

Dell EMC Networking – Deploying Native Fibre-Channel and FCoE simultaneously

Short guide on deploying Fibre-Channel and FCoE in a converged environment using the Dell EMC S4148U standalone.

Dell EMC Networking – Technical Marketing
May 2018

Revisions

Date	Description	Authors
May 2018	Initial release	Mario Chow

THIS WHITE PAPER 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.

Contents

Test Set Up 4

Dell EMC Networking S4148U Configuration 5

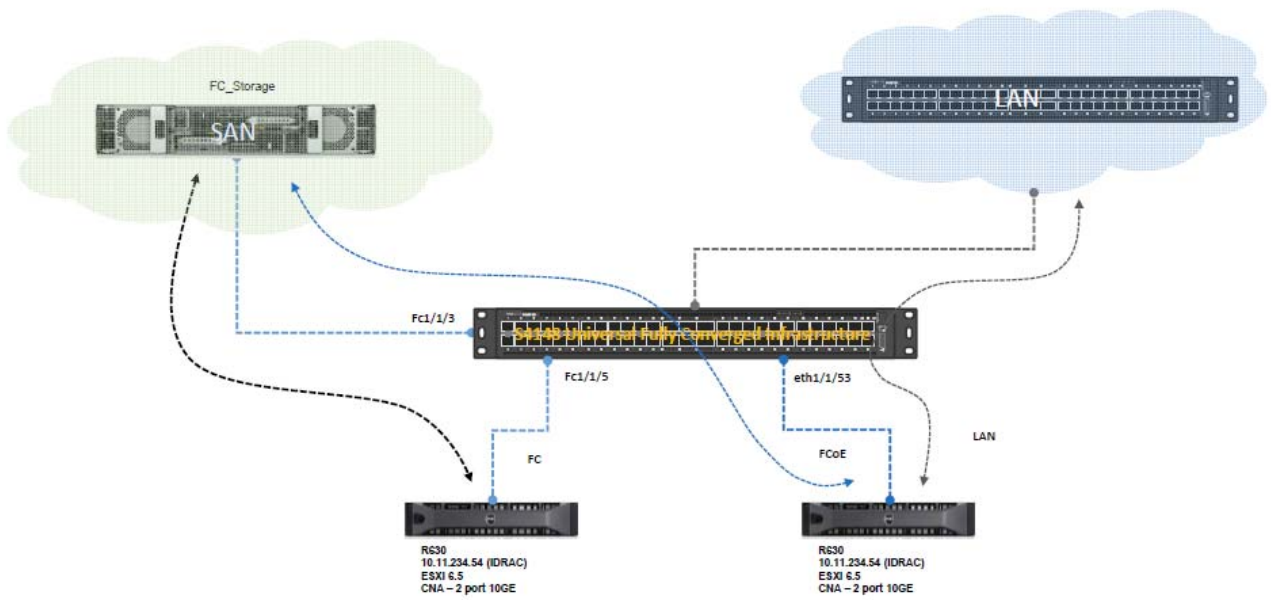
Test Set Up

Figure 1 shows the setup used to test native Fibre-Channel (FC) and Fibre-Channel over Ethernet (FCoE) deployment on the Dell EMC S4148U. The following list defines the setup:

- Traffic is uni-directional
- Storage traffic is generated by the server
- The S4148U is running OS10 (10.4.0E(X2))
- The target storage device is an emulated target – SAN Blaze
- HBA connection speed is at 16Gbps on interface Fc1/1/5 (FC)
- CNA connection speed is at 10Gbps on interface Eth1/53 (FCoE)

The objective of this short document is to provide a configuration cheat sheet on the Dell EMC S4148U as it relates to having two different types of end hosts (HBA, CNA) connecting to a fibre-channel storage target.

Figure 1 Dell EMC S4148U Fibre-Channel and Fibre-Channel over Ethernet Test setup



Dell EMC Networking S4148U Configuration

1. Enable FC feature and a domain ID for FPort
 - a. **Switch#** conf t
 - b. **Switch(config)#** dcbx enable
 - c. **Switch(config)#** feature fc <domain-id>
2. Configure the Ethernet interface as fibre-channel interface
 - a. **Switch#** conf t
 - b. **Switch(config)#** port-group 1/1/1
 - c. **Switch(config-pg-1/1/1)#** mode fc <16g-2x or 8g-4x>
 - d. **Switch(config-pg-1/1/1)#** end
 - e. **Switch#**
3. Create FCoE vlan
 - a. **Switch#** conf t
 - b. **Switch(config)#** int vlan 1002 – *it's recommended to use or reserve 1002 vland id or higher for FC/FCoE traffic in order to differentiate between storage and non-storage traffic.*
 - c. **Switch(config-if-vl-1002)#** description FC_FCoE_traffic
 - d. **Switch(config-f-vl-1002)#** end
 - e. **Switch#**
4. Create the vfabric. This is the storage fabric on which specific zones are attached. In this case, a default zone is created and anyone is permitted to connect to this zone.
 - a. **Switch#** conf t
 - b. **Switch(config)#** vfabric <id>
 - c. **Switch(config-vfabric-<id>#** vlan 1002
 - d. **Switch(config-vfabric-<id>#** fcoe fcmmap <0xefc00 – 0xefc0ff>
 - e. **Switch(config-vfabric-<id>#** zone default-zone permit
Configure allow or deny default-zone. No specific zone is being configured. To configure a specific zone, use "zoneset" command
 - f. **Switch(config-vfabric-<id>#** end
 - g. **Switch#**
5. Attach vfabric to the proper interfaces
 - a. **Switch#** conf t
 - b. **Switch(config)#** int range fibrechannel 1/1/3-1/1/5
 - c. **Switch(config-range-fc1/1/3-1/1/5)#** vfabric 2
 - d. **Switch(config-range-fc1/1/3-1/1/5)#** end
 - e. **Switch#**
6. The configurations from steps 1-5 apply for straight native Fibre-channel deployment on the S4148U. The subsequent configuration steps apply to Fibre-channel over Ethernet deployment.
 - a. **Switch#** conf t

- b. **Switch(config)#** policy-map type qos test
 - c. **Switch(config-pmap-qos)#** class class-trust
 - d. **Switch(config-pmap-qos)#** trust dot1p
 - e. **Switch(config-pmap-qos)#** end
 - f. **Switch#**

7. Using the previously configured policy map that trusts incoming dot1p's values, turn on ETS (Enhanced Transmission Selection) system wide.
 - a. **Switch#** conf t
 - b. **Switch(config)#** system qos
 - c. **Switch(config-sys-qos)#** ets mode on
 - d. **Switch(config-sys-qos)#** service-policy input type qos test
 - e. **Switch(config-sys-qos)#** end
 - f. **Switch#**

8. Configure a qos map consisting of two queues (queue 1 – LAN traffic, queue 3 – FCoE traffic). Assign each queue to a different qos group. The same qos map will be applied on all interfaces expected to receive FCoE traffic.
 - a. **Switch#** conf t
 - b. **Switch(config)#** qos-map traffic-class TC-Q
 - c. **Switch(config-qos-map)#** queue 1 qos-group 0-2,4-7
 - d. **Switch(config-qos-map)#** queue 3 qos-group 3
 - e. **Switch(config-qos-map)#** end
 - f. **Switch#**

9. Create queueing class maps that uses the qos-map defined in step 8.
 - a. **Switch#** conf t
 - b. **Switch(config)#** class-map type queueing LAN
 - c. **Switch(config-cmap-queueing)#** match queue 1
 - d. **Switch(config-cmap-queueing)#** exit
 - e. **Switch(config)#** class-map type queueing FCoE
 - f. **Switch(config-cmap-map)#** match queue 3
 - g. **Switch(config-cmap-map)#** end
 - h. **Switch#**

10. Create policy map that uses the class maps defined in step 9 and assign a percentage of the link bandwidth to the specific traffic type defined by the class maps (LAN and FCoE).
 - a. **Switch#** conf t
 - b. **Switch(config)#** policy-map type queueing ETS
 - c. **Switch(config-pmap-queueing)#** class LAN
 - d. **Switch(config-pmap-c-que)#** bandwidth percent 10
 - e. **Switch(config-pmap-c-que)#** exit
 - f. **Switch(config-pmap-queueing)#** class FCoE
 - g. **Switch(config-pmap-c-que)#** bandwidth percent 90
 - h. **Switch(config-pmap-c-que)#** end
 - i. **Switch#**

11. Configure the service policy maps and qos maps on all the relevant interfaces expected to receive LAN and SAN traffic. In this case, there is only one interface that is expected to receive LAN and FCoE traffic.
 - a. **Switch# conf t**
 - b. **Switch(config)# int eth1/1/53**
 - c. **Switch(config-eth1/1/53)# description Link_2_CNA_FCoE**
 - d. **Switch(config-eth1/1/53)# switchport mode trunk**
 - e. **Switch(config-eth1/1/53)# switchport access vlan 1**
 - f. **Switch(config-eth1/1/53)# service-policy input type network-qos PFC**
 - g. **Switch(config-eth1/1/53)# service-policy output type queuing ETS**
 - h. **Switch(config-eth1/1/53)# ets mode on**
 - i. **Switch(config-eth1/1/53)# qos-map traffic-class TC-Q**
 - j. **Switch(config-eth1/1/53)# priority-flow-control mode on**
 - k. **Switch(config-eth1/1/53)# vfabric 2**
 - l. **Switch(config-eth1/1/53)# spanning-tree port type edge**

The configurations provided apply only to the Dell EMC S4148U switch. The CNA still needs to be properly configured in order to bring up FCoE services. The setup in figure 1, uses ESXi 6.5 on the server with the CNA adapter.