Combined Version Release Notes and Compatibility Matrix for Cisco VCWare on Cisco AS5300 Universal Access Servers/Voice Gateways

November 7, 2005

Note The Cisco VCWare Compatibility Matrix is now located in these release notes. See the "Cisco VCWare Compatibility Matrixes" section on page 3.

The *Combined Version Release Notes for Cisco VCWare on Cisco AS5300 Universal Access Servers/Voice Gateways* describe new features and changes to the voice feature card software (VCWare) and digital signal processor (DSP) firmware (DSPWare) on Cisco AS5300 universal voice gateways. Cisco VCWare supports modem and facsimile detection and Pulse Code Modulation (PCM) switchover with VoIP RealTime Transport Protocol (RTP) into platform-independent DSPWare.

This document contains the following sections:

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Voice Gateway Overview

Cisco VCWare

Cisco VCware is a software image that runs only on voice cards used in the Cisco AS5300 voice gateway. Because Cisco VCWare is a separate image from Cisco IOS Software, it must be loaded and upgraded separately from Cisco IOS Software. For all other Cisco voice gateways using C54x series DSPs, the DSPware is embedded in the Cisco IOS Software image, so in those systems, Cisco VCware is not used.

Note Cisco VCWare is not backward compatible and cannot be used with earlier Cisco IOS software releases. Each Cisco VCWare release must be used with its compatible Cisco IOS software release.

Cisco AS5300 Voice Gateway

The Cisco AS5300 universal access server is an award-winning dialup remote access server that is used as a Voice-over-IP (VoIP) Gateway when paired with the Cisco VCWare software image. When equipped with voice feature cards (VFCs) and voice-enabled Cisco IOS software, the Cisco AS5300/Voice Gateway supports carrier-class VoIP and Fax-over-IP services.

The Cisco AS5300 includes three feature card slots. One slot holds a T1/E1/PRI feature card, while the other two support digital modem feature cards or voice DSP feature cards. When equipped with modem cards, the Cisco AS5300 serves as a remote access concentrator for dialup (modem or ISDN) Internet access. When equipped with voice feature cards and voice IOS, the Cisco AS5300 serves as a VoIP Gateway. The Cisco AS5300 can serve in both capacities using one slot for modems and the other for voice DSPs. Modem, voice, or fax calls are routed to the appropriate cards/resources via Dialed Number Identification Service (DNIS). A called-party number is one example of DNIS.

The Cisco AS5300 supports High-Density VoIP applications: Up to 96/120 voice or fax calls using 4 T1/E1 ports in a two-rack unit (RU) form factor. This High-Density VoIP application requires a minimum of Cisco IOS Release 12.0(4)XH1or higher and High-Density voice feature cards with TI c549-based DSP modules (part number AS53-VOXD) and associated voice card firmware.

Note The Cisco AS5300 requires 128MB of memory for systems using Cisco IOS Release12.1(5)T and later releases.

For more information about Cisco AS5300 memory requirements, hardware support, and feature support, refer to the *Release Notes for Cisco AS5300 Universal Access Servers, Cisco IOS Release 12.2*.

New Cisco VCWare and Cisco IOS Software Features

Cisco VCware version 11.41 used with Cisco IOS Release 12.3(10) is a maintenance release. No new features have been added. See the "Cisco VCWare Compatibility Matrixes" section on page 3 for supported feature sets and caveat information.

Note Features supported in Cisco VCWare are released simultaneously in the Cisco IOS Release required for your Cisco VCWare version. For more information about new features, refer to the New Feature Documentation index, Cisco IOS Release 12.3.

Cisco VCWare Compatibility Matrixes

This section contains the following compatibility information:

Cisco VCWare with Cisco IOS Software Compatibility Matrix

Note The information in Table 1 identifies the earliest version of a given Cisco IOS software branch that is compatible with the listed VCWare. If the indicated version of Cisco IOS software is not available on Cisco.com for any reason, any subsequent Cisco IOS software version of the same branch will also work.

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 11.41a with Cisco DSPWare 4.1.41	All Cisco IOS Software releases that support the Cisco AS5300. Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. http://www.cisco.com/go/fn	**Supported Feature Sets for CiscoVCWare 11.41a** • c542-based All Codecs feature set, Cisco part number: VC-SWS-11.41a. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.11.41a.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-11.41a. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.11.41a.bin **Caveats** Unresolved Caveats: • CSCdv78915—crosstalk problem • CSCea22571 DTMF Relay ciso-rtp failed with network delay jitter Resolved Caveats: • CSCee31721—Could not send message to VFC • CSCsb76059—Cisco AS5300 is not sending ISDN call proceeding

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 11.41 with Cisco DSPWare 4.1.41	12.3(10)	**Supported Feature Sets for Cisco VCWare 11.41** • c542-based All Codecs feature set, Cisco part number: VC-SWS-11.41. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.11.41.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-11.41. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.11.41.bin **Caveats** Unresolved caveats: • CSCdv78915—crosstalk problem • CSCea22571—DTMF Relay cisco-rtp failed with network delay jitter Resolved caveats: • CSCdx66831—G.726 interop w/non-Cisco GW shows misordered 4-bit samples in power load • CSCdy01832—Clippings on G.723 annex codecs • CSCea06347—Fax relay does not work with G.168 echo canceller (ECAN) and G.729 codec • CSCdu10530—Implement G.711 Annex I PLC for all voice platforms • CSCea05647—tone_detect message does not report ON/OFF status for operator int • CSCeb12186—Idle pattern on DS-0 trunk is 0x55 instead of 0x7F • CSCea41229—Digits playback to originating side when terminating side answers • CSCea20558—DSP takes longer to switch to voice mode after a fax relay • CSCeb12688—echo_canceller_control DSP message is ignored with extended ECAN • CSCeb27126—DSP channel return non-zero processes ID for tone_detect message • CSCdz69094—Low speed modem connection fails • CSCeb37276—DSP ignores echo_canceller_cotrol message (msgID=66) • CSCuk44354—DTMF tones are not completely stripped • CSCin42579—%DSM-3-DSP_TIMEOUT message is seen on shut/no shut • CSCea82502—DSP timeout w/ fax relay on G.168 ECAN in unrestricted mode • CSCeb58953—Loud click heard at start of G.729 voice call

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 11.32 with Cisco DSPWare 4.1.32	12.3(3), 12.3(5), and 12.(6)	**Supported Feature Sets for Cisco VCWare 11.32** • c542-based All Codecs feature set, Cisco part number: VC-SWS-11.32. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.11.32.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-11.32. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.11.32.bin **Caveats** Unresolved caveats: • CSCdx66831—G.726 interoperability with non-Cisco GW shows misordered 4-bit samples in payload • CSCeb12688—echo_canceller_control DSP message is ignored with extended echo canceller • CSCdy01832—Clipping found on G.723 annex codecs • CSCuk43338—ST. Conference Call quality is bad intermittently • CSCea06347—Fax relay does not work with the extended echo canceller • CSCea22571—DTMF Relay cisco-rtp failed with network delay jitter • CSCea20558—DSP takes longer time to switch to voice mode after a fax-relay • CSCdz69094—Low Speed Modem connection fails • CSCea05647—tone_detect message does not report ON/OFF status for operator int • CSCeb12186—Idle pattern on ds0 trunk is 0x55 instead of 0x7F • CSCuk44354—DTMF tones not completely stripped • CSCea41229—Digits playback to Originating side when Terminating side answers • CSCeb64447—Modem passthrough playout dilation for improved CSR Resolved caveats: • CSCeb37276—DSP ignores echo_canceller_cotrol message (msgID=66) • CSCea82502—DSP timeout w/ fax relay on new EB unrestricted mode

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 11.31 with Cisco DSPWare 4.1.31	12.2(15)T	**Supported Feature Sets for Cisco VCWare 11.31** • c542-based All Codecs feature set, Cisco part number: VC-SWS-11.31. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.11.31.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-11.31. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.11.31.bin **Caveats** Unresolved caveats: • CSCdx66831—G.726 interoperability with non-Cisco GW shows misordered 4-bit samples in payload • CSCeb12688—echo_canceller_control DSP message is ignored with extended echo canceller • CSCdy01832—Clipping found on G.723 annex codecs • CSCea06347—Fax relay does not work with the extended echo canceller • CSCdv78915—Crosstalk problem • CSCea22571—DTMF Relay cisco-rtp failed with network delay jitter

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 11.30 with Cisco DSPWare 4.1.30	12.2(13)T5	**Supported Feature Sets for Cisco VCWare 11.30** • c542-based All Codecs feature set, Cisco part number: VC-SWS-11.30. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.11.30.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-11.30. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.11.30.bin **Caveats** Resolved caveats: • CSCdw81343—DBM level reporting incorrectly with enhanced echo canceller • CSCdr65044—G.728 voice quality poor; ECC set is less than 32ms impedance • CSCdy65576—DSP ignores messages sent to it while it is in the wrong mode • CSCea34825—DSP debugger to do MIPS measurement and PCM data dump • CSCea20402—HPI-3-CODEC-_NOT_LOADED:DSP timeout on c549.hc (Ditech restriction) • CSCea44970—Low throughput in Modem Relay due to retransmit counter error • CSCdz83759—voip:modem passthrough fails to detect VFC modem tone • CSCea41737—GSMEFR and G.723a SID frames not processed • CSCea49440—Background noise estimates not always accurate • CSCuk38450—Fix dejitter updating problem with out-of-sequence packets • CSCea85074—M-bit is set during quick switchover to modem passthrough • CSCdz75087—G.728 codec voice quality is bad on the Cisco AS5300 C542 when echo cancel equals 32ms • CSCea04031—Pulse dialing on digital voice interfaces broken echo cancellation feature

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
		Unresolved caveats: • CSCdx66831—G.726 interoperability with non-Cisco GW shows misordered 4-bit samples in payload • CSCeb12688—echo_canceller_control DSP message is ignored with extended echo canceller • CSCdy01832—Clipping found on G.723 annex codecs • CSCea06347—Fax relay does not work with the extended echo canceller • CSCdv78915—Crosstalk problem • CSCea22571—DTMF Relay cisco-rtp failed with network delay jitter
Cisco VCWare 11.28 with Cisco DSPWare 4.1.28	12.2(13)T3, 12.2(13)T4, 12.2(15)T, 12.2(15)T1 and T2, and 12.3(1) mainline	**Supported Feature Sets for Cisco VCWare 11.28** • c542-based All Codecs feature set, Cisco part number: VC-SWS-11.28. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.11.28.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-11.28. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.11.28.bin **Caveats** Resolved caveats: • CSCdz14657—Tone detector performance degrades when single tone generation is configured • CSCdz32122—Cisco AS5300 DTMF relay NTE packets not setting marker bit • CSCdz33566—Idle channel suppression failing after alarms • CSCdy31058—VTSP-3-DSP_TIMEOUT during T.38 fax calls VTSP-3-DSPALARM Unresolved caveats: • CSCdy01832—Clipping found on G.723 annex codecs • CSCdr65044—G.728 voice quality poor. ECC set is less than 32ms impedance • CSCea06347—Fax relay does not work with the extended echo cancellation feature

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 11.26 with Cisco DSPWare 4.1.26	12.2(13)T	**Supported Feature Sets for Cisco VCWare 11.26** • c542-based All Codecs feature set, Cisco part number: VC-SWS-11.26. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.11.26.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-11.26. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.11.26.bin **Caveats** Resolved caveats: • CSCdy32316—Cisco VCWare 10.26:ping DSP command does not work properly. • CSCdy87334—Fax relay calls cause DSP errors and mutes if modem passthru configuration • CSCdx83936—Image 4.0.26 5300 c542 codec G.728 voice quality not good • CSCdy05188—Concealment broken for G.711ulaw/G.711alaw codecs • CSCdv71641—DSP serial port reset needed • CSCdy68011—Cannot switch to modem relay with loud CM tones • CSCdw49906—With VAD enabled, comfort noise ramps up and down • CSCdx80541—H.245-signal dtmf-relay failures in a mixed feature environment • CSCdx20362—Cisco AS5300 call hang/failures due to VTSP-3-DSP_TIMEOUT on Event=0x6 • CSCdx42831—Modem drain event occurs when early packet received • CSCdx57870—CSR drops to lower 90s when using G.726 codec • CSCdw86126—The HiWaterPlayoutDelay value goes down Unresolved caveats: • CSCdv71475— Cisco AS5300 DTMF test failure 1% on c549 hc, mc, and c542 • CSCdy01832—Clipping on G.723 annex codecs • CSCdx85545—10% COT TEST failure

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 10.27 with Cisco DSPWare 4.0.27	Cisco IOS Release 12.2(11)T5	**Supported Feature Sets for Cisco VCWare 10.27** • c542-based All Codecs feature set, Cisco part number: VC-SWS-10.27. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.10.27.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-10.27. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.10.27.bin **Caveats** Resolved caveats: • CSCdw86126—The HiWaterPlayoutDelay value goes down • CSCdx80541—H245 signal DTMF-relay failures in a mixed feature • CSCdy31058—VTSP-3-DSP_TIMEOUT occurs during T.38 fax calls and issues VTSP-3 DSPALARM • CSCdx83936—Cisco AS5300 C542 codec G.728 voice quality not good • CSCdy05188—IP impaired PAMS scores low for G.711ulaw and G.711alaw codecs • CSCdx57870—CSR drops to lower 90s when using G.726 codec • CSCdy68011—Cannot switch to modem relay with loud CM tones (DSPWare image 4.0.26) • CSCdw49906—With VAD enabled, comfort noise ramps up and down • CSCdz14657—Tone detector performance degrades when single tone generation configured Unresolved caveats: • CSCdr65044—G.728 voice quality is poor—ECC set to less than 32ms improves voice quality • CSCdy01832—Clipping occurs on G.723 annex codecs

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 10.26a with Cisco DSPWare 4.0.26	12.2(11)T	**Supported Feature Sets for Cisco VCWare 10.26a** • c542-based All Codecs feature set, Cisco part number: VC-SWS-10.26a. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.10.26a.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-10.26a. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.10.26a.bin **Caveats** Resolved caveats: • CSCdx81796—T.38 Fax disconnect delay between Cisco AS5400 and Cisco AS5300 • CSCdx20362—Cisco AS5300 call hang/failure due to VTSP-3-DSP_TIMEOUT on Event=0x6 • CSCdy32316—In Cisco VCWare, 10.26:ping dsp command does not work properly • CSCdy14928—3-way calling failed at second time with alarm indication Unresolved caveats: • CSCdx83936—Cisco AS5300 c542 codec G.728 voice quality not good • CSCdr65044—G.728 voice quality is poor—ECC set < 32ms improves voice quality • CSCdv71475— Cisco AS5300 DTMF test failure 1% on c549 hc, mc and c542 • CSCdy05188—IP Impaired PAMS scores low for G.711ulaw/G.711alaw codecs • CSCdx80541—h245-signal dtmf-relay failures in a mixed feature • CSCdw86126—The HiWaterPlayoutDelay value goes down • CSCdx57870—CSR drops to lower 90s when using G.726 codec • CSCdy01832—Clipping on G.723 annex codecs • CSCdx85545—10% COT TEST failure

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 9.19 with Cisco DSPWare 3.6.15	12.2(2)XB (all images)	**Supported Feature Sets for Cisco VCWare 9.19** • c542-based All Codecs feature set, Cisco part number: VC-SWS-9.19. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.9.19.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-9.19. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.9.19.bin **Caveats** Resolved caveats: • CSCdt49066—DSPs randomly go down and are unavailable for calls • CSCdu81671—Possible payload type corruption w/NTE DTMF relay. • CSCdr37862—Fax relay debugs do not appear • CSCdu53333—DSP does not respond • CSCdv16291—Unable to change byte size on GSMEFR • CSCdv05965—DSPRM FAX/VOICE Set Codec (call mode=0) error during fax call • CSCdu31155—DTMF relay fails with more than one call Unresolved caveats: • CSCdr65044—G.728 voice quality is poor. ECC set < 32ms improves voice quality • CSCdv71641—DSP serial port reset needed • CSCdv71475—Image 3.6.14 5300 DTMF test failure 1% on c549 hc, mc and c542 • CSCdw21528—Need additional control code for VAD on DSPs

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 9.08a with Cisco DSPWare 3.6.6a	12.2(2)XA (all images)	**Supported Feature Sets for Cisco VCWare 9.08a** • c542-based All Codecs feature set, Cisco part number: VC-SWS-9.08. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.9.08a.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-9.08. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.9.08a.bin **Caveats** Resolved caveats: • CSCdu13520—Hairpin IVR calls cause severe packet drops in Cisco AS5300 DSPs Unresolved caveats: • CSCdr65044—G.728 voice quality poor. ECC set < 32ms improves voice quality • CSCdu31155—DTMF relay fails with more than one call

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 8.11 with Cisco DSPWare 3.5.15	12.1(5)XM (all images)[1]	**Supported Feature Sets for Cisco VCWare 8.11** • c542-based All Codecs feature set, Cisco part number: VC-SWS-8.11. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.8.11.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-8.11. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.8.11.bin **Note** VCWare 8.*xx* does not support ATM, FRF11, Caller ID, or 3-way conferencing. **Caveats** Resolved caveats: • CSCds05104—DTMF tones are not recognized properly • CSCds89787—DSP interrupt not being able to be cleared after host interrupts • CSCdt26146—DTMF relay causes lost packets counter to increment • CSCdt03504—Very large delay reported in fax call stats • CSCdt62978—Transcoding: Cannot make call between G.711ulaw and G.711Alaw Unresolved caveats: • CSCdr65044—G.728 voice quality poor. ECC set to less than 32 ms improves voice quality

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.44 with Cisco DSPWare 3.4.55	12.2(13)a, 12.2(16), and 12.2(16)a	**Supported Feature Sets for Cisco VCWare 7.44** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.44. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.7.44.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.44. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.7.44.bin **Caveats** Resolved caveats: • CSCdx81796—Customer T.38 fax disconnect delay between Cisco AS5400 and Cisco AS5300 • CSCdx20362—Cisco AS5300 call hang and failure due to VTSP-3-DSP_TIMEOUT on Event=0x6 • CSCdx57870—CSR drops to lower 90s when using G.726 codec • CSCdz46237—G.729-to-G.723 switchover DSP problem • CSCdz27990— Multiple RFC2833 event packets sent for DTMF tones • CSCdy31058—VTSP-3-DSP_TIMEOUT during T.38 Fax Calls VTSP-3-DSPALARM • CSCdu53872 —Carlos6: Could not send fax of huge density on onramp testing—change 6 minute timer to 12 minutes to allow for faxing of high density documents • CSCdw86126—The HiWaterPlayoutDelay value goes down • CSCdx45294—Tx Vox Duration (in ms): is off by a factor of 10 in **show voice call x/y:z.t** • CSCdx83936—Image 4.0.26 5300 c542 codec G.728 voice quality not good • CSCdw60702—Need DSP code to make noise threshold configurable • CSCdv71475—Cisco AS5300 DTMF test failure—1% on c549 hc, c549 hcmc, and c542 Unresolved caveats: • CSCdr65044—G.728 voice quality is poor—ECC set to less than 32ms improves voice quality • CSCea04706—Dangling DSP on Cisco AS5300—DSP resource recovery

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.42 with Cisco DSPWare 3.4.53	12.2(13)	**Supported Feature Sets for Cisco VCWare 7.42** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.42. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.7.42.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.42. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.7.42.bin **Caveats** Resolved caveats: • CSCdx81796—Customer T.38 fax disconnect delay between Cisco AS5400 and Cisco AS5300 • CSCdx20362—Cisco AS5300 call hang and failure due to VTSP-3-DSP_TIMEOUT on Event=0x6 • CSCdx57870—CSR drops to lower 90s when using G.726 codec • CSCdu53872—Could not send fax of huge density on onramp testing • CSCdw86126—The HiWaterPlayoutDelay value goes down • CSCdx69650—Fax Relay:Change EflagStartTimer value Unresolved caveats: • CSCdy31058—VTSP-3-DSP_TIMEOUT during T.38 fax calls VTSP-3-DSPALARM • CSCdz27990—Multiple RFC2833 event packets sent for DTMF tones • CSCdz75087—G.728 codec voice quality is bad on Cisco AS5300 C542 when Echo Cancel=32ms

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.41 with Cisco DSPWare 3.4.52	12.2(12)	**Supported Feature Sets for Cisco VCWare 7.41** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.41. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.7.41.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.41. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.7.41.bin **Caveats** Resolved caveats: • CSCdw71450—Echo for first 5 seconds of call with ecan coverage 32ms and ERL 17dB • CSCdv88794—Failure to training sequence for some fax machines • CSCdx13786—G.728 codec has intermittent distortion during call Unresolved caveats: • CSCdx81796—Customer T.38 fax disconnect delay between Cisco AS5400 and Cisco AS5300 • CSCdx20362—Cisco AS5300 call hang and failure due to VTSP-3-DSP_TIMEOUT on Event=0x6 • CSCdx57870—CSR drops to lower 90s when using G.726 codec • CSCdr65044—G.728 voice quality is poor—ECC set < 32ms improves voice quality • CSCdv7147—Cisco AS5300 DTMF test failure—1% on c549 hc, c549 hcmc, and c542

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.40 with Cisco DSPWare 3.4.51	12.2(10)	**Supported Feature Sets for Cisco VCWare 7.40** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.40. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.7.40.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.40. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.7.40.bin **Note** Cisco VCware version 7.40 used with Cisco IOS Release 12.2(10), and Cisco IOS Release 12.2(11)T used with Cisco VCWare version 10.26a support the Cisco VCWare Version Checker feature, which delivers a compatibility warning at bootup and when using the **show vfc version vcware** and **show vfc version dspware** commands. See the "Cisco VCWare Version Checker Warning Output" section on page 46 for more information. **Caveats** Resolved caveats: • CSCdw55474—VTSP-3-DSP_TIMOUT • CSCdw49906—With VAD enabled, comfort noise ramps up and down • CSCdv71641—DSP serial port reset needed • CSCdx06369—DSP timeout Unresolved Caveats: • CSCdr65044—G.728 voice quality is poor. ECC set < 32ms improves voice quality • CSCdv7147—Cisco AS55300 DTMF test failure, 1% on c549 hc, mc and c542

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.39 with Cisco DSPWare 3.4.50	12.2(7) (all images)	**Supported Feature Sets for Cisco VCWare 7.39** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.39. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.7.39.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.39. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.7.39.bin **Caveats** Resolved caveats: • CSCdw21165—Spurious voice packets produced with multicast hoot & holler • CSCdv60706—Voice quality degrades with G.726r32 and 32msec echo-cancel coverage Unresolved caveats: • CSCdr65044—G.728 voice quality poor. ECC set < 32ms improves voice quality

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.38 with Cisco DSPWare 3.4.49	12.2(6)	**Supported Feature Sets for Cisco VCWare 7.38** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.38. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.7.38.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.38. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.7.38.bin **Caveats** Resolved caveats: • CSCdu77495—With DTMF relay in H.323 mode, DTMF regenerated in wrong power level • CSCdu80453—Output attenuation -6 through 0 does not display dB levels correctly • CSCdv16291—Unable to change byte size on GSMEFR • CSCdu53333—DSP does not respond; seeing %VTSP-3-DSP_TIMEOUT Unresolved caveats: • CSCdt09085—Interrupted answer tone during fax transmission • CSCdr65044—G.728Voice quality is poor. ECC set < 32ms improves voice quality

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.36 with Cisco DSPWare 3.4.47	12.2(5)	**Supported Feature Sets for Cisco VCWare 7.36** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.36. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.7.36.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.36. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.7.36.bin **Caveats** Resolved caveats: • CSCdu15386—Playout parameters are not reset when switching to new SSRC • CSCdu31261—Aggressive VAD should be configurable Unresolved caveats: • CSCdu53333—DSP does not respond; seeing %VTSP-3-DSP_TIMEOUT • CSCdt09085—Interrupted answer tone during fax transmission • CSCdr65044—G.728Voice quality is poor. ECC set < 32ms improves voice quality

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.35 with Cisco DSPWare 3.4.46	12.2(3)	**Supported Feature Sets for Cisco VCWare 7.35** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.35. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.7.35.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.35. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.7.35.bin **Caveats** Resolved caveats: • CSCds84306—voip:cisco-rtp dtmf-relay degraded performance with 1% packet loss • CSCdt32323—Missing and out-of-sequence digits with h245-signaling • CSCdr37862—Fax relay bugs do not appear • CSCdt30863—GSMEFR codec poor voice quality with duplicate and out of order packets • CSCdt32349—Adaptive playout buffer trouble on FXS and T1 voice-port • CSCdu13520—Hairpin IVR calls cause severe packet drops in Cisco AS5300 DSPs Unresolved caveats: • CSCdt09085—Interrupted answer tone during fax transmission • CSCdu53333—DSP does not respond; seeing %VTSP-3-DSP_TIMEOUT • CSCdr65044—G.728Voice quality is poor. ECC set < 32ms improves voice quality

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.32 with Cisco DSPWare 3.4.43	12.2(1), 12.2(1a), 12.1(3a)XI7	**Supported Feature Sets for Cisco VCWare 7.32** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.32. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c542.7.32.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.32. – Supports G.711, G.729, G.726, G.723.1, G.728, GSMFR, GSMEFR, and fax relay – File name: vcw-vfc-mz.c549.hc.7.32.bin **Caveats** Resolved caveats: • CSCdt49066—DSPs randomly go down and are unavailable for calls • CSCdu03931—Forward digits not forwarding beyond 10 digits • CSCdt26146—DTMF-RELAY causes lost packets counters to increment • CSCds76547—Poor voice quality with VAD and SID. Unresolved caveats: • CSCdu53333—DSP does not respond; seeing %VTSP-3-DSP_TIMEOUT • CSCdr65044—G.728Voice quality is poor. ECC set < 32ms improves voice quality

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.23 with Cisco DSPWare 3.4.35	12.1(2)XH, 12.1(3)T, 12.1(5)T	**Supported Feature Sets for Cisco VCWare 7.23** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.0. – Supports G.711, G.729, G.726, G.723.1,and G.728. – File name: vcw-vfc-mz.c542.7.23.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.0. – Supports All Codecs. – File name: vcw-vfc-mz.c549.hc.7.23.bin **Caveats** Resolved caveats: • CSCdr98104—Adding GSMFR and GSMEFR codecs (required for Cisco IOS software release 12.1(5)T) • CSCdr60346—Report RTP timestamp in get_tx_stats message • CSCdr94841—Poor voice quality due to adaptive de-jitter buffer not coping Unresolved caveats: • CSCdu53333—DSP does not respond; seeing %VTSP-3-DSP_TIMEOUT • CSCdr65044—G.728 voice quality is poor. ECC set < 32ms improves voice quality.

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 7.16 with Cisco DSPWare 3.4.27	12.1(3)XI	**Supported Feature Sets for Cisco VCWare 7.16** • c542-based All Codecs feature set, Cisco part number: VC-SWS-7.0. – Supports G.711, G.729, G.726, G.723.1,and G.728. – File name: vcw-vfc-mz.c542.7.16.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-7.0. – Supports All Codecs. – File name: vcw-vfc-mz.c549.hc.7.16.bin **Caveats** Resolved caveats: • CSCdr72821—Voice and fax calls not possible on the same DSP • CSCdr84411—NSE dtmf-relay:* and # mapped to wrong DTMF event value Unresolved caveats: • CSCdu53333—DSP does not respond; seeing %VTSP-3-DSP_TIMEOUT • CSCdr65044—G.728 voice quality is poor. ECC set < 32ms improves voice quality
Cisco VCWare 6.08 with Cisco DSPWare 3.3.13	12.1(2)T, 12.1(2a)T2	**Supported Feature Sets for Cisco VCWare 6.08** • c542-based All Codecs feature set, Cisco part number: VC-SWS-6.0. – Supports G.711, G.729, G.726, G.723.1, G.728, and fax relay – File name: vcw-vfc-mz.c542.6.08.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-6.0. – Supports G.711, G.729, G.726, G.723.1, G.728, and fax relay – File name: vcw-vfc-mz.c549.hc.6.08.bin **Caveats** None

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 5.12 with Cisco DSPWare 3.2.18	12.0(6)T, 12.0(7)T, 12.1(1), 12.1(1a)T1, 12.1(2a), 12.1(1)AA1, 12.1(1)T, 12.1(2a)AA, 12.1(3), 12.1(3)AA, 12.1(4)AA, 12.1(7)T	**Supported Feature Sets for Cisco VCWare 5.12** • c542-based All Codecs feature set, Cisco part number: VC-SWS-5.1. – Supports G.711, G.729, G.726, G.723.1, G.728, and fax relay – File name: vcw-vfc-mz.c542.5.12.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-5.1. – Supports G.711, G.729, G.726, G.723.1, G.728, and fax relay – File name: vcw-vfc-mz.c549.hc.5.12.bin **Caveats** None
Cisco VCWare 5.09 with Cisco DSPWare 3.2.17	12.0(7)XR2	**Supported Feature Sets for Cisco VCWare 5.09** • c542-based All Codecs feature set, Cisco part number: VC-SWS-5.0. – Supports G.711, G.729, G.726, G.723.1, G.728, and fax relay – File name: vcw-vfc-mz.c542.5.09.bin • c549-based All Codecs feature set, Cisco part number: VC-SWA-5.0. – Supports G.711, G.729, G.726, G.723.1, G.728, and fax relay – File name: vcw-vfc-mz.c549.hc.5.09.bin **Caveats** None
Cisco VCWare 4.10 with Cisco DSPWare 3.1.10	12.0(4)XH1, 12.0(6)T, 12.0(7)T	**Supported Feature Sets for Cisco VCWare 4.10** VCWare 4.10 is released in 2 versions: • c549-based All Codecs feature set, Cisco part number: VC-SWA-4.10. – Supports G.711, G.729, G.726, G.723.1, G.728, and fax relay – File name: vcw-vfc-mz.c549.hc.4.10.bin • c542-based All Codecs feature set, Cisco part number: VC-SWS-4.10. – Supports G.711, G.729, G.726, G.723.1, G.728, and fax relay – File name: vcw-vfc-mz.c542.4.10.bin **Caveats** None

Table 1 Cisco VCWare/Cisco IOS Release Compatibility Matrix (continued)

Firmware Version	Cisco IOS Software Release	Cisco VCWare Solution Supported
Cisco VCWare 4.04 with Cisco DSPWare 3.1.7	12.0(4)XH, 12.0(5)T2, 12.0(7)T only	**New Features for Cisco VCWare 4.04** • Support for c549-based DSP modules and c542-based DSP modules with two separate VCWare images. **Caveats** None
	12.0(2)XH only	**New Features for Cisco VCWare 4.04 with 12.0(2)XH** • Support for High-Density voice cards (TI c549-based DSP Modules, p/n AS53-VOXD) and adds new codecs, including G.723.1. **Caveats** None
Cisco VCWare 2.52 with Cisco DSPWare 2.3(3)	11.3(8)NA1	**New Features for Cisco VCWare 2.52** • Improved comfort noise functionality. For TI c542-based DSP Modules, p/n AS53-6VOX. **Caveats** None
Cisco VCWare 2.4 with Cisco DSPWare 2.3(3)	11.3(6)NA2 through 11.3(10)NA. Do not use with prior releases of 11.3NA.	**New Features for Cisco VCWare 2.4** • E1/R2, MFC/R2 support. **Caveats** None
Cisco VCWare 1.0	11.3(2)NA to 11.3(5)NA	**Initial Release Cisco VCWare 1.0** • T1 CAS support. **Caveats** None

1. The Cisco AS5300 requires 128MB of memory for systems using Cisco IOS Release12.1(5)T and later releases.

Cisco VCWare Part Numbers

The following table contains Cisco VCWare versions and part numbers.

Table 2 Cisco VCWare Releases

Cisco VCWare	Product Name	Spare Product Name[1]	Image Name
11.41a	VC-SWS-11.41a	VC-SWS-11.41a=	vcw-vfc-mz.c542.11.41a
11.41a	VC-SWA-11.41a	VC-SWA-11.41a=	vcw-vfc-mz.c549.hc.11.41a
11.41	VC-SWS-11.41	VC-SWS-11.41=	vcw-vfc-mz.c542.11.41
11.41	VC-SWA-11.41	VC-SWA-11.41=	vcw-vfc-mz.c549.hc.11.41
11.32	VC-SWS-11.32	VC-SWS-11.32=	vcw-vfc-mz.c542.11.32

Table 2 Cisco VCWare Releases (continued)

Cisco VCWare	Product Name	Spare Product Name[1]	Image Name
11.32	VC-SWA-11.32	VC-SWA-11.32=	vcw-vfc-mz.c549.hc.11.32
11.31	VC-SWS-11.31	VC-SWS-11.31=	vcw-vfc-mz.c542.11.31
11.31	VC-SWA-11.31	VC-SWA-11.31=	vcw-vfc-mz.c549.hc.11.31
11.30	VC-SWS-11.30	VC-SWS-11.30=	vcw-vfc-mz.c542.11.30
11.30	VC-SWA-11.30	VC-SWA-11.30=	vcw-vfc-mz.c549.hc.11.30
11.28	VC-SWS-11.28	VC-SWS-11.28=	vcw-vfc-mz.c542.11.28
11.28	VC-SWA-11.28	VC-SWA-11.28=	vcw-vfc-mz.c549.hc.11.28
11.26	VC-SWS-11.26	VC-SWS-11.26=	vcw-vfc-mz.c542.11.26
11.26	VC-SWA-11.26	VC-SWA-11.26=	vcw-vfc-mz.c549.hc.11.26
10.27	VC-SWS-10.27	VC-SWS-10.27=	vcw-vfc-mz.c542.10.27
10.27	VC-SWA-10.27	VC-SWA-10.27=	vcw-vfc-mz.c549.hc.10.27
10.26a	VC-SWS-10.26a	VC-SWS-10.26a=	vcw-vfc-mz.c542.10.26a
10.26a	VC-SWA-10.26a	VC-SWA-10.26a=	vcw-vfc-mz.c549.hc.10.26a
9.19	VC-SWS-9.19	VC-SWS-9.19=	vcw-vfc-mz.c542.9.19
9.19	VC-SWA-9.19	VC-SWA-9.19=	vcw-vfc-mz.c549.hc.9.19
9.08a	VC-SWS-9.08a	VC-SWS-9.08a=	vcw-vfc-mz.c542.9.08a
9.08a	VC-SWA-9.08a	VC-SWA-9.08a=	vcw-vfc-mz.c549.hc.9.08a
8.11	VC-SWS-8.11	VC-SWS-8.11=	vcw-vfc-mz.c542.nm.8.11
8.11	VC-SWA-8.11	VC-SWA-8.11=	vcw-vfc-mz.c549.hc.nm.8.11
7.44	VC-SWA-7.44	VC-SWA-7.44=	vcw-vfc-mz.c542.7.44
7.44	VC-SWS-7.44	VC-SWS-7.44=	vcw-vfc-mz.c549.hc.7.44
7.42	VC-SWA-7.42	VC-SWA-7.42=	vcw-vfc-mz.c542.7.42
7.42	VC-SWS-7.42	VC-SWS-7.42=	vcw-vfc-mz.c549.hc.7.42
7.41	VC-SWA-7.41	VC-SWA-7.41=	vcw-vfc-mz.c542.7.41
7.41	VC-SWS-7.41	VC-SWS-7.41=	vcw-vfc-mz.c549.hc.7.41
7.40	VC-SWA-7.40	VC-SWA-7.40=	vcw-vfc-mz.c542.7.40
7.40	VC-SWS-7.40	VC-SWS-7.40=	vcw-vfc-mz.c549.hc.7.40
7.39	VC-SWA-7.39	VC-SWA-7.39=	vcw-vfc-mz.c542.7.39
7.39	VC-SWS-7.39	VC-SWS-7.39=	vcw-vfc-mz.c549.hc.7.39
7.38	VC-SWA-7.38	VC-SWA-7.38=	vcw-vfc-mz.c542.7.38
7.38	VC-SWS-7.38	VC-SWS-7.38=	vcw-vfc-mz.c549.hc.7.38
7.36	VC-SWA-7.36	VC-SWA-7.36=	vcw-vfc-mz.c542.7.36
7.36	VC-SWS-7.36	VC-SWS-7.36=	vcw-vfc-mz.c549.hc.7.36
7.35	VC-SWS-7.35	VC-SWS-7.35=	vcw-vfc-mz.c542.7.35
7.35	VC-SWA-7.35	VC-SWA7.-35=	vcw-vfc-mz.c549.hc.7.35
7.32	VC-SWS-7.32	VC-SWS-7.32=	vcw-vfc-mz.c542.7.32

Table 2 Cisco VCWare Releases (continued)

Cisco VCWare	Product Name	Spare Product Name[1]	Image Name
7.32	VC-SWA-7.32	VC-SWA-7.32=	vcw-vfc-mz.c549.hc.7.32
7.23	VC-SWS-7.1	VC-SWS-7.1=	vcw-vfc-mz.c542.7.23
7.23	VC-SWA-7.1	VC-SWA-7.1=	vcw-vfc-mz.c549.hc.7.23
7.16	VC-SWS-7.0	VC-SWS-7.0=	vcw-vfc-mz.c542.7.16
7.16	VC-SWA-7.0	VC-SWA-7.0=	vcw-vfc-mz.c549.hc.7.16
6.08	VC-SWS-6.0	VC-SWS-6.0=	vcw-vfc-mz.c542.6.08
6.08	VC-SWA-6.0	VC-SWA-6.0=	vcw-vfc-mz.c549.hc.6.08
5.12	VC-SWS-5.1	VC-SWS-5.1=	vcw-vfc-mz.c542.5.12
5.12	VC-SWA-5.1	VC-SWA-5.1=	vcw-vfc-mz.c549.hc.5.12
5.09	VC-SWS-5.0	VC-SWS-5.0=	vcw-vfc-mz.c542.5.09
5.09	VC-SWA-5.0	VC-SWA-5.0=	vcw-vfc-mz.c549.hc.5.09
4.10	VC-SWS-4.10	VC-SWS-4.10=	vcw-vfc-mz.c542.4.10
4.10	VC-SWA-4.10	VC-SWA-4.10=	vcw-vfc-mz.c549.hc.4.10
4.04	VC-SWS-4.04	VC-SWS-4.04=	vcw-vfc-mz.c542.4.04
4.04	VC-SWA-4.04	VC-SWA-4.04=	vcw-vfc-mz.c549.hc.4.04
2.52	VC-SW-2.52	VC-SW-2.52=	vcw-vfc-mz.2.52
2.4	VC-SW-2.4	VC-SW-2.4=	vcw-vfc-mz.2.4
1.0	VC-SW-1.0	VC-SW-1.0=	vcw-vfc-mz.1.0

1. Spare parts for Cisco VCWare Versions 9.19, 9.15, 9.08, 8.11, 7.38, 7.36, 7.35, 7.32, and 5.1 are not available at this time.

Required Cisco IOS Plus Software Images

Cisco VCWare requires the following voice-specific Cisco IOS Plus images:

- Cisco AS5300 Series IOS IP PLUS—c5300-is-mz
- Cisco AS5300 Series IOS IP PLUS IPSEC 56—c5300-is56i-mz
- Cisco AS5300 Series IOS ENTERPRISE PLUS—c5300-js-mz
- Cisco AS5300 Series IOS ENTERPRISE IPSEC 56—c5300-js56i-mz

Restrictions

The following restrictions apply to all versions of Cisco VCWare:

- High-Density voice cards and DSP modules (c549-based) cannot be in the same system as previous c542-based voice cards.
- You can use Cisco VCWare in the Cisco AS5300 with Cisco MICA modems installed in the other feature card slot(s), but the equivalent configuration with Microcom modems is not supported: you cannot use VoIP and Cisco Microcom modems at the same time.
- If G.711 is used for more than 100 calls, voice activity detection (VAD) must be enabled.

Note Four T1 ports translate to 96 calls, so this limit applies only to the four E1s.

- The Cisco AS5300/Voice Gateway is rated to support up to two calls per second on a sustained basis. While the system does not prevent a higher call rate from being processed, the call success rate and CPU utilization can be adversely affected beyond two calls per second.
- Only the Voice Cisco IOS Plus images are supported (not IP Sec images, for example). See the Required Cisco IOS Plus Software Images section for more information.
- Use of the 10ms packet size (lowest value) is not supported or recommended for high volume applications or channel requirements (two T1/E1) greater than 48/60.

Note Factory default setting is 20ms packet size.

Caveats

For information about Cisco VCWare caveats listed by Cisco VCWare version, see Table 1.

For information about Cisco IOS software caveats and features, refer to the *Cisco IOS Release 12.2* index and *Caveats for Cisco IOS Release 12.2*.

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any Cisco software release. You can reach Bug Navigator II on Cisco.com at **Service & Support: Online Technical Support: Software Bug Toolkit** or at http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl.

Upgrading Cisco VCWare

This section provides instructions for upgrading Voice Feature Card VCWare using a PC. If you are not in a PC environment, use the procedures as general guidelines; the steps are similar.

Use the procedures in the following sections to upgrade your Cisco VCWare:

1. Determining Your Software Release
2. Installing the TFTP Application on Your PC
3. Connecting Your PC with the Access Server
4. Establishing Console Session
5. Pinging Your PC and the Access Server
6. Identifying Voice Feature Cards
7. Replacing Firmware with Cisco VCWare in VCWare Mode or Replacing Firmware with Cisco VCWare in ROM Monitor Mode

Obtaining New Cisco VCWare Releases

Use the following link to download the latest Cisco VCWare software release:

http://www.cisco.com/cgi-bin/tablebuild.pl/vcware

Note You must have an account with Cisco.com and be logged in to download new Cisco VCWare software releases. See the "Obtaining Documentation" section on page 49 for access instructions.

Determining Your Software Release

To determine the release of Cisco IOS software running on your access server, log in to the access server and enter the **show version** user EXEC command:

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) 5300 Software (C5300-IS-MZ), Version 12.1(5)XM
```

The output contains additional information, including processor revision numbers, memory amounts, hardware IDs, and partition information. See Example show version Output for an example of the **show version** command output.

Installing the TFTP Application on Your PC

This section provides instructions for installing a TFTP application on your PC to transfer the latest Cisco VCWare file. Ignore this section if:

- You are not in a PC environment.
- You already have a TFTP application installed on your PC that has been tested by transferring incorruptible (incompressible or binary) files.
- You are using a remote host which has a TFTP server application running.

Note If you are using a UNIX or Sun workstation or a Macintosh, refer to your system user manuals for native TFTP applications. You can also use a remote copy protocol (RCP) application available from independent software vendors. A number of TFTP programs are also available as shareware from public sources on the World Wide Web.

Use the following steps to install the TFTP:

Step 1 Use the Microsoft Windows 95, Windows 98, or Windows NT 4.0 Explorer to create a directory labeled tftpboot on the root drive (usually C) on your hard disk.

Step 2 Open your Internet browser, log onto Cisco.com (for login instructions, see the "Obtaining Documentation" section on page 49), and go to the following site to find the download instructions for the TFTP program:

http://www.cisco.com/kobayashi/sw-center/sw-internet.shtml

Note The TFTP program currently at the URL noted above is provided as a courtesy of Cisco Systems and is not an officially supported product. This URL can change at any time without notice.

Step 3 Click TFTP Server for Windows 95/Windows 98/NT 4.0.

Step 4 Follow the instructions to the Software Download page to download the software to your hard drive.

Step 5 Double-click the executable file and follow the screen directions.

Step 6 Go to your c:\tftpboot directory and double-click tftpsrv.exe to launch the TFTP server application.

Step 7 Set your TFTP server application root directory:

a. Choose Server Root Directory from the Options menu.

b. Double-click tftpboot in the [] list box. If necessary, choose drive C from the Drives list box.

c. Click OK. The status bar below the menu bar displays c:\tftpboot as the TFTP server application root directory.

Note You must select the c:\tftpboot directory as your TFTP server application root directory to perform any backup procedures. This also applies if you are using an RCP on your system.

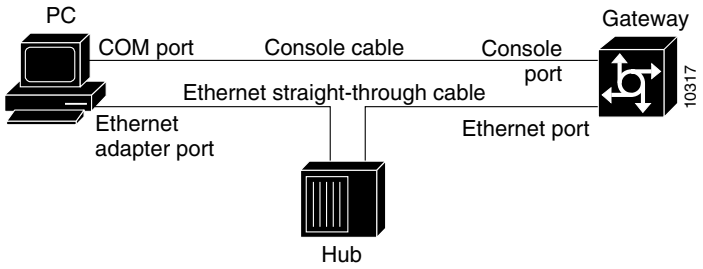
Continue with the following section, "Connecting Your PC with the Access Server."

Connecting Your PC with the Access Server

Use the steps in this section to connect your PC to the access server. If you are not using a PC, skip this section, or use the procedure as a guideline.

Step 1 Use network cables to connect the PC and access server to the network. Figure 1 shows a connected network:

Figure 1 Connecting the PC and Access Server



Step 2 Connect your PC COM port to the access server console port using the standard Cisco console cable.

Step 3 Make sure the PC, access server, and hub are all powered on.

Continue with the following section, "Establishing Console Session."

Establishing Console Session

Use the steps in this section to establish a console session from your PC to the Cisco AS5300. You will use this session to talk to the access server. If you are not using a PC, ignore this section, or use the procedure as a guideline.

Step 1 Choose Start/Programs/Accessories/HyperTerminal.

Step 2 Double-click Hypertrm.exe to display the Connection Description dialog box.

Step 3 Enter a name for your connection, (AS5300, for example), and click OK. HyperTerminal displays the Phone Number dialog box.

Step 4 Choose the COM port connecting the PC and the access server in the Connect Using list box. You have options to connect directly to one of four COM ports.

Step 5 Click OK. HyperTerminal displays the COM Properties dialog box.

Step 6 Choose the following options in the COM Properties dialog box, then click OK:

- Bits per second: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

Step 7 Press **Enter** until the access server displays the prompt. You are prompted to enter a login password if login is configured.

Note If the access server prompt does not appear, you might have selected the wrong COM port, the cables might not be connected properly, or the access server might not be powered on. Check these before continuing.

Step 8 Change to enable mode (also called Privileged EXEC mode) by entering the following command and your system password:

```
Router> enable
Password: password
Router#
```

Step 9 Keep the HyperTerminal window open, and continue with the following section, "Pinging Your PC and the Access Server."

Pinging Your PC and the Access Server

Use the steps in this section to ping the access server and the PC to verify that they are talking to each other and that there are no configuration problems on your access server. If you are not using a PC, skip this section, or use the procedure as a guideline.

Note The PC used for the upgrade and the access server you are upgrading must have the same subnet mask.

Step 1 Choose the adapter connecting to the router or access server and note the PC IP address:

a. On your desktop, choose Start/Run to display the Run dialog box.

b. Enter **winipcfg**, and click OK to display the IP Configuration dialog box.

```
Router> winipcfg
```

c. Choose the PC adapter connector (Ethernet or Token Ring) used for the connection to the router or access server if you have more than one adapter connector installed on your PC.

d. Make a note of the PC IP address, and then click OK.

Note You must have an IP address assigned before you can continue. Enter the **show running-configuration** command at the access server `Router#` prompt to verify that the access server has an assigned IP address. If the access server does not have an IP address, see your access server documentation for details on assigning an IP address.

Step 2 In the HyperTerminal dialog box make sure you are at the `Router#` prompt (see Establishing Console Session).

Step 3 Enter the **ping** command with your PC IP address:

```
Router# ping xxx.xxx.xxx.xxx
```

The access server displays five exclamation points (!) if everything is working and it displays five dots (.....) if there is a problem. If there is a problem, check the cabling between the router and the PC and check the access server configuration.

Step 4 Keep the HyperTerminal window open and continue with the following section, "Downloading a New Cisco VCWare Release," which describes how to identify voice cards in the system and download the new software.

Downloading a New Cisco VCWare Release

To download Cisco VCWare to your voice card, do the following:

1. Identify your voice feature cards to determine whether the VFC is in VCWare mode or ROM monitor mode. Knowing which mode you are in determines how you download software to the VFC. (See Identifying Voice Feature Cards.)
2. Check to see that the version of VFC ROM monitor software version 1.2 or 1.3 is compatible with your installed Cisco IOS image. Cisco VCWare Version 7.xx or higher requires Cisco IOS Release 12.1(5)MX3 or higher.

   Replace firmware with Cisco VCWare by using the procedures in one of the following sections: "Replacing Firmware with Cisco VCWare in VCWare Mode" or "Replacing Firmware with Cisco VCWare in ROM Monitor Mode."

Note In certain countries, use of these products or provision of voice telephony over the Internet may be prohibited and/or subject to laws, regulations, or licenses, including requirements applicable to the use of the products under telecommunications and other laws and regulations; customer must comply with all such applicable laws in the countries where customer intends to use the product. For more information about these regulations, refer to the following link: http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/5300/5300pnc.htm

Identifying Voice Feature Cards

Use the following steps to identify the voice cards in the system and determine whether the VFC is in VCWare mode or ROM monitor mode. This determines how you download software to the VFC. If Cisco VCWare is not loaded on the VFC, you can use ROM monitor mode to download the VCWare. Otherwise, download the software in VCWare mode.

Step 1 Determine the technology if Cisco VCWare is in VCWare mode by entering the following command:

```
Router# show vfc 0-2 technology
Technology in VFC slot 0-2 is C549
```

If the **show vfc 0-2 technology** command does not work for you, assume the technology is C542.

The Cisco VCWare images you will need for upgrading to the current Cisco VCWare version are named as follows:

- If the technology is c542, the name is vcw-vfc-mz.c542.<vcware version>.bin.
- If the technology is c549 (the only other option currently), the name is vcw-vfc-mz.c549.hc.<vcware version>.bin.

Step 2 Enter enable mode:

```
Router# enable
```

Step 3 Enter your password:

```
Password: password
Router#
```

You are in enable mode when the prompt changes to `Router#`.

Step 4 Determine the number of voice cards in the system, the slot number for each card, and the VFC mode (VCWare or ROM monitor) in which you are running.

```
Router# show vfc 0-2 board
```

The VFC mode is indicated as follows:

- VCWARE for VCWare mode
  or
- ROMMON for ROM monitor mode

Note the location and the mode type for each voice card. You will need this information when you upgrade the Cisco VCWare.

When you have completed the steps above, use one of the following procedures:

- Replacing Firmware with Cisco VCWare in VCWare Mode, if your voice card is running in VCWare mode.
- Replacing Firmware with Cisco VCWare in ROM Monitor Mode, if your voice card is running in ROM monitor mode.

Replacing Firmware with Cisco VCWare in VCWare Mode

Use the steps that follow to download new voice software if your voice card is running in VCWare mode. When downloading from a diskette, first copy the software *from* the diskette *to* a TFTP server. After the software is loaded onto the TFTP server, follow the steps in the next section.

Caution Erasing the VFC files can result in system outage or the corruption of your VFC board. Make sure that the correct version of software resides on your TFTP server before continuing.

Step 1 Optional. Erase the contents of the VFC Flash memory in the selected voice card as follows:

```
Router# erase vfc slot_number

This will erase the contents of VFC Flash. Continue ?[y/n]:Y
This will take some time. Please, wait...vfc
```

If this command fails, use the instructions in the Replacing Firmware with Cisco VCWare in ROM Monitor Mode section.

Step 2 Optional. Verify that the VFC Flash memory is empty:

```
Router# show vfc slot_number directory
Files in slot 1 VFC flash:

     File Name                        Size (Bytes)
```

Step 3 Copy your files using the following criteria and the **copy tftp: vfc:** command:

```
Router# copy tftp: vfc:
Address or name of remote host []? 223.255.212.244
Source file name []? /path/vcw-vfc-mz.c549.hc.<vcware version>.bin
Destination file name []? vcw-vfc-mz.c549.hc.<vcware version>.bin
Accessing tftp://223.255.212.244/path/vcw-vfc-mz.c549.hc.<vcware version>.bin...
Voice card slot number slot ? 1
Copy "tftp://223.255.212.244/path/vcw-vfc-mz.c549.hc.<vcware version>.bin" to VFC?
[yes/no] Y

Loading vcw-vfc-mz.c549.hc.<vcware version>.bin from 223.255.212.244 (via Ethernet0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!![OK - 491256/982016 bytes]
```

Note The destination image name must *begin* with "**vcw-**" (all lowercase); no character can be in front of **vcw-** (no directory path can be included at the beginning of the image name). Be absolutely certain to enter the name correctly. If any character or space is entered incorrectly, the file will not be recognized and will not be copied.

Step 4 Verify that Cisco VCWare is in the VFC Flash memory by listing the directory files using the following commands:

```
Router# show vfc slot_number directory

Files in slot 1 VFC flash:

     File Name                        Size (Bytes)

     1 .  vcw-vfc-mz.c549.hc.<vcware version>.bin      506636
```

Step 5 Reload the VFC code from Flash memory for the specified slot before you unbundle the new VFC image.

Note If the Cisco VCWare release is 10.xx and higher, Step 6 through Step 8 are optional: You may proceed directly to Step 9. For releases 10.xx and higher, there is no need to enter the **unbundle vfc** *x* or **clear vfc** *x* commands after you copy the Cisco VCWare to the VFC flash. To load a new version of Cisco VCWare (release 10.xx and higher), all you need to do is enter the **erase vfc** *x* and **copy tftp: vfc:** command then reload the Cisco AS5300.

```
Router# clear vfc slot_number
```

```
Do you really want to reset this card ? [y/n]:

Please, wait...

Voice Feature Card in slot 1 is reset.
```

Step 6 (Optional with release 10.xx and higher) Unbundle Cisco DSPWare from the Cisco VCWare and configure the file and capability lists with default values. (See Step 9 and Step 10.)

```
Router# unbundle vfc slot_number

You must do 'clear vfc 1' before unbundling a VFC software
image that you have just copied over to VFC flash.
You have requested unbundling of the default DSP firmware
set which will re-write the default-file and capabilities lists.
After unbundling, you must reload the Router for any changes
to take effect.
```

Step 7 (Optional with release 10.xx and higher) Press **y** to continue:

```
Do you want to continue ? [y/n]: y
Please, wait...
Slot <x>. Unbundling done. You may need to reload the Router.
```

Step 8 (Optional with release 10.xx and higher) Verify that DSPWare is unbundled by listing the directory files.

Note If the Cisco VCWare release is 10.xx or higher, this step is not applicable. The only file reported will be the Cisco VCWare file itself.

```
Router# show vfc slot_number directory

Files in slot 1 VFC flash:

     File Name                          Size (Bytes)

     1 .  vcw-vfc-mz.c549.hc.<vcware version>.bin      506636
     2 .  btl-vfc-1.0.1.bin                            1882
     3 .  btj-vfc-1.0.1.bin                            4174
     4 .  jbc-vfc-1.3.0.bin                            12808
     5 .  cor-vfc-hc-1.<dspware version>.bin           195392
     6 .  bas-vfc-hc-1.<dspware version>.bin           210
     7 .  fax-vfc-hc-1.<dspware version>.bin           20730
     8 .  cdc-g711-hc-1.<dspware version>.bin          210
     9 .  cdc-g726-hc-1.<dspware version>.bin          5370
     10.  cdc-g729-hc-1.<dspware version>.bin          31124
     11.  cdc-g728-hc-1.<dspware version>.bin          22208
     12.  cdc-g723.1-hc-1.<dspware version>.bin        32736
     13.  cdc-gsmfr-hc-1.<dspware version>.bin         9192
     14.  cdc-gefr-hc-1.<dspware version>.bin          28536
```

Step 9 Verify that the default file list is initialized by listing the default files:

```
Router# show vfc slot_number default-file

Default File List for VFC in slot 1:

     1. btl-vfc-1.0.1.bin
     2. cor-vfc-hc-1.<dspware version>.bin
     3. bas-vfc-hc-1.<dspware version>.bin
     4. cdc-g729-hc-1.<dspware version>.bin
     5. fax-vfc-hc-1.<dspware version>.bin
```

```
     6. jbc-vfc-l.3.0.bin
     7. btj-vfc-l.0.1.bin
```

Step 10 Verify that the capability list is populated by listing the capability list files:

```
Router# show vfc slot_number cap-list

Capability List for VFC in slot 1:

     1. cor-vfc-hc-1.<dspware version>.bin
     2. bas-vfc-hc-1.<dspware version>.bin
     3. fax-vfc-hc-1.<dspware version>.bin
     4. cdc-g711-hc-1.<dspware version>.bin
     5. cdc-g726-hc-1.<dspware version>.bin
     6. cdc-g729-hc-1.<dspware version>.bin
     7. cdc-g728-hc-1.<dspware version>.bin
     8. cdc-g723.1-hc-1.<dspware version>.bin
     9. cdc-gsmfr-hc-1.<dspware version>.bin
     10. cdc-gefr-hc-1.<dspware version>.bin
```

Step 11 Reboot the Cisco AS5300 for these changes to take effect.

```
Router# reload
```

Verify

Check that you have successfully downloaded the software by doing the following:

- Enter the **show vfc** *slot_number* **directory** command to verify that Cisco VCWare is in Flash memory. Only one filename should appear.

Note If the Cisco VCWare release is 10.xx or higher, this step is not applicable. The only file reported will be the Cisco VCWare file itself.

```
Router# show vfc 1 dir

Files in slot 1 VFC flash:

File Name                        Size (Bytes)

1 .  vcw-vfc-mz.c549.hc.<vcware version>.bin      506636
2 .  btl-vfc-l.0.1.bin                            1882
3 .  btj-vfc-l.0.1.bin                            4174
4 .  jbc-vfc-l.3.0.bin                            12808
5 .  cor-vfc-hc-1.<dspware version>.bin           195392
6 .  bas-vfc-hc-1.<dspware version>.bin           210
7 .  fax-vfc-hc-1.<dspware version>.bin           20730
8 .  cdc-g711-hc-1.<dspware version>.bin          210
9 .  cdc-g726-hc-1.<dspware version>.bin          5370
10.  cdc-g729-hc-1.<dspware version>.bin          31124
11.  cdc-g728-hc-1.<dspware version>.bin          22208
12.  cdc-g723.1-hc-1.<dspware version>.bin        32736
13.  cdc-gsmfr-hc-1.<dspware version>.bin         9192
14.  cdc-gefr-hc-1.<dspware version>.bin          28536
```

Note If this command times out, repeat the process beginning with the steps in the Identifying Voice Feature Cards section.

- Enter the **show vfc** *slot_number* **default-file** and **show vfc** *slot_number* **cap-list** commands to verify that DSPWare is unbundled and the default file list and cap-list are initialized.

```
RouterA# sh vfc 1 def

Default File List for VFC in slot 1:

1. btl-vfc-1.0.1.bin
2. cor-vfc-hc-1.<dspware version>.bin
3. bas-vfc-hc-1.<dspware version>.bin
4. cdc-g729-hc-1.<dspware version>.bin
5. fax-vfc-hc-1.<dspware version>.bin
6. jbc-vfc-1.3.0.bin
7. btj-vfc-1.0.1.bin

RouterA# sh vfc 1 cap-list

Capability List for VFC in slot 1:

1. cor-vfc-hc-1.<dspware version>.bin
2. bas-vfc-hc-1.<dspware version>.bin
3. fax-vfc-hc-1.<dspware version>.bin
4. cdc-g711-hc-1.<dspware version>.bin
5. cdc-g726-hc-1.<dspware version>.bin
6. cdc-g729-hc-1.<dspware version>.bin
7. cdc-g728-hc-1.<dspware version>.bin
8. cdc-g723.1-hc-1.<dspware version>.bin
9. cdc-gsmfr-hc-1.<dspware version>.bin
10 cdc-gefr-hc-1.<dspware version>.bin
```

If you are having trouble downloading the voice card software in VCWare mode, try the following:

- Enter the **show vfc** *slot_number* **board** command to verify that the voice card is back up in VCWare mode.

```
Router# show vfc 1 board
VFC board state is UP, vfc status VCWARE running(0x4)
VFC board in slot 1 with 24 dsps
Router#
```

- Determine whether the VFC ROM version you are running is version 1.2 or version 1.3.

```
Router# sh vfc 1 ver vcw

Voice Feature Card in Slot 1:
     VCware Version     :<vcware version>
     ROM Monitor Version:1.3
     DSPware Version    :<dspware version>
     Technology         :C549
```

- Enter the **reload** command to reboot the Cisco AS5300 so these changes take effect.

Replacing Firmware with Cisco VCWare in ROM Monitor Mode

Use the steps that follow to download new voice software if your voice card is running in ROM monitor mode. When downloading from a diskette, first copy the software *from* the diskette *to* a TFTP server. After the software is loaded onto the TFTP server, follow the steps in the next section.

Caution Erasing the VFC files can result in system outage or the corruption of your VFC board. Check to ensure that the correct version of software resides on your TFTP server before continuing.

Step 1 Optional. Erase the contents of the VFC Flash memory in the selected voice card as follows. This may take a few minutes.

```
Router# clear vfc 1 purge
Purging will erase the entire VFC flash and put VFC in ROM Monitor mode.
```

Step 2 Press **y** to continue:

```
Do you really want to reset this card ? [y/n]: y
Purging will take sometime.

Please, wait...
Erasing flash eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
 done
VFC flash in slot 1 is erased. VFC is in Rom Monitor mode.
```

Step 3 Copy your files using the following criteria and the **copy tftp: vfc:** command:

```
Router# copy tftp: vfc:

Address or name of remote host []? 223.255.212.244
Source file name []? /path/vcw-vfc-mz.c549.hc.<vcware version>.bin
Destination file name []? vcw-vfc-mz.c549.hc.7.xx.bin
Accessing tftp://223.255.212.244/path/vcw-vfc-mz.c549.hc.<vcware version>.bin...
Voice card slot number slot ? 1
Copy "tftp://223.255.212.244/path/vcw-vfc-mz.<vcware version>.bin" to VFC? [yes/no] Y
Loading vcw-vfc-mz.c549.hc.7.xx.bin from 223.255.212.244 (via Ethernet0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!![OK - 491256/982016 bytes]
```

Note The destination image name must *begin* with "**vcw-**" (all lowercase); no character can be in front of **vcw-** (no directory path can be included at the beginning of the image name). Be absolutely certain to enter the name correctly. If any character or space is entered incorrectly, the file will not be recognized and will not be copied.

Step 4 Continue with Step 5 in the "Replacing Firmware with Cisco VCWare in VCWare Mode" section on page 38.

Note If the Cisco VCWare release is 10.xx or higher, you can proceed directly to Step 5 below.

Step 5 Reboot the Cisco AS5300 for these changes to take effect.

```
Router# reload
```

Verify

Check that you have successfully downloaded the software by doing the following:

- Enter the **show vfc** *slot_number* **directory** command to verify that Cisco VCWare is in the Flash memory. Only one filename should appear.

Note If the Cisco VCWare release is 10.xx or higher, this step is not applicable. The only file reported will be the Cisco VCWare file itself.

```
Router# show vfc 1 dir

Files in slot 1 VFC flash:
File Name                          Size (Bytes)
1 .  vcw-vfc-mz.c549.hc.<vcware version>.bin      506636
2 .  btl-vfc-l.0.1.bin                            1882
3 .  btj-vfc-l.0.1.bin                            4174
4 .  jbc-vfc-l.3.0.bin                            12808
5 .  cor-vfc-hc-l.<dspware version>.bin           195392
6 .  bas-vfc-hc-l.<dspware version>.bin           210
7 .  fax-vfc-hc-l.<dspware version>.bin           20730
8 .  cdc-g711-hc-l.<dspware version>.bin          210
9 .  cdc-g726-hc-l.<dspware version>.bin          5370
10.  cdc-g729-hc-l.<dspware version>.bin          31124
11.  cdc-g728-hc-l.<dspware version>.bin          22208
12.  cdc-g723.1-hc-l.<dspware version>.bin        32736
13.  cdc-gsmfr-hc-l.<dspware version>.bin         9192
14.  cdc-gefr-hc-l.<dspware version>.bin          28536
```

Note If this command times out, repeat the process beginning with the steps in the Identifying Voice Feature Cards section.

- Enter the **show vfc** *slot_number* **default-file** and **show vfc** *slot_number* **cap-list** commands to verify that DSPWare is unbundled and the default file list and cap-list are initialized.

```
Router# show vfc 1 def (full word is default-file)

Default File List for VFC in slot 1:

1. btl-vfc-l.0.1.bin
2. cor-vfc-hc-l.<dspware version>.bin
3. bas-vfc-hc-l.<dspware version>.bin
4. cdc-g729-hc-l.<dspware version>.bin
5. fax-vfc-hc-l.<dspware version>.bin
6. jbc-vfc-l.3.0.bin
7. btj-vfc-l.0.1.bin

Router# show vfc 1 cap-list

Capability List for VFC in slot 1:

1. cor-vfc-hc-1.<dspware version>.bin
2. bas-vfc-hc-1.<dspware version>.bin
3. fax-vfc-hc-1.<dspware version>.bin
4. cdc-g711-hc-1.<dspware version>.bin
5. cdc-g726-hc-1.<dspware version>.bin
6. cdc-g729-hc-1.<dspware version>.bin
7. cdc-g728-hc-1.<dspware version>.bin
8. cdc-g723.1-hc-1.<dspware version>.bin
```

```
Router#
```

Tips

If you are having trouble downloading the voice card software in ROM monitor mode, try the following:

- Enter the **show vfc** *slot_number* **board** command to verify that the voice card is back up in VCWare mode.

```
Router# show vfc 1 board

VFC board state is UP, vfc status VCWARE running(0x4)
VFC board in slot 1 with 24 dsps
Router#

Determine if the VFC ROM version you are running is Version 1.2 or Version 1.3.
Router# sh vfc 1 ver vcw

Voice Feature Card in Slot 1:
VCware Version     : <vcware version>
ROM Monitor Version: 1.2
DSPware Version    : <dspware version>
Technology         : C549
```

- Enter the **reload** command to reboot the Cisco AS5300 so these changes take effect.

Troubleshooting

This section contains tips and workarounds for ensuring correct installation and operation of Cisco VCWare.

- If the system crashes after the new VFC cards have been placed in the system, it might mean that one or both of the VFC cards are not seated properly. Pull each VFC card partially out of its slot and reseat it firmly.
- If a download failure occurs in VCWare mode and the VFC falls back to ROM monitor mode, see the Replacing Firmware with Cisco VCWare in ROM Monitor Mode section.
- If both VFC cards are loaded correctly, using the **show version** command indicates the total number of functioning voice resources. For example, the total number of DSP modules on both VFC cards is 10: 10 times 6 means a total of 60 voice resources are available. See the Example show version Output section for an example of the **show version** command output.

Example show version Output

The following is an example of output from the **show version** command with two VFC cards fully populated (60 DSP/voice resources) and the **show vfc # version vcware** command.

```
E1_UUT2# show version
Cisco Internetwork Operating System Software
IOS (tm) 5300 Software (C5300-IS-M), Version 12.1(5)XM, EARLY DEPLOYMENT
RELEASE SOFTWARE (fc1)
TAC:Home:SW:IOS:Specials for info
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled Fri 22-Dec-00 12:46
Image text-base: 0x60008958, data-base: 0x60ED6000
```

```
ROM: System Bootstrap, Version 11.2(9)XA, RELEASE SOFTWARE (fc2)
BOOTFLASH: 5300 Software (C5300-BOOT-M), Version 11.2(9)XA1, RELEASE
SOFTWARE (fc1)

sblab112 uptime is 3 minutes
System returned to ROM by reload at 14:38:02 PST Mon Jan 22 2001
System restarted at 14:47:58 PST Mon Jan 22 2001
System image file is "tftp://172.29.248.12/wwx/c5300-is-mz.<ios version>"
cisco AS5300 (R4K) processor (revision A.32) with 131072K bytes of
memory.
Processor board ID 11768660
R4700 CPU at 150Mhz, Implementation 33, Rev 1.0, 512KB L2 Cache
Channelized E1, Version 1.0.
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
Primary Rate ISDN software, Version 1.1.
Backplane revision 2
Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x30,
 Board Hardware Version 1.64, Item Number 800-2544-02,
 Board Revision B0, Serial Number 11768660,
 PLD/ISP Version 0.0,  Manufacture Date 12-Jan-1999.
1 Ethernet/IEEE 802.3 interface(s)
1 FastEthernet/IEEE 802.3 interface(s)
93 Serial network interface(s)
4 Channelized E1/PRI port(s)
60 Voice resource(s)
128K bytes of non-volatile configuration memory.
8192K bytes of processor board System flash (Read/Write)
8192K bytes of processor board Boot flash (Read/Write)

Configuration register is 0x2102

E1_UUT# sh vfc 1 version vcware

Voice Feature Card in Slot 1:
VCware Version     :<vcware version>
ROM Monitor Version:1.3
DSPware Version    :<dspware version>
Technology         :C549

E1_UUT# sh vfc 2 version vcware

Voice Feature Card in Slot 2:
     VCware Version     :<vcware version>
     ROM Monitor Version:1.3
     DSPware Version    :<dspware version>
     Technology         :C549
```

Cisco VCWare Version Checker Warning Output

Cisco VCware version 7.40 used with Cisco IOS Release 12.2(10), and Cisco IOS Release 12.2(11)T used with Cisco VCWare version 10.26a support the Cisco VCWare Version Checker feature, which delivers a compatibility warning at bootup and when using the **show vfc version vcware** and **show vfc version dspware** commands. This new version checker feature detects possible mismatches between Cisco IOS software and Cisco VCWare and DSPWare. If no mismatch is found, the version checker will

not print anything out. Otherwise, a compatibility mismatch advisory is output at bootup and when the **show vfc version** commands are used. The new information is advisory only, so there is no action taken whether the software is compatible or incompatible.

Examples of the new version checker feature are shown in the following sections:

- Cisco VCWare Version Checker Warning Output at Bootup
- Update to show vfc version Output

Cisco VCWare Version Checker Warning Output at Bootup

The following is an example of the version checker warning message when a mismatch of firmware and software is detected at boot up:

```
Firmware version mismatch for bundle AS5300 VCWare
  - version found (11.17x (eng)) is higher than maximum allowed (10.xx)
Firmware version mismatch for bundle AS5300 C549
  - version found (4.1.17x) is higher than maximum allowed (4.0.xx)
```

Update to show vfc version Output

The following is an example of output that shows compatible firmware and software:

```
Router# show vfc 1 version vcware

Voice Feature Card in Slot 1:
     VCWare Version     : 7.35
     ROM Monitor Version: 1.3
     DSPWare Version    : 3.4.46L
     Technology         : C549
VCWare/DSPWare version compatibility OK
```

Table 3 show vfc version vcware Field Descriptions

Field	Description
Voice Feature Card in Slot 1	The voice feature card is in slot 1.
VCWare Version	The VCWare version shows 7.35, which is the required minimum for this release.
ROM monitor	ROM monitor version shows 1.3
DSPWare Version	The DSPWare version shows 3.4.46L, which is the required minimum for this release.
Technology	The technology shows C549. C549 technology is available to support either medium complexity codecs or high complexity codecs.
VCWare/DSPWare version compatibility status	The Cisco VCWare and DSPWare versions are compatible with Cisco IOS Release Software. VCWare/DSPWare version compatibility is either OK, or shows a mismatch. **Note** This option is available only with Cisco IOS Release 12.2(10) and later or 12.2(11)T and later.

```
Router# show vfc 1 version dspware

DSPWare version in VFC slot 1 is 3.4.46L
VCWare/DSPWare version compatibility OK
```

Table 4 show vfc version dspware Field Descriptions

Field	Description
Voice Feature Card in Slot 1	The voice feature card is in slot 1.
DSPWare Version	The DSPWare version shows 3.4.46L, which is the required minimum for this release.
VCWare/DSPWare version compatibility status	The Cisco VCWare and DSPWare versions are compatible with Cisco IOS Release Software. VCWare/DSPWare version compatibility is either OK, or shows a mismatch. **Note** This option is available only with Cisco IOS Release 12.2(10) and later or 12.2(11)T and later.

If you were to enter an explicit request, and the software was incompatible, the following output would be seen:

```
Router# show vfc 1 version vcware

Voice Feature Card in Slot 1:
     VCWare Version     : 6.04
     ROM Monitor Version: 1.3
     DSPWare Version    : 3.3.10L
     Technology         : C549
Firmware version mismatch for bundle AS5300 VCWare
  - version found (6.04) is lower than minimum required (7.14)
Firmware version mismatch for bundle AS5300 C549
  - version found (3.3.10L) is lower than minimum required (3.4.26L)

Router# show vfc 1 version dspware

DSPWare version in VFC slot 1 is 3.3.10L
Firmware version mismatch for bundle AS5300 VCWare
  - version found (6.04) is lower than minimum required (7.14)
Firmware version mismatch for bundle AS5300 C549
  - version found (3.3.10L) is lower than minimum required (3.4.26L)
```

Related Links

For more information, refer to the following documents and indexes:

- Cisco AS5300 Documentation index
- Cisco AS5300 Universal Access Servers Release Notes index
- *Cisco IOS Multiservice Applications Configuration Guide, Release 12.1*
- Cisco IOS software release information
- *Cisco IOS Voice, Video, and Fax Configuration Guide, Release 12.2*
- *Cisco IOS Voice, Video, and Fax Command Reference, Release 12.2*
- Cisco VCWare software download

Note You must have an account with Cisco.com and be logged in to download new Cisco VCWare software releases.

- *Configuration Guides and Command References, Cisco IOS Release 12.2*
- Cross-Platform Release Notes, Cisco IOS Release 12.2.
- *How to Configure the Extended G.168 Echo Canceller* section in the Voice Port Configuration document
- New Feature Documentation index, Cisco IOS Release 12.2.
- Voice-over-IP for Cisco AS5300 index

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-china.cisco.com
- http://www-europe.cisco.com

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 and may be more current than printed documentation. The CD-ROM package is available as a single unit or as an annual subscription.

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- Registered Cisco Direct Customers can order Cisco Product documentation from the Networking Products MarketPlace:

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Technical Assistance Center

The Cisco TAC website 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.

This document is to be used in conjunction with the documents listed in the Related Links section.