New IP Telephony Update—Cisco ICS 7750
Session 2007
Cisco ICS 7750

AVVID Solution for Small, Medium and Enterprise Branch Offices

Agenda

- Cisco ICS 7750 Product Overview
- Complimentary Products
- Applications
- Design Considerations
- Summary
Cisco ICS 7750

Product Overview

Cisco AVVID Product Family:
Scalable, End-to-End Solutions

Cisco MCS 7820
Catalyst 4000
with voice gateway
or any Catalyst Switch

Cisco MCS 7830, 7835
Catalyst 6000
with voice gateway
or any Catalyst Switch

Cisco ICS 7750 and
Catalyst 3500-XL + PWR
or any Catalyst Switch

Price —
Performance/
# of Ports

No. users 20 100 150 200 500 1000

Small/Medium Branch Office
Small Business

Medium Business

Large Branch Office
IP Telephony Buying Criteria

- Open architecture—standards based for interoperability
- Scalability—meet growth for the next 5 years, simple expansion
- High availability—10/100BaseT Fast Ethernet, fault tolerant
- Network solutions—Least cost routing, failover, network dial plan
- IP Phone—web based integration, CTI
- Redundancy options—CPU and power
- Applications—for today and tomorrow
- Service and support

Integrated Communications “Portal” for Businesses

- Terminals
  - IP phones
  - Softphone
  - Web attendant
  - Desktop PC
  - Wireless

- Applications
  - System Management
  - Voice Mail
  - AutoAttendant
  - Unified Messaging
  - IVR
  - Web CallCenter
  - Personal Assistant

- Connectivity
  - PSTN
  - WAN Internet

- Multimedia
  - Data
  - Voice
  - Video
Product Overview
Cisco ICS 7750

- AVVID-based integrated IP telephony system
- Proven IOS-based Multiservice Router and voice gateways
- Embedded Application Servers for Voice Mail, Auto Attendant, and other apps
- Call Manager 3.0 software
- Integrated Web-based system management
- Dual port 10/100 switch interface for connectivity to recommended QoS enabled Cisco Catalyst switches
- Typical configurations to 150 stations

ICS 7750 Logical Diagram
Cisco ICS 7750
Typical System Configuration

Components Overview
Cisco ICS 7750 Components

- System platforms:
  - Catalyst data switches
  - Cisco ICS 7750 system

- ICS system and resource cards:
  - System Switch Processor
  - System Alarm Processor
  - Multiservice Router Processor
  - System Processing Engine
  - Analog Station Interface

- ICS platform components:
  - Power supply
  - Redundant power supply (option)
  - Fan tray
  - UPS (external option)

ICS Resource Cards
Six Universal Slots for:
- Call Manager System Processing Engine (1+1 redundancy)
- Voice mail and applications SPEs
- MRP for router, trunk and DSP
  - VIC: FXO, FXS, E&M, T1-CAS with DSU/CSU
  - WIC: T1 with CSU and BRI

Future Releases:
- ASI—16 port analog, FXS ports
- DSP farm
- Higher density FXO
- E1
- ISDN PRI/BRI VIC
- Multi app SPE
Cisco ICS 7750 Chassis—Front View

- 6 Interchangeable Slots
- 2 Fixed Slots
- 2 Slots for Power Supplies
- Fan Tray

System Cards
System Processing Engine (SPE)

- Windows 2000 computer running system software
- Pentium II processor with up to 512 MB memory
- Resides in an interchangeable slot
- One is required, up to five allowed for redundancy/additional apps
System Cards
Service Alarm Processor (SAP)

- Monitors the status of:
  - Chassis
  - Power supplies
  - Fans
- Communicates status to SPE
- Single SAP resides in fixed slot 8

Processor Cards
System Alarm Processor (SAP)

STATUS LED
PWR 1 LED
FAN LED
SHTDN Button
COM 1
COM 2
CONSOLE

ALARM LED
PWR 2 LED
TEMP LED
System Cards
System Switch Processor (SSP)

- Eight port Ethernet Switch
- Two RJ-45 switched 10/100 Ethernet ports connect to Catalyst switches
- All telephony signaling and voice destined outside the Cisco ICS 7750 will travel across these two ports
- Single SSP resides in fixed slot 7

Processor Cards
System Switch Processor (SSP)

- STATUS LED
- ALARM LED
- SHTDN button
- 10/100 Ethernet Ports
- 1X LED
- 2X LED
Voice and data router
- Supports up to two WIC/VIC’s
- No Flash memory
- Resides in an interchangeable slot
- Maximum of five are supported
Processor Cards
Multiservice Route Processor (MRP)

STATUS LED
ALARM LED
SLOT 0 LED

SHTDN button

SLOT 1 LED

Slot 0

Slot 1

Wan Interface Cards (WICs)

- 1T WIC
- 2T WIC
- 2A/S WIC
- 1B-S/T WIC
- 1B-U WIC
- 1DSU-56K4 WIC
- 1DSU-T1 WIC
Voice Interface Cards (VICs)

- 2FXS VIC
- 2FXO VIC
- 2E&M VIC

MultiFlex Voice and Data
- 1MFT-T1 VWIC
- 2MFT-T1 VWIC

Cisco ICS 7750

Complimentary Products
Catalyst 3524-PWR-XL Stackable In-Line Power

- Line power for Cisco IP phones, with autodetect
- Enhanced voice quality (QoS)
- 24 10/100 Ethernet ports and 2 GBIC

Cisco Second Generation IP Telephones
Cisco 7960 IP Phone

- Two RJ-45, switched, 10/100Mbps, half—or full-duplex, Ethernet ports
- Headset and console ports
- Category 3 or 5 cabling for 10 Mbps connections
- Category 5 cable for 100 Mbps connections
- Supports G.711 and G729a compression

Cisco 7960 IP Phone

- LCD
- Line or Speed Dial Buttons
- Footstand Adjustment
- Soft Keys
- "i" Button
- On-Screen Mode Buttons
- Volume Buttons
- Function Toggles
- Scroll Keys
- Dial Pad
- Speaker
- Handset
Cisco 7910 IP Phone

- Single-line phone with four fixed feature buttons
- Two-line, 20 characters per line, LCD display
- Two RJ-45 ports

IP Addressing Deployment Options

- **IP Phone and PC on Same Switch Ports**
  - 171.68.249.100
  - 171.68.249.101
  - Real IP Addresses

- **IP Phone and PC on Separate Switch Ports**
  - 171.68.249.101
  - 171.68.249.100
  - Real IP Addresses

- **IP Phone and PC Share the Same Device (Soft Phone)**
  - 10.1.1.1
  - 171.68.249.100
  - Real IP Addresses

- **IP Phone uses “10.0.0.0” Network**
  - 171.68.249.100

- **IP Phone Uses “10.0.0.0” Network**
  - 10.1.1.1
  - 171.68.249.100
What Happens Inside the Phone

- IP phone sends voice packets (RTP stream) marked at CoS/ToS value 5
- PC may or may not send a CoS
- Phone can manipulate PC CoS
- Capabilities of switch will determine what can be achieved

PC Is Not Trusted
Normal Mode

Phone Sets PC CoS to Zero

Untrusted Phone ASIC will re-write CoS = 0
PC Is Trusted

Phone Does Not Change PC CoS

Catalyst Auxiliary VLAN

This feature provides automatic phone VLAN configuration

- No end-user intervention required
- Provides the benefits of VLAN technology for the phone
- Preserves existing IP address structure
- Uses 802.1Q technology between switch and phone
Catalyst Switch <-> Phone Interaction Plug and Play Operation

1. Phone Discovery
2. Provide Power
3. CDP

- Unpowered phone plugs into powered linecard port
- Port senses the device using phone discovery mechanism and reports it to the supervisor
- Supervisor checks power budget, allocates default amount and informs port to apply power
- Port turns on power to the phone and reports LinkUp to supervisor, once the PHY on the phone is enabled.
- If phone was powered by external patch panel or wall power, switch port will report LinkUp to Supervisor
- Phone begins CDP exchange with the switch and gets its VLAN ID (VVID) as well as reports actual power needed for operation.
- Phone will now send a DHCP request on that VLAN for an IP address

Phone’s Actions on Startup

1. Get IP address, mask, DNS, etc.
   - Static or DHCP
2. Get TFTP server address
   - Static address
   - Use any one
   - Option 150 (single IP address)
   - Option 66 (first IP address or DNS name)
   - Look up CiscoCM1.your.domain
3. Get configuration from CallManager TFTP*
   - List of up to three CallManagers
   - Region info and keyboard template
   - Version of code to run
4. Get new code (one time only)
5. Register with CallManager

*Use configuration in Flash after timeout
Cisco ICS 7750 Applications

ICS System Manager
Cisco ICS 7750

ICS 7750 System Manager is an integrated, easy-to-use interface to operate, administer, and manage your Cisco ICS 7750.

- **Configure** to setup your Multiservice Route Processor, System Switch Processor, and telephony applications.
- **Monitor** to check real-time status of various components of ICS 7750.
- **EventManager** to diagnose and troubleshoot system problems.
- **Software Upgrade** to manage software images.
- **Security** to manage user access.
Cisco IP SoftPhone

Windows IP phone client for CallManager 3.0
Standards based: TAPI, DirectXMedia and LDAP

IP SoftPhone—Fingertip Features

- Standalone or with IP phone
- Control IP phone
- Is phone on PC
- Easy feature access
- One click conference and transfer
- Keyboard shortcuts
- Directory integration
- Personal and public (LDAP)
- Dial by name/email address
Cisco ICS 7750
Design Considerations

An End-to-End AVVID Network
ICS 7750 simplifies the EBO network deployment and manageability while maintaining interoperability with the Enterprise campus.

The communications, applications and information “portal” for internet business solutions
Some Design Considerations

- Support for up to 214 devices per system
- Voicemail support from Cisco or 3rd party
- Switched network design for high availability
- Call manager cluster for redundancy and scaling
- Inline power to phone sets
- Single cable for phone and PC
- Quality of service from the desktop
- IP addressing plan

Cisco ICS 7750 Product Roadmap

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Cisco ICS 7750
Summary

• An integrated communications system:
  Platform: Converged business solution for IP data, voice, video and applications
  Networks: Multiservice LAN, WAN, PSTN, and legacy PBX connectivity
  Applications: Core voice applications and converged voice, data, and video applications
  System Management: Web-based tool manages entire system locally or remotely—voice, data networks, applications, common directory; works with CiscoView

• Supports up to 150 users in typical configurations
• Interoperates with other AVVID-based products
  Customer investment protection

For More Cisco ICS 7750 Information

• Attend other AVVID and Call Manager sessions at Networkers 2000