



DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY TEST COMMAND
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IN REPLY
REFER TO: Networks and Transport Division (JTE)

17 June 2004

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of HiPath 4000 Private Branch Exchange (PBX) 1 with Software Release Version V1.0 System Maintenance Release (SMR) 12

References: (a) DOD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01C, "Interoperability and Supportability of Information Technology and National Security Systems," 20 November 2003

1. References (a) and (b) establish the Defense Information Systems Agency (DISA), Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.
2. The HiPath 4000 with software release Version V1.0 SMR12, hereinafter referred to as the system under test (SUT), meets all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Switched Network (DSN). The SUT was tested and met the critical interoperability requirements for joint use within the DSN for the following switch types: Private Branch Exchange (PBX) 1 and PBX 2. The SUT also offers a Voice over Internet Protocol capability, however this capability is not covered under this certification. This certification expires upon changes that could affect interoperability, but no later than three years from the date of this memorandum.
3. This certification is based on interoperability testing conducted by the JITC at the Global Information Grid Network Test Facility, Fort Huachuca, AZ, from 11 November through 15 December 2003, and review of vendor's letters of compliance on 26 February 2004. Testing was conducted in an environment that emulates the DSN. The Certification Testing Summary in enclosure 2 provides more details about the test, 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 interoperability test summary of the SUT is indicated in table 1. The PBX1 required and conditional Capability Requirements (CRs) and Feature Requirements (FRs) are listed in table 2. This interoperability test status is based on the PBX1's ability to meet:

- a. DSN services for Network and Applications specified in reference (c).

JITC Memo, JTE, Special Interoperability Test Certification of HiPath 4000 Private Branch Exchange (PBX) 1 with Software Release Version V1.0 System Maintenance Release (SMR) 12

b. PBX1 interface and signaling requirements for trunks/lines specified in reference (d) verified through JITC testing and/or vendor submission of Letter(s) of Compliance (LoC).

c. PBX1 FRs/CRs specified in reference (d) verified through JITC testing and/or vendor submission of LoC.

d. The overall system interoperability performance derived from test procedures listed in reference (e).

Table 1. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (DTMF)	No	Certified	Met all CRs and FRs.
E1 CAS (DTMF)	No (Europe only)	Certified	Met all CRs and FRs
T1 ISDN PRI NI 1/2 (ANSI T1. 619a)	Yes	Certified	Met all CRs and FRs.
E1 ISDN PRI (Q.955.3)	No (Europe only)	Certified	Met all CRs and FRs
DSN Line Interfaces			
Interface & Signaling	Critical	Status	Remarks
2-Wire Analog	Yes	Certified	Met all CRs and FRs.
ISDN BRI NI 1/2	Yes	Certified	Met all CRs and FRs.
Digital Proprietary (Dispatch Release 3.0.1-c)	No	Certified	Met all CRs and FRs.
VoIP	No	Not Tested	
DSN Features and Capabilities			
Features and Capabilities	Critical	Status	Remarks
Common Features	No	Certified	
Attendant	No	Not Tested	
Public Safety	No	Not Tested	
Preset Conferencing	No	Certified	Tested with Dispatch and DAX Version 5.13B.
Nailed-up Connections	No	Not Tested	
PAT	No	Not Tested	
DSN Hotline Services	No	Not Tested	
Network Management	No	Not Tested	
ISDN Services (EKTS)	No	Certified	Met all CRs and FRs.
Synchronization	Yes	Certified	Met all CRs and FRs.

Table 1. SUT Interoperability Test Summary (continued)

DSN Features and Capabilities (continued)				
Features and Capabilities		Critical	Status	Remarks
Reliability		Yes	Certified	Met all CRs and FRs.
Security ¹		Yes	Certified	Met all CRs and FRs.
VoIP System		No	Not Tested	
VoIP LANs		No	Not Tested	
Network Gateways				
	Interface & Signaling	Critical	Status	Remarks
PSTN	T1 CAS (DTMF)	No	Certified	Met all CRs and FRs.
	E1 CAS (DTMF)	No (Europe only)	Certified	Met all CRs and FRs
	T1 ISDN PRI NI 1/2	No	Certified	Met all CRs and FRs.
	E1 ISDN PRI (Q.931)	No (Europe only)	Certified	Met all CRs and FRs.
Legend:				
ANSI - American National Standards Institute		LoC - Letters of Compliance		
BRI - Basic Rate Interface		Mbps - Megabits per second		
CAS - Channel Associated Signaling		MLPP - Multi-Level Precedence and Preemption		
CRs - Capability Requirements		NI 1/2 - National ISDN one or two		
DSN - Defense Switched Network		PAT - Precedence Access Threshold		
DTMF - Dual Tone Multi-Frequency		PRI - Primary Rate Interface		
E1 - European Transmission Std. (2.048 Mbps)		PSTN - Public Switched Telephone Network		
EKTS - Electronic Key Telephone System		Q.931 - ITU Signaling Standard for ISDN		
FRs - Feature Requirements		Q.955.3 - ITU ISDN Signaling std. for E1 MLPP		
IATP - Information Assurance Test Plan		SS7 - Signaling System 7		
IAW - in accordance with		Std. - Standard		
ISDN - Integrated Services Digital Network		SUT - System Under Test		
ITU - International Telecommunications Union		T1 - Digital Transmission Link level 1 (1.544 Mbps)		
JITC - Joint Interoperability Test Command		T1.619a - SS7 and ISDN Signaling Standard for T1		
LAN - Local Area Network		VoIP - Voice over Internet Protocol		
Notes:				
1 JITC verifies security via vendor LoC. Further testing IAW the IATP is required prior to being authorized connection approval.				

Table 2. PBX1 Requirements

DSN Trunk Interfaces				
Interface	Critical	Requirements Required (R) or Conditional (C)		References
T1 CAS	No	Trunking	<ul style="list-style-type: none"> • Framing (R) • Line Code (R) • Signaling (R) • Alarms (R) • Timing (R) • WWNDP (R) • Outpulsing digit formats (C: CAS only) • Routing (C) • Trunk Groups(C) 	<ul style="list-style-type: none"> • GSCR Sect. 7 • GSCR Sect. 7 • GSCR Sect. 5 • GSCR Sect. 2.5.7, 7.1.4 & 7.2.2 • GSCR Sect. 11.1.1.2 • GSCR Sect. 4.5.1 • GSCR Sect. 4.5.2 • GSCR Sect. 4.2 • GSCR Sect. 2.5.5 & 2.5.6 • GSCR Sect. 4
E1 CAS	No (Europe only)		<ul style="list-style-type: none"> • Call Processing (R) • CAS to CCS trunk interworking (C) • PCM-24/PCM-30 Interoperation(C) • Direct Inward Dialing (C) 	<ul style="list-style-type: none"> • GSCR Sect. 3.10 • GSCR Sect. 7.3 • GSCR Sect 2.3.2
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Voice	<ul style="list-style-type: none"> • MOS (R) • MLPP (R) • Secure calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B
		Facsimile	<ul style="list-style-type: none"> • Analog: EIA/TIA-465-A (R) • Digital: MIL-STD-188-161D (C) 	<ul style="list-style-type: none"> • JTA • JTA
E1 ISDN PRI (ITU Q.955.3)	No (Europe only)	Data	<ul style="list-style-type: none"> • Modem (VBD) (R) • 56-kbps switched data (R: ISDN PRI only) • 64-kbps switched data (R: ISDN PRI only) • NX56 synchronous BER (R: ISDN PRI only) • NX64 synchronous BER (R: ISDN PRI only) • Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Sect. 3.10
		VTC	<ul style="list-style-type: none"> • H.320 (R: ISDN PRI only) 	<ul style="list-style-type: none"> • JTA
DSN Line Interfaces				
2-Wire Analog	Yes	Access	<ul style="list-style-type: none"> • DN Identification (R) • Line signaling (R) • Alerting Signals and Tones (R) • WWNDP (R) • Call Processing (R) • Call Treatments (R) • 2W user access (R: 2-Wire Analog only) • Analog busy/idle (R: 2-Wire Analog only) 	<ul style="list-style-type: none"> • GSCR Sect 2.1.1 • GSCR Sect 5.2 • GSCR Sect 5.5 • GSCR Sect. 4.5 • GSCR Sect. 4.4 • GSCR Sect. 4.1 • GSCR Sect 4.3.3 • GSCR Sect 4.3.4.1
		Voice	<ul style="list-style-type: none"> • MOS (R) • MLPP (R) • Secure Calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • CJCSI 6215.01B
ISDN BRI NI 1/2	Yes	Facsimile	<ul style="list-style-type: none"> • Analog: EIA/TIA-465-A (R) • Digital: MIL-STD-188-161D (C) 	<ul style="list-style-type: none"> • JTA • JTA
2-Wire Proprietary Digital	No	Data	<ul style="list-style-type: none"> • Modem (VBD) (R) • 56-kbps switched data (R: ISDN BRI only) • 64-kbps switched data (R: ISDN BRI only) • NX56 synchronous BER (R:ISDN BRI only) • NX64 synchronous BER (R: ISDN BRI only) • Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Sect. 3.10
		VTC	<ul style="list-style-type: none"> • H.320 (R: ISDN BRI only) 	<ul style="list-style-type: none"> • JTA

Table 2. PBX1 Requirements (continued)

DSN Features & Capabilities			
Interface	Critical	Requirements Required (R) or Conditional (C)	References
Common Features	No	<ul style="list-style-type: none"> • Selective call rejection (C) • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (C) • Three-way calling (C) • Add-on transfer and conference calling (C) • Call forwarding (C) • Call pick-up (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.1.2 • GSCR Sect. 2.1.3 • GSCR Sect. 2.1.4 • GSCR Sect. 2.1.5 • GSCR Sect. 2.1.6 • GSCR Sect. 2.1.7 • GSCR Sect. 2.1.8 • GSCR Sect. 2.1.9
Attendant	No	<ul style="list-style-type: none"> • Initiate all precedence levels (C) • Visual display (C) • Override class of service (C) • Override busy line (C) • Call deflection (C) • Auto recall (C) • Waiting queue (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.2.1 • GSCR Sect. 2.2.2 • GSCR Sect. 2.2.3 • GSCR Sect. 2.2.4 • GSCR Sect. 2.2.5 • GSCR Sect. 2.2.6 • GSCR Sect. 2.2.7
Public Safety	No	<ul style="list-style-type: none"> • 911 (C) • Trace of terminating calls (C) • Outgoing call trace (C) • Tandem call trace (C) • Trace of a call in progress (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.4.1 • GSCR Sect. 2.4.2 • GSCR Sect. 2.4.3 • GSCR Sect. 2.4.4 • GSCR Sect. 2.4.5
Preset Conferencing	No	<ul style="list-style-type: none"> • Support 10 bridges; 1 originator and 20 conferees (C) • Assign up to 20 address numbers per bridge (C) • Use KXX codes for bridge access (C) • Conference notification recorded announcement (C) • Auto retrieval and alternate address (C) • Bridge release (C) • Lost connection (C) • Secondary conferencing (C) • Address translation (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6.1 • GSCR Sect. 2.6.2 • GSCR Sect. 2.6.3 • GSCR Sect. 2.6.4 • GSCR Sect. 2.6.5 • GSCR Sect. 2.7
Nailed-up Connections	No	<ul style="list-style-type: none"> • Between any two like terminations (C) • PCM-24 and PCM-30, both CAS and CCS (C) • Supervision passed end-to-end for A/D or D/A (C) • Monitored and auto reconfigure (C) • Support at least 10% of circuits as nailed-up (C) • Non-preemptable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.8
PAT	No	<ul style="list-style-type: none"> • 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 & Admin of thresholds (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1.1 • GSCR Sect. 2.11.1.2 • GSCR Sect. 2.11.1.3 • GSCR Sect. 2.11.1.4 • GSCR Sect. 2.11.1.5 • GSCR Sect. 2.11.1.6 • GSCR Sect. 2.11.1.7 • GSCR Sect. 2.11.1.8 • GSCR Sect. 2.11.1.9 • GSCR Sect. 2.11.1.10
DSN Hotline Services	No	<ul style="list-style-type: none"> • Hotline restrictions (C) • Auto initiate (C) • Analog and digital (C) • Subscription basis (C) • Protected hotline calling (C) • WWNDP interoperable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12.1-4 • GSCR Sect. 2.12.5

Table 2. PBX1 Requirements (continued)

DSN Features & Capabilities (continued)			
Interface	Critical	Requirements Required (R) or Conditional (C)	References
Network Management	No	<ul style="list-style-type: none"> • Interfaces (C) • Measurements and data generation (C) • Fault management (C) • Configuration management (C) • Accounting management (C) • Performance management (C) • NM controls (C) • Remote access (C) 	<ul style="list-style-type: none"> • GSCR Sect. 9.1 • GSCR Sect. 9.2 • GSCR Sect. 9.3 • GSCR Sect. 9.4 • GSCR Sect. 9.5 • GSCR Sect. 9.6 • GSCR Sect. 9.7 • GSCR Sect. 9.8
ISDN Services	No	<ul style="list-style-type: none"> • EKTS (C) 	<ul style="list-style-type: none"> • GSCR Sect. 10, table 10-3
Synchronization	Yes	<ul style="list-style-type: none"> • Line timing mode (R) • Internal Stratum 4 (R) 	<ul style="list-style-type: none"> • GSCR Sect. 11.1.1.2 • GSCR Sect. 11.1.2.2
Reliability	Yes	<ul style="list-style-type: none"> • GR-512-CORE (R) 	<ul style="list-style-type: none"> • GSCR Sect.12
Security ¹	Yes	<ul style="list-style-type: none"> • DITSCAP (R) 	<ul style="list-style-type: none"> • DODI 8100.3
VoIP			
VoIP System	No	<p>VoIP function is conditional. If VoIP is provided all of the following requirements must be met:</p> <ul style="list-style-type: none"> • LAN parameters • CoS /QoS • VLANs • IEEE Stds. Conformance • .99999 availability • Modular devices • 2 sec. link restoral • LAN NM • Traffic Engineering 	<ul style="list-style-type: none"> • GSCR App. 3
LANs	No	<p>VoIP function is conditional. If VoIP is provided all of the following requirements must be met:</p> <ul style="list-style-type: none"> • LAN parameters • CoS • Queuing mechanisms • Policing mechanism • VLAN support • NM and voice in different VLAN • IEEE stds. Conformance • 2 sec. link restoral • LAN NM • Traffic Engineering 	<ul style="list-style-type: none"> • GSCR App. 3

Table 2. PBX1 Requirements (continued)

Network Gateways				
Gateway	Critical	Requirements Required (R) or Conditional (C)		References
PSTN	No	Trunking	<ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B
Legend:				
2W	- 2-Wire	LoC	- Letter(s) of Compliance	
911	- 911 Emergency Service	Mbps	- Megabits per second	
A/D	- Analog to Digital	MIL-STD	- Military Standard	
ANSI	- American National Standards Institute	MLPP	- Multi-Level Precedence and Preemption	
App	- Appendix	MOS	- Mean Opinion Score	
BER	- Bit Error Ratio	NI 1/2	- National ISDN Std. one or two	
BRI	- Basic Rate Interface	NM	- Network Management	
CAS	- Channel Associated Signaling	NX56	- Data format restricted to multiples of 56 kbps	
CCS	- Common Channel Signaling	NX64	- Data format restricted to multiples of 64 kbps	
CJCSI	- Chairman Joint Chiefs of Staff Instruction	PAT	- Precedence Access Threshold	
CoS	- Class of Service	PBX	- Private Branch Exchange	
D/A	- Digital to Analog	PCM-24	- Pulse Code Modulation 24 Channels	
DITSCAP	- Department of Defense Information Technology Security Certification and Accreditation Process	PCM-30	- Pulse Code Modulation 30 Channels	
DN	- Directory Number	PRI	- Primary Rate Interface	
DODI	- Department of Defense Instruction	PSTN	- Public Switched Telephone Network	
DSN	- Defense Switched Network	Q.955.3	- ITU ISDN Signaling Std. For E1 MLPP	
E1	- European Transmission Std. (2.048 Mbps)	QoS	- Quality of Service	
EIA	- Electronic Industries Alliance	sec.	- second	
EKTS	- Electronic Key Telephone System	Sect.	- section	
GR	- Generic Requirement	SS7	- Signaling System 7	
GSCR	- Generic Switching Center Requirements	Std	- Standard	
H.320	- ITU Standard for narrowband VTC	STE	- Secure Terminal Equipment	
IATP	- Information Assurance Test Plan	STU-III	- Secure Telephone Unit-III	
IAW	- in accordance with	STU-IIIR	- STU-III - Red switch	
IEEE	- Institute of Electrical and Electronics Engineers, Inc.	T1	- American Transmission Std. (1.544 Mbps)	
ISDN	- Integrated Services Digital Network	T1.619a	- SS7 and ISDN MLPP Signaling Std. For T1	
ITU	- International Telecommunication Union	TIA	- Telecommunications Industry Association	
JITC	- Joint Interoperability Test Command	VBD	- Variable bit data	
JTA	- Joint Technical Architecture	VLAN	- Virtual Local Area Network	
kbps	- kilobits per second	VoIP	- Voice over Internet Protocol	
KXX	- K= any number 2-8; X= any number 1-9	VTC	- Video Teleconferencing	
LAN	- Local Area Network	WWNDP	- Worldwide Numbering and Dialing Plan	
Note:				
1. JITC verifies security via a LoC. Further testing IAW the IATP is required prior to being authorized connection approval.				

5. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified but Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil/>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125/> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.

JITC Memo, JTE, Special Interoperability Test Certification of HiPath 4000 Private Branch Exchange (PBX) 1 with Software Release Version V1.0 System Maintenance Release (SMR) 12

6. The JITC point of contact is Capt. Michel Roy, DSN 821-8575, commercial (520) 533-8575, FAX DSN 879-4347, or e-mail to roym@fhu.disa.mil.

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ADDITIONAL REFERENCES

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

CERTIFICATION TESTING SUMMARY

- 1. SYSTEM TITLE.** HiPath 4000 Private Branch Exchange (PBX) 1 with Software Release Version V1.0 SMR12, hereinafter referred to as the System Under Test (SUT).
- 2. PROPONENT.** Defense Information Systems Agency (DISA).
- 3. PROGRAM MANAGER.** Mr. Howard Osman, GS23, Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, E-mail: Osmanh@ncr.disa.mil.
- 4. TESTERS.** Joint Interoperability Test Command (JITC), Fort Huachuca, AZ.
- 5. SYSTEM UNDER TEST DESCRIPTION.** Private Branch Exchanges (PBXs) are Military Department (MILDEP)-controlled elements of the Defense Switched Network (DSN). The HiPath 4000 PBX1 has a distributed architecture and provides communication over an Internet Protocol (IP) system for medium-size and large enterprises. The SUT combines voice and data in both circuit and packet switching. Its modular hardware and software design allows it to grow incrementally ranging from 2000 to 100,000 user lines. The SUT offers a Voice over Internet Protocol capability, however this capability is not covered under this certification.
- 6. OPERATIONAL ARCHITECTURE.** The DSN architecture is a two level network hierarchy consisting of DSN backbone switches and Military/Agency installation switches. Joint Staff policy and subscriber mission requirements determine which type of switch can be used at a particular location. The DSN architecture therefore consists of several categories of switches including PBXs. The Generic Switching Center Requirements (GSCR) operational DSN Architecture is depicted in figure 2-1. The architecture depicts the relationship of MILDEP PBX1s to the other DSN switch types.

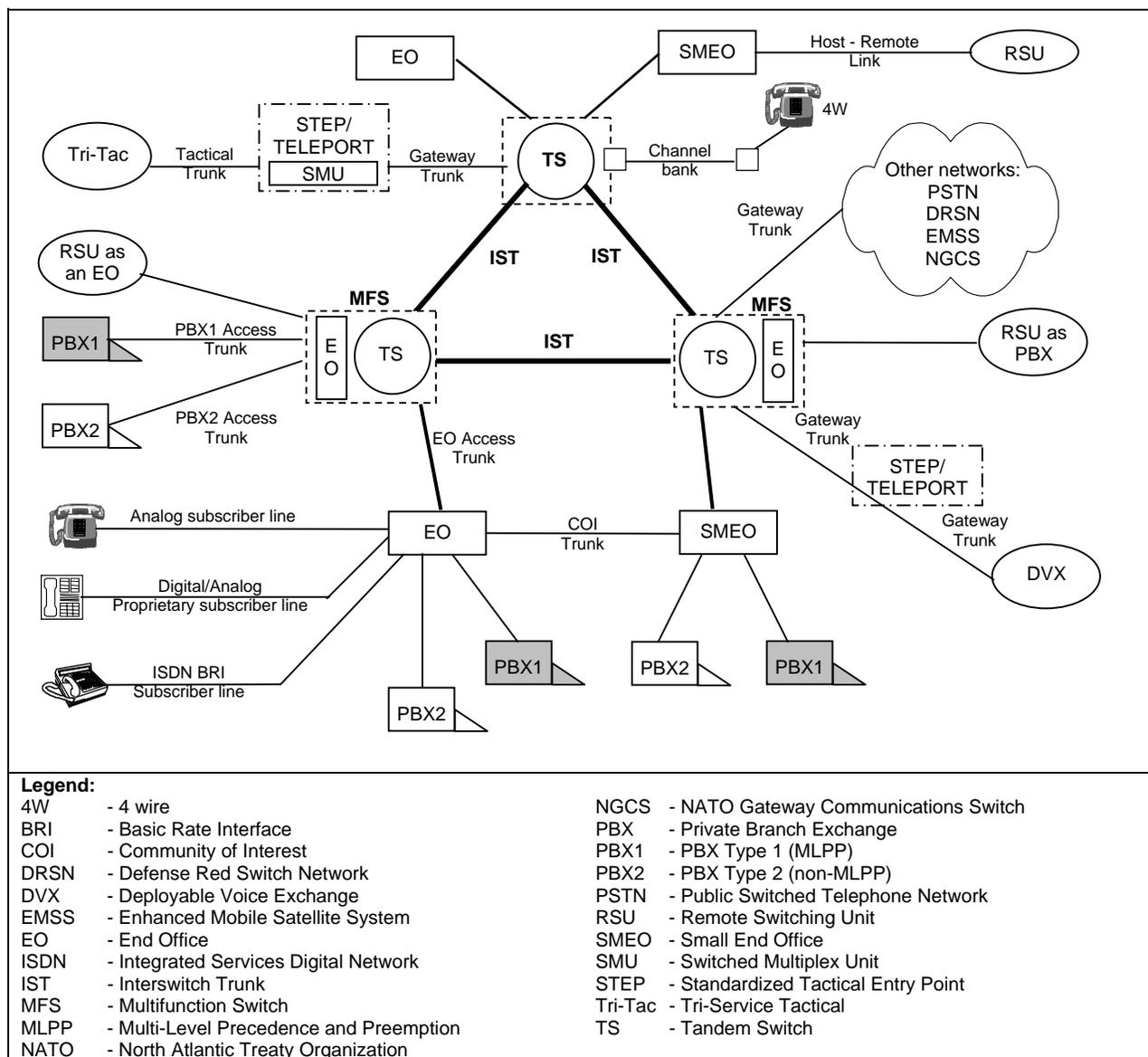


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to PBX1's are listed in table 2-1. These requirements are derived from:

- a. DSN services for Network and Applications specified in Chairman Joint Chiefs of Staff instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services."
- b. GSCR interface and signaling requirements for trunks/lines verified through JITC testing and/or vendor submission of Letter(s) of Compliance (LoC).
- c. GSCR PBX1 Capability and Feature Requirements (CRs/FRs) verified through JITC testing and/or vendor submission of LoC.

Table 2-1. PBX1 Requirements

DSN Trunk Interfaces				
Interface	Critical	Requirements Required (R) or Conditional (C)		References
T1 CAS	Yes	Trunking	<ul style="list-style-type: none"> • Framing (R) • Line Code (R) • Signaling (R) • Alarms (R) • Timing (R) • WWNDP (R) • Outputting digit formats (C: CAS only) 	<ul style="list-style-type: none"> • GSCR Sect. 7 • GSCR Sect. 7 • GSCR Sect. 5 • GSCR Sect. 2.5.7, 7.1.4 & 7.2.2 • GSCR Sect. 11.1.1.2 • GSCR Sect. 4.5.1 • GSCR Sect. 4.5.2
E1 CAS	No (Europe only)		<ul style="list-style-type: none"> • Routing (C) • Trunk Groups(C) • Call Processing (R) • CAS to CCS trunk interworking (C) • PCM-24/PCM-30 Interoperation (C) • Direct Inward Dialing (C) 	<ul style="list-style-type: none"> • GSCR Sect. 4.2 • GSCR Sect. 2.5.5 & 2.5.6 • GSCR Sect. 4 • GSCR Sect. 3.10 • GSCR Sect. 7.3 • GSCR Sect 2.3.2
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Voice	<ul style="list-style-type: none"> • MOS (R) • MLPP (R) • Secure calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Sect. 3 • CJCSI 6215.01B
E1 ISDN PRI (ITU Q.955.3)	No (Europe only)	Facsimile	<ul style="list-style-type: none"> • Analog: EIA/TIA-465-A (R) • Digital: MIL-STD-188-161D (C) 	<ul style="list-style-type: none"> • JTA • JTA
		Data	<ul style="list-style-type: none"> • Modem (VBD) (R) • 56-kbps switched data (R: ISDN PRI only) • 64-kbps switched data (R: ISDN PRI only) • NX56 synchronous BER (R: ISDN PRI only) • NX64 synchronous BER (R: ISDN PRI only) • Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Sect. 3.10
		VTC	<ul style="list-style-type: none"> • H.320 (R: ISDN PRI only) 	<ul style="list-style-type: none"> • JTA
DSN Line Interfaces				
2-Wire Analog	Yes	Access	<ul style="list-style-type: none"> • DN Identification (R) • Line signaling (R: Ground Start and Loop Start) • Alerting Signals and Tones (R) • WWNDP (C) • Call Processing (C) • Call Treatments (R) • 2W user access (R: 2-Wire Analog only) • Analog busy/idle (R: 2-Wire Analog only) 	<ul style="list-style-type: none"> • GSCR Sect 2.1.1 • GSCR Sect 5.2 • GSCR Sect 5.5 • GSCR Sect. 4.5 • GSCR Sect. 4.4 • GSCR Sect. 4.1 • GSCR Sect 4.3.3 • GSCR Sect 4.3.4.1
		Voice	<ul style="list-style-type: none"> • MOS (R) • MLPP (R) • Secure Calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Section 3.4.3, 3.9 • CJCSI 6215.01B
ISDN BRI NI 1/2	Yes	Facsimile	<ul style="list-style-type: none"> • Analog: EIA/TIA-465-A (R) • Digital: MIL-STD-188-161D (C) 	<ul style="list-style-type: none"> • JTA • JTA
2-Wire Proprietary Digital	No	Data	<ul style="list-style-type: none"> • Modem (VBD) (R) • 56-kbps switched data (R: ISDN BRI only) • 64-kbps switched data (R: ISDN BRI only) • NX56 synchronous BER (R:ISDN BRI only) • NX64 synchronous BER (R:ISDN BRI only) • Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • GSCR Sect. 3.10
		VTC	<ul style="list-style-type: none"> • H.320 (R: ISDN BRI only) 	<ul style="list-style-type: none"> • JTA

Table 2-1. PBX1 Requirements (continued)

DSN Features & Capabilities			
Features/ Capabilities	Critical	Requirements Required (R) or Conditional (C)	References
Common Features	No	<ul style="list-style-type: none"> • Selective call rejection (C) • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (C) • Three-way calling (C) • Add-on transfer and conference calling (C) • Call forwarding (C) • Call pick-up (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.1.2 • GSCR Sect. 2.1.3 • GSCR Sect. 2.1.4 • GSCR Sect. 2.1.5 • GSCR Sect. 2.1.6 • GSCR Sect. 2.1.7 • GSCR Sect. 2.1.8 • GSCR Sect. 2.1.9
Attendant	No	<ul style="list-style-type: none"> • Initiate all precedence levels (C) • Visual display (C) • Override class of service (C) • Override busy line (C) • Call deflection (C) • Auto recall (C) • Waiting queue (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.2.1 • GSCR Sect. 2.2.2 • GSCR Sect. 2.2.3 • GSCR Sect. 2.2.4 • GSCR Sect. 2.2.5 • GSCR Sect. 2.2.6 • GSCR Sect. 2.2.7
Public Safety	No	<ul style="list-style-type: none"> • E911 (C) • Trace of terminating calls (C) • Outgoing call trace (C) • Tandem call trace (C) • Trace of a call in progress (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.4.1 • GSCR Sect. 2.4.2 • GSCR Sect. 2.4.3 • GSCR Sect. 2.4.4 • GSCR Sect. 2.4.5
Preset Conferencing	No	<ul style="list-style-type: none"> • Support 10 bridges; 1 originator and 20 conferees (C) • Assign up to 20 address numbers per bridge (C) • Use KXX codes for bridge access (C) • Conference notification recorded announcement (C) • Auto retrieval and alternate address (C) • Bridge release (C) • Lost connection (C) • Secondary conferencing (C) • Address translation (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6 • GSCR Sect. 2.6.1 • GSCR Sect. 2.6.2 • GSCR Sect. 2.6.3 • GSCR Sect. 2.6.4 • GSCR Sect. 2.6.5 • GSCR Sect. 2.7
Nailed-up Connections	No	<ul style="list-style-type: none"> • Between any two like terminations (C) • PCM-24 and PCM-30, both CAS and CCS (C) • Supervision passed end-to-end for A/D or D/A (C) • Monitored and auto reconfigure (C) • Support at least 10% of circuits as nailed-up (C) • Non-preemptable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.8
PAT	No	<ul style="list-style-type: none"> • 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) • Op measurement registers (C) • Maintenance and Administration of thresholds (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1 • GSCR Sect. 2.11.1.1 • GSCR Sect. 2.11.1.2 • GSCR Sect. 2.11.1.3 • GSCR Sect. 2.11.1.4 • GSCR Sect. 2.11.1.5 • GSCR Sect. 2.11.1.6 • GSCR Sect. 2.11.1.7 • GSCR Sect. 2.11.1.8 • GSCR Sect. 2.11.1.9 • GSCR Sect. 2.11.1.10
DSN Hotline Services	No	<ul style="list-style-type: none"> • Hotline restrictions (C) • Auto initiate (C) • Analog and digital (C) • Subscription basis (C) • Protected hotline calling (C) • WWNDP interoperable (C) 	<ul style="list-style-type: none"> • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12 • GSCR Sect. 2.12.1-4 • GSCR Sect. 2.12.5

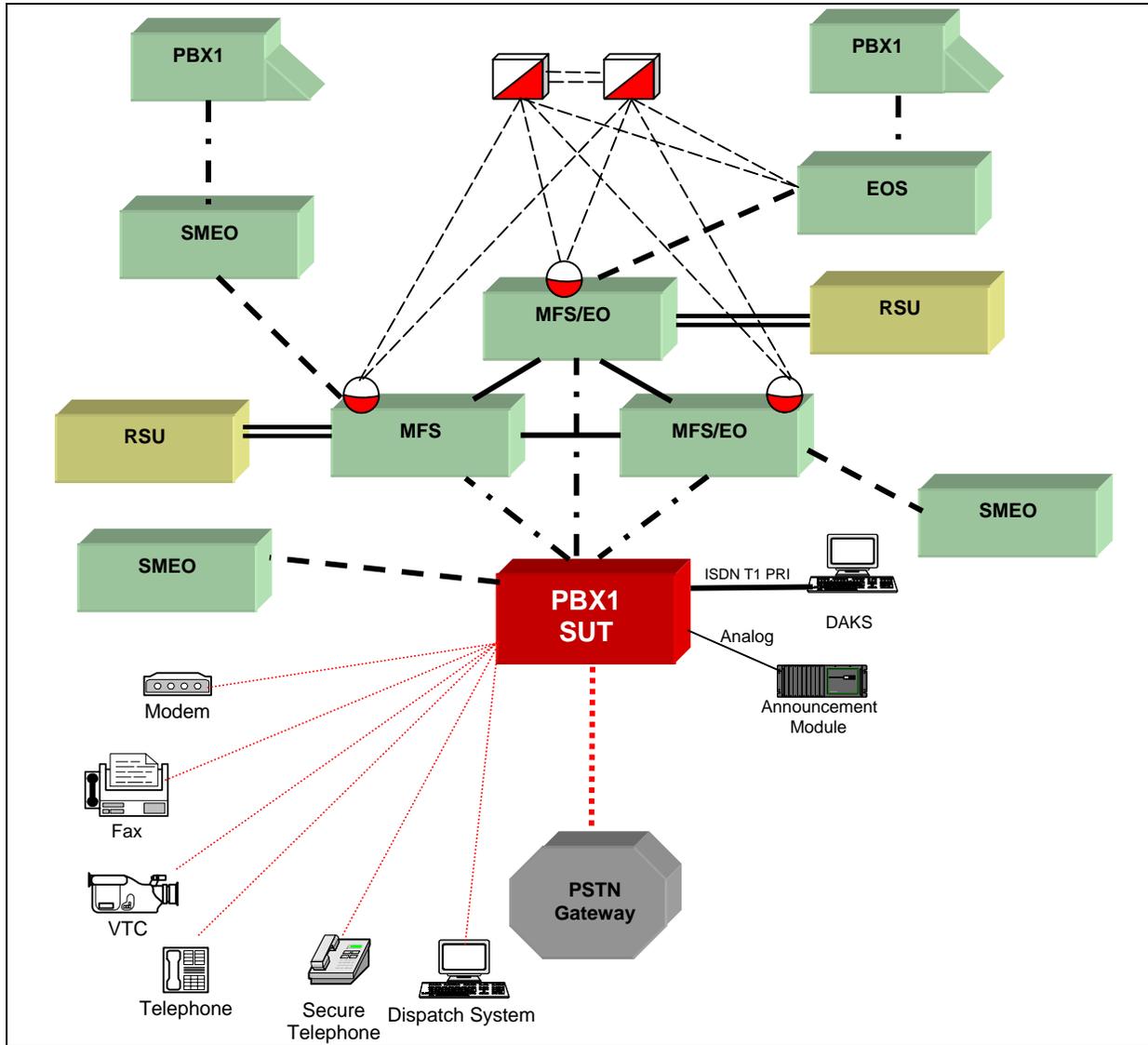
Table 2-1. PBX1 Capability and Feature Requirements (continued)

DSN Features & Capabilities (continued)			
Features/ Capabilities	Critical	Requirements Required (R) or Conditional (C)	References
Network Management	No	<ul style="list-style-type: none"> • Interfaces (C) • Measurements and data generation (C) • Fault management (C) • Configuration management (C) • Accounting management (C) • Performance management (C) • NM controls (C) • Remote access (C) 	<ul style="list-style-type: none"> • GSCR Sect. 9.1 • GSCR Sect. 9.2 • GSCR Sect. 9.3 • GSCR Sect. 9.4 • GSCR Sect. 9.5 • GSCR Sect. 9.6 • GSCR Sect. 9.7 • GSCR Sect. 9.8
ISDN Services	No	<ul style="list-style-type: none"> • EKTS (C) 	<ul style="list-style-type: none"> • GSCR Sect. 10, table 10-3
Synchronization	Yes	<ul style="list-style-type: none"> • Line timing mode (R) • Internal Stratum 4 (R) 	<ul style="list-style-type: none"> • GSCR Sect. 11.1.1.2 • GSCR Sect. 11.1.2.2
Reliability	Yes	<ul style="list-style-type: none"> • GR-512-CORE (R) 	<ul style="list-style-type: none"> • GSCR Sect.12
Security ¹	Yes	<ul style="list-style-type: none"> • DITSCAP (R) 	<ul style="list-style-type: none"> • DODI 8100.3
VoIP			
VoIP System	No	<p>VoIP function is conditional. If VoIP is provided all of the following requirements must be met:</p> <ul style="list-style-type: none"> • MOS 4.0 or better • G.711 PCM Codec • Security IAW DITSCAP • NM • Line timing • Internal Clock • Latency @ 60 msec or less • IPv6 capable 	<ul style="list-style-type: none"> • GSCR App. 3
LANs	No	<p>VoIP function is conditional. If VoIP is provided all of the following requirements must be met:</p> <ul style="list-style-type: none"> • LAN parameters • CoS /QoS • VLANs • IEEE Stds. Conformance • .99999 availability • Modular devices • 2 sec. link restoral • LAN NM • Traffic Engineering 	<ul style="list-style-type: none"> • GSCR App. 3

Table 2-1. PBX1 Requirements (continued)

Network Gateways				
Gateway	Critical	Requirements Required (R) or Conditional (C)		References
PSTN	No	Trunking	<ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) 	<ul style="list-style-type: none"> • CJCSI 6215.01B • CJCSI 6215.01B • CJCSI 6215.01B
Legend:				
2W	- 2-Wire	Mbps	- Megabits per second	
A/D	- Analog to Digital	MILD-STD	- Military Standard	
ANSI	- American National Standards Institute	MLPP	- Multi-Level Precedence & Preemption	
BER	- Bit Error Ratio	MOS	- Mean Opinion Score	
BRI	- Basic Rate Interface	msec	- millisecond	
CAS	- Channel Associated Signaling	NI 1/2	- National ISDN Std. 1 or 2	
CCS	- Common Channel Signaling	NM	- Network Management	
CJCSI	- Chairman Joint Chiefs of Staff Instruction	NX56	- Data format restricted to multiples of 56 kbps	
CoS	- Class of Service	NX64	- Data format restricted to multiples of 64 kbps	
D/A	- Digital to Analog	Op	- Operations	
DITSCAP	- Department of Defense Information Technology Security and Accreditation Process	PAT	- Precedence Access Threshold	
DN	- Directory Number	PBX	- Private Branch Exchange	
DODI	- Department of Defense Instruction	PCM-24	- Pulse Code Modulation 24 Channels	
DSN	- Defense Switched Network	PCM-30	- Pulse Code Modulation 30 Channels	
E1	- European Transmission Std. (2.048 Mbps)	PRI	- Primary Rate Interface	
E911	- Emergency 911 Service	PSTN	- Public Switched Telephone Network	
EIA	- Electronic Industries Alliance	Q.955.3	- ITU ISDN Signaling Std. For E1 MLPP	
EKTS	- Electronic Key Telephone System	QoS	- Quality of Service	
GSCR	- Generic Switching Center Requirements	Sect.	- section	
H.320	- ITU Standard for narrowband VTC	SS7	- Signaling System 7	
IAW	- in accordance with	Std	- Standard	
IEEE	- Institute of Electrical and Electronic Engineers, Inc.	STE	- Secure Terminal Equipment	
IPv6	- Internet Protocol Version 6	STU-III	- Secure Telephone Unit-III	
ISDN	- Integrated Services Digital Network	SUT	- System Under Test	
ITU	- International Telecommunications Union	T1	- American Transmission Std. (1.544 Mbps)	
JITC	- Joint Interoperability Test Command	T1.619a	- SS7 and ISDN Signaling Standard for T1	
JTA	- Joint Technical Architecture	TIA	- Telecommunications Industry Association	
kbps	- kilobits per second	VBD	- variable bit data	
KXX	- K= any number 2-8; X= any number 1-9	VLAN	- Virtual Local Area Network	
LAN	- Local Area Network	VoIP	- Voice over Internet Protocol	
LoC	- Letter(s) of Compliance	VTC	- Video Teleconferencing	
		WWNDP	- Worldwide Numbering and Dialing Plan	
Note:				
1 JITC verifies security via a LoC. Further testing IAW the IATP is required prior to being authorized connection approval.				

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC's Global Information Grid Network Test Facility in a manner and configuration similar to that of the DSN operational environment. Testing of the system's required functions and features was conducted using the notional test configuration depicted in figure 2-2. Per this configuration, the SUT was tested as the end-point in relation to the other switches.



Legend:			
BRI	- Basic Rate Interface		SS7 Service Switching Point (SSP)
CAS	- Channel Associated Signaling		SS7 Signal Transfer Point (STP)
DAKS	- Digital Alarm and Conference Server		DSN Gateway Trunk
DRSN	- Defense Red Switch Network		DSN Interswitch Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI)
DSN	- Defense Switched Network		DSN Line (2 Wire Analog, ISDN BRI, Digital Proprietary)
E1	- European Transmission Standard (2.048 Mbps)		SS7 Links (A-Link, B-Link or C-Link)
EO	- End Office		DRSN Gateway 2 wire analog interface
FAX	- facsimile		DSN End Office Access Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI)
ISDN	- Integrated Services Digital Network		DSN PBX Access Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI)
Mbps	- Megabits per second		RSU-Host Umbilical Link
MFS	- Multifunction Switch		
PBX1	- Private Branch Exchange Type 1		
PRI	- Primary Rate Interface		
PSTN	- Public Switched Telephone Network		
RSU	- Remote Switching Unit		
SMEO	- Small End Office		
SS7	- Signaling System 7		
STU-III R	- Secure Terminal Unit 3rd Generation Red Switch		
SUT	- System Under Test		
T1	- American Transmission Standard (1.544 Mbps)		
VTC	- Video Teleconferencing		

Figure 2-2. Notional Test Configuration

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 HiPath 4000		3.0.1-c	
		Card Number	Software Release
Ring generator 20Hz 85V		S30810-Q2468-X100	V1.0 SMR 12
WAN Module LAN		S30810-Q2205-X	
Signaling Unit Periphery DTMF		S30810-Q2233-X	
Subscriber Line Module Analog		S30810-Q2246-X	
Subscriber Line Module Digital		S30810-Q2169-X100	
Subscriber Line Module		S30810-Q2117-X	
Subscriber Line Module		S30810-Q2479-X	
Trunk Module Digital New HiPath		S30810-Q2192-X	
Subscriber Trunk Module IP		S30810-Q2303-X10	
Digital Interface Unit		S30810-Q2096-X200	
Digital Interface Unit New S2M/CASPCM30		S30810-Q2196-X	
Subscriber Line Module Sky Trading		S30810-Q2816-X	
DAKS Audio Conference Bridge		5.13d	
Announcement Module		4.3 Build 102	
Telephone Instruments			
Nortel Networks MSL-100		MSL17	
REDCOM IGX		6.0A R1P3	
Avaya MultiVantage		R012x.00.0.221.1	
Siemens EWSD		19d with Patch Set 32	
Siemens KNS-4100		APS4V2.3	
Lucent 5ESS		5E16.2	
SMU 96 Tactical Gateway		RD302185	
Nortel Networks Broad Band STP		3.0.3.18d	
Interface Type	Model (s)/ Release		
2-Wire Analog	Panasonic KX-TS15-W		
2-Wire Digital Proprietary	OptiPoint 500 Advance, OptiPoint 400 Standard, Optiset E Advance plus, OptiPoint 600 Office		
2-Wire Proprietary Dispatch Console	Release 3.0.1-c		
ISDN BRI	Optiset E Advance		
Legend:			
5ESS - Class 5 Electronic Switching System			
BRI - Basic Rate Interface			
DAKS - Digital Alarm and Conference System			
DTMF - Dual Tone Multifrequency			
EWSD - Elektronisches Wahl-System Digital			
Hz - Hertz			
IGX - Integrated Services Digital Network (ISDN) Gateway Exchange			
IP - Internet Protocol			
ISDN - Integrated Services Digital Network			
LAN - Local Area Network			
MSL - Meridian Switching Load			
SMU - Switch Multiplexer Unit			
STP - Signal Transfer Point			
V - Volts			

10. TESTING LIMITATIONS. None.

11. TEST RESULTS

a. DSN Trunk Interfaces. SUT met all critical interoperability certification requirements for DSN Trunk Interfaces. Detailed trunk configurations and associated lessons learned can be found on the DISA web page: <http://jitc.fhu.disa.mil/>.

b. DSN Line Interfaces. SUT met all critical interoperability certification requirements for DSN Line Interfaces. Refer to Table 2-2 for specific instrument models tested under this certification test.

c. Features and Functions. SUT met all critical interoperability certification requirements for Features and Functions.

d. Network Gateways. The SUT met all critical interoperability certification requirements for Network Gateways.

e. System Interoperability Results. The SUT with Software Release Version V1.0 SMR12 is certified for joint use in the DSN as a PBX1 in accordance with the requirements set forth in the GSCR. The SUT product line offers a Voice over Internet Protocol (VoIP) capability, however VoIP is not covered under this certification. The interoperability test summary is shown in table 2-3 and the detailed interoperability test status is shown table 2-4.

Table 2-3. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (DTMF)	No	Certified	Met all CRs and FRs.
E1 CAS (DTMF)	No (Europe only)	Certified	Met all CRs and FRs.
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all CRs and FRs.
E1 ISDN PRI (ITU Q.955.3)	No (Europe only)	Certified	Met all CRs and FRs.
DSN Line Interfaces			
Interface & Signaling	Critical	Status	Remarks
2-Wire Analog	Yes	Certified	Met all CRs and FRs.
ISDN BRI NI 1/2	Yes	Certified	Met all CRs and FRs.
Digital Proprietary	No	Certified	Met all CRs and FRs.
VoIP	No	Not Tested	
DSN Features and Capabilities			
Features and Capabilities	Critical	Status	Remarks
Common Features	No	Certified	
Attendant	No	Not Tested	
Public Safety	No	Not Tested	
Preset Conferencing	No	Certified	Met all CRs and FRs with DAKS Audio Conferencing Bridge
Nailed-up Connections	No	Not Tested	
PAT	No	Not Tested	
DSN Hotline Services	No	Not Tested	
Network Management	No	Not Tested	
ISDN Services (EKTS)	No	Certified	
Synchronization	Yes	Certified	Met all CRs and FRs.
Reliability	Yes	Certified	Met all CRs and FRs.
Security ¹	Yes	Certified	Met all CRs and FRs.
VoIP System	No	Not Tested	
VoIP LANs	No	Not Tested	

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

Network Gateways				
	Interface & Signaling	Critical	Status	Remarks
PSTN	T1 CAS (DTMF)	No	Certified	Met all CRs and FRs.
	E1 CAS (DTMF)	No (Europe only)	Certified	Met all CRs and FRs.
	T1 ISDN PRI NI 1/2	No	Certified	Met all CRs and FRs.
	E1 ISDN PRI (Q.931)	No (Europe only)	Certified	Met all CRs and FRs.
Legend: ANSI - American National Standards Institute BRI - Basic Rate Interface CAS - Channel Associated Signaling CRs - Capability Requirements DAKS - Digital Access Communications Server DITSCAP - Department of Defense Information Technology Security and Accreditation Process DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E1 - European Transmission Standard (2.048 Mbps) EKTS - Electronic Key Telephone System FRs - Feature Requirements ISDN - Integrated Services Digital Network ITU - International Telecommunications Union JITC - Joint Interoperability Test Command LAN - Local Area Network LoC - Letters of Compliance Mbps - Megabits per second MLPP - Multi-Level Precedence and Preemption NI 1/2 - National ISDN 1 or 2 PAT - Precedence Access Threshold PRI - Primary Rate Interface PSTN - Public Switched Telephone Network Q.931 - ITU Signaling Standard for ISDN Q.955.3 - ITU ISDN Signaling Standard For E1 MLPP SS7 - Signaling System 7 SUT - System Under Test T1 - Digital Transmission Link level 1 (1.544 Mbps) T1.619a - SS7 and ISDN Signaling Standard for T1 VoIP - Voice over Internet Protocol Notes: 1 JITC verifies security via a LoC. Further testing IAW the IATP is required prior to being authorized connection approval.				

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

Table 2-4. SUT Interoperability Requirements/Status

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

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

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

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

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

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

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

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

DSN Line Interfaces (continued)							
Interface	Critical	Interface Status	GSCR Requirement Required (R) Conditional (C)		Reference	Test Results	Operational Impact
Digital Proprietary	No	Certified	Access	DN Identification (R)	GSCR Sect 2.1.1	Met	
				Line signaling (R)	GSCR Sect 5.2	Met	
				Alerting Signals and Tones (R)	GSCR Sect 5.5	Met	
				WWNDP (R)	GSCR Sect. 4.5	Met	
				Call Processing (C)	GSCR Sect. 4.4	Met	
				Call Treatments (R)	GSCR Sect. 4.1	Met	
			Voice	MOS (R)	CJCSI 6215.01B	Met	
				MLPP (R)	GSCR Sect. 3.4.3, 3.9	Met	
DSN Features & Capabilities							
Features/ Capabilities	Critical	Status	GSCR Requirement Required (R) Conditional (C)		Reference	Test Results	Operational Impact
Common Features	No	Certified	Selective call rejection (C)		GSCR Sect. 2.1.2	Not Tested	
			Denied originating service (C)		GSCR Sect. 2.1.3	Not Tested	
			Code restriction and diversion (C)		GSCR Sect. 2.1.4	Met	
			Three-way calling (C)		GSCR Sect. 2.1.5	Met	
			Add-on transfer and conference calling (C)		GSCR Sect. 2.1.6	Met	
			Call forwarding (C)		GSCR Sect. 2.1.7	Met	
			Call pick-up (C)		GSCR Sect. 2.1.8	Met	
Call waiting (C)		GSCR Sect. 2.1.9	Met				
Attendant	No	Not Tested	Initiate all precedence levels (C)		GSCR Sect. 2.2.1	Not Tested	
			Visual display (C)		GSCR Sect. 2.2.2	Not Tested	
			Override class of service (C)		GSCR Sect. 2.2.3	Not Tested	
			Override busy line (C)		GSCR Sect. 2.2.4	Not Tested	
			Call deflection (C)		GSCR Sect. 2.2.5	Not Tested	
			Auto recall (C)		GSCR Sect. 2.2.6	Not Tested	
Public Safety	No	Not Tested	911 (C)		GSCR Sect. 2.4.1	Not Tested	
			Trace of terminating calls (C)		GSCR Sect. 2.4.2	Not Tested	
			Outgoing call trace (C)		GSCR Sect. 2.4.3	Not Tested	
			Tandem call trace (C)		GSCR Sect. 2.4.4	Not Tested	
			Trace of a call in progress (C)		GSCR Sect. 2.4.5	Not Tested	

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

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

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

DSN Features & Capabilities (continued)						
Features/ Capabilities	Critical	Status	GSCR Requirement Required (R) Conditional (C)	Reference	Test Results	Operational Impact
Network Management	No	Not Tested	Interfaces (C)	GSCR Sect. 9.1	Not Tested	
			Measurements and data generation (C)	GSCR Sect. 9.2	Not Tested	
			Fault management (C)	GSCR Sect. 9.3	Not Tested	
			Configuration management (C)	GSCR Sect. 9.4	Not Tested	
			Accounting management (C)	GSCR Sect. 9.5	Not Tested	
			Performance management (C)	GSCR Sect. 9.6	Not Tested	
			NM controls (C)	GSCR Sect. 9.7	Not Tested	
Remote access (C)	GSCR Sect. 9.8	Not Tested				
ISDN Services	No	Certified	EKTS (C)	GSCR Sect. 10, table 10-3	Met	
Synchronization	Yes	Certified	Line timing mode (R)	GSCR Sect. 11.1.1.2	Met	
			Internal Stratum 4 (R)	GSCR Sect. 11.1.2.2	Met	
Reliability	Yes	Certified	GR-512-CORE (R)	GSCR Sect. 12	Met	
Security ¹	Yes	Certified	DITSCAP (R)	DODI 8100.3	Met	
VoIP System	No	Not Tested	MOS 4.0 or better (R)	GSCR App. 3	Not Tested	
			G.711 PCM Codec (R)	GSCR App. 3	Not Tested	
			Security IAW DITSCAP (R)	GSCR App. 3	Not Tested	
			NM(R)	GSCR App. 3	Not Tested	
			Line timing (R)	GSCR App. 3	Not Tested	
			Internal Clock (R)	GSCR App. 3	Not Tested	
			Latency @ 60 msec or less (R)	GSCR App. 3	Not Tested	
IPv6 capable (R)	GSCR App. 3	Not Tested				
LANs	No	Not Tested	LAN parameters (R)	GSCR App. 3	Not Tested	
			CoS/QoS (R)	GSCR App. 3	Not Tested	
			VLANs (R)	GSCR App. 3	Not Tested	
			IEEE Stds. Conformance (R)	GSCR App. 3	Not Tested	
			.99999 availability (R)	GSCR App. 3	Not Tested	
			Modular devices (R)	GSCR App. 3	Not Tested	
			2 sec. link restoral (R)	GSCR App. 3	Not Tested	
			LAN NM (R)	GSCR App. 3	Not Tested	
Traffic Engineering (R)	GSCR App. 3	Not Tested				

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

Network Gateway																																																																																																																																										
Gateway	Critical	Interface Status	GSCR Requirement Required (R) Conditional (C)	Reference	Test Results	Operational Impact																																																																																																																																				
PSTN	No	Certified	Same interfaces and Requirements as DSN		Met																																																																																																																																					
<p>Legend:</p> <table border="0"> <tr> <td>2W</td><td>- 2-Wire</td> <td>GSCR</td><td>- Generic Switching Center Requirements</td> <td>NX64</td><td>- Data format restricted to multiples of 64 kbps</td> </tr> <tr> <td>A/D</td><td>- Analog to Digital Conversion</td> <td>H.320</td><td>- ITU standard for narrowband VTC</td> <td>Op</td><td>- Operations</td> </tr> <tr> <td>ANSI</td><td>- American National Standards Institute</td> <td>IATP</td><td>- Information Assurance Test Plan</td> <td>PAT</td><td>- Precedence Access Threshold</td> </tr> <tr> <td>App.</td><td>- Appendix</td> <td>IAW</td><td>- In accordance with</td> <td>PCM-24</td><td>- Pulse Code Modulation 24 Channels</td> </tr> <tr> <td>BER</td><td>- Bit Error Ratio</td> <td>IEEE</td><td>- Institute of Electrical and Electronics Engineers, Inc.</td> <td>PCM-30</td><td>- Pulse Code Modulation 30 Channels</td> </tr> <tr> <td>BRI</td><td>- Basic Rate Interface</td> <td>IPv6</td><td>- Internet Protocol Version 6</td> <td>PRI</td><td>- Primary Rate Interface</td> </tr> <tr> <td>C</td><td>- conditional</td> <td>ISDN</td><td>- Integrated Services Digital Network</td> <td>PSTN</td><td>- Public Switched Telephone Network</td> </tr> <tr> <td>CAS</td><td>- Channel Associated Signaling</td> <td>ITU</td><td>- International Telecommunications Union</td> <td>QoS</td><td>- Quality of Service</td> </tr> <tr> <td>CCS</td><td>- Common Channel Signaling</td> <td>JITC</td><td>- Joint Interoperability Test Command</td> <td>R</td><td>- Required</td> </tr> <tr> <td>CJCSI</td><td>- Chairman Joint Chiefs of Staff Instruction</td> <td>JTA</td><td>- Joint Technical Architecture</td> <td>Sec.</td><td>- Seconds</td> </tr> <tr> <td>CoS</td><td>- Class of Service</td> <td>Kbps</td><td>- kilobits per second</td> <td>Sec.</td><td>- Section</td> </tr> <tr> <td>CRs</td><td>- Capability Requirements</td> <td>KXX</td><td>- K= any number 2-8; X= any number 1-9</td> <td>Std</td><td>- Standard</td> </tr> <tr> <td>D/A</td><td>- Digital to Analog Conversion</td> <td>LAN</td><td>- Local Area Network</td> <td>STE</td><td>- Secure Terminal Equipment</td> </tr> <tr> <td>DAA</td><td>- Designated Accreditation Authority</td> <td>LoC</td><td>- Letter (s) of Compliance</td> <td>STU-III</td><td>- Secure Telephone Unit-III</td> </tr> <tr> <td>DITSCAP</td><td>- Department of Defense Information Technology Security and Accreditation Process</td> <td>Mbps</td><td>- Megabits per second</td> <td>SUT</td><td>- System Under Test</td> </tr> <tr> <td>DN</td><td>- Directory Number</td> <td>MIL-STD</td><td>- Military Standard</td> <td>T1</td><td>- American Transmission Std. (1.544 Mbps)</td> </tr> <tr> <td>DODI</td><td>- Department of Defense Instruction</td> <td>MOS</td><td>- Mean Opinion Score</td> <td>TIA</td><td>- Telecommunications Industry Association</td> </tr> <tr> <td>DSN</td><td>- Defense Switched Network</td> <td>Msec</td><td>- Milliseconds</td> <td>VBD</td><td>- Variable bit data</td> </tr> <tr> <td>EIA</td><td>- Electronics Industries Association</td> <td>NI 1/2</td><td>- National ISDN Std. 1 or 2</td> <td>VLAN</td><td>- Virtual LAN</td> </tr> <tr> <td>EKTS</td><td>- Electronic Key Telephone System</td> <td>NM</td><td>- Network Management</td> <td>VoIP</td><td>- Voice over Internet Protocol</td> </tr> <tr> <td>FRs</td><td>- Feature Requirements</td> <td>NX56</td><td>- Data format restricted to multiples of 56 kbps</td> <td>VTC</td><td>- Video Teleconferencing</td> </tr> <tr> <td></td><td></td> <td></td><td></td> <td>WWNDP</td><td>- Worldwide Numbering and Dialing Plan</td> </tr> </table> <p>Notes:</p> <ol style="list-style-type: none"> The SUT is required to meet the Interoperability CRs and FRs for only one of the two trunk interfaces (T1 CAS or T1 ISDN PRI). The SUT is required to meet the Interoperability CRs and FRs for only one of two line interfaces (2W Analog or ISDN BRI). JITC verifies security via vendor LoC. Further testing IAW the IATP is required prior to being authorized connection approval. 							2W	- 2-Wire	GSCR	- Generic Switching Center Requirements	NX64	- Data format restricted to multiples of 64 kbps	A/D	- Analog to Digital Conversion	H.320	- ITU standard for narrowband VTC	Op	- Operations	ANSI	- American National Standards Institute	IATP	- Information Assurance Test Plan	PAT	- Precedence Access Threshold	App.	- Appendix	IAW	- In accordance with	PCM-24	- Pulse Code Modulation 24 Channels	BER	- Bit Error Ratio	IEEE	- Institute of Electrical and Electronics Engineers, Inc.	PCM-30	- Pulse Code Modulation 30 Channels	BRI	- Basic Rate Interface	IPv6	- Internet Protocol Version 6	PRI	- Primary Rate Interface	C	- conditional	ISDN	- Integrated Services Digital Network	PSTN	- Public Switched Telephone Network	CAS	- Channel Associated Signaling	ITU	- International Telecommunications Union	QoS	- Quality of Service	CCS	- Common Channel Signaling	JITC	- Joint Interoperability Test Command	R	- Required	CJCSI	- Chairman Joint Chiefs of Staff Instruction	JTA	- Joint Technical Architecture	Sec.	- Seconds	CoS	- Class of Service	Kbps	- kilobits per second	Sec.	- Section	CRs	- Capability Requirements	KXX	- K= any number 2-8; X= any number 1-9	Std	- Standard	D/A	- Digital to Analog Conversion	LAN	- Local Area Network	STE	- Secure Terminal Equipment	DAA	- Designated Accreditation Authority	LoC	- Letter (s) of Compliance	STU-III	- Secure Telephone Unit-III	DITSCAP	- Department of Defense Information Technology Security and Accreditation Process	Mbps	- Megabits per second	SUT	- System Under Test	DN	- Directory Number	MIL-STD	- Military Standard	T1	- American Transmission Std. (1.544 Mbps)	DODI	- Department of Defense Instruction	MOS	- Mean Opinion Score	TIA	- Telecommunications Industry Association	DSN	- Defense Switched Network	Msec	- Milliseconds	VBD	- Variable bit data	EIA	- Electronics Industries Association	NI 1/2	- National ISDN Std. 1 or 2	VLAN	- Virtual LAN	EKTS	- Electronic Key Telephone System	NM	- Network Management	VoIP	- Voice over Internet Protocol	FRs	- Feature Requirements	NX56	- Data format restricted to multiples of 56 kbps	VTC	- Video Teleconferencing					WWNDP	- Worldwide Numbering and Dialing Plan
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