DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY TEST COMMAND
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IN REPLY REFER TO: Battlespace Communications Portfolio (JTE) 29 March 2007

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of Nortel Communication Server (CS) 2100 Digital Switching System with Software Release Succession Enterprise (SE)08 and specified Software Patch Groups

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

1. References (a) and (b) establish the Defense Information Systems Agency, Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.

2. The Nortel CS 2100 Digital Switching System with Software Release SE08 and specified Software Patch Groups is hereinafter referred to as the System Under Test (SUT). The SUT SE08 software load is a hybrid solution that includes both Voice over Internet Protocol and Time Division Multiplexing interfaces. The SUT meets the critical interoperability requirements and is certified as interoperable for joint use within the Defense Switched Network (DSN). The SUT was tested and met the critical interoperability requirements for the following DSN switch types: Multifunction Switch (MFS), End Office (EO), Small End Office (SMEO), Private Branch Exchange (PBX) 1, PBX 2, and Deployable Voice Exchange (DVX). The MFS and EO European Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) requirements for Europe are met by the SUT with the DSN Option 11C switching system with Software Release 4.5w and specified product enhancement packages. In this configuration, the DSN Option 11C is a tandem switch and is not authorized nor approved to support line side subscribers. The SUT meets the SMEO, PBX 1, PBX 2, and DVX requirements for Europe without the DSN Option 11C. The SUT offers an internal Automated Call Distributor (ACD) capability; however this capability does not meet the Multi-Level Precedence and Preemption (MLPP) interaction requirements in accordance with the GSCR. Furthermore, the MLPP interaction requirement is also not met with an external ACD system. Therefore, the SUT ACD capability is not authorized nor approved for use within the DSN with either an internal or external ACD. The SUT was tested and is certified with the following optional peripherals: Intelligent Peripheral Equipment Column (IPEC), Spectrum Peripheral Module (SPM), Media Gateway 9000 (MG9K), and the MG9K with Enhanced ISDN Line Concentration Module (LCME). The SUT is certified with or without any combination of these optional peripherals. The SUT is certified to support DSN assured services over Internet Protocol with any Assured

Services Voice Application Local Area Network (ASVALAN) on the DSN Approved Products List (APL). The SUT is also certified for joint use with any Voice Application Local Area Network (VALAN) on the DSN APL. However, since VALANs do not support the Assured Services Requirements detailed in reference (c), Command and Control (C2) users and Special C2 users are not authorized to be served by the SUT connected to a VALAN. 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 Remote Switching Unit (RSU) was tested but did not meet the critical interoperability requirements and is therefore not authorized nor approved for use in the DSN. 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 JITC and a review of the vendor's Letters of Compliance (LoC). Certification testing of the DSN Option 11C was completed on 18 December 2006 and documented in reference (c). Certification testing of the CS 2100 was conducted at JITC's Global Information Grid Network Test Facility at Fort Huachuca, Arizona from 15 August 2005 through 27 October 2006. Regression testing was conducted from 8 January through 12 February 2007. Review of the vendor's LoC was completed on 30 October 2006. Analysis of system data was completed on 12 March 2007. Additional testing was conducted with the DSN Option 11C as the vendor's proposed solution to satisfy the required MFS and EO European ISDN PRI interface for deployment in Europe from 21 May through 1 June 2007. Enclosure 2 documents the test results and describes the tested network and system configurations. System interoperability should be verified before deployment in an operational environment that varies significantly from the test environment.

4. The SUT interoperability test summary is listed in table 1. The MFS Capability Requirements (CRs) and Feature Requirements (FRs) are listed in table 2. The SUT specified patch groups and DSN Option 11C Product Enhancement Packages are listed in enclosure 3. This interoperability test summary is based on the SUT's ability to meet:

a. The following network interfaces as specified in reference (d): DSN, Defense Red Switch Network Gateway, Tactical Network Gateway, and Public Switched Telecommunications Network.

b. Interface and signaling requirements for trunk, line, and network management interfaces, and interoperability CRs and FRs derived from reference (e).

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

d. Review of the LoC submitted by Nortel.

e. Internet Protocol version 6 requirements specified in reference (e), paragraph 1.7, table 1-3, by 30 June 2008 in accordance with reference (g) verified through vendor submission of LoC.

Table 1. SUT Interoperability Summary

DSN Trunk Interfaces			
Interface & Signaling	**Critical**	**Status**	**Remarks**
T1 CAS (DTMF, MFR1, DP)	Yes	Certified	Met all CRs and FRs with the following exceptions: The SUT does not support the WWNDP in accordance with the GSCR.[1] The SUT does not retry direct route during failed wink condition or glare condition.[2]
E1 CAS (DTMF, MFR1, DP)	Yes (Europe only)	Certified	Met all CRs and FRs with the following exceptions: The SUT does not support the WWNDP in accordance with the GSCR.[1] The SUT does not retry direct route during failed wink condition or glare condition.[2]
E1 CAS (DTMF, DP)	Yes (Europe only)	Certified	Met all CRs and FRs with the following exceptions: The SUT does not support the WWNDP in accordance with the GSCR.[1] The SUT does not retry direct route during failed wink condition or glare condition.[2]
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all CRs and FRs with the following exception: The SUT does not support the WWNDP in accordance with the GSCR.[1]
E1 ISDN PRI (ITU-T Q.955.3)	Yes (Europe only)	Certified	Met all CRs and FRs with the following minor exceptions: The SUT does not support the WWNDP in accordance with the GSCR.[1] The MFS and EO European ISDN PRI requirements for Europe are met by the SUT with the DSN Option 11C switching system with Software Release 4.5w and specified product enhancement packages listed in enclosure 3.
T1 SS7 (ANSI T1.619a)	Yes	Certified	Met all CRs and FRs with the following exception: The SUT does not support the WWNDP in accordance with the GSCR.[1]
E1 SS7 (ITU-T Q.735.3)	Yes (Europe only)	Certified	Met all CRs and FRs with the following exception: The SUT does not support the WWNDP in accordance with the GSCR.[1]
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 exceptions: The SUT does not provide the correct precedence ring back cadence on an analog phone in accordance with the GSCR.[4] Improper MLPP interaction when calls are placed to a MLHG DN.[5]
ISDN BRI S/T and U Interface ITU-T Q.931	Yes	Certified	Met all CRs and FRs with the following minor exceptions: Improper MLPP interaction when calls are placed to a MLHG DN.[5] The SUT does not support MLPP interaction with MADN.[6] A member of an EKTS cannot be assigned as a member of an MLHG.[7]
2-Wire Digital and Analog (Proprietary)	No	Certified	Met all CRs and FRs with the following minor exceptions: Improper MLPP interaction when calls are placed to a MLHG DN.[5] The SUT does not support MLPP interaction with the MADN.[6]
VoIP	No	Certified	Met all CRs and FRs with the following minor exception: Improper MLPP interaction when calls are placed to a MLHG DN.[5]
Line-Side T1 CAS DTMF (Ground-Start)	No	Certified	Met all CRs and FRs. This interface is provided by the IPEC with a line side T1 interface and is certified exclusively for voicemail.
2 Wire Analog Ground Start Line (GR-506-CORE)	Yes	Certified	Met all CRs and FRs.
Voicemail			
Interface	**Critical**	**Status**	**Remarks**
Line-Side T1 CAS DTMF (Ground-Start)	No	Certified	Met all CRs and FRs. This interface is provided by the IPEC with a line side T1 interface and is certified exclusively for voicemail.
2 Wire Analog Ground Start Line (GR-506-CORE)	No	Certified	Met all CRs and FRs.
Network Management			
Interface & Signaling	**Critical**	**Status**	**Remarks**
IEEE 802.3 10BaseT Ethernet, TCP/IP	No[7]	Certified	Met all CRs and FRs.
EIA-232 Asynchronous at 9.6 kbps	No[7]	Certified	Met all CRs and FRs.
ITU-T X.25	No[7]	Certified	Met all CRs and FRs.

Table 1. SUT Interoperability Summary (continued)

DSN Features and Capabilities			
Features and Capabilities	**Critical**	**Status**	**Remarks**
Common Features	Yes	Certified	Met all CRs and FRs with the following minor exceptions: The SUT does not provide the correct conference disconnect tone in accordance with the GSCR.[9] CFV of all inter-switch calls do not forward to the DSN.[10] The SUT does not provide a splash ring on an ISDN BRI telephone when the telephone has the CFV feature assigned to the phone.[11]
Attendant	Yes	Certified	Met all CRs and FRs with the following three consoles: Amcom Software Inc. BOSS Version 4.0.5, File Version 4.1.8.2 MSAC Replacement, the Nortel MSL-100 NT4X09 hard console, and the T-Metrics PhoneGroups® Personal Computer-based Console with Software Release 7102081953.
Public Safety	Yes	Certified	Met all CRs and FRs.
Preset Conferencing	Yes	Certified	Met all CRs and FRs.
Nailed-up Connections	Yes	Certified	Met all CRs and FRs.
Precedence Access Threshold	No	Certified	Met all CRs and FRs.
DSN Hotline Services	Yes	Certified	Met all CRs and FRs.
Tandem Switching	Yes	Certified	Met all CRs and FRs.
ISDN Services (EKTS)	No	Not Certified	The SUT does not support MLPP with EKTS. The EKTS option is not authorized nor approved for use in the DSN.
Synchronization	Yes	Certified	Met all CRs and FRs.
Reliability	Yes	Certified	Met all CRs and FRs.
Security	Yes	See note 12.	See note 12.
RSU			
Features and Capabilities	**Critical**	**Status**	**Remarks**
Normal Operation	No	Not Certified	The RSU does not meet the GSCR requirements for certification. The RSU is not authorized nor approved for use in the DSN.
Degraded Operations	No	Not Certified	The SUT did not meet the following critical requirements in the degraded operations condition: MLPP is not supported during emergency standalone; MLPP is only partially met during the partial standalone when the umbilical is saturated. The RSU is not authorized nor approved for use in the DSN.
VoIP			
Features and Capabilities	**Critical**	**Status**	**Remarks**
VoIP Systems	No	Certified	The SUT is certified for VoIP with certified ASVALAN posted on the JITC DSN APL (http://jitc.fhu.disa.mil/tssi/apl.html). See notes 13 and 14.
Network Gateways			
Gateway / **Interface & Signaling**	**Critical**	**Status**	**Remarks**
PSTN — T1 CAS (DTMF, MFR1, DP)	Yes	Certified	Met all CRs and FRs.
PSTN — E1 CAS (DTMF, MFR1, DP)	Yes (Europe only)	Certified	Met all CRs and FRs.
PSTN — T1 ISDN PRI NI 1/2 (ANSI T1.607)	Yes	Certified	Met all CRs and FRs.
PSTN — E1 ISDN PRI (ITU-T Q.931)	Yes (Europe only)	Certified	Met all CRs and FRs with the following minor exception: The SUT does not meet full requirement for carrier alarms [3]. To meet the MFS and EO European ISDN PRI interface for deployment in Europe, the SUT requires the DSN Option 11C with Software Release 4.5w and Product Enhancement Packages listed in enclosure 3.
Tactical — T1 CAS (DTMF, MFR1, DP)	Yes	Certified	Met all CRs and FRs.
Tactical — E1 CAS (MFR1)	Yes (Europe only)	Certified	Met all CRs and FRs.
DRSN[15] — 2-Wire Analog (GR-506-CORE))	Yes	Certified	Met all CRs and FRs.

Table 1. SUT Interoperability Summary (continued)

LEGEND:

10BaseT	- 10 Mbps (Baseband Operation, Twisted Pair) Ethernet
802.3	- Standard for carrier sense multiple access with collision detection at 10 Mbps
ANSI	- American National Standards Institute
APL	- Approved Products List
ASVALAN	- Assured Services Voice Application Local Area Network
BOSS	- Basic Operator Services System
BRI	- Basic Rate Interface
C2	- Command and Control
CAS	- Channel Associated Signaling
CFV	- Call Forward Variable
CRs	- Capability Requirements
DCE	- Data Circuit-Terminating Equipment
DISA	- Defense Information Systems Agency
DN	- Directory Number
DP	- Dial Pulse
DRSN	- Defense Red Switch Network
DSN	- Defense Switched Network
DSS1	- Digital Subscriber Signaling 1
DTE	- Data Terminal Equipment
DTMF	- Dual Tone Multi-Frequency
E1	- European Basic Multiplex Rate (2.048 Mbps)
EIA	- Electronic Industries Alliance
EIA-232	- Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices
EKTS	- Electronic Key Telephone System
EO	- End Office
FRs	- Feature Requirements
GR	- Generic Requirement
GR-506-CORE	- Telcordia Signaling for Analog Interface Generic Requirement
GSCR	- Generic Switching Center Requirements
IEEE	- Institute of Electrical and Electronics Engineers, Inc.
IMP	- Impulses per minute
IPEC	- Intelligent Peripheral Equipment Column
IPv4	- Internet Protocol version 4
IPv6	- Internet Protocol version 6
ISDN	- Integrated Services Digital Network
ITU-T	- International Telecommunication Union - Telecommunication Standardization Sector
JITC	- Joint Interoperability Test Command
kbps	- kilobits per second
MADN	- Multiple Appearance Directory Number
Mbps	- Megabits per second
MFR1	- Multifrequency Recommendation 1
MFS	- Multifunction Switch
MLHG	- Multiline Hunt Group
MLPP	- Multi-Level Precedence and Preemption
MSAC	- Meridian Services Attendant Console
MSL	- Meridian Switching Load
NI 1/2	- National ISDN Standard 1 or 2
PM	- Program Manager
PRI	- Primary Rate Interface
PSTN	- Public Switched Telephone Network
Q.735.3	- SS7 Signaling Standard for E1 MLPP
Q.931	- Signaling Standard for ISDN
Q.955.3	- ISDN Signaling standard for E1 MLPP
RSU	- Remote Switching Unit
SE	- Succession Enterprise
SMEO	- Small End Office
SS7	- Signaling System 7
S/T	- ISDN BRI four-wire interface
SUT	- System Under Test
T1	- Digital Transmission Link Level 1 (1.544 Mbps)
T1.607	- ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
T1.619a	- SS7 and ISDN MLPP Signaling Standard for T1
TCP/IP	- Transmission Control Protocol/Internet Protocol
U	- ISDN BRI two-wire interface
VALAN	- Voice Application Local Area Network
VoIP	- Voice over Internet Protocol
WWNDP	- Worldwide Numbering and Dialing Plan
X.25	- Interface between DTE and DCE for terminals operating in the packet mode and connected to public data networks by dedicated circuit

NOTES:

1 The SUT does not support the WWNDP in accordance with the GSCR, section 4.5.1. The SUT supports an area code office code format of KYX and KNX (where K=is any digit 2-8, Y=0 or 1, N= any digit 2-9, and X= any digit 0-9). The new WWNDP requires a new format for area code and office code of KXX and KXX (where K= any digit 2-8 and X= any digit 0-9). This discrepancy currently has a minor operational impact in the DSN. Furthermore, the vendor has made a commitment in a formal letter from their Vice President to the DSN PM to develop a software patch to fix this discrepancy by the next software release SE09.1 and back patch it to SE08.

2 The SUT does not retry direct route during failed wink condition or glare condition. The SUT tries the direct route one time then completes the call over the alternate route. Since the call is correctly routed over the alternate route, there is no operational impact.

3 With the DSN 11C included to meet the SUT European ISDN PRI interface there exist a minor discrepancy when either the T1 or E1 interfaces are severed. When either the T1 ISDN PRI or E1 ISDN PRI interfaces are severed the respective carrier alarms are not propagated from one interface to the other. However, when this condition occurs, calls placed over this interface via the DSN 11C receive an appropriate treatment (T120 busy, or Isolated Code Announcement).

4 The SUT does not provide the correct precedence above ROUTINE ring back cadence on an analog phone in accordance with the GSCR. The GSCR requires 30 IMP. The SUT is providing precedence above ROUTINE ring back cadence of 40 IMP. Since the precedence above ROUTINE ring back cadence is distinguished from the ROUTINE ring back cadence, there is no operational impact.

5 When a member of a MLHG is busy and a higher precedence call is placed to the DN of that member (not the MLHG pilot number), the higher precedence call is forwarded to the next idle member of the MLHG. Since the higher precedence call is handled and will divert to an attendant console, night service or alternate DN, there is no operational impact.

6 The SUT does not support MLPP interaction with telephones assigned the MADN option. This option applies to EKTS ISDN BRI telephones, and proprietary "P Phones". The SUT does not support MLPP interaction with these instruments because the assignment of both preemptable and MADN options simultaneously on the same instrument is not permitted. Therefore, the MADN functionality of the SUT is not certified for use within the DSN. This is not a required feature for a MFS. The operational impact is minor.

7 A member of an EKTS cannot be assigned as a member of an MLHG. The SUT does not allow the assignment of an ISDN BRI with options DNH (Directory Number Hunt) and MDN (Multiple Appearance Directory Number). Therefore, the SUT is not certified with the EKTS feature. EKTS is a conditional requirement for an MFS. The operational impact is minor.

8 The Network Management requirements can be satisfied with one of the three following physical interfaces: Ethernet/TCP/IP (IEEE 802.3), Serial EIA-232/Asynchronous, or Serial Synchronous (ITU-T X.25).

9 The SUT does not provide the exact conference disconnect tone in accordance with the GSCR. The tone provided is the same tone provided to commercial customers. The tone currently being provided is distinct and will have no operational impact.

10 When CFV is assigned to a DN on the SUT, it will allow forwarding of all calls to the PSTN not the DSN. There is no operational impact because CFV is a conditional feature for a MFS.

11 The SUT does not provide a splash ring on an ISDN BRI telephone when the telephone has the CFV feature assigned to the phone. This discrepancy has a minor operational impact.

12 Security is tested by DISA-led Information Assurance test teams and published in a separate report.

13 The SUT is certified to support DSN assured services over Internet Protocol with any ASVALAN on the DSN APL. The SUT is also certified for joint use with any VALAN on the DSN APL. However, since VALANs do not support the Assured Services Requirements detailed in reference (c), C2 users and Special C2 users are not authorized to be served by the SUT connected to a VALAN.

14 An IPv6 capable system or product, as defined in the GSCR, paragraph 1.7, shall be capable of receiving, processing, and forwarding IPv6 packets and/or interfacing with other systems and protocols in a manner similar to that of IPv4. IPv6 capability is currently satisfied by a vendor Letter of Compliance signed by the Vice President of the company. The vendor stated, in writing, compliance to the following criteria by 30 June 2008**:**

a. Conformant with IPv6 standards profile contained in the Department of Defense Information Technology Standards Registry (DISR).
b. Maintaining interoperability in heterogeneous environments and with IPv4.
c. Commitment to upgrade as the IPv6 standard evolves.
d. Availability of contractor/vendor IPv6 technical support.

15 Interoperability certification of the SUT does not constitute DRSN PM approval for connectivity to the DRSN. It is the user's responsibility to request connectivity approval directly from the PM.

Table 2. MFS Requirements

Interface	Critical	Requirements Required or Conditional		References
DSN Trunk Interfaces				
T1 SS7 (ANSI T1.619a) E1 SS7 (ITU-T Q.735.3) T1 CAS (MFR1, DTMF, DP) E1 CAS (MFR1, DTMF, DP) T1 ISDN PRI NI 1/2 (ANSI T1.619a) E1 ISDN PRI (ITU-T Q.955.3)	Yes Yes (Europe only) Yes Yes (Europe only) Yes Yes (Europe Only)	Trunking	• Framing (R) • Line Code (R) • Signaling (R) • Alarms (R) • WWNDP (R) • Outpulsing digit formats (R: CAS only) • Routing (R) • Trunk Groups (R) • CAS to CCS trunk interworking (R) • PCM-24/PCM-30 Interoperation (R) • Direct Inward Dialing (R)	• GSCR Section 7 • GSCR Section 7 • GSCR Section 5 • GSCR Section 2.5.7, 7.1.4 & 7.2.2 • GSCR Section 4.5.1 • GSCR Section 4.5.2 • GSCR Section 4.2 • GSCR Section 2.5.5 & 2.5.6 • GSCR Section 3.10 • GSCR Section 7.3 • GSCR Section 2.3.2
		Voice	• MOS (R) • MLPP (R) • Secure calls (R)	• CJCSI 6215.01B • GSCR Section 3 • CJCSI 6215.01B
		Facsimile	• Analog: TIA/EIA-465-A (R)	• DISR
		Data	• Modem (VBD) (R) • 56 kbps switched data (R) • 64 kbps switched data (R: E1, PRI, and SS7) • NX56 synchronous BER (R) • NX64 synchronous BER (R: E1, PRI, and SS7) • Secure data (STE/STU-III) (R)	• CJCSI 6215.01B • GSCR Section 3.10 • GSCR Section 3.10 • GSCR Section 3.10 • GSCR Section 3.10 • CJCSI 6215.01B
		VTC	• ITU-T H.320 (R)	• DISR
DSN Line Interfaces				
2-Wire Analog ISDN BRI NI 1/2 (ANSI T1.619a) Proprietary IEEE 802.3 TCP/IP	Yes Yes No No	Access	• Directory Number Identification (R) • Line signaling (R) • Loop Start Line (R: 2-Wire Analog only) • Analog Ground Start (R) • Alerting Signals and Tones (R) • WWNDP (R) • Call Treatments (R) • 2W user access (R: 2-Wire Analog only) • Analog busy/idle (R: 2-Wire Analog only)	• GSCR Section 2.1.1 • GSCR Section 5.2 • GSCR Section 5.2.1 • GSCR Section 5.2.2 • GSCR Section 5.5 • GSCR Section 4.5 • GSCR Section 4.1 • GSCR Section 4.3.3 • GSCR Section 4.3.4.1
		Voice	• MOS (R) • Announcements (R) • MLPP (R) • Secure Calls (R)	• CJCSI 6215.01B • GSCR Section 3.1.3 • GSCR Section 3.4.3/3.9 • CJCSI 6215.01B
		Facsimile	• Analog: TIA/EIA-465-A (R)	• DISR
		Data	• Modem (VBD) (R: 2W analog only) • 56 kbps switched data (R: BRI only) • 64 kbps switched data (R: BRI only) • NX56 synchronous BER (R: BRI only) • NX64 synchronous BER (R: BRI only) • Secure data (STE/STU-III) (R)	• CJCSI 6215.01B • GSCR Section 3.10 • GSCR Section 3.10 • GSCR Section 3.10 • GSCR Section 3.10 • CJCSI 6215.01B
		VTC	• ITU-T H.320 (R: BRI only)	• DISR
SUT Voice Mail interfaces				
2 Wire Analog (Ground Start) T1 CAS (DTMF) (Ground Start)	No	• FCC Part15/Part 68 (R): Analog only • DTMF outpulsing (C) • DISR compliance as applicable (R) • ROUTINE precedence only in accordance with GSCR, Section 3.3 (R) • TIA/EIA-470-B (R): Analog only		• GSCR A7.5 • GSCR A7.5, 5.4.1, 5.4.2 • GSCR A7.5 • GSCR A7.5.5 • GSCR A7.5.1

Table 2. MFS Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
Common Features	Yes	• Selective call rejection (C) • Denied originating service (C) • Code restriction and diversion (R) • Call waiting (C) • Three-way calling (C) • Add-on transfer, conference calling, and call hold (C) • Call forwarding (C) • Call pick-up (C)	• GSCR Section 2.1.2 • GSCR Section 2.1.3 • GSCR Section 2.1.4 • GSCR Section 2.1.5 • GSCR Section 2.1.6 • GSCR Section 2.1.7 • GSCR Section 2.1.8 • GSCR Section 2.1.9
Attendant	Yes	• Initiate all precedence levels (R) • Visual display (R) • Override class of service (R) • Override busy line (R) • Call deflection (R) • Auto recall (R) • Waiting queue (R) • Release to pivot (R: SS7 only)	• GSCR Section 2.2.1 • GSCR Section 2.2.2 • GSCR Section 2.2.3 • GSCR Section 2.2.4 • GSCR Section 2.2.5 • GSCR Section 2.2.6 • GSCR Section 2.2.7 • GSCR Section 2.2.8
Public Safety	Yes	• Basic Emergency Service (911) (C) • Trace of terminating calls (R) • Outgoing call trace (R) • Tandem call trace (R) • Trace of a call in progress (R)	• GSCR Section 2.4.1 • GSCR Section 2.4.2 • GSCR Section 2.4.3 • GSCR Section 2.4.4 • GSCR Section 2.4.5
Preset Conferencing	Yes	• Support 10 bridges; 1 originator and 20 conferees per bridge (R) • Assign up to 20 address numbers per bridge (R) • Use KXX codes for bridge access (R) • Conference notification recorded announcement (R) • Auto retrial and alternate address (R) • Bridge release (R) • Lost connection (R) • Secondary conferencing (R) • Address translation (R)	• GSCR Section 2.6 • GSCR Section 2.6 • GSCR Section 2.6 • GSCR Section 2.6.1 • GSCR Section 2.6.2 • GSCR Section 2.6.3 • GSCR Section 2.6.4 • GSCR Section 2.6.5 • GSCR Section 2.7
Nailed-up Connections	Yes	• Between any two like terminations (R) • PCM-24 and PCM-30, both CAS and CCS (R) • Supervision passed end-to-end for A/D or D/A (R) • Monitored and auto reconfigure (R) • Support at least 10% of circuits as nailed-up (R) • Non-preemptable (R)	• GSCR Section 2.8 • GSCR Section 2.8 • GSCR Section 2.8 • GSCR Section 2.8 • GSCR Section 2.8 • GSCR Section 2.8
PAT	No	• Classmark for/not for PAT screening (C) • 7 PAT mechanisms (C) • Outgoing call screening (C) • 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)	• GSCR Section 2.11.1 • GSCR Section 2.11.1 • GSCR Section 2.11.1.1 • GSCR Section 2.11.1.2 • GSCR Section 2.11.1.3 • GSCR Section 2.11.1.4 • GSCR Section 2.11.1.5 • GSCR Section 2.11.1.6 • GSCR Section 2.11.1.7 • GSCR Section 2.11.1.8 • GSCR Section 2.11.1.9 • GSCR Section 2.11.1.10
DSN Hotline Services	Yes	• Hotline restrictions (R) • Auto initiate (R) • Analog and digital (R) • Subscription basis (R) • Protected hotline calling (R) • WWNDP interoperable (R)	• GSCR Section 2.12 • GSCR Section 2.12 • GSCR Section 2.12 • GSCR Section 2.12 • GSCR Section 2.12.1-4 • GSCR Section 2.12.5

Table 2. MFS Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
Tandem Switching	Yes	• Tandem Features (R)	• GSCR Section 8 table 8-1
Network Management	Yes	• Interfaces (R) • Measurements and data generation (R) • Fault management (R) • Configuration management (R) • Accounting management (R) • Performance management (R) • Network Management controls (R) • Remote access (R)	• GSCR Section 9.1 • GSCR Section 9.2 • GSCR Section 9.3 • GSCR Section 9.4 • GSCR Section 9.5 • GSCR Section 9.6 • GSCR Section 9.7 • GSCR Section 9.8
ISDN Services	No	• Electronic Key Telephone Systems (EKTS) (C)	• GSCR Section 10, table 10-3
Synchronization	Yes	• External line timing mode (R) • Line timing mode (R) • Internal Stratum 3 (R)	• GSCR Section 11.1.1.1 • GSCR Section 11.1.1.2 • GSCR Section 11.1.2.1
Reliability	Yes	• GR-512-CORE (R)	• GSCR Section12
Security	Yes	• GR-815, STIGs, and DIACAP (replacement for DITSCAP) (R)	• GSCR Section 13
RSU			
Normal Operations	No	RSU function is conditional. If an RSU is provided, **all** of the following requirements must be met: • Same user features as EO, SMEO, or PBX • Normal operations in accordance with GR-532-CORE • If EO, provide diverse routing to host and PSTN	 • GSCR Section 2.10.2 • GSCR Section 2.10.2 • GSCR Section 2.10.2
Degraded Operations	No	RSU function is conditional. If an RSU is provided, **all** of the following requirements must be met: • Stand-alone - Stand-alone in accordance with GR-532-CORE - Automated Message Accounting not required - MLPP required • Partial stand-alone operations - Partial in accordance with GR-532-CORE - 3% users provided assured dial tone - Normal MLPP interaction	 • GSCR Section 2.10.3.1 • GSCR Section 2.10.3.2
VoIP			
VoIP System	No	VoIP function is conditional. If VoIP is provided, **all** of the following requirements must be met: • MOS 4.0 or better • ITU-T G.711 PCM Codec • Security • Network Management • Line timing • Internal Clock • Latency ≤ 60 milliseconds • IPv6 capable	 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3, paragraph 1.7

Table 2. MFS Requirements (continued)

Network Gateways				
Gateway	**Critical**	**Requirements Required or Conditional**		**References**
PSTN[1]	Yes	Trunking	• Positive Identification Control (R) • On-Netting (R) • Off-Netting (R)	• CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B
Tactical[2]	Yes	Trunking	• Trunk Groups (R) • Call Processing (R)	• GSCR Section 2.5.5 & 2.5.6 • GSCR Section 4
		Voice	• MLPP (R) • Secure calls (R)	• GSCR Section 3 • CJCSI 6215.01B
		Facsimile	• Analog: TIA/EIA-465-A (R)	• DISR
DRSN[3]	Yes	Access	• Alerting Signals and Tones (R) • Call Processing (R) • Call Treatments (R) • Analog busy/idle (R)	• GSCR Section 5.5 • GSCR Section 4.4 • GSCR Section 4.1 • GSCR Section 4.3.4.1
		Voice	• MOS (R) • MLPP (R) • Secure calls (R)	• CJCSI 6215.01B • GSCR Section 3 • CJCSI 6215.01B

LEGEND:

2W - 2-Wire
A/D - Analog to Digital Conversion
ANSI - American National Standards Institute
BER - Bit Error Ratio
BRI - Basic Rate Interface
C - Conditional
CAS - Channel Associated Signaling
CCS - Common Channel Signaling
CJCS - Chairman of the Joint Chiefs of Staff
CJCSI - CJCS Instruction
D/A - Digital to Analog Conversion
DIACAP - DoD Information Assurance Certification and Accreditation Process
DISA - Defense Information Systems Agency
DISR - DoD IT Standards Registry
DITSCAP - DoD IT Security Certification and Accreditation Process
DoD - Department of Defense
DP - Dial Pulse
DRSN - Defense Red Switch Network
DSN - Defense Switched Network
DTMF - Dual Tone Multi-Frequency
E1 - European Basic Multiplex Rate (2.048 Mbps)
EIA - Electronic Industries Alliance
EO - End Office
FCC - Federal Communications Commision
G.711 - Standard for PCM of Voice Frequencies
GR - Generic Requirement
GR-512 - LSSGR: Reliability, Section 12
GR-532 - LSSGR: Call Processing Features
GR-815 - Generic Requirements For Network Element/Network System (NE/NS) Security
GSCR - Generic Switching Center Requirements
H.320 - Standard for Narrowband VTC
IEEE - Institute of Electrical and Electronics Engineers, Inc.
IPv6 - Internet Protocol version 6
ISDN - Integrated Services Digital Network
IT - Information Technology
ITU-T - International Telecommunication Union - Telecommunication Standardization Sector
kbps - kilobits per second
KXX - K= any number 2-8; X= any number 1-9
LSSGR - Local Access and Transport Area (LATA) Switching Systems Generic Requirements
Mbps - Megabits per second
MFR1 - Multi-Frequency Recommendation 1
MFS - Multifunction Switch
MLPP - Multi-Level Precedence and Preemption
MOS - Mean Opinion Score
NI 1/2 - National ISDN Standard 1 or 2
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 - Pulse Code Modulation
PCM-24 - Pulse Code Modulation - 24 Channels
PCM-30 - Pulse Code Modulation - 30 Channels
PRI - Primary Rate Interface
PSTN - Public Switched Telephone Network
Q.735.3 - SS7 Signaling Standard for E1 MLPP
Q.955.3 - ISDN Signaling standard for E1 MLPP
R - Required
RSU - Remote Switching Unit
SMEO - Small End Office
SMU - Switch Multiplexer Unit
SS7 - Signaling System 7
STE - Secure Terminal Equipment
STIGs - Security Technical Implementation Guides
STU-III - Secure Telephone Unit - 3rd generation
T1 - Digital Transmission Link Level 1 (1.544 Mbps)
T1.619a - SS7 and ISDN MLPP Signaling Standard for T1
TIA - Telecommunications Industry Association
TIA/EIA-465-A - Group 3 Facsimile Apparatus for Document Transmission
TIA/EIA-470-B - Performance and Compatibility Requirements for Telephone Sets with Loop Signaling
VBD - Variable bit data
VoIP - Voice over Internet Protocol
VTC - Video Teleconferencing
WWNDP - Worldwide Numbering and Dialing Plan

NOTES:

1 Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.
2 Data and VTC services are not provided via the DSN to tactical (SMU) interface.
3 Facsimile, data, and VTC services are not provided via the DSN to DRSN interface.

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

JITC Memo, JTE, Special Interoperability Test Certification of Nortel Communication Server (CS) 2100 Digital Switching System with Software Release Succession Enterprise (SE)08 and specified Software Patch Groups

6. The JITC point of contact is Capt. Oskar Widecki, DSN 879-5269, commercial (520) 538-5269, FAX DSN 879-4347, or e-mail oskar.widecki@disa.mil. The tracking number for the SUT is 42322.

FOR THE COMMANDER:

3 Enclosures a/s

MANUEL H. GARCIA, JR.
Chief
Battlespace Communications Portfolio

Distribution:
Joint Staff J6I, Room 1E596, Pentagon, Washington, DC 20318-6000
Joint Interoperability Test Command, Liaison, ATTN: TED/JT1, 2W24-8C, P.O. Box 4502, Falls Church, VA 22204-4502
Defense Information Systems Agency, Net-Centricity Requirements and Assessment Branch, ATTN: GE333, Room 244, P.O. Box 4502, Falls Church, VA 22204-4502
Office of Chief of Naval Operations (N71CC2), CNO N6/N7, 2000 Navy Pentagon, Washington, DC 20350
Headquarters U.S. Air Force, AF/XICF, 1800 Pentagon, Washington, DC 20330-1800
Department of the Army, Office of the Secretary of the Army, CIO/G6, ATTN: SAIS-IOQ, 107 Army Pentagon, Washington, DC 20310-0107
U.S. Marine Corps (C4ISR), MARCORSYSCOM, 2200 Lester St., Quantico, VA 22134-5010
DOT&E, Net-Centric Systems and Naval Warfare, 1700 Defense Pentagon, Washington, DC 20301-1700
U.S. Coast Guard, CG-64, 2100 2nd St. SW, Washington, DC 20593
Defense Intelligence Agency, 2000 MacDill Blvd., Bldg 6000, Bolling AFB, Washington, DC 20340-3342
National Security Agency, ATTN: DT, Suite 6496, 9800 Savage Road, Fort Meade, MD 20755-6496
Director, Defense Information Systems Agency, ATTN: GS235, Room 5W24-8A, P.O. Box 4502, Falls Church, VA 22204-4502
Office of Assistant Secretary of Defense (NII)/DoD CIO, Crystal Mall 3, 7th Floor, Suite 7000, 1851 S. Bell St., Arlington, VA 22202
Office of Under Secretary of Defense, AT&L, Room 3E144, 3070 Defense Pentagon, Washington, DC 20301
U.S. Joint Forces Command, J68, Net-Centric Integration, Communications, and Capabilities Division, 1562 Mitscher Ave., Norfolk, VA 23551-2488
Defense Information Systems Agency (DISA), ATTN: GS23 (Mr. Osman), Room 5W23, 5275 Leesburg Pike (RTE 7), Falls Church, VA 22041

ADDITIONAL REFERENCES

(c) Joint Interoperability Test Command (JITC), Memo, "Special Interoperability Test Certification of Nortel Defense Switched Network (DSN) Communications Server (CS) 1000M Cabinet and CS1000M Chassis (including Voice over Internet Protocol [VoIP]) and DSN Option 11C Digital Switching Systems with Software Release 4.5w and Product Enhancement Packages," 7 March 2007

(d) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001

(e) Defense Information Systems Agency (DISA), "Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR), Incorporated Change 1," 1 March 2005

(f) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 1, Revision 1," 1 June 2005

(g) Executive Office of the President, "Transition Planning for Internet Protocol version 6 (IPv6)," 2 August 2005

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Nortel Communication Server (CS) 2100 Digital Switching System with Software Release Succession Enterprise (SE)08 and specified Software Patch Groups is hereinafter referred to as the System Under Test (SUT).

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

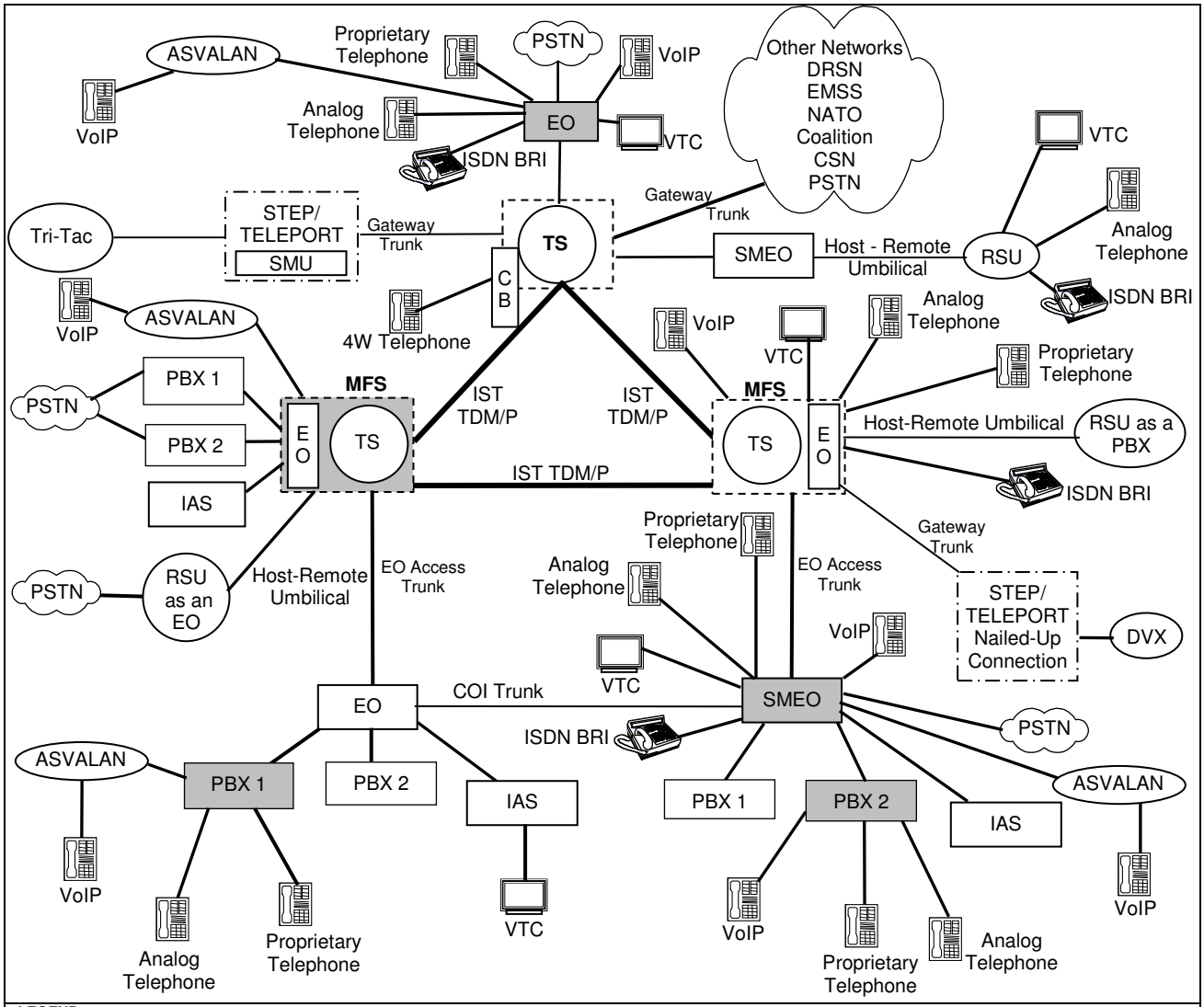
3. PROGRAM MANAGER. Mr. Howard Osman, GS23, Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, E-mail: Howard.Osman@disa.mil.

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

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is the largest member of the Meridian 1 family of business communications systems. The SUT is based on the Succession CS 2000 platform. The SUT SE08 software load is a hybrid solution that includes both Voice over Internet Protocol (VoIP) and Time Division Multiplexing (TDM) interfaces. The SUT is a carrier-grade switching system for large campus and geographically dispersed large enterprises. The SUT can support a maximum capacity of 1.65 million busy hour call attempts, 165,000 clients (not including trunks), and 56,000 simultaneous calls. The SUT has an overall maximum capacity of 165,000 trunk and/or endpoints. Within this capacity, the following limits apply to different endpoint types: 48,000 Primary Interface trunks, 130,000 analog subscriber lines, and 3,808 inter-node VoIP hosts. The SUT offers an internal Automated Call Distributor (ACD) capability; however this capability does not meet the Multi-Level Precedence and Preemption (MLPP) interaction requirements in accordance with the GSCR. Furthermore, the MLPP interaction requirement is also not met with an external ACD system. Therefore, the SUT ACD capability is not authorized nor approved for use within the Defense Switched Network (DSN) with either an internal or external ACD. The SUT optional Media Gateway 9000 (MG9K) will support a maximum capacity of 1,952 analog lines and 732 M5000 proprietary business sets. If the MG9K is included with an optional Line Trunk Controller (LTC) with Enhanced Integrated Services Digital Network (ISDN) Line Concentration Modules (LCMEs), it will have an additional capacity of 7,720 analog, ISDN, or proprietary digital sets. The optional Intelligent Peripheral Equipment Column (IPEC) was tested with the SUT to provide Line Side T1 interface with ground start signing to the Call Pilot voicemail system only. The Spectrum Peripheral Module (SPM) provides Digital Transmission Link Level 1 (T1) and European Basic Multiplex Rate (E1) mapping with a direct Optical Carrier Level 3 interface to the SUT. Previous software and hardware configurations within this product line are currently deployed in Europe, the Pacific, and are the backbone Digital Switching System for Continental United States. The SUT supports the following trunk interfaces: T1 Signaling System 7 (SS7), E1 SS7, T1 Channel Associated Signaling (CAS), E1 CAS, T1 ISDN Primary Rate Interface (PRI). The SUT was tested and met the critical interoperability requirements for the following DSN switch types: Multifunction Switch (MFS), End Office (EO), Small End Office (SMEO), Private Branch Exchange (PBX) 1, PBX 2, and Deployable Voice Exchange (DVX). The MFS and EO

European ISDN PRI requirements for Europe are met by the SUT with the DSN Option 11C switching system with Software Release 4.5w and specified product enhancement packages listed in enclosure 3. In this configuration, the DSN Option 11C is a tandem switch and is not authorized nor approved to support line side subscribers. The SUT meets the SMEO, PBX 1, PBX 2, and DVX requirements for Europe without the DSN Option 11C. The SUT was tested and is certified with the following optional peripherals: IPEC, SPM, MG9K, and the MG9K with LCME. The SUT is certified with or without any combination of these optional peripherals. The SUT offers a Remote Switching Unit (RSU). The RSU was tested but did not meet the critical interoperability requirements and is therefore not authorized nor approved for use in the DSN.

6. OPERATIONAL ARCHITECTURE. The DSN architecture is a two-level network hierarchy consisting of DSN backbone switches and Service/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 MFSs. The Generic Switching Center Requirements (GSCR) operational DSN Architecture is depicted in figure 2-1. The architecture depicts the relationship of MFSs to the other DSN switch types.



LEGEND:

4W	- 4-Wire
ASVALAN	- Assured Services Voice Application Local Area Network
BRI	- Basic Rate Interface
CB	- Channel Bank
COI	- Community of Interest
CSN	- Canadian Switch Network
DRSN	- Defense Red Switch Network
DSN	- Defense Switched Network
DVX	- Deployable Voice Exchange
EMSS	- Enhanced Mobile Satellite System
EO	- End Office
IAS	- Integrated Access Switch
ISDN	- Integrated Services Digital Network
IST	- Interswitch Trunk
MFS	- Multifunction Switch
NATO	- North Atlantic Treaty Organization
PBX	- Private Branch Exchange
PBX 1	- Private Branch Exchange 1
PBX 2	- Private Branch Exchange 2
PSTN	- Public Switched Telephone Network
RSU	- Remote Switching Unit
SMEO	- Small End Office
SMU	- Switched Multiplex Unit
STEP	- Standardized Tactical Entry Point
TDM/P	- Time Division Multiplex/Packetized
Tri-Tac	- Tri-Service Tactical Communications Program
TS	- Tandem Switch
VoIP	- Voice over Internet Protocol
VTC	- Video Teleconferencing
	- System Under Test

Figure 2-1. DSN Architecture

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

a. DSN services for Network and Applications specified in Chairman of the 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 Letters of Compliance (LoC).

c. GSCR MFS Capability Requirements (CRs) and Feature Requirements (FRs) verified through JITC testing and/or vendor submission of LoC.

d. Internet Protocol version 6 requirements specified in reference (e), paragraph 1.7, table 1-3, by 30 June 2008 in accordance with reference (g) verified through vendor submission of LoC.

Table 2-1. MFS Requirements

DSN Trunk Interfaces				
Interface	**Critical**	**Requirements Required or Conditional**		**References**
T1 SS7 (ANSI T1.619a)	Yes	Trunking	• Framing (R) • Line Code (R) • Signaling (R) • Alarms (R)	• GSCR Section 7 • GSCR Section 7 • GSCR Section 5 • GSCR Section 2.5.7, 7.1.4 & 7.2.2
E1 SS7 (ITU-T Q.735.3)	Yes (Europe only)		• WWNDP (R) • Outpulsing digit formats (R: CAS only) • Routing (R) • Trunk Groups (R)	• GSCR Section 4.5.1 • GSCR Section 4.5.2 • GSCR Section 4.2 • GSCR Section 2.5.5 & 2.5.6
T1 CAS (MFR1, DTMF, DP)	Yes		• CAS to CCS trunk interworking (R) • PCM-24/PCM-30 Interoperation (R) • Direct Inward Dialing (R)	• GSCR Section 3.10 • GSCR Section 7.3 • GSCR Section 2.3.2
E1 CAS (MFR1, DTMF, DP)	Yes (Europe only)	Voice	• MOS (R) • MLPP (R) • Secure calls (R)	• CJCSI 6215.01B • GSCR Section 3 • CJCSI 6215.01B
		Facsimile	• Analog: TIA/EIA-465-A (R)	• DISR
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Data	• Modem (VBD) (R) • 56 kbps switched data (R) • 64 kbps switched data (R: E1, PRI, and SS7) • NX56 synchronous BER (R) • NX64 synchronous BER (R: E1, PRI, and SS7) • Secure data (STE/STU-III) (R)	• CJCSI 6215.01B • GSCR Section 3.10 • GSCR Section 3.10 • GSCR Section 3.10 • GSCR Section 3.10 • CJCSI 6215.01B
E1 ISDN PRI (ITU-T Q.955.3)	Yes (Europe Only)	VTC	• ITU-T H.320 (R)	• DISR

Table 2-1. MFS Requirements (continued)

DSN Line Interfaces				
2-Wire Analog ISDN BRI NI 1/2 (ANSI T1.619a) Proprietary IEEE 802.3 TCP/IP	Yes Yes No No	Access	• Directory Number Identification (R) • Line signaling (R) • Loop Start Line (R: 2-Wire Analog only) • Analog Ground Start (R) • Alerting Signals and Tones (R) • WWNDP (R) • Call Treatments (R) • 2W user access (R: 2-Wire Analog only) • Analog busy/idle (R: 2-Wire Analog only)	• GSCR Section 2.1.1 • GSCR Section 5.2 • GSCR Section 5.2.1 • GSCR Section 5.2.2 • GSCR Section 5.5 • GSCR Section 4.5 • GSCR Section 4.1 • GSCR Section 4.3.3 • GSCR Section 4.3.4.1
		Voice	• MOS (R) • Announcements (R) • MLPP (R) • Secure Calls (R)	• CJCSI 6215.01B • GSCR Section 3.1.3 • GSCR Section 3.4.3/3.9 • CJCSI 6215.01B
		Facsimile	• Analog: TIA/EIA-465-A (R)	• DISR
		Data	• Modem (VBD) (R: 2W analog only) • 56 kbps switched data (R: BRI only) • 64 kbps switched data (R: BRI only) • NX56 synchronous BER (R: BRI only) • NX64 synchronous BER (R: BRI only) • Secure data (STE/STU-III) (R)	• CJCSI 6215.01B • GSCR Section 3.10 • GSCR Section 3.10 • GSCR Section 3.10 • GSCR Section 3.10 • CJCSI 6215.01B
		VTC	• ITU-T H.320 (R: BRI only)	• DISR
SUT Voice Mail interfaces				
Interface	**Critical**	**Requirements Required or Conditional**		**References**
2 Wire Analog (Ground Start) T1 CAS (DTMF) (Ground Start)	No	• FCC Part15/Part 68 (R): Analog only • DTMF outpulsing (C) • DISR compliance as applicable (R) • ROUTINE precedence only in accordance with GSCR, Section 3.3 (R) • TIA/EIA-470-B (R): Analog only		• GSCR A7.5 • GSCR A7.5, 5.4.1, 5.4.2 • GSCR A7.5 • GSCR A7.5.5 • GSCR A7.5.1
DSN Features & Capabilities				
Feature/ Capability	**Critical**	**Requirements Required or Conditional**		**References**
Common Features	Yes	• Selective call rejection (C) • Denied originating service (C) • Code restriction and diversion (R) • Call waiting (C) • Three-way calling (C) • Add-on transfer, conference calling, and call hold (C) • Call forwarding (C) • Call pick-up (C)		• GSCR Section 2.1.2 • GSCR Section 2.1.3 • GSCR Section 2.1.4 • GSCR Section 2.1.5 • GSCR Section 2.1.6 • GSCR Section 2.1.7 • GSCR Section 2.1.8 • GSCR Section 2.1.9
Attendant	Yes	• Initiate all precedence levels (R) • Visual display (R) • Override class of service (R) • Override busy line (R) • Call deflection (R) • Auto recall (R) • Waiting queue (R) • Release to pivot (R: SS7 only)		• GSCR Section 2.2.1 • GSCR Section 2.2.2 • GSCR Section 2.2.3 • GSCR Section 2.2.4 • GSCR Section 2.2.5 • GSCR Section 2.2.6 • GSCR Section 2.2.7 • GSCR Section 2.2.8
Public Safety	Yes	• Basic Emergency Service (911) (C) • Trace of terminating calls (R) • Outgoing call trace (R) • Tandem call trace (R) • Trace of a call in progress (R)		• GSCR Section 2.4.1 • GSCR Section 2.4.2 • GSCR Section 2.4.3 • GSCR Section 2.4.4 • GSCR Section 2.4.5

Table 2-1. MFS Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	**Critical**	**Requirements Required or Conditional**	**References**
Preset Conferencing	Yes	• Support 10 bridges; 1 originator and 20 conferees per bridge (R) • Assign up to 20 address numbers per bridge (R) • Use KXX codes for bridge access (R) • Conference notification recorded announcement (R) • Auto retrial and alternate address (R) • Bridge release (R) • Lost connection (R) • Secondary conferencing (R) • Address translation (R)	• GSCR Section 2.6 • GSCR Section 2.6 • GSCR Section 2.6 • GSCR Section 2.6.1 • GSCR Section 2.6.2 • GSCR Section 2.6.3 • GSCR Section 2.6.4 • GSCR Section 2.6.5 • GSCR Section 2.7
Nailed-up Connections	Yes	• Between any two like terminations (R) • PCM-24 and PCM-30, both CAS and CCS (R) • Supervision passed end-to-end for A/D or D/A (R) • Monitored and auto reconfigure (R) • Support at least 10% of circuits as nailed-up (R) • Non-preemptable (R)	• GSCR Section 2.8 • GSCR Section 2.8 • GSCR Section 2.8 • GSCR Section 2.8 • GSCR Section 2.8 • GSCR Section 2.8
PAT	No	• Classmark for/not for PAT screening (C) • 7 PAT mechanisms (C) • Outgoing call screening (C) • 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)	• GSCR Section 2.11.1 • GSCR Section 2.11.1 • GSCR Section 2.11.1.1 • GSCR Section 2.11.1.2 • GSCR Section 2.11.1.3 • GSCR Section 2.11.1.4 • GSCR Section 2.11.1.5 • GSCR Section 2.11.1.6 • GSCR Section 2.11.1.7 • GSCR Section 2.11.1.8 • GSCR Section 2.11.1.9 • GSCR Section 2.11.1.10
DSN Hotline Services	Yes	• Hotline restrictions (R) • Auto initiate (R) • Analog and digital (R) • Subscription basis (R) • Protected hotline calling (R) • WWNDP interoperable (R)	• GSCR Section 2.12 • GSCR Section 2.12 • GSCR Section 2.12 • GSCR Section 2.12 • GSCR Section 2.12.1-4 • GSCR Section 2.12.5
Tandem Switching	Yes	• Tandem Features (R)	• GSCR Section 8 table 8-1
Network Management	Yes	• Interfaces (R) • Measurements and data generation (R) • Fault management (R) • Configuration management (R) • Accounting management (R) • Performance management (R) • Network Management controls (R) • Remote access (R)	• GSCR Section 9.1 • GSCR Section 9.2 • GSCR Section 9.3 • GSCR Section 9.4 • GSCR Section 9.5 • GSCR Section 9.6 • GSCR Section 9.7 • GSCR Section 9.8
ISDN Services	No	• Electronic Key Telephone Systems (EKTS) (C)	• GSCR Section 10, table 10-3
Synchronization	Yes	• External line timing mode (R) • Line timing mode (R) • Internal Stratum 3 (R)	• GSCR Section 11.1.1.1 • GSCR Section 11.1.1.2 • GSCR Section 11.1.2.1
Reliability	Yes	• GR-512-CORE (R)	• GSCR Section12
Security	Yes	• GR-815, STIGs, and DIACAP (replacement for DITSCAP) (R)	• GSCR Section 13

Table 2-1. MFS Requirements (continued)

RSU				
Normal Operations	No	RSU function is conditional. If an RSU is provided, **all** of the following requirements must be met: • Same user features as EO, SMEO, or PBX • Normal operations in accordance with GR-532-CORE • If EO, provide diverse routing to host and PSTN		• GSCR Section 2.10.2 • GSCR Section 2.10.2 • GSCR Section 2.10.2
Degraded Operations	No	RSU function is conditional. If an RSU is provided, **all** of the following requirements must be met: • Stand-alone - Stand-alone in accordance with GR-532-CORE - Automated Message Accounting not required - MLPP required • Partial stand-alone operations - Partial in accordance with GR-532-CORE - 3% users provided assured dial tone - Normal MLPP interaction		• GSCR Section 2.10.3.1 • GSCR Section 2.10.3.2
VoIP				
VoIP System	No	VoIP function is conditional. If VoIP is provided, **all** of the following requirements must be met: • MOS 4.0 or better • ITU-T G.711 PCM Codec • Security • NM • Line timing • Internal Clock • Latency ≤ 60 milliseconds • IPv6 capable		• GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3 • GSCR Appendix 3, paragraph 1.7
Network Gateways				
Gateway	**Critical**	**Requirements Required or Conditional**		**References**
PSTN[1]	Yes	Trunking	• Positive Identification Control (R) • On-Netting (R) • Off-Netting (R)	• CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B
Tactical[2]	Yes	Trunking	• Trunk Groups (R) • Call Processing (R)	• GSCR Section 2.5.5 & 2.5.6 • GSCR Section 4
		Voice	• MLPP (R) • Secure calls (R)	• GSCR Section 3 • CJCSI 6215.01B
		Facsimile	• Analog: TIA/EIA-465-A (R)	• DISR
DRSN[3]	Yes	Access	• Alerting Signals and Tones (R) • Call Processing (R) • Call Treatments (R) • Analog busy/idle (R)	• GSCR Section 5.5 • GSCR Section 4.4 • GSCR Section 4.1 • GSCR Section 4.3.4.1
		Voice	• MOS (R) • MLPP (R) • Secure calls (R)	• CJCSI 6215.01B • GSCR Section 3 • CJCSI 6215.01B

Table 2-1. MFS Requirements (continued)

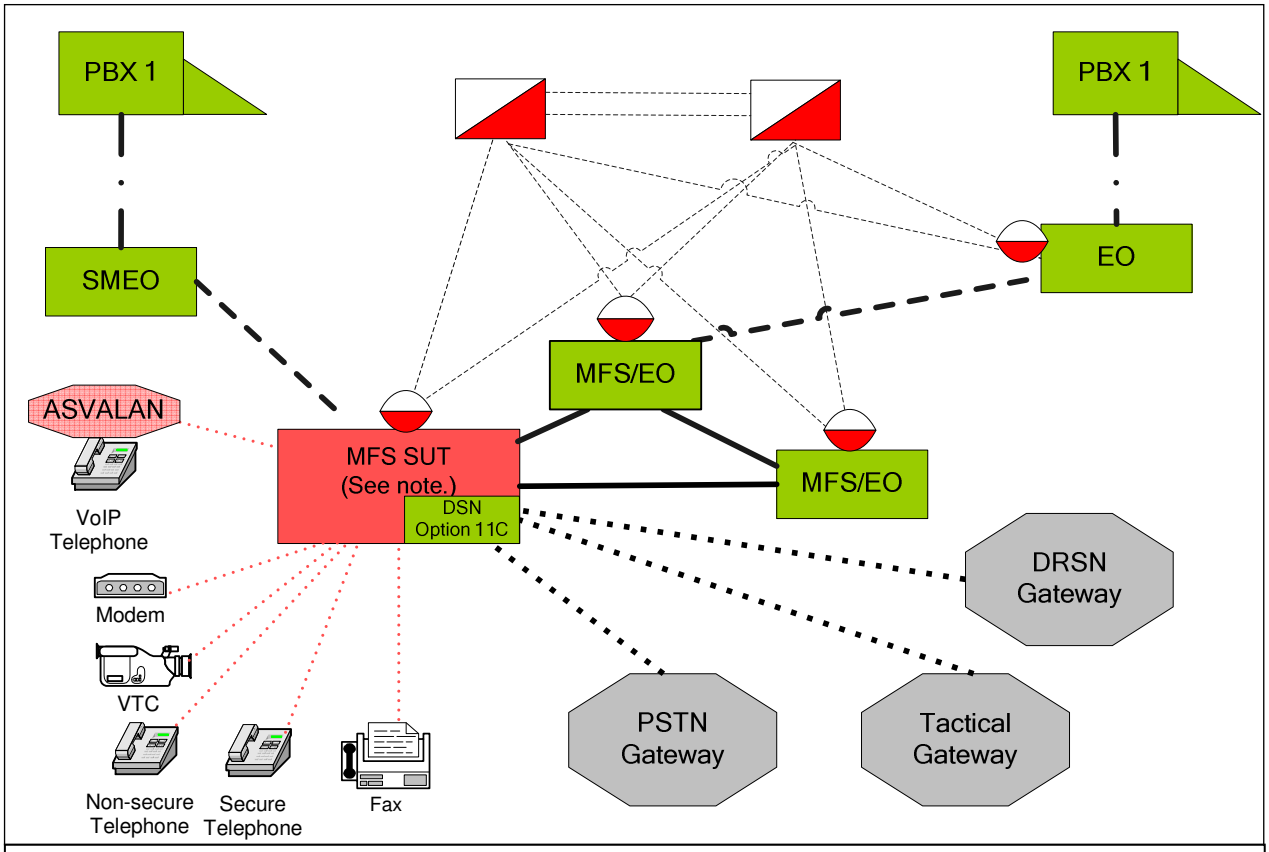
LEGEND:

2W	- 2-Wire
A/D	- Analog to Digital Conversion
ANSI	- American National Standards Institute
BER	- Bit Error Ratio
BRI	- Basic Rate Interface
C	- Conditional
CAS	- Channel Associated Signaling
CCS	- Common Channel Signaling
CJCS	- Chairman of the Joint Chiefs of Staff
CJCSI	- CJCS Instruction
D/A	- Digital to Analog Conversion
DIACAP	- DoD Information Assurance Certification and Accreditation Process
DISA	- Defense Information Systems Agency
DISR	- DoD IT Standards Registry
DITSCAP	- DoD IT Security Certification and Accreditation Process
DoD	- Department of Defense
DP	- Dial Pulse
DRSN	- Defense Red Switch Network
DSN	- Defense Switched Network
DTMF	- Dual Tone Multi-Frequency
E1	- European Basic Multiplex Rate (2.048 Mbps)
EIA	- Electronic Industries Alliance
EO	- End Office
FCC	- Federal Communications Commision
G.711	- Standard for PCM of Voice Frequencies
GR	- Generic Requirement
GR-512	- LSSGR: Reliability, Section 12
GR-532	- LSSGR: Call Processing Features
GR-815	- Generic Requirements For Network Element/Network System (NE/NS) Security
GSCR	- Generic Switching Center Requirements
H.320	- Standard for Narrowband VTC
IEEE	- Institute of Electrical and Electronics Engineers, Inc.
IPv6	- Internet Protocol version 6
ISDN	- Integrated Services Digital Network
IT	- Information Technology
ITU-T	- International Telecommunication Union - Telecommunication Standardization Sector
kbps	- kilobits per second
KXX	- K= any number 2-8; X= any number 1-9
LSSGR	- Local Access and Transport Area (LATA) Switching Systems Generic Requirements
Mbps	- Megabits per second
MFR1	- Multi-Frequency Recommendation 1
MFS	- Multifunction Switch
MLPP	- Multi-Level Precedence and Preemption
MOS	- Mean Opinion Score
NI 1/2	- National ISDN Standard 1 or 2
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	- Pulse Code Modulation
PCM-24	- Pulse Code Modulation - 24 Channels
PCM-30	- Pulse Code Modulation - 30 Channels
PRI	- Primary Rate Interface
PSTN	- Public Switched Telephone Network
Q.735.3	- SS7 Signaling Standard for E1 MLPP
Q.955.3	- ISDN Signaling standard for E1 MLPP
R	- Required
RSU	- Remote Switching Unit
SMEO	- Small End Office
SMU	- Switch Multiplexer Unit
SS7	- Signaling System 7
STE	- Secure Terminal Equipment
STIGs	- Security Technical Implementation Guides
STU-III	- Secure Telephone Unit - 3rd generation
T1	- Digital Transmission Link Level 1 (1.544 Mbps)
T1.619a	- SS7 and ISDN MLPP Signaling Standard for T1
TIA	- Telecommunications Industry Association
TIA/EIA-465-A	- Group 3 Facsimile Apparatus for Document Transmission
TIA/EIA-470-B	- Performance and Compatibility Requirements for Telephone Sets with Loop Signaling
VBD	- Variable bit data
VoIP	- Voice over Internet Protocol
VTC	- Video Teleconferencing
WWNDP	- Worldwide Numbering and Dialing Plan

NOTES:

1 Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.
2 Data and VTC services are not provided via the DSN to tactical (SMU) interface.
3 Facsimile, data, and VTC services are not provided via the DSN to DRSN interface.

8. TEST NETWORK DESCRIPTION. The SUT was tested at the JITC Global Information Grid Network Test Facility. This test was conducted using four test configurations shown in figures 2-2 through 2-6. Testing of the system's required functions and features was conducted using the test configuration depicted in figure 2-2. Network integration testing was conducted using the test configuration depicted in figure 2-3. The Nortel IP solution was tested using the configuration depicted in figure 2-4. These figures accurately emulate the DSN operational environment. Figure 2-5 depicts the test configuration used to test the SUT European ISDN PRI interface with the DSN Option 11C. Figure 2-6 depicts the test configuration used to test the Advanced DSN Integrated Management Support System (ADIMSS) network management required functions and features.



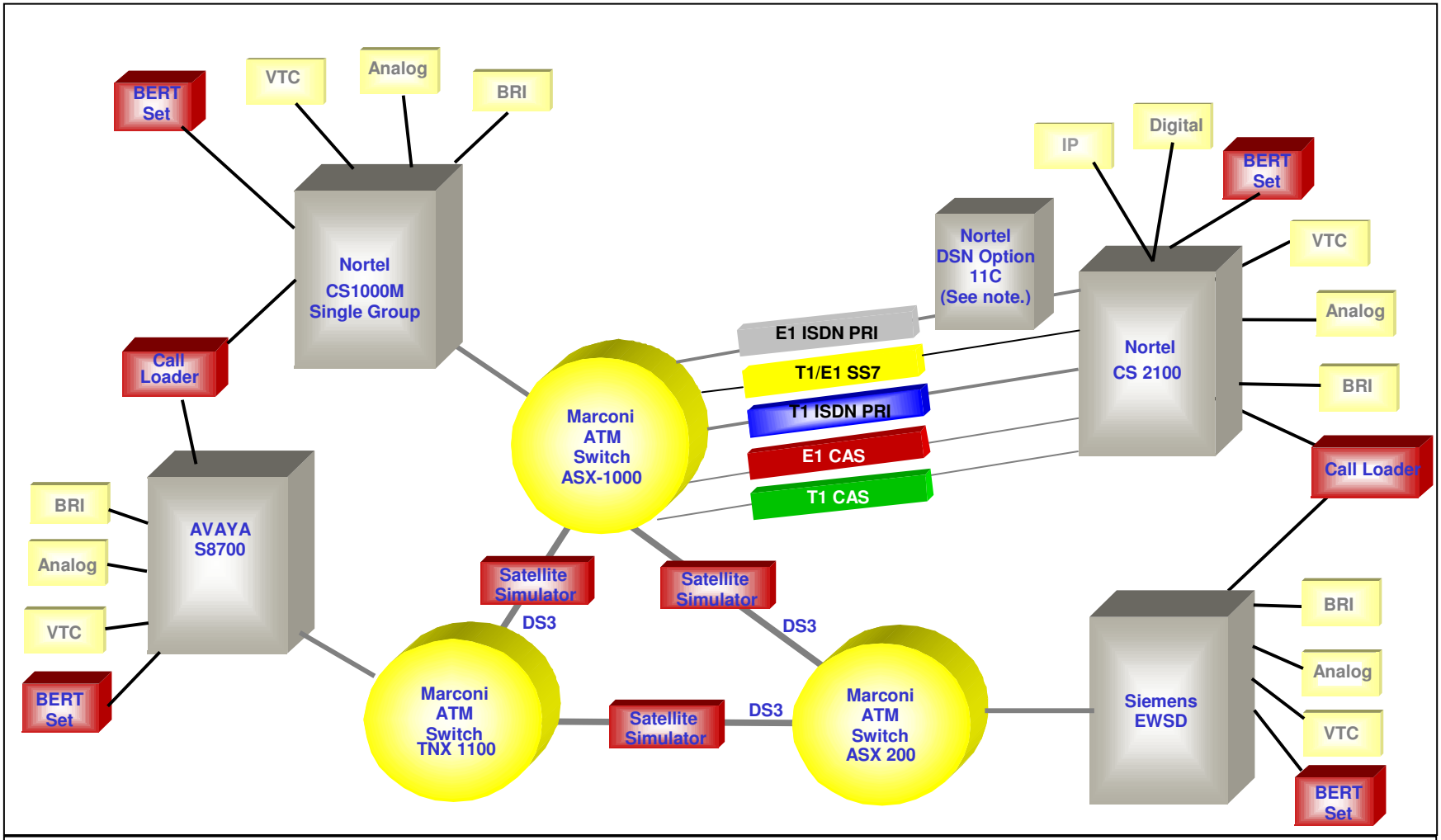
LEGEND:

A-Link	- Access Link (SS7)
ASVALAN	- Assured Services Voice Application Local Area Network
B-Link	- Bridge Link (SS7)
BRI	- Basic Rate Interface
C-Link	- Cross Link (SS7)
CAS	- Channel Associated Signaling
DRSN	- Defense Red Switch Network
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	- Mulitfunction Switch
PBX	- Private Branch Exchange
PBX 1	- Private Branch Exchange 1
PRI	- Primary Rate Interface
PSTN	- Public Switched Telephone Network
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 SS7, T1 CAS, E1 SS7, E1 CAS)
- DSN Line (2-Wire Analog, ISDN BRI)
- SS7 Links (A-Link, B-Link, or C-Link)
- DSN EO Access Trunk (T1 SS7, E1 SS7, T1 CAS, E1 CAS, T1 ISDN PRI, E1 ISDN PRI)
- DSN PBX Access Trunk (T1 SS7, E1 SS7, T1 CAS, E1 CAS, T1 ISDN PRI, E1 ISDN PRI)

NOTE: To meet the MFS and EO European ISDN PRI requirements for deployment in Europe, the SUT requires the DSN Option 11C switching system with Software Release 4.5w and specified product enhancement packages. In this configuration, the DSN Option 11C is a tandem switch and is not authorized nor approved to support line side subscribers. The SUT meets the SMEO, PBX 1, and PBX 2 requirements for Europe without the DSN Option 11C.

Figure 2-2. Test Configuration

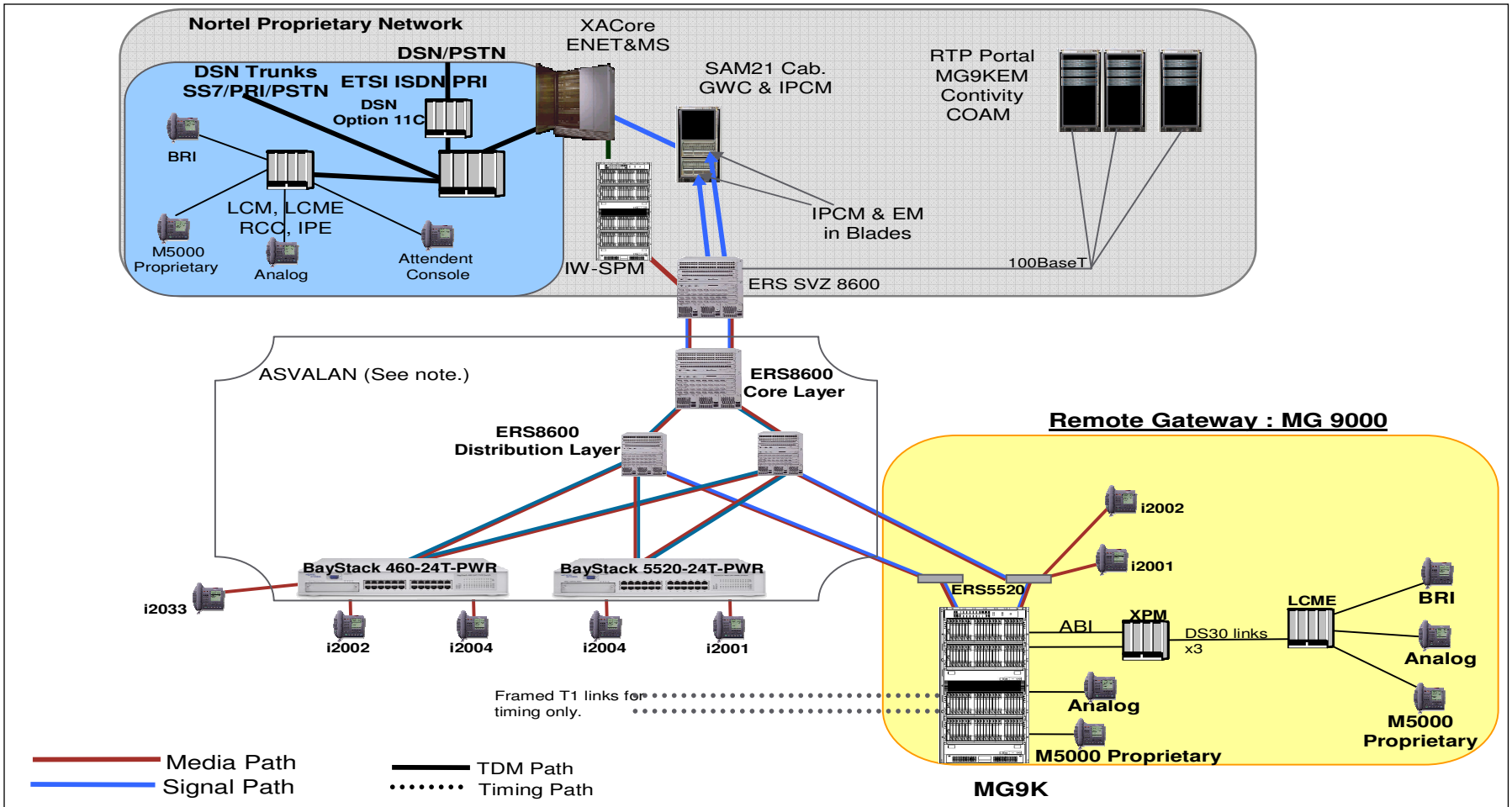


LEGEND:

ATM - Asynchronous Transfer Mode	E1 - European Basic Multiplex Rate (2.048 Mbps)	PBX 2 - Private Branch Exchange 2
BERT - Bit Error Rate Test	EO - End Office	PRI - Primary Rate Interface
BRI - Basic Rate Interface	EWSD - Elektronisches Wählsystem Digital	SMEO - Small End Office
CAS - Channel Associated Signaling	IP - Internet Protocol	SS7 - Signaling System 7
CS - Communication Server	ISDN - Integrated Services Digital Network	SUT - System Under Test
DS3 - Digital Signaling Level 3	MFS - Multifunction Switch	T1 - Digital Transmission Link Level 1 (1.544 Mbps)
DSN - Defense Switched Network	Mbps - Megabits per second	VTC - Video Teleconferencing
DVX - Deployable Voice Exchange	PBX 1 - Private Branch Exchange 1	

NOTE: To meet the MFS and EO European ISDN PRI requirements for deployment in Europe, the SUT requires the DSN Option 11C switching system with Software Release 4.5w and specified product enhancement packages. In this configuration, the DSN Option 11C is a tandem switch and is not authorized nor approved to support line side subscribers. The SUT meets the SMEO, PBX 1, PBX 2, and DVX requirements for Europe without the DSN Option 11C.

Figure 2-3. Network Integration Test Configuration

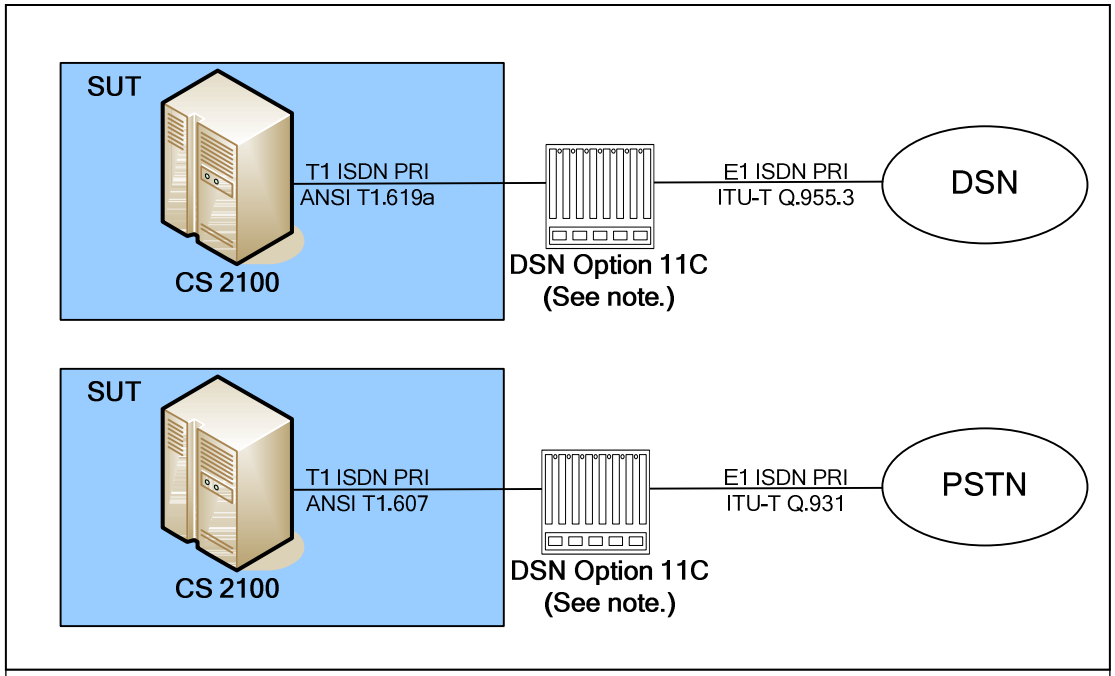


LEGEND:

100BaseT	- 100 Mbps (Baseband Operation, Twisted Pair) Ethernet	ERS	- Ethernet Routing Switch	LCME	- Enhanced ISDN Line Concentration Module	SE	- Succession Enterprise
ABI	- Access Bridging Interface	GWC	- Gateway Controller	MG9K	- Media Gateway 9000	SS7	- Signaling System 7
APL	- Approved Products List	IP	- Internet Protocol	MS	- Mobile Station	SUT	- System Under Test
ASVALAN	- Assured Services Voice Application Local Area Network	IPCM	- IP Client Manager	PRI	- Primary Rate Interface	SVZ	- Secure Voice Zone
BRI	- Basic Rate Interface	IPE	- Intelligent Peripheral Equipment	PSTN	- Public Switched Telephone Network	TDM	- Time Division Multiplexer
COAM	- Centralized Operation Administration and Maintenance	ISDN	- Integrated Services Digital Network	PWR	- Power	XA	- Extended Architecture
DSN	- Defense Switched Network	IW-SPM	- Interworking Spectrum Peripheral Module	RCC	- Radio Common Carrier	X3	- times three
EM	- Element Manager	JITC	- Joint Interoperability Test Command	RTP	- Realtime Transport Protocol	XMS	- Extended Multiprocessor System
ENET	- Enhanced Network	LCM	- Line Concentration Module	SAM21	- Shelf and ATM Interface Manager-21	XPM	- XMS-Based Peripheral Module

NOTE: The SUT is certified with any ASVALAN found on the DSN APL found at http://jitc.fhu.disa.mil/tssi/apl.html

Figure 2-4. Nortel CS 2100 Succession Enterprise XA-Core IP Test Configuration

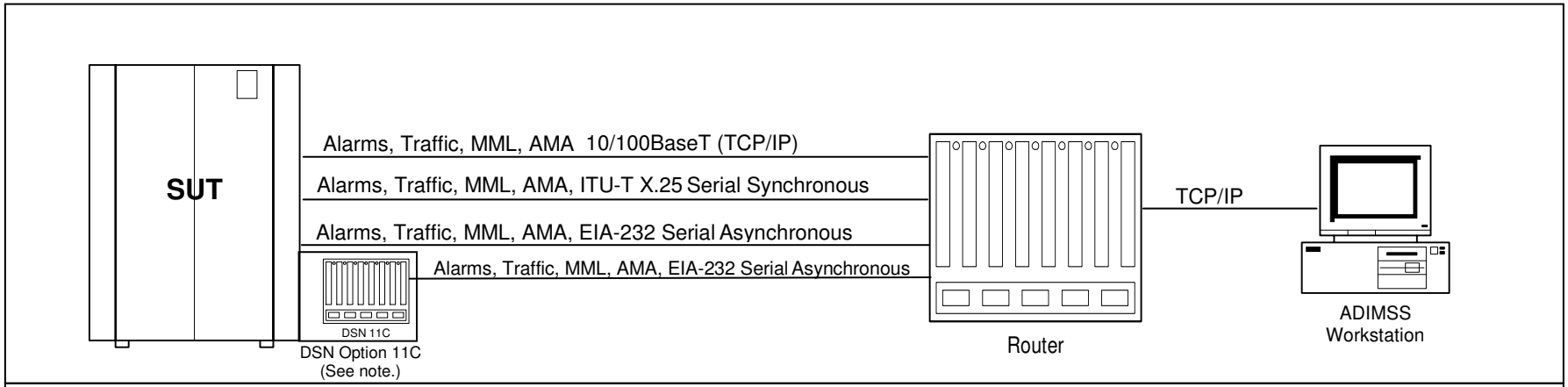


LEGEND:

ANSI	- American National Standards Institute	PBX 1	- Private Branch Exchange 1
CS	- Communication Server	PBX 2	- Private Branch Exchange 2
DSN	- Defense Switched Network	PRI	- Primary Rate Interface
DSS1	- Digital Subscriber Signaling 1	PSTN	- Public Switched Telephone Network
DVX	- Deployable Voice Exchange	Q.931	- Signaling Standard for ISDN
E1	- European Basic Multiplex Rate (2.048 Mbps)	Q.955.3	- ISDN Signaling standard for E1 MLPP
EO	- End Office	SMEO	- Small End Office
ISDN	- Integrated Services Digital Network	SS7	- Signaling System 7
ITU-T	- International Telecommunication Union - Telecommunication Standardization Sector	SUT	- System Under Test
		T1	- Digital Transmission Link Level 1 (1.544 Mbps)
Mbps	- Megabits per second	T1.607	- ISDN - Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
MFS	- Multifunction Switch		
MLPP	- Multi-Level Precedence and Preemption	TI.619a	- SS7 and ISDN MLPP Signaling Standard For T1

NOTE: To meet the MFS and EO European ISDN PRI requirements for deployment in Europe, the SUT requires the DSN Option 11C switching system with Software Release 4.5w and specified product enhancement packages. In this configuration, the DSN Option 11C is a tandem switch and is not authorized nor approved to support line side subscribers. The SUT meets the SMEO, PBX 1, PBX 2, and DVX requirements for Europe without the DSN Option 11C.

Figure 2-5. SUT European ISDN PRI Interface Test Configuration



LEGEND:

10/100BaseT	- Ethernet Baseband Operation, Twisted Pair
ADIMSS	- Advanced DSN Integrated Management Support System
Alarms	- Fault Management
AMA	- Automated Message Accounting (Accounting Management)
CS	- Communication Server
DCE	- Data Circuit-terminating Equipment
DSN	- Defense Switched Network
DTE	- Data Terminal Equipment
DVX	- Deployable Voice Exchange
EIA	- Electronic Industries Alliance
EIA-232	- Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices
EO	- End Office
ISDN	- Integrated Services Digital Network
ITU-T	- International Telecommunication Union - Telecommunication Standardization Sector
MFS	- Multifunction Switch
MML	- Man Machine Language (Remote access to switch)
PBX 1	- Private Branch Exchange 1
PBX 2	- Private Branch Exchange 2
PRI	- Primary Rate Interface
SMEO	- Small End Office
SUT	- System Under Test
TCP/IP	- Transmission Control Protocol/Internet Protocol
Traffic	- Performance Management
X.25	- Interface between DTE and DCE for terminals operating in the packet mode and connected to public data networks by dedicated circuit

NOTE: To meet the MFS and EO European ISDN PRI requirements for deployment in Europe, the SUT requires the DSN Option 11C switching system with Software Release 4.5w and specified product enhancement packages. In this configuration, the DSN Option 11C is a tandem switch and is not authorized nor approved to support line side subscribers. The SUT meets the SMEO, PBX 1, PBX 2, and DVX requirements for Europe without the DSN Option 11C.

Figure 2-6. Nortel CS 2100 ADIMSS Network Management System

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

Table 2-2. Tested System Configurations

System Name	Software Release
Siemens EWSD	19d with Patch set 46
Avaya S8700	CM 3.0 (R013x.00.0.340.3) and Super Patch 11815
Avaya G3CSI Prologix	CM 3.0 (R013i.00.0.340.5)
LUCENT 5ESS	5E16.2, Software Update 06-0002
REDCOM IGX	6.1A R1P8
REDCOM HDX	2.0A R3P0
REDCOM SLICE	2.0A R3P0
Nortel CS1000M Single Group	Succession 3.0
Secure Digital Switch (DRSN)	15.02.03
Digital Small Switch (DRSN)	8.04.04
Nortel BroadBand STP	Release 8.0.4.38E
Tekelec STP	31.6.11-53.46.65
SMU 96 Tactical Gateway	Version RD302185
MARCONI ATM switch ASX-1000, ASX-200BX, and TNX-1100	Versions 6.0.1 and 6.2

SUT				
	Component Cabinets	**Description**	**Product Code**	**Version**
SUT	**CPDT**	Channel Supervision Message CP	NT6X42AA	7
		Speech Bus Formatter Card (Turkey) (MD)	NT6X41AB	11
		XPM DS512 Link Control CP	NT6X40FB	3
		5v 12v Power Converter	NT2X70AF	28
		Enhanced PCM30 IF CP	NT6X27BB	7
		Enhanced PCM30 IF CP	NT6X27BB	3
		Unified Processor	NTMX77AA	57
		Universal Time Switch CP	NT6X44EA	2
		Global Tone Receiver (GTR)	NT6X92EA	2
		XPM Flash EEPROM Pack	NT7X05AA	1
		CPP Message Protocol/Download	NT6X69LB	5
		PCM30 Signaling CP (MD)	NT6X28AA	35
		5v 12v Power Converter	NT2X70AF	29
		Channel Supervision Message CP	NT6X42AA	17
		Speech Bus Formatter CP	NT6X41AC	2
		XPM DS512 Link Control CP	NT6X40FB	6
		5v 12v Power Converter	NT2X70AF	78
		Continuity Tone Detector	NT6X70AA	6
		Universal Time Switch CP	NT6X44EA	4
		International UTR	NT6X92CA	41
		CPP Message Protocol/Download	NT6X69LB	12
		PCM30 Signaling Control CP	NT6X28AC	8
		Modular Supervisory Panel	NTRX40AA	5
		ISDN Ready Shelf Assembly	NT6X0223	6
		Cooling Unit	NTRX91AA	5
		CPP Message Protocol/Download	NT6X69LB	12
		PCM30 Signaling Control CP	NT6X28AC	8
	MCTM	Frame Supervisory Panel	NTNX26NA	9
		MCTM-1 Meridian Cabinet T	NTNX33CA	29
		ISDN Ready Shelf Assembly	NT6X0223	6
		10" Cooling Unit	NTNX27CA	6
		DS1 EFF Card CP	NT6X50AB	CF
		DS1 EFF Card CP	NT6X50AB	CK
		XPM PowerPC Processor	NTSX05AA	5
		Time Switch CP (MD)	NT6X44AB	3
		Domestic UTR (MD 2Q99)	NT6X92BC	4

Table 2-2. Tested System Configurations (continued)

SUT				
	Component Cabinets	**Description**	**Product Code**	**Version**
SUT	**MCTM (continued)**	Enhanced ISDN Signaling Pre-Processor (MD)	NTBX01AB	2
		Message Protocol and Tone	NT6X69AD	2
		Channel Supervision Message CP	NT6X42AA	7
		Speech Bus Formatter Card (Turkey) (MD)	NT6X41AB	11
		XPM DS512 Link Control CP	NT6X40FB	3
		5v 12v Power Converter	NT2X70AF	29
		DS1 EFF Card CP	NT6X50AB	CG
		DS1 EFF Card CP	NT6X50AB	CJ
		DS1 EFF Card CP	NT6X50AB	BV
		XPM PowerPC Processor	NTSX05AA	5
		Domestic UTR (MD 2Q99)	NT6X92BC	4
		Enhanced Time Switch CP	NTBX01AB	2
		Channel Supervision Message CP	NT6X42AA	5
		Speech Bus Formatter (MD 1Q99)	NT6X41AA	AJ
		XPM DS512 Link Control CP	NT6X40FB	3
		5v 12v Power Converter	NT2X70AF	29
		DS1 EFF Card CP	NT6X50AA	ODV
		DS1 EFF Card CP	NT6X50AA	BB
		DS30A LCM I/F CP	NT6X48AA	4
		XPM PowerPC Processor	NTSX05AA	6
		Time Switch CP (MD)	NT6X44AB	7
		Domestic UTR (MD)	NT6X92BB	1R
		Domestic UTR (MD 2Q99)	NT6X92BC	4
		Message Protocol and Tone	NT6X69AD	1
		Channel Supervision MSG CP	NT6X42AA	15
		XPM Plus Terminator Paddleboard	NTMX71AA	5
		DS512 Link Paddleboard	NT6X40GA	7
		10" Cooling Unit	NTNX27CA	6
		Enhanced D-Channel Handler	NTBX02BA	14
		DS1 Interface CP (MD)	NT6X50AA	AG
		DS30A LCM I/F CP	NT6X48AA	10
		Message Protocol and Tone	NT6X69AD	3
		Channel Supervision Message CP	NT6X42AA	15
		5v 12v Power Converter	NT2X70AF	48
		Enhanced D-Channel Handler	NTBX02BA	17
		DS30A LCM I/F CP	NT6X48AA	11
		XPM PowerPC Processor	NTSX05AA	5
		Time Switch CP	NT6X44AA	20
		Common Peripheral	NT6X01AB	2
		Message Protocol and Tone	NT6X69AD	3
		Channel Supervision Message CP	NT6X42AA	15
		XPM DS512 Link Control CP (MD)	NT6X40FB	3
		5v 12v Power Converter	NT2X70AF	46
		DS1 EFF Card CP	NT6X50AB	BX
		DS1 EFF Card CP	NT6X50AB	AN
		Unified Processor (MD)	NTMX77AA	57
		Continuity Tone Detector	NT6X70AA	6
		Time Switch CP	NT6X44AB	3
		Global Tone Receiver (GTR)	NT6X92EA	2
		XPM Flash EEPROM Pack	NT7X05AA	3
		Message Protocol and Tone	NT6X69AD	7
		Speech Bus Formatter (MD 1Q99)	NT6X41AA	1F
		XPM DS512 Link Control CP	NT6X40FB	5
		5v 12v Power Converter	NT2X70AF	29
		DS1 Interface CP (MD)	NT6X50AA	AP
		DS1 EFF Card CP	NT6X50AB	71
		XPM Flash EEPROM Pack	NT7X05AA	1
		Speech Bus Formatter (MD 1Q99)	NT6X41AA	AJ
		XPM DS512 Link Control CP	NT6X40FB	5
		DS512 Link Paddleboard	NT6X40GA	7

Table 2-2. Tested System Configurations (continued)

SUT				
	Component Cabinets	**Description**	**Product Code**	**Version**
SUT	**MCTM (continued)**	XPM Plus Terminator Paddleboard	NTMX71AA	5
		Frame Supervisory Panel	NTNX26NA	10
		PCM30 75 Ohm IF CP (MD)	NT6X27CA	8
		DS30A LCM I/F CP	NT6X48AA	10
		DS1 Interface CP (MD)	NTSX05AA	6
		Time Switch CP	NT6X44AA	20
		Global Tone Receiver (GTR)	NT6X92EA	2
		International Common	NT6X01BA	3
		Message Protocol and Tone	NT6X69AD	7
		Channel Supervision Message CP	NT6X42AA	17
		Speech Bus Formatter CP	NT6X41AC	2
		XPM DS512 Link Control CP	NT6X40FB	3
		5v 12v Power Converter	NT2X70AF	47
		DS1 EFF Card CP	NT6X50AB	BY
		DS1 EFF Card CP	NT6X50AB	BT
		Remote Control Equipment (MD)	NT6X10AA	10
		XPM PowerPC Processor	NTSX05AA	5
		Processor Stack CP (MD)	NT6X44AA	21
		Enhanced ISDN Signaling Pre-Processor (MD)	NTBX01BA	2
		Remote Controller Frame 1	NT6X10AD	10
		Channel Supervision Message CP	NT6X42AA	17
		XPM DS512 Link Control CP	NT6X40FB	3
		Enhanced D-Channel Handler	NTBX02BA	14
		DS30A LCM I/F CP	NT6X48AA	11
		DS30A LCM I/F CP	NT6X48AA	10
		Remotes PowerPC Processor	NTSX05AA	6
		Time Switch CP	NT6X44AA	21
		Global Tone Receiver (GTR)	NT6X92EA	2
		International Common	NT6X01BA	3
		Message Protocol and Tone	NT6X69AD	10
		Channel Supervision Message CP	NT6X42AA	17
		XPM DS512 Link Control CP	NT6X40FB	6
		5v 12v Power Converter	NT2X70AF	46
		Remotes PowerPC Processor	NTSX05AA	6
		Global Tone Receiver (GTR)	NT6X92EA	2
		Enhanced ISDN Signaling Pre-Processor (MD)	NTBX01BA	3
		Speech Bus Formatter CP	NT6X41AC	2
		5v 12v Power Converter	NT2X70AF	47
		DS512 Link Paddleboard	NT6X40GA	7
		Line Card Type B	NT6X18AA	2U
	SCC (Back)	F-BUS Extension Paddleboard	NT9X79AB	6
		16 Link DS30 MS Paddleboard	NT9X69AB	5
		SR-512 2 Links Paddleboard	NT9X62CA	4
		16 Link DS30 Message Switch Paddleboard	NT9X69AB	19
		Remote Terminal Interfacer CP	NT9X26AB	29
		DMS-Bus Stratum 1 External Clock	NT9X54AC	15
		16 Link DS30MS Paddleboard	NT9X69BA	13
		Intra F-Bus B Termination NIU	NTEX20BA	2
		DIX (Ethernet) Paddleboard	NT9X85AA	3
		Terminator Interface Paddleboard (MD)	NTEX26AA	6
		STP V35 I/F CPNTA Paddleboard	NT9X77AB	6
		NIU DS30 Link Interface	NTEX28AA	Not available
		NIU DS30 Link Interface	NTEX28AA	Not available
		Intra F-BUS A Termination	NTEX20AA	1
		ENET QUAD DS512 Fiber I/F	NT9X40BB	13
		ENET DS512/DS30 I/F Paddleboard	NT9X45BA	04
		ENET DS512/DS30 I/F Paddleboard	NT9X45BA	04
		ENET QUAD DS512 Fiber I/F	NT9X40BB	13
		ENET HCS Fiber Link Interface needed for SPM Interface	NT9X40DA	07

Table 2-2. Tested System Configurations (continued)

SUT				
	Component Cabinets	**Description**	**Product Code**	**Version**
SUT	**SCC (Back) (continued)**	ENET HCS Fiber Link Interface needed for SPM Interface	NT9X40DA	04
		XA-Core Input/Output Processor	NTLX05AB	2
		Reset Terminal Interface Packet	NTLX08AB	3
		Terminating Filler Pack	NTLX20BA	4
		XA-Core 384MB Shared Memory	NTLX14CA	14
	SCC (Front)	F-Bus Repeater	NT9X74AD	12
		IPF Integrated Processor UPGR	NTEX22BB	42
		Ethernet Interface CP	NT9X84AA	4
		STP Signaling Terminal	NT9X76AA	41
		32MB ASU Processor and F-Bus CONT	NTEX22CA	16
		STP Signaling Terminal	NT9X76AA	42
		NIU Channel Bus Controller	NTEX25AA	7
		IPF Integrated Processor Upgrade	NTEX22BB	34
		IPF Integrated Processor Upgrade	NTEX22BB	43
		System Clock Circuit Pack	NT9X16AA	5
		Global +5v, 20A Power Converter	NT9X31AB	3
		Global +5v,86A Power Converter (MD)	NT9X30AB	2
		CPU 16MB DRAM ENET	NT9X13KA	5
		ENET Clock & Message CP	NT9X36BA	27
		4K X 8K Crosspoint CP	NT9X35FA	8
		4K X 8K Crosspoint CP	NT9X35FA	16
		4K X 8K Crosspoint CP	NT9X35FA	14
		XA-Core Filler Circuit	NTLX20AA	1
		Digital Audio Tape	NTLX07BA	5
		Disk Drive Packet	NTLX06AC	4
		XA-Core 256MB Processor PPC604	NTLX02CA	19
		Terminating Filler Pack	NTLX20BA	4
		XA-Core 384MB Shared Memory	NTLX14CA	11
		XA-Core 384MB Shared Memory	NTLX14CA	14
		XA-Core Processor Element	NTLX02CA	19
		XA-Core Cooling Unit Fan Drawer	NTLX11AA	4
		Filler Panel	NT0X42AD	2
		Filter Panel	NT0X42AG	5
		Trunk Module IP CP (MD)	NT2X45AB	2B
		Trunk Module Processor 32K (MD)	NT0X70AC	0A
		TM/DCM/ISM Control (MD)	NT2X53AA	0D
		Group CODEC	NT2X59AA	17
		LTU Analog Card	NT2X10AB	0A
		Line Test Unit Digital	NT2X11AD	9
		Transmission Test Unit (MD)	NT2X47AD	10
		TTL Digital Filter (MD)	NT2X56AB	3
		Test Signal Generator	NT1X90AA	0B
		TOPS Control Processor CP	NT3X02AA	33
		Multi Output Power	NT2X09AA	DF
		Power Converter +-5 & 12 (MD)	NT2X70AB	CL
		Trunk Module IF CP (MD)	NT2X45AB	28
		Trunk Module Processor CP (MD)	NT0X70AA	2L
		PCM Level Meter (MD)	NT2X96AA	9
		Line Test Unit (MD-USE AC)	NT2X10AA	3H
		Line Test Unit Digital	NT2X11AA	4K
		Loop Ground Test Line	NT2X75AA	8
		Transmission Termination TRK	NT2X71AA	6
		101 Communication Test	NT5X30AA	17
		Incoming/Outgoing Test (MD)	NT2X90AB	5
		Multi Output Power	NT2X09AA	CR
		Power Converter +-5 & 12 (MD)	NT2X70AB	AN
		Power Converter +-5 & 12 (MD)	NT2X70AB	DP
		TM Controller CP	NT4X65AA	35

Table 2-2. Tested System Configurations (continued)

SUT				
	Component Cabinets	**Description**	**Product Code**	**Version**
SUT	**SCC (Front) (continued)**	6 Party Conference Circuit CP (MD)	NT3X67AA	12
		Trunk Module IF CP (MD)	NT2X45AB	2L
		Power Converter +-5v +-12V 50A (MD)	NT2X70AD	BR
		Digital Group Control Card CP	NT6X52AA	34
		Digital Group Control Card CP	NT6X52AA	39
		Digital Group Control Card CP	NT6X52AA	2D
		LCM Drawer Unit	NT6X05AA	2
		LCM Drawer Unit	NT6X05AA	22
		LCM Drawer Unit	NT6X05AA	8
		LCM Drawer Unit	NT6X05AA	23
		LCM Drawer Unit	NT6X05AA	4
		Bus Interface Card (BIC)	NT6X54AA	42
		Bus Interface Card (BIC)	NT6X54AA	49
		Bus Interface Card (BIC)	NT6X54AA	62
		Bus Interface Card (BIC)	NT6X54AA	64
		Bus Interface Card (BIC)	NT6X54AA	52
	MCLC	LCMI Digital Group Controller CP	NTBX35AA	37
		SRU Enhanced ISDN LCM Processor	NTBX34CB	2
		ISDN LCME BAT/RNG Router	NTBX72AA	6
		P-Phone Line Card 15KFT	NT6X21AC	AU/07/08
		World Line Card POTS Type	NT6X17BA	29/31
		P-Phone Line Card 15KFT	NT6X21AD	6
		Point of Use Power Supply	NTBX7101	4
		ISDN T Line Card	NTBX26AA	20
		ISDN 2B1Q U-Interface CP	NTBX27AA	3
		ISDN Enhanced Line Drawer BIC	NTBX36BA	36
		North American Ring Generator CP	NT6X30CA	43
		Ring Generator	NTNX38CA	20
		ISDN Enhanced Line Drawer	NTBX32BA	4
		ISDN Enhanced Line Drawer	NTBX32BA	R04
	IPEC (Optional cards added for voicemail)	PE Power Supply	NT6D40BA	3
		Ring Generator	NT6D42CD	3
		Controller	NT7D07AB	7
		Line Side T1 Interface	NT5D11AE	2
	MCAM	ISM DC Converter	NTFX43AA	7
		Compact Conference Circuit	NT1X81AA	2
		EDRAM Card	NT1X80AA	9
		102 Test Trunk CP	NT1X00AB	1
		Miscellaneous Scan Card	NT0X10AA	16
		Digital 4 Channel DGT/ESA	NT2X48BB	3
		TTL Digital Filter (MD)	NT2X56AB	3
		Transmission Test Unit	NT2X47AC	4
		Master Clock Generator (MD)	NT3X09BA	14
		Remote Metallic Test	NT3X09AA	2
		TM/ISM Signal Distribution CP	NT2X57AA	7
		Miscellaneous Scan Card	NT0X10AA	7
		OAU Alarm Transfer CP	NT3X83AC	2
		OAU Dead System (MD Y2K)	NT3X82AJ	2
		ISM Processor CP	NTFX42AA	3
		ISM DC Converter	NTFX43AA	7
		IOM Main Controller Card	NTFX30AA	9
		IOM Storage Media Card	NTFX32AA	8
		Compact Conference Circuit	NT1X81AA	2
		102 Test Trunk Card	NT1X00AB	9
		TOPS Digital Signal	NT3X03AA	16
		TOPS Control Processor CP	NT3X02AA	33
		101 Communication Test	NT5X30AA	18
		Multi-Line Test Unit Analog	NT2X10BB	6

Table 2-2. Tested System Configurations (continued)

SUT				
SUT	**Component Cabinets**	**Description**	**Product Code**	**Version**
	MCAM (continued)	Multi-Line Test Unit	NT2X11BA	5
		Incoming/Outgoing Test	NT2X90AD	8
		Incoming/Outgoing Test	NT2X90AD	10
		TM/ISM Signal Distribution CP	NT2X57AA	7
		Miscellaneous Scan Card	NT0X10AA	7
		OAU Dead System (MD Y2K)	NT3X82AJ	2
		ISM Processor CP	NTFX42AA	3
		ISM DC Converter	NTFX43AA	7
		Receiver Off Hook Tone (MD)	NT1X00AC	3
		Jack Ended Trunk Circuit	NT1X54AA	0K
		PCM Level Meter (MD)	NT2X96AA	7
		Test Signal Generator (MD)	NT1X90AA	8
		ISM Processor CP	NTFX42AA	3
		Cooling Unit	NTRX91AA	5
	MCAM (Back)	IOM Paddleboard (power feed and connection feeders)	NTFX31AA	8

	Subcomponent	**Software**	**Firmware**
SUT VoIP components	Nortel 8600 Switch	V3.01.21s168rec	Not Applicable
	Baystack 4 Switch 5520-EI PWR 28 port & 52_port/switch 5520 - EI 28 port & 52 port	V3.01.12s168	Not Applicable
	IP Phones	i2001	0604099
		i2002	
		i2004	
		i2033 Conference Phone	
	Core and Billing Manager (CBM)	Solaris 9 and Apache 2.0.5.0	Not Applicable
	Communications Server 2000 Management Tool (CMT)	Solaris 9 and Oracle 9.0.4	Not Applicable
	Medial Gateway 9000 Element Manger (MG9K EM)	Solaris 9 and Apache 2.0.5.0	Not Applicable
	RTP EM	Solaris 9	Not Applicable
	RTP DBS	Solaris 9 and Oracle 9.0.4	Not Applicable
	IPCM EM	Windows XP Embedded	Not Applicable
	IPCM	Windows XP Embedded	Not Applicable

	Components	**Software**	**Product Code/Version**
Network Management	Ethernet Interface Unit	ETC21BK	NTFX22BB 22 NT9X84AA 04 NT9X85AA 03
	Serial Input/Output Module (includes X.25 interface)	IOMRBC01	NTFX30AA 09

	Components	**Subcomponents**	**Product Code/Version**
SUT SPM Components	SPM with load CEM21BN	Common Equipment Module (CEM)	NTLX82AA 13
		Optical Carrier Rate 3 (OC3)	NTLX71AA 07 / 03
		Digital Signal Processor (DSP)	NTLX65BA 02
		Voice Signal Processor (VSP)	NTLX86AA 02
		Data Link Controller (DLC)	NTLX72AA 07 / 01
	Inter-Working SPM	Common Equipment Module (CEM)	NTLX82BA 12 / 07
		Gigabit Ethernet Module (GEM)	NTLZ20CA 04

	Subcomponent	**Software**	**Product Code**
SUT Preset Conference Bridge	Conference Trunk Module	MTMKA02	NT1X81AA

Table 2-2. Tested System Configurations (continued)

SUT Peripherals	**Peripheral Module**		**Peripheral Module Load**	**Firmware Load**
	MTM 0-4		MTMKA02	Not Applicable
	CTM 0, 2		MTMKA02	Not Applicable
	DTM 0, 1		EDRMAE11	Not Applicable
	LCM 0 0, 0 1		XLCM18AW	Not Applicable
	RMT ELCM 1 0		XLCM18AW	Not Applicable
	LCME 1 0, 1 1		LCME18AW	Not Applicable
	RMT LCME 1 0		LCME18AW	Not Applicable
	DCH 0, 1, 3, 4, 5		EDH20CE	Not Applicable
	LTCI 3-7		QLI20CE	SXFWAK02
	LTC (See note 1.)		ECL14BC	SXFWAK02
	DTC7 0		ED714BC	UPFWNV03
	DTC (See note 1.)		EDL14BC	UPFWNV03
	DTCI (See note 1.)		QLI20CE	UPFWNV03
	PDTC 0-1		ODT20CE	UPFWNV03
	LIU7 1-4		ARS21BM	Not Applicable
	LIU7 5-6		LTS21BM	Not Applicable
	EIU 0-2		ETC21BC	Not Applicable
	MPC 0-2		IOM$LOAD	Not Applicable
	IOM 0-1		IOMRBC01	Not Applicable
	IPE 2 0		EIPE17AH	Not Applicable
	NIU 1		NRS21BK	Not Applicable
	RMM 0		RMM10A	Not Applicable
	RCC2 0		XRI17AY	Not Applicable
	ENET		ENC21BK	Not Applicable
	MS		MUC21BK	MPF21BK
DSN Option 11C with Software Release 4.5w and Specified Patches (See note 2.)	**Part Number**		**Part Description**	**Release**
	Shelf 0	NTDK78AA	Power Supply	Release 11
		NTDK20EA	Small System Controller	Release 7
		NTRB21AC	DTI or PRI T-1 card	Release 2
		NTAK02BC	Serial Digital Interface/D-Channel	Release 1
		NTRB21AB	DTI or PRI T-1 card	Release 1
		NTRB21AC	DTI or PRI T-1 card	Release 1
		NTRB21AA	DTI or PRI T-1 card	Release 9
		NTBK50AA	E-1 PRI Card	Release 8
		NTBK22AA	Multi-Purpose ISDN Signaling Processor	Release 10
		NTAK02BC	Serial Digital Interface/D-Channel	Release 1
		NTAG36AC	Recorded Announcement Board	Release 13
	Shelf 1	NTDK78AA	Power Supply	Release 11
		NTDK20JA	Small System Controller	Release 1
		NTAK10DC	E-1 CAS Card	Release 2
	Shelf 2	NTDK78AA	Power Supply	Release 11
		NTDK20JA	Small System Controller	Release 1
		NTRB21AB	DTI or PRI T-1 Card	Release 1
		NTRB21AC	DTI or PRI T-1 Card	Release 3
SUT Telephones	**Phone Types**		**Model**	**Firmware**
	2-Wire Analog		Panasonic KX-TS15-W	Not Applicable
	ISDN BRI		Nortel M5317T	5.0 1999
	P- Phone		Nortel P-Phone Digital Display	Not Applicable
	Digital Phone		Nortel M5008, M5316	Not Applicable
	ISDN BRI		Tone Commander Telephones: 6210U, 6210T, 6220U, 6220T, 6220T TSG	01.06.12 and 01.07.22
	ISDN BRI		Tone Commander Telephones: 8610U, 8610T, 8620U, 8620T	01.07.22
	ISDN BRI		Tone Commander Telephones: 8810U, 8810T	02.07.22

Table 2-2. Tested System Configurations (continued)

LEGEND:

5ESS	- Class 5 Electronic Switching System	F-Bus	- Frame Transport Bus	PBX 2	- Private Branch Exchange 2
ASU	- Application Services Unit	HCS	- Header Check Sequence	PCM	- Pulse Code Modulation
ATM	- Asynchronous Transfer Mode	HDX	- High Density Exchange	PCM-30	- Pulse Code Modulation - 30 Channels
BRI	- Basic Rate Interface	I/F	- Interface	PDTC	- PCM-30 Digital Trunk Controller
CAS	- Channel Associated Signaling	IGX	- International Gateway Exchange	PM	- Peripheral Module
CM	- Communication Manager	IOM	- Input/Output Module	P-Phone	- Proprietary Phone
CP	- Circuit Pack	IOS	- Internetworking Operating System	PRI	- Primary Rate Interface
CPDT	- Cabinet PCM-30 Digital Trunk	IP	- Internet Protocol	PWR	- Power
CPNTA	- Control Point Network Terminal Adapter	IPCM	- Internet Protocol Client Manager	RCC2 0	- Remote Cluster Controller 2
CPP	- Common Peripheral Processor	IPE	- Intelligent Peripheral Equipment	RLC	- Remote Line Controller
CS	- Communications Server	IPF	- Integrated Processor and F-Bus Interface	RMM	- Remote Maintenance Module
CTM	- Conference Trunk Module	ISDN	- Integrated Services Digital Network	RTP	- Real Time Protocol
DBS	- Database Server	ISM	- Integrated Services Module	SCC	- Switching Control Center
DCH	- D-Channel Handler	JITC	- Joint Interoperability Test Command	SMEO	- Small End Office
DCM	- Digital Carrier Module	LCM	- Line Concentration Module	SMU	- Switch Multiplexer Unit
DIX	- D-Channel Index	LCME	- Enhanced ISDN Line Concentration Module	SPM	- Spectrum Peripheral Module
DMS	- Digital Multiplex Signaling	LCMI	- ISDN Line Concentration Module	SRU	- Shared Resource Unit
DRSN	- Defense Red Switch Network	LIU7	- Link Interface Unit 7	S/T	- ISDN BRI 4-Wire Interface
DS	- Digital Signal	LTC	- Line Trunk Controller	STP	- Signal Transfer Point
DS1	- Digital Signal Level 1	LTCI	- Line Trunk Controller ISDN	SUT	- System Under Test
DSN	- Defense Switched Network	LTU	- Line Termination Unit	T-1	- Digital Transmission Link Level 1
DTC	- Digital Trunk Controller	Mbps	- Megabits per second	TM	- Trunk Module
DTI	- Digital Trunk Interface	MCAM	- Meridian Cabinet Auxiliary Module	TOPS	- Traffic Operator Position System
DTM	- Digital Trunk Module	MCTM	- Meridian Cabinet Trunk Module	TSG	- Telephone Secure Group
DVX	- Deployable voice Exchange	MD	- Manufactured Discontinued	TTL	- Transistor-Transistor Logic
E-1	- European Basic Multiplex Rate	MFS	- Multifunction Switch	U	- ISDN BRI 2-Wire Interface
EEPROM	- Electronically Erasable Programmable Read Only Memory	MIG	- Metal in gap	UTR	- Universal Tone Receiver
		MPC	- Multi-Protocol Controller	V	- version
EFF	- Extended Frame Format	MS	- Message Switch	VoIP	- Voice over Internet Protocol
EIU	- Ethernet Interface Unit	MSL	- Meridian Switching Load	XA	- Extended Architecture
ELCM	- Enhanced Line Concentration Module	MTM	- Maintenance Trunk Module	XMS	- Extended Multiprocessor System
EM	- Element Manager	NIU	- Network Interface Unit	XP	- Experience
ENET	- Enhanced Network	OAU	- Office Alarm Unit	XPM	- XMS-based Peripheral Module
EO	- End Office	PBX 1	- Private Branch Exchange 1		

NOTES:

1 The SUT was tested with the following peripheral modules: LTCI and DTC7. JITC analysis determined the LTC, DTC, and DTC ISDN (DTCI) are functionally identical and they are also covered under this certification for use in the DSN.

2 To meet the MFS and EO European ISDN PRI interface requirements for deployment in Europe, the SUT requires the DSN Option 11C switching system with Software Release 4.5w and product enhancement package as described in this enclosure. The SUT meets the SMEO, PBX 1, PBX 2, and DVX requirements for Europe without the DSN Option 11C.

10. TESTING LIMITATIONS. The Internal Overload Control (IOC) requirement was not tested. All interfaces required for initial deployment of the SUT were successfully tested in an operationally realistic environment; however, JITC did not have available test equipment capable of generating enough voice and signaling traffic to demonstrate compliance with the IOC requirements specified in reference (d). IOC is currently operational in Nortel switches similar to the SUT in the DSN and commercial networks. Based on current performance, the risk of not testing this feature is determined to have a minor impact.

11. TEST RESULTS

a. Discussion. Detailed trunk configurations and associated lessons learned can be found on the DISA web page: http://jitc.fhu.disa.mil/tssi/.

(1) DSN Trunk Interfaces. The SUT met all critical interoperability certification requirements for DSN Trunk Interfaces with the following minor exceptions:

(a) The SUT does not support the DSN Worldwide Numbering and Dialing Plan (WWNDP) in accordance with the GSCR, section 4.5.1. The SUT supports an area code office code format of KYX and KNX (where K=is any digit 2-8, Y=0 or 1, N= any digit 2-9, and X= any digit 0-9). The new DSN WWNDP requires a new format for

area code and office code of KXX and KXX (where K= any digit 2-8 and X= any digit 0-9). This discrepancy currently has a minor operational impact in the DSN. Furthermore, the vendor has made a commitment in a formal letter from their Vice President to the DSN Program Manager (PM) to develop a software patch to fix this discrepancy by the next software release SE09.1 and back patch it to SE08.

(b) The SUT does not retry direct route during failed wink condition or glare condition. The SUT tries the direct route one time then completes the call over the alternate route. Since the call is correctly routed over the alternate route there is no operational impact.

(c) To meet the MFS and EO European ISDN PRI requirements for deployment in Europe, the SUT requires the DSN Option 11C switching system with Software Release 4.5w and specified product enhancement packages. In this configuration, the DSN Option 11C is a tandem switch and is not authorized nor approved to support line side subscribers. The SUT meets the SMEO, PBX 1, PBX 2, and DVX requirements for Europe without the DSN Option 11C. The 11C provides both E1 ISDN PRI access to the PSTN and E1 ISDN PRI (International Telecommunication Union - Telecommunication Standardization Sector [ITU-T] Q.955.3) access to the DSN. Both interfaces were tested and met the required interoperability requirements. With the DSN 11C included to meet the SUT European ISDN PRI interface there exist a minor discrepancy when either the T1 or E1 interfaces are severed. When either the T1 ISDN PRI or E1 ISDN PRI interfaces are severed the respective carrier alarms are not propagated from one interface to the other. However, when this condition occurs, calls placed over this interface via the DSN 11C receive an appropriate treatment (T120 busy, or Isolated Code Announcement).

(2) DSN Line Interfaces. When service order (servord) line configurations are required for VoIP lines including digital and analog lines directly connected to the optional MG9K or subtending off of the MG9K, they must be configured using the Operation Support System (OSS) Gateway. If servord changes for the VoIP lines are configured using the traditional servord interface, the line database may be corrupted. Furthermore, servord changes for all lines off of the SUT can be configured using the OSS Gateway. The SUT met all critical interoperability certification requirements for DSN Line Interfaces with the following minor exceptions:

(a) The SUT does not provide the correct precedence above ROUTINE ring back cadence on an analog phone in accordance with the GSCR. The GSCR requires 30 Impulses Per Minute (IMP). The SUT is providing precedence above ROUTINE ring back cadence of 40 IMP. Since the precedence above ROUTINE ring back cadence is distinguished from the ROUTINE ring back cadence, there is no operational impact.

(b) When a member of a Multiline Hunt Group (MLHG) is busy and a higher precedence call is placed to the Directory Number (DN) of that member (not the MLHG pilot number), the higher precedence call is forwarded to the next idle member of the

MLHG. Since the higher precedence call is handled and will divert to an attendant console, night service or alternate DN, there is no operational impact.

(c) The SUT does not support MLPP interaction with telephones assigned the Multiple Appearance Directory Number (MADN) option. This option applies to Electronic Key Telephone System (EKTS) ISDN Basic Rate Interface (BRI) telephones, and proprietary "P-Phones". The SUT does not support MLPP interaction with these instruments because the assignment of both preemptable and MADN options simultaneously on the same instrument is not permitted. Therefore, the MADN functionality of the SUT is not certified for use within the DSN. This is not a required feature for a MFS. The operational impact is minor.

(d) A member of an EKTS cannot be assigned as a member of an MLHG. The SUT does not allow the assignment of an ISDN BRI with options DNH (Directory Number Hunt) and MDN (Multiple Appearance Directory Number). Therefore, the SUT is not certified with the EKTS feature. EKTS is a conditional requirement for an MFS. The operational impact is minor.

(3) Network Management (NM). The GSCR NM requirements are that a switch provides NM capabilities via Ethernet, serial asynchronous (Electronic Industries Alliance [EIA]-232), or serial synchronous (ITU-T X.25). The SUT meets all the requirements for NM over Institute of Electrical and Electronic Engineers 802.3 (10BaseT Ethernet) Transmission Control Protocol/Internet Protocol, EIA-232 asynchronous serial, and ITU-T X.25 synchronous serial interfaces. It was verified that these interfaces pass required NM data elements to the ADIMSS.

(4) Features and Capabilities

(a) Common Features. The SUT met all CRs and FRs for common features with the following minor exceptions:

1. The SUT does not provide the exact conference disconnect tone in accordance with the GSCR. The tone provided is the same tone provided to commercial customers. The tone currently being provided is distinct and will have no operational impact.

2. When Call Forward Variable (CFV) is assigned to a DN on the SUT, it will allow forwarding of all calls to the Public Switched Telephone Network (PSTN) not the DSN. There is no operational impact because CFV is a conditional feature for a MFS.

3. The SUT does not provide a splash ring on an ISDN BRI telephone when the telephone has the CFV feature assigned to the phone. This discrepancy has a minor operational impact.

(b) Attendant. The SUT met all CRs and FRs for attendant services.

(c) Public Safety. The SUT met all CRs and FRs for public safety.

(d) Preset Conferencing. The SUT met all CRs and FRs for preset conferencing. This capability is satisfied with the following three consoles: Amcom Software Inc. BOSS Version 4.0.5, File Version 4.1.8.2 MSAC Replacement, the Nortel MSL-100 NT4X09 hard console, and the T-Metrics PhoneGroups® Personal Computer-based Console with Software Release 7102081953.

(e) Nailed-up Connections. The SUT met all CRs and FRs for nailed-up connections. The SUT supports 56 kilobits per second (kbps) and 64 kbps nailed up connections between the following interfaces: Pulse Code Modulation (PCM)-24 (T1) to PCM-24 (T1), PCM-30 (E1) to PCM-30 (E1), and PCM-30 (E1) to PCM-24 (T1).

(f) Precedence Access Threshold. The SUT met all CRs and FRs for Precedence Access Threshold.

(g) DSN Hotline Services. The SUT met all CRs and FRs for DSN Hotline Services.

(h) ISDN Services EKTS. The SUT did not meet all CRs and FRs for ISDN services EKTS. The SUT does not support MLPP interaction when an EKTS telephone is assigned the MADN option. The SUT does not allow the assignment of both preemptable and MADN option simultaneously. The EKTS option is not authorized nor approved for use in the DSN. Since the EKTS ISDN service is a conditional requirement, there is no operational impact.

(i) Synchronization. All critical interoperability certification CRs and FRs were met for this feature by the SUT. The SUT supports synchronization in the following modes: line timing mode, external timing mode, and internal timing mode.

(j) Reliability. All critical interoperability certification CRs and FRs for this feature were met by the SUT and verified by vendor LoC.

(k) Security. Security CRs and FRs are verified using the Information Assurance Test Plan. Results of the security testing are reported in a separate test report generated by the DISA Information Assurance test personnel.

(5) RSU. The SUT does not meet all the critical interoperability certification requirements for RSUs and therefore is not authorized nor approved for use in the DSN. The SUT did not meet the following critical requirements in the degraded operations condition: MLPP is not supported during emergency standalone, MLPP is only partially met during the partial standalone when the umbilical is saturated.

(6) VoIP System. The SUT is certified to support DSN assured services over Internet Protocol with any Assured Services Voice Application Local Area Network

(ASVALAN) on the DSN Approved Products List (APL). The SUT is also certified for joint use with any Voice Application Local Area Network (VALAN) on the DSN APL. However, since VALANs do not support the Assured Services Requirements detailed in reference (c), Command and Control (C2) users and Special C2 users are not authorized to be served by the SUT connected to a VALAN. The GSCR, appendix 3, section A3.2, outlines the requirements for the VoIP system. The VoIP system requirements encompass end-to-end VoIP requirements. The following paragraphs detail the results of the SUT VoIP solution.

(a) Voice Quality. In accordance with the GSCR, appendix 3, section A3.2.1, VoIP calls shall have a Mean Opinion Score (MOS) of at least 4.0 as measured in accordance with Department of Defense Information Technology Standards Registry (DISR) voice quality standards. This applies from handset to handset and from handset to gateway trunk in the DSN. For intra-switch calls, the SUT VoIP solution had an average MOS of 4.27. The average inter-switch MOS was 4.26. This average was based on a total of 90 intra-switch and inter-switch calls with the lowest intra-switch MOS being 4.07 and the lowest inter-switch MOS of 4.06.

(b) Class of Service (CoS) and Quality of Service (QoS). The GSCR, appendix 3, section A3.3.2, outlines several methodologies to implement CoS and QoS. The network products employed 802.1Q at the Data Link Layer 2 (L2) for CoS and Differentiated Services Code Point (DSCP) at the Network Layer 3 (L3) for QoS. The SUT provides CoS by assignment of an 802.1p/Q tag. The 802.1Q tags were used to uniquely identify and separate traffic as it passed through network connections. Voice Virtual Local Area Network traffic was assigned to a high priority queue, ensuring voice traffic took precedence over data traffic. The priority bit for L2 voice signaling was tagged with a value of 6 and the voice media was tagged with a value of 5. The L3 DSCP bits for voice signaling, was tagged with 48 and voice media was tagging 46, in the tested configuration. By using the Ixia test equipment, a data load of 1.2 times the total link aggregate, was injected on the certified ASVALAN to insure that all CoS and QoS settings were working properly. Packet captures indicated all L2 and L3 tagging was properly tagged by the SUT.

(c) Coder/Decoder (CODEC). In accordance with the GSCR, appendix 3, section A3.2.2, the ITU-T G.711 PCM CODEC with a 20 millisecond (ms) packet fill was required and was met by the SUT VoIP solution.

(d) Phones. The following Nortel Phones met the requirements set forth by the GSCR: i2001, i2002, i2004.

(e) MLPP. The GSCR, section 3, details the requirements for MLPP. All critical MLPP features and functions were met by the SUT.

(f) Security. Security requirements in accordance with the GSCR, appendix 3, were verified using the Information Assurance Test Plan. Results of the

security testing are reported in a separate test report generated by the DISA Information Assurance test personnel.

(g) NM. The GSCR, appendix 3, defines the overall NM requirements that VoIP systems must meet. The NM requirements for the SUT LAN were satisfied with vendor LoC.

(h) Synchronization. Synchronization is required for overall voice platforms to include VoIP systems. For the SUT solution, synchronization in accordance with the GSCR, section 11, was met. The SUT derived synchronization with line timing mode via traditional (PCM-24 or PCM-30) TDM-based interfaces.

(i) Latency. The GSCR, appendix 3, section A3.2.7, states that one-way system latency for the VoIP system must be 60 ms or less as averaged over any five-minute period. The latency requirement is measured from IP handset to the egress trunk. The SUT met the requirement. The average latency for 90 independent, five-minute calls was measured to be 48.73ms, with none of the five-minute calls having a latency exceeding 60ms.

(j) Packet Loss. The GSCR, appendix 3, section A3.3.1.3, states packet loss shall not exceed 0.05% averaged over any five-minute period. The SUT average packet loss was measured at 0.00% for 90 five-minute calls placed.

(k) Internet Protocol version 6 (IPv6). An IPv6 capable system or product, as defined in the GSCR, paragraph 1.7, shall be capable of receiving, processing, and forwarding IPv6 packets and/or interfacing with other systems and protocols in a manner similar to that of Internet Protocol version 4 (IPv4). IPv6 capability is currently satisfied by a vendor LoC signed by the Vice President of the company. The vendor stated, in writing, compliance to the following criteria by 30 June 2008:

1. Conformant with IPv6 standards profile contained in the DISR.

2. Maintaining interoperability in heterogeneous environments and with IPv4.

3. Commitment to upgrade as the IPv6 standard evolves.

4. Availability of contractor/vendor IPv6 technical support.

(7) Network Gateways. The SUT met all critical interoperability certification CRs and FRs the following Network Gateways: PSTN, Defense Red Switch Network (DRSN) and the Tactical Network Gateway. The certified interfaces for the PSTN are T1 CAS, E1 CAS, T1 ISDN PRI, and Ground Start Line. The certified interface for the DRSN is 2-Wire analog (GR-506-CORE). Interoperability Certification of the SUT does not constitute DRSN Program Manager (PM)'s approval for connectivity to the DRSN. It

is the user's responsibility to request connectivity approval directly from the PM. The certified interfaces for the Tactical Network Gateway are T1 and E1 CAS.

b.Test Summary. The Nortel CS 2100 Digital Switching System with Software Release SE08 and Software Patch Groups listed in enclosure 3 is certified for joint use in the DSN, in accordance with the requirements set forth in reference (e). The SUT was tested and met the critical interoperability requirements for the following DSN switch types: MFS, EO, SMEO, PBX 1, PBX 2, and DVX. To meet the MFS and EO European ISDN PRI requirements for deployment in Europe, the SUT requires the DSN Option 11C switching system with Software Release 4.5w and specified product enhancement packages. In this configuration, the DSN Option 11C is a tandem switch and is not authorized nor approved to support line side subscribers. The SUT meets the SMEO, PBX 1, PBX 2, and DVX requirements for Europe without the DSN Option 11C. The 11C provides both E1 ISDN PRI access to the PSTN and E1 ISDN PRI (ITU-T Q.955.3) access to the DSN. Both interfaces were tested and met the required interoperability requirements. The SUT was tested and is certified with the following optional peripherals: SPM, MG9K, and the MG9K with LCME. The SUT is certified with or without any combination of these optional peripherals. The SUT offers an RSU. The RSU was tested but did not meet the critical interoperability requirements and is therefore not authorized not approved for use in the DSN. The SUT ACD capability is not authorized nor approved for use within the DSN with either an internal or external ACD. The interoperability summary and status to include criticality for each interface can be found in table 2-3.

Table 2-3. SUT Interoperability Summary

DSN Trunk Interfaces			
Interface & Signaling	**Critical**	**Status**	**Remarks**
T1 CAS (DTMF, MFR1, DP)	Yes	Certified	Met all CRs and FRs with the following exceptions: The SUT does not support the WWNDP in accordance with the GSCR.[1] The SUT does not retry direct route during failed wink condition or glare condition.[2]
E1 CAS (DTMF, MFR1, DP)	Yes (Europe only)	Certified	Met all CRs and FRs with the following exceptions: The SUT does not support the WWNDP in accordance with the GSCR.[1] The SUT does not retry direct route during failed wink condition or glare condition.[2]
E1 CAS (DTMF, DP)	Yes (Europe only)	Certified	Met all CRs and FRs with the following exceptions: The SUT does not support the WWNDP in accordance with the GSCR.[1] The SUT does not retry direct route during failed wink condition or glare condition.[2]
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all CRs and FRs with the following exception: The SUT does not support the WWNDP in accordance with the GSCR.[1]
E1 ISDN PRI (ITU-T Q.955.3)	Yes (Europe only)	Certified	Met all CRs and FRs with the following minor exceptions: The SUT does not support the WWNDP in accordance with the GSCR.[1] The SUT does not meet the full requirement for carrier alarms [3]. The MFS and EO European ISDN PRI requirements for Europe are met by the SUT with the DSN Option 11C switching system with Software Release 4.5w and specified product enhancement packages listed in enclosure 3.
T1 SS7 (ANSI T1.619a)	Yes	Certified	Met all CRs and FRs with the following exception: The SUT does not support the WWNDP in accordance with the GSCR.[1]
E1 SS7 (ITU-T Q.735.3)	Yes (Europe only)	Certified	Met all CRs and FRs with the following exception: The SUT does not support the WWNDP in accordance with the GSCR.[1]

Table 2-3. SUT Interoperability Summary (continued)

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 exceptions: The SUT does not provide the correct precedence ring back cadence on an analog phone in accordance with the GSCR.[4] Improper MLPP interaction when calls are placed to a MLHG DN.[5]
ISDN BRI S/T and U Interface ITU-T Q.931	Yes	Certified	Met all CRs and FRs with the following minor exceptions: Improper MLPP interaction when calls are placed to a MLHG DN.[5] The SUT does not support MLPP interaction with MADN.[6] A member of an EKTS cannot be assigned as a member of an MLHG.[7]
2-Wire Digital and Analog (Proprietary)	No	Certified	Met all CRs and FRs with the following minor exceptions: Improper MLPP interaction when calls are placed to a MLHG DN.[5] The SUT does not support MLPP interaction with the MADN.[6]
VoIP	No	Certified	Met all CRs and FRs with the following minor exception: Improper MLPP interaction when calls are placed to a MLHG DN.[5]
Line-Side T1 CAS DTMF (Ground-Start)	No	Certified	Met all CRs and FRs. This interface is provided by the IPEC with a line side T1 interface and is certified exclusively for voicemail.
2 Wire Analog Ground Start Line (GR-506-CORE)	Yes	Certified	Met all CRs and FRs.
Voicemail			
Interface	**Critical**	**Status**	**Remarks**
Line-Side T1 CAS DTMF (Ground-Start)	No	Certified	Met all CRs and FRs. This interface is provided by the IPEC with a line side T1 interface and is certified exclusively for voicemail.
2 Wire Analog Ground Start Line (GR-506-CORE)	No	Certified	Met all CRs and FRs.
Network Management			
Interface & Signaling	**Critical**	**Status**	**Remarks**
IEEE 802.3 10BaseT Ethernet, TCP/IP	No[7]	Certified	Met all CRs and FRs.
EIA-232 Asynchronous at 9.6 kbps	No[7]	Certified	Met all CRs and FRs.
ITU-T X.25	No[7]	Certified	Met all CRs and FRs.
DSN Features and Capabilities			
Features and Capabilities	**Critical**	**Status**	**Remarks**
Common Features	Yes	Certified	Met all CRs and FRs with the following minor exceptions: The SUT does not provide the correct conference disconnect tone in accordance with the GSCR.[9] CFV of all inter-switch calls do not forward to the DSN.[10] The SUT does not provide a splash ring on an ISDN BRI telephone when the telephone has the CFV feature assigned to the phone.[11]
Attendant	Yes	Certified	Met all CRs and FRs with the following three consoles: Amcom Software Inc. BOSS Version 4.0.5, File Version 4.1.8.2 MSAC Replacement, the Nortel MSL-100 NT4X09 hard console, and the T-Metrics PhoneGroups® Personal Computer-based Console with Software Release 7102081953.
Public Safety	Yes	Certified	Met all CRs and FRs.
Preset Conferencing	Yes	Certified	Met all CRs and FRs.
Nailed-up Connections	Yes	Certified	Met all CRs and FRs.
Precedence Access Threshold	No	Certified	Met all CRs and FRs.
DSN Hotline Services	Yes	Certified	Met all CRs and FRs.
Tandem Switching	Yes	Certified	Met all CRs and FRs.
ISDN Services (EKTS)	No	Not Certified	The SUT does not support MLPP with EKTS. The EKTS option is not authorized nor approved for use in the DSN.
Synchronization	Yes	Certified	Met all CRs and FRs.
Reliability	Yes	Certified	Met all CRs and FRs.
Security	Yes	See note 12.	See note 12.

Table 2-3. SUT Interoperability Summary (continued)

RSU			
Features and Capabilities	**Critical**	**Status**	**Remarks**
Normal Operation	No	Not Certified	The RSU does not meet the GSCR requirements for certification. The RSU is not authorized nor approved for use in the DSN.
Degraded Operations	No	Not Certified	The SUT did not meet the following critical requirements in the degraded operations condition: MLPP is not supported during emergency standalone; MLPP is only partially met during the partial standalone when the umbilical is saturated. The RSU is not authorized nor approved for use in the DSN.

VoIP			
Features and Capabilities	**Critical**	**Status**	**Remarks**
VoIP Systems	No	Certified	The SUT is certified for VoIP with certified ASVALAN posted on the JITC DSN APL (http://jitc.fhu.disa.mil/tssi/apl.html). See notes 13 and 14.

Network Gateways				
Gateway	**Interface & Signaling**	**Critical**	**Status**	**Remarks**
PSTN	T1 CAS (DTMF, MFR1, DP)	Yes	Certified	Met all CRs and FRs.
	E1 CAS (DTMF, MFR1, DP)	Yes (Europe only)	Certified	Met all CRs and FRs.
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	Yes	Certified	Met all CRs and FRs.
	E1 ISDN PRI (ITU-T Q.931)	Yes (Europe only)	Certified	Met all CRs and FRs with the following minor exception: The SUT does not meet full requirement for carrier alarms [3]. To meet the MFS and EO European ISDN PRI interface for deployment in Europe, the SUT requires the DSN Option 11C with Software Release 4.5w and Product Enhancement Packages listed in enclosure 3.
Tactical	T1 CAS (DTMF, MFR1, DP)	Yes	Certified	Met all CRs and FRs.
	E1 CAS (MFR1)	Yes (Europe only)	Certified	Met all CRs and FRs.
DRSN[15]	2-Wire Analog (GR-506-CORE))	Yes	Certified	Met all CRs and FRs.

LEGEND:

10BaseT	- 10 Mbps (Baseband Operation, Twisted Pair) Ethernet
802.3	- Standard for carrier sense multiple access with collision detection at 10 Mbps
ANSI	- American National Standards Institute
APL	- Approved Products List
ASVALAN	- Assured Services Voice Application Local Area Network
BOSS	- Basic Operator Services System
BRI	- Basic Rate Interface
C2	- Command and Control
CAS	- Channel Associated Signaling
CFV	- Call Forward Variable
CRs	- Capability Requirements
DCE	- Data Circuit-Terminating Equipment
DISA	- Defense Information Systems Agency
DN	- Directory Number
DP	- Dial Pulse
DRSN	- Defense Red Switch Network
DSN	- Defense Switched Network
DSS1	- Digital Subscriber Signaling 1
DTE	- Data Terminal Equipment
DTMF	- Dual Tone Multi-Frequency
E1	- European Basic Multiplex Rate (2.048 Mbps)
EIA	- Electronic Industries Alliance
EIA-232	- Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices
EKTS	- Electronic Key Telephone System
EO	- End Office
FRs	- Feature Requirements
GR	- Generic Requirement
GR-506-CORE	- Telcordia Signaling for Analog Interface Generic Requirement
GSCR	- Generic Switching Center Requirements
IEEE	- Institute of Electrical and Electronics Engineers, Inc.
IMP	- Impulses per minute
IPEC	- Intelligent Peripheral Equipment Column
IPv4	- Internet Protocol version 4
IPv6	- Internet Protocol version 6
ISDN	- Integrated Services Digital Network
ITU-T	- International Telecommunication Union - Telecommunication Standardization Sector
JITC	- Joint Interoperability Test Command
kbps	- kilobits per second
MADN	- Multiple Appearance Directory Number
Mbps	- Megabits per second
MFR1	- Multifrequency Recommendation 1
MFS	- Multifunction Switch
MLHG	- Multiline Hunt Group
MLPP	- Multi-Level Precedence and Preemption
MSAC	- Meridian Services Attendant Console
MSL	- Meridian Switching Load
NI 1/2	- National ISDN Standard 1 or 2
PM	- Program Manager
PRI	- Primary Rate Interface
PSTN	- Public Switched Telephone Network
Q.735.3	- SS7 Signaling Standard for E1 MLPP
Q.931	- Signaling Standard for ISDN
Q.955.3	- ISDN Signaling standard for E1 MLPP
RSU	- Remote Switching Unit
SE	- Succession Enterprise
SMEO	- Small End Office
SS7	- Signaling System 7
S/T	- ISDN BRI four-wire interface
SUT	- System Under Test
T1	- Digital Transmission Link Level 1 (1.544 Mbps)
T1.607	- ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
T1.619a	- SS7 and ISDN MLPP Signaling Standard for T1
TCP/IP	- Transmission Control Protocol/Internet Protocol
U	- ISDN BRI two-wire interface
VALAN	- Voice Application Local Area Network
VoIP	- Voice over Internet Protocol
WWNDP	- Worldwide Numbering and Dialing Plan
X.25	- Interface between DTE and DCE for terminals operating in the packet mode and connected to public data networks by dedicated circuit

Table 2-3. SUT Interoperability Summary (continued)

NOTES:

1 The SUT does not support the WWNDP in accordance with the GSCR, section 4.5.1. The SUT supports an area code office code format of KYX and KNX (where K=is any digit 2-8, Y=0 or 1, N= any digit 2-9, and X= any digit 0-9). The new WWNDP requires a new format for area code and office code of KXX and KXX (where K= any digit 2-8 and X= any digit 0-9). This discrepancy currently has a minor operational impact in the DSN. Furthermore, the vendor has made a commitment in a formal letter from their Vice President to the DSN PM to develop a software patch to fix this discrepancy by the next software release SE09.1 and back patch it to SE08.

2 The SUT does not retry direct route during failed wink condition or glare condition. The SUT tries the direct route one time then completes the call over the alternate route. Since the call is correctly routed over the alternate route, there is no operational impact.

3 With the DSN 11C included to meet the SUT European ISDN PRI interface there exist a minor discrepancy when either the T1 or E1 interfaces are severed. When either the T1 ISDN PRI or E1 ISDN PRI interfaces are severed the respective carrier alarms are not propagated from one interface to the other. However, when this condition occurs, calls placed over this interface via the DSN 11C receive an appropriate treatment (T120 busy, or Isolated Code Announcement).

4 The SUT does not provide the correct precedence above ROUTINE ring back cadence on an analog phone in accordance with the GSCR. The GSCR requires 30 IMP. The SUT is providing precedence above ROUTINE ring back cadence of 40 IMP. Since the precedence above ROUTINE ring back cadence is distinguished from the ROUTINE ring back cadence, there is no operational impact.

5 When a member of a MLHG is busy and a higher precedence call is placed to the DN of that member (not the MLHG pilot number), the higher precedence call is forwarded to the next idle member of the MLHG. Since the higher precedence call is handled and will divert to an attendant console, night service or alternate DN, there is no operational impact.

6 The SUT does not support MLPP interaction with telephones assigned the MADN option. This option applies to EKTS ISDN BRI telephones, and proprietary "P Phones". The SUT does not support MLPP interaction with these instruments because the assignment of both preemptable and MADN options simultaneously on the same instrument is not permitted. Therefore, the MADN functionality of the SUT is not certified for use within the DSN. This is not a required feature for a MFS. The operational impact is minor.

7 A member of an EKTS cannot be assigned as a member of an MLHG. The SUT does not allow the assignment of an ISDN BRI with options DNH (Directory Number Hunt) and MDN (Multiple Appearance Directory Number). Therefore, the SUT is not certified with the EKTS feature. EKTS is a conditional requirement for an MFS. The operational impact is minor.

8 The Network Management requirements can be satisfied with one of the three following physical interfaces: Ethernet/TCP/IP (IEEE 802.3), Serial EIA-232/Asynchronous, or Serial Synchronous (ITU-T X.25).

9 The SUT does not provide the exact conference disconnect tone in accordance with the GSCR. The tone provided is the same tone provided to commercial customers. The tone currently being provided is distinct and will have no operational impact.

10 When CFV is assigned to a DN on the SUT, it will allow forwarding of all calls to the PSTN not the DSN. There is no operational impact because CFV is a conditional feature for a MFS.

11 The SUT does not provide a splash ring on an ISDN BRI telephone when the telephone has the CFV feature assigned to the phone. This discrepancy has a minor operational impact.

12 Security is tested by DISA-led Information Assurance test teams and published in a separate report.

13 The SUT is certified to support DSN assured services over Internet Protocol with any ASVALAN on the DSN APL. The SUT is also certified for joint use with any VALAN on the DSN APL. However, since VALANs do not support the Assured Services Requirements detailed in reference (c), C2 users and Special C2 users are not authorized to be served by the SUT connected to a VALAN.

14 An IPv6 capable system or product, as defined in the GSCR, paragraph 1.7, shall be capable of receiving, processing, and forwarding IPv6 packets and/or interfacing with other systems and protocols in a manner similar to that of IPv4. IPv6 capability is currently satisfied by a vendor Letter of Compliance signed by the Vice President of the company. The vendor stated, in writing, compliance to the following criteria by 30 June 2008**:**

a. Conformant with IPv6 standards profile contained in the Department of Defense Information Technology Standards Registry (DISR).
b. Maintaining interoperability in heterogeneous environments and with IPv4.
c. Commitment to upgrade as the IPv6 standard evolves.
d. Availability of contractor/vendor IPv6 technical support.

15 Interoperability certification of the SUT does not constitute DRSN PM approval for connectivity to the DRSN. It is the user's responsibility to request connectivity approval directly from the PM.

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

Table 3-1. Nortel CS 2100 Software Release SE08 Software Patch Group Identification Numbers

CM (Front End) Patches							
AAA99	CAY03P88	DDR08P88	**DSN27P8U**	NNR17P89	NNR87P89	SPL10P89	TTY45P86
AEA61P87	CAY07P89	DDR09P87	**DSN28P8U**	NNR18P89	NNR88P88	SPL11P89	TWH50P87
AEA62P8L	CAY09P89	DDR10P87	DVD60P8J	NNR19P89	NNR89P87	SPL12P8J	TWH54P88
AHN00P88	CAY12P86	DDR14P88	GDN98P87	NNR20P88	NNR90P89	SPL13P88	TWH55P89
AHN02P8J	CAY13P89	DDR21P8J	GET26P87	NNR22P89	NNR92P88	SPL20P87	TWH58P8L
AHN06P88	CAY14P87	DDR25P89	GET27P89	NNR24P88	NNR94P89	SPL21P89	TWH64P8J
AHN07P8L	CAY16P89	DDR38P87	GET28P89	NNR25P8L	NNR95P86	SPL22P89	TWH65P8J
AHN08P89	CAY17P88	DDR40P89	HND11P88	NNR26P87	NNR97P88	SPL23P89	TWH70P89
AHN10P89	CAY18P89	DDR41P86	HND15P89	NNR27P89	NNR99P89	SPL24P89	TWH84P89
APG41P89	CAY21P8L	DDR43P89	HND37P89	NNR29P89	ORD57P88	SPL25P89	TWH88P88
APG42P89	CAY22P89	DDR47P8L	HND48P89	NNR31P8L	ORD74P89	SPL26P89	VGR50P86
APG43P86	CAY23P87	DDR55P8J	HND51P89	NNR34P88	PFY63P88	SPL27P8L	VGR54P86
BBS00P89	CAY28P89	DDR59P89	IFY11P88	NNR35P8L	PFY93P88	SPL28P89	WBA18P88
BBS01P8J	CAY30P89	DDR64P89	INO31P8L	NNR37P89	PTC10P88	SPL29P8J	WBA19P88
BBS11P89	CAY33P89	DDR68P88	ISY04P88	NNR38P8L	PTC68P89	SPL30P89	WBA21P88
BBS20P89	CAY36P88	DDR70P87	IVN57P87	NNR39P89	RAV35P87	SPL31P89	WBA22P88
BBS23P89	CAY39P88	DDR71P88	JDR42P87	NNR40P89	RAV36P89	SPL32P88	WBA23P87
BBS27P88	CAY40P89	DDR73P89	JDR44P8L	NNR41P89	RAV37P87	SPL33P88	WBA24P88
BBS30P87	CAY41P89	DDR74P89	JEO96P8L	NNR42P87	RAV40P87	SPL34P89	WBA25P88
BBS33P89	CAY42P8L	DDR80P88	JEO98P89	NNR43P88	RDV34P86	SPL36P88	WBA30P87
BBS37P88	CAY43P88	DDR84P86	JEO99P8L	NNR45P86	RDV35P86	SPL37P89	WBA31P87
BBS39P89	CAY45P89	DDR90P86	JHH16P8J	NNR46P86	RNS74P89	SPL47P89	WBA33P88
BBS44P89	CAY48P86	DDR91P86	JSE33P89	NNR48P86	RNS75P8J	SPL48P8J	WBA37P88
BBS46P87	CAY49P89	DDR92P89	JSE35P89	NNR49P87	RNS88P89	SPMNAIL	WBA38P87
BBS47P89	CAY57P88	DDR84P86	JSE36P89	NNR51P89	RNS91P89	SRR53P89	WBA44P87
BBS53P89	CAY61P89	DDR90P86	JSE37P88	NNR53P8J	RNS92P89	SRR55P89	WBA47P88
BBS59P89	CAY69P88	DDR91P86	JSE38P86	NNR54P89	RNS93P8L	SRR56P89	WHY09P86
BCE09P8L	CAY71P8J	DDR92P89	JSE39P8L	NNR57P87	RNS94P89	SRR59P89	WHY13P86
BFM02P88	CAY77P89	DDR99P88	JSE40P88	NNR58P88	RNS95P8J	SRR61P8J	WHY14P86
BHC54P89	CAY82P89	DED04P86	JWT18P87	NNR61P86	RNS97P89	SRR65P89	WHY16P86
BRD09P87	CAY83P89	DGD32P88	JWT19P87	NNR63P86	RNS98P8J	SRR76P89	WHY18P86
BRD10P88	CAY91P88	DGD46P89	NNR00P87	NNR71P89	RUNLAB	SRR77P8L	WSF91P87
BRD13P8J	CAY95P86	**DSN00P8U**	NNR02P8L	NNR74P87	SKT39P8U	SRR80P89	ZAT76P88
BRD33P89	CBM13P87	**DSN01P89**	NNR03P89	NNR75P88	SPL01P86	TGR28P88	ZAT82P87
BRD36P88	CKD39P87	DSN02P87	NNR06P88	NNR76P89	SPL02P87	TGR29P89	ZAT83P8L
BRD42P89	CLF46P87	DSN09P89	NNR09P8J	NNR77P89	SPL03P88	TGR30P88	ZAT87P89
BRD45P86	CLF48P87	DSN10P8U	NNR10P89	NNR78P8J	SPL04P89	TLW59P87	ZAT89P8L
BRD61P89	CPH56P89	**DSN11P88**	NNR11P89	NNR81P89	SPL05P89	TLW60P89	ZIG40P89
BRD79P87	DDR00P89	DSN15P8U	NNR12P88	NNR83P87	SPL06P89	TPC21P86	ZIG63P89
BRD81P89	DDR03P8J	DSN16P89	NNR13P8L	NNR84P86	SPL07P89	TTL64P89	
CAY00P89	DDR05P8J	**DSN21P88**	NNR14P8J	NNR85P89	SPL08P89	TTL66P88	
CAY02P87	DDR07P88	**DSN24P80**	NNR16P89	NNR86P88	SPL09P89	TTL67P89	
ISN (MS and ENET) Patches							
CLF45I86	DDR98I86	JWT20I86	NNR95I86	RDV35I86	VGR54I86		
CLF45I86	DDR98I86	JWT20I86	NNR95I86	RDV35I86	VGR54I86		

Table 3-1. Nortel CS 2100 Software Release SE08 Software Patch Group Identification Numbers (continued)

XPM Patches							
DTC							
XBC53X14	XBH05X14	XIG53X14	XIJ41X14	XOG41X14	XSI76X14	XYP03X14	XYY45X14
XBC59X14	XCB13X14	XIG57X14	XIX14X14	XOG75X14	XSI86X14	XYP05X14	XYY58X14
XBC75X14	XDY43X14	XIG64X14	XMC62X14	XPG22X14	XUT61X14	XYP06X14	XYY61X14
XBC81X14	XIG12X14	XIG68X14	XMC63X14	XQM11X14	XUT72X14	XYP12X14	XYY62X14
XBC88X14	XIG14X14	XIG72X14	XMV08X14	XQM13X14	XXJ23X14	XYR13X14	XYY93X14
XBC91X14	XIG17X14	XIG95X14	XMV18X14	XRF04X14	XXV56X14	XYR20X14	XZB21X14
XBC96X14	XIG24X14	XIG98X14	XMV25X14	XRP99X14	XYP02X14	XYY00X14	XZB22X14
XBD51X14	XIG49X14						
PDTC							
XBD33X3Y	XFN05X3Y	XFN41X3Y	XFN96X3Y	XNT79X3Y	XXV12X3Y	XXV45X3Y	XXV60X3Y
XCC61X3Y	XFN09X3Y	XFN43X3Y	XNT18X3Y	XNT92X3Y	XXV24X3Y	XXV46X3Y	XXV88X3Y
XFN02X3Y	XFN22X3Y	XFN56X3Y	XNT32X3Y	XRR99X3Y	XXV31X3Y	XXV52X3Y	
XFN04X3Y	XFN30X3Y	XFN92X3Y	XNT64X3Y	XXV04X3Y	XXV32X3Y	XXV54X3Y	
LTC							
XFY28X3Z	XIX05X3Z	XMN25X3Z	XMN29X3Z	XT184X3Z	XYP15X3Z	XYR10X3Z	XYR19X3Z
XFY28X3Z	XIX05X3Z	XMN25X3Z	XMN29X3Z	XT184X3Z	XYP15X3Z	XYR10X3Z	XYR19X3Z
XIJ48X3Z	XKH52X3Z	XMN27X3Z	XMN31X3Z	XXV58X3Z	XYP22X3Z	XYR16X3Z	XYR24X3Z
XIJ48X3Z	XKH52X3Z	XMN27X3Z	XMN31X3Z	XXV58X3Z	XYP22X3Z	XYR16X3Z	XYR24X3Z
LIU Patches							
DDR98I88	NNR95I88	RDV35I88	VGR54I88	WBA27I88	WBA31I88	WBA52I88	
EIU Patches							
CAY14I87	CLF46I87	DDR98I86	NNR89I87	NNR95I86	RDV35I86	VGR54I86	WSF91I87
NIU Patches							
DDR98I86	NNR95I86	RDV35I86	VGR54I86				
RCC2 Patches							
XAH19X7A	XIG69X7A	XIJ21X7A	XIX17X7A	XQM38X7A	XUT94X7A	XYR17X7A	XYY78X7A
XAH25X7A	XIG73X7A	XIJ28X7A	XMN10X7A	XQM66X7A	XUT97X7A	XYY55X7A	XYY81X7A
XBH06X7A	XIG74X7A	XIX00X7A	XMN16X7A	XQN67X7A	XUT99X7A	XYY66X7A	XYY87X7A
XDJ98X7A	XIG89X7A	XIX03X7A	XQM36X7A	XUT92X7A	XYR00X7A	XYY68X7A	XYY89X7A
XIG30X7A	XIJ09X7A						
DCH Patches							
XIJ50X3Y	XKH55X3Y	XYR23X3Y	XYR29X3Y	XYR36X3Y	XYR38X3Y		
SPM 0 Patches							
OC3							
EGG01S5E	IFO04S5E	IFO43S5E	IFO48S5E	**IFO46S5E**	INY31S5E	INO71S5E	INY50S5E
EGG04S5E							
DSP							
EGG20S5E	INO46S5E	JLC42S5E	SNT0001A005E				
DLC							
EGG06S5E	INS20S5E	INY18S5E	ISY07S5E	ISY10S5E	JYN26S5E	OLI69S5E	

Table 3-1. Nortel CS 2100 Software Release SE08 Software Patch Group Identification Numbers (continued)

CEM							
EGG05S5E	IFO29S5E	INF19S5E	INO56S5E	INS53S5E	INY41S5E	IOS25S5E	JLC59S5E
EGG14S5E	IFO44S5E	INF36S5E	INO62S5E	INS54S5E	INY44S5E	IOS27S5E	JLC71S5E
ELF04S5E	IFO46S5E	INO21S5E	INS04S5E	INS72S5E	INY56S5E	ISF13S5E	JLC86S5E
GAG45S5E	IFY08S5E	INO27S5E	INS14S5E	INS74S5E	INY57S5E	ISF22S5E	JLC88S5E
IFO02S5E	IFY12S5E	INO30S5E	INS19S5E	INS75S5E	INY60S5E	ISY09S5E	LBJ65S5E
IFO08S5E	IFY22S5E	INO32S5E	INS21S5E	INS81S5E	INY77S5E	ISY19S5E	NMD05S5E
IFO11S5E	INF08S5E	INO35S5E	INS25S5E	INY09S5E	INY80S5E	ISY47S5E	NMD07S5E
IFO13S5E	INF12S5E	INO38S5E	INS28S5E	INY23S5E	IOS03S5E	ISY59S5E	SNT0001C000D
IFO25S5E	INF13S5E	INO48S5E	INS42S5E	INY24S5E	IOS05S5E	ISY65S5E	WSS84S5E
IFO26S5E	INF17S5E	INO51S5E	INS51S5E	INY34S5E	IOS06S5E	ISY74S5E	
SPM 1 Patches							
CEM							
BEZ21S5E	ELF11S5E	INO23S5E	INS22S5E	INS32S5E	ISY05S5E	ISY18S5E	JWT29S5E
EGG03S5E	INF10S5E	INO29S5E	INS29S5E				
GEM							
JYN27S5E							
GWC							
XAB49G8S	XAH64G8S	XBD46G8S	XFY16G8S	XFZ54G8S	XJK73G8S	XQN07G8S	XSL34G8S
XAB51G8S	XAH65G8S	XBD47G8S	XFY17G8S	XFZ55G8S	XJK78G8S	XQN08G8S	XSL39G8S
XAB53G8S	XAH69G8S	XBD52G8S	XFY27G8S	XFZ63G8S	XJK79G8S	XQN11G8S	XSL50G8S
XAB55G8S	XAK20G8S	XBD54G8S	XFY31G8S	XFZ68G8S	XJK86G8S	XQN13G8S	XSL55G8S
XAB56G8S	XAK43G8S	XBD67G8S	XFY48G8S	XGH15G8S	XJK87G8S	XQN17G8S	XSL60G8S
XAB58G8S	XAK44G8S	XBD73G8S	XFY51G8S	XGH16G8S	XJK96G8S	XQN21G8S	XVM59G8S
XAB59G8S	XAK46G8S	XBD79G8S	XFY70G8S	XGH29G8S	XJK98G8S	XQN22G8S	XXV01G8S
XAB63G8S	XAK48G8S	XBD86G8S	XFY79G8S	XHJ05G8S	XJK99G8S	XQN24G8S	XXV07G8S
XAB65G8S	XAK49G8S	XBD98G8S	XFY83G8S	XHJ06G8S	XKE12G8S	XQN29G8S	XXV16G8S
XAB69G8S	XAK53G8S	XBH34G8S	XFY84G8S	XHJ07G8S	XKE13G8S	XQN30G8S	XYP24G8S
XAB75G8S	XAK54G8S	XCS16G8S	XFY87G8S	XHJ12G8S	XKN47G8S	XQN37G8S	XYP27G8S
XAB79G8S	XAK57G8S	XCZ14G8S	XFY94G8S	XHJ14G8S	XKN86G8S	XQN46G8S	XYP28G8S
XAB83G8S	XAK60G8S	XDM38G8S	XFZ01G8S	XHJ17G8S	XKN88G8S	XQN61G8S	XYR31G8S
XAH41G8S	XAK61G8S	XDM41G8S	XFZ04G8S	XIJ46G8S	XKN90G8S	XQN68G8S	XYR35G8S
XAH42G8S	XAK64G8S	XFJ32G8S	XFZ07G8S	XIX34G8S	XKN92G8S	XQN78G8S	XYR41G8S
XAH43G8S	XAK68G8S	XFJ65G8S	XFZ14G8S	XJD14G8S	XKN97G8S	XQN83G8S	XYR43G8S
XAH44G8S	XAK71G8S	XFJ67G8S	XFZ22G8S	XJD17G8S	XMP12G8S	XQN96G8S	XYR44G8S
XAH48G8S	XBD12G8S	XFJ69G8S	XFZ25G8S	XJD25G8S	XMP13G8S	XQN97G8S	
XAH50G8S	XBD17G8S	XFJ71G8S	XFZ29G8S	XJK36G8S	XOC04G8S	XRV67G8S	
XAH54G8S	XBD30G8S	XFJ74G8S	XFZ30G8S	XJK64G8S	XPG31G8S	XRV69G8S	
XAH55G8S	XBD39G8S	XFN72G8S	XFZ41G8S	XJK67G8S	XQN01G8S	XRV71G8S	
XAH60G8S	XBD41G8S	XFN80G8S	XFZ44G8S	XJK70G8S	XQN04G8S	XRV75G8S	
XAH62G8S	XBD43G8S	XFN88G8S	XFZ45G8S	XJK72G8S	XQN05G8S	XSL30G8S	

Table 3-1. Nortel CS 2100 Software Release SE08 Software Patch Group Identification Numbers (continued)

MG9000 - ELEMENT MANAGER							
SSPFS							
EDV20OZ8	JFJ34OZ8	JFJ47OZ8	LAX77OZ8	LAX98OZ8	LEX14OZ8	LEX21OZ8	LEX40OZ8
EDV22OZ8	JFJ35OZ8	JFJ49OZ8	LAX79OZ8	LEX01OZ8	LEX15OZ8	LEX24OZ8	LEX52OZ8
HAD44OZ8	JFJ36OZ8	LAX71OZ8	LAX83OZ8	LEX04OZ8	LEX16OZ8	LEX31OZ8	REX05OZ8
HMM36OZ8	JFJ37OZ8	LAX72OZ8	LAX85OZ8	LEX05OZ8	LEX18OZ8	LEX32OZ8	REX16OZ8
HMM38OZ8	JFJ38OZ8	LAX73OZ8	LAX90OZ8	LEX10OZ8	LEX19OZ8	LEX37OZ8	ZIG50OZ8
JFJ33OZ8	JFJ40OZ8	LAX76OZ8	LAX92OZ8				
PSE							
AJI08OZ8	ZUD19OZ8	ZUD26OZ8	ZUD27OZ8				
MG9000 SERVER							
ABE08OZ8	HAD30OZ8	HAD38OZ8	HAD55OZ8	ZOD85OZ8	ZUD10OZ8	ZUD38OZ8	ZUD42OZ8
AJI28OZ8	HAD31OZ8	HAD39OZ8	ZOD84OZ8	ZOD89OZ8	ZUD30OZ8	ZUD41OZ8	ZUD48OZ8
DGY04OZ8	HAD33OZ8						
MG9000 MIDTIER							
ABE05OZ8	DGY03OZ8	HAD28OZ8	ZOD90OZ8	ZUD31OZ8	ZUD47OZ8	ZUD49OZ8	
ABE11OZ8	HAD26OZ8	HAD34OZ8	ZUD11OZ8	ZUD39OZ8			
MG9000							
ABI							
BSH02UFK	FNM90UFK	HPA97UFK	HPF28UFK	HPF95UFK	HPH52UFK	NOS04UFK	TNG79UFK
FNM01UFK	FNM93UFK	HPF03UFK	HPF36UFK	HPH24UFK	HPH53UFK	TNG38UFK	TNG92UFK
FNM45UFK	GKO76UFK	HPF07UFK	HPF44UFK	HPH33UFK	JJK16UFK	TNG43UFK	TNG96UFK
FNM48UFK	GKO81UFK	HPF12UFK	HPF64UFK	HPH50UFK	JJK20UFK	TNG54UFK	ZOO08UFK
FNM49UFK	GKO99UFK	HPF18UFK	HPF67UFK	HPH51UFK	MJI28UFK	TNG78UFK	
FNM51UFK	HPA94UFK						
GigE							
BNZ34UFK	FZY49UFK	HPF19UFK	JJK22UFK	TNG46UFK	TNG62UFK	TNG65UFK	TNG77UFK
CJS03UFK	GKO70UFK	HPF29UFK	NIN03UFK	TNG47UFK	TNG63UFK	TNG66UFK	TNG84UFK
CJS08UFK	GKO86UFK	HPF34UFK	TNG39UFK	TNG61UFK	TNG64UFK	TNG67UFK	TNG98UFK
CJS11UFK	GKO87UFK	HPH26UFK					
ITP							
APG50UFK	FNM21UFK	FNM70UFK	HPF08UFK	HPF52UFK	HPH15UFK	TNG20UFK	TNG95UFK
BNZ30UFK	FNM28UFK	FNM80UFK	HPF10UFK	HPF57UFK	HPH22UFK	TNG36UFK	ZOO02UFK
BNZ35UFK	FNM43UFK	FNM92UFK	HPF16UFK	HPF62UFK	JDL06UFK	TNG37UFK	ZOO03UFK
BNZ37UFK	FNM50UFK	GKO75UFK	HPF22UFK	HPF70UFK	JJK15UFK	TNG42UFK	ZOO04UFK
BNZ39UFK	FNM52UFK	GKO79UFK	HPF26UFK	HPF71UFK	JJK19UFK	TNG52UFK	ZOO07UFK
BNZ41UFK	FNM56UFK	GKO84UFK	HPF35UFK	HPF72UFK	MJI31UFK	TNG60UFK	ZOO20UFK
BNZ42UFK	FNM61UFK	GKO88UFK	HPF42UFK	HPF73UFK	MWS28UFK	TNG80UFK	ZOO39UFK
BNZ43UFK	FNM62UFK	GKO90UFK	HPF45UFK	HPF85UFK	NOS03UFK	TNG81UFK	ZOO42UFK
BNZ48UFK	FNM63UFK	HPF06UFK	HPF46UFK	HPF96UFK	NOS05UFK	TNG88UFK	ZOO43UFK
FNM00UFK							
ITX							
CJS04UFK	FNM60UFK	FNM99UFK	GKO97UFK	HPF17UFK	HPF27UFK	HPF63UFK	TNG53UFK
FNM44UFK	FNM81UFK	GKO80UFK	HPF11UFK	HPF23UFK	HPF43UFK	HPH23UFK	TNG91UFK
CMT							
QCA							
HMM40OZ8	NOU75OZ8	ZOD86OZ8	ZUD02OZ8	ZUD16OZ8			

Table 3-1. Nortel CS 2100 Software Release SE08 Software Patch Group Identification Numbers (continued)

SESM							
BCK01OZ8	HAD36OZ8	HAD50OZ8	HAD69OZ8	HMM29OZ8	ZIG43OZ8	ZOD81OZ8	ZUD13OZ8
BCK02OZ8	HAD37OZ8	HAD53OZ8	HAD78OZ8	HMM30OZ8	ZIG47OZ8	ZIG52OZ8	ZUD18OZ8
DGY01OZ8	HAD40OZ8	HAD56OZ8	HAD79OZ8	HMM31OZ8	HMM35OZ8	ZOD87OZ8	ZUD21OZ8
HAD27OZ8	HAD41OZ8	HAD57OZ8	HAD80OZ8	HAD89OZ8	ZIG52OZ8	ZUD01OZ8	ZUD22OZ8
HAD29OZ8	HAD42OZ8	HAD61OZ8	HAD62OZ8	HMM35OZ8	ZOD78OZ8	ZUD06OZ8	ZUD44OZ8
HAD32OZ8	HAD43OZ8	HAD50OZ8	HAD89OZ8	HMM37OZ8	ZOD79OZ8	ZUD07OZ8	ZUD51OZ8
HAD35OZ8	HAD47OZ8	HAD62OZ8	HAD94OZ8	NOU71OZ8	ZOD80OZ8	ZUD09OZ8	
PSE							
AJI08OZ8	ZUD19OZ8	ZUD26OZ8	ZUD27OZ8				
NPM							
AJI06OZ8	AJI11OZ8	HAD72OZ8	NOU77OZ8	ZUD28OZ8	ZUD37OZ8	ZUD40OZ8	ZUD58OZ8
AJI07OZ8	HAD46OZ8	HAD81OZ8	ZOD98OZ8				
IEMSCSS							
MFT17OZ8	MFT19OZ8	MFT22OZ8	MFT24OZ8	MFT29OZ8	MFT31OZ8	MFT32OZ8	MFT35OZ8
MFT18OZ8	MFT20OZ8	MFT23OZ8	MFT28OZ8	MFT30OZ8			
IEMS							
IEM23OZ8	IEM28OZ8	IEM35OZ8	IEM36OZ8	IEM38OZ8	IEM39OZ8	IEM40OZ8	IEM43OZ8
IEM24OZ8	IEM31OZ8						
SSPFS							
EDV20OZ8	JFJ34OZ8	JFJ47OZ8	LAX77OZ8	LAX98OZ8	LEX14OZ8	LEX21OZ8	LEX40OZ8
EDV22OZ8	JFJ35OZ8	JFJ49OZ8	LAX79OZ8	LEX01OZ8	LEX15OZ8	LEX24OZ8	LEX52OZ8
HAD44OZ8	JFJ36OZ8	LAX71OZ8	LAX83OZ8	LEX04OZ8	LEX16OZ8	LEX31OZ8	REX05OZ8
HMM36OZ8	JFJ37OZ8	LAX72OZ8	LAX85OZ8	LEX05OZ8	LEX18OZ8	LEX32OZ8	REX16OZ8
HMM38OZ8	JFJ38OZ8	LAX73OZ8	LAX90OZ8	LEX10OZ8	LEX19OZ8	LEX37OZ8	ZIG50OZ8
JFJ33OZ8	JFJ40OZ8	LAX76OZ8	LAX92OZ8				
XACORE							
IFO35P88	**RTA01P8J**						

LEGEND:

CM	- Computing Module	LTC	- Line Trunk Controller Module
CME	- Common Equipment Module	MS	- Message Switch
DCH	- D Channel Handler	MSL	- Meridian Switching Load
DSP	- Digital Signal Processor	NIU	- Network Interface Unit
DTC	- Digital Trunk controller Module	OC3	- Optical Carrier 3
EIU	- Ethernet Interface Unit	PDTC	- PCM-30 Digital Trunk Controller
ENET	- Enhanced Network (Fiber)	RCC2	- Remote Cluster Controller 2
IDs	- Identifications	SPM	- Spectrum Peripheral Module
ISN	- Integrated Service Node	VSP	- Voice Services Processor
LIU	- Link Interface Unit	XPM	- Enhanced Peripheral Module

NOTE: Patch IDs that are bold denote the patches applied or previously applied and modified by Nortel to fix test discrepancies identified during interoperability certification testing of the SUT.

Table 3-2. Nortel DSN Option 11C Product Enhancement Packages

Core Software Patch Groups					
Patch Name	**Date Created**	**Patch Name**	**Date Created**	**Patch Name**	**Date Created**
p18240_1.ssc	15 December 2006	p20765_1.ssc	15 December 2006	p21442_3scc	15 December 2006
p18870_1.ssc	15 December 2006	p20835_1.ssc	15 December 2006	p21448_3.ssc	15 December 2006
p19237_2.ssc	15 December 2006	p20839_1.ssc	15 December 2006	p21449_2.ssc	15 December 2006
p19832_2.ssc	15 December 2006	p20845_2.ssc	15 December 2006	p21451_1.ssc	15 December 2006
p19852_1.ssc	15 December 2006	p20880_1.ssc	15 December 2006	p21450_1scc	15 December 2006
p19899_1.ssc	15 December 2006	p20893_1.ssc	15 December 2006	p21452_1scc	15 December 2006
p19908_1.ssc	15 December 2006	p20906_1.ssc	15 December 2006	p21466_1scc	15 December 2006
p19964_1.ssc	15 December 2006	p20930_1.ssc	15 December 2006	p21469_1scc	15 December 2006
p20020_1.ssc	15 December 2006	p20931_1.ssc	15 December 2006	p21473_1scc	15 December 2006
p20025_1.ssc	15 December 2006	p20948_5.ssc	15 December 2006	p21478_2scc	15 December 2006
p20166_2.ssc	15 December 2006	p20981_3.ssc	15 December 2006	p21533_3scc	15 December 2006
p20223_2.ssc	15 December 2006	p20986_1.ssc	15 December 2006	p21573_1scc	15 December 2006
p20335_1.ssc	15 December 2006	p20990_2.ssc	15 December 2006	p21618_2scc	15 December 2006
p20419_3.ssc	15 December 2006	p21011_2.ssc	15 December 2006	p21631_1scc	15 December 2006
p20436_2.ssc	15 December 2006	p21015_1.ssc	15 December 2006	p21676_2scc	15 December 2006
p20441_1.ssc	15 December 2006	p21029_1.ssc	15 December 2006	p21755_1scc	15 December 2006
p20506_2.ssc	15 December 2006	p21036_1.ssc	15 December 2006	p21758_2scc	15 December 2006
p20556_1.ssc	15 December 2006	p21038_1.ssc	15 December 2006	p21794_1scc	15 December 2006
p20589_1.ssc	15 December 2006	p21052_2.ssc	15 December 2006	p21795_1scc	15 December 2006
p20616_2.ssc	15 December 2006	p21107_2.ssc	15 December 2006	p21802_1scc	15 December 2006
p20620_1.ssc	15 December 2006	p21115_3scc	15 December 2006	p21803_1scc	15 December 2006
p20644_1.ssc	15 December 2006	p21116_1scc	15 December 2006	p21873_1scc	15 December 2006
p20659_1.ssc	15 December 2006	p21150_1scc	15 December 2006	p22095_1scc	15 December 2006
p20676_1.ssc	15 December 2006	p21302_2scc	15 December 2006	p22237_1scc	15 December 2006
p20702_1.ssc	15 December 2006	p21319_2scc	15 December 2006	p22239_1scc	15 December 2006
p20703_1.ssc	15 December 2006	p21321_1scc	15 December 2006	p22513_1.ssc	15 December 2006
p20708_1.ssc	15 December 2006	p21345_1scc	15 December 2006	p23037_1.ssc	15 December 2006
p20720_1.ssc	15 December 2006	p21383_1scc	15 December 2006	**MPLR24046_1.ssc**	**23 May 2007**
p20734_1.ssc	15 December 2006	p21394_1scc	15 December 2006	**MPLR24047_1.ssc**	**24 May 2007**
p20758_1.ssc	15 December 2006	p21440_2scc	15 December 2006		
Signaling Server Software Patch Groups					
Patch Name	**Date Created**	**Patch Name**	**Date Created**	**Patch Name**	**Date Created**
p21474_1.ss1	25 July 2006	p21112_1.ss1	25 July 2006	p20990_2.ss1	25 July 2006
p21553_1.ss1	25 July 2006	p21090_1.ss1	25 July 2006	p20848_1.ss1	25 July 2006
p21883_1.ss1	25 July 2006	p21083_1.ss1	25 July 2006	p20805_1.ss1	25 July 2006
p21861_1.ss1	25 July 2006	p21075_1.ss1	25 July 2006	p20781_1.ss1	25 July 2006
p21652_1.ss1	25 July 2006	p21044_1.ss1	25 July 2006	p20754_2.ss1	25 July 2006
p21641_1.ss1	25 July 2006	p21017_1.ss1	25 July 2006	p20746_1.ss1	25 July 2006
p21571_1.ss1	25 July 2006	p20999_1.ss1	25 July 2006	p20737_1.ss1	25 July 2006
p21564_1.ss1	25 July 2006	p20987_1.ss1	25 July 2006	p20736_1.ss1	25 July 2006
p21562_1.ss1	25 July 2006	p20962_1.ss1	25 July 2006	p20704_1.ss1	25 July 2006
p21544_1.ss1	25 July 2006	p20938_3.ss1	25 July 2006	p20498_3.ss1	25 July 2006
p21315_1.ss1	25 July 2006	p20897_1.ss1	25 July 2006	p20257_1.ss1	25 July 2006
p21290_1.ss1	25 July 2006	p20884_1.ss1	25 July 2006	p19322_1.ss1	25 July 2006
p21178_1.ss1	25 July 2006	p20882_1.ss1	25 July 2006	p18859_1.ss1	25 July 2006
p21207_1.ss1	25 July 2006	p20876_1.ss1	25 July 2006	p20732_1.ss1	25 July 2006
p21172_1.ss1	25 July 2006	p20853_1.ss1	25 July 2006	p20618_1.ss1	25 July 2006
Voice Media Gateway Card Software Patch Groups					
Patch Name	**Date Created**	**Patch Name**	**Date Created**	**Patch Name**	**Date Created**
p21534_2.lsa	25 July 2006	p21083_1.lsa	25 July 2006	p20962_1.lsa	25 July 2006
p21512_1.lsa	25 July 2006	p21030_1.lsa	25 July 2006	p20889_1.lsa	25 July 2006
p21112_1.lsa	25 July 2006	p21017_1.lsa	25 July 2006	p20781_1.lsa	25 July 2006
p21090_1.lsa	25 July 2006	p20990_2.lsa	25 July 2006	p18859_1.lsa	25 July 2006

NOTE: Patch IDs that are bold denote the patches developed specifically for this configuration.