DEFENSE INFORMATION SYSTEMS AGENCY
P. O. BOX 4502
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IN REPLY
REFER TO: Joint Interoperability Test Command (JTE) **2 Feb 10**

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of Tellabs 5500 Next Generation Cross-Connect Switch within the Defense Information Systems Network

References: (a) Department of Defense Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) Chairman, Joint Chiefs of Staff Instruction 6212.01E, "Interoperability and Supportability of Information Technology and National Security Systems," 15 December 2008
(c) and (d), see enclosure 1

1. References (a) and (b) establish the Joint Interoperability Test Command (JITC) as the responsible organization for Interoperability Certification.

2. The Tellabs 5500 Next Generation Cross-Connect Switch (NGX), with Software Release FP3.2, will hereinafter be referred to as the System Under Test (SUT). The SUT is a multi-service, multi-protocol optical switching system that consolidates the functionality of Synchronous Optical Network, Add/Drop Multiplexer, wideband and broadband Digital Cross-Connect System, and multiplexing transport functionality. The SUT met all tested critical interoperability requirements as set forth by the Unified Capabilities Requirement (UCR) 2008 (reference (c)) and is certified interoperable for use within the Defense Information Systems Network (DISN) in accordance with UCR, Section 5.3 for Assured Services Local Area Network Infrastructure and Section 5.5 for Network Infrastructure Product Requirement. The JITC certifies all configurations, features, and functions cited in this document for use within the DISN. This certification expires upon changes that affect interoperability but no later than three years from the date of this memorandum.

3. The JITC based these findings on the results of testing conducted at the JITC Indian Head, Maryland test facility and review of Tellabs Letters of Compliance. Testing originally consisted of assessment testing from April through September 2009 against vendor-defined functional and capability requirements. The JITC validated existing test artifacts to determine the interoperability status of the SUT against the UCR 2008 Optical Transport System requirements. The Interoperability Certification Summary (enclosure 2) documents all certified requirements for the SUT. Further details are available in the JITC Assessment Report.

4. Table 1 lists the Tellabs 5500 NGX interfaces tested and Table 2 is a list of UCR 2008 requirements tested.

Table 1. Tellabs 5500 NGX Interface Summary

INTERFACE	UCR 2008 REQUIRED	STATUS	REMARKS
OC-3	Yes	MET	Met UCR 2008 requirements.
OC-12	Yes	MET	Met UCR 2008 requirements.
OC-48	Yes	MET	Met UCR 2008 requirements.
DS-1	Yes	MET	Met UCR 2008 requirements.
DS-3	Yes	MET	Met UCR 2008 requirements.

LEGEND:
DS Digital Signal
NGX Next Generation Cross-Connect Switch
OC Optical Carrier
UCR Unified Capabilities Requirements

Table 2. Tellabs 5500 NGX Requirements Summary

REQUIREMENT	UCR 2008 REFERENCE	STATUS	REMARKS
SONET Interface Requirements	5.5.4.2	Certified	Certified based on Special Interoperability Certification testing
Electrical Interface Requirements	5.5.4.5	Certified	Certified based on Special Interoperability Certification testing
Cross-Connect Requirements	5.5.4.8	Certified	Certified based on Special Interoperability Certification testing
Performance Requirements	5.5.4.9	Certified	Certified based on Special Interoperability Certification testing
Equipment Redundancy Requirements	5.5.4.10	Certified	Certified based on Special Interoperability Certification testing
General Protection Requirements	5.5.4.11	Certified	Certified based on Special Interoperability Certification testing
Interoperability Requirements	5.5..4.12	Certified	Certified based on Special Interoperability Certification testing
Fault Management Requirements	5.5.4.13	Certified	Certified based on Special Interoperability Certification testing
Performance Management Requirements	5.5.4.14	Certified	Certified based on Special Interoperability Certification testing
EMS Requirements	5.5.4.15	Certified	Certified based on Special Interoperability Certification testing
Standards Compliance Requirements	5.5.4.16	Certified	Standards conformance verification testing performed during Special Interoperability Certification testing

LEGEND:
EMS Element Management System
NGX Next Generation Cross- Connect Switch
SONET Synchronous Optical Network
UCR Unified Capabilities Requirement

5. The JITC distributes interoperability information via the JITC Electronic Report Distribution system, which uses Non-secure Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program, which .mil/.gov users can access at https://stp.fhu.disa.mil/ (NIPRNet). Assessment reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool at http://jit.fhu.disa.mil/ (NIPRNet) or http://199.208.204.125/ (Secure Internet Protocol Router Network).

6. The JITC testing point of contact is Mr. Son Pham, commercial (301) 744-2636 or DSN 354-2636. His e-mail address is son.pham@disa.mil. The JITC mailing address is 3341 Strauss Avenue, Suite 236, Indian Head, Maryland 20640-5149. The tracking number for the SUT is 0914903.

FOR THE COMMANDER:

Germaine M. Forbes

2 Enclosures a/s

for RICHARD A. MEADOR
Chief, Battlespace Communications
Portfolio

Distribution (electronic mail):
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ADDITIONAL REFERENCES

(c) Office of Assistant Secretary of Defense for Networks and Information Integration/ Department of Defense Chief Information Officer Document, "Department of Defense Unified Capabilities Requirements 2008," 22 January 2009
(d) Joint Interoperability Test Command Document, "Tellabs 7100 and 7100-Nano Optical Transport Systems, 5500 Next Generation Cross-Connect Switch, 1134 and 1150 Multi-Service Access Platforms, and 1000 Voice Gateway Special Interoperability Certification Test Report" November 2009

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CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. Tellabs 5500 Next Generation Cross-Connect Switch

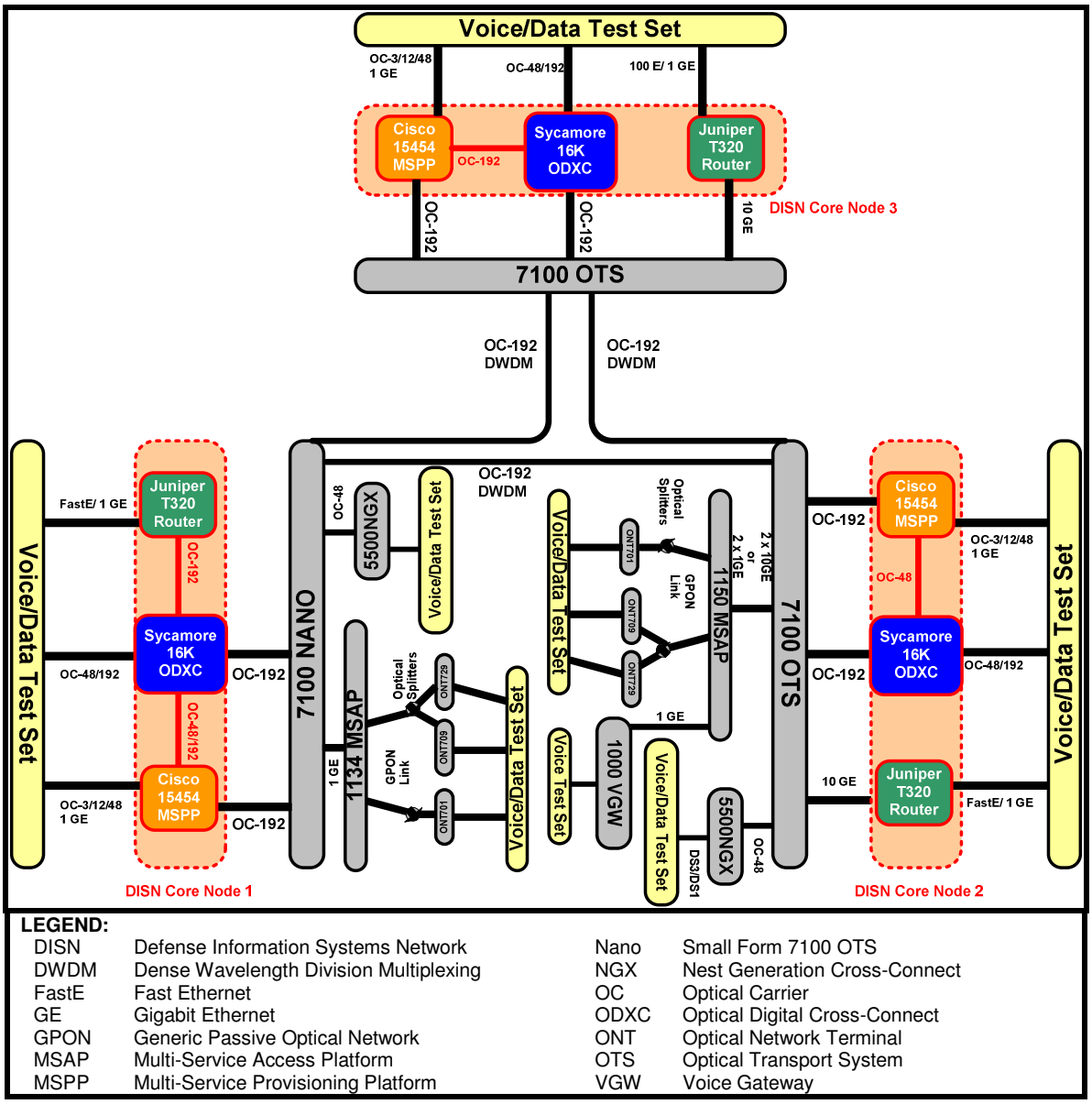
2. PROPONENTS. United States Army Information Systems Engineering Command

3. PROGRAM MANAGER. Mr. Robert Wellborn, address: Commander, HQUSAISEC AMSEL-IE-IS Bldg 53301 Fort Huachuca, AZ 85613-5300,
e-mail: robert-wellborn@us.army.mil

4. TESTER. Joint Interoperability Test Command (JITC), Indian Head, Maryland

5. SYSTEM UNDER TEST (SUT) DESCRIPTION. The Tellabs 5500 Next Generation Cross-Connect (NGX) Transport Switch combines digital cross-connect and Synchronous Optical Network transport technologies onto one platform for bandwidth management. The 5500 NGX switch combines cross-connect and add-drop multiplexing capability in a compact, single-shelf system. Geared toward smaller applications in wireless, wire-line, or cable-provider network, the Tellabs 5500 NGX switch delivers a complement of bandwidth management features designed to grow with a business, support new services, and speed responsiveness.

6. OPERATIONAL ARCHITECTURE. As defined in the Unified Capabilities Requirements (UCR), the 5500 Next Generation Cross-Connect Switch is a Multi-Service Provisioning Platform (MSPP) and the Tellabs 7100 and 7100 Nano are Optical Transport Systems (OTS). The 1134 and 1150 Multi-Service Access Platforms (MSAP) with the accompanying 701/709/729 Optical Network Terminals (ONT), peripherals, and the 1000 Voice Gateway (VGW) were tested as Assured Services Local Area Network devices to demonstrate Tellabs Generic Passive Optical Network technology. The 1134 and 1150 MSAPs are also called Optical Line Terminals (OLT). A high-level Defense Information Systems Network (DISN) node architecture, as depicted in Figure 2-1, displays the role of the OTS and MSPP devices in the DISN architecture. The Tellabs OLTs connect directly to the 7100 OTS using the 7100 layer-2 support services for link aggregation groups, as shown in Figure 2-2.



LEGEND:

DISN	Defense Information Systems Network	Nano	Small Form 7100 OTS
DWDM	Dense Wavelength Division Multiplexing	NGX	Nest Generation Cross-Connect
FastE	Fast Ethernet	OC	Optical Carrier
GE	Gigabit Ethernet	ODXC	Optical Digital Cross-Connect
GPON	Generic Passive Optical Network	ONT	Optical Network Terminal
MSAP	Multi-Service Access Platform	OTS	Optical Transport System
MSPP	Multi-Service Provisioning Platform	VGW	Voice Gateway

Figure 2-1. Tellabs Test Bed Architecture

7. REQUIRED SYSTEMS INTERFACES. For SUT testing, the JITC used requirements from the UCR 2008, dated January 2009, and industry best practices. Appendix A to Enclosure 2 lists all test cases and requirement references.

8. TEST NETWORK DESCRIPTION. The JITC tested the SUT at its Indian Head, Maryland Advanced Technology Testing Laboratory using test configurations shown in Figures 2-2, 2-3, 2-4, and 2-5. Figure 2-2 shows the Tellabs 5500 NGX in a stand-alone configuration. The 1+1 Automatic Protection Switching (APS) trunks between the two 5500 NGX devices were OC-48.

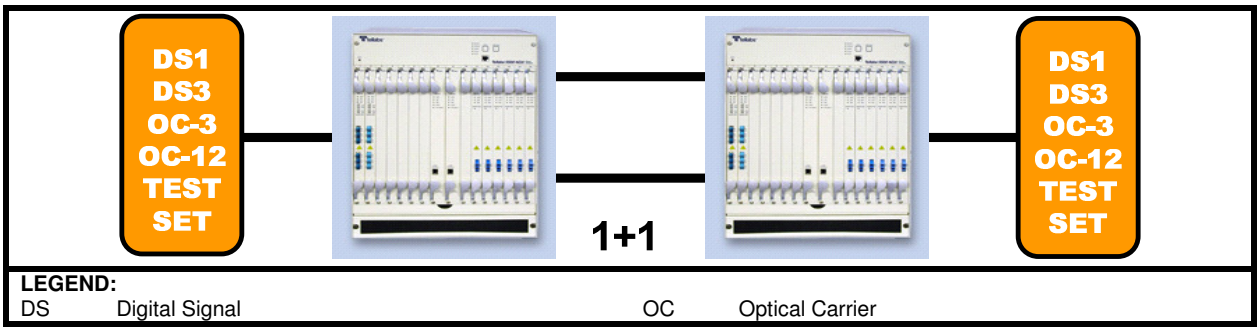


Figure 2-2. Tellabs Configuration 1

Network management for the 5500 NGX passed through the Tellabs 7100 OTS system.

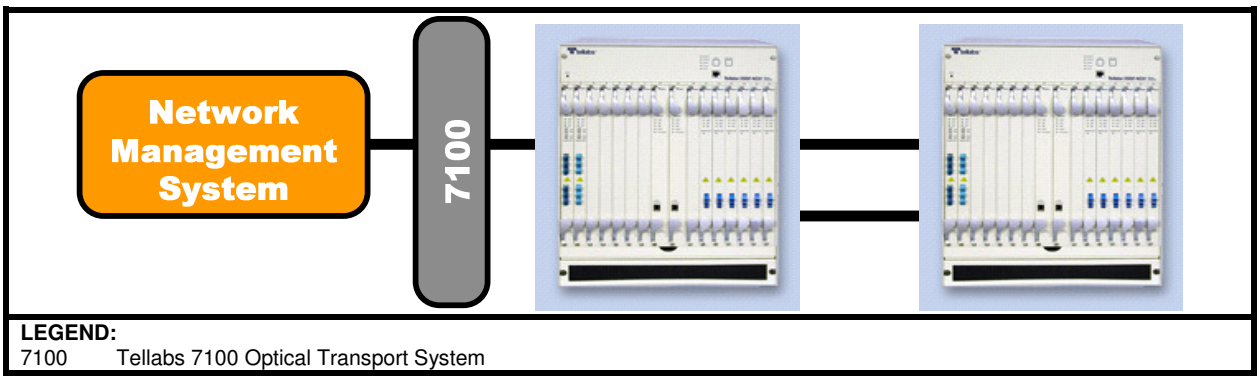
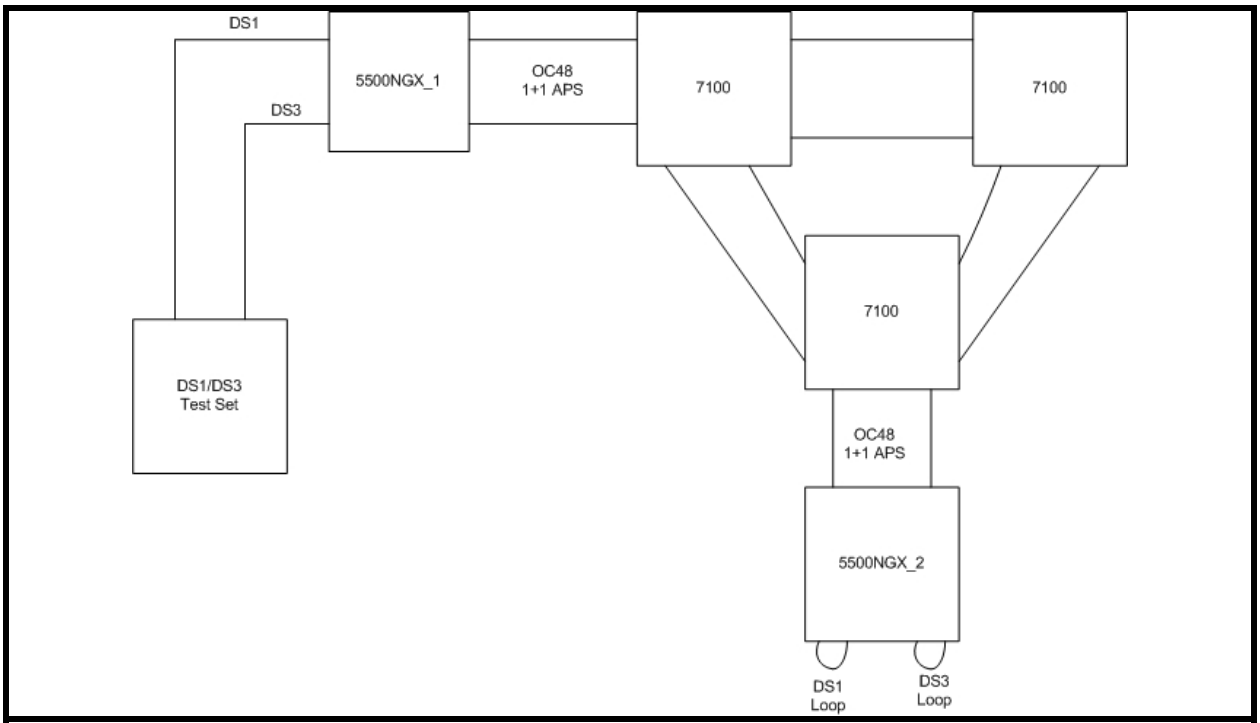


Figure 2-3. Tellabs Configuration 2

The Tellabs 7100 OTS systems are shown providing 1+1 APS with the 5500 NGX.

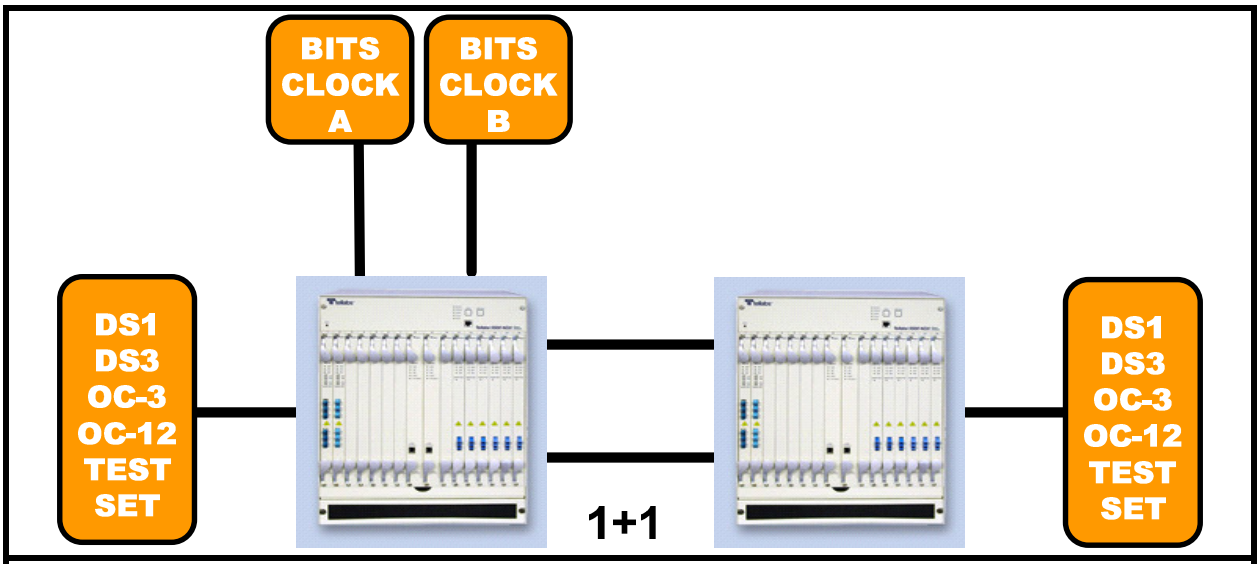


LEGEND:

5500NGX	Tellabs 5500 Next-Generation	DS	Digital Signal
7100	Tellabs 7100 Optical Transport System	OC	Optical Carrier
APS	Automatic Protection Switching		

Figure 2-4. Tellabs Configuration 3

Redundant timing connected to one of the 5500 NGX node. Line timing distributed to the second 5500 NGX node.



LEGEND:

BITS	Building Integrated Timing Supply	OC	Optical Carrier
DS	Digital Signal		

Figure 2-5. Tellabs Configuration 4

9. SYSTEM CONFIGURATIONS. Table 2-1 lists the tested software configuration for the Tellabs equipment shown in Figure 2-1. The DISN Core Equipment used in Figure 2-1 is listed Table 2-2.

Table 2-1. Tested Tellabs Equipment

PLATFORM	SOFTWARE RELEASE	APPLICATION
Tellabs 7100	FP5.1.1	VxWorks – not user accessible
Tellabs 7100 Nano	FP5.1.1	VxWorks – not user accessible
Tellabs 5500 NGX	FP3.2.3.1	OSE – not user accessible
1134 MSAP	FP25.3.1	MontaVista Linux 4.0 – not user accessible
1150 MSAP	FP25.3.1	Monta Vista Linux 4.0 – not user accessible
1000 VGW	13.4.7	VxWorks – not user accessible
Tellabs 7100 Tellabs Manager Server Tellabs 719x NMS	FP6.0	Node Management Software
Tellabs 5500 NGX Tellabs Manager	FP6.0	Node Management Software
1134/1150 MSAP Element Management System	FP8.4	Node Management Software
Tellabs Service Layer Manager Server Universal Gateway Server	FP8.4	System Management Software

LEGEND:

MSAP	Multi-Service Access Platform	NMS	Network Management System
Nano	Small Form 7100 Chassis	VGW	Voice Gateway
NGX	Next Generation		

Table 2-2 Non-SUT Equipment

VOICE AND DATA TEST SET	SOFTWARE VERSION	INTERFACE CARDS
Cisco 15454	09.00-008I-17.17	ETH 100T-12-G, OC-3IR-STM1 SH-1310-8, OC-12IR-STM4-1310-4, DS-1N-14, G1K-4, OC-192SR/STM-64, OC-48 AS-IR-1310, DS-3N-12E
Sycamore ODXC	7.6.21 Build 0562.26.27.57.14	GPIC2 2 X OC-192/STM-64, GPIC 24 x OC-3-12/STM1-4IR, GPIC2 8 x OC-48/STM16, USC - OC-192 LR 2c LIM 1
Juniper T320 Router	9.2.R2.15	4 x FE 100 Base Tx, 10 x GigE LAN 1000 Base, 1x OC-192 SM SR2, 1 x 10GigE LAN, XENPAK
Cicso Catalyst 6500	12.1 (13)	48 E ports, 8 ports GigE, 2 port 10GigE
RedCom Switch	6.1	1/ 4 Port line card (MA0653-115) 2/ Multi E1/T1 (MET) Interface Board (MA0683-122 3/ Single Slot System Processor (S3P) Board/ line signaling Protocol for trunk lines (GR303 or SS7)(MA0688-101)

LEGEND:

DS	Digital Signal	ODXC	Optical Digital Cross-Connect
ETH	Ethernet	R	Revision
GigE	Gigabit Ethernet	SM	Single Mode
LAN	Local Area Network	SR	Short Reach
LIM	Line Interface Module	Tx	Transmit
OC	Optical Carrier	USC	Universal Services Card

Table 2-3. Test Equipment

Manufacturer	Type	Port Type	Software Version
Agilent	Optical Tester	1550 nm	A.06.01
		1310 nm	
	Router Tester 900	OC-3/OC-12 /POS	6.11
		OC-48 Multilayer	
		1000 Base X	
Ixia	Traffic generator	10 Gig	5
		LM1000STX	
Digital Lightwave	Optical Wavelength Manager	Monitor Ports	2.4.0
Spirent Abacus	Bulk Call Generator	T1-RJ45/RJ11	6.0.r20
Agilent	Rack Mounted Router Tester 900	10 Gig LAN/WAN	6.11
		10/100/1000 Base-T	
		1000 Base-X	
		OC-48c POS	
		OC-3/12/POS	
Agilent JDSU	T-Berd 8000	OC-192 POS	6.11
		DSU	6.4
		10/100/1000	
		OC-3-12	
		DS-3	
		OC-192	

LEGEND:

DS	Digital Signal	nm	nanometer
DSU	Data Services Unit	OC	Optical Carrier
Gig	Gigabit	POS	Packet Over Synchronous Optical Network
LAN	Local Area Network	WAN	Wide Area Network

10. TEST LIMITATIONS. The JITC tested the Tellabs devices using the configuration illustrated in Figures 2-2, 2-3, 2-4, and 2-5. Testing covered a wide variety of configurations using multiple traffic paths. It was not possible to test every implementation scenario.

11. TEST RESULTS. In accordance with the UCR 2008 requirements, the Tellabs 5500 NGX transports and restores traffic in a reliable, timely, and secure manner. The Tellabs 5500 NGX interoperates with other transport systems comprising the Department of Defense (DoD) Global Information Grid (GIG). The JITC prepared a detailed report, titled "Tellabs 7100 and 7100-Nano OTSs, 5500 Next Generation Cross-Connect Switch, 1134 and 1150 MSAPs, and 1000 VGW Special Interoperability Certification Test Report" during November 2009.

12. TEST AND ANALYSIS REPORT. Appendix A to Enclosure 2 contains tables for the 5500 NGX test results. The JITC distributes interoperability information via the JITC Electronic Report Distribution system, which uses Non-secure Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program, which .mil/.gov users can access at https://stp.fhu.disa.mil/ (NIPRNet). Assessment reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool at http://jitc.fhu.disa.mil (NIPRNet) or http://199.208.204.125/ (Secure Internet Protocol Router Network).

APPENDIX A TO ENCLOSURE 2

TEST RESULTS

Table A-1. Tellabs 5500 NGX Test Results

REQUIREMENT NUMBER	TITLE	REQUIRED RESULTS	ACTUAL RESULTS	REFERENCE	MET/NOT MET
Tellabs 5500 NGX SC-01	Hardware Functionality	There is no physical damage to ports, cards, shelves, or racks. There is no physical damage to electrical backplane connectors on shelves and cards. Laser safety labels are plainly visible next to laser ports. Optical connectors are not directed toward the eyes of users and are designed to avoid the possibility of eye injury. Visual status indicators are operational.	No physical damage to ports, cards, shelves, or racks. No physical damage to electrical backplane connectors on shelves and cards. Laser safety labels were plainly visible next to laser ports. Optical connectors were not directed toward the eyes of users and were designed to avoid the possibility of eye injury. Visual status indicators were operational.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-02	Basic System Configurability	All parameters controlling the initial setup of a Tellabs 5500 NGX node can be configured, including the node identifier parameter. The Tellabs 5500 NGX system's date and time can be configured.	All parameters controlling the initial setup of a system node were configured, including the node identifier parameter. The system's date and time was configured.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-03	Recovery from Electrical Power Failure	The Tellabs 5500 NGX recovers from a total electrical power failure within 30 minutes of the failure.	The system recovered from a total electrical power failure within 6 minutes of the failure.	UCR 2008 Section 5.4.4.7 Survivability/Availability Counter measures	MET
Tellabs 5500 NGX SC-04	Multi-Level User Accounts	The Tellabs 5500 NGX supports multiple user account levels that limit users to specific access privileges. A user name and password are required for each user account. Only an administrator-level user can add and remove users, as well as change user account levels.	The system supports multiple user account levels that limit users to specific access privileges. A user name and password was required for each user account. The administrator-level user could add and remove users, as well as change user account levels.	UCR 2008 Section 5.4.4.2 Access Control Counter measures	MET
Tellabs 5500 NGX SC-05	Inventory Discovery	The inventory information for a Tellabs 5500 NGX node reported by the EMS or NMS accurately reflects the actual cards and shelves used in the node.	The inventory information for a system node is reported by the Element Management System and TL1 reflected the actual cards and shelves used in the node.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-06	Network and Alarm Discovery	The EMS and NMS can discover the network configuration and alarm status of the Tellabs 5500 NGX.	The Element Management System and NMS discovered the network configuration and alarm status of the system.	UCR 2008 Section 5.4.4.10 Network Management Counter measures	MET

Table A-1. Tellabs 5500 NGX Test Results (continued)

REQUIREMENT NUMBER	TITLE	REQUIRED RESULTS	ACTUAL RESULTS	REFERENCE	MET/NOT MET
Tellabs 5500 NGX SC-07	Software Loop-Back of Circuits	Software loop-back on one end of a circuit can be established and will send data traffic back to the circuit's originating point.	Software loop-back of circuits was established. Test traffic was sent back to the circuit's originating point.	UCR 2008 Section 5.5.4.14 Performance Management Requirements	MET
Tellabs 5500 NGX SC-08	Alarm Reporting Accuracy	The appropriate alarm is reported by the Tellabs 5500 NGX for each alarm condition and for each available service on the Tellabs 5500 NGX.	Appropriate alarms were reported by the system for alarms encountered during testing.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-09	Non-service-affecting Modules and Connections	No traffic errors occurred when a non-service-affecting module or connection is removed from, or restored to, the Tellabs 5500 NGX.	No traffic errors occurred when non-service-affecting modules or connections were removed from, or restored to, the system.	UCR 2008 Section 5.5.4.10 Equipment Redundancy Requirements	MET
Tellabs 5500 NGX SC-10	Usability of NMS	The Tellabs 5500 NGX NMS software application allows performance of standard management functions with simplicity and ease, such as configuration of interfaces, cards, shelves, and nodes, provisioning of circuits, routes, and protection paths, and monitoring of network performance and alarms. Its functionality and features are similar to those of the Tellabs 5500 NGX EMS and CLI. Its on-line help provides clear explanations of its procedures and functions.	The system NMS software application allows standard management functions to be performed.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-11	Remote Device Configuration and Control	A Tellabs 5500 NGX node can be remotely configured and controlled via the Tellabs 5500 NGX's Data Communications Channel.	System nodes were remotely configured and controlled via the system's Data Communications Channel.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-12	Hitless Software Upgrade	No traffic errors occur when the software on the Tellabs 5500 NGX is upgraded.	No traffic errors occurred when the software on the system was upgraded.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-13	Configuration Backup and Restore	The Tellabs 5500 NGX configuration can be saved to, and restored from, an external file.	The system configuration was saved to, and restored from, an external file.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-14	DS-1/DS-3 BER	The BER at a load of 100% of line rate for all available DS-1/DS-3 services is not greater than 10^{-12}.	DS-1: Zero bit errors. DS-3: Zero bit errors.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-15	DS-1/DS-3 Propagation Delay Latency	No errors on DS-1 and DS-3 services. Record the propagation delay.	DS-1 round trip delay – 2 ms DS-3 round trip delay – 2 ms	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET

Table A-1. Tellabs 5500 NGX Test Results (continued)

REQUIREMENT NUMBER	TITLE	REQUIRED RESULTS	ACTUAL RESULTS	REFERENCE	MET/NOT MET
Tellabs 5500 NGX SC-16	SONET BER	The BER at a load of 100% of line rate for all available SONET services was zero.	OC-3/STS-3: Zero bit errors. OC-12/STS-12: Zero bit errors. OC-48/STS-48: Zero bit errors. OC-3/VT1.5: Zero bit errors. OC-12/VT1.5: Zero bit errors.	UCR 2008 Section 5.5.4.2 SONET Interface Requirements	MET
Tellabs 5500 NGX SC-17	Total Aggregate Capacity	The Tellabs 5500 NGX runs error free under loading for 72 hours.	DS-1, DS-3, OC-3, and OC-12 services were run simultaneously over the OC-48 trunk without error for 72 hours.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-18	Basic Setup and IP Communication	The SONET analyzer detects a valid signal and frame and runs clean.	The SONET analyzer detected a valid signal and frame and ran clean.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-19	Timing and Synchronizatio n	No errors on the SONET analyzer when the status of the primary and secondary timing references change from working to failed when a good timing reference is still present.	System switched from BITS clock to line timing reference without error. System switched from BITS clock to holdover without error.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-20	Power Redundancy	No traffic errors during power switches. Descriptive alarms are reported to the Management System.	No traffic errors during power switches. Descriptive alarms were reported to the Management System.	UCR 2008 Section 5.5.4.10 Equipment Redundancy Requirements	MET
Tellabs 5500 NGX SC-21	Cross-Connect Module Card Operation	Test traffic is not affected during removal of the Cross-Connect Module card.	Test traffic was not affected during removal of the primary NGX Control Board.	UCR 2008 Section 5.5.4.10 Equipment Redundancy Requirements	MET
Tellabs 5500 NGX SC-22	Cross-Connect Module Card Redundancy	Test traffic is not affected during reboot of the Cross-Connect Module card.	Test traffic was not affected during reboot of the primary Cross-Connect Module card when the stand-by module was made active to facilitate the reboot process.	UCR 2008 Section 5.5.4.10 Equipment Redundancy Requirements	MET
Tellabs 5500 NGX SC-23	OC-3 Card Redundancy and APS 1+1 Operations	The Tellabs 5500 NGX OC-3 card is redundant. The APS switch time is less than 60 milliseconds.	The system OC-3 card was redundant. The APS switch time was less than 60 milliseconds. The test equipment screen turns red if the switch time exceeds 60 milliseconds.	UCR 2008 Section 5.5.3.12 Standards Compliance Requirements and 5.5.4.11 General Protection Requirements	MET

Table A-1. Tellabs 5500 NGX Test Results (continued)

REQUIREMENT NUMBER	TITLE	REQUIRED RESULTS	ACTUAL RESULTS	REFERENCE	MET/NOT MET
Tellabs 5500 NGX SC-24	OC-12 Card Redundancy and APS 1+1 Operations	The Tellabs 5500 NGX OC-12 card is redundant. The APS switch time is less than 60 milliseconds.	The system OC-12 card was redundant. The APS switch time was less than 60 milliseconds. The test equipment screen turns red if the switch time exceeds 60 milliseconds.	UCR 2008 Section 5.5.3.12 Standards Compliance Requirements and 5.5.4.11 General Protection Requirements	MET
Tellabs 5500 NGX SC-25	OC-48 Card Redundancy and APS 1+1 Operations	The Tellabs 5500 NGX OC-48 card is redundant. The APS switch time is less than 60 milliseconds.	The system OC-48 card was redundant. The APS switch time was less than 60 milliseconds. The test equipment screen turns red if the switch time exceeds 60 milliseconds.	UCR 2008 Section 5.5.3.12 Standards Compliance Requirements and 5.5.4.11 General Protection Requirements	MET
Tellabs 5500 NGX SC-26	Auto Discovery of Card Status	The Management System correctly identifies when cards are removed from the chassis, and it can auto-discover new cards when they are inserted.	Moved DS-3 card to new port and EMS automatically grayed out the old slot one position. The card appeared in slot 3.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-27	Unrestored Circuits	Unrestored circuits can be established and they are not rerouted after a network failure. These circuits remain down until the network failure is repaired.	Circuits remained down until the network failure is repaired as expected.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX SC-28	UPSR Restored Circuits	Circuits are rerouted around network failures.	Circuits were rerouted around network failures.	UCR 2008 Section 5.5.4.11 General Protection Requirements	MET

LEGEND:

APS	Automatic Protection Switching	MSPP	Multi-Service Provisioning Platform
BER	Bit Error Rate	Mux	Multiplexor
BITS	Building Integrated Timing Supply	OC	Optical Carrier
CLI	Command Line Interface	SC	Standards Conformance
DS	Digital Signal	SONET	Synchronous Optical Network
EMS	Element Management System	STS	Synchronous Transport Signal
IP	Internet Protocol	Sub	Subrate
ms	millisecond	T-1	digitally multiplexed telecommunications carrier
NGX	Next Generation Cross-Connect Switch	UCR	Unified Capabilities Requirements
NMS	Network Management System	UPSR	Unidirectional Path Switched Ring
M13	Multiplexor 13		

Table A-2. Tellabs 5500 NGX Interoperability Test Results

REQUIREMENT NUMBER	TITLE	REQUIRED RESULTS	ACTUAL RESULTS	REFERENCE	MET/NOT MET
Tellabs 5500 NGX IOP-1	Ethernet Throughput of DISN Core Traffic Transported Across the Tellabs 5500 NGX	Throughput with no frames lost for all frame sizes and all Ethernet services are not less than 95%.	Throughput with no frames lost for all frame sizes and all Ethernet services were 100%.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX IOP-2	Ethernet Frame Loss of DISN Core Traffic Transported Across the Tellabs 5500 NGX	The frame loss at a load of 100% of line rate for all frame sizes and all Ethernet services are not greater than 0.1%.	The frame loss was 0% for all Ethernet services transported across the 5500 NGX.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX IOP-3	Ethernet Latency of DISN Core Traffic Transported Across the Tellabs 5500 NGX	The latency at a load of 100% of line rate for all frame sizes and all Ethernet services is not greater than 60 milliseconds.	The latency at a load of 100% of line rate for all frame sizes and all Ethernet services reported by the test equipment was less than 1 millisecond.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX IOP-4	SONET BER of DISN Core Traffic Transported Across the Tellabs 5500 NGX	The BER at a load of 100% of line rate for all available SONET services is not greater than 10^{-12}.	Zero bit errors.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX IOP-5	O-UPSR Protect/Revert Switch Time for DISN Core Traffic Transported Across the Tellabs 5500 NGX	The Tellabs 5500 NGX's Protect Switch Time is not greater than 60 milliseconds. The Tellabs 5500 NGX's Revert Switch Time is not greater than 60 milliseconds.	The system's Protect Switch Time was not greater than 60 milliseconds as reported by the test equipment. The system's Revert Switch Time was not greater than 60 milliseconds as reported by the test equipment.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX IOP-6	SONET BER of Tellabs 5500 NGX Traffic Transported Across the DISN	The BER at a load of 100% of line rate for all available SONET services is not greater than 10^{-12}.	DS-1: Zero bit errors. DS-3: Zero bit errors. OC-3: Zero bit errors. OC-12: Zero bit errors.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET
Tellabs 5500 NGX IOP-7	DISN Protect/Revert Switch Time for Tellabs 5500 NGX Traffic Transported Across the DISN	The DISN Core MSPP Protect Switch Time is not greater than 60 milliseconds. The DISN Core MSPP Revert Switch Time is not greater than 60 milliseconds. The DISN Core ODXC Protect Switch Time is not greater than 60 milliseconds. The DISN Core ODXC Revert Switch Time is not greater than 60 milliseconds.	The DISN Core MSPP Protect Switch Time was not greater than 60 milliseconds. The DISN Core MSPP Revert Switch Time was not greater than 60 milliseconds. The DISN Core ODXC Protect Switch Time was not greater than 60 milliseconds. The DISN Core ODXC Revert Switch Time was not greater than 60 milliseconds.	UCR 2008 Section 5.5.4.1 MSPP, M13, Sub-T-1 Mux Requirements	MET

LEGEND:

BER	Bit Error Rate	OC	Optical Carrier
DISN	Defense Information Systems Network	ODXC	Optical Digital Cross-Connect
IOP	Interoperability	O-UPSR	Optical-Unidirectional Path Switched Ring
M13	Multiplexor 13	SONET	Synchronous Optical Network
MSPP	Multi Service Provisioning Platform	Sub	Subrate
Mux	Multiplexor	T-1	digitally multiplexed telecommunications carrier
NGX	Next Generation Cross-Connect Switch	UCR	Unified Capabilities Requirements

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