

VxRail Networking Guide with Dell EMC S4148-ON Switches

S4148-ON Deployment and Configuration Guide for VxRail

Dell EMC Networking Infrastructure Solutions
March 2018

Revisions

Date	Description	Authors
March 2018	Initial release	Ed Blazek, Jordan Wilson

THIS DOCUMENT IS FOR INFORMATIONAL PURPOSES ONLY, AND MAY CONTAIN TYPOGRAPHICAL ERRORS AND TECHNICAL INACCURACIES. THE CONTENT IS PROVIDED AS IS, WITHOUT EXPRESS OR IMPLIED WARRANTIES OF ANY KIND.
Copyright © 2018 Dell Inc. All rights reserved. Dell and the Dell EMC logo are trademarks of Dell Inc. in the United States and/or other jurisdictions. All other marks and names mentioned herein may be trademarks of their respective companies.

Table of Contents

1	Introduction	5
1.1	Networking switches overview	6
1.1.1	S4100-ON switch series (S4148U, S4148F, S4148FE, S4148T)	6
1.1.2	S4128-ON switch (S4128F, S4128T)	7
1.1.3	Z9100-ON switch	7
1.1.4	S6010-ON switch	7
1.1.5	S3048-ON switch	7
1.2	VxRail nodes overview	8
1.2.1	VxRail P Series nodes	8
1.2.2	VxRail V Series nodes	8
1.2.3	VxRail S Series nodes	8
1.2.4	VxRail E Series nodes	9
1.2.5	The VxRail E, P, V and S Series supports SFP+ or BaseT network adapters	9
1.2.6	Basic requirements	10
2	Network topologies	11
2.1.1	Single-switch topology	11
2.1.2	Dual-switch topology	12
2.1.3	Dual-switch topology with Z9100-ON switches	13
2.1.4	Management network	14
3	Switch initial setup	15
3.1	Installer laptop connection	15
3.2	Configuration prerequisites	15
3.2.1	Check switch firmware version	15
3.2.2	Factory default configuration	16
3.2.3	Switch-port profiles	16
3.2.4	Unified ports on the S4148U	17
3.2.5	Verify license installation	17
4	Switch configuration	18
4.1	Global switch settings and initial setup	19
4.2	VxRail node facing interfaces	20
4.3	VLAN configuration	20
4.3.1	Inter switch links (ISL) configuration	22

4.3.2	ISL port channel configuration without VLT	23
4.3.3	ISL port channel with VLT configuration	23
4.4	Network facing uplink configurations	24
4.4.1	Network facing uplink configuration – 100GbE	25
4.4.2	Network facing uplink configuration – 40GbE	25
4.4.3	Network facing uplink configuration - 10GbE	26
4.4.4	Network facing uplink configuration - 4 x 10GbE breakout ports	27
5	Configuration examples	28
5.1	Single-switch example	28
5.2	Dual-switch example	32
A	Basic configuration worksheet	36
B	VLAN worksheet	37
C	Network I/O control predefined shares	38
D	Validated Components	39
D.1	VxRail	39
D.2	Networking switches	39
E	Technical support and resources	40
E.1	Product manuals and technical guides	40
F	Accessing the RS-232 console port	41

1

Introduction

VxRail™ sits at the forefront of a fundamental shift in IT infrastructure consumption away from application-specific, build-your-own infrastructure and toward virtualized, general-purpose, engineered systems. Dell EMC and VMware have embraced this shift with the VxRail hyper-converged appliance that delivers compelling economics, faster time-to-value, linear scaling over time, and operational simplicity.

To take full advantage of the value of a VxRail solution, one must carefully consider the network that not only enables multiple nodes to function as cluster, but also enables connectivity to the customer's IT environment. The inclusion of dedicated switches for a VxRail cluster can massively simplify this process and avoid many of the pitfalls associated with the deployment of a hyper-converged solution that originates in network connectivity.

The audience for this deployment guide is professional services personnel responsible for the deployment of the VxRail cluster when purchased with a pair of dedicated Dell EMC Networking S4148-ON switches and cluster. The deployment guide covers the process of connecting a cluster of VxRail nodes (minimum of three nodes, maximum of 64 nodes) to the pair of Dell EMC Networking S4148-ON switches in a high-availability configuration, and configuring those switches to connect to the customer's IP network. [Figure 1](#). An overview of a VxRail node with dual S4148-ON Top-of-Rack (ToR) leaf switches outlines configuration. The document provides guidelines for VxRail appliances built on 13th and 14th generation PowerEdge servers, however the configuration examples are for 13th generation appliances.

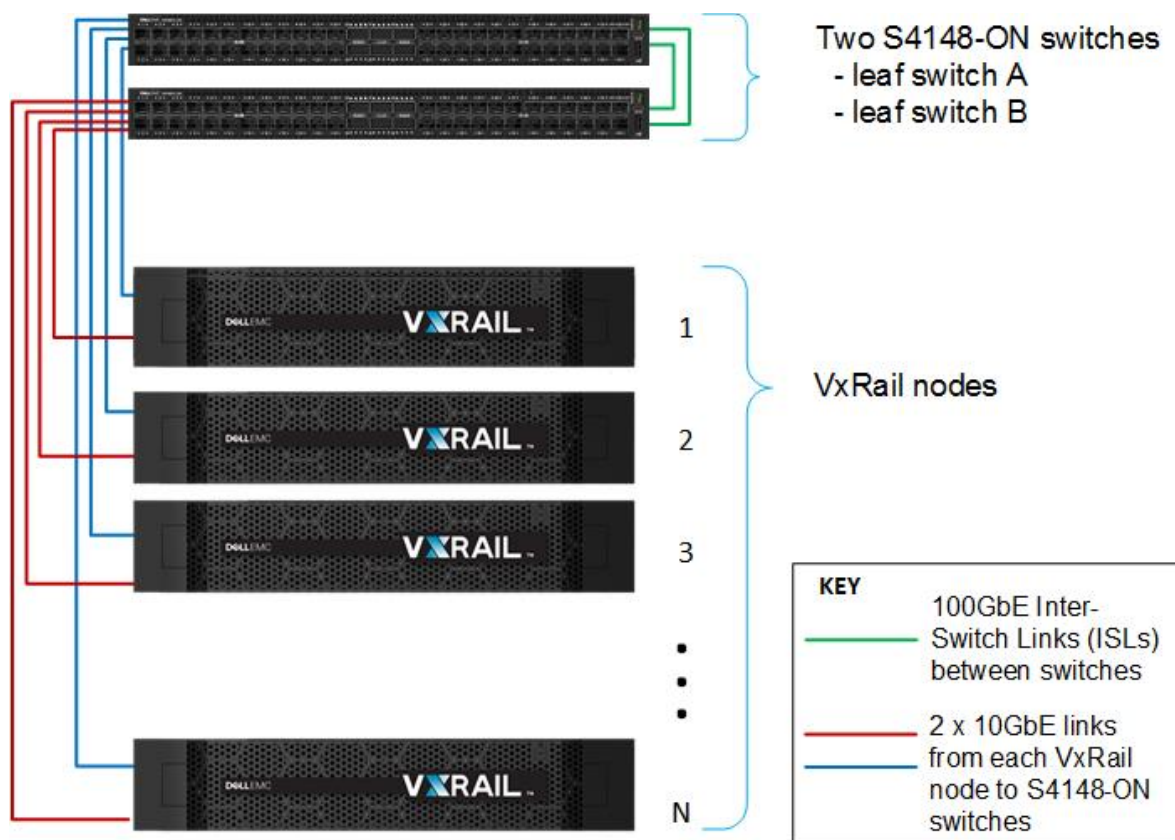


Figure 1 VxRail cluster with dual S4148-ON Top-of-Rack switches

1.1 Networking switches overview

Dell EMC Networking has introduced a new networking OS, OS10 Enterprise Edition. OS10 is a disaggregated native Linux-based network operating system that has a wholly disaggregated software architecture. OS10 decouples the base software from the Layer 2 and Layer 3 protocol stack and services, which brings forth the ability for open programmability and portability. However, Dell EMC Networking's legacy OS9 is still very relevant in the industry and supported on the majority of Dell EMC Networking devices. This document utilizes OS10 enterprise edition running on the S4148-ON switches.

1.1.1 S4100-ON switch series (S4148U, S4148F, S4148FE, S4148T)

The Dell EMC Networking S4148-ON switch is a 1RU (Rack-Unit) high-density 1/10/25/40/50/100GbE, top of rack switch. S4148-ON switches are leaf switches running OS10 in this deployment guide. The S4148-ON switch operates with up to 48 dual-speed, 1/10GbE SFP+ (S4148T-ON with BaseT) ports, and 4 ports of 100GbE QSFP28 ports. This switch uses a non-blocking and cut-through switching architecture to provide ultra-low-latency performance for applications.

This deployment guide walks you through the steps to add a single cluster of VxRail nodes to either one or two S4148-ON, Top-of-Rack (ToR) switches.

Most customers install unique VxRail clusters in separate racks. If you are adding more than one cluster in the same rack, print out copies of [Appendix B](#) and fill them out separately for each cluster. For the additional clusters, refer to the S4148-ON port assignments shown in [Table 2](#) and use the next available ports for each additional cluster.

Note: Switch-port profiles determine available interfaces

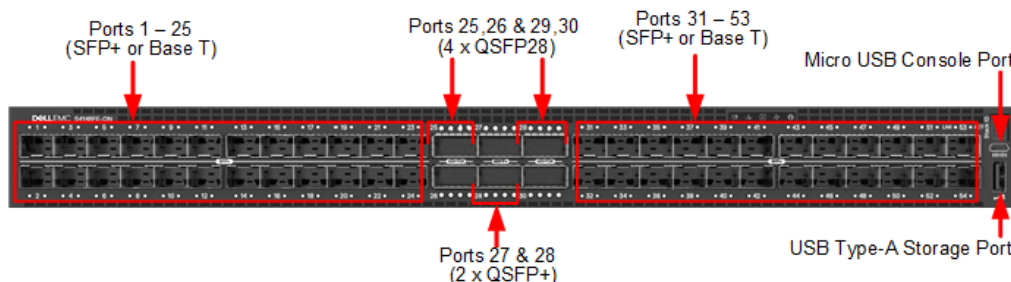


Figure 2 S4148-ON front view

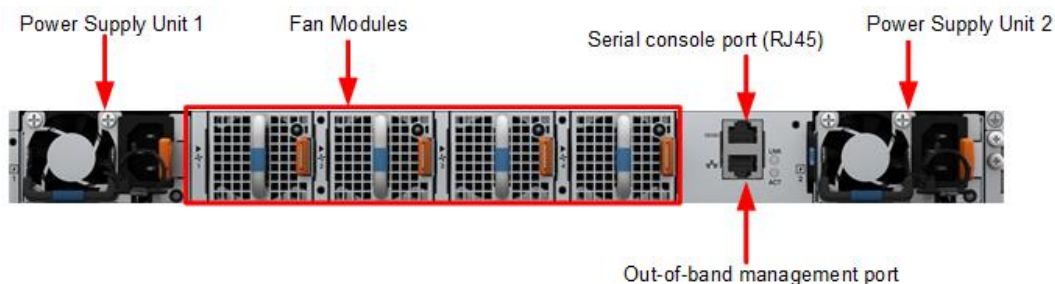


Figure 3 S4148-ON rear view

1.1.2 S4128-ON switch (S4128F, S4128T)

The Dell EMC Networking S4128-ON is a 1RU (Rack-Unit) 1/10/25/40/50/100GbE, top of rack switch running QS10. The S4128-ON switch operates with up to 28 dual-speed, 1/10GbE SFP+ (S4128T-ON with BaseT) ports, and 2 ports QSFP28 optical ports. This switch uses a non-blocking and cut-through switching architecture to provide ultra-low-latency performance for applications.

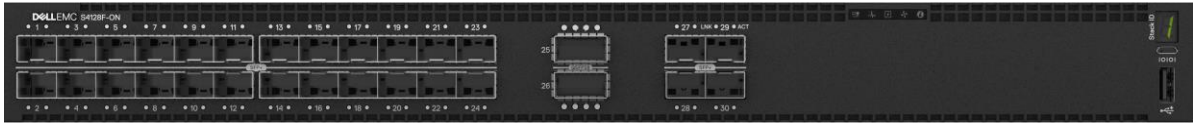


Figure 4 S4128-ON front view

1.1.3 Z9100-ON switch

The Z9100-ON is a 1RU Layer 2/3 switch with 32 ports supporting 10/25/40/50/100GbE. Two Z9100-ON switches running OS10 used as upstream spine switches in this deployment guide.



Figure 5 Z9100-ON front view

1.1.4 S6010-ON switch

The S6010-ON is a 1RU Layer 2/3 switch with 32 ports supporting 40GbE. Two S6010-ON switches running OS10 used as upstream spine switches in this deployment guide.



Figure 6 S6010-ON front view

1.1.5 S3048-ON switch

The S3048-ON is a 1RU Layer 2/3 switch with 48, 1GbE Base-T ports as well as 4, 10GbE ports. Management traffic uses one S3048-ON switch running OS10 in this deployment guide.



Figure 7 S3048-ON front view

1.2 VxRail nodes overview

1.2.1 VxRail P Series nodes

The VxRail P Series is a single or dual socket 2RU node. Heavy workloads like databases use optimized VxRail P Series nodes. P Series nodes can be configured with up to four disk groups and offer high-power, high core count, and high clock speed processors.



Figure 8 VxRail P Series node front view

1.2.2 VxRail V Series nodes

The VxRail V Series is a dual socket 2RU node. The VxRail V Series nodes are graphics capable nodes with support for up to 2 graphics accelerators which may be added later, allowing clients to buy and scale. These nodes are best suited for specialized use cases such as high-end 2D/3D visualization.



Figure 9 VxRail V Series node front view

1.2.3 VxRail S Series nodes

The VxRail S Series is a single or dual socket 2RU node. The VxRail S Series nodes are capacity-optimized nodes with expanded storage for use cases such as virtualized Microsoft SharePoint, Microsoft Exchange, big data, and analytics. S Series nodes utilize 3.5-inch drives, allowing for a maximum capacity of 48 TB.



Figure 10 VxRail S Series node front view

1.2.4 VxRail E Series nodes

The VxRail E Series low-profile node is a single or dual-socket 1RU node. The VxRail E Series nodes are best suited for remote office, stretch cluster or entry-level workloads. E Series nodes have two disk groups, providing the capacity and performance to handle a wide variety of use cases.



Figure 11 VxRail E Series node front view

1.2.5 The VxRail E, P, V and S Series supports SFP+ or BaseT network adapters.

All VxRail nodes come with one onboard network daughter card (NDC) and depending on the appliance generation, NDC options vary.

13th Generation Appliances

- Quad-port NDC - 2 x 10GbE SFP+ ports and 2 x 1GbE BaseT ports
- Quad-port NDC - 2 x 10GbE BaseT ports and 2 x 1GbE BaseT ports

14th Generation Appliances

- Quad-port NDC - 4 x 10GbE SFP+ ports
- Quad-port NDC - 4 x Base T ports that support 100 M, 1GbE, and 10GbE ports

The VxRail 4.0 nodes use two 10GbE NDC ports for system traffic.

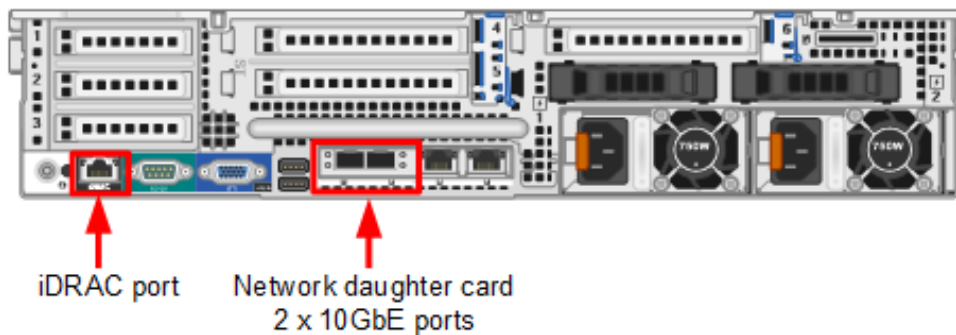


Figure 12 VxRail 2RU node back view with NDC

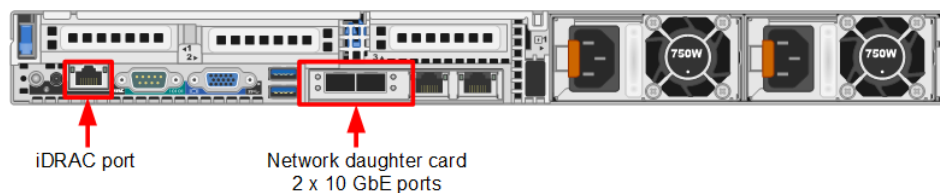


Figure 13 VxRail E Series node, back view with NDC

1.2.6 Basic requirements

- The customer's IP gateway address and subnet mask.
- In-band or out-of-band switch management.
- The IP addresses for switch management.
- The number and type of Ethernet ports required for VxRail node connectivity in a single or dual-switch configuration.
- The number and type of Ethernet ports for the S4148-ON inter-switch links (ISLs) used to interconnect the switches.
- The number and type of Ethernet ports for the S4148-ON network uplinks used to connect the switches to the customer's existing network.

There are references to in-band and out-of-band management in this deployment guide. This refers to whether switch routed management traffic is sent to an out-of-band management port on the switch see [Figure 17](#) or whether management traffic is routed in-band to one of the other switch ports.

In addition, successful configuration requires connectivity to and basic knowledge of the customer's network and connectivity to the management network.

2 Network topologies

A VxRail deployment can be deployed using a single-switch or with a dual-switch configuration. The single-switch provides the lowest cost option but creates a single point of failure. Dell EMC recommends two switches, as they provide redundancy for high availability. The following explains the difference between single-switch and dual-switch topologies and shows upstream switches to highlight solution examples.

2.1.1 Single-switch topology

In the single-switch topology, all nodes connect to a single switch using their network ports. This topology has the advantage of lower cost, but does not protect against a switch failure. Network redundancy establishes only at the link level.

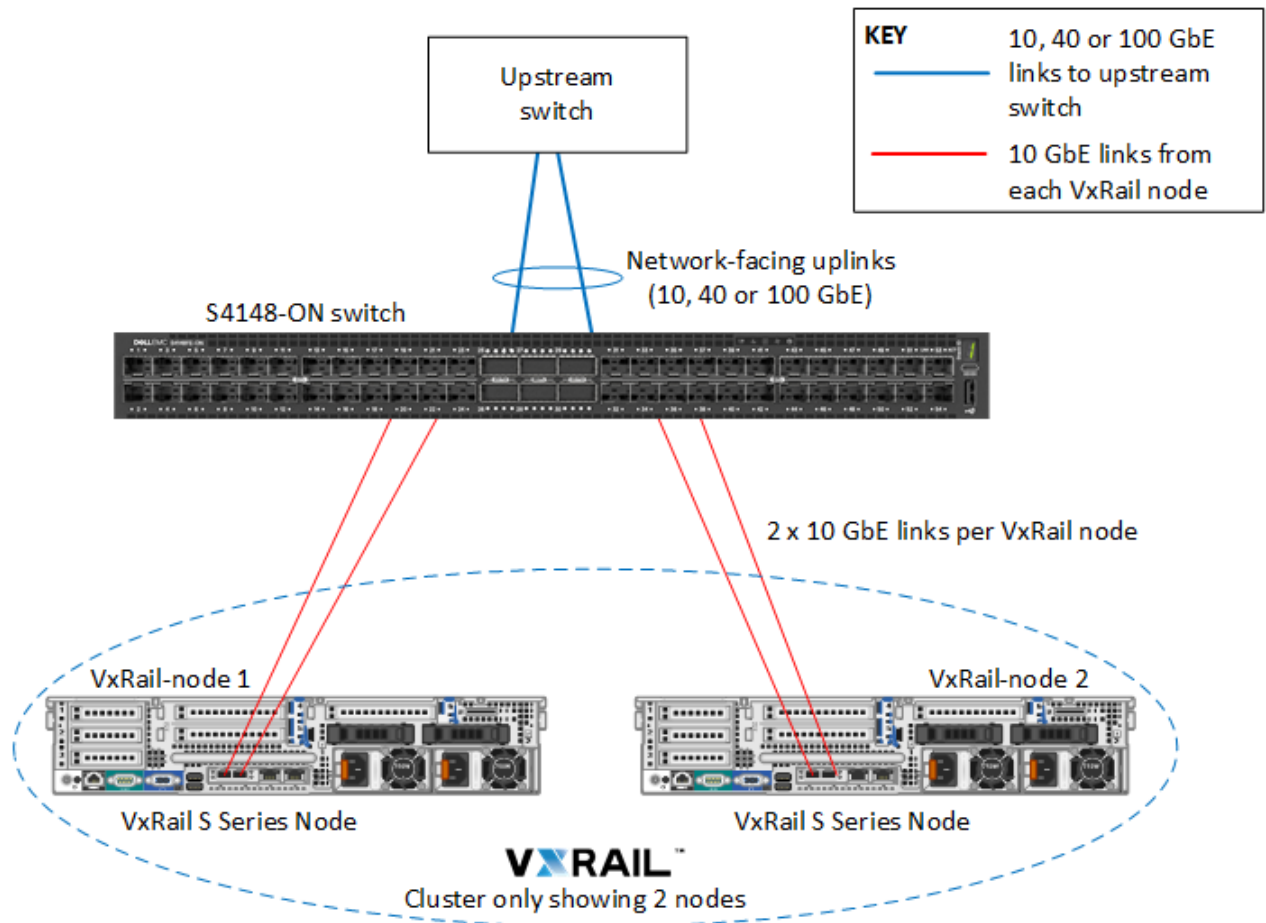


Figure 14 Example of a single-switch topology

2.1.2 Dual-switch topology

This topology establishes network redundancy at both the link and the switch level. Failure of a single-switch or network link does not cause an overall loss of communication.

In the dual-switch topology, each node connects to both switches in an active/standby capability. Refer to [Appendix C](#) for detailed information. The two S4148-ON switches connect with either a VLT configuration or a port channel configuration. VLT is preferred and is a Dell EMC Networking layer 2-multipathing technology, which allows for running a loop-free layer 2 (L2) multipath network without any blocked ports. VLT synchronizes layer 2-table information between the switches and makes the switches appear as one logical unit.

Usually a server connects to the pair of VLT switches with a LACP LAG. However, LACP is not used with VxRail nodes since the nodes are configured with a virtual switch with active and standby adapters. Other non-VxRail devices can utilize LACP LAG to the pair of VLT switches, for an active/active L2 multipathing scenario.

In a multi-switch environment, configure the ports used for inter-switch communication to carry IPv6 multicast traffic for the VxRail management VLAN. Likewise, configure the ports to carry IPv4 traffic (unicast starting in VxRail Release 4.5.0 and multicast in prior releases) between switches for the vSAN VLAN.

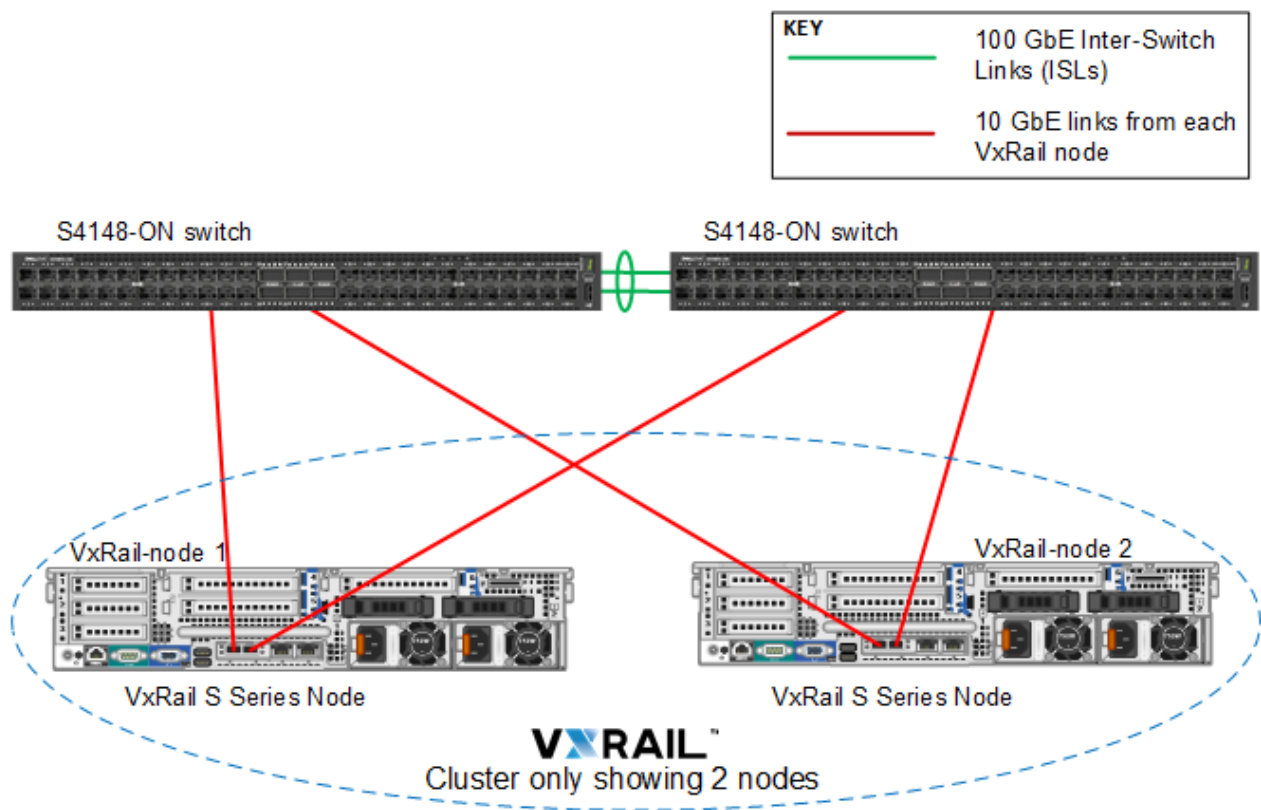


Figure 15 Example of a dual-switch topology

As the customer's environment grows with added VxRail nodes, a basic topology can quickly scale up to 32 server nodes while utilizing only 64 x 10GbE ToR ports (32 x 10GbE ToR ports per switch) for connecting to the server nodes. The 2 x 100GbE ports on the S4148-ON use ISL ports and upstream connectivity for a potential 2:1 oversubscription ratio

2.1.3 Dual-switch topology with Z9100-ON switches

In this setup, the Dell EMC S4148-ON switches are the ToR switches, and the Z9100-ON switches are the upstream switches. The links to the upstream switches (Z9100-ON) are utilizing 100GbE.

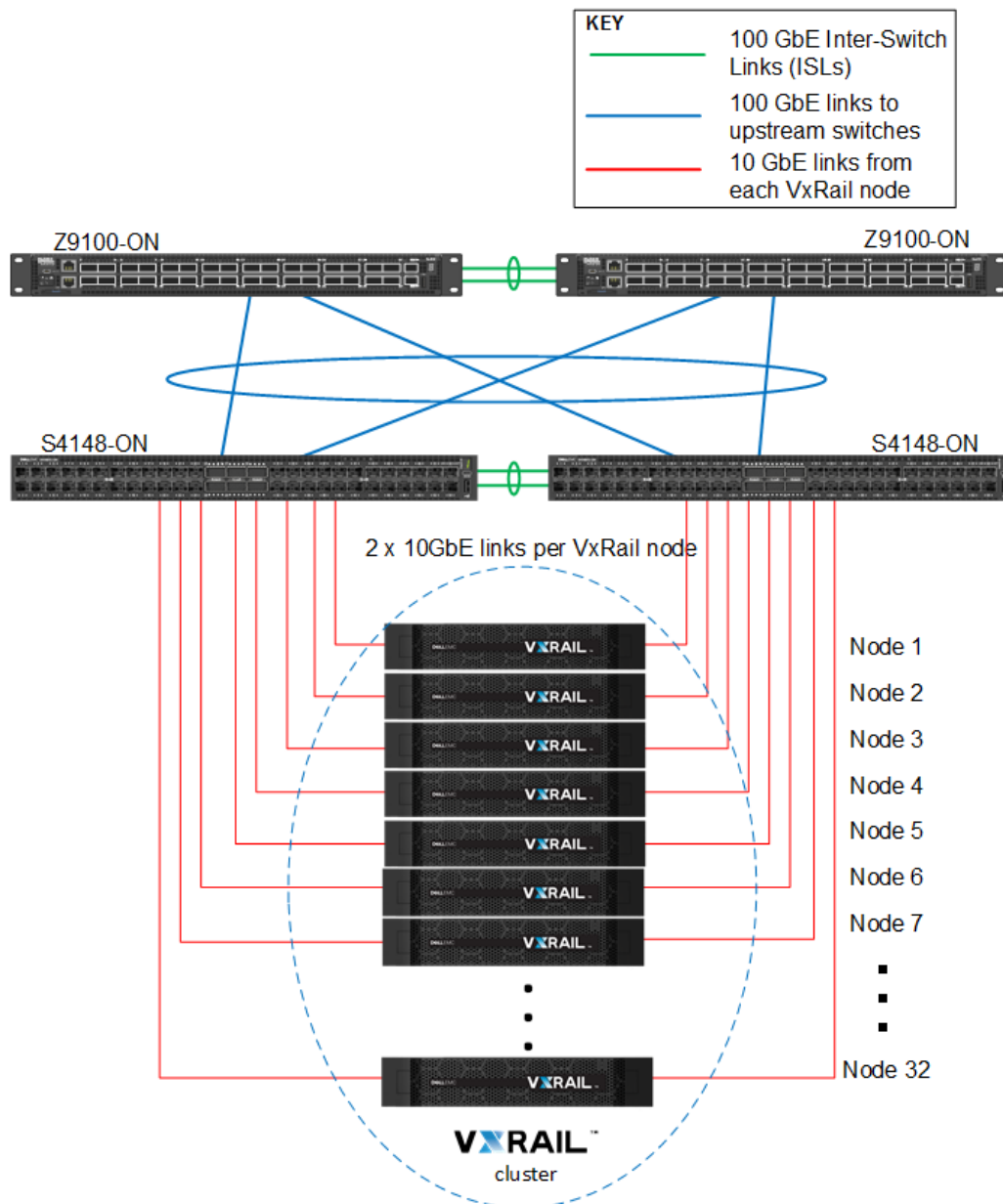


Figure 16 Example of a VxRail cluster with upstream Z9100-ON switches

2.1.4 Management network

VxRail nodes located at a data center may not be easily accessible. Dell EMC recommends setting up an out-of-band management switch to facilitate direct communication with each switch and node. One Dell EMC S3048-ON switch is configured in each rack to provide connectivity for access to the management network. Out-of-band (OOB) ports on switches and iDRAC ports on VxRail nodes are connected to the S3048-ON switch for the management network.

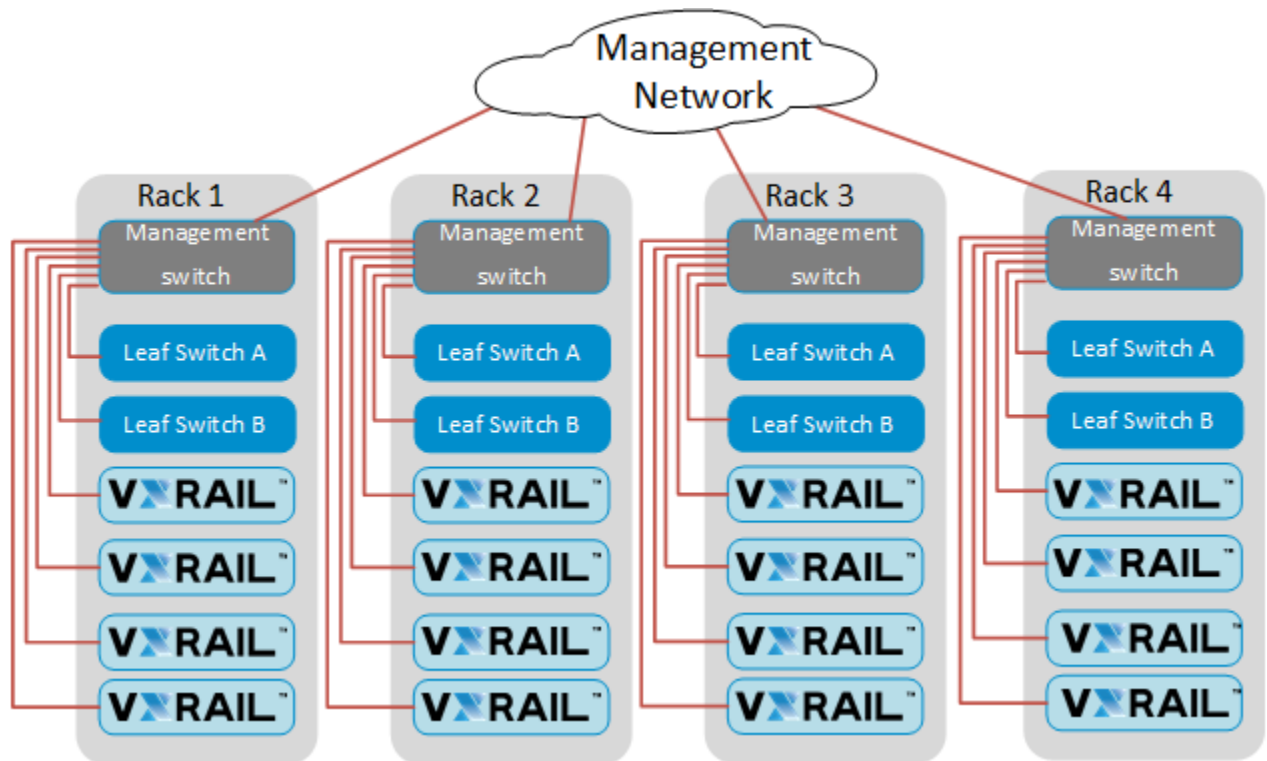


Figure 17 Management network

3 Switch initial setup

This deployment guide assumes that the installer has a basic familiarity with the VxRail node requirements, including the number of nodes for installation, whether the VxRail deployment uses VLANs or if all network traffic resides in a single broadcast domain. The installer should also know how many ports are available on the upstream switches from the S4148-ON and whether they are 10GbE, 25GbE, 40GbE, 50GbE and 100GbE ports.

3.1 Installer laptop connection

1. Serial console port: The laptop needs to connect to the serial console port of the S4148-ON (Figure 18). A serial cable with an RJ-45 connector is provided with the S4148-ON switch for connecting to the console port of the switch. The laptop may require an adaptor.
2. Serial console software: The installer must perform the configuration via the serial port. Console access requires a terminal emulator program such as PuTTY.
3. Installer laptop rights must allow setting up and using the serial console port and terminal emulator program.
4. For more detail on configuring the serial connection to the serial console port, refer to section [Accessing the RS-232 console port](#).



Figure 18 S4148-ON rear view

3.2 Configuration prerequisites

3.2.1 Check switch firmware version

The firmware version on the switch should be 10.4.0E (R2) or later and if it is not, visit Dell.com/support to download the latest firmware version for the switch.

```
Switch-1# show version
Dell EMC Networking OS10 Enterprise
Copyright (c) 1999-2018 by Dell Inc. All Rights Reserved.
OS Version: 10.4.0E (R2)
Build Version: 10.4.0E (R2.29)
Build Time: 2018-01-26T17:43:42-0800
System Type: S4148F-ON
Architecture: x86_64
```


3.2.2 Factory default configuration

Setting the switch to factory default will delete all configuration settings and restart the switch.

```
Switch-1# delete startup-configuration
Proceed to delete startup-configuration [confirm yes/no(default)]:yes
Switch-1# reload
System configuration has been modified. Save? [yes/no]:no
Continuing without saving system configuration
Proceed to reboot the system? [confirm yes/no]: yes
```

The switch reboots with factory default settings and is ready to configure utilizing the default username and password of admin/admin.

3.2.3 Switch-port profiles

On the S4148 switch series, switch-port profiles determine the enabled front-panel ports, supported breakout modes on Ethernet, and unified ports. Change the port profile on a switch to customize uplink and unified port operation, and the availability of front-panel data ports.

Note: switch-port profile 1 is the default profile on the S4148-ON switches

This document utilized switch-port profiles 1 and 2.

- Profile-1 (10GbE and 100GbE uplinks)
- Profile-2 (40GbE uplinks)

To change the switch-port profile, enter the `switch-port-profile` command with the desired profile, save it to the startup configuration, and reload the switch.

1. Set the switches switch-port profile

```
Switch-1# configure terminal
Switch-1(config)# switch-port-profile 1/1 profile-1
Warning: Switch port profile will be applied only after a save and reload.
All management port configurations will be retained but all other
configurations will be wiped out after the reload.
Switch-1(config)# exit
Switch-1# copy running-configuration startup-configuration
Switch-1# reload
Proceed to reboot the system? [confirm yes/no]yes
```

2. Verify the switches switch-port profile

```
Switch-1# show switch-port-profile
```

Node/Unit	Current	Next-boot	Default
1/1	profile-1	profile-1	profile-1

3.2.4 Unified ports on the S4148U

This section only applies to the S4148U switch. Skip this section if using other S4148 switches (S4148F, S4148FE, and S4148T). To configure unified ports on S4148U switches to Ethernet ports. Refer to the switch user's guide for further details.

Port-group 1/1/1-1/1/6 refers to the first 24 SFP+ ports on the switch. Use the following commands to convert these ports to Ethernet ports.

```
Switch-1# configure terminal
Switch-1(config)# port-group 1/1/1
Switch-1(conf-pg-1/1/1)# mode Eth 10g-4x
Switch-1(conf-pg-1/1/1)# exit
Switch-1(config)#
```

Note: QSFP+ and QSFP28 ports are by default in Ethernet mode. They can be configured by configuring port-group 1/1/7-1/1/10 using the previous commands. Refer to the OS10 Enterprise User Guide for more information.

Repeat the prior steps for port-group 1/1/2 to 1/1/6.

3.2.5 Verify license installation

```
OS10# show license status
Switch-1# show license status
System Information
Vendor Name       : Dell EMC
Product Name      : S4148F-ON
Hardware Version  : A00
Platform Name     : x86_64-dellemc_s4148f_c2338-r0
PPID              : CN09H9MN2829875P0042
Service Tag       : JLP6XC2
License Details
-----
Software          : OS10-Enterprise
Version           : 10.4.0E(R2)
License Type       : PERPETUAL
License Duration   : Unlimited
License Status     : Active
License location   : /mnt/license/JLP6XC2.lic
```

4 Switch configuration

You will now configure the switch or switches using the parameters and values chosen and recorded in the [Appendix A](#) and [Appendix B](#) worksheets. Power-on the switch and connect the laptop's serial cable to the S4148-ON console port. No passwords or login accounts required for console access in factory default configuration. Table 1 provides overall values used to validate the environment and for example values.

Table 1 Overview of values used as examples in this document.

		Single Switch Example	Dual Switch Example (Switch-1)	Dual Switch Example Switch-2
Top of Rack Switch	Vendor	Dell EMC	Dell EMC	Dell EMC
	Model	S4148-ON	S4148-ON	S4148-ON
	Number of switches	1	2	2
	Switch Ports Used (4 nodes)	1,2,3,4,5,6,7,8	1,3,5,7	1,3,5,7
	NTP server	100.67.10.20	100.67.10.20	100.67.10.20
	Hostname	Switch-1	Switch-1	Switch-2
	Management IP/ Mask	100.67.171.34/24	100.67.171.35/24	100.67.171.34/24
	Management route	100.67.171.254	100.67.171.254	100.67.171.254
	spanning-tree	rstp	rstp	rstp
	telnet server	No	No	No
	ssh server	Yes	Yes	Yes
	snmp-server	Yes	Yes	Yes
	IGMP snooping ((VxRail 4.0 and earlier)	Yes	Yes	Yes
	S4148 uplink ports to Z9100	25,26	25,26	25,26
Appliance Settings	Management VLAN Name	Management	Management	Management
	Management VLAN ID	1	1	1
	VSAN VLAN Name	vSAN	vSAN	vSAN
	VSAN VLAN ID	120	120	120
	vMotion VLAN Name	vMotion	vMotion	vMotion
	vMotion VLAN ID	110	110	110
	VM Network 1 VLAN Name	VM_Network_A	VM_Network_A	VM_Network_A
	VM Network 1 VLAN ID	130	130	130
Uplink Settings	Number of Switches	1	2	2
	Speed	100GbE	100GbE	100GbE
	Z9100 ports to the S4148	29,30	29,30	29,30
	VLAN(s)	1,110,130	1,110,130	1,110,130

4.1 Global switch settings and initial setup

You will now configure the switch or switches using the parameters and values chosen and recorded in [Appendix A](#) and [Appendix B](#) worksheets. Power-on the switch and connect the laptop's serial cable to the S4148-ON console port. No passwords or login accounts are required for console access in factory default configuration.

1. Enter a hostname for the switch using the following command:

Command	Example
Switch-1# configure terminal Switch-1(conf) # hostname name	Switch-1# configure terminal Switch-1(conf) # Switch-1

2. Configure the Management port IP address

Command	Example
interface mgmt 1/1/1 no ip address dhcp ip address ip-address /subnet mask no shutdown management route ip-address /subnet mask gateway-address	interface mgmt 1/1/1 no ip address dhcp ip address 100.67.171.35/24 no shutdown management route 0.0.0.0/0 100.67.171.254

3. Verify Management Configuration:

- a. Switch-1# show running-configuration interface mgmt 1/1/1

```
interface mgmt1/1/1
  no shutdown
  ip address 100.67.171.34/24
  ipv6 address autoconfig
```

- b. Switch-1# show running-configuration | grep management

```
management route 0.0.0.0/0 100.67.171.254
Switch-1# show interface mgmt 1/1/1
Management 1/1/1 is up, line protocol is up
Hardware is Dell EMC Eth, address is 14:18:77:25:55:b9
Current address is 14:18:77:25:55:b9
Interface index is 35454736
Internet address is 100.67.171.35/24
Mode of IPv4 Address Assignment: MANUAL
Interface IPv6 oper status: Enabled
Items deleted
Output 0 errors, Output 0 invalid protocol
Time since last interface status change: 07:56:26
```

4.2 VxRail node facing interfaces

Configure VxRail node-facing interfaces based on the number of nodes and switches selected. [Table 2](#) defines the S4148-ON ports for single-switch and dual-switch topologies.

Table 2 Single and Dual-Switch selections

Number of VxRail Nodes (Utilizing 2 ports)	Single S4148-ON TOR Port Numbers	Dual S4148-ON TOR Port Numbers
1	1,2	1
2	1-4	1,3
3	1-6	1,3,5
4	1-8	1,3,5,7
5	1-10	1,3,5,7,9
6	1-12	1,3,5,7,9,11
" " "	" " "	" " "
12	1-24	1,3,5,7,9,11,13,15,17,19,21,23
From 12 to 13 Nodes	Skip ports 25-30	Skip ports 25-30
13	1-24 and 31-32	1,3,5,7,9,11,13,15,17,19,21,23,31
16	1-24 and 31-38	1,3,5,7,9,11,,,37
"	"	"

Note: Ports 25 through 30 are for upstream or ISL ports

1. Interface configuration, enter the commands:

Command	Example
interface ethernet node/slot/port description desc_text switchport mode trunk switchport trunk allowed vlan vlan-id-list no shutdown	interface ethernet 1/1/1 description "Appliance 1 Port 1" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge

4.3 VLAN configuration

For the following steps, refer to the worksheets in [Appendix A](#) and [Appendix B](#) for the VLAN IDs and VLAN names.

1. Configure the Management VLAN interface, which uses the switch's default native VLAN ID, using the following commands:

Command	Example
interface vlan id description Management no shutdown	interface vlan1 description Management no shutdown

2. If the network is flat using a single broadcast domain, skip to step 3. If using VLANs, begin configuring VLAN interfaces using the following command:

Command	Example
interface ethernet node/slot/port description desc_text switchport mode trunk switchport trunk allowed vlan vlan-id	interface ethernet 1/1/1 description "Appliance 1 Port 1" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address

The commands above are common for all VLAN interfaces. Repeat the steps above for each VLAN.

For complete examples, see the running configurations in the [Configuration examples](#) section.

3. Enable IGMP snooping on the vSAN VLAN in this example configuration. Required for VxRail releases before release 4.5. Do this with the following global command:

```
ip igmp snooping enable
```

4. Enable the ip igmp snooping querier function on the vSAN VLAN interfaces through the VLAN interface mode command. Configure the ip igmp snooping querier with an IP address.

Command	Example
interface vlan vSAN VLAN ID ip igmp snooping querier ip address ip-address /subnet mask	interface vlan120 ip igmp snooping querier ip address 192.168.120.251/24

5. Validate your configurations with the following commands

- a. Switch-1(conf-if-vl-1)# show ip igmp snooping interface vlan 120

```
Vlan120 is up, line protocol is up  
IGMP snooping is enabled on interface  
IGMP snooping query interval is 125 seconds  
IGMP snooping querier timeout is 255 seconds  
IGMP snooping last member query response interval is 1000 ms  
IGMP snooping fast-leave is disabled on this interface
```

Note: The IPv4 multicast requirement (ip igmp snooping enable and ip igmp snooping querier) is a requirement of vSAN 6.0. Configure IPv4 multicast correctly for the vSAN deployment portion. IP IGMP snooping querier requires an IP address. This interface enables IGMP snooping querier.

b. Switch-1# show running-configuration interface VLAN 120

```
interface vlan120
description VSAN
no shutdown
ip address 192.168.120.251/24
ip igmp snooping querier
vrrp-group 120
priority 254
virtual-address 192.168.120.254
```

c. Switch-1# show VLAN

Codes: * - Default VLAN, M - Management VLAN, R - Remote Port Mirroring VLANs Q: A - Access (Untagged), T - Tagged

	NUM	Status	Description	Q	Ports
*	1	up	Management	A	Eth1/1/1-1/1/22,1/1/31-1/1/54 Po1-2,100
	110	up	vMotion	T	Eth1/1/1-1/1/8 Po1-2,100
	120	up	VSAN	T	Eth1/1/1-1/1/8 Po1-2,100
	130	up	VM_Network_A	T	Eth1/1/1-1/1/8 Po1-2,100

Note: Ensure the appropriate interface has switchport trunk allowed VLAN 110,120,130,140. This will tag each port for the specified VLANs.

d. Switch-1# show port-channel summary

Flags: D - Down I - member up but inactive P - member up and active
U - Up (port-channel)

Group	Port-Channel	Type	Protocol	Member	Ports
1	port-channel1	(D)	Eth	STATIC	1/1/23 (D) 1/1/24 (D)
2	port-channel2	(D)	Eth	STATIC	1/1/25 (D) 1/1/26 (D)
100	port-channel100	(U)	Eth	STATIC	1/1/29 (P) 1/1/30 (P)

4.3.1 Inter switch links (ISL) configuration

Two 100GbE ports from each Dell EMC Networking S4148-ON switch create an inter switch link. This configuration provides 200GbE bandwidth between the ToR switches.

The two examples for configuring ISL ports are:

- ISL Port-Channel without VLT - Section 4.3.2
- ISL Port-Channel with VLT - Section 4.3.3

Note: ISL Port-Channel with VLT is the preferred high availability option and a best practice.

4.3.2 ISL port channel configuration without VLT

Static link aggregation groups (LAGs) establish ISL links between switches. These links between switches require the addition of the port channel created for the ISL to all interface VLANs defined for the network.

This topology establishes network redundancy at both the link and the switch level. Failure of a single-switch or network link does not cause an overall loss of communication.

Configure the Inter-Switch Links (ISLs) for dual-switch topologies using the following commands for Switch 1 and Switch 2: (recommended port values shown).

Table 3 Dual-Switch ISL

Switch-1 (S4148-ON)	Switch-2 (S4148-ON)
<pre>interface port-channel 100 description " ISL to switch 2" switchport mode trunk switchport trunk allowed vlan 110,120,130 no shutdown interface ethernet 1/1/29 description "ISL to switch 2" channel-group 100 mode active no shut interface ethernet 1/1/30 description "ISL to switch 2" channel-group 100 mode active no shut</pre>	<pre>interface port-channel 100 description "ISL to switch 1" switchport mode trunk switchport trunk allowed vlan 110,120,130 no shutdown interface ethernet 1/1/29 description "ISL to switch 1" channel-group 100 mode active no shut interface ethernet 1/1/30 description "ISL to switch 1" channel-group 100 mode active no shut</pre>

4.3.3 ISL port channel with VLT configuration

In this example, two Dell EMC S4148F-ON switches are connected with a VLTi port-channel. VLT is a layer 2 multipathing technology that allows for running a loop-free L2 multipath network without any blocked ports. The VLTi synchronizes layer 2 table information between the switches and makes the switch appear as one logical unit. Usually a server connects to the pair of VLT switches with a LACP LAG, however, LACP is not used with VxRail nodes as the nodes are configured with a virtual switch with active and standby adapters. Other non-VxRail devices can utilize LACP LAG to the pair of VLT switches, for an active/active L2 multipathing scenario.

Use VRRP for gateway redundancy with vSAN and management VLANs. VRRP is an active/standby first hop redundancy protocol (FHRP) when used among VLT peers, it becomes active/active. Both VLT peers have the VRRP virtual MAC address in their FIB table as local destination address; this allows the backup VRRP router to forward intercepted frames whose destination MAC address matches the VRRP virtual MAC address.

Configure the Inter-Switch Links (ISLs) for dual-switch topologies.

- a. Configure the Inter-Switch Links (ISLs) port channel with VLT for dual-switch topologies on Switch 1 using the following commands in the first column: (recommended port values shown)
- b. Configure Switch-2 using the commands in column 2 for Switch-2

Table 4 ISL port channel with VLT configuration

Switch-1 (S4148-ON)	Switch-2 (S4148-ON)
interface ethernet1/1/29 <ul style="list-style-type: none">• description VLTi• no shutdown• no switchport interface ethernet1/1/30 <ul style="list-style-type: none">• description VLTi• no shutdown• no switchport vlt-domain 127 <ul style="list-style-type: none">• backup destination 100.67.171.34• discovery-interface ethernet1/1/29-1/1/30	interface ethernet1/1/29 <ul style="list-style-type: none">• description VLTi• no shutdown• no switchport interface ethernet1/1/30 <ul style="list-style-type: none">• description VLTi• no shutdown• no switchport vlt-domain 127 <ul style="list-style-type: none">• backup destination 100.67.171.35• discovery-interface ethernet1/1/29-1/1/30

4.4 Network facing uplink configurations

This section contains multiple configurations, and only one is required based on your environment. Switch-port profiles play a crucial role in port options.

- If configuring 10GbE ports go to section 4.4.3 below.
- If configuring 100GbE ports go to section 0 below.
- If configuring 40GbE ports go to section 4.4.2 below.

Table 5 Network facing uplink ports

Port Type	Ports to use	Switch-port profiles
10GbE	1-24, 31-54	Switch-port profile 1
40GbE	25-30	Switch-port profile 2
100GbE (recommended)	25,26	Switch-port profile 1

4.4.1 Network facing uplink configuration – 100GbE

1. Configure each switch using the following commands: (100GbE example using two ports)

Table 6 100GbE Network facing uplink configuration

Switch-1 (S4148-ON)	Switch-2 (S4148-ON)
interface port-channel 2 description "100Gb LAG to customer 2" no ip address switchport mode trunk switchport trunk allowed vlan 110,130 vlt-port-channel 2 no shutdown	interface port-channel 2 description "100Gb LAG to customer 2" no ip address switchport mode trunk switchport trunk allowed vlan 110,130 vlt-port-channel 2 no shutdown
interface ethernet1/1/25 description "100Gb Uplink to Customer 2" channel-group 2 mode active no shutdown no switchport	interface ethernet1/1/25 description "100Gb Uplink to Customer 2" channel-group 2 mode active no shutdown no switchport
interface ethernet1/1/26 description "100Gb Uplink to Customer 2" channel-group 2 mode active no shutdown no switchport	interface ethernet1/1/26 description "100Gb Uplink to Customer 2" channel-group 2 mode active no shutdown no switchport

2. Save the configuration in each switch using the following command from the enable prompt:

```
Switch-1# Write Memory
```

4.4.2 Network facing uplink configuration – 40GbE

To utilize 40GbE uplinks, you must change the switch-port-profile to profile-2. Reference section [Switch-port profiles](#) for instruction.

1. Configure each switch using the following commands: (40GbE example using two ports)

Table 7 40GbE Network facing uplink configuration

Switch-1 (S4148-ON)	Switch-2 (S4148-ON)
interface port-channel 2 description "40Gb LAG to customer 2" no ip address switchport mode trunk switchport trunk allowed vlan 110,130 vlt-port-channel 2 no shutdown	interface port-channel 2 description "40Gb LAG to customer 2" no ip address switchport mode trunk switchport trunk allowed vlan 110,130 vlt-port-channel 2 no shutdown
interface ethernet1/1/25	interface ethernet1/1/25

description "40Gb Uplink to Customer 2" channel-group 2 mode active no shutdown no switchport interface ethernet1/1/26 description "40Gb Uplink to Customer 2" channel-group 2 mode active no shutdown no switchport	description "40Gb Uplink to Customer 2" channel-group 2 mode active no shutdown no switchport interface ethernet1/1/26 description "40Gb Uplink to Customer 2" channel-group 2 mode active no shutdown no switchport
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

2. Save the configuration using the following command from the enable prompt:

```
Switch-1# Write Memory
```

4.4.3 Network facing uplink configuration - 10GbE

Configure the network-facing upstream ports as LAGs in the ISLs port configuration section. The examples show both 10GbE and 100GbE interfaces. Section 4.4.2 also covers the configuration steps for 40GbE connections. LAGs can connect to multiple upstream switches if they support multi-chassis LAG features such as vPC, or VLT.

The example shows 10GbE port configurations for reference information.

1. Configure the network facing uplinks on Switch 1 using the following commands: (10GbE recommended port values shown)

Table 8 10GbE Network facing uplink configuration

Switch-1 (S4148-ON)	Switch-2 (S4148-ON)
interface ethernet 1/1/23 description "10Gb Uplink to Customer 1" channel-group 1 mode active no ip address no shutdown interface ethernet 1/1/24 description "10Gb Uplink to Customer 1" channel-group 1 mode active no ip address no shutdown interface port-channel 1 description "10Gb LAG to customer 1" no ip address switchport mode trunk switchport trunk allowed vlan 110,130 no shutdown	interface ethernet 1/1/23 description "10Gb Uplink to Customer 1" channel-group 1 mode active no ip address no shutdown interface ethernet 1/1/24 description "10Gb Uplink to Customer 1" channel-group 1 mode active no ip address no shutdown interface port-channel 1 description "10Gb LAG to customer 1" no ip address switchport mode trunk switchport trunk allowed vlan 110,130 no shutdown

2. Configure Switch 2 using the commands in column 2 for Switch-2

4.4.4 Network facing uplink configuration - 4 x 10GbE breakout ports

QSFP+ and QSFP28 ports on S4148-ON switches can be configured as breakouts with 10GbE uplink ports. To configure these ports as 4 x 10GbE ports, use the following commands.

1. Configure interface breakout node/slot/port map {10g-4x | 25g-4x | 40g-1x | 50g-2x | 100g-1x}

```
Switch-1(config)# interface breakout 1/1/25 map 10g-4x
Switch-1(config)# exit
Switch-1#
```

2. Verify the port status with the following command:

```
Switch-1(config)# do show interface status
```

```
-----
Port          Description  Status  Speed  Duplex  Mode  Vlan  Tagged-Vlans
-----
Eth 1/1/25:1          down      0    auto    A      1    -
Eth 1/1/25:2          down      0    auto    A      1    -
Eth 1/1/25:3          down      0    auto    A      1    -
Eth 1/1/25:4          down      0    auto    A      1    -
```

5 Configuration examples

5.1 Single-switch example

The configuration below is the running configuration seen on the console from the `show running-config` command. Portions of the configuration have been removed that are repetitive or are not applicable to deployment of VxRail.

Switch-1 (S4148-ON)
Global switch settings
hostname Switch-1 snmp-server community name ro ntp server 100.67.10.20 spanning-tree mode rstp ip igmp snooping
Management configuration
interface mgmt 1/1/1 no ip address dhcp ip address 100.67.171.34/24 no shutdown management route 0.0.0.0/0 100.67.171.254
VLAN configurations
interface vlan1 description Management no shutdown ! interface vlan110 description vMotion no shutdown ! interface vlan120 description VSAN no shutdown ip igmp snooping querier ip address 192.168.120.254/24 ! interface vlan130 description VM_Network_A no shutdown

VxRail node facing interfaces

```
interface ethernet 1/1/1
description "Appliance 1 Port 1"
switchport mode trunk
switchport trunk allowed vlan 110,120,130
no ip address
no shutdown
spanning-tree port type edge
!
interface ethernet 1/1/2
description "Appliance 1 Port 2"
switchport mode trunk
switchport trunk allowed vlan 110,120,130
no ip address
no shutdown
spanning-tree port type edge
!
interface ethernet 1/1/3
description "Appliance 2 Port 1"
switchport mode trunk
switchport trunk allowed vlan 110,120,130
no ip address
no shutdown
spanning-tree port type edge
!
interface ethernet 1/1/4
description "Appliance 2 Port 2"
switchport mode trunk
switchport trunk allowed vlan 110,120,130
no ip address
no shutdown
spanning-tree port type edge
!
interface ethernet 1/1/5
description "Appliance 3 Port 1"
switchport mode trunk
switchport trunk allowed vlan 110,120,130
no ip address
no shutdown
spanning-tree port type edge
!
interface ethernet 1/1/6
description "Appliance 3 Port 2"
switchport mode trunk
switchport trunk allowed vlan 110,120,130
no ip address
no shutdown
spanning-tree port type edge
!
interface ethernet 1/1/7
description "Appliance 4 Port 1"
```



```

switchport mode trunk
switchport trunk allowed vlan 110,120,130
no ip address
no shutdown
spanning-tree port type edge
!
interface ethernet 1/1/8
description "Appliance 4 Port 2"
switchport mode trunk
switchport trunk allowed vlan 110,120,130
no ip address
no shutdown
spanning-tree port type edge

```

Port channel 1 is used for 10 GbE upstream connections and requires the correct switch-port profile

```

interface port-channel 1
description "10Gb LAG to customer 1"
no ip address
switchport mode trunk
switchport trunk allowed vlan 110,130

```

Port-channel 2 is used for both 40 and 100 GbE upstream connections depending on the specified switch-port profile

```

interface port-channel 2
description "100Gb LAG to customer 2"
no ip address
switchport mode trunk
switchport trunk allowed vlan 110,130

```

Example for 10GbE uplink ports, this requires switch-port profile-1

```

interface ethernet 1/1/23
description "10Gb Uplink to Customer 1"
channel-group 1 mode active
no ip address
no shutdown
!
interface ethernet 1/1/24
description "10Gb Uplink to Customer 1"
channel-group 1 mode active
no ip address
no shutdown

```

Example for 40GbE uplink ports, this requires switch-port profile-2

```

interface ethernet 1/1/25
description "40Gb Uplink to Customer 2"
channel-group 2 mode active
no ip address
no shutdown
!

```

```
interface ethernet 1/1/26
description "40Gb Uplink to Customer 2"
channel-group 2 mode active
no ip address
no shutdown
```

Example for 100GbE uplink ports, this requires switch-port profile-1

```
interface ethernet 1/1/25
description "100Gb Uplink to Customer 2"
channel-group 2 mode active
no ip address
no shutdown
!
interface ethernet 1/1/26
description "100Gb Uplink to Customer 2"
channel-group 2 mode active
no ip address
no shutdown
```

5.2 Dual-switch example

The running configuration example below is seen on the console from the `show running-config` command. Portions of the configuration have been removed that are repetitive or are not applicable to deployment of VxRail.

Switch-1 (S4148-ON)	Switch-2 (S4148-ON)
Global switch settings	
hostname Switch-1 snmp-server community name ro ntp server 100.67.10.20 spanning-tree mode rstp ip igmp snooping	hostname Switch-2 snmp-server community name ro ntp server 100.67.10.20 spanning-tree mode rstp ip igmp snooping
Management configuration	
interface mgmt 1/1/1 no ip address dhcp ip address 100.67.171.35/24 no shutdown management route 0.0.0.0/0 100.67.171.254	interface mgmt 1/1/1 no ip address dhcp ip address 100.67.171.34/24 no shutdown management route 0.0.0.0/0 100.67.171.254
VLT Configuration	
interface ethernet1/1/29 description VLTi no shutdown no switchport ! interface ethernet1/1/30 description VLTi no shutdown no switchport ! vlt-domain 127 backup destination 100.67.171.34 discovery-interface ethernet1/1/29-1/1/30	interface ethernet1/1/29 description VLTi no shutdown no switchport ! interface ethernet1/1/30 description VLTi no shutdown no switchport ! vlt-domain 127 backup destination 100.67.171.35 discovery-interface ethernet1/1/29-1/1/30
VLAN configurations	
interface vlan1 description Management no ip address no shutdown ! interface vlan110 description vMotion no shutdown ! interface vlan120 description VSAN	interface vlan1 description Management no ip address no shutdown ! interface vlan110 description vMotion no shutdown ! interface vlan120 description VSAN

<pre> no shutdown ip igmp snooping querier ip address 192.168.120.251/24 ! vrrp-group 120 priority 254 virtual-address 192.168.120.254 ! interface vlan130 description VM_Network_A no shutdown </pre>	<pre> no shutdown ip igmp snooping querier ip address 192.168.120.252/24 ! vrrp-group 120 priority 254 virtual-address 192.168.120.254 ! interface vlan130 description VM_Network_A no shutdown </pre>
VxRail node facing interfaces	
<pre> interface ethernet 1/1/1 description "Appliance 1 Port 1" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/2 description "Appliance 1 Reserved" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/3 description "Appliance 2 Port 1" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/4 description "Appliance 2 Reserved" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/5 description "Appliance 3 Port 1" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address </pre>	<pre> interface ethernet 1/1/1 description "Appliance 1 Port 2" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/2 description "Appliance 1 Reserved" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/3 description "Appliance 2 Port 2" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/4 description "Appliance 2 Reserved" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/5 description "Appliance 3 Port 2" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address </pre>

no shutdown spanning-tree port type edge ! interface ethernet 1/1/6 description "Appliance 3 Reserved" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/7 description "Appliance 4 Port 1" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/8 description "Appliance 4 Reserved" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge	no shutdown spanning-tree port type edge ! interface ethernet 1/1/6 description "Appliance 3 Reserved" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/7 description "Appliance 4 Port 2" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge ! interface ethernet 1/1/8 description "Appliance 4 Reserved" switchport mode trunk switchport trunk allowed vlan 110,120,130 no ip address no shutdown spanning-tree port type edge
Port channel 1 is used for 10 GbE upstream connections and requires the correct switch-port profile	
interface port-channel 1 description "10Gb LAG to customer 1" no ip address switchport mode trunk switchport trunk allowed vlan 110,130	interface port-channel 1 description "10Gb LAG to customer 1" no ip address switchport mode trunk switchport trunk allowed vlan 110,130
VLT Configuration	
vlt-port-channel 1 no shutdown	vlt-port-channel 1 no shutdown
Port-channel 2 is used for both 40 and 100 GbE upstream connections depending on the specified switch-port profile	
interface port-channel 2 description "100Gb LAG to customer 2" no ip address switchport mode trunk switchport trunk allowed vlan 110,130	interface port-channel 2 description "100Gb LAG to customer 2" no ip address switchport mode trunk switchport trunk allowed vlan 110,130

VLT Configuration	
vlt-port-channel 2 no shutdown	vlt-port-channel 2 no shutdown
Example for 100GbE uplink ports, this requires switch-port profile-1	
interface ethernet 1/1/25 description "100Gb Uplink to Customer 2" channel-group 2 mode active no ip address no shutdown ! interface ethernet 1/1/26 description "100Gb Uplink to Customer 2" channel-group 2 mode active no ip address no shutdown	interface ethernet 1/1/25 description "100Gb Uplink to Customer 2" channel-group 2 mode active no ip address no shutdown ! interface ethernet 1/1/26 description "100Gb Uplink to Customer 2" channel-group 2 mode active no ip address no shutdown
Example for 40GbE uplink ports, this requires switch-port profile-2	
interface ethernet 1/1/25 description "40Gb Uplink to Customer 2" channel-group 2 mode active no ip address no shutdown ! interface ethernet 1/1/26 description "40Gb Uplink to Customer 2" channel-group 2 mode active no ip address no shutdown	interface ethernet 1/1/25 description "40Gb Uplink to Customer 2" channel-group 2 mode active no ip address no shutdown ! interface ethernet 1/1/26 description "40Gb Uplink to Customer 2" channel-group 2 mode active no ip address no shutdown
Example for 10GbE uplink ports, this requires switch-port profile-1	
interface ethernet 1/1/23 description "10Gb Uplink to Customer 1" channel-group 1 mode active no ip address no shutdown ! interface ethernet 1/1/24 description "10Gb Uplink to Customer 1" channel-group 1 mode active no ip address no shutdown	interface ethernet 1/1/23 description "10Gb Uplink to Customer 1" channel-group 1 mode active no ip address no shutdown ! interface ethernet 1/1/24 description "10Gb Uplink to Customer 1" channel-group 1 mode active no ip address no shutdown

A Basic configuration worksheet

Table 9 Basic configuration worksheet.

Workstation Setting	Required	Workstation Value
Number of VxRail Nodes	Yes (minimum 3)	
Number of S4148-ON switches	Yes (minimum 1)	
Number of 10GbE network-facing uplink ports	Yes (minimum 1)	
Number of 100GbE network-facing uplink ports		
Number of 100GbE inter-switch links (ISLs) (only used in a dual-switch configuration)	Yes (recommended 2)	
Switch 1 Out-of-band management port IP address and mask.	No	
Switch 2 Out-of-band management port IP address and mask.	No	
Management port default gateway	No	
Switch 1 In-band Management IP address and mask.	No	
Switch 2 In-band Management IP address and mask.	No	
In-band Management port default gateway	No	

B VLAN worksheet

The table below shows entries for up to five VM Network VLANs and example values used in the document. You can use VLAN ID values within the range of 2 to 4094. The table indicate no VLANs are required but best practices are to have a minimum of four VLANs (Management, vMotion, vSAN and Guest Networks).

Table 10 VLAN worksheet

Worksheet Setting	Required	VLAN ID	VLAN Name
VxRail Manager VLAN	No		
vMotion VLAN	No		
vSAN VLAN	No		
VM Network VLAN A	No		
VM Network VLAN B	No		
VM Network VLAN C	No		
VM Network VLAN D	No		
VM Network VLAN E	No		

C Network I/O control predefined shares

Network I/O control allows users to allocate network bandwidth to the business-critical application and to resolve situations where several types of traffic compete for shared resources. Network teaming policies for both 10Gb and 1Gb network adapters along with predefined shares.

Table 11 Network traffic on E, P, S and V series 2 x 10GbE ports

Traffic Type	Requirement	Uplink 1 (10Gb) VMNIC0	Uplink 2 (10Gb) VMNIC1	Uplink 3 (1Gb) No VMNIC	Uplink 4 (1Gb) No VMNIC	NIOC Shares
Management	IPv6 multicast	Active	Standby	Unused	Unused	20
vSphere VMotion		Active	Standby	Unused	Unused	50
vSAN	IPv4 multicast See Note	Standby	Active	Unused	Unused	100
Virtual Machines		Active	Standby	Unused	Unused	30

Table 12 Network traffic on E, P, S and V Series 4 x 10GbE ports

Traffic Type	Requirement	Uplink 1 (10Gb) VMNIC0	Uplink 2 (10Gb) VMNIC1	Uplink 3 (10Gb) VMNIC2	Uplink 4 (10Gb) VMNIC3	NIOC Shares
Management	IPv6 multicast	Active	Standby	Unused	Unused	40
vSphere VMotion		Unused	Unused	Standby	Active	50
vSAN	IPv4 multicast See Note	Unused	Unused	Active	Standby	100
Virtual Machines		Standby	Active	Unused	Unused	60

Table 13 Network traffic on E and S series 1GbE ports

Traffic Type	Requirement	Uplink 1 (1Gb) VMNIC2	Uplink 2 (1Gb) VMNIC3	Uplink 3 (1Gb) VMNIC0	Uplink 4 (1Gb) VMNIC1	NIOC Shares
Management	IPv6 multicast	Standby	Active	Unused	Unused	40
vSphere VMotion		Unused	Unused	Standby	Active	50
vSAN	IPv4 multicast See Note	Unused	Unused	Active	Standby	100
Virtual Machines		Active	Standby	Unused	Unused	60

Note: vSAN for VxRail version 4.5.0 and above requires IPv4 unicast

D Validated Components

D.1 VxRail

VxRail Product	Version
VxRail Manager	4.0.200-5234142
VMware vCenter Server Appliance	6.0.0 build-5183552
VMware ESXi	6.0.0 build-5224934
VxRail Manager	4.0.200-5234142

D.2 Networking switches

Switch	Switch
S4148-ON – Leaf switches	OS10 - 10.4.0E (R2)
S6010-ON – Spine switches	OS10 - 10.4.0E (R2)
Z9100-ON – Spine switches	OS10 - 10.4.0E (R2)
S3048-ON – Management switch	OS10 - 10.4.0E (R2)

E Technical support and resources

Contacting Technical Support

Dell.com/support - focused on meeting customer needs with proven services and support.

Feedback for this deployment guide

We encourage readers of this publication to provide feedback on the quality and usefulness of this best practices guide by sending an email to Dell_Networking_Solutions@Dell.com

[Dell TechCenter](#) is an online technical community where IT professionals have access to numerous resources for Dell EMC software, hardware, and services.

E.1 Product manuals and technical guides

[Dell EMC VxRail support and documentation](#)

[Manuals and documentation for the Dell Networking S4148F-ON / S4148T-ON / S4148FE](#)

[OS10 Enterprise User Guide release 10.4.0E \(R1\)](#)

[Manuals and documentation for the Dell Networking S4148U-ON](#)

[Manuals and documentation for Dell Networking Z9100-ON](#)

[Manual and documentation for the Networking S6010-ON](#)

[Dell TechCenter Networking Guides](#)

F Accessing the RS-232 console port

Note: Before starting, be sure that your PC has a 9-pin serial port and that you have a terminal emulation program already installed and running on the PC.

If your PC does not have a DB-9 serial port connection, use a USB-to-Serial adapter.

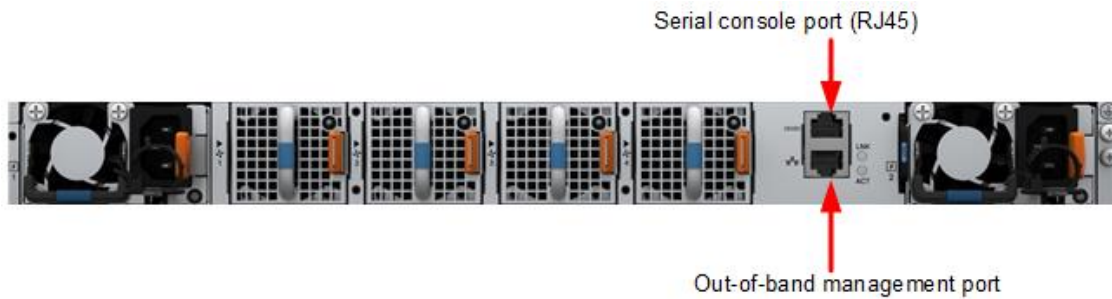


Figure 19 S4148-ON RS-232 console ports

1. Install the RJ-45 connector side of the provided cable into the S4148-ON console port.
2. Install the DB-9 female side of the provided copper cable into your PC's serial port (or into other data terminal equipment [DTE] server hardware that you intend to use).
3. Keep the default terminal settings on the console as follows:
 - 115200 baud rate (set the Micro USB console port to 9600 baud rate)
 - No parity
 - 8 data bits
 - 1 stop bit
 - No flow control