



DEFENSE INFORMATION SYSTEMS AGENCY

P. O. BOX 4502
ARLINGTON, VIRGINIA 22204-4502

IN REPLY

REFER TO: Joint Interoperability Test Command (JTE)

23 July 2008

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of the Cisco Unity Unified Messaging System Software Release 5.0(1) with Private Branch Exchange Internet Protocol Media Gateway (PIMG) Digital Interface

References: (a) DoD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01D, "Interoperability and Supportability of Information Technology and National Security Systems," 8 March 2006
(c) and (d), see enclosure 1

1. References (a) and (b) establish the Defense Information Systems Agency, JITC, as the responsible organization for interoperability test certification.
2. The Cisco Unity Unified Messaging System Software Release 5.0(1) with PIMG Digital interface is hereinafter referred to as the System Under Test (SUT). The SUT met all the critical interoperability requirements for a Customer Premise Equipment voicemail device and is certified for joint use within the Defense Switched Network (DSN). The SUT meets the critical interoperability requirements set forth in reference (c) and testing was conducted using test procedures derived from reference (d). The SUT was tested with the Nortel Communication Server (CS)1000M Single Group with the NT8D02GA digital line card and the Avaya S8710 with the TN2224 CP digital line card. JITC analysis determined a minor risk in certifying the SUT with the following switching systems on the DSN APL that are certified with the same respective digital interfaces: Nortel Meridian 1 (M1) Option 61C, Nortel M1 Option 81C, Nortel CS1000M Cabinet, Nortel CS1000M Chassis, Nortel M1 Option 11C, Avaya S8700, Avaya S8720, Avaya S8500, Avaya S8400, Avaya S8300, and Avaya G3CSI (ProLogix). The SUT offers facsimile (fax) and e-mail capabilities; however, the fax capability was not tested and is not covered under this certification. No other configurations, features, or functions, except those cited within this report, are certified by the JITC, or authorized by the Program Management Office for use within the DSN. This certification expires upon changes that affect interoperability, but no later than three years from the date of this memorandum.
3. This certification is based on interoperability testing by JITC and review of the vendor's Letters of Compliance (LoC). Interoperability testing was conducted at JITC's Global Information Grid Network Test Facility, Fort Huachuca, Arizona from 14 through 25 April 2008. Review of the vendor's LoC was completed on 26 May 2008. The Certification Testing Summary (enclosure 2) documents the test results and describes the test network.

JITC Memo, JTE, Special Interoperability Test Certification of the Cisco Unity Unified Messaging System Software Release 5.0(1) with Private Branch Exchange Internet Protocol Media Gateway (PIMG) Digital Interface

4. The Functional Requirements used to evaluate the interoperability of the SUT and the interoperability statuses are indicated in table 1. This interoperability test status is based on the SUT’s ability to meet CPE voicemail system requirements specified in appendix 7 of reference (c) verified through JITC testing and/or vendor submission of LoC.

Table 1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Met	UCR Paragraph
Avaya 2-Wire ¹ Digital Proprietary (TN2224CP)	No	Yes	FCC Part15/Part 68 (R)	Met	A7.5
			DISR compliance as applicable (R)	Met	A7.5
			ROUTINE precedence only in accordance with UCR, Section 3.3 (R)	Met	3.3
Nortel CS1000M 2-Wire Digital Proprietary ² (NT8D02GA)	No	Yes	FCC Part15/Part 68 (R)	Met	A7.5
			DISR compliance as applicable (R)	Met	A7.5
			ROUTINE precedence only in accordance with UCR, Section 3.3 (R)	Met	3.3
IP (100BaseT) (IEEE 802.3-2005)	No	Yes	Service Class Tagging (R)	Met	A3.2.9.2
			IEEE 802.3 (C)	Met	A7.5
Security	Yes	See note 3.	Security (R)	See note 3.	A7.6
LEGEND: 100baseT - 100 Mbps (Baseband Operation, Twisted Pair) Ethernet 802.3-2005 - Local Area Network/metropolitan Area Network Carrier Sense Multiple Access/Collision Detection Access Method A - Appendix C - Conditional DISR - Department of Defense Information Technology Standards Registry FCC - Federal Communications Commission UCR - Unified Capabilities Requirements IEEE - Institute of Electrical and Electronics Engineers IP - Internet Protocol JITC - Joint Interoperability Test Command Mbps - Megabits per second R - Required SUT - System Under Test					
NOTES: 1 The SUT emulates an Avaya digital proprietary end-instrument and is certified with all Avaya S8700, S8710, S8720, S8500, S8400, S8300, and G3CSI (ProLogix) switches listed on DSN APL certified with the same TN2224CP proprietary digital interface. 2 The SUT emulates a Nortel digital proprietary end-instrument and is certified with all Nortel Communications Server (CS)1000M Single Group, Meridian 1 (M1) Option 61C, M1 Option 81C, CS1000M Cabinet, Nortel CS1000M Chassis, Nortel M1 Option 11C switches listed on DSN APL certified with the same proprietary NT8D02GA digital interface. 3 Security is tested by DISA-led Information Assurance test teams and published in a separate report.					

5. No detailed test report was developed in accordance with the Program Manager’s request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.

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6. The JITC point of contact is Mr. Edward Mellon, DSN 879-5159, commercial (520) 538-5159, FAX DSN 879-4347, or e-mail to edward.mellon@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The Unified Capabilities Connection Office tracking number is 0735101.

FOR THE COMMANDER:

2 Enclosures a/s



RICHARD A. MEADOR

Chief

Battlespace Communications Portfolio

JITC Memo, JTE, Special Interoperability Test Certification of the Cisco Unity Unified Messaging System Software Release 5.0(1) with Private Branch Exchange Internet Protocol Media Gateway (PIMG) Digital Interface

Distribution:

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Office of Chief of Naval Operations (N71CC2), CNO N6/N7, 2000 Navy Pentagon, Washington, DC 20350

Headquarters U.S. Air Force, AF/XICF, 1800 Pentagon, Washington, DC 20330-1800

Department of the Army, Office of the Secretary of the Army, CIO/G6, ATTN: SAIS-IOQ, 107 Army Pentagon, Washington, DC 20310-0107

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Office of Under Secretary of Defense, AT&L, Room 3E144, 3070 Defense Pentagon, Washington, DC 20301

U.S. Joint Forces Command, J68, Net-Centric Integration, Communications, and Capabilities Division, 1562 Mitscher Ave., Norfolk, VA 23551-2488

Defense Information Systems Agency (DISA), ATTN: GS23 (Mr. McLaughlin), Room 5W23, 5275 Leesburg Pike (RTE 7), Falls Church, VA 22041

ADDITIONAL REFERENCES

- (c) Defense Information Systems Agency, "Department of Defense Voice Networks Unified Capabilities Requirements, 21 December 2007
- (d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Cisco Unity Unified Messaging System Software Release 5.0(1) with Private Branch Exchange Internet Protocol Media Gateway (PIMG) Digital interface is hereinafter referred to as the System Under Test (SUT).

2. PROPONENT. United States Air Force

3. PROGRAM MANAGER. Van Ribultan, 95 CG/SCXV, 25 North Wolfe Avenue, Building 3950, Room 100, Edwards Air Force Base, California 93524, e-mail: van.ribultan@edwards.af.mil.

4. TESTER. Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is for use with the switching systems within this certification over the tested interfaces using the Cisco Unity server software version 5.0(1). The SUT is a Voice Messaging System that offers Unified Communications capabilities through integration with Microsoft Exchange Server 2003 or 2007, and Microsoft Outlook in order to interface and provide Voice Message services to Certified Defense Switched Network (DSN) equipment. The SUT is capable of using two wire digital lines with the PIMG digital interface to provide these services. Survivability features included in the server platforms may include raid hard-drive arrays which support hot-swapping of drives, dual power supplies, and Network Interface Card (NIC) teaming depending on model. Microsoft Exchange may be installed on the same system as Unity for Voicemail or Unity can be integrated into an existing Microsoft Exchange infrastructure for Unified Messaging. The SUT utilizes a web-based interface to maintain the necessary information needed to provide messaging services to authorized mailbox owners as well as system maintenance. The information includes mailbox associations, system and messaging service settings, maintenance and diagnostics. The SUT offers facsimile (fax) and e-mail capabilities; however, the fax capability was not tested and is not authorized nor approved for use within the DSN.

6. OPERATIONAL ARCHITECTURE. The Unified Capabilities Requirements (UCR) DSN architecture in figure 2-1 depicts the relationship of the SUT to the DSN switches.

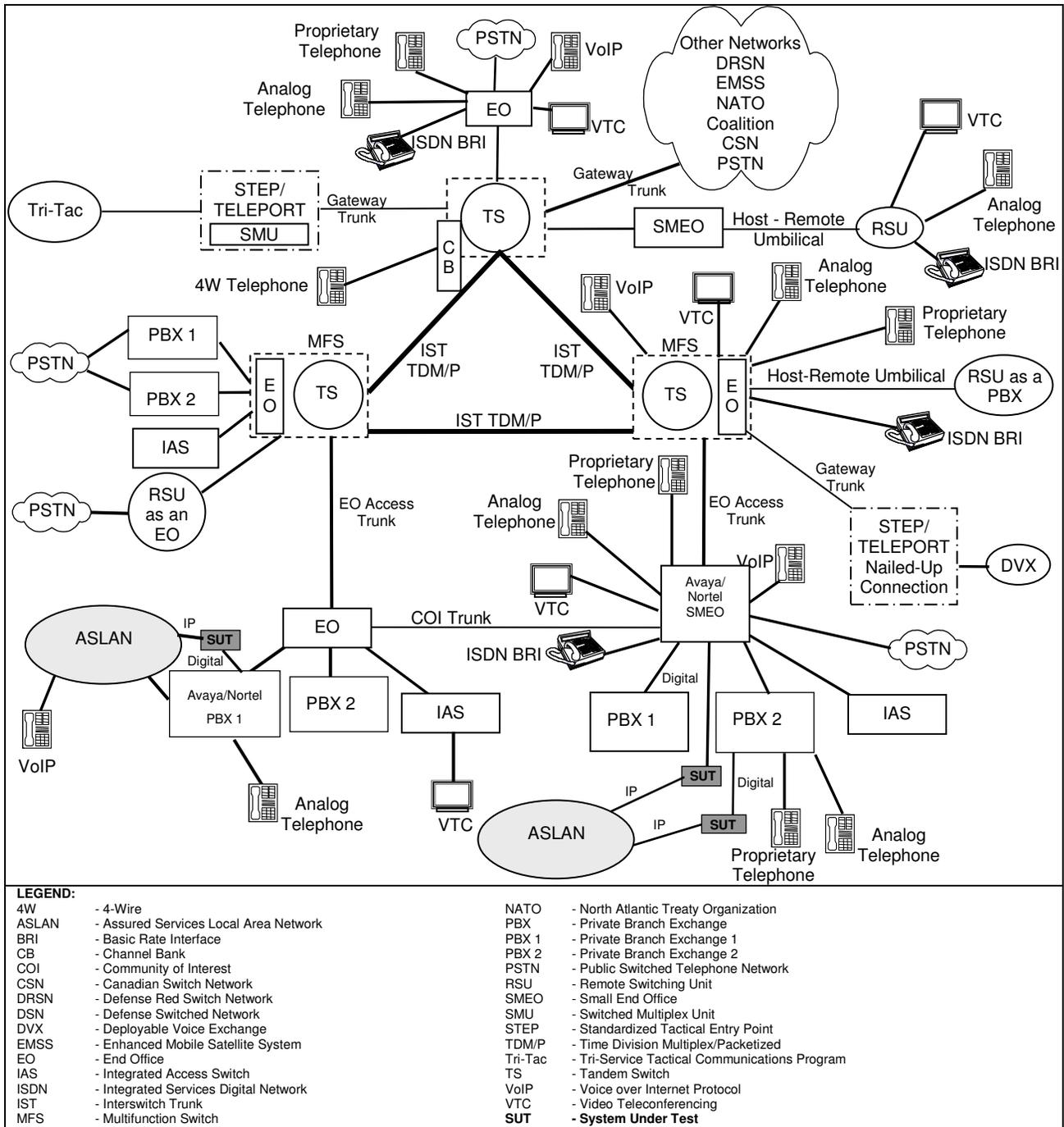


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to the SUT and interoperability results are listed in table 2-1. These requirements are derived from the UCR Interface and Functional Requirements and were verified through JITC testing. The specific SUT applications certified on each interface are depicted in table 2-1.

Table 2-1.SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Met	UCR Paragraph
Avaya 2-Wire ¹ Digital Proprietary (TN2224CP)	No	Yes	FCC Part15/Part 68 (R)	Met	A7.5
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			ROUTINE precedence only in accordance with UCR, Section 3.3 (R)	Met	3.3
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			IEEE 802.3 (C)	Met	A7.5
Security	Yes	See note 3.	Security (R)	See note 3.	A7.6
LEGEND: 100baseT - 100 Mbps (Baseband Operation, Twisted Pair) Ethernet 802.3-2005 - Local Area Network/metropolitan Area Network Carrier Sense Multiple Access/Collision Detection Access Method A - Appendix C - Conditional DISR - Department of Defense Information Technology Standards Registry FCC - Federal Communications Commission UCR - Unified Capabilities Requirements IEEE - Institute of Electrical and Electronics Engineers IP - Internet Protocol JITC - Joint Interoperability Test Command Mbps - Megabits per second R - Required SUT - System Under Test					
NOTES: 1 The SUT emulates an Avaya digital proprietary end-instrument and is certified with all Avaya S8700, S8710, S8720, S8500, S8400, S8300, and G3CSI (ProLogix) switches listed on DSN APL certified with the same TN2224CP proprietary digital interface. 2 The SUT emulates a Nortel digital proprietary end-instrument and is certified with all Nortel Communications Server (CS)1000M Single Group, Meridian 1 (M1) Option 61C, M1 Option 81C, CS1000M Cabinet, Nortel CS1000M Chassis, Nortel M1 Option 11C switches listed on DSN APL certified with the same proprietary NT8D02GA digital interface. 3 Security is tested by DISA-led Information Assurance test teams and published in a separate report.					

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC's Global Information Grid Network Test Facility in a manner and configuration similar to that of the DSN operational environment. Testing the system's required functions and features was conducted using the test configurations depicted in figure 2-2.

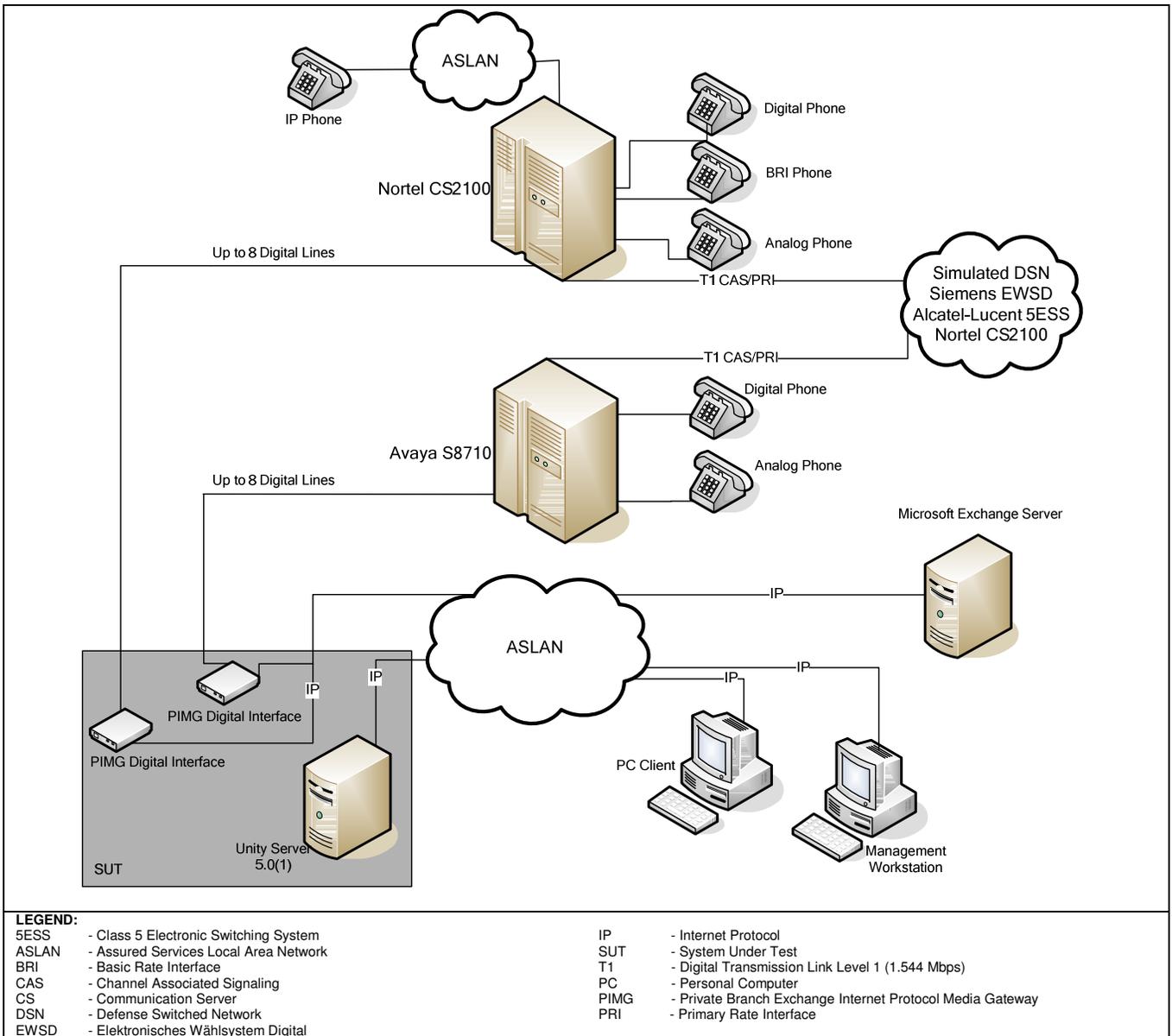


Figure 2-2. Cisco Unity 5.0(1) with PIMG Digital Test Configuration

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations, hardware and software components tested with the SUT. The SUT was tested in an operationally realistic environment to determine interoperability with a complement of DSN switches noted in table 2-2. The DSN switches listed in table 2-2 only depict the tested configuration. Table 2-2 is not intended to identify the only switch software releases that are certified with the SUT. The SUT is certified specifically with the following switching systems on the DSN APL that are certified with the same respective digital interfaces: Nortel Communication Server (CS)1000M Single Group, Nortel Meridian 1 (M1) Option 61C, Nortel M1 Option 81C, Nortel CS1000M Cabinet, Nortel

CS1000M Chassis, Nortel M1 Option 11C, Avaya S8710, Avaya S8700, Avaya S8720, Avaya S8500, Avaya S8400, Avaya S8300, and Avaya G3CSI (ProLogix).

Table 2-2. Tested System Configurations

System Name		Software Release		
Avaya S8710		Communication Manager (CM) 4.0 (R014x.00.2.731.7: Super Patch 14419)		
Siemens EWSD		19d with Patch Set 46		
Nortel CS2100		Succession Enterprise (SE) 09.1		
Alcatel-Lucent 5ESS		5E16.2 Broadcast Warning Message (BWM) 07-0003		
Nortel CS1000M SG		DSN 4.5w		
S U T	Cisco Unity Server	Application	Hardware	Software/Firmware
		5.0(1)	MCS7800 Series Platform ¹	Microsoft Windows Server 2003 Server SP2,
	PIMG Digital	Not Applicable	Private Branch Exchange Internet Protocol Media Gateway	5.1SU2
Peripheral Equipment		Windows Exchange Server		Microsoft Exchange 2003 or 2007 on Windows Server 2003 SP2
		Client Workstation		Microsoft Outlook with Cisco ViewMail 5.0(1) on Windows XP
		Management Workstation		Windows XP Workstation SP2
Peripheral Components		Telephones/ Digital Lines		Panasonic KX-TS15-W (Analog)
				Panasonic KX-T2355 (Analog)
				Siemens Optiset ISDN BRI
				Avaya Digital Line Card TN2224CP ²
				Nortel M5317T
		Nortel Digital Line Card NT8D02GA ³		NA
LEGEND: 5ESS - Class 5 Electronic Switching System APL - Approved Products List BRI - Basic Rate Interface CCM - Cisco CallManager CS - Communication Server DSN - Defense Switched Network EWSD - Elektronisches Wählsystem Digital ISDN - Integrated Services Digital Network MCS - Media Convergence Server PIMG - Private Branch Exchange Internet Protocol Media Gateway Rev SG - Single Group SP - Service Pack SUT - System Under Test				
NOTES: 1 The SUT is certified with all MCS7800 series servers listed with the CCM switching systems listed on the APL. 2 The SUT emulates an Avaya digital proprietary end-instrument and is certified with all Avaya S8700, S8710, S8720, S8500, S8400, S8300, and G3CSI (ProLogix) switches listed on DSN APL certified with the same TN2224CP proprietary digital interface. 3 The SUT emulates a Nortel digital proprietary end-instrument and is certified with all Nortel Communications Server (CS)1000M Single Group, Meridian 1 (M1) Option 61C, M1 Option 81C, CS1000M Cabinet, Nortel CS1000M Chassis, Nortel M1 Option 11C switches listed on DSN APL certified with the same proprietary NT8D02GA digital interface				

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

(1) Voice mail interaction with Multi-Level Precedence and Preemption (MLPP). The UCR, appendix 7 states that CPE must meet MLPP requirements. The SUT was tested in accordance with the UCR, section 3.3, which states that precedence levels above ROUTINE shall not be forwarded to voice mail. The SUT was tested to insure that it properly interacted with MLPP as required in the UCR, section 3.3. Intra-switch and inter-switch calls were placed over the network test configuration to

subscribers configured on the Cisco Unity Server and assigned voice mail at different precedence levels with the following results:

(a) All ROUTINE calls placed to a voice mail subscriber that was busy or did not answer, were properly routed to voice mail as required by UCR, appendix 7.

(b) All calls above ROUTINE placed to a voice mail subscriber that was busy or did not answer were not routed to voice mail, but instead were diverted to an alternate directory number if not answered before the precedence call diversion timer expired, as required by UCR, section 3.

(2) Service Class Tagging. UCR paragraph A3.2.9.2, states that an Internet Protocol (IP) device shall be capable of implementing Service Class Tagging using the 6-bit Differential Service Code Point field in the IP Header. In addition, the IP device shall assign a unique tag for voice media and signaling.

(a) Tagging between PIMGD and Unity Server. Captures were taken between the SUT PIMGD and the Unity messaging server. Voice media was sent as International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) G.711 packets to and from the PIMGD. All ITU-T G.711 packets were 20 milliseconds in size and were correctly tagged with a Layer 3 priority of hexadecimal 2E (decimal value of 46). Voice signaling packets between the SUT PIMGD and Unity messaging server utilized Session Initiation Protocol (SIP). All SIP packets were correctly tagged with a layer 3 priority of hexadecimal 30 (decimal 48).

(b) Tagging between the Unity Server and Exchange Server. Traffic from the Unity server to and from the Exchange server was incorrectly tagged at 0 for operation administration and management. These tags were verified by capturing the packets at the egress of the Unity Messaging system. The lack of proper tagging was determined to be of a minimal impact, due to the fact that all calls are ROUTINE and all packets to and from the Exchange server are Transmission Control Protocol and will be re-transmitted if lost.

(c) Tagging between the Unity Server and the Personal Computer (PC) Client (e-mail). The SUT provides the ability to convert a voicemail message recorded by a user in the Unity Server to simple mail transport protocol IP packets transmitted to a PC client in the form of an email. This functionality was tested and the packets transmitted by the Unity Server to the PC client were correctly tagged at 0.

b. Test Summary. The SUT meets the critical interoperability requirements for a Customer Premise Equipment voice mail system in accordance with appendix 7 of the UCR and is certified for joint use within the DSN with the following switching systems on the DSN APL that are certified with the same respective digital interfaces. The SUT is certified specifically with the following switching systems on the DSN APL that are certified with the same respective digital interfaces: Nortel CS1000M Single Group, Nortel M1 Option 61C, Nortel M1 Option 81C, Nortel CS1000M Cabinet, Nortel

CS1000M Chassis, Nortel M1 Option 11C, Avaya S8710, Avaya S8700, Avaya S8720, Avaya S8500, Avaya S8400, Avaya S8300, and Avaya G3CSI (ProLogix). The SUT offers facsimile (fax) and e-mail capabilities; however, the fax capability was not tested and is not authorized nor approved for use within the DSN.

12. TEST AND ANALYSIS REPORT. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.