page where the statistics for the relevant agents will be displayed. These are the actual live stats that your agents are seeing.

Queue	N. Wait	Max Wait	ACL	SPH	OCPH	CPH	QCONV%	CONV%	Avg Wait	Wrap
Queue 1	0	0.00	1.13	0.0	0.0	0.0	0.0%	0.0%	0.00	0.00
Queue 2	0	0.00	0.46	0.0	0.0	0.0	0.0%	0.0%	0.00	0.00

Agent	Queue	Status	PCode	Last	ACL	SPH	OCPH	CPH	N. Calls	QCONV %	CONV %	Wrap
Agent1101	Queue 1	Logged off		-	2.20	0.0	0.0	0.0	429	0.0%	0.0%	0.00
Agent1103	Queue 2	Logged off		-	1.00	0.0	0.0	0.0	428	0.0%	0.0%	0.00

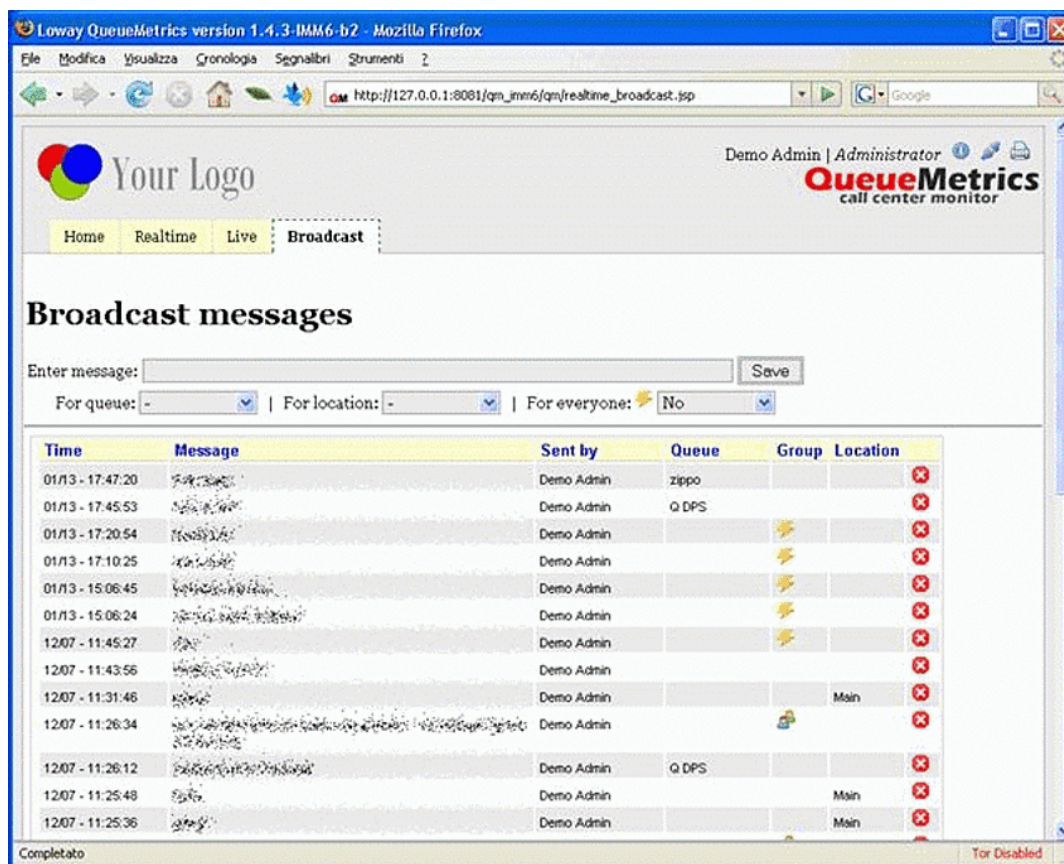
All the statistics can be displayed in a set of colours:

- **Black:** the agent is seeing this item, no alarms
- **Yellow:** the agent is seeing this item, yellow alarm triggered
- **Red:** the agent is seeing this item, red alarm triggered
- **Gray:** this item is hidden from the agent (but is calculated all the same).

Statistics are reloaded when the AGAW runner script runs, so will be updated sequentially by queue. If the runner script is not active, stale statistics will be displayed.

## Supervisors: sending broadcast notifications

If the supervisor holds the key BRO\_MSG, when he navigates to the *Realtime* page there will be a tab called "Broadcast" as in the following page:



From this page you can enter broadcast messages that can reach one or more of the following:

- Everyone logged in (using the Lightning icon)
- All agents working on a queue
- All agents working at a specific location
- A specific agent
- If the user has the key SUPERVISOR, all the agents he's currently supervising (using the Group icon)

It is also possible to remove messages that have been sent using the "Delete" icon on the right.

Broadcast notifications can be received in multiple ways:

- By agents using the AGAW client, or
- By agents logged in with the Agent's page, or
- By agents via an RSS feed

In order for your agents to access their broadcast feed, they should point their RSS reader to the following URL:

[http://qmserver-rssname.corp:8080/queuemetrics/qm\\_rss\\_broadcasts.do?user=Agent/101](http://qmserver-rssname.corp:8080/queuemetrics/qm_rss_broadcasts.do?user=Agent/101)

where *Agent/101* is the agent code for the agent whose messages we want to receive.



Enabling RSS feeds requires a special configuration - see the discussion for Tasks over RSS the section called "RSS data export for tasks" [339] which address the same needs.

## Supervisors: contacting specific agents

If the agent has a defined XMPP address (defined in the **Agent configuration** page) and the supervisor holds the key MON\_IM, there will be a new icon that will appear in the Realtime screen and will allow contacting the agent directly via XMPP/Jabber.

## Administrators: monitoring the AGAW system

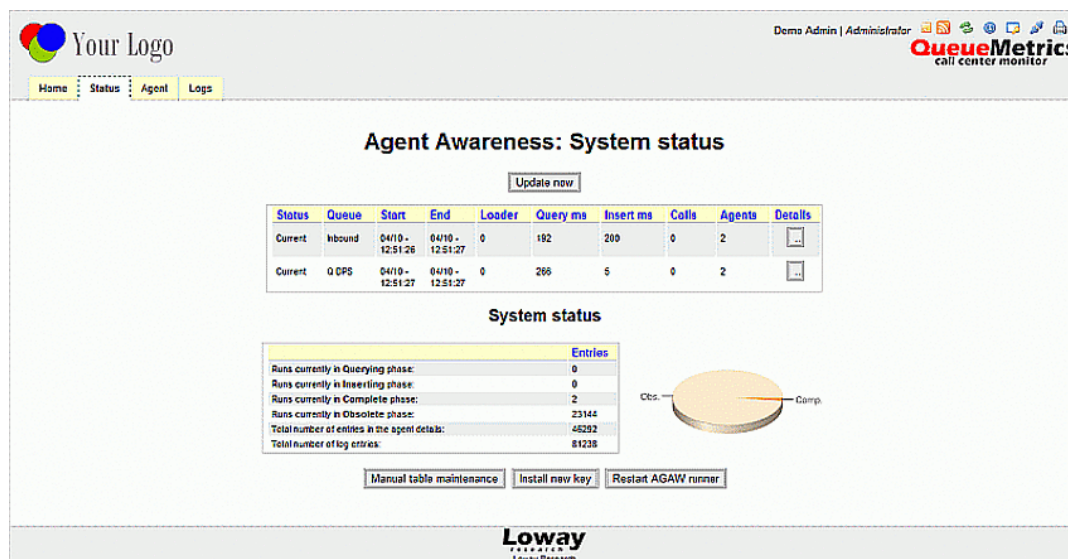
Administrators can run a general supervision of the whole AGAW system. In order for this feature to be enabled, they must be given the AGAW\_ADM key.

This allows for the "Agent Awareness" entry to appear under the "Edit QueueMetrics settings" section.

By clicking on it, the user is led to the Status page.

## The AGAW status page

This is the main page used to monitor the AGAW subsystem. *All data in this section is populated by the Queue Runner - if the Queue Runner is not running, then you will find no data in this section!*



This page shows the name of each queue that has been or is being processed, when the run started and ended, how much time it took to run, the number of calls and distinct agents involved.

For example, in the screenshot you can see that there are two queues in "Current" status.

At the bottom of the page, you can see the number of entries per status plus the database size. When requested, QueueMetrics will send the client all queues that are in the "Complete" state.



Possible run statuses are:

- **Querying:** data is being gathered for this queue
- **Inserting:** data is being written to the database
- **Complete:** data is available for the AGAW clients to read
- **Obsolete:** data that was previously available, now waiting for deletion (A number of database systems have better performance if data is being added to a table versus the case where it is being added and deleted. So we do programmed deletions of stale data)

A histogram makes it clearer as to which kind of lines are in the database.

The page can be reloaded using the button at the top to see what's going on in real-time.

By clicking on the details of a run, you will see all agent information that has been computed for that run of the queue, like in the following screenshot:

Agent Awareness: Run detail													
<a href="#">Back</a>													
Run ID	Status	Queue		Start		End		Loader	Query (ms)	Insert (ms)			
342	Current	Queue 1		12:03 - 12:55:23		12:03 - 12:55:25		0	1607	15			
N.Calls OK	N.Calls Lost	N.Calls On	N.Agents	N.Wait	Max wait	Avg wait	ACL	Avg wrap	SPH	OCPH	CPH	OCONV %	CONV %
1206	429	0	2	0	0.00	0.00	1:13	0.00	0.0	0.0	0.0	0.0%	0.0%
Agent activity													
Agent	ACL	Avg Wrap	SPH	OCPH	CPH	OCONV %	CONV %	N. calls	Legon	Last	P.Code		
John Doe (101)	2:30	0.00	0.0	0.0	0.0	0.0%	0.0%	429	Logged off	-			
Mike Boo (102)	0:34	0.00	0.0	0.0	0.0	0.0%	0.0%	857	Logged off	-			

If there are any color alarms, they are shown as the background color. Possible color configurations are:

- Black text: item visible in the client, no alarm
- Yellow background: Item visible, yellow alarm
- Red background: Item visible, red alarm
- Gray text: This item is hidden from the client.

## The AGAW Table maintenance page

It is possible to perform either a manual or a programmed table maintenance. We suggest basically running table maintenance from a script, but the manual option is available in case it's needed.

Maintenance will first purge unused records, and will then run a table optimization to maximize access and insert speed.

<a href="#">Home</a> <a href="#">Status</a> <a href="#">Agents</a> <a href="#">Logs</a>	
Agent Awareness: Manual table cleanup	
<a href="#">Back</a>	
Operation	Duration
Deleting old records	0.0
Deleting old messages	0.0
Deleting old client messages	0.0
Deleting old client messages	0.0

For each operation performed, an overview is displayed, showing the duration of the required operation in milliseconds.

When running on a busy system, high maintenance times are normal, as the database back-end will try to find a suitable moment to perform the required operations.

## The AGAW Agents page

The Agent page is based on the same routine that fetches data for an agent - if you select the agent, then all the data that would be currently served to that agent is shown.

Loway QueueMetrics version 1.4.3-IMM6-b2 - Mozilla Firefox

File Modifica Visualizza Cronologia Segnalibri Strumenti 2

http://127.0.0.1:8081/qm\_imm6/agaw/admin/agaw\_agentview.jsp

Google

Your Logo

Demo Admin | Administrator

QueueMetrics  
call center monitor

Home Status **Agent** Logs

### Agent Awareness

John Doe (101) View

Queue	Status	PCode	Last	# Wait	Max Wait	ACL	SPH	CPH	My ACL	My SPH	My CPH	N Calls
queue-dps	on	36	2008-01-13 17:39:41.0	0	0:00	2:05	0.0	0.0	2.05	3.6	1.1	2
queue-test	off		1970-01-01 01:00:00.0	0	0:00	0:00	0.0	0.0	0.00	0.0	0.0	0

Loway  
Research

Completato

Tor Disabled

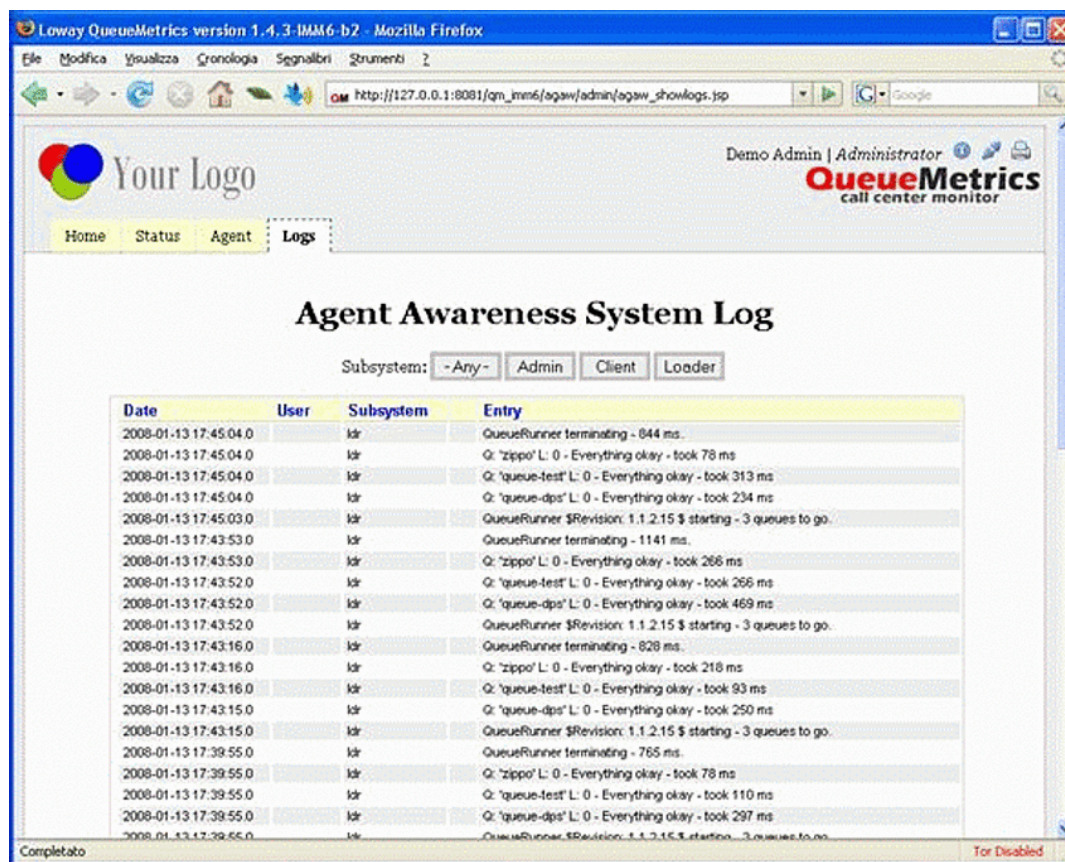
Agents can be selected from the drop-down box on the top of the page.

This is useful to see what an agent would see without accessing a real facade.

## The AGAW logs page

The system log instead will show the log of the activity for both the Queue Runner and for each agent - this is useful to see real-life performance:





The AGAW log is divided into three parts:

- Admin: operations performed by the administrators.
- Client: access times for clients reading AGAW data. One entry is added for each time the AGAW system is accessed
- Loader: The activity log of the AGAW runner. From here you can see if the Runner is working and what it is doing.

In case of errors, the relevant lines are displayed with a red dot.

When the Runner is processing, you get:

- A line saying that the runner is starting, its current version and how many queues it's going to consider (eg. "Queue Runner \$Revision: 1.16 \$ starting - 3 queues to go.")
- A line for each processed queue, if errors were encountered and how long it took, one by one (e.g. "Q: queue-dps L: 0 - Everything okay - took 250 ms");
- A line saying that the runner is shutting down and how long the whole run took (e.g. "Queue Runner terminating - 828 ms")

You can also see client accesses for debug purposes:

- You see which agent requested data and the amount of processing time (e.g. "Agent/101 - Client Query: Q:2 B:0 E:0 Took 297 ms Pr:0 Lo:94 Ut:0 Pe:0 Co:203 Br:0 = 297")

- The various figures can be used for debugging purposes (e.g. "Co" is the connection time to the DB)

---

# Chapter 16. QueueMetrics Tasks

Tasks are a general mechanism to send some QM users a set of actions to perform. This could be, e.g. an agent which call has been reviewed, or a grader knowing that an agent has accepted a task.

Tasks are handled on a separate page that works as a "mailbox" for incoming tasks and lets you check the tasks you generated.

Differently from the way QueueMetrics usually works, tasks also allow for "direct URL linking", so that you can have a short URL that is published over RSS or email and allows the user access to the task. Before access is granted, anyway, user authentication is performed.

Tasks are strictly typed, that is, you can have only a given set of them. In order to handle a basic one-to-one communication, a generic *Note* task is provided.

Tasks are shown on the top of each page generated by QueueMetrics - when you have new tasks, you see a flashing NEW icon. A user's tasks are exported over RSS - a RSS icon allows easy subscription by clicking on it.

Unread tasks are also shown on the AGAW page, with a count of the number of tasks outstanding.

Access to the Task subsystem is controlled by the key TASKS.

## The task page

If the user is enabled for tasks, they will see a couple of new icons on the top every page:



The yellow icon leads to the tasks page; if you have new tasks, it is displayed together with a flashing NEW icon.

The orange icon lets you access a RSS feed for all the tasks for the current user (see below on how to set this up).

When you click on the yellow icon, you are lead to the tasks editor page:

**QueueMetrics** **YourLogo** Agent 101 | Agent supervisors

Home **Tasks List**

**Task list**

View tasks:  View #:  Search

**Extended search options**

Task type:  Due date start period:  Due date end period:  Process Field:  Show future tasks: ☐

Items found: 193 Page 1 of 7

Task id	From	Description	Due date	Status	Process Field
333	Joe Robot	Meeting: This is a Meeting Task from XML_RPC	12/09 - 10:23:12	TBD	PFAMILY/PID00
338	Joe Robot	Training: Training on Google Analytics	12/09 - 10:23:12	TBD	HR_HEALT_2011/TR221100
367	Joe Robot	Meeting: This is a Meeting Task from XML_RPC	12/09 - 10:23:12	TBD	PFAMILY/PID00
366	Joe Robot	Training: Training on Google Analytics	12/09 - 10:23:12	TBD	HR_HEALT_2011/TR221100

On top of the page, you see a selector with:

- **Tasks to be done:** tasks addressed to me that I have to complete
- **My group:** Tasks for my class that I can address
- **Tasks I completed:** the set of tasks that I completed (and their completion codes)
- **Task I sent:** The tasks I sent somebody else (if any)
- A box to access directly a task by number (it will be found only if the current user can see it: that is, he is the assignee, or a member of the group it is assigned to, or the assigner).

You can optionally make the list shorter by selecting:

- A task type
- The period the task was supposed to be due
- An option to display future tasks as well
- The Process field which is formed by the Process Family / Process ID and can be inserted only via XML-RPC.

For each task, the following information is displayed:

- An icon displays whether the task is overdue (red), about to be due (yellow) or yet to be due (green)
- The task sender
- The task ID, that is an unique number that lets you access a specific task directly
- An icon for the type of task involved
- The task description

- The due date (if any).
- The status: it can be **TBD** (to be done) or **Completed** or **Disputed**.

The list is paged, so you only see the first 10 elements or so.

When you click on a the pencil icon of a task, it is displayed in a panel like the one below:

**QueueMetrics** **YourLogo** Agent 101 | Agent supervisors

Home Tasks List **Task Detail**

**QA Scored: Average score 87.40**

Call graded - Form: SecondForm, Date: 2015-05-19, Time: 12:22:11, Queue: 300, Score: 87.40

**Notes:**

[View](#) [Process](#) [Dispute](#) [Reject](#) [Edit Note](#)

**Task info**

From	To	Created on	Valid from	Expires on	Last updated	Status	Process Field
Agent/101	Agent/101	2015-05-19	2015-05-19	2015-05-26	2015-05-19	TBD	

06/01 - 09:54:00

**Loway**

This is a QA task; tasks of other kinds may differ slightly in their appearance and behavior.

The top box contains a description of the task; while the bottom box contains a note that can be edited freely.

The following buttons are typical:

- **View:** in case the task is related to something else (like in this case, a QA form) this button lets you access a form with the related information.
- **Process:** the user acknowledges having seen the task
- **Dispute:** the user acknowledges having seen the task, and disputes the given score
- **Edit Note:** lets you save the edited Note field.

By the bottom of the page, general information on the task is displayed:

- **From:** the originator
- **To:** the receiver
- **Created on:** the day it was created

- **Valid from:** the day the task started being addressable
- **Expires on:** the deadline for completing the task
- **Last updated:** the date this task was last processed
- **Status:** the current task status

If the task is related to other tasks, a task history table is shown. In this table user could find, for each related task, information about:

- **Task Id:** the unique identifier of the related task
- **From:** the originator
- **To:** the receiver
- **Created on:** the day it was created
- **Valid from:** the day the task started being addressable
- **Expires on:** the deadline for completing the task
- **Last updated:** the date this task was last processed
- **Status:** the current task status
- **Abstract:** the task title
- **Notes:** notes associated to the task (if any)

When a user processes or disputes a task, it is possible to ping a specific URL if defined within the property `default.tasks.pingURL`. Further details about this property can be found within the System Preferences chapter.

## Extended task reports



Users holding the special key `TASKS_VIEWALL` can monitor all tasks on the system - they will have three new choices in the drop-down menu:

- All tasks
- All tasks to be done
- All tasks done

Combined with the advanced search criteria, they can be used by the superuser to monitor the well-being of tasks being handled on the system.

## Task Statistics

Users holding the special key `TASKS_REP` can access the tab showing task statistics where it is possible to Search by Tasks start/end date and by Task type.




Demo Admin | Administrator

[Home](#)
[Task Statistics](#)

### Task Statistics

Task start date period: 2014-07-01, 8, 50  
 Task end date period: 2015-06-01, 18, 00  
 Task type: -

Task Type	Process	Created	Open	Open Overdue	Solved	Solved Overdue	Avg Resolution
Totals		97	87	87	10	0	0d 8:36
Notes		3	3	3	0	0	
QA		27	26	26	1	0	0d 0:30
Training		56	47	47	9	0	0d 9:29
Meeting		11	11	11	0	0	


06/01 - 10:07:11

The result of such Search shows, for each Task Type:

- The Process field
- Created/existing tasks for each task Type
- How many tasks are Open
- How many are Overdue
- How many have been Solved within the due date
- How many were Solved late
- The Average Resolution Time

The "View Details" icon leads to Task Details where one can see the Status of each Task, the users involved, the Task Creation date/time, Validity From and Expiry date/time.

## Tasks for groups: Class tasks

Tasks can be addressed to user Classes as well as users. This is useful e.g. for supervisors, when you mean "Any supervisor", not a specific one.

When you act on such a task, you get the ownership, that is the task is changed as to signify it was originally sent to the acting agent.

You do not see outstanding class tasks with the "new" icon, as it is for personal tasks.

When a task is processed by a person, the acting person is displayed as "PersonsName on behalf of AgentClass".



## Task validity and expiration

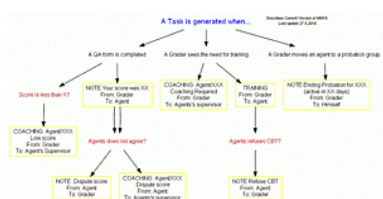
Each task has a "Valid from" and "Due by" dates. This makes it possible to create tasks that:

- Show up in the future (so you can add yourself a task to complete some future action)
- Be notified of the expiration dates.

All tasks that do not have a specified expiration date are to expire by 7 days after they are added to the system.

## Types of tasks handled by QueueMetrics

The following task types are currently defined, as explained in the graph below:



## Call QA Graded Task

This task is generated when someone grades a call processed by an agent, and it is sent to the agent that processed the call.

The title is. "Call graded on queue XXXX processed on XXX".

When you click on the task, you are lead to the correct QA form for that call. You can enter comments on that call and ACCEPT/DISPUTE the grading. When you process that task, a new task of type NOTE is sent to the grader.

If you DISPUTE the grading, a NOTE task is sent out to the person who graded the call and a separate one to the supervisor of the agent who disputed (if any).

## Note Task

This task simply displays a text and can open up a URL when clicking on the Accept button. This is used to notify on an ACCEPT/DISPUTE. The task note is sent when some events happen in QueueMetrics like, for example, when someone grades an agent call, or an administrator/supervisor changes group for a particular agent. The task note could also be sent through an external XML-RPC call.

## Training Task

This is a special task that contains a URL and is sent to the agent by the grader to improve their skills. This is used to send links to CBTs where URLs can be defined through the the section called "Configuring CBTs (Computer Based Training)" [246] pages. This task could be sent through the Performance Tracker Result Page, the Grader Report page and the Training & Coaching Page.

An agent can accept (open up the URL) or dispute this task. (This task basically behaves like a Note but has a Dispute button as well).

## Meeting Task

Meeting Tasks (also called Coaching Tasks) can be sent through the Performance Tracker Result Page, the Grader Report page and the Training & Coaching Page. This task includes a message and a date and time of the meeting event. This is a task that can also be sent to an agent via XML-RPC.

An agent can accept or dispute/refuse/reject this task.

## RSS data export for tasks

Any QueueMetrics user can subscribe to their own "task inbox" as RSS feed. You can access the RSS feed and subscribe to it in most browsers just by clicking on the orange RSS icon that is displayed next to the Tasks icon.

In order to display the RSS icon, you need to set the properties as described in the chapter below:  
"Setting computed URLs"



This access method offers no security at all, so any user who has access to any other user's workstation can access the other person's RSS feed.

The RSS feed contains only the titles of current tasks to be done and a link; when the link is clicked, the user is authenticated (if necessary) and lead to the tasks page, so basically clicking on the RSS link is the same thing as going to the Tasks page and selecting a task in order to view its details. If the user that logs on is not the intended recipient of the task, the task is not displayed.



It is advisable that the RSS polling speed be set to a minimum on the RSS reader (like once every 20 minutes or so) in order to minimize the load on the QM server.

## Setting computed URLs

In the configuration files, you should set two properties before using RSS tasks:

```
url.qm=http://qmserver.my.corp:8080/queuemetrics  
url.rss=http://qmserver-rss.my.corp:8080/queuemetrics
```

In general, the servers *qmserver* and *qmserver-rss* should be the same machine - this is necessary because if your RSS reader is embedded in your browser, every time it requests a RSS feed, it also logs you off from the current session.

---

# Chapter 17. Payroll data in QueueMetrics

Starting from QueueMetrics version 1.6., QueueMetrics is able to produce extensive payroll information suitable to be exported to a third party application.

QueueMetrics is able to extract most of the data required for payroll generation from the agent sessions information reported by QM. Through some special pages a supervisor can edit and correct that information before exporting.

## How it works

Payroll is based on agent sessions and is displayed as a separate "micro-application" within QM, available only to agents holding a special key. Each agent has a specific payroll code associated through the agents configuration page. This *payroll code* identifies the agent in the payroll generated data file.

To Supervisors that can access to payroll subsection will be shown all "punch times", for a given period of time, with the opportunity to zoom in, display incomplete sessions and display sessions for one specific agent. Supervisors holding a second special key are allowed to correct - enlarge or restrict - agent sessions, given a set of rules that avoids overlaps with other agent activities, to be further specified. A third key allow "enlarging" agent sessions, i.e. causing the cost to be more for the call center. Payroll extraction is just manual: the user should inspect payroll data and download payroll trace files, to be loaded into external WR Timetracker for further processing. Supervisors are able to see all punches and/or to filter out some of them by agent group and/or location. All activity is logged into the QueueMetrics log subsystem.

Payroll information generated by QueueMetrics is based on a specific output file format:

- **ADP** "punch files", that basically handle the time an agent has been available under ACD

but the underlying structure let us able to expand the file format selection by implementing a specific file writer.

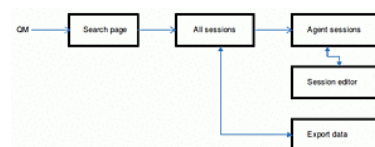
To summarize, here are the keys that limit user's permissions when working with Payroll:

- Users allowed to check the payroll page will be marked by the key **PAYROLL**
- Users allowed to edit the queue\_log records will be marked as **QLOG\_EDIT**
- Users allowed to edit session data by making it longer will be marked by **QLOG\_LNGR** (they must hold QLOG\_EDIT as well).

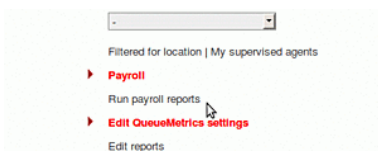
All queue\_log editing is tracked and logged.

## Payroll web pages

The payroll process happens on the following web pages:



The Search page is linked from the main QM page.



## The search page

The search page lets a supervisor search for session activity.

The page lets you select a time interval, or choose one of the pre-selected time intervals. It also lets you filter by one criteria of the following ones:

- Location
- Agent group
- Supervisor (a button "me" is available if the user is a knows supervisor, and will pre-select the current supervisor)

## The Sessions page

The payroll extraction page lets you preview the data that will be downloaded in the "punch" format. If you click on an agent's name, then you will be lead to a page where all sessions for that agent will be shown for the specified time interval.

Agent name	N. sessions	N. Payable	Total duration	Not Satisfactory	Not Payable
Agent1	1	1	20:00:00	20:00:00	20:00:00
Agent2	1	1	20:00:00	20:00:00	20:00:00

The table can be exported as Excel/CSV/XML, as all other QM tables.

Next to the agent name, if present, is an icon that displays the current Agent group. If there is a payroll note for the agent, a yellow icon is displayed by the end of the row.

The button "Export now" lets you download the "punch" data file, in the format specified on screen.

## The Agent detail page

On the Agent detail page all sessions for that agent will be shown for the specified time interval. Next to the agent name, if present, is an icon that displays the current Agent group.

**Payroll extraction for agent/101**

Period from:	2010-09-05 12:17:40
Period to:	2010-10-05 12:17:40

**John Doe (101)**

Agent name	Pause Code	Duration	Starts	Ends	
John Doe (101)	-	331:30:11	09/07 - 15:53:40	09/21 - 11:46:50	
John Doe (101)	-	-	09/07 - 15:53:40	09/07 - 15:53:56	
John Doe (101)	BP Backoffice	14:48	09/07 - 15:55:00	09/07 - 16:09:48	
John Doe (101)	NBNP Lunch	-	09/07 - 16:10:00	09/07 - 16:31:48	
John Doe (101)	NBNP Lunch	-	09/07 - 16:31:49	09/07 - 16:32:45	
John Doe (101)	NBP Hourly break	1:20:49	09/21 - 10:08:26	09/21 - 11:29:15	
John Doe (101)	-	6:11	09/21 - 11:47:00	09/21 - 11:59:59	
John Doe (101)	-	-	09/21 - 11:47:10	09/21 - 11:53:59	
John Doe (101)	BP Backoffice	1:58	09/21 - 11:56:08	09/21 - 11:58:06	
John Doe (101)	-	7:08	10/04 - 11:32:00	10/04 - 11:40:25	
John Doe (101)	BNP Email	-	10/04 - 11:36:16	10/04 - 11:37:34	

Export as...

**Payroll Notes**

Date	User	Notes
2010-10-04 12:48:16	demoadmin	Test aggiunta nota a agent/101
2010-09-20 11:53:10	demoadmin	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
2010-09-20 11:52:24	demoadmin	Message from John Doe (101)

Pause types and codes are displayed, according to the following table:

- **BP:** Pause is Billable and Payable
- **BNP:** Pause is Billable but not payable (be careful!)
- **NBP:** Pause is not billable but Payable
- **NBNP:** Pause is neither billable nor payable

A set of payroll notes can be added by the user and read. Notes could also be deleted by a user holding the proper security key (See Appendix A, *Security keys* [374] for further information).

If you have the grants to edit a session, by clicking on the icon placed next to the duration field, you will be able to edit that session.

The table can be exported as Excel/CSV/XML, as all other QM tables.

## The Session editor page

The page displays the information about the selected agent session, and it searches the maximum/minimum values allowed for starting and ending the session.

**Agent session editor**

Agent name	John Doe (101)		
Agent code	agent101		
Agent group	Main Location		
Agent location	Main Location		

	Actual	Minimum	Maximum	Change
Current session start	0907 - 15:53:40	0906 - 15:53:41	0907 - 15:53:40	
Current session end	0921 - 11:46:50	0921 - 11:29:16	0921 - 11:46:59	

Insert new time in the short format (HH:mm:ss) or complete format (yyyy-MM-dd HH:mm:ss)

It will be able to change the agent session by entering the new start and end times, either one or both at once.



If you need to make a session extend over the midnight, you must enter the full resulting date in the format like "2010-11-07 11:03:40"

An error is raised if this makes the session longer and you do not hold the key QLOG\_LNGR).

If the period is invalid, an error will be displayed. When the changes are applied, the page will reload with the new data

## The pause editor page

The page displays the information about the selected agent pause, and it searches the maximum/minimum values allowed for starting and ending the session.

Home Search Sessions List Session Details **Edit Pause**

**Agent pause editor (Backoffice)**

Agent name	John Doe (101)		
Agent code	agent101		
Agent group	Main Location		
Agent location	Main Location		

	Actual	Minimum	Maximum	Change
Current pause start	0907 - 15:53:00	0907 - 15:53:57	0907 - 16:09:47	
Current pause end	0907 - 16:09:40	0907 - 15:55:01	0907 - 16:09:59	

Insert new time in the short format (HH:mm:ss) or complete format (yyyy-MM-dd HH:mm:ss)

**Change pause code**

Backoffice

This page works exactly like the Session editor, but lets you set/change the pause code as well.

An error is raised if this makes the session longer or you change a pause from non-payable to payable without holding the key QLOG\_LNGR.

If the period is invalid, an error will be displayed. When the changes are applied, the page will reload with the new data



Each time the user asks for a pause modification (either the start/end time, either the pause code) the system modifies the database information in order to reorganize the pause in a *standard* format. The standard format is characterized to have a PAUSEALL, PAUSEREASON, UNPAUSEALL sequence where the PAUSEREASON is placed one second after the PAUSEALL event. This prevents problems with possible malformed pauses present in the database. All modifications are logged in the syslog pages with corresponding rollback SQL statements.

# Editing the system queue\_log file

When the user asks for changes on a specific agent session statement, QM will try and see if it can find that session and it is "well-formed". This means that some sessions might not be updateable though they work fine in QM.

Not well-formed sections are, for example, sections where a log-on event is not present, or overlapped with other events. This could be caused by a not corrected queue log, following some pbx unavailability or something other.

If the target session is "well-formed", QueueMetrics will try to detect whether the change causes some havoc with other calls/sessions. If it does, the change is rejected.

If the target section is well-formed but causes a growing cost for the call center, and so requires the key QLOG\_LNGR, that key is checked; if not found, the change is rejected.

## Well-formed agent sessions

An agent session is considered well-formed if:

- At least one line with one of the Agent logon verbs is present at the time stamp that is given as the start of the session
- A line with one of the logoff verbs is present at the time stamp that is given at the end of the session, with same partition ID as at least one starting line found

## The editing log

All activity details are logged to the master QM log, where they will be available for inspection through direct SQL access.

The trace log contains:

- A description of the changes, the time and the user who requested them
- A sequence of SQL that generates the new session timing
- A sequence of SQL that is able to restore the records as they were before the change



---

# Chapter 18. Configuring Asterisk for QueueMetrics

QueueMetrics is designed to analyze queue\_log data provided by any Asterisk installation; the following guidelines will help you to make the most out of it.

## Configuring queues to report exit status

In the following example:

- all calls are monitored, i.e. saved to disk;
- if after 60 seconds on the queue the call is unanswered, the call is routed to voicemail and this event is reported correctly by QM;
- there are two levels of agents: agents 302 and 303 will answer the queue (level 1); only if none of them is available the call is routed to agent 301 (level 2). If nobody is available, the queue keeps trying until timeout is reached.
- Agents can transfer the call to other extensions by pressing the "#" key;
- Agents terminate the current call by pressing the "\*" key.

### Extensions.conf

```
[q-my-sample]
; ...queue description....
exten => s,1,SetVar(MONITOR_FILENAME=/var/spool/asterisk/QSAMPLE-${UNIQUEID})
exten => s,2,Queue(q-sample|nt||60)
exten => s,3,Playback(voicemail-invitation)
exten => s,4,VoiceMail,s2001
```

### Queues.conf

```
[q-sample]
music = default
announce = q-sample-announce
strategy = roundrobin
timeout = 60
retry = 5
maxlen = 0
announce-frequency = 0
announce-holdtime = no
monitor-format = wav
monitor-join = yes
queue-youarenext = silence
queue-thankyou = q-sample-thankyou
member=>Agent/302,0
member=>Agent/303,0
member=>Agent/301,1
```

Make sure that you do not forget the explicit timeout when calling the Queue() command from *extensions.conf*, or queue timeouts will not be logged by Asterisk and therefore not reported by QM. A patch that corrects this Asterisk behaviour can be found at <http://bugs.digium.com/view.php?id=5422>.

## Configuring URLs to be launched by the agent real-time page

The URL should be embedded in the Queue() command as prescribed by Asterisk:

```
exten => s,7, Queue(myqueue|nt|http://mysite/app?uid=${UNIQUEID}&clid=${CALLERID})
```

This command launches the queue "myqueue" and launches the webapp located http://site/app passing the following parameters:

1. *uid* is the Asterisk internal unique call id
2. *clid* is the Caller\*ID for the current call

The URL will appear on a clickable link on the Agent's page.

If you set the property *realtime.agent\_autoopenurl* to *true*, whenever the Agent's page is reloaded, the most recent unopened URL is launched automatically.

## Listening to recorded calls using QM

- *Make sure it is legal* This is not strictly a QM issue, but before attempting to record all calls on a queue, you should consult a lawyer to make sure it is legal in your country. It would be probably fair enough to tell your operators their calls are being recorded and to add a voice message telling the customers their call will be recorded.
- *Tell Asterisk to record all calls* To record all calls add something like this to *extensions.conf*:

```
exten => s,1,SetVar(MONITOR_FILENAME=/var/spool/asterisk/q/QSAMPLE-${UNIQUEID})
exten => s,2,Queue(q-sample|nt||60)
```

This way all sound files are stored under /var/spool/asterisk/q/ with the name of the queue (QSAMPLE) followed by the call id.

- *Tell QueueMetrics where to look for the calls* You should set up the *WEB-INF/configuration.property* file in QM like this:

```
default.monitored_calls=/var/spool/asterisk/q/
```

When looking for the recording of a call, QM will explore all files contained in /var/spool/asterisk/q/ and any directories below for a file name containing the right call ID. It might find more than one file name and will display all of them. It is possible that sometimes Asterisk fails at mixing together the two files (Asterisk records separate files for the caller and the agent, and then tries to mix them together at the end of the call) so you will find two files named -in and -out instead. The search behaviour can be customized -see the section called "Listening to calls using Pluggable Modules (PM)" [276].

- *Tell QueueMetrics you have the right to listen to the calls* Any user willing to listen to calls must hold the key CALLMONITOR. This is to make sure that only authorized personnel can listen to recorded calls. If you do not have this key, no sound files will be shown.

- *Make sure QueueMetrics has the right to read saved calls* You should make sure that the process running QM (i.e. the servlet container, might be Tomcat, Jetty, or something else depending on your setup) has the rights to access the files where recorded calls are stored. If using a separate web server, it should not be able to access those files directly, as QM will pipe out files only after enforcing security checks.
- *Debug tip: see which files QM sees* There is a hidden transaction in QM made to debug call listening. To launch it, logon as an administrator and type the transaction "*qm\_show\_files.do*" in the URL bar instead of the page name. You will be lead to a page showing the filenames QM can read from the hard disk, whether the current user has the CALLMONITOR key and the search path as defined in *default.monitored\_calls*.

## Using AddQueueMember for dynamic agents

AddQueueMember is a command that lets you add dynamic agents to a queue. Its main advantage is that you can add channels, i.e. terminals, so you'll have most of the advantages of agents without the performance and stability problems that the agents module may cost in very large systems.

Its disadvantage is that it does not log the agent login/logoff to the queue\_log, and so programs that analyze the queue log data like QueueMetrics will not see agents logging on and off. This is a major organizational problem in a real-world call center, where tracking agent logons and logoffs is vital to the smooth running of the operations.

The answer is to add a fake queue\_log data for each logon and logoff. For QM, it is important to avoid multiple logoff lines and to compute online permanence with logoffs.

To do the adding, you dial 422XX, where XX is your local extension; the same happens with 423XX to be logged off.

```
; Add Member - 422

exten => _422XX,1,Answer
exten => _422XX,2,AddQueueMember(my-queue,SIP/${EXTEN:3})
exten => _422XX,3,System( echo "${EPOCH}|${UNIQUEID}|NONE|SIP/${EXTEN:3}|\
AGENTLOGIN|- ">> /var/log/asterisk/queue_log )
exten => _422XX,4,Set(DB(dynlogin/log_Agent-${EXTEN:3})=${EPOCH})
exten => _422XX,5,Hangup

; Remove Member - 423
exten => _423XX,1,Answer
exten => _423XX,2,RemoveQueueMember(my-queue,SIP/${EXTEN:3})
exten => _423XX,3,Set(ORGEPOCH=${DB(dynlogin/log_Agent-${EXTEN:3})})
exten => _423XX,4,Set(RV=${EPOCH} - ${ORGEPOCH})
exten => _423XX,5,GotoIf("${RV}" = "0"?8:6)
exten => _423XX,6,System( echo "${EPOCH}|${UNIQUEID}|NONE|SIP/${EXTEN:3}|\
AGENTLOGOFF|-|${RV}" >> /var/log/asterisk/queue_log )
exten => _423XX,7,Set(ORGEPOCH=${DB_DELETE(dynlogin/log_Agent-${EXTEN:3})})
exten => _423XX,8,Hangup
```

With this setup, we verified that the queue\_log can be analyzed by QueueMetrics and the dynamic agent shows up fine (albeit with the name of a terminal, like SIP/23, instead of the usual Agent/23 string, but you can modify it in QM itself).

This setup might even be used in a call center where agents are not actually used but queues connect straight to terminals to "fake" agent logon/logoff, in order to have such data available for reporting.

## Defining outbound queues (campaigns)

Standard Asterisk queues are, by definition, inbound queues; they accept a number of incoming calls, let them wait in line and distribute them to various agents based on the queue logic.

To make it possible to analyze outbound calls with QM, we added the concept of a "campaign" or "outbound queue", that is a set of calls made by different agents that are working for the same purpose. Of course there is no such thing as an outbound queue in Asterisk, so we have to run a special piece of dialplan or an AGI script to produce the same information on queue\_log for outbound calls as it is automatically produced for inbound queues.

As this only regards the actual Dial(...) statement that Asterisk runs, it is possible to have different sources of numbers to be dialled by agents on outbound queues; they might enter the number on their keypad, or use the telephone, launch them from the Agent's page or maybe use a predictive dialler for the task. QueueMetrics does not care, as long as the correct events are logged.

## Placing outbound calls

If you run Asterisk 1.4 or newer and want to place outbound calls, you use an example script supplied within the *extensions\_queuemetrics.conf*; it should be imported by the main Asterisk configuration.

After this, if you place a call directed to *Local/XXXXXXXXXX@queuedial*, where *XXX* is the code for the campaign and *YYYYYY*... the number to be dialled, a call will be created and logged as *Agent/ZZZ*, where *ZZZ* is the caller-id of the extension placing the call.

You may want to tweak the following supplied piece of dialplan to adapt it to your needs:

```
[queuedial]
exten => _XXX. ,1,Set(QDIALER_QUEUE=q-${EXTEN:0:3})
exten => _XXX. ,n,Set(QDIALER_NUMBER=${EXTEN:3})
exten => _XXX. ,n,Set(QDIALER_AGENT=Agent/${CALLERID(num)})
exten => _XXX. ,n,Set(QDIALER_CHANNEL=SIP/${QDIALER_NUMBER})
exten => _XXX. ,n,Set(QueueName=${QDIALER_QUEUE})
exten => _XXX. ,n,MixMonitor(Q-${QDIALER_QUEUE}-${UNIQUEID}.WAV|b|)
;exten => _XXX. ,n,Set(CALLERID(all)="1234567890" ) ; Uncomment and change this if
exten => _XXX. ,n,Goto(qm-queuedial,s,1)
```

You can/should modify the following variable definitions:

- *QDIALER\_QUEUE* is taken from the first three digits. If you have only one campaign system-wide, you may want to hardcode this value so the user needs not input it.
- *QDIALER\_AGENT* is the Agent code that the call will be logged under. The simplest approach is just to use the extension's caller-id, under the hypothesis that Agent/123 works at SIP/123. You may also look up under Asterisk who is the agent working at a given extension - an example is given in the *[queuedial-loggedon]* context in the same file.
- *QDIALER\_CHANNEL* is the channel that you have to dial to call out. Will likely be something
- You can comment out the MixMonitor line if you don't need call recordings.

Please note that:

- The outbound queue should not be defined in Asterisk, but must be in QueueMetrics.
- When running a QueueMetrics analysis, some values are their own mirrors: like, the Caller\*ID of an incoming call is the number dialled of an outbound queue, while the Agent field is the caller.

- It is possible to do live listening of outgoing calls (see the section called “Enabling ACD call attempts recording on Asterisk 1.0 and 1.2” [349]).
- It’s possible to specify your caller ID uncommenting the line where the Set function is called and, obviously, changing the caller ID information to properly set it as required. The same modification is needed for the extensions 28 definition present in the same file.

## Placing outbound calls through the AGI script

This section applies only if you run a version of Asterisk 1.0 or 1.2; for 1.4 or newer, please use the dialplan logic supplied in the file *extensions\_queuemetrics.conf*.

The AGI script to be used instead of the Dial(...) command is available in the standard QM distribution and can be used in the following way:

```
exten => xxx,1,DeadAGI(queueDial.agi|Number|DialString|QueueName|Agent)
```

The following parameter have to be passed by dialplan logic:

- *Number*: the number you are trying to dial. Needed for correct logging only.
- *DialString*: the actual Asterisk dial string, like SIP/34, or maybe IAX2/ usr:pass@iax.server/8885551234. If you need additional parameters in the Dial() command, modify the AGI script manually.
- *QueueName*: the outbound queue to be used for accounting. Must be defined in QueueMetrics and must not exist in Asterisk!
- *Agent*: the agent placing the call, e.g. Agent/123

A working example might be the following:

```
exten => 426,1,DeadAGI(queueDial.agi|34|SIP/34|queue-out-1|Agent/101)
```

The terminal SIP/34 is dialled and the resulting events are logged as if generated by Agent/101 working on queue-out-1.

Please note:

- The outbound queue should not be defined in Asterisk, but must be in QueueMetrics.
- When running a QueueMetrics analysis, some values are their own mirrors: like, the Caller\*ID of an incoming call is the number dialled of an outbound queue.
- When monitoring calls in real-time, it is impossible to distinguish calls waiting to be answered from calls in conversation. This is an Asterisk limitation, as the generated events are not provided in real-time. Those values are anyway correct in the reports.
- Extensive debugging output is available at /var/log/asterisk/agi-log.txt
- It is possible to do live listening of outgoing calls (see the section called “Enabling ACD call attempts recording on Asterisk 1.0 and 1.2” [349]).

## Enabling ACD call attempts recording on Asterisk 1.0 and 1.2

To get the AGENTATTEMPT code to work, it is necessary to patch the Asterisk module called *app\_queue.c* in order to track down the required information. In order to perform this task, you must be

confident with general Unix project patching and recompiling. It is advisable that Asterisk be shut down before applying the patch.

In order to apply the patch, just copy the file *app\_queue\_agentattempt.patch* found under *WEB-INF/README/* to the *apps/* directory of your Asterisk project, and then issue the following statement:

```
patch -p0 < app_queue_agentattempt.patch
```

As long as you see no errors, the patching process worked successfully. It's now time to rebuild the app by issuing a general make statement from the main Asterisk directory.

Restart Asterisk and check that the queue system is still working fine.

To see if the patch was correct, try dialling a queue and see that Asterisk writes AGENTATTEMPT records to the *queue\_log* file.

QueueMetrics starts to analyze AGENTATTEMPT verbs when the configuration key *default.ignoreRingNoAnswer* is set to true.

## Enabling ACD call attempts recording on Asterisk 1.4

Asterisk 1.4 is natively able to produce the RINGNOANSWER log entry that serves the same purpose of AGENTATTEMPT, so no patching is necessary. In this case QueueMetrics reports in the realtime page the last agent that had not picked up the phone when ringing. QueueMetrics starts to analyze RINGNOANSWER verbs when the configuration key *default.ignoreRingNoAnswer* is set to false.

Is possible to have the AGENTATTEMPT information in a not patched Asterisk 1.4 with some modifications in the dialplan. This option is limited to people not using the hotdesking feature. For more information on that, please refer to the QueueMetrics advanced configuration manual.

## Listening to live calls: Unattended Call Monitoring

In order to implement this feature, QueueMetrics follows the following steps:

- It will try to dial the channel defined in the property *callfile.monitoring.channel* by passing the local extension. This should make your local phone ring.
- Once the call is picked-up, it will try to dial *11@queuemetrics* (if the call is inbound) or *14@queuemetrics* (if the call is outbound) in order to start the ChanSpy() monitoring and will pass along all required variables to match the requested call.

To enable unattended audio monitoring for inbound calls, you'll have to edit the Asterisk dial-plan in order to include the *[queuemetrics]* context.

- Make sure that the *queuemetrics* context exists and that the extensions 10, 11 and 14 are defined for it. See Appendix B, *The [queuemetrics] context* [378]
- Make sure that the channel defined in the property *callfile.monitoring.channel* is set to *Local/\$EM@from-internal [mailto:EM@from-internal]/n* (in this example, your telephone would be known by Asterisk as something like *105@from-intenal*).
- Make sure that the extension/context are set to *11/queuemetrics* ( the unattended audio monitoring endpoint).

- Make sure that the *callfile.dir* property points to a valid callfile directory, and that will be writable by QueueMetrics. As a (now preferred) alternative you may enter a Monitor URI in the format *tcp:user:pass@server*; in this case QM will not attempt to generate a call-file but will use the Manager command to create an equivalent call instead.
- Make sure the *callfile.monitoring.enabled* configuration property is set to *true*
- Make sure your users hold the MON\_AUDIO key
- **Important:** make sure that each agent will have their local extension set in QueueMetrics; usually entering "-" will be enough. If this is not set, the icon will not appear.
- Now, when you click on the icon, a callfile will be generated and call snooping will start.

To enable unattended call monitoring for outgoing calls as well, you'll have to set the piece of dial-plan referenced by the *callfile.outmonitoring...* properties.

Outgoing calls placed though *queueDial.agi* will usually be listened to by attaching to the local *SIP/XXX* or *Local/XXX* channel of the calling agent and not to the standard *Agent/XXX* channel used for inbound, so a different piece of dial-plan will be used. Note that in order for QueueMetrics to reference the outgoing calls, you must tell it that queue direction is Outgoing.

See also Appendix B, *The [queuemetrics] context* [378] for an example of implementing Asterisk code for inbound and outbound call monitoring.

It is possible to use different PMs to handle different live audio - see the section called "Listening to calls using Pluggable Modules (PM)" [276].



if you pass an empty variable to the ChanSpy() command, it will let the user listen to any channels on the system. *This may be a major security issue.* So if you edit the supplied dialplan to match your configuration, make sure that you add a check in case a computed channel to listen on might be empty!

## Enabling VNC Monitoring

To enable VNC monitoring you will first need a VNC server that is running on each client's machine and that will serve the current layout.

You will also have to create a web page with a VNC client that may accept a VNC URL and show a VNC client (there are a number of Java-based VNC clients that can be displayed as an applet).

Configure the VNC URL as something like: `http://myserver/vncpage.php?ip=192.168.3.17`

Where the PHP page will connect the VNC applet to the server located on address 192.168.3.17

Make sure that your users hold the MON\_VNC key in order to be able to access this feature.

As an alternative, we have some clients that use a simpler setup with each machine having their own copy of UltraVNC - <http://ultravnc.sourceforge.net/> - and each machine running a web server with the locally-configured Java viewer. The VNC url is then the address of the local machine; when a person connects to it, s/he is asked for a password and then the screen is displayed through a Java applet. They report this setup to be very simple and working very well.

## Enabling Agent's page actions

In order to enable actions on the Agent's page:



- Check that all actions are enabled in the properties, this means that `callfile.actionname.enabled=true`
- Check that a Manager API is configured correctly for the server
- Check that the dialplan on the server contains the appropriate commands for this action. A sample [queuemetrics] context you can include easily within a standard dialplan using call-back agents is provided as a reference.

As of QM release 12.10 it is possible to set input validation for both the agent code and the extension. As an example, by setting the key `realtime.agentRegexp=I\d\d\d` you are defining that the agent code must start with a one and cannot be more than 3 digits, while by setting the key `realtime.extensionRegexp=\d\d\d\d0` you define that the agent extension must be four digits and must end with a zero. Please note that the backslash in the regexp has to be written as `\\` in the `configuration.properties` file.

## Enabling XML-RPC call listening and streaming

It is possible to run remote audio monitoring of both completed and ongoing calls using third party monitoring tools, for example OrecX. As QueueMetrics has no way of knowing the internal details of such applications, we made it possible to call an external XML-RPC server (we offer a stub written in PHP, but it can be written in any language and reside on any server, as long as it uses an XML-RPC library) that will basically pass back to QM the URLs required to perform the required task.

In order to enable this, we first tell QueueMetrics to use the XML-RPC Pluggable Modules for both call listening and streaming:

```
audio.server=it.loway.app.queuemetrics.callListen.listeners.ClassicXmlRpcRecording
audio.liveserver=it.loway.app.queuemetrics.callListen.RTlisteners.ClassicXmlRpcLis
```

The XML-RPC server will be set by setting its URL in a configuration property, like for example:

```
default.audioRpcServer=http://127.0.0.1/xmlrpc/xmlrpc_audio_server.php
```

The server must implements three XML-RPC calls called:

- **QMAudio.findStoredFile** This function is used to find and play back a stored audio file, by returning the URL of a player that will play it or the audio file itself. This function has in input the following parameters:

- `$ServerID`: ignore for now
- `$AsteriskID`: The Asterisk call-id, as written in the second field of `queue_log`
- `$QMUserID`: the ID of the current QM user
- `$QMUserName`: the name of the current QM user

and it must return the following values:

- `$FILE_FOUND` : If the file was found or not (maybe it was not recorded)
- `$FILE_LISTEN_URL` : an URL to open up a player for this call
- `$FILE_LENGTH` : size of the audio file (displayed as returned)
- `$FILE_ENCODING` : encoding of the audio file (eg mp3)

- `$FILE_DURATION` : duration of the audio file

In case multiple values are to be returned (because e.g. the call is split into multiple recordings) then the following format must be used:

- `$FILE_FOUND` : true
- `$FILE_LISTEN_URL` : "MULTI:http://url1 http://url2 http://url3"
- `$FILE_LENGTH` : "100k 50k 120k"
- `$FILE_ENCODING` : "mp3 mp3 mp3"
- `$FILE_DURATION` : "1:00 0:30 1:20"

As you can see, the listen URL starts with the string "MULTI:" and has multiple values separated with space. The other parameters also hold multiple values separated by space.

- **QMAudio.listenOngoingCall** This function is used to query for an ongoing inbound call. If found, QM will launch a new popup to open the player which URL is returned. This function has in input the following parameters:

- `$ServerID`: ignore for now
- `$AsteriskID`: The asterisk call-id, as written in the second field of `queue_log`
- `$Agent`: the name of the agent being monitored e.g. "agent/101"
- `$QMUserID`: the ID of the current QM user
- `$QMUserName`: the name of the current QM user

and it must return the following values:

- `$CALL_FOUND`: If the call was found or not
- `$CALL_LISTEN_URL` : the URL of the player
- `$CALL_POPUP_WIDTH`, `$CALL_POPUP_HEIGHT`: width and height of the popup being opened. Currently a double popup is opened.
- **QMAudio.listenOngoingCallOutgoing** This function is used to query for an ongoing outgoing call. If found, QM will launch a new popup to open the player which URL is returned. The parameters are the same as for *QMAudio.listenOngoingCall*.

To make implementer's life easier, we provide a simple XML-RPC stub server under *WEB-INF/mysql-utils/xml-rpc* that can be used as a starting point: no need to handle the XML-RPC stuff, just change the results of the two supplied functions and data goes back to QueueMetrics.

## Enabling call outcomes

A call tracking code is a code to be input by a user telling the status of a call, be it inbound or outbound. This status code is a string (though we suggest to use numeric status codes, in order to make it easy to input them using a telephone keypad) and may be input either when the call is ongoing or after a short while from its end.

The queue\_log entry looks like the following one:

```
1234 | 1231.1 | NONE | Agent/1234 | CALLSTATUS | 21
```

This will set the CALLSTATUS to "21" for the call which Call-ID is "1231.1" it may be an open call or it may be terminated by no longer than 30 minutes.

If it is not possible to force the Call-ID, a second version of the verb is available:

```
1234 | 2222.3 | NONE | Agent/1234 | CALLSTATUS | 21 | 1231.1
```

This has exactly the same meaning; the second Call-ID passed as a parameter will override the original one.

If you prefer, you may log the queue name instead of "NONE" field shown above; in any case QM will ignore this piece of information.

The following rules apply:

- A CALLSTATUS row must be set after the call is started or it's terminated; in any other case it's simply discarded
- There may be multiple CALLSTATUS rows for the same Call-ID; in this case, the last one overrides previous codes.
- The CALLSTATUS must be passed within 30 minutes from the end of a call.
- CALLSTATUS for a non-existent Call-ID will be discarded
- Even if a queue reset is detected, CALLSTATUS for existing Call-ID are applied

The agent may either be a full "Agent/xxx" string or the valid name of an Asterisk channel. It is acceptable to use a generic channel name instead of the specific one, i.e. "SIP/123" and "SIP/123-abcd" are equivalent.

The sample [queuemetrics] context that comes with QueueMetrics can be used as a starting point to output such data.

## Keeping the UNIQUEID of the call when setting status code

One of our clients has successfully implemented Call Outcomes by using AEL.

In the Hangup-Extension, use:

```
if("${MEMBERINTERFACE}" != "" && "SIP/${CALLERID(ani)}" != "${MEMBERINTERFACE}"  
    // to be able to record QueueMetrics call outcome later  
    Set(GLOBAL(queue_last_call_${MEMBERINTERFACE:4})=${UNIQUEID});  
}
```

The outcome is recorded like this:

```
_#XX = > {  
    // ${user_name} contains the extension number of the agent  
    Answer();  
    if("${queue_last_call_${user_name}}" != "") {
```

```

        QueueLog(NONE, ${queue_last_call_${user_name}} , SIP/${user_name} , CALLS
        Set(GLOBAL(queue_last_call_${user_name})=) ;
        Playback(beep) ;
    } else {
        Playback(beeperr) ;
    }
    Hangup() ;
}

```

## Enabling call features

A call feature code is a code to be input by a user telling the sub-status of a call, be it inbound or outbound. This feature code is a string and may be input either when the call is ongoing or after a short while from its end. Several call feature codes can be associated to a single call; QueueMetrics will count all the associated feature code. A feature code may have an optional free text associated with it.

The queue\_log entry looks like the following one:

```
1234 | 1231.1 | NONE | Agent / 1234 | INFO | FTR | 36
```

This will set the feature code to "36" for the call which Call-ID is "1231.1" it may be an open call or it may be terminated by no longer than 30 minutes.

A second version of the verb is available:

```
1234 | 1231.1 | NONE | Agent / 1234 | INFO | FTR | 41 | Hello there
```

This has exactly the same meaning but the feature code contains a free text associated with it.

Feature codes can be removed from a call by mean of a trace added in the queue log:

```
1234 | 1231.1 | NONE | Agent / 1234 | INFO | NOFTR | 36
```

This will remove the feature code "36" to the call with Call-ID is "1231.1". If no feature code "36" have been already associated with the call, QueueMetrics simply discards the trace.

The following rules apply: \* Features should be entered while the call is ongoing or within 30 minutes of its closure. The loopback period is the same as for setting the outcome. \* Features have a code and an optional textual value. The text should be printable ASCII7 and cannot contain pipe or special, non-printable characters. Though we enforce no limit on this, we suggest using no more than 40 characters. \* If multiple features with the same code are applied for the same call, the last one wins (sets the text of it) \* In order to remove a feature, a special verb NOFTR is passes \* If successive lines set the feature after a NOFTR, the feature is set and so on.

The sample [queuemetrics] context that comes with QueueMetrics can be used as a starting point to output such data.

## Enabling pause codes

A pause reason code is a code to be input by a user telling the reason why a pause was started. It should be ideally input together with the decision to go on pause, though QueueMetrics will accept the code and will attach to the correct pause even if the pause is resumed, as long as no other pause is started. The reason code is a string - though we suggest to use numeric status codes, in order to make it easy to input it using a standard telephone keypad.

The format is the following one:

```
1234 | 1231.1 | NONE | Agent/1234 | PAUSEREASON | 21
```

This will set the pause reason to "21" for the pause that is either going on or has just finished. If the code is input after over 30 minutes from the end of the last pause, it is discarded.

The following rules apply:

- A PAUSEREASON row must be set after the agent's pause is started or it's terminated; in any other case it's simply discarded
- There may be multiple PAUSEREASON rows for the same pause; in this case, the last one overrides previous codes.
- The PAUSEREASON must be passed within 30 minutes from the end of a pause; otherwise it will be silently discarded.
- PAUSEREASON for a non-existent agent pause will be discarded.
- If a pause extends over multiple call sessions, the PAUSEREASON will be correctly set only for sessions terminating after the PAUSEREASON has been set.
- Even if a queue reset is detected, PAUSEREASON for existing pause are applied
- The agent may either be a fill "Agent/xxx" string or the valid name of an Asterisk channel. It is acceptable to use a generic channel name instead of the specific one, i.e. "SIP/123" and "SIP/123-abcd" are equivalent.

The sample **[queuemetrics]** context that comes with QueueMetrics can be used as a starting point to output such data.



Since Asterisk 1.6, it is possible to pass a pause reason code to the native Pause application. QueueMetrics will handle this correctly, and allows mixing the two methods as you best see fit.

## Tracking required skills

Skills can be specified at any time before or after the call enters the queue but the suggested way is to have them immediately after the ENTERQUEUE verb as in:

```
1167335958 | 1167335958.530054 | cpc | NONE | ENTERQUEUE | | 01909723335
1167335958 | 1167335958.530054 | cpc | NONE | INFO | REQSILL | DE | 90
1167335958 | 1167335958.530054 | cpc | NONE | INFO | REQSILL | NET | 70
1167335958 | 1167335958.530054 | cpc | Agent/101 | CONNECT | 41 | Agent/101
1167335958 | 1167335958.530054 | cpc | Agent/101 | COMPLETECALLER | 41 | 23
```

In the example above, the call is queued on a queue called *cpc* with required skills *DE* >= 90 and *NET* > 70, so it could be a request for someone servicing internet support in German. Basically you just add an event for each required skill, and the level at which it is required. We do not need this information on connected/failed calls, as we assume that the routing is always correct.

The following rules apply:

- Rules are read as a label (the rule) and a number. If the number is invalid, it is read as zero and no exception is raised

- The label can be any valid ASCII7 string, punctuation and spaces
- For a skill to be added, it must have a non-empty label and a skill level > 0
- If a skill is repeated multiple times, the last value wins. In the call details, the full sequence of events is displayed
- It is not possible to remove a skill from a call

## Closing ongoing calls

It sometimes happens that Asterisk will not log the call termination records for a call; as QM is based on the logged events, a call missing the call closure log will linger on forever in the realtime screen (or at least the maximum time allowed by the ...) and will appear as Ongoing or Not answered yet in the historical reports.

Since version 1.4.5 of QueueMetrics, it is possible to manually close a call from either the historical reports or the real-time screen. In order for this to work:

- You must be running with MySQL storage or clustered storage
- Your user must own key CLOSECALLS

When this is done, open calls on the reports will show a red scissor icon:

Queue details

Export as...

Date	Caller	Queue	Disconnection	Position	Wait	Pos.	Attempts	Code	Key	Stints	Srv
03/17 - 15:48:17	37	Q DPS	Abandon	1	0:19	1	0			1	
03/17 - 16:05:09	30	Q DPS	Abandon	1	0:07	1	0			1	
04/11 - 18:20:26	30	Q DPS	Abandon	1	0:00	1	0			1	
05/19 - 17:35:53	37	Q DPS	Unanswered yet	0	210:35:34	0	0			1	
06/06 - 14:54:07	37	Q DPS	Abandon	1	0:05	1	0			1	

And the same will happen for the real-time screen:

Calls being processed:

Source	Caller	Entered	Waiting	Duration	Agent	Srv
37	37	16:12:38	0:00	-		

Export as...

By clicking on that icon, a popup will appear that will ask for the length the call should be closed to. This length refers to the wait duration if the call is not answered and the conversation time if the call is answered. It is possible to change that from the default 5 seconds by setting a configuration property.

If the call has already been closed in the meantime, or you're doing this operation twice, QM will report that the call has already been closed.



if you do this on calls that are still ongoing, you will risk having duplicate data on the report. So don't use this feature unless you know what you are doing. The required security key must be manually assigned only to trusted users.

## Tracking DNIS and IVR information



In order to track IVR information, it would be advisable to follow the newer logging format defined in the section called "Implementing IVR tracking" [369].

In order to keep track of DNIS and IVR information that relates to each call, you have to write special records on the *queue\_log* file that QueueMetrics parses.

This is very easy to do, e.g. imagine you have a piece of dialplan where you are going to call queue *q-sample* and you have the DNIS code in the *MYDNIS* dialplan variable, and the sequence of keys pressed as *MYIVR*:

```
exten => s,n,.....
exten => s,n,QueueLog(q-sample,${UNIQUEID},NONE,INFO,DID|${MYDNIS})
exten => s,n,QueueLog(q-sample,${UNIQUEID},NONE,INFO,IVR|${MYIVR})
exten => s,n,Queue(q-sample|nt||60)
exten => s,n,.....
```

There is no predefined format for DNIS and IVR information; QueueMetrics just handles it as free-form text strings. It can be optionally decoded by creating values in the IVR and DNIS configuration pages.

You can output only one record, or both, or none, depending on what you need.

## Adding TAG information to calls

Some call centers require to report call set at the list level below campaign. This is frequently used for outbound campaigns.

QueueMetrics searches TAG information on the queue log file. To enable Asterisk to place a TAG signature in the queue log a dialplan modification is needed. Below is an example on how this could be done, assuming you have the TAG code in the *MYTAG* dialplan variable:

```
exten => s,n,.....
exten => s,n,QueueLog(q-sample,${UNIQUEID},NONE,INFO,TAG|${MYTAG})
exten => s,n,Queue(q-sample|nt||60)
exten => s,n,.....
```

You can assign only one TAG for each call. If more than one TAG are assigned to a single call, QueueMetrics will discard all TAGs except the latest found in the queue log file.

## Enabling Hotdesking in the agent page

Since the demise of AgentCallbackLogin, it has been hard to do "hotdesking" in Asterisk - that is, having agents that work on queues because of their competences and not because they are sitting at a given extension.

With QueueMetrics 1.6.1, hotdesking is very easy to implement and it has no downsides, because:

- it is completely transparent to Asterisk
- you can emulate the single-sign-on behavior of AgentCallback and still have the flexibility of adding/removing members as needed on a queue by queue basis.
- call recordings, agent monitoring and all other functionalities are unaffected

Requirements:

- QueueMetrics 1.6.1 or newer
- MySQL storage model



- Asterisk 1.4 or 1.6

## How it works

Set the following properties within the `configuration.properties` file, as follows:

```
default.queue_log_file=sql:P001          <-- change as needed
callfile.dir=tcp:admin:amp111@127.0.0.1 <-- change as needed
default.rewriteLocalChannels=true
callfile.agentlogin.enabled=false
callfile.agentlogoff.enabled=false
default.hotdesking=86400
```

Make sure that `extensions_queuemetrics.conf` is loaded in the Asterisk dialplan (you need to use the `extensions_queuemetrics` file that comes with QM 1.6.1 or newer).

This setup means that we access the `queue_log` file through the database, connect to Asterisk over AMI to send commands, rewrite agent codes, do not use Agentcallback-style agents and enable hotdesking.

Now we use a piece of dialplan like this one when we associate an agent to a queue:

Imagine we have `AGENTCODE` set to 200 (the agent's login code) and `AGENT_EXT` set to 123 (this is the SIP extension code):

```
....
exten => 35,3,QueueLog(NONE,${UNIQUEID},Agent/${AGENTCODE},HOTDESK,SIP/${AGENT_EXT}
exten => 35,4,AddQueueMember(myqueue,SIP/${AGENT_EXT})
....
```

This logs on Agent/200 to queue "myqueue", tracking him as SIP/123. Note that from the point of view of Asterisk, we only see that extension 123 is made a member of the queue.

When you logoff, pause, unpause agents, you always work at the SIP level (the actual extension that is linked to the queue) so there is no need to change anything.

If you use the QueueMetrics Agent's page, you can do logon/logoffs/pauses from the buttons by the top of the page; this lets you add an agent to all queues at once, like you used to do with AgentCallBackLogins, and still retain the flexibility to change that at runtime.

## Example hotdesking configuration

In the following sections, we summarize the changes that have to be made to an existing system to enable hotdesking.

## Changes to `configuration.properties`

Add/change the `default.hotdesking` property to 86400. This property enables hotdesking and lets the parse "look back" up to 1 day (change as needed).

```
default.hotdesking=86400
```

Add/change the sections below:

```
callfile.agentpause_ht.enabled=true
callfile.agentpause_ht.channel=Local/32@queuemetrics/n
callfile.agentpause_ht.extension=10
```

```

callfile.agentpause_ht.context=queuemetrics

callfile.agentunpause_ht.enabled=true
callfile.agentunpause_ht.channel=Local/33@queuemetrics/n
callfile.agentunpause_ht.extension=10
callfile.agentunpause_ht.context=queuemetrics

callfile.agentaddmember_ht.enabled=true
callfile.agentaddmember_ht.channel=Local/35@queuemetrics/n
callfile.agentaddmember_ht.extension=10
callfile.agentaddmember_ht.context=queuemetrics

callfile.agentremovemember_ht.enabled=true
callfile.agentremovemember_ht.channel=Local/37@queuemetrics/n
callfile.agentremovemember_ht.extension=10
callfile.agentremovemember_ht.context=queuemetrics

```

This code specifies the Asterisk extensions that QueueMetrics will call for each button present in the agent live page when hotdesking is enabled.

Change the *realtime.agent\_button\_x.channel* key to the value *Local/[EM]@from-internal*

This last option is needed only if you use custom agents buttons to dial out extensions and should be repeated for each dial-enabled button. In the code below, a valid example for the button 4 is reported:

```

realtime.agent_button_4.enabled=true
realtime.agent_button_4.caption=Secretary
realtime.agent_button_4.url=
realtime.agent_button_4.channel=Local/[EM]@from-internal
realtime.agent_button_4.ext=200@queuedial

```



if you use a channel like *Local/123@from-internal* as the hotdesking extension, remember to turn off local channel rewriting first, or it will not work.

## Changes to extensions\_queuemetrics.conf

Here should be defined the Asterisk extensions used by QueueMetrics to perform actions triggered from the agent live page.

Add to this file the code reported below:

```

; extension 32: agent pause with hotdesking (with pause code)
exten => 32,1,Answer
exten => 32,2,NoOp( "QM: Pausing Agent/${AGENTCODE} at extension SIP/${QM_AGENT_LO
    with pause reason '${PAUSEREASON}' made by '${QM_LOGIN}' " )
exten => 32,3,PauseQueueMember( ,SIP/${QM_AGENT_LOGEXT} )
exten => 32,4,System( echo "${EPOCH}|${UNIQUEID}|NONE|Agent/${AGENTCODE}|PAUSEREAS
    >> /var/log/asterisk/queue_log )
exten => 32,5,Hangup

; extension 33: agent unpause with hotdesking
exten => 33,1,Answer
exten => 33,2,NoOp( "QM: Unpausing Agent/${AGENTCODE} at extension SIP/${QM_AGENT

```

```

        made by '${QM_LOGIN}' " )
    exten => 33,3,UnpauseQueueMember(,SIP/${QM_AGENT_LOGEXT})
    exten => 33,4,Hangup

; extension 35: agent addqueuemember with hotdesking (for asterisk v1.4+)
    exten => 35,1,Answer
    exten => 35,2,NoOp( "QM: AddQueueMember (asterisk v1.4+) Agent/${AGENTCODE} at ext
        SIP/${QM_AGENT_LOGEXT} on queue ${QUEUENAME} made by '${QM_LOGIN}' with priori
        '${QM_AGENT_PRIORLBL}' and prioritynum '${QM_AGENT_PRIONUM}' " )
    exten => 35,3,Macro(queuelog,${EPOCH},${UNIQUEID},NONE,Agent/${AGENTCODE},\
        HOTDESK,SIP/${QM_AGENT_LOGEXT})
    exten => 35,4,AddQueueMember(${QUEUENAME},SIP/${QM_AGENT_LOGEXT})
    exten => 35,5,Hangup

; extension 37: agent removequeuemember with hotdesking (for asterisk v1.4+)
    exten => 37,1,Answer
    exten => 37,2,NoOp( "QM: RemoveQueueMember (asterisk v1.4+) Agent/${AGENTCODE} at
        SIP/${QM_AGENT_LOGEXT} on queue ${QUEUENAME} made by '${QM_LOGIN}' " )
    exten => 37,3,RemoveQueueMember(${QUEUENAME},SIP/${QM_AGENT_LOGEXT})
    exten => 37,4,Hangup

```

Please note that the *extensions\_queuemetrics.conf* file that ships with 1.6.1 already has these changes embedded.

In order to have the hotdesking working a complete QueueMetrics restart and Asterisk reload should be performed.

## Running Asterisk 1.8 with QueueMetrics

QueueMetrics is compatible with Asterisk 1.8 but you need to properly set it. The first requirement is related to a strange behavior found in Asterisk 1.8.0 and 1.8.1 that prevents Asterisk to properly log all queue activity until a reload command is issued from the CLI. To fix this problem we had to change the code in the *logger.c* file found in the main subfolder present in the asterisk sources, near the line 396, in order to have something similar to what is listed below:

```

    if (qlog)
        fclose(qlog);

    {
        char tmp[4096];
        snprintf(tmp, sizeof(tmp), "%s/%s", ast_config_AST_LOG_DIR, queue
        qlog = fopen(tmp, "a");
    }

```

Then we had to rebuild asterisk and to reinstall it.

The next step is to replace the *extensions\_queuemetrics.conf* file with the specific version for Asterisk 1.8. To do this, you need to copy the *extensions\_queuemetrics\_18.conf* replacing the one present into the asterisk configuration folder then reload the dialplan from the CLI. The *extensions\_queuemetrics\_18.conf* is targeted to Asterisk 1.8 with hotdesking enabled.



This applies ONLY to some earlier versions of Asterisk 1.8

## Handling Agents priorities on queues

Starting from QueueMetrics 1.6.3 is possible to define priorities when logging agents in a specific queue. The priority associated to each agent is dependent on how the agent was configured in the queue (main, spill or wrap).

- QM\_AGENT\_PRIOLBL is set to "U" when the queue is not assigned to the agent, "M" when the queue is a normal working queue for the agent (Main), "W" when the agent is set as Wrap for the queue, "S" when the agent is set as Spill for the queue.
- QM\_AGENT\_PRIONUM is set to 0 when the queue is not assigned to the agent or the queue is a normal working queue for the agent; 1 when the agent is set as Wrap for the queue, 2 when the agent is set as Spill for the queue.

## Using known numbers

In QueueMetrics, it is possible to keep track of a set of "known numbers" through a specific editor as described in the section called "Configuring known numbers (VIP callers / blacklists)" [228]

For each number, we track:

- An action to be done
- A name and description
- An optional expiry date
- The number of times the rule was hit, and the last time it was hit
- An optional "agent affinity" attribute

A webservice - built to be easy to query from the Asterisk dialplan or through JSON - lets the user query whether the number exists and what to do with it.

Possible actions include:

- *Blacklist*: the number is to be hung up, or moved to a low priority queue
- *VIP*: the number is to be moved to a VIP queue, or its queue priority is to be made higher
- *Agent affinity*: if a number has "affinity" with some agent, then the agent should be tried first (by using a personal queue, or reaching them through a direct channel and "faking" agent records so that they appear as if the call was processed on a queue)
- *Caller name / CRM ID*: the caller-id is rewritten so that a proper name can be associated with the call.

Those actions are to be implemented at the Asterisk dialplan level.

The webservice is meant to be easy to interoperate with a standard Asterisk CURL call.

```
exten => s,1,Set(res=${CURL(http://my.qm:8080/queuemetrics/numberLookup.do?number=
```

The page returns a response as text/plain that will be embedded in the dialplan variable *res*. The response is based on the following table:

**Table 18.1. Possible API modes**

Mode	Sample response	Notes
action	UNKNOWN BLACKLIST VIP <blank>	The response UNKNOWN means that the number is not listed; the response blank means that it is listed but no action is required. The number of hits and last hit counters are updated.
affinity	Agent/106 " <blank>	The number has a known affinity for Agent/106. If no known affinity, returns blank.
name	John Doe <blank>	An URL-encoded name for this number, or blank if no name set / unknown number. The name will be stripped of non-Ascii7 characters.
json	{ 'action': 'vip', 'name': 'John Doe', 'affinity': 'Agent/101\ ' }	In this mode, a JSON object is returned with the information shown. This way you can query all the parameters at once, or you can use a JSON library for querying. The response is returned as application/json.
hash	action=vip&name=John Doe&affinity=	In this mode, the returned string is encoded as an Asterisk hash (see below). This way, all the results can be read at once.

*Notes*

- It is important to make sure that the HTTP error case is handled at the dialplan level, in case QM was unavailable at the time of the call.
- It is also important to set a quick connection timeout through CURLOPT(<option>) to make sure that if QM does not answer quickly, the default case is handled.

The trivial format used in the response makes it possible to use the service using the command-line curl, or by using a trivial scripting language.

The "user" parameter is mandatory and requires a valid QueueMetrics username and password, separated by a ":". This is needed because the API will be publicly exposed. The user must hold the security key *PBXAPI*

In order to avoid security risks, the user should be custom-made and assigned to a class that only contains the key PBXAPI. This way the user will be able to log on to QM but will have no actual grants but logging off.

*Asterisk hashes*

When querying an Asterisk hash, the result is built as a string so that you can do:

```
Set (HASH(numinfo))=${CURL(myurl)}
```

to load the results from QM, and then parameter e.g. *action* can be read as:

```
${HASH(numinfo,action)}
```

In order to avoid issues when returning data from QueueMetrics in the HASH format:

- Data is returned as UTF8
- All special characters in the returned strings will be replaced by and underscore. Those being:
  - non printable (CR, LF, etc.)
  - having a possible meaning in the Asterisk dialplan or in the querystring-like hash format being non ASCII7

When querying each response separately, the response is instead UTF8.

## Configuring the AMI connection

QueueMetrics bases its reports on data generated from the Asterisk `queue_log` file; still, it sometimes needs to send commands to Asterisk in order to performs some actions, e.g. log on agents, or listen to live calls.

In order to perform such commands, two things are required:

- A working AMI connection should be present
- The `extensions_queuemetrics.conf` file should be included in the PBX's dialplan

For historical reasons, the default way QueueMetrics used to send commands was to generate Asterisk call files; now this method is obsolete and the correct one is to set-up an AMI connection.

In order to set up an AMI conenction, you have to set the following property like e.g.:

```
callfile.dir=tcp:admin:amp111@127.0.0.1
```

The AMI URL is in the following format: `tcp:username:password@server:port`

- username: This is the AMI username
- password: This is the chosen "secret"
- server: This is the IP address of the server, or 127.0.0.1 if the same server.
- port: This part is optional; if not present will default to 5038.

All three fields are mandatory. The password is sent over a clear-text TCP connection, so make sure to protect it using e.g. a VPN tunnel if it is to traverse public networks.



Username and password should be made only of letters and digits; no other character should be used.

The configuration above should be matched by the configuration in Asterisk's own `manager.conf` file, that should look like the following one:

```
[general]
enabled = yes
port = 5038
bindaddr = 0.0.0.0
webenabled = no

[admin]
secret = amp111
deny = 0.0.0.0/0.0.0.0
permit = 127.0.0.1/255.255.255.0
read = system,call,log,verbose,command,agent,user,originate
write = system,call,log,verbose,command,agent,user,originate
```

In order to make testing easier, QueueMetrics includes a test tool that checks whether the current connection is working or not; see [Checking an Asterisk Manager connection](#) the section called “Checking an Asterisk Manager connection” [263] for details.

## Listening to encrypted recordings

QueueMetrics allows to listen to recordings that are stored in an encrypted format. This works by invoking a custom-supplied filter that will decrypt the recording on-the-fly before QM streams it back to the user.



This is possible only for recordings that are read from disk and streamed by QM; it does not work for recordings that are streamed by a third-party player (e.g. Oreka), which will usually implement its own encryption scheme.

## What is a filter

In order to decrypt a call, QueueMetrics uses a filter, i.e. a program (usually a script) that, given the filename that it needs to decrypt, will output the decrypted file to STDOUT. This way the decrypted file is never saved on disk.



Encrypting and decrypting recordings on-the-fly can impose a severe load on your QueueMetrics server, as encryption is usually CPU-intensive.

A sample filter may look like the following script:

```
PASSW=myPassword
echo $PASSW | gpg --passphrase-fd 0 --batch --decrypt $1
```

As the filter is not dependent on any specific encryption technology (public key, symmetric keys, etc) QueueMetrics is able to adapt to whatever technology suits you best.

Please note that the called script does not receive a password - it must be able to run the decryption internally. Most encryption technologies have the concept of “secure password stores”, so that you can avoid storing the password in a plain-text format.

## Setting up a filter

In order for QM to decrypt a file, it must match two conditions:



- It must end in `.crypt`, as appended to the natural extension of the file (e.g. the encrypted version of a file named `'audio.mp3'` must be called `'audio.mp3.crypt'`)
- The configuration property `'audio.decrypt'` must point to the decryption filter, as in the example below.

The script to be run must be readable and executable by the QueueMetrics process, as in:

```
audio.decrypt=/encryptionTools/decryptGPG.sh
```

When an encrypted file is found by QueueMetrics, it is displayed with a "lock" icon. By clicking on it, the file is decrypted on the server and streamed back in an unencrypted format.

If a file is not encrypted, QueueMetrics will stream it back without attempting any decryption.

## Encrypting calls

As Asterisk does not currently offer any facility for storing encrypted recordings, audio files must be encrypted on a periodical basis.

- Every so often, a process runs and checks for unencrypted recordings in the audio destination directories
- Every file found is first encrypted, and if the encrypted file was actually created, then its unencrypted version is removed.

We offer a sample encryption routine in the files `'encryptAllGPG.sh'` and `'encryptGPG.sh'` that can be used as an example to deploy your own script.



The sample encryption and decryption scripts are available under the `'WEB-INF/mysql-utils/audio-encryption'` folder in QM. They are meant as a reference blueprint only and may not be suitable for the required Corporate security standards.

## Tracking IVR data

Since QueueMetrics 13.03, IVR information is tracked natively within QueueMetrics.

IVR information is different from queue information, as:

- IVR data is typically tracked before a call hits a queue, and bears no queue information. So IVR calls might be ancestors of any call in the system.
- If you know happen to know from the start of the call that a particular call belongs to a more specific **area**, you may want to track this immediately so that this IVR call will not appear on "unassigned" calls (see below for more information).
- IVR data is made up of multiple **IVR menus**, each of which may have a **selection**, that is a digit pressed by the caller in order to progress forward.
- An **IVR Path** is a unique sequence of IVR menus that lead to a destination
- IVRs may define **goals**, that is activities that don't lead the caller directly to a queue but are tracked as they satisfy, in a fully automated manner, the needs of a caller. For example, when a caller reaches the

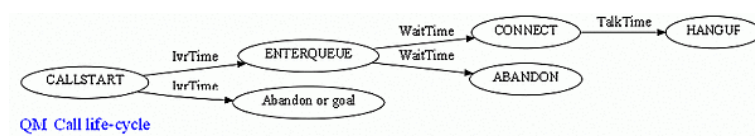
TTS menu reading back their current account amount in your banking IVR, that is usually a goal you want to track.

- If a call is still in the IVR phase at the end of the analysis, without having reached any goal or having hung up, it is considered hung up just after the last known event.

IVR tracking requires changes to the current dial-plan of Asterisk in order to track the required information. Such changes - detailed in the section called "Implementing IVR tracking" [369] - are not complex to implement, and are implemented natively in the QueueMetrics module of FreePBX. So if you use a common Asterisk distribution, chances are you already have IVR tracking available.

## A call's life-cycle

When a call is tracked with QM, it may traverse the following tree:



As you can see, QM defines three time periods about a call:

- the IVR Time, that is between when a call is first tracked and when it hits a queue. For calls that do not have any events before hitting a queue, it is always set to zero.
- the Wait Time, that is how long a call has been waiting on a queue before being answered or hung up
- the Talk Time, that is the length of the conversation between the agent and the caller.

## IVRs and QueueMetrics

QueueMetrics handles IVRs when running reports by filtering all calls by the set of queues specified in the report. As IVRs have no queues, all IVRs are processed for the time period requested. IVRs that end up on queues different from the ones being reported on are reported as "lost".

IVR activity usually takes place before the call is queued. Filters on IVRs, DNIS and caller-ids are correctly applied to the analysis if specified (so you can drill down an IVR analysis on a specific selection path or on a caller / called number).

What you get out of an IVR analysis:

- Tracing IVR paths: the report the section called "IV01 - IVR Traversals" [133]. This way you can see which paths were traversed, how many calls went through each path and what happened to them. This is very useful as it is the key to understanding attrition - people hangin up without having reached a goal.
- Tracing IVR timings: the report the section called "IV02 - IVR Timing" [134]. By understanding the timing statistics of each IVR menu, you can improve the user experience by making often-accessed items higher on the menus and on top of the tree. This improves user satisfaction and saves circuit usage.
- Tracing IVR goals: the report the section called "IV03 - IVR Goals" [134]. For each goal, what path traversal tree was followed, how much it took for it to be traversed as average / min / max times.

- IVR call details: all calls that were not queued are available in the IVR call details, under the codes the section called "OD04 - IVR details (paged)" [76] and the section called "OD05 - IVR details (full list)" [76].

The detailed description of each data block is visible in the relevant manual section.

## Using IVR areas

Considering an IVR call as a possible ancestor of any queued call on the system is often overkill. Very often you are able to tell - for example, based on the DNIS or the caller-id - the "area" that the call pertains to. If this does not happen, calls tracked at the IVR level do not belong to a queue but are possible ancestors of any queue - and therefore appear in the IVR and attrition reports for any queue.

Though this requirement is formally correct (as the main reason for having an IVR offered is routing the caller into the correct queue) it often happens that at some point during the call life-cycle, before the call is connected to a queue, you can determine an "area" of interest that may or may not be a specific queue.

For example, if your call center services multiple clients, you will likely have a separate DNIS for each. When that DNIS is called, maybe you do not yet know if the call will be connected to "client7-sales" or "client7-support", but you are sure that it will be for "client", so it will be inappropriate to show that call as a general untagged ancestor to any call queued on the system.

## Tagging calls by area in the QueueMetrics security system

The QueueMetrics security system is built so that only information pertaining to the queues an user has express permission on are accessible for reporting or monitoring.

As the unit of access is the queue, we had find an access token that acts "as-if" it was a proper queue. We call this "area" and we will log this to the queue\_log in the general queue field.

This makes it possible to decide on which areas the reports should run by adding the areas to the allowed queues for a specific report, as you would generally do when creating a composite queue.

For instance, to implement the example above, you might be reporting on a composite queue defined as "ivr-client7|client7-sales|client7-support".

A call starts its life-cycle by belonging to area NONE, then starts belonging to an area as soon as one is specified, and starts belonging to a queue as soon as it hits one. Neither behavior is reversible.

The following visibility rules apply:

	<b>IVR call - area = NONE (c.1)</b>	<b>IVR call - area set (c.2)</b>	<b>IVR call - queue reached (c.3)</b>
<b>Any report for any queue</b>	Visible	-	-
<b>Reports for destination queue(s) only</b>	Visible	Not Visible	Visible
<b>Reports for area(s) and destination queue(s)</b>	Visible	Visible	Visible

The initial QueueMetrics IVR tracking only implemented columns #1 and #3 of the table above. By adding the "areas" as in column #2:

- Existing systems are backwards-compatible; the behavior does not change unless you specify an area for a call;
- You are free - if you want - to specify an area immediately, so that the behavior specified in column #1 does never happen on your system.

## Using areas

The following general rules apply to areas:

- A call is displayed in QueueMetrics as belonging to the last area or queue it was showing at its termination or by the end of the requested time-frame.
- An area is set on the first call verb having an area different from NONE. This may or may not be the first tracking verb on the call.
- You cannot specify an area of NONE after a call had an area specified. This behavior is implemented in order to avoid logging the area on each IVR key-press on manually-created dial-plans. If you do, the area is not changed
- If you specify a different area for the call, the new code replaces the old one.
- When a call finally enters a queue, the queue code replaces the area code

The area name might be any valid name in Asterisk (lowercase ascii7 string, not containing spaces or pipes). Uppercase names are automatically lowercased upon reading. It is perfectly allowable to use the very same code for a queue and an area.



We suggest using name similar to "ivr-abc" in order to make it clear it is not a normal queue.

In cases where the IVR tree is extremely complex, you might want to specify multiple areas for the same call. In this case, when you run a report, you must specify all the different areas that make up your IVR tree as the allowed queue(s) for the report. As always:

- Any call which final state was without an area will be visible in all reports.
- Any call which final state is in a certain area is only visible to users having that area defined as a possible queue

## Implementing IVR tracking

In order to track IVR data, we need to tell QM a few bits of information:

- When a digit is pressed, the time-stamp when the event happens, the digit pressed and the name of the IVR menu. These are logged through the verb INFO-IVRAPPEND
- When a call is started, you may want to log the moment when the call reaches the PBX; the calling number and optionally the calling DID. This is done through INFO-IVRSTART and it is optional
- When a goal is reached, you may want to log the name of the goal. This is done through INFO-IVRGOAL and it is optional

- When a call is hung up in the IVR, you may want to log this information in order to have detailed IVR timing. This is done through INFO-IVRHANGUP and it is optional.



Before QueueMetrics 13.03, QueueMetrics used to track IVR sequences as one single record containing the digit sequence and optionally a second entry tracking IVR wait time. Though this is still recognized by QueueMetrics, it is impossible to run traversal analyses on such data as the required information is not present.

## Dial-plan tracking

In order to implement dial-plan tracking, the unique-id logged must match the unique-id of the call leg that will reach the queue.

In order to track the **beginning of a call**, you should produce an INFO IVRSTART record like the following one:

```
1353461650 | 1353461627.33271 | NONE | NONE | INFO | IVRSTART | 1234 | 5556777
```

This way you track both the caller-id of the caller ("1234" in our case) and the DNIS the call came through ("5556777" in our case). You may leave either field blank if that information is not needed.

The record above is optional - if it is missing calls will be tracked from the first IVR menu, and the traversal time for that IVR menu will be set to zero.

In order to **track an IVR digit**, you would use the following format:

```
1353461660 | 1353461627.33271 | NONE | NONE | INFO | IVRAPPEND | 1 | ivr-2
```

In this case, we tell QM that the key 1 was pressed in IVR "ivr-2". The IVR event duration (that is, how much it took the caller to make a selection) is automatically inferred from the end of the previous event. If this is not the case, you have an option to pass it explicitly to QM as the last parameter (6 seconds in the case shown):

```
1353461670 | 1353461627.33271 | NONE | NONE | INFO | IVRAPPEND | 1 | ivr-2 | 6
```

If a **goal** is reached, you should mark this by producing a record like:

```
1353461680 | 1353461627.33271 | NONE | NONE | INFO | IVRGOAL | attendant3 | ivr-2 | 6
```

The goal in this case is called "attendant3". The IVR name is optional and not currently used. The explicit timing duration is optional.

A call can have only one goal. Any call hitting a queue is considered to have reached a goal.

In order to tell QM that a call **hung-up in an IVR**, you should produce a record like:

```
1353461660 | 1353461627.33271 | NONE | NONE | INFO | IVRHANGUP |
```

## Tracking areas

The logging is changed so that the INFO verbs allow the reading of this piece of information. So any sub-verb (e.g. INFO DNIS, INFO IVRSTART, INFO IVRAPPEND and more) will work correctly with this.

An example of logging might be:

```
1345678 | 1234.5678 | IVR-1 | NONE | INFO | IVRSTART | 1234 | 12345
```

This logs the IVRSTART as belonging to area IVR-1.

It is perfectly valid to assign a call to an area from a specific point in time onwards (generally because they made a defining IVR decision)

```
1345668 | 1234.5678 | NONE | NONE | INFO | IVRSTART | 1234 | 12345
1345679 | 1234.5678 | IVR-3 | NONE | INFO | IVRAPPEND | 3 | MYMENU
```

As shown above.

## Deprecated IVR tracking verbs

The following records are understood by QM but should not be used anymore:

```
1000000 | 214530.A | sk-fissi | NONE | INFO | IVRWAIT
1000000 | 214530.A | sk-fissi | NONE | INFO | IVR | 345
```

## The FreePBX module

Since FreePBX 2.11 a new module is available on the FreePBX SVN repository. This module allows to easily integrate FreePBX IVR with QueueMetrics. The module will be published shortly and will be available through the standard FreePBX modules administration page. Till this date, you could manually install the module following the below steps. In a command shell, type the code:

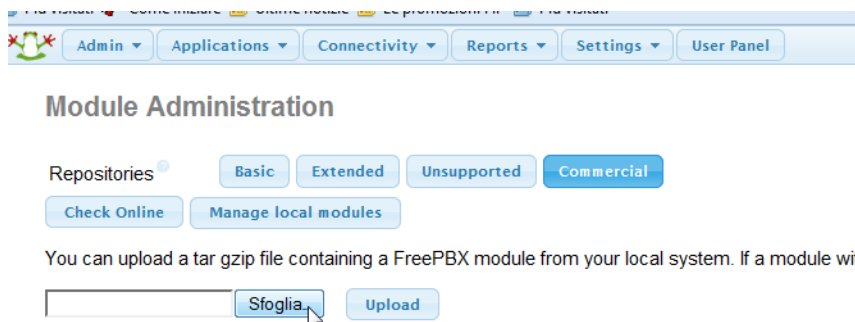
```
svn co http://svn.freepbx.org/modules/branches/2.11/queuemetrics
tar -cvf queuemetrics-2.11.0.1.tar queuemetrics/
gzip queuemetrics-2.11.0.1.tar
```

This generates a queuemetrics-2.11.0.1.tar.gz module you can install on your FreePBX box.

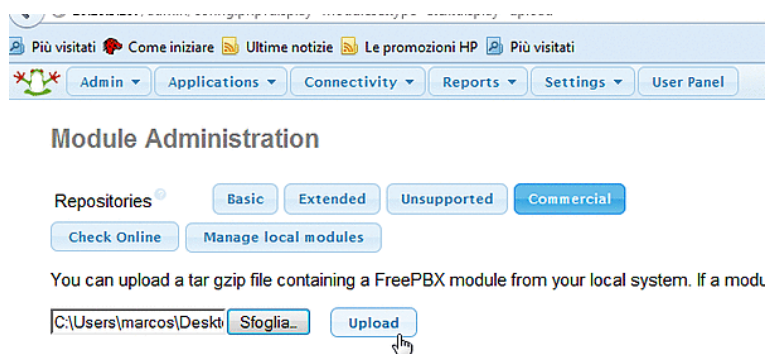
In the FreePBX modules administration page press the "Upload modules" button.



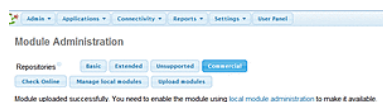
Browse to the queuemetrics-2.11.0.1.tar.gz file you downloaded from the FreePBX repository.



then press "Upload" to store the file on your FreePBX box.



You will find the module in the modules administration page.



Click on it then select the "Install" option. Click on "Process" at the bottom of the page.

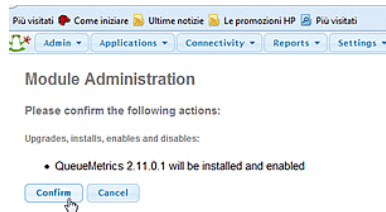
<a href="#">Print Extensions</a>	2.11.0.0	Bandwid
<a href="#">System Dashboard</a>	2.10.0.3	FreePBX
<a href="#">Weak Password Detection</a>	2.10.0.1	Schmoo

## Settings

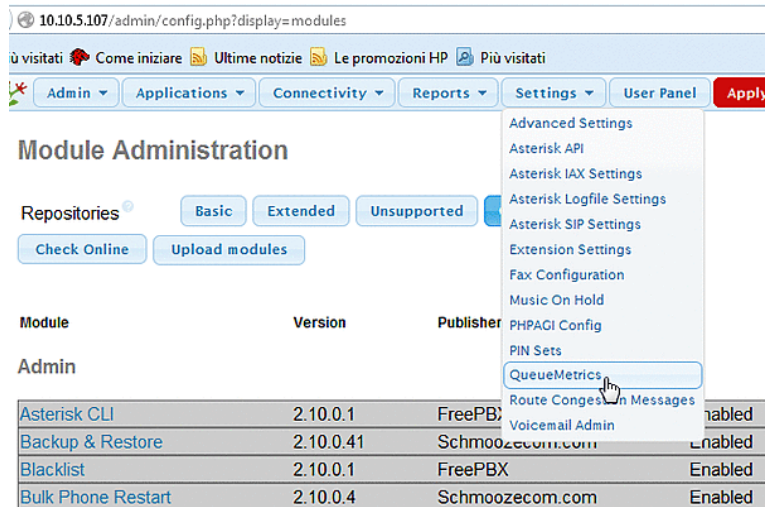
<a href="#">Asterisk API</a>	2.10.0.2	FreePBX
<a href="#">Asterisk IAX Settings</a>	2.10.0.3	Bandwid
<a href="#">Asterisk SIP Settings</a>	2.11.0.1	schmoo
<a href="#">Camp-On</a>	2.10.0.2	FreePBX
<a href="#">Extension Settings</a>	2.10.0.2	Mikael C
<a href="#">Fax Configuration</a>	2.10.0.6	Schmoo
<a href="#">Music on Hold</a>	2.11.0.1	FreePBX
<a href="#">PHPAGI Config</a>	2.10.0.1	FreePBX
<a href="#">PIN Sets</a>	2.10.0.2	FreePBX
<a href="#">QueueMetrics</a>		Schmoo
<div> <div>Action</div> <div> <input type="radio"/> No Action  <input checked="" type="radio"/> Install         </div> </div> <div>Description</div>		
<a href="#">Route Congestion Messages</a>	2.10.0.1	Bandwid

Then confirm.

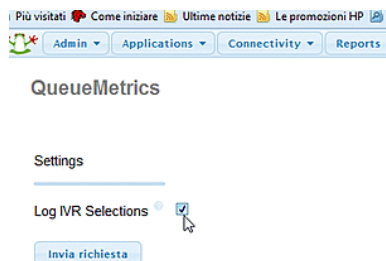




At the end of the procedure you will find a new option on the Settings menu.



This opens a new page settings where you can enable the QueueMetrics IVR log routines.



---

# Appendix A. Security keys

The following security keys are defined:

KEY	MEANING
USER	Must be held by any valid user
USRADMIN	User can edit other users and classes
USR_AGENT	User can edit agents
USR_QUEUE	User can edit queues
USR_LOCATION	User can edit locations
USR_OUTCOME	User can edit call outcomes and call features
USR_CALLTAG	User can edit call tags
USR_PCODE	User can edit pause codes
USR_MYSQL	User can see the MySQL database page
USR_QAEDIT	User can edit the set of Quality Assessment metrics
USR_AGROUPS	User can edit agent groups
USR_IVR	User can edit the list of known IVR selections
USR_DNIS	User can edit the list of known DID/DNIS
USR_CBTs	User can edit the list of known CBTs
USR_SKILLS	User can edit agent skills
REALTIME	User can see real-time stats
RTLIVE	User can access the Live stats
QUEUE_AN	User can run reports
AGREP	User can filter reports by agent
AGENT	User is an agent and sees agent page
CALLMONITOR	The user can listen to a recorded call
CALLMONITOR_ADDTAGS	The user can add markers to recorded calls
CALLMONITOR_DELTAGS	The user can delete markers from recorded calls
MON_AUDIO	The user can monitor a real-time call
MON_VNC	The user can monitor an agent's screen via VNC
ROBOT	User may launch ROBOT transactions.
CHPASSWD	User can change his own access password
SUPERVISOR	User is a supervisor and can run the supervisor's report

KEY	MEANING
QA_TRACK	User can enter Quality Assessment data
QA_REPORT	User can run Quality Assessment reports
QA_REMOVE	User can delete Quality Assessment data
QA_REPLACE	Together with QA_REMOVE, user can edit an already submitted Quality Assessment data
CLOSECALLS	This user can close ongoing calls from the Real-time or the historical stats page.
AGAW	This user can access AGAW facades (for agents).
AGAW_ADM	This user can access the AGAW administration screens
AGAW_REP	This user can access the AGAW supervisor screen
BRO_MSG	This user can send broadcast messages to agents
MON_IM	This user can start an IM chat to an agent
CONFIG	This user can start the auto configuration wizard (attended and unattended mode)
USR_AGROUPS	This user can edit custom agent groups
PAYROLL	This user is allowed to check the payroll page
PAYROLL_REMOVE NOTE	This user is allowed to remove a note in the payroll page
QLOG_EDIT	This user is allowed to edit the queue_log records
QLOG_LNGR	This user is allowed to edit session data by making it longer (they must hold QLOG_EDIT as well)
USR_REPORTS	Edit QueueMetrics reports
USR_REPORTS_EXPORT_EDIT	Edit PDF and XML export jobs
USR_REPORTS_EXPORT	This user is allowed to export whole reports in PDF and XLS
USR_KNUMBERS	User can view and edit known numbers
TASKS	User can see/edit tasks he sent and he received
TASKS_VIEWALL	User can see all tasks present in the database
BATCH_ADM	Audio export - Creates and closes batches

KEY	MEANING
BATCH_ADD	Audio export - This user can add calls to an open batch
BATCH_VIEW	Audio export - This user can see batches
BATCH_DEL	Audio export - This user can remove calls from a batch.
QA_PERF_TRACK	Can run Agent Performance Tracking
QA_PERF_RULES	Can define rulesets for Agent Performance Tracking
QA_CALREP	Access to Grader calibration reports
TASKS	User can see their tasks
TASKS_REP	User can access the tab showing Task Statistics
TASKS_VIEWALL	User can see other people's tasks
TASK_PUSH_TC	User can access to the Training and Coaching page for sending CBTs and Coaching tasks
USR_SYSLOG	User can view the system's audit log
KEYUPDATE	User can install a new QueueMetrics activation key
QA_GRADER	Allows access to the Grader's page and related statistics
QUEUE_LST	Allows direct access to the call list (skipping the Reports page)
VISITOR	Grants access to a partial set of statistics and features such as the Remote Monitoring page. The VISITORS class holds this key (plus USER MON_VNC MON_AUDIO).
RT_ADDMEMBER	User can add agents to a queue from the realtime page
RT_REMOVEMEMBER	User can remove agents from a queue from the realtime page
RT_PAUSEAGENT	User can pause agents from the realtime page
RT_UNPAUSEAGENT	User can unpause agents from the realtime page
RT_SENDEXTAGENT	User can send a SMS to the agent's phone from the realtime agent (Asterisk 10+ only)
RT_HANGUPCALL	User can hangup a live call from the realtime page
RT_TRANSFERCALL	User can transfer a call to a specific extension from the realtime page

---

KEY	MEANING
EDIT_CFG	User can edit the local configuration.properties file
SSAREPORT	Enable Self Service reporting for an Agent
NEWAGENTPAGE	Turns on the new experimental Agent page
SQUERY_ADD	Users can save reports as homepage links
SQUERY_FORALL	User can save public reports
WALLBOARD_ADD	Users can save new wallboards
WALLBOARD_FORALL	User can save public wallboards
PBXAPI	User can call PBX-level services

---

# Appendix B. The [queuemetrics] context

QueueMetrics is able to trigger a number of advanced functionalities, like audio monitoring, clients logging in, going on pause, etc. right from the Asterisk dialplan.



You can check the current dialplan of a working Asterisk system from the the section called “Using the DbTest Diagnostic Tools” [262] page.

In order to make this portable and easy to understand, we suggest to create a special context named *queuemetrics* in your dialplan where QueueMetrics will trigger functions through a callfile. An example file that is ready-to-use for most call centres can be found under *WEB-INF/mysql-utils/extensions-examples* - see the included README file for more details.

Whenever an action is invoked by a logged-on user, the following variables are set at the channel level:

- QM\_LOGIN is the login of the current Qm user asking for the action to be performed
- QM\_CLASS is the current class the requesting user is in.

This makes it possible to perform addirtional security checks or auditing at the Asterisk level, but is not used by the supplied dialplan.

We therefore define a number of functions in the terms of extension relative to the context *queuemetrics*, as follows:

- **10: Dummy extension** Used only because a call-file requires two end-points in any case. Define as:

```
exten => 10,1,Answer
exten => 10,2,Wait(10)
exten => 10,3,Hangup
```

- **11: Remote monitoring** This extension makes unattended monitoring of inbound traffic possible through the command ChanSpy(). The variables QM\_AGENT\_CODE, QM\_EXT\_MONITOR, QM\_AGENT\_EXT are set, as well as QM\_CALLERID, QM\_QUEUE and QM\_QUEUE\_URL. The following example explains how the feature works:

```
exten => 11,1,Answer
exten => 11,2,NoOp( "QM_AGENT_CODE: ${QM_AGENT_CODE}" )
exten => 11,3,NoOp( "QM_EXT_MONITOR: ${QM_EXT_MONITOR}" )
exten => 11,4,NoOp( "QM_AGENT_EXT: ${QM_AGENT_EXT}" )
exten => 11,5,NoOp( "QM_LOGIN: ${QM_LOGIN}" )
exten => 11,6,ChanSpy( ${QM_AGENT_CODE} )
exten => 11,7,Hangup
```



this may have important security implications - see the section called “Listening to live calls: Unattended Call Monitoring” [350].

- **12: Call status code** This extension logs a calls status code. The variables CALLSTATUS, CALLID, QM\_LOGIN and AGENTCODE are defined. The following example explains how the feature works:

```
exten => 12,1,Answer
```

```

exten => 12,2,NoOp( "QM: Setting call status '${CALLSTATUS}' \
    on call '${CALLID}' for agent '${AGENTCODE}' made by '${QM_LOGIN}' " )
exten => 12,3,System( echo "${EPOCH}|${CALLID}|NONE|Agent/${AGENTCODE} \
    |CALLSTATUS|${CALLSTATUS}" >> /var/log/asterisk/queue_log )
exten => 12,4,Hangup

```

- **14: Remote monitoring of outgoing calls** This extension makes unattended monitoring of outbound traffic possible through the command ChanSpy(). The variables QM\_AGENT\_CODE, QM\_EXT\_MONITOR and QM\_AGENT\_EXT are set, as well as QM\_CALLERID, QM\_QUEUE and QM\_QUEUE\_URL. The following example explains how the feature works:

```

; 14: Remote monitoring of outgoing calls - like SIP/callednumber
exten => 14,1,Answer
exten => 14,2,NoOp( "QM_AGENT_CODE: ${QM_AGENT_CODE}" )
exten => 14,3,NoOp( "QM_EXT_MONITOR: ${QM_EXT_MONITOR}" )
exten => 14,4,NoOp( "QM_AGENT_EXT: ${QM_AGENT_EXT}" )
exten => 14,5,NoOp( "QM_CALLERID: ${QM_CALLERID}" )
exten => 14,6,ChanSpy(SIP/${QM_CALLERID}|q)
exten => 14,7,Hangup

```

Please note that you should set the channels SIP/xxxx to the names of your local outgoing channel or the name of the local SIP leg of the call.



this may have important security implications - see the section called “Listening to live calls: Unattended Call Monitoring” [350].

- **16 and 17: Add/Remove call feature codes** This extension pair adds or removes a call feature code. The variables FEATCODE, CALLID, AGENTCODE, QM\_LOGIN and FEATTEXT are defined. The following example explains how the feature works:

```

; extension 16: set call status code
exten => 16,1,Answer
exten => 16,2,NoOp( "QM: Setting call feature '${FEATCODE}' on call '${CALLID}' " )
exten => 16,3,System( echo "${EPOCH}|${CALLID}|NONE|Agent/${AGENTCODE}|INFO|FTR| " )
exten => 16,4,Hangup

; extension 17: unset call status code
exten => 17,1,Answer
exten => 17,2,NoOp( "QM: Removing call feature '${FEATCODE}' on call '${CALLID}' " )
exten => 17,3,System( echo "${EPOCH}|${CALLID}|NONE|Agent/${AGENTCODE}|INFO|NOFT| " )
exten => 17,4,Hangup

```

- **20: Agent login** This extension logs in a call-back agent. The variables AGENTCODE and AGENT\_EXT are defined. Please note that for this to work properly, there must be no password set on the Asterisk agent. The following example explains how the feature works:

```

exten => 20,1,Answer
exten => 20,2,NoOp( "QM: Logging on Agent/${AGENTCODE} to \
    extension ${AGENT_EXT}@sip made by '${QM_LOGIN}' " )
exten => 20,3,AgentCallBackLogin(${AGENTCODE}||${AGENT_EXT}@sip)
exten => 20,4,Hangup

```

- **21: Agent logoff** This extension logs off an agent. The variable AGENTCODE is defined. The following example explains how the feature works:



```

exten => 21,1,Answer
exten => 21,2,NoOp( "QM: Logging off Agent/${AGENTCODE} \
                    made by '${QM_LOGIN}'" )
exten => 21,3,System(asterisk -rx "agent logoff Agent/${AGENTCODE}")
exten => 21,4,Hangup

```

- **22: Agent pause** (with pause code) This extension pauses an agent and sets the pause code. The variables AGENTCODE and PAUSEREASON are defined. The following example explains how the feature works:

```

exten => 22,1,Answer
exten => 22,2,NoOp( "QM: Pausing Agent/${AGENTCODE} with pause \
                    reason '${PAUSEREASON}' made by '${QM_LOGIN}'" )
exten => 22,3,PauseQueueMember( |Agent/${AGENTCODE} )
exten => 22,4,System( echo "${EPOCH}|${UNIQUEID}|NONE|Agent/${AGENTCODE} \
                    |PAUSEREASON|${PAUSEREASON}" >> /var/log/asterisk/queue_log )
exten => 22,5,Hangup

```

- **23: Agent unpauses** This extension unpauses an agent. The variable AGENTCODE is defined. The following example explains how the feature works:

```

exten => 23,1,Answer
exten => 23,2,NoOp( "QM: Unpausing Agent/${AGENTCODE} made by '${QM_LOGIN}' " )
exten => 23,3,UnpauseQueueMember( |Agent/${AGENTCODE} )
exten => 23,4,Hangup

```

- **24 and 25: Agent AddQueueMember** These extensions (targeted to asterisk 1.2 the first, for asterisk 1.4 the second) dynamically add an agent to the specified queue. The variable AGENTCODE and QUEUENAME is defined. Only for the extension 25, the variables QM\_AGENT\_PRIORLBL and QM\_AGENT\_PRIONUM are set with the information related to agent priority in the queue: QM\_AGENT\_PRIORLBL could have the values U, M, W, S, respectively for agents not assigned in the queue, assigned as main, assigned as wrap, assigned as spill in the queue. The variable QM\_AGENT\_PRIONUM has the value 0 for agent not assigned in the queue or assigned as main in the queue, 1 for agents assigned as wrap, 2 for agents assigned as spill in the queue. The following example explains how the feature works:

```

exten => 24,1,Answer
exten => 24,2,NoOp( "QM: AddQueueMember (v1.2) Agent/${AGENTCODE} \
                    on queue ${QUEUENAME} made by '${QM_LOGIN}'" )
exten => 24,3,System( echo "${EPOCH}|${UNIQUEID}|${QUEUENAME} \
                    |Local/${AGENTCODE}@from-internal|ADDMEMBER|" >> /var/log/asterisk/queue_log )
exten => 24,4,Hangup

exten => 25,1,Answer
exten => 25,2,NoOp( "QM: AddQueueMember (v1.4+) Agent/${AGENTCODE} \
                    on queue ${QUEUENAME} made by '${QM_LOGIN}' \
                    with prioritylabel '${QM_AGENT_PRIORLBL}' and prioritynum '${QM_AGENT_PRIONUM}'" )
exten => 25,3,AddQueueMember( ${QUEUENAME} |Local/${AGENTCODE}@from-internal )
exten => 25,4,Hangup

```

- **26 and 27: Agent RemoveMember** These extensions (targeted to asterisk 1.2 the first, for asterisk 1.4 the second) dynamically remove an agent to the specified queue. The variable AGENTCODE and QUEUENAME is defined. The following example explains how the feature works:

```

exten => 26,1,Answer

```

```

exten => 26,2,NoOp( "QM: RemoveQueueMember (v1.2) Agent/${AGENTCODE} \
    on queue ${QUEUENAME} made by '${QM_LOGIN}' " )
exten => 26,3,System( echo "${EPOCH}|${UNIQUEID}|${QUEUENAME} \
    |Local/${AGENTCODE}@from-internal|REMOVEDMEMBER|" \
    >> /var/log/asterisk/queue_log )
exten => 26,4,Hangup

exten => 27,1,Answer
exten => 27,2,NoOp( "QM: RemoveQueueMember (v1.4+) Agent/${AGENTCODE} \
    on queue ${QUEUENAME} made by '${QM_LOGIN}' " )
exten => 27,3,RemoveQueueMember(${QUEUENAME}|Local/${AGENTCODE}@from-internal)
exten => 27,4,Hangup

```

- **28: Agent custom dial** This extension lets able the agent to dial extensions through outbound queues from the agent's live page. The variable AGENTCODE, EXTODIAL, and OUTQUEUE is defined. Is possible to force a specific caller ID uncommenting the queue where the Set function is called and, obviously, changing the caller ID information to your needs. The following example explains how the feature works:

```

exten => 28,1,Answer
exten => 28,n,NoOp( "QM: Agent Custom Dial. Dialing ${EXTODIAL} \
    on queue ${OUTQUEUE} made by '${QM_LOGIN}' " )
exten => 28,n,Set(QDIALER_QUEUE=${OUTQUEUE})
exten => 28,n,Set(QDIALER_NUMBER=${EXTODIAL})
exten => 28,n,Set(QDIALER_AGENT=Agent/${AGENTCODE})
exten => 28,n,Set(QDIALER_CHANNEL=SIP/${QDIALER_NUMBER})
exten => 28,n,Set(QueueName=${QDIALER_QUEUE})
exten => 28,n,MixMonitor(Q-${QDIALER_QUEUE}-${UNIQUEID}.WAV|b|)
;exten => 28,n,Set(CALLERID(all)="1234567890" ) ; Uncomment and change this if
exten => 28,n,Goto(qm-queuedial,s,1)
exten => 28,n,Hangup

```

- **29: Send SMS to agent's phones** This extension allows the users holding the proper key to send a short message to the agent's phone from the realtime page. This feature is supported by Asterisk revision 10 and later versions and is disabled by default. Please note that this feature should be supported by the agent's phone.

```

exten => 29,1,NoOp( "QM: Send Text from Live Page. Sending text to ${EXTODIAL} "
exten => 29,n,Set(MESSAGE(body)=From: ${QM_LOGIN} - ${MESSAGEBODY})
exten => 29,n,MessageSend(sip:${EXTODIAL})
exten => 29,n,Hangup

```

- **30: Hangup a live call** This extension allows the users holding the proper key to send an hangup message to the PBX in order to hangup a live call from the realtime page.

```

exten => 30,1,NoOp( "QM: Call Hangup made by ${QM_LOGIN} for callID: ${CALLID} w
exten => 30,n,ChannelRedirect(${CALLID},queuemetrics,10,3)
exten => 30,n,Hangup

```

- **31: Redirect a live call** This extension allows the users holind the proper key to send a transfer event to the PBX from the realtime page. This forces the live call to be transferred to a specified extension.

```

exten => 31,1,NoOp( " QM: Call redirect ,ade by ${QM_LOGIN} for callID: ${CALLID}
exten => 31,n,ChannelRedirect(${CALLID},from-internal,${REDIR_EXT},1)
exten => 31,n,Hangup

```



When using `AddQueueMember/RemoveQueueMember` to dynamically login/out to a queue is mandatory to match the agent code with their extension; eg. Agent/303 must be sitting at extension 303.



When using `AddQueueMember/RemoveQueueMember` to dynamically login/out to a queue the agent pause/unpause dialplan given must be changed to fit the current agent channels; eg. if Agent/303 is added to the queue

In order to trigger these functions, QueueMetrics need to be able to access the Asterisk callfile spool, as defined by the `callfile.dir` property.. If your Asterisk system is remote, you'll have to arrange a periodic file transfer or use a disk share in order to make the above features work.

As an alternative, QueueMetrics may connect to a working Asterisk server over the Manager interface. See the description of the `callfile.dir` property for more information.

---

# Appendix C. System preferences

QM stores system-wide preferences in a text file called *configuration.properties* under WEB-INF. The absolute path of that file can be found by looking at the directory called **System path** on the Licence page in QM.

**All properties are case-sensitive.**



You can check the current set of system preferences from the the section called “Using the DbTest Diagnostic Tools” [262] page.

## Defaults

Property name	Description
default.queue	Internal ID (ex. 7, 49....) of the default queue, leave blank for no default queue.
default.queue_log_file	Default queue log file.
default.monitored_calls	The top level directory where monitored calls are held. All its subdirectories are explored recursively. Do NOT forget to add an ending slash.
default.webloaderpbx	Enable or disable the web qloader feedback actions generation. Please refer to the WQLoader USER MANUAL for further information.
default.areacode_digits	How many digits to consider as a default area code
default.start_hour	Preset start and end hours and number of days for the custom report.
default.end_hour	
default.days	
liveclock.enable	If live clock is enabled, the system clock is synchronized with Asterisk server system clock.
default.max_realtime_age	How old a call can be included in real-time report
default.showQueueComposition	If true, show the details of the queues composing the aggregate queue; if false, show only the aggregate queue's name
default.useXmlExcel	True: Generate the Excel file as an XML file (mandatory for UTF charsets); false: generate as an ISO-8859 CSV file
default.hourly_slot	How long in minutes is an hourly slot for hourly breakdown. Default 60 minutes (1hr). If set to e.g. 15, calls will be broken down by 15 minute intervals.

Property name	Description
default.useRawAgentSessions	If true, show all agent sessions. If false, show only agent sessions with at least one call handled. Defaults to false.
default.closeDuration	The default duration of a call that is manually closed. This is the wait time for calls that have not been answered and the talk time for calls that have been answered.
default.crmapp	<p>If present and not empty it will enable the CRM integration column on the answered/unanswered call details tables. The key could be populated with an URL where some tokens will be expanded by the QM engine. Find a list of valid tokens here: the section called “CRM Integration” [189]</p> <p>One example of valid URL with token expansion could be: <code>http://server/app?agent=[A]&amp;unique=[U]</code></p>
default.crmlabel	If present, used by the Realtime agent page to identify the CRM page on the dropdown menu
default.websocketurl	The websocket URL used by the Realtime Agent page softphone. It should be in the followin form: <code>ws://IPServer:Port/path</code>
default.sipaddress	The SIP server name or IP, used by the Realtime Agent page softphone.
default.rtcWebBreaker	rtcWebBreaker flag used by the Realtime Agent page softphone. The RTCWeb Breaker is used to enable audio and video transcoding when the endpoints do not support the same codecs or the remote server is not RTCWeb-compliant. Valid values are "true" or "false". If not present, the default value is "true".
default.showAstClid	If present and set to true it will enable the asterisk unique ID column on the answered/unanswered call details tables.
default.showSecondsOnTotalCalls	If present and set to true, the summary report call time figures will be shown in hhmmss format instead of hours format
default.disablebackhistory	If set to true, disable the history back navigation button in browsers

Property name	Description
default.secondsServiceLevel	The default SLA that Traffic Distribution graphs will use (see DD08). Default: 20 seconds
default.shortCallsLimit	The default Short Call limit that Traffic Distribution graphs will use (see DD08). Default: 5 seconds
default.jobmanifest_language	The language used when generating a manifest file for exported jobs. Typically it affects the ID3 tags stored in mp3 recorded call files (since QM1.6.2)
default.pausecoderequired	If true, agents are required to provide a valid pause reason when entering a pause from the agent page. Default value is false
default.noncontig.days	Which days to include in Custom Reports non-contiguous time - (1: Sun 2:Mon) e.g. 23456 means MON to FRI
default.noncontig.period1.start	Start and end times (as HH:MM:SS or HH:MM) for non-contiguous time reports
default.noncontig.period1.end	See above
default.noncontig.period2.start	See above
default.noncontig.period2.end	See above
default.decimalDigits	Number of digits to display for floating-point numbers - defaults to 1
default.tasks.pingURL	If present and enabled, this property allows to specify a URL that is to be queried by the QueueMetrics server every time a task is completed/disputed by a person. All task information is sent to this URL. One example could be: <a href="http://server/index.html">http://server/index.html</a>
default.searchQA_byCallDate	Defines if the QA reports should be calculated by call date or by filling form date
default.timeZoneOffset	Defines The default time zone offset. Valid values are between -24 and 24 hours (default = 0)
default.ssarMaxReportPeriod	Defines the maximum reporting period for a Self Service agent report. Default set to 15 days
default.export.orientation	Default page orientation for PDF whole report export buttons (value: portrait or landscape)
default.displayHomePageNews	Enable/Disable the QueueMetrics news block present on the home page

Property name	Description
default.disable_directlogin_to_agentpage	If set to true, users holding AGENT and NEWAGENTPAGE keys are not directed to the Icon page when logging on QueueMetrics (since QM 14.10.5)
default.wombat.agent_recall_enabled	Enable/Disable the access to the Recall Scheduler panel in the Icon agent page. (since QM 15.02.4)
default.groupingMargin	Controls the margin used for FCR call clustering. Default 168hrs (7 days)
default.rewriteHotdeskingChannels	Enables rewriting of hotdesking information in data1 field of queue_log table. Default true.
default.synchronizer_mode	Controls the default mode for the synchronizer page and for the QmPushCfgService Json service, default is "CR_UPD_DEL_USR" (Create Update Delete and Create Users)
default.shortcall_treshold	Controls the threshold in seconds for short/long calls for reports, default is 30
default.rememberLastExtension	Controls the behaviour of the agent login panel in the agent's page. Default is set to true, which remembers the last extension the agent used

### SMTP settings

All the settings for your SMTP host. Used by QueueMetrics to send reports by e-mail.

Property name	Description
default.smtphost	SMTP server host name or IP address
default.smtpport	SMTP server host port
default.smtpfrom	Sender E-mail address used by QueueMetrics
default.smtpuser	Optional username needed to authenticate to the SMTP host
default.smtppassword	Optional password needed to authenticate to the SMTP host
default.smtpssl	Use SSL when sending mail (value: true or false)
default.smtpDebug	SMTP transaction are reported on catalina.out (value: true or false)

### Call SLA

It is possible to have a different definition for the initial part of the SLA, having e.g. SLA computed every 5 seconds up to 30 seconds and every 10 seconds up to 60.



Property name	Description
sla.max_initial_delay	The max initial delay and interval that will be shown in the SLA graphs
sla.initial_interval	
sla.max_monitored_delay	The max delay and interval that will be shown in the SLA graph graphs
sla.interval	

### Parser

The following properties control how QueueMetrics interprets data read from Asterisk. Depending on the version of Asterisk you are using, they may have to be set differently from the system defaults in order to get a correct picture of what is going on.

Property name	Description
default.permanentCallbackAgents	If call-back agents should be considered still logged on after a system reload; the current version of Asterisk will do this automatically. Default: true
default.considerIncompleteEntities	If incomplete entities (calls or agent sessions that are in progress at the moment that are in progress at the moment the analysis is being run) should be counted in the reports or not. Default: true
default.rewriteLocalChannels	Rewrites queue_log entries in the form <i>Local/xxx@context</i> to <i>Agent/xxx</i> . Default: false.
default.rewriteLocalWithQueue	If true, extension <i>Local/123@ext</i> on queue <i>Q1</i> is read as <i>Agent/Q1-123</i> . Default false.
default.joinMultiStintCalls	If true, multi-stint calls in the current analysis set are joined by default
default.useEndingChannelName	If true, the last reference to an agent is used as its name (in case they are different)
default.stripChannelNames	If true, anything after the "-" sign is deleted (ie. <i>SIP/203-abcd</i> is read as <i>SIP/203</i> ). If false, the agent channel name is loaded as in the queue_log file. Default: true.
default.ignoreQueueStarts	If false, agents are logged on and calls closed on QUEUESTART records. Otherwise they will be ignored. Default false.
default.alwaysLogonUnpaused	If set to true, when an agent logs on, he will always be unpaused. Default false.
default.ignoreRingNoAnswer	If true, the analyzer will ignore the RINGNOANSWER verbs in the queue

Property name	Description
	log in favour of AGENTATTEMPT verbs.
default.subqueueModeEnabled	If set to true, all activities on subqueues are reported in the parent queue
default.exitOnAgentDumpSysCompat	If true, AGENTDUMP and SYSCOMPAT verbs considered call closure records. If false, they are counted as failed attempts.
default.maxOngoingWaitTime	If set > 0, calls having more than the number of seconds of wait time are skipped. Defaults to 0 (all calls counted).
default.maxOngoingTalkTime	If set > 0, calls having more than the number of seconds of talk time are skipped. Defaults to 0 (all calls counted).

### System administration

The following parameters affect how QueueMetrics interacts with the host system it is running on.

Property name	Description
script.reboot	The command to restart Tomcat. Must be set if this is wanted.

### Layout

Property name	Description
layout.logo	Your company logo (full or relative path) - shall be resized to be an image 200 x 72. The variable \$WEBAPP refers to the local webapp, as an alternative use the full http://.. URL.
layout.splash	HTML string displayed on the login page.
default.noLicenseWarning	Set to <i>true</i> to disable license expiration notifications on the Home Page.
default.language	The default language. Must be one of the installed language packs. Default: en
default.country	The default country for the Locale. Must be one of the installed language packs. Default: US
default.forceDefaultLanguage	Whether to always offer the default system language as defined above (default: false)
default.viewTechInfo	Is it possible to see Tech Info on the licence page and run DBTest?

Property name	Description
url.qm	The URL of the webapp QM is running under, if not detected correctly.
url.rss	The URL of the webapp QM is running under - used for RSS access. Like <a href="http://1.2.3.4:8080/qm">http://1.2.3.4:8080/qm</a>
default.displayHomePageNews	Whether the news block on the home page should appear or not

### Database Access

The following properties define the fields used by the table in MySQL storage. See the section called “Monitoring clusters with QueueMetrics” [12] for complete information.

Property name	Description
sqlPreset. <i>i</i> .table	Sets the table name for preset <i>i</i>
sqlPreset. <i>i</i> .f_time_id	The time columns.
sqlPreset. <i>i</i> .use_timestamp	True: time is a Unix timestamp; False: time is an SQL date-time
sqlPreset. <i>i</i> .f_call_id	
sqlPreset. <i>i</i> .f_queue	
sqlPreset. <i>i</i> .f_agent	
sqlPreset. <i>i</i> .f_verb	
sqlPreset. <i>i</i> .f_partition	May be left blank for partition-less schemas
sqlPreset. <i>i</i> .f_data1	
sqlPreset. <i>i</i> .f_data2	
sqlPreset. <i>i</i> .f_data3	
sqlPreset. <i>i</i> .f_data4	
sqlPreset. <i>i</i> .f_data5	
sqlPreset. <i>i</i> .f_incr	The order-preserving index column. May be left blank, but this may lead to incorrect results.

### Realtime Page

Property name	Description
realtime.calls_invisible	Is the calls panel in the realtime page invisible by default? 0 false, 1 true
realtime.agents_invisible	Is the agents panel in the realtime page invisible by default? 0 false, 1 true
realtime.aggr_by_queue_invisible	Is the aggregated by queue panel in the realtime page invisible by default? 0 false, 1 true
realtime.aggr_by_tag_invisible	Is the aggregated by tag panel in the realtime page invisible by default? 0 false, 1 true

Property name	Description
realtime.agent_and_outcome_invisible	Is the aggregated by agent and outcome panel in the realtime page invisible by default? 0 false, 1 true
realtime.members_only	Are not the only agents to be shown on the realtime page those who are "known" for the queue? 0 false, 1 true
realtime.refresh_time	In how many seconds is the realtime page to refresh?
realtime.use_sql_now	0: analyze all available data; 1: analyze all data which timestamp is lower than the current NOW() function. Do not change.
realtime.startHour	The starting hour of the day, in order to compute the realtime report. It can be either a fixed hour (e.g. 3: from the last 3:00 AM) or a sliding window if prefixes with S (e.g. s3: the last three hours). Default value is 0 (from midnight). A useful value is also -24 (yesterday's midnight).
realtime.all_subqueues	Enable default showing of all subqueues if set to 1
realtime.waitAlarmOnLiveCalls	Decide whether to check for alarms on the wait time of ongoing conversations.
realtime.hideExportButtons	If true, hide export buttons on the Real-time page. Defaults to false.
realtime.absolutePauseTimes	If true, the start of the current pause is shown as an absolute hour; if false, it is shown as the time passed since.
realtime.calls_invisible.buttonEnabled	Decide which buttons o the real-time page can be toggled by the user. Buttons not enabled are set to their default value.
realtime.agents_invisible.buttonEnabled	
realtime.members_only.buttonEnabled	
realtime.all_subqueues.buttonEnabled	
realtime.aggr_by_queue_invisible.buttonEnabled	
realtime.aggr_by_tag_invisible.buttonEnabled	
realtime.agent_and_outcome_invisible.buttonEnabled	
realtime.assignedLocationsOnly	If true, the user will not be able to monitor without a given location. See page the section called "Using Locations" [156] for more details.
realtime.useRowCache	Cache result objects for the Real-time and Agents page when using SQL or

Property name	Description
	cluster storage. Set to true to enable. Defaults to false.
realtime.show_incorrect_queue_sets	If true, queues the agent is working on and he's a member of are displayed in black; queues the agent is working on but he's not a member of are displayed in brown; any queues the agent is a known member of but he's not currently logged on to are displayed as a tooltip to the gray "Down Arrow" symbol. Default false.
realtime.preventLoggedAgentInfoChanges	If true, or missing, the agent cannot change their code and extension if logged on at least one queue
default.callStatusTimeout	How much time (in seconds) an agent have to set an outcome code to the call after the call has finished. Defaults to 1800.
realtime.relativePauseTimes	Adds a new column (Paused For) to the "Agents currently logged in" table in the real-time page. This column shows how long an agent has been on pause, only if the pause is still ongoing.

### Wallboard

Property name	Description
realtime.useNewWallboard	Whether to use the new user-configurable wallboard. Defaults to true.

### Agent's Realtime Page

Property name	Description
realtime.max_bytes_agent	When the real-time page for an agent is computed, the queue_log is NOT read in its entirety but only the last <i>n</i> bytes. In database storage mode, the number of seconds, starting from now and counting backwards, that will be queried for agent events.
realtime.agent_autoopenurl	When the real-time page for an agent shows a new call in the call list, and if the call detail contains an URL, this URL will be open in a new browser window.
realtime.agent_button_X.enabled	Enable or disable a custom button in the realtime page. X shall be an integer between 1 and 4.
realtime.agent_button_X.caption	This is the label associated to a button.

Property name	Description
realtime.agent_button_X.url	Defines the URL that will be opened when the button is pressed. The tokens [A] and [U] are expanded by QueueMetrics with, respectively, the Agent's ID and the most recent call Asterisk Call Unique ID as displayed in the call list. If no calls are present, <i>Unspecified</i> will be used instead.
realtime.agent_button_X.channel	Defines the first leg to be used in a dial command issued to the Asterisk server when the agent presses the button. E.g. <i>Local/104@from-internal</i> .
realtime.agent_button_X.ext	Defines the second leg to be used in a dial command issued to the Asterisk server when the agent presses the button. E.g. <i>200@ext-queue</i> .
realtime.agent.show_agaw	Enable or disable the AGAW subset information table present in the agent's realtime page.
realtime.dynamicLoginQueues	In the standard Agent Realtime page defines what queues should be listed in the dropdown when agents log-in/out through the Add Member/Remove Member button. The key should be filled with three optional values as reported below: <i>all</i> : The dropdown will show the "All assigned" option followed by the queues assigned to the agent (in QueueMetrics queues configuration) and queues where the agent was not assigned but it's free to log in dynamically <i>registered</i> : The dropdown will show the "All assigned" option followed by the queues assigned to the agent (in QueueMetrics queues configuration) <i>assigned</i> : The dropdown will show only the "All assigned" option. In this situation the Add Member/Remove Member buttons behave like the "old" Log on and Log off pushbuttons. In the the new Icon panel based Agent Realtime page, the meaning of these settings is slightly different because the login panel is different: <i>all</i> : The login panel shows all the queues visible by the agent in the available queue list and the agent is able to login on any of the queue <i>registered</i> : The login panel shows only the queues assigned to the agent and the agent

Property name	Description
	could login/out on a single queue or on all queues <i>assigned</i> : The login panel shows only the queues assigned to the agent and the agent could login/out only on all queues only (in this situation the login panel behave like the "old" Log on and Log off pushbuttons)
realtime.agentRegexp	Sets allowed agent codes (e.g. set as "2\\d\\d" to allow agents like "2XX" but not "3XX" or "2X")
realtime.extensionRegexp	Sets allowed extension codes. Any other code will be rejected. (e.g. set as "3\\d\\d" to allow extensions like "3XX")
default.lockedAgentPopupCode	If true, the agent cannot change their code in the login/logoff/pause pop-ups. Defaults to false.
realtime.useActivePolling	Whether to have the client poll the server "behind the scenes" and reload the page when a call is detected.
realtime.ajaxPollingDelay	The interval between each successive client poll. The expected delay for calls is one half of this value.
realtime.all_includes_current_logins	If true, when logging off from ALL queues, any queue the agent is currently logged on will be disconnected. Default false.
realtime.agent_background_url	Default background web page for the realtime agent page. Normally used if no CRM and other background are used. If empty, the standard QueueMetrics background applies.
realtime.agent_web1_url	An URL used as first background in the Realtime Agent page. The key could be populated with an URL where some tokens will be expanded by the QM engine. Valid tokens are [A] (expanded with agent code). See also default.crmapp and default.crmlabel.
realtime.agent_web1_label	If present, used by the Realtime Agent page to identify this specific background on the dropdown menu
realtime.agent_web2_url	An URL used as second background in the Realtime Agent page. The key could be populated with an URL where some tokens will be expanded by the QM engine. Valid tokens are [A] (expanded with agent code). See also default.crmapp and default.crmlabel.



Property name	Description
realtime.agent_web2_label	If present, used by the Realtime Agent page to identify this specific background on the dropdown menu
realtime.agent_webpanel1_url	An URL to be presented into the custom web panel in the Realtime Agent page. This URL does not support token expansion.
realtime.agent_webpanel1_label	If present, used by the Realtime Agent page to enable and identify the custom web panel on the dropdown menu
realtime.assertExtensionNotInUse	Before logging an agent in (in hotdesking mode) makes sure the extension is not in use. This option runs an analysis behind the scenes, so use it sparingly as will increase server load.
realtime.agentPausedOnLogin	When an agent logs in, if she is currently not working on any queues, pause them with the "autopauseCodeLogin" code. If the agent is currently working on some queues and paused, and adds new queues to their set, a pause is forced to make sure the Asterisk state is consistent on all queues. This option runs an analysis behind the scenes, so use it sparingly as will increase server load.
realtime.autopauseCodeLogin	The pause code to use for autopauses on login
agent.openUrlInPopup	If true, URLs in Icon will open in a separate window. Defaults to false.
agent.outcome_size	Maximum number of outcomes shown in the outcome menu before having to scroll. Defaults to 15, minimum value is 1 and maximum value is 50.
agent.pause_dialout	If true, stops agents from dialing out when on pause.

### Asterisk Interaction

Property name	Description
callfile.dir	The call-file directory Asterisk uses to generate calls based on .call files. Must be writable by the Java process. Default <code>_/var/spool/asterisk/outgoing</code> As an alternative, you may enter a Manager interface URI here, in the format <code>_tcp:user:password@server</code> If you do, QM will not generate call-files

Property name	Description
	but will use the manger interface to generate calls. The same field is used by the asterisk configuration wizard when "Single Machine AMI" was selected as source.
callfile.monitoring.enabled	If unattended audio monitoring is enabled on this system. Default true.
callfile.monitoring.channel	The channel, and extension@context [mailto:extension@context] that will be called to implement the unattended audio monitoring functionality. Do not forget the trailing /n in the channel. A number of variables act as placeholders to be substituted by the actual data Asterisk is using: <b>\$AG</b> : the current agent; <b>\$AE</b> : the agent's extension; <b>\$EM</b> : the monitoring extension; See the section called "Listening to live calls: Unattended Call Monitoring" [350] for further information.
callfile.monitoring.extension	
callfile.monitoring.context	
callfile.agentpause.enabled	This function is used to start a pause from the Agent's page and to set its Pause Code - see the sample dial plan provided.
callfile.agentpause.channel	
callfile.agentpause.extension	
callfile.agentpause.context	
callfile.agentunpause.enabled	This function is used to end a pause from the Agent's page - see the sample dial plan provided.
callfile.agentunpause.channel	
callfile.agentunpause.extension	
callfile.agentunpause.context	
callfile.agentlogin.enabled	This function is used to log in an agent from the Agent's page - see the sample dial plan provided.
callfile.agentlogin.channel	
callfile.agentlogin.extension	
callfile.agentlogin.context	
callfile.agentlogoff.enabled	This function is used to log off an agent from the Agent's page - see the sample dial plan provided.
callfile.agentlogoff.channel	

Property name	Description
callfile.agentlogoff.extension	
callfile.agentlogoff.context	
callfile.calloutcome.enabled	This function is used to set the call outcome code from the Agent's page - see the sample dial plan provided.
callfile.calloutcome.channel	
callfile.calloutcome.extension	
callfile.calloutcome.context	
callfile.addfeature.enabled	This function, together with callfile.removefeature.enabled, is used to add a call feature from the Agent's page - see the sample dial plan provided.
callfile.addfeature.channel	
callfile.addfeature.extension	
callfile.addfeature.extension	
callfile.removefeature.enabled	This function, together with callfile.addfeature.enabled, is used to remove a call feature from the Agent's page - see the sample dial plan provided.
callfile.removefeature.channel	
callfile.removefeature.extension	
callfile.removefeature.context	
callfile.agentdial.enabled	This function is not implemented yet.
callfile.agentdial.channel	This function is not implemented yet.
callfile.agentdial.extension	
callfile.agentdial.context	
callfile.outmonitoring.enabled	This function lets you monitor outgoing calls using a different piece of dial-plan, as outgoing channel names might be different from incoming ones.
callfile.outmonitoring.channel	
callfile.outmonitoring.extension	
callfile.outmonitoring.context	
callfile.agentaddmember.enabled	This function is used to dynamically add an agent to a specific queue from the Agent's page - see the sample dial plan provided.
callfile.agentaddmember.channel	
callfile.agentaddmember.extension	
callfile.agentaddmember.context	
callfile.agentremovemember.enabled	This function is used to dynamically remove an agent from a specific queue

Property name	Description
	from the Agent's page - see the sample dial plan provided.
callfile.agentremovemember.channel	
callfile.agentremovemember.extension	
callfile.agentremovemember.context	
callfile.customdial.enabled	This function lets able an agent to dial through one outbound specific queue - see the sample dial plan provided.
callfile.customdial.channel	
callfile.customdial.extension	
callfile.customdial.context	

#### WombatDialer integration (since QM 15.02.4)

Property name	Description
wombat.url	URL where the Wombat Dialer can be reached
wombat.username	Username needed to access to some WombatDialer services
wombat.password	Password for accessing some WombatDialer services
default.wombat.agent_recall_enabled	Enable/Disable the access to the Recall Scheduler panel in the Icon agent page.

#### Real-Time Sounds

Property name	Description
sound.yellowAlarm	Sound to be played if a yellow alarm is triggered. Can be either an absolute URL or a relative path
sound.redAlarm	Sound to be played if a red alarm is triggered. Can be either an absolute URL or a relative path

#### Cluster configuration

Property name	Description
cluster.servers	A set of servers, which names must be used for subsequent properties
cluster.servername.manager	The manager API for this server, in the format tcp:user:pass@server. This field is also used by the asterisk autoconfiguration wizard when "Cluster AMI" source was selected.

Property name	Description
cluster.servername.queueolog	The queue log partition to use, in the format sql:P001
cluster.servername.monitored_calls	The directory where monitored calls for this server can be found. If it starts with "http", an XML-RPC server to query this information
cluster.servername.callfilesdir	The directory in which callfiles must be generated for this sever. Usually leave blank.
cluster.servername.audioRpcServer	The URL of an XML-RPC server to be used for audio monitoring
cluster.servername.agentSecurityKey	The key with which this cluster entry must be protected on the Agent's page
cluster.servername.websocketurl	The websocket URL used by the Realtime Agent page softphone for the selected server. It should be in the following form: ws://IPServer:Port/path
cluster.servername.sipaddress	The SIP server name or IP, used by the Realtime Agent page softphone for the selected server
cluster.servername.rtcWebBreaker	rtcWebBreaker flag used by the Realtime Agent page softphone for the selected server. The RTCWeb Breaker is used to enable audio and video transcoding when the endpoints do not support the same codecs or the remote server is not RTCWeb-compliant. Valid values are "true" or "false". If not present, the default value is "true".

### Audio Monitoring

Property name	Description
audio.server	The PM to use for listening to recorded calls.
audio.liveserver	The PM to use for listening to live calls.
default.audioRpcServer	The URL of an external XML-RPC server for both listening of recorded calls and live call monitoring.
audio.lookBack	How many hours to check for midnight crossing. Used by the <i>LocalFilesByDay</i> PM.
audio.decrypt	The streaming decryption filter for encrypted recordings.
audio.html5player	Plays audio in the browser using an HTML5 audio player. Defaults to false.

### Misc

Property name	Description
manager.dump	By setting this property to true, the dialog between Asterisk and QM used to show the Live! Page is dumped to the Catalina.out log file. This makes it possible to send it over to Loway for debugging purposes.
default.skip_task_on_qagrading	If not present or set to false, a new task will be sent to the graded agent each time a new qa form will be completed. If present and set to true, no tasks will be sent.
export.conversionCommand	If present, this specify the batch script (full) name to be called by the MP3 HTTP Transfer implementor for export tasks.

#### AGAW configuration

Property name	Description
dbmaint.agaw_oldestRun	Oldest obsolete run to keep when running a database optimization, in minutes
dbmaint.agaw_oldestLog	Oldest obsolete log to keep when running an optimization, in minutes
dbmaint.agaw_oldestBroadcast	Oldest obsolete broadcast entries to keep when running an optimization, in minutes

#### Autoconfiguration Wizard

Property name	Description
default.autoconf.source	Defines the default source that will be selected in the dropdown list on the wizard configuration page. It could assume the following values: <b>file</b> for File sources; <b>ami</b> for Single Machine AMI; <b>amic</b> for Clustered Machines AMI; <b>rtldb</b> for Asterisk Realtime Database; <b>quef</b> for Asterisk Queue Log file
default.autoconf.fileagents	Defines the default agents file definition will be shown in the configuration wizard page and will be read by the configuration wizard unattended mode
default.autoconf.filequeues	Defines the default queues file definition will be shown in the configuration wizard page and will be read by the configuration wizard unattended mode

Property name	Description
default.autoconf.fileusers	Defines the default users file definition will be shown in the configuration wizard page and will be read by the configuration wizard unattended mode
default.autoconf.filequeueelog	Defines the default queue log file will be shown in the configuration wizard page and will be read by the configuration wizard unattended mode
default.autoconf.realtimedrv	Defines the database technology used by asterisk to read/write the realtime database (as Java Driver package) For MySQL the default value is com.mysql.jdbc.Driver
default.autoconf.realtimeuri	Defines the realtime database location and authentication parameters in jdbc format.

### Synchronizer

Property name	Description
default.synchronizer_mode	Controls the default mode for the synchronizer page and for the QmPushCfgService Json service, default is "CR_UPD_DEL_USR" (Create Update Delete and Create Users)
default.synchronizer_reader	Controls the default source reader for the synchronizer page, default is "SOURCETYPE_FILE"
synchronizer.default_file_queueelog	Controls the default location for the queue_log file for the Synchronizer menu
synchronizer.default_file_agents	Controls the default location for the agents.conf file for the Synchronizer menu
synchronizer.default_file_queues	Controls the default location for the queues.conf file for the Synchronizer menu
synchronizer.default_file_users	Controls the default location for the users.conf file for the Synchronizer menu
synchronizer.url_source	Controls the URL for the URL source reader in the Synchronizer
synchronizer.default_password	This is the password that will be set as the default passwords for all users created through the synchronizer. If not specified all new passwords will be generated randomly. It is not specified by default.



**Obsolete parameters**

Property name	Description
default.showLostCallsWhenFiltering	If true, lost calls are shown when running a report in filter mode. This is usually <i>false</i> , as all lost calls would be shown even if you run a report for a single agent.
	Removed in version 1.5.1

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# Chapter 19. Additional queue\_log logs for QueueMetrics

In addition to the standard **queue\_log** logs generated by Asterisk, QueueMetrics is able to parse a number of other *verbs* in order to enable advanced tracking features. Some of this additional logs are already generated by QueueMetrics itself or Uniloaders although you can freely implement them in your own dialplans.

## Basic queue\_log structure

The **queue\_log** file is normally located under `/var/log/asterisk/`. Each line in this file is to be considered as an event happened in the queues. The fields are separated by a pipe sign; here an example line:

```
10000005 | 214530.123 | queue | Agent / 123 | CONNECT | 4
```

The fields are, in order: *timestamp* of the event, *unique id* of the call, *queue name*, *agent code*, *verb name*, and up to 5 additional data fields which usage depends on the verb.

You can add custom lines in **queue\_log** by calling Asterisk's `QueueLog ( )` function.

## Music-On-Hold Tracking

The MOH events must be tracked during the call (between the CONNECT and the COMPLETEAGENT or COMPLETECALLER events); the CALLERONHOLD event is written when the call is put on hold, CALLEROFFHOLD when the call is resumed. These events are currently tracked by Uniloaders, enabling the Unitracker feature.

```
10000001 | 214530.A | queue | NONE | ENTERQUEUE | | 123456
10000005 | 214530.A | queue | Agent / 302 | CONNECT | 4
10000015 | 214530.A | queue | NONE | CALLERONHOLD
10000025 | 214530.A | queue | NONE | CALLEROFFHOLD
10000042 | 214530.A | queue | Agent / 302 | COMPLETEAGENT | 4 | 37
```

## Tracking IVR

IVR events must be tracked before the beginning of the call; here's an example of IVR tracking with the IVRSTART and IVRAPPEND although you can find a detailed explanation here: the section called "Tracking IVR data" [366]

```
10000000 | 214530.A | ivr1 | NONE | INFO | IVRSTART | A | B
10000010 | 214530.A | NONE | NONE | INFO | IVRAPPEND | X
10000020 | 214530.A | queue | NONE | ENTERQUEUE | | 123456
10000030 | 214530.A | queue | Agent / 302 | CONNECT | 10
10000040 | 214530.A | queue | Agent / 302 | COMPLETEAGENT | 10 | 10
```

## Adding Tags to a call

You can add a tag to a call (the section called "Adding TAG information to calls" [358]), before, during and after the call itself, keeping in mind that if you run a report for a certain period of time only events

happened in the report's time window are shown. A call can have only one tag, if multiple tag are added to the logs only the last one will be used.

Tags are added using the verb *INFO*. Here's an example of tag added to the call after a few IVR choices:

```
1020000 | 2.1 | NONE | NONE | INFO | DID | 1234
1020000 | 2.1 | NONE | NONE | INFO | IVRAPPEND | 1 | i1
1020000 | 2.1 | NONE | NONE | INFO | IVRAPPEND | 3 | i1
1020001 | 2.1 | NONE | NONE | INFO | TAG | T2
```

A tag can be used in your CRM integration URL as follows: `http://mycrm/?tag=[TAG]`

Refer to this page for additional details about this feature: the section called "CRM Integration" [189]

## Adding Feature codes to a call

You can add a feature code to a call (the section called "Adding TAG information to calls" [358]), before, during and after the call itself, keeping in mind that if you run a report for a certain period of time only events happened in the report's time window are shown.

Feature codes are added using the verb *INFO*. Here's an example of feature code added to the call after a few IVR choices; you can also see how a feature code can accept an additional free text field:

```
1020000 | 2.1 | NONE | NONE | INFO | DID | 1234
1020000 | 2.1 | NONE | NONE | INFO | IVRAPPEND | 1 | i1
1020000 | 2.1 | NONE | NONE | INFO | IVRAPPEND | 3 | i1
1020001 | 2.1 | NONE | NONE | INFO | FTR | X1
1020001 | 2.1 | NONE | NONE | INFO | FTR | X2 | Free text field
```

Existing feature codes can also be removed. QueueMetrics will report the complete history of added and removed feature codes in the call's detail:

```
1080003 | 8.1 | NONE | NONE | INFO | NOFTR | X1
1080003 | 8.1 | NONE | NONE | INFO | NOFTR | X2
```

A feature code can be used in your CRM integration URL as follows: `http://mycrm/?x1=[F:X1]`

Or you can just check if a feature code exists (outputs 1) or not (outputs 0): `http://mycrm/?xlexist=[FX:X1]`

Refer to this page for additional details about this feature: the section called "CRM Integration" [189]

## Adding custom variables to a call

You can add custom variables to a call, before, during and after the call itself, keeping in mind that if you run a report for a certain period of time only events happened in the report's time window are shown.

Variables are added using the verb *INFO*. Here's an example of variable added to the call:

```
1030000 | 3.1 | q1 | NONE | ENTERQUEUE | | 01202579573 | 1
1030001 | 3.1 | NONE | NONE | INFO | VAR | MY_VAR_NAME | MY_VAR_VALUE
1030002 | 3.1 | q1 | SIP/5435 | CONNECT | 2 | 1411721579.4098058 | 4
```

A variable can be used in your CRM integration URL as follows: `http://mycrm/?myvar=[V:MY_VAR_NAME]` Refer to this page for additional details about this feature: the section called "CRM Integration" [189]

## Tracking Outbound calls

If you want to track outbound calls you should create fake `queue_log` records as if the call was actually made in a queue. An outbound call is introduced by the `CALLOUTBOUND` verb. The called number will be tracked in the second additional field after the verb name (the first additional field is referred to the call's URL). These events are currently tracked by Uniloader, enabling the Unitracker feature.

This is a valid outbound call:

```
1092000000 | 1092214530.A | sk-fissi | Agent/302 | CALLOUTBOUND | | 12345679
1092000005 | 1092214530.A | sk-fissi | Agent/302 | CONNECT | 5
1092000042 | 1092214530.A | sk-fissi | Agent/302 | COMPLETEAGENT | 5 | 37
```

## Tracking pause reasons

QueueMetrics leaves you discern between the different kinds of pause your agents, in order to track also payable or billable activities. Pause codes are defined in the "Edit Pause codes" page (the section called "Configuring pause codes" [225]).

Using the `PAUSEREASON` verb immediately after the `PAUSEALL` verb you can add a pause code. In case of multiple `PAUSEREASON` verbs for the same pause only the most recent will be taken into consideration:

```
1400156431 | x1 | 9998 | SIP/99881 | ADDMEMBER |
1400156432 | NONE | NONE | SIP/99881 | PAUSEALL |
1400156432 | 1400156430.782045 | NONE | SIP/99881 | PAUSEREASON | 99
1400156432 | NONE | NONE | SIP/99881 | UNPAUSEALL |
1400156432 | NONE | 9988 | SIP/99881 | UNPAUSE |
1400156443 | x2 | 9998 | SIP/99881 | REMOVEMEMBER |
```

## Adding the call status (outcome)

The call status will help you track the results of your calls. A call status can be added after the beginning of the call, and after the end of the call keeping in mind that if you run a report for a certain period of time only events happened in the report's time window are shown. In case of multiple call statuses only the last one is kept into consideration.

The call statuses are defined in the "Edit call outcomes" page (the section called "Configuring call outcomes" [221])

```
10000000 | 1142264431.21 | queue-dps | NONE | ENTERQUEUE | | 34
10000030 | 1142264431.21 | queue-dps | Agent/102 | CONNECT | 30
10000040 | 1142264431.21 | queue-dps | Agent/102 | COMPLETEAGENT | 30 | 10
10000050 | 1142264431.21 | NONE | Agent/102 | CALLSTATUS | 30
```

## Tracking Hotdesking events

Tracking the hotdesking events (the section called "Enabling Hotdesking in the agent page" [358]) just before the queue login events is very useful if you are using dynamic extensions in your call center. This will help QueueMetrics tracking the association between the agent code and the extension number used by that agent at any given moment:

---

```
100000|10101010.11|NONE|Agent/102|HOTDESK|Sip/1235
```

## Tracking Skills

In skill-based routing systems you can track the requested skills with the REQSILL verb. (the section called “Configuring skills” [227]). These events are valid before the call is connected to the agent.

```
100000|1167335958.530054|cpc|NONE|ENTERQUEUE||01909723335
100001|1167335958.530054|cpc|NONE|INFO|REQSKILL|DE|90
100002|1167335958.530054|cpc|NONE|INFO|REQSKILL|NET|70
100041|1167335958.530054|cpc|Agent/101|CONNECT|41|Agent/101
100064|1167335958.530054|cpc|Agent/101|COMPLETECALLER|41|23
```

---

# Appendix D. Audit log records

The following details are logged for all events:

- *Date* and time of the event
- *User-id* that is requesting/causing the event; if this is not applicable, a *0* may be logged instead.
- *Container session ID* - useful for tracking multiple activities done on the same user session and for further cross-matching with system logs.
- An *action* and zero or more parameters, as detailed below.

The audit table should be secured as needed by the system administrator by revoking the DELETE grants from it by the QueueMetrics database users.

## Action class: User lifecycle (10XX)

### Action: user login - successful

- *Action-id*: 1001
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation

### Action: user logoff

- *Action-id*: 1002
- *Text1*: The full login, as a string, of the user logging off
- *Text2*: The IP address (dotted quad) of the user's workstation



This event tracks only manual logoffs. Other causes of disconnection (e.g., the user closes his browser, session timeouts, etc) are not tracked. Therefore you cannot count on having a logoff event for each logon event.

### Action: user login - unsuccessful

- *Action-id*: 1003
- *Text1*: The full login, as a string, of the user that tried to log on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: The error message displayed

### Action: password change

- *Action-id*: 1004

- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation

## Action class: Key management (11XX)

### Action: key changed

- *Action-id*: 1101
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: The new key that was installed

### Action: key accessed via XML-RPC

- *Action-id*: 1102
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: The key that was passed (it may be blank if it was just a query)

### Action: AGAW key changed

- *Action-id*: 1103
- *Text1*: The full login, as a string, of the user logged on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: The new key that was installed

### Action: AGAW key accessed via XML-RPC

- *Action-id*: 1104
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: The key that was passed (it may be blank if it was just a query)

### Action: AGAW restarted

This action is logged only when the AGAW runner is restarted from the web GUI.

- *Action-id*: 1105



- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation

## Action class: QueueLog editing (20XX)

### Action: QueueLog edited

- *Action-id*: 2001
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: The new statement
- *Text4*: The SQL rollback statement.

This event is triggered by a change to the queue\_log made by the Payroll module. A rollback SQL statement is supplied in case it is needed to revert the changes.

## Action class: QA editing (21XX)

### Action: QA form deleted

- *Action-id*: 2101
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: The rollback SQL statement

### Action: Deletion of a comment

- *Action-id*: 2102
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: Which comment was deleted

### Action: Deletion of all comments

- *Action-id*: 2103
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: Which call was involved

## Action class: Realtime agent management (23XX)

### Action: Realtime Agent Logon

- *Action-id:* 2301
- *Text1:* The full login, as a string, of the user logging on
- *Text2:* The IP address (dotted quad) of the user's workstation
- *Text3:* AgentCode: XXX AgentExtension: XXX

### Action: Realtime Agent Logoff

- *Action-id:* 2302
- *Text1:* The full login, as a string, of the user logging on
- *Text2:* The IP address (dotted quad) of the user's workstation
- *Text3:* AgentCode: XXX AgentExtension: XXX

### Action: Realtime Agent Pause

- *Action-id:* 2303
- *Text1:* The full login, as a string, of the user logging on
- *Text2:* The IP address (dotted quad) of the user's workstation
- *Text3:* AgentCode: XXX AgentExtension: XXX

### Action: Realtime Agent Unpause

- *Action-id:* 2304
- *Text1:* The full login, as a string, of the user logging on
- *Text2:* The IP address (dotted quad) of the user's workstation
- *Text3:* AgentCode: XXX AgentExtension: XXX

### Action: Realtime Agent SMS

- *Action-id:* 2305
- *Text1:* The full login, as a string, of the user logging on
- *Text2:* The IP address (dotted quad) of the user's workstation
- *Text3:* AgentCode: XXX AgentExtension: XXX

## Action class: Realtime call management (24XX)

### Action: Call soft hangup

- *Action-id*: 2401
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: AgentCode: XXX AgentExtension: XXX UniqueID: XXXXXXXXXXXX

### Action: Call transfer

- *Action-id*: 2402
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: AgentCode: XXX AgentExtension: XXX UniqueID: XXXXXXXXXXXX

### Action: Call closure

- *Action-id*: 2403
- *Text1*: The full login, as a string, of the user logging on
- *Text2*: The IP address (dotted quad) of the user's workstation
- *Text3*: UniqueID: XXXXXXXXXXXX

---

# Appendix E. The QueueMetrics watchdog page

QueueMetrics has a watchdog page - that is, if you request a page called: */sysup.jsp*, you get an answer that is a valid JSON object of the format:

```
{
  "state" : "QMUP",
  "ramFreeMb" : 118,
  "ramTotalMb" : 152,
  "ramMaxMb" : 1818,
  "generatedOn" : "Tue Nov 05 16:44:30 CET 2013",
  "version" : "13.12.01 build 607"
}
```

If the page contains the string QMUP, this means that QueueMetrics is working and able to talk to the database.

The other information on memory usage can be used to be stored in a long-term tracking system (e.g. Nagios, Zabbix, Pandora....) in order to make it possible to understand if there are memory issues.

We offer a sample watchdog script that checks whether QM is running or not and restarts it - you can find it at *'WEB-INF/mysql-utils/restart/watchdogQm.pl'*.

---

# Appendix F. Glossary

**AGAW:** The Agent Awareness subsystem of QueueMetrics.

**ARA:** The Asterisk Realtime Architecture.

**Agent:** a person working at the monitored call center and answering to calls. Asterisk offers a way for agents not to be bound by physical telephone terminals but to log on to tell the system they are available.

**Aggregate queue:** see → *Composite queue*.

**Atomic queue:** a queue that matches one-to-one to an underlying Asterisk queue.

**Call analyst:** a person whose job is to grade agent's calls through the QA system. This may be a specific job or an agent.

**Call-back agent:** an agent that will not stay on-line, but which telephone will be rung by Asterisk when a call comes in for him.

**Caller:** a person calling the Asterisk system

**Call-file:** a function in Asterisk, where by writing a specially-crafted file, it is possible to interact with the dial-plan. With a modern version of Asterisk, it is generally better to use the *Manager interface*.

**Campaign:** a set of outbound calls placed for a given purpose.

**Composite queue:** A virtual queue made of more than one atomic queue. Useful for reporting all center activity at once.

**DNIS (Dialed Number Identification Service)** is a service that tracks which telephone number was dialed by a customer (e.g in case of multiple incoming numbers).

**Engagement code:** an acronym that represents a grading items for the QA forms.

**Grader:** see → *Call Analyst*.

**Invisible queue:** a queue that is defined in QueueMetrics but cannot be chosen from the front page. Useful for queue → *wildcard matching*.

**IVR (Interactive voice response)** is a dialog system that allows Asterisk to detect keypad inputs and address the caller to the correct queue or department.

**Jabber:** see → *XMPP*.

**Manager interface:** a TCP/IP Asterisk interface, where a process with the right credentials can connect to a remote Asterisk server over the network and control or query its behaviour. Must be enabled manually by the Asterisk administrator.

**Monitoring:** in Asterisk terminology, the act of recording to disk.

**Outbound queue:** see → *Campaign*.

**Queue:** the call distribution object that let Asterisk keep callers waiting and distributes them in the correct order to available agents. Each caller is processed on a first-come-first-server basis.

**Subqueue:** an artifact of QueueMetrics qloaderd that lets you see different calls processed by the same physical Asterisk queue "as if" they were processed on multiple subqueues. Often used e.g. to tag calls to clients or products without creating hundreds of physical queues in Asterisk.

**VNC:** a technology that can display the screen of another computer on your own screen through a TCP/IP connection. A number of free and commercial VNC implementations exist.

**Wildcard matching:** a technique to group together all queues that have a name sharing similar characteristics. See the section called “Using wildcards in queue names” [216] for details.

**XMPP (eXtensible Messaging and Presence Protocol):** An open instant messaging protocol. Used for off-band communication in the AGAW subsystem.