



DEFENSE INFORMATION SYSTEMS AGENCY

JOINT INTEROPERABILITY TEST COMMAND

P.O. BOX 12798

FORT HUACHUCA, ARIZONA 85670-2798

IN REPLY

REFER TO: Networks and Transport Division (JTE)

16 Aug 05

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of Nortel Networks Succession Defense Switched Network (DSN) Options 61C and 81C Digital Switching Systems with Software Release 3.0 and Product Enhancement Packages

References: (a) DOD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 4 May 2004
(b) CJCSI 6212.01C, "Interoperability and Supportability of Information Technology and National Security Systems," 20 November 2003

1. References (a) and (b) establish the Defense Information Systems Agency (DISA), Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.
2. The Nortel Networks Succession DSN Option 61C Digital Switching System with software release 3.0 and specified patch groups listed in enclosure 3, hereinafter referred to as the system under test (SUT), meets all of its critical interoperability requirements and is certified as interoperable for joint use within the DSN. The Nortel Networks Succession DSN Option 81C Digital Switching System employs the same software and trunk/line card hardware as the Succession DSN Option 61C. JITC analysis determined Option 81C to be functionally identical to the Succession DSN Option 61C for interoperability certification purposes. The identified test discrepancies shown in the Certification Testing Summary (enclosure 2) that remained open after software patches were applied and regression testing was completed have a minor operational impact. The SUT was tested and met the critical interoperability requirements for joint use within the DSN for the following switch types: Small End Office (except Europe), Private Branch Exchange (PBX) 1, and PBX 2. This certification expires upon system changes that affect interoperability, but no later than three years from the date of this memorandum.
3. This finding is based on interoperability testing conducted by the JITC in the Global Information Grid Network Test Facility, Ft. Huachuca, Arizona, from 5 September 2003 through 25 February 2004. The Special Interoperability Certification Letter and Test Summary Report for this test effort as shown in reference (c) excluded the E1 Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI), and European Basic Multiplex Rate (E1) Channel Associated Signaling (CAS) interfaces. Additional regression testing of product-enhancement packages developed to support the aforementioned interfaces was conducted at JITC from 14 through 25 February 2005 and 2 through 5 May 2005. Enclosure 2 documents the test results and describes the tested network and systems configurations. System interoperability should be

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verified before deployment in an operational environment that varies significantly from the test environment.

4. The interoperability summary of the SUT is indicated in table 1. The interoperability status and criticality are listed in table 2, and the Exchange Requirements (ERs) and Functional Requirements (FRs) for each network interface are listed in table 3. The E1 ISDN PRI and E1 CAS interface card nomenclature and product equipment codes are listed in table 4. The product enhancement packages applied to the SUT to meet the E1 ISDN PRI, and E1 CAS interfaces are shown in table 5. The Nortel Succession switch product line offers a Voice over Internet Protocol capability; however, this capability is not covered by this certification. Network Management (NM) capabilities of the SUT platform were tested in accordance with the DISA NS53 requirements as set forth in references (d) and (e). These references require that a switch provide NM capabilities via Ethernet Transmission Control Protocol/Internet Protocol (Institute of Electrical and Electronic Engineers, Inc. 802.3), asynchronous serial Electronic Industries Alliance (EIA), or synchronous serial International Telecommunications Union-Telecommunications Standardization Sector (X.25 or BX.25 variant). The SUT meets the NM requirements through the use of serial EIA-232 connections. This interoperability test summary is based upon evaluation of:

a. The following network interfaces as specified in reference (f): DSN, Tactical Network Gateway, and Public Switched Telephone Network Gateway.

b. The interface and signaling requirements for trunk/line interfaces, and interoperability ERs and FRs derived from references (g) and (h).

c. The overall system interoperability performance derived from test procedures listed in reference (i).

d. Review of Letters of Compliance submitted by Nortel Networks.

Table 1. SUT Interoperability Summary

Network	Critical	Status	Remarks
DSN	Yes	Certified	- Certified as a SMEO (excludes Europe), PBX 1, and PBX 2. - VoIP not certified. - The identified test discrepancies shown in enclosure 2 that remained open have an overall minor operational impact.
DRSN Gateway	Yes	Certified	- All requirements met.
Tactical Gateway	No	Certified	- All requirements met.
NATO Gateway	No	Not Tested	
PSTN Gateway	Yes	Certified	- All requirements met.
LEGEND:			
DRSN	- Defense Red Switch Network	PSTN	- Public Switched Telephone Network
DSN	- Defense Switched Network	SMEO	- Small End Office
NATO	- North Atlantic Treaty Organization	SUT	- System Under Test
PBX 1	- Private Branch Exchange 1	VoIP	- Voice over Internet Protocol
PBX 2	- Private Branch Exchange 2		

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Table 2. SUT Interoperability Status

	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
Defense Switched Network	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	Certified	Met all ERs and FRs with the following minor exceptions: Restoral to service from a local red alarm not met. ¹ Hotline services not met. ² Attendant services automatic recall not met. ³
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	Certified	Met all ERs and FRs with the following minor exceptions: Restoral to service from a local red alarm not met. ¹ Hotline services not met. ² Attendant services automatic recall not met. ³
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all ERs and FRs with the following minor exceptions: Restoral to service from a local red alarm not met. ¹ Hotline services not met. ² Attendant services automatic recall not met. ³ NI2 Protocol provides a Release Complete Message in lieu of a Disconnect Message for Unavailable Resources. ⁴
	Analog E&M Signaling Type I	No	Not Certified	Did not pass DSN preempt signals. ⁵
	PCM-30 E1 CAS DTMF	No	Certified	Met all ERs and FRs with the following minor exceptions: Hotline services not met.² Attendant services automatic recall not met.³
	PCM-30 ISDN PRI (ITU-T Q.955.3)	No	Certified	Met all ERs and FRs with the following minor exceptions: Hotline services not met.² Attendant services automatic recall not met.³ ETSI Protocol provides a Release Complete Message in lieu of a Disconnect Message for Unavailable Resources.⁴
	Line Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	TPC ISDN BRI ST and U Interface ITU-T Q.931	Yes	Certified	Met all ERs and FRs with the following minor exceptions: Hotline services not met. ² Attendant services automatic recall not met. ³ ISDN supplemental services not met. ⁶
	TPC 2-Wire analog	Yes	Certified	Met all ERs and FRs with the following minor exceptions: Hotline services not met. ² Attendant services automatic recall not met. ³ Does not support intra-switch call waiting. ⁷
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all ERs and FRs with the following minor exceptions: Hotline services not met. ² Attendant services automatic recall not met. ³
Network Management Interfaces				
	Interface & Signaling	Critical	Status	Remarks
	TPC EIA Asynchronous @ 9.6 kbps	Yes	Certified	Met all critical ERs and FRs.
Defense Red Switch Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	2-Wire Analog Loop	Yes	Certified	Met all critical ERs and FRs.
Tactical Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified	Met all critical ERs and FRs.

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Table 2. SUT Interoperability Status (continued)

NATO Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
		No	Not Tested	See note 8.
PSTN Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	Same Interfaces and Signaling as DSN	Yes	Certified	See note 9.

LEGEND:

AMI	- Alternate Mark Inversion	ITU-T	- International Telecommunication Union – Telecommunication Standardization Sector
B8ZS	- Bipolar Eight Zero Substitution	kbps	- kilobits per second
BRI	- Basic Rate Interface	Mbps	- Megabits per second
CAS	- Channel Associated Signaling	NATO	- North Atlantic Treaty Organization
DISN	- Defense Information Systems Network	NI2	- National ISDN 2
DP	- Dial Pulse	PCM-24	- Pulse Code Modulation 24 Channels
DRSN	- Defense Red Switch Network	PCM-30	- Pulse Code Modulation 30 Channels
DSN	- Defense Switched Network	PRI	- Primary Rate Interface
DTMF	- Dual Tone Multi-Frequency	PSTN	- Public Switched Telephone Network
E&M	- Ear and Mouth	Q.931	- Signaling standard for ISDN
E1	- European Basic Multiplex Rate	Q.955.3	- ISDN signaling standard for E1 MLPP
EIA	- Electronic Industries Alliance	SF	- Superframe
ERs	- Exchange Requirements	ST	- ISDN BRI Four-Wire Interface
ESF	- Extended Superframe	SUT	- System Under Test
ETSI	- European Telecommunications Standards Institute	T1	- Digital Transmission Link Level 1 (1.544 Mbps)
FRs	- Functional Requirements	TPC	- Twisted Pair Copper
GSCR	- Generic Switching Center Requirements	U	- ISDN BRI Two-Wire Interface
GSTP	- Generic Switch Test Plan		
ISDN	- Integrated Services Digital Network		

NOTES:

- The SUT does not meet the GSCR exchange requirements for restoral to service from a local red alarm. SUT takes 30 seconds to recover versus 15 seconds. This is not a critical requirement.
- The SUT does not meet the GSCR exchange requirements for Hotline services. Hotline services are not a critical requirement.
- The SUT's attendant console does not support automatic recall of attendant. The operational impact is minor.
- ISDN PRI T1 trunk groups using NI2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources), and ISDN PRI E1 interfaces send a Release Message in Lieu of the Disconnect Message with Cause 46 (Unavailable Resources). The operational impact is considered minor since the user still receives a Blocked Precedence Announcement.
- Analog E&M Signaling Type I did not pass the DSN preempt signals as required by the GSCR for the four types of preemption. Analog E&M Signaling Type I is not certified for use in the DSN.
- ISDN supplemental services are currently not used in the DISN. The operational impact is none.
- Analog instruments do not provide intra-switch call waiting. The operational impact is minor.
- NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function.
- The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.

Table 3. SUT Exchange and Functional Requirements

Defense Switched Network	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	- MLPP - Hotline Services ¹ - System Interface <ul style="list-style-type: none"> • Non-secure Voice and Data • Secure Voice and Data (STU-III and STE) • NX56 and NX64 Synchronous Data (<i>T1/E1 ISDN PRI only</i>) • Non-secure and Secure FAX • VTC (<i>T1/E1 ISDN PRI only</i>) • Alarms
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	- Integrated Services Digital Network (<i>T1/E1 ISDN PRI only</i>) - Attendant Services ²
	PCM-24 T1 B8ZS/ESF ISDN PRI	Yes	- System Administration, Measurements, and Service Standards
	PCM-30 E1 CAS DTMF	No	- Y2K (Rollover, Valid, and Invalid Dates)
	PCM-30 ISDN PRI (ITU-T Q.955.3)	No	- Screening, Zone Restriction, and DSN Access Restriction
	Analog E&M Signaling Type I	No	- Automated Message Accounting - Network Integration - ANSI T1.619a (<i>T1 ISDN PRI</i>) ³ - ITU-T Q.955.3 (<i>E1 ISDN PRI only</i>)

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Table 3. SUT Exchange and Functional Requirements (continued)

	Line Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
Defense Switched Network (continued)	TPC ISDN BRI ST and U Interface ITU-T Q.931	Yes	- MLPP - Hotline Services ¹ - ANSI T1.619a - ISDN Supplemental Services - Call Treatments - DSN Announcements - Attendant Services ² - VTC - NX56 and NX64 Synchronous Data - Non-secure Voice and Data - Secure Voice and Data (STE)
	TPC 2-Wire analog	Yes	- MLPP - Hotline Services ¹ - DSN Announcements - Traffic Measurements - Attendant Services ² - Call Treatments ⁴ - Non-secure Voice and Data - Non-secure and Secure FAX - Secure Voice and Data (STU-III and STE)
	TPC 2-Wire Digital and Analog (Proprietary)	No	- MLPP - Hotline Services ¹ - DSN Announcements - Traffic Measurements - Attendant Services ² - Call Treatments - Non-secure Voice
	Network Management Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	TPC EIA Asynchronous @ 9.6 kbps	No	- Automated Message Accounting - Traffic Measurements - Alarms - Man Machine Language
Defense Red Switch Network Gateway	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	TPC 2-Wire analog	Yes	- MLPP - Secure Voice (STU-III & STE)
Tactical Network Gateway	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	- MLPP - Non-secure Voice
NATO Gateway	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	Not tested	No	See note 5.

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Table 3. SUT Exchange and Functional Requirements (continued)

PSTN Gateway	Trunk Interfaces																																														
	Interface & Signaling	Critical	Exchange & Functional Requirements																																												
	Same Interfaces and Signaling as DSN	Yes	See note 6.																																												
<p>LEGEND:</p> <table border="0"> <tr> <td>AMI - Alternate Mark Inversion</td> <td>NATO - North Atlantic Treaty Organization</td> </tr> <tr> <td>ANSI - American National Standards Institute</td> <td>NI2 - National ISDN 2</td> </tr> <tr> <td>B8ZS - Bipolar Eight Zero Substitution</td> <td>NX56 - Data format is restricted to multiples of 56 kbps</td> </tr> <tr> <td>BRI - Basic Rate Interface</td> <td>NX64 - Data format is restricted to multiples of 64 kbps</td> </tr> <tr> <td>CAS - Channel Associated Signaling</td> <td>PCM-24 - Pulse Code Modulation - 24 Channels</td> </tr> <tr> <td>DP - Dial Pulse</td> <td>PCM-30 - Pulse Code Modulation - 30 Channels</td> </tr> <tr> <td>DSN - Defense Switched Network</td> <td>PRI - Primary Rate Interface</td> </tr> <tr> <td>DTMF - Dual Tone Multi-Frequency</td> <td>PSTN - Public Switched Telephone Network</td> </tr> <tr> <td>E&M - Ear and Mouth</td> <td>Q.931 - Signaling Standard for ISDN</td> </tr> <tr> <td>E1 - European Basic Multiplex Rate (2.048 Mbps)</td> <td>Q.955.3 - ISDN signaling standard for E1 MLPP</td> </tr> <tr> <td>EIA - Electronic Industries Alliance</td> <td>SF - Superframe</td> </tr> <tr> <td>EKTS - Electronic Key Telephone System</td> <td>SS7 - Signaling System 7</td> </tr> <tr> <td>ESF - Extended Superframe</td> <td>ST - ISDN BRI Four-Wire Interface</td> </tr> <tr> <td>FAX - Facsimile</td> <td>STE - Secure Terminal Equipment</td> </tr> <tr> <td>GSCR - Generic Switching Center Requirements</td> <td>STU-III - Secure Telephone Unit-3rd generation</td> </tr> <tr> <td>GSTP - Generic Switch Test Plan</td> <td>SUT - System Under Test</td> </tr> <tr> <td>ISDN - Integrated Services Digital Network</td> <td>T1 - Digital Transmission Link Level 1 (1.544 Mbps)</td> </tr> <tr> <td>ITU-T - International Telecommunication Union - Telecommunication Standardization Sector</td> <td>T1.619a - SS7 and ISDN Signaling Standard for T1</td> </tr> <tr> <td>kbps - kilobits per second</td> <td>TPC - Twisted Pair Copper</td> </tr> <tr> <td>Mbps - Megabits per second</td> <td>U - ISDN BRI Two-Wire Interface</td> </tr> <tr> <td>MLPP - Multi-Level Precedence and Preemption</td> <td>VTC - Video Teleconferencing</td> </tr> <tr> <td></td> <td>Y2K - Year 2000</td> </tr> </table> <p>NOTES:</p> <ol style="list-style-type: none"> SUT does not meet the GSCR exchange requirements for Hotline Services. Hotline Services are not a critical requirement. SUT's attendant console does not support automatic recall of attendant. The operational impact is minor. ISDN PRI T1 trunk groups using NI2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources), and ISDN PRI E1 interfaces send a Release Message in Lieu of the Disconnect Message with Cause 46 (Unavailable Resources). The operational impact is considered minor since the user still receives a Blocked Precedence Announcement. Analog instruments do not support intra-switch call waiting. The operational impact is minor. NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function. The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR. 				AMI - Alternate Mark Inversion	NATO - North Atlantic Treaty Organization	ANSI - American National Standards Institute	NI2 - National ISDN 2	B8ZS - Bipolar Eight Zero Substitution	NX56 - Data format is restricted to multiples of 56 kbps	BRI - Basic Rate Interface	NX64 - Data format is restricted to multiples of 64 kbps	CAS - Channel Associated Signaling	PCM-24 - Pulse Code Modulation - 24 Channels	DP - Dial Pulse	PCM-30 - Pulse Code Modulation - 30 Channels	DSN - Defense Switched Network	PRI - Primary Rate Interface	DTMF - Dual Tone Multi-Frequency	PSTN - Public Switched Telephone Network	E&M - Ear and Mouth	Q.931 - Signaling Standard for ISDN	E1 - European Basic Multiplex Rate (2.048 Mbps)	Q.955.3 - ISDN signaling standard for E1 MLPP	EIA - Electronic Industries Alliance	SF - Superframe	EKTS - Electronic Key Telephone System	SS7 - Signaling System 7	ESF - Extended Superframe	ST - ISDN BRI Four-Wire Interface	FAX - Facsimile	STE - Secure Terminal Equipment	GSCR - Generic Switching Center Requirements	STU-III - Secure Telephone Unit-3 rd generation	GSTP - Generic Switch Test Plan	SUT - System Under Test	ISDN - Integrated Services Digital Network	T1 - Digital Transmission Link Level 1 (1.544 Mbps)	ITU-T - International Telecommunication Union - Telecommunication Standardization Sector	T1.619a - SS7 and ISDN Signaling Standard for T1	kbps - kilobits per second	TPC - Twisted Pair Copper	Mbps - Megabits per second	U - ISDN BRI Two-Wire Interface	MLPP - Multi-Level Precedence and Preemption	VTC - Video Teleconferencing		Y2K - Year 2000
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Table 4. E1 ISDN PRI and E1 CAS Certified Hardware and Software Components

Card Type	Product Equipment Code	Firmware								
E1 ISDN PRI	NT5D97AD w/ Daughter Board NTBK51BA	ESGF Load AC26								
E1 CAS	NT5D97AD	NA								
<p>LEGEND:</p> <table border="0"> <tr> <td>CAS - Channel Associated Signaling</td> <td>ISDN - Integrated Services Digital Network</td> </tr> <tr> <td>E1 - European Basic Multiplex Rate (2.048 Mbps)</td> <td>Mbps - Megabits per second</td> </tr> <tr> <td>ESGF - European Telecommunications Standards Institute (ETSI) Q interface signaling (Qsig) Generic Functions Transport</td> <td>NA - Not Applicable</td> </tr> <tr> <td></td> <td>PRI - Primary Rate Interface</td> </tr> </table>			CAS - Channel Associated Signaling	ISDN - Integrated Services Digital Network	E1 - European Basic Multiplex Rate (2.048 Mbps)	Mbps - Megabits per second	ESGF - European Telecommunications Standards Institute (ETSI) Q interface signaling (Qsig) Generic Functions Transport	NA - Not Applicable		PRI - Primary Rate Interface
CAS - Channel Associated Signaling	ISDN - Integrated Services Digital Network									
E1 - European Basic Multiplex Rate (2.048 Mbps)	Mbps - Megabits per second									
ESGF - European Telecommunications Standards Institute (ETSI) Q interface signaling (Qsig) Generic Functions Transport	NA - Not Applicable									
	PRI - Primary Rate Interface									

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Table 5. SUT Product Enhancement Packages

Core Software Patch List		
Patch ID Number	CR Number	Description
MPLR17817	Q00758895	DSN: Tandem ATVN MCDN trunk 2nd call fails after preemption
MPLR18070	Q00786849	Preemption of a partially dialed routine precedence call
MPLR18220	Q00802114	DSN: Bug 30 messages during Tandem calls
MPLR18263	Q00817316	Option 11C switch reinitializes due to CDR-Q procedure
MPLR18302	Q00841477	NI2 DID Tandem to ATVN
MPLR18622	Q00888789	This patch was developed to suppress password information on the switches in LD 22.
MPLR18870 Issue 3	NA	This patch was developed to meet the E1 ISDN PRI and E1 CAS interface requirements.
MPLR20223 Issue 1	NA	This patch was developed to meet the E1 ISDN PRI and E1 CAS interface requirements.
MPLR 20305 Issue	NA	This patch was developed to meet the E1 ISDN PRI and E1 CAS interface requirements.
LEGEND: ATVN - Autovon CAS - Channel Associated Signaling CDR-Q - Call Detail Recording-Queue CR - Call Report DID - Direct Inward Dial DSN - Defense Switched Network E1 - European Basic Multiplex Rate (2.048 Mbps) ID - Identification ISDN - Integrated Services Digital Network LD - Overlay Mbps - Megabits per second MCDN - Meridian Customer Defined Network MPLR - Meridian Patch Library Reference NA - Not Applicable NI2 - National ISDN 2 PRI - Primary Rate Interface SUT - System Under Test		
NOTE: This certification specifically covers regression testing of newly product enhancement packages in bold . The other packages were tested and covered under a certification letter that was signed on 24 June 2004.		

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 Mr. John Hooper, DSN 879-5041, commercial (520) 538-5041, FAX DSN 879-4347, or e-mail to John.Hooper@disa.mil.

FOR THE COMMANDER:

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Headquarters US Air Force, AF/XICC, 1250 Pentagon, Washington, DC 20330-1250

Department of the Army, Office of the Secretary of the Army, G-6/ASA (ALT), ATTN: ASAALT (SAAL-SSI), 103 Army Pentagon, Washington, DC 20310-0103

US Marine Corps (C4ISR), MARCORSSYSCOM, 2200 Lester Street, Quantico, VA 22134

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Commander, Defense Information Systems Agency (DISA), ATTN: GS23 (Mr. Osman), Room 5w23, 5275 Leesburg Pike (RTE 7), Falls Church, VA 22041

ADDITIONAL REFERENCES

- (c) Joint Interoperability Certification Memorandum, JTE, "Special Interoperability Test Certification of Nortel Networks Succession Defense Switched Network (DSN) Options 61C and 81C Digital Switching Systems with Software Release 3.0 and Specified Patch Groups," 7 May 2004.
- (d) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Network Management Requirements for End Offices," 2 August 2001.
- (e) DISA NS53, Memorandum, "DSN Switch Network Management Interface," 26 July 2001
- (f) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001
- (g) DISA, Joint Interoperability and Engineering Organization (JIEO), Technical Report 8249, "Defense Information Systems Network (DISN) Circuit Switched Subsystem, Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR)," March 1997
- (h) DISA NS53, Memorandum, "DSN Global Network Requirements for Tandem (Standalone), Multifunction, End Office, and Small End Office Switches," 30 January 2003
- (i) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP)," 17 June 1999

CERTIFICATION TESTING SUMMARY

- 1. SYSTEM TITLE.** Nortel Networks Succession Defense Switched Network (DSN) Option 61C Digital Switching System with Software Release 3.0 and specified Product Enhancement Packages, hereinafter referred to as the system under test (SUT).
- 2. PROPONENT.** Defense Information Systems Agency (DISA).
- 3. PROGRAM MANAGER.** Mr. Howard Osman, GIG Combat Support Services (GS23), Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, E-mail: Howard.Osman@disa.mil.
- 4. TESTER.** Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.
- 5. SYSTEM UNDER TEST DESCRIPTION.** The Nortel Networks Succession DSN Digital Switching System product line, in addition to the Option 61C, includes Option 81C. This platform utilizes the same software and trunk/line card hardware as the SUT and was developed to satisfy scalability requirements. JITC analysis determined the Succession DSN Option 81C identical to the SUT for interoperability purposes. The Option 61C offers the following features: scalable, distributed platform for growth from 200 to 2000 lines, modular client/server architecture for flexibility, scalability, and a redundant call processing core for extra reliability in mission-critical enterprises. Nortel Network's Succession DSN Options 61C and 81C Digital Switching Systems are currently in use within the DSN providing Small End Office (SMEO) switch functionality. The SUT was tested and met the critical interoperability requirements for joint use within the DSN for the following switch types: SMEO (except Europe), Private Branch Exchange 1 (PBX 1), and PBX 2.
- 6. OPERATIONAL ARCHITECTURE.** The Generic Switching Center Requirements (GSCR) operational DSN Architecture is depicted in figure 2-1.

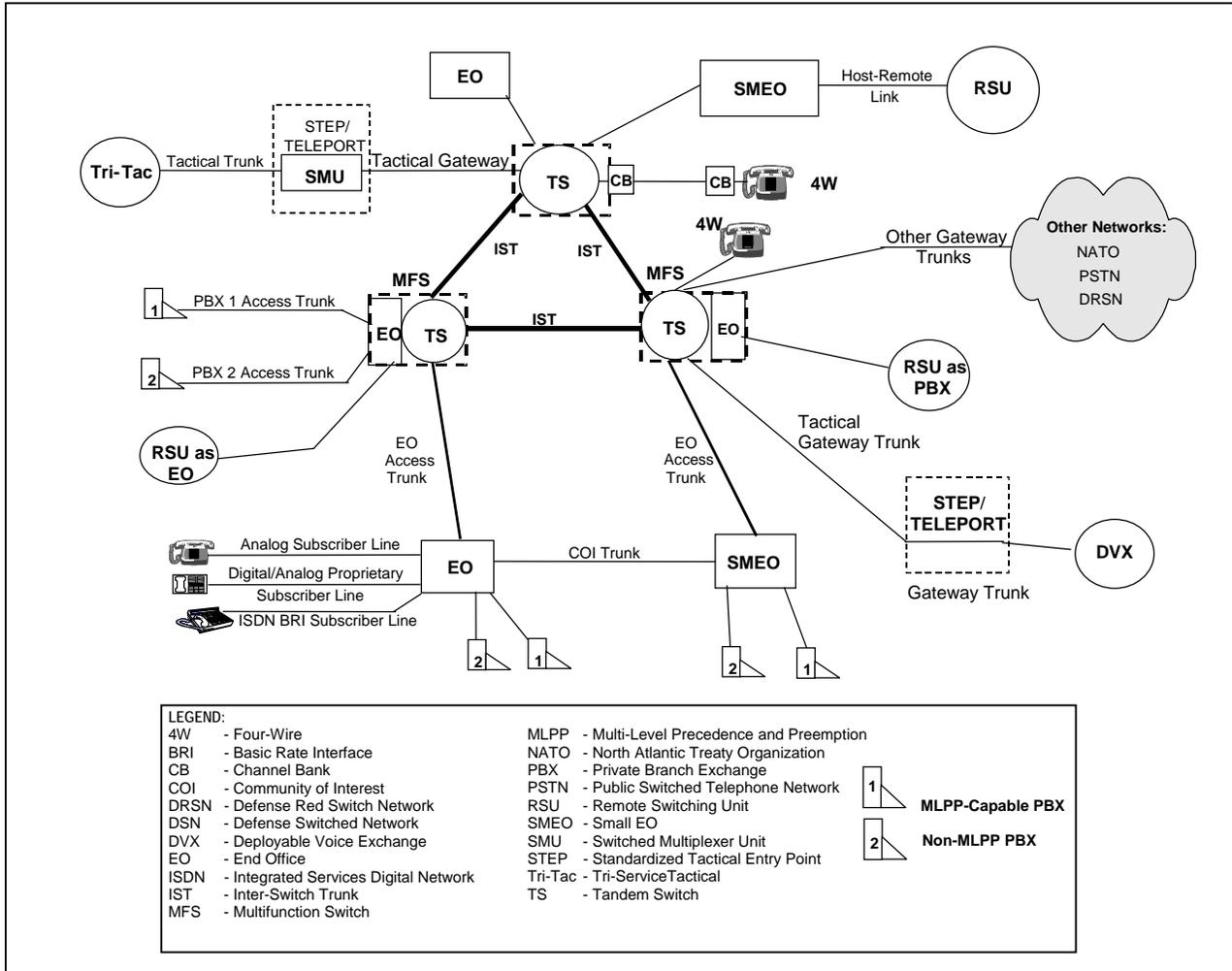


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. This interoperability test status is based upon evaluation of the network interfaces as specified in:

a. The Chairman of the Joint Chiefs of Staff (CJCS) policy for Department of Defense voice services: DSN, Defense Red Switch Network (DRSN) Gateway, Tactical Network Gateway, North Atlantic Treaty Organization (NATO) Gateway, and Commercial Network Gateway.

b. Interface and signaling requirements for trunk, line, and network management derived from the GSCR document.

c. Interoperability Exchange Requirements (ERs) and Functional Requirements (FRs) derived from the GSCR.

The ERs and FRs for the CJCS network interfaces are indicated in table 2-1. The criticality and certification status of these interfaces can be found in paragraph 11. The test summary can be found in paragraph 11b.

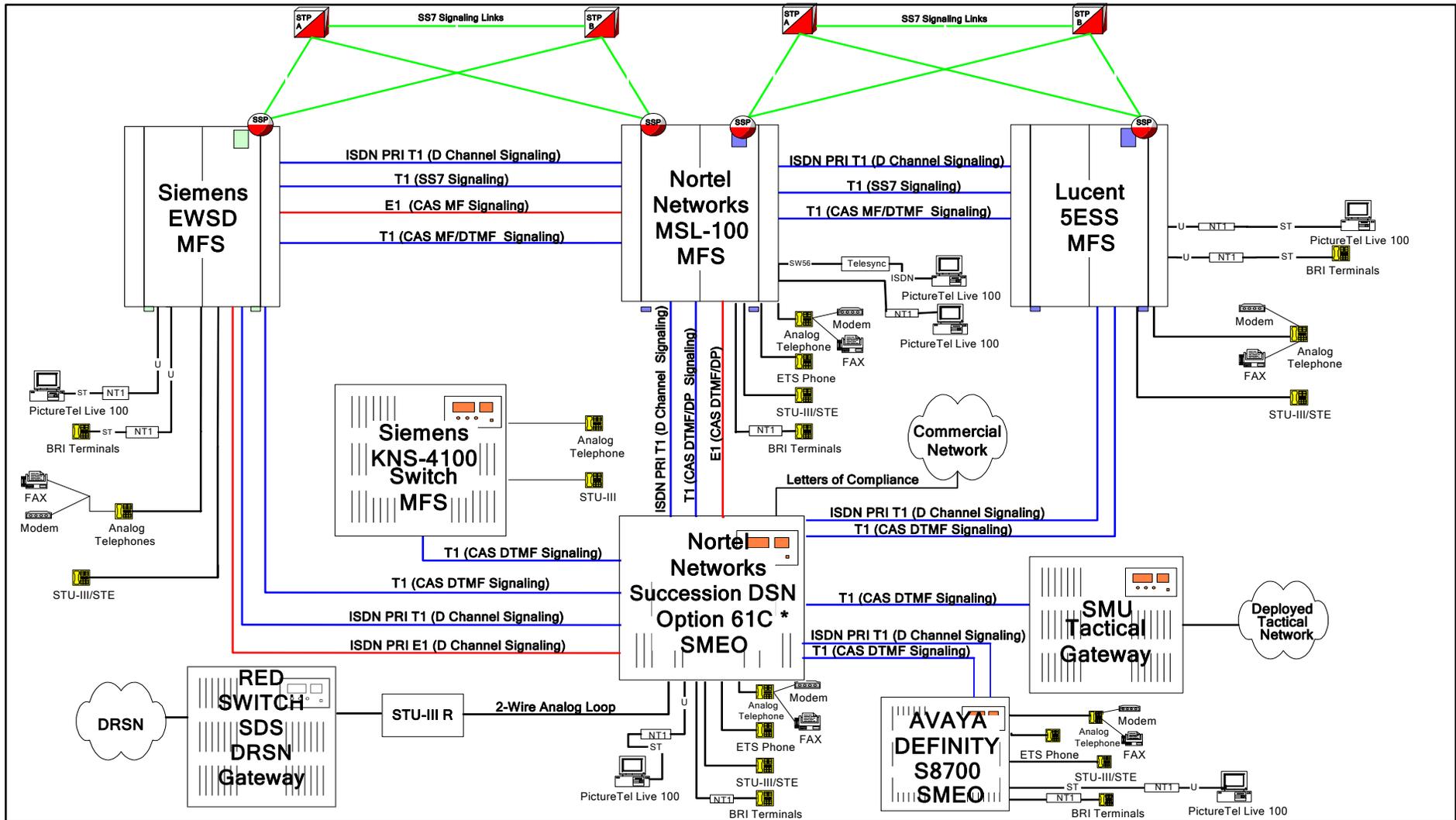
Table 2-1. SUT Exchange and Functional Requirements

Defense Switched Network	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - System Interface <ul style="list-style-type: none"> • Non-secure Voice and Data • Secure Voice and Data (STU-III and STE) • NX56 and NX64 Synchronous Data (<i>T1/E1 ISDN PRI only</i>) • Non-secure and Secure FAX • VTC (<i>T1/E1 ISDN PRI only</i>) • Alarms - Integrated Services Digital Network (<i>T1/E1 ISDN PRI only</i>) - Attendant Services² - System Administration, Measurements, and Service Standards - Y2K (Rollover, Valid, and Invalid Dates) - Screening, Zone Restriction, and DSN Access Restriction - Automated Message Accounting - Network Integration - ANSI T1.619a (<i>T1 ISDN PRI only</i>)³ - ITU-T Q.955.3 (<i>E1 ISDN PRI only</i>)
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	
	PCM-24 T1 B8ZS/ESF ISDN PRI	Yes	
	PCM-30 E1 CAS DP IN/DTMFOUT, DTMF 2-Way	No	
	PCM-30 ISDN PRI (ITU-T Q.955.3)	No	
	Analog E&M Signaling Type I	No	
Line Interfaces			
Interface & Signaling	Critical	Exchange and Functional Requirements	
TPC ISDN BRI ST and U Interface ITU-T Q.931	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - ANSI T1.619a - ISDN Supplemental Services - Call Treatments - DSN Announcements - Attendant Services² - VTC - NX56 and NX64 Synchronous Data - Non-secure Voice and Data - Secure Voice and Data (STE) 	
TPC 2-Wire analog	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - DSN Announcements - Traffic Measurements - Attendant Services² - Call Treatments⁴ - Non-secure Voice and Data - Non-secure and Secure FAX - Secure Voice and Data (STU-III and STE) 	
TPC 2-Wire Digital and Analog (Proprietary)	No	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - DSN Announcements - Traffic Measurements - Attendant Services² - Call Treatments - Non-secure Voice 	

Table 2-1. SUT Exchange and Functional Requirements (continued)

Defense Switched Network (continued)	Network Management Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
	TPC EIA Asynchronous @ 9.6 kbps	Yes	- Automated Message Accounting - Traffic Measurements - Alarms - Man Machine Language
Defense Red Switch Network Gateway	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
	2-Wire Analog Loop	Yes	- MLPP - Secure Voice
Tactical Network Gateway	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	- MLPP - Non-secure Voice
NATO Gateway	Interface & Signaling	Critical	Exchange and Functional Requirements
	Not tested	No	See note 5.
Commercial Network Gateway	Interface & Signaling	Critical	Exchange and Functional Requirements
	Same Interfaces and Signaling as DSN	Yes	See note 6.
LEGEND: AMI - Alternate Mark Inversion ANSI - American National Standards Institute B8ZS - Bipolar Eight Zero Substitution BRI - Basic Rate Interface CAS - Channel Associated Signaling DP - Dial Pulse DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency EIA - Electronic Industries Alliance ESF - Extended Superframe FAX - Facsimile GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan ISDN - Integrated Services Digital Network ITU-T - International Telecommunication Union – Telecommunication Standardization Sector kbps - kilobits per second Mbps - Megabits per second MLPP - Multi-Level Precedence and Preemption NATO - North Atlantic Treaty Organization NI2 - National ISDN 2 NX56 - Data format restricted to multiples of 56 kbps NX64 - Data format restricted to multiples of 64 kbps PCM-24 - Pulse Code Modulation 24 Channels PRI - Primary Rate Interface Q.931 - Signaling Standard for ISDN Q.955.3 - ISDN signaling standard for E1 MLPP SF - Superframe SS7 - Signaling System 7 ST - ISDN BRI Four-Wire Interface STE - Secure Terminal Equipment STU-III - Secure Telephone Unit III SUT - System Under Test T1 - Digital Transmission Link level 1 (1.544 Mbps) T1.619a - SS7 and ISDN Signaling Standard for T1 TPC - Twisted Pair Copper U - ISDN BRI Two-Wire Interface VTC - Video Teleconferencing Y2K - Year 2000			
NOTES: 1 SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement. 2 SUT's attendant console does not support automatic recall of attendant. The operational impact is minor. 3 ISDN T1 PRI trunkgroups using NI2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources). There is no operational impact as the calling user still receives a Blocked Precedence Announcement (BPA). 4 Analog instruments do not meet the GSCR exchange requirements for intra-switch call waiting. The operational impact is minor. 5 NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function. 6 The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.			

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. This test was conducted using three test configurations shown in figures 2-2 through 2-4. Testing of the system's required functions and features was conducted using the test configuration depicted in figure 2-2, which accurately emulates the DSN operational environment. Network integration testing, which accurately emulates the DSN operational environment, was conducted using the test configuration depicted in figure 2-3. Figure 2-4 depicts the test configuration used to test the Advanced Defense Switched Network Integrated Management Support System network management required functions and features.



Legend:

- 5ESS - Electronic Switching System Number 5
- BRI - Basic Rate Interface
- CAS - Channel Associated Signaling
- DP - Dial Pulse
- DRSN - Defense Red Switch Network
- DSN - Defense Switched Network
- DTMF - Dual Tone Multi-Frequency
- E1 - European Basic Multiplex Rate (2.048 Mbps)
- ETS - Electronic Telephone Set
- EWSD - Elektronisches Wählsystem Digital

- FAX - Facsimile
- ISDN - Integrated Services Digital Network
- Mbps - Megabits per second
- MF - Multi-Frequency
- MFS - Multifunction Switch
- MSL - Meridian Switching Load
- NT1 - Network Termination 1
- PRI - Primary Rate Interface
- SDS - Secure Digital Switch
- SMEO - Small End Office

- SMU - Switch Multiplexer Unit
- SS7 - Signaling System Number 7
- ST - ISDN BRI 4-Wire Interface
- STE - Secure Terminal Equipment
- STU-III - Secure Telephone Unit-III
- STU-III R - Secure Telephone Unit-III Red Switch
- SW56 - Switched 56
- T1 - Digital Transmission Link level 1 (1.544 Mbps)
- U - ISDN BRI 2-Wire Interface



SS7 Signal Transfer Point



Service Switching Point

* Although the Nortel Networks Succession Option 61C was the system tested, the certification also applies to the Nortel Networks Succession Option 81C.

Figure 2-2. Test Configuration

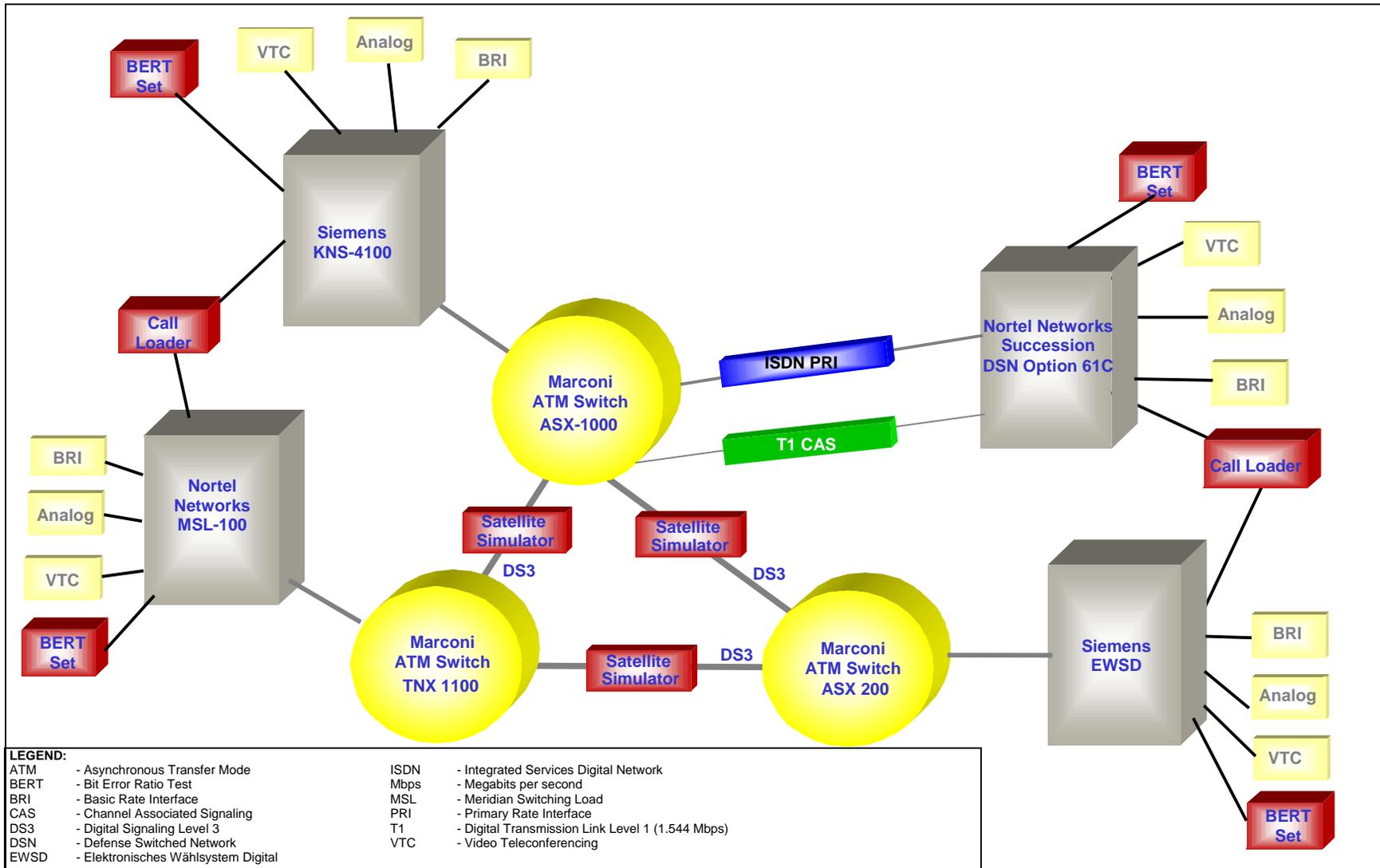
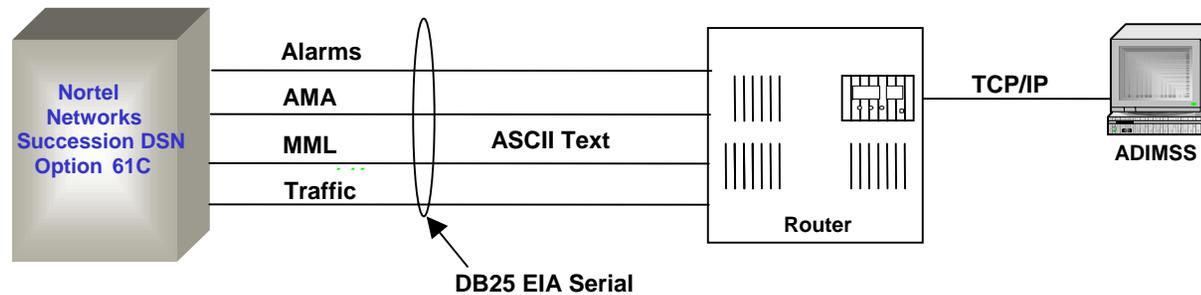


Figure 2-3. Network Integration Test Configuration



LEGEND:

- ADIMSS - Advanced DSN Integrated Management Support System
- Alarms - Fault Management
- AMA - Automated Message Accounting (Accounting Management)
- ASCII - American Standard Code for Information Interchange
- DB - "D" describes the shape of the housing, "B" describes the size of the housing
- DSN - Defense Switched Network
- EIA - Electronic Industries Alliance
- MML - Man Machine Language (Remote access to switch)
- SUT - System Under Test
- TCP/IP - Transfer Control Protocol/Internet Protocol
- Traffic - Performance Management

NOTE:

DSN Switch Network Management Interfaces as described in reference (d) and Network Management Requirements for End Offices as described in reference (c).

Figure 2-4. SUT Network Management System Interface

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations used in the test.

Table 2-2. Tested System Configurations

System Name	Software Release
Nortel Networks MSL-100	MSL-17
Nortel Networks Succession DSN Option 11C	3.0
Avaya MultiVantage S8700	R011x.7585.7.0.2
Nortel Networks Succession DSN Option 61C	3.0
Siemens EWSD	19d with Patch Set 32
Siemens KNS-4100	APS4V2.3
Lucent Technologies 5ESS	5E16.2 SU2
SMU 96 Tactical Gateway	RD302185
DSS Red Switch	8.03
MARCONI ATM switches	Versions 6.2 and 7.1
LEGEND: 5ESS - Class 5 Electronic Switching System ATM - Asynchronous Transfer Mode DSN - Defense Switched Network DSS - Digital Small Switch EWSD - Elektronisches Wählsystem Digital MSL - Meridian Switching Load SMU - Switch Multiplexer Unit SU - Software Update	

10. TESTING LIMITATIONS. The Nortel Networks Succession DSN Option 61C Digital Switching System was the only switch platform tested by JITC; however, the test results are applicable to the DSN Option 81C. The Nortel Networks Succession DSN Option 61C Digital Switching System employs the same software and trunk/line card hardware as the DSN Option 81C digital switch, and JITC analysis determined it to be functionally identical for certification purposes.

11. TEST RESULTS. Tables 2-3 through 2-8 synopsise the SUT interface ER and FR status and criticality. The identified test discrepancies shown below denote only those test discrepancies that remained open after software patches were applied and regression testing was completed. A detailed description of these discrepancies can be found in paragraph 11a.

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CAS (B8ZS/ESF) (AMI/SF) DTMF	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met ¹
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ²
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CAS (B8ZS/ESF) (AMI/SF) DP IN/DTMF OUT	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met ¹
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ²
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-30 E1 CAS DP IN/DTMF OUT	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline services	Yes	II-3.2	21.3.10	No	Not Met ¹
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant services	Yes	II-7.2	2.1.3	No	Met ²
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-30 E1 CAS DTMF 2-Way	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline services	Yes	II-3.2	21.3.10	No	Not Met ¹
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant services	Yes	II-7.2	2.1.3	No	Met ²
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-24 T1 (B8ZS/ESF) ISDN PRI	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met ¹
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		ISDN	No	II-6.2	6.6, 21.1, 21.2, 21.3	Yes	Met
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ²
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met
		ANSI T1.619a	No	II-6.2	21.3.1	Yes	Met ³

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-30 E1 ISDN PRI	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline services	Yes	II-3.2	21.3.10	No	Not Met ¹
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		ISDN	No	II-6.2	6.6, 21.1, 21.2, 21.3	Yes	Met
		Attendant services	Yes	II-7.2	2.1.3	No	Met ²
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met
		ITU-T Q.955.3	Yes	23 April 04 GSCR E-2.7.1	8 September 2003 Section 3	No	Met ³

Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
Analog E&M Signaling Type I	Not Certified	MLPP	Yes	II-2.2	2.2.1, 5.3.4.3 through 4.9	No	Not Met ⁴
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met ¹
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	No	Met
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ²
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	No	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	No	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	No	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	No	Met

LEGEND:

AMA - Automated Message Accounting	ETSI - European Telecommunications Standards Institute	Q.955.3 - ISDN signaling standard for E1 MLPP
AMI - Alternate Mark Inversion	FAX - facsimile	Para - Paragraph
ANSI - American National Standards Institute	FR - Functional Requirement	PCM-24 - Pulse Code Modulation – 24 channels
B8ZS - Bipolar Eight Zero Substitution	GSCR - Generic Switching Center Requirements	PRI - Primary Rate Interface
CAS - Channel Associated Signaling	GSTP - Generic Switch Test Plan	SF - Superframe
DP - Dial Pulse	ISDN - Integrated Services Digital Network	SS7 - Signaling System 7
DSN - Defense Switched Network	ITU-T - International Telecommunication Union – Telecommunication Standardization Sector	SUT - System Under Test
DTMF - Dual-Tone Multi Frequency	Mbps - Megabits per second	T1 - Digital Transmission Link Level 1 (1.544 Mbps)
E&M - Ear and Mouth	MLPP - Multi-Level Precedence and Preemption	T1.619a - SS7 and ISDN Signaling Standard for T1
ER - Exchange Requirement	NI2 - National ISDN 2	VTC - Video Teleconferencing
ESF - Extended Superframe		Y2K - Year 2000

NOTES:

- SUT does not meet the GSCR exchange requirements for Hotline Services. Hotline Services are not a critical requirement.
- SUT's attendant console does not support automatic recall of attendant. The operational impact is minor.
- ISDN PRI T1 trunk groups using NI2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources), and ISDN PRI E1 interfaces send a Release Message in Lieu of the Disconnect Message with Cause 46 (Unavailable Resources). The operational impact is considered minor since the user still receives a Blocked Precedence Announcement.
- Analog E&M Signaling Type I did not pass the DSN preempt signals as required by the GSCR for the four types of preemption. This is not a critical requirement for a Private Branch Exchange. Analog E&M Signaling Type I is not certified for use in the DSN.

Table 2-4. Defense Switched Network Line Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
TPC, ISDN BRI ST and U, ITU-T Q.931	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met ¹
		ANSI T1.619a	No	II-6.2	21.3.1	Yes	Met
		ISDN Supplemental Services	Yes	II-6.2	21.3	No	Not Met ²
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ³
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		DSN Announcements	No	II-19.2	5.6	Yes	Met
TPC, 2-Wire Analog	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met ¹
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ³
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met ⁴
		AMA	No	II-14.2	8.1	Yes	Met
		DSN Announcements	No	II-19.2	5.6	Yes	Met

Table 2-4. Defense Switched Network Line Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
TPC 2-Wire Digital (Proprietary)	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	No	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met ¹
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ³
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	No	Met
		AMA	No	II-14.2	8.1	Yes	Met
		DSN Announcements	No	II-19.2	5.6	No	Met

LEGEND:
AMA - Automated Message Accounting
ANSI - American National Standards Institute
BRI - Basic Rate Interface
DSN - Defense Switched Network
DISN - Defense Information Systems Network
ER - Exchange Requirement
FR - Functional Requirement
GSCR - Generic Switching Center Requirements
GSTP - Generic Switch Test Plan
ISDN - Integrated Services Digital Network
ITU-T - International Telecommunication Union – Telecommunication Standardization Sector
Mbps - Megabits per second
MLPP - Multi-Level Precedence and Preemption
Para - Paragraph
Q.931 - Signaling standard for ISDN
SS7 - Signaling System 7
ST Interface - ISDN BRI 4-Wire Interface
SUT - System Under Test
T1 - Digital Transmission Link Level 1 (1.544 Mbps)
T1.619a - SS7 and ISDN MLPP Signaling Standard For T1
TPC - Twisted Pair Copper
U Interface - ISDN BRI 2-Wire Interface

NOTES:
1 The SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement.
2 ISDN Supplemental Services are currently not used in the DISN. The operational impact is minor.
3 The SUT's attendant console does not support automatic recall of attendant. The operational impact is minor.
4 Analog instruments do not meet the GSCR exchange requirements for intra-switch call waiting. This is not a critical requirement for a SMEO.

Table 2-5. Defense Switched Network Network Management Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
TPC EIA Asynchronous @ 9.6 kpbs	Certified	AMA	No	II-23.2	2.1.10, 16.1	Yes	Met
		Traffic Measurements	No	II-23.2	2.1.10, 16.1	Yes	Met
		MML	No	II-23.2	2.1.10, 16.1	Yes	Met
		Alarms	No	II-23.2	2.1.10, 16.1	Yes	Met
LEGEND: AMA - Automated Message Accounting EIA - Electronic Industries Alliance ER - Exchange Requirement FR - Functional Requirement GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan kbps - Kilobits per second MML - Man Machine Language Para - Paragraph TPC - Twisted Pair Copper							

Table 2-6. Defense Red Switch Network Gateway Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
TPC 2-Wire analog	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Secure Voice (STU-III, STE)	No	NA	2.2.1, 5.3.4	Yes	Met
LEGEND: ER - Exchange Requirement FR - Functional Requirement GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan MLPP - Multi-Level Precedence and Preemption Para - Paragraph STE - Secure Terminal Equipment STU-III - Secure Telephone Unit III TPC - Twisted Pair Copper							

Table 2-7. Tactical Network Gateway Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-24 T1 (B8ZS/ESF) (AMI/SF) DTMF	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	No	Met
		Non-secure Voice	Yes	NA	2.2.1, 5.3.4	No	Met
LEGEND: AMI - Alternate Mark Inversion B8ZS - Bipolar Eight Zero Substitution DTMF - Dual Tone Multi-Frequency ER - Exchange Requirement ESF - Extended Superframe FR - Functional Requirement GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan Mbps - Megabits per second MLPP - Multi-Level Precedence and Preemption Para - Paragraph PCM-24 - Pulse Code Modulation 24 channels SF - Superframe T1 - Digital Transmission Link Level 1 (1.544 Mbps)							

Table 2-8. Commercial Network Gateway Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
Same Interfaces Signaling as DSN	Certified	See Note	No	See Note	See Note	Yes	Met
LEGEND: DSN - Defense Switched Network ER - Exchange Requirement FR - Functional Requirement GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan Para - Paragraph							
NOTE: The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.							

a. Discussion

(1) **DSN.** All critical interface ERs and FRs for DSN were met. The following minor exceptions are noted:

(a) The SUT does not meet the following GSCR requirement: recovery from a local red alarm within the allowed time period on a Pulse Code Modulation-24 channels (PCM-24) interface. It takes 30 seconds for a PCM-24 interface on the SUT to recover from a red alarm. The GSCR requirement for recovery from a local red alarm is 15 seconds plus or minus 5 seconds. The operational impact is minor.

(b) The SUT Analog Ear and Mouth (E&M) Signaling Type I trunking is not certified. The SUT's Analog E&M trunks do not meet the GSCR requirements for DSN preempt signals. This is not a critical requirement for a SMEO.

(c) The SUT does not meet the Bellcore standard for American National Standards Institute (ANSI) T1.619a Primary Rate Interface (PRI) Interface Identifier Present Value. Bellcore SR-NWT-002343 P.8-72 requires that when the Digital Signal Level 1 identified contains the data channel carrying this information element, the interface should be identified as value "0" (implicitly identified). The SUT ANSI T1.619a PRI interface sends the incorrect interface identifier, present value of "1" (explicitly identified). There was no noted discrepancy during interoperability certification testing. The operational impact is minor.

(d) The SUT's Attendant Console does not meet the following requirement: Automatic Recall of Attendant Console, "camp-on" feature as required in table 2-3 Attendant Features, GSCR para 2.1.3. The operational impact of this discrepancy is minor.

(e) The SUT does not support route digit 5 or 6 for Hotline Services. This is not a critical requirement for a SMEO.

(f) The SUT does not support the following unique Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) Supplemental Services as specified in the respective GSCR paragraphs listed below. There are currently no switches in the DISN that support ISDN BRI Supplemental Services. The operational impact is minor.

- Conference Calling. GSCR Para. 21.3.2
- User-to-User Signaling. GSCR Para. 21.3.3
- Call Hold. GSCR Para. 21.3.4
- Call Waiting. GSCR Para. 21.3.5
- Normal Call Transfer. GSCR Para. 21.3.6
- Explicit Call Transfer. GSCR Para. 21.3.7
- ISDN Call Deflection. GSCR Para. 21.3.8
- Preset Conference Calling. GSCR Para. 21.3.11

(g) The SUT does not support intra-switch call waiting on analog instruments. Inter-switch precedence call waiting is supported on all instrument types on the SUT. The operational impact is minor.

(h) The SUT's Dual Rate Interface card (NT5D12AG) deactivates itself after a period of inactivity. PRI trunkgroups on the SUT that have been inactive for a period of two weeks or longer go into a "sleep" mode. In order to restore the trunkgroup it is necessary to physically reseat the associated Dual Rate Interface card. This is not considered to be a critical exception because the SUT's PRI trunkgroup sends a yellow alarm towards the distant node switch until it is restored. The operational impact is minor.

(i) The SUT does not meet the ANSI T1.619 1992, ANSI T1.619a 1994, standard for ISDN ANSI T1.619a PRI National ISDN 2 (NI2) protocol with unavailable resources, Blocked Precedence Announcement. The SUT's ANSI T1.619a ISDN PRI trunkgroups using NI2 protocol send a release complete message in lieu of a disconnect message with cause value 46 (unavailable resources). There was no noted discrepancy during interoperability testing with this anomaly. The operational impact is minor.

(2) DRSN Gateway. All critical interface ERs and FRs for the DRSN gateway were met.

(3) Tactical Network Gateway. All interface ERs and FRs for the tactical network gateway were met.

(4) NATO Gateway. The NATO Gateway interfaces were not tested.

(5) Commercial Network Gateway. The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP, specified in tables 2-1 through 2-15 of the GSCR, with minor exceptions. Exceptions were reviewed and assessed by DISA GS23, the Development and Operational Engineering Department, and determined to have a minor operational impact.

b. Test Summary. The Nortel Networks Succession DSN Options 61C and 81C Digital Switching Systems with software release 3.0 and specified patch groups identified in enclosure 3 are certified for joint use in the DSN for the following switch types: SMEO (except for Europe), PBX 1, and PBX 2, in accordance with the GSCR. Minor discrepancies identified during testing and the GSCR requirements not tested will have a minor operational impact. The interoperability summary and status to include criticality for each interface are shown in tables 2-9 and 2-10.

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>.

Table 2-9. SUT Interoperability Summary

Network	Status	Remarks
DSN	Certified	- Certified as SMEO (except Europe), PBX 1, and PBX 2 - VoIP not Certified - The identified test discrepancies that remained open have an overall minor operational impact.
DRSN Gateway	Certified	- All critical requirements met.
Tactical Gateway	Certified	- All critical requirements met.
NATO Gateway	Not Tested	
Commercial Gateway	Certified	- All critical requirements met.
LEGEND:		
DRSN	- Defense Red Switch Network	PBX 2 - Private Branch Exchange 2
DSN	- Defense Switched Network	SMEO - Small End Office
NATO	- North Atlantic Treaty Organization	SUT - System Under Test
PBX 1	- Private Branch Exchange 1	VoIP - Voice over Internet Protocol

Table 2-10. SUT Interoperability Status

Trunk Interfaces				
Interface & Signaling	Critical	Status	Remarks	
PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ Attendant Services automatic recall not met. ²	
PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ Attendant Services automatic recall not met. ²	
PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ Attendant Services automatic recall not met. ²	
Analog E&M Signaling Type I	No	Not Certified	Did not pass DSN preempt signals. ³	
PCM-30 E1 CAS DTMF 2-Way, DP IN DTMF OUT	No	Certified	Met all ERs and FRs with the following minor exceptions: Hotline services not met.¹ Attendant services automatic recall not met.²	
PCM-30 ISDN PRI (ITU-T Q.955.3)	No	Certified	Met all ERs and FRs with the following minor exceptions: Hotline services not met.¹ Attendant services automatic recall not met.² ETSI Protocol provides a Release Message in lieu of a Disconnect Message for Unavailable Resources.⁴	
Line Interfaces				
Interface & Signaling	Critical	Status	Remarks	
TPC ISDN BRI ST and U Interface ITU-T Q.931	Yes	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ ISDN Supplemental Services were not met. ⁵ Attendant Services automatic recall not met. ²	
TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ Intra-switch call waiting not supported. ⁶ Attendant Services automatic recall not met. ²	
TPC 2-Wire Digital (Proprietary)	No	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ Attendant Services automatic recall not met. ²	
Network Management Interfaces				
Interface & Signaling	Critical	Status	Remarks	
TPC EIA Asynchronous @ 9.6 kbps	Yes	Certified	Met all critical ERs and FRs.	

Defense Switched Network

Table 2-10. SUT Interoperability Status (continued)

Defense Red Switch Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	2-Wire Analog Loop	Yes	Certified	Met all critical ERs and FRs.
Tactical Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified	Met all ERs and FRs.
NATO Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
		No	Not Tested	
Commercial Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	Same Interfaces and Signaling as DSN	Yes	Certified	See note 7.
LEGEND: AMI - Alternate Mark Inversion B8ZS - Bipolar Eight Zero Substitution BRI - Basic Rate Interface CAS - Channel Associated Signaling DP - Dial Pulse DISN - Defense Information Systems Network DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E&M - Ear and Mouth EIA - Electronic Industries Alliance ERs - Exchange Requirements ESF - Extended Superframe ETSI - European Telecommunications Standards Institute FRs - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan ISDN - Integrated Services Digital Network kbps - kilobits per second Mbps - Megabits per second NATO - North Atlantic Treaty Organization PCM-24 - Pulse Code Modulation 24 Channels PCM-30 - Pulse Code Modulation 30 Channels PRI - Primary Rate Interface Q.931 - Signaling standard for ISDN Q.955.3 - ISDN signaling standard for E1 MLPP RS - Recommended Standard SF - Superframe ST - ISDN BRI Four-Wire Interface T1 - Digital Transmission Link level 1 (1.544 Mbps) TPC - Twisted Pair Copper U - ISDN BRI Two-Wire Interface				
NOTES: 1 SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement. 2 SUT's attendant console does not support automatic recall of attendant. The operational impact is minor. 3 Analog E&M Signaling did not pass the DSN preempt signals as required by the GSCR for the four types of preemption. Analog E&M Signaling is not a critical requirement. 4 ISDN PRI T1 trunk groups using NI2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources), and ISDN PRI E1 interfaces send a Release Message in Lieu of the Disconnect Message with Cause 46 (Unavailable Resources). The operational impact is considered minor since the user still receives a Blocked Precedence Announcement. 5 ISDN Supplemental Services are currently not used in the DISN. The operational impact is minor. 6 Intra-switch call waiting is not supported on analog instruments. The operational impact is minor. 7 The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.				

Table 3-1. SUT Software Release 3.0 Patch Identification Patch List

Core Software Patch List		
Patch ID Number	CR Number	Description
MPLR17817	Q00758895	DSN: Tandem ATVN MCDN trunk 2nd call fails after preemption
MPLR18070	Q00786849	Preemption of a partially dialed routine precedence call
MPLR18220	Q00802114	DSN: Bug 30 messages during Tandem calls
MPLR18263	Q00817316	Option 11C switch reinitializes due to CDR-Q procedure
MPLR18302	Q00841477	NI2 DID Tandem to ATVN
MPLR18622	Q00888789	This patch was developed to suppress password information on the switches in LD 22.
MPLR18870 Issue 3	NA	This patch was developed to meet the E1 ISDN PRI and E1 CAS interface requirements.
MPLR20223 Issue 1	NA	This patch was developed to meet the E1 ISDN PRI and E1 CAS interface requirements.
MPLR 20305 Issue	NA	This patch was developed to meet the E1 ISDN PRI and E1 CAS interface requirements.
LEGEND: ATVN - Autovon CAS - Channel Associated Signaling CDR-Q - Call Detail Recording-Queue CR - Call Report DID - Direct Inward Dial DSN - Defense Switched Network E1 - European Basic Multiplex Rate (2.048 Mbps) ID - Identification ISDN - Integrated Services Digital Network LD - Overlay Mbps - Megabits per second MCDN - Meridian Customer Defined Network MPLR - Meridian Patch Library Reference NA - Not Applicable NI2 - National ISDN 2 PRI - Primary Rate Interface SUT - System Under Test		
NOTE: This certification specifically covers regression testing of newly product enhancement packages in bold . The other packages were tested and covered under a certification letter that was signed on 24 June 2004.		