



DEFENSE INFORMATION SYSTEMS AGENCY

JOINT INTEROPERABILITY TEST COMMAND

P.O. BOX 12798

FORT HUACHUCA, ARIZONA 85670-2798

IN REPLY
REFER TO:

Battlespace Communications Portfolio (JTE)

24 July 2007

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of GENBAND M5 Unified Messaging and Personal Communications Manager (PCM) with Software Release UC2.3.2

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

1. References (a) and (b) establish the Defense Information Systems Agency, Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.
2. The GENBAND M5 Unified Messaging and PCM with Software Release UC2.3.2 is hereinafter referred to as the System Under Test (SUT). The SUT met all the critical interoperability requirements for a Customer Premise Equipment voicemail system and is certified for joint use within the Defense Switched Network (DSN). The SUT is certified specifically with the Lucent Class 5 Electronics Switching System (5ESS) and the Siemens Elektronisches Wählsystem Digital (EWSD) switches listed on the DSN Approved Products List (APL). The SUT meets the critical interoperability requirements set forth in reference (c) and testing was conducted using test procedures derived from reference (d). 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 of the SUT and review of the vendor's Letters of Compliance (LoC). Interoperability testing was conducted by JITC at the Global Information Grid Network Test Facility, Fort Huachuca, Arizona from 16 through 27 April 2007 and 21 through 25 May 2007. Review of the vendor's LoC was completed on 3 July 2007. The Certification Testing Summary (enclosure 2) documents the test results and describes the test network. No other configurations, features, or functions, except those cited within this report, are certified or authorized for use within the DSN.
4. The Functional Requirements used to evaluate the interoperability of the SUT and the interoperability statuses are depicted in table 1.

JITC Memo, JTE, Special Interoperability Test Certification of GENBAND M5 Unified Messaging and Personal Communications Manager (PCM) with Software Release UC2.3.2

Table 1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Status	GSCR Paragraph
ISDN T1 PRI (NI 2)	Yes	Yes	FCC Part 15/Part 68 (R)	Met	A7.5
			Routine Precedence only in accordance with GSCR Paragraph 3.3 (R)	Met	A7.5.5
			DISR compliance as applicable (R)	Met	A7.5
			PCM 24 (R)	Met	A7.1
	Yes	See note.	Security (R)	See note.	A7.6.5
LEGEND: A - Appendix DISA - Defense Information Systems Agency DISR - Department of Defense Information Technology Standards Registry FCC - Federal Communications Commission GSCR - Generic Switching Center Requirements ISDN - Integrated Services Digital Network Mbps - Megabits per second NI 2 - National ISDN Standard 2 PCM 24 - Pulse Code Modulation - 24 Channels PRI - Primary Rate Interface SUT - System Under Test T1 - Digital Transmission Link Level 1 (1.544 Mbps)					
NOTE: Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report.					

5. 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>.

6. The JITC point of contact is Michael Kutch, DSN 879-4618, commercial (520) 538-4618, FAX DSN 879-4347, or e-mail to michael.kutch@disa.mil. The tracking number for the SUT is 0629901.

FOR THE COMMANDER:



MANUEL H. GARCIA, JR.
Chief
Battlespace Communications Portfolio

2 Enclosures a/s

JITC Memo, JTE, Special Interoperability Test Certification of GENBAND M5 Unified Messaging and Personal Communications Manager (PCM) with Software Release UC2.3.2

Distribution:

Joint Staff J6I, Room 1E596, Pentagon, Washington, DC 20318-6000

Joint Interoperability Test Command, Liaison, ATTN: TED/JT1, 2W24-8C, P.O. Box 4502, Falls Church, VA 22204-4502

Defense Information Systems Agency, Net-Centricity Requirements and Assessment Branch, ATTN: GE333, Room 244, P.O. Box 4502, Falls Church, VA 22204-4502

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

U.S. Marine Corps (C4ISR), MARCORSYSCOM, 2200 Lester St., Quantico, VA 22134-5010

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Director, Defense Information Systems Agency, ATTN: GS235, Room 5W24-8A, P.O. Box 4502, Falls Church, VA 22204-4502

Office of Assistant Secretary of Defense (NII)/DoD CIO, Crystal Mall 3, 7th Floor, Suite 7000, 1851 S. Bell St., Arlington, VA 22202

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. Osman), Room 5W23, 5275 Leesburg Pike (RTE 7), Falls Church, VA 22041

ADDITIONAL REFERENCES

- (c) Defense Information Systems Agency, "Department of Defense Voice Networks Generic Switching Center Requirements (GSCR), Errata Change 2," 14 December 2006
- (d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. GENBAND M5 Unified Messaging and Personal Communications Manager (PCM) with Software Release UC2.3.2 is hereinafter referred to as the System Under Test (SUT).

2. PROPONENT. 500 Combat Sustainment Squadron; United States Air Force.

3. PROGRAM MANAGERS. Mr. Steven Rhodes, 6029 Wardleigh Road, Layton, Utah 84056, E-mail: steven.rhodes@hill.af.mil.

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

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is a Voice Messaging System that offers a high capacity multimedia telephony server that can accommodate up to 10,000 subscribers. The SUT resides outside the switch in a rack mounted cabinet configuration. The subscribers are provided with a personal mailbox for their voicemail messages that can be accessed from either the Internet or a telephone. The SUT also offers a feature called Single Number Service (SNS). This feature allows a user to redirect calls once forwarded to voicemail to another number. This feature can be activated and deactivated by the user via the internet. The following components comprise the SUT.

SunFire V240 Application Server. The application server is the main element of the solution that provides service logic and control for the application. It incorporates all of the application software provided by the vendor and also provides a console for maintenance and administrative access to the system.

Sun StorEdge 3320 Small Computer System Interface (SCSI) Array, Just a Bunch of Disks (JBOD). The SCSI Array, JBOD is an external disk array without local processing capabilities that operates exclusively under the control of the application server. It provides runtime expandable storage capabilities for user data, such as voicemail messages and account configuration information.

Cisco AS5350XM Media Gateway. The media gateway operates under the control of the application server and provides signaling interworking between the packet-based protocols used within the Internet Protocol core of the SUT and the Time Division Multiplex (TDM) network interface. The media gateway allows the SUT to provide voice messaging and communications service to the TDM voice network.

Cognitronics CX500 Media Server. The media server is an embedded device that provides audio recording, playback, and signal detection and generation for the bearer path connections made to the SUT via the media gateway. The media server is also under the control of the application server.

Dell PowerConnect 2216. The Ethernet Switch is a Layer 2 Ethernet communications device that provides a private, dedicated control network to interconnect components within the core of the SUT.

6. OPERATIONAL ARCHITECTURE. The Generic Switching Center Requirements (GSCR) DSN architecture in figure 2-1 depicts the relationship of the SUT to the DSN switches.

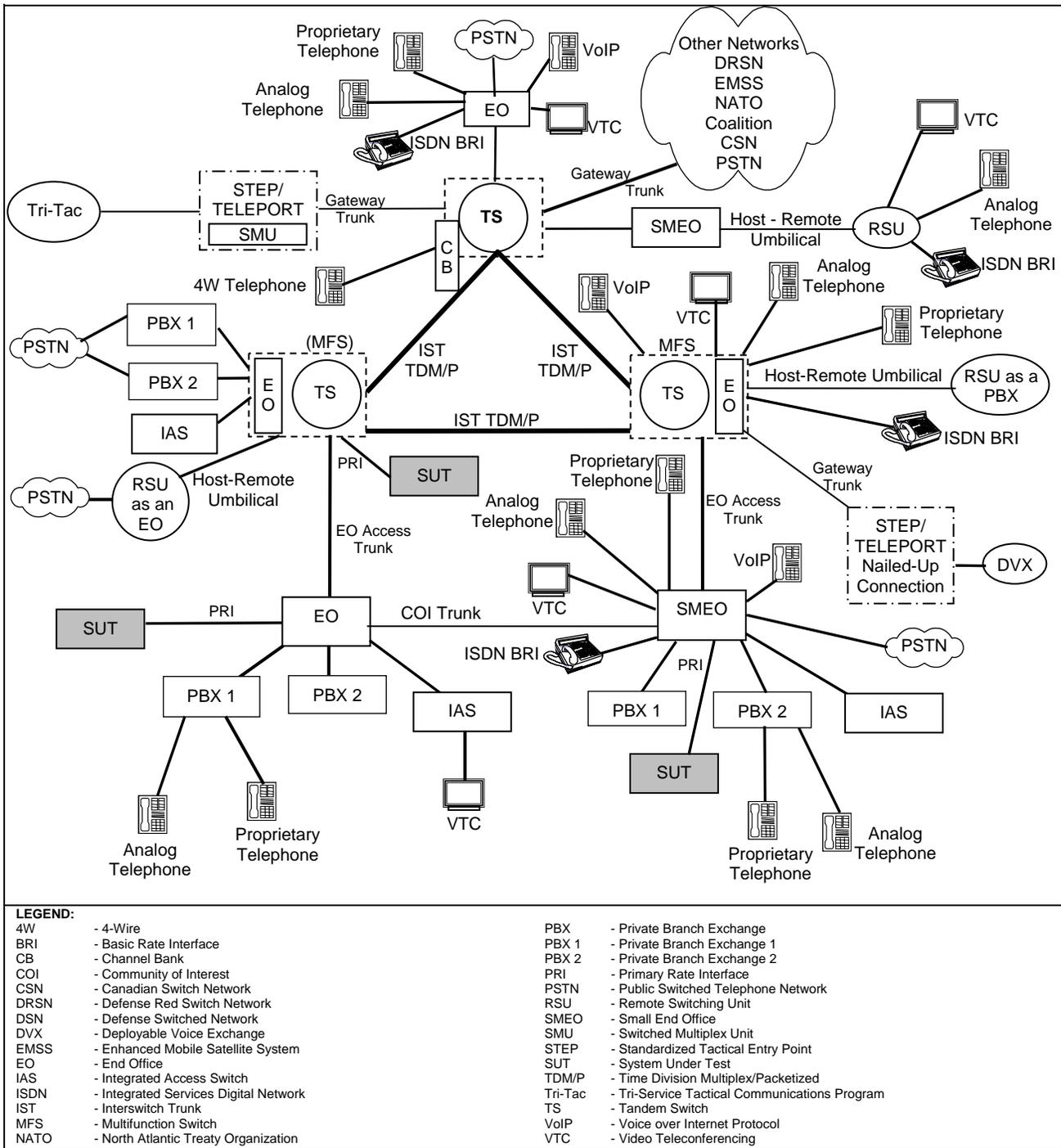


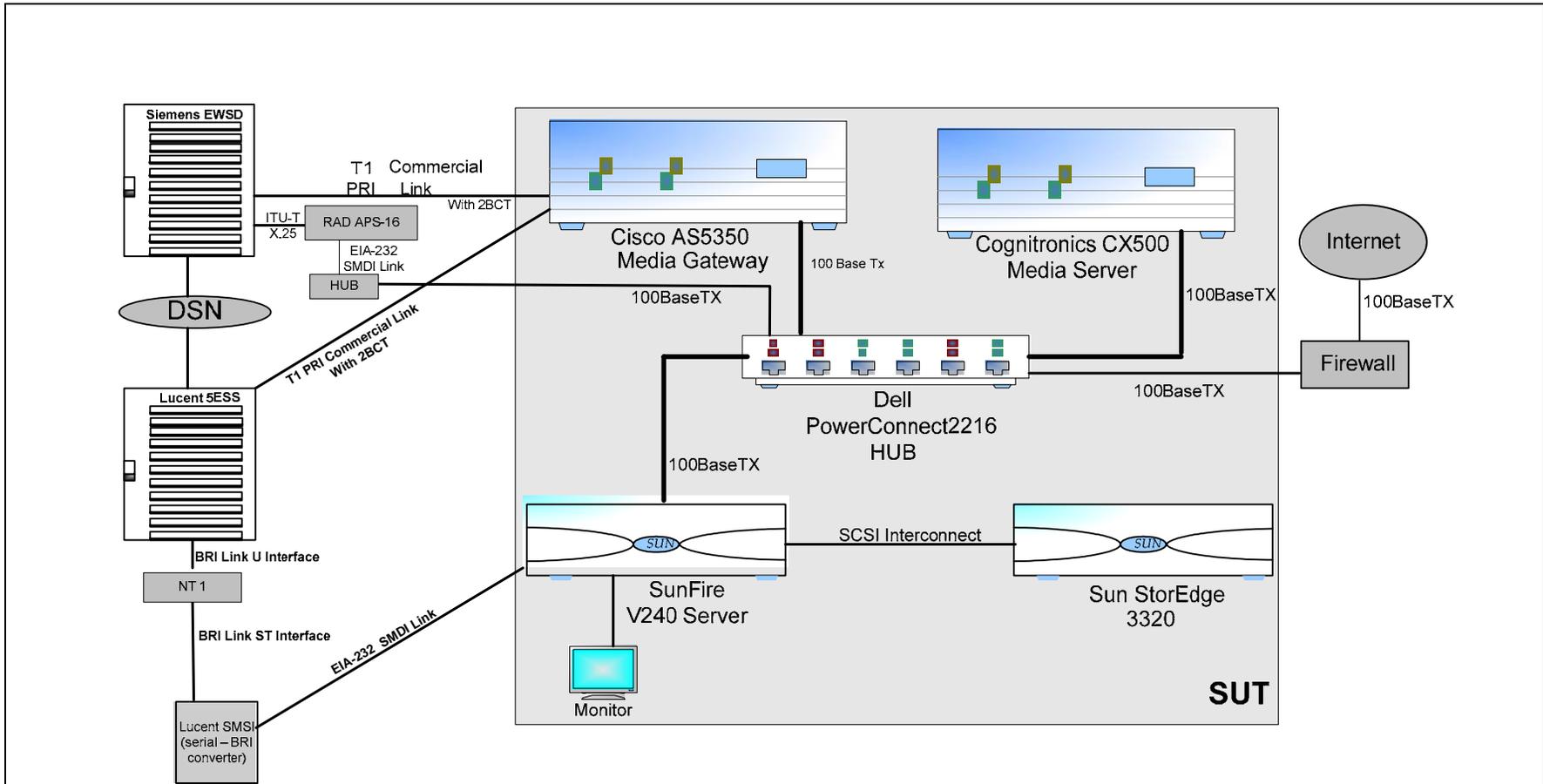
Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to the SUT and interoperability results are listed in table 2-1. These requirements are derived from the GSCR Interface and Functional Requirements verified through JITC testing.

Table 2-1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Status	GSCR Paragraph
ISDN T1 PRI (NI 2)	Yes	Yes	FCC Part 15/Part 68 (R)	Met	A7.5
			Routine Precedence only in accordance with GSCR Paragraph 3.3 (R)	Met	A7.5.5
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LEGEND: A - Appendix DISA - Defense Information Systems Agency DISR - Department of Defense Information Technology Standards Registry FCC - Federal Communications Commission GSCR - Generic Switching Center Requirements ISDN - Integrated Services Digital Network Mbps - Megabits per second NI 2 - National ISDN Standard 2 PCM 24 - Pulse Code Modulation - 24 Channels PRI - Primary Rate Interface SUT - System Under Test T1 - Digital Transmission Link Level 1 (1.544 Mbps)					
NOTE: Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report.					

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



LEGEND:

- 2BCT - 2 Bearer Channel Transfer
- 100BaseTX - 100 Mbps Ethernet over Category 5 Twisted Pair Copper
- 5ESS - Class 5 Electronic Switching System
- APS - Asynchronous Packet Switch
- BRI - Basic Rate Interface
- DCE - Data Circuit-Terminating Equipment
- DSN - Defense Switched Network
- DTE - Data Terminal Equipment
- EIA - Electronic Industries Alliance
- EIA-232 - Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices
- EWSD - Elektronisches Wählsystem Digital
- ISDN - Integrated Services Digital Network

- Mbps - Megabits per second
- NT - Network Termination
- PRI - Primary Rate Interface
- SCSI - Small Computer System Interface
- SMDI - Simplified Message Desk Interface
- SMSI - Simplified Message Service Interface
- SUT - System Under Test
- ST - ISDN BRI 4-Wire Interface
- T1 - Digital Transmission Link Level 1 (1.544 Mbps)
- U - ISDN BRI 2-Wire Interface
- X.25 - Interface between DTE and DCE for terminals operating in the packet mode and connected to public data networks by dedicated circuit

Figure 2-2. SUT Test Configuration

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations and their respective software used in the test.

Table 2-2. Tested System Configurations

System Name		Hardware/Software Release
Lucent 5ESS		Release 5E16.2, Software Update 06-0002
Siemens EWSD		software release 19d, patch set 46
AVAYA S8710		Communication Manager (CM) 4.0 (R014x.00.2.731.7)
Nortel CS2100		Succession Enterprise (SE) 08
SUT With Release UC2.3.2	Sub Components	Software
	SunFire V240 Server	5.8, Solaris 8 02/04 Release, Oracle 9i Standard Edition, Release 9.2.0.8.0, Apache Tomcat Version 5.5.17, Juniper RADIUS Enterprise Edition Release 5.4.1, SNS 3.0.1, SUT application Release UC2.3.2
	Storage Server Sun StorEdge 3320	5.8
	Cognitronics CX500 Media Server	MGCP Rel 2.0, OAM&P, CX 1.0S, CX 2.0, Solaris 8, AudioCodes Mediant 2000 with Release 5.00A.028.007, AudioCodes IPMedia 2000 with Release 5.00.028.005
	Cisco AS5350XM Media Gateway	12.4 (11) T1 (fc5), AudioCodes Mediant 2000 with Release 5.00A.028.007, AudioCodes IPMedia 2000 with Release 5.00.028.005
Peripheral Components	Lucent SMSI	Serial to BRI converter
	Alpha Telecom Inc. (ATI) NT1	Network Termination Unit
	RAD APS-16	Asynchronous Packet Switch
LEGEND: 5ESS - Class 5 Electronic Switching System APS - Asynchronous Packet Switch BRI - Basic Rate Interface CS - Communication Server EWSD - Elektronisches Wählsystem Digital MGCP - Media Gateway Control Protocol NT1 - Network Termination 1 OAM&P - Operation, Administration, Maintenance, and Provisioning SMSI - Simplified Message Server Interface SNS - Single Number Service SUT - System Under Test		

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Voicemail interaction with Multi-Level Precedence and Preemption (MLPP).

The SUT was tested with the Lucent 5ESS and Siemens EWSD to insure that it properly interacted with MLPP as required in the GSCR. Inter- and intra-switch calls of different precedence levels were placed to voicemail subscribers of the two switches with the following results:

(1) All ROUTINE calls placed to voicemail subscribers that were busy or did not answer were properly routed to voicemail.

(2) All calls above ROUTINE placed to voicemail subscribers that were busy were properly diverted to the attendant console as required in the GSCR, appendix 7.

(3) All calls above ROUTINE placed to voicemail subscribers that were not answered within 15 to 45 seconds were properly diverted to the attendant console as required in the GSCR, appendix 7.

(4) Subscribers without voicemail that were assigned Call Forwarding Busy (CFB) and Call Forward Do Not Answer (CFD) were tested to insure proper MLPP interaction as required in the GSCR, appendix 7. Subscribers assigned CFB and CFD properly forwarded all precedence level calls to the call forwarding directory number.

b. SNS Interaction with MLPP. This feature allowed a DSN subscriber to redirect a ROUTINE call placed to a voicemail subscriber to another predetermined directory number (PDN). The 5ESS and EWSD must be configured for the Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) NI 2 interface with Bearer-Channel (B-Channel) Transfer capability as shown in table 2-3 to interact with this feature. The 5ESS and EWSD allowed only ROUTINE calls to be diverted to the SUT as described above. Once diverted to the SUT, the SNS feature transferred the call to a PDN using the B-Channel Transfer. After the transfer occurred, the ROUTINE call was preempted by a higher precedence call within the DSN. The preempted parties properly received precedence notification tone and the higher precedence call was connected. After the call was released, subsequent busy and unanswered calls were properly diverted to the SUT and then transferred to the SNS directory number.

Table 2-3. 2 Bearer Channel Transfer Configuration

1. Copy "tbct_sip_2.2.tcl" to gateway flash drive as follows:
 - a. login (user: rsinsp pass: GENband123\$)
 - b. enable (pass: battery)
 - c. copy ftp://user:pass@ipaddress/location flash:
specify user, password, ip address and location of temporary workstation with ftp server, and tbct file
2. Change Cisco 5350 gateway configuration file:

```
voice service voip
  sip
  header-passing
  application
  service tbct flash://tbct_sip_2.2.tcl
  tbct max calls 30
  tbct max call-duration 30
  trunk group pri1
  isdn supp-service tbct

interface Serial3/0:23
  trunk-group pri1
  isdn supp-service tbct tbct-with-crflg

dial-peer voice 402 voip
  service tbct
  destination-pattern 700T
  translate-outgoing called 100
  incoming called-number 31422333T

dial-peer voice 201 pots
  service tbct
  destination-pattern 31422333T
```

c. Test Summary. The SUT meets the critical interoperability requirements for a Customer Premise Equipment voicemail system in accordance with appendix 7 of the GSCR. The SUT is certified for joint use within the DSN specifically with the Lucent 5ESS and the Siemens EWSD switches listed on the DSN APL.

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>.