Wave IP 2500
Installation Guide

Last Updated 9/07/07

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Contents

About This Guide

Welcome to the *Wave IP 2500 Installation Guide*. This guide provides detailed instructions for physically installing a Vertical Wave system and performing initial system configuration.

The Vertical Wave system delivers comprehensive communication support—PBX voice capability, multiprotocol router capabilities, full LAN/WAN connectivity, and a suite of communication applications—in a unified platform designed for scalability, reliability, and ease of use. Review the following sections for general information pertaining to this guide:

- Getting the most out of this guide
- Using the Help system
- Conventions used in this guide
- Related reading
- Support services
- Corporate Web site
- System security
- Compliance statements

Getting the most out of this guide

This installation guide is intended for technicians responsible for installing the Vertical Wave IP 2500 chassis. It contains the following information:

- Chapter 2, Before You Begin, contains guidelines for setting up the installation site before installing the system, including information about site preparation, safety requirements, and identifying the Wave IP 2500 components.
- Chapter 3, Setting Up the Vertical Wave IP 2500, describes the physical installation procedures for the Wave IP 2500, including mounting and grounding the chassis, connecting the Wave IP 2500 to your service provider's voice or data trunks, and connecting digital and analog phones.

- Chapter 4, Initial Configuration, explains the tasks required to set up the Vertical Wave IP 2500 system for initial configuration, including information about Ethernet port, modem, and serial port connections.
- Chapter 5, Entering and Activating Wave Licenses explains how to enter and activate your Wave licenses to enable full system functionality.
- Chapter 6, Installing Wave Workstation Applications explains how to install the Wave workstation applications: ViewPoint, the TAPI Service Provider, the Contact Manager Assistant, and the Wave Archived Recording Browser.
- Appendix A, Trunk and Station Ports and Pinouts, lists the port numbers, description, and pinout pairs for RJ-21X interfaces on the ISC1, cards, and modules that provide trunk and station resources on the Wave IP 2500.
- Appendix B, Wave IP 2500 Status LEDs, presents the potential settings of the System Status LEDs located on the front of the ISC1.
- Appendix C, Using Wave Workstation Applications with Microsoft Terminal Services or Citrix MetaFrame, explains how to use Microsoft Terminal Services or Citrix® MetaFrame with Wave.
- Appendix D, Performing Unattended Workstation Installations, explains how to install the Wave workstation applications unattended (silently), so that your organization can perform automatic software updates or use a network maintenance system that performs remote installations.
- Appendix E, Configuring Wave for the Windows Firewall, contains important information about Windows firewall exceptions and Wave.
- Appendix F, Upgrading Redboot, explains how to upgrade the Redboot boot loader for the Integrated Services Card (ISC1).
- Appendix G, Troubleshooting, contains information that may be helpful when you are troubleshooting problems that occur during installation or initial configuration of your Wave system.
- Appendix G contains a copy of the Vertical End User Software License Agreement.

Using the Help system

The Vertical Wave Help system provides both online and context-sensitive Help. To access each type of Help, use the following methods:

- Online Help—From the Wave Global Administrator Management Console, press F1 or the Help icon located in the top right corner of the screen, then select a topic from either the Contents tab or the Index tab.
- Context-sensitive Help—From each Global Administrator Management Console applet or dialog box, click the Help button to directly access the relevant Help topic.

Conventions used in this guide

In the course of describing product features and functions, this guide uses the conventions described in this section.

Special messages

Note: A note expands on information in the text.

Hint: A hint suggests a way to work smarter or helps you perform a task.

Important: An Important note relays information that is of special interest.

Caution: A caution highlights information that helps you prevent damage to the equipment or to data, and tells you how to avoid the problem.

Warning: A warning alerts you to a situation that could cause you physical harm.

Terms used

Term	How to Interact
Click	Click the left mouse button.
Right-click	Click the right mouse button.

Term	How to Interact
Shift-click	Hold down the Shift key, and simultaneously click the left mouse button.
Ctrl-click	Hold down the Ctrl key, and simultaneously click the left mouse button.
Ctrl+another key	Hold down the Ctrl key, and simultaneously press one or more additional keys, for example Ctrl+Q.
Enter	Press the Enter key, or click OK.
Type	Type the indicated text, but do not press the Enter key or click OK until you are diected to do so.
Press	Press the indicated key or keys.
Check	Place a check mark in the check box.
Select	Choose an option from a menu, drop-down list, or list of radio buttons.

Type conventions

Type Convention	Used to Indicate
italics	Book titles, variables, and word emphasis
`courier font`	Screen text and user-typed command line entries
Initial Caps	Menu titles, window names, button names, file names, and directories

Related reading

For information about this version of Vertical Wave, including new features, known issues, and other late-breaking information, see the Release Notes included on the Documentation CD.

The following documents are included with the Wave IP 2500 in Acrobat format, and can be found on the Vertical Wave Documentation CD.

Manuals

Wave IP 2500 Installation Guide (this manual). Provides detailed instructions for physically installing a Vertical Wave system and performing initial system configuration.

Wave IP 2500 System Recovery Guide. Describes how to use the Vertical Wave System Recovery Disk or System Recovery USB Thumbdrive to restore your Wave IP 2500 to its original factory settings for emergency recovery.

Wave Global Administrator Guide. Provides task-based instructions on how to use all aspects of the Wave Global Administrator Management Console.

Wave ViewPoint User Guide. Provides task-based instructions on how to use Vertical Wave, including working from remote locations, participating in a contact center, and so forth.

Wave Phone User Guide. Describes how to use Vertical Wave SIP phones, digital phones, analog phones, and SIP softphones with Wave.

Quick Reference Guides

Wave Analog Phone Quick Reference Guide. Provides instructions for using analog telephones with Vertical Wave.

Edge Digital Phone Quick Reference Guide. Provides instructions for using Vertical Edge digital telephones.

Wave SIP Phone Quick Reference Guide. Provides instructions for using Vertical Wave SIP telephones.

Wave Voice Mail Quick Reference Guide. Provides instructions for using Vertical Wave Voice Mail features.

Support services

Vertical Communications, Inc. has worked diligently to produce the highest quality communications system possible. In the course of installing or customizing a system, however, customers may require personal attention.

For technical support, contact your reseller. For more information about Vertical Communications, Inc. and its products, contact your Vertical Wave provider.

Corporate Web site

The Vertical Communications, Inc. Web site provides information about Vertical Communications, Inc. and the Vertical Wave product line.

http://www.vertical.com

System security

You are responsible for the security of your Vertical Wave system. Unauthorized use of the Vertical Wave system could result in toll fraud. You must read all system administration documentation to understand which configuration options can introduce the risk of toll fraud, and which configuration options can be activated or deactivated to prevent fraud.

For more information, see Appendix A, “Protecting your Phone System Against Toll Fraud” in the *Wave Global Administrator Guide*.

Note: Vertical Communications, Inc. does not warrant that the configuration software is immune from or will prevent unauthorized use of common-carrier telecommunications facilities and services accessed through or connected to the Vertical Wave chassis. Vertical Communications, Inc. is not responsible for any charges that could result from unauthorized use.

Compliance statements

Federal Communication Commission (FCC) statement

The following statements are provided in accordance with the Federal Communications Commission (FCC) regulations. Please read these statements carefully before installing your system.

FCC Part 15

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Vertical Communications, Inc. could void your authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Part 68

This equipment complies with Part 68 of the FCC rules. Located on the equipment is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN). If requested, this information must be provided to the telephone company.

The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to determine the maximum REN for the calling area.

This equipment cannot be used on the telephone company-provided coin service. Connection to Party Line Service is subject to State tariffs.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.

If problems are experienced with this equipment, please contact your reseller.

If the problem is causing harm to the telephone network, the telephone company may require you to remove the equipment from the network until the problem is resolved.

It is recommended that the customer install an AC surge arrester in the AC outlet to which this device is connected. This is to avoid damaging the equipment caused by local lightening strikes and other electrical surges.

This equipment is Hearing-Aid Compatible (HAC).

This equipment uses the following Uniform Service Order Code (USOC) jacks and codes:

Model Name	Facility Interface Code	REN or Service Order Code	Jack Type
VW-8AT-M	02LS2	0.2B	RJ-21X
VW-8AT-M	02GS2	0.2B	RJ-21X
VW-IS1-C	02LS2	0.2B	RJ-21X
VW-1T1S-M	04DU9-BN	6.0Y	RJ-48C
VW-1T1S-M	04DU9-DN	6.0Y	RJ-48C
VW-1T1S-M	04DU9-1KN	6.0Y	RJ-48C
VW-1T1S-M	04DU9-1SN	6.0Y	RJ-48C
VW-1T1S-M	04DU9-1SN (PRI)	6.0Y	RJ-48C
VW-8x8AU-M	02LS2	0.2B	RJ-21X
VW-8x8AU-M	02GS2	0.2B	RJ-21X
VW-8x8AU-M	02RV2-T	AS.2	RJ-21X

Direct Inward Dialing (DID) interfaces

Allowing this equipment to be operated in such a manner as to not provide for proper answer supervision is a violation of Part 68 of the FCC rules.

Proper answer supervision is when:

- The equipment returns answer supervision to the Public Switched Telephone Network (PSTN) when Direct Inward Dialing (DID) calls are:
  - Answered by the called station
  - Answered by the attendant
  - Routed to a recorded announcement that can be administered by the Customer Premise Equipment (CPE) user
- The equipment returns answer supervision on all DID calls forwarded to the PSTN. Permissible exceptions are:
  - A call is unanswered
  - A busy tone is received
  - A reorder tone is received

Underwriter's Laboratory

Underwriter's Laboratory (UL) & Canadian Underwriter's Laboratory (CUL)

This equipment complies with the UL 60950-1 and CSA C22.2 No. 60950-1 standards.

To reduce the risk of fire: use 26 AWG line cords that have been evaluated as Communication Circuit Accessories, UL 1863, for all telephone connections. This statement applies to all cards and modules that connect to telephones or the Public Switched Telephone Network (PSTN).

Industry Canada

This section describes the requirements for end users in accordance with CS-03.

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements documents. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in certain situations

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Ringer Equivalence Number (REN) for each device (card or module) is listed in the appropriate chapter.

The standard connecting arrangement (telephone jack type) for each card or module is listed in the appropriate chapter.

Before You Begin

It is important to set up your site properly before installing the Vertical Wave IP 2500. Follow the guidelines in this chapter to ensure that all required services and tools are available. Review the following sections before installing the Wave IP 2500:

- Site Preparation
- Safety Requirements
- Unpacking the Wave IP 2500

Site Preparation

Before removing the Wave IP 2500 from the packing material do the following:

- Determine the Wave IP 2500 chassis location. The Wave IP 2500 requires a dust-free location with heating, air conditioning, and ventilation. See “Environmental Requirements” on page 2-2.
- Install all punchdown blocks and patch panels.
- Purchase and install an EIA- or IEC-compliant, 19-inch equipment rack, if you plan to rack mount the Wave IP 2500.
- Install TIA/EIA-568A standard cabling (for example, Category 3 for voice, or Category 5 for voice and data).
- Verify line connectivity.

Caution: An Uninterruptible Power Supply (UPS) is strongly recommended in case of a site power failure.

Environmental Requirements

For the Wave IP 2500 to operate properly, the environmental specifications in the following table must be met.

Item	Value
Temperature, operating	32° to 104° F (0° to 40° C)
Temperature, storage	-4° to 140° F (-20° to 60° C)
Relative humidity, operating	5-80%, non condensing
Relative humidity, storage	Maximum 85%, non condensing
Operating altitude	Maximum 10,000 ft (3050 m)
Clearance for servicing	Minimum 24 in (61 cm) front and back
Clearance for cooling	Minimum 4 in (10 cm) on all sides
AC power source	15-amp circuit required
Heat emitted	Maximum 2830 BTU/hour main chassis, 1910 BTU/hour EXU chassis
Power consumption	Maximum 830W main chassis, 560W EXU chassis
Internal power supply	Input voltage: 100-120 VAC, 50/60 Hz Input current: maximum 9A main chassis, 6A EXU chassis

Required Tools

You need the following tools to install the Wave IP 2500:

- #1 and #2 Phillips screwdriver
- Flat-head screwdriver
- Antistatic mat to protect electronic components from static electricity damage
- Antistatic wrist strap attached to a grounded, antistatic leash

Safety Requirements

Refer to the following cautionary procedures to help ensure your safety and avoid damaging the Wave IP 2500:

- Protective Grounding
- Electrical Safety
- Proper Lifting

Protective Grounding

Caution: For your safety and to avoid damaging sensitive electronic components, be sure to do the following.

- Ground the Wave IP 2500 chassis according to the instructions in "Grounding the Wave IP 2500" on page 3-8.
- To prevent electrostatic discharge:
  - Always work at a static-safe area that includes an anti-static mat and an antistatic wrist strap that has been adhered it to a grounded surface, such as a mounting rack or the Wave IP 2500 face plate.
  - Keep electronic components inside static-safe packaging until you are ready to use them.
  - Unpack electronic components in a static-free area.
  - Store spare parts in the original static-safe packaging or in static-safe containers.

Electrical Safety

- Power off the Wave IP 2500 and disconnect the power cable whenever you remove, replace, or install hardware components.
- Never touch bare conductors or wires on telephony ports or other interfaces.

Proper Lifting

The Wave IP 2500 chassis weighs 26 pounds (11.8 kg) and each EXU weighs 19 pounds (8.6 kg).

Caution: Lift the Wave IP 2500 with assistance whenever possible to prevent possible injury to yourself or damage to the system.

The following steps are guidelines for properly lifting heavy objects from the ground.

To move the Wave IP 2500:

1. Position your feet at shoulder width.
2. Keep your back straight.
3. Bend at your hips and knees.
4. Grasp the Wave IP 2500 by opposite corners, and position your body so the weight is centered over your feet.
5. Lift the chassis slowly with your leg muscles.
6. Avoid twisting motions.
7. Bend at your hips and knees to put the chassis down.

Unpacking the Wave IP 2500

When you receive the Wave IP 2500, locate the packing slip on the outside of the box. The packing slip lists the various Wave IP 2500 components that you ordered.

Each Wave IP 2500 includes the following items:

- Wave IP 2500 base unit.
- Additional modules and cards that you ordered.
- Vertical Wave Documentation CD. Includes Vertical Wave manuals and Quick Reference Guides in Acrobat format.
- Vertical Wave System Recovery Disk. Provides a backup of your Vertical Wave system as it was shipped. You only need to use the Recovery Disk in the unlikely event of a system failure. For more information, see the *Wave IP 2500 System Recovery Guide*, included on the Wave Documentation CD.
- Power cord.

Setting Up the Vertical Wave IP 2500

Setting up the Wave IP 2500 includes the following tasks. Each step is described in detail later in this chapter.

- Mounting the Wave IP 2500 (see page 3-4).
- Grounding the Wave IP 2500 (see page 3-8).
- Connecting the Wave IP 2500 to your LAN (see page 3-9).
- Connecting the Wave IP 2500 to power and powering on (see page 3-10).
- Connecting to trunk and station ports on the ISC1 (see page 3-11).
- Installing expansion components, including Expansion Units (EXUs), Media Resource Modules (MRMs), and all other expansion cards and modules. See page 3-12.
- Connecting modules and cards (see page 3-16).
- Connecting a music-on-hold (MOH) system (see page 3-20).
- Connecting a paging system (see page 3-21).

Where to go next

After you complete the tasks described in this chapter, go to Chapter 4, “Initial Configuration.”

About the Wave IP 2500

The Wave IP 2500 consists of the following components. Each is described in the following sections.

- Wave IP 2500 base unit.
- Expansion options, including:
  - EXUs
  - MRMs
  - Expansion cards and modules

The Wave IP 2500 base unit

The Wave IP 2500 base unit consists of the following:

- A 19-inch rack-mountable chassis that includes room for expansion.
- The Wave Integrated Services Card (ISC1), an embedded processor that provides primary system control including voice processing and packet switching elements.

About the ISC1

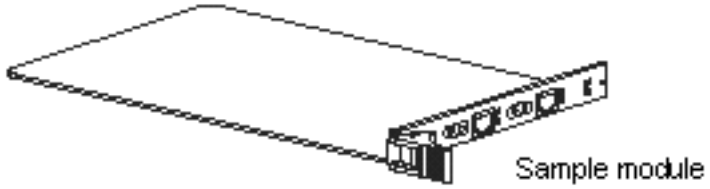
The ISC1 includes the following:

- 6 SIP Gateway ports
- 4 analog FXO trunk ports
- 4 analog FXS station ports
- 2 10/100 Mbps Ethernet ports (see “About the Ethernet ports on the Wave IP 2500” on page 3-9 for important information about using these ports.)
- 2 partial-width slots that can accommodate 2 expansion modules
- 2 full-width universal slots that can accommodate 2 expansion cards or modules
- 1 USB device port
- 1 USB host port
- RJ-21X connector (with embedded FXS and FXO ports)
- Audio port for an external music-on-hold source
- 1 port for an external paging system
- V.34 Fax modem

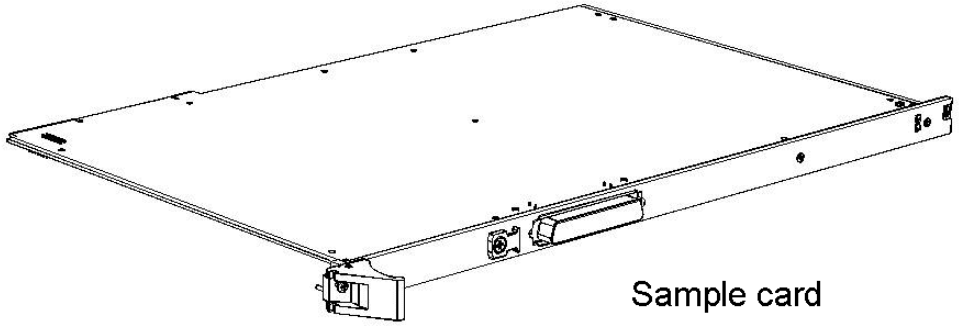
Expansion options

The ISC1 is the minimum requirement for a Wave IP 2500 system. There are several ways to expand the Wave IP 2500 base unit to support a wide variety of trunk and station configurations:

- **Expansion cards and modules.** The Wave IP 2500 supports two kinds of expansion boards, cards and modules:
  - **Modules** are partial-width boards that can be installed in module slots or universal slots in the base unit or in Expansion Units (EXUs), described on page 3-4.



    The following modules are available:
    - **Analog trunk module.** Supports 8 analog FXO loop start or ground start trunk ports.
    - **Analog universal module.** Supports 8 analog FXS station ports and 8 analog FXO loop start or ground start trunk ports.
    - **Digital station module.** Supports 12 digital station ports.
    - **T1 module with drop-and-insert (DNI) V.35 serial interface.** Supports a single T1 PRI digital trunk. It features an integrated CSU/DSU, and allows shared data and voice services over a single T1 circuit.
  - **Cards** are full-width boards that support higher port densities than modules. Cards can be installed in the universal slots in the base unit or in EXUs.



The following cards are available:

- **Analog station card.** Supports 24 analog FXS station ports.
- **Digital station card.** Supports 24 digital station ports

- **Expansion Units (EXUs).** An EXU provides 2 universal slots that can each support one module or card.Up to 4 modular EXUs can be mounted on top of the Wave IP 2500 base unit. A fully expanded system with 4 EXUs provides 8 additional universal slots.
- **Media Resource Modules (MRM).** Each Wave IP 2500 is pre-configured to support a specific number of users and concurrent voice applications. To expand the system's core telephony, voice processing, and VoIP capabilities, you can install one of 3 available MRM models that provide up to 128, 256, or 384 additional voice processing channels. Only one MRM at a time can be installed on the ISC1.

Mounting the Wave IP 2500

The Wave IP 2500 can be rack mounted, wall mounted, or table mounted. See "Environmental Requirements" on page 2-2 for specific requirements on how to site the Wave IP 2500.

Caution: Due to the weight of the Wave IP 2500, mount it with assistance whenever possible. Review "Proper Lifting" on page 2-4 before rack mounting.

Important: Note the following:

- Do not place anything on or against the chassis that prevents proper ventilation. Be sure to allow a minimum cooling clearance of 4 inches on all sides of the Wave IP 2500.
- To prevent the fans from pulling dust into the chassis, mount the Wave IP 2500 at least 2 feet (0.5 meters) above the floor. Do not operate the Wave IP 2500 at floor level.

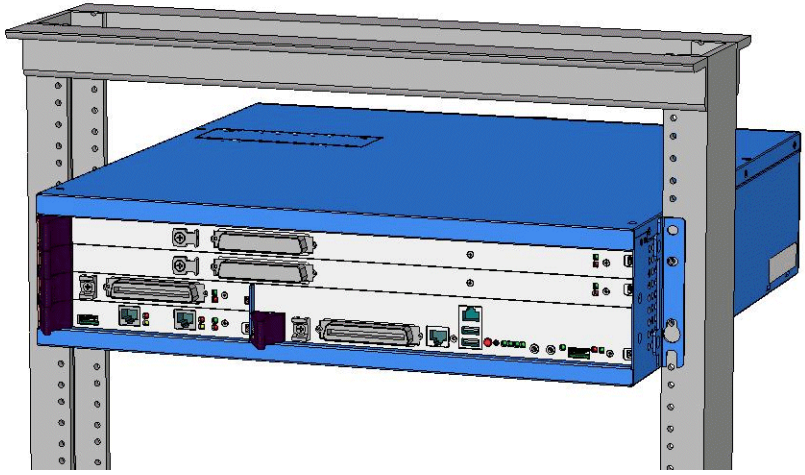
Rack mounting the Wave IP 2500

The Wave IP 2500 is shipped ready to be rack mounted. The Wave IP 2500 requires an EIA- or IEC-compliant, 19-inch rack for proper mounting.

To rack mount the Wave IP 2500:

1. Insert a rack mounting screw loosely into each side of the rack.
2. Slide the Wave IP 2500 chassis into the rack and hang it onto the screws using either the keyhole or slot on each mounting bracket. (This frees you from having to hold the chassis in place as you continue.)

3. Tighten the screws, and then insert and tighten a second rack mounting screw in each bracket. When successfully rack-mounted, the Wave IP 2500 chassis looks like this:



Wall mounting the Wave IP 2500

You can mount the Wave IP 2500 chassis onto a wall by first attaching a piece of prepared plywood to studs in the wall, then attaching the chassis to the plywood.

Note: You can only wall mount the Wave IP 2500 chassis itself —wall mounting is not an option if you are using one or more EXUs.

Caution: Note the following:

- Do not attach the chassis directly to a wall without using the plywood as a support—the plywood must be firmly attached to wall studs in order to support the weight of the chassis.
- Do not wall mount the chassis with the cards in a horizontal position. Only wall mount the chassis with the cards in a vertical position, as in the picture on page 3-7.

To wall mount the Wave IP 2500 chassis:

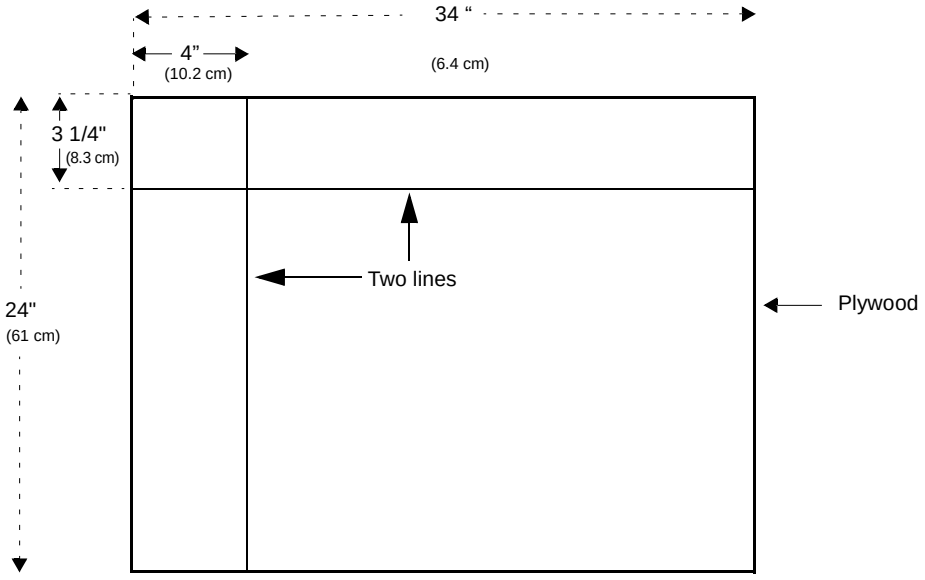
1. Prepare a piece of plywood that meets the following minimum dimensions for proper ventilation and service access:

   Thickness—0.75 inches (2 cm)

   Height—24 inches (61 cm)

   Width— 34 inches (86.4 cm)

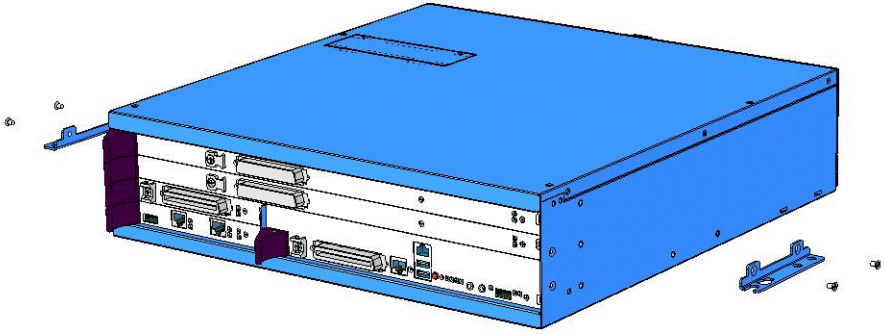
2. Draw a vertical line on the plywood 4 inches (10.2 cm) from the left edge, and a horizontal line 3-1/4 inches (8.3 cm) from the top edge:



3. Locate supporting studs in your wall, and firmly attach the prepared piece of plywood to the studs using the appropriate screws.

4. If the mounting brackets are currently installed on the front of the Wave IP 2500, remove them.

5. Position the mounting brackets at the bottom of each of the chassis side panels. Use a #2 Phillips screwdriver to fasten each mounting bracket to the chassis with the screws provided.



6. With another person's assistance, lift the Wave IP 2500 chassis and place it against the wall-mounted plywood so that the side of the chassis with the fans faces to the left. Line up the left side of the chassis with the vertical line that you drew on the plywood, and line up the top of the chassis with the horizontal line that you drew.
7. Insert and tighten two self-threading #10 screws through each mounting bracket to securely attach the chassis to the plywood. When successfully wall-mounted, the Wave IP 2500 chassis looks like this:

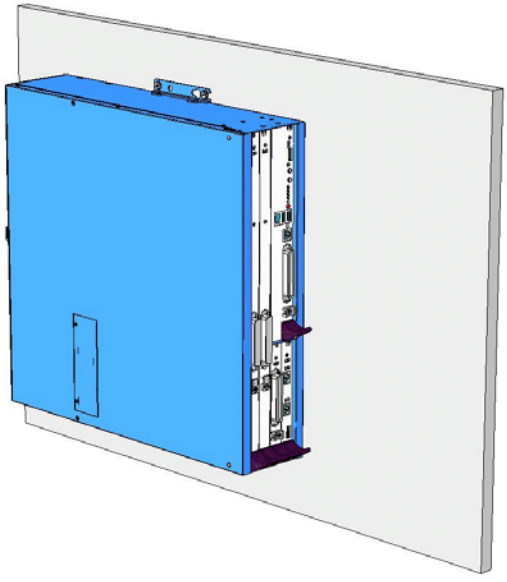


Table mounting the Wave IP 2500

Table mounting is a convenient solution for temporary or mobile operation requirements of the Wave IP 2500. Do not place the Wave IP 2500 on the floor.

Caution: Ensure that the table supports a minimum weight load of 26 pounds (11.8 kg) for the Wave IP 2500 chassis, as well as 19 pounds (8.6 kg) additional weight for each EXU that you are using.

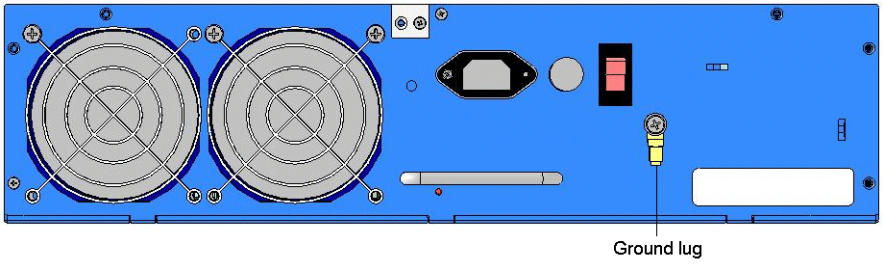
Grounding the Wave IP 2500

Warning: The protective ground lug (earth contact) on the Wave IP 2500 chassis must be permanently connected to earth.

Warning: The National Electrical Code requires that the telephone and electrical services have a common ground. If separate grounds are used for telephone and electrical services, a voltage differential could develop between the two services. This could expose you to an electrical shock and damage the equipment.

To ground the Wave IP 2500:

1. Locate the ground lug on the back of the Wave IP 2500.



2. Loosen the slotted screw on the ground lug with a flat-head screwdriver.
3. Insert a 10- or 12-gauge stranded grounding wire into the ground lug opening.
4. Tighten the slotted screw.

5. Connect the other end of the grounding wire to one of the following ground types:
    - Power service ground
    - Building steel ground
    - Metallic cold water pipe that is bonded to a power ground (if permitted by local building codes)
    - Ground rod that is 5 feet long and 5/8 inch in diameter. (Use this option only if none of the other options are available.)

Connecting the Wave IP 2500 to your LAN

This section describes how to connect the Wave IP 2500 to your LAN using a standard Ethernet cable. You can also connect the Wave IP 2500 to your network using a network hub, switch, or router.

Note: The cabling for your LAN should be installed by a network cabling professional before the arrival of the Wave IP 2500.

About the Ethernet ports on the Wave IP 2500

There are 2 Ethernet ports located on the front of the ISC1, labeled ENET 1 and ENET 2.

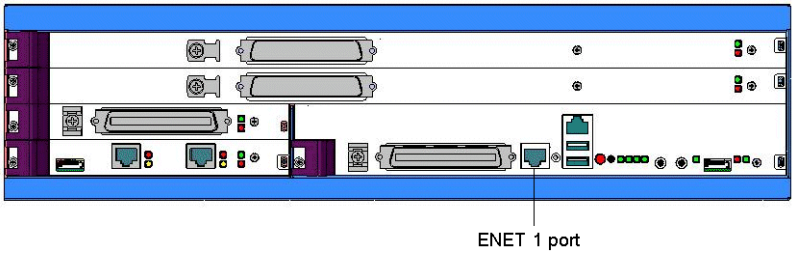
Important: ENET 1 and ENET 2 are connected to an embedded switch in the ISC1 which does not currently support the Spanning Tree algorithm. Consequently, **ENET 1 and ENET 2 must not both be simultaneously connected to another switch on your network.** Connecting both Ethernet ports to a switch on your network creates a loop that makes the embedded switch inoperable, and the Wave IP 2500 will be cut off from your network.

- ENET 1 is the Wave IP 2500's primary interface and under normal conditions it is the *only interface that should be connected to your network*. You use ENET 1 to connect the Wave IP 2500 to your network to provide Wave system functionality, for example access to the Global Administrator Management Console, ViewPoint, VoIP station and trunk resources, and so forth.
- ENET 2 should only be used in the following special circumstances:
    - To directly connect the administrator PC to the Wave IP 2500 for system configuration and administration, as described on page 4-4. (You can also connect to the Wave IP 2500 from the administrator PC via a local or remote modem connection, as described on page 4-7.)

- As a backup in case ENET 1 is not functional. You can use ENET 2 to connect the Wave IP 2500 to your network to provide Wave system functionality, *as long as ENET 1 is not used for the same purpose*.
- For troubleshooting or diagnostic purposes, for example internal packet sniffing. All packets exchanged between the Vertical Application Module (VAM) and the embedded processor are copied to ENET 2 for diagnostic purposes. (Note that packet copying does not significantly add to network traffic.)

To connect the Wave IP 2500 to your LAN:

1. Locate the 8-pin modular RJ-45 Ethernet port labeled ENET 1 on the ISC1.



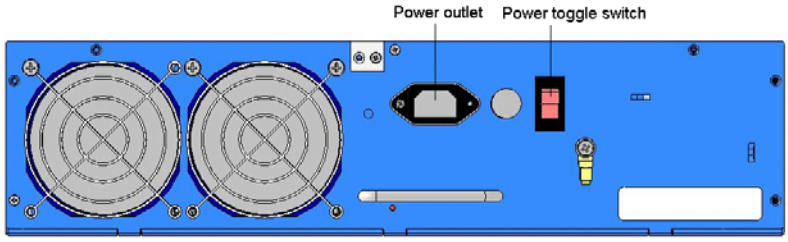
2. Connect one end of a standard, straight-through Ethernet cable to the ENET 1 port.
3. Connect the other end of the cable to your LAN.

Connecting the Wave IP 2500 to power and powering on

Connect the Wave IP 2500 to a dedicated circuit using the supplied power cord. Do not use any other power cord.

To connect the Wave IP 2500 to power and power on:

1. Locate the power outlet and power toggle switch on the back of the Wave IP 2500.



2. Set the base unit power supply rocker switch and any EXU power switch rocker switches located on the back of the Wave IP 2500 to the off position.
3. Connect the power cables from the main chassis and any EXUs to dedicated circuits.
4. Set each EXU's rocker switch to the On position. (The EXU will not actually power on until the main chassis is powered on.)
5. Power on the base unit by toggling the rocker switch.
6. Observe the status LEDs on the front of the Wave IP 2500 to ensure that the system initialization completes successfully and that there are no component failures

   For complete details of the information provided by the status LEDs, see Appendix B, "Wave IP 2500 Status LEDs."

Connecting to trunk and station ports on the ISC1

The RJ-12X port on the ISC1 provides the following:

- 4 analog FXO trunk ports that support loop start trunks only.
- 4 analog FXS station ports.

See Appendix A, "Trunk and Station Ports and Pinouts" for RJ-21X interface port descriptions and pinout pairs for the ISC1.

To connect to analog trunk and station ports on the ISC1:

1. Locate the RJ-21X port (labeled J1) on the ISC1.
2. Connect the analog station/trunk cable to the RJ-21X port.

Power failover support

The Wave IP 2500 provides for failover telephone service in the event of a power failure.

If the power fails, the analog phone connected to station port 1 on the ISC1 automatically connects to the analog trunk plugged into trunk port 1, enabling the analog phone to make calls even if the Wave IP 2500 is not functioning.

Hint: When setting up stations, connect station 1 to a phone located in an accessible area, such as the lobby or front desk.

Installing expansion components

This section describes how to install the following components to expand the Wave IP 2500 base unit:

- Expansion Unit (EXU). See the next section.
- Media Resource Module (MRM). See page 3-14.
- Expansion cards and modules. See page 3-15.

Installing EXUs on a Wave IP 2500

You can install up to 4 EXUs on a Wave IP 2500.

To install an EXU:

1. Unplug the Wave IP 2500's power cord, but do not disconnect the grounding wire.
2. Remove the connector hatch retention screws on the top of the Wave IP 2500 base unit, and then remove the connector hatch.
3. Remove the backplane terminator from the base unit using both hands to pull it straight up and out.

   Caution: Make a note of the direction that the backplane terminator is facing when you remove so that you can replace it the same way. A reversed backplane terminator can cause malfunctions and damage equipment.
4. Open the side and rear latches on the EXU.

5. Stack the EXU on top of the base unit or another EXU, aligning pins and electrical connectors on the bottom of the EXU with the pins on the lower unit.

6. Press down gently to engage the backplane connector.
7. Engage the side and rear latches to secure the EXU.
8. If the Wave IP 2500 is rack-mounted, attach the EXU using 2 rack screws per side. If this is the top-most EXU, go to step 10.
9. To install another EXU, remove the connector hatch from the top of the EXU that you just installed. Repeat steps 4-8 to stack up to 4 EXUs.
10. Secure the backplane terminator to the topmost EXU.

    Caution: Be sure to replace the backplane terminator facing the same direction it was when you removed it. Also, pay careful attention to pin alignment. Connector pin A1 must align with slot pin A1. DO NOT power on the Wave IP 2500 until you are certain that the backplane terminator is installed correctly.

11. Replace the connector hatch on the topmost EXU and secure it with the retention screws.
12. Connect each EXU to power and ground it.
13. Reconnect the Wave IP 2500 to power.

A Wave IP 2500 base unit with 1 EXU is shown below.

Installing a Media Resource Module

Only one MRM can be installed on the ISC1.

1. Unplug the Wave IP 2500's power cord, but do not disconnect the grounding wire.
2. Remove the ISC1 from the Wave IP 2500 base unit. To do so:
   - Label or note the position of any cables connected to the ISC1 faceplate.
   - Disconnect all cables from the faceplate.
   - Loosen the retention screws.
   - Open the insertion lever at the left side of the faceplate, then pull firmly on the lever to disengage the ISC1 from its slot.
3. Place the ISC1 on a static-safe work area.
4. Install the MRM standoffs on the ISC1 with the screws provided.
5. Align the MRM over the standoffs, and then fasten the retention screws in the corner holes.
6. Plug the MRM ribbon connector into connector P4 (the light-blue 40-pin socket) on the ISC1.
7. Re-install the ISC1 in the Wave IP 2500 base unit. To do so:
   - Slide the ISC1 back into its slot.
   - Engage the insertion lever.
   - Fasten the retention screws.
   - Reconnect cables to the faceplate.

8. Reconnect the Wave IP 2500 to power.

Installing expansion modules and cards

This section provides guidelines for installing all modules and cards. See "Connecting modules and cards" on page 3-16 for information on connecting trunks, stations, and other devices to specific modules and cards after you have installed them.

Caution: The Wave IP 2500's analog station interface is not designed to withstand surges commonly associated with wires that are exposed to the external environment. Do not route the wires connecting analog station cards or modules to stations outside the building where the Wave IP 2500 is located.

Note: To install a Media Resource Module, see the instructions starting on page 3-14.

To install modules and cards:

1. Unplug the Wave IP 2500's power cord and the power cords of all EXUs, but do not disconnect the grounding wires.
2. Remove the blank module or universal slot faceplate.
3. Insert modules and cards carefully.
    - Note the position of the circuit board installation guides—there are 2 guides per slot:
        - Modules align with the bottom guide.
        - Cards align with the top guide.
    - Note the position of slot connectors:
        - The ISC1 slot and module slots have a single slot connector.
        - Universal slots have 2 slot connectors:
            - Modules connector to the bottom slot connector.
            - Cards connect to the top slot connector
4. Seat the module or card properly for good electrical connection. Engage the black insertion lever, and tighten all faceplate mounting screws.
5. To install a partial-width module in a full-width universal slot, use a Wave IP 2500 module converter. First, screw the module into the converter, and then insert the converter into the universal slot.

6. Install blank faceplates on all unused slots.
7. Reconnect the Wave IP 2500 and all EXUs to power.

Module and card status LEDs

Each module and card has a pair of LEDs that indicate the item's status:

Ready (green)	Error (red)	Status
ON	OFF	Normal state—module or card is fully operations.
OFF	ON	Initial state when Wave IP 2500 is powered on; module or card has not yet initialized.
ON	ON	Software is initializing. If module or card remains in this state after the Wave IP 2500 is fully operational, module or card initialization has failed.
OFF	OFF	No power to the module or card, or a fatal error has occurred.

Note: The T1 module with drop-and-insert V.35 serial interface has an additional set of status lights for the T1 and serial ports that are located to the left of the module status LEDs.

Connecting modules and cards

This section provides instructions for connecting trunks, stations, and other devices to modules and cards.

Important: Before performing the steps in the following sections, ensure that the following tasks have been completed, depending on your configuration:

- The punchdown block or multiport adapter has been properly wired by a telecommunications professional.

- Analog and T1 trunks have been installed by your service provider.
- Incoming analog DID trunks have been tested to ensure no voltage is present, as well as to verify that they are DID trunks.

See the following sections for information about connecting each of the supported modules and cards:

- Analog trunk module. See page 3-17.
- Analog universal module. See page 3-18.
- Digital station module. See page 3-18.
- T1 module with drop-and-insert V.35 serial interface. See page 3-19.
- Analog station card. See page 3-19.
- Digital station card. See page 3-20.

Caution: Ensure that only analog phones are connected to analog station ports and only digital phones to digital station ports. This will prevent damage to the analog circuitry.

Connecting the analog trunk module

The analog trunk module provides 8 analog FXO loop start or ground start trunk ports. It is a partial-width module that can be installed in any module slot or in any universal slot via a module carrier.

See Appendix A, ”Trunk and Station Ports and Pinouts” for RJ-21X interface port descriptions and pinout pairs for the analog trunk module.

To connect the analog trunk module:

1. Locate the RJ-21X port on the module.
2. Connect the analog trunk or station cable to the RJ-21X port.

Connecting the analog universal module

The analog universal module provides the following:

- 8 analog FXO trunk ports, supporting loop start, ground start, and analog DID trunks (analog DID trunks support inbound calling only).
- 8 analog FXS station ports.

The analog universal module is a partial-width module that can be installed in any module slot or in any universal slot via a module carrier.

See Appendix A, ”Trunk and Station Ports and Pinouts” for RJ-21X interface port descriptions and pinout pairs for the analog universal module.

To connect the analog universal module:

1. Locate the RJ-21X port on the module.
2. Connect the analog station/trunk cable to the RJ-21X port.

Connecting the digital station module

The digital station module provides 12 digital station ports. It is a partial-width module that can be installed in any module slot or in any universal slot via a module carrier.

See Appendix A, ”Trunk and Station Ports and Pinouts” for RJ-21X interface port descriptions and pinout pairs for the digital station module.

To connect the digital station module:

1. Locate the RJ-21X port on the module.
2. Connect the RJ-21X cable from your punchdown block or multiport adapter to the port.

Connecting the T1 module with drop-and-insert V.35 serial interface

The T1 module with drop-and-insert (DNI) V.35 serial interface supports one T1 or ISDN PRI digital trunk with an integrated CSU/DSU to provide shared data and voice services over a single T1 circuit. There are 2 connectors on the T1 module:

- The RJ-48C port is used to connect to the T1 or ISDN PRI network interface.
- The DB-60 port provides V.35 serial communications for data connections, for example to connect to the DB-60 cable from an external router.

The T1 module is a partial-width module that can be installed in any module slot or in any universal slot via a module carrier.

To connect the T1 module:

1. Locate the RJ-48C port and DB-60 connector on the module.
2. Connect the T1 cable to the RJ-48C port.
3. Connect the serial cable from your external router to the DB-60 port.

   The serial cable may be either a DB-60 male to DB-60 male cable, or a DB-60 male to V.35 female DCE cable. In either case the DB-60 male connector goes to the DB-60 female port on the ISC1.

   Caution: Use care when connecting or disconnecting the serial cable. Because of the connector's small size and high pin count, pins on the cable connector can be easily bent and the DB-60 port may be damaged.

Connecting the analog station card

The analog station card provides 24 analog FXS station ports. It is a full-width card that can be installed in any universal slot.

See Appendix A, "Trunk and Station Ports and Pinouts" for RJ-21X interface port descriptions and pinout pairs for the analog station card.

To connect the analog station card:

1. Locate the RJ-21X port on the card.
2. Connect the RJ-21X cable from your punchdown block or multiport adapter to the port on the Wave IP 2500 using a male RJ-21X connector.

Connecting the digital station card

The digital station card provides 24 digital station ports. It is full-width card that can be installed in any universal slot.

See Appendix A, ”Trunk and Station Ports and Pinouts” for RJ-21X interface port descriptions and pinout pairs for the digital station card.

To connect the 24-port digital station card:

1. Locate the RJ-21X port on the card.
2. Connect the RJ-21X cable from your punchdown block or multiport adapter to the port.

Connecting a music-on-hold (MOH) system

A music-on-hold device plays prerecorded music or messages to callers—either from a tape or CD—when they are placed on hold or while being transferred.

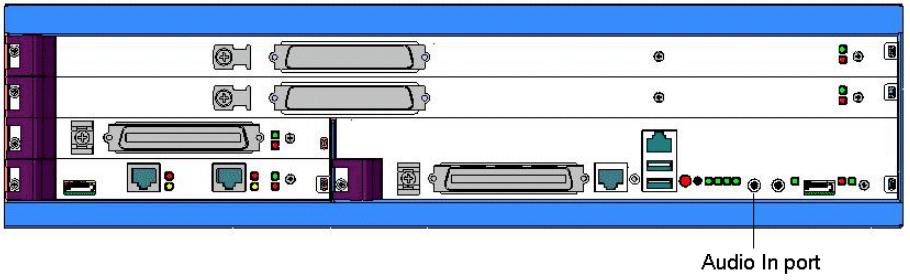
The Wave IP 2500 is compatible with most standard music-on-hold devices that connect via a 3.5 mm stereo plug. If a cable is not provided, you must purchase one separately.

Note: Although a stereo cable is required, music on hold only plays in mono.

Caution: Always follow the instructions supplied by the manufacturer of your music-on-hold device when installing and connecting the device to avoid possible injury to yourself or damage to the equipment.

To connect a music-on-hold device:

1. Locate the audio input port (labeled Audio In) on the ISC1.



2. Connect the cable from your music-on-hold device to the port.
3. Enable music on hold in the General Settings applet of the Global Administrator Management Console. See the *Wave Global Administrator Guide* for more information.

Connecting a paging system

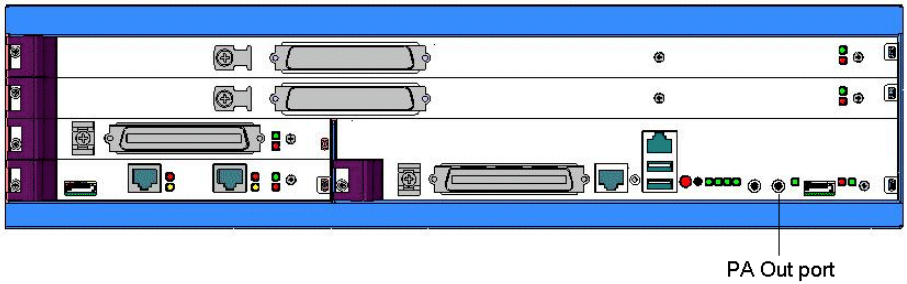
A paging system allows Wave users to make public announcements over a loudspeaker.

The Wave IP 2500 is compatible with most standard paging systems that connect via a 3.5 mm stereo plug. If a cable is not provided, you must purchase one separately.

Note: Although a stereo cable is required, only one channel is used for paging.

Caution: Always follow the instructions supplied by the manufacturer of your paging system when installing and connecting the system to avoid possible injury to yourself or damage to the equipment.

1. Locate the audio output port (labeled PA Out) on the front of the ISC1.



2. Connect the cable from your paging system to the port.
3. Enable paging in the General Settings applet of the Global Administrator Management Console. See the *Wave Global Administrator Guide* for more information.

Chapter 4

Initial Configuration

The Vertical Wave IP 2500 is delivered with all hardware and software components installed. This chapter describes the following tasks that you must perform to initially configure the Vertical Wave IP 2500:

1. Obtaining all required HotFixes. See page 4-2.
2. Configuring the administrator PC. See page 4-2.
3. Connecting to the Vertical Wave IP 2500 via your LAN or a modem. See page 4-4.
4. Applying all required HotFixes. See page 4-9.
5. Adding the Wave IP 2500 to your LAN. See page 4-11.

This chapter also explains how to perform the following tasks:

- Power-cycling the Wave IP 2500. See page page 4-15.
- Resetting the Wave IP 2500 IP addresses to the factory defaults. See page 4-16.
- Using the Service Account Utility any time that you change the default Wave domain name, account name, or account password. See page 4-17.

Where to go next

After you complete the tasks described in this chapter, go to Chapter 5, “Entering and Activating Wave Licenses.”

Obtaining all required HotFixes

Before you begin initial configuration of your Wave IP 2500, contact your Vertical representative to obtain any required HotFixes and other critical information. Once you have obtained the HotFix CAB files from your Vertical representative, place them on the hard drive of the PC that you will use to administer the Wave IP 2500.

Important: Be sure to move the HotFix CAB files to the administrator PC before performing the steps in the next section, where you will change the IP address of the administrator PC. Once you change the IP address of the administrator PC, that PC will be dedicated to the Wave IP 2500 and you will no longer be able to access your network or go out on the Internet from it.

Configuring the administrator PC

Before you can connect to the Wave IP 2500 for initial configuration, you must configure TCP/IP on the administrator PC that you will use to connect with.

Administrator PC requirements

The administrator PC must meet the following minimum requirements:

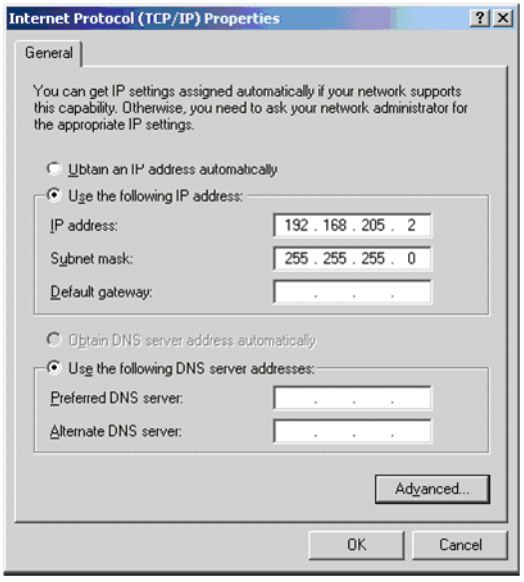
- A Pentium 233 MHz PC running Microsoft Windows 2000 or Windows XP
- 64 MB RAM
- LAN or WAN connectivity through an Ethernet card or modem
- Microsoft Internet Explorer 6.0 SP1. Be sure that Internet Explorer is configured to connect directly to the Internet—do not connect using a defined proxy server.

Note: You may require your Microsoft operating system disks in order to install components necessary for connecting to the Wave IP 2500.

Configuring TCP/IP on the administrator PC

1. Click Start > Control Panel > Network Connections.
2. Right-click Local Area Connection and then click Properties. The Local Area Connection Properties dialog box opens.

3. Select the entry for Internet Protocol (TCP/IP), and then click Properties. The Internet Protocol (TCP/IP) Properties dialog box opens.



4. On the General tab, click Use the following IP address, and enter the following information:

   IP address: 192.168.205.x. “x” can be any number between 2 and 254, except for 10 (192.168.205.10 is reserved for the IP address of the Integrated Services Card (ISC1) on the Wave IP 2500).

   Subnet mask: 255.255.255.0

5. Click OK to save your changes, and again to exit the Local Area Connection Properties dialog box.

6. If you are prompted to restart the your computer, do so.

Connecting to the Vertical Wave IP 2500

After configuring the TCP/IP protocol on the administrator PC, you are ready to connect to the Wave IP 2500 for initial configuration.

You can connect to the Wave IP 2500 in any of the following ways:

- Network connection. See the next section.
- Local or remote modem connection. See page 4-7.

Connecting to the Wave IP 2500 via your network

This section describes how to connect to the Wave IP 2500 from the administrator PC using a standard Ethernet cable. You can also connect to the Wave IP 2500 using a network hub, switch, or router.

1. Connect one end of a standard, straight-through Ethernet cable to the network card in the administrator PC. Connect the other end of the cable to the RJ-45 Ethernet port labeled ENET 1 on the front of the ISC1.

   Important: ENET 1 is the Wave IP 2500's primary interface and under normal conditions it is the *only interface that should be connected to your LAN*. The port labeled ENET 2 is only used in special circumstances, as described in "About the Ethernet ports on the Wave IP 2500" on page 3-9.

2. Launch Microsoft Internet Explorer. If the administrator PC is running Windows XP Service Pack (SP) 2, go to step 3. Else, go to step 4.

3. **Warning: In Microsoft Windows XP SP 2, Microsoft enhanced the default browser security in Internet Explorer. These security defaults affect the functionality of Global Administrator Management Console (for example, by disabling or hiding some applets). To ensure that you do not encounter any problems when using the Global Administrator Management Console, perform the following steps:**

   - On the administrator PC, in Internet Explorer, click Tools > Internet Options.
   - Click the Privacy tab.
   - In the Pop-up Blocker section, click Settings.

- In the Address of Web site to allow text box, type one of the following:
  - http://192.168.205.1, the default IP address of the Vertical Application Module (VAM) in the Wave IP 2500
  - http://yourIP2500servername
- Click Close and then OK to save your changes.

If you entered the VAM's IP address (the default is http://192.168.205.1), perform the following additional steps. If you entered your server name, go to step 4.

- In Internet Explorer, click Tools > Internet Options.
- On the Security tab, select Trusted Sites, and then click Sites.
- Uncheck Require server verification (https:) for all sites in this zone.
- In the Add this Web site to the zone text box, type the VAM's IP address (the default is http://192.168.205.1), and then click Add to add it to the Web Sites list.
- Click OK twice to save your changes.

4. On the administrator PC, browse to the following location to open the Global Administrator Management Console:

   http://192.168.205.1/ioadmin

   Important: If this is the first time that you are logging on to the Wave IP 2500 from this administrator PC and you are prompted to install a specific version of the Java Runtime Environment, do so. Failure to install the correct version may prevent some Global Administrator Management Console features from working correctly.

5. The Log On screen opens in your browser:

6. Enter the following defaults, and then click Log On. (Note that Password is case-sensitive.)

   User Name: GlobalAdministrator

   Password: Vertical4VoIP!

   Note: If any other users are logged on to the Wave IP 2500, a list of logged-on users is displayed (this will not be the case when you initially configure your Wave IP 2500). Click OK to close the dialog box and continue.

7. The Global Administrator Management Console opens. You are now successfully connected to the Wave IP 2500.

Go to “Applying all required HotFixes” on page 4-9.

Connecting to the Wave IP 2500 via a modem

You can use a local or remote modem connection to connect to the Wave IP 2500 from the administrator PC for system configuration.

The following terms are used throughout this section:

- **Wave modem:** The *answering* modem, included with the Wave IP 2500 base unit and located on the ISC1. The Wave modem can be reached through any trunk port or any analog station port on the Wave IP 2500. The IP address of the Wave modem is always 192.168.210.1.
- **Client modem:** The *calling* modem, installed on the administrator PC. The following client modems have been certified for use with the Wave IP 2500. Other modems may also work, but only these models have been tested so far by Vertical. The IP address of the client modem is in the range of 192.168.210.2 to 192.168.210.10.
    - USRobotics USB Mini Faxmodem Model 5635
    - USRobotics Internal 56K Faxmodem PCI Model 5699B
    - USRobotics Serial V.90 56K Sportseter Model 0701
    - Zoom V.90/V.92 Faxmodem Series 0269
- **Remote connection:** A modem connection made through a trunk port on the Wave IP 2500. By default, the Wave modem is configured to answer on the third analog trunk port of the ISC1. You can use the Hunt Groups and Trunk Groups applets in the Global Manager Administrative Console to configure the Wave modem to answer on any other digital or analog trunk. (Modem throughput will often be much better on a digital trunk.)
- **Local connection:** A modem connection made through an analog station port on the Wave IP 2500. Although less useful than a remote connection, a local modem connection can be made through any analog station port on the Wave IP 2500. The default Wave modem extension is 570.

Connecting to the Wave IP 2500 via a modem connection

Important: Before proceeding, install the modem on the administrator PC according to the manufacturer's documentation.

Note: The following procedures describe the steps to perform on an administrator PC running Windows XP. The steps may be different on a PC running another Windows operating system.

To configure the client modem on the administrator PC:

1. On the administrator PC, select Start > Control Panel > Network Connections > Create a new connection. When the New Connection Wizard starts, click Next to continue.
2. In the Network Connection Type screen, select Connect to the network at my workplace, and then click Next.
3. In the Network Connection screen, select Dial-up connection and then click Next.
4. In the Connection Name screen, enter a name for the connection, for example, Wave Modem Connection. Click Next to continue.
5. If you have another device (besides the client modem) connected to the administrator PC, in the Select a Device screen, select the checkbox for the modem that you added. Click Next to continue.
6. In the Phone Number to Dial screen, enter the Phone number:
   - For a remote connection, enter the 7 or 10 digit phone number that will ring the desired trunk.
   - For a local connection, enter the extension number for the Wave modem (the default is 570).

   Click Next to continue.
7. In the Connection Availability screen, specify whether this connection will be available to all users or just to yourself. Choose Anyone's use or My use only, depending on your security requirements. Click Next to continue.
8. In the final screen, click Finish. The Connect dialog box opens automatically after a few moments. Go to the next section.

To connect to the Wave IP 2500 via a local modem connection:

1. Select Start > Settings > Network Connections and then click the new connection (for example, Wave Modem Connection).
2. In the Connect dialog box, enter the following information, and then click Connect.
   - User name: GlobalAdministrator
   - Password: Vertical4VoIP!

   Note: Password is case-sensitive.
3. Once you have established the connection, you can do the following:
   - To start the Global Administrator Management Console on the Wave IP 2500 via the modem connection, point your browser to 192.168.210.1, the IP address of the Wave modem.

     Important: You can perform all Management Console tasks via the modem connection, but be aware that HotFix upgrades will be very slow, typically taking several hours to complete, and software upgrades will take even longer. HotFix or software upgrades will run much faster if you connect to the Wave IP 2500 via your network, as desribed on page 4-4.
   - To establish a Remote Desktop session on the Wave IP 2500 via the modem connection, start Remote Desktop and then enter 192.168.210.1 (the IP address of the Wave modem) in the Computer field.

   Go to the next section.

Applying all required HotFixes

This section describes how to use the Software Upgrade applet to apply one or more HotFixes to upgrade the Wave IP 2500. The Software Upgrade automatically restarts the Wave IP 2500 as required by the HotFixes that you apply.

Important: You must apply all required HotFixes before performing any subsequent configuration steps described in this chapter.

Issues that can prevent or affect an upgrade

Before the upgrade process begins, the Software Upgrade applet runs several checks to verify that the Wave IP 2500 is ready to be upgraded.

- If the company name entered in the General Settings applet in the Global Administrator Management Console includes quotation marks (“”), the upgrade of Call Detail Report data cannot proceed. Be sure you don't use quotation marks in the Company Name field.
- If there are any problems with the hard drive on which you are applying the upgrade, you will receive a message indicating that you must restart the Wave IP 2500 before you can upgrade. Note that the restart will take noticeably longer than normal, because the hard drive problems are being repaired.
- If the Software Upgrade applet encounters problems with the database or detects certain critical errors in the event log, the upgrade will not proceed. If the upgrade process fails to proceed as expected, contact your Vertical representative for assistance.

To apply one or more HotFixes

1. From the administrator PC, log on to the Global Administrator Management Console according to steps 4-5 on page 4-5.
2. Click Software Upgrade in the General Administration section. The Software Upgrade applet starts, and the Upgrade button is automatically active.
3. Click Browse and navigate to the directory containing the HotFix CAB file(s).
4. Select the CAB file to apply and click Open. The CAB file is displayed in the Filename field.
5. Do one of the following:
   - To apply a single HotFix, click Add and Start Upgrade. The HotFix is uploaded to the Wave IP 2500, and the upgrade process begins.
   - To apply multiple HotFixes in the same upgrade, click Add. Repeat step 5 for each HotFix to be loaded.

     The HotFixes will be installed in the order listed. To re-order the list, select a HotFix and then click UP or DOWN. When you are satisfied with the list of HotFixes, click the Start button below the Upgrade List to initiate the upgrade.

     Note: Follow the instructions included with each HotFix, Unless otherwise specified, best practice is to load HotFixes in numerical order.

6. Once the upgrade process starts, you will be alerted on the progress of the upgrade via the SNMP Alarms applet. Minimize the SNMP Alarms window so that you can see the next message.
7. When you see the following message, click Done to close the Software Upgrade applet and return to the Global Administrator Management Console.

   "Upgrade Status Upgrade request successful. InstantOffice System upgrade will start momentarily."
8. Restore the SNMP Alarms window and monitor it until the "Rebooting InstantOffice" entry appears. The Wave IP 2500 restarts one or more times, depending on the number of restarts required by the HotFixes that you installed. This process may take 10 minutes or more.

   Note: HotFix installation is complete when the blink pattern of the red LED at the far right of the ISC1 changes from a fast double blink to a steady single blink.
9. Once the Wave IP 2500 restarts for the final time, log on again to the Wave IP 2500 again using your Wave user name and password.
10. To verify that the HotFixes were applied successfully, click Software Versions in the General Administration section of the Global Administrator Management Console. The top entry shows the latest release. HotFix entries are listed in the order that they were applied, using the following format:

    [Day] [Date] [Year] [Time]= [HotFix information]

Adding the Wave IP 2500 to your LAN

Before performing the following tasks according to the steps in this section, be sure that you have successfully connected the Wave IP 2500 to your LAN according to the steps on page 3-9.

- **Changing the IP network settings** of the following components on the Wave IP 2500:
  - Integrated Services Card (ISC1)
  - Vertical Application Module (VAM)
  - Media Resource Module (MRM), if one is installed
- **Configuring the Wave IP 2500 for one-click license activation.** In order to activate your Wave licenses using one-click activation, the Wave IP 2500 must be able to connect to the Internet and communicate with the Vertical Activation Server. Make sure that the settings in the IP Network Settings dialog box are correctly set so that gateway and DNS servers have external access. (For more about license activation, see page 5-6.)

- **Adding the Wave IP 2500 to your Windows domain.** You should add the Wave IP 2500 to your domain if you are using one, so that users can install or upgrade the ViewPoint workstation application without needing to enter network credentials, a very error-prone task. (For more about installing workstation applications, see page 6-4.)

  Caution: Adding the Wave IP 2500 to your company's Windows domain makes it subject to the policies and domain settings established by your IT department. For example, the Wave IP 2500 may start to download Microsoft updates automatically. Be aware that these policies and settings may affect, interfere, or hinder system operation.

- **Changing the default name of the Wave IP 2500.** By default, each Wave IP 2500 is named "default". If more than one Wave IP 2500 is on the same network segment, each should have a unique name to avoid problems.

Adding and configuring the Wave IP 2500 on your LAN

1. From the administrator PC, log on to the Global Administrator Management Console on the Wave IP 2500 using your Wave user name and password.

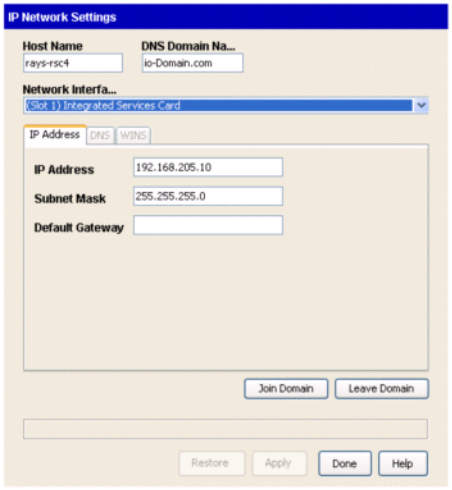
To change the IP network settings on the Wave IP 2500:

Caution: Be sure to make all IP network setting changes outside of business hours to avoid momentary interruptions to digital signaling (for example, key presses or LCD updates to digital phones) while the new settings are applied.

You should make all IP network setting changes for the ISC1, VAM, and MRM at the same time.

2. Select IP Network Settings in the Data Administration section.

3. In the IP Network Settings dialog box, select the Integrated Services Card from the Network Interfaces dropdown list.



4. On the IP Address tab, accept the factory defaults for the following settings, or assign different ones.

   - IP Address: IP address of the ISC1. The default is 192.168.205.10.
   - Subnet Mask: The network subnet mask for the ISC1. The default is 255.255.0.0.
   - Default Gateway: The default gateway for the ISC1. The default is 0.0.0.0.

   Important: The ISC1, VAM, and MRM (if one is installed) IP addresses all need to be on the same subnetwork. The Subnet Mask and Default Gateway settings should be the same for all components.

5. Set the VAM IP network information by selecting the Vertical Wave Application Module from the Network Interfaces drop-down list, and then perform steps 3-4.

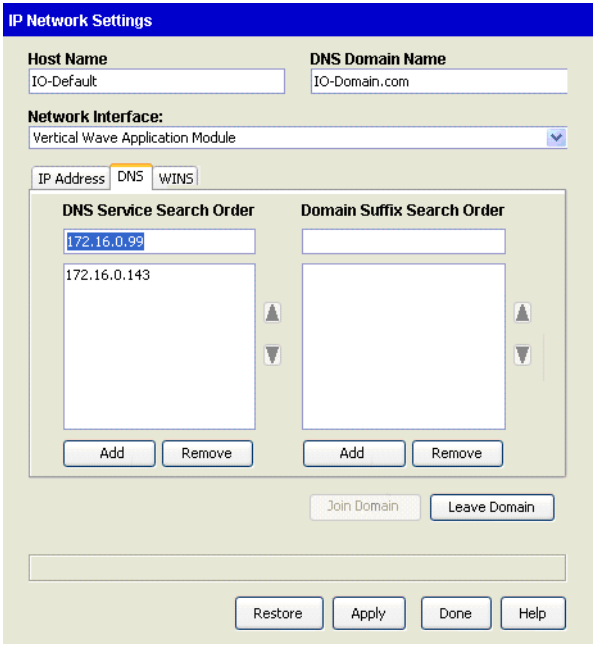
6. If an MRM is installed on your Wave IP 2500, select Media Resource Module from the list and perform steps 3-4.

   Note: Depending on the model, an MRM will have 1, 2, or 3 IP addresses.

7. If you have no further chamges to make, go to step 15.

To configure the Wave IP 2500 for one-click license activation:

8. Verify that that the gateway and DNS servers have external access so that they can connect to the Internet and communicate with the Vertical Activation Server.
9. Click the DNS tab.
10. Enter the DNS server's IP address in the DNS Service Search Order text box, and then click Add.



11. If you have no further changes to make, go to step 15.

To add the Wave IP 2500 to your Windows domain:

12. On any tab, click Join Domain. To remove the Wave IP 2500 from your Windows domain, click Remove.
13. If you have no further changes to make, go to step 15.

To change the name of the Wave IP 2500:

14. On any tab, type the new name in the Host Name text box.
15. Click Apply and then click Done to save all of your changes. Note the following:
    - If you changed IP network settings or configured the Wave IP 2500 for one-click license activation, your changes take effect immediately. You do not need to restart the Wave IP 2500.
    - If you changed the Wave IP 2500's Host Name, your change will not take effect until the next time that the Wave IP 2500 is restarted.

Power-cycling the Wave IP 2500

This section describes various shutdown and restart procedures.

To restart the Wave IP 2500 (without powering off):

1. In the Global Administrator Management Console, choose Restart System in the General Administration section.
2. In the Restart system dialog box, specify how many seconds should elapse before the system restarts.
3. Click Restart.
4. Click Yes at the confirmation screen, and then click OK to restart the Wave IP 2500.

To shut down and power off the Wave IP 2500:

1. Press and hold the red button on the ISC1.
2. When you observe the following pattern on the ISC1 system status LEDs, release the red button:

Status	LED1	LED2	LED3	LED4
Shutdown button press detected. System shutdown initiated.	**Green**	**Blinking red / solid green**	**Blinking green / blinking red**	**Blinking green**

System shutdown begins, and when complete, the Wave IP 2500 powers itself off.

To restart the Wave IP 2500 after powering off:

1. Turn the power switch on the back of the Wave IP 2500 off, wait 30 seconds, and then turn the power switch on.
2. When you observe the following pattern on the ISC1 system status LEDs, the Wave IP 2500 is fully operational:

Status	LED1	LED2	LED3	LED4
Normal firmware operation.	**Green**	**Blinking red / solid green**	**Blinking green**	**Blinking green**

Note: For a detailed description of the system status LED sequence during normal system startup, see “Normal firmware boot sequence” on page B-1.

Resetting the Wave IP 2500 IP addresses to the factory defaults

If you lose or forget the current ISC1 or VAM IP address settings, you can reset them to the factory default settings.

1. Shut down the Wave IP 2500, and turn off the power supply switch on the back of the chassis.
2. Press and hold the red button on the front of the ISC1.
3. While continuing to press the red button, turn the power supply switch back on. Wait for a few seconds until you observe the following status indicator LED sequence, and then release the red button.

Status	LED1	LED2	LED3	LED4
Red button press detected at power on. Programming factory default IP settings.	**Red**	off	off	**Red**
Redboot started. Factory default IP address settings have been applied.	**Red**	off	off	**Green**

Using the Service Account Utility

If at any time you change the default domain name (io-default), account (GlobalAdministrator), or account password (Vertical4VoIP!), you must run the Service Account utility according to the following steps:

1. From the administrator PC, log on to the Global Administrator Management Console on the Wave IP 2500 using your Wave user name and password.
2. Click the System Desktop icon at the top right of the Global Administrator Management Console.
3. Click OK to clear the warning message.
4. In the Logon to Windows dialog box, enter your Wave user name and password, and then click OK.
5. Choose Start > All Programs > TVAccUtl.
6. Enter the Domain name, Account name, and Password for the domain.
7. Click OK to save your changes. Click OK to acknowledge the message indicating that the service account information has been updated successfully.

Chapter 5

Entering and Activating Wave Licenses

This chapter explains how to do the following:

- Enter Wave licenses via the Global Administrator Management Console.
- Activate your Wave licenses to enable full functionality on your Wave system.
- View the status of your Wave licenses.

Caution: It is strongly recommended that you enter all of your Wave licenses and activate them immediately after installing your Wave IP 2500 as described in this manual. Doing so avoids the disruptions described in "Before your licenses are activated" on page 5-6.

Important: Be sure to use the version of Java that came with your Wave IP 2500—do not upgrade to a newer version that you obtain elsewhere. Failure to use the correct version of Java may result in the inability to import and/or activate licenses and other errors.

Where to go next

After you complete the tasks described in this chapter, your Wave IP 2500 is fully operational. You are now ready to configure your phone system by performing the following tasks. For more information, see the *Wave Global Administrator Guide*.

- Connect and configure trunks and stations.
- Add and configure users, auto attendants, inbound and outbound call routing, your dial plan, voice mail, and so forth.

Optionally, install ViewPoint and other Wave workstation applications on PCs in your network as described in Chapter 6 in this manual.

About Wave licenses

Wave licenses form the basis of your ability to install and use Wave. Keep your license information in a safe location and do not share it with others.

Wave licenses do the following:

- Control the ability to configure Wave system resources, for example VoIP resources, SIP phones, and so forth.
- Enable Wave add-on applications such as Global Manager, Call Navigator, and so forth.

Full vs. trial licenses

Wave licenses are available as full or trial licenses.

- A full license can be used for a period of time before it must be activated. If the grace period elapses and you do not activate the license, you will no longer be able to configure the type of system resource controlled by the license or use the add-on, as described in the table on page 5-3.
- A trial license lets you evaluate a feature or add-on for a period of time. Trial licenses cannot be activated—after the trial period expires, you must purchase a full license to continue using the feature or add-on.

Obtaining Wave licenses

Contact your Wave provider for the licenses required for your specific configuration. You may want to purchase additional licenses to allow for expected system growth so that you do not have to wait for a license the next time you want to expand your system.

Wave licenses are supplied by your Vertical provider in the following formats:

- Wave license files: License files can be imported directly onto the Wave IP 2500. License files are named LICxxxxxxx.lic, where x = the sales order number.
- Acrobat file: Each license file is accompanied by an Acrobat file that lists the included licenses. If the license file itself is lost or unreadable, you can enter the license keys in the associated Acrobat file manually.
- Printed copy: When you initially receive your Wave IP 2500, a printed copy of your license information is included in the box.

Important: Before proceeding, ensure that you received the correct licenses by reviewing the Acrobat file that came with your license file or the printed copy that came with your Wave IP 2500. If you have any questions, contact your Vertical provider before entering and activating the licenses.

Wave license requirements

If you do not have the correct number of Wave licenses entered, your ability to configure your Wave system will be affected in the following ways:

Without this license type	
Wave ISM	You cannot add or modify users via the User/Workgroup Configuration applet.
Wave IP Gateway	You cannot configure VoIP resources via the Resource Management applet.
Wave IP User	You cannot configure SIP phones with MAC addresses via the User/Workgroup Configuration applet.
Wave SIP Trunk	You cannot configure signaling control points (SCPs) via the IP Telephony applet.
Wave ViewPoint	Only the number of Viewpoint users for which there are licenses can concurrently access the Wave system.
Wave Contact Center Reporter	Allows ViewPoint users to produce Call Log reports using the Contact Center Reporter.
Wave Add-on	Varies depending on the add-on. See the documentation for the Add-on for details.

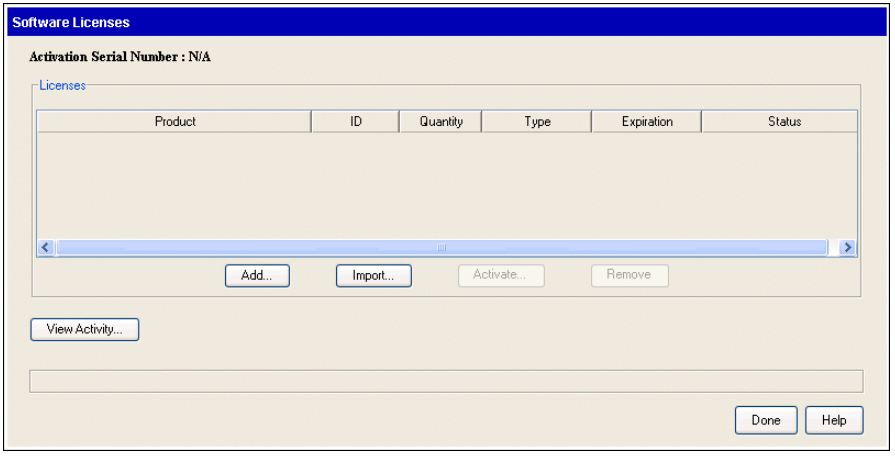
Entering Wave licenses

You can add Wave licenses to the Wave IP 2500 in either of the following ways:

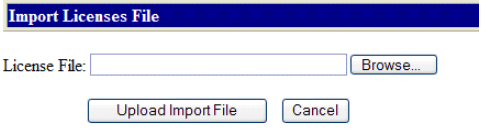
- Upload a license file, as described in the next section.
- Manually enter the license key for each license, as described on page 5-5.

Entering Wave licenses by importing a license file

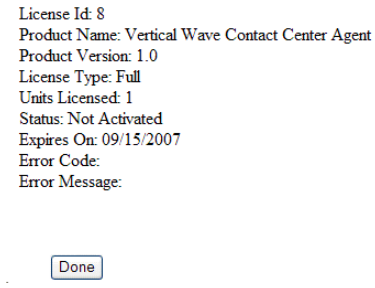
1. On the Administration tab of the Global Manager Administration Console, select Software Licenses. The Software Licenses applet starts:



2. Click Import. In the Import Licenses File dialog box, click Browse to go to the license text file that you want to import.



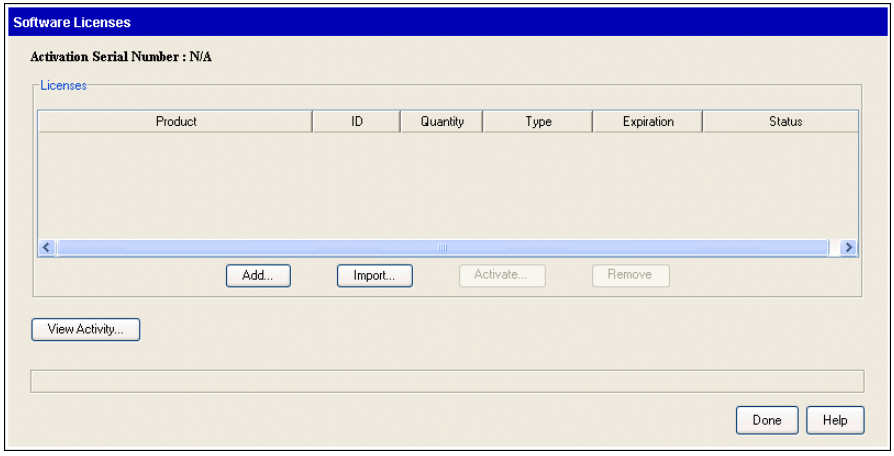
3. Click Open to return to the Import Licenses File dialog box, and then click Upload Import File.
4. A list of all of the licenses in the file is displayed. Scroll to the bottom of the list and click Done.



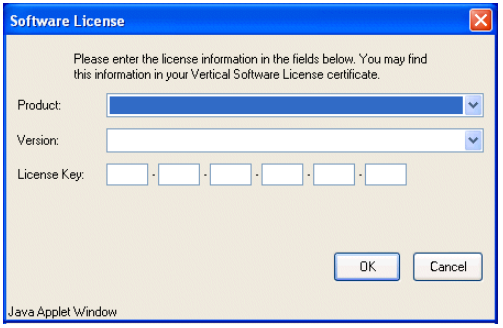
5. After the import finishes, the Import Licenses File dialog box opens. Cancel to return to the Software Licenses applet. Go to “Activating Wave licenses” on page 5-6.

Entering Wave licenses by entering license keys manually

1. On the Administration tab of the Global Manager Administration Console, select Software Licenses. The Software Licenses applet starts:



2. Click Add. The Software License dialog box opens:



3. Enter the following information:
   - Select the Product for which you want to enter licenses from the drop-down list.
   - Select the Version number for that product.
   - Enter the full 24-character License Key.
4. Click OK. The license you added is now displayed.
5. To add additional licenses, repeat steps 3-4. When you are done, click Cancel to return to the Software Licenses applet. Go to the next section to activate the new licenses.

Activating Wave licenses

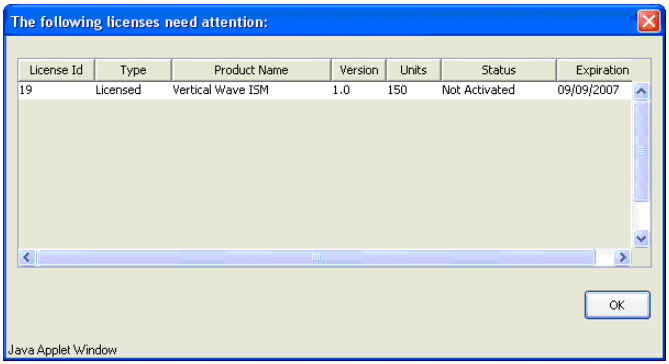
When you have entered your licenses, you are ready to activate them.

Before your licenses are activated

You can use non-trial Wave licenses for a period of time without activating them (the specific period of time can vary by license type.) The grace period starts on the day that you enter the license via the Software Licenses applet. You can activate your licenses at any time during the grace period or after the grace period elapses.

Until you activate your licenses, the following will occur:

- Every time you launch the Global Administrator Management Console, you will be reminded that licenses need to be activated. The dates when license grace periods are due to elapse are displayed in the Expiration column



- If the grace period expires before a license is activated, whenever any user accesses their voice messages, the user hears a message stating that there is an expired license on the system and to contact the system administrator.

Activating your licenses eliminates these behaviors, and prevents any interruption to your system's operation if the grace period expires.

Important: Whenever you activate licenses (either during initial system installation or to expand your system at a later time), be sure to back up your Wave system according to the instructions in "Backing up your system configuration" in Chapter 14 in the *Wave Global Administrator Guide* so that you do not have to repeat the activation process if you ever need to restore your system.

The activation process

Activation consists of the following steps:

1. You submit your license information to Vertical.
2. Vertical verifies the information.

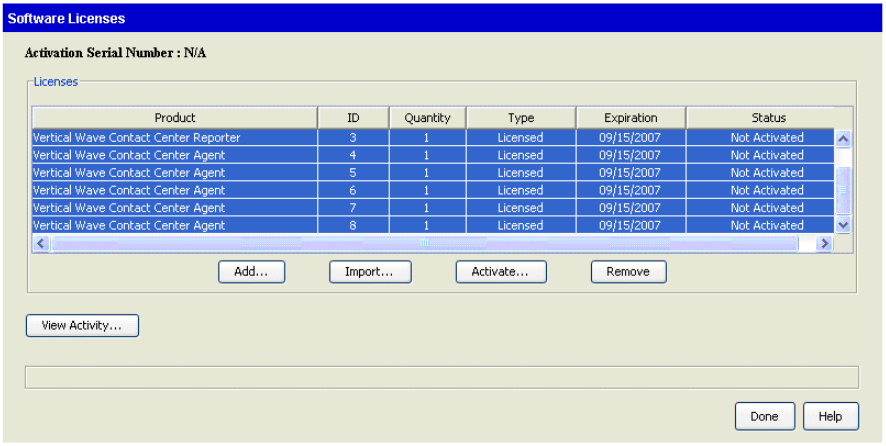
   Note: When you activate your licenses, the registration information that you submit to Vertical is verified and saved for future troubleshooting purposes. You have the opportunity to review the details of Vertical's privacy statement during the activation process detailed later in this chapter.

3. Activated licenses are returned to you and applied to your system.

You use one-click activation to activate your Wave licenses. One-click activation requires that the Wave IP 2500 has Internet access and is able to reach the Vertical Activation Server. If you encounter problems with one-click activation, contact your Vertical provider.

Activating your Wave licenses using one-click activation

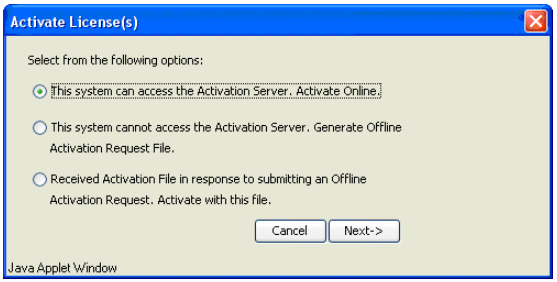
1. In the Software Licenses applet, click one license to activate it or CTRL+click to select multiple licenses.



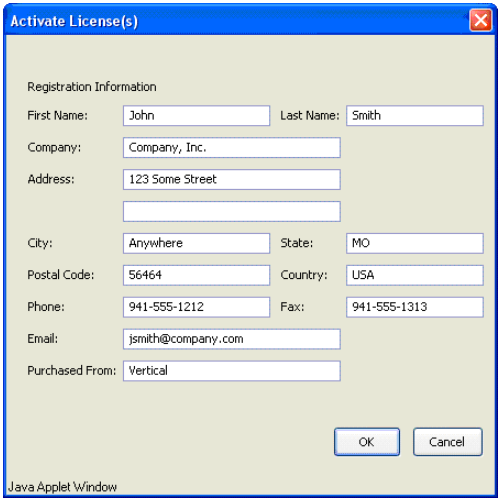
   Note: Only those licenses that are in the statuses of Not Activated, Activation Pending, and Activation Failed can be selected for Activation.

2. Click Activate. To continue, accept the Vertical Communications Privacy Statement and then click OK.

3. The Activate Licenses dialog box opens. Select **This system can access the Activation Server. Activate Online**, and then click Next.



4. In the next screen, enter registration information about your organization:



5. Click OK to submit the selected licenses for activation. During activation, the Activate License(s) dialog box (with the registration information cleared) is displayed.

   - If activation is successful, activated licenses are returned and automatically added to your system. You are returned to the screen that displays all of your licenses. (Note that the Status column will not update until you exit and restart the Software Licenses applet.) Go to the next step.

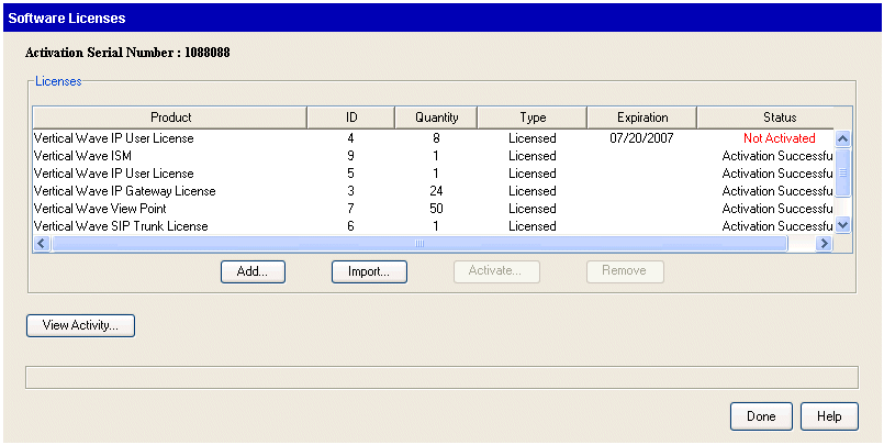
- If activation was not successful, the reason is displayed. The most common status resulting from an unsuccessful one-click activation, “Activation Pending”, indicates a bad Internet connection, or that the Vertical Activation Server is down; the system will retry activation automatically. If you continue to experience problems, contact your Vertical representative.

6. Click Done to return to the Global Manager Management Console.

Viewing the status of licenses on your system

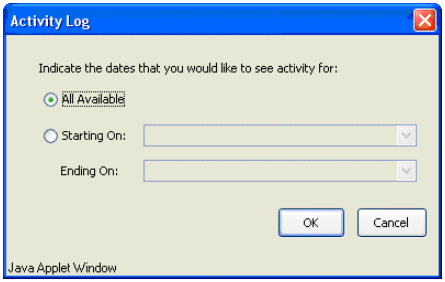
To view the status of licenses on your system at any time:

1. On the Administration tab of the Global Manager Administration Console, select Software Licenses.
2. The Software Licenses applet starts and displays the status of all of the licenses on your system:



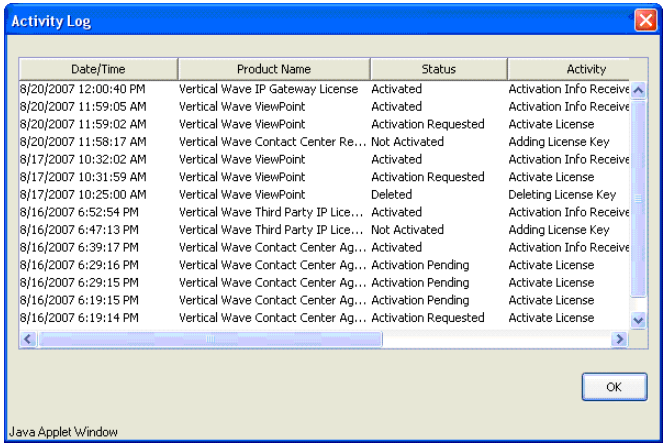
3. To view license activity by date, click View Activity.

4. In the next screen, click All Available to display all licensing activities, or enter Starting On and Ending On dates to view licensing activities for a specific time period.



Click OK to continue.

5. The Activity log opens showing the following information:



6. Click OK to close the Activity Log.

Installing Wave Workstation Applications

Introduction

The Wave workstation applications are a set of optional programs that help users take full advantage of how Wave integrates the PC and the phone. The following Wave components are the workstation applications:

- Wave ViewPoint
- The Wave TAPI Service Provider
- The Wave Contact Manager Assistant
- The Wave Archived Recording Browser

Performing unattended installs

For information on installing the Wave workstation applications without user input, see Appendix D, “Performing Unattended Workstation Installations.”

Requirements

You can install the Wave workstation applications on any Windows PC on the network that meet the requirements in this section. While it is possible to install the Wave IP 2500 on the Wave IP 2500 itself, best practice is to use the Wave IP 2500 as a dedicated server.

ViewPoint PC requirements

PCs running ViewPoint must meet the following requirements:

- **Operating system:** The following operating systems can be used:
  - Windows Server 2003, base release as well as SP1 and R2
  - Windows XP SP2
  - Windows Vista

  Important: If your ViewPoint PCs currently run or will run Windows XP Professional SP2 or Windows Server 2003 SP1 or R2 with the Windows firewall enabled, review the important information about Windows Firewalls in Appendix E, "Configuring Wave for the Windows Firewall."
- **Processor:** Minimum Pentium III.
- **Memory:** Minimum 512 MB RAM for Windows 2003 Server or Windows XP. Minimum 2 GB RAM for Windows Vista.

  This is the minimum memory required to support ViewPoint. More memory may be required if other applications are running on the same PC. To manage thousands of voice messages or call recordings, consider using the Wave Archived Recording Browser instead of ViewPoint.
- **Disk space:** 20 MB free disk space.
- **Software:** The following are required:
  - TCP/IP with Microsoft Network Client.
  - Internet Explorer 5 or later.
  - .NET 2.0 (installed automatically if not detected on the workstation application PC.)
- **Hardware:** Sound card and speakers to listen to voice messages and call recordings and to hear call announcements without using a phone.
- **Network connection:** TCP/IP connection to the Wave IP 2500, as well as access to the Wave IP 2500's file shares (\Netsetup, \Reports, and \Buffer).
- **Excel 2003:** In order to run any of the ViewPoint Call Log reports (available from the Tools menu), you must install Excel 2003 on the ViewPoint PC—no other version of Excel is supported.

ViewPoint license requirements

You must purchase, enter, and activate the following licenses on the Wave IP 2500:

- One ViewPoint license for each user who needs to concurrently access the Wave system.
- One Contact Center Reporter license in order for all users to be able to run Call Log reports in ViewPoint.

See Chapter 5, "Entering and Activating Wave Licenses" for more about entering and activating Wave licenses.

TAPI SP and Contact Manager Assistant PC requirements

The PC on which you want to install the Wave TAPI Service Provider or the Wave Contact Manager Assistant workstation applications must meet the following minimum requirements:

- Operating system: The following operating systems can be used:
  - Windows Server 2003, base release as well as SP1 or R2
  - Windows XP Professional or Windows XP Home, base release as well as SP1-SP2

  If your TAPI Service Provider or Contact Manager Assistant PCs currently run or will run Windows XP Professional SP2 or Windows 2003 Server 2003 SP1 or R2, review the important information about Windows Firewalls in Appendix E, "Configuring Wave for the Windows Firewall."
- **Software:** The Contact Manager Assistant requires the TAPI Service Provider. Neither the Contact Manager Assistant or the TAPI Service Provider require the presence of ViewPoint on the same PC.

  The following contact managers are also supported:
  - Act! 3.0, 4.0, 2000, and 6.0
  - GoldMine 4.0, 5.0, 6.5, and 6.7, and GoldMine Business Contact Manager
  - GoldMine FrontOffice 2000
  - Microsoft Outlook 98, 2000, XP, and 2003
- **Network connection:** TCP/IP connection to the Wave IP 2500. See "Supported integrated trunk and station board" in Chapter 4 in Installing Intel Telephony Components.

Terminal server support

You can install the workstation applications on a terminal server running Citrix MetaFrame or Windows Terminal Services. For instructions, see Appendix C, “Using Wave Workstation Applications with Microsoft Terminal Services or Citrix MetaFrame.”

Installing the Wave workstation applications

In order to install any of the Wave workstation applications, you must be logged on as a user with Administrator rights.

About installing ViewPoint

ViewPoint is the most efficient way to use Wave, and some Wave features are available only through ViewPoint. However, ViewPoint is not required in order to make and receive calls, and most Wave features can be accessed without it by using the telephone commands. See the *Wave ViewPoint User Guide* for a list of ViewPoint-only features.

You can install ViewPoint on any Windows PC on the network that meets the requirements described on page 6-2.

Note: The Wave Contact Center Reporter is installed automatically along with ViewPoint. Users will be able to run Call Log reports from the ViewPoint Tools menu if a Wave Contact Center license is present on the Wave IP 2500. For more about the Call Log reports, click Help on the Contact Center Reporter toolbar.

About installing the TAPI Service Provider

In addition to the PC requirements described on page 6-3, a user must have the following to install and use the TAPI SP:

- A Wave user name and station ID. You cannot use station ID 0.
- A Windows telephony location that allows the user to place calls. Typically, you need to configure your area code and external dialing prefix, for example “9”.

Using the Wave Workstation Setup

You use the Wave Workstation Setup to install any or all of the workstation applications.

If an older version of ViewPoint is detected when a user starts ViewPoint on a workstation PC, a message is displayed saying that a new version need to be installed. When the user confirms the upgrade, Workstation Setup starts and all workstation aplications that are detected on the workstation PC are upgraded.

Important: This message does not appear and the upgrade does not take place if the user *only* has TAPI Service Provider or Contact Manager Assistant (and not ViewPoint) installed. If you are upgrading and have users who only use the TAPI Service Provider or Contact Manager Assistant, you or they need to install the new versions according to the following steps.

If you encounter problems installing the Wave workstation applications, or running them after installation, contact your Vertical representative.

To install the Wave workstation applications

1. Log on to the PC on which the workstation applications will be installed as a user with administrator privileges.
2. Close all open Windows applications.
3. Start the Wave Workstation Setup by running setup.exe, located in the Netsetup directory on the Wave IP 2500. The default location is:

   \\<Wave IP 2500 name>\Netsetup\setup.exe
4. When Workstation Setup starts, follow the on-screen instructions.
5. Review the License Agreement. Click I accept the terms in this license agreement, and then click Next to continue.
6. In the Customer Information dialog box, enter the User Name associated with this PC and Organization. If you want only this user to be able to run the workstation applications from this PC, select Only for me. Click Next to continue.
7. In the Wave Server Information dialog box, enter the Wave IP 2500 name and the Telephone Station ID of the phone that will be used by the person at this PC.

   The station ID corresponds to the port number on the station board to which the phone is connected. To hear your station ID, pick up the phone and dial *00.

Important: If there is not a Wave phone near this PC, enter a station ID of 0. Without a phone, the user at this PC will be able to perform all functions with the exception of managing calls and recording voice prompts. If you enter a station ID of 0, when you click Next the No Telephone Station ID Specified dialog box opens to make sure that you understand this limitation, and gives you the opportunity to go back and enter a valid station ID.

Click Next to continue.

8. In the Setup Type dialog box, select one of the following:
   - Select Typical to install the listed workstation applications in the default location.When installing Wave for the first time, only ViewPoint is installed. When upgrading from a previous version of Wave, Workstation Setup detects the workstation applications that are installed, and upgrades those applications to the current version.

     Click Next to continue. Go to step 10.
   - Select Custom to choose which workstation applications to install, including the TAPI Service Provider, Contact Manager Assistant, and Archived Recording Browser, or to change the installation drive or folder.

     Click Next to continue.
9. In the Custom Setup screen, you can do any of the following:
   - Click a workstation application to see a description of it as well as the amount of disk space it requires.
   - Click Space to check the available space on each hard drive on the PC.
   - Click Change to change the destination drive or folder where the selected workstation application will be installed. You can specify a different location for each workstation application.
   - If you do not want to install one of the listed workstation applications on this PC, click the drop-down list for the application and then select This feature will not be available.
   - To install another listed workstation application, click the drop-down list for the application and then select This feature will be installed on local hard drive.

     Click Next to continue.
10. In the Ready to Install screen, click Install. Installation may take several minutes.

11. When Workstation Setup finishes copying files, if you are installing the TAPI Service Provider, the TAPI Service Provider Configuration Wizard opens.
12. Enter the name of the Wave IP 2500 and the Station ID of the phone that will be used by the person at this PC.

    The station ID corresponds to the port number on the station board to which the phone is connected. To hear the station ID, pick up the phone and dial *00. If there is not a Wave phone near this PC, enter a station ID of 0. Click Next to continue.
13. In the next screen, select the User Name of the person assigned to this station ID from the drop-down list, and enter the user's Password.

    If the person at this PC will be using GoldMine contact management software, deselect the Application can hang up calls checkbox.

    Click Finish to continue.
14. If you are installing the TAPI Service Provider for the first time, Workstation Setup prompts you to define a Windows telephony dialing location for your PC, which is required to place outbound calls. If you see this prompt, click OK.
    - In the Location Information dialog box, select your country from the drop-down list, enter your area code, and enter the number you must dial to get an outside line, for example "9". Click OK.
    - In the Phone and Modem Options dialog box, select the location from which you are dialing, and click OK.
15. In the Install Completed screen, select the Show What's New checkbox to see a complete listing of the new features available in this version of Wave. Click Finish to complete the installation.

Configuring the Wave workstation applications

Configuring ViewPoint

For information about customizing and using ViewPoint, see the *Wave ViewPoint User Guide*.

Configuring the TAPI Service Provider

Workstation Setup runs the TAPI Service Provider Configuration wizard automatically when you install the TAPI Service Provider for the first time on a PC. You can run the Configuration Wizard later, for example to change your station ID. To do so:

1. Click Start > Programs > Vertical Wave > Wave TAPI Service Provider Configuration Wizard.
2. Follow the on-screen instructions. Click Help for more information.

Configuring your contact manager for use with the TAPI Service Provider

Before making calls from the contact manager, you must configure it to recognize the TAPI Service Provider. Use one or more of the following procedures as needed.

To configure Outlook

1. Open the Contacts view in Outlook.
2. Choose Actions > Call Contact > New Call.
3. In the New Call dialog box, click Dialing Options.
4. In the Dialing Options dialog box, verify that Connect Using Line is set to “Wave Line 1.” This option is available after the TAPI Service Provider is installed.
5. Click OK.

To configure GoldMine, GoldMine FrontOffice, or GoldMine Business Contact Manager

Use the following procedure after you refer to the documentation that came with the product:

1. Choose Edit > Preferences.
2. Click the Modem tab.
3. Under Modem Settings, verify that TAPI Line is set to “Wave Line 1.” This option is available after the TAPI Service Provider is installed.
4. Click OK.

To configure Act!

1. In Act!, Choose Edit > Preferences.
2. Click the Dialer tab.
3. Select the Use Dialer checkbox.

4. Under Modem or Line, verify that “Wave Line 1” is selected. This option is available after the TAPI Service Provider is installed.
5. To receive screen pops with contact information when a contact calls, select the Lookup contact using caller ID checkbox. Deselect the checkbox if you do not want to receive screen pops.
6. Click OK.

Calling from another application

After installing the TAPI Service Provider, users can call contacts by using the instructions provided with their contact managers. Calls appear in their Call Logs as if they had dialed them from ViewPoint or the phone.

Configuring the Wave Contact Manager Assistant

1. If the Contact Manager Assistant is not running, start it by clicking

   Start > Programs > Vertical Wave > Wave Contact Manager Assistant.
2. If only the Contact Manager Assistant splash screen appears, right-click the Outlook, GoldMine, GoldMine FrontOffice, or GoldMine Business Contact Manager icon on the system tray at the lower right of your screen. Select Setup.
3. Click Help for detailed instructions.

Synchronizing system clocks

It is recommended that you make sure that the system clocks on the Wave IP 2500 and user PCs are synchronized. This ensures that message time stamps, which are set by the Wave IP 2500’s clock, agree with the time displayed on the user PCs.

In Microsoft domain-based networks, you can synchronize the workstation clock with the Wave IP 2500’s clock by including the following statement in the logon script that executes when the workstation connects to the domain controller:

net time \\<Wave IP 2500 Name> /set /yes

Using Wave Workstation Applications with Microsoft Terminal Services or Citrix MetaFrame

Using Microsoft Terminal Services or Citrix® MetaFrame with Wave enables you to do the following:

- Run ViewPoint on a PC that does not meet the minimum requirements described in "ViewPoint PC requirements" on page 6-2.
- Centrally manage the installation and maintenance of ViewPoint by installing it on an application server, instead of on individual users' PCs.

Note: The Wave TAPI Service Provider workstation application cannot be used with Microsoft Terminal Services or Citrix Metaframe.

Microsoft Terminal Services or Citrix MetaFrame can be used in Application Server mode. In Application Server mode, remote PCs can be used as terminals for programs running in a multi session environment on an application server. For example, several users on remote PCs can start terminal sessions to run ViewPoint. Each session starts a new instance of ViewPoint, and all instances of ViewPoint run simultaneously on the application server. No Wave software is required on the remote PCs.

ViewPoint is compatible with the multi session environment provided by Microsoft Terminal Services and Citrix MetaFrame. See "Installing Wave workstation applications on an application server" on page C-1 for details on how to set up an application server for use with Wave.

Installing Wave workstation applications on an application server

Bear the following considerations in mind when you set up an application server for Wave:

- The application server should not be the same PC as your Wave IP 2500 server.
- Applications should not be installed in the same partition as the Windows operating system. In most cases, Windows will be installed on your C drive and applications will be installed on a D drive. The D drive can either be a separate hard disk or another partition on the same disk as the C drive.

- Always use Add/Remove Programs (located on the Windows Control Panel) to install programs. This ensures that the programs are set up properly for multi session use.

  Important: The server must be in remote administration mode to remotely install any Wave workstation applications. See "Installing workstation applications on a Windows 2003 server" on page C-2.

Installing workstation applications on a Windows 2003 server

To install the Wave workstation applications on a Microsoft Windows 2003 Terminal Server, see the documentation that came with Terminal Services.

Trunk and Station Ports and Pinouts

This appendix lists the port numbers, description, and pinout pairs for RJ-21X interfaces on the ISC1, cards, and modules that provide trunk and station resources on the Wave IP 2500.

Integrated Services Card (ISC1)

RJ-21X interface port descriptions and pinouts

Pin	Function	Pin	Function	Description
1	Ring	26	Tip	Analog FXS station port 1 (failover)
2	Ring	27	Tip	Analog FXS station port 2
3	Ring	28	Tip	Analog FXS station port 3
4	Ring	29	Tip	Analog FXS station port 4
...		...		Not used
17	C	42	NC	Alarm relay (reserved for future use)
18	C	43	NO	Alarm relay (reserved for future use)
...		...		Not used
21	Ring	46	Tip	Analog FXO trunk port 1 (failover)
22	Ring	47	Tip	Analog FXO trunk port 2
23	Ring	48	Tip	Analog FXO trunk port 3
24	Ring	49	Tip	Analog FXO trunk port 4
25	Ground	50	Ground	Chassis ground

Analog Universal Module port descriptions and pinouts

RJ-21X interface port descriptions and pinouts

Pin	Function	Pin	Function	Description
1	Ring	26	Tip	Analog FXO trunk port 1
2	Ring	27	Tip	Analog FXO trunk port 2
3	Ring	28	Tip	Analog FXO trunk port 3
4	Ring	29	Tip	Analog FXO trunk port 4
5	Ring	30	Tip	Analog FXO trunk port 5
6	Ring	31	Tip	Analog FXO trunk port 6
7	Ring	32	Tip	Analog FXO trunk port 7
8	Ring	33	Tip	Analog FXO trunk port 8
...		...		Not used
17	Ring	42	Tip	Analog FXS station/DID Trunk port 1
18	Ring	43	Tip	Analog FXS station/DID Trunk port 2
19	Ring	44	Tip	Analog FXS station/DID Trunk port 3
20	Ring	45	Tip	Analog FXS station/DID Trunk port 4
21	Ring	46	Tip	Analog FXS station/DID Trunk port 5
22	Ring	47	Tip	Analog FXS station/DID Trunk port 6
23	Ring	48	Tip	Analog FXS station/DID Trunk port 7
24	Ring	49	Tip	Analog FXS station/DID Trunk port 8
25	Ground	50	Ground	Chassis ground

Analog Trunk Module port descriptions and pinouts

RJ-21X interface port descriptions and pinouts

Pin	Function	Pin	Function	Description
1	Ring	26	Tip	Analog FXO trunk port 1
2	Ring	27	Tip	Analog FXO trunk port 2
3	Ring	28	Tip	Analog FXO trunk port 3
4	Ring	29	Tip	Analog FXO trunk port 4
5	Ring	30	Tip	Analog FXO trunk port 5
6	Ring	31	Tip	Analog FXO trunk port 6
7	Ring	32	Tip	Analog FXO trunk port 7
8	Ring	33	Tip	Analog FXO trunk port 8
...		...		Not used
25	Ground	50	Ground	Chassis ground

Analog Station Card port descriptions and pinouts

RJ-21X interface port descriptions and pinouts

Pin	Function	Pin	Function	Description
1	Ring	26	Tip	Analog FXS station port 1
2	Ring	27	Tip	Analog FXS station port 2
3	Ring	28	Tip	Analog FXS station port 3
4	Ring	29	Tip	Analog FXS station port 4
5	Ring	30	Tip	Analog FXS station port 5

Pin	Function	Pin	Function	Description
6	Ring	31	Tip	Analog FXS station port 6
7	Ring	32	Tip	Analog FXS station port 7
8	Ring	33	Tip	Analog FXS station port 8
9	Ring	34	Tip	Analog FXS station port 9
10	Ring	35	Tip	Analog FXS station port 10
11	Ring	36	Tip	Analog FXS station port 11
12	Ring	37	Tip	Analog FXS station port 12
13	Ring	38	Tip	Analog FXS station port 13
14	Ring	39	Tip	Analog FXS station port 14
15	Ring	40	Tip	Analog FXS station port 15
16	Ring	41	Tip	Analog FXS station port 16
17	Ring	42	Tip	Analog FXS station port 17
18	Ring	43	Tip	Analog FXS station port 18
19	Ring	44	Tip	Analog FXS station port 19
20	Ring	45	Tip	Analog FXS station port 20
21	Ring	46	Tip	Analog FXS station port 21
22	Ring	47	Tip	Analog FXS station port 22
23	Ring	48	Tip	Analog FXS station port 23
24	Ring	49	Tip	Analog FXS station port 24
25	Ground	50	Ground	Chassis ground

Digital Station Card port descriptions and pinouts

RJ-21X interface port descriptions and pinouts

Pin	Function	Pin	Function	Description
1	Ring	26	Tip	Digital station port 1
2	Ring	27	Tip	Digital station port 2
3	Ring	28	Tip	Digital station port 3
4	Ring	29	Tip	Digital station port 4
5	Ring	30	Tip	Digital station port 5
6	Ring	31	Tip	Digital station port 6
7	Ring	32	Tip	Digital station port 7
8	Ring	33	Tip	Digital station port 8
9	Ring	34	Tip	Digital station port 9
10	Ring	35	Tip	Digital station port 10
11	Ring	36	Tip	Digital station port 11
12	Ring	37	Tip	Digital station port 12
13	Ring	38	Tip	Digital station port 13
14	Ring	39	Tip	Digital station port 14
15	Ring	40	Tip	Digital station port 15
16	Ring	41	Tip	Digital station port 16
17	Ring	42	Tip	Digital station port 17
18	Ring	43	Tip	Digital station port 18
19	Ring	44	Tip	Digital station port 19
20	Ring	45	Tip	Digital station port 20
21	Ring	46	Tip	Digital station port 21

Pin	Function	Pin	Function	Description
22	Ring	47	Tip	Digital station port 22
23	Ring	48	Tip	Digital station port 23
24	Ring	49	Tip	Digital station port 24
25	Ground	50	Ground	Chassis ground

Digital Station Module port descriptions and pinouts

RJ-21X interface port descriptions and pinouts

Pin	Function	Pin	Function	Description
1	Ring	26	Tip	Digital station port 1
2	Ring	27	Tip	Digital station port 2
3	Ring	28	Tip	Digital station port 3
4	Ring	29	Tip	Digital station port 4
5	Ring	30	Tip	Digital station port 5
6	Ring	31	Tip	Digital station port 6
7	Ring	32	Tip	Digital station port 7
8	Ring	33	Tip	Digital station port 8
9	Ring	34	Tip	Digital station port 9
10	Ring	35	Tip	Digital station port 10
11	Ring	36	Tip	Digital station port 11
12	Ring	37	Tip	Digital station port 12
...		...		Not used
25	Ground	50	Ground	Chassis ground

Wave IP 2500 Status LEDs

System Status LED settings are a valuable troubleshooting tool. When you contact your Vertical technical support representative, you may be asked to describe the System Status LEDs that you are observing. You can view the System Status LEDs by physically examining the front of the ISC1 directly, or via the Chassis View applet in the Global Administrator Management Console.

This appendix lists the potential System Status LED settings for the following scenarios:

- Normal firmware boot sequence
- Boot failure indicators
- Shutdown sequence
- VAM module detection sequence
- Factory default IP address setting reset indicators

Normal firmware boot sequence

You will observe the following status LED setting sequence during a normal firmware boot sequence after the Wave IP 2500 is powered on.

Status	LED1	LED2	LED3	LED4
Early boot complete. Starting Redboot.	off	**Green**	**Green**	**Green**
Redboot started.	**Red**	off	off	off
Redboot loading Linux.	**Red**	**Green**	**Green**	off
Redboot transferred control to Linux. Linux decompressing.	**Red**	**Green**	**Green**	**Green**
Linux booting.	**Green**	**Blinking red / blinking green**	off	off

Status	LED1	LED2	LED3	LED4
Firmware waiting for iCom connection.	**Green**	**Blinking red / blinking green**	**Blinking red**	**Blinking red**
Initial connection established. Waiting for iCom heartbeat handshake.	**Green**	**Blinking red / blinking green**	**Blinking green**	**Red**
Normal firmware operation.	**Green**	**Blinking red / solid green**	**Blinking green**	**Blinking green**

Boot failure indicators

The following status LED settings indicate possible boot failures. Contact your technical support representative for more information.

Status	LED1	LED2	LED3	LED4
Early boot failure likely due to some kind of hardware failure, except for the following color combination which indicates that early boot completed successfully: off-**Green-Green-Green**	off	Any color	Any color	Any color
Invalid Flash configuration detected.	**Red**	**Red**	**Green**	**Red**
Flash checksum failure while waiting for PLD Programmer.	**Red**	off	**Red**	off
PLD Programming failure.	**Red**	off	**Red**	**Red**
Bad Flash image configured.	**Red**	off	**Green**	**Red**
Too many failed Flash attempts.	**Red**	off	**Red**	**Green**
User connected to Redboot and aborted booting to Linux for maintenance.	**Red**	**Red**	**Green**	off

Status	LED1	LED2	LED3	LED4
If this pattern stays on for longer than 2 seconds, transfer of control to Linux did not occur.	**Red**	**Green**	**Green**	off
If this pattern stays on for longer than 5 seconds, Linux failed to decompress itself.	**Red**	**Green**	**Green**	**Green**
First time MAC/Serial Number programming.	**Red**	**Green**	off	**Green**
Invalid MAC/Serial Number found.	**Red**	**Green**	off	**Red**

Shutdown sequence

While in normal firmware operation mode, you will observe the following status LED settings after initiating a system shutdown/power off by pressing and holding the red button on the front of the ISC1 for 2-3 seconds.

Status	LED1	LED2	LED3	LED4
Normal firmware operation.	**Green**	**Blinking red / solid green**	**Blinking green**	**Blinking green**
Shutdown button press detected. System shutdown initiated.	**Green**	**Blinking red / solid green**	**Blinking green / blinking red**	**Blinking green**

VAM module detection indicators

After powering on the Wave IP 2500, while bootup is still in Redboot mode (indicated by a red ISC1 Status LED1), the following settings indicate whether or not a Vertical Application Module (VAM) was detected. on the ISC1.

Status	System Status LED1	System Status LEDs 2-4	ISC1 Red LED	ISC1 Green LED
VAM detected.	**Red**	Any color	**Red**	off
VAM not detected.	**Red**	Any color	**Red**	**Green**

Resetting factory default IP address indicators

After resetting the ISC1 and VAM IP address settings to the factory defaults as described on page 4-16, the following status indicator LED sequence indicates that the procedure was successful.

Status	LED1	LED2	LED3	LED4
Red button press detected at power on. Programming factory default IP settings.	**Red**	off	off	**Red**
Redboot started. Factory default IP address settings have been applied.	**Red**	off	off	**Green**

Performing Unattended Workstation Installations

You can install the Wave workstation applications unattended (silently), so that your organization can perform automatic software updates or use a network maintenance system that performs remote installations. When running Workstation Setup unattended, you can perform either of the following types of installation:

- **Typical installation:** In a typical installation, the following occur. You cannot change any of these options.
    - When installing Wave on a PC for the first time, only ViewPoint is installed.
    - When upgrading from a previous version of Wave, Workstation Setup detects the workstation applications that are installed, and upgrades those applications to the current version.
    - The workstation applications are installed in the default location.
- **Custom installation:** In a custom installation, you can specify which workstation applications to install, change the installation drive or folder, uninstall workstation applications, and specify other options.

Note: Because the PC where the workstation applications are installed must be restarted to complete the installation, you should perform unattended installations when users will not be interrupted while they are working.

Performing a typical unattended installation

To perform a typical unattended workstation application installation, run the following command on the PC where the workstation applications will be installed:

```
\\<Wave Servername>\Netsetup\setup.exe /s /v"/qn INSTALLLEVEL=200 /l*v
%TEMP%\wssetup.log"
```

Performing a custom unattended installation

To perform a custom unattended workstation application installation, run the following command on the PC where the workstation applications will be installed, including any of the parameters described in the table on page D-3.

\\<Wave Servername>\Netsetup\setup.exe /s /v"/qn CUSTOM_INSTALL=1 INSTALLLEVEL=200 /l*v %TEMP%\wssetup.log"

This example only shows the parameters required for *any* custom unattended installation. For other examples of custom installation commands, see the next section.

Note that any string value that contains a space must be delimited with the characters /" before and after the string value, as in the following example:

TVCMAFOLDER=/"C:\Program Files\CMA/"

Custom unattended installation examples

The following examples demonstrate different unattended installations. See "Workstation Setup command parameters" on page D-3 for details on the command parameters you can use.

The following command installs ViewPoint in the default location:

setup.exe /s /v"/qn CUSTOM_INSTALL=1 INSTALLLEVEL=200 ADDLOCAL=Client"

The following command installs all of the workstation applications in the default location:

setup.exe /s /v"/qn CUSTOM_INSTALL=1 INSTALLLEVEL=200 ADDLOCAL=ALL"

The following command does the following:

- Installs the single-line TAPI Service Provider in the default location.
- Installs the Contact Manager Assistant in the specified location.
- Configures the single-line TAPI Service Provider.
- Launches the Contact Manager Assistant when the installation completes, if a restart is not required.

setup.exe /s /v"/qn CUSTOM_INSTALL=1 INSTALLLEVEL=200 ADDLOCAL=TSP,CMA TVSERVER=TeleVantage TVSTATION=1 TVUSER=Operator TVPASSWORD=0 TVTSPAPPHANGUP=1 TVTSPTRACE=1 TVCMAFOLDER=/"C:\Program Files\CMA/" TVLAUNCHCMA=1 /l*v %TEMP%\wssetup.log"

The following command uninstalls the

When run on a Terminal Server PC, the following command installs all of the workstation applications in the default location:

setup.exe /s /v"/qn CUSTOM_INSTALL=1 INSTALLLEVEL=200 ADDLOCAL=ALL TERMINALSVRMODE=1"

Workstation Setup command parameters

The following parameters can be specified in any order. Separate parameters with spaces..

Name	Value	Description
CUSTOM_INSTALL	Integer	Installation type: **0** = (Default) Typical installation. **1** = Custom installation.
INSTALLLEVEL	**200**	Required whenever you use the ADDLOCAL parameter (not required to REMOVE a workstation application.)
ADDLOCAL	**Client** **CMA** **TSP** **ALL**	Workstation application to install: To install more than one application, separate each one with a comma (,), for example: `ADDLOCAL=`**`Client,CMA`** To install all of the workstation applications, specify **ALL**, for example: `ADDLOCAL=`**`ALL`**
REMOVE	**Client** **CMA** **TSP** **ALL**	Workstation application to remove: To remove more than one application, separate each one with a comma (,), for example: `REMOVE=`**`Client,CMA`** To remove all of the workstation applications, specify **ALL**, for example: `REMOVE=`**`ALL`**
TVSERVER	String	Name of the Wave IP 2500, for example: `TVSERVER=WaveServer`

Name	Value	Description
TVSTATION	String	Station ID of the phone that will be used by the person at this PC: `TVSTATION=`**`186`** If you do not know the station ID, pick up the phone and dial *0. If there is not a Wave phone near this PC, enter a station ID of 0. `TVSTATION=`**`0`**
SUPPRESS_MSGS	Integer	**0** = (Default) Workstation Setup displays message boxes on the PC where the applications are installed. Workstation Setup stops processing and waits until someone responds to each message box. **1** = Suppress display of message boxes. The messages are still written to the Workstation Setup Log (see “Performing a typical unattended installation” on page D-1.)
Use the following 4 parameters to specify the complete path to the location where a workstation application will be installed, for example: `TVCLIENTFOLDER=`**`/"C:\Program Files\TV Client/"`** If not specified, the application will be installed in the default location.		
TVCLIENTFOLDER	String	Location where ViewPoint will be installed.
TVTSPFOLDER	String	Location where the single-line TAPI Service Provider will be installed.
TVCMAFOLDER	String	Location where the Contact Manager Assistant will be installed.
Optionally, use the following 4 parameters if you are installing the single-line TAPI Service Provider (`ADD_LOCAL=`**`TSP`** or `ADD_LOCAL=`**`ALL`**.) If you do not provide this information during the unattended install, you must run the TAPI Configuration Wizard later to configure TAPI SP for the user at this PC. See “Configuring the TAPI Service Provider” on page 6-8 for more information		

Name	Value	Description
TVUSER	String	**TAPI SP only.** User name of the person assigned to the station ID in TVSTATION: `TVUSER=`**`SRyan`** Note: TVUSER must be the user assigned to the station ID in TVSTATION, else this parameter is ignored.
TVPASSWORD	String	**TAPI SP only.** User's Wave password: `PASSWORD=`**`17530`**
TVTSPAPPHANGUP	Integer	**TAPI SP only.** Specifies whether applications using TAPI SP can hang up calls. **0** = (Default) Applications using the TAPI SP cannot hang up calls. **1** = Applications using the TAPI SP can hang up calls. Important: Some contact manager programs experience problems when TVTSPAPPHANGUP=**1**. For details, run the TAPI SP Configuration Wizard after installing TAPI SP, and read the Help for the second Wizard screen. Do set TVTSPAPPHANGUP=**1** for users who use Microsoft Outlook as their contact manager.
TVTSPTRACE	Integer	**TAPI SP only.** Specifies whether TAPI SP writes debugging information to disk when placing calls. This information is useful when communicating with technical support. **0** = (Default) TAPI SP does not create a trace file. **1** = TAPI SP creates a trace file. Note: The trace file is located at the following location: **C:\Program Files\TeleVantage Client\Logs\Tvtsp.txt**
Set the following parameter to **1** when installing workstation applications on a server PC running Windows Terminal Server or Citrix MetaFrame so that users do not have to re-enter logon information when they access the applications.		

Name	Value	Description
TERMINALSVRMODE	Integer	**1** = Individual user logon settings are preserved for users who access workstation applications via Terminal Services. **0** = (Default) Mode used for non-Terminal Services installations.
Use the following 3 parameters to launch a workstation application after the installation completes. Note: Each parameter takes effect only if the application was installed successfully and no restart is necessary. These parameters are not affected by the REBOOT parameter setting.		
TVLAUNCHCLIENT	Integer	**0** = (Default) Do not start ViewPoint after the installation completes. **1** = Start ViewPoint after the installation completes.
TVLAUNCHCMA	Integer	**0** = (Default) Do not start the Contact Manager Assistant after the installation completes. **1** = Start the Contact Manager Assistant after the installation completes.
REBOOT	String	**Force** = (Default) Automatically restarts the PC where the workstation applications are installed after the installation completes. **ReallySuppress** = Do not restart the PC after installation completes. If you specify `REBOOT=ReallySuppress`, the PC must be restarted later.

Verifying that an unattended installation was successful

You can determine if a unattended installation was successful by viewing the Workstation Setup Log. This file is created in the **\Temp** directory on the PC where Workstation Setup was run. When an installation is successful, an entry like this one appears near the end of the file:

> MSI (c) (80:34): Product: workstation applications -- Installation operation completed successfully.

Note: You can also examine the Windows Event Log on the PC to see if the installation completed successfully.

Configuring Wave for the Windows Firewall

The information in this appendix applies to the following systems:

- Any PC where a Wave workstation application has been installed that is running Windows Vista, Windows XP SP2, or Windows Server 2003 SP1 or higher.
- The Wave IP 2500. All Wave IP 2500s ship with a version of Windows Server 2003 installed. (Windows Vista and Windows XP are not supported on the Wave IP 2500.)

Overview

After the Wave IP 2500 is installed and Wave workstation applications are installed on users' PCs, the firewall settings on those systems are automatically updated so that Wave can operate properly on most networks. These changes are made because Wave will not work properly with the default Windows Firewall settings for the versions of Windows listed above.

Without these modifications to the default Windows Firewall settings, Wave applications cannot communicate over a network. If necessary, you can tailor these modifications to match your unique network configuration and security requirements, as described later in this Appendix.

About the Windows Firewall

The Windows Firewall is designed to protect Windows from unwanted network access, including potentially hostile viruses. Left unchanged, these security measures also prevent Wave workstation applications from receiving requests from the Wave IP 2500, for example a request to display a new call in the ViewPoint Call Monitor.

To enable necessary communication between Wave components, Wave adds several entries to the Firewall Exceptions List on all Wave systems running these versions of Windows. Each Wave workstation PC is updated as soon as a Wave application on it runs for the first time after installation or upgrade.

For a complete list of the Windows Firewall exceptions added by Wave and their associated default values, see “Windows Firewall exceptions added for Wave” on page E-3.

You *must* change the default firewall security settings using the Global Administrator Management Console according to the instructions in “Adjusting Windows Firewall exceptions” on page E-2.

If you do not make these changes, Wave workstation applications such as ViewPoint may not operate properly, for example calls will not appear in the Call Monitor.

Adjusting Windows Firewall exceptions

Perform the following procedure on your Wave IP 2500.

1. In the Global Administrator Management Console, click User/Workgroup Management, and then choose **Tools > System Settings**.
2. Select the Security \ Workstation Firewall tab, and then click **Custom List**.

   The settings on this tab determine which IP addresses will be allowed to send network requests to the Wave workstation PCs. You only need to specify the VAM’s IP address on your Wave IP 2500, which you can do in several ways.

   - If the VAM has a fixed IP address, click **Server IP Address** to automatically enter it.
   - If you have multiple Wave IP 2500s, enter the VAM’s IP address for each one, so that any Wave workstation PC can connect to any Wave IP 2500. Separate each IP address with a comma and no space.

   Important: If a VAM’s IP address ever changes you must update this setting in order for the Wave workstation applications to continue to be able to connect.
3. Click **OK** to close the System Settings dialog box.

Now, when any Wave workstation application starts, it reads the Security \ Workstation Firewall settings you set above, and modifies the workstation PC’s Windows Firewall Exception List to match those settings. For example, if you entered 192.168.114.20 in the Custom List (the VAM’s fixed IP address), then as soon as ViewPoint is run on any PC, that PC's Windows Firewall is opened to DCOM traffic from 192.168.114.20 so it can receive events from the Wave IP 2500.

When updated Windows Firewall exceptions are applied

The changes you made according to the steps in the previous section will be picked up by workstation PCs the next time that each application starts and connects to the Wave IP 2500.

If you make changes to the Security \ Workstation Firewall tab while one or more Wave workstation applications are in an active session, the new settings will not be applied until the applications are restarted.

- Restarting the Wave IP 2500 forces all workstation applications except the TAPI Service Provider to restart.
- To restart the TAPI Service Provider, restart the PC where that application is running.

Windows Firewall exceptions added for Wave

The following Windows Firewall exceptions are added to Wave workstation PCs using the settings you specified in the Security \ Workstation Firewall tabs, according to the instructions in the previous section. All of these exceptions are required to run Wave across a network.

- DCOM Resolver: Port TCP135.
- Wave ViewPoint: Vertical.Wave.ViewPoint.exe.
- Wave Contact Center Reporter: TVReporter.exe.
- Wave Voicemail Archive Browser: TVRecordingBrowser.exe.

Upgrading Redboot

This chapter describes how to upgrade the Redboot boot loader for the Integrated Services Card (ISC1).

Important: You do not need to perform the steps in this chapter if you are installing Wave ISM on a new Wave IP 2500 for the first time. The latest released version of Redboot was pre-installed at the time your Wave IP 2500 was shipped.

Perform these steps if the following apply to you:

- You upgraded an existing Wave IP 2500, and the Wave Release Notes indicate that a Redboot upgrade is required.
- At a later time, your Vertical representative notifies you that a new Redboot upgrade is available via a HotFix.

Important: Before upgrading Redboot according to the instructions in this appendix, be sure that you have successfully installed the upgrade or HotFix. See the upgrade or HotFix Release Notes for more information.

Before you begin

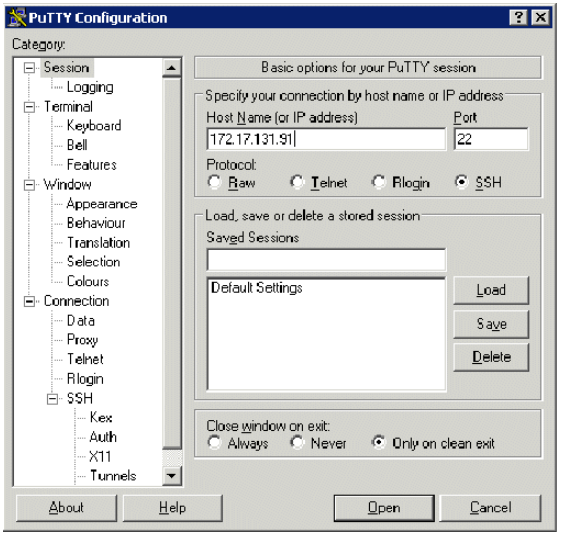
Verify the following before you begin:

- You know the IP address of the Vertical Application Module (VAM) on the Wave IP 2500, and the VAM's login account information.
- You can connect to the VAM over your LAN or via a point-to-point Ethernet connection from the Wave administrator PC or other remote PC.

Upgrading Redboot

To upgrade Redboot

1. Launch a Remote Desktop Connection to the VAM from your remote PC using the VAM's IP address.
2. Start the PuTTY utility. To do so, from the Start menu choose Programs > PuTTY.



3. In the PuTTY Configuration dialog box, configure the PuTTY utility to communicate with the ISC1. To do so, enter the following information:
   - Host Name (or IP address): ISC1's IP address
   - Port: 22
4. Click Open to launch a PuTTY session to the ISC1.
5. Log on using the following information:
   - Username: root
   - Password: Vertical4VoIP!

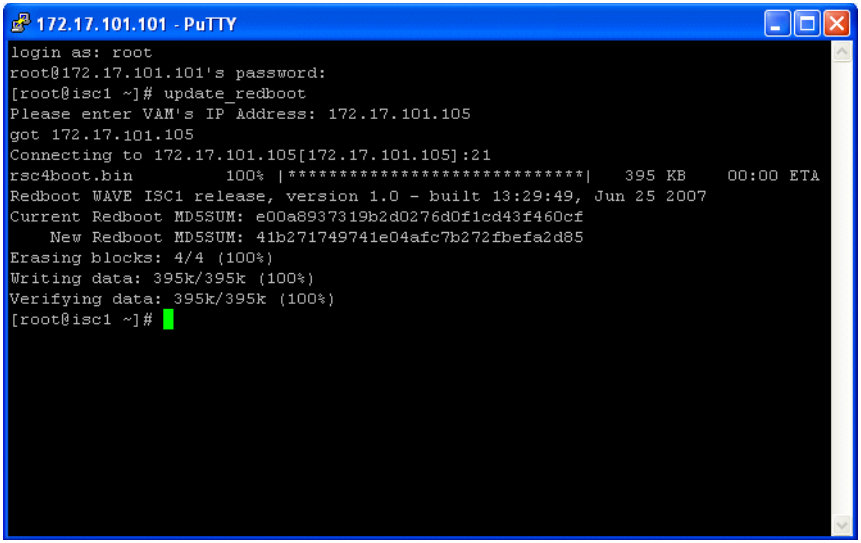
6. The first time you connect with PuTTY, click Yes in the Putty Security Alert dialog box to continue.

7. The PuTTY session provides a Linux "bash" prompt session. Type the following command at the # prompt to flash the new Redboot:

   `update_redboot`

   Enter the VAM's IP address when you are prompted to do so. Flashing of Redboot will take a few seconds.

   You will see a series of messages while flashing is in progress. Flashing is complete when the Writing data" and "Verifying data" messages are displayed:



8. Type the following command at the # prompt to view the version of Redboot now installed:

   ```
   rsc4versions
   ```

   Note: Use this command if your Vertical technical support representative ever asks you to verify the Redboot version installed on your Wave IP 2500.

The new Redboot will take effect the next time that the Wave IP 2500 is restarted—you do not need to restart the Wave IP 2500 immediately.

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Index

A

C

D

E

F

G

H

I

L

M

O

P

R

S

T

U

V

W