



DEFENSE INFORMATION SYSTEMS AGENCY
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21 October 2003

IN REPLY
REFER TO: Networks, Transmission and
Integration Division (JTE)

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Joint Interoperability Test Certification of Nortel Networks Meridian 1 Options 61C, 81C, and 81CPP Digital Switching Systems with Software Release 25.47

References:

- (a) DOD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 11 January 2002
- (b) CJCSI 6212.01B, "Interoperability and Supportability of National Security Systems and Information Technology Systems," 8 May 2000

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 Meridian 1 Option 61C Digital Switching System with software release 25.47 and specified patch groups listed in enclosure 3, hereafter 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 Defense Switched Network (DSN). The Nortel Networks Meridian 1 Options 81C and 81CPP Digital Switching Systems employ the same software and trunk/line card hardware as the Meridian 1 Option 61C. JITC analysis determined Options 81C and 81CPP to be functionally identical to the Meridian 1 Option 61C for interoperability certification purposes. The identified test discrepancies shown in 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. Although the SUT supports European interfaces, none of these interfaces were tested or certified. 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 at the Network Engineering and Integration Laboratory, Ft. Huachuca, AZ. The Certification Testing Summary

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(enclosure 2) documents the test results and describes the tested network and systems configurations. System interoperability should be verified before deployment in an operational environment that varies significantly from the test environment.

4. The interoperability summary of the SUT is indicated below 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 Nortel Meridian 1 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 (c) and (d). These references require that a switch provide NM capabilities via either Ethernet, serial (RS-232), or serial (X.25 or BX.25 variant). The SUT meets the NM requirements through the use of serial (RS-232) connections. This interoperability test summary is based upon evaluation of:

a. The following network interfaces as specified in reference (e): DSN, Defense Red Switch Network Gateway, Tactical Network Gateway, North Atlantic Treaty Organization Gateway, and Public Switched Telecommunications Network or Commercial Network Gateway.

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

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

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

Table 1. Nortel Networks Meridian 1 Options 61C, 81C, and 81CPP Digital Switching Systems Interoperability Summary

Network	Critical	Status	Remarks
DSN	Yes	Certified	- Certified as a SMEO, PBX1, and PBX2 - 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 critical requirements met
Tactical Gateway	No	Certified	- All critical requirements met
NATO Gateway	No	Not Tested	
Commercial Network Gateway	Yes	Certified	- All critical requirements met
Legend:			
DRSN	- Defense Red Switch Network	PBX	- Private Branch Exchange
DSN	- Defense Switched Network	SMEO	- Small End Office
NATO	- North Atlantic Treaty Organization	VoIP	- Voice over Internet Protocol

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Table 2. 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 critical ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	Certified	Met all critical ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs.
	Line Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. ISDN Supplemental Services not met. ¹
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs.
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all critical ERs and FRs.
	Network Management Interfaces			
	Interface & Signaling	Critical	Status	Remarks
TPC RS-232 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. ²
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.	
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 3.	
Legend:				
AMI	- Alternate Mark Inversion	ISDN	- Integrated Services Digital Network	
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	PCM-24	- Pulse Code Modulation 24 Channels	
DP	- Dial Pulse	PM	- Program Manager	
DRSN	- Defense Red Switch Network	PRI	- Primary Rate Interface	
DSN	- Defense Switched Network	RS	- Recommended Standard	
DTMF	- Dual Tone Multi-Frequency	SF	- Superframe	
ERs	- Exchange Requirements	ST	- ISDN BRI Four-Wire Interface	
ESF	- Extended Superframe	SUT	- System Under Test	
FRs	- Functional Requirements	T1	- Digital Transmission Link level 1 (1.544 Mbps)	
GSCR	- Generic Switching Center Requirements	TPC	- Twisted Pair Copper	
GSTP	- Generic Switch Test Plan	U	- ISDN BRI Two-Wire Interface	
Notes:				
1 ISDN Supplemental Services currently not used in the DISN. The operational impact is none.				
2 Interoperability Certification of the SUT does not constitute DRSN Program Manager's (PM) approval for connectivity to the DRSN. It is the user's responsibility to request connectivity approval directly from the PM.				
3 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 "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.				

Table 3. 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	<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 kbps and NX64 kbps Synchronous Data <i>(T1 ISDN PRI only)</i> • Non-secure and Secure FAX • VTC <i>(T1 ISDN PRI only)</i> • Alarms - Integrated Services Digital Network <i>(T1 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)</i>
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	
PCM-24 T1 B8ZS/ESF ISDN PRI	Yes		
Line Interfaces			
Interface & Signaling	Critical	Exchange & Functional Requirements	
TPC ISDN BRI ST and U Interface Q.931	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - ANSI T1.619a - ISDN Supplemental Services - Call Treatments - DSN Announcements - Attendant Services² - EKTS - VTC - NX56 kbps and NX64 kbps 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 Treatments - Non-secure Voice and Data - Non-secure and Secure FAX - Secure Voice and Data (STU-III and STE) 	

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Table 3. Exchange and Functional Requirements (continued)

	Line Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
Defense Switched Network (continued)	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 RS-232 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 & 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 3
Commercial Network Gateway	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	Same Interfaces and Signaling as DSN	Yes	See note 4
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 EKTS - Electronic Key Telephone System ESF - Extended Superframe FAX - Facsimile GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan ISDN - Integrated Services Digital Network kbps - kilobits per second Mbps - Megabits per second MLPP - Multi-Level Precedence and Preemption NATO - North Atlantic Treaty Organization NX56 - Data format is restricted to multiples of 56K NX64 - Data format is restricted to multiples of 64K PCM-24 - Pulse Code Modulation 24 Channels PRI - Primary Rate Interface RS - Recommended Standard SF - Superframe 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) TPC - Twisted Pair Copper U - ISDN BRI Two-Wire Interface VTC - Video Teleconferencing Y2K - Year 2000			
Notes: 1 SUT does not meet the GSCR exchange requirements for hotline services. Hotline Services is not a critical requirement. 2 SUT does not meet the GSCR exchange requirements for attendant services. Attendant Services is not a critical requirement. 3 NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function. 4 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 "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.			

5. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system -- ERD uses unclassified (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

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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 hooperj@fhu.disa.mil.

FOR THE COMMANDER:

3 Enclosures:	LESLIE F. CLAUDIO
1 Additional References	Chief
2 Certification Testing Summary	Networks, Transmission and
3 Meridian 1 Options 61C, 81C, and 81CPP Software Release 25.47 Patch Identification Patch List Identification	Integration Division

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ADDITIONAL REFERENCES

- (c) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Network Management Requirements for End Offices," 2 August 2001
- (d) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Switch Network Management Interface," 26 July 2001
- (e) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001
- (f) Defense Information Systems Agency (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
- (g) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Global Network Requirements for Tandem (Standalone), Multifunction, End Office, and Small End Office Switches," 30 January 2003
- (h) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP)," 17 June 1999

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Nortel Networks Meridian 1 Options 61C, 81C, and 81CPP Digital Switching Systems with Software Release 25.47 and specified Software Patch Groups listed in enclosure 3 (hereafter referred to as the system under test [SUT]).

2. PROPONENT. Defense Information Systems Agency (DISA).

3. PROGRAM MANAGER. Mr. Howard Osman, Network Services (NS) 53, Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, E-mail: Osmanh@ncr.disa.mil.

4. TESTERS. Joint Interoperability Test Command (JITC), Fort Huachuca, AZ.

5. SYSTEM UNDER TEST DESCRIPTION. The Nortel Networks Meridian 1 Digital Switching System product line, in addition to the Option 61C, includes Options 81C and 81CPP. These three platforms utilize the same software and trunk/line card hardware as the SUT, and were developed to satisfy scalability requirements. 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 Meridian 1 Options 61C, 81C, and 81CPP Digital Switching Systems are currently in use within the Defense Switched Network (DSN) providing Small End Office (SMEO) switch functionality. If a switch satisfies SMEO criteria, it will satisfy the lesser standards of a Private Branch Exchange (PBX).

6. OPERATIONAL ARCHITECTURE. The Generic Switching Center Requirements (GSCR) operational Defense Switched Network (DSN) Architecture is depicted in figure 2-1.

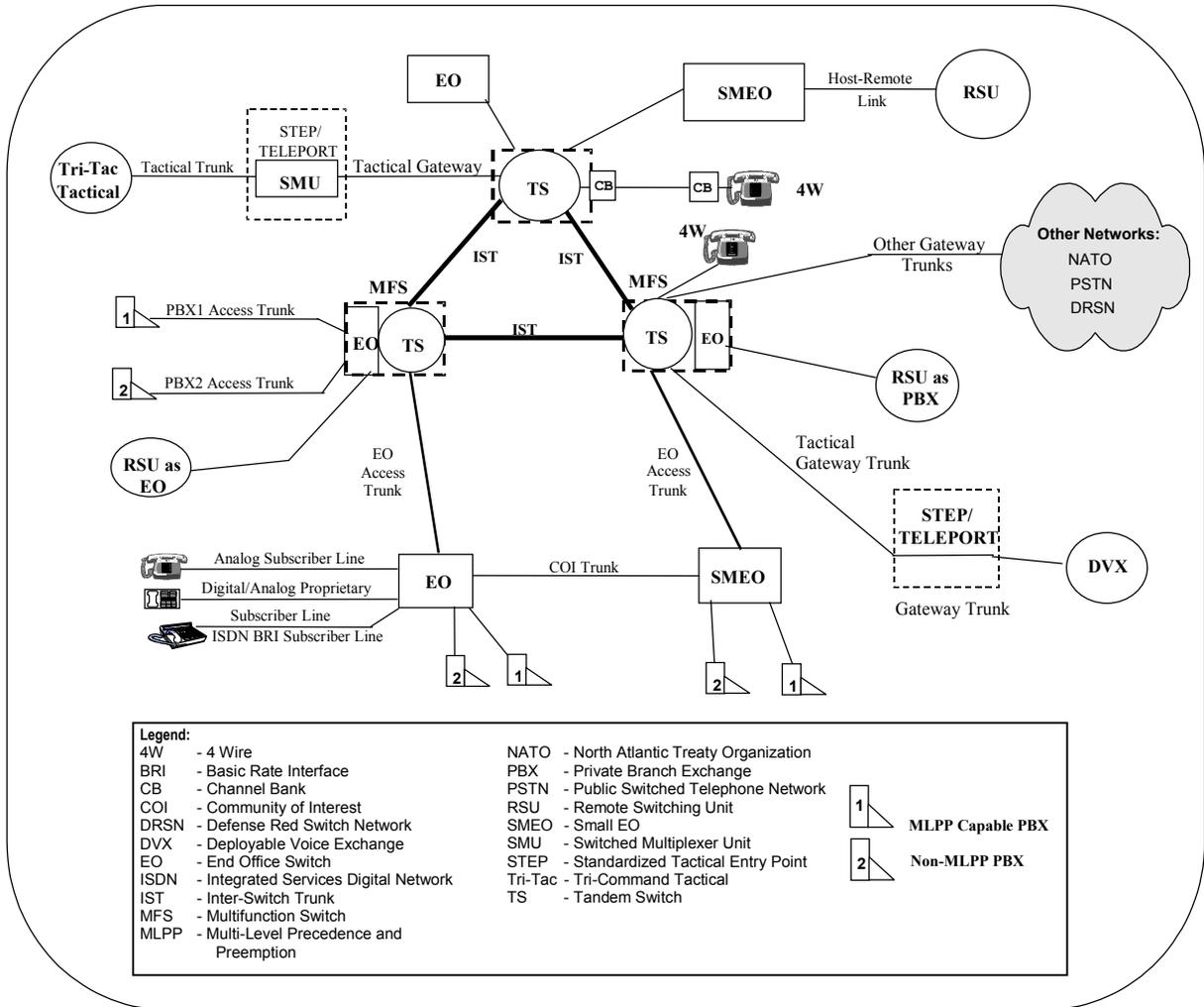


Figure 2-1. DSN Architecture

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.

d. The overall system interoperability performance derived from the Generic Switch Test Plan (GSTP).

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. Exchange and Functional Requirements

	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
Defense Switched Network	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 kbps and NX64 kbps Synchronous Data (T1 ISDN PRI only) • Non-secure and Secure FAX • VTC (T1 ISDN PRI only) • Alarms - Integrated Services Digital Network (T1 ISDN PRI only) - 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 (T1 ISDN PRI only)
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	
	PCM-24 T1 B8ZS/ESF ISDN PRI	Yes	

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

	Line Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
Defense Switched Network (continued)	TPC ISDN BRI ST and U Interface 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 kbps and NX64 kbps 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 Treatments - 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
	Network Management Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
	TPC RS-232 Asynchronous @ 9.6 kbps	Yes	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - MLPP - Non-secure Voice

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

NATO Gateway	Interface & Signaling	Critical	Exchange and Functional Requirements
	Not tested	No	See note 3.
Commercial Network Gateway	Interface & Signaling	Critical	Exchange and Functional Requirements
	Same Interfaces and Signaling as DSN	Yes	See note 4.

Legend:

AMI - Alternate Mark Inversion	GSTP - Generic Switch Test Plan	RS - Recommended Standard
ANSI - American National Standards Institute	ISDN - Integrated Services Digital Network	SF - Superframe
B8ZS - Bipolar Eight Zero Substitution	kbps - kilobits per second	ST - ISDN BRI Four-Wire Interface
BRI - Basic Rate Interface	Mbps - Megabits per second	STE - Secure Terminal Equipment
CAS - Channel Associated Signaling	MLPP - Multi-Level Precedence and Preemption	STU-III - Secure Telephone Unit III
DP - Dial Pulse	NATO - North Atlantic Treaty Organization	SUT - System Under Test
DSN - Defense Switched Network	NX56 - Data format restricted to multiples of 56K	T1 - Digital Transmission Link level 1 (1.544 Mbps)
DTMF - Dual Tone Multi-Frequency	NX64 - Data format restricted to multiples of 64K	TPC - Twisted Pair Copper
ESF - Extended Superframe	PCM-24 - Pulse Code Modulation 24 Channels	U - ISDN BRI Two-Wire Interface
FAX - Facsimile	PRI - Primary Rate Interface	VTC - Video Teleconferencing
GSCR - Generic Switching Center Requirements		Y2K - Year 2000

Notes:

- SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement.
- SUT does not meet all the GSCR exchange requirements for Attendant Services. Attendant Services is not a critical requirement.
- 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 "L" and "V" 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 Network Engineering and Integration Laboratory 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.

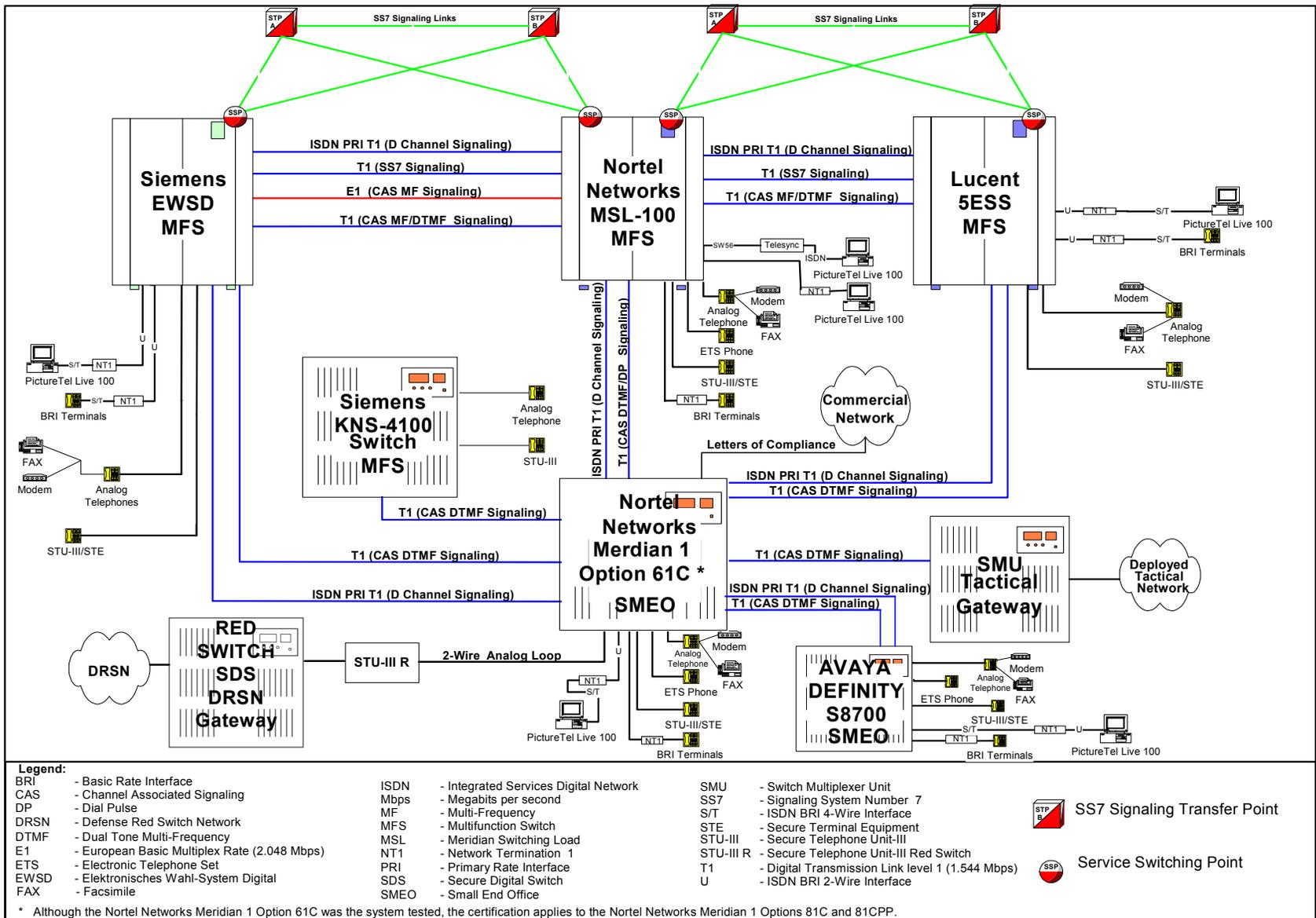


Figure 2-2. Test Configuration

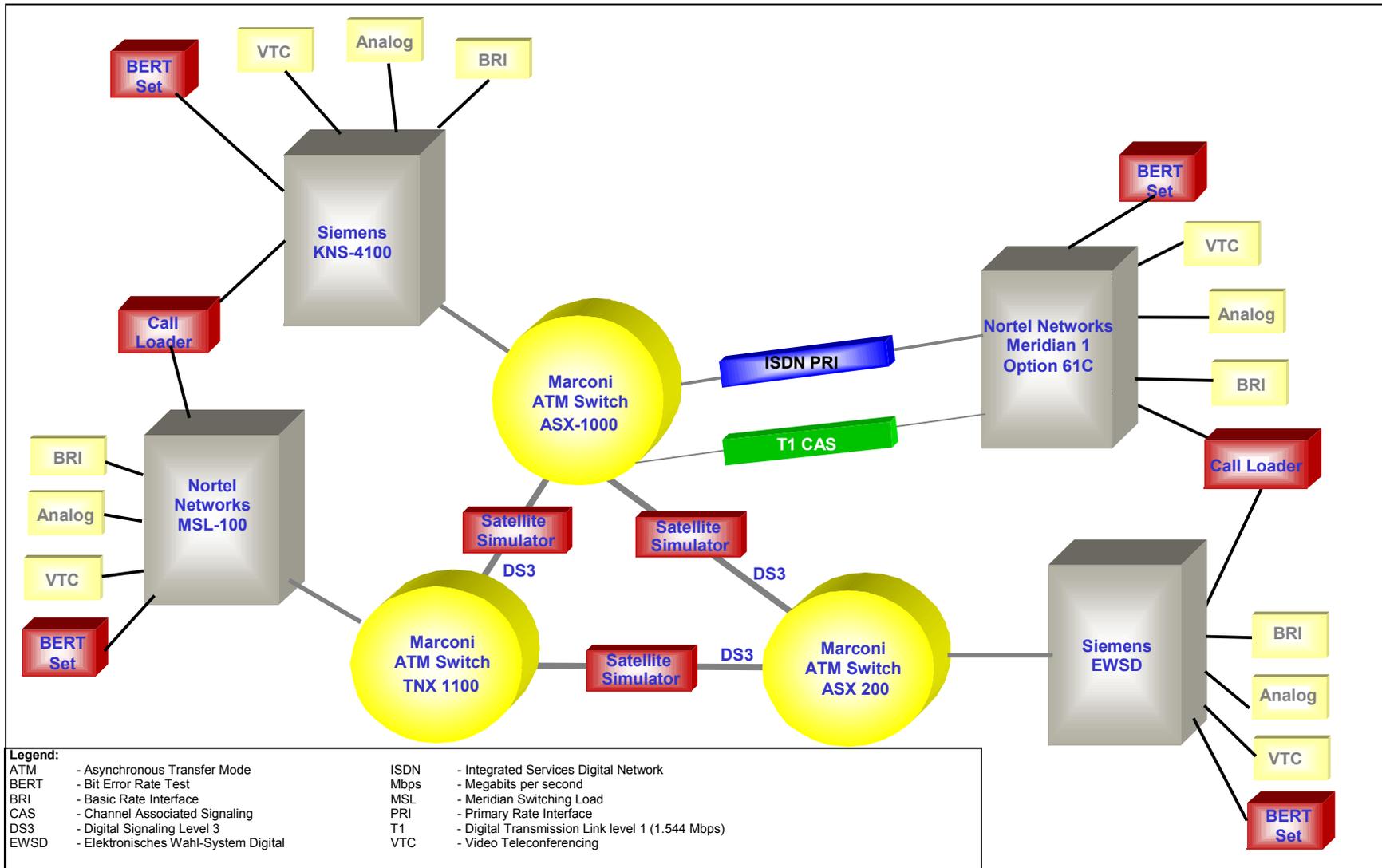
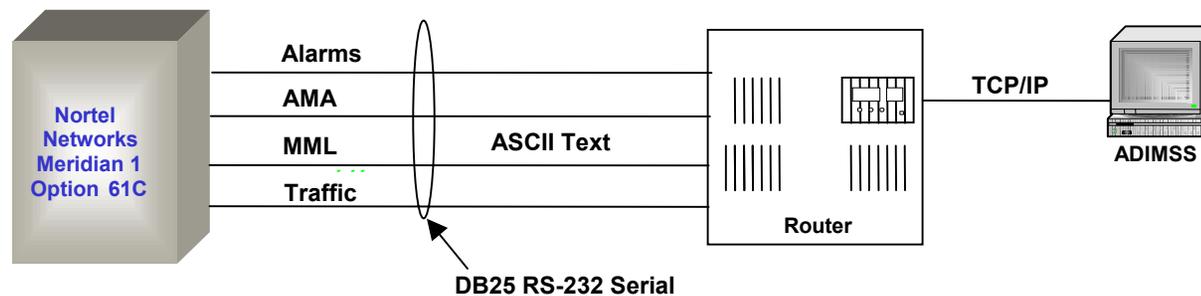


Figure 2-3. Network Integration Test Configuration



Legend:

- ADIMSS - Advanced Defense Switched Network 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
- MML - Man Machine Language (Remote access to switch)
- RS - Recommended Standard
- 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. Nortel Networks Meridian 1 Options 61C, 81C, and 81CPP ADIMSS 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
Avaya MultiVantage S8700	R011x.7585.7.0.2
Nortel Networks Meridian 1 Option 61C	25.47
Siemens EWSD	19d with Patch Set 32
Siemens KNS-4100	APS4V2.3
Lucent Technologies 5ESS	5E16.2
SMU 96 Tactical Gateway	RD302185
Tekelec STP	23.1
Nortel Networks Broad Band STP	3.0.3.18d
DSS Red Switch	8.03
MARCONI ATM switches	Versions 6.2 and 7.1
Legend: ATM - Asynchronous Transfer Mode DSS - Digital Small Switch EWSD - Elektronisches Wahl-System Digital MSL - Meridian Switching Load SMU - Switch Multiplexer Unit STP - Signaling Transfer Point	

10. TESTING LIMITATIONS. The Nortel Networks Meridian 1 Option 61C Digital Switching System was the only switch platform tested by JITC; however, the test results are applicable to the Option 81C and Option 81CPP. The Nortel Networks Meridian 1 Option 61C Digital Switching System employs the same software and trunk/line card hardware as the Option 81C and Option 81CPP digital switches, 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	Not 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	Not 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 CCS (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	Not 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

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

Legend:		
AMA - Automated Message Accounting	ER - Exchange Requirements	PCM-24 - Pulse Code Modulation 24 channels
AMI - Alternate Mark Inversion	ESF - Extended Superframe	PRI - Primary Rate Interface
ANSI - American National Standards Institute	FAX - Facsimile	SF - Superframe
B8ZS - Bipolar Eight Zero Substitution	FR - Functional Requirements	SUT - System Under Test
CAS - Channel Associated Signaling	GSCR - Generic Switching Center Requirements	T1 - Digital Transmission Link level 1 (1.544 Mbps)
CCS - Common Channel Signaling	GSTP - Generic Switch Test Plan	VTC - Video Teleconferencing
DP - Dial Pulse	ISDN - Integrated Services Digital Network	Y2K - Year 2000
DSN - Defense Switched Network	Mbps - Megabits per second	
DTMF - Dual Tone Multi-Frequency	MLPP - Multi-Level Precedence and Preemption	
Notes:		
1 SUT does not meet all the GSCR exchange requirements for attendant services.		
2 SUT does not meet all the GSCR exchange requirements for hotline services.		

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, 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 ²
		ANSI T1.619a	No	II-6.2	21.3.1	Yes	Met
		ISDN Supplemental Services	Yes	II-6.2	21.3	No	Not Met ³
		Attendant Services	Yes	II-7.2	2.1.3	No	Not Met ²
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	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 ²
		Attendant Services	Yes	II-7.2	2.1.3	No	Not Met ¹
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	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	Not Met ²
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	No	Met
		DSN Announcements	No	II-19.2	5.6	No	Met

Legend:
ANSI - American National Standards Institute
BRI - Basic Rate Interface
DSN - Defense Switched Network
DISN - Defense Information Systems Network
ER - Exchange Requirements
FR - Functional Requirements
GSCR - Generic Switching Center Requirements
GSTP - Generic Switch Test Plan
ISDN - Integrated Services Digital Network
MLPP - Multi-Level Precedence and Preemption
ST Interface - ISDN BRI 4-Wire Interface
SUT - System Under Test
TPC - Twisted Pair Copper
U Interface - ISDN BRI 2-Wire Interface

Notes:
1 SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement.
2 The does not meet the GSCR exchange requirements for Attendant Services. Attendant Services is not a critical requirement.
3 ISDN Supplemental Services currently not used in the DISN. The operational impact is minor.

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 RS-232 Asynchronous @ 9.6 kbps	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 ER - Exchange Requirements FR - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan kbps - kilobits per second MML - Man Machine Language RS - Recommended Standard 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 Requirements FR - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan MLPP - Multi-Level Precedence and Preemption 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	No	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 Requirements ESF - Extended Superframe FR - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan Mbps - Megabits per second MLPP - Multi-Level Precedence and Preemption 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
<p>Legend: DSN - Defense Switched Network ER - Exchange Requirements FR - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan</p> <p>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 "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.</p>							

a. Discussion

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

(a) The SUT attendant console does not meet the following GSCR requirements:

- Transfer of a line or trunk call at a precedence above ROUTINE. GSCR Para. 2.1.3.3
- Display of precedence or class of service. GSCR Para. 2.1.3.2
- Queuing by order of precedence (highest first). GSCR Para. 2.1.3.1

The SUT Attendant console is not certified. This is not a critical requirement for a SMEO and its operational impact is minor.

(b) The SUT does not support route digit 5 or 6 for Hotline Services. This is not a critical requirement for a SMEO and its operational impact is minor.

(c) 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

(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/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" 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 NS53, the Development

and Operational Engineering Department, and determined to have a minor operational impact.

b. Test Summary. The Nortel Networks Meridian 1 Options 61C, 81C, and 81CPP Digital Switching Systems with their associated software releases listed in table 2-1 of the memo, are certified for joint use in the DSN except for Europe, in accordance with the requirements set forth in 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 is shown in tables 2-9 and 2-10.

12. TEST AND ANALYSIS REPORT. No detailed test report was developed per the Program Manager’s request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system -- ERD uses unclassified (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. Nortel Networks Meridian 1 Options 61C, 81C, and 81CPP Digital Switching Systems Interoperability Summary

Network	Status	Remarks
DSN	Certified	- Certified as SMEO & PBX1 - VoIP not certified - Not certified for joint use in Europe
DRSN Gateway	Certified	
Tactical Gateway	Certified	
NATO Gateway	Not Tested	
Commercial Gateway	Certified	
Legend: DRSN - Defense Red Switch Network DSN - Defense Switched Network NATO - North Atlantic Treaty Organization PBX1 - Private Branch Exchange 1 SMEO - Small End Office VoIP - Voice over Internet Protocol		

Table 2-10. 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 critical ERs and FRs. Hotline services ¹ and Attendant Services ² not met.
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	Certified	Met all critical ERs and FRs. Hotline services ¹ and Attendant Services ² not met.
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs. Hotline services ¹ and Attendant Services ² not met.
	Line Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. Hotline services ¹ , Attendant Services ² , and ISDN Supplemental Services ³ were not met. Operational impact is minor.
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Hotline services ¹ and Attendant Services ² not met.
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all critical ERs and FRs. Hotline services ¹ and Attendant Services ² not met.
	Network Management Interfaces			
	Interface & Signaling	Critical	Status	Remarks
TPC RS-232 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 ERs and FRs.	
NATO Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	No	Not Tested	Operational impact is minor.	
Commercial Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
Same Interfaces and Signaling as DSN	Yes	Certified	See note 4.	
Legend:				
AMI	- Alternate Mark Inversion	ISDN	- Integrated Services Digital Network	
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	
DP	- Dial Pulse	PCM-24	- Pulse Code Modulation 24 Channels	
DISN	- Defense Information Systems Network	PRI	- Primary Rate Interface	
DSN	- Defense Switched Network	RS	- Recommended Standard	
DTMF	- Dual Tone Multi-Frequency	SF	- Superframe	
ERs	- Exchange Requirements	ST	- ISDN BRI Four-Wire Interface	
ESF	- Extended Superframe	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			
Notes:				
1 SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement.				
2 SUT does not meet the GSCR exchange requirements for Attendant Services. Attendant Services is not a critical requirement.				
3 ISDN Supplemental Services currently not used in the DISN. The operational impact is minor.				
4 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 "L" and "V" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.				

Meridian 1 Options 61C, 81C, and 81CPP Software Release 25.47 Patch Identification Patch List

CORE Software Patch List			
Patch ID Number	PRS Number	Description	
MPLR16260	MP17717	INI CODE ID (INI000 000001D) FROM DCH_HANDLER PROCEDURE	
MPLR16674	Q004828	DSN: Precedence calls to a Hunt Group do not get proper treatment	
MPLR16789	Q436716	Four Issues: 1. T1 CAS Intermittent Preempt Wink. 2. Bug105. 3. ANSI T1.619A PRI Preempt for Re-use Unanswered. 4. AMA: Data: Outgoing (cause 9) - Timing Issue	
MPLR16790	Q005260	SLPREM - Preemption: 1. Origination Busy Treatment. FFC code. 2. Busy Non-preemptable station trunk Preemption Cause 46. 3. T1 PRI Non-preemptable station Busy Not Equipped Announcement (BNEA).	
MPLR16798	Q005385	DSN: No DMI Digit Manipulation after glare failure.	
MPLR16801	Q005259	DSN: The M1 Option 61C switch does not provide the correct response to a failed wink start condition.	
MPLR16806	Q005259	DSN: Outgoing Preempt Not For Reuse Answered Trailing Digit.	
MPLR16857	Q005423	DSN: Outgoing trunk preemption fails over NI-2	
MPLR16878	Q005193	DSN: Call Transfer 2nd leg sends originators precedence level.	
MPLR16879	Q005194	DSN: Conference Call not preserving precedence level.	
MPLR16912	Q005571	DSN: Different Service Domains via T1 CAS allow preemption	
MPLR16926	Q005592	Change BSERV on NI2 causes system to INI.	
MPLR16937	Q005626	DSN: Changing MLSD in LD 87 causes other fields to change.	
MPLR16939	Q005571	DSN: BRI sets with different Service Domains allow preemption	
MPLR16945	Q005629	NI2: Bearer channel disable/enable fails with SL-100/Siemens	
MPLR17308	Q006365	Euro-ISDN STE mu-law to A-law conversion over E1 PRI	
MLPR17473	Q001747	The IGF and OGF timers for preemption calls on T1 CAS needs the minimum threshold to be lowered.	
MLPR17344	Q005871	ATVN trunks on TMDI card behave differently from tie trunks - channel status mismatch between M1 and SL100 when the loop is enabled.	
MLPR17582	Q005965	DSN: Unable to send B-Channel status message from individual channels.	
MLPR17502	Q005871	Channel status mismatch after Yellow Alarm cleared.	
LOADWARE Software Patch List			
Patch ID Number	PRS Number	Description	
MPLR17079	Q005959	X11 25.47 psdl file NI02 version 23 fails to download	
MLPR17395	Q005965	NI2 remote busy-out	
Legend:			
AMA	- Automated Message Accounting	INI	- Initialize
ANSI	- American National Standards Institute	ISDN	- Integrated Services Digital Network
ATVN	- Autovon	LD	- Overlay
BNEA	- Busy, Not Equipped Announcement	Mbps	- Megabits per second
BRI	- Basic Rate Interface	MLPP	- Multi-Level Precedence and Preemption
BSERV	- Bearer Service	MLSD	- MLPP Service Domain
CAS	- Channel Associated Signaling	NI-2	- National ISDN-2
DCH	- Data Channel	OGF	- Outgoing Flash Timer
DMI	- Digit Manipulation Index	PRI	- Primary Rate Interface
DSN	- Defense Switched Network	PRS	- Patch Report System
E1	- European Basic Rate (2.048 Mbps)	SLPREM	- Station Loop Preemption
FFC	- Flexible Feature Code	STE	- Secure Terminal Equipment
ID	- Identification	T1	- Digital Transmission Link Level 1 (1.544 Mbps)
IGF	- Incoming Flash Timer	TMDI	- Time Multiplexer Digital Interface