



DEFENSE INFORMATION SYSTEMS AGENCY

JOINT INTEROPERABILITY TEST COMMAND

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FORT HUACHUCA, ARIZONA 85613-7051

IN REPLY
REFER TO: Networks and Transport Division (JTE)

16 July 2004

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of Nortel Networks Succession Defense Switched Network (DSN) Option 11C Cabinet and Option 11C Chassis 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)," 11 January 2002
(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 11C Cabinet Digital Switching System with Software Release 3.0 and product enhancement packages, hereinafter referred to as the system under test (SUT), meets all of its critical interoperability requirements. Thus, it is certified as interoperable for joint use within the DSN. The Nortel Networks DSN Option 11C Chassis Digital Switching System employs the same software and trunk/line card hardware as the SUT. JITC analysis determined the DSN Option 11C Chassis Digital Switching System to be functionally identical to the SUT for interoperability certification purposes and is certified for joint use within the DSN. The SUT also offers a Voice over Internet Protocol capability; however, this capability is not covered under this certification. 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 Private Branch Exchange (PBX) 1 and PBX 2. This certification expires upon changes that could affect interoperability, but no later than three years from the date of this memorandum.
3. This certification is based on interoperability testing conducted by the JITC at the Global Information Grid Network Test Facility, Fort Huachuca, AZ, from 20 November 2003 through 4 February 2004. Testing was conducted in an environment that emulates the DSN and review of letters of compliance submitted by the vendor on 25 February 2004. Enclosure 2 provides more details about the test, documents the test results, and describes the tested network and system configurations.

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Enclosure 3 lists the product enhancement packages applied to the SUT for certification. System interoperability should be verified before deployment in an operational environment that varies significantly from the test environment.

4. The interoperability test summary of the SUT is indicated in table 1. The PBX 1 required and conditional Capability Requirements (CRs) and Feature Requirements (FRs) are listed in table 2. Network Management (NM) capabilities of the SUT platform were tested in accordance with requirements as set forth in reference (d). This reference requires that a switch provide NM capabilities via Ethernet, serial Electronic Industries Alliance (EIA), or serial (X.25 or BX.25 variant). NM features and functions are not a requirement for a PBX 1; however, the vendor requested that NM be tested and included in this certification. The SUT meets the NM requirements through a serial EIA connection. This interoperability test status is based on the PBX 1's ability to meet:

- a. DSN services for Network and Applications specified in reference (c).
- b. PBX 1 interface and signaling requirements for trunks/lines specified in reference (d) verified through JITC testing and/or vendor submission of Letter(s) of Compliance (LoC).
- c. PBX 1 CRs and FRs specified in reference (d) verified through JITC testing and/or vendor submission of LoC.
- d. The overall system interoperability performance derived from test procedures listed in reference (e).

Table 1. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (DTMF, DP)	No	Certified	Met all CRs and FRs with the following minor exception: Restoral to service from a local red alarm not met. ¹
E1 CAS (DTMF, DP)	No (Europe only)	Not Tested	
T1 ISDN PRI NI 1/2 (ANSI T1. 619a)	Yes	Certified	Met all CRs and FRs with the following minor exceptions: NI 2 Protocol provides a release complete message in lieu of a disconnect message for unavailable resources. ²
E1 ISDN PRI (Q.955.3)	No (Europe only)	Not Tested	
Analog E&M Type 1	No	Not Certified	Analog E&M services are not met. ³
DSN Line Interfaces			
Interface & Signaling	Critical	Status	Remarks
2-Wire Analog (GR-506-CORE)	Yes	Certified	Met all CRs and FRs with the following minor exception: Does not support intraswitch call waiting. ⁴
ISDN BRI NI 1/2	Yes	Certified	Met all CRs and FRs.
Digital Proprietary	No	Certified	Met all CRs and FRs.
VoIP	No	Not Tested	

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Table 1. SUT Interoperability Test Summary (continued)

Network Gateways				
Interface & Signaling		Critical	Status	Remarks
PSTN	T1 CAS (DTMF, DP)	No	Certified	Met all CRs and FRs.
	E1 CAS (DTMF, DP)	No (Europe only)	Not Tested	
	T1 ISDN PRI NI2	No	Certified	Met all CRs and FRs.
	E1 ISDN PRI (Q.931)	No (Europe only)	Not Tested	
DSN Features and Capabilities				
Features and Capabilities		Critical	Status	Remarks
Common Features		No	Certified	Met all Common Features.
Attendant		No	Certified	Met all CRs and FRs except attendant services automatic recall. ⁵
Public Safety		No	Not Tested	
Preset Conferencing		No	Not Tested	
Nailed-up Connections		No	Not Tested	
PAT		No	Not Tested	
DSN Hotline services		No	Not Certified	Hotline services are not met. ⁶
Network Management		No	Certified	Met all CRs and FRs.
ISDN services (EKTS)		No	Not Tested	
Attendant		No	Certified	Met all CRs and FRs except attendant services automatic recall. ⁵
Public Safety		No	Not Tested	
Preset Conferencing		No	Not Tested	
Nailed-up Connections		No	Not Tested	
PAT		No	Not Tested	
DSN Hotline services		No	Not Certified	Hotline services are not met. ⁶
Network Management		No	Certified	Met all CRs and FRs.
ISDN services (EKTS)		No	Not Tested	
Synchronization		Yes	Certified	Met all CRs and FRs.

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Table 1. SUT Interoperability Test Summary (continued)

Network Gateways (continued)			
Interface & Signaling	Critical	Status	Remarks
Reliability	Yes	Certified	Met all CRs and FRs.
Security ⁷	Yes	Certified	Met all CRs and FRs.
VoIP System	No	Not Tested	
VoIP LANs	No	Not Tested	
Legend:			
ANSI - American National Standards Institute		JITC - Joint Interoperability Test Command	
BRI - Basic Rate Interface		LAN - Local Area Network	
CAS - Channel Associated Signaling		LoC - Letters of Compliance	
CRs - Capability Requirements		Mbps - Megabits per second	
DP - Dial Pulse		MLPP - Multi-Level Precedence Preemption	
DSN - Defense Switched Network		NI 1/2 - National ISDN 1 or 2	
DTMF - Dual Tone Multi-Frequency		PAT - Precedence Access Threshold	
E&M - Ear and Mouth		PRI - Primary Rate Interface	
E1 - European Basic Multiplex Rate (2.048 Mbps)		PSTN - Public Switched Telephone Network	
EKTS - Electronic Key Telephone System		Q.931 - ITU signaling std. for ISDN	
FRs - Feature Requirements		Q.955.3 - ITU ISDN Signaling Std. For E1 MLPP	
GR - Generic Requirement (Telcordia)		SS7 - Signaling System 7	
GSCR - Generic Switching Center Requirements		Std. - Standard	
IATP - Information Assurance Test Plan		SUT - System Under Test	
IAW - in accordance with		T1 - Digital Transmission Link Level 1 (1.544 Mbps)	
ISDN - Integrated Services Digital Network		T1.619a - SS7 and ISDN signaling std. for T1	
ITU - International Telecommunication Union		VoIP - Voice over Internet Protocol	
Notes:			
1 The SUT does not meet the GSCR exchange requirements for restoral to service from a local red alarm. The SUT takes 30 seconds to recover versus the required 15 seconds. The operational impact is minor.			
2 ISDN T1 PRI trunkgroups using NI 2 protocol send a release complete message in lieu of a disconnect message with Cause 46 (unavailable resources). The operational impact is minor since the user still receives a blocked precedence announcement.			
3 Analog E&M Signaling Type 1 did not pass the DSN preempt signals as required by the GSCR for the four types of preemption. Analog E&M Signaling Type 1 is not certified for use in the DSN.			
4 Analog instruments do not provide intra-switch call waiting. The operational impact is minor.			
5 The SUT's attendant console does not support automatic recall of attendant. The operational impact is minor.			
6 The SUT does not meet the GSCR exchange requirements for hotline services. Hotline services are not a critical requirement.			
7 JITC verifies security via vendor LoC. Further testing IAW the IATP is required prior to being authorized connection approval.			

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Table 2. PBX 1 Requirements

DSN Trunk Interfaces				
Digital Interface	Critical	Requirements Required (R) or Conditional (C)		References
T1 CAS	No	Trunking	<ul style="list-style-type: none"> Framing (R) Line Code (R) Signaling (R) Alarms(R) Timing (R) WWNDP (R) Outpulsing digit formats (C: CAS only) Routing (C) Trunk Groups (C) Call Processing (C) CAS to CCS trunk interworking (C) PCM-24/PCM-30 Interoperation (C) Direct Inward Dialing (C) 	<ul style="list-style-type: none"> GSCR Sect. 7 GSCR Sect. 7 GSCR Sect. 5 GSCR Sect. 2.5.7, 7.1.4 and 7.2.2 GSCR Sect. 11.1.1.2 GSCR Sect. 4.5.1 GSCR Sect. 4.5.2 GSCR Sect. 4.2 GSCR Sect. 2.5.5 and 2.5.6 GSCR Sect. 4 GSCR Sect. 3.10 GSCR Sect. 7.3 GSCR Sect 2.3.2
E1 CAS	No (Europe only)			
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Voice	<ul style="list-style-type: none"> MOS (R) MLPP (R) Secure calls (R) 	<ul style="list-style-type: none"> CJCSI 6215.01B CJCSI 6215.01B CJCSI 6215.01B
E1 ISDN PRI (Q955.3)	No (Europe only)	Facsimile	<ul style="list-style-type: none"> Analog: EIA/TIA-465-A (R) Digital: MIL-STD-188-161D (C) 	<ul style="list-style-type: none"> JTA JTA
		Data	<ul style="list-style-type: none"> Modem (VBD) (R) 56-kbps switched data (R: ISDN PRI only) 64-kbps switched data (R: ISDN PRI only) NX56 synchronous BER (R: ISDN PRI only) NX64 synchronous BER (R: ISDN PRI only) Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> CJCSI 6215.01B GSCR Sect. 3.10
		VTC	<ul style="list-style-type: none"> H.320 (C: ISDN PRI only) 	<ul style="list-style-type: none"> JTA
Analog Interface	Critical	Requirements Required (R) or Conditional (C)		References
Analog E&M Type 1	No	Trunking	<ul style="list-style-type: none"> WWNDP (R) Routing (C) Call Processing (C) Direct Inward Dialing (C) 	<ul style="list-style-type: none"> GSCR Sect. 4.5.1 GSCR Sect. 4.2 GSCR Sect. 4 GSCR Sect 2.3.2
		Voice	<ul style="list-style-type: none"> MOS (R) MLPP (R) Secure calls (R) 	<ul style="list-style-type: none"> CJCSI 6215.01B CJCSI 6215.01B CJCSI 6215.01B
		Facsimile	<ul style="list-style-type: none"> Analog: EIA/TIA-465-A (R) Digital: MIL-STD-188-161D (C) 	<ul style="list-style-type: none"> JTA JTA
		Data	<ul style="list-style-type: none"> Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> CJCSI 6215.01B
DSN Line Interfaces	Critical	Requirements Required (R) or Conditional (C)		References
2-Wire Analog (GR-506-CORE)	Yes	Access	<ul style="list-style-type: none"> DN Identification (R) Line signaling (R) Alerting Signals and Tones(R) WWNDP (R) Call Processing (R) Call Treatments (R) 2W user access (R: 2-Wire Analog only) Analog busy/idle (R: 2-Wire Analog only) 	<ul style="list-style-type: none"> GSCR Sect 2.1.1 GSCR Sect 5.2 GSCR Sect 5.5 GSCR Sect. 4.5 GSCR Sect. 4.4 GSCR Sect. 4.1 GSCR Sect 4.3.3 GSCR Sect 4.3.4.1
ISDN BRI NI 1/2	Yes			
2-Wire Digital	No	Voice	<ul style="list-style-type: none"> MOS (R) MLPP (R) Secure Calls (R) (ISDN BRI and Analog only) 	<ul style="list-style-type: none"> CJCSI 6215.01B GSCR Sect 3 CJCSI 6215.01B
VoIP	No	Facsimile	<ul style="list-style-type: none"> Analog: EIA/TIA-465-A (R) Digital: MIL-STD-188-161D (C) (ISDN BRI only) 	<ul style="list-style-type: none"> JTA JTA

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Table 2. PBX 1 Requirements (continued)

DSN Line Interfaces	Critical	Requirements Required (R) or Conditional (C)		References
2-Wire Analog (GR-506-CORE)	Yes	Data	<ul style="list-style-type: none"> • Modem (VBD) (R) (Analog only) • 56-kbps switched data (R: ISDN BRI only) • 64-kbps switched data (R: ISDN BRI only) • NX56 synchronous BER (R: ISDN BRI only) • NX64 synchronous BER (R: ISDN BRI only) • Secure data (STE/STU-III) (R) (ISDN BRI and Analog only) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Sect. 3.10
ISDN BRI NI 1/2	Yes			
2-Wire Digital	No			
VoIP	No			
Network Gateways				
Gateway	Critical	Requirements Required (R) or Conditional (C)		References
PSTN	No	Trunking	<ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off Netting (C) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B
DSN Features & Capabilities				
Interface	Critical	Requirements Required (R) or Conditional (C)		References
Common Features	No	<ul style="list-style-type: none"> • Selective call rejection (C) • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (C) • Three-way calling (C) • Add-on transfer and conference calling (C) • Call forwarding (C) • Call pick-up (C) 		<ul style="list-style-type: none"> • GSCR Sect. 2.1.2 • GSCR Sect. 2.1.3 • GSCR Sect. 2.1.4 • GSCR Sect. 2.1.5 • GSCR Sect. 2.1.6 • GSCR Sect. 2.1.7 • GSCR Sect. 2.1.8 • GSCR Sect. 2.1.9
Attendant	No	<ul style="list-style-type: none"> • Initiate all precedence levels (C) • Visual display (C) • Override class of service (C) • Override busy line (C) • Call deflection (C) • Auto recall (C) • Waiting queue (C) 		<ul style="list-style-type: none"> • GSCR Sect. 2.2.1 • GSCR Sect. 2.2.2 • GSCR Sect. 2.2.3 • GSCR Sect. 2.2.4 • GSCR Sect. 2.2.5 • GSCR Sect. 2.2.6 • GSCR Sect. 2.2.7
Public Safety	No	<ul style="list-style-type: none"> • 911 (C) • Trace of terminating calls (C) • Outgoing call trace (C) • Tandem call trace (C) • Trace of a call in progress (C) 		<ul style="list-style-type: none"> • GSCR Sect. 2.4.1 • GSCR Sect. 2.4.2 • GSCR Sect. 2.4.3 • GSCR Sect. 2.4.4 • GSCR Sect. 2.4.5
Preset Conferencing	No	<ul style="list-style-type: none"> • Support 10 bridges; 1 originator and 20 conferees (C) • Assign up to 20 address numbers per bridge (C) • Use KXX codes for bridge access (C) • Conference notification recorded announcement (C) • Auto retrieval and alternate address (C) • Bridge release (C) • Lost connection (C) • Secondary conferencing (C) • Address translation (C) 		<ul style="list-style-type: none"> • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6.1 • GSCR Sect. 2.6.2 • GSCR Sect. 2.6.3 • GSCR Sect. 2.6.4 • GSCR Sect. 2.6.5 • GSCR Sect. 2.7
Nailed-up Connections	No	<ul style="list-style-type: none"> • Between any two like terminations (C) • PCM-24 and PCM-30, both CAS and CCS (C) • Supervision passed end-to-end for A/D or D/A (C) • Monitored and auto reconfigure (C) • Support at least 10% of circuits as nailed-up (C) • Non-preemptable (C) 		<ul style="list-style-type: none"> • GSCR Sect. 2.8

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Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Interface	Critical	Requirements Required (R) or Conditional (C)	References
PAT	No	<ul style="list-style-type: none"> • Classmark for/not for PAT screening (C) • 7 PAT mechanisms (C) • Outgoing call screening • Functional structure (C) • Simultaneous calls limitation (C) • Overflow process (C) • Decrementing call -in-progress count (C) • Call treatment (C) • Queuing (C) • Attendant calls (C) • Operation measurement registers (C) • Maintenance and Administration of thresholds (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1.1 • GSCR Sect. 2.11.1.2 • GSCR Sect. 2.11.1.3 • GSCR Sect. 2.11.1.4 • GSCR Sect. 2.11.1.5 • GSCR Sect. 2.11.1.6 • GSCR Sect. 2.11.1.7 • GSCR Sect. 2.11.1.8 • GSCR Sect. 2.11.1.9 • GSCR Sect. 2.11.1.10
DSN Hotline services	No	<ul style="list-style-type: none"> • Hotline restrictions (C) • Auto initiate (C) • Analog and digital (C) • Subscription basis (C) • Protected hotline calling (C) • WWNDP interoperable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12.1-4 • GSCR Sect. 2.12.5
Network Management	No	<ul style="list-style-type: none"> • Interfaces (C) • Measurements and data generation (C) • Fault management (C) • Configuration management (C) • Accounting management (C) • Performance management (C) • NM controls (C) • Remote access (C) 	<ul style="list-style-type: none"> • GSCR Sect. 9.1 • GSCR Sect. 9.2 • GSCR Sect. 9.3 • GSCR Sect. 9.4 • GSCR Sect. 9.5 • GSCR Sect. 9.6 • GSCR Sect. 9.7 • GSCR Sect. 9.8
ISDN services	No	<ul style="list-style-type: none"> • EKTS (C) 	<ul style="list-style-type: none"> • GSCR Sect. 10, table 10-3
Synchronization	Yes	<ul style="list-style-type: none"> • Line timing mode (R) • Internal Stratum 4 (R) 	<ul style="list-style-type: none"> • GSCR Sect. 11.1.1.2 • GSCR Sect. 11.1.2.2
Reliability	No	<ul style="list-style-type: none"> • GR-512-CORE (R) 	<ul style="list-style-type: none"> • GSCR Sect.12
Security (see note)	Yes	<ul style="list-style-type: none"> • DITSCAP (R) 	<ul style="list-style-type: none"> • DODI 8100.3
VoIP System	No	<p>VoIP function is conditional. If VoIP is provided, all of the following requirements must be met:</p> <ul style="list-style-type: none"> • LAN parameters • CoS /QoS • VLANs • IEEE Stds. Conformance • .99999 availability • Modular devices • 2 sec. link restoral • LAN NM • Traffic Engineering 	<ul style="list-style-type: none"> • GSCR App. 3

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Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities					
Interface	Critical	Requirements Required (R) or Conditional (C)	References		
VoIP					
LANs	No	<p>VoIP function is conditional. If VoIP is provided all of the following requirements must be met:</p> <ul style="list-style-type: none"> • LAN parameters • CoS /Qos • Queuing mechanisms • Policing mechanism • VLAN support • NM and voice in different VLAN • IEEE stds. Conformance • 2 sec. link restoral • LAN NM • Traffic Engineering 	<ul style="list-style-type: none"> • GSCR App. 3 		
<p>Legend:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> 2W - 2-Wire 911 - 911 Emergency Service A/D - Analog to Digital ANSI - American National Standards Institute App - Appendix BER - Bit Error Ratio BRI - Basic Rate Interface CAS - Channel Associated Signaling CCS - Common Channel Signaling CJCSI - Chairman Joint Chiefs of Staff Instruction CoS - Class of Service D/A - Digital to Analog DITSCAP - Department of Defense Information Technology Security Certification and Accreditation Process DN - Directory Number DODI - Department of Defense Instruction DSN - Defense Switched Network E&M - Ear and Mouth E1 - European Basic Multiplex Rate (2.048 Mbps) EIA - Electronic Industries Alliance EKTS - Electronic Key Telephone System GR - Generic Requirement (Telcordia) GSCR - Generic Switching Center Requirements H.320 - ITU Std. for narrowband VTC IATP - Information Assurance Test Plan IAW - in accordance with IEEE - Institute of Electrical and Electronics Engineers, Inc. ISDN - Integrated Services Digital Network ITU - International Telecommunication Union JITC - Joint Interoperability Test Command JTA - Joint Technical Architecture kbps - kilobits per second KXX - K= any number 2-8; X= any number 1-9 </td> <td style="width: 50%; vertical-align: top;"> LAN - Local Area Network LoC - Letter(s) of Compliance Mbps - Megabits per second MIL-STD - Military Standard MLPP - Multi-Level Precedence and Preemption MOS - Mean Opinion Score NI 1/2 - National ISDN Std. 1 or 2 NM - Network Management NX56 - Data format restricted to multiples of 56 kbps NX64 - Data format restricted to multiples of 64 kbps PAT - Precedence Access Threshold PBX - Private Branch Exchange PCM-24 - Pulse Code Modulation 24 Channels PCM-30 - Pulse Code Modulation 30 Channels PRI - Primary Rate Interface PSTN - Public Switched Telephone Network Q.955.3 - ITU ISDN Signaling Std. for E1 MLPP QoS - Quality of Service sec. - second Sect. - section SS7 - Signaling System 7 Std. - Standard STE - Secure Terminal Equipment STU-III - Secure Telephone Unit-III T1 - Digital Transmission Link Level 1 (1.544 Mbps) T1.619a - SS7 and ISDN Signaling Std. For T1 TIA - Telecommunications Industry Association VBD - Variable bit data VLAN - Virtual Local Area Network VoIP - Voice over Internet Protocol VTC - Video Conferencing WWNDP - Worldwide Numbering and Dialing Plan </td> </tr> </table> <p>Note: JITC verifies security via a LoC. Further testing IAW the IATP is required prior to being authorized connection approval.</p>				2W - 2-Wire 911 - 911 Emergency Service A/D - Analog to Digital ANSI - American National Standards Institute App - Appendix BER - Bit Error Ratio BRI - Basic Rate Interface CAS - Channel Associated Signaling CCS - Common Channel Signaling CJCSI - Chairman Joint Chiefs of Staff Instruction CoS - Class of Service D/A - Digital to Analog DITSCAP - Department of Defense Information Technology Security Certification and Accreditation Process DN - Directory Number DODI - Department of Defense Instruction DSN - Defense Switched Network E&M - Ear and Mouth E1 - European Basic Multiplex Rate (2.048 Mbps) EIA - Electronic Industries Alliance EKTS - Electronic Key Telephone System GR - Generic Requirement (Telcordia) GSCR - Generic Switching Center Requirements H.320 - ITU Std. for narrowband VTC IATP - Information Assurance Test Plan IAW - in accordance with IEEE - Institute of Electrical and Electronics Engineers, Inc. ISDN - Integrated Services Digital Network ITU - International Telecommunication Union JITC - Joint Interoperability Test Command JTA - Joint Technical Architecture kbps - kilobits per second KXX - K= any number 2-8; X= any number 1-9	LAN - Local Area Network LoC - Letter(s) of Compliance Mbps - Megabits per second MIL-STD - Military Standard MLPP - Multi-Level Precedence and Preemption MOS - Mean Opinion Score NI 1/2 - National ISDN Std. 1 or 2 NM - Network Management NX56 - Data format restricted to multiples of 56 kbps NX64 - Data format restricted to multiples of 64 kbps PAT - Precedence Access Threshold PBX - Private Branch Exchange PCM-24 - Pulse Code Modulation 24 Channels PCM-30 - Pulse Code Modulation 30 Channels PRI - Primary Rate Interface PSTN - Public Switched Telephone Network Q.955.3 - ITU ISDN Signaling Std. for E1 MLPP QoS - Quality of Service sec. - second Sect. - section SS7 - Signaling System 7 Std. - Standard STE - Secure Terminal Equipment STU-III - Secure Telephone Unit-III T1 - Digital Transmission Link Level 1 (1.544 Mbps) T1.619a - SS7 and ISDN Signaling Std. For T1 TIA - Telecommunications Industry Association VBD - Variable bit data VLAN - Virtual Local Area Network VoIP - Voice over Internet Protocol VTC - Video Conferencing WWNDP - Worldwide Numbering and Dialing Plan
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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

JITC Memo, JTE, Special Interoperability Test Certification of Nortel Networks Succession Defense Switched Network (DSN) Option 11C Cabinet and Option 11C Chassis Digital Switching Systems with Software Release 3.0 and Product Enhancement Packages

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 hooperj@fhu.disa.mil.

FOR THE COMMANDER:

2 Enclosures a/s

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JITC Memo, JTE, Special Interoperability Test Certification of Nortel Networks Succession Defense Switched Network (DSN) Option 11C Cabinet and Option 11C Chassis Digital Switching Systems with Software Release 3.0 and Product Enhancement Packages

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

ADDITIONAL REFERENCES

- (c) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001
- (d) Defense Information Systems Agency (DISA), "Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR)," 8 September 2003
- (e) Joint Interoperability Test Command, Draft, "Defense Switched Network Generic Switch Test Plan (GSTP)" 19 June 1999

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Nortel Networks Succession Defense Switched Network (DSN) Option 11C Cabinet Digital Switching System with Software Release 3.0, hereinafter referred to as the System Under Test (SUT).

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

3. PROGRAM MANAGER. Mr. Howard Osman, GS23, Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, E-mail: Osmanh@ncr.disa.mil.

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

5. SYSTEM UNDER TEST DESCRIPTION. Private Branch Exchanges (PBXs) are Military Department (MILDEP)-controlled elements of the DSN. The SUT telephone system supports up to 1000 lines. The SUT supports the same desktop and system features as the larger Nortel Networks Succession DSN switching systems, including digital telephones, in-building wireless communications, voice messaging, call center, PC-based system management, and multimedia applications. The SUT can be configured for a single site or provide multi-location Integrated Services Digital Network (ISDN) Private Networking. The SUT's modular design allows the addition of capacity and new capabilities on an "as needed" basis. Nortel Network's DSN Option 11C Chassis Digital Switching System is based on the SUT platform. The DSN Option 11C Chassis Digital Switching System was designed to serve branch offices with 80 lines or less. It provides the full range of Nortel Networks Succession DSN Digital Switching System features and uses the same telephones software and trunk/line card hardware as the SUT. The SUT and DSN Option 11C Chassis Digital Switching System are currently in use within the DSN providing PBX 1 switch functionality. JITC analysis determined the DSN Option 11C Chassis Digital Switching System to be functionally identical to the SUT for interoperability certification purposes and is certified for joint use within the DSN. The SUT also offers a Voice over Internet Protocol capability; however, this capability is not covered under this certification.

6. OPERATIONAL ARCHITECTURE. The DSN architecture is a two-level network hierarchy consisting of DSN backbone switches and Military/Agency installation switches. Joint Staff policy and subscriber mission requirements determine which type of switch can be used at a particular location. The DSN architecture, therefore, consists of several categories of switches including PBXs. The Generic Switching Center Requirements (GSCR) operational DSN Architecture is depicted in figure 2-1. The architecture depicts the relationship of MILDEP PBX 1s to the rest of the DSN switch types.

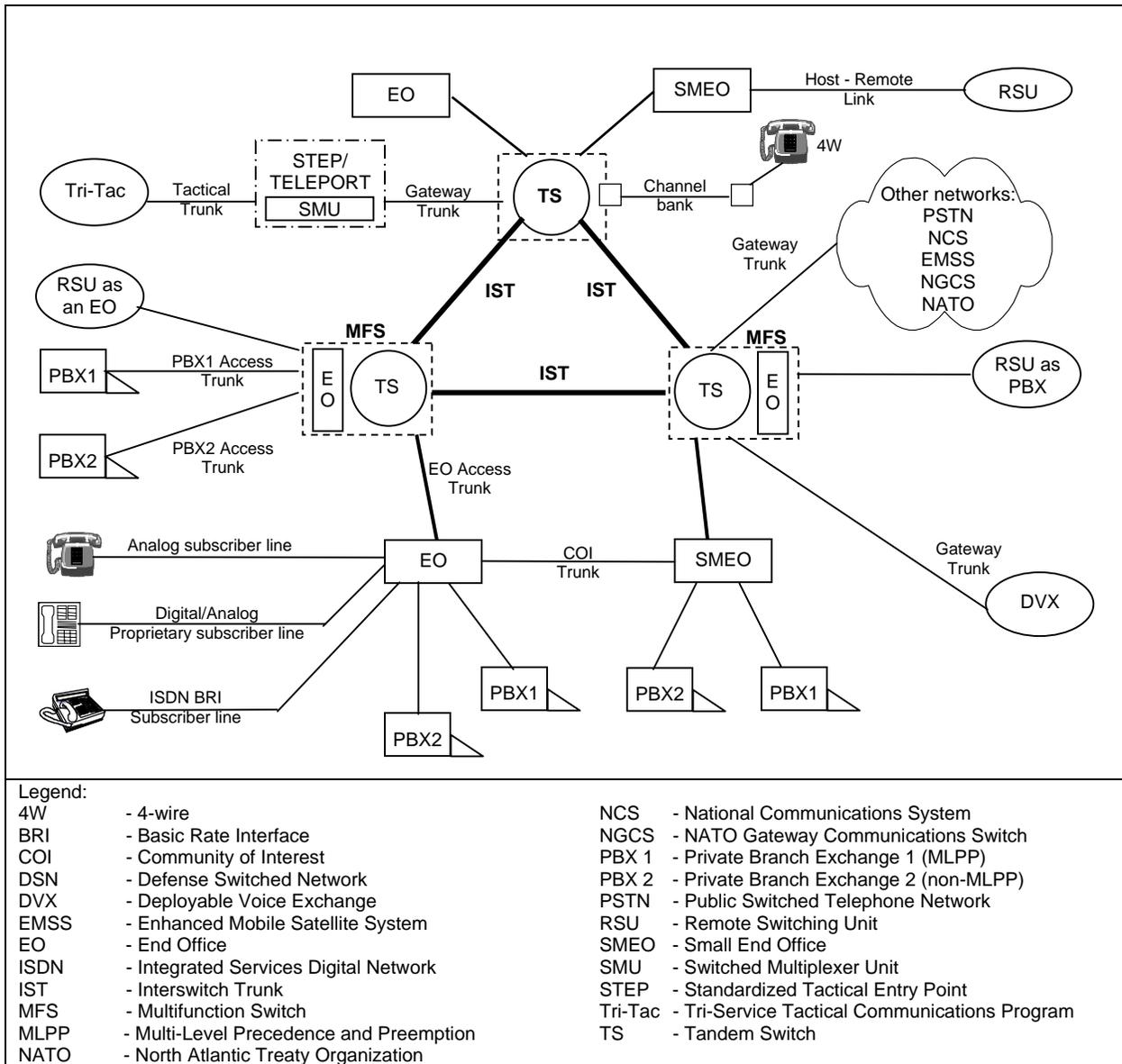


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to PBX 1s are listed in table 2-1. These requirements are derived from:

- a. DSN services for Network and Applications specified in Chairman Joint Chiefs of Staff instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services."
- b. GSCR interface and signaling requirements for trunks/lines verified through JITC testing and/or vendor submission of Letter(s) of Compliance (LoC).
- c. GSCR PBX 1 Capability Requirements (CRs) and Feature Requirements (FRs) verified through JITC testing and/or vendor submission of LoC.

Table 2-1. PBX 1 Requirements

DSN Trunk Interfaces				
Digital Interface	Critical	Requirements Required (R) or Conditional (C)		References
T1 CAS	Yes	Trunking	<ul style="list-style-type: none"> • Framing (R) • Line Code (R) • Signaling (R) • Alarms (R) • Timing (R) • WWNDP (R) • Outpulsing digit formats (C: CAS only) • Routing (C) • Trunk Groups (C) • Call Processing (R) • CAS to CCS trunk interworking (C) • PCM-24/PCM-30 Interoperation (C) • Direct Inward Dialing (C) 	<ul style="list-style-type: none"> • GSCR Sect. 7 • GSCR Sect. 7 • GSCR Sect. 5 • GSCR Sect. 2.5.7, 7.1.4 & 7.2.2 • GSCR Sect. 11.1.1.2 • GSCR Sect. 4.5.1 • GSCR Sect. 4.5.2 • GSCR Sect. 4.2 • GSCR Sect. 2.5.5 & 2.5.6 • GSCR Sect. 4 • GSCR Sect. 3.10 • GSCR Sect. 7.3 • GSCR Sect 2.3.2
E1 CAS	No (Europe only)		Voice	<ul style="list-style-type: none"> • MOS (R) • MLPP (R) • Secure calls (R)
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Facsimile	<ul style="list-style-type: none"> • Analog: EIA/TIA-465-A (R) • Digital: MIL-STD-188-161D (C) 	<ul style="list-style-type: none"> • JTA • JTA
		Data	<ul style="list-style-type: none"> • Modem (VBD) (R) • 56-kbps switched data (R: ISDN PRI only) • 64-kbps switched data (R: ISDN PRI only) • NX56 synchronous BER (R: ISDN PRI only) • NX64 synchronous BER (R: ISDN PRI only) • Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Sect. 3.10
E1 ISDN PRI (Q.955.3)	No (Europe only)	VTC	<ul style="list-style-type: none"> • H.320 (C: ISDN PRI only) 	<ul style="list-style-type: none"> • JTA
Analog Interface	Critical	Requirements Required (R) or Conditional (C)		References
Analog E&M Type1	No	Trunking	<ul style="list-style-type: none"> • WWNDP (R) • Routing (C) • Call Processing (C) • Direct Inward Dialing (C) 	<ul style="list-style-type: none"> • GSCR Sect. 4.5.1 • GSCR Sect. 4.2 • GSCR Sect. 4 • GSCR Sect 2.3.2
		Voice	<ul style="list-style-type: none"> • MOS (R) • MLPP (R) • Secure calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B
		Facsimile	<ul style="list-style-type: none"> • Analog: EIA/TIA-465-A (R) • Digital: MIL-STD-188-161D (C) 	<ul style="list-style-type: none"> • JTA • JTA
		Data	<ul style="list-style-type: none"> • Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B

Table 2-1. PBX 1 Requirements (continued)

DSN Line Interfaces				
Features/ Capabilities	Critical	Requirements Required (R) or Conditional (C)		References
2-Wire Analog (GR-506-CORE)	Yes	Access	<ul style="list-style-type: none"> • DN Identification (R) • Line signaling (R: Ground Start and Loop Start) • Alerting Signals and Tones (C) • WWNDP (C) • Call Processing (C) • Call Treatments (C) • 2W user access (R: 2-Wire Analog only) • Analog busy/idle (R: 2-Wire Analog only) 	<ul style="list-style-type: none"> • GSCR Sect 2.1.1 • GSCR Sect 5.2 • GSCR Sect 5.5 • GSCR Sect. 4.5 • GSCR Sect. 4.4 • GSCR Sect. 4.1 • GSCR Sect 4.3.3 • GSCR Sect 4.3.4.1
		Voice	<ul style="list-style-type: none"> • MOS (R) • MLPP (R) • Secure Calls (R) (ISDN BRI and Analog only) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Section 3.4.3, 3.9 • CJCSI 6215.01B
ISDN BRI NI 1/2	Yes	Facsimile	<ul style="list-style-type: none"> • Analog: EIA/TIA-465-A (R) • Digital: MIL-STD-188-161D (C) (ISDN BRI only) 	<ul style="list-style-type: none"> • JTA • JTA
		Data	<ul style="list-style-type: none"> • Modem (VBD) (R) • 56-kbps switched data (R: ISDNBRI only) • 64-kbps switched data (R: ISDN BRI only) • NX56 synchronous BER (R:ISDN BRI only) • NX64 synchronous BER (R:ISDN BRI only) • Secure data (STE/STU-III) (R) (ISDN BRI and Analog only) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Sect. 3.10
2-Wire Digital	No			
VoIP	No	VTC	<ul style="list-style-type: none"> • H.320 (C: ISDN BRI only) 	<ul style="list-style-type: none"> • JTA
DSN Features & Capabilities				
Common Features	No	<ul style="list-style-type: none"> • Selective call rejection (C) • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (C) • Three-way calling (C) • Add-on transfer and conference calling (C) • Call forwarding (C) • Call pick-up (C) 		<ul style="list-style-type: none"> • GSCR Sect. 2.1.2 • GSCR Sect. 2.1.3 • GSCR Sect. 2.1.4 • GSCR Sect. 2.1.5 • GSCR Sect. 2.1.6 • GSCR Sect. 2.1.7 • GSCR Sect. 2.1.8 • GSCR Sect. 2.1.9
Attendant	No	<ul style="list-style-type: none"> • Initiate all precedence levels (C) • Visual display (C) • Override class of service (C) • Override busy line (C) • Call deflection (C) • Auto recall (C) • Waiting queue (C) 		<ul style="list-style-type: none"> • GSCR Sect. 2.2.1 • GSCR Sect. 2.2.2 • GSCR Sect. 2.2.3 • GSCR Sect. 2.2.4 • GSCR Sect. 2.2.5 • GSCR Sect. 2.2.6 • GSCR Sect. 2.2.7
Public Safety	No	<ul style="list-style-type: none"> • 911 (C) • Trace of terminating calls (C) • Outgoing call trace (C) • Tandem call trace (C) • Trace of a call in progress (C) 		<ul style="list-style-type: none"> • GSCR Sect. 2.4.1 • GSCR Sect. 2.4.2 • GSCR Sect. 2.4.3 • GSCR Sect. 2.4.4 • GSCR Sect. 2.4.5
Preset Conferencing	No	<ul style="list-style-type: none"> • Support 10 bridges; 1 originator and 20 conferees (C) • Assign up to 20 address numbers per bridge (C) • Use KXX codes for bridge access (C) • Conference notification recorded announcement (C) • Auto retrial and alternate address (C) • Bridge release (C) • Lost connection (C) • Secondary conferencing (C) • Address translation (C) 		<ul style="list-style-type: none"> • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6.1 • GSCR Sect. 2.6.2 • GSCR Sect. 2.6.3 • GSCR Sect. 2.6.4 • GSCR Sect. 2.6.5 • GSCR Sect. 2.7

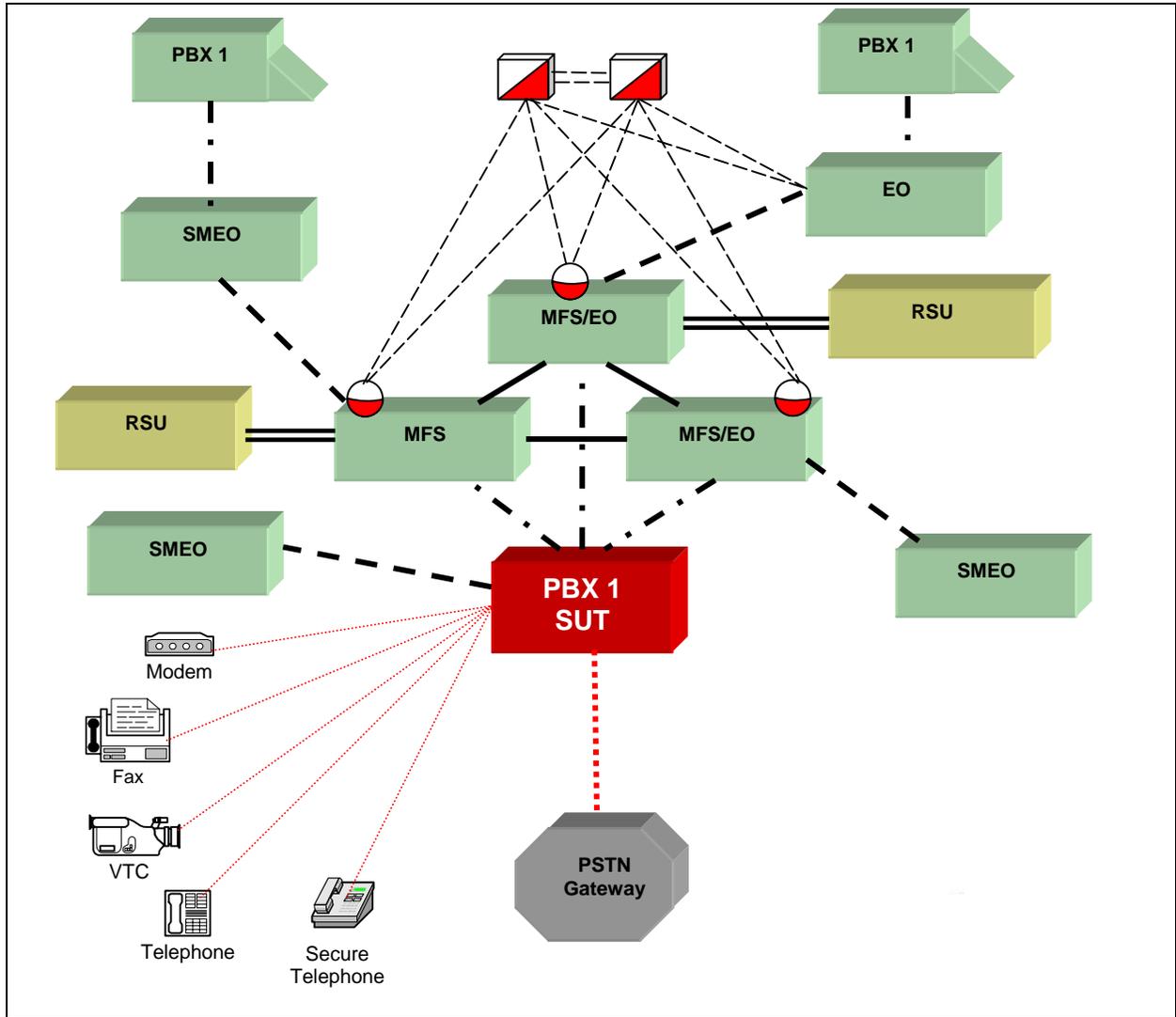
Table 2-1. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Features/ Capabilities	Critical	Requirements Required (R) or Conditional (C)	References
Nailed-up Connections	No	<ul style="list-style-type: none"> • Between any two like terminations (C) • PCM-24 and PCM-30, both CAS and CCS (C) • Supervision passed end-to-end for A/D or D/A (C) • Monitored and auto reconfigure (C) • Support at least 10% of circuits as nailed-up (C) • Non-preemptable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.8
PAT	No	<ul style="list-style-type: none"> • Classmark for/not for PAT screening (C) • 7 PAT mechanisms (C) • Outgoing call screening • Functional structure (C) • Simultaneous calls limitation (C) • Overflow process (C) • Decrementing call-in-progress count (C) • Call treatment (C) • Queuing (C) • Attendant calls (C) • Operation measurement registers (C) • Maintenance and Administration of thresholds (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1.1 • GSCR Sect. 2.11.1.2 • GSCR Sect. 2.11.1.3 • GSCR Sect. 2.11.1.4 • GSCR Sect. 2.11.1.5 • GSCR Sect. 2.11.1.6 • GSCR Sect. 2.11.1.7 • GSCR Sect. 2.11.1.8 • GSCR Sect. 2.11.1.9 • GSCR Sect. 2.11.1.10
DSN Hotline services	No	<ul style="list-style-type: none"> • Hotline restrictions (C) • Auto initiate (C) • Analog and digital (C) • Subscription basis (C) • Protected hotline calling (C) • WWNDP interoperable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12.1-4 • GSCR Sect. 2.12.5
Network Management	No	<ul style="list-style-type: none"> • Interfaces (C) • Measurements and data generation (C) • Fault management (C) • Configuration management (C) • Accounting management (C) • Performance management (C) • NM controls (C) • Remote access (C) 	<ul style="list-style-type: none"> • GSCR Sect. 9.1 • GSCR Sect. 9.2 • GSCR Sect. 9.3 • GSCR Sect. 9.4 • GSCR Sect. 9.5 • GSCR Sect. 9.6 • GSCR Sect. 9.7 • GSCR Sect. 9.8
ISDN services	No	<ul style="list-style-type: none"> • EKTS (C) 	<ul style="list-style-type: none"> • GSCR Sect. 10, table 10-3
Synchronization	Yes	<ul style="list-style-type: none"> • Line timing mode (R) • Internal Stratum 4 (R) 	<ul style="list-style-type: none"> • GSCR Sect. 11.1.1.2 • GSCR Sect. 11.1.2.2
Reliability	Yes	<ul style="list-style-type: none"> • GR-512-CORE (C) 	<ul style="list-style-type: none"> • GSCR Sect.12
Security (see note)	Yes	<ul style="list-style-type: none"> • DITSCAP (R) 	<ul style="list-style-type: none"> • DODI 8100.3
VoIP			
VoIP System	No	<p>VoIP function is conditional. If VoIP is provided all of the following requirements must be met:</p> <ul style="list-style-type: none"> • MOS 4.0 or better • G.711 PCM Codec • Security IAW DITSCAP • NM • Line timing • Internal Clock • Latency @ 60 msec or less • IPV6 capable 	<ul style="list-style-type: none"> • GSCR App. 3

Table 2-1. PBX 1 Requirements (continued)

DSN Features & Capabilities						
Features/ Capabilities	Critical	Requirements Required (R) or Conditional (C)		References		
VoIP						
LANs	No	VoIP function is conditional. If VoIP is provided all of the following requirements must be met: <ul style="list-style-type: none"> • LAN parameters • CoS /QoS • VLANs • IEEE Stds. Conformance • .99999 availability • Modular devices • 2 sec. link restoral • LAN NM • Traffic Engineering 		<ul style="list-style-type: none"> • GSCR App. 3 		
Network Gateways						
Gateway	Critical	Requirements Required (R) or Conditional (C)		References		
PSTN	No	Trunking	<ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off Netting (C) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B 		
Legend: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> 2W - 2-Wire 911 - 911 Emergency Service A/D - Analog to Digital ANSI - American National Standards Institute App - Appendix BER - Bit Error Ratio BRI - Basic Rate Interface C - Conditional CAS - Channel Associated Signaling CCS - Common Channel Signaling CJCSI - Chairman Joint Chiefs of Staff Instruction CoS - Class of Service D/A - Digital to Analog DITSCAP - Department of Defense Information Technology Security Certification and Accreditation Process DN - Directory Number DODI - Department of Defense Instruction DSN - Defense Switched Network E&M - Ear and Mouth E1 - European Basic Multiplex Rate (2.048 Mbps) EIA - Electronic Industries Alliance EKTS - Electronic Key Telephone System G.711 - ITU Recommendation for PCM voice at digital rates of 48, 56, and 64 kbps GR - Generic Requirement (Telcordia) GSCR - Generic Switching Center Requirements H.320 - ITU Std. for narrowband VTC IATP - Information Assurance Test Plan IAW - in accordance with IEEE - Institute of Electrical and Electronics Engineers, Inc. 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For T1 TIA - Telecommunications Industry Association VBD - Variable bit data VLAN - Virtual Local Area Network VoIP - Voice over Internet Protocol VTC - Video Teleconferencing WWNDP - Worldwide Numbering and Dialing Plan </td> </tr> </table>					2W - 2-Wire 911 - 911 Emergency Service A/D - Analog to Digital ANSI - American National Standards Institute App - Appendix BER - Bit Error Ratio BRI - Basic Rate Interface C - Conditional CAS - Channel Associated Signaling CCS - Common Channel Signaling CJCSI - Chairman Joint Chiefs of Staff Instruction CoS - Class of Service D/A - Digital to Analog DITSCAP - Department of Defense Information Technology Security Certification and Accreditation Process DN - Directory Number DODI - Department of Defense Instruction DSN - Defense Switched Network E&M - Ear and Mouth E1 - European Basic Multiplex Rate (2.048 Mbps) EIA - Electronic Industries Alliance EKTS - Electronic Key Telephone System G.711 - ITU Recommendation for PCM voice at digital rates of 48, 56, and 64 kbps GR - Generic Requirement (Telcordia) GSCR - Generic Switching Center Requirements H.320 - ITU Std. for narrowband VTC IATP - Information Assurance Test Plan IAW - in accordance with IEEE - Institute of Electrical and Electronics Engineers, Inc. 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Note: JITC verifies security via a LoC. Further testing IAW the IATP is required prior to being authorized connection approval.						

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 the two test configurations as shown in figures 2-2 and 2-3. Testing of the system's required functions and features was conducted using the notional test configuration depicted in figure 2-2. Per this configuration, the SUT was tested as the end-point in relation to the other switches. This configuration accurately emulates the DSN operational environment. Figure 2-3 depicts the test configuration used to test the Advanced DSN Integrated Management Support System network management required functions and features.



Legend:

- BRI - Basic Rate Interface
- CAS - Channel Associated Signaling
- DSN - Defense Switched Network
- E1 - European Basic Multiplex Rate (2.048 Mbps)
- EO - End Office
- FAX - facsimile
- ISDN - Integrated Services Digital Network
- Mbps - Megabits per second
- MFS - Multifunction Switch
- PBX 1 - Private Branch Exchange Type 1
- PRI - Primary Rate Interface
- PSTN - Public Switched Telephone Network
- RSU - Remote Switching Unit
- SMEO - Small End Office
- SS7 - Signaling System 7
- SUT - System Under Test
- T1 - Digital Transmission Link Level 1 (1.544 Mbps)

VTC - Video Teleconferencing



SS7 Service Switching Point (SSP)



SS7 Signal Transfer Point (STP)

..... DSN Gateway Trunk

———— DSN Interswitch Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI)

..... DSN Line (2 Wire Analog, ISDN BRI, Digital Proprietary)

--- SS7 Links (A-Link, B-Link, or C-Link)

———— DSN End Office Access Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI)

———— DSN PBX Access Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI)

==== RSU-Host Umbilical Link

Figure 2-2. Notional Test Configuration

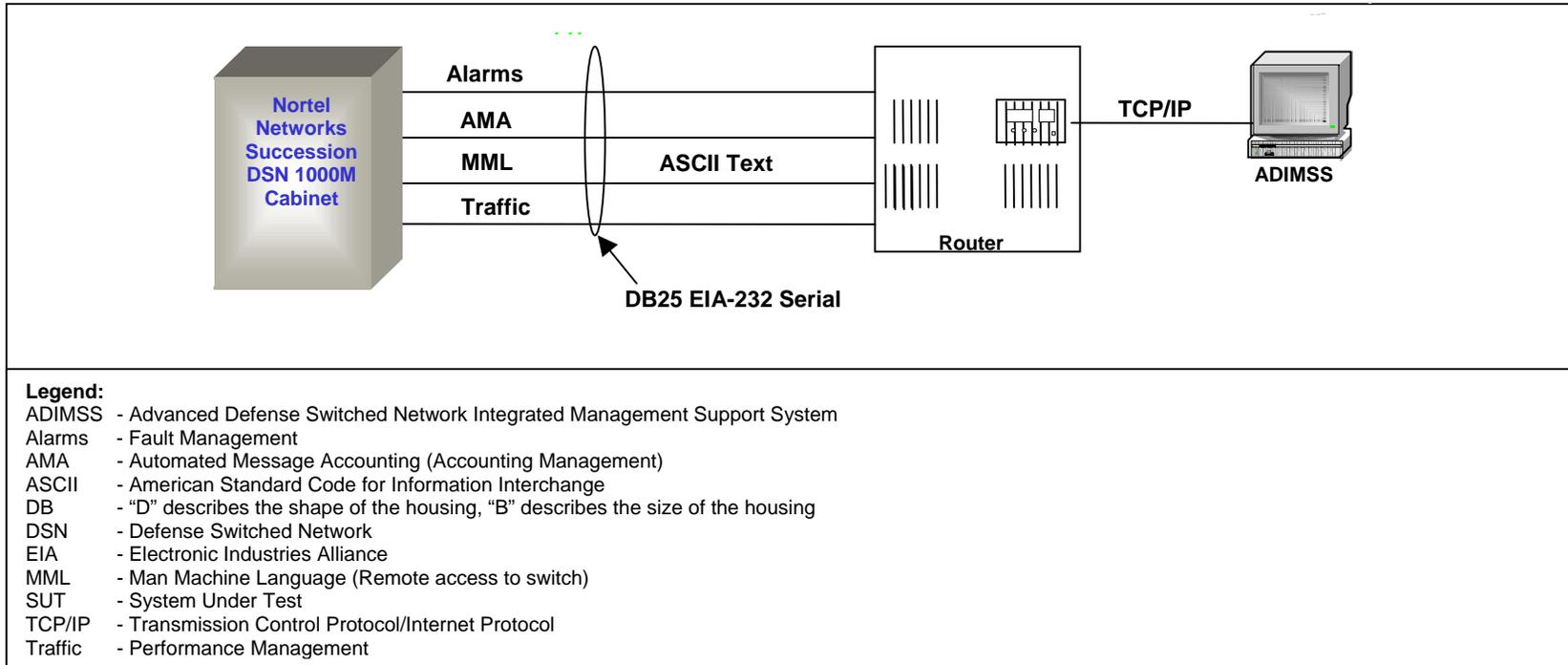


Figure 2-3. SUT ADIMSS Network Management System Interface

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	SEO6		
Avaya MultiVantage S8700	R011x.7585.7.0.2		
Nortel Networks Succession DSN Option 11C Cabinet Digital Switching System	Product Engineer Code	Software Release	
CORE Processor	NT5D03FB	3.0	
Trunk Module Digital Interface Card	NTRB21AB		
Trunk Module Digital Interface Card	NTRB21AC		
Multipurpose ISDN Signaling Processor Card	NTBK22AA		
Serial Data Interface Card	N7AK02BC		
Digital Line Card	NT8D02GA		
Analog Line Card	NT8D09AK		
Universal Interface Line Card	NT6D71AA		
Siemens EWSD	19d with Patch Set 32		
Nortel Networks Succession DSN 1000M Single Group Call Server	3.0		
Siemens KNS-4100	APS4V2.3		
Lucent Technologies 5ESS	5E16.2		
SMU 96 Tactical Gateway	RD302185		
MARCONI ATM switches	Versions 6.2 and 7.1		
Legend:			
ATM	- Asynchronous Transfer Mode	M	- Meridian
DSN	- Defense Switched Network	MSL	- Meridian Switching Load
EWSD	- Elektronisches Wählsystem Digital	SMU	- Switch Multiplexer Unit
ISDN	- Integrated Services Digital Network		

10. TESTING LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

DSN. All critical interface Capability Requirements (CRs) and Feature Requirements (FRs) for DSN were met. The following minor exceptions are noted:

(1) 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 channel (PCM-24) interface. It takes approximately 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.

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

(3) The SUT does not meet the American National Standards Institute (ANSI) T1.619 1992, ANSI T1.619a 1994, standards for ISDN ANSI T1.619a Primary Rate Interface (PRI) National ISDN 2 (NI 2) protocol with unavailable resources, blocked precedence announcement. The SUT's ANSI T1.619a ISDN PRI trunkgroups using NI 2 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.

(4) 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.

(5) The SUT 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 paragraph 2.1.3. The operational impact is minor.

(6) The SUT does not support route digit 5 or 6 for hotline services. This is not a critical requirement for a PBX. The operational impact is minor.

(7) The SUT does not support the following unique ISDN Basic Rate Interface (BRI) supplemental services as specified in the respective GSCR paragraphs listed below. There are currently no switches in the Defense Information Systems Network 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

b. System Interoperability Results. The SUT with Software Release 3.0 is certified for joint use in the DSN as a PBX 1 in accordance with the requirements set forth in the GSCR. Minor discrepancies identified during testing will have no adverse operational impact. The interoperability test summary is shown in table 2-3 and the detailed interoperability test status is shown table 2-4.

Table 2-3. SUT Interoperability Test Summary

DSN Trunk Interfaces				
Interface & Signaling	Critical	Status	Remarks	
T1 CAS (DTMF, DP)	No	Certified	Met all CRs and FRs with the following minor exception: Restoral from a local red alarm not met. ¹	
E1 CAS (DTMF, DP)	No (Europe only)	Not Tested		
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all CRs and FRs with the following minor exception: NI 2 Protocol provides a release complete message in lieu of a disconnect message for unavailable resources. ²	
E1 ISDN PRI (Q.955.3)	No (Europe only)	Not Tested		
Analog E&M Type 1	No	Not Certified	Analog E&M services are not met. ³	
DSN Line Interfaces				
Interface & Signaling	Critical	Status	Remarks	
2-Wire Analog (GR-506-CORE)	Yes	Certified	Met all CRs and FRs with the following minor exception: Does not support intraswitch call waiting. ⁴	
ISDN BRI NI 1/2	Yes	Certified	Met all CRs and FRs.	
Digital Proprietary	No	Certified	Met all CRs and FRs.	
VoIP	No	Not Tested		
DSN Features and Capabilities				
Features and Capabilities	Critical	Status	Remarks	
Common Features	No	Certified	Met all Common Features.	
Attendant	No	Certified	Attendant service automatic recall not met. ⁵	
Public Safety	No	Not Tested		
Preset Conferencing	No	Not Tested		
Nailed-up Connections	No	Not Tested		
PAT	No	Not Tested		
DSN hotline services	No	Not Certified	Hotline services not met. ⁶	
Network Management	No	Not Tested		
ISDN Services (EKTS)	No	Not Tested		
Synchronization	Yes	Certified	Met all CRs and FRs.	
Reliability	Yes	Certified	Met all CRs and FRs.	
Security ⁷	Yes	Certified	Met all CRs and FRs.	
VoIP System	No	Not Tested		
VoIP LANs	No	Not Tested		
Network Gateways				
	Interface & Signaling	Critical	Status	Remarks
PSTN	T1 CAS (DTMF, DP)	No	Certified	Met all CRs and FRs.
	E1 CAS (DTMF, DP)	No (Europe only)	Not Tested	
	T1 ISDN PRI NI 1/2	No	Certified	Met all CRs and FRs.
	E1 ISDN PRI (Q.931)	No (Europe only)	Not Tested	

Table 2-3. SUT Interoperability Test Summary (continued)

Legend:	
ANSI - American National Standards Institute	JITC - Joint Interoperability Test Command
BRI - Basic Rate Interface	LAN - Local Area Network
CAS - Channel Associated Signaling	LoC - Letters of Compliance
CRs - Capability Requirements	Mbps - Megabits per second
DP - Dial Pulse	MLPP - Multi-Level Precedence and Preemption
DSN - Defense Switched Network	NI 1/2 - National ISDN 1 or 2
DTMF - Dual Tone Multi-Frequency	PAT - Precedence Access Threshold
E&M - Ear and Mouth	PRI - Primary Rate Interface
E1 - European Basic Multiplex Rate (2.048 Mbps)	PSTN - Public Switched Telephone Network
EKTS - Electronic Key Telephone System	Q.931 - ITU signaling std. for ISDN
FRs - Feature Requirements	Q.955.3 - ITU ISDN Signaling Std. for E1 MLPP
GR - Generic Requirement (Telcordia)	SS7 - Signaling System 7
GSCR - Generic Switching Center Requirements	Std. - Standard
IATP - Information Assurance Test Plan	SUT - System Under Test
IAW - in accordance with	T1 - Digital Transmission Link Level 1 (1.544 Mbps)
ISDN - Integrated Services Digital Network	T1.619a - SS7 and ISDN signaling std. for T1
ITU - International Telecommunications Union	VoIP - Voice over Internet Protocol
Notes:	
1 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 the required 15 seconds, plus or minus 5 seconds. The operational impact is minor.	
2 ISDN T1 PRI trunkgroups using NI 2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources). The operational impact is minor since the user still receives a Blocked Precedence Announcement.	
3 Analog E&M Signaling Type 1 did not pass the DSN preempt signals as required by the GSCR for the four types of preemption. Analog E&M Signaling Type 1 is not certified for use in the DSN.	
4 Analog instruments do not provide intra-switch call waiting. The operational impact is minor.	
5 The SUT's attendant console does not support automatic recall of attendant. The operational impact is minor.	
6 The SUT does not meet the GSCR exchange requirements for hotline services. Hotline services are not a critical requirement.	
7 JITC verifies security via a LoC. Further testing IAW the IATP is required prior to being authorized connection approval.	

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, 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 2-4. SUT Interoperability Requirements/Status

DSN Trunk Interfaces							
Interface	Critical	Interface Status	GSCR Requirement Required (R) Conditional (C)	Reference	Test Results	Operational Impact	
T1 CAS	No	Certified	Trunking	Framing (R)	GSCR Sect. 7	Met	
				Line Code (R)	GSCR Sect. 7	Met	
				Signaling (R)	GSCR Sect. 5	Met	
				Alarms (R)	GSCR Sect. 2.5.7, 7.1.4 & 7.2.2	Met	Minor ¹
				Timing (R)	GSCR Sect. 11.1.1.2	Met	
				WWNDP (R)	GSCR Sect. 4.5.1	Met	
				Outpulsing digit formats (C)	GSCR Sect. 4.5.2	Met	
				Routing (C)	GSCR Sect. 4.2	Met	
				Trunk Groups (C)	GSCR Sect. 2.5.5 & 2.5.6	Met	
				Call Processing (R)	GSCR Sect. 4	Met	
				CAS to CCS trunk interworking (C)	GSCR Sect. 3.10	Not Tested	
				PCM-24/PCM-30 Interoperation (C)	GSCR Sect. 7.3	Not Tested	
			Direct Inward Dialing (C)	GSCR Sect. 2.3.2	Met		
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3	Met	Minor ²
				Secure calls (R)	CJCSI 6215.01B	Met	
			Facsimile	Analog: EIA/TIA-465-A (R)	JTA	Met	
				Digital: MIL-STD-188-161D (C)	JTA	Not Tested	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
				56-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Not Tested	
				64-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Not Tested	
				NX56 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Not Tested	
				NX64 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Not Tested	
VTC	Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Met				
	H.320 (C: ISDN PRI only)	JTA	Not Tested				

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	GSCR Requirement Required (R) Conditional (C)		Reference	Test Results	Operational Impact
T1 ISDN PRI (ANSI T1.619a)	Yes	Certified	Trunking	Framing (R)	GSCR Sect. 7	Met	
				Line Code (R)	GSCR Sect. 7	Met	
				Signaling (R)	GSCR Sect. 5	Met	
				Alarms (R)	GSCR Sect. 2.5.7, 7.1.4 & 7.2.2	Met	Minor ¹
				Timing (R)	GSCR Sect. 11.1.1.2	Met	
				WWNDP (R)	GSCR Sect. 4.5.1	Met	
				Outpulsing digit formats (C)	GSCR Sect. 4.5.2	Met	
				Routing (C)	GSCR Sect. 4.2	Met	
				Trunk Groups (C)	GSCR Sect. 2.5.5 & 2.5.6	Met	
				Call Processing (R)	GSCR Sect. 4	Met	
				CAS to CCS trunk interworking (C)	GSCR Sect. 3.10	Not Tested	
			PCM-24/PCM-30 Interoperation (C)	GSCR Sect. 7.3	Not Tested		
			Direct Inward Dialing (C)	GSCR Sect. 2.3.2	Met		
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3	Met	Minor ²
				Secure calls (R)	CJCSI 6215.01B	Met	
			Facsimile	Analog: EIA/TIA-465-A (R)	JTA	Met	
				Digital: MIL-STD-188-161D (C)	JTA	Not Tested	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
				56-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				64-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				NX56 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
				NX64 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Met	
Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Met					
VTC	H.320 (C: ISDN PRI only)	JTA	Met				

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	GSCR Requirement Required (R) Conditional (C)		Reference	Test Results	Operational Impact
E&M TYPE 1	No	Not Certified	Trunking	Signaling (R)	GSCR Sect. 5	Met	
				Alarms (R)	GSCR Sect. 2.5.7, 7.1.4 & 7.2.2	Met	
				WWNDP (R)	GSCR Sect. 4.5.1	Met	
				Outpulsing digit formats (C)	GSCR Sect. 4.5.2	Met	
				Routing (C)	GSCR Sect. 4.2	Met	
				Trunk Groups (C)	GSCR Sect. 2.5.5 & 2.5.6	Met	
				Call Processing (R)	GSCR Sect. 4	Met	
				CAS to CCS trunk interworking (C)	GSCR Sect. 3.10	Not Tested	
				PCM-24/PCM-30 Interoperation (C)	GSCR Sect. 7.3	Not Tested	
				Direct Inward Dialing (C)	GSCR Sect. 2.3.2	Met	
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3	Not Met	Minor ³
				Secure calls (R)	CJCSI 6215.01B	Met	
			Facsimile	Analog: EIA/TIA-465-A (R)	JTA	Met	
				Digital: MIL-STD-188-161D (C)	JTA	Not Tested	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
				56-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Not Tested	
				64-kbps switched data (R: ISDN PRI only)	GSCR Sect. 3.10	Not Tested	
				NX56 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Not Tested	
				NX64 synchronous BER (R: ISDN PRI only)	GSCR Sect. 3.10	Not Tested	
VTC	Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Not Tested				
	H.320 (C: ISDN PRI only)	JTA	Not Tested				

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Line Interfaces							
Interface	Critical	Interface Status	GSCR Requirement Required (R) Conditional (C)		Reference	Test Results	Operational Impact
2-Wire Analog (GR-506-CORE)	Yes	Certified	Access	DN Identification (R)	GSCR Sect 2.1.1	Met	
				Line signaling (C)	GSCR Sect 5.2	Met	
				Alerting Signals and Tones (C)	GSCR Sect 5.5	Met	
				WWNDP (R)	GSCR Sect. 4.5	Met	
				Call Processing (C)	GSCR Sect. 4.4	Met	
				Call Treatments (R)	GSCR Sect. 4.1	Met	
				2W user access (R)	GSCR Sect 4.3.3	Met	
				Analog busy/idle (R)	GSCR Sect 4.3.4.1	Met	
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3.4.3, 3.9	Met	
				Secure calls (R)	CJCSI 6215.01B	Met	
			Facsimile	Analog: EIA/TIA-465-A (R)	JTA	Met	
				Digital: MIL-STD-188-161D (C)	JTA	Not Tested	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
				Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Met	
VTC	H.320 (C: ISDN BRI only)	JTA	Not Tested				

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Line Interfaces (continued)							
Interface	Critical	Interface Status	GSCR Requirement Required (R) Conditional (C)		Reference	Test Results	Operational Impact
ISDN BRI NI 1/2	Yes	Certified	Access	DN Identification (R)	GSCR Sect 2.1.1	Met	
				Line signaling (C)	GSCR Sect 5.2	Met	
				Alerting Signals and Tones (C)	GSCR Sect 5.5	Met	
				WWNDP (R)	GSCR Sect. 4.5	Met	
				Call Processing (C)	GSCR Sect. 4.4	Met	
				Call Treatments (R)	GSCR Sect. 4.1	Met	
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3.4.3, 3.9	Met	
				Secure calls (R)	CJCSI 6215.01B	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01B	Met	
				56-kbps switched data (R))	GSCR Sect. 3.10	Met	
				64-kbps switched data (R)	GSCR Sect. 3.10	Met	
				NX56 synchronous BER (R)	GSCR Sect. 3.10	Met	
				NX64 synchronous BER (R)	GSCR Sect. 3.10	Met	
				Secure data (STE/STU-III) (R)	GSCR Sect. 3.10	Met	
			VTC	H.320 (C)	JTA	Met	

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Line Interfaces (continued)							
Interface	Critical	Interface Status	GSCR Requirement Required (R) Conditional (C)		Reference	Test Results	Operational Impact
Digital Proprietary	No	Certified	Access	DN Identification (R)	GSCR Sect 2.1.1	Met	
				Line signaling (C)	GSCR Sect 5.2	Met	
				Alerting Signals and Tones (C)	GSCR Sect 5.5	Met	
				WWNDP (R)	GSCR Sect. 4.5	Met	
				Call Processing (C)	GSCR Sect. 4.4	Met	
				Call Treatments (C)	GSCR Sect. 4.1	Met	
			Voice	MOS (R)	CJCSI 6215.01B	Met	
DSN Features & Capabilities							
Features/ Capabilities	Critical	Status	GSCR Requirement Required (R) Conditional (C)		Reference	Test Results	Operational Impact
Common Features	No	Certified	Selective call rejection (C)		GSCR Sect. 2.1.2	Not Tested	
			Denied originating service (C)		GSCR Sect. 2.1.3	Not Tested	
			Code restriction and diversion (C)		GSCR Sect. 2.1.4	Met	
			Three-way calling (C)		GSCR Sect. 2.1.5	Met	
			Add-on transfer and conference calling (C)		GSCR Sect. 2.1.6	Met	
			Call forwarding (C)		GSCR Sect. 2.1.7	Met	
			Call pick-up (C)		GSCR Sect. 2.1.8	Met	
			Call waiting (C)		GSCR Sect. 2.1.9	Not Met	Minor ⁴
			Initiate all precedence levels (C)		GSCR Sect. 2.2.1	Met	
Attendant	No	Certified	Visual display (C)		GSCR Sect. 2.2.2	Met	
			Override class of service (C)		GSCR Sect. 2.2.3	Met	
			Override busy line (C)		GSCR Sect. 2.2.4	Met	
			Call deflection (C)		GSCR Sect. 2.2.5	Met	
			Auto recall (C)		GSCR Sect. 2.2.6	Not Met	Minor ⁵
			Waiting queue (C)		GSCR Sect. 2.2.7	Met	
			911 (C)		GSCR Sect. 2.4.1	Not Tested	
Public Safety	No	Not Tested	Trace of terminating calls (C)		GSCR Sect. 2.4.2	Met	
			Outgoing call trace (C)		GSCR Sect. 2.4.3	Met	
			Tandem call trace (C)		GSCR Sect. 2.4.4	Met	
			Trace of a call in progress (C)		GSCR Sect. 2.4.5	Met	

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features & Capabilities (continued)						
Features/ Capabilities	Critical	Status	GSCR Requirement Required (R) Conditional (C)	Reference	Test Results	Operational Impact
Preset Conferencing	No	Not Tested	Support 10 bridges; 1 originator and 20 conferees (C)	GSCR Sect. 2.1.6	Not Tested	
			Assign up to 20 address numbers per bridge (C)	GSCR Sect. 2.6	Not Tested	
			Use KXX codes for bridge access (C)	GSCR Sect. 2.6	Not Tested	
			Conference notification recorded announcement (C)	GSCR Sect. 2.6.1	Not Tested	
			Auto retrieval and alternate address (C)	GSCR Sect. 2.6.2	Not Tested	
			Bridge release (C)	GSCR Sect. 2.6.3	Not Tested	
			Lost connection (C)	GSCR Sect. 2.6.4	Not Tested	
			Secondary conferencing (C)	GSCR Sect. 2.6.5	Not Tested	
Nailed-Up Connections	No	Not Tested	Address translation (C)	GSCR Sect. 2.7	Not Tested	
			Between any two like terminations (C)	GSCR Sect. 2.8	Not Tested	
			PCM-24 and PCM-30, both CAS and CCS (C)	GSCR Sect. 2.8	Not Tested	
			Supervision passed end-to-end for A/D or D/A (C)	GSCR Sect. 2.8	Not Tested	
			Monitored and auto reconfigure (C)	GSCR Sect. 2.8	Not Tested	
PAT	No	Not Tested	Support at least 10% of circuits as nailed-up (C)	GSCR Sect. 2.8	Not Tested	
			Non-preemptable (C)	GSCR Sect. 2.8	Not Tested	
			Classmark for/not for PAT screening (C)	GSCR Sect. 2.11.1	Not Tested	
			7 PAT mechanisms (C)	GSCR Sect. 2.11.1	Not Tested	
			Outgoing call screening (C)	GSCR Sect. 2.11.1.1	Not Tested	
			Functional structure (C)	GSCR Sect. 2.11.1.2	Not Tested	
			Overflow Process (C)	GSCR Sect. 2.11.1.3	Not Tested	
			Simultaneous calls limitation (C)	GSCR Sect. 2.11.1.4	Not Tested	
			Decrementing call-in-progress count (C)	GSCR Sect. 2.11.1.5	Not Tested	
			Call treatment (C)	GSCR Sect. 2.11.1.6	Not Tested	
DSN hotline services	No	Not Certified	Queuing (C)	GSCR Sect. 2.11.1.7	Not Tested	
			Attendant calls (C)	GSCR Sect. 2.11.1.8	Not Tested	
			Op measurement registers (C)	GSCR Sect. 2.11.1.9	Not Tested	
			Maintenance and Administration of thresholds (C)	GSCR Sect. 2.11.1.10	Not Tested	
			Hotline restrictions (C)	GSCR Sect. 2.12	Not Met	Minor ⁶
			Auto initiate (C)	GSCR Sect. 2.12	Met	
			Analog and digital (C)	GSCR Sect. 2.12	Not Met	Minor ⁶
			Subscription basis (C)	GSCR Sect. 2.12	Not Tested	
			Protected hotline calling (C)	GSCR Sect. 2.12.1-4	Not Met	Minor ⁶
			WWNDP interoperable (C)	GSCR Sect. 2.12.5	Not Met	Minor ⁶

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features & Capabilities (continued)						
Features/ Capabilities	Critical	Status	GSCR Requirement Required (R) Conditional (C)	Reference	Test Results	Operational Impact
Network Management	No	Certified	Interfaces (C)	GSCR Sect. 9.1	Met	
			Measurements and data generation (C)	GSCR Sect. 9.2	Met	
			Fault management (C)	GSCR Sect. 9.3	Met	
			Configuration management (C)	GSCR Sect. 9.4	Met	
			Accounting management (C)	GSCR Sect. 9.5	Met	
			Performance management (C)	GSCR Sect. 9.6	Met	
			NM controls (C)	GSCR Sect. 9.7	Met	
			Remote access (C)	GSCR Sect. 9.8	Met	
ISDN services	No	Not Tested	EKTS (C)	GSCR Sect. 10, table 10-3	Not Tested	
Synchronization	Yes	Certified	Line timing mode (C)	GSCR Sect. 11.1.1.2	Met	
			Internal Stratum 4 (R)	GSCR Sect. 11.1.2.2	Met	
Reliability	Yes	Certified	GR-512-CORE (C)	GSCR Sect. 12	Met	
Security	Yes	Certified	DITSCAP (R)	DODI 8100.3	Met	
VoIP System	No	Not Tested	MOS 4.0 or better (R)	GSCR App. 3	Not Tested	
			G.711 PCM Codec (R)	GSCR App. 3	Not Tested	
			Security IAW DITSCAP (R)	GSCR App. 3	Not Tested	
			NM (R)	GSCR App. 3	Not Tested	
			Line timing (R)	GSCR App. 3	Not Tested	
			Internal Clock (R)	GSCR App. 3	Not Tested	
			Latency @60 msec or less (R)	GSCR App. 3	Not Tested	
			IPv6 capable (R)	GSCR App. 3	Not Tested	
LANs	No	Not Tested	LAN parameters (R)	GSCR App. 3	Not Tested	
			CoS/QoS (R)	GSCR App. 3	Not Tested	
			VLANs (R)	GSCR App. 3	Not Tested	
			IEEE Stds. Conformance (R)	GSCR App. 3	Not Tested	
			.99999 availability (R)	GSCR App. 3	Not Tested	
			Modular devices (R)	GSCR App. 3	Not Tested	
			2 sec. link restoral (R)	GSCR App. 3	Not Tested	
			LAN NM (R)	GSCR App. 3	Not Tested	
Traffic Engineering (R)	GSCR App. 3	Not Tested				

Table 2-4. SUT Interoperability Requirements/Status (continued)

Network Gateway																																																																																																																																																
Gateway	Critical	Interface Status	GSCR Requirement Required (R) Conditional (C)		Reference	Test Results	Operational Impact																																																																																																																																									
PSTN	No	Certified	Trunking	Positive Identification Control (C)	CJCSI 215.1B	Met																																																																																																																																										
				On-Netting (C)	CJCSI 215.1B	Met																																																																																																																																										
				Off-Netting (C)	CJCSI 215.1B	Met																																																																																																																																										
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PCM-24	- Pulse Code Modulation 24 Channels	ANSI	- American National Standards Institute	IPv6	- Internet Protocol version 6	PCM-30	- Pulse Code Modulation 30 Channels	App.	- Appendix	ISDN	- Integrated Services Digital Network	PRI	- Primary Rate Interface	BER	- Bit Error Ratio	ITU	- International Telecommunication Union	PSTN	- Public Switched Telephone Network	BRI	- Basic Rate Interface	JITC	- Joint Interoperability Test Command	QoS	- Quality of Service	C	- conditional	JTA	- Joint Technical Architecture	R	- Required	CAS	- Channel Associated Signaling	kbps	- kilobits per second	Sec.	- Seconds	CCS	- Common Channel Signaling	KXX	- K = any number 2-8, X = any number 1-9	Sect.	- Section	CJCSI	- Chairman Joint Chiefs of Staff Instruction	LAN	- Local Area Network	SS7	- Signaling System 7	CoS	- Class of Service	LoC	- Letters of Compliance	Std.	- Standard	D/A	- Digital to Analog Conversion	Mbps	- Megabits per second	STE	- Secure Terminal Equipment	DITSCAP	- Department of Defense Information Technology Security and Accreditation Process	MIL-STD	- Military Standard	STU-III	- Secure Telephone Unit-III	DN	- Directory Number	MLPP	- Multi-Level Precedence & Preemption	SUT	- System Under Test	DODI	- Department of Defense Instruction	MOS	- Mean Opinion Score	T1	- Digital Transmission Link Level 1 (1.544 Mbps)	DSN	- Defense Switched Network	msec	- Milliseconds	T1.619a	- SS7 and ISDN Signaling Std. 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<p>Notes:</p> <ol style="list-style-type: none"> 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 the required 15 seconds, plus or minus 5 seconds. The operational impact is minor. ISDN T1 PRI trunkgroups using NI 2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources). The operational impact is minor since the user still receives a Blocked Precedence Announcement.2 Analog E&M Signaling Type 1 did not pass the DSN preempt signals as required by the GSCR for the four types of preemption. Analog E&M Signaling Type 1 is not a critical interface requirement for a PBX 1. Analog E&M Signaling Type 1 did not pass the DSN preempt signals as required by the GSCR for the four types of preemption. Analog E&M Signaling Type 1 is not certified for use in the DSN. Analog instruments do not provide intra-switch call waiting. The operational impact is minor. The SUT's attendant console does not support automatic recall of attendant. The operational impact is minor. The SUT does not meet the GSCR exchange requirements for hotline services. Hotline services are not a critical requirement for a PBX 1. JITC verifies security via vendor LoC. Further testing IAW the IATP is required prior to being authorized connection approval. 																																																																																																																																																

Table 3-1. 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	NI 2 DID Tandem to ATVN
MPLR18622	Q00888789	This patch was developed to suppress password information on the switches in LD 22.
Legend: ATVN - Autovon CDR-Q - Call Detail Record - Queue CR - Call Report DID - Direct Inward Dial DSN - Defense Switched Network ID - Identification ISDN - Integrated Services Digital Network LD - Overlay MCDN - Meridian Customer Defined Network MPLR - Meridian Patch Library Reference NI 2 - National ISDN 2 SUT - System Under Test		