



**Intel® NetStructure™ Host Media
Processing Software:
Interoperability Test with
Cisco 2611XM Router,
Cisco AS5400,
Cisco CallManager 3.3(2), and
Cisco 79xxG IP Phones**

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1. Introduction

Purpose of This Document

This is the test report for the IP interoperability assessment of Intel® NetStructure™ Host Media Processing (HMP) software with Cisco* products. This document summarizes and discusses the results of the interoperability tests with Cisco 2611XM, Cisco AS5400, Cisco CallManager* 3.3(2), and Cisco 79xxG IP phone and analog phone/fax. This document also details how the Cisco products were configured for the tests.

Status

Issues found during the test will be handled with the Intel NetStructure HMP development and test team. Also we will initiate Cisco TAC support if necessary. All problems will be tracked in the *HMP-IP Interoperability Test Result* spreadsheet based on PTR# or Cisco TAC#. We also list all the PTR and Cisco TAC for the open problems found during the test in section 6 Interoperability Issues. This document will be updated when a problem is resolved in a PTR or Cisco TAC and the test is re-executed.

Definitions & Acronyms

Acronym	Term	Definition/Description
CCM	Cisco CallManager	Cisco IP telephony solution, part of Cisco AWID (Architecture of Voice, Video, and Integrated Data)
CCME	Cisco CallManager Express*	Cisco IP telephony solution embedded in Cisco IOS Software that provides call processing for Cisco IP phones.
DSP	Digital Signal Processing	
FP	Feature Pack	
FXO	Foreign Exchange Office	The interface receives POTS (Plain Old Telephone Service) from CO (Central Office) of PSTN.
FXS	Foreign Exchange Station/Subscriber	The interface delivers POTS service from CO and must connect to subscriber equipment (phones, fax machine, modems)
LAN	Local Area Network	
MRD	Marketing Requirement Document	
PIMG	Intel NetStructure PBX-IP Media Gateway	
PRD	Project Requirement Document	
PSTN	Public Switched Telephone Network	Telephone system based upon copper wires that carry analog voice signals
PTP	Project Test Plan	
TAC	Cisco's Technical Assistance Center	Cisco products technical support.
TC	Test Case	
TCS	Test Case Specification	Refines the TDS to a level at which tests can be executed. It provides input and output specifications required of the test items. It may also be used to specify the steps for executing a set of test cases.
TDS	Test Design Specification	The core test planning document. It enumerates the test cases that will be required to test the product with an appropriate level of coverage.
TR	Test Report	Summarizes the results of the designated test activities and provides evaluations based on the results.

VAD	Voice Activity Detection	
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References

Ref#	Name	Author	Comments
1	IP Interoperability Requirements	Intel Corporation	
2	HMP IP Media Server Building Blocks PRD	Intel Corporation	PRD (SYS-PR-195)
3	HMP-based IP Media Server Resource Building Blocks MRD	Intel Corporation	MRD (PMD-PR-045)
4	Global Call IP for Host Media Processing Technology Guide – April 2004	Intel Corporation	Document #05-2039-002
5	Intel NetStructure HMP Interoperability Test with Cisco 2611XM Router (Embedded with Cisco IOS Software 12.3(4) & Cisco CallManager Express 3.0) Cisco AS5400 Media Gateway (Embedded with Cisco IOS Software 12.3) Cisco CallManager 3.3 Cisco CallManager 4.0 Cisco 79xxG IP phones Test Design Specification	Intel Corporation	TDS
6	Cisco CallManager Express 3.1 Data sheet	Cisco Corporation	http://www.cisco.com/en/US/products/sw/voicesw/ps4625/products_data_sheet0900aecd8016c267.html
7	Cisco CallManager Administration Guide, Release 3.3(2)	Cisco Corporation	http://www.cisco.com/en/US/products/sw/voicesw/ps556/products_administration_guide_book09186a008011b41c.html
8	Cisco AS5400 Configuration Guide	Cisco Corporation	
9	Cisco IOS Release 12.3 Configuration Guides and Command References	Cisco Corporation	http://www.cisco.com/univercd/cc/td/doc/product/software/ios123/123cgcr/index.htm
10	Cisco CallManager Administration Guide, Release 4.0(1)	Cisco Corporation	http://www.cisco.com/en/US/products/sw/voicesw/ps556/products_administration_guide_book09186a00801e8ada.html

2. Software Validated

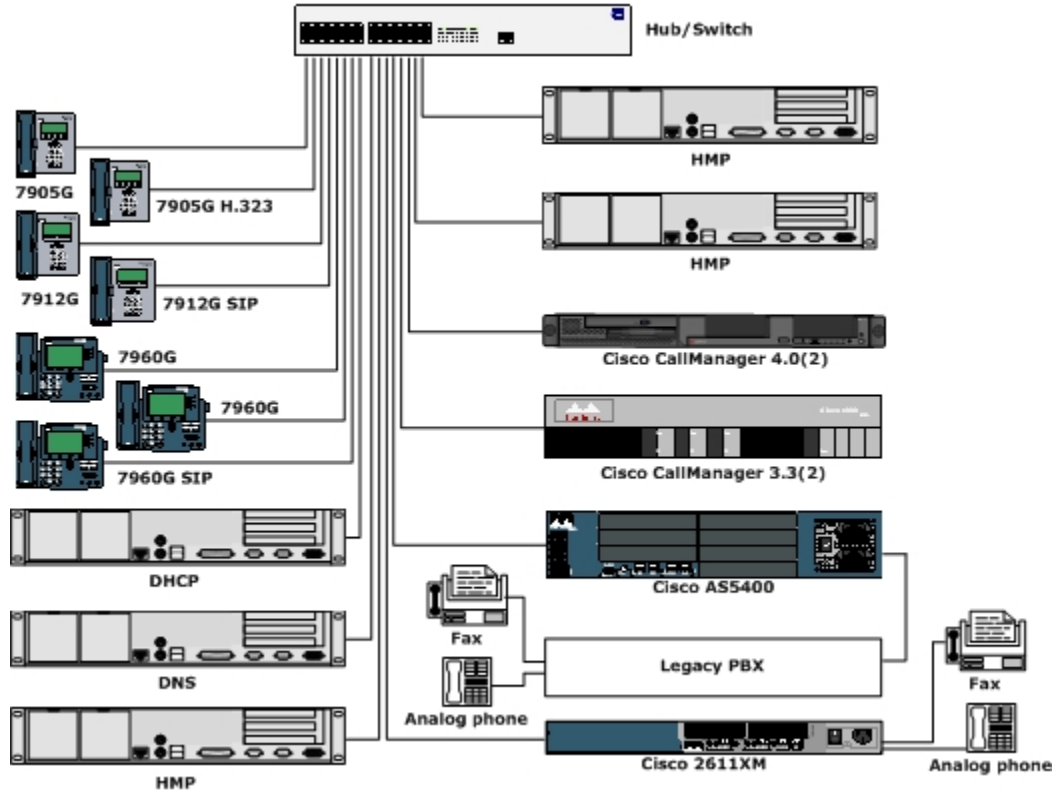
System	Software Version and Description
HMP 1.1	<p><u>For most of the test cases:</u> Intel® NetStructure (TM) Host Media Processing (HMP) Software Release 1.1 SU for Windows on Intel Architecture Build Date=10/21/2004 Build Number=10 IP Host=3.1.0.25</p> <p><u>For SIP blind/supervised transfer:</u> HMP 1.1 SU for Windows on Intel Architecture Build Date=11/24/2004 Build Number=13 IP Host=4.0.0.13</p> <p><u>For Cisco CallManager 4.0(2):</u> HMP 1.1 SU for Windows on Intel Architecture Build Date=01/21/2005 Build Number=16 IP Host=4.0.0.16</p>
Cisco 2611XM	IOS Version 12.3(8)T5 with gatekeeper feature set CCME Version 3.1 Telephony Service
Cisco AS5400	IOS Version 12.3(8)T5
Cisco CallManager 3.3(2)	Version 3.3(2)es63 (engineer special 63)
Cisco CallManager 4.0(2)	Version 4.0(2)a

Note: See

Appendix B. Software Version for detail.

3. Test Environment

The following diagram is the system setup for the HMP IP interoperability test with Cisco 2611XM, AS5400, CallManager 3.3(2), and Cisco IP phones.



Switch

Equipment	Description
3Com* SuperStack* Switch 3300 24-Port	24-Port Ethernet* Switch

HMP 1.1 Service Update #10

Item	Description
Platform	Intel SR2300 with SE7501WV2 motherboard
CPU	Intel® Xeon™ processor 2.4 GHz
RAM	1GB DDR 266 MHz SDRAM
CD-ROM drive	56X
Hard Disk	65GB, SCSI
Network Interface Card	10/100/1000Base-T
Size	2U

HMP 1.1 Service Update #13

Item	Description
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Platform	Intel® SR2300 with Intel® SE7501WV2 motherboard
CPU	Dual Intel® Xeon™ processor 2.2 GHz
RAM	2GB DDR 266 MHz SDRAM
CD-ROM drive	56X
Hard Disk	17GB, SCSI
Network Interface Card	10/100/1000Base-T
Size	2U

HMP 1.1 Service Update #16

Item	Description
Platform	Intel SR2300 with SE7501WV2 motherboard
CPU	Dual Xeon 2.2 GHz
RAM	2GB DDR 266 MHz SDRAM
CDROM drive	56X
Hard Disk	17GB, SCSI
Network Interface Card	10/100/ 1000BT
Size	2U

DNS/DHCP

Item	Description
Platform	PCI
CPU	Intel® Pentium® III processor 600 MHz
RAM	256MB
CD-ROM drive	12X
Hard Disk	20GB, SCSI
Network Interface Card	10Base-T
Size	2U

Cisco 2600 Router

Components	Description
Cisco 2611XM Multiservice Router	128MB DRAM factory upgrade 32MB Flash factory upgrades One 2 ports Foreign Exchange Office (FXO) Voice Interface Card (VIC) One 2 ports Foreign Exchange Station (FXO) Voice Interface Card (VIC)
Cisco IOS with Multimedia Conference Manager (MCM)	IOS 12.3(8)T5 with MCM gatekeeper feature set running under 2611XM
Cisco CallManager Express 3.1 with 36 user licenses	IOS Telephony Service 3.1

Cisco AS5400

Components	Description
AS5400	108 Universal Port Card Octal T1/PRI DFC card Dual AC Power Supply 512MB Main SDRAM upgrade 128MB Shared I/O upgrade 16MB Boot Flash upgrade

	64MB System Flash upgrade 192 Data License
AS5400 IOS	IOS 12.3(8)T5

Cisco CallManager 3.3(2)

The Cisco CallManager 3.3 software runs on a Cisco Media Convergence Server (MCS) 7835-1266.

Product Description	MCS 7835-1266
Product Type	Cisco Media Convergence Server
CPU	Intel® Pentium® III processor 1.26 GHz
RAM	1GB 133 MHz SDRAM
Hard Drives	Dual redundant 18.2 GB SCSI hot-plug
Hardware RAID Controller	Yes
Size	2U
Maximum IP Phones supported	2500
Dual Power Supply	Yes

Cisco CallManager 4.0(2)

The Cisco CallManager 4.0(2) software runs on a Cisco Media Convergence Server (MCS) 7825H-3000.

Product Description	MCS 7825H-3000
Product Type	Cisco Media Convergence Server
CPU	Pentium 4 3.06 GHz
RAM	1GB 2x512 MHz SDRAM
Hard Drives	40GB ATA/100
Hardware RAID Controller	Yes
Size	1U
Maximum IP Phones supported	1000
Dual Power Supply	Yes

Cisco IP phones

Model	7905G	7912G	7960G
Type	IP phone	IP phone	IP phone
Main Features	<ul style="list-style-type: none"> – Four soft keys – Volume control – Hearing-aid compatible – A single position foot stand 	<ul style="list-style-type: none"> – Four soft keys – Volume control – Hearing-aid compatible – A single position foot stand 	<ul style="list-style-type: none"> – Four soft keys – Volume control – Hearing-aid compatible – A single position foot stand
Protocols	SCCP, H.323v2 , SIP	SCCP, SIP	SCCP, SIP, MGCP
Voice Coders	G.711a, G.711u G.729ab	G.711a, G.711u, G.729ab	G.711, G.729a
VAD	Yes	Yes	Yes
Speaker	Yes	Yes	Yes
Call Waiting	Yes	Yes	Yes
Call Forward	Yes	Yes	Yes
Call Transfer	Yes	Yes	Yes
Conference	Yes	Yes	Yes
Voice Mail	Yes	Yes	Yes
Display	<ul style="list-style-type: none"> – Pixel-based display – Display calling party information, time, calling time. 	<ul style="list-style-type: none"> – Pixel-based display – Display calling party information, time, calling time. 	<ul style="list-style-type: none"> – Pixel-based display – Display calling party information, time, calling time.
Network	10Base-T Ethernet	10/100Base-T Ethernet	10/100Base-T Ethernet
Dimensions (H x W x D)	8 x 7 x 6 in. 20.3 x 17.7 x 15.2 cm	6.5 x 7 x 6 in. 16.4 x 17.7 x 15.2 cm	8 x 10.5 x 6 in. 20.3 x 26.7 x 15.2 cm
Weight	1.9 lb (0.9 kg)	1.9 lb (0.9 kg)	3.5 lb (1.6 kg)
Reference	http://www.cisco.com/en/US/products/hw/phones/ps379/products_data_sheet09186a00800c835a.html	http://www.cisco.com/en/US/products/hw/phones/ps379/products_data_sheet09186a00801739c0.html	http://www.cisco.com/en/US/products/hw/phones/ps379/products_data_sheet09186a0080091984.html

4. Test Summary

Overview of the Test Results

Each test case specified below contains one or more system configurations. Therefore the result uses the following notations. For detail configurations and test scenarios, refer to the TDS (Reference #5).

- P** Pass on all the system configurations and test scenarios.
- P*** Pass only on the system configurations which we are able to configure at this time. Or pass only on the setups which the test scenarios are supported by the features of the HMP. See Appendix A. Test Note.
- F** Fail on all the system configurations. See section 6. Interoperability Issues.
- F*** Fail on some test scenarios. See section 6. Interoperability Issues.
- D** Features required to execute this test case is not yet available in our product. See Appendix A. Test Note.
- D*** Test case was originally planned on more configurations than it was run on due to limitations of configurations. See Appendix A. Test Note.
- Test case is not valid on all the system configurations. Some features are not supported in third-party equipment or the test case only concludes the HMP internal features, not the interoperability with Cisco products. See Appendix A. Test Note.

All test cases regarding handling incoming/outgoing calls verified the voice path and full duplex by applying play and record (see Ref. #5 for details.) All the call progress tests are deferred because Intel NetStructure HMP 1.1 SU#10 does not support the early media feature.

Cisco 2611XM, AS5400, CallManager 3.3(2) and CallManager 4.0(2) H.323 Test Cases

Use Case Category	Scenarios	Test Case ID	Result
Initialization/ Shutdown	Perform Gatekeeper discovery on Cisco 2611XM IOS Gatekeeper.	TC1	P
	Perform registration with Cisco 2611XM IOS Gatekeeper using E.164 prefix.	TC2	P
	Change registration information with the Cisco 2611XM IOS Gatekeeper.	TC3	P*
	Cancel Registration with Cisco 2611XM IOS Gatekeeper	TC4	P
Handle incoming call from Cisco 79xxG IP Phone	Connect multiple simultaneous incoming calls from Cisco 79xxG IP Phones using symmetric coders.	TC5	P
	Connect multiple simultaneous incoming call from Cisco 79xxG IP Phones using asymmetric coders	TC6	F
	Connect multiple simultaneous incoming H.323 call from Cisco 79xxG IP Phones using slow start procedure, H.245 tunneling disabled.	TC7	P
	Connect multiple simultaneous incoming H.323 call from Cisco 79xxG IP Phones using slow start procedure, H.245 tunneling enabled.	TC8	P
	Connect multiple simultaneous incoming H.323 call from Cisco 79xxG IP Phones using fast connect procedure, H.245 tunneling disabled.	TC9	P

Handle incoming call from Cisco 79xxG IP Phone	Connect multiple simultaneous incoming H.323 call from Cisco 79xxG IP Phones using fast connect procedure, H.245 tunneling enabled.	TC10	P
	Connect multiple simultaneous incoming calls from Cisco 7960G SCCP IP Phones via Cisco CallManager x.x(x) session controller using symmetric coders using symmetric coders.	TC63	P
	Connect multiple simultaneous incoming calls from Cisco 7960G SCCP IP Phones via Cisco CallManager x.x(x) session controller using symmetric coders using asymmetric coders.	TC64	F
	Place multiple, simultaneous calls from Cisco 7960G SCCP IP Phones via Cisco CallManager x.x(x) session controller using slow start procedure, H.245 tunneling disabled.	TC65	P
	Connect multiple simultaneous incoming calls from Cisco 7960G SCCP IP Phones via Cisco CallManager x.x(x) session controller using slow start procedure, H.245 tunneling enabled.	TC66	—
	Connect multiple simultaneous incoming calls from Cisco 7960G SCCP IP Phones via Cisco CallManager x.x(x) session controller using fast connect procedure, H.245 tunneling disabled.	TC67	—
	Connect multiple simultaneous incoming calls from Cisco 7960G SCCP IP Phones via Cisco CallManager x.x(x) session controller using fast connect procedure, H.245 tunneling enabled.	TC68	—
	Connect multiple simultaneous incoming calls from Cisco 7905G H.323 Phones via Cisco CallManager 3.3(2) session controller	TC69	P
	Retrieve the call party information from the SETUP message for an incoming call arriving from a Cisco 7960G SCCP IP Phone and Cisco 7905G H.323 Phone via a Cisco Call Manager x.x(x) session controller.	TC70	P
Handle incoming call from analog phone connected to Cisco 2611XM.	Connect multiple simultaneous incoming calls from analog phone connected to Cisco 2611XM.	TC11	P
Process DTMF input	Perform In-band DTMF detection	TC12	P
	Perform H.245 UII DTMF detection	TC13	P
	Perform RFC2833 DTMF detection	TC58	P
	Perform In-band DTMF detection with Cisco CallManager x.x(x)	TC71	P
	Perform H.245 UII DTMF detection with Cisco CallManager x.x(x)	TC72	P
Process DTMF input	Perform RFC2833 DTMF detection with Cisco CallManager x.x(x)	TC73	P

Make an outgoing call to an Cisco 29xxG IP Phone	Place multiple simultaneous H.323 calls to Cisco 79xxG IP Phones using symmetric coders.	TC14	P*
	Place multiple simultaneous H.323 calls to Cisco 79xxG IP Phones using asymmetric coders	TC15	F
	Place multiple, simultaneous H.323 calls to Cisco 79xxG IP Phones using slow start procedure, H.245 tunneling disabled.	TC16	P*
	Place multiple, simultaneous H.323 calls to Cisco 79xxG IP Phones using slow start procedure, H.245 tunneling enabled.	TC17	P*
	Place multiple, simultaneous H.323 calls to Cisco 79xxG IP Phones using fast start procedure, H.245 tunneling disabled.	TC18	P*
	Place multiple, simultaneous H.323 calls to Cisco 79xxG IP Phones using fast start procedure, H.245 tunneling enabled.	TC19	P*
	Process call failure: called party does not answer.	TC21	P*
	Process call failure: called party is busy.	TC22	P*
	Process call failure: capability not supported by Cisco 79xxG IP Phone	TC23	P*
Make an outgoing call to an analog Phone connected to Cisco 2611XM and perform call progress analysis.	Place a H.323 call to an analog phone connected to Cisco 2611XM.	TC20	P*
Make an outgoing call to an analog Phone connected to Cisco AS5400	Place a H.323 call to an analog phone connected to Cisco AS5400 via a Legacy PBX.	TC56	P
Handle incoming call from an analog phone connected to Cisco AS5400	Connect multiple simultaneous incoming H.323 calls from analog phone connected to Cisco AS5400 via a Legacy PBX.	TC54	P
Send/Receive T.38 fax over IP using H.323 to setup the call.	Send T.38 fax in an established voice call.	TC29	P
	Receive T.38 fax in an established voice call.	TC30	P
	Receive T.38 fax without an established voice session.	TC31	F
	Send T.38 fax without an established voice session.	TC32	F
Hold/Retrieve	Verify a connected H.323 call between HMP-based IP Media Server and a Cisco 79xxG IP phones can be put on hold and retrieved using Cisco 79xxG IP phones' Hold/Retrieve keys.	TC24	D
Bridge calls	Bridge two H.323 calls that use different coders	TC33	—
Transfer	Perform a blind transfer to another H.323 IP phone via a gatekeeper-model or direct-called model. HMP is the transferring endpoint.	TC25	P

	Perform a supervised transfer to another H.323 IP phone via a gatekeeper-model or direct-called model. HMP is the transferring endpoint.	TC26	F
	Participate a blind transfer to another H.323 IP phone via a gatekeeper-model or direct-called model. HMP is the transferred endpoint.	TC27	—
	Participate a supervised transfer to another H.323 IP phone via a gatekeeper-model or direct-called model. HMP is the transferred endpoint.	TC28	—
	Perform a blind transfer to another analog phone. HMP is the transferring endpoint via Cisco AS5400.	TC59	P
	Perform a supervised transfer to another analog phone. HMP is the transferring endpoint via Cisco AS5400.	TC60	F

Cisco 2611XM, AS5400 and CallManager 4.0(2) SIP Test Cases

Use Case Category	Scenarios	Test Case ID	Result
Handle incoming call from Cisco 79xxG SIP Phone	Connect multiple simultaneous incoming calls from Cisco 79xxG IP Phones using SIP.	TC34	P
	Switch coders using re-INVITE after call connected with Cisco 79xxG IP Phone.	TC35	D
Handle incoming SIP call from analog Phone connected to Cisco 2611XM	Connect multiple incoming calls from analog phones using SIP.	TC36	P
	Switch coders using re-INVITE after call connected with analog phone.	TC37	D
Handle incoming SIP call from analog phone connected to Cisco AS5400	Connect multiple incoming SIP calls from analog phones connected to Cisco AS5400.	TC55	P
Make an outgoing call to an Cisco 79xxG SIP Phone	Place a SIP call to Cisco 79xxG IP Phone connected to Cisco 2611XM	TC38	P*
	Handle unsuccessful call to Cisco 79xxG IP Phones.	TC40	D*
Make an outgoing call to an Cisco 79xxG SIP Phone and perform call progress analysis	Place a call to Cisco 79xxG IP phone and perform call progress analysis on the in-band tones.	TC44	D
Make an outgoing SIP call to an analog phone connected to Cisco 2611XM	Place a call to an analog phone connected to Cisco 2611XM	TC39	P
Place a SIP call to an analog phone connected and perform call progress analysis	Place a call to an analog phone and perform call progress analysis on the in-band tones.	TC45	D
Make an outgoing SIP call to an analog	Place a SIP call to an analog phone connected to Cisco AS5400	TC57	F*

phone connected to Cisco AS5400			
Process DTMF input	Perform In-band DTMF detection during SIP call	TC51	P
MWI	Activate message waiting indicator light of an Cisco 79xxG SIP Phone	TC42	D
	Deactivate message waiting indicator light of an Cisco 79xxG SIP Phone	TC43	D
Hold/Retrieve	Verify a connected SIP call between HMP-based IP Media Server and a Cisco 79xxG SIP phone can be put on hold and retrieved using Cisco 79xxG Hold/Retrieve keys.	TC41	D
Bridge calls	Bridge and outgoing call with an incoming call using different coders (IP drop-and-insert)	TC50	—
Send/Receive T.38 fax over IP using SIP to setup the call.	Send T.38 fax with an established voice session	TC74	P
	Receive T.38 fax with an established voice session	TC75	P
	Send T.38 fax without an established voice session	TC52	F
	Receive T.38 fax without an established voice session	TC53	F
Transfer	Perform a REFER-based SIP blind transfer to another Cisco SIP phone	TC46	P*
	Perform a REFER-based SIP supervised transfer to another Cisco SIP phone.	TC47	P*
	Participate in a REFER-based SIP blind transfer as a transferred endpoint.	TC48	—
	Participate in a REFER-based SIP supervised transfer as a transferred endpoint.	TC49	—
	Perform a REFER-based SIP blind transfer to another analog phone via Cisco AS5400	TC61	P
	Perform a REFER-based SIP supervised transfer to another phone via Cisco AS5400	TC62	P

Codec Compatibility Test Results

Cisco equipment and the test application were set to slow start and tunneling was disabled for the codec compatibility test.

CODEC	BIT RATE (kbps)	FRAME SIZE (ms)	FRAMES PER PACKET	VAD	RESULT							
					2611XM		AS5400		CCM3.3(2)		CCM4.0(2)	
					I	O	I	O	I	O	I	O
g.711 A-law	64	10	1	N	P	P	P	P	P	P	P	P
g.711 A-law	64	20	1	N	P	P	P	P	P	P	P	P
g.711 A-law	64	30	1	N	P	P	P	P	P	P	P	P
g.711 Mu-law	64	10	1	N	P	P	P	P	P	P	P	P
g.711 Mu-law	64	20	1	N	P	P	P	P	P	P	P	P
g.711 Mu-law	64	30	1	N	P	P	P	P	P	P	P	P
g.723.1	5.3	30	1	N	P	P	P	P	P	P	P	P

g.723.1	5.3	30	2	N	P	P	P	P	P	P	P	P
g.723.1	5.3	30	3	N	P	P	P	P	P	P	P	P
g.723.1	6.3	30	1	N	P	P	P	P	P	P	P	P
g.723.1	6.3	30	2	N	P	P	P	P	P	P	P	P
g.723.1	6.3	30	3	N	P	P	P	P	P	P	P	P
g.729a	8	10	1	N	F	F	F	F	P	P	P	P
g.729a	8	10	2	N	F	F	F	F	P	P	P	P
g.729a	8	10	3	N	F	F	F	F	P	P	P	P
g.729a	8	10	4	N	F	F	F	F	P	P	P	P
g.729ab	8	10	1	Y	F	F	F	F	P	P	P	P
g.729ab	8	10	2	Y	F	F	F	F	P	P	P	P
g.729ab	8	10	3	Y	F	F	F	F	P	P	P	P
g.729ab	8	10	4	Y	F	F	F	F	P	P	P	P

I: Inbound (receiving calls) O: Outbound (place outbound calls)
 P: Pass F: Fail

5. Variances

Variances from PTP

None.

Variances from TDS

- Some tests were deferred due to unavailability of features in HMP 1.1 SU#10.

Unsupported Features in the HMP 1.1 SU#10	Deferred the scenarios with the unsupported features of the following test cases
Early media	TC14, TC16-TC20, TC44, TC45
Hold/Retrieve	TC24, TC41
SIP redirect (3xx)	TC38, TC40
SIP re-INVITE	TC35, TC37

Variances from TCS

None.

6. Interoperability Issues

This section outlines the interoperability issues that require resolution in order to comply to the interoperability requirements for HMP.

General

Failed Test Case	Causes & Descriptions
TC6	<p><u>Configuration</u> Cisco 79xxG IP Phones ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ HMP</p> <p><u>Result</u> Test failed. Calls can not be established.</p> <p><u>Causes</u> Cisco 2611XM matched one codec for both directions and HMP sends "OpenLogicalChannelReject". And Cisco 2611XM sends "releaseComplete" with Cause Value: Bearer capability not implemented(65)</p> <p><u>Conclusion</u> Cisco 2611XM is unable to accept asymmetric codec setup. Cisco TAC support</p>

	<p>had been initiated. (TAC#600773920) Based on the Cisco TAC answers, Cisco 2611XM does not support asymmetric codec.</p>
TC15	<p><u>Configuration</u> HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ Cisco 79xxG</p> <p><u>Result</u> Test failed. Calls can not be established.</p> <p><u>Causes</u> HMP sends “setup OpenLogicalChannel” to try to setup a call, but Cisco 2611XM sends “releaseComplete” right away with Cause Value: Bearer capability not implemented(65)</p> <p><u>Conclusion</u> Cisco 2611XM is unable to accept asymmetric codec setup. Cisco TAC support had been initiated. (TAC#600773920) Based on the Cisco TAC answers, Cisco 2611XM does not support asymmetric codec.</p>
TC31 TC53	<p><u>Configuration</u> HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Analog FAX</p> <p><u>Result</u> HMP is unable to receive T.38 fax without an established voice session from the Cisco 2611XM router.</p> <p><u>Causes</u> Cisco 2611XM is unable to send/receive T.38 fax without an established voice session. Cisco TAC support had been initiated. (TAC#600761051) Based on the Cisco TAC answers, Cisco 2611XM does not support send/receive T.38 fax without an established voice session.</p>
	<p><u>Configuration</u> HMP ↔ LAN ↔ Cisco AS5400 ↔ Legacy PBX ↔ Analog FAX</p> <p><u>Result</u> HMP is unable to receive T.38 fax without an established voice session from the Cisco 5400 gateway.</p> <p><u>Causes</u> Cisco AS5400 is unable to send/receive T.38 fax without an established voice session. Cisco TAC support had been initiated. (TAC#600761051) Based on the Cisco TAC answers, Cisco AS5400 does not support send/receive T.38 fax without an established voice session.</p>
TC32 TC52	<p><u>Configuration</u> HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Analog FAX</p> <p><u>Result</u> HMP is unable to send T.38 fax without an established voice session via a Cisco 2611XM router.</p> <p><u>Causes</u> Cisco 2611XM is unable to send/receive T.38 fax without an established voice session. Cisco TAC support had been initiated. (TAC#600761051) Based on the Cisco TAC answers, Cisco 2611XM does not support send/receive T.38 fax without an established voice session.</p>
	<p><u>Configuration</u> HMP ↔ LAN ↔ Cisco AS5400 ↔ Legacy PBX ↔ Analog FAX</p> <p><u>Result</u> HMP is unable to send T.38 fax without an established voice session via a Cisco AS5400 gateway.</p> <p><u>Causes</u> Cisco AS5400 is unable to send/receive T.38 fax without an established voice session. Cisco TAC support had been initiated. (TAC#600761051) Based on the Cisco TAC answers, Cisco AS5400 does not support send/receive T.38 fax without an established voice session.</p>

<p>TC57</p>	<p><u>Configuration</u> Analog phone ↔ Legacy PBX ↔ Cisco AS5400 ↔ LAN ↔ HMP</p> <p><u>Result</u> HMP is unable to place a SIP call to an analog phone via Cisco AS5400 with slow start enabled. Call can be established, but can't hear any voice from both side. HMP is able to place a successful SIP call with slow start disabled (can hear voice on both side)</p> <p><u>Causes</u> During codec negotiation, at Cisco side, Cisco AS5400 fail to select a match codec, even the codec is explicitly configured in the AS5400. At HMP side, HMP fail to send a correct capability table list based on the ethereal capture.</p> <p><u>Conclusion</u> Both Cisco AS5400 and HMP might have some issues. Logs and ethereal capture have sent for investigation. Cisco TAC support will be initiated.</p>
<p>TC60</p>	<p><u>Configuration</u> Analog phone ↔ Legacy PBX ↔ Cisco AS5400 ↔ LAN ↔ HMP</p> <p><u>Result</u> Supervised transfer test fail. Two call could be established successfully between HMP and two analog phones, but transfer fail after gc_InitXfer and gc_InvokeXfer.</p> <p><u>Causes</u> Unknown. Logs and ethereal capture have been sent for investigation.</p>
<p>TC64</p>	<p><u>Configuration</u> Cisco 7960G SCCP IP Phones ↔ LAN ↔ Cisco CallManager 3.3(2) ↔ LAN ↔ HMP</p> <p><u>Result</u> During the test, calls can be setup successfully between Cisco 7960G SCCP IP phone and HMP, but the voice only could be sent from HMP to Cisco 7960G SCCP IP phone (can hear voice through the phone). HMP is unable to record any voice sent from the IP phone.</p> <p><u>Conclusion</u> CCM 3.3(2) and Cisco 7960G SCCP IP phone are unable to accept asymmetric codec setup. Cisco TAC support had been initiated. (TAC#600773920) Based on the Cisco TAC answers, CCM 3.3(2) does not support asymmetric codec.</p> <hr/> <p><u>Configuration</u> Cisco 7960G SCCP IP Phones ↔ LAN ↔ Cisco CallManager 4.0(2) ↔ LAN ↔ HMP</p> <p><u>Result</u> During the test, calls can be setup successfully between Cisco 7960G SCCP IP phone and HMP, but the voice only could be sent from HMP to Cisco 7960G SCCP IP phone (can hear voice through the phone). HMP is unable to record any voice sent from the IP phone.</p> <p><u>Conclusion</u> CCM 4.0(2) does not support asymmetric codec based on Cisco TAC support.</p>

Codec Compatibility

Cisco equipment and the test application were set to slow start and tunneling was disabled for the codec compatibility test.

Note: CCM 3.3(2) and CCM 4.0(2) are session controllers and are not capable of processing media. Therefore, CCM 3.3(2) and CCM 4.0(2) are only able to determine if the endpoint support a certain codec capability. If the endpoint doesn't support the certain codec used by other endpoint, CCM 3.3(2) and CCM 4.0(2) will then look for DSP farm. After a call is setup via CCM 3.3(2) or CCM 4.0(2), all media will be passed between HMP and the other endpoint (IP phone or another HMP) or through a DSP farm. In the coder compatibility test, we actually tested if CCM 3.3(2) and CCM 4.0(2) are able to match a certain

codec specified in the codec compatibility test supported by the endpoint, not if it is able to process the media using the specified codec.

g.729a and g.729ab

HMP fails to use these codecs with Cisco 2611XM and Cisco AS5400. Based on the Cisco 2611XM and AS5400 IOS 12.3 document, Cisco 2611XM and Cisco AS5400 have g.729a and g.729ab capability in the Cisco codec medium complexity setup. The ethereal capture also shows these codec capabilities on Cisco 2611XM and AS5400. But during the test, Cisco 2611XM and Cisco AS5400 fail to match the right codec and always select g.729 when the test application is configured to use g.729a only. Cause is unknown. Cisco TAC support has been initiated for the problems. (TAC#600773920)

Based on the Cisco TAC support, Cisco 2611XM and Cisco AS5400 do follow G.729 standard. And based on the standard G.729a/ab should be able to interoperate with G.729. After discuss with HMP development team, the issue was caused by HMP GlobalCall.

Interoperability Issues Sorted by Category

Interoperability Issues: Cisco

Interoperability issues believed to be caused either by an unsupported feature on Cisco or an issue with the Cisco equipment.

TC #	Description
TC66-TC68	Cisco CallManager 3.3(2) and 4.0(2) do not support outgoing call tunneling and fast start.
TC46-TC49	Cisco CallManager 4.0(2) does not support SIP transfer
TC42-TC43	Cisco CallManager 4.0(2) does not support SIP Subscribe/Notify which is the method that current HMP uses to activate/deactivate MWI.

Interoperability Issues: HMP

Interoperability issues believed to be caused by an issue with HMP.

TC #	Description
TC14, TC16-TC20, TC44, TC45	Early media feature is not supported in the HMP 1.1 SU#10. Therefore, some scenarios in those test cases are deferred.
TC24, TC41	Hold/Retrieve feature is not supported in the HMP 1.1 SU#10. Therefore, some scenarios in those test cases are deferred
TC38, TC40	SIP redirect (3xx) feature is not supported in the HMP 1.1 SU#10. Therefore, some scenarios in those test cases are deferred
TC35, TC37	SIP re-INVITE feature is not supported in the HMP 1.1 SU#10. Therefore, some scenarios in those test cases are deferred
—	MWI feature is not supported in the HMP 1.1 SU#10. Therefore, some scenarios in those test cases are deferred. HMP fail to use G.729a and G.729ab codec with Cisco 2611XM and Cisco AS5400 (See Codec Compatibility section)

Interoperability Issues under Investigation

Interoperability issues still under investigation.

TC #	Description
TC57	<p><u>Result</u> HMP is unable to place a SIP call to an analog phone via Cisco AS5400 with slow start enabled. Call can be established, but can't hear any voice from both side. HMP is able to place a successful SIP call with slow start disabled (can hear voice on both side)</p> <p><u>Causes</u> During codec negotiation, at Cisco side, Cisco AS5400 fail to select a match codec, even the codec is explicitly configured in the AS5400. At HMP side, HMP fail to send a correct capability table list based on the ethereal capture.</p>
TC60	<p><u>Result</u> Supervised transfer test fail. Two calls could be established successfully between HMP and two analog phones, but transfer fails after gc_InitXfer and gc_InvokeXfer.</p> <p><u>Causes</u> Unknown.</p>

Appendix A. Test Notes

This section records the test notes during the tests. Refer to Section 4, Test Summary, for the test results.

Test Case	Test Note
TC3	<p><u>Configuration</u> HMP ↔ LAN ↔ Cisco 2611XM.</p> <p><u>Note</u> In the test, phone extension was modified for updating the registration information in the gatekeeper. “re-register” feature is not supported in HMP 1.1 SU#10. Therefore, the test case was done by “unregister” and “register”.</p>
TC14 TC16 TC17 TC18 TC19	<p><u>Configuration</u> HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ Cisco 79xxG_IP Phones</p> <p><u>Note</u> Early media is not supported in HMP 1.1 SU#10. Therefore, the call progress analysis can't be performed.</p>
TC20	<p><u>Configuration</u> HMP ↔ LAN ↔ Cisco CallManager 3.3 ↔ Cisco 2611XM ↔ PSTN ↔ Analog Phone HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Analog Phone</p> <p><u>Note</u> Early media is not supported in HMP 1.1 SU#10. Therefore, the call progress analysis can't be performed.</p>
TC21 TC22 TC23	<p><u>Configuration</u> a. HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Analog Phone b. HMP ↔ LAN ↔ Cisco CallManager 3.3 ↔ Cisco 2611XM ↔ PSTN ↔ Analog Phone c. HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ Cisco 79xxG IP Phones</p> <p><u>Note</u> Test pass in configurations a and b. In the configuration c, since we use FXO and FXS loopback as the PSTN connection and FXO will always answer the call first, we can not perform call failure testing with “called party does not answer” and “called party is busy” and “capability not supported by Cisco 79xxG IP phones. But the tests are pass in the “HMP ↔ LAN ↔ Cisco 2611XM ↔ Cisco 79xxG” configuration. Therefore, the tests are considered pass between HMP and Cisco 2611XM in configuration c.</p>
TC24	<p><u>Configuration</u> Cisco 79xxG IP Phones ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ LAN ↔ HMP</p> <p><u>Note</u> “Hold/Retrieve” feature is not supported in HMP 1.1 SU#10. Therefore, the test is deferred.</p>
TC27 TC28	<p><u>Configuration</u> Cisco 79xxG IP Phones ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ LAN ↔ HMP</p> <p><u>Note</u> Performing transfer as a transferred endpoint, the endpoint has to act as a PBX or connect to other endpoints directly. Since the system configuration is used to test the interoperability with Cisco 2611XM and Cisco 2611XM will always be the one that handles all the calls (act as a transferred endpoint), HMP cannot be the transferred endpoint. Therefore, the test cases are invalid in both blind and supervised transfer test cases.</p>

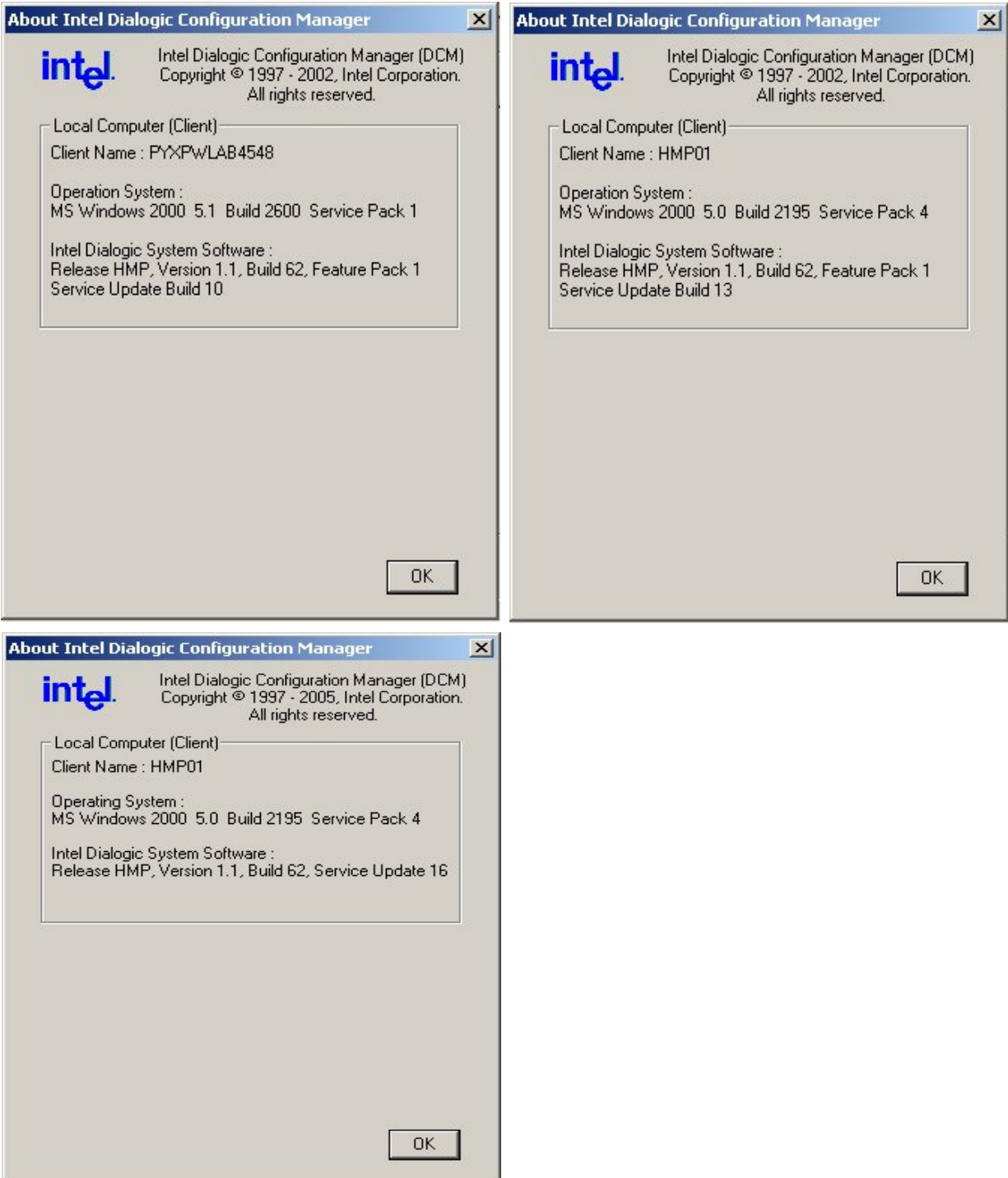
TC33	<p><u>Configuration</u> Cisco 79xxG IP Phones ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ LAN ↔ HMP</p> <p><u>Note</u> Bridge two call using HMP test cases is actually testing the routing capability of HMP itself. There is no interoperability issue with Cisco product. Therefore, the test is invalid from the interoperability point of view.</p>
TC35	<p><u>Configuration</u> a. Cisco 79xxG IP Phones ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ LAN ↔ HMP b. Cisco 7912G SIP Phones ↔ LAN ↔ Cisco 2611XM ↔ LAN ↔ HMP</p> <p><u>Note</u> SIP re-INVITE is not supported in HMP 1.1 SU#10. Therefore, the test is deferred in both system configurations.</p>
TC37	<p><u>Configuration</u> Analog phone ↔ PSTN ↔ Cisco 2611XM ↔ LAN ↔ HMP</p> <p><u>Note</u> SIP re-INVITE is not supported in HMP 1.1 SU#10. Therefore, the test is deferred.</p>
TC38	<p><u>Configuration</u> a. HMP ↔ LAN ↔ Cisco 2611XM ↔ LAN ↔ Cisco 7912G SIP Phones. b. HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ LAN ↔ Cisco 79xxG IP Phones.</p> <p><u>Note</u> SIP IP to IP call within the same Cisco 2611XM router needs SIP redirect (3xx) feature. HMP 1.1 SU#10 does not support the feature. In the configuration b above, since the call is going through PSTN, the test could be performed and the test pass.</p>
TC40	<p><u>Configuration</u> a. HMP ↔ LAN ↔ Cisco 2611XM ↔ LAN ↔ Cisco 7912G SIP Phones. b. HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ LAN ↔ Cisco 79xxG IP Phones.</p> <p><u>Note</u> SIP IP to IP call within the same Cisco 2611XM router needs SIP redirect (3xx) feature. HMP 1.1 SU#10 does not support the feature. In the configuration b above, since we use FXO/FXS loopback as the PSTN connection and the FXO will always answer the call, the test could not be performed in this configuration.</p>
TC41	<p><u>Configuration</u> a. Cisco 7912G SIP Phones ↔ LAN ↔ Cisco 2611XM ↔ LAN ↔ HMP. b. Cisco 79xxG IP Phones ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ LAN ↔ HMP. c. Cisco 7960G SIP Phones ↔ LAN ↔ Cisco CallManager 4.0(2) ↔ LAN ↔ HMP</p> <p><u>Note</u> “Hold/Retrieve” feature is not supported in HMP 1.1 SU#10. Therefore, the test is deferred.</p>
TC42 TC43	<p><u>Configuration</u> a. Cisco 7912G SIP Phones ↔ LAN ↔ Cisco 2611XM ↔ LAN ↔ HMP b. Cisco 7960G SIP Phones ↔ LAN ↔ Cisco CallManager 4.0(2) ↔ LAN ↔ HMP</p> <p><u>Note</u> SIP MWI feature is not supported in HMP 1.1 SU#10. Therefore, the test is deferred. SIP IP to IP call within the same Cisco 2611XM router needs SIP redirect feature. HMP does not support redirect feature currently. Cisco CallManager 4.0(2) does not support SIP Subscribe/Notify which is the method that current HMP uses to activate/deactivate MWI.</p>
TC44	<p><u>Configuration</u> a. HMP ↔ LAN ↔ Cisco 2611XM ↔ LAN ↔ Cisco 7912G SIP Phones.</p>

	<p>b. HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ LAN ↔ Cisco 79xxG IP Phones.</p> <p><u>Note</u> Early media is not supported in HMP 1.1 SU#10. Therefore, the call progress analysis can't be performed.</p>
TC45	<p><u>Configuration</u> HMP ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Analog phones</p> <p><u>Note</u> Early media is not supported in HMP 1.1 SU#10. Therefore, the call progress analysis can't be performed.</p>
TC46 TC47	<p><u>Configuration</u> Cisco 7960G SIP Phones ↔ LAN ↔ Cisco CallManager 4.0(2) ↔ LAN ↔ HMP</p> <p><u>Note</u> Cisco CallManager 4.0(2) does not support SIP transfer.</p>
TC50	<p><u>Configuration</u> a. Cisco 79xxG IP Phones ↔ LAN ↔ Cisco 2611XM ↔ PSTN ↔ Cisco 2611XM ↔ LAN ↔ HMP b. Cisco 7912G SIP Phones ↔ LAN ↔ Cisco 2611XM ↔ LAN ↔ HMP</p> <p><u>Note</u> Bridge two call using HMP test cases is actually testing the routing capability of HMP itself. There is no interoperability with Cisco product. Therefore, the test is invalid from the interoperability point of view.</p>
TC50	<p><u>Configuration</u> Cisco 79xxG IP Phones ↔ LAN ↔ Cisco CallManager 3.3(2) ↔ LAN ↔ HMP c. Cisco 7912G SIP Phones ↔ LAN ↔ Cisco 2611XM ↔ LAN ↔ HMP</p> <p><u>Note</u> Bridge two call using HMP test cases is actually testing the routing capability of HMP itself. There is no interoperability issue with Cisco product. Therefore, the test is invalid from the interoperability point of view.</p>
TC66 TC67 TC68	<p><u>Configuration</u> Cisco 79xxG SCCP IP Phones ↔ LAN ↔ Cisco CallManager 3.3(2) ↔ LAN ↔ HMP</p> <p><u>Note</u> Cisco CallManager 3.3(2) does not support outgoing call tunneling and outgoing call fast start. The test can be executed and a call can be made, but both HMP and Cisco 79xxG IP phone endpoints will end up using slow start and tunneling disable.</p>

Appendix B. Software Version

Intel NetStructure HMP Release 1.1 for Windows SU#10, SU#13 and SU#16

Start DCM and click on the Help → About Intel® Dialogic® Configuration Manager.



HMP IP Host

The IP Host version could be verified by the following line in the gc_h3r.log file.

For HMP 1.1 SU#10...

```
! 15:30:35.457 ! M_SIG_MAN ! L_SPECIAL ! 0 ! Board 1 - Sigal H.323 Version 3,1,0,25.
```

For HMP 1.1 SU#13...

```
! 15:22:35.446 ! M_SIG_MAN ! L_SPECIAL ! 0 ! Board 1 - Sigal H.323 Version 4,0,0,13.
```

The IP Host version for SU#16 could be found in the rtflog by turning on gc_h3r debugging on the rtfconfig.xml.

```
^10:18:50.185 ,2448 ,2464 , , , ,gc_h3r ! H323_SIG_MGR ! L_SPECIAL !  
0 ! Board 1 - Sigal H.323 Version 4,0,0,16
```

Cisco 2611XM, IOS 12.3(8)T5

```
CISCO2600#show ver  
Cisco IOS Software, C2600 Software (C2600-JSX-M), Version 12.3(8)T5, RELEASE SOFTWARE (fc2)  
Technical Support: http://www.cisco.com/techsupport  
Copyright (c) 1986-2004 by Cisco Systems, Inc.  
Compiled Wed 20-Oct-04 11:42 by cmong
```

```
ROM: System Bootstrap, Version 12.2(8r) [cmong 8r], RELEASE SOFTWARE (fc1)
```

```
CISCO2600 uptime is 2 hours, 20 minutes  
System returned to ROM by reload at 21:04:11 EST Thu Jun 6 2002  
System image file is "flash:c2600-jsx-mz.123-8.T5.bin"
```

```
Cisco 2611XM (MPC860P) processor (revision 0x300) with 126095K/4977K bytes of memory.  
Processor board ID JAE0819GGJP (1117241769)  
M860 processor: part number 5, mask 2  
2 FastEthernet interfaces  
2 Voice FXO interfaces  
2 Voice FXS interfaces  
32K bytes of NVRAM.  
32768K bytes of processor board System flash (Read/Write)
```

```
Configuration register is 0x2102
```

```
CISCO2600#
```

Cisco CallManager Express 3.1

```
CISCO2600#show telephony-service  
CONFIG (Version=3.1)
```

```
=====
```

```
Version 3.1
```

```
Cisco CallManager Express
```

```
For on-line documentation please see:
```

```
http://www.cisco.com/univercd/cc/td/doc/product/access/ip\_ph/ip\_ks/index.htm
```

```
ip source-address 10.10.10.142 port 2000
```

```
load 7910 P00403020214
```

```
load 7905 P00303020214
```

```
load 7960-7940 P00303020214
```

```
max-ephones 24
```

```
max-dn 48
```

```
max-conferences 4
```

```
max-redirect 5
```

```
voicemail 100
```

```
moh music-on-hold.au
```

```
time-format 12
```

```
date-format mm-dd-yy
```

```
keepalive 30
```

```
timeout interdigit 10
```

```
timeout busy 10
```

```
timeout ringing 180
```

```
web admin system name administrator password interop
```

```
web admin customer name Customer
```

```
edit DN through Web: enabled.
```

```
edit TIME through web: enabled.
```

```
Log (table parameters):
```

```
max-size: 150
```

```
retain-timer: 15
```

```
create cnf-files version-stamp 7960 Jul 26 2004 17:46:57
```

```
local directory service: enabled.
```

```
CISCO2600#
```

Cisco AS5400, IOS 12.3(8)T5

CISCOAS5400#show ver
Cisco IOS Software, 5400 Software (C5400-JS-M), Version 12.3(8)T5, RELEASE SOFTWARE (fc2)
Technical Support: <http://www.cisco.com/techsupport>
Copyright (c) 1986-2004 by Cisco Systems, Inc.
Compiled Wed 20-Oct-04 16:20 by cmong

ROM: System Bootstrap, Version 12.2(1r)1, RELEASE SOFTWARE (fc1)
BOOTLDR: 5400 Software (C5400-BOOT-M), Version 12.2(2)XB2, EARLY DEPLOYMENT RELEASE SOFTWARE (fc1)

CISCOAS5400 uptime is 5 weeks, 5 days, 3 hours, 5 minutes
System returned to ROM by reload at 21:12:50 UTC Sun Jan 2 2000
System image file is "flash:c5400-js-mz.123-8.T5.bin"

Cisco AS5400 (R7K) processor (revision T) with 524288K/131072K bytes of memory.
Processor board ID JAE0822KM7W
R7000 CPU at 250MHz, Implementation 39, Rev 1.0, 256KB L2, 2048KB L3 Cache
Last reset from IOS reload

Manufacture Cookie Info:

EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x31,
Board Hardware Version 3.34, Item Number 800-5171-02,
Board Revision C0, Serial Number JAE0822KM7W,
PLD/ISP Version 2.2, Manufacture Date 31-May-2004.
Processor 0x14, MAC Address 0x0FF7D04B48
Backplane HW Revision 1.0, Flash Type 5V

2 FastEthernet interfaces

54 Serial interfaces

216 terminal lines

8 Channelized T1/PRI ports

512K bytes of NVRAM.

65536K bytes of processor board System flash (Read/Write)

16384K bytes of processor board Boot flash (Read/Write)

Configuration register is 0x2102

CISCOAS5400#

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