



# Announcing DES-5221 Specialist – Implementation Engineer, Data Center Networking Exam Retirement

The **DES-5221 exam** that supports the Specialist – Implementation Engineer, Data Center Networking Version 1.0 certification, **will retire on May 1, 2023**. This exam will be replaced by the new **DES-5222 exam** aligning to the 'Specialist – Implementation Engineer, PowerSwitch Data Center Version 2.0' certification **available as of January 20, 2023**. This will include a revision of the Specialist-level **credential version from 1.0 to 2.0**.

The DES-5222 exam and certification cover the ability to perform intermediate skill level tasks in installing, configuring, maintaining, and troubleshooting Dell Data Center Networking products, features and implementation.

## How will this impact me?

If you have taken the *Dell EMC PowerSwitch Data Center Implementation and Administration* course before 4/19/23, please plan to take the **DES-5221 exam** before **May 1, 2023**.

- [View the DES-5221 exam description and practice test »](#)
- [View the DES-5222 exam description and practice test »](#)

Your credential 'Specialist – Implementation Engineer, Data Center Networking Version 1.0' once achieved, will not expire. As a certified Dell Technologies Proven Professional, you will continue to gain access to exclusive program benefits.

## Specialist – Implementation Engineer, Data Center Networking Version 1.0

### Certification Description



#### [Proven Professional Website](#)

Engage with your peers in our [Proven Professional Community](#).

#### Certification Overview

This certification validates the ability to perform intermediate skill level tasks in installing, configuring, maintaining, and troubleshooting Dell EMC Data Center Networking products.

#### Certification Requirements

To complete the requirements for this certification you must:

1. Achieve one of the following credentials
  - [Associate - Networking Version 1.0](#)
  - [Associate - Networking Version 2.0](#)
  - Dell Certified Associate – Networking (*Valid if already earned, but not achievable anymore*)
  - Dell Certified Professional – Networking (*Valid if already earned, but not achievable anymore*)
2. Pass the following Implementation Exam
  - [DES-5221 Specialist - Implementation Engineer, Data Center Networking Exam](#)

Note: These details reflect certification requirements as of November 15, 2019.

**Dell Technologies Partners:** Achieving a certification validates capability; however, it does not imply authorization to deliver services. Services Delivery Competencies provide partners with the ability to deliver services under their own brand or co-deliver with Dell Technologies. Tiered partners are eligible to obtain services delivery competencies upon completing the specific requirements outlined in the [enablement matrix](#). Only partners that have met these requirements should be delivering their own services in lieu of Dell Technologies Services.

#### Other Certification Recommendations

Once you have achieved this Certification you may be interested in:

- [Specialist – Implementation Engineer, Campus Networking](#)

\*The Proven Professional Program periodically updates certification requirements. Please check the [Proven Professional CertTracker](#) website regularly for the latest information and for other options to meet the Associate level requirement.

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## DES-5221 Specialist – Implementation Engineer, Data Center Networking Exam

### Exam Description



#### Overview

This exam is a qualifying exam for the **Specialist – Implementation Engineer, Data Center Networking** track.

This exam focuses on concepts related to the Data Center environment and Dell EMC Networking's S-Series and Z-Series products. Focus is on Dell EMC Networking SmartFabric OS10-based protocols and features.

Dell Technologies provides free practice tests to assess your knowledge in preparation for the exam. Practice tests allow you to become familiar with the topics and question types you will find on the proctored exam. Your results on a practice test offer one indication of how prepared you are for the proctored exam and can highlight topics on which you need to study and train further. A passing score on the practice test does not guarantee a passing score on the certification exam.

#### Duration

90 Minutes  
(~60 Questions)

**Pass Score: 63**

#### Practice Test

Exam [DES-5221](#)

#### Products

Products likely to be referred to on this exam include but are not limited to:

- Dell EMC Networking S-Series Switches
- Dell EMC Networking Z-Series Switches

#### Exam Topics

Topics likely to be covered on this exam include:

##### **Networks – The Basics (19.6%)**

- Identify common data center topologies, protocols, and topologies; describe the Dell EMC data center switch portfolio
- Basic switch configuration: Identify the normal boot process of a S and Z-Series switch running OS 10. List the first-time switch setup requirements. Perform the steps for upgrading switch firmware in OS 10.
- Access Control Lists: Explain the purpose of access control; apply appropriate commands to deny or permit IP connectivity; complete the required configuration to permit host access control; determine why particular computers are being blocked from accessing a server
- AAA Security: Explain the purpose of AAA security; describe AAA process, core components and their function; configure local and RADIUS authentication
- Dynamic Host Configuration Protocol: DHCP's basic operation; Explain the role of the DHCP Relay; configure DHCP in OS10; identify the options to secure DHCP from attacks

##### **Layer-2 Technologies and Protocols (20.1%)**

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- Virtual Lans - Identify the characteristics of a VLAN; explain the differences between tagged and untagged frames; configure VLAN trunking; configure VLAN Port membership; verify trunking and Port Membership; troubleshoot VLANs
- Spanning-tree Protocol - Identify the operations and use cases for STP; Configure and validate RSTP/MSTP/RSTP-PV; Manipulate spanning tree root bridge and port cost configurations
- Link Aggregation Groups - Identify the operations and use cases for LAGs; configure, verify, and trouble shoot static LAGs; configure, verify, and troubleshoot dynamic LAGs
- Discovery Protocols - Describe the characteristics of discovery protocols; describe uses cases for using discovery protocols; explain how to configure and validate. Configure discovery protocols; interpret LLDP outputs

**Discovery Protocols - Describe the characteristics of discovery protocols; describe uses cases for using discovery protocols; explain how to configure and validate. Configure discovery protocols; interpret LLDP outputs (30.7%)**

- Basic Routing - Configure IPv4 on an interface; identify when to utilize a gateway as a last resort; configure and modify static routes; test inter-VLAN routing
- Open Shortest Path First - describe OSPF operation, and core components; configure and validate OSPF using; interpret OSPF show commands; describe the operations and use cases for ECMP; test inter-VLAN routing
- Border Gateway Protocol - Explain operations of BGP;
- identify design best practices when configuring BGP in a leaf/spine environment; configure and validate BGP; Describe the operations and use cases for ECMP; configure and validate ECMP
- Policy-Based Routing - Describe the basic operation of PBR; identify PBR use cases; configure and validate PBR

**Data Center Technologies and Protocols (29.6%)**

- Virtual Link Trunking - Describe the components that makeup a VLT configuration; Configure and validate VLTs; troubleshoot basic VLT configuration issues
- Virtual Router Redundancy Protocol - describe the basic operation of VRRP; identify the components of VRRP; describe VRRP Priorities; compare Pre-empt and no Pre-empt; configure VRRP on switches configured for VLT
- Uplink Failure Detection - describe the components and operation of UFD; identify the differences between Active/Active and Active/Standby; configure and verify UFD
- Virtual Routing and Forwarding - describe the operations and use cases for (VRF); configure and validate VRF
- Quality of Service - Describe the basic operation of QoS; Describe how QoS identifies and marks traffic; identify the characteristics of QoS; identify QoS protocols and their uses; configure QoS
- Multicast - Explain in depth the concepts relating to IP Multicast technology; compare IGMP and PIM use cases; identify the steps required to configure multicasting into an existing multicast environment

The percentages after each topic above reflects the approximate distribution of the total question set across the exam.

## Recommended Training

The following curriculum is recommended for candidates preparing to take this exam.



### Dell Technologies Employees and Partners:

Please complete the following course in one of the available formats

Course Title	Course Number	Mode	Available
Dell EMC PowerSwitch Data Center Implementation and Administration	ES102NET00232	Classroom	11/4/19
Dell EMC PowerSwitch Data Center Implementation and Administration	ES102NET00232	Virtual Classroom	11/4/19
Dell EMC PowerSwitch Data Center Implementation and Administration	ESNETD02182	On Demand	11/18/20

### Dell Technologies Customers:

Please complete the following course in one of the available formats

Course Title	Course Number	Mode	Available
Dell EMC PowerSwitch Data Center Implementation and Administration	ES102NET00232	Classroom	11/4/19
Dell EMC PowerSwitch Data Center Implementation and Administration	ES102NET00232	Virtual Classroom	11/4/19

Note: These exam description details reflect contents as of **November 15, 2019**.

The Proven Professional Program periodically updates exams to reflect technical currency and relevance. Please check the Proven Professional website regularly for the latest information.

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