



## DEFENSE INFORMATION SYSTEMS AGENCY

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

7 Mar 13

### MEMORANDUM FOR DISTRIBUTION

SUBJECT: Extension of the Special Interoperability Test Certification of the Cisco 2900 Series from Internetwork Operating System (IOS) 15.1(4)M3 to IOS 15.1(4)M5

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 (f), see Enclosure

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

2. The Cisco 2951 with IOS 15.1(4)M3 is hereinafter referred to as the System Under Test (SUT). The SUT meets all of its critical interoperability requirements for joint use within the Defense Information System Network (DISN) as a High Availability Customer Edge Router (CER). When a CER meets the High Availability CER requirements, it is also certified as a Medium Availability with System Quality Factors (SQF), Medium Availability without SQF, and Low Availability CER. The SUT met the High Availability and Medium Availability with SQF CER requirements in a dual-chassis configuration. The SUT met the critical interoperability requirements set forth in Reference (c), using test procedures derived from Reference (d). The SUT met the critical interoperability requirements for the following Wide Area Network (WAN) interfaces: Institute of Electrical and Electronics Engineers (IEEE) 802.3i (10BaseT), IEEE 802.3u (100BaseT), Digital Signal Level (DS)1 and DS3. The SUT also met the critical interoperability requirements for the following Assured Services Local Area Network (ASLAN) interfaces: IEEE 802.3i (10BaseT), IEEE 802.3u (100BaseT), and IEEE 802.3ab (1000BaseT). The Cisco 2921, 2911 and 2901 employ the same software and similar hardware as the SUT. JITC analysis determined these systems to be functionally identical to the SUT for interoperability certification purposes and therefore, they are also certified for joint use. No other configurations, features, or functions, except those cited within this memorandum, are certified by JITC. This certification expires upon changes that could affect interoperability, but no later 8 August 2015, which is no later than three years from the date of the Unified Capabilities (UC) Approved Products List (APL) memorandum.

3. The extension of this certification is based upon Desktop Review (DTR) 1. The original certification, documented in Reference (e), is based on interoperability testing conducted by JITC, review of the vendor's Letters of Compliance (LoC), DISA adjudication of open test

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discrepancy reports (TDRs), and DISA Certifying Authority (CA) Recommendation of the Information Assurance (IA) configuration. Interoperability testing was conducted by JITC, Fort Huachuca, Arizona, from 2 April through 1 May 2012. Review of the vendor’s LoC was completed on 12 June 2012. DISA adjudication of outstanding TDRs was completed on 10 July 2012. The DISA CA provided a positive Recommendation on 1 June 2012 based on the security testing completed by DISA-led IA test teams and published in a separate report, Reference (f). This DTR was requested to update from IOS 15.1(4)M3 to IOS 15.1(4)M5. This release includes IA fixes. JITC determined IA Verification and Validation (V&V) testing was required prior to approval. The DISA-led IA test team conducted V&V testing on 14 January 2013 and successfully verified the IA changes associated with this DTR. JITC analysis determined that this IOS update would not have any impact on the interoperability of the SUT; therefore, no interoperability testing was conducted. The DISA CA provided a positive recommendation for this update on 7 March 2013. Therefore, JITC approves this DTR. The results of the IA testing are published in a separate report, Reference (f).

4. The interface, Capability Requirement (CR) and Functional Requirement (FR), and component status of the SUT are listed in Tables 1 and 2. The threshold CR/FRs for CERs are established by Section 5.3.2.14 of Reference (c) and were used to evaluate the interoperability of the SUT.

**Table 1. SUT Interface Interoperability Status**

Interface	Critical	UCR Reference	Threshold CR/FR (See note.)	Status	Remarks
<b>ASLAN Interfaces</b>					
10Base-X	Yes	5.3.2.4.2 5.3.2.14.9	1-3	Certified	The SUT met all critical CRs and FRs for the IEEE 802.3i (10BaseT) interface.
100Base-X	Yes	5.3.2.4.2 5.3.2.14.9	1-3	Certified	The SUT met all critical CRs and FRs for the IEEE 802.3u (100BaseT) interface.
1000Base-X	No	5.3.2.4.2 5.3.2.14.9	1-3	Certified	The SUT met all critical CRs and FRs for the IEEE 802.3ab (1000BaseT) interface.
10GBase-X	No	5.3.2.4.2 5.3.2.14.9	1-3	Not Tested	This interface is not supported and is not required.
<b>WAN Interfaces</b>					
10Base-X	Yes	5.3.2.4.2 5.3.2.14.9	1-3	Certified	The SUT met all critical CRs and FRs for the IEEE 802.3i (10BaseT) interface.
100Base-X	Yes	5.3.2.4.2 5.3.2.14.9	1-3	Certified	The SUT met all critical CRs and FRs for the IEEE 802.3u (100BaseT) interface.
1000Base-X	No	5.3.2.4.2 5.3.2.14.9	1-3	Not Tested	This interface is not supported and is not required.
10GBase-X	No	5.3.2.4.2 5.3.2.14.9	1-3	Not Tested	This interface is not supported and is not required.
DS1	No	5.3.2.14.9	1-2	Certified	The SUT met all critical CRs and FRs for this interface.
DS3	No	5.3.2.14.9	1-2	Not Tested	The SUT met all critical CRs and FRs for this interface.
E1	No	5.3.2.14.9	1-2	Not Tested	This interface is supported; however, it was not tested and is not required.
E3	No	5.3.2.14.9	1-2	Not Tested	This interface is supported; however, it was not tested and is not required.
EIA-530	No	5.3.2.14.9	1-2	Not Tested	This interface is not supported and is not required.
OC-X	No	5.3.2.14.9	1-2	Not Tested	This interface is not supported and is not required.

**Table 1. SUT Interface Interoperability Status (continued)**

Interface	Critical	UCR Reference	Threshold CR/FR (See note.)	Status	Remarks																																												
<b>Network Management Interfaces</b>																																																	
10Base-X	Yes	5.3.2.4.4	4	Certified	The SUT met all critical CRs and FRs for the IEEE 802.3i (10BaseT) interface.																																												
100Base-X	Yes	5.3.2.4.4	4	Certified	The SUT met all critical CRs and FRs for the IEEE 802.3u (100BaseT) interface.																																												
1000Base-X	No	5.3.2.4.4 5.3.2.14.9	4	Certified	The SUT met all critical CRs and FRs for the IEEE 802.3ab (1000BaseT) interface.																																												
<p><b>NOTE:</b> The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in Reference (e), Enclosure 3. The system under test does not need to provide conditional requirements. However, if a capability is provided, it must function according to the specified requirements.</p> <p><b>LEGEND:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">802.3ab</td> <td style="width: 35%;">1000BaseT Gbps Ethernet over twisted pair at 1 Gbps (125 Mbps)</td> <td style="width: 15%;">EIA</td> <td style="width: 35%;">Electronic Industries Alliance</td> </tr> <tr> <td>802.3i</td> <td>10BaseT Mbps over twisted pair</td> <td>EIA-530</td> <td>Standard for 25-position interface for DTE and DCE employing serial binary data interchange</td> </tr> <tr> <td>802.3u</td> <td>Standard For Carrier Sense Multiple Access With Collision Detection At 100 Mbps</td> <td>FR</td> <td>Functional Requirement</td> </tr> <tr> <td>ASLAN</td> <td>Assured Services Local Area Network</td> <td>Gbps</td> <td>Gigabits per second</td> </tr> <tr> <td>CR</td> <td>Capability Requirement</td> <td>IEEE</td> <td>Institute of Electrical and Electronics Engineers</td> </tr> <tr> <td>DCE</td> <td>Data Circuit-Terminating Equipment</td> <td>LoC</td> <td>Letter of Compliance</td> </tr> <tr> <td>DS1</td> <td>Digital Signal Level 1 (1.544 Mbps)</td> <td>Mbps</td> <td>Megabits per second</td> </tr> <tr> <td>DS3</td> <td>Digital Signal Level 3</td> <td>OC</td> <td>Optical Carrier</td> </tr> <tr> <td>DTE</td> <td>Data Terminal Equipment</td> <td>SUT</td> <td>System Under Test</td> </tr> <tr> <td>E1</td> <td>European Digital Multiplex Rate (2.048 Mbps)</td> <td>UCR</td> <td>Unified Capabilities Requirements</td> </tr> <tr> <td></td> <td></td> <td>WAN</td> <td>Wide Area Network</td> </tr> </table>						802.3ab	1000BaseT Gbps Ethernet over twisted pair at 1 Gbps (125 Mbps)	EIA	Electronic Industries Alliance	802.3i	10BaseT Mbps over twisted pair	EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	802.3u	Standard For Carrier Sense Multiple Access With Collision Detection At 100 Mbps	FR	Functional Requirement	ASLAN	Assured Services Local Area Network	Gbps	Gigabits per second	CR	Capability Requirement	IEEE	Institute of Electrical and Electronics Engineers	DCE	Data Circuit-Terminating Equipment	LoC	Letter of Compliance	DS1	Digital Signal Level 1 (1.544 Mbps)	Mbps	Megabits per second	DS3	Digital Signal Level 3	OC	Optical Carrier	DTE	Data Terminal Equipment	SUT	System Under Test	E1	European Digital Multiplex Rate (2.048 Mbps)	UCR	Unified Capabilities Requirements			WAN	Wide Area Network
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**Table 2. SUT CRs and FRs Status**

CR/FR ID	Capability/Function	Applicability <sup>1</sup>	UCR Reference	Status	Remarks
<b>Product Interface Requirements</b>					
<b>1</b>	Internal Interface Requirements	Required	5.3.2.4.1	Met	The SUT met all critical CRs and FRs.
	External Physical Interfaces between Network Components	Required	5.3.2.4.2	Met	The SUT met all critical CRs and FRs.
	IP Queue Control Capabilities	Required	5.3.2.17.3.4.2.12 para 1	Met	The SUT met all critical CRs and FRs.
	DSCP	Required	5.3.3.3.2	Met	The SUT met all critical CRs and FRs.
	VVoIP Per-Hop Behavior Requirements	Required	5.3.3.3.3	Met	The SUT met all critical CRs and FRs.
	Traffic Conditioning Requirements	Required	5.3.3.3.4	Met	The SUT met all critical CRs and FRs.
<b>CER Requirements</b>					
<b>2</b>	Traffic Conditioning	Required	5.3.2.14.1	Met	The SUT met all critical CRs and FRs.
	Differentiated Services Support	Required	5.3.2.14.2	Met	The SUT met all critical CRs and FRs.
	Per Hop Behavior Support	Required	5.3.2.14.3	Met	The SUT met all critical CRs and FRs.
	Interface to the LSC/MFSS for Traffic Conditioning	Conditional	5.3.2.14.4	Not Tested	The SUT does not support this feature and it is not required.
	Interface to the LSC/MFSS for Bandwidth Allocation	Conditional	5.3.2.14.5	Not Tested	The SUT does not support this feature and it is not required.
	Availability	Required	5.3.2.14.7	Met	The SUT met all critical CRs and FRs. The SUT met High Availability CER requirements. <sup>2</sup>
	Packet Transit Time	Required	5.3.2.14.8	Met	The SUT met all critical CRs and FRs.

**Table 2. SUT CRs and FRs Status (continued)**

CR/FR ID	Capability/Function	Applicability <sup>1</sup>	UCR Reference	Status	Remarks
<b>CER Requirements (continued)</b>					
2	CER Interfaces and Throughput Support	Required	5.3.2.14.9	Met	The SUT met all critical CRs and FRs.
	Assured VVoIP Latency	Required	5.3.3.4.1	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Assured VVoIP CE Latency	Required	5.3.3.4.3	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Assured VVoIP CER-to-CER Latency	Required	5.3.3.4.5	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Assured VVoIP CER-to-CER Jitter	Required	5.3.3.5.3	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Assured VVoIP CE Jitter	Required	5.3.3.5.4	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Assured VVoIP CER-to-CER Packet Loss	Required	5.3.3.6.3	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Assured VVoIP CE Packet Loss	Required	5.3.3.6.4	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	End-to-End Availability	Required	5.3.3.12.1	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Availability Design Factors	Required	5.3.3.12.2	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Product Quality Factors	Required	5.3.3.12.3	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Layer 1 – Physical Layer	Required	5.3.3.12.4.1	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Layer 2 – Data Link Layer	Required	5.3.3.12.4.2	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	Provisioning	Required	5.3.3.13	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
	IP Routing Protocols	Required	5.3.3.14	Met	The SUT met this requirement with Static Routing, BGP-4, IS-IS, OSPFv2, OSPFv3, and VRRP.
	Voice Grade of Service	Required	5.3.3.15	Met	The SUT met all critical CRs and FRs. <sup>3</sup>
Survivability	Required	5.3.3.16	Not Tested	This is an E2E engineering requirement and is not testable in a lab environment. <sup>4</sup>	
<b>IPv6 Requirements</b>					
3	IPv6	Required	5.3.3.10	Met	The SUT met all critical CRs and FRs.
	Product Requirements	Required	5.3.5.4	Met	The SUT met all critical CRs and FRs with the following minor exception: The SUT does not support the following RFCs 4301 and 4303. <sup>5</sup>
<b>NM Requirements</b>					
4	VVoIP NMS Interface Requirements	Required	5.3.2.4.4	Met	The SUT met all critical CRs and FRs for the 10/100/1000BaseT interfaces. This was met by the vendor's LoC.
	NM Requirements for CERs	Required	5.3.2.18.1	Met	The SUT met all critical CRs and FRs for the 10/100/1000BaseT interfaces. This was met by the vendor's LoC.
	NM	Required	5.3.2.14.6	Met	The SUT met all critical CRs and FRs for the 10/100/1000BaseT interfaces. This was met by testing and the vendor's LoC.
<p><b>NOTES:</b></p> <p>1. The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in Reference (e), Enclosure 3.</p> <p>2. If a CER meets the High Availability CER requirements, it meets all of the lesser requirements for Medium Availability with and without SQF and Low Availability. The Cisco 2951 meets the High Availability with a dual-chassis configuration. The Cisco 2921, 2911 and 2901 CERs were not tested; however, they employ the same software and similar hardware as the Cisco 2951. JITC analysis determined these systems to be functionally identical to the 2951 for interoperability certification purposes and therefore, they are also certified for joint use.</p> <p>3. This requirement was verified in an emulated operational environment. To meet E2E requirements, the SUT must be deployed IAW its deployment guide and the engineering guidelines provided in UCR 2008, Change 3, section 5.3.3.</p>					

**Table 2. SUT CRs and FRs Status (continued)**

<b>NOTES (continued):</b>			
4. This requirement was verified in an operational emulated environment. To meet E2E requirements, the SUT must be deployed in accordance with its deployment guide and the engineering guidelines provided in UCR Section 5.3.3.			
5. The vendor submitted an IPv6 LoC with the following noted discrepancy: The SUT does not support RFCs 4301 and 4303. DISA adjudicated this deficiency as minor because this RFC addresses requirements for IPSec, which is an optional requirement and is not implemented in the certified configuration.			
<b>LEGEND:</b>			
BGP	Border Gateway Protocol	LoC	Letters of Compliance
B/P/C/S	Base/Post/Camp/Station	LSC	Local Session Controller
CE	Customer Edge	MFSS	Multifunction Softswitch
CER	Customer Edge Router	NM	Network Management
CR	Capability Requirement	NMS	Network Management System
DSCP	Differentiated Services Code Point	POA&M	Plan of Actions and Milestones
E2E	End-to-End	RFC	Request for Comments
FR	Functional Requirement	OSPF	Open Shortest Path First
IAW	in accordance with	SQF	System Quality Factors
ID	Identification	SUT	System Under Test
IP	Internet Protocol	UCR	Unified Capabilities Requirements
IPv6	Internet Protocol version 6	VRRP	Virtual Router Redundancy Protocol
IS-IS	Intermediate System-Intermediate System	VVoIP	Voice and Video over Internet Protocol
JITC	Joint Interoperability Test Command		

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). 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: [disa.meade.ns.list.unified-capabilities-certification-office@mail.mil](mailto:disa.meade.ns.list.unified-capabilities-certification-office@mail.mil).

JITC Memo, JTE, Extension of the Special Interoperability Test Certification of the Cisco 2900 Series from Internetwork Operating System (IOS) 15.1(4)M3 to IOS 15.1(4)M5

6. The JITC point of contact is Capt Jonathan Kim, DSN 879-5182, commercial (520) 538-5182, FAX DSN 879-4347, or e-mail to jonathan.s.kim.mil@mail.mil. JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The UCCO tracking number for the SUT is 1116703.

FOR THE COMMANDER:

Enclosure a/s

  
for RICHARD A. MEADOR  
Chief  
Battlespace Communications Portfolio

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DOT&E, Netcentric Systems and Naval Warfare  
Medical Health Systems, JMIS IV&V  
HQUSAISEC, AMSEL-IE-IS  
UCCO

## **ADDITIONAL REFERENCES**

- (c) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008, Change 3," September 2011
- (d) Joint Interoperability Test Command, "Unified Capabilities Test Plan (UCTP)," Draft
- (e) Joint Interoperability Test Command, Memo, JTE, "Special Interoperability Test Certification of the Cisco 2900 Series with Internetwork Operating System (IOS) 15.1(4)M3," 6 August 2012
- (f) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of Cisco 2900 Release (Rel.) 15.1(4)M (Tracking Number 1116703)," Draft