



DEFENSE INFORMATION SYSTEMS AGENCY

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IN REPLY
REFER TO: Joint Interoperability Test Command (JTE)

9 Jun 10

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of the Juniper Circuit to Packet (CTP) 1004, 2024, and 2056 with software release 5.4 R2-P1

References: (a) DOD Directive 4630.05, "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
(c) through (e), see Enclosure 1

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.

2. The Juniper CTP 1004, 2024, and 2056 with software release 5.4 R2-P1 are hereinafter referred to as the SUT. The SUT meets all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Switched Network (DSN) as a Strategic Network Element. The SUT is deployed as a mated pair, and both SUTs must be loaded with the same certified 5.4 R2-P1 software release in order to interoperate correctly. The SUT has three certified types of encapsulation which are Circuit to Packet (CTP), Structured-Agnostic Time Division Multiplexing (TDM) over Internet Protocol (IP) (SAToP), and Circuit Emulation Services over a Packet Switched Network (CESoPSN). There is a fourth encapsulation called Voice Compression (VCOMP); however, this encapsulation type failed initial interoperability testing and is therefore not certified by JITC. The SUT meets the critical interoperability requirements set forth in Reference (c), using test procedures derived from Reference (d). No other configurations, features, or functions, except those cited within this report, are certified by the JITC. This certification expires upon changes that affect interoperability, but no later than three years from the date of Defense Information Assurance (IA)/Security Accreditation Working Group (DSAWG) accreditation.

3. This finding is based on interoperability testing, review of the vendor's Letters of Compliance (LoC), and DSAWG accreditation. Interoperability testing was conducted by JITC at the Global Information Grid Network Test Facility, Fort Huachuca, Arizona, from 28 September through 30 October 2009. Review of the vendor's LoC was completed on 23 February 2010. DSAWG granted accreditation on 14 June 2010 based on the security testing completed by DISA-led IA test teams and published in a separate report, Reference (e). The Certification Testing Summary (Enclosure 2) documents the test results and describes the test network.

4. The overall interoperability status of the SUT is indicated in Table 1. The interfaces and associated Capability Requirements (CRs) and Feature Requirements (FRs) critical used to evaluate the interoperability status are listed in Table 2. The interoperability test status is based on the SUT’s ability to meet:

- a. DSN services for Network and Applications specified in reference (c).
- b. The overall system interoperability performance derived from test procedures listed in reference (d).

Table 1. SUT Interoperability Test Summary

DSN Access Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (AMI/SF) DTMF, MFR1	No ¹	Certified	Met all CRs and FRs.
T1 CAS (B8ZS/ESF) DTMF, MFR1	No ¹	Certified	Met all CRs and FRs.
T1 PRI (ANSI T1.607/T1.619a)	No ¹	Certified	Met all CRs and FRs.
T1 SS7 (ANSI T1.619a)	No ¹	Certified	Met all CRs and FRs.
E1 CAS (HDB3) DTMF, MFR1, DP	No ¹ (Europe only)	Certified	Met all CRs and FRs.
E1 ISDN PRI (ITU-T Q.955.3)	No ¹ (Europe only)	Certified	Met all CRs and FRs.
E1 SS7 (ANSI T1.619a)	No ¹ (Europe only)	Certified	Met all CRs and FRs.
Serial (EIA-232, EIA-530)	No ¹	Certified	Met all CRs and FRs.
DSN Transport Interfaces			
Transport Level	Critical	Status	Remarks
Fast Ethernet (IEEE 802.3u)	No ²	Certified	Met all CRs and FRs.
Features And Capabilities			
Features And Capabilities	Critical	Status	Remarks
Synchronization	Yes	Certified	Met all CRs and FRs.
Network Management	Yes	Certified	Met all CRs and FRs.
Security	Yes	Certified	See note 3.
NOTES:			
1 The UCR does not stipulate a minimum Access interface requirement for a Strategic Network Element.			
2 The UCR does not stipulate a minimum Transport interface requirement for a Strategic Network Element.			
3 Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).			

Table 1. SUT Interoperability Test Summary (continued)

LEGEND:		
802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	EIA-530 Standard for 25-position interface for DTE and DCE employing serial binary data interchange
AMI	Alternate Mark Inversion	IEEE Institute of Electrical and Electronics Engineers
ANSI	American National Standards Institute	ISDN Integrated Services Digital Network
B8ZS	Bipolar Eight Zero Substitution	ITU-T International Telecommunication Union – Telecommunication Standardization Sector
CAS	Channel Associated Signaling	
CRs	Capability Requirements	Mbps Megabits per second
DCE	Data Circuit-terminating Equipment	MFR1 Multi-Frequency Recommendation 1
DISA	Defense Information Systems Agency	MLPP Multi-Level Precedence and Preemption
DP	Dial Pulse	PRI Primary Rate Interface
DSN	Defense Switched Network	Q.955.3 ISDN Signaling Standard for E1 MLPP
DSS1	Digital Subscriber Signaling 1	SF Super Frame
DTE	Data Terminal Equipment	SS7 Signaling System 7
DTMF	Dual Tone Multi-Frequency	SUT System Under Test
E1	European Basic Multiplex Rate (2.048 Mbps)	T1 Digital Transmission Link Level 1 (1.544 Mbps)
ESF	Extended Super Frame	T1.607 ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
FRs	Feature Requirements	T1.619a SS7 and ISDN MLPP Signaling Standard for T1
HDB3	High Density Bipolar 3	UCR Unified Capabilities Requirements
EIA	Electronic Industries Alliance	
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	

Table 2. SUT Capability and Feature Interoperability Requirements

DSN Access Interfaces			
Interface	Critical	Requirements Required or Conditional	References
T1 CAS (AMI/SF) DTMF, MFR1	No ¹	<ul style="list-style-type: none"> • DS1 Interface Characteristics (C) • DS1 Supervisory Channel Associated Signaling (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.4 • UCR Section 5.2.12.5.5.1.2.4
T1 CAS (B8ZS/ESF) DTMF, MFR1	No ¹	<ul style="list-style-type: none"> • DS1 Clear Channel Capability (C) • DS1 Alarm and Restoral Requirements (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.4 • UCR Section 5.2.12.5.5.1.2.5
T1 PRI (ANSI T1.607/T1.619a)	No ¹	<ul style="list-style-type: none"> • E1 Interface Characteristics (C) • E1 Supervisory Channel Associated Signaling (C) • E1 Clear Channel Capability (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.5 • UCR Section 5.2.12.5.5.1.2.5 • UCR Section 5.2.12.5.5.1.2.5
T1 SS7 (ANSI T1.619a)	No ¹	<ul style="list-style-type: none"> • E1 Alarm and Restoral Requirements (C) • MOS (R) • BERT (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.1 • UCR Section 5.2.12.5.5.1.1
E1 CAS (HDB3) DTMF, MFR1, DP	No ¹	<ul style="list-style-type: none"> • Secure Transmission (Voice and Data) (R) • Modem (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.1 • UCR Section 5.2.12.5.5.1.1
E1 ISDN PRI (ITU-T Q.955.3)	No ¹	<ul style="list-style-type: none"> • Facsimile (R) • Call Control Signals (R) • Alarms (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.1 • UCR Section 5.2.12.5.5.1.1.1
E1 SS7 (ANSI T1.619a)	No ¹	<ul style="list-style-type: none"> • Call Congestion Control (R) • Call Congestion for TDM Transport (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.1.2 • UCR Section 5.2.12.5.5.1.1.2.1
Serial (EIA-232, EIA- 530)	No ¹	<ul style="list-style-type: none"> • Voice Compression (C) • TIA/EIA-232, TIA-EIA-530 (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.1.3 • UCR Section 5.2.8.1

Table 2. SUT Capability and Feature Interoperability Requirements (continued)

DSN Transport Interfaces			
Interface	Critical	Requirements Required or Conditional	References
IP	No ²	<ul style="list-style-type: none"> • DS1 Interface Characteristics (R) • E1 Interface Characteristics (R) • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) • Call Control Signals (includes MLPP) (R) • Congestion Control (C) (IP interface only) • Voice Compression (C) • Alarms • Delay (R) • Jitter (R) • Packet Loss (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.4 • UCR Section 5.2.12.5.5.1.2.5 • UCR Section 5.2.12.5.5.1.1 • UCR Section 5.2.12.5.5.1.1.2.2 • UCR Section 5.2.12.5.5.1.1.3 • UCR Section 5.2.12.5.5.1.1.1 • UCR Section 5.2.12.5.5.1.2.9 • UCR Section 5.2.12.5.5.1.2.9 • UCR Section 5.2.12.5.5.1.2.9
SUT Features And Capabilities			
Feature/Capability	Critical	Requirements Required or Conditional	References
Synchronization	Yes	<ul style="list-style-type: none"> • Timing (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.7
Network Management	Yes	<ul style="list-style-type: none"> • Management Option (R) • Local Management (Front Panel and/or External Console) (C) • ADIMSS (C) • Fault Management (C) • Loop Back Capability (C) • Operational Configuration Restoral (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.2.1 • UCR Section 5.2.12.5.5.2.2 • UCR Section 5.2.12.5.5.2.3 • UCR Section 5.2.12.5.5.2.4
Security	Yes	<ul style="list-style-type: none"> • STIGs and DoDI 8510.01 (DIACAP) (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.7
NOTES:			
1 The UCR does not stipulate a minimum required DSN access interface.			
2 The UCR does not stipulate a minimum required DSN transport interface.			
LEGEND:			
ADIMSS	Advanced DSN Integrated Management Support System	ESF	Extended Super Frame
AMI	Alternate Mark Inversion	HDB3	High Density Bipolar Three
ANSI	American National Standards Institute	IP	Internet Protocol
B8ZS	Bipolar Eight Zero Substitution	ISDN	Integrated Services Digital Network
BERT	Bit Error Rate Test	ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
C	Conditional	Mbps	Megabits per second
CAS	Channel Associated Signaling	MFR1	Multi-Frequency Recommendation 1
DCE	Data Circuit-terminating Equipment	MLPP	Multi-Level Precedence and Preemption
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process	MOS	Mean Opinion Score
DoDI	Department of Defense Instruction	PRI	Primary Rate Interface
DP	Dial Pulse	Q.955.3	ISDN Signaling Standard for E1 MLPP
DS1	Digital Signal Level 1	R	Required
DSN	Defense Switched Network	SF	Super Frame
DSS1	Digital Subscriber Signaling 1	SS7	Signaling System 7
DTE	Data Terminal Equipment	STIGs	Security Technical Implementation Guides
DTMF	Dual Tone Multi-Frequency	SUT	System Under Test
E1	European Basic Multiplex Rate (2.048 Mbps)	T1	Digital Transmission Link Level 1 (1.544 Mbps)
EIA	Electronic Industries Alliance	T1.607	ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	TDM	Time Division Multiplexing
		UCR	Unified Capabilities Requirements

JITC, Memo, JTE, Special Interoperability Test Certification of Juniper CTP 1004, 2024, and 2056 with software release 5.4 R2-P1

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://jitic.fhu.disa.mil/tssi>. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: ucco@disa.mil.

6. The JITC point of contact is Mr. Khoa Hoang, DSN 879-4376, commercial (520) 538-4376, FAX DSN 879-4347, or e-mail to khoa.hoang@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 0910501.

FOR THE COMMANDER:



for RICHARD A. MEADOR
Chief
Battlespace Communications Portfolio

2 Enclosures a/s

Distribution (electronic mail):

Joint Staff J-6

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U.S. Joint Forces Command, Net-Centric Integration, Communication, and Capabilities
Division, J68

Defense Information Systems Agency, GS23

ADDITIONAL REFERENCES

- (c) Defense Information Systems Agency (DISA), "Department of Defense Networks Unified Capabilities Requirements," 22 January 2009
- (d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006
- (e) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of Juniper CTP 1004, 2024, and 2056 with software release 5.4 R2-P1 (Tracking Number 0910501)," 14 June 2010

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Juniper CTP 1004, 2024, and 2056 with software release 5.4 R2-P1; hereinafter referred to as the SUT.

2. PROPONENT. USAF 50 Space Communications Squadron (SCS)/SCXP.

3. PROGRAM MANAGER. Mr. Michael Hamilton, SCS/SCXP, 301 O'Malley Avenue, Schriever Air Force Base, Colorado 80912-3037, E-mail: michael.hamilton@afspc.af.mil.

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

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is a Strategic Network Element (S-NE) that provides multiple Digital Transmission Link Level 1 (T1), European Basic Multiplex Rate (E1), and serial access interfaces over an Internet Protocol (IP) transport. The SUT supports T1/E1 Primary Rate Interface (PRI), Channel Associated Signaling (CAS), and Signaling System 7 (SS7) interfaces. The SUT supports serial Electronic Industries Alliance (EIA)-232 and EIA-530 interfaces with a data rate range of 9.6 kilobits per second (kbps) to 12.288 Megabits per second (Mbps). Although the CTP 2024 and 2056 support 4-Wire Ear & Mouth (4WE&M), 2-Wire Foreign Exchange Service (2WFXS), and 2-Wire Foreign Exchange Office (2WFXO) analog, these interfaces were not tested and are not covered under this certification. The SUT has three certified types of encapsulation; Circuit to Packet (CTP), Structured-Agnostic Time Division Multiplexing (TDM) over Internet Protocol (IP) (SAToP), and Circuit Emulation Services over a Packet Switched Network (CESoPSN). There is a fourth encapsulation called Voice Compression (VCOMP); this encapsulation type failed initial interoperability testing and is therefore not certified by JITC.

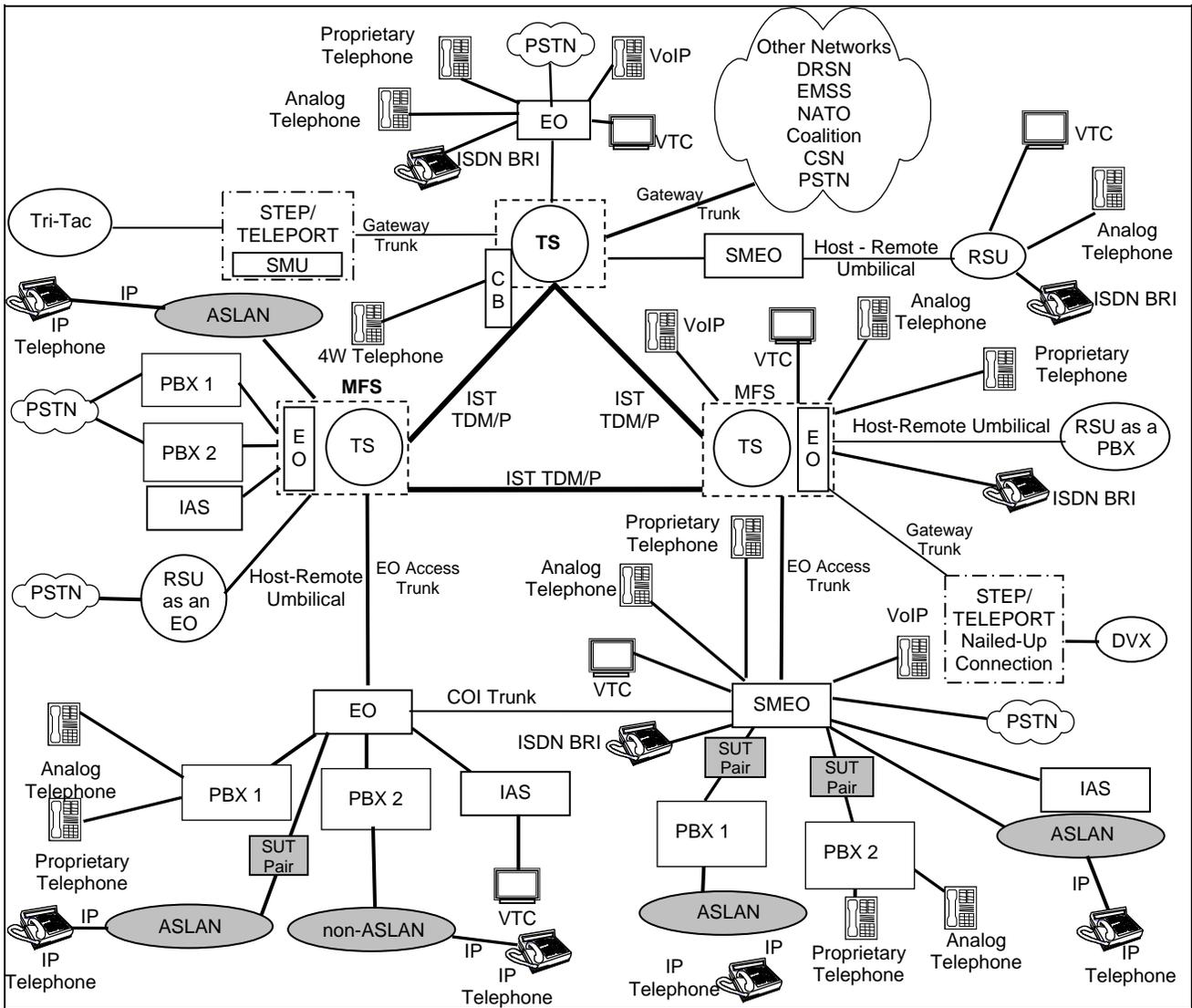
(a) CTP 2024. The CTP 2024 platform is a rack-mountable chassis that can be configured with 8 to 24 T1 or E1 interfaces with options for EIA-232 or EIA-530 interfaces. The chassis includes the option for redundant power.

(b) CTP 2056. The CTP 2056 platform is a rack-mountable chassis that can be configured with 8 to 56 T1, E1, EIA-232, or EIA-530 interfaces. The chassis includes the option for redundant power.

(c) CTP 1004. The CTP 1004 platform includes support for four T1, E1, EIA-232, or EIA-530 interfaces in a rack mountable chassis.

(d) Juniper CTPView Network Management. The CTPView network management system provides network operators with the tools necessary to monitor network availability, report on IP network performance, provision voice bundles, and troubleshoot voice issues through a Graphical User Interface (GUI).

6. OPERATIONAL ARCHITECTURE. The Unified Capabilities Requirements (UCR) Defense Switched Network (DSN) operational architecture is depicted in Figure 2-1. The Juniper CTP 1004, 2024, and 2056 are point-to-point devices that are fielded in pairs, and both must be loaded with the same certified 5.4 R2-P1 software release in order to interoperate correctly. The SUT pairs will be employed as a Strategic Network Element (SNE) in the DSN backbone as depicted in Figure 2-1.



LEGEND:

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

Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. The SUT Interoperability Test Summary is shown in Table 2-1 and the Capability and Feature Requirements used to evaluate the interoperability of the SUT are indicated in Table 2-2. The SUT met these requirements through testing and submission of Letters of Compliance (LoC).

Table 2-1. SUT Interoperability Test Summary

DSN Access Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (AMI/SF) DTMF, MFR1	No ¹	Certified	Met all CRs and FRs.
T1 CAS (B8ZS/ESF) DTMF, MFR1	No ¹	Certified	Met all CRs and FRs.
T1 PRI (ANSI T1.607/T1.619a)	No ¹	Certified	Met all CRs and FRs.
T1 SS7 (ANSI T1.619a)	No ¹	Certified	Met all CRs and FRs.
E1 CAS (HDB3) DTMF, MFR1, DP	No ¹ (Europe only)	Certified	Met all CRs and FRs.
E1 ISDN PRI (ITU-T Q.955.3)	No ¹ (Europe only)	Certified	Met all CRs and FRs.
E1 SS7 (ANSI T1.619a)	No ¹ (Europe only)	Certified	Met all CRs and FRs.
Serial (EIA-232, EIA-530)	No ¹	Certified	Met all CRs and FRs.
DSN Transport Interfaces			
Transport Level	Critical	Status	Remarks
Fast Ethernet (IEEE 802.3u)	No ²	Certified	Met all CRs and FRs.
Features And Capabilities			
Features And Capabilities	Critical	Status	Remarks
Synchronization	Yes	Certified	Met all CRs and FRs.
Network Management	Yes	Certified	Met all CRs and FRs.
Security	Yes	Certified	See note 3.
NOTES:			
1 The UCR does not stipulate a minimum Access interface requirement for a Strategic Network Element.			
2 The UCR does not stipulate a minimum Transport interface requirement for a Strategic Network Element.			
3 Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).			
LEGEND:			
802.3u	Standard for carrier sense multiple access with collision detection at 100 Mbps	EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange
AMI	Alternate Mark Inversion	IEEE	Institute of Electrical and Electronics Engineers
ANSI	American National Standards Institute	ISDN	Integrated Services Digital Network
B8ZS	Bipolar Eight Zero Substitution	ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
CAS	Channel Associated Signaling	Mbps	Megabits per second
CRs	Capability Requirements	MFR1	Multi-Frequency Recommendation 1
DCE	Data Circuit-terminating Equipment	MLPP	Multi-Level Precedence and Preemption
DISA	Defense Information Systems Agency	PRI	Primary Rate Interface
DP	Dial Pulse	Q.955.3	ISDN Signaling Standard for E1 MLPP
DSN	Defense Switched Network	SF	Super Frame
DSS1	Digital Subscriber Signaling 1	SS7	Signaling System 7
DTE	Data Terminal Equipment	SUT	System Under Test
DTMF	Dual Tone Multi-Frequency	T1	Digital Transmission Link Level 1 (1.544 Mbps)
E1	European Basic Multiplex Rate (2.048 Mbps)	T1.607	ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
ESF	Extended Super Frame	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
FRs	Feature Requirements	UCR	Unified Capabilities Requirements
HDB3	High Density Bipolar 3		
EIA	Electronic Industries Alliance		
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices		

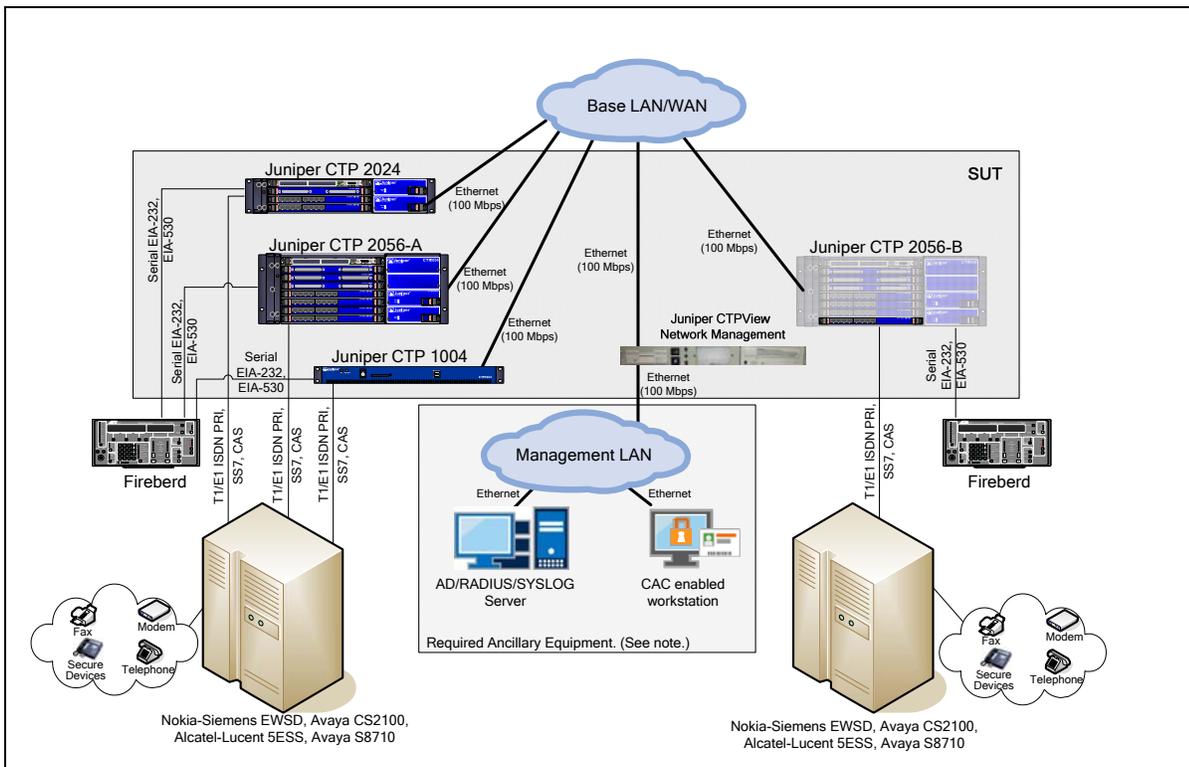
Table 2-2. SUT Capability and Feature Interoperability Requirements

DSN Access Interfaces			
Interface	Critical	Requirements Required or Conditional	References
T1 CAS (AMI/SF) DTMF, MFR1	No ¹	<ul style="list-style-type: none"> • DS1 Interface Characteristics (C) • DS1 Supervisory Channel Associated Signaling (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.4 • UCR Section 5.2.12.5.5.1.2.4
T1 CAS (B8ZS/ESF) DTMF, MFR1	No ¹	<ul style="list-style-type: none"> • DS1 Clear Channel Capability (C) • DS1 Alarm and Restoral Requirements (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.4 • UCR Section 5.2.12.5.5.1.2.4
T1 PRI (ANSI T1.607/T1.619a)	No ¹	<ul style="list-style-type: none"> • E1 Interface Characteristics (C) • E1 Supervisory Channel Associated Signaling (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.5 • UCR Section 5.2.12.5.5.1.2.5
T1 SS7 (ANSI T1.619a)	No ¹	<ul style="list-style-type: none"> • E1 Clear Channel Capability (C) • E1 Alarm and Restoral Requirements (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.5 • UCR Section 5.2.12.5.5.1.1
E1 CAS (HDB3) DTMF, MFR1, DP	No ¹	<ul style="list-style-type: none"> • MOS (R) • BERT (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.1 • UCR Section 5.2.12.5.5.1.1
E1 ISDN PRI (ITU-T Q.955.3)	No ¹	<ul style="list-style-type: none"> • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.1 • UCR Section 5.2.12.5.5.1.1 • UCR Section 5.2.12.5.5.1.1
E1 SS7 (ANSI T1.619a)	No ¹	<ul style="list-style-type: none"> • Call Control Signals (R) • Alarms (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.1.1 • UCR Section 5.2.12.5.5.1.1.2
Serial (EIA-232, EIA- 530)	No ¹	<ul style="list-style-type: none"> • Call Congestion Control (R) • Call Congestion for TDM Transport (C) • Voice Compression (C) • TIA/EIA-232, TIA-EIA-530 (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.1.2.1 • UCR Section 5.2.12.5.5.1.1.3 • UCR Section 5.2.8.1
DSN Transport Interfaces			
Interface	Critical	Requirements Required or Conditional	References
IP	No ²	<ul style="list-style-type: none"> • DS1 Interface Characteristics (R) • E1 Interface Characteristics (R) • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) • Call Control Signals (includes MLPP) (R) • Congestion Control (C) (IP interface only) • Voice Compression (C) • Alarms • Delay (R) • Jitter (R) • Packet Loss (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.4 • UCR Section 5.2.12.5.5.1.2.5 • UCR Section 5.2.12.5.5.1.1 • UCR Section 5.2.12.5.5.1.1.2.2 • UCR Section 5.2.12.5.5.1.1.3 • UCR Section 5.2.12.5.5.1.1.1 • UCR Section 5.2.12.5.5.1.2.9 • UCR Section 5.2.12.5.5.1.2.9 • UCR Section 5.2.12.5.5.1.2.9
SUT Features And Capabilities			
Feature/Capability	Critical	Requirements Required or Conditional	References
Synchronization	Yes	<ul style="list-style-type: none"> • Timing (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.1.2.7
Network Management	Yes	<ul style="list-style-type: none"> • Management Option (R) • Local Management (Front Panel and/or External Console) (C) • ADIMSS (C) • Fault Management (C) • Loop Back Capability (C) • Operational Configuration Restoral (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.2.1 • UCR Section 5.2.12.5.5.2.2 • UCR Section 5.2.12.5.5.2.3 • UCR Section 5.2.12.5.5.2.4
Security	Yes	<ul style="list-style-type: none"> • STIGs and DoDI 8510.01 (DIACAP) (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.12.5.5.7
NOTES:			
1 The UCR does not stipulate a minimum required DSN access interface.			
2 The UCR does not stipulate a minimum required DSN transport interface.			

Table 2-2. SUT Capability and Feature Interoperability Requirements (continued)

LEGEND:	
ADIMSS	Advanced DSN Integrated Management Support System
AMI	Alternate Mark Inversion
ANSI	American National Standards Institute
B8ZS	Bipolar Eight Zero Substitution
BERT	Bit Error Rate Test
C	Conditional
CAS	Channel Associated Signaling
DCE	Data Circuit-terminating Equipment
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process
DoDI	Department of Defense Instruction
DP	Dial Pulse
DS1	Digital Signal Level 1
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
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange
ESF	Extended Super Frame
HDB3	High Density Bipolar Three
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
Mbps	Megabits per second
MFR1	Multi-Frequency Recommendation 1
MLPP	Multi-Level Precedence and Preemption
MOS	Mean Opinion Score
PRI	Primary Rate Interface
Q.955.3	ISDN Signaling Standard for E1 MLPP
R	Required
SF	Super Frame
SS7	Signaling System 7
STIGs	Security Technical Implementation Guides
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
TDM	Time Division Multiplexing
UCR	Unified Capabilities Requirements

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC’s Global Information Grid Network Test Facility in a manner and configuration similar to that of the DSN operational environment. This test was conducted using the test configuration shown in Figure 2-2.



NOTE: The required ancillary equipment is a condition of fielding for Information Assurance, which is covered under a separate report, Reference (e).

LEGEND:

5ESS	Class 5 Electronic Switching System	EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange
AD	Active Directory	EWSD	Elektronisches Wählsystem Digital
CAC	Common Access Card	Fax	Facsimile
CAS	Channel Associated Signaling	ISDN	Integrated Services Digital Network
CS	Communication Server	LAN	Local Area Network
CTP	Circuit to Packet	Mbps	Megabits per second
DCE	Data Circuit-terminating Equipment	PRI	Primary Rate Interface
DTE	Data Terminal Equipment	RADIUS	Remote Authentication Dial In User Service
E1	European Basic Multiplex Rate (2.048 Mbps)	SS7	Signaling System 7
EIA	Electronic Industries Alliance	SUT	System Under Test
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	SYSLOG	System Log
		T1	Digital Transmission Link Level 1 (1.544 Mbps)
		WAN	Wide Area Network

Figure 2-2. SUT Test Network

9. SYSTEM CONFIGURATIONS. Table 2-3 provides the system configurations, hardware, and software components tested with the SUT. The SUT was tested in an operationally realistic environment to determine interoperability with a complement of DSN switches noted in Table 2-3. Table 2-3 lists the DSN switches, which depict the tested configuration, and is not intended to identify the only switches that are certified with the SUT. The SUT is certified with switching systems listed on the Unified Capabilities (UC) Approved Products List (APL) that offer the same certified access interfaces as the SUT. The SUT is fielded in pairs and each pair must have the same software release.

Table 2-3. Tested System Configurations

System Name		Software																																						
Avaya CS2100		Succession Enterprise (SE) 09.1																																						
Alcatel-Lucent 5ESS		5E16 Broadcast Warning Message (BWM) 09-0002																																						
Nokia-Siemens EWSD		19d Patch Set 46																																						
Avaya S8710		Communication Manager (CM) 4.0 (R014X.00.2.731.7 Super Patch 14419)																																						
System Under Test																																								
Juniper CTP with Software Release 5.4 R2-p1	CTP System	Hardware	Function																																					
	1004	CTP1004-T1E1	CTP1004 chassis providing 4 ports EIA530, RS-232, V.35, T1, E1																																					
	2024	CTP2000-IM-8P-T1	CTP2000 interface module with serial RS-232, EIA530, V.35, T1 and E1																																					
		CTP-CLK-RTM	CTP2000 line clock main rear transition module																																					
	2056A	CTP2000-IM-8P-T1	CTP2000 interface module with serial RS-232, EIA530, V.35, T1 and E1																																					
		CTP2000-IM-8P-T1E1	CTP2000 interface module with 8 T1, E1 ports																																					
		CTP2000-IM-4WEM (See note.)	CTP2000 line 4WE&M 8-port analog voice module																																					
		4WEM-RTM (See note.)	CTP2000 line 4WE&M 8-port rear transition module																																					
		CTP2000-IM-2WFXS (See note.)	CTP2000 line 2WFXS 24-port analog voice module																																					
		2WFXS-RTM (See note.)	CTP2000 line 2WFXS 24-port rear transition module																																					
		CTP-CLK-MAIN	CTP2000 line clock main rear transition module																																					
		CTP-CLK-SPOKE	CTP2000 line clock spoke rear transition module																																					
		CTP2000-COMPRESSSION (See note.)	CTP2000 compression module																																					
		2056B	CTP2000-IM-8P-T1	CTP2000 interface module with serial RS-232, EIA530, V.35, T1 and E1																																				
	CTP2000-IM-8P-T1E1		CTP2000 interface module with 8 T1, E1 ports																																					
	CTP2000-IM-4WEM (See note.)		CTP2000 line 4WE&M 8-port analog voice module																																					
	4WEM-RTM (See note.)		CTP2000 line 4WE&M 8-port rear transition module																																					
	CTP2000-IM-2WFXO (See note.)		CTP2000 line 2WFXO 12-port analog voice module																																					
	2WFXO-RTM (See note.)		CTP2000 line 2WFXO 12-port rear transition module																																					
	CTP-CLK-MAIN		CTP2000 line clock main rear transition module																																					
	CTP-CLK-SPOKE		CTP2000 line clock spoke rear transition module																																					
	CTP2000-COMPRESSSION (See note.)	CTP2000 compression module																																						
	<p>NOTE: This module requires Voice Compression (VCOMP); however, this encapsulation type is not certified by JITC. The only interface modules certified for use in the CTP 2056 are the CTP2000-IM-8P-T1 and CTP2000-IM-8P-T1E1.</p> <p>LEGEND:</p> <table> <tr> <td>2WFXS</td> <td>2-Wire Foreign Exchange Service</td> <td>EIA-232</td> <td>Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices</td> </tr> <tr> <td>4WE&M</td> <td>4-Wire Ear & Mouth</td> <td>EIA-530</td> <td>Standard for 25-position interface for DTE and DCE employing serial binary data interchange</td> </tr> <tr> <td>5ESS</td> <td>Class 5 Electronic Switching System</td> <td>EWSD</td> <td>Elektronisches Wählsystem Digital</td> </tr> <tr> <td>CS</td> <td>Communication Server</td> <td>JITC</td> <td>Joint Interoperability Test Command</td> </tr> <tr> <td>CTP</td> <td>Circuit to Packet</td> <td>Mbps</td> <td>Megabits per second</td> </tr> <tr> <td>DCE</td> <td>Data Circuit-terminating Equipment</td> <td>T1</td> <td>Digital Transmission Link Level 1 (1.544 Mbps)</td> </tr> <tr> <td>DTE</td> <td>Data Terminal Equipment</td> <td></td> <td></td> </tr> <tr> <td>E1</td> <td>European Basic Multiplex Rate (2.048 Mbps)</td> <td></td> <td></td> </tr> <tr> <td>EIA</td> <td>Electronic Industries Alliance</td> <td></td> <td></td> </tr> </table>				2WFXS	2-Wire Foreign Exchange Service	EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	4WE&M	4-Wire Ear & Mouth	EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	5ESS	Class 5 Electronic Switching System	EWSD	Elektronisches Wählsystem Digital	CS	Communication Server	JITC	Joint Interoperability Test Command	CTP	Circuit to Packet	Mbps	Megabits per second	DCE	Data Circuit-terminating Equipment	T1	Digital Transmission Link Level 1 (1.544 Mbps)	DTE	Data Terminal Equipment			E1	European Basic Multiplex Rate (2.048 Mbps)			EIA	Electronic Industries Alliance		
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EIA	Electronic Industries Alliance																																							

10. TESTING LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

(1) DSN Access/Transport Interfaces. The SUT supports the following access interfaces: T1 CAS, T1 PRI, T1 SS7, E1 CAS, E1 PRI, E1 SS7, serial EIA-232, and serial EIA-530. The SUT supports IP transport. The specific requirements and test results tested over all the SUT DSN access and transport interfaces are described in the subparagraphs below.

(a) T1 Interface Characteristics. The UCR, section 5.2.12.5.5.1.2.4, states that the T1 interface shall meet the requirements in accordance with UCR, section 5.2.6.1. The Sunrise T10 test set was used to measure the SUT Digital Signal Level 1 (DS1) pulse mask to verify compliance to this requirement. The SUT met the International Telecommunication Union-Telecommunication Standardization Sector (ITU-T) G.711 and American National Standard Institute (ANSI) T.102 pulse mask characteristics which meets this requirement. The SUT T1 interface supports both Alternate Mark Inversion (AMI) and Bipolar Eight Zero Substitution (B8ZS) line coding as required in the UCR, section 5.2.6.1.1.

(b) T1 Supervisory Channel Associated Signaling. The UCR, section 5.2.12.5.5.1.2.4, states that the T1 supervisory channel associated signaling interface shall meet the requirements in accordance with UCR, section 5.2.6.1.2. Trunk seizure, answer supervision, preemption signals, and all other trunk supervisory information sent and received on a per channel basis was passed transparently through the SUT as required in the UCR, section 5.2.6.1.2.

(c) T1 Clear Channel Capability. The UCR, section 5.2.12.5.5.1.2.4, states that the T1 interface shall meet the clear channel capability requirements in accordance with UCR, section 5.2.6.1.3. The SUT is capable of transmitting and receiving B8ZS line coding in accordance with UCR, section 5.2.6.1.3.

(d) E1 Interface Characteristics. The UCR, section 5.2.12.5.5.1.2.5, states that the E1 interface shall meet the requirements in accordance with UCR, section 5.2.6.2. Furthermore, the E1 interface shall meet the requirements of ITU-T Recommendation G.703 and ITU-T Recommendation G.732. Voice signals in the PCM-30 framing format shall utilize the A-law encoding technique in accordance with ITU-T Recommendation G.772 (REV), "*Protected Monitoring Points on Digital Transmission Systems.*" The Sunrise E10 test set was used to measure the SUT E1 pulse mask to verify compliance to this requirement. The SUT E1 interface characteristics in accordance with the UCR were met with both testing and vendors LoC.

(e) Mean Opinion Score (MOS). The UCR, section 5.2.12.5.5.1.1, states that the introduction of S-NEs shall not cause the end-to-end average MOS to fall below 4.0 over any five-minute time interval. The Abacus call loader was used to generate 123,623 voice calls across the T1 interfaces, with 100 percent of all calls having a MOS of at least 4.58. The SUT had a minimum MOS of 4.58 with an average MOS of 4.59, which met the requirement for a S-NE. The Abacus call loader was also used to generate 162,025 calls across the E1 interfaces with 100 percent of calls having a MOS of at least 4.5, which met the requirement for a S-NE.

(f) Bit Error Rate Test (BERT). The UCR, section 5.2.12.5.5.1.1, states that the introduction of an NE shall not exceed the end-to-end digital bit error rate requirement of less than 1 error in 1×10^9 (averaged over a 9-hour period). The SUT met this requirement for all interfaces with a recorded bit error ratio of 1×10^{-9} over an 8

to 15-hour period with multiple tests spanning a 48-hour period with no errors. This was conducted on E1 and T1 interfaces as well as all supported serial interfaces.

(g) Secure Transmission (Voice and Data). The UCR, section 5.2.12.5.5.1.1, states that the introduction of NE(s) shall not degrade secure transmission for secure end devices as defined by UCR, section 5.2.12.6.6. There were 480 secure calls were placed between Secure Terminal Equipment (STEs) and Secure Wireline Terminal (SWTs), STE to STE, and SWT to SWT without degrading transmissions between end devices, which met the requirement with a secure call completion rate of 97 percent. The SUT secure call test results are shown in Table 2-4.

Table 2-4. SUT Secure Call Test Results

DSN Access Interfaces	DSN Transport Interfaces	Secure Call Matrix (2 calls placed per combination with a 97% completion rate)				
		From / To	STE (SCIP mode)	STE (STU mode)	STE (ISDN mode)	SWT
T1 CAS, E1 CAS, T1 ISDN PRI, E1 ISDN PRI, T1 SS7	IP with CTP, SAToP, and CESoPSN encapsulation	STE (SCIP mode)	Completed	Completed	Completed	Completed
		STE (STU mode)	Completed	Completed	Completed	Completed
		STE (ISDN mode)	Completed	Completed	Completed	Completed
		SWT	Completed	Completed	Completed	Completed

LEGEND:

CAS	Channel Associated Signaling	SAToP	Structured-Agnostic Time Division Multiplexing (TDM) over IP
CESoPSN	Circuit Emulation Services over a Packet Switched Network	SCIP	Secure Communications Internet Protocol
CTP	Circuit to Packet	SS7	Signaling System 7
DSN	Defense Switched Network	STE	Secure Terminal Equipment
E1	European Basic Multiplex Rate (2.048 Mbps)	STU	Secure Telephone Unit
IP	Internet Protocol	SUT	System Under Test
ISDN	Integrated Services Digital Network	SWT	Secure Wireline Terminal
Mbps	Megabits per second	T1	Digital Transmission Link Level (1.544 Mbps)
PRI	Primary Rate Interface		

(h) Modem. The UCR, section 5.2.12.5.5.1.1 states that the S-NE(s) shall support a minimum modem transmission speed of 9.6 kbps across the associated pair of S-NE(s). There were 37,252 T1 modem calls and 5,244 E1 modem calls placed through the SUT using the Abacus call loader. All modem calls had a transmission rate of 14.4 kbps, which met the requirement.

(i) Facsimile. The UCR, section 5.2.12.5.5.1.1, states that the S-NE(s) shall support a minimum facsimile transmission speed of 9.6 kbps across the associated NE(s). There were 84,776 T1 facsimile calls and 128,760 E1 facsimile calls placed through the SUT using the Abacus call loader. All facsimile calls had a transmission rate of 14.4 kbps, which met the requirement.

(j) Call Control Signals. The UCR, section 5.2.12.5.5.1.1, states that the S-NE shall transport all call control signals transparently on an end-to-end basis. This requirement was verified via testing and the vendor's LoC. The SUT transparently transported CAS supervision, and Common Channel Signaling protocol to include MLPP call control signals, which met the requirement.

(k) Delay. Delay occurs when packets take more time than expected to reach their destination. The UCR, section 5.2.12.5.5.1.2.9, states that the addition of S-NEs shall not increase the one-way packet delay for each S-NE used, when measured from ingress to egress and averaged over any five-minute period more than that which is specified under the following conditions:

1. TDM Ingress G.711 (Non-secure calls) to Non-Transcoding ITU-T G.711 IP Egress shall not increase delay more than 50 milliseconds (ms) per NE pair as measured end-to-end.

2. TDM Ingress ITU-T G.711 (Non-secure calls) to Transcoding IP Egress with compression codec's (Section 5.2.12.5.5.1.1.3) shall not increase delay by more than 100 ms per NE pair as measured end-to-end

3. TDM Ingress ITU-T G.711 (Secure calls) to Non-Transcoding G.711 IP Egress shall not increase delay by more than 50 ms per NE pair as measured end-to-end.

4. TDM Ingress ITU-T G.711 (Secure calls) to Transcoding IP Egress with compression codec's (Section 5.2.12.5.5.1.1.3) shall not increase delay by more than 250 ms per NE pair as measured end-to-end.

All delay calls had a delay of no more then 37 ms one-way, which met the requirement.

(l) Jitter (Transport IP Interface). The UCR, section 5.2.12.5.5.1.2.9, states that the insertion of a NE shall not cause jitter measured from ingress to egress to increase by more than five ms averaged over any five-minute period. The SUT jitter measurement averaged over a five-minute period was .02 ms, which met the requirement.

(m) Packet Loss (Transport IP Interface). The UCR, section 5.2.12.5.5.1.2.9, states that the insertion of a NE shall not cause packet loss measured from ingress to egress to increase by more than 0.05 percent averaged over any five-minute period. The packet loss for the SUT was measured 0.00 percent for a five-minute period, which met the requirement.

(n) Differential Services Code Point (DSCP) Layer 3 Quality of Service (Transport IP Interface). The NE shall implement IP congestion control. Congestion may be controlled by using Differentiated Services which shall be capable of providing preferential treatment for call congestion over other media types in accordance with UCR 2008, section 5.3.3, and a capability to limit the provisioning of input and output interfaces such that congestion is impossible under the worst transport congestion scenario. The SUT sends the media and signaling sessions in the same packet stream and in accordance with the UCR, the sessions can be tagged with the same DSCP value. The SUT has the capability to set the DSCP value on a port by port basis

allowing the voice media and signaling to be set at one value (e.g. 46) and the serial ports for data traffic at another value (e.g. 0). This will allow the proper prioritization to protect voice and signaling media with a higher prioritization than data within the converged Local Area Network. The NE supports layer 3 DSCP and the value is settable, which met the requirement. The DSCP value for signaling was set to 48, for voice media the value was set to 46 and for Operations, Administration and Management (OA&M) the value was set to 16. Packets were captured to verify that the values were correct and can be set.

(o) Alarm and Restoral Requirements. The UCR, section 5.2.12.5.5.1.1.1, states that the NE shall be able to propagate Carrier Group Alarms (CGAs), in accordance with UCR, section 5.2.1.5.7, upon physical loss of either the access or transport interfaces. The SUT is capable of transparently passing the appropriate alarms, which met the requirement. This was verified by capturing the alarm status between the DSN switches and the SUT with the Sage 375A, Ultra-T1 and Ultra E1 test equipment.

(p) Call Congestion. The UCR, section 5.2.12.5.5.1.1.2, states that the NE shall assure that congestion between NEs does not impact DSN calls in progress or subsequent calls. Call congestion handling shall be met in one or more of the following three ways: dynamic load control signal; software capability which makes congestion impossible; or congestion is not possible in the SUT. Call congestion in the SUT is met because congestion is not possible due to the fact that TDM can not saturate the transport link on the SUT.

(q) Voice Compression. The UCR, section 5.2.12.5.5.1.1.3, states that the NE may include voice compression and if so must support at least one of the following standards:

- International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) Recommendation G.726, 32 kbps Adaptive Differential Pulse Code Modulation (ADPCM)
- ITU-T Recommendation G.728, 16 kbps Low-Delay Code Excited Linear Prediction (LD-CELP)
- ITU-T Recommendation G.729, 9.6 kbps Conjugate-Structure Algebraic-Code-Excited Linear-Prediction (CS-A CELP)

Voice compression is not a feature provided by the SUT. This requirement is conditional and has no operational impact on network interoperability.

(2) Device Management

(a) Management Option. The UCR, section 5.2.12.5.5.2.1, states that the NE devices must be managed by at least one of the following: The device may be managed locally by a front or back panel and/or external console control capability shall be provided for local management. The NE may be able to be centrally monitored and

managed by the Advanced DSN Integrated Management Support System (ADMISS) in accordance with UCR, sections 5.2.8 and 5.2.8.4. The SUT is managed from a remote client, which can be used to monitor multiple units. The SUT is monitored by a management workstation. The workstation connects to the modules via Ethernet connection and uses Hypertext Transport Protocol Secure (HTTPS) via TLS (Transport Layer Security) for secure encrypted session tunneling. Administrative tasks are performed via HTTPS web interface. The web interface allows an administrator to configure general settings, monitor operations, create or edit services, manage media processor units, and perform maintenance. Users can then access the Out Door Unit (ODU) through HTTPS, which is powered by the Power Indoor unit (PIDU). The Juniper CTP is managed by a web browser (CTP view) or by Simple Network Management Protocol (SNMP) v3.

(b) Fault Management. The UCR, section 5.2.12.5.5.2.2, states that NEs may be capable of performing a self-test diagnostic function on non-active and active channels on a noninterference basis and report any failures to the assigned network management system. The SUT supports fault management using a secure management workstation.

(c) Loop Back Capability. The UCR, section 5.2.12.5.5.2.3, states that NE shall provide loop back capability on each of the trunk side interfaces in accordance with ITU-T Recommendation V.54, "Loop Test Devices For Modems." This requirement was verified via testing and the vendor's LoC.

(d) Operational Configuration Restoral. The UCR, section 5.2.12.5.5.3, states that loss of power should not remove configuration settings. The unit should be restored to the last customer configured state prior to the power loss, without intervention when power is restored. The SUT was placed into a power failure condition. The SUT returned to the last customer configured state prior to the power failure, which met the requirement.

(3) Security. The UCR, section 5.2.12.5.5.7, states that the NE shall conform to the requirements outlined in Department of Defense Instruction (DoDI) 8510.01, "DoD Information Assurance Certification and Accreditation Process (DIACAP)". Security is tested as part of the Information Assurance testing and is covered under a separate report, Reference (e).

b. System Interoperability Results. The SUT meets all of its critical interoperability requirements set forth in Reference (c) for a S-NE and is certified as interoperable for joint use within the DSN. When connected to the interfaces certified in this letter, the SUT and its associated applications were transparent to the switching systems interfaced causing no degradation of service or negative impact, and met all the critical interoperability requirements.

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>. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: ucco@disa.mil.