



DEFENSE INFORMATION SYSTEMS AGENCY

JOINT INTEROPERABILITY TEST COMMAND

P.O. BOX 12798

FORT HUACHUCA, ARIZONA 85670-2798

IN REPLY
REFER TO:

Battlespace Communications Portfolio (JTE)

13 March 2007

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of the Tektronix Direct Quality R7 Web Application (Release 7.09 Build 115 with Service Pack 2) and Power Probe 6000 running on Linux Red Hat 7.3 (Vahalla) Kernel 2.4.20-18.7 Symmetric Multiprocessing (SMP) on an i686

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

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

2. The Tektronix Direct Quality R7 Web Application (Release 7.09 Build 115 with Service Pack 2) and Power Probe 6000 running on Linux Red Hat 7.3 (Vahalla) Kernel 2.4.20-18.7 SMP on an i686 is hereinafter referred to as the System Under Test (SUT). The SUT meets the interface requirements and all required functional capabilities and is certified for joint use within the Defense Switched Network (DSN). The SUT met the interface and functional requirements for a Customer Premise Equipment device as set forth in appendix 7 of reference (c). Testing was conducted using test procedures derived from reference (d). The Internet Protocol version 6 requirements set forth in references (c) and (e) were satisfied by the vendor's Letters of Compliance (LoC). This certification expires upon changes that affect interoperability, but no later than three years from the date of this memorandum.

3. This certification is based on interoperability testing conducted by DISA and review of the vendor's LoC. Interoperability testing was conducted by DISA at the Eagle Lab Test Center, Leesburg Pike, Falls Church, Virginia under JITC review from 4 to 8 December 2006. Review of the vendor's LoC by JITC completed on 8 February 2007. The Certification Testing Summary (enclosure 2) documents the test results and describes the test configuration. Users should verify interoperability before deploying the SUT in an environment that varies significantly from that described.

4. The Functional Requirements used to evaluate the interoperability of the SUT and the interoperability statuses are indicated in table 1.

JITC Memo, JTE, Special Interoperability Test Certification of the Tektronix Direct Quality R7 Web Application (Release 7.09 Build 115 with Service Pack 2) and Power Probe 6000 running on Linux Red Hat 7.3 (Vahalla) Kernel 2.4.20-18.7 Symmetric Multiprocessing (SMP) on an i686

Table 1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Met	GSCR Paragraph
2-Wire Analog	No ¹	Yes	FCC Part15/Part 68 (R)	Met	A.7.5
			DTMF outpulsing (R)	Met	A.7.5
			TIA/EIA-470-B (R)	Met	A.7.5
IEEE 802.3 Ethernet ²	No ¹	Yes	IEEE 802.3 (C)	Met	A.7.5
	Yes	See note 3.	Security (R)	See note 3.	A7.6.5

LEGEND:
802.3 - Standard for carrier sense multiple access with collision detection at 10 Mbps
A - Appendix
C - Conditional
DISA - Defense Information Systems Agency
DTMF - Dual Tone Multi-Frequency
EIA - Electronic Industries Alliance
FCC - Federal Communications Commission
GSCR - Generic Switching Center Requirements
IEEE - Institute of Electrical and Electronics Engineers, Inc.
IPv4 - Internet Protocol version 4
IPv6 - Internet Protocol version 6
LoC - Letters of Compliance
Mbps - Megabits per second
PCM-24 - Pulse Code Modulation - 24 Channels
PCM-30 - Pulse Code Modulation - 30 Channels
R - Required
SUT - System Under Test
TIA - Telecommunications Industry Association
TIA/EIA-470-B - Performance and Compatibility Requirements for Telephone Sets with Loop Signaling

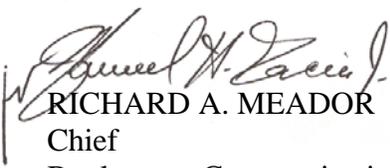
NOTES:
1 The SUT interoperability requirement can be met with any of the following interfaces: Ethernet, analog, digital, serial, PCM-24, or PCM-30.
2 An IPv6 capable system or product, as defined in the GSCR, paragraph 1.7, shall be capable of receiving, processing, and forwarding IPv6 packets and/or interfacing with other systems and protocols in a manner similar to that of IPv4. IPv6 capability is currently satisfied by a vendor LoC signed by the Vice President of the company. The vendor stated, in writing, compliance to the following criteria by 30 June 2008:
(a) Conformant with IPv6 standards profile contained in the Department of Defense Information Technology Standards Registry (DISR).
(b) Maintaining interoperability in heterogeneous environments and with IPv4.
(c) Commitment to upgrade as the IPv6 standard evolves.
(d) Availability of contractor/vendor IPv6 technical support.
3 Information Assurance testing was conducted by DISA-led Information Assurance test teams and published in a separate report.

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

6. The JITC point of contact is Mike Napier, DSN 879-6787, commercial (520) 538-6787, FAX DSN 879-4347, or e-mail to michael.napier@disa.mil. The tracking number for the SUT is 51823.

FOR THE COMMANDER:

2 Enclosures a/s


RICHARD A. MEADOR
Chief
Battlespace Communications Portfolio

JITC Memo, JTE, Special Interoperability Test Certification of the Tektronix Direct Quality R7 Web Application (Release 7.09 Build 115 with Service Pack 2) and Power Probe 6000 running on Linux Red Hat 7.3 (Vahalla) Kernel 2.4.20-18.7 Symmetric Multiprocessing (SMP) on an i686

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Headquarters U.S. Air Force, AF/XICF, 1800 Pentagon, Washington, DC 20330-1800

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Director, Defense Information Systems Agency, ATTN: GS235, Room 5W24-8A, P.O. Box 4502, Falls Church, VA 22204-4502

Office of Assistant Secretary of Defense (NII)/DoD CIO, Crystal Mall 3, 7th Floor, Suite 7000, 1851 S. Bell St., Arlington, VA 22202

Office of Under Secretary of Defense, AT&L, Room 3E144, 3070 Defense Pentagon, Washington, DC 20301

U.S. Joint Forces Command, J68, Net-Centric Integration, Communications, and Capabilities Division, 1562 Mitscher Ave., Norfolk, VA 23551-2488

Defense Information Systems Agency (DISA), ATTN: GS23 (Mr. Osman), Room 5w23, 5275 Leesburg Pike (RTE 7), Falls Church, VA 22041

ADDITIONAL REFERENCES

- (c) Defense Information Systems Agency, "Department of Defense Voice Networks Generic Switching Center Requirements (GSCR), Incorporated Change 1," October 2006
- (d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 1, Revision 1," 1 June 2005
- (e) Executive Office of the President, "Transition Planning for Internet Protocol version 6 (IPv6)," 2 August 2005

CERTIFICATION TESTING SUMMARY

- 1. SYSTEM TITLE.** Tektronix Direct Quality R7 Web Application (Release 7.09 Build 115 with Service Pack 2) and Power Probe 6000 running on Linux Red Hat 7.3 (Vahalla) Kernel 2.4.20-18.7 Symmetric Multiprocessing (SMP) on an i686 is hereinafter referred to as the System Under Test (SUT).
- 2. PROPONENT.** Defense Information Systems Agency (DISA).
- 3. PROGRAM MANAGER.** Mr. Howard Osman, GS23, Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, e-mail: Howard.Osman@disa.mil.
- 4. TESTER.** Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.
- 5. SYSTEM UNDER TEST DESCRIPTION.** The SUT is a Commercial-Off-the-Shelf Customer Premise Equipment (CPE) Quality of Service (QoS) testing device. The SUT provides the capability for automatically measuring the QoS for analog line types and then providing a score for the quality of the analog call. The SUT consists of a 2 rack unit (2U) standalone server running a Graphical User Interface (GUI) application and a 2U test probe package. The SUT's test probe package is connected to the Defense Switched Network (DSN) via analog lines from a DSN switch. The standalone server is connected to the test probe package via an IEEE 802.3 Ethernet interface. The test probe package contains the interface modules used to measure and report voice, FAX, and modem analog line performance. The test probes store test results until queried from the server. One server can support many test probes. The SUT provides a system level test tool that can be used to generate test plans, automate test scheduling, and provide e-mail notification of test completion. The SUT management access was provided at the server only. The SUT offers multiple test services capability but was tested and is certified for use with analog line types only.
- 6. OPERATIONAL ARCHITECTURE.** The Generic Switching Center Requirements (GSCR) DSN architecture in figure 2-1 depicts the relationship of the SUT to the DSN switches.

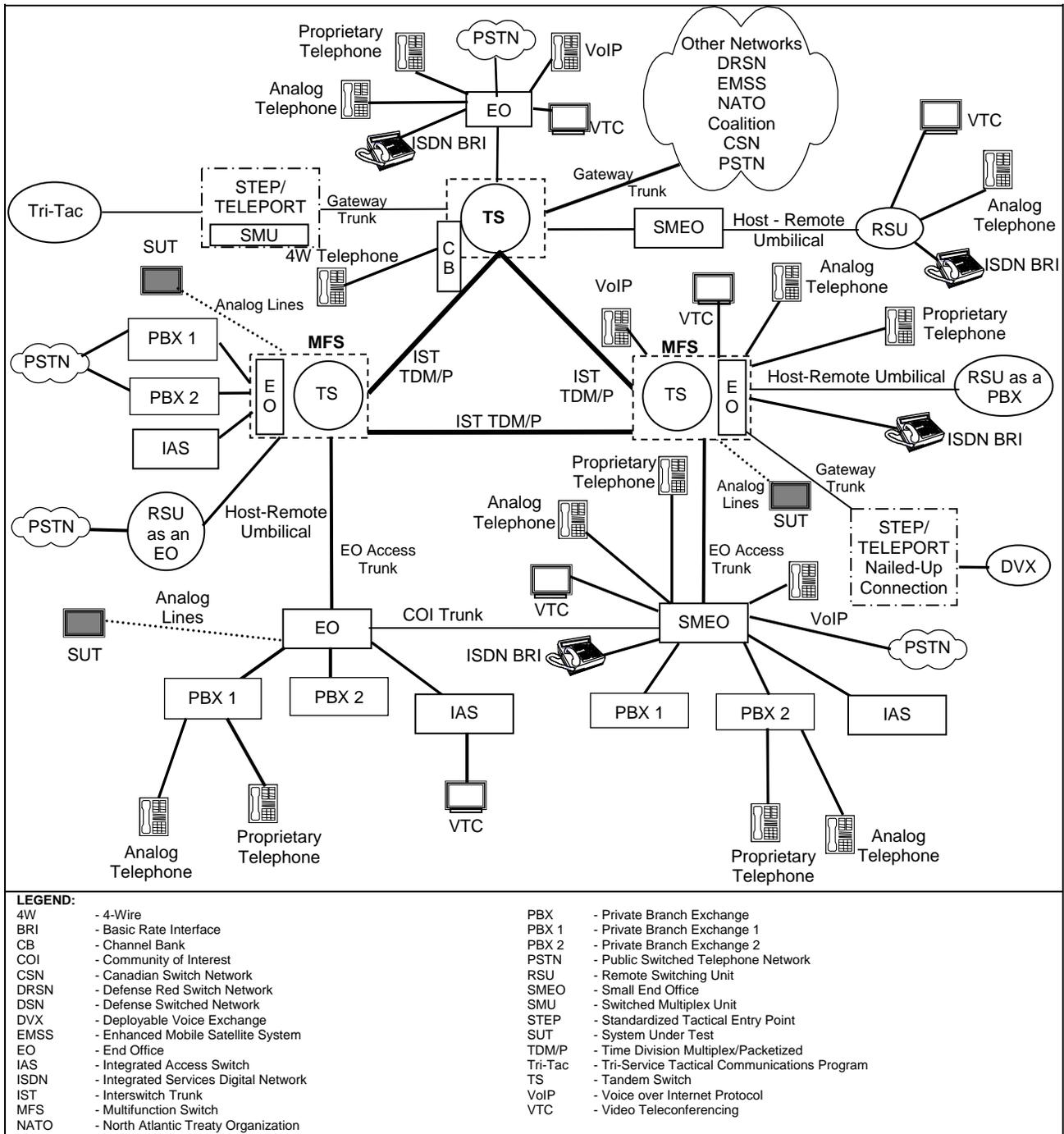


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to the SUT and interoperability results are listed in table 2-1. These requirements are derived from the GSCR Interface and Functional Requirements and were verified through JITC review and vendor submission of Letters of Compliance.

Table 2-1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Functional Requirements	Met	GSCR Paragraph
2-Wire Analog	No ¹	Yes	FCC Part15/Part 68 (R)	Met	A.7.5
			DTMF outpulsing (R)	Met	A.7.5
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IEEE 802.3 Ethernet ²	No ¹	Yes	IEEE 802.3 (C)	Met	A.7.5
	Yes	See note 3.	Security (R)	See note 3.	A7.6.5
LEGEND: 802.3 - Standard for carrier sense multiple access with collision detection at 10 Mbps A - Appendix C - Conditional DISA - Defense Information Systems Agency DTMF - Dual Tone Multi-Frequency EIA - Electronic Industries Alliance FCC - Federal Communications Commission GSCR - Generic Switching Center Requirements IEEE - Institute of Electrical and Electronics Engineers, Inc. IPv4 - Internet Protocol version 4 IPv6 - Internet Protocol version 6 LoC - Letters of Compliance Mbps - Megabits per second PCM-24 - Pulse Code Modulation - 24 Channels PCM-30 - Pulse Code Modulation - 30 Channels R - Required SUT - System Under Test TIA - Telecommunications Industry Association TIA/EIA-470-B- Performance and Compatibility Requirements for Telephone Sets with Loop Signaling					
NOTES: 1 The SUT interoperability requirement can be met with any of the following interfaces: Ethernet, analog, digital, serial, PCM-24, or PCM-30. 2 An IPv6 capable system or product, as defined in the GSCR, paragraph 1.7, shall be capable of receiving, processing, and forwarding IPv6 packets and/or interfacing with other systems and protocols in a manner similar to that of IPv4. IPv6 capability is currently satisfied by a vendor LoC signed by the Vice President of the company. The vendor stated, in writing, compliance to the following criteria by 30 June 2008: (a) Conformant with IPv6 standards profile contained in the Department of Defense Information Technology Standards Registry (DISR). (b) Maintaining interoperability in heterogeneous environments and with IPv4. (c) Commitment to upgrade as the IPv6 standard evolves. (d) Availability of contractor/vendor IPv6 technical support. 3 Information Assurance testing was conducted by DISA-led Information Assurance test teams and published in a separate report.					

8. TEST NETWORK DESCRIPTION. The SUT was tested at the DISA Eagle Lab Test Center, Leesburg Pike, Falls Church, Virginia under JITC review in a manner and configuration similar to that of the DSN operational environment. Testing the system's required functions and features was conducted using the test configurations depicted in figure 2-2.

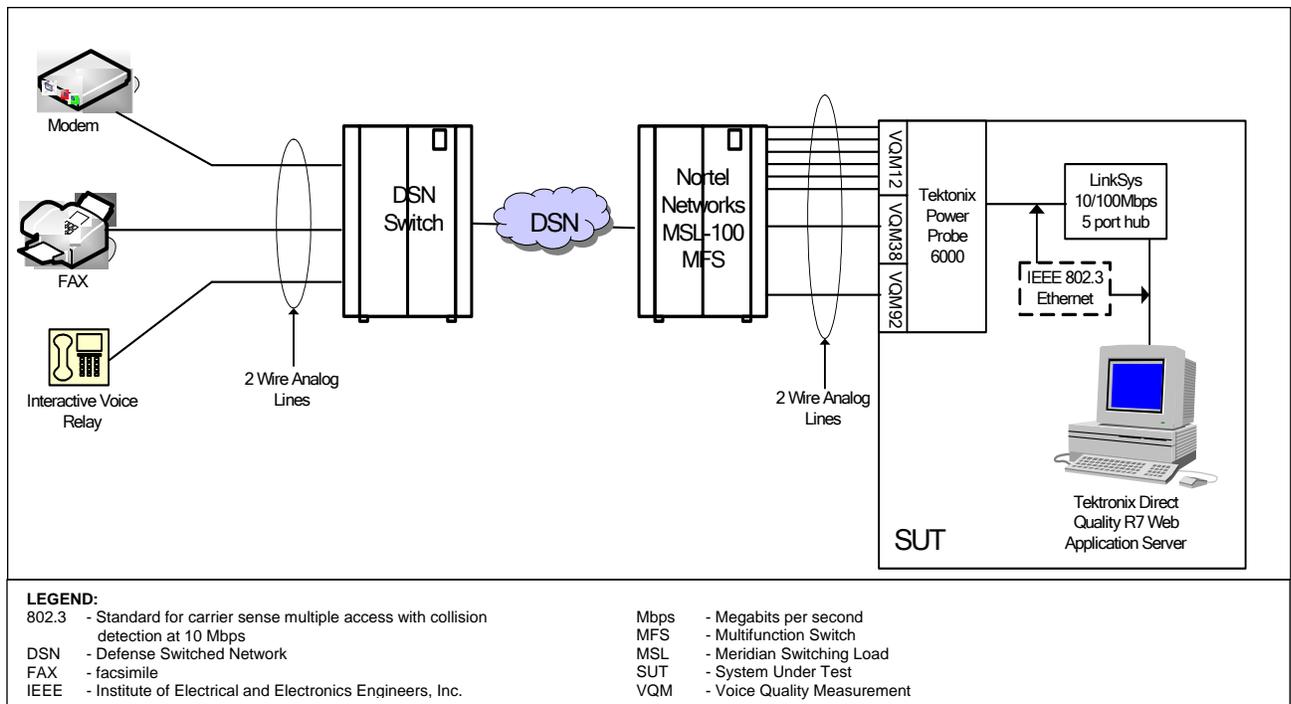


Figure 2-2. SUT Test Configuration

9. SYSTEM CONFIGURATIONS. The tested system configurations are depicted in table 2-2.

Table 2-2. Tested System Configurations

System Name	Hardware/Software Release	
Nortel MSL-100	SE06	
SUT	Hardware	Software
	Rack-mounted server, Intel XEON processor 2.4GHz, 136GB HD, 1 GB DDR266 SDRAM DIMM	MS Windows Server 2003, Service Pack 1, MS SQL Version 8.0.0.760, Web Application Tektronix Direct Quality R7 Release 7.09 Build 115 with Service Pack 2
	Linksys EFAH05W 10/100 Mbps 5 port Hub	N/A
	Rack-mounted server, Intel XEON processor 2.4GHz, 136GB HD, 1 GB DDR266 SDRAM DIMM	Power Probe 6000 running on Linux Red Hat 7.3 (Vahalla) Kernel 2.4.20-18.7 SMP on an i686
	Power Probe 6000 Interface Components	Software Version
	VQM12 (6-port Analog Board)	VOX_2-8996
	VQM38 (FAX Board)	FAXMOD_0-1268
	VQM92 (Modem Board)	FAXMOD_0-1268

Table 2-2. Tested System Configurations (continued)

LEGEND:	
DDR	- Double Data Rate
DIMM	- Dual Inline Memory Module
FAX	- Facsimile
FAXMOD	- facsimile/modem
GB	- Gigabyte
GHz	- Gigahertz
HD	- Hard drive
Mbps	- Megabits per second
MS	- Microsoft
MSL	- Meridian Switching Load
N/A	- Not Applicable
SDRAM	- Synchronous Dynamic Random Access Memory
SE	- Succession Enterprise
SMP	- Symmetric Multiprocessing
SQL	- Structured Query Language
SUT	- System Under Test
VOX	- Voice
VQM	- Voice Quality Measurement

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Discussion. The SUT connection to the DSN was via analog lines to support automated QoS testing. To test interoperability, automated operational voice, modem, and FAX QoS analog line testing was scheduled in the SUT database server and then automatically run by the SUT at the scheduled time. The SUT’s test probes were connected to analog lines off of a DSN Multifunction Switch. Automated voice testing was successfully performed from the SUT’s voice test probe module to an interactive voice relay device located at the distant node DSN switch. The SUT modem and FAX testing were successfully tested from the SUT’s modem and FAX modules to modems and FAXes located at the distant node DSN switches. The SUT is essentially an automated test device without any human intervention and posed no negative affect with interoperability. The SUT test result information included Mean Opinion Score for voice testing and handshake rate percentage and connection rates for FAX and modem testing. Test results were stored in the SUT’s test agents until queried by the SUT database server.

b. Test Summary. The SUT met the critical interoperability requirements for a CPE device with an analog two-wire interface and is certified for joint use within the DSN.

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>.