DEFENSE INFORMATION SYSTEMS AGENCY
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IN REPLY REFER TO: Joint Interoperability Test Command (JTE) 19 September 2022

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 (f), see Enclosure

1. Certification Authority. Reference (a) establishes the Joint Interoperability Test Command (JITC) as the Joint Interoperability Certification Authority 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, 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) 3. DTR 3 was requested to update the SUT Software Release version from SmartFabric OS 10.5 to SmartFabric OS 10.5.4.0 and extend the DoDIN APL expiration date for an additional three (3) years. See Paragraph 4 for additional 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's 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 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.
	EDG-000210: Per IO-3 ASLAN testing, SUT generates VRRPv3 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 1.)	On 29 October 2019, DISA adjudicated this discrepancy as minor with Vendor's POA&M. Updated with DTR 2.
TDR#	**Open Test Discrepancies**		
DEL-0731-002	IP6-000390: Per Dell Letter of Compliance, Router Advertisement inconsistencies are not logged.	CLOSED (See note 2.)	On 29 October 2019, DISA adjudicated this discrepancy as minor with Vendor's POA&M. Updated with DTR 2.
DEL-0731-005	Per Vendor's LoC, the SUT is partially compliant with CYB-045000 and non-compliant with CYB-056000, CYB-056010, CYB-056020, CYB-059030, CYB-060000, CYB-060010 and CYB-073060.	None UCR Change Requirement	On 15 October 2019, DISA adjudicated this discrepancy as Change Requirement as the CS requirements (Section 4) are designated to be removed in the next official DCR version release. Until then, prior adjudications have noted these requirements as change requirements.
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:
1. TDR DEL-0731-004: The VRRPv3 checksums for IPv4 traffic portion of this TDR 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. The failback recovery portion of this TDR remains open with CoF.
2. TDR DEL-0731-002: This TDR was closed with DTR 2 based on the Vendor's updated LoC stating compliance with IP6-000390 requirements.

(Table continues next page.)

Table 1. Conditions (continued)

LEGEND:			
802.3af-2003	Power over Ethernet up to 15.4 Watts	IAW	In Accordance With
802.3at-2003	Power over Ethernet up to 25.5 Watts	IO	Interoperability
ASI	Authorized Service Interruption	IP	Internet Protocol
ASLAN	Assured Services Local Area Network	IP6	IPv6
CCA	Call Connection Agent	LoC	Letters of Compliance
CoF	Condition of Fielding	POA&M	Plan of Action and Milestones
CS	Cybersecurity	PoE	Power Over Ethernet
CYB	Cybersecurity	SUT	System Under Test
DCR	DoDIN Capabilities Requirements	TDR	Test Discrepancy Report
DEL	Dell	TIC	Technology Integration Center
DISA	Defense Information Systems Agency	UCCS	Unified Capabilities Conference System
DoDIN	Department of Defense Information Network	UCR	Unified Capabilities Requirements
DTR	Desktop Review	USAISEC	U.S. Army Information Systems Engineering Command
EDG	Edge	v	version
G	Gigabit	VRRP	Virtual Router Redundancy Protocol
GBaseX	Gigabit Ethernet over Fiber or Copper	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 802.3ab (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)	O	O	O	Met	

(Table continues next page.)

Table 2. Interface Status (continued)

Interface (See note 1.)	Applicability			Status	Remarks
	Co	D	A		
Uplink (Trunk) Interfaces (See note 2.) (continued)					
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.

NOTE(S):
1. The SUT high-level requirements are depicted in Table 3. Table 3-2 of Enclosure 3 in Reference (c) provides a detailed list of requirements.
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 with the Z9332F-ON switch conducted by USAISEC-TIC during an MVTE 13-31 January 2020.

LEGEND:

A	Access	GBaseX	Gigabit Ethernet over Fiber or Copper
BaseFX	Megabit Ethernet over Fiber	IEEE	Institute of Electrical and Electronics Engineers
BaseT	Megabit (Baseband Operation, Twisted Pair) Ethernet	MVTE	Multi-Vendor Test Event
BaseX	Megabit Ethernet over Fiber or Copper	O	Optional
C	Conditional	SUT	System Under Test
Co	Core	TIC	Technology Integration Center
DTR	Desktop Review	USAISEC	U.S. Army Information Systems Engineering Command
D	Distribution	UTP	Unshielded Twisted Pair
G	Gigabits		

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	Internet Protocol version 6 (R)	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 to Table 1 for conditions.
3. A 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	O	Optional
FR	Functional Requirement	R	Required
ID	Identification	SUT	System Under Test
LAN	Local Area Network	UCR	Unified Capabilities Requirements

Table 4. DoDIN APL Product Summary

Product Identification			
Product Name	Dell EMC Networking PowerSwitch Z9264F-ON and Z9332F-ON		
Software Release	SmartFabric OS 10.5 (See note 1.)		
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, and 4.)	**Tested Version** (See note 1.)	**Remarks**
ASLAN Core/Distribution/Access	**Z9264F-ON** **Z9332F-ON** (See note 5.) **Z9432F-ON** (See note 6.)	SmartFabric OS 10.5.4.0	Redundant power modules

NOTE(S):
1. With DTR 3, the SUT Software Release version was updated from SmartFabric OS 10.5 to SmartFabric OS 10.5.4.0.
2. Table 3-3 in Enclosure 3 of Reference (c) provides the detailed descriptions on the initially tested components and sub-components.
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.

LEGEND:

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

4. Test Details. This extension of the certification is based on DTR 3. 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 (e), 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.

JITC Memo, JTE, 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

DTR 3 was requested to update the SUT Software Release version from SmartFabric OS 10.5 to SmartFabric OS 10.5.4.0 and extend the DoDIN APL expiration date for an additional three (3) years.

JITC analysis determined no additional CS or IO testing was required because the software update to implement minor enhancements and bug fixes did not change the certified IO features and functions or approved CS posture of the SUT. Additionally, analysis of the DTR 3 request was performed based on current UCR 2013 Change 2 test procedures, Reference (f). Furthermore, there were no past due CS or IO Vendor Plan of Actions and Milestones (POA&M).

Based on analysis, no change to the certified SUT IO features and functions, and no past due IO Vendor POA&Ms, JITC approves DTR 3.

Additionally, the current CS posture of the SUT is documented in a separate report, Reference (d).

5. Additional Information. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Sensitive but Unclassified Internet Protocol 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 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). 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:

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Enclosure a/s

LAWRENCE T. DORN
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JITC Memo, JTE, 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

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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, "Cybersecurity Assessment Report for Dell EMC Networking PowerSwitch Z-Series Switches, Software Release SmartFabric Operating System (OS) 10.5 (Tracking Number 1907701)," September 2022
(e) 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
(f) JITC, "Assured Services Local Area Network (ASLAN) and Non-ASLAN Test Procedures Version 1.1 For Unified Capabilities Requirements (UCR) 2013 Change 2," April 2022 (Draft)