

Cisco Wholesale Voice Solution Release Notes

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Document Release

This is the first release of this document. Reasons for subsequent releases will be noted in this section.

Introduction

The Cisco Wholesale Voice Solution provides service providers (SPs) with the required architecture design, network components, software features, functional areas, and provisioning methodologies needed to run a VoIP wholesale service. With an understanding of the concepts underlying the



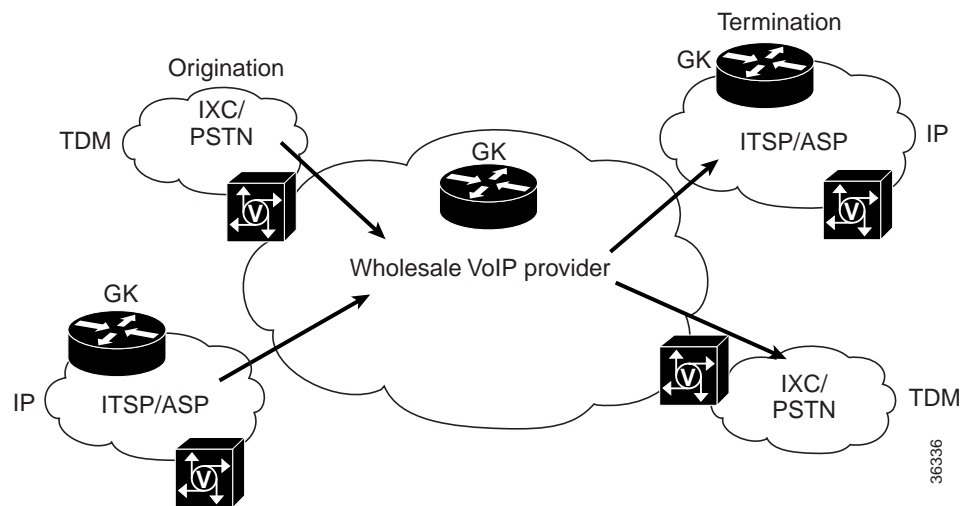
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architecture, including interconnect topologies, components, and a variety of important issues that must be considered, the SP can then deploy options from a set of configuration templates. The result is a wholesale network that allows the SP to sell unbranded voice services to retailers, such as Internet telephony service providers (ITSPs), application service providers (ASPs), interexchange carriers (IXCs), or Post Telephone and Telegraph administrations (PTTs).

Central to the delivery of wholesale voice services are voice points of presence (POPs), which are interconnected to other service providers. The specific recommended components and design methods are determined by the type of interconnection or “call topology” that the wholesale SP is supporting. These call topologies are used to build a set of deployment templates for an SP to enable wholesale applications. [Figure 1](#) illustrates the interconnection possibilities that a wholesale VoIP provider must accommodate.

Figure 1 Possible Interconnect Scenarios



The Cisco Wholesale Voice Solution is a *set* of solutions and network design and configuration templates that provide trunk-level transport of global switched telephone traffic distributed over VoIP. Calls originate in the PSTN, are routed through IXCs, and are handed off to a wholesale VoIP carrier for transport. To the end user, the service looks like any other long-distance call, except that it is less expensive. To the originating long-distance carrier, the wholesale carrier is only one of a number of termination options.

By using OPT (Open Packet Telephony) distributed architectures, the Cisco Wholesale Voice Solution maintains separate call control, connection control, and transport planes. At the heart of the solution are Cisco gateways (GWs), gatekeepers (GKs), and directory gatekeepers (DGKs), as well as an IP backbone. This solution will provide other network providers with connectivity between basic telephone areas and international routes. (Local residential services and features will not be provided.) The remaining components of the solution are third-party shared services that will vary with each application—such as settlement servers, billing servers, and AAA (authentication, authorization, and accounting) servers, among others.

See [Related Documentation, page 11](#), in particular the *Cisco Wholesale Voice Solution Overview*, for a complete discussion.

Benefits and Features

The Cisco Wholesale Voice Solution provides the following benefits:

- Voice quality that is comparable to that of the PSTN
- A cost-effective, reliable VoIP network infrastructure
- Support for least-cost routing and other enhanced call-routing methods
- Intercarrier call authorization and accounting (peer to peer)
- Support for intercarrier clearinghouse and settlement services
- Support for local, national, and international dial plans
- Connectivity with the PSTN over carrier interfaces
- Connectivity with other VoIP service providers and other vendors' VoIP equipment
- A world-wide network of other VoIP service providers interested in interconnecting

System Requirements

The Cisco Wholesale Voice Solution uses both Cisco and third-party components, as listed in the following sections:

- [Cisco Hardware and Software Components](#)
- [Cisco Network Management Components](#)
- [Third-Party Components](#)

Cisco Hardware and Software Components

Cisco Core Components and Minimum Requirements

The components comprising the Cisco Wholesale Voice Solution were tested with Cisco IOS software releases 12.2(2)XA and 12.2(T). The caveats listed under [Caveats, page 9](#), relate to these releases. However, those caveats will be resolved in releases 12.2(2)XA1 and 12.2(2)T1. Cisco recommends that you use the later releases. Please contact your Cisco account representative for further information.



Tip

To determine the release currently running on a machine, see [Determining Software Release Versions, page 8](#).

[Table 1](#) lists *minimum* requirements of the tested Cisco components that support the gatekeeper core for both SS7 and non-SS7 applications. Flash and DRAM memory requirements must be met to download the image.

Requirements can vary depending on whether IP Plus or Enterprise Plus Cisco IOS software images are used, and whether the images support OSP (Open Settlement Protocol). For more detail about the various images and their filenames, see [Table 2 on page 5](#).

Table 1 Cisco Core Components and Requirements, Including Minimum Recommended Memory

Component	Hardware	Cisco IOS Release Required	Flash Memory Required, MB	DRAM Memory Required, MB	Hard Disk, GB
Cisco Voice Gateways	Cisco 3640	12.2(2)T	16 ¹ or 32 ²	64 ¹ or 96 ²	—
	Cisco 3660	12.2(2)T	16 ¹ or 32 ²	64 ¹ or 96 ²	—
	Cisco AS5300	12.2(2)XA	16	128	—
	Cisco AS5350	12.2(2)XA	32	256	—
	Cisco AS5400	12.2(2)XA	32	256	—
Cisco H.323 Gatekeepers and Directory Gatekeepers	Cisco 3660	12.2(2)T	8	64	—
	Cisco 7200	12.2(2)T	16	128	—
Cisco Signaling Controller ³	Cisco SC2200 (Sun Netra t 1400)	Signaling Controller Software Release 7.4(11)	—	2048	4
Cisco SS7 Signaling Link ³ Terminal	Cisco 2611	Custom 12.2(2)T image	16 MB	48 MB	—
Cisco Switch (optional)	Catalyst 5000 or 6000 series	12.0(7)XE1 with Release 5.5(1)	—	—	—

1. IP Plus and IP Plus with OSP
2. Enterprise Plus and Enterprise Plus with OSP
3. Only for applications requiring SS7 signaling

Cisco IOS Software Image Filenames for Gateways and Gatekeepers

Table 2 lists the filenames of the images required on the Cisco gateways and gatekeepers. Cisco IOS software can optionally support OSP. Although the functionality is the same, the binary images are different. Please check with your Cisco account representative for details regarding the image variants and your requirements.

The image variants are identified as follows:

Identifier	Image Variant
-is-	IP Plus
-js-	Enterprise Plus
-ik8s-	IP Plus with OSP
-jk8s-	Enterprise Plus with OSP
-ix-	IP with H.323

Table 2 Required Cisco IOS Software Images, with and without OSP Support

Component	Hardware	Cisco IOS Image Filename	
		Without OSP Support	With OSP Support
Cisco Voice Gateways	Cisco 3640	c3640-is-mz.122-2.T.bin	c3640-ik8s-mz.122-2.T.bin
		c3640-js-mz.122-2.T.bin	c3640-jk8s-mz.122-2.T.bin
	Cisco 3660	c3660-is-mz.122-2.T.bin	c3660-ik8s-mz.122-2.T.bin
		c3660-js-mz.122-2.T.bin	c3660-jk8s-mz.122-2.T.bin
	Cisco AS5300	c5300-is-mz.122-2.XA.bin	c5300-ik8s-mz.122-2.XA.bin
		c5300-js-mz.122-2.XA.bin	c5300-jk8s-mz.122-2.XA.bin
	Cisco AS5350 ¹	c5400-is-mz.122-2.XA.bin	c5400-ik8s-mz.122-2.XA.bin
		c5400-js-mz.122-2.XA.bin	c5400-jk8s-mz.122-2.XA.bin
Cisco AS5400	c5400-is-mz.122-2.XA.bin	c5400-ik8s-mz.122-2.XA.bin	
	c5400-js-mz.122-2.XA.bin	c5400-jk8s-mz.122-2.XA.bin	
Cisco H.323 Gatekeepers and Directory Gatekeepers	Cisco 3660	c3660-ix-mz.122-2.T.bin	—
	Cisco 7200	c7200-is-mz.122-2.T.bin	—
Cisco Signaling Controller ²	Cisco SC2200 (Sun Netra t 1400)	Signaling Controller Software Release 7.4(11)	—
Cisco SS7 Signaling Link ^{2s} Terminal	Cisco 2611	Custom 12.2(2)T image	—
Cisco Switch (optional)	Catalyst 5000 or 6000 series	12.0(7)XE1 with Release 5.5(1)	—

1. The Cisco AS5350 is functionally similar to the Cisco AS5400.

2. Only for applications requiring SS7 signaling

Cisco Network Management Components

Table 3 lists Cisco optional Cisco network management components and their minimum requirements.

Table 3 Cisco Network Management Components

Component	Minimum Cisco Software Release Required	Platform Hardware	Platform Software	RAM Memory Required, MB	Hard Disk, GB
CiscoWorks2000 Voice Manager (CVM)	CVM Release 2.0.2	Windows server with 450 MHz CPU	Windows NT 4.0 with Service Pack 5, CiscoWorks2000 CD One	256	8
		Sun server (SPARC/ UltraSPARC) with 333 MHz CPU	Solaris 2.6 with kernel patch 105181-xx, CiscoWorks2000 CD One for Solaris	256	8
		Any client	Windows 95 running Netscape 4.04 or Internet Explorer 4.01 and 64 MB of virtual memory; or Windows NT running Netscape 4.04 or Internet Explorer 4.01 and 64 MB of virtual memory; or Solaris running Netscape 4.04 with Telnet and Java enabled and 64 MB of virtual memory	64	—

Table 3 Cisco Network Management Components (continued)

Component	Minimum Cisco Software Release Required	Platform Hardware	Platform Software	RAM Memory Required, MB	Hard Disk, GB
Cisco Internet Performance Manager (IPM)	IPM Release 2.3, Cisco IOS 12.1(3) or later	Windows server and client	Windows NT 4.0 with Service Pack 6a; Windows 2000 Professional with Service Pack 1; Windows 2000 Server with Service Pack 1; Windows 98 (client only)	—	—
		Sun server and client	Solaris 2.6 or 2.7 with latest patches	—	—
Cisco Info Center ¹	CIC Release 2.0		Solaris 2.6 or 2.7 with latest patches	variable	variable

1. Requirements depend upon client-server architecture. See Internetwork Performance Monitor, Release 2.3, at the following URL: <http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/ipmcw2k/cipm23/index.htm>

Third-Party Components

Table 4 lists third-party components that have been tested as optional adjuncts to the Cisco Wholesale Voice Solution. For the most current information, contact your Cisco account representative, visit the manufacturer's website, or contact the manufacturer's representative.

Table 4 Third-Party Components

Component	Manufacturer	Product and Version	Website
OSP server	TransNexus	ver. 11142000 (on Solaris 2.7)	http://www.transnexus.com
Billing server	MIND CTI	iPhonEX ver. 4.10.010	http://www.mindcti.com
IVR prompt server	SUN	TFTP server utility on SPARC or UltraSPARC running Solaris 5.6	http://www.sun.com

Determining Software Release Versions

Cisco IOS

To determine the release version of Cisco IOS software currently running, log in to the router and enter the **show version EXEC** command. The following sample output from the **show version** command indicates the version number on the second output line:

```
Router> show version
Cisco Internetwork Operating System Software
IOS (tm) 12.1 Software c5300-i-mz, Version 12.1(6), RELEASE SOFTWARE
```

Cisco SC2200

Enter the following MML command on the Cisco SC2200:

```
rtrv-ne
```

New Features

Table 5 lists key new features that are applicable to components that support the Cisco Wholesale Voice Solution with Cisco IOS Release 12.2(2)XA. These features and others in that release are described in detail under New Features in Release 12.2(2)XA at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122x/122xa/122xa_2/index.htm



Caution

For all available features, always refer to the most recent Cisco IOS documentation, including release notes, for the Cisco IOS a particular platform is running. See Cisco IOS Software Configuration at the following URL:

<http://www.cisco.com/univercd/cc/td/doc/product/software/index.htm>

Table 5 *New Features Supported by Cisco IOS Release 12.2(2)XA for the Cisco Wholesale Voice Solution*

Feature	Platform
Advanced Voice Busyout	Cisco AS5300, Cisco AS5350, Cisco AS5400
Call Admission Control for H.323 VoIP Gateways	Cisco AS5300, Cisco AS5350, Cisco AS5400
Four SS7 Link Support on the Cisco Signaling Link Terminal	Cisco SLT

Table 5 *New Features Supported by Cisco IOS Release 12.2(2)XA for the Cisco Wholesale Voice Solution*

Feature	Platform
H.323 Scalability and Interoperability Enhancements	GKs and GWs: Cisco 3600 series; GWs: Cisco 7200 series, Cisco AS5300, Cisco AS5350, Cisco AS5400
H.323 Version 2 Support	Cisco 3600 series, Cisco AS5300
Inter-Domain Gatekeeper Security Enhancement	Cisco 3600 series, Cisco AS5300, Cisco 7200 series
Location Confirmation Enhancements for Alternate Endpoints	Cisco 3600 series, Cisco 7200 series
SS7 Interconnect to Lucent 1AESS Switches	Cisco AS5400
Supported IOS Software Features for Cisco AS5400 and Cisco AS5350 Universal Gateways on Cisco IOS Release 12.2(2)XA	Cisco AS5350, Cisco AS5400

Platform Support Through Feature Navigator

Cisco IOS software is packaged in feature sets that support specific platforms. To get updated information regarding platform support for this feature, access Feature Navigator. Feature Navigator dynamically updates the list of supported platforms as new platform support is added for the feature.

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image.

To access Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions at <http://www.cisco.com/register>.

Feature Navigator is updated when major Cisco IOS software releases and technology releases occur. As of May 2001, Feature Navigator supports M, T, E, S, and ST releases. You can access Feature Navigator at the following URL:

<http://www.cisco.com/go/fn>

Caveats

Table 6 lists severity 1 and 2 caveats for the Cisco Wholesale Voice Solution, and presents workarounds where applicable.



Tip

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, go to Cisco.com and press Login. Then go to Software Center > Cisco IOS Software > Cisco Bugtool Navigator II. You can also go directly to <http://www.cisco.com/support/bugtools/>.

Table 6 Release Caveats and Workarounds

Solution Release 2.0		
DDTS Number	Caveat	Workaround
CSCds09939	Some voice calls get dropped if initiated simultaneously.	Caller must redial.
CSCds35073	Wrong number of B-channel is displayed.	Calls may be accepted when the NFAS D-channel(s) are Out Of Service.
CSCdt35119	ISDN Layer 2 is not up as a result of a ds0-busyout.	There is no workaround.
CSCdt89231	dB differences between DTMF tones are out of spec on E&M.	Configure the VWIC for analog E&M Type 1, 4-wire, wink-start.
CSCdu13767	Controller crashed on a 5300 running as a callgen with NEAT_CRASHED exception. Unreproducible.	There is no workaround.
CSCdu13866	Cisco 3640 E&M wink returns immediate busy upon incoming call.	There is no workaround.
CSCdu14929	OSP configuration is modified during reload, so signature is not verified.	Generate new keys and certificates after the router has been reloaded.
CSCdu43638	Cannot add zone prefix in gatekeeper with active gateway registrations.	Shut down the gatekeeper before adding new zone prefix entries.
CSCdu52016	Bearer path does not exist for TDM hairpinned call across slots.	There is no workaround.
CSCdu53663	Restart messages are sent periodically if voice-port is out of busyout state.	Reload the router.
CSCdu55874	Resource monitor reports a busyout ds0 as free after call disconnect.	There is no workaround.
CSCdu57585	After a V92/QC stress test, one cannot dial out of the Cisco AS5300.	There is no workaround.
CSCdu57844	H.245 memory leak (h245InitUserCB) forces all calls to open a separate H.245 connection.	There is no workaround.
CSCdu52247	Codec 26 errors if the fax rate of 12000 is used in the dial-peer, T.38 fax-relay.	There is no workaround.
CSCdu52821	DSP timeout is followed by a router reload (no stack produced).	There is no workaround.

Important Notes

The Cisco IOS software releases that were tested as part of the Cisco Wholesale Voice Solution are undergoing improvements to resolve the caveats listed in [Caveats, page 9](#). Consequently, the Cisco IOS image filenames listed in [Table 2 on page 5](#) may become obsolete, and Cisco recommends that you use the later releases.



Tip

Referring to the Cisco IOS software release names listed in [Table 1 on page 4](#), examples of such software revisions would be from 12.2(2)T to 12.2(2)T1, and from 12.2(2)XA to 12.2(2)XA1.

Related Documentation

Solution-Specific Documents

Documents supporting the Cisco Wholesale Voice Solution, including these release notes, are available at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/access/sc/rel7/soln/wv_rel1/index.htm

These include the following:

- *Cisco Wholesale Voice Solution Overview*
- *Cisco Wholesale Voice Solution Design and Implementation Guide*

The above provide all necessary links to reference material required to implement the solution.

Obtaining Documentation

The following sections provide sources for obtaining documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following sites:

- <http://www.cisco.com>
- http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM is updated monthly. The CD-ROM package is available as a single unit or as an annual subscription.

Ordering Documentation

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- Registered Cisco Direct Customers can order Cisco Product documentation from the Networking Products MarketPlace:
http://www.cisco.com/cgi-bin/order/order_root.pl
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To access Cisco.com, go to the following website:

<http://www.cisco.com>

Technical Assistance Center

The Cisco TAC web site is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

Contacting TAC by Using the Cisco TAC Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website:

<http://www.cisco.com/tac>

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for Cisco.com, go to the following website:

<http://www.cisco.com/register/>

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at the following website:

<http://www.cisco.com/tac/caseopen>

Contacting TAC by Telephone

If you have a priority level 1 (P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

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