DEFENSE INFORMATION SYSTEMS AGENCY
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IN REPLY REFER TO: Joint Interoperability Test Command (JTE) 3 August 2021

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Extension of the Joint Interoperability Certification of the Dell EMC Networking PowerSwitch Z9264F-ON, Z9332F-ON, and Z9432F-ON with Software Release SmartFabric Operating System (OS) 10.5

References: (a) Department of Defense Instruction 8100.04, "DoD Unified Capabilities (UC)," 9 December 2010
(b) Office of the Department of Defense Chief Information Officer, "Department of Defense Unified Capabilities Requirements 2013, Change 2," September 2017
(c) through (e), see Enclosure

1. Certification Authority. Reference (a) establishes the Joint Interoperability Test Command (JITC) as the Joint Interoperability Certification Authority (CA) for the Department of Defense Information Network (DoDIN) products, Reference (b).

2. Conditions of Certification. The Dell EMC Networking PowerSwitch Z9264F-ON, Z9332F-ON, and Z9432F-ON with Software Release SmartFabric Operating System (OS) 10.5 is hereinafter referred to as the System Under Test (SUT). The SUT meets the critical requirements of the Unified Capabilities Requirements (UCR), Reference (b), as an Assured Services Local Area Network (ASLAN) Core, Distribution, and Access switch and is certified for joint use with the conditions described in Table 1. This certification expires upon changes that affect interoperability, but no later than the expiration date specified in the DoDIN Approved Products List (APL) memorandum.

This extension of the certification is for Desktop Review (DTR) 2. DTR 2 was requested to add the Z9432F-ON to this certification as a Core, Distribution and Access switch and to update the SmartFabric OS Software Release version 10.5 to patch release 10.5.1.6 to close two interoperability Test Discrepancy Reports (TDRs) and four Cybersecurity (CS) findings. See Table 1 for updated Conditions, Table 4 for a list of components, and Paragraph 4 for the test details.

Table 1. Conditions

Description	Operational Impact	Remarks
UCR Waivers		
None		

(Table continues next page.)

Table 1. Conditions (continued)

Description		Operational Impact	Remarks
TDR#	**Conditions of Fielding**		
DEL-0731-001	EDG-000080: Per ASLAN testing and vendor documentation, the SUT does not support PoE IAW either 802.3af-2003 or 802.3at-2009. CoF: The SUT is certified for only data and VVoIP endpoints that do not require PoE, such as CCA, UCCS, and Soft Clients.	Minor with CoF	On 29 October 2019, DISA adjudicated this discrepancy as minor with vendor POA&M and CoF.
DEL-0731-003	IP6-000490: Per Dell Letter of Compliance, Stateless Address Autoconfiguration and Manual Address Assignment, IAW IP6-000490: Non-Comply - User must select desired flag values when enabling router advertisements. CoF: Managed Address Configuration flags must be set to desired value when implemented by the user. Vendor to include configuration in deployment guide.	Minor with CoF	On 29 October 2019, DISA adjudicated this discrepancy as minor with CoF.
DEL-0731-004	EDG-000210: Per IO-3 ASLAN testing, SUT generates VRRP v3 checksums for IPv4 traffic in a different manner than other heterogeneous vendors. CoF: SUT must be configured with VRRPv2 to support Distribution switch failover in less than 5 seconds within an IPv4 infrastructure.	CLOSED (See note.)	On 29 October 2019, DISA adjudicated this discrepancy as minor with vendor POA&M. Updated per DTR 2. (See note)
DEL-0731-004	EDG-000210: Per IO-3 ASLAN testing, SUT recovery time exceeds 5 seconds. CoF: For failback recovery, site required to schedule ASI.	Minor with CoF	On 29 October 2019, DISA adjudicated this discrepancy as minor with CoF.
TDR#	**Open Test Discrepancies**		
DEL-0731-002	IP6-000390: Per Dell Letter of Compliance, Router Advertisement inconsistencies are not logged.	CLOSED (See note.)	On 29 October 2019, DISA adjudicated this discrepancy as minor with vendor POA&M. Updated per DTR 2. (See note)
DEL-0731-006	EDG-000010: Per IO-18 ASLAN testing, packet loss is measured in downstream Low Priority Scavenging traffic when upstream traffic is oversubscribed (testing with 6 queues).	Information Only	On 13 February 2020, DISA adjudicated this discrepancy as Information Only.
DEL-0731-007	EDG-000010: Per IO-19 ASLAN testing, packet loss is measured in downstream Low Priority Scavenging traffic when upstream traffic is oversubscribed (testing with 6 queues).	Information Only	On 13 February 2020, DISA adjudicated this discrepancy as Information Only.
DEL-0731-008	With DTR 2, 50GBaseX breakout of 400G could not be tested on the Z9432F-ON switch due to test lab limitations.	Information Only	On 7 July 2021, DISA adjudicated this discrepancy as Information Only. 50G breakout of 400G on Z9432F-ON not tested and not certified.

NOTE: With DTR 2, TDR DEL-0731-002 was closed based on the Vendor's updated LoC showing compliance with IP6-000390 requirements, and TDR DEL-0731-004 was closed based on testing conducted at USAISEC-TIC 24 May - 11 June 2021, which demonstrated the SUT fully supports the VRRP v3 checksums for IPv4 traffic requirement.

LEGEND:

802.3af-2003	Power over Ethernet up to 15.4 Watts	IP6	Internet Protocol version 6
802.3at-2003	Power over Ethernet up to 25.5 Watts	LoC	Letter of Compliance
ASI	Authorized Service Interruption	POA&M	Plan of Action and Milestones
ASLAN	Assured Services Local Area Network	PoE	Power Over Ethernet
CCA	Call Connection Agent	SUT	System Under Test
CoF	Condition of Fielding	TDR	Test Discrepancy Report
DEL	Dell	UCCS	Unified Capabilities Conference System
DISA	Defense Information Systems Agency	UCR	Unified Capabilities Requirements
DTR	Desktop Review	TIC	Technology Integration Center
EDG	Edge	USAISEC	U.S. Army Information Systems Engineering Command
G	Gigabit	v	version
IAW	In Accordance With	VRRP	Virtual Router Redundancy Protocol
IO	Interoperability	VVoIP	Voice and Video over Internet Protocol

3. Interoperability Status. Table 2 provides the SUT interface interoperability status, Table 3 provides the Capability Requirements and Functional Requirements status, and Table 4 provides a DoDIN APL Product Summary, to include all subsequent DTR updates.

Table 2. Interface Status

Interface (See note 1.)	Applicability			Status	Remarks
	Co	D	A		
Network Management Interfaces					
IEEE 802.3i (10BaseT UTP)	C	C	C	Met	
IEEE 802.3u (100BaseT UTP)	C	C	C	Met	
IEEE 802.3ab (1000BaseT UTP)	C	C	C	Met	
Access (User) Interfaces (See note 2.)					
IEEE 802.3i (10BaseT UTP)	C	C	C	Not Tested	See note 3.
IEEE 802.3u (100BaseT UTP)	C	C	C	Not Tested	See note 3.
IEEE 802.3u (100BaseFX)	C	C	C	Not Tested	See note 3.
IEEE 802.3ab (1000BaseT UTP)	C	C	C	Not Tested	See note 3.
IEEE 802.3z (1000BaseX Fiber)	C	C	C	Met	See note 4.
IEEE 802.3bz (2.5/5GBaseX)	O	O	O	Not Tested	See note 3.
IEEE 802.3ae (10GBaseX)	C	C	C	Met	
IEEE 802.3by (25GBaseX)	O	O	O	Met	
IEEE 802.3ba (40GBaseX)	O	O	O	Met	
IEEE 802.3cd (50GBaseX)	O	O	O	Met	See note 5.
IEEE 802.3ba (100GBaseX)	O	O	O	Met	
IEEE 802.3bs (400GBaseX)	O	O	O	Met	See note 6.
Uplink (Trunk) Interfaces (See note 2.)					
IEEE 802.3u (100BaseT UTP)	O	O	O	Not Tested	See note 3.
IEEE 802.3u (100BaseFX)	O	O	O	Not Tested	See note 3.
IEEE 802.3ab (1000BaseT UTP)	O	O	O	Not Tested	See note 3.
IEEE 802.3z (1000BaseX Fiber)	C	C	C	Met	See note 4.
IEEE 802.3bz (2.5/5GBaseX)	O	O	O	Not Tested	See note 3.
IEEE 802.3ae (10GBaseX)	C	C	C	Met	
IEEE 802.3by (25GBaseX)	O	O	O	Met	
IEEE 802.3ba (40GBaseX)	C	C	C	Met	
IEEE 802.3cd (50GBaseX)	O	O	O	Met	See note 5.
IEEE 802.3ba (100GBaseX)	C	C	C	Met	
IEEE 802.3bs (400GBaseX)	O	O	O	Met	See note 6.

NOTE(S):
1. The SUT high-level requirements are depicted in Table 3. These high-level requirements refer to a more detailed list of requirements provided in Table 3-2 of Enclosure 3 in Reference (c).
2. Core, Distribution, and Access products must minimally support one of the interfaces listed in this table as conditional for the given role. Other rates and standards may be provided as optional interfaces.
3. The SUT does not support this (conditional or optional) interface.
4. USAISEC-TIC tested the 10/25/40/50/100 GBaseX interfaces with the Z9264F, but not the 1GBaseX interface. Analysis determined the 1GBaseX interface is certified based on the vendor's Letters of Compliance to the IEEE 802.3 standards and the testing data collected at all other data rates.
5. The 50GBase-X interface is certified for the SUT based on testing with the Z9264F switch during initial certification. With DTR 2 testing of the Z9432F-ON switch, the 50GBaseX breakout of 400G could not be tested due to test lab limitations; therefore, the Z9432F-ON switch is not certified for 50GBaseX breakout. See Table 1 for Conditions.
6. With DTR 1, the IEEE 802.3bs 400GBaseX interface was added to this certification based on testing of the Z9332F-ON switch conducted by USAISEC-TIC during an MVTE 13-31 January 2020

(Table continues next page.)

Table 2. Interface Status (continued)

LEGEND:

802.3ab	1000BaseT Gbps Ethernet over Twisted Pair	C	Conditional
802.3ae	10 Gbps Ethernet over Fiber	Co	Core
802.3ba	40 and 100 Gigabit Ethernet over Twisted pair and Fiber	DTR	Desktop Review
802.3bs	400GbE over optical physical media	D	Distribution
802.3by	25 Gbps Ethernet over Multi-Mode Fiber	GBaseX	Gigabit Ethernet over Fiber or Copper
802.3bz	2.5/5 Gbps Ethernet over balanced Twisted Pair	Gbps	Gigabits per second
802.3cd	50 Gigabit Ethernet Standard	IEEE	Institute of Electrical and Electronics Engineers
802.3i	10BaseT 10 Mbps Ethernet over Twisted Pair	Mbps	Megabits per second
802.3u	Fast Ethernet at 100 Mbps, copper and Fiber	MVTE	Multi-Vendor Test Event
802.3z	Gigabit Ethernet over Fiber	O	Optional
A	Access	SUT	System Under Test
BaseFX	Megabit Ethernet over Fiber	TIC	Technology Integration Center
BaseT	Megabit (Baseband Operation, Twisted Pair) Ethernet	USAISEC	U.S. Army Information Systems Engineering Command
BaseX	Megabit Ethernet over Fiber or Copper	UTP	Unshielded Twisted Pair

Table 3. Capability Requirements and Functional Requirements Status

CR/FR ID	UCR Requirement (High-Level) (See note 1.)	UCR 2013 Change 2 Reference	Status
1	General LAN Switch and Router Product Requirements (R)	7.2.1	Met
2	LAN Switch and Router Redundancy Requirements (R)	7.2.2	Partially Met (See note 2.)
3	LAN Product Requirements Summary (R)	7.2.3	Partially Met (See notes 2 and 3.)
4	Multiprotocol Label Switching (O)	7.2.4	Not Tested (See note 4.)
5	IPv6	5.2	Partially Met (See note 2.)

NOTE(S):

1. The annotation of "required" refers to a high-level requirement category. Enclosure 3 of Reference (c) addresses the applicability of each sub-requirement.
2. Reference Table 1 for conditions.
3. A USAISEC-TIC-led Cybersecurity test team conducted Security testing and published the results in a separate report, Reference (d).
4. The SUT does not support this optional requirement.

LEGEND:

CR	Capability Requirement	R	Required
FR	Functional Requirement	SUT	System Under Test
ID	Identification	TIC	Technology Integration Center
IPv6	Internet Protocol version 6	UCR	Unified Capabilities Requirements
LAN	Local Area Network	USAISEC	U.S. Army Information Systems Engineering Command
O	Optional		

Table 4. DoDIN APL Product Summary

Product Identification			
Product Name	Dell EMC Networking PowerSwitch Z9264F-ON and Z9332F-ON (See note 1.)		
Software Release	SmartFabric OS 10.5		
UCR Product Type(s)	ASLAN Core/Distribution/Access Switch		
Product Description	The SUT delivers voice-class availability, 1/10/25/40/50/100/400 GbE SFP+/QSFP+/QSFP28/QSFP56-DD for switching VoIP, video, and data traffic.		
DoDIN Certified Function	**Component/Sub-component Name** (See notes 2, 3, 4 and 5.)	**Tested Version**	**Remarks**
ASLAN Core/Distribution/Access	**Z9264F-ON** **Z9332F-ON**	**SmartFabric OS 10.5.1.6**	Redundant power modules

Component/Sub-Component added with DTR 2 (See note 3.)					
Component	**Tested Version**	**Sub-Component**	**Function** (See note 6.)	**Blocking Factor** (See note 7.)	
				C/D	**A**
Z9432F-ON ASLAN Core/ Distribution/Access	**SmartFabric 10.5.1.6**	N/A	**32x 400GbE QSFP56-DD, 2x AC PSU, Fan module, I/O Panel to PSU Airflow** or - 128x100GbE (QSFP56-DD to 4xQSFP28 breakout) or - 32x100 GbE (QFSP28) – with breakout capability for 10/25/50 (See note 6.) or - 64x40GbE using QSFP28 to 2xQSFP+ breakout	**Met**	**Met**

NOTE(S):
1. With DTR 1, the SUT Product Name was updated from Dell EMC Networking PowerSwitch Z9264F-ON to Dell EMC Networking PowerSwitch Z9264F-ON and Z9332F-ON with the addition of the Z9332F-ON switch.
2. Table 3-3 of Enclosure 3 in Reference (c) provides the detailed component and subcomponent descriptions.
3. Components bolded and underlined were tested by USAISEC-TIC.
4. The Z9332F-ON 10, 25, 40, 50, and 100 GbE interfaces are approved based on similarity to the same data rate interfaces that were tested on the Z9264-ON switch.
5. With DTR 1, the Z9332F-ON switch was added to this certification with the 400 GbE interface data rate based on an MVTE conducted at USAISEC-TIC 13-31 January 2020.
6. With DTR 2, the Z9432F-ON switch was added to this certification based on Interoperability testing conducted at USAISEC-TIC 24 May - 11 June 2021. The 10/40 GbE interfaces are certified on the Z9432F-ON based on similarity to the same data rate interfaces tested on the previously certified Z9264-ON switch; however, the 50GbE breakout of 400G on the Z9432F-ON was not tested due to test lab limitations and is therefore not certified, see Table 1 for Conditions. Non-Blocking testing was conducted using port-pairs and Layer 2 snaking as described in the "Preface" of the ASLAN IO-17 Test Procedure. The SUT received a 100% throughput non-blocking, which meets blocking for Core, Distribution, and Access.
7. Blocking Factor is the ratio of all traffic to non-blocked traffic, i.e., a block factor of 8 to 1 means 12.5 percent of the traffic is not blocked. For Core and Distribution, the minimum performance level is 2 to 1. For Access, the minimum performance level is 8 to 1.

LEGEND:

AC	Alternating Current	PSU	Power Supply Unit
APL	Approved Products List	QSFP-DD	Quad Small Form-factor Pluggable Double Density
ASLAN	Assured Services Local Area Network	QSFP+	Quad Small Form-factor Pluggable Plus
DoDIN	Department of Defense Information Network	QSFP28	28Mbps Signaled Quad Small Form-factor Pluggable
DTR	Desktop Review	SFP+	Small Form-factor Pluggable Plus
EMC	Egan, Marino & Curly	SUT	System Under Test
GbE	Gigabit Ethernet	TIC	Technology Integration Center
I/O	Input/Output	UCR	Unified Capabilities Requirements
IO	Interoperability	USAISEC	U.S. Army Information Systems Engineering Command
MVTE	Multi-Vendor Test Event	VoIP	Voice over Internet Protocol
OS	Operating System		

4. Test Details. This extension of the certification is based on DTR 2. The original certification, documented in Reference (c), was based on interoperability (IO) testing, review of the Vendor's Letters of Compliance (LoC) and DISA adjudication of open IO TDRs for inclusion on the DoDIN APL. The United States Army Information Systems Engineering Command (USAISEC) – Mission Engineering Directorate (MED), Technology Integration Center (TIC), hereafter referred to as USAISEC-TIC, conducted initial testing at Fort Huachuca,

Arizona from 19 August through 20 September 2019 using test procedures derived from Reference (d), and completed review of the Vendor's LoC on 18 October 2019. DISA completed adjudication of outstanding TDRs on 29 October 2019. USAISEC-TIC-led Cybersecurity (CS) test teams conducted CS testing and published the results in a separate report, Reference (e). Enclosure 2 of Reference (c) documents the test results and describes the tested network and system configurations. Enclosure 3 of Reference (c) provides the detailed interface, capability, and functional requirements and test results.

This extension of the certification is for Desktop Review (DTR) 2. DTR 2 was requested to add the Z9432F-ON to this certification as a Core, Distribution and Access switch and to update the SmartFabric OS Software Release version 10.5 to patch release 10.5.1.6 to close two Test Discrepancy Reports (TDRs) and four Cybersecurity (CS) findings.

JITC analysis, with input from USAISEC-TIC, determined CS and IO testing was required for the new hardware and to validate closure of the IO test discrepancy and CS Findings with the software patch. Furthermore, there were no past due CS or IO Vendor Plan of Actions and Milestones (POA&M).

USAISEC-TIC conducted IO testing on the Z9432F-ON switch loaded with the 10.5.1.6 software patch from 24 May through 11 June 2021 using failover, jitter, latency, packet loss, blocking factor and queue-shaping test procedures derived from Reference (d). Testing demonstrated the Z9432F-ON switch meets current UCR ASLAN requirements at the 400 Gigabit Ethernet (GbE) interface data rate in accordance with Reference (b), with one new test discrepancy due to a testing limitation for 50 GbE breakout of the 400G on the Z9432F-ON switch, documented in TDR DEL-0731-008 and adjudicated by DISA as Information Only. Testing also validated the SUT fully supports requirements for VRRP v3 checksums for IPv4 traffic and corresponding TDR DEL-0731-004 was closed. Finally, TDR DEL-0731-002 was closed based on the Vendor's updated LoC showing compliance with IP6-000390 requirements. See Table 1 for updated Conditions.

Based on analysis, the IO testing, and no past due IO Vendor POA&Ms, JITC approves this DTR with the conditions and limitations noted in Table 1.

Additionally, results from the CS testing are documented in a separate report, Reference (e).

5. Additional Information. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Sensitive but Unclassified IP Data (formerly known as NIPRNet) e-mail. Interoperability status information is available via the JITC System Tracking Program (STP). STP is accessible by .mil/.gov users at https://stp.fhu.disa.mil/. Test reports, lessons learned, and related testing documents and references are on the JITC Industry Toolkit (JIT) at https://jit.fhu.disa.mil/. Due to the sensitivity of the information, the CS Assessment Package (CAP) containing the approved configuration and deployment guide must be requested directly from the Approved Products Certification Office (APCO) via e-mail: disa.meade.ie.list.approved-products-certification-office@mail.mil. All associated information is available on the DISA APCO website located at https://aplits.disa.mil/.

6. Point of Contact (POC). USAISEC-TIC testing POC: Mr. James Hatch; commercial telephone (520) 533-2860; DSN telephone 821-2860; e-mail address: james.d.hatch12.civ@mail.mil. JITC certification POC: Ms. Lisa Esquivel; commercial telephone (520) 538-5531; DSN telephone 879-5531; DSN FAX: 879-4347; e-mail address: lisa.r.esquivel.civ@mail.mil; mailing address: Joint Interoperability Test Command, ATTN: JTE (Ms. Lisa Esquivel), P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The APCO tracking number for the SUT is 1907701.

FOR THE COMMANDER:

CLARK.BRADLEY.ALAN.1231466564 Digitally signed by CLARK.BRADLEY.ALAN.1231466564 Date: 2021.08.03 08:55:30 -07'00'

Enclosure

for JEFFREY P. O'DONNELL
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Acting Chief
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HQUSAISEC, ELIE-ISE-ME
APCO

ADDITIONAL REFERENCES

(c) Joint Interoperability Test Command (JITC), "Joint Interoperability Certification of the Dell EMC Networking PowerSwitch Z9264F-ON with Software Release SmartFabric Operating System (OS) 10.5, December 2019
(d) JITC, "Assured Services Local Area Network (ASLAN) and Non-ASLAN Test Procedures Version 1.0 for Unified Capabilities Requirements (UCR) 2013 Change 2," October 2017
(e) United States Army Information Systems Engineering Command - Mission Engineering Directorate, Technology Integration Center (USAISEC-TIC), "Cybersecurity Assessment Report for Dell EMC Networking PowerSwitch Z-Series Switches Software Release Dell EMC Networking SmartFabric OS 10.5 (Tracking Number TN 1907701)," July 2021