



DEFENSE INFORMATION SYSTEMS AGENCY

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FORT MEADE, MARYLAND 20755-0549

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

17 Jan 12

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of the Cambium Networks Point To Point (PTP) 600 Series with Software Version 10-00

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 (IO) test certification.

2. The Cambium Networks PTP 600 Series with software version 10-00 are hereinafter referred to as the system under test (SUT). The SUT meets all of its critical interoperability requirements and is certified for joint use within the Defense Information System Network (DISN) as a Fixed Network Element. The SUT meets the critical interoperability requirements set forth in Reference (c), using test procedures derived from Reference (d). The SUT was tested with the PTP 45600 Outdoor Unit (ODU). The PTP 48600, PTP 25600, PTP 49600, PTP 54600, PTP 58600, PTP 59600 ODUs were not tested; however they employ the same software and similar hardware as the SUT. JITC analysis determined these components to be functionally identical to the SUT for interoperability certification purposes and they are also certified for joint use. No other configurations, features, or functions, except those cited within this report, are certified by JITC. This certification expires upon changes that affect interoperability, but no later than three years from the date of the Unified Capability (UC) Approved Products List (APL) memorandum.

3. This finding is based on interoperability testing and DISA Certifying Authority (CA) recommendation. IO testing was conducted by the U.S. Army Information Systems Engineering Command Technology Integration Center (USAISEC TIC), Fort Huachuca Arizona, from 14 through 17 September 2011 on the Motorola PTP 600. On 17 October 2011, Motorola and Cambium Networks issued a letter of sameness establishing that both companies' PTP 600 Series products are functionally identical and therefore this certification applies to the PTP 600 Series products manufactured by both companies. The DISA CA provided a positive recommendation on 14 December 2011 based on the security testing completed by DISA-led Information Assurance (IA) test teams and published in a separate report, Reference (e). The

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Certification Testing Summary (Enclosure 2) documents the test results and describes the test network.

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

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

Table 1. SUT Interoperability Test Summary

DSN Access Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 PRI (ANSI T1.607/ANSI T1.619a)	No ¹	Not Tested	Not Available
E1 PRI (ITU-T Q.931/ ITU-T Q.955.3)	No ¹	Not Tested	Not Available
T1 CAS (DTMF/MFR1/DP)	No ¹	Not Tested	Not Available
E1 CAS (DTMF/MFR1/DP)	No ¹	Not Tested	Not Available
ITU-T V.35, ITU-T V.36, ITU-T V.37	No ¹	Not Tested	Not Available
T1 SS7 (ANSI T1.619a)	No ¹	Not Tested	Not Available
E1 SS7 (ANSI T1.619a)	No ¹	Not Tested	Not Available
EIA-232	No ¹	Not Tested	Not Available
EIA-530	No ¹	Not Tested	Not Available
ITU-T X.21	No ¹	Not Tested	Not Available
FXS (2-Wire Analog)	No ¹	Not Tested	Not Available
FXO (2-Wire Analog)	No ¹	Not Tested	Not Available
E&M (Type I, II, III, IV)	No ¹	Not Tested	Not Available
Copper Media (1000 Mbps Ethernet)	No ¹	Partial Compliance	See note 2.
DSN Transport Interfaces			
Transport Level	Critical	Status	Remarks
Proprietary Adaptive Modulation Wireless (5.4, 5.8, and 5.9 GHz License Exempt RF band, and 2.5, 4.5,4.8, and 4.9 licensed RF band)	No	Certified	Proprietary Interface
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.
Voice Compression	No	Not Certified	Voice compression is not supported by the SUT.
Security	Yes	Certified	See note 3.
NOTES:			
1 The UCR does not stipulate a minimum access interface requirement for a Fixed Network Element.			
2 The SUT supports the access interface at the 1000 Mbps FDX Ethernet constrained to a maximum throughput of the wireless transport, 300 Mbps. The SUT supports full rate operations in 10/100 Mbps FDX Ethernet for access interfaces.			
3 Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).			

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Table 1. SUT Interoperability Test Summary (continued)

LEGEND:	
ANSI	American National Standards Institute
CAS	Channel Associated Signaling
CRs	Capability Requirements
DCE	Data Circuit-Terminating Equipment
DISA	Defense Information Systems Agency
DP	Dial Pulse
DSN	Defense Switched Network
DSS1	Digital Subscriber Signaling 1
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-Frequency
E&M	Ear and Mouth
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 data terminal equipment and data circuit-terminating equipment employing serial binary data interchange
FDX	Full Duplex
FRs	Feature Requirements
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
FXO	Foreign Exchange Office
FXS	Foreign Exchange Station
GHz	gigahertz
kbps	kilobits per second
kHz	kiloHertz
Mbps	Megabits per second
MFR1	Multi-Frequency Recommendation 1
MLPP	Multi-Level Precedence and Preemption
PRI	Primary Rate Interface
Q.931	Signaling Standard for ISDN
Q.955.3	ISDN Signaling standard for E1 MLPP
RF	radio frequency
SS7	Signaling System 7
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
UCR	Unified Capabilities Requirements
V.35	Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
V.36	Modems for synchronous data transmission using 60-108 kHz group band circuits
V.37	Synchronous data transmission at a data signaling rate higher than 72 kbps using 60-108 kHz group band circuits
X.21	includes specifications for DTE/DCE physical interface elements, alignment of call control characters and error checking, elements of the call control phase for circuit switching services, and test loops

Table 2. SUT Capability and Feature Interoperability Requirements

DSN Access Interfaces			
Interface	Critical	Requirements Required or Conditional	References
T1 PRI (ANSI T1.607/ANSI T1.619a) T1 CAS (DTMF/MFR1/DP) T1 SS7 (ANSI T1.619a)	No ¹ No ¹ No ¹	<ul style="list-style-type: none"> • DS1 Interface Characteristics (C) as specified in UCR 2008, Section 5.2.6.1 • DS1 Supervisory Channel Associated Signaling (C) as specified in UCR 2008, Section 5.2.6.1 • DS1 Clear Channel Capability (C) as specified in UCR 2008, Section 5.2.6.1 (SS7 and PRI only) • DS1 Alarm and Restoral Requirements (C) as specified in UCR 2008, Section 5.2.6.1 • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) as specified in UCR 2008, Section 5.2.12.6 • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) as specified in UCR 2008, Section 5.2.1.5.7 • Call Congestion Control (R) • Call Congestion for TDM Transport (C) • Voice Compression (C) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.2 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.2.2
E1 PRI (ITU-T Q.931/ ITU-T Q.955.3) E1 CAS (DTMF/MFR1/DP) E1 SS7 (ANSI T1.619a)	No ¹ No ¹ No ¹	<ul style="list-style-type: none"> • E1 Interface Characteristics (C) as specified in UCR 2008, Section 5.2.6.2 • E1 Supervisory Channel Associated Signaling (C) as specified in UCR 2008, Section 5.2.6.2 • E1 Clear Channel Capability (C) as specified in UCR 2008, Section 5.2.6.2 • E1 Alarm and Restoral Requirements (C) as specified in UCR 2008, Section 5.2.6.2 • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) as specified in UCR 2008, Section 5.2.12.6 • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) as specified in UCR 2008, Section 5.2.1.5.7 • Call Congestion Control (R) • Call Congestion for TDM Transport (C) • Voice Compression (C) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.5 • UCR Section 5.9.2.3.5 • UCR Section 5.9.2.3.5 • UCR Section 5.9.2.3.5 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.2 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.2.2
ITU-T V.35, ITU-T V.36, ITU-T V.37 EIA-232, EIA-530, ITU-T X.21,	No ¹	<ul style="list-style-type: none"> • Serial Interface Characteristics (C) as specified in UCR 2008, Section 5.2.6.4 • BERT (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.2 • UCR Section 5.9.2.1
E&M (Type I, II, III, IV), FXS and FXO (2-wire Analog)	No ¹	<ul style="list-style-type: none"> • Analog 2 Wire and 4 Wire Interface Characteristics (C) as specified in UCR 2008, Section 5.2.6.4 • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) as specified in UCR 2008, Section 5.2.12.6 • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) as specified in UCR 2008, Section 5.2.1.5.7 • Call Congestion Control (R) • Call Congestion for TDM Transport (C) • Voice Compression (C) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.2 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.2.2

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

DSN Transport Interfaces			
Interface	Critical	Requirements Required or Conditional	References
Multi-Mode or Single Mode Fiber (1.3 Gigabit)	No ²	<ul style="list-style-type: none"> • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) as specified in UCR 2008, Section 5.2.12.6 • Modem (R) • Facsimile (R) • Call Control Signals (includes MLPP) (R) • Congestion Control (C) (IP interface only) • Voice Compression (C) • Alarms • Delay (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.3.7 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.2.2 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.2
Twisted Pair Copper (1.3 Gigabit)	No ²	<ul style="list-style-type: none"> • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) as specified in UCR 2008, Section 5.2.12.6 • Modem (R) • Facsimile (R) • Call Control Signals (includes MLPP) (R) • Congestion Control (C) (IP interface only) • Voice Compression (C) • Alarms • Delay (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.3.7 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.2.2 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.2
SUT Features And Capabilities			
Feature/Capability	Critical	Requirements Required or Conditional	References
Compression	No	<ul style="list-style-type: none"> • Voice Compression standards 	<ul style="list-style-type: none"> • UCR Section 5.9.2.2
Synchronization	Yes	<ul style="list-style-type: none"> • Timing (R) as specified in UCR 2008, Section 5.2.10.1 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.7
Network Management	Yes	<ul style="list-style-type: none"> • Management Option (R) Local Management (Front Panel and/or External Console) (C) • ADIMSS (C) as specified in UCR 2008, sections 5.2.8, Network Management, 5.2.8.3, Fault Management, and 5.2.8.4, Configuration Management. • Fault Management (C) • Loop Back Capability (C) • Operational Configuration Restoral (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.4.1 • UCR Section 5.9.2.4.2 • UCR Section 5.9.2.4.3 • UCR Section 5.9.2.4.4
Security	Yes	<ul style="list-style-type: none"> • STIGs and DoDI 8510.01 (DIACAP) (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.6
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. SUT Capability and Feature Interoperability Requirements (continued)

LEGEND:			
ADIMSS	Advanced DSN Integrated Management Support System	kbps	kilobits per second
ANSI	American National Standards Institute	kHz	kiloHertz
BERT	Bit Error Rate Test	Mbps	Megabits per second
C	Conditional	MFR1	Multi-Frequency Recommendation 1
CAS	Channel Associated Signaling	MLPP	Multi-Level Precedence and Preemption
DCE	Data Circuit-Terminating Equipment	MOS	Mean Opinion Score
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process	PRI	Primary Rate Interface
DoDI	Department of Defense Instruction	Q.931	Signaling Standard for ISDN
DP	Dial Pulse	Q.955.3	ISDN Signaling standard for E1 MLPP
DS1	Digital Signal Level 1	R	Required
DSN	Defense Switched Network	SS7	Signaling System 7
DSS1	Digital Subscriber Signaling 1	STIGs	Security Technical Implementation Guides
DTE	Data Terminal Equipment	SUT	System Under Test
DTMF	Dual Tone Multi-Frequency	T1	Digital Transmission Link Level 1 (1.544 Mbps)
E&M	Ear and Mouth	T1.607	ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
E1	European Basic Multiplex Rate (2.048 Mbps)	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	TDM	Time Division Multiplexing
EIA-530	Standard for 25-position interface for data terminal equipment and data circuit-terminating equipment employing serial binary data interchange	UCR	Unified Capabilities Requirements
FXO	Foreign Exchange Office	V.35	Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
FXS	Foreign Exchange Station	V.36	Modems for synchronous data transmission using 60-108 kHz group band circuits
ISDN	Integrated Services Digital Network	V.37	Synchronous data transmission at a data signaling rate higher than 72 kbps using 60-108 kHz group band circuits
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	X.21	includes specifications for DTE/DCE physical interface elements, alignment of call control characters and error checking, elements of the call control phase for circuit switching services, and test loops

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 personnel from the Unified Capabilities Certification Office (UCCO), e-mail: ucco@disa.mil.

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6. The JITC point of contact is Captain Stéphane Arsenault, DSN 879-5269, commercial (520) 538-5269, FAX DSN 879-4347, or e-mail to Stephane.Arsenault@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 1127301.

FOR THE COMMANDER:

2 Enclosures a/s


for BRADLEY A. CLARK
Chief
Battlespace Communications Portfolio

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) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008 Change 2," December 2010
- (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 Motorola PTP 600 (Tracking Number 1190601)," September 2011

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CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. The Cambium Networks Point To Point (PTP) 600 Series Software Version 10-00 (Tracking Number: 1127301); hereinafter referred to as the SUT.

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

3. PROGRAM MANAGER. Mr. Jessie L. Showers, NS2, Room 5W19, P.O. Box 4502, Arlington, VA 22204-4502, e-mail: Jessie.Showers@disa.mil

4. SPONSOR. Installation Information Infrastructure Modernization Program, Sponsor POC: Mr. Steven Pursell, U.S. Army Information Systems Engineering Command, Technology Integration Center (USAISEC TIC), Bldg 53302, Fort Huachuca, AZ 85613, e-mail: steven.d.pursell.civ@mail.mil

5. TESTER. USAISEC TIC, Bldg 53302, Fort Huachuca, AZ, 85613-5300

6. SYSTEM UNDER TEST DESCRIPTION. Cambium Networks PTP 600 is a Point-to-Point (PTP) bridge that supports a variety of fixed and portable communications devices over a high availability wireless Ethernet bridge. The Cambium Networks PTP operates in the 4.4 to 4.8 GigaHertz (GHz) spectrum (PTP 45600 and 48600) at data rates up to 300 Megabits per second (Mbps) for the 45600 and 200 Mbps for the 48600 and the 5.4 - 5.8 GHz spectrum (PTP 54600 and 58600) at data rates up to 300 Mbps. The over the air interface uses a proprietary protocol, which utilizes Advanced Encryption Standard (AES) encryption for securing communications. The PTP 600 series has a connectorized model for use with external antennas and an integrated model with a built-in antenna. All PTP 600 frequency variants and connector/integrated variants use the same software.

7. OPERATIONAL ARCHITECTURE. The Unified Capabilities Requirements (UCR) Network Element (NE) diagram is depicted in Figure 2-1. This figure depicts the relationship of the SUT, an NE in the operational architecture.

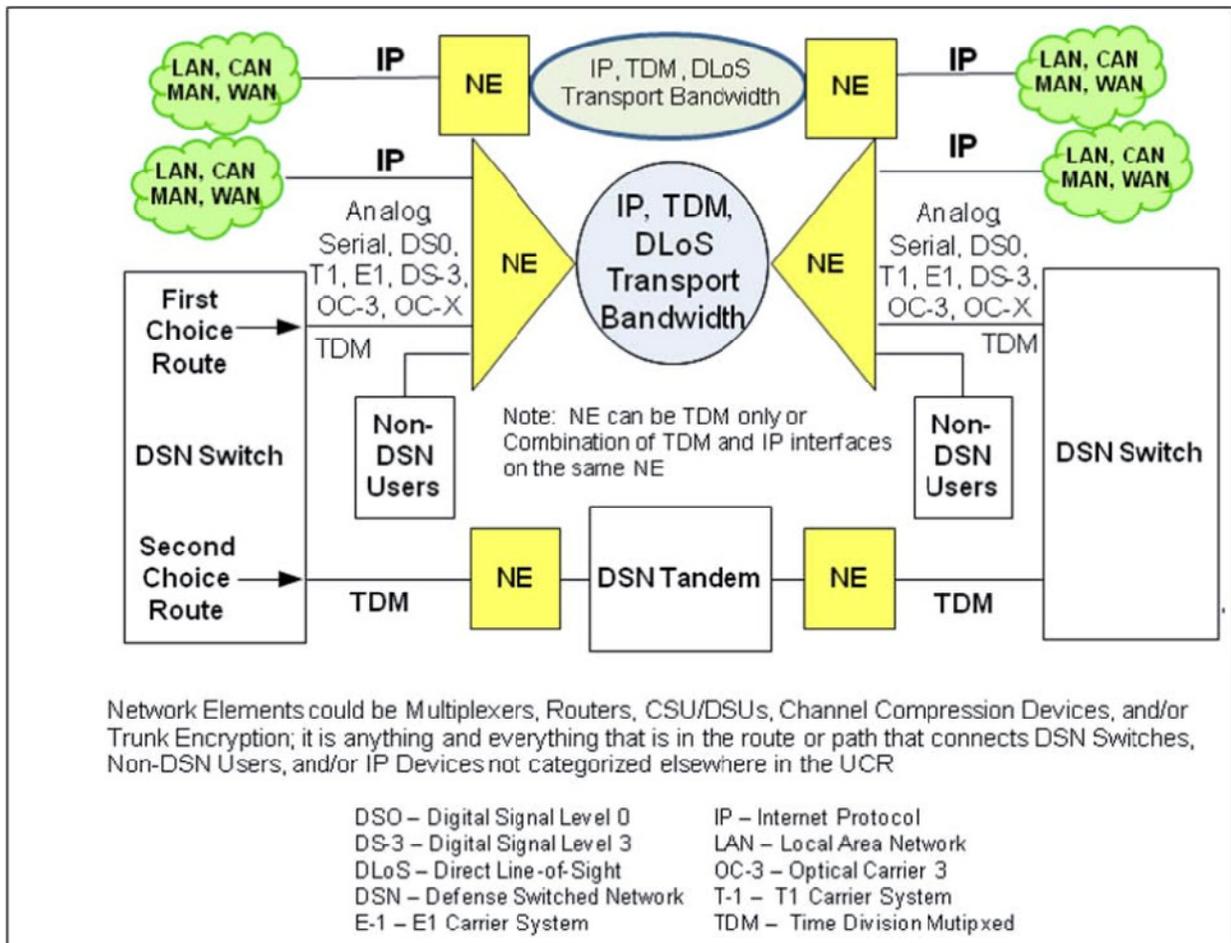


Figure 2-1. Network Elements Diagram

8. 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.

Table 2-1. SUT Interoperability Test Summary

DSN Access Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 PRI (ANSI T1.607/ANSI T1.619a)	No ¹	Not Tested	Not Available
E1 PRI (ITU-T Q.931/ ITU-T Q.955.3)	No ¹	Not Tested	Not Available
T1 CAS (DTMF/MFR1/DP)	No ¹	Not Tested	Not Available
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E1 SS7 (ANSI T1.619a)	No ¹	Not Tested	Not Available
EIA-232	No ¹	Not Tested	Not Available
EIA-530	No ¹	Not Tested	Not Available
ITU-T X.21	No ¹	Not Tested	Not Available
FXS (2-Wire Analog)	No ¹	Not Tested	Not Available
FXO (2-Wire Analog)	No ¹	Not Tested	Not Available
E&M (Type I, II, III, IV)	No ¹	Not Tested	Not Available
Copper Media (1000 Mbps Ethernet)	No ¹	Partial Compliance	See note 2.
DSN Transport Interfaces			
Transport Level	Critical	Status	Remarks
Proprietary Adaptive Modulation Wireless (5.4, 5.8, and 5.9 GHz License Exempt RF band, and 2.5, 4.5,4.8, and 4.9 licensed RF band)	No	Certified	Proprietary Interface
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.
Voice Compression	No	Not Certified	Voice compression is not supported by the SUT.
Security	Yes	Certified	See note 3.
NOTES:			
1 The UCR does not stipulate a minimum access interface requirement for a Fixed Network Element.			
2 The SUT supports the access interface at the 1000 Mbps FDX Ethernet constrained to a maximum throughput of the wireless transport, 300 Mbps. The SUT supports full rate operations in 10/100 Mbps FDX Ethernet for access interfaces.			
3 Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).			

Table 2-1. SUT Interoperability Test Summary (continued)

LEGEND:	
ANSI	American National Standards Institute
CAS	Channel Associated Signaling
CRs	Capability Requirements
DCE	Data Circuit-Terminating Equipment
DISA	Defense Information Systems Agency
DP	Dial Pulse
DSN	Defense Switched Network
DSS1	Digital Subscriber Signaling 1
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-Frequency
E&M	Ear and Mouth
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 data terminal equipment and data circuit-terminating equipment employing serial binary data interchange
FDX	Full Duplex
FRs	Feature Requirements
ISDN	Integrated Services Digital Network
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
FXO	Foreign Exchange Office
FXS	Foreign Exchange Station
kbps	kilobits per second
KHz	kiloHertz
Mbps	Megabits per second
MFR1	Multi-Frequency Recommendation 1
MLPP	Multi-Level Precedence and Preemption
PRI	Primary Rate Interface
Q.931	Signaling Standard for ISDN
Q.955.3	ISDN Signaling standard for E1 MLPP
RF	radio frequency
SS7	Signaling System 7
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
UCR	Unified Capabilities Requirements
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V.37	Synchronous data transmission at a data signaling rate higher than 72 kbps using 60-108 kHz group band circuits
X.21	includes specifications for DTE/DCE physical interface elements, alignment of call control characters and error checking, elements of the call control phase for circuit switching services, and test loops

Table 2-2. SUT Capability and Feature Interoperability Requirements

DSN Access Interfaces			
Interface	Critical	Requirements Required or Conditional	References
T1 PRI (ANSI T1.607/ANSI T1.619a)	No ¹	<ul style="list-style-type: none"> • DS1 Interface Characteristics (C) as specified in UCR 2008, Section 5.2.6.1 • DS1 Supervisory Channel Associated Signaling (C) as specified in UCR 2008, Section 5.2.6.1 • DS1 Clear Channel Capability (C) as specified in UCR 2008, Section 5.2.6.1 (SS7 and PRI only) • DS1 Alarm and Restoral Requirements (C) as specified in UCR 2008, Section 5.2.6.1 • MOS (R) • BERT (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.3.4
T1 CAS (DTMF/MFR1/DP)	No ¹	<ul style="list-style-type: none"> • Secure Transmission (Voice and Data) (R) as specified in UCR 2008, Section 5.2.12.6 • Modem (R) • Facsimile (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1
T1 SS7 (ANSI T1.619a)	No ¹	<ul style="list-style-type: none"> • Call Control Signals (R) • Alarms (R) as specified in UCR 2008, Section 5.2.1.5.7 • Call Congestion Control (R) • Call Congestion for TDM Transport (C) • Voice Compression (C) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.2 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.2.2
E1 PRI (ITU-T Q.931/ ITU-T Q.955.3)	No ¹	<ul style="list-style-type: none"> • E1 Interface Characteristics (C) as specified in UCR 2008, Section 5.2.6.2 • E1 Supervisory Channel Associated Signaling (C) as specified in UCR 2008, Section 5.2.6.2 • E1 Clear Channel Capability (C) as specified in UCR 2008, Section 5.2.6.2 • E1 Alarm and Restoral Requirements (C) as specified in UCR 2008, Section 5.2.6.2 • MOS (R) • BERT (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.5 • UCR Section 5.9.2.3.5 • UCR Section 5.9.2.3.5 • UCR Section 5.9.2.3.5
E1 CAS (DTMF/MFR1/DP)	No ¹	<ul style="list-style-type: none"> • Secure Transmission (Voice and Data) (R) as specified in UCR 2008, Section 5.2.12.6 • Modem (R) • Facsimile (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1
E1 SS7 (ANSI T1.619a)	No ¹	<ul style="list-style-type: none"> • Call Control Signals (R) • Alarms (R) as specified in UCR 2008, Section 5.2.1.5.7 • Call Congestion Control (R) • Call Congestion for TDM Transport (C) • Voice Compression (C) 	<ul style="list-style-type: none"> • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.2 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.2.2
ITU-T V.35, ITU-T V.36, ITU-T V.37 EIA-232, EIA-530, ITU-T X.21,	No ¹	<ul style="list-style-type: none"> • Serial Interface Characteristics (C) as specified in UCR 2008, Section 5.2.6.4 • BERT (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.2 • UCR Section 5.9.2.1
E&M (Type I, II, III, IV), FXS and FXO (2-wire Analog)	No ¹	<ul style="list-style-type: none"> • Analog 2 Wire and 4 Wire Interface Characteristics (C) as specified in UCR 2008, Section 5.2.6.4 • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) as specified in UCR 2008, Section 5.2.12.6 • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) as specified in UCR 2008, Section 5.2.1.5.7 • Call Congestion Control (R) • Call Congestion for TDM Transport (C) • Voice Compression (C) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.2 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.2.2

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

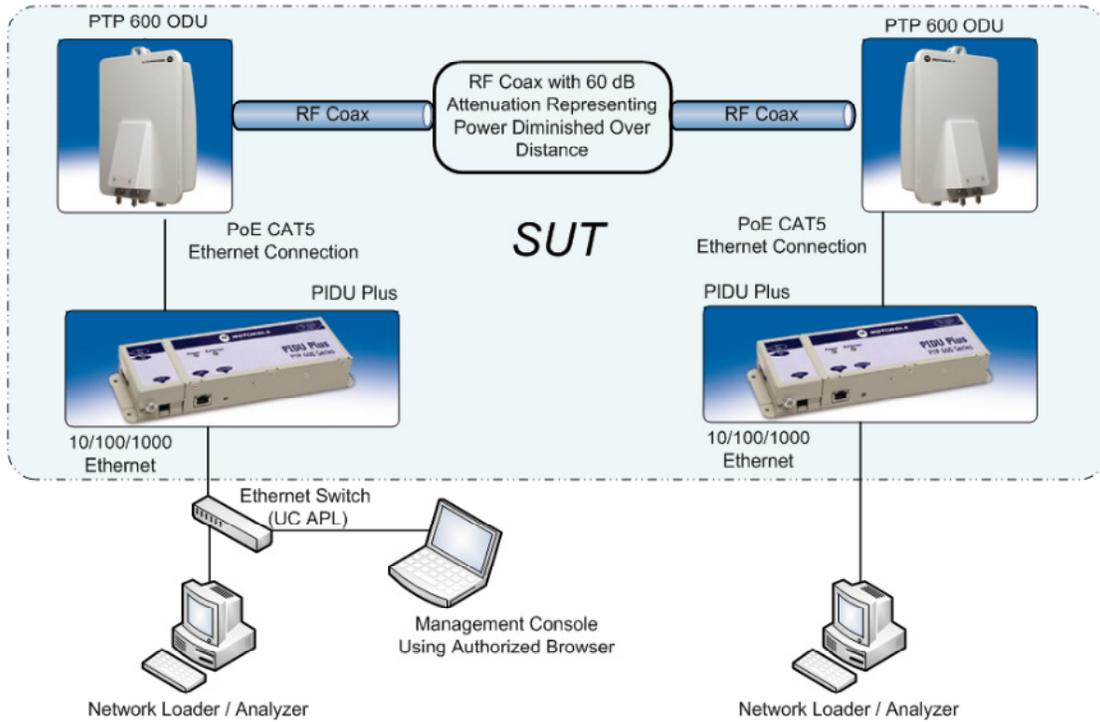
DSN Transport Interfaces			
Interface	Critical	Requirements Required or Conditional	References
Multi-Mode or Single Mode Fiber (1.3 Gigabit)	No ²	<ul style="list-style-type: none"> • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) as specified in UCR 2008, Section 5.2.12.6 • Modem (R) • Facsimile (R) • Call Control Signals (includes MLPP) (R) • Congestion Control (C) (IP interface only) • Voice Compression (C) • Alarms • Delay (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.3.7 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.2.2 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.2
Twisted Pair Copper (1.3 Gigabit)	No ²	<ul style="list-style-type: none"> • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) as specified in UCR 2008, Section 5.2.12.6 • Modem (R) • Facsimile (R) • Call Control Signals (includes MLPP) (R) • Congestion Control (C) (IP interface only) • Voice Compression (C) • Alarms • Delay (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.3.7 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.2.2 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.2
SUT Features And Capabilities			
Feature/Capability	Critical	Requirements Required or Conditional	References
Compression	No	<ul style="list-style-type: none"> • Voice Compression standards 	<ul style="list-style-type: none"> • UCR Section 5.9.2.2
Synchronization	Yes	<ul style="list-style-type: none"> • Timing (R) as specified in UCR 2008, Section 5.2.10.1 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.7
Network Management	Yes	<ul style="list-style-type: none"> • Management Option (R) • Local Management (Front Panel and/or External Console) (C) • ADIMSS (C) as specified in UCR 2008, sections 5.2.8, Network Management, 5.2.8.3, Fault Management, and 5.2.8.4, Configuration Management. • Fault Management (C) • Loop Back Capability (C) • Operational Configuration Restoral (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.4.1 • UCR Section 5.9.2.4.2 • UCR Section 5.9.2.4.3 • UCR Section 5.9.2.4.4
Security	Yes	<ul style="list-style-type: none"> • STIGs and DoDI 8510.01 (DIACAP) (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.6
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	kbps	kilobits per second
ANSI	American National Standards Institute	kHz	kiloHertz
BERT	Bit Error Rate Test	Mbps	Megabits per second
C	Conditional	MFR1	Multi-Frequency Recommendation 1
CAS	Channel Associated Signaling	MLPP	Multi-Level Precedence and Preemption
DCE	Data Circuit-Terminating Equipment	MOS	Mean Opinion Score
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process	PRI	Primary Rate Interface
DoDI	Department of Defense Instruction	Q.931	Signaling Standard for ISDN
DP	Dial Pulse	Q.955.3	ISDN Signaling standard for E1 MLPP
DS1	Digital Signal Level 1	R	Required
DSN	Defense Switched Network	SS7	Signaling System 7
DSS1	Digital Subscriber Signaling 1	STIGs	Security Technical Implementation Guides
DTE	Data Terminal Equipment	SUT	System Under Test
DTMF	Dual Tone Multi-Frequency	T1	Digital Transmission Link Level 1 (1.544 Mbps)
E&M	Ear and Mouth	T1.607	ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
E1	European Basic Multiplex Rate (2.048 Mbps)	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	TDM	Time Division Multiplexing
EIA-530	Standard for 25-position interface for data terminal equipment and data circuit-terminating equipment employing serial binary data interchange	UCR	Unified Capabilities Requirements
FXO	Foreign Exchange Office	V.35	Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
FXS	Foreign Exchange Station	V.36	Modems for synchronous data transmission using 60-108 kHz group band circuits
ISDN	Integrated Services Digital Network	V.37	Synchronous data transmission at a data signaling rate higher than 72 kbps using 60-108 kHz group band circuits
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	X.21	includes specifications for DTE/DCE physical interface elements, alignment of call control characters and error checking, elements of the call control phase for circuit switching services, and test loops

9. TEST NETWORK DESCRIPTION. The SUT was tested at USAISEC TIC in a manner and configuration similar to that of the DSN operational environment. This testing was conducted using the test configurations shown in Figure 2-2. Non-secure voice, non-secure data, video, bit error rate, and test calls were placed over the SUT.

The 60 decibel (dB) in line attenuation represents a minimal signal loss when using the 4416 MHz frequency. UCR testing confirms suitable operations based on published requirements. The UCR does not include specifications for the maximum separation range of the devices.



LEGEND:

APL	Approved Product List	PIDU	Powered Indoor Unit
CAT5	Category 5 Cable (Twisted Pair)	PTP	Point To Point
dB	Decibel (unit of power and intensity)	ODU	Outdoor Unit
DISN	Defense Information Systems Network	RF	Radio Frequency
DSN	Defense Switch Network	UC	Unified Capabilities
PoE	Power Over Ethernet		

Figure 2-2. SUT Test Configuration

10. SYSTEM CONFIGURATIONS. Table 2-3 provides the system configuration hardware, and software components tested with the SUT. The SUT was tested in an operationally realistic environment. The SUT is fielded in pairs and each pair must have the same software release.

Table 2-3. Tested System Configurations

System Name	Equipment		
Required Ancillary Equipment	Active Directory		
	SysLog		
	RADIUS		
Site Provided	Management Workstation		
Cambium Networks PTP 600 Software Rel. 10-00 (NOTE: Components bolded and underlined were tested by the USAISEC TIC. The other components in the family series were not tested; however, they utilize the same OS software and hardware as the SUT, and JITC analysis determined them to be functionally identical for interoperability certification purposes. As such, they are also certified for joint use.)	Hardware	Software/Firmware	
	<u>Cambium Networks PTP 45600 ODU</u>	10-00	
	Cambium Networks PTP 48600 ODU	TI DSP OS/Processor	
	Cambium Networks PTP 48600 ODU	10-00	
	Cambium Networks PTP 48600 ODU	TI DSP OS/Processor	
	Cambium Networks PTP 25600 ODU	10-00	
	Cambium Networks PTP 25600 ODU	TI DSP OS/Processor	
	Cambium Networks PTP 49600 ODU	10-00	
	Cambium Networks PTP 49600 ODU	TI DSP OS/Processor	
	Cambium Networks PTP 54600 ODU	10-00	
Cambium Networks PTP 54600 ODU	TI DSP OS/Processor		
Cambium Networks PTP 58600 ODU	10-00		
Cambium Networks PTP 58600 ODU	TI DSP OS/Processor		
Cambium Networks PTP 59600 ODU	10-00		
Cambium Networks PTP 59600 ODU	TI DSP OS/Processor		
<u>Cambium Networks PTP 600 PIDU Plus</u>	No SW in PIDU		
LEGEND:			
DSP	Digital Signal Protocol	PIDU	Powered Indoor Unit
FPS	Frames per Second	Rel.	Release
JITC	Joint Interoperability Test Command	SW	Software
ODU	Outdoor Unit	SysLog	System Log
OS	Operating System	TI	Texas Instruments
PTP	Point To Point	RADIUS	Remote Authentication Dial-In User Server

11. TESTING LIMITATIONS. The USAISEC TIC test team noted the following testing limitations.

- a. Secure Voice and Secure Data network appliances were not available to support testing. An SUT with a high quality data transport represents a low risk to successful Secure Voice and Secure Data operations.
- b. The Voice Over Internet Protocol (VoIP) call generator is license constrained to a capacity of 200 concurrent VoIP calls. All other traffic types are not license constrained.

12. TEST RESULTS

a. Discussion

(1) DSN Access/Transport Interfaces. The SUT supports a single 10/100/1000 Mbps Ethernet access interface. The SUT is a physical layer wireless Ethernet bridge

using a proprietary adaptive wireless transport interface with a single 10/100/1000 Mbps Ethernet access interface. Testing was conducted with the use of test tools simulating the traffic generated by actual edge devices. The IXIA IxChariot, in association with related performance endpoints, was used as the primary test tool generating and analyzing the various traffic types. Other test tools were used as a secondary confirmation and backup test capability. These include Iperf and Wireshark software utilities. The specific requirements and test results tested over the SUT DSN access and transport interfaces are described in the subparagraphs below.

(a) IP Interface Characteristics. The UCR 2008 Change 2, section 5.9.2.1.2.2, states conditionally: “The NE(s) using IP transport shall implement IP congestion control. Congestion may be controlled by using DiffServ, which shall be capable of providing preferential treatment for call congestion over other media types IAW Section 5.3.3, Network Infrastructure End-to-End Performance Requirements, and a capability to limit the provisioning of input and output interfaces so congestion is impossible under the worst transport congestion scenario. The IP interface parameters subject to ingress or egress requirements shall be met IAW Section 5.9.2.3.9, IP Interface.” IP Traffic using dissimilarly encoded Differentiated Services Code Points (DSCP) was sent across the SUT along with traffic encoded as best effort; DSCP = 00. Analyzing the traffic characteristics at the distant end provides the confirmation the SUT supports DSCP for traffic management. The SUT supported proper classification of traffic based on DSCP encoding. It provided traffic priority based on the DSCP encoding. It did not modify DSCP encodings on traffic traversing the SUT. These results were consistent on all tests run using the SUT. These results confirm the SUT supports DSCP as a form of congestion control, as required by UCR 2008 Change 2.

(b) E2E Average MOS. The UCR 2008 Change 2, section 5.9.2.1.1, states: “The introduction of an NE(s) shall not cause the E2E average MOS to fall below 4.0 as measured over any 5-minute time interval.” The SUT consistently demonstrated MOS averages of 4.3 above the requirement threshold in accordance with UCR 2008 Change 2, section 5.9.2.1.1. The SUT meets this requirement.

(c) E2E Measured Bit Error Rate (BER). The UCR 2008 Change 2, section 5.9.2.1.2, states: “The introduction of an NE(s) shall not degrade the E2E measured BER to no more than 0.03 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 SUT supports a single Ethernet IP interface, so there is no direct BER measurement possible. The SUT demonstrated 10 hours of continuous data (VoIP and Best Effort traffic) transfer service with 0.000 % bytes lost. The SUT demonstrated consistently high quality data transfers representative of meeting and beneficially exceeding the Measured BER requirement, in accordance with UCR 2008 Change 2, section 5.9.2.1.2.

(d) DoD Secure Communications Devices (DSCD) Operations. The UCR 2008 Change 2, section 5.9.2.1.3, states: “The introduction of an NE(s) shall not degrade secure transmission for secure end devices as defined in Section 5.2.2, DoD

Secure Communications Devices.” Reference the associated, published Letter of Sameness, Motorola Test Discrepancy Report (TDR) line number: M10001 for information. This requirement was written for use with an analog interface and not appropriate to an Ethernet interface. There were no DSCDs available to support direct testing with the SUT. The SUT consistently demonstrated high quality data transfers with no errors throughout testing. The SUT’s error free operations demonstrate a low risk for degradation to suitable DSCD operations, in accordance with UCR 2008 Change 2, section 5.9.2.1.3.

(e) Modem Transmissions. The UCR 2008 Change 2, section 5.9.2.1.4, states: “The NE(s) shall support a minimum modem transmission speed of 9.6 kbps across the associated NE(s).” The SUT does not have an analog serial interface. The SUT supports a single 10/100/1000 Mbps Ethernet port. Reference the associated, published Letter of Sameness, Motorola TDR line number: M10002 for information. This requirement was written for use with an analog interface and is not appropriate with an Ethernet interface. The SUT met UCR for operations at 10 and 100 Mbps FDX Ethernet for all tests. The 1000 Mbps FDX Ethernet operations did not meet UCR requirement 5.3.1.3.1, General Performance Parameters; Non-Blocking, for sufficient link capacity in this interface mode. The SUT’s 1000 Mbps FDX Ethernet interface mode maximum throughput was 300 Mbps. This is concurrent with the SUT vendor’s maximum throughput specification of 300 Mbps which saturates the RF link. Thus, the SUT operating in the 10/100 Mbps FDX Ethernet mode meets UCR. The SUT’s consistent high quality data transfer characteristics represent the ability to meet and beneficially exceed the Modem Transmission requirement, in accordance with UCR 2008 Change 2, section 5.9.2.1.4.

(f) Facsimile Transmission. The UCR 2008 Change 2, section 5.9.2.1.5 states: “The NE(s) shall support a minimum facsimile transmission speed of 9.6 kbps across the associated NE(s).” The SUT does not have an analog serial interface. The SUT supports a single 10/100/1000 Mbps Ethernet port. Reference the associated, published Letter of Sameness, Motorola TDR line number: M10003 for information. This requirement was written for use with an analog interface and is not appropriate with an Ethernet interface. The SUT met UCR for operations at 10 and 100 Mbps FDX Ethernet for all tests. The 1000 Mbps FDX Ethernet operations did not meet UCR requirement 5.3.1.3.1, General Performance Parameters; Non-Blocking, for sufficient link capacity in this interface mode. The SUT’s 1000 Mbps FDX Ethernet interface mode maximum throughput was 300 Mbps. This is concurrent with the SUT vendor’s maximum throughput specification of 300 Mbps, which saturates the RF link. Thus the SUT operating in the 10/100 Mbps FDX Ethernet mode meets UCR. The SUT’s consistent high quality data transfer characteristics and representatively high quality VoIP call transfer characteristics represent the SUT’s ability to meet and beneficially exceed the Facsimile Transmission requirement, in accordance with UCR 2008 Change 2, section 5.9.2.1.5.

(g) Call Control Signals. The UCR 2008 Change 2, section 5.9.2.1.6, states: “The NE shall transport all call control signals transparently on an E2E basis.”

Reference the associated, published Letter of Sameness, Motorola TDR line number: M10004 for information. This requirement was written for use with an analog interface and is not appropriate with an Ethernet interface. The SUT is a 10/100 Ethernet Bridge which transports all properly crafted Ethernet frames. The SUT consistently demonstrated high quality data transfer characteristics. Testing using a variety of deliberately crafted information encoded into Ethernet frames confirmed accurate and reliable transport across the SUT. This is representative of the ability to successfully convey Call Control Signals properly encoded in Ethernet frames. The SUT's consistent high quality data and VoIP call transfer characteristics represent the ability to meet and beneficially exceed the transport of Call Control Signals requirement, in accordance with UCR 2008 Change 2, section 5.9.2.1.6.

(h) IP Interface Delay Requirement. The UCR 2008 Change 2, section 5.9.2.3.9.1.a, states: "The addition of NEs with IP transports shall not increase the one-way latency per NE pair when measured from end to end over any 5-minute period specified for Time Division Multiplexing ingress G.711 (non-secure calls) to non-transcoding G.711 IP egress and shall not increase delay more than 50 ms per NE pair as measured end-to-end." The 50 ms delay represents the most stringent requirement in this section. The SUT delay (one way latency) consistently measured at an average value of 3 ms. The SUT's average delay of 3 ms represents the ability to meet and beneficially exceed the IP Interface Delay requirement, in accordance with UCR 2008 Change 2, section 5.9.2.3.9.1.a.

(i) IP Interface Jitter Requirements. The UCR 2008 Change 2, section 5.9.2.3.9.1.b, states: "The addition of an NE shall not cause jitter measured from ingress to egress to increase by more than 5 ms averaged over any 5-minute period." The SUT consistently produced jitter measurements that averaged 0.9 ms. The SUT's jitter measurements met and beneficially exceed the IP Interface Jitter requirement in accordance with UCR 2008 Change 2, section 5.9.2.3.9.1.b.

(j) IP Interface Packet Loss. The UCR 2008 Change 2, section 5.9.2.3.9.1.c, states: "The addition of an NE shall not cause packet loss measured from ingress to egress to increase by more than 0.05 percent averaged over any 5-minute period." The SUT consistently produced packet loss measurements of 0.0%. The SUT's packet loss measurement met and beneficially exceeded the IP Interface Packet Loss requirement in accordance with UCR 2008 Change 2, section 5.9.2.3.9.1.c.

(2) Device Management

(a) Management Option. The UCR 2008 Change 2, section 5.9.2.4.1.1.b.1, states: "The NE shall provide network management (NM) data/monitoring via one or more of the following physical interfaces: Ethernet/TCP/IP (IEEE 802.3), Serial (RS-232)/Asynchronous, Serial/Synchronous (X.25 and/or BX.25 variant)." The SUT supports secure web management using the Ethernet/TCP/IP (IEEE 802.3) interface. Using this Graphical User Interface, the administrator can perform the

following: view alarms, review system logging events, monitor performance metrics, and execute network management tasks. The SUT meets the Management Option in accordance with UCR 2008 Change 2, section 5.9.2.4.1.1.b.1.

(b) Fault Management. The UCR 2008 Change 2, section 5.9.2.4.2, states: "The NE shall report any failure of self-test diagnostic function on non-active and active channels on a noninterference basis to the assigned NMS." The SUT supports fault management using a secure management workstation. The SUT meets the Fault Management requirement in accordance with UCR 2008 Change 2, section 5.9.2.4.2.

(c) Operational Configuration Restoral. The UCR 2008 Change 2, section 5.9.2.4.4, states: "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 consistently recovered successfully to an operational state when subjected to multiple power failure conditions. The SUT returned to the last customer configured state prior to the power failure. The SUT meets the Operational Configuration Restoral requirement in accordance with UCR 2008 Change 2, section 5.9.2.4.4.

(3) Security. The UCR Change 2, section 5.9.2.6, states: "All components of the NE shall meet security requirements for each supported mode, as outlined in DoDI 8510.01 and the applicable STIG(s)." 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 Fixed Network Element (FNE) and is certified as interoperable for joint use within the Defense Information System Network (DISN). 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.

13. 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/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.