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IN REPLY REFER TO: Joint Interoperability Test Command (JTE) **7 Aug 12**

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Extension of the Special Interoperability Test Certification of the Fujitsu FLASHWAVE 4500 from Software Release 11.1 to Software Release 11.1.1

References: (a) Department of Defense Directive 4630.05, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) Department of Defense Instruction 8100.04, "DoD Unified Capabilities (UC)," 9 December 2010
(c) through (g), see Enclosure

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

2. The Fujitsu FLASHWAVE 4500, with Software Release 11.1, is hereinafter referred to as the System Under Test (SUT). The SUT meets all its critical interoperability requirements and JITC certifies the SUT for joint use in the Defense Information Systems Network (DISN) as a Fixed-Network Element (F-NE). The SUT provides additional optical transport interfaces and functional capabilities. JITC evaluated and certifies the SUT for optical transport for the Optical Carrier interfaces detailed in Table 1. Additional sponsor functional capabilities are addressed in Table 2. The operational status of the SUT will be verified during deployment. Any new discrepancies that are discovered in the operational environment will be evaluated for impact and adjudicated to the satisfaction of the DISA via a vendor Plan of Action and Milestones to address the concern(s) within 120 days of identification. JITC conducted testing using F-NE requirements within the Unified Capabilities Requirements (UCR) 2008, Change 1, Reference (c), and other sponsor requested requirements. JITC does not certify any other configurations, features, or functions, except those cited within this memorandum. This certification expires upon changes that could affect interoperability, but no later than three years from the date the DISA Certifying Authority (CA) provided a positive Recommendation.

3. The extension of this certification is based upon Desktop Review (DTR) 1, DTR 2, and DTR 4. JITC conducted interoperability testing at the Indian Head, Maryland, test facility from 22 February through 19 March 2010. A review of the current changes in the SUT in References (d), (e), (f) and comparison with the new requirements in Reference (c) was conducted on 15 June 2012 to certify the SUT for interoperability within the DISN without additional interoperability testing. The DISA Information Assurance (IA) CA reviewed the JITC published IA Assessment Report and provided a positive recommendation of the IA configuration on

3 December 2010. Defense IA/Security Accreditation Working Group (DSAWG) granted the accreditation on 22 December 2010, based on the security testing completed by the IA test team and published in a separate report, Reference (g).

DTR 1 included seven components, as listed in Table 3. DTR 2 updates the Software Release from 11.1 to 11.1.1, as listed in Table 4. DTR 4 included five components, as listed in Table 5. These components have the same exact functionality as previously tested and approved components in Software Release 11.1. JITC determined, through analysis, that there is minimal risk in approving the following DTRs. This change is unlikely to affect the interoperability of the certified F-NE. Therefore, JITC approves DTRs 1, 2, and 4. The DSAWG accreditation for DTRs 1, 2, and 4 was not required because it is relevant only to interoperability certification.

4. Table 1 shows the SUT Interface Interoperability Status and Table 2 shows the Capability and Feature Requirements used to evaluate the interoperability of the SUT.

Table 1. SUT Interface Interoperability Status

Interface		Critical (See note)	Reference (UCR 2008, Change 1)	Threshold CR/FR	Status	Remarks
NE	Analog	No	5.9.2.3.1	1, 2, and 4	NA	Not supported by the SUT.
	Serial	No	5.9.2.3.2	1, 2, and 4	NA	Not supported by the SUT.
	BRI ISDN	No	5.9.2.3.3	1, 2, and 4	NA	Not supported by the SUT.
	DS1	No	5.9.2.3.4	1, 2, 3, and 4	Certified	SUT met requirements for specified interfaces.
	E1	No	5.9.2.3.5	1, 2, 3, and 4	NA	Not supported by the SUT.
	DS3	No	5.9.2.3.6	1, 2, 3, and 4	Certified	SUT met requirements for specified interfaces.
	OC-X	No	5.9.2.3.8	1, 2, 3, and 4	Certified	SUT met requirements for the following interfaces: OC-3/3C, 12/12C- 48/48C STM-16; OC-192/STM-64.
	IP (Ethernet)	No	5.9.2.3.9	1, 2, 4, and 7	Certified	SUT met requirements for 10/100/1000.
NM	10Base-X	Yes	5.3.2.4.4	8	Certified	SUT met NM requirements for specified interfaces
	100Base-X	Yes	5.3.2.4.4	8	Certified	

NOTE: UCR does not specify any minimum interfaces. The SUT must minimally provide one of the listed ingress and egress interfaces specified.

LEGEND:

10Base-X	10 Mbps Ethernet generic designation	ISDN	Integrated Services Digital Network
100Base-X	100 Mbps Ethernet generic designation	Mbps	Megabits per second
BRI	Basic Rate Interface	NA	Not Applicable
CR	Capability Requirement	NE	Network Element
DS1	Digital Signal Level 1 (1.544 Mbps)	NM	Network Management
DS3	Digital Signal Level 3 (44.736 Mbps)	OC-X	Optical Carrier - X (OC-3, OC-12, etc.)
E1	European Interface Standard (2.048 Mbps)	STM	Synchronous Transport Module
FR	Functional Requirement	SUT	System Under Test
GbE	Gigabit Ethernet	UCR	Unified Capabilities Requirements
IP	Internet Protocol		

Table 2. SUT CRs and FRs Status

CR/ FR ID	Capability/Function	Applicability (See notes 1 and 2.)	Reference (UCR 2008, Change 1)	Status	Remarks
F-NE CR/FR					
1	**General NE Requirements**				
	General Requirements	Required	5.9.2.1	Met	
	Alarms	Required	5.9.2.1.1	Met	
	Congestion Control & Latency	Required	5.9.2.1.2	Met	
2	**Compression**				
	G.726	Conditional	5.9.2.2	NA	Not supported by the SUT.
	G.728	Conditional	5.9.2.2	NA	Not supported by the SUT.
	G.729	Conditional	5.9.2.2	NA	Not supported by the SUT.
3	**Interface Requirements**				
	Timing	Required	5.9.2.3.7	Met	
4	**Device Management**				
	Management Options	Required	5.9.2.4.1	Met	
	Fault Management	Conditional	5.9.2.4.2	Met	
	Loop-Back Capability	Conditional	5.9.2.4.3	Met	
	Operational Configuration Restoral	Required	5.9.2.4.4	Met	
5	**DLoS**				
	DLoS Transport	Conditional	5.9.2.4.5	NA	Not supported by the SUT.
6	**IPv6 Requirements**				
	Product Requirements	Required	5.3.5.4	Met	SUT is a Layer-2 device and transports IPv4 and IPv6 traffic transparently.
7	**NM Requirements**				
	VVoIP NMS Interface Requirements	Required	5.3.2.4.4	Met	
	General Management Requirements	Required	5.3.2.17.2	Met	
Other Tested Requirements					
8	**AGF Requirements**				
	AGF SONET Interface Requirements	Required	5.5.3.4.2	Partially Met	Certified based on sponsor requirements. See note 3.
	AGF SDH Interface Requirements	Required	5.5.3.4.3	Not Met	See note 4.
	AGF Electrical Interface Requirements	Required	5.5.3.4.4	Partially Met	Certified based on sponsor requirements. See note 5.
	AGF Ethernet Interface Requirements	Required	5.5.3.4.5	Partially Met	Certified based on sponsor requirements. See note 6.
	AGF SAN Interface Requirements	Required	5.5.3.4.6	Met	Certified based on sponsor requirements.
	AGF Cross-Connect Requirements	Required	5.5.3.4.7	Partially Met	Certified based on sponsor requirements. See note 7.
	AGF Interface Performance Requirements	Required	5.5.3.4.8	Met	Certified based on sponsor requirements.
	AGF Redundancy Requirements	Required	5.5.3.4.9	Partially Met	Certified based on sponsor requirements. See note 8.
	AGF General Protection Requirements	Required	5.5.3.4.10	Met	Certified based on sponsor requirements.
	AGF Interoperability Requirements	Required	5.5.3.4.11	Met	Certified based on sponsor requirements.
	AGF Fault Management Requirements	Required	5.5.3.4.12	Met	Certified based on sponsor requirements.

Table 2. SUT CRs and FRs Status (continued)

CR/FR ID	Capability/Function	Applicability (See notes 1 and 2.)	Reference (UCR 2008, Change 1)	Status	Remarks
8 (cont)	AGF Performance Monitoring Requirements	Required	5.5.3.4.13	Partially Met	Certified based on sponsor requirements. See note 9.
	AGF Functional Device Requirements	Required	5.5.3.4.14	Partially Met	Certified based on sponsor requirements. See note 10.
	AGF Functional Device Interface Performance Requirements	Required	5.5.3.4.15	Met	Certified based on sponsor requirements.
	AGF Functional Device EMS Requirements	Required	5.5.3.4.16	Partially Met	Certified based on sponsor requirements. See note 11.
	AGF Physical Design Requirements	Required	5.5.3.4.17	Partially Met	Certified based on sponsor requirements. See note 12.
	AGF Standards Compliance Requirements	Required	5.5.3.4.18	Partially Met	Certified based on sponsor requirements. See note 13.

NOTES:
1. Applicability refers to the high level roll-up of section requirements. A detailed listing of individual requirements applicability is provided in Enclosure 3.
2. The sponsor requested the SUT be assessed against UCR 2008, Section 5.5 as an AGF device.
3. The SUT does not support the following: OC-3 SFP, OC-12 SFP, OC-48 SFP, OC-192 XFP: IR-1, IR-2, LR-1, LR-2, LR-3, and MM.
4. The SUT does not support SDH.
5. The SUT does not support FDL Status Messages.
6. The SUT does not support Transparent VLAN Tagging.
7. The SUT SONET Cross Connect fabric supports only 300 Gbps instead of the required 320 Gbps. The SUT Ethernet Switch fabric does not support the required 20 G of IP Switch fabric.
8. The SUT does not support 1:1 redundancy for DS3.
9. The SUT does not support PM capability on all the supported interfaces.
10. The SUT DS1/E1 Line Terminations does not provide both DS1/E1 Terminal and Service Loop-Back Capabilities.
11. The SUT EMS does not report Physical Layer (Layer 1) Statistics. The SUT is not able to Provision Circuit Using Different Types Of Cross-Connects.
12. The SUT complies up to 13,000 feet; Low Altitude was not tested.
13. The SUT did not meet the following: the IEEE Standards for LAN and MANs, Virtual Bridged LANs, IEEE 802.1Q-2003, X3-230, ANSI INCITS 374-2003, Information FC-SB-3 and ANSI INCITS 230:1994, Information Technology Fiber Channel Physical and Signaling Interface.

Table 2. SUT CRs and FRs Status (continued)

LEGEND:

ADPCM	Adaptive Differential Pulse Code Modulation	IPv4	Internet Protocol version 4
AGF	Aggregation Grooming Function	IPv6	Internet Protocol version 6
ANSI	American National Standards Institute	IR	Intermediate Reach
CR	Capability Requirement	Kbps	Kilobits per second
CS-ACELP	Conjugate Structure Algebraic Code-Excited Linear Prediction	LAN	Local Area Network
		LD-CELP	Low Delay-Code Excited Linear Prediction
DLoS	Direct Line of Sight	LR	Long Reach
DS	Digital Signal	MAN	Metropolitan Area Network
E1	European Interface Standard (2.048 Mbps)	MM	Multiplexor Module
EMS	Element Management System	NA	Not Applicable
F-NE	Fixed Network Element	NE	Network Element
FC-SB-S3	Fiber Channel- Single-Byte Command Code Sets Mapping Protocol 3	NM	Network Management
		NMS	Network Management System
FDL	Fiber Delay Line	OC	Optical Carrier
FR	Functional Requirement	OTS	Optical Transport System
G	Gigabit	PM	Power Management
G.726	ITU-T speech codec for ADPCM (32 Kbps)	SAN	Storage Area Network
G.728	ITU-T speech codec for LD-CELP (16 Kbps)	SDH	Secure Digital Host
G.729	ITU-T speech codec for CS-ACELP (8 Kbps)	SFP	Small Form Pluggable
Gbps	Gigabits per second	SONET	Synchronous Optical Network
ID	Identification	SUT	System Under Test
IEEE	Institute of Electrical and Electronics Engineers	UCR	Unified Capabilities Requirements
INCITS	International Committee for Information Technology Standards	VLAN	Virtual Local Area Network
		VVoIP	Voice and Video over Internet Protocol
IP	Internet Protocol	XFP	Small Form Factor

Table 3 lists the equipment used for DTR 1 testing.

Table 3. List of DTR 1 Equipment to be included in the Original Certification

DTR 1 - New Components Part Number	Description	Comparable Approved Components Part Number
FC9570B40A	CWDM SFP – 1611 nm OC3/12/48	FC9570B40B
FC9570B40C	CWDM SFP - 1571 nm OC3/12/48	
FC9570B40D	CWDM SFP – 1551 nm OC3/12/48	
FC9570B40E	CWDM SFP - 1531 nm OC3/12/48	
FC9570B40F	CWDM SFP – 1511 nm OC3/12/48	
FC9570B40G	CWDM SFP – 1491 nm OC3/12/48	
FC9570B40H	CWDM SFP - 1471 nm OC3/12/48	

LEGEND:

CWDM	Coarse Wavelength Division Multiplexer	OC	Optical Carrier
DTR	Desktop Review	SFP	Small Form Pluggable
nm	nanometer		

Table 4 lists the differences between Software Release 11.1 to 11.1.1 in DTR 2.

Table 4. DTR 2 Software Revision to be included in the Original Certification

DTR 2 Objective/Issue	Description of Change	Original Revision Number	New Revision Number
If an RPR facility is provisioned while the system is operating Software Release 7.1, the software cannot be upgraded to Software Release 11.1.	Release 11.1.1 corrects an issue whereby the software cannot be upgraded from Release 7.1 to Release 11.1. By performing this change, the objective described is achieved. No existing FLASHWAVE 4500 hardware will become obsolete as a result of the availability of Software Release 11.1.1.	FC9580CR11-I01	FC9580CR11-I02
In a multi-shelf configuration, an SPLTE and SPLTF test access connection may be denied when an STS is provisioned with RDLINE=Y or has a Standing Manual or Forced Switch.			
In some cases, RTRV/RTRVBULK-CRS-VT1 does not report VT cross-connects made to LO-TPORT unit even though the cross connects exists.			
The STS database corrupts when a HO-TPORT unit with two or more STS cross connects established has one cross connect deleted and a PSW cross connect added.			

LEGEND:

CRS	Cross Connect	RPR	Resilient Packet Ring
DTR	Desktop Review	RTRV	Retrieve
HO-TPORT	High Order – Transmission port	RTRVBULK	Retrieve Bulk
LO-TPORT	Low Order – Transmission port	SPLTE	Split E
PSW	Path Switch	SPLTF	Split F
RDLINE=Y	Red Line equals Yes (prevents deletion of cross-connects)	STS	Synchronous Transport Signal
		VT	Virtual Tributaries

Table 5 lists the equipment used for DTR 4 testing.

Table 5. DTR 4 Equipment to be included in the Original Certification

DTR 4 - New Components Part Number	Description	Comparable Approved Components Part Number
FC95700020	OC-3 IR-1 SFP	FC95700021
FC95700050	OC-12 IR-1 SFP	FC95700051
FC95700170	OC-48 Multi-rate IR-1 SFP	FC95700090
P4500CPU2R1111A	Pre-loaded CPU2 with Software Rls 11.1.1	PL4500CPU2R1111A
P4500DCC2R1111A	Pre-loaded DCC2 with Software Rls 11.1.1	PL4500DCC2R1111A

LEGEND:

CPU2	Central Processing Unit x 2	OC-3	Optical Carrier Level 3 (155 Mbps)
DCC2	Distributed, Collaborative Command and Control	OC-12	Optical Carrier Level 12 (622 Mbps)
DTR	Desktop Review	OC-48	Optical Carrier Level 48 (2.448 Gbps)
Gbps	Gigabits per second	Rls	Release
IR	Intermediate Reach	SFP	Small Form Pluggable
Mbps	Megabits per second		

5. In accordance with the Program Manager's request, JITC did not develop a detailed test report. JITC distributes interoperability information via the JITC Electronic Report Distribution 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, which .mil/.gov users can access 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 at http://jit.fhu.disa.mil (NIPRNet). Information related to Approved Products List (APL) testing is available on the DISA APL Testing and Certification website located at http://www.disa.mil/Services/Network-Services/UCCO. All associated test information is available on the DISA Unified Capability Certification Office APL Integrated Tracking System (APLITS) website located at https://aplits.disa.mil.

6. The JITC testing point of contact is Mr. Son Pham, commercial (301) 743-4258. His e-mail address is Son.m.Pham2.civ@mail.mil; mailing address: 3341 Strauss Avenue, Suite 236, Indian Head, MD 20640-5149. The tracking number for the SUT is 0928102.

FOR THE COMMANDER:

Enclosure a/s

for RICHARD A. MEADOR
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ADDITIONAL REFERENCES

(c) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008 Change 1," January 2010
(d) Fujitsu Desk Top Review (DTR) 1 Reference Document, "Fujitsu FLASHWAVE 4500 R11.1 TN 0928102 DTR-1," 21 March 2011
(e) Fujitsu Desk Top Review (DTR) 2 Reference Document, "Fujitsu FLASHWAVE 4500 R11.1 TN 0928102 DTR-2" 27 April 2011
(f) Fujitsu Desk Top Review (DTR) 4 Reference Document, "Fujitsu FLASHWAVE 4500 R11.1 TN 0928102 DTR-4," 07 September 2011
(g) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of Fujitsu Network Communications, Inc. FLASHWAVE 4500 Fixed Network Element (F-NE), Software Release 11.1, (TN0928102)," 03 December 2010

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