Cisco.com

Cisco's IP Telephony Solution

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Agenda
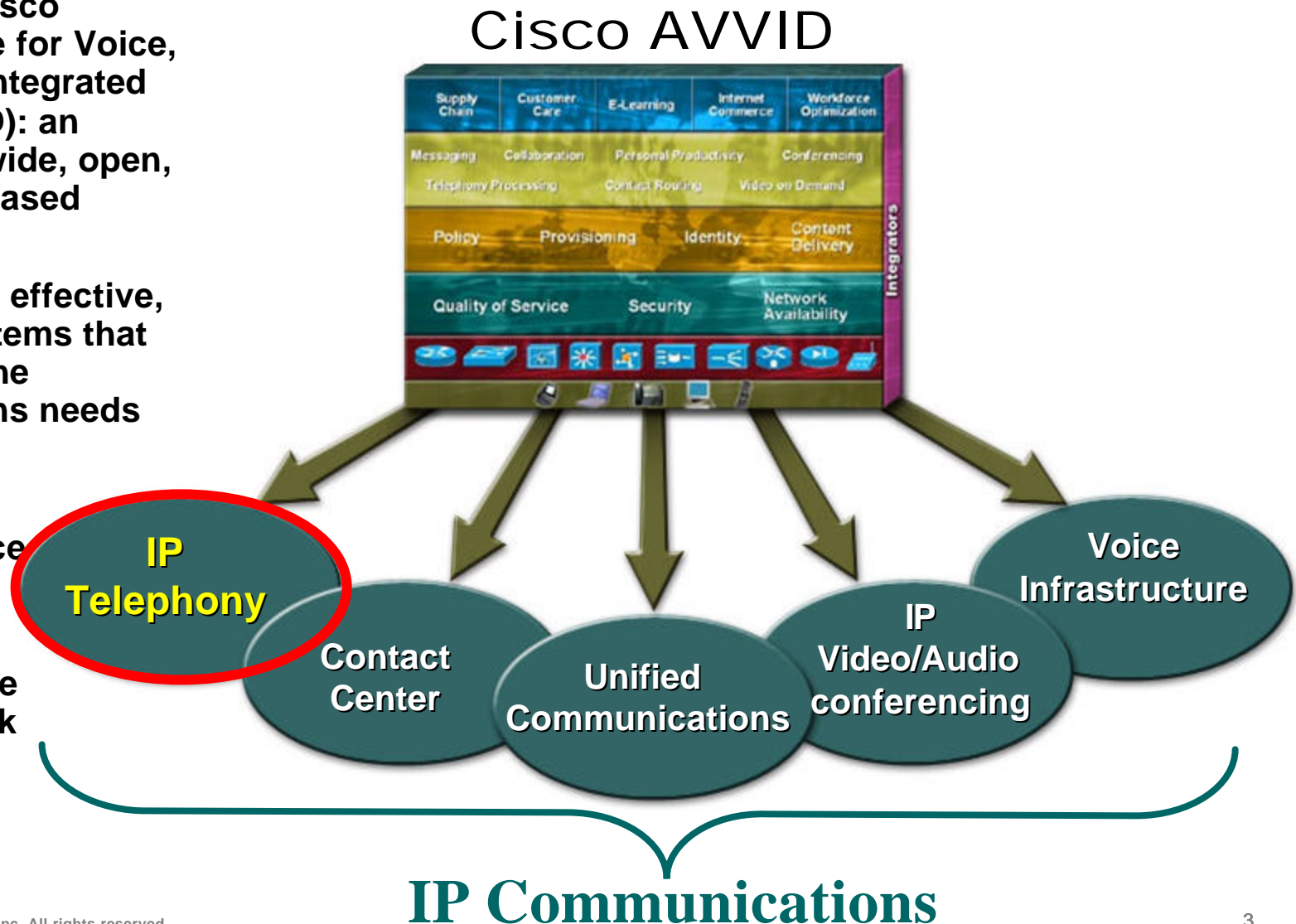
- **What is IP Telephony?**

- **Deployment models**

- **Benefits of IP Telephony**

- **Case Studies**

- **IP Telephony Solution components**

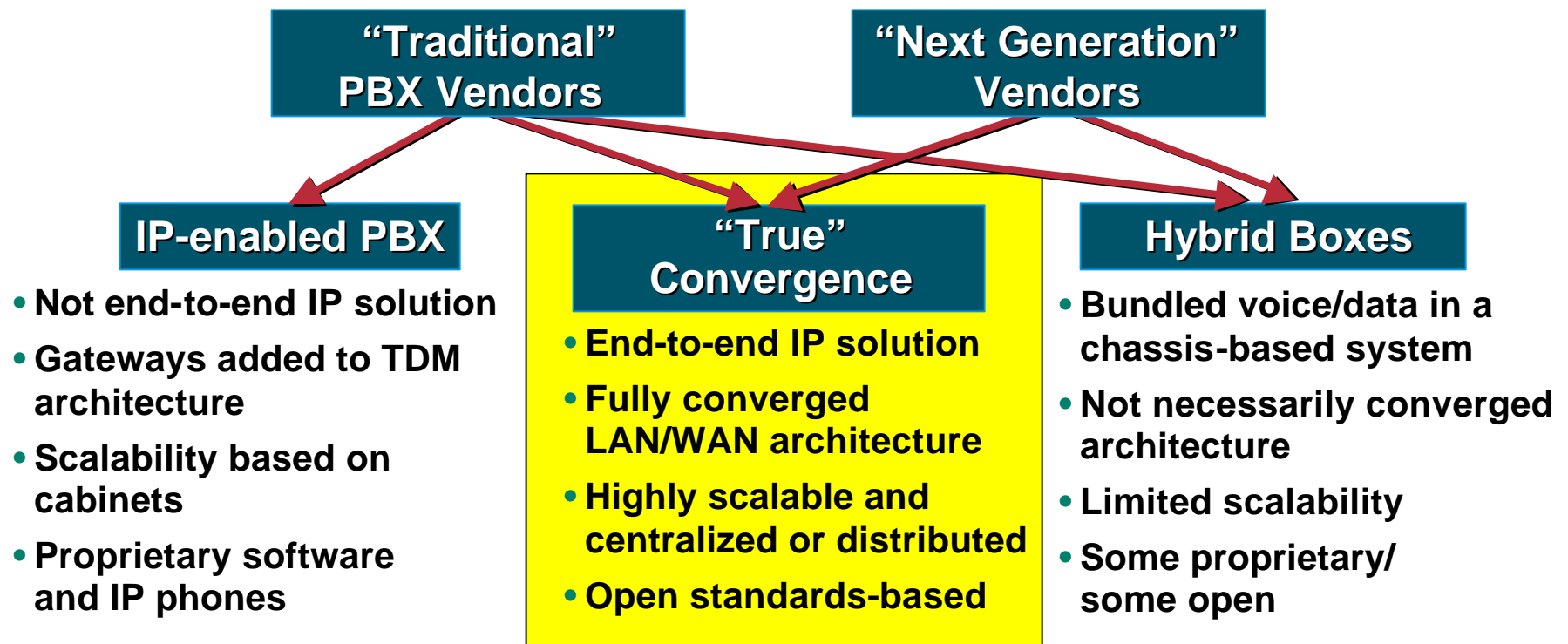# IP Communication System—Optimizes Business Communications

- ◆ **Leverage Cisco Architecture for Voice, Video and Integrated Data (AVVID): an enterprise wide, open, standards based architecture**

- ◆ **Deliver cost effective, reliable systems that scale with the organizations needs**

- ◆ **Maximize productivity and enhance customer service**
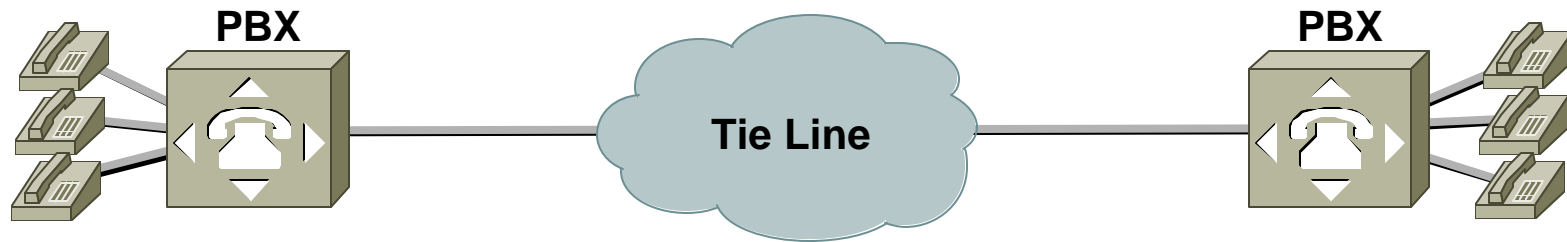
- ◆ **Leverage the data network investment**

Cisco AVVID

Supply Chain	Customer Care	E-Learning	Internet Commerce	Workforce Optimization
Messaging	Collaboration	Personal Productivity		Conferencing
Telephony Processing		Contact Routing	Video on Demand	
Policy	Provisioning		Identity	Content Delivery
Quality of Service		Security		Network Availability

IP Telephony

Contact Center

Unified Communications

IP Video/Audio conferencing

Voice Infrastructure

IP Communications

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Convergence Strategies

There Are Three Basic Approaches to Data/Voice Network Convergence

"Traditional" PBX Vendors

"Next Generation" Vendors

IP-enabled PBX

- Not end-to-end IP solution
- Gateways added to TDM architecture
- Scalability based on cabinets
- Proprietary software and IP phones

"True" Convergence

- End-to-end IP solution
- Fully converged LAN/WAN architecture
- Highly scalable and centralized or distributed
- Open standards-based

Hybrid Boxes

- Bundled voice/data in a chassis-based system
- Not necessarily converged architecture
- Limited scalability
- Some proprietary/ some open

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Enterprise Voice Evolution

PBX

Tie Line

PBX

Legacy PSTN Internetworking

PBX

Router/GW

IP WAN

Router/GW

PBX

Toll Bypass

CallManager

Router/GW

IP WAN

CallManager

Router/GW

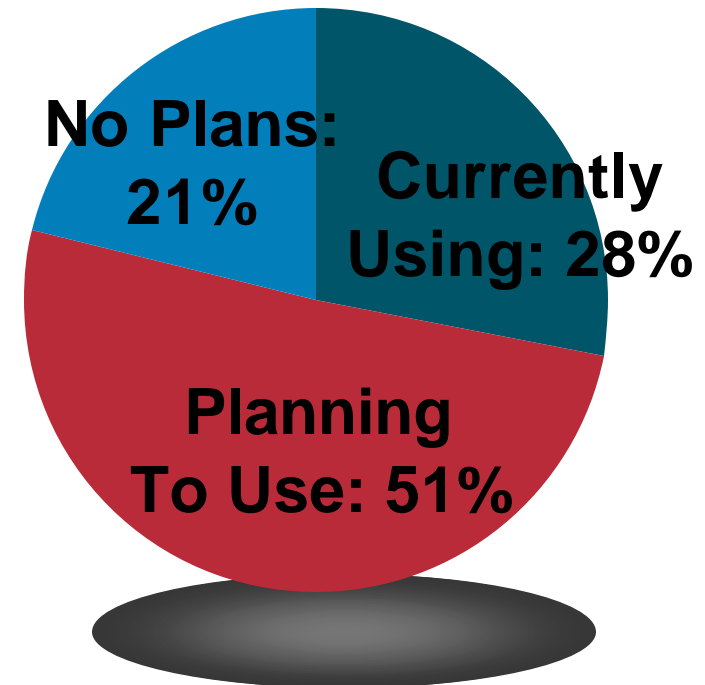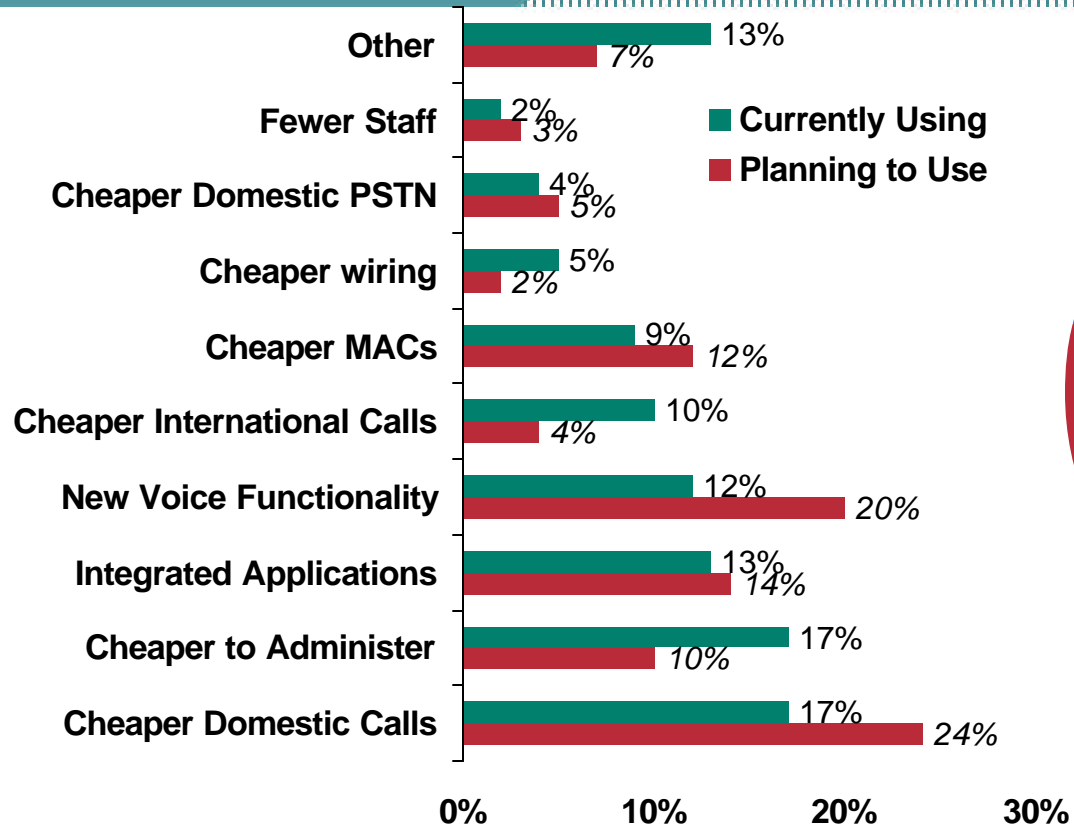**End-to-End IP Telephony with Application Enablement**

Why not just IP enable?

"**Putting VoIP cards in a PBX does not constitute IP Telephony**. IPT enables a whole raft of communication that the PBX cannot match. The user is still locked in to the PBX's feature set …… the one that hardly anybody uses on a regular phone. So why do it? **Why pay for another device that only does the same thing as the phone you already have?**"

Source: Bob Emmerson, Industry Analyst

79% of Businesses Moving to IP Telephony

Currently Using
Planning to Use

Category	Currently Using	Planning to Use
Other	13%	7%
Fewer Staff	2%	3%
Cheaper Domestic PSTN	4%	5%
Cheaper wiring	5%	2%
Cheaper MACs	9%	12%
Cheaper International Calls	10%	4%
New Voice Functionality	12%	20%
Integrated Applications	13%	14%
Cheaper to Administer	17%	10%
Cheaper Domestic Calls	17%	24%

0%   10%   20%   30%

No Plans: 21%

Currently Using: 28%

Planning To Use: 51%

"This year, we found that nearly one in five (18 percent) of the respondents who have already deployed VOIP are using it to carry 20 percent or more of their voice traffic."

Source: Jim Metzler, Business Communications Review, July 2002

Why Migrate to Cisco's IP Telephony Solution?

- Deploy and maintain one network, lowering monthly expense and overall TCO through a common architecture (upgrades, spares, etc)

- Open standards-based allows longterm flexibility and interoperability with 3rd party applications

- Scalability and High Availability

- Location independence-Locate agents and workers anywhere, allowing reduced facilities overhead

- Enhance employee productivity through Applications and access to critical tools

- Enhance customer service through tighter voice/data integration

- Rapid Deployment of new locations or applications, for better business resilience and agility in changing markets

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IP Telephony — Perception vs. Reality

Perception:	Reality:
No E911 Support	E911 Support Is Available
Concern About Voice Quality	Available with QoS and Call Admission Control (CAC)
Lack of System Availability	Triple Redundancy for High Availability
Lack of Scalability	Systems Can Scale to 100,000 Users
Learning Curve Issues	Partner Support for Installation and Service, AT&T, SBC, Williams, Norstan, British Telecom, France Telecom, KPMG, EDS, Etc.
No IP Voice Applications	Contact Center (IPCC), Interactive Voice Response (IP-IVR), Personal Assistant (IP-PA), Cisco Unity Voicemail and Unified Messaging, Cisco Conference Connection available today

How to Migrate:
1. Change Transport Mechanism

Enterprise Campus

Enterprise Branch Office

PSTN

Toll Bypass

WAN

2. Adopt IP Telephony

Enterprise Campus

Enterprise Branch Office

PSTN

WAN

*SRST < 48 user
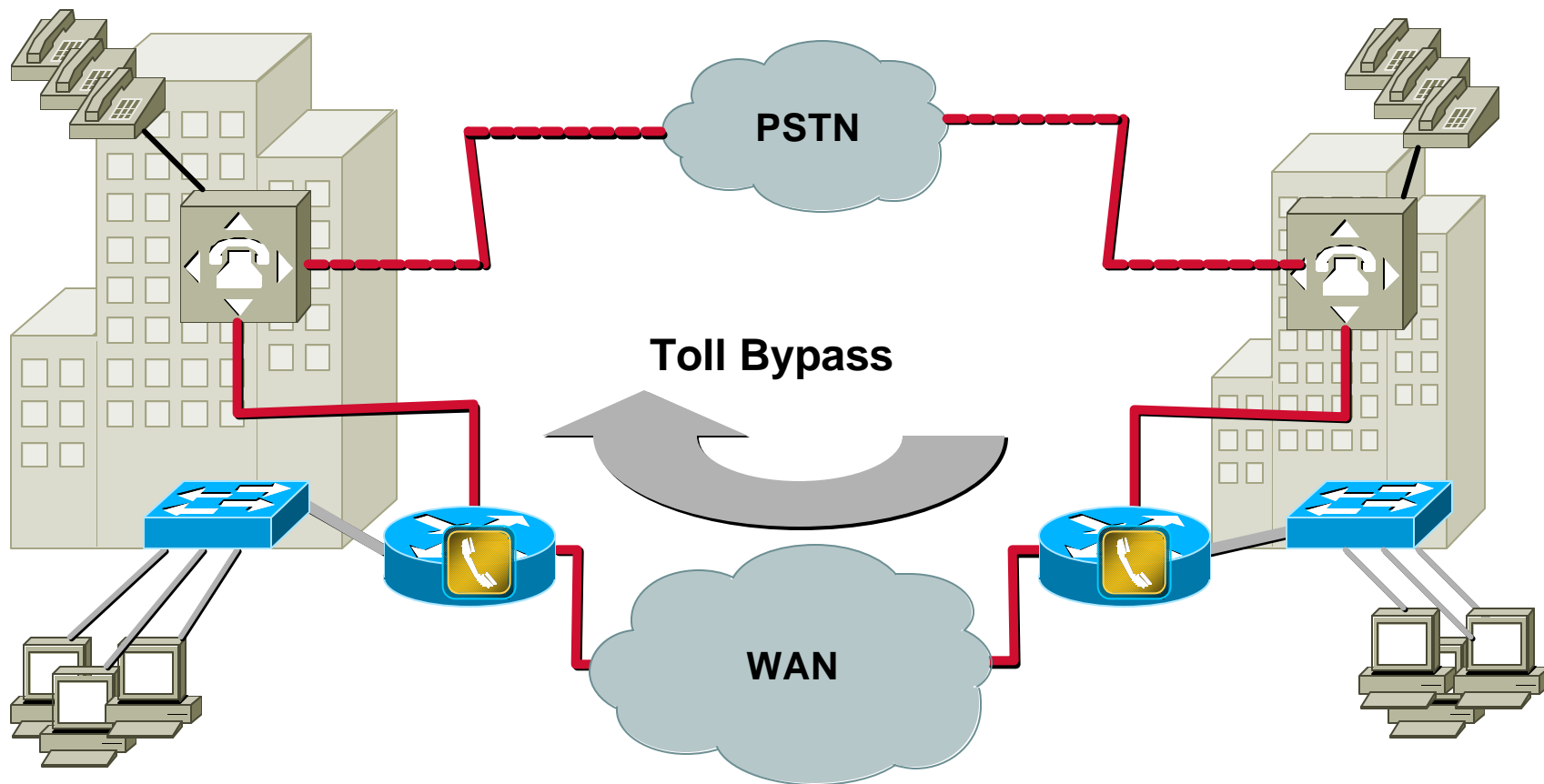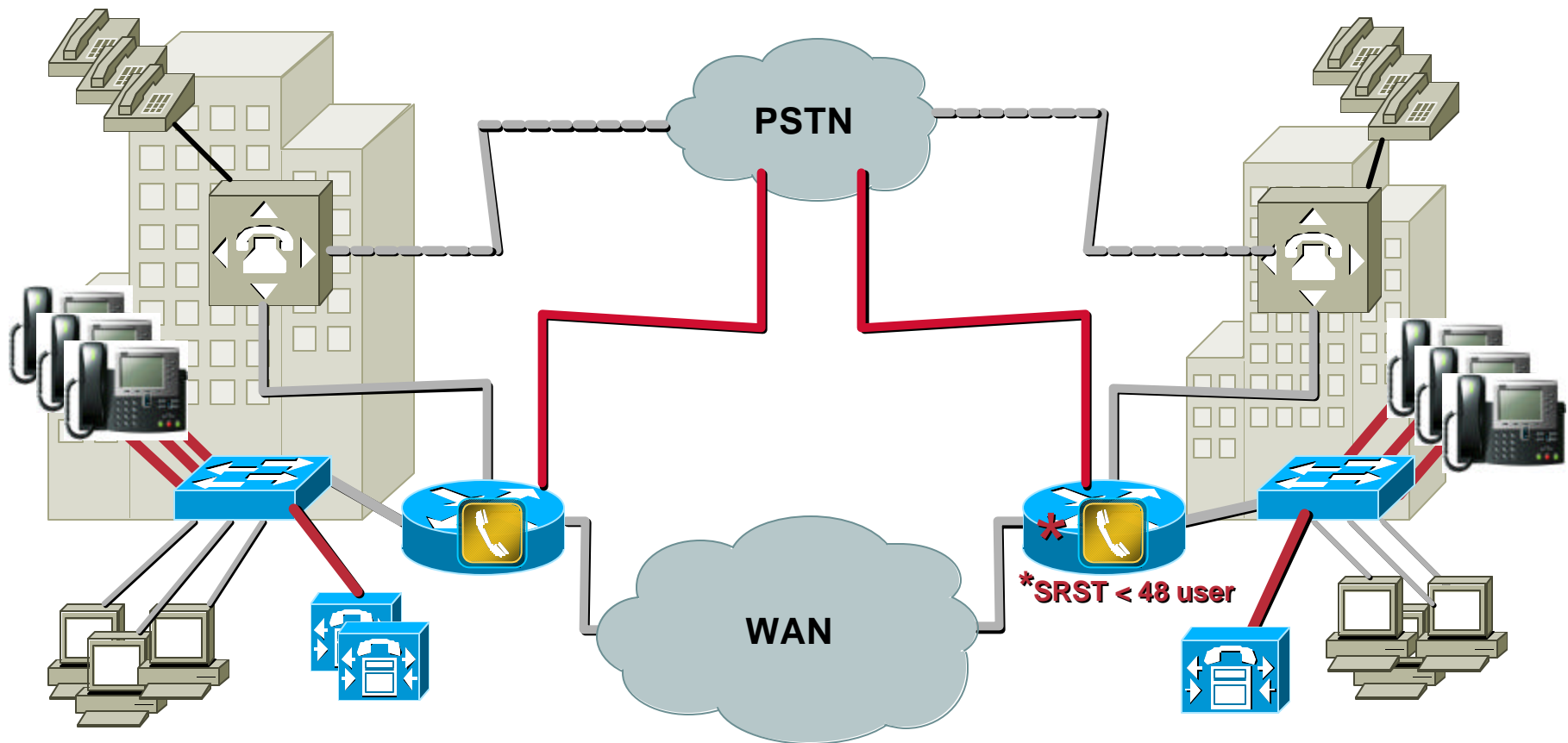
3. Deploy Converged IP Applications
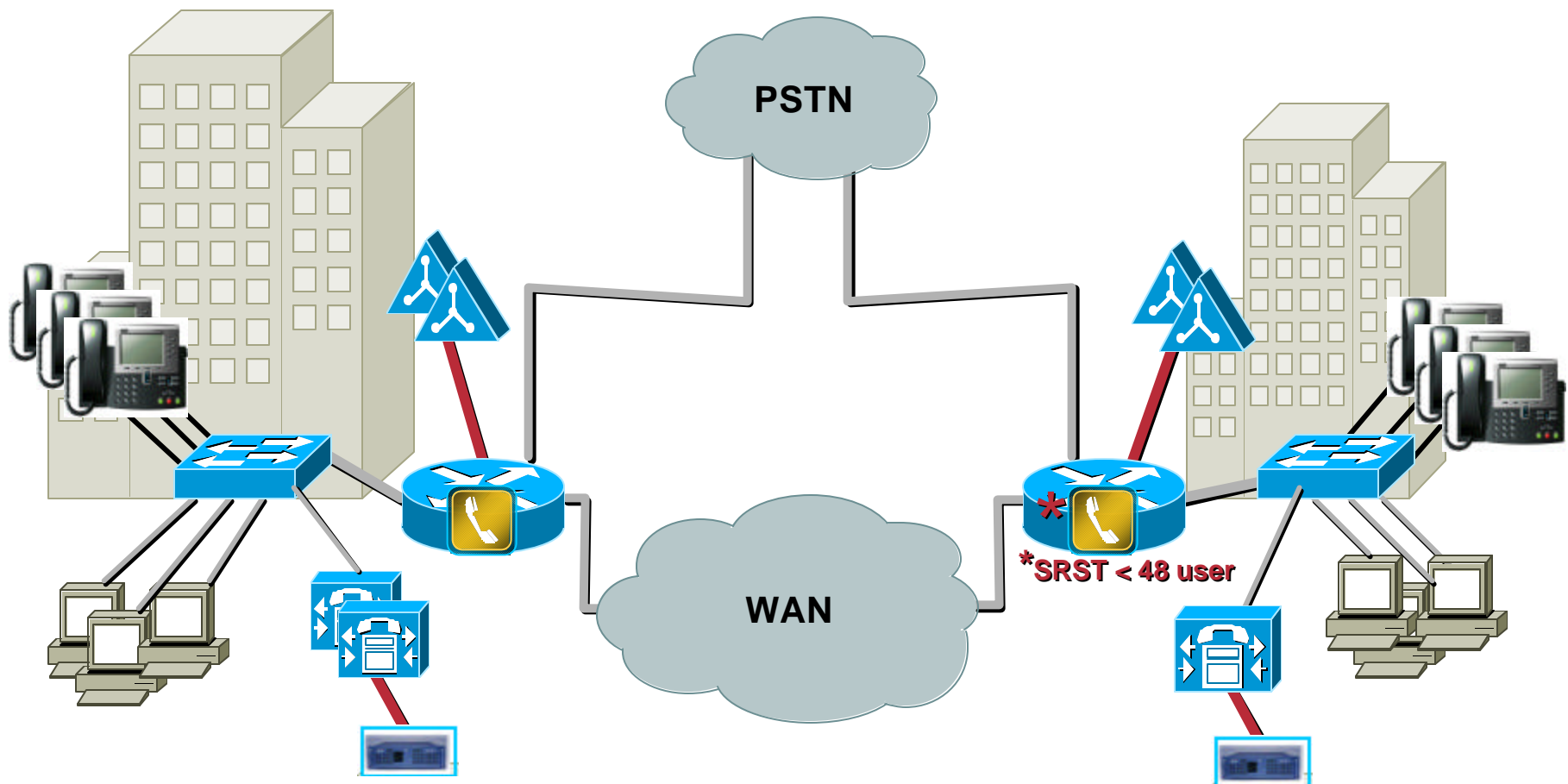
Enterprise Campus
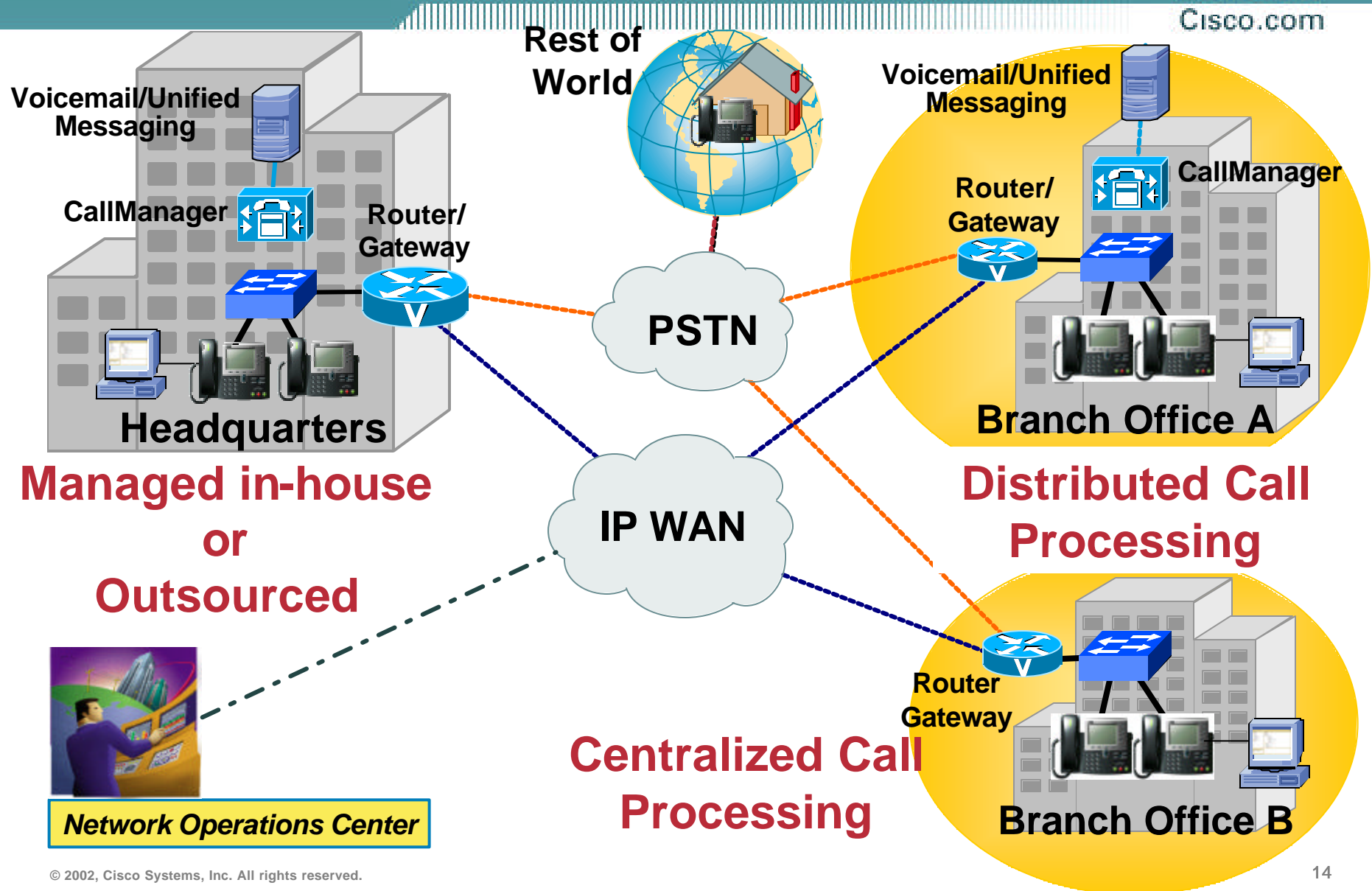
Enterprise Branch Office

PSTN

WAN

*SRST < 48 user

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Choices…Flexible Deployment Offerings
Centralized, Distributed, Managed IP PBX

Rest of World

Voicemail/Unified Messaging

CallManager

Router/Gateway

Voicemail/Unified Messaging

CallManager

Router/Gateway

PSTN

Headquarters

Branch Office A

Managed in-house or Outsourced

Distributed Call Processing

IP WAN

Router Gateway

Network Operations Center

Centralized Call Processing

Branch Office B

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Centralized Call Processing – Productivity Paradigm Shift

- How much does it cost to visit each site?

- If you can save 2 or 3 "truck rolls" over the next few years, how much will you save?

- How significant is it to be able to deploy technology at a much faster pace than your competitors?

- Imagine deploying new voice productivity applications to users at hundreds of remote sites over the weekend!

How?
Centralized Call Processing

- **Cisco CallManager servers and application servers located at central site**

- **Router, Ethernet switch and IP phones at remote locations**

- **Branch office router provides call processing backup during WAN failure – SRS Telephony**

- **IP WAN used for call setup**
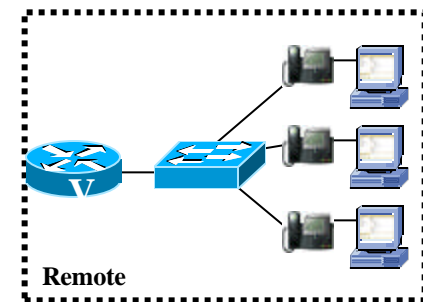
Remote

Benefits of Centralized Call Processing
Improved Productivity

- Give remote users full enterprise level feature sets across telephony applications, instead of reduced capabilities (PBX vs. key system)

- Local PSTN trunking at remote sites (typically)

- IT staff is not required at each remote site

- Deploy telephony to remote sites at a fraction of the time it takes for PBX or Key Systems

- Ability to rapidly deploy new productivity applications to remote users (without requiring a "truck roll" to each site)

- Easy upgrades and maintenance

- Builds upon existing Cisco network infrastructure to deliver Enterprise Voice Solutions

Centralized Call Processing:
What is SRS Telephony?

- Survivable Remote Site Telephony integrated with existing data network, to enable Centralized Call Processing

- Unique, industry-first capability in remote office **routers** for IP Telephony redundancy

- Does not require PBX deployment at remote offices – simplifying management and reducing costs

- Cost-effective **enterprise wide** deployment of IP telephony enabled by Cisco AVVID (Architecture for Voice, Video and Integrated Data)

- Always available remote IP telephony

- Ideal for enterprise customers utilizing Centralized Cisco CallManager deployment for IP telephony at their remote offices

CiscoIOS™

Cisco AVVID
Architecture for
Voice, Video and
Integrated Data

Survivable Remote Site Telephony – How it works

When Network Failure Doesn't Affect Productivity

- IP Phones exchange Keep alive messages and Call Processing messages with Centrally located CallManager (CCM)
- WAN Link fails – IP phones lose contact with CCM
- IP Phones register with local router as router of last resort

- Router queries phones for configuration and auto-configures itself
- Router provides call processing for duration of failure via PSTN
- Phone displays "CM Fallback Operating"
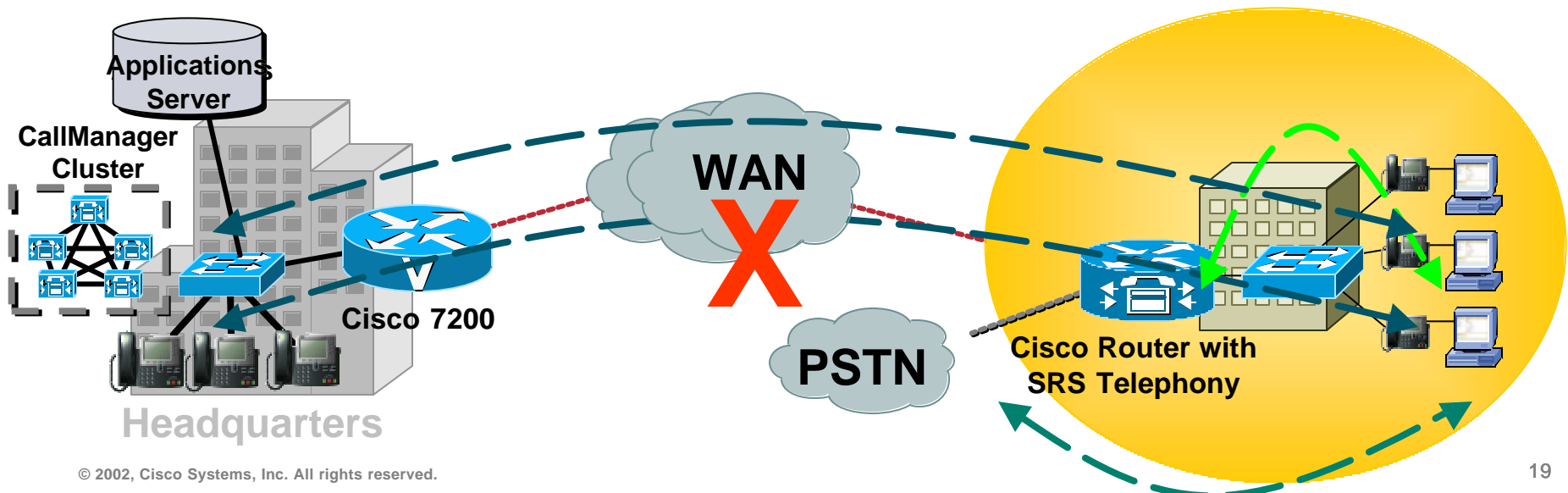
Applications Server

CallManager Cluster

Cisco 7200

Headquarters

WAN

PSTN

Cisco Router with SRS Telephony

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Benefits of Cisco IP Telephony

Feature	Benefit
IP call processing	• Lower deployment and maintenance costs • Scalability from 3-30,000 users • Feature parity across all sites
CallManager Clustering	• High availability
Cisco Emergency Responder	• Automatic updates of location information for dynamic and nomadic users • lowers costs and ensures accurate E-911 locations
Extension and User Mobility	• Removes Moves, Adds, Changes (MAC) costs. • Improves productivity
Integrated Network Services (Application and network integration)	• Enables automatic QoS and VLAN provisioning, and enhanced security and system management • Lowers costs and enhances system integrity
Centralized Call Processing	• Virtual PBX with consistent features and services across the enterprise • Lowers costs and improves productivity

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Cray Inc. ROI Case Study

ROI Calculator

- **Deployment Details**
  - Global market leader in high-end supercomputers
  - Multi-site deployment
  - Replaced existing PBX with IP Telephony
  - 650 phones
  - Required data network upgrade to handle time-sensitive voice traffic

- **ROI Findings**
  - Payback—7 months
  - ROI Drivers:
    - Cost of Cisco IP Telephony and data gear cost the same as PBX
    - Improved productivity of network support staff by 33%
    - Reduced MAC's costs by $30K/year
    - Reduced inter-office calling charges by $25K/year

Summary Sheet

IP Telephony ROI Case Study—Cray Inc.

CRAY

Challenge

- Limited support resources required a simpler to manage voice and data communications network

- Moving into new facility required new voice and data network investment

Strategy

- Deployed 650 IP phones and Unified Messaging to three domestic sites in fall of 2000

- Converged network has simplified network management and increased productivity of the network support staff
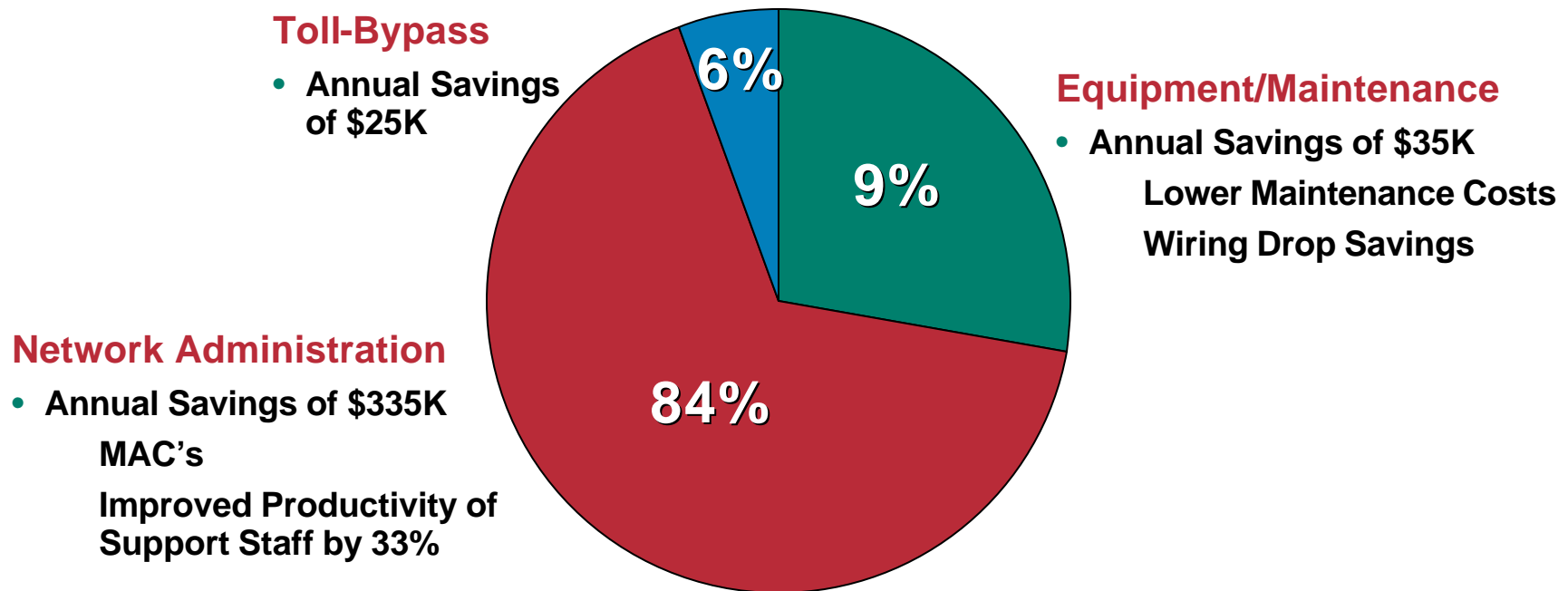
Cray Inc.—Results

- ROI Findings:

  Payback—6 months

  Total Annual Benefit: $395K per year

% Contribution to Cost Savings

Toll-Bypass
- Annual Savings of $25K

Equipment/Maintenance
- Annual Savings of $35K

  Lower Maintenance Costs

  Wiring Drop Savings

Network Administration
- Annual Savings of $335K

  MAC's

  Improved Productivity of Support Staff by 33%

6%

9%

84%

Ministry of Social Policy (MoSP)

Who: Largest government agency in New Zealand

8,000 employees across 210 sites

Challenge: Convert legacy PBX communication systems onto one voice/data infrastructure

Solution: 210 remote sites and four (4) core sites

Each core site has a Cisco CallManager cluster

No servers at the remote sites—only IP phones

Results: Large volume calls—130 to 160K/per day

Quick deployment—4 weeks
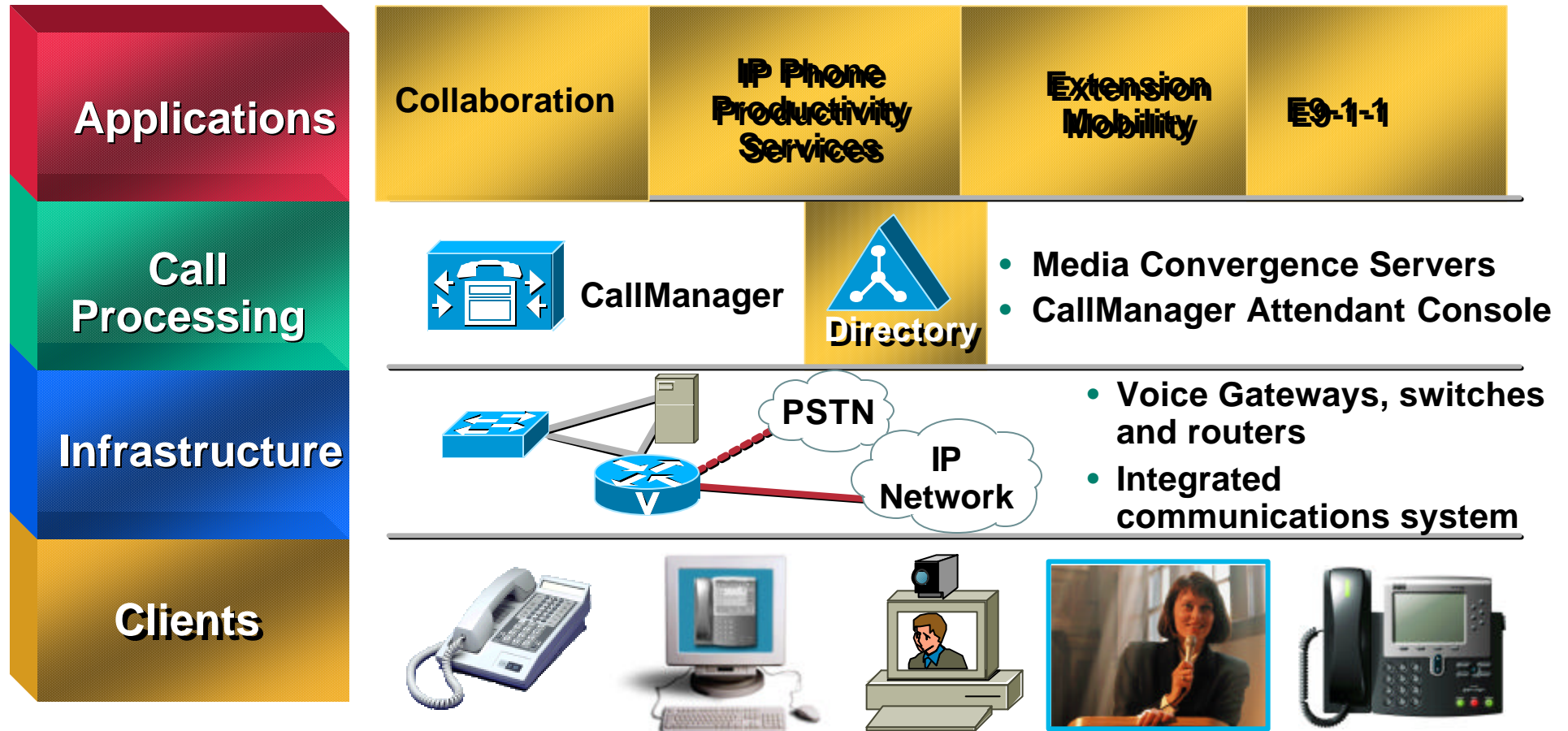
33% more users at same operational cost

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IP Telephony Solution Building Blocks

Applications
- Collaboration
- IP Phone Productivity Services
- Extension Mobility
- E9-1-1

Call Processing
- CallManager
- Directory
- Media Convergence Servers
- CallManager Attendant Console

Infrastructure
- PSTN
- IP Network
- Voice Gateways, switches and routers
- Integrated communications system

Clients

The World Is Now Global—All Apps Must Traverse Time and Distance

What is Cisco CallManager?
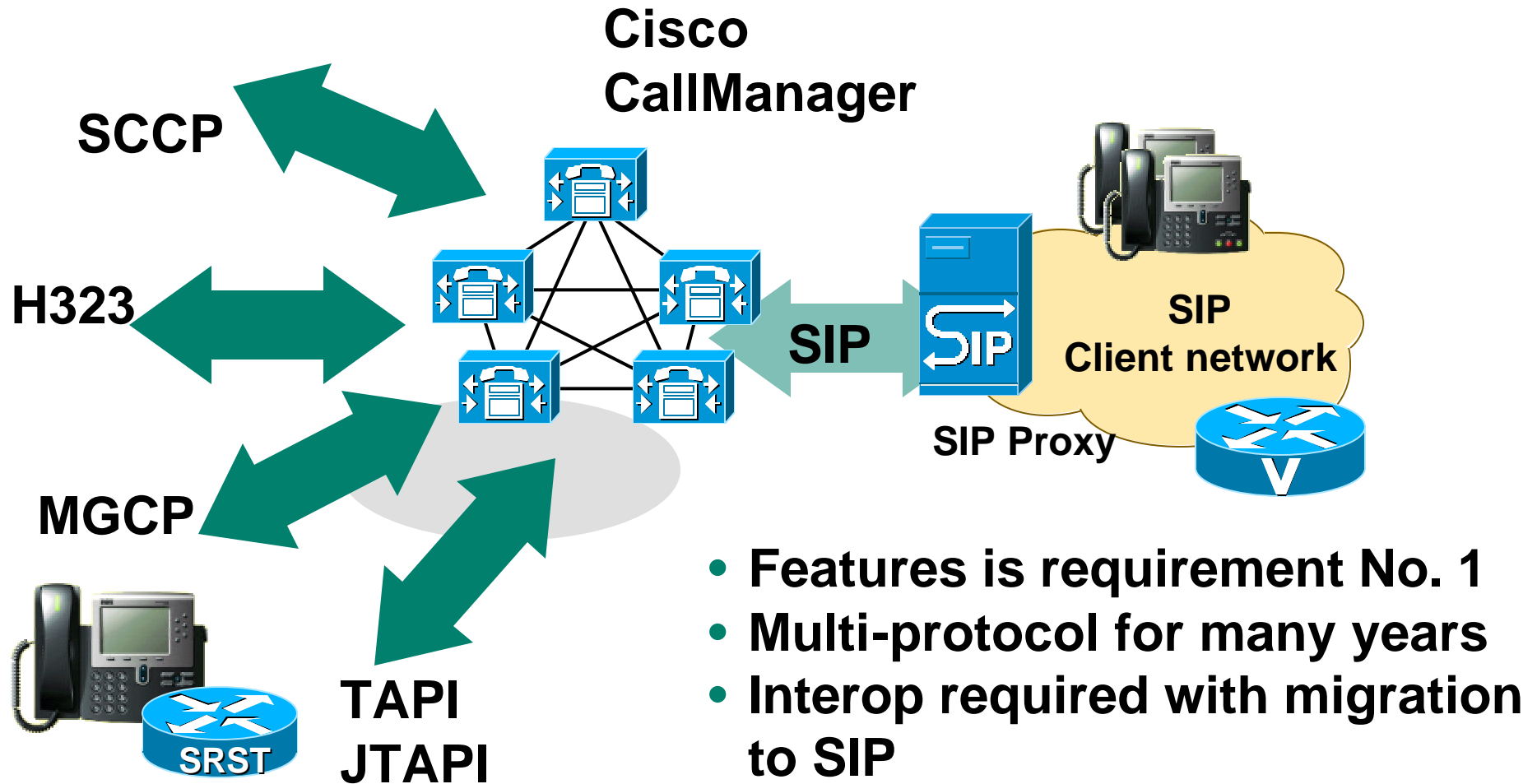
- **Software application within Cisco AVVID architecture**

- **Provides call processing, call control, feature control to phones, gateways, devices**

- **Shared resource manager for VoIP gateways, conference bridges, etc.**

- **Host for call control APIs (TAPI/JTAPI) and configuration APIs (AXL) to third-party applications and devices**

- **Enabled by industry standard WinTel platforms (MCS 7800 Series, ICS 7750)**

Multi-Protocol IP Telephony

Cisco CallManager

SCCP

H323

MGCP

SRST

TAPI JTAPI

SIP

SIP Proxy

SIP Client network

- **Features is requirement No. 1**
- **Multi-protocol for many years**
- **Interop required with migration to SIP**

Cisco Portfolio of IP Phones and Analog Adaptors/Gateway

FEATURES

Cisco IP Phone 7960G
- 145X100 pixel, grayscale display
- 4 soft keys
- 6 programmable line keys
- High quality speaker phone
- Line/local power
- 2-port Ethernet switch
- Supports/enables XML apps.

Cisco IP Phone 7940G
- 145X100 pixel, grayscale display
- 4 soft keys
- 2 programmable line keys
- High quality speaker phone
- Line/local power
- 2-port Ethernet switch
- XML applications

Cisco IP SoftPhone
- Windows-based IP phone client
- Phone control and standalone modes
- VPN client support
- USB handset support
- Intuitive user interface

Cisco IP Phone 7910G and 7910G+SW
- 2x24 character display
- 6 feature keys
- Single line
- Line/local power
- 7910G+SW has a 2-port Ethernet switch

Cisco IP Conference Station 7935
- High quality, state of the art speakers
- Hands-free conference phone
- Standard features

Cisco VG248 Analog Phone Gateway
- 48 FXS Ports
- Single 10/100 port, single PSU
- 2 RJ-21 Telco connectors
- Fax and modem
- Legacy voicemail (SMDI)
- Fully featured

Cisco IP Phone 7905G
- 192x64 pixel, monochrome display
- 4 soft keys
- Line/local power
- 1 RJ-45
- Single line

Cisco ATA 186/188
- 2 FXS Ports
- 1 RJ-45 10BaseT uplink (Cisco 186 ATA)
- 1 RJ-45 10/100BaseT data port (Cisco ATA 188)

Productivity Applications
Cisco IP Phones

- **Brings the power of WWW to Cisco IP Phones (7960 and 7940)**

- **Provides a dynamic and interactive environment among users, the enterprise, and the Internet—all through the Cisco IP Phone User Interface**

- **Utilizes modern web technologies for application services**

  - **XML-based data tags for phone content processing (text menu, text, input, directory, graphic image, graphic menu)**

  - **HTTP for transport**

  - **IP Phone Appls—processes clear text and static set of XML objects; doesn't process HTML tags**

What is E9-1-1?

- **Emergency calls routed to the right emergency center**

- **Call-taker knows the caller's location and can return the call**

- **Multi-Line Telephone Systems:**

  Identify at least the bldg and floor of a 911 caller

911

PSAP California

Central Site California

San Jose CO Switch

911 Selective Router

PSTN

IP WAN

New York CO Switch

911 Selective Router

Remote Site New York

911

PSAP New York

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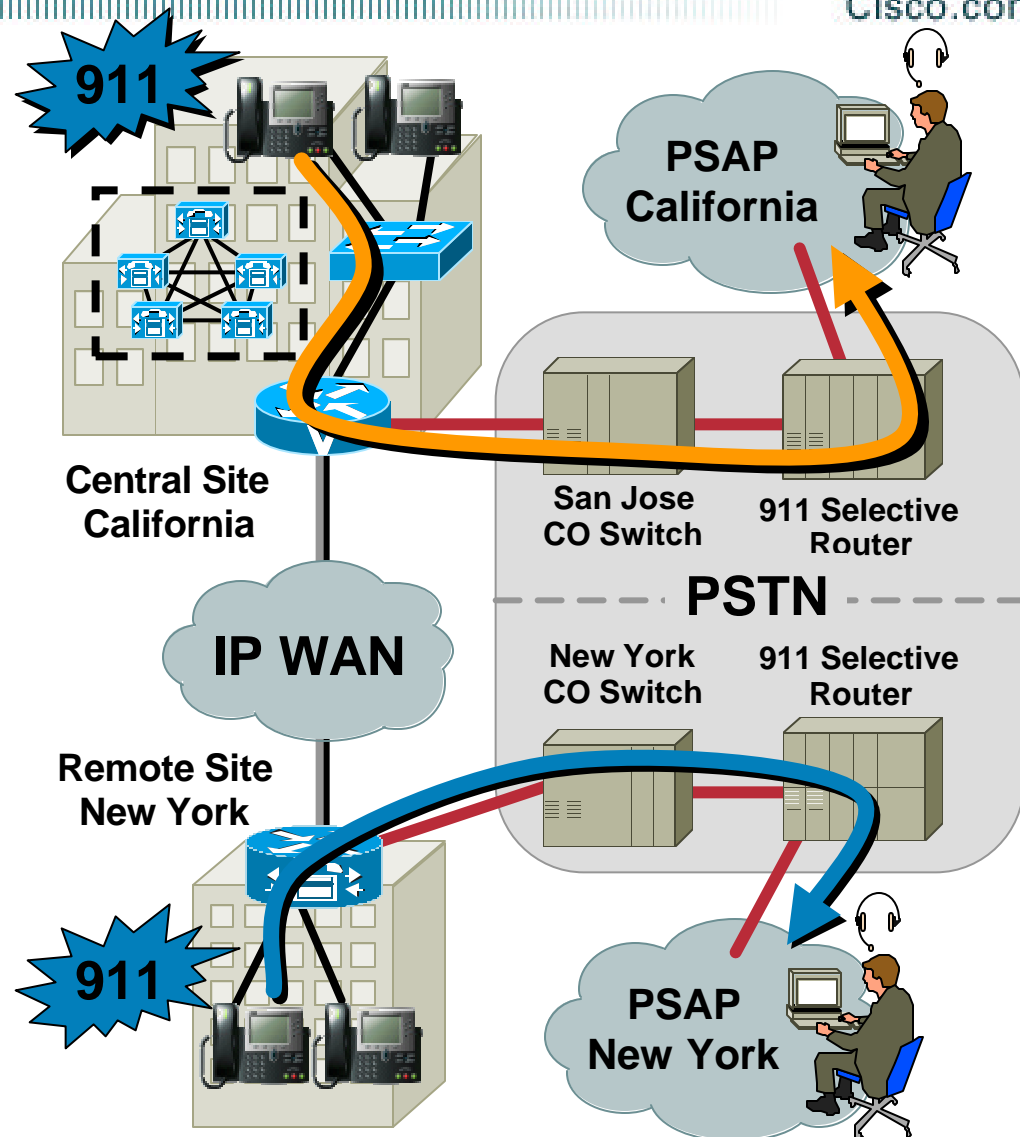
Cisco ER:
Differentiating Features

Proposed/Legislated E9-1-1 Requirements:

	Cisco Support		Trad PBX Support	
	Stationary	Nomadic	Stationary	Nomadic

- **Automatically provide location of 911 callers to public safety answering point (PSAP):**

  Identify precise floor of 911 caller when in any building over 7,000 ft^2 containing 48+ people {NENA[*] model legislation}

  Identify 911 caller to within 40,000 ft^2 {Illinois legislation}

- **Enable callback from PSAP to 911 caller**

  * NENA= National Emergency Numbers Association

Types of Endpoints

	Cisco Support		Trad PBX Support	
	Stationary	Nomadic	Stationary	Nomadic
	✔	✔	✔	☐
	✔	✔	✔	☐
	✔	✔	✔	☐
	✔	✔	✔	☐

Extension Mobility

Building A

CallManager Cluster

Ring

- **IP Phone and Extension Mobility allows you to be reachable anywhere on the network**

Campus IP Network

Building B
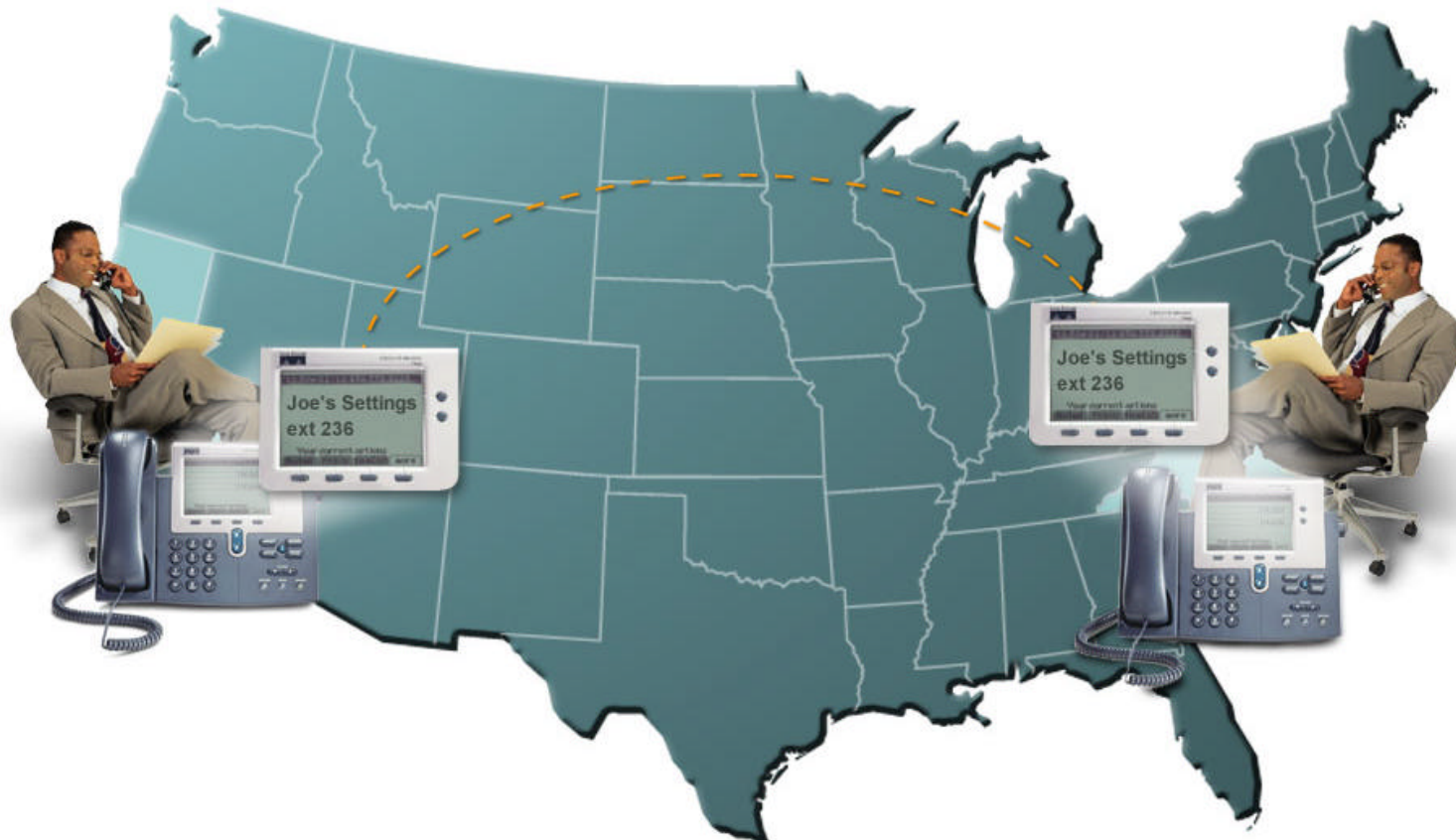
Building C

Ring
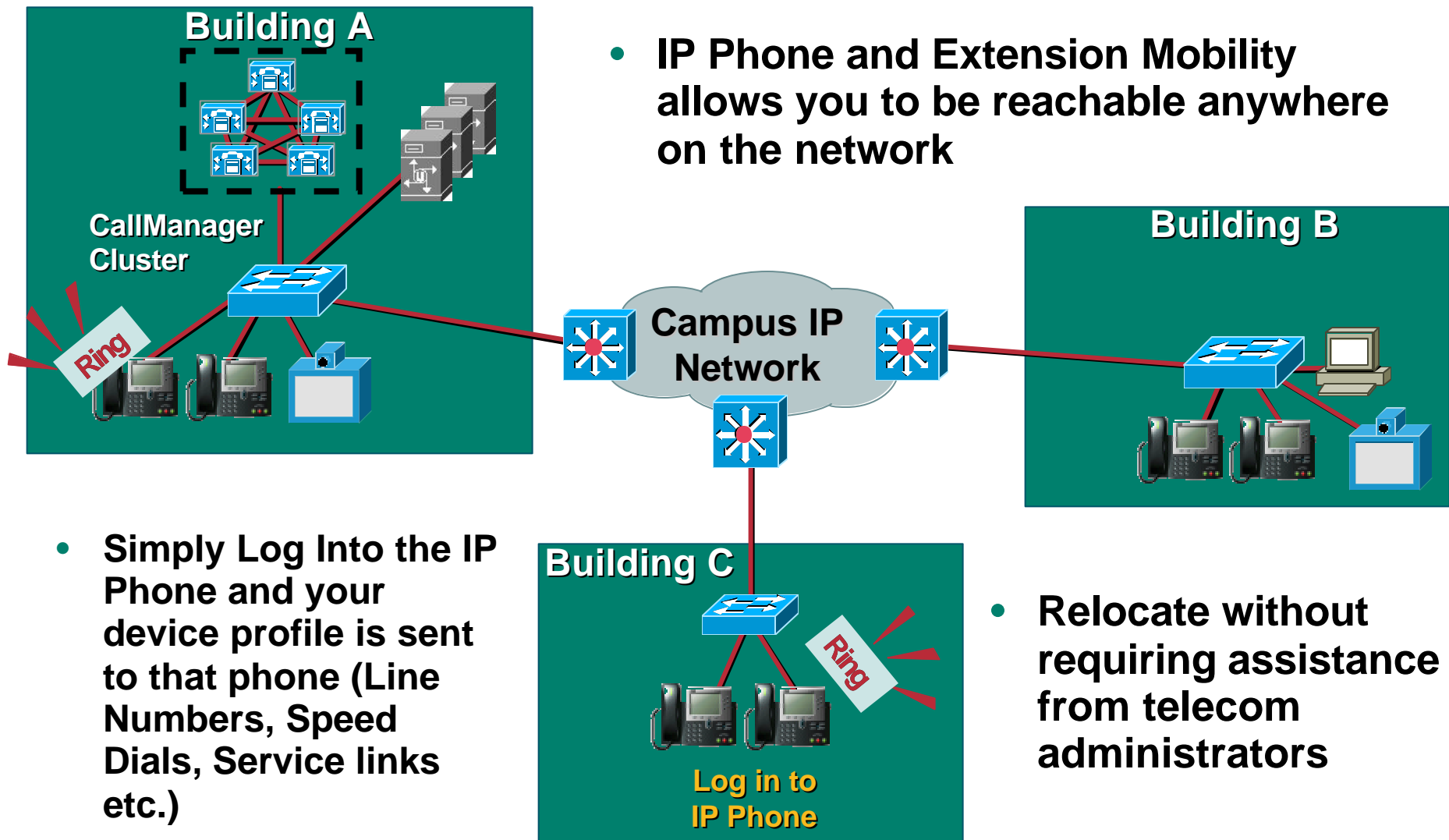
Log in to IP Phone

- **Simply Log Into the IP Phone and your device profile is sent to that phone (Line Numbers, Speed Dials, Service links etc.)**

- **Relocate without requiring assistance from telecom administrators**

Virtualizing the Office Extension Mobility

Joe's Settings
ext 236

Joe's Settings
ext 236

- **User logs into any IP Phone at remote office**
- **Personal settings available on remote IP phone**
- **IP Phones can point to any available server anywhere**
- **Ideal for mobile office worker**
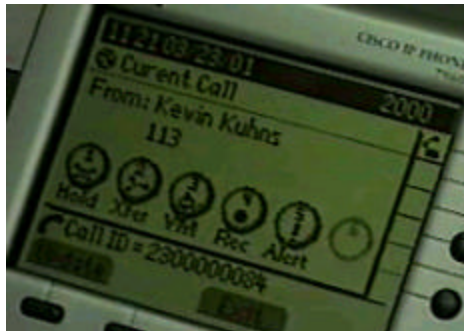
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Vertical Markets
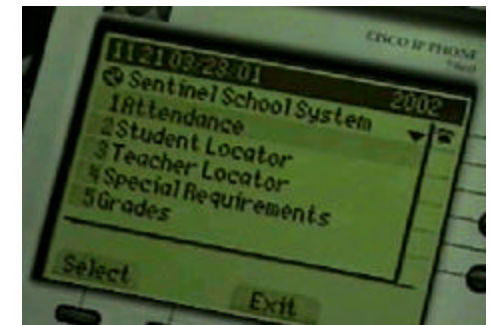## *Exploring the Possibilities*

Government (State, Local, Federal)

Hospitality
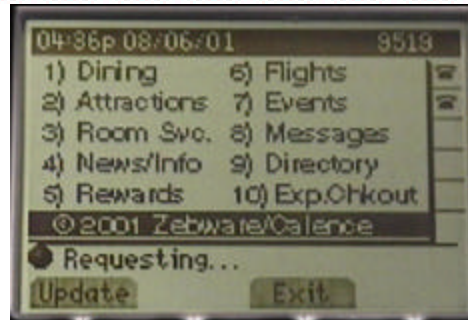
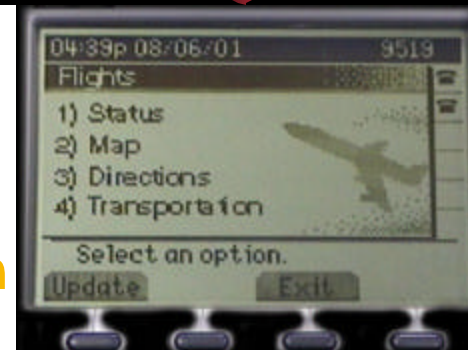**Retail and Distribution**

Colleges and Universities

Transportation

Secondary (K-12) Education

# Colleges and Universities: *Real possibilities*

IP Telephony Applications

- **Empower employees**
- **Competitive Advantage**
- **Customer Satisfaction**
- **Employee Satisfaction**
- **Revenue Generation**
- **Cost Controls / Reductions**

Colleges and Universities

- On-Screen Class Registration
- On-Screen Advertisements
- On-Screen Ticket Sales
- On-Screen Book Sales
- On-Screen "location finder"
- On-Screen scheduling
- On-Screen Email for targeted messages

Horizontal Markets
Enterprise-Wide Examples
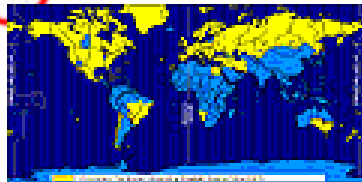
World Clock

Meeting Room Scheduler
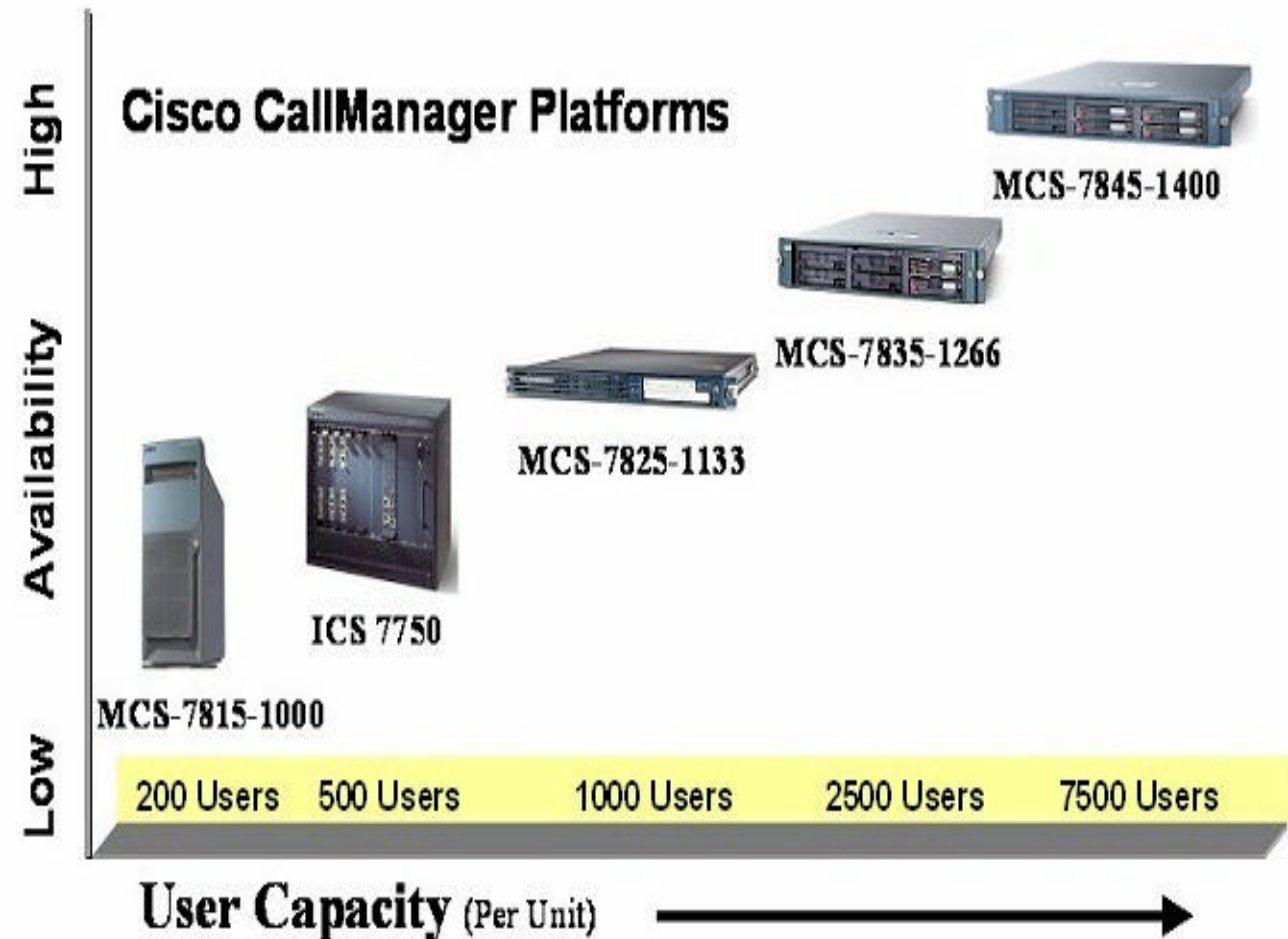
Yellow Pages Lookup

Weather

Flight Status

Stock Tracker

Transit Schedules

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Cisco Media Convergence Servers

Customer Benefits

- The MCS 7800 Family of Media Convergence Servers provide highly reliable Windows 2000 server platforms to host voice applications – ranging from 200 up to 7500 users.

- Delivers the high performance and availability demanded by today's enterprise networks

- Represent a turnkey call processing solution that is easy to deploy and highly cost-effective

Cisco CallManager Platforms

High ← → Low (Availability)

MCS-7845-1400
MCS-7835-1266
MCS-7825-1133
ICS 7750
MCS-7815-1000

| 200 Users | 500 Users | 1000 Users | 2500 Users | 7500 Users |

User Capacity (Per Unit) →

Voice Enabled Infrastructure

Catalyst 6500

Cisco AS5350

Catalyst 4000

HIDS

Cisco 3600

Cisco 3550 Series

Cisco 2600

PIX Firewall

Cisco VG200

Cisco 2900 Series

IOS Firewall

Cisco 1750

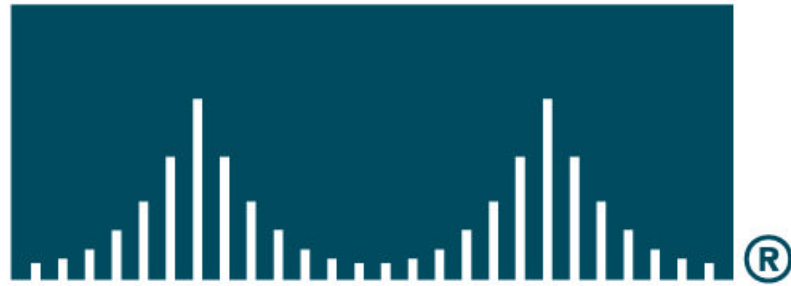**Switches**   **Routers**   **Security**

Cisco IP Telephony – a successful solution

Cisco.com

- **Over One Million Cisco IP phones shipped**

- **34,000 Cisco employees using IP Communications worldwide— over 100 PBXs replaced globally**

- **Longevity of IP telephony customer deployments: New Zealand Ministry of Social Policy, Datek Online, Cray, Merrill Lynch, Key Bank, Hartford Public Schools**

- **IP Telephony Phone market leader… 52% market share (Cal Q2, 2002 Synergy Res.)**