



DEFENSE INFORMATION SYSTEMS AGENCY

P. O. BOX 549
FORT MEADE, MARYLAND 20755-0549

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

26 July 12

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of Cornet Technology Inc. ClearWave with Software Release 2.4.0.3

References: (a) DOD Directive 4630.05, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01E, "Interoperability and Supportability of Information Technology and National Security Systems," 15 December 2008
(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 Cornet Technology Inc. ClearWave with Software Release 2.4.0.3 is hereinafter referred to as the System Under Test (SUT). The SUT meets all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Information System Network (DISN) as a Fixed Network Element (F-NE) as set forth in Reference (c). The SUT is a physical layer, single mode, fiber matrix switch. The SUT is certified for operation with any product on the Unified Capabilities (UC) Approved Products List (APL) that is certified with single mode fiber interfaces. The SUT meets the critical interoperability requirements set forth in Reference (c) and testing was conducted 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 could affect interoperability, but no later than three years from the date of the UC APL memorandum.

3. This finding is based on interoperability testing conducted by JITC at the Global Information Grid Network Test Facility, Fort Huachuca, Arizona, from 30 January through 3 February 2012. The DISA CA granted accreditation on 25 July 2012 based on the security testing completed by DISA-led Information Assurance (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 and the Capability Requirements (CR) and Feature Requirements (FR) used to evaluate the interoperability of the SUT are indicated in Table 1.

Table 1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Status	UCR Reference																																																
Fiber Optic (Single Mode)	No (See note 1.)	Yes	MOS (R)	Met	UCR Section 5.9.2.1																																																
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Security STIGs and DoDI 8510.01 (DIACAP) (R)	Met ²	UCR Section 5.9.2.6																																																			
<p>NOTES:</p> <ol style="list-style-type: none"> The UCR 2008, Change 3 does not stipulate a minimum required DISN access interface. Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e). <p>LEGEND:</p> <table border="0"> <tr> <td>ADIMSS</td> <td>Advanced DSN Integrated Management Support System</td> <td>IEEE</td> <td>Institute of Electrical and Electronics Engineers</td> </tr> <tr> <td>BERT</td> <td>Bit Error Rate Test</td> <td>IP</td> <td>Internet Protocol</td> </tr> <tr> <td>BX.25</td> <td>Bell Labs X.25 variant</td> <td>ITU-T</td> <td>International Telecommunication Union - Telecommunication Standardization Sector</td> </tr> <tr> <td>DCE</td> <td>Data Circuit-terminating Equipment</td> <td>MOS</td> <td>Mean Opinion Score</td> </tr> <tr> <td>DIACAP</td> <td>Department of Defense Information Assurance Certification and Accreditation Process</td> <td>NE</td> <td>Network Element</td> </tr> <tr> <td>DoD</td> <td>Department of Defense</td> <td>NM</td> <td>Network Management</td> </tr> <tr> <td>DISA</td> <td>Defense Information Systems Agency</td> <td>R</td> <td>Required</td> </tr> <tr> <td>DISN</td> <td>Defense Information System Network</td> <td>STIG</td> <td>Security Technical Implementation Guides</td> </tr> <tr> <td>DSN</td> <td>Defense Switched Network</td> <td>SUT</td> <td>System Under Test</td> </tr> <tr> <td>DTE</td> <td>Data Terminal Equipment</td> <td>TCP</td> <td>Transmission Control Protocol</td> </tr> <tr> <td>EIA</td> <td>Electronic Industries Alliance</td> <td>UCR</td> <td>Unified Capabilities Requirements</td> </tr> <tr> <td>EIA-232</td> <td>Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices</td> <td>X.25</td> <td>Interface between DTE and DCE for terminals operating in the packet mode and connected to public data networks by dedicated circuit</td> </tr> </table>						ADIMSS	Advanced DSN Integrated Management Support System	IEEE	Institute of Electrical and Electronics Engineers	BERT	Bit Error Rate Test	IP	Internet Protocol	BX.25	Bell Labs X.25 variant	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	DCE	Data Circuit-terminating Equipment	MOS	Mean Opinion Score	DIACAP	Department of Defense Information Assurance Certification and Accreditation Process	NE	Network Element	DoD	Department of Defense	NM	Network Management	DISA	Defense Information Systems Agency	R	Required	DISN	Defense Information System Network	STIG	Security Technical Implementation Guides	DSN	Defense Switched Network	SUT	System Under Test	DTE	Data Terminal Equipment	TCP	Transmission Control Protocol	EIA	Electronic Industries Alliance	UCR	Unified Capabilities Requirements	EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	X.25	Interface between DTE and DCE for terminals operating in the packet mode and connected to public data networks by dedicated circuit
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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). 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

JITC Memo, JTE, Special Interoperability Test Certification of Cornet Technology Inc.
ClearWave with Software Release 2.4.0.3

personnel from the Unified Capabilities Certification Office (UCCO), e-mail:
disa.meade.ns.list.unified-capabilities-certification-office@mail.mil.

6. The JITC point of contact is Mr. Dale Fulton, DSN 879-0507, commercial (520) 538-0507, FAX DSN 879-4347, or e-mail to dale.h.fulton.civ@mail.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 1104001.

FOR THE COMMANDER:

2 Enclosures a/s


for RICHARD A. MEADOR
Chief
Battlespace Communications Portfolio

Distribution (electronic mail):

DoD CIO

Joint Staff J-6, JCS

USD(AT&L)

ISG Secretariat, DISA, JTA

U.S. Strategic Command, J665

US Navy, OPNAV N2/N6FP12

US Army, DA-OSA, CIO/G-6 ASA(ALT), SAIS-IOQ

US Air Force, A3CNN/A6CNN

US Marine Corps, MARCORSYSCOM, SIAT, A&CE Division

US Coast Guard, CG-64

DISA/TEMC

DIA, Office of the Acquisition Executive

NSG Interoperability Assessment Team

DOT&E, Netcentric Systems and Naval Warfare

Medical Health Systems, JMIS IV&V

HQUSAISEC, AMSEL-IE-IS

UCCO

ADDITIONAL REFERENCES

- (c) Defense Information Systems Agency (DISA), "Department of Defense Unified Capabilities Requirements 2008, Change 3," September 2011
- (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 Cornet Technology Inc. ClearWave with Software Release 2.4.0.3, (Tracking Number 1104001)," Draft

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Cornet Technology Inc. ClearWave with Software Release 2.4.0.3; hereinafter referred to as the System Under Test (SUT).

2. SPONSOR. United States Army Information Systems Engineering Command (USAISEC), ELIE-ISE-TS, Mr. Bryan Kleese, Building 53301 Arizona Street, Fort Huachuca, Arizona 85613, bryan.kleese@us.army.mil.

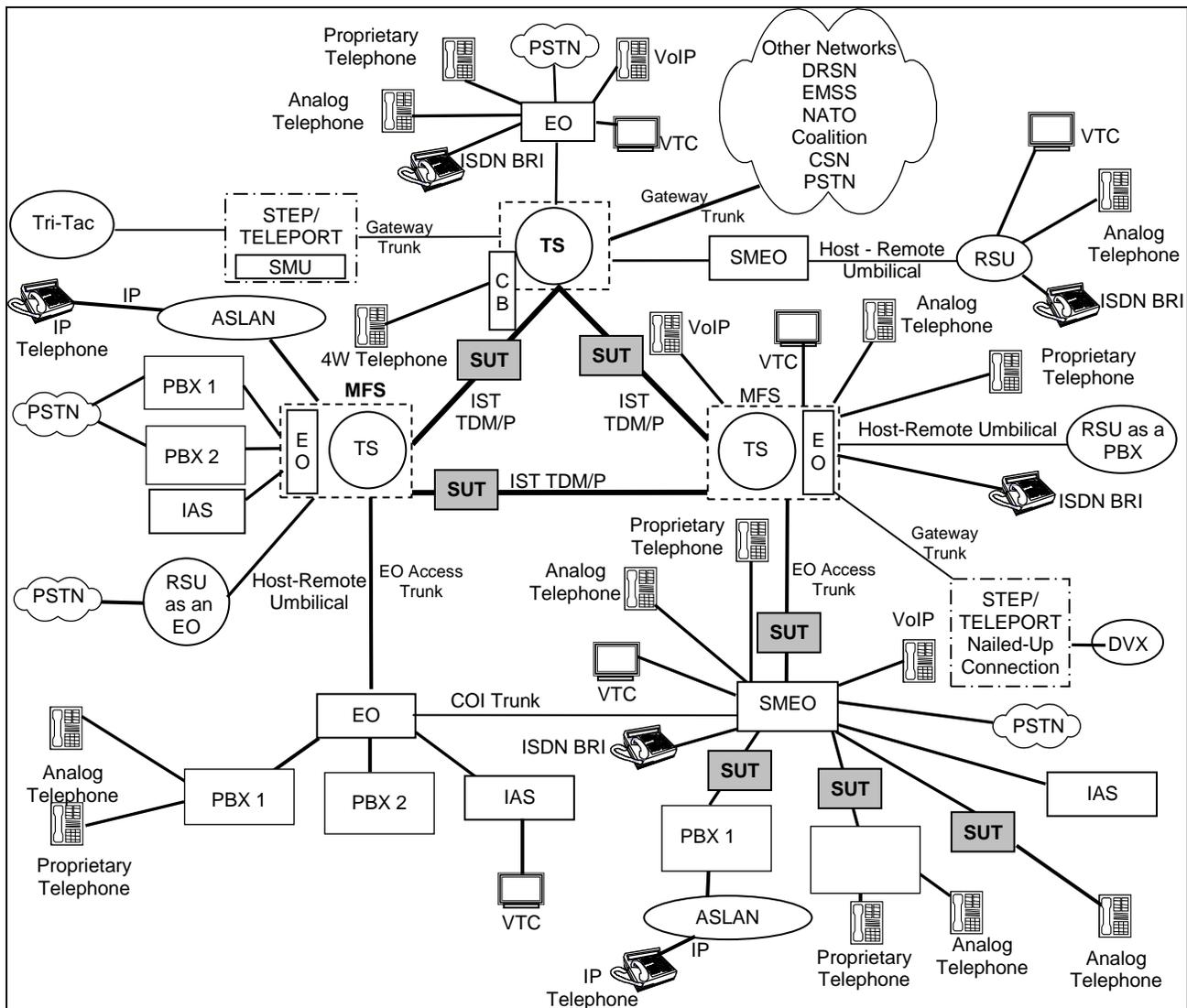
3. SYSTEM POC. Brett Elms, 6800 Versar Center, Springfield, Virginia 22151, b.elms@cornet.com.

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

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is a physical layer fiber optic cross connect switch for management of a fiber distribution frame. It allows testing and monitoring of the single mode fiber optic signals without splicing or interference with the fiber strands. Switching is agnostic to wavelength and data rate, based only on power level of the single mode fiber optic interfaces.

The SUT is certified as a Fixed Network Element (F-NE) within the Defense Information System Network (DISN). The SUT has the following single access interface that is certified for joint use within the DISN: Fiber Optic (single mode). The SUT supports up to 320 simultaneous bi-directional single mode fiber connections.

6. OPERATIONAL ARCHITECTURE. The DISN architecture in Figure 2-1 depicts the relationship of the SUT to the DISN switches.



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	PSTN	Public Switched Telephone Network
CSN	Canadian Switch Network	RSU	Remote Switching Unit
DISN	Defense Information System Network	SMEO	Small End Office
DRSN	Defense Red Switch Network	SMU	Switched Multiplex Unit
DVX	Deployable Voice Exchange	STEP	Standardized Tactical Entry Point
EMSS	Enhanced Mobile Satellite System	TDM/P	Time Division Multiplex/Packetized
EO	End Office	Tri-Tac	Tri-Service Tactical Communications Program
IAS	Integrated Access Switch	TS	Tandem Switch
IP	Internet Protocol	SUT	System Under Test
ISDN	Integrated Services Digital Network	VoIP	Voice over Internet Protocol
IST	Interswitch Trunk	VTC	Video Teleconferencing
MFS	Multifunction Switch		

Figure 2-1. DISN Architecture

7. REQUIRED SYSTEM INTERFACES. The overall interoperability status and the Capability Requirements (CR) and Feature Requirements (FR) used to evaluate the interoperability of the SUT are indicated in Table 2-1.

Table 2-1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Status	UCR Reference
Fiber Optic (Single Mode)	No (See note 1.)	Yes	MOS (R)	Met	UCR Section 5.9.2.1
			BERT (R)	Met	UCR Section 5.9.2.1
			Secure Transmission (Voice and Data) (R)	Met	UCR Section 5.9.2.1
			Modem (R)	Met	UCR Section 5.9.2.1
			Facsimile (R)	Met	UCR Section 5.9.2.1
			Call Control Signals (R)	Met	UCR Section 5.9.2.1
			Alarms (R)	Met	UCR Section 5.9.2.1
			Call Congestion Control (R)	Met	UCR Section 5.9.2.1
			Management Option (R) The SUT shall be managed by one of the following: Local Management (Front/Back Panel and/or external console), ADIMSS, or NM System deployed by DoD components.	Met	UCR Section 5.9.2.4.1
			The NE shall provide data/monitoring via one or more of the following physical interfaces: • Ethernet/TCP/IP (IEEE 802.3) • Serial (EIA-232)/Asynchronous • Serial/Synchronous (ITU-T X.25 and/or BX.25 variant)	Met	UCR Section 5.9.2.4.1
Operational Configuration Restoral (R)	Met	UCR Section 5.9.2.4.4			
Security STIGs and DoDI 8510.01 (DIACAP) (R)	Met ²	UCR Section 5.9.2.6			

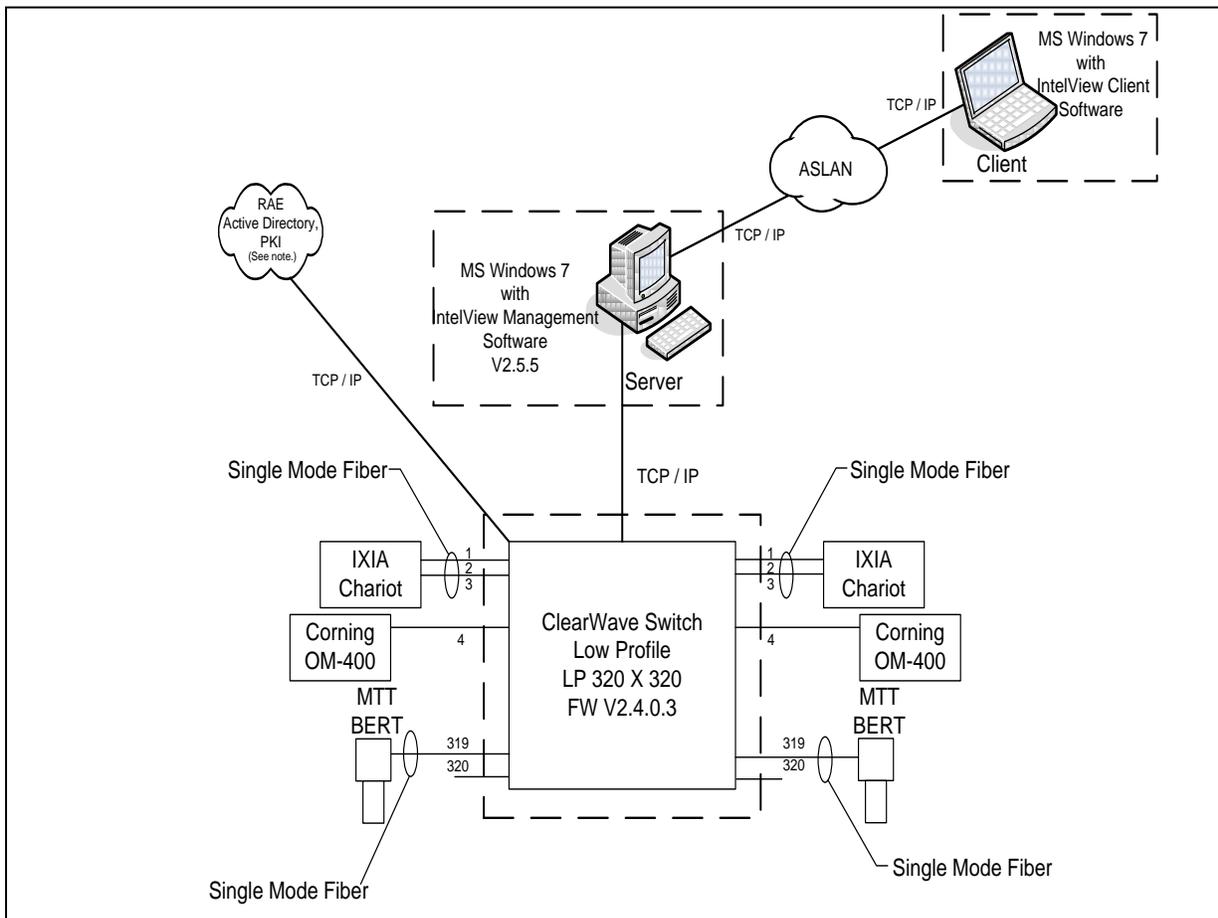
NOTES:

1. The UCR 2008, Change 3 does not stipulate a minimum required DISN access interface.
2. Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).

LEGEND:

ADIMSS	Advanced DSN Integrated Management Support System	IEEE	Institute of Electrical and Electronics Engineers
BERT	Bit Error Rate Test	IP	Internet Protocol
BX.25	Bell Labs X.25 variant	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
DCE	Data Circuit-terminating Equipment	MOS	Mean Opinion Score
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process	NE	Network Element
DoD	Department of Defense	NM	Network Management
DISA	Defense Information Systems Agency	R	Required
DISN	Defense Information System Network	STIG	Security Technical Implementation Guides
DSN	Defense Switched Network	SUT	System Under Test
DTE	Data Terminal Equipment	TCP	Transmission Control Protocol
EIA	Electronic Industries Alliance	UCR	Unified Capabilities Requirements
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	X.25	Interface between DTE and DCE for terminals operating in the packet mode and connected to public data networks by dedicated circuit

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 its DISN operational environment. Testing of the system's required functions and features was conducted using the test configuration shown in Figure 2-2.



NOTE: The required ancillary equipment that is not shown is a condition of fielding for Information Assurance, which is covered under a separate report, Reference (e).

LEGEND:

ASLAN	Assured Services Local Area Network	PKI	Public Key Infrastructure
BERT	Bit Error Rate Test	RAE	Required Ancillary Equipment
FW	Firmware	SUT	System Under Test
MS	Microsoft	TCP/IP	Transmission Control Protocol/ Internet Protocol
MTT	Modular Test Toolkit		

Figure 2-2. SUT Test Configuration

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations, hardware, and software components tested with the SUT. The SUT is certified with any product on the Unified Capabilities (UC) Approved Products List (APL) that is certified with single mode fiber interfaces.

(b) Bit Error Rate Test (BERT). The UCR 2008, Change 3, paragraph 5.9.2.1(2), states that the introduction of an NE(s) shall not degrade the E2E measured BER to no more than .03 percent from the baseline minimum E2E digital BER requirement, which is not more than one error in 1×10^9 bits (averaged over a 9-hour period). The measured BERT without the SUT was 1×10^{-10} which was exactly the same with the SUT in the network, which met this requirement.

(c) Secure Transmission. The UCR 2008, Change 3, paragraph 5.9.2.1(3), states that the introduction of an NE(s) shall not degrade secure transmission for secure end devices as defined in Section 5.2.2, Department of Defense Secure Communications Devices. The SUT as a physical layer device is agnostic to secure modem tones and protocol, which met this requirement.

(d) Modem. The UCR 2008, Change 3, paragraph 5.9.2.1(4), states that the NE(s) shall support a minimum modem transmission speed of 9.6 kilobits per second (kbps) across the associated NE(s). The SUT as a physical layer device is agnostic to modem tones and protocols and will support any transmission speed supported by the end equipment, which met this requirement.

(e) Facsimile. The UCR 2008, Change 3, paragraph 5.9.2.1(5), states that the NE(s) shall support a minimum facsimile transmission speed of 9.6 kbps across the associated NE(s). The SUT as a physical layer device is agnostic to Facsimile tones and protocols and will support any transmission speed supported by the end instrument, which met this requirement.

(f) CALL Control Signals. UCR 2008, Change 3, paragraph 5.9.2.1(5), states that the NE shall transport all call control signals transparently on an E2E basis. The SUT as a physical layer device is transparent to control signals on an E2E basis, which met this requirement.

(2) Device Management.

(a) Alarms. UCR 2008, Change 3, paragraph 5.9.2.1.1, states that the NE shall be able to propagate Carrier Group Alarms (CGA) upon physical loss of the Time Division Multiplexing (TDM) interface. The NE shall provide the capability of detecting a CGA. When this alarm is detected, all associated outgoing trunks shall be made busy automatically to subsequent customer call attempts. Call attempts on associated incoming trunks shall not be processed. When possible, the Reverse Make Busy feature shall be exercised on incoming trunks. Voice switching systems using a TDM connection to an NE shall receive the proper CGAs from the NE upon loss of the transport link between NEs, regardless of whether the transport link is TDM, Internet Protocol (IP), or Direct Line of Sight between the NEs. The NEs that support IP ingress or egress traffic either as inbound or outbound NE traffic and/or transport between NE(s) shall support one or more of the following routing protocols: Link-State and/or Distance-Vector, so the NE can notify the IP network (e.g., Local Area Network or Metropolitan Area Network), using one of these routing protocols, the condition of its link

state for transporting ingress IP traffic, namely operational or down. The SUT as a physical layer device is agnostic and transparent to alarm signaling and protocols, which met this requirement.

(b) Congestion Control. UCR 2008, Change 3, paragraph 5.9.2.1.2, states that the NE shall assure that congestion between paired NEs does not affect DISN calls in progress or subsequent calls. Congestion is not possible with the SUT, which met this requirement.

(c) Management Options. UCR 2008, Change 3, paragraph 5.9.2.4.1, states that the NE shall provide network management data/monitoring via one or more of the following physical interfaces:

- Ethernet/Transmission Control Protocol/IP (Institute of Electrical and Electronics Engineers (IEEE) 802.3)
- Serial (RS-232)/Asynchronous
- Serial/Synchronous (X.25 and/or BX.25 variant)

The SUT uses the IEEE 802.3u interface for management, which meets this requirement.

(d) Remote Monitoring and Management. The UCR Change 3, paragraph 5.9.2.4, 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 in accordance with UCR 2008, Change 3, paragraph 5.9.2.4.1. 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 Secure Shell (SSH) via pre-shared keys. Administrative tasks are performed via SSH. The SSH interface allows an administrator to configure general settings, monitor operations, create or edit services, and perform maintenance. The SUT is managed by a Management workstation via IP, which met this requirement.

(e) Operational Configuration Restoral. UCR 2008, Change 3, paragraph 5.9.2.4.4, states the loss of power should not remove configuration settings. Unit should be restored to the last customer-configured state before the power loss, without intervention when power is restored. The SUT, when power cycled, does not lose its configuration, which met this requirement.

(3) Security. Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).

b. System Interoperability Results. The SUT meets all of its critical interoperability requirements and is certified as interoperable for joint use within the DISN as a F-NE as

set forth in Reference (c) with a single-mode fiber access interface only. The SUT is certified with any product on the UC APL that is certified with single mode fiber interfaces.

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). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssj>. 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: disa.meade.ns.list.unified-capabilities-certification-office@mail.mil.