



## DEFENSE INFORMATION SYSTEMS AGENCY

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

**10 Nov 11**

### MEMORANDUM FOR DISTRIBUTION

SUBJECT: Extension of the Special Interoperability Test Certification of the Brocade NetIron XMR Series Release 5.1.01

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 (g), see Enclosure 1

1. References (a) and (b) establish Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification.
2. The Brocade NetIron NI-XMR-8-AC Release 5.1.01 is 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 an Assured Services Local Area Network (ASLAN) Core, Distribution, and Access Layer switch. The SUT is certified as interoperable for joint use with other ASLAN components listed on the Unified Capabilities (UC) Approved Products List (APL) with the following interfaces: 10000/1000Base SX/LX and 100/1000BaseFX. The SUT meets the critical interoperability requirements set forth in Reference (c), using test procedures derived from Reference (d). The Brocade NetIron NI-XMR-32-AC-A, NI-XMR-16-AC, NI-XMR-4-AC, NI-XMR-32-DC, NI-XMR-16-DC, NI-XMR-8-DC, and NI-XMR-4-DC switches employ the same software and hardware as the SUT. JITC analysis determined these systems to be functionally identical to the SUT for interoperability certification purposes and they are also certified for joint use.

The SUT is certified to support Assured Services within an ASLAN. If a component meets the minimum requirements for deployment in an ASLAN, it also meets the lesser requirements for deployment in a non-ASLAN. Non-ASLANs are "commercial grade" and provide support to Command and Control (C2) (ROUTINE only calls) (C2(R)) or non-C2 voice subscribers. When deployed in a non-ASLAN, the SUT may also be used to receive all levels of precedence, but is limited to supporting calls that are originated at ROUTINE precedence only. Non-ASLANs do not meet the availability or redundancy requirements for C2 or Special C2 users and therefore are not authorized to support precedence calls originated above ROUTINE.

Testing of the SUT did not include video services or data applications; however, simulated preferred data, best effort data, voice, and video traffic was generated during testing to determine the SUT's ability to prioritize and properly queue voice media and signaling traffic. No other configurations, features, or functions, except those cited within this document, are certified by

JITC. This certification expires upon changes that could affect interoperability, but no later than three years from the date the Defense Information Systems Agency (DISA) Certifying Authority (CA) provided a positive Recommendation.

3. The extension of this certification is based on Desktop Review (DTR) 1. The original is based on interoperability testing conducted by JITC, review of the vendor’s Letters of Compliance (LoC), and DISA CA Recommendation. Interoperability testing was successfully conducted by JITC, Fort Huachuca, Arizona, from 3 January through 4 March 2011. Review of the vendor’s LoC was completed on 19 March 2011. The DISA CA provided a positive Recommendation on 4 April 2011 based on the security testing completed by DISA-led IA test teams and published in a separate report, Reference (g). This DTR request included the change of software from 5.1.01 to 5.1.01b and the addition of Multiprotocol Label Switching (MPLS). JITC determined there was minor risk in approving the software upgrade since the 5.1.01b software provides enhancements and would not change the interoperability results. JITC determined Verification and Validation (V&V) testing of MPLS was required prior to approval. V&V interoperability testing of the changes associated with this DTR was successfully conducted from 5 July through 22 July 2011. The SUT met all critical requirements for MPLS. All open discrepancies were adjudicated by DISA on 25 October 2011; therefore JITC approves this DTR. The IA posture of this DTR did not change; therefore, the DISA CA approval date of 4 April 2011 remains the same.

4. Table 1 provides a Unified Capabilities Approved Products List (UC APL) product summary. The interface, Capability Requirements (CR) and Functional Requirements (FR), and component status of the SUT is listed in Tables 2 and 3. The threshold Capability/Functional requirements for ASLAN components are established by Section 5.3.a of Reference (c) and were used to evaluate the interoperability of the SUT. Figure 1 depicts the MPLS homogeneous test configuration of the SUT. Figure 2 depicts the MPLS heterogeneous test configuration of the SUT with Juniper.

**Table 1. UC APL Product Summary**

Component (See note.)	Release	Sub-Component (See note.)	Certification Applicability		
			Core	Distribution	Access
<u>Brocade NetIron NI-XMR-8-AC</u>	5.1.01b	<u>NI-XMR-MR</u> NI-XMR-32-MR	Yes	Yes	Yes
		NI-X-SF1 <u>NI-X-SF3</u> NI-X-32-SF			
		NI-XMR-10Gx2 <u>NI-XMR-10Gx4</u> BR-MLX-10Gx4-X			
		<u>NI-XMR-1Gx20-SFP</u> BR-MLX-1GFX24-X BR-MLX-1GFX24-X-ML			
		<u>NI-XMR-1Gx20-GC</u> BR-MLX-1GCX24-X BR-MLX-1GCX24-X-ML			
Brocade NetIron XMR-32-AC-A	5.1.01b	Same as above. See note.	Yes	Yes	Yes
Brocade NetIron NI- XMR-16-AC	5.1.01b	Same as above. See note.	Yes	Yes	Yes
Brocade NetIron NI- XMR-8-AC	5.1.01b	Same as above. See note.	Yes	Yes	Yes
Brocade NetIron XMR-4-AC	5.1.01b	Same as above. See note.	Yes	Yes	Yes

JITC Memo, JTE, Extension of the Special Interoperability Test Certification of the Brocade NetIron XMR Series Release 5.1.01

Brocade NetIron XMR-32-DC	5.1.01b	Same as above. See note.	Yes	Yes	Yes
Brocade NetIron NI- XMR-16-DC	5.1.01b	Same as above. See note.	Yes	Yes	Yes
Brocade NetIron XMR-4-DC	5.1.01b	Same as above. See note.	Yes	Yes	Yes



**Table 3. SUT CRs and FRs Status**

CR/FR ID	Capability/ Function	Applicability (See note 1.)	UCR Reference	Status	Remarks
1	<b>General Performance Parameters</b>				
	Performance Parameters	Required	5.3.1.3	Met	
	Port Interface Rates	Required	5.3.1.3.1	Met	
	Port Parameter Requirements	Required	5.3.1.3.2	Met	
	Class of Service Markings	Required	5.3.1.3.3	Met	
	VLAN Capabilities	Required	5.3.1.3.4	Met	
	Protocols	Required	5.3.1.3.5	Met	
	QoS Features	Required	5.3.1.3.6	Met	
Network Monitoring	Required	5.3.1.3.7	Met		
Security	Required	5.3.1.3.8	Met	See note 2.	
2	<b>E2E Performance Requirements</b>				
	Voice Services	Required	5.3.1.4.1	Met	
	Video services	Required	5.3.1.4.2	Met	
	Data services	Required	5.3.1.4.3	Met	
3	<b>NM Requirements</b>				
	Configuration Control	Required	5.3.1.6.1	Met	
	Operational Changes	Required	5.3.1.6.2	Met	
	Performance Monitoring	Required	5.3.1.6.3	Met	
	Alarms	Required	5.3.1.6.4	Met	
	Reporting	Required	5.3.1.6.5	Met	
4	<b>Engineering Requirements</b>				
	Physical Media	Required	5.3.1.7.1	Site requirement	
	Traffic Engineering	Required	5.3.1.7.3	Site requirement	Configured with four queues, each set to 25% of total bandwidth.
	Availability	Required	5.3.1.7.6	Partially driven by topology	100% availability during test.
	Redundancy	Required	5.3.1.7.7	Met	
5	<b>MPLS</b>				
	MPLS Requirements	Conditional	5.3.1.8.4.1	Partially Met	See note 3.
	MPLS VPN Augmentation to VLANs	Conditional	5.3.1.8.4.2	Partially Met	See note 3.
6	<b>IPv6 Requirements</b>				
	Product Requirements	Required	5.3.5.4	Partially Met	See note 3

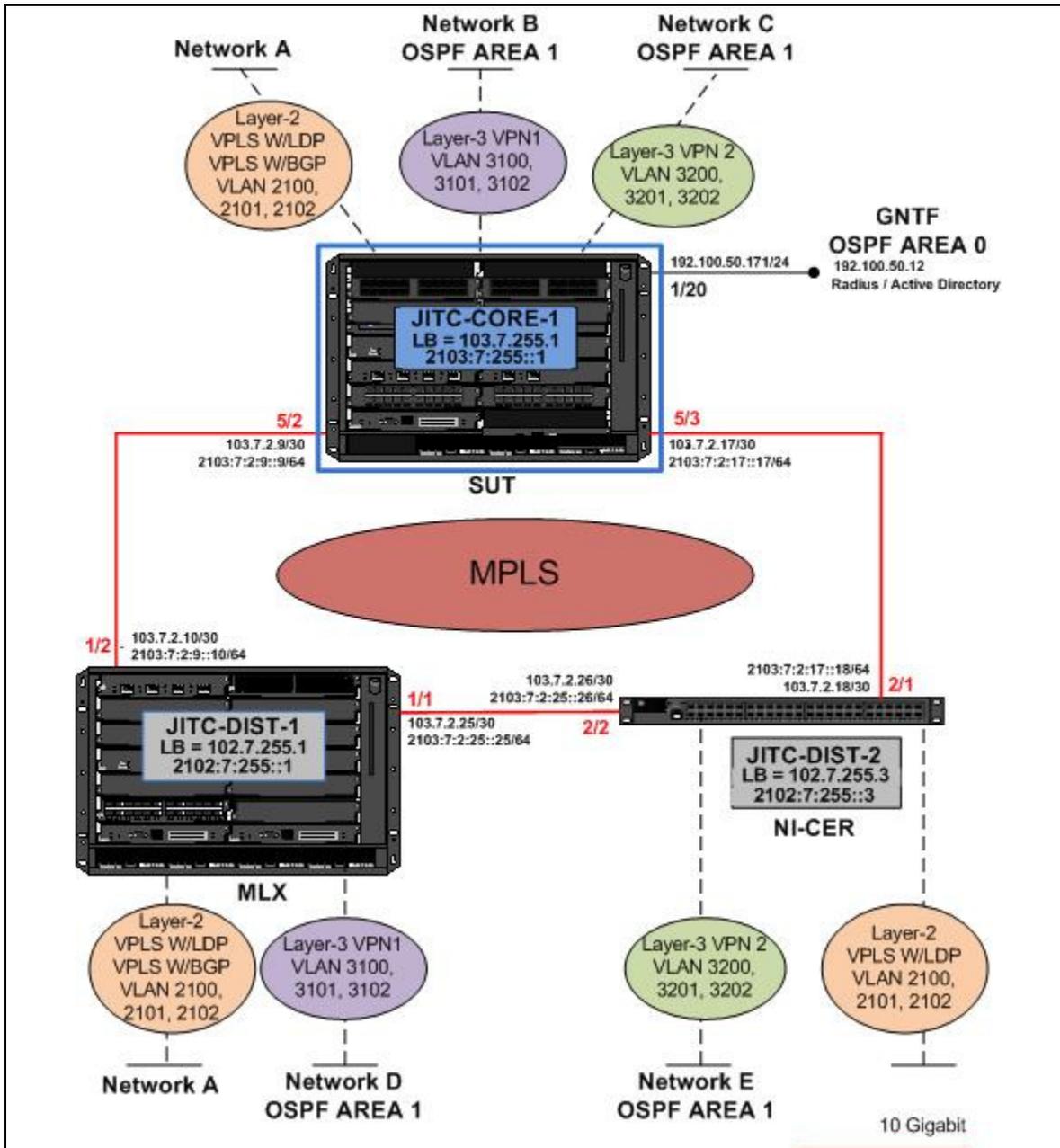
**Table 3. SUT CRs and FRs Status (continued)**

**NOTES:**

1. The annotation of 'required' refers to a high-level requirement category. The applicability of each sub-requirement is provided in 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.
2. Refers to IA requirements for UCR 2008, Change 2, Section 5.4. Detailed IA requirements are included in Reference (f).
3. The SUT met all the critical MPLS interoperability requirements with the following minor exceptions:
  - a. Processor failover exceeded 5 seconds. This was adjudicated by DISA on 25 October 2011 as having a critical operational impact with the following stipulation: The SUT is certified as a dual chassis with a single processor per chassis with MPLS and dual processor with single chassis for OSPF. The vendor delivered a POA&M with the intent to correct this discrepancy by 31 October 2012 with software version 5.4.
  - b. Layer 3 VPNs do not support IPv6 Dual Stack requirements. This was adjudicated by DISA on 25 October 2011 with a minor impact. The vendor delivered a POA&M with the intent to correct this discrepancy by 30 April 2012 with software version 5.3.
  - c. The following MPLS RFCs that were either not met or partially met by the SUT were adjudicated by DISA on 25 October 2011 with having a minor operational impact based on vendors PoAM and the fact that the SUT tested interoperable with other MPLS vendors with no discrepancies associated with these RFCs shortcomings.
    - RFC 2685 (Non Compliant): SUT does support RFCs 4761 and 4762 for MPLS VPN capability.
    - RFC 3032 (Partial Compliant): SUT supports the encoding of label stack, support generating ICMP Messages for Labeled IP Packets, comply with processing the Time to Live Field, and support transporting MPLS unicast Labeled Packets over point to point protocol and LAN media.
    - RFC 3140 (Non Compliant): SUT does support DSCP via RFC 2474 and Per Hop Behavior via RFC 3270. The vendors behavior of mapping DSCP to the 8 hardware queues was interoperable with other MPLS vendors
    - RFC 3270 (Partial Compliant): SUT supports E-LSPs and not L-LSP's.
    - RFC 3443 (Partial Compliant): SUT only supports Penultimate Hop Popping (PHP) modes
    - RFC 4182 (Partial Compliant): SUT only supports the encoding of label stack, support generating ICMP Messages for Labeled IP Packets, processing the Time to Live Field, and transporting MPLS unicast Labeled Packets over PPP and LAN media

**LEGEND:**

CR	Capability Requirement	LSP	Label Switched Path
DISA	Defense Information Systems Agency	MPLS	Multiprotocol Label Switching
E2E	End-to-End	NM	Network Management
E-LSP	EXP-inferred-PSC LSP	POA&M	Plan of Action and Milestones
FR	Functional Requirement	QoS	Quality of Service
GMPLS	Generalized Multiprotocol Label Switching	RFC	Request for Comment
IA	Information Assurance	SUT	System Under Test
ICMP	Internet Control Message Protocol	UCR	Unified Capabilities Requirements
ID	Identification	VLAN	Virtual Local Area Network
IPv6	Internet Protocol version 6	VPN	Virtual Private Network
L-LSP	Label-only-inferred-PSC LSP		



**LEGEND:**

BGP Border Gateway Protocol  
 GNTF Global Network Testing Facility  
 IP Internet Protocol  
 JITC Joint Interoperability Test Command  
 LDP Label Distribution Protocol  
 PoE Power Over Ethernet  
 MPLS Multiprotocol Label Switching  
 OSPF Open Shortest Path First

RADIUS Remote Authentication Dial-in User server  
 SUT System Under Test  
 VLAN Virtual Local Area Network  
 VPLS Virtual Private LAN Service  
 VPN Virtual Private Network

————— 1 Gigabits per second  
 ————— 10 Gigabits per second

**Figure 1. SUT Homogeneous MPLS Test Configuration**

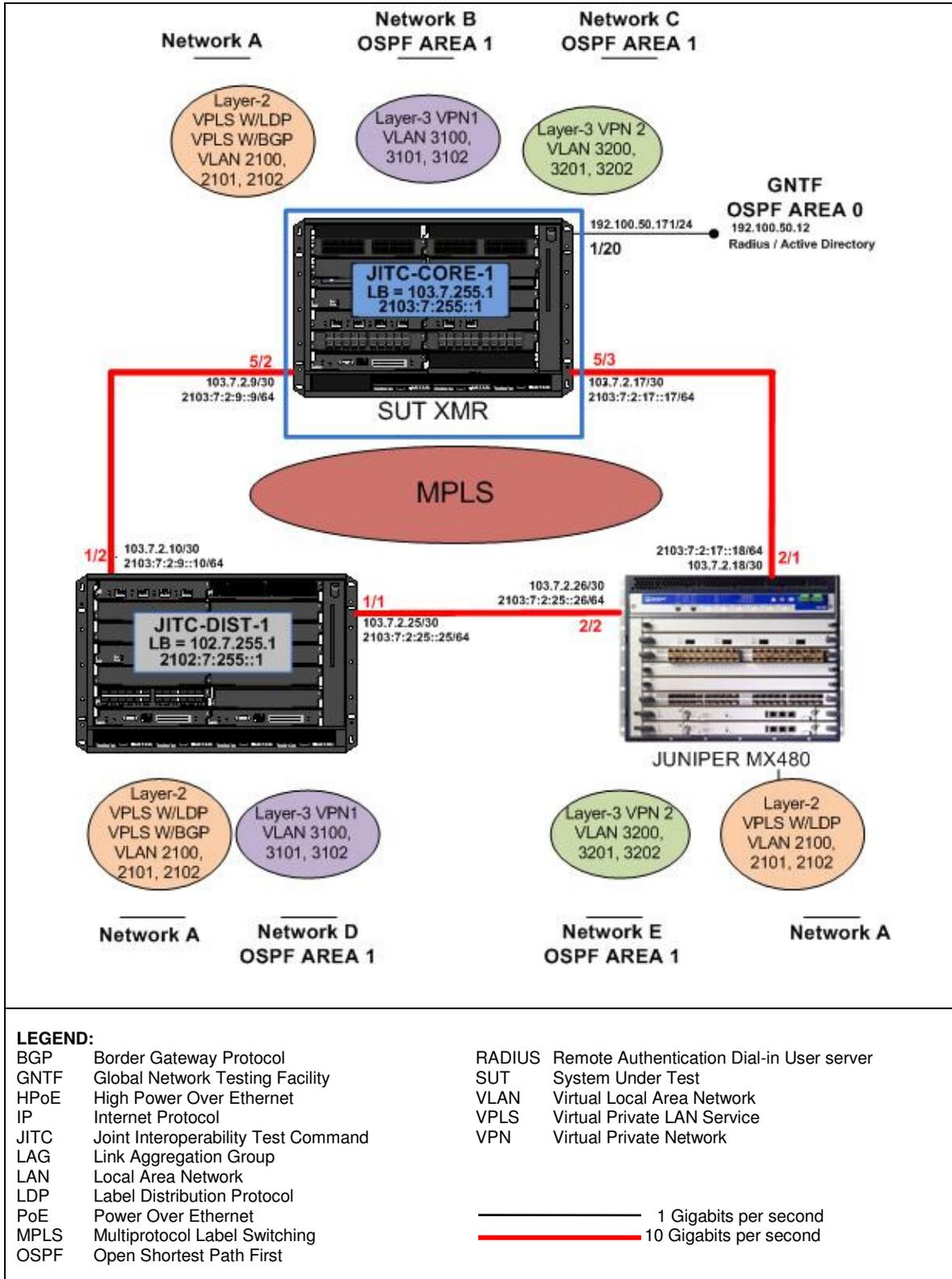


Figure 2. SUT Heterogeneous MPLS Test Configuration with Juniper

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>. All associated data is available on the Defense Information Systems Agency Unified Capability Coordination Office (UCCO) website located at <http://www.disa.mil/ucco/>.

6. The JITC point of contact is Mr. Edward Mellon, DSN 879-5159, commercial (520) 538-5159, FAX DSN 879-4347, or e-mail to [Edward.Mellon@disa.mil](mailto:Edward.Mellon@disa.mil). The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The Tracking Number for the SUT is 1030601.

FOR THE COMMANDER:

Enclosure a/s



for BRADLEY A. CLARK

Chief

Battlespace Communications Portfolio

JITC Memo, JTE, Extension of the Special Interoperability Test Certification of the Brocade NetIron XMR Series Release 5.1.01

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## **ADDITIONAL REFERENCES**

- (c) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008, Change 1," 22 January 2010
- (d) Department of Defense Instruction 8100.03, "Department of Defense (DoD) Voice Networks," 16 January 2004
- (e) Joint Interoperability Test Command, "ASLAN Component Test Plan (UCTP)," November 2010
- (f) Joint Interoperability Test Command, "Information Assurance Test Plan (IATP)," 22 January 2009 with Change 1
- (g) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of Brocade XMR Release (Rel.) 5.1.01 (Tracking Number 1030601)," 4 April 2011