

# Dell Networking S5000

Converged network and infrastructure with Dell S5000

- Converge LAN/SAN traffic
- Optimize & simplify the network
- Consolidate to decrease cost

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February 2014



# Dell Networking S5000

Converged network and infrastructure with Dell S5000  
using rack and blade servers

- Understand the converged topology and benefits
- 3-step deployment process
- Deployment Validation

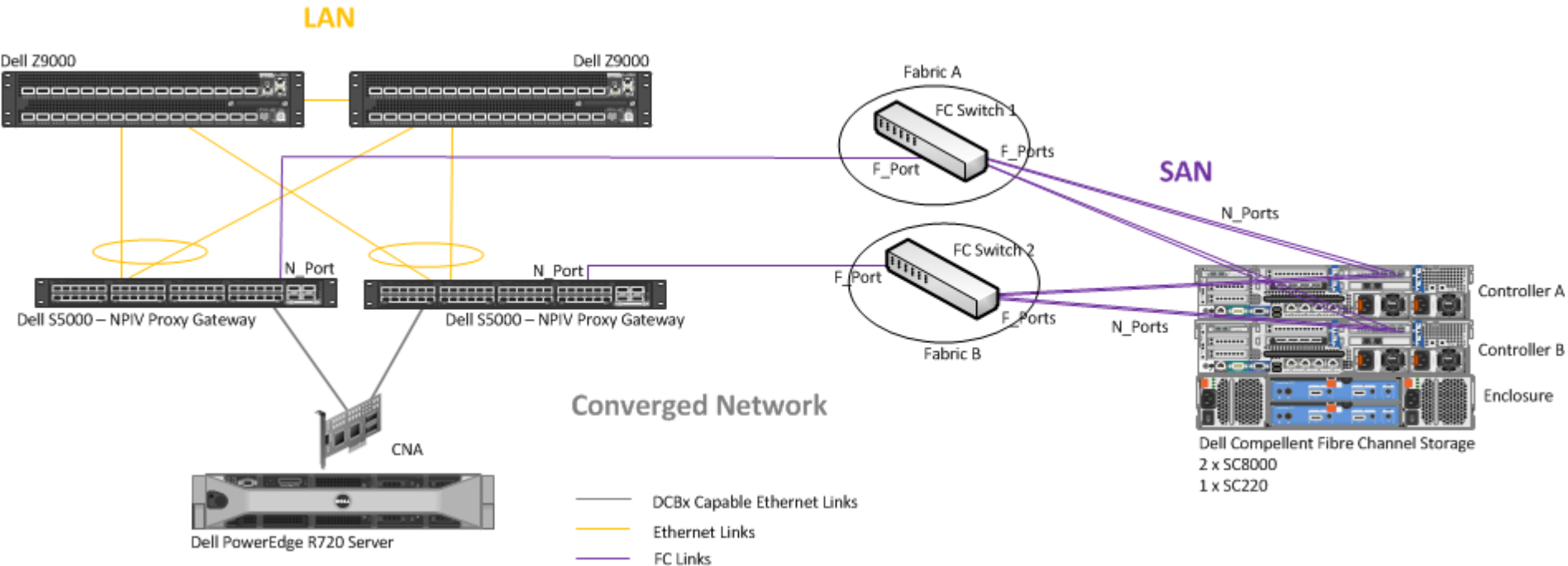


Converged network topology

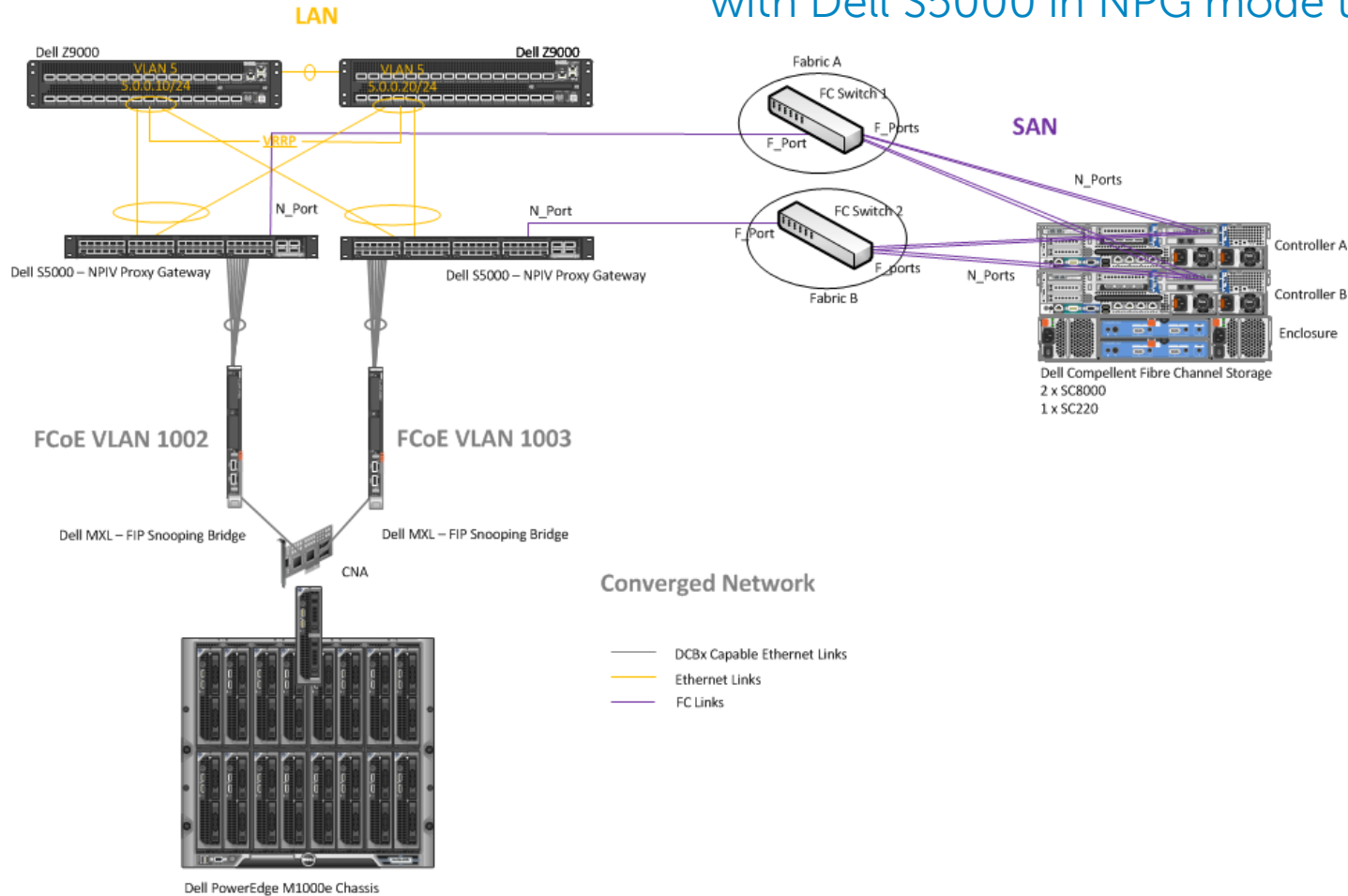
NPIV Proxy Gateway (NPG) Mode



## Moving to a converged network/infrastructure with Dell S5000 in NPG mode using rack servers



# Moving to a converged network/infrastructure with Dell S5000 in NPG mode using blade servers

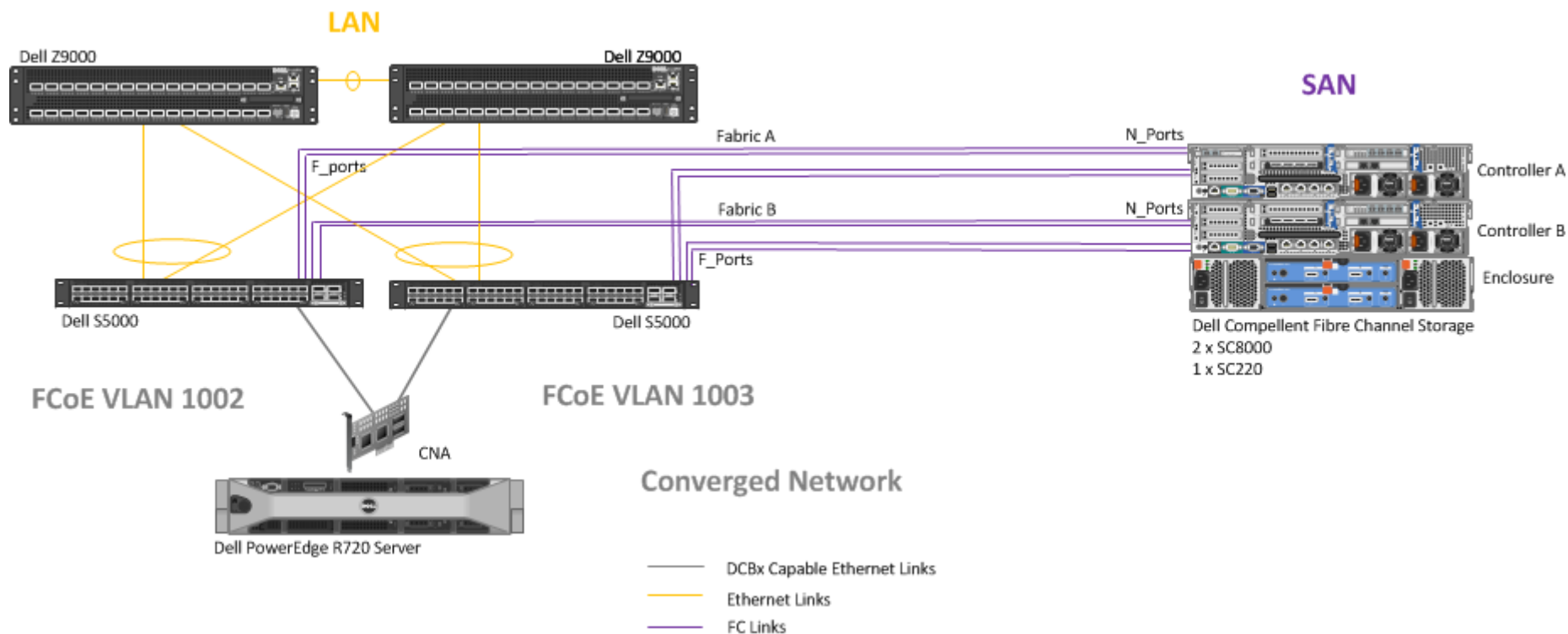


Converged network topology

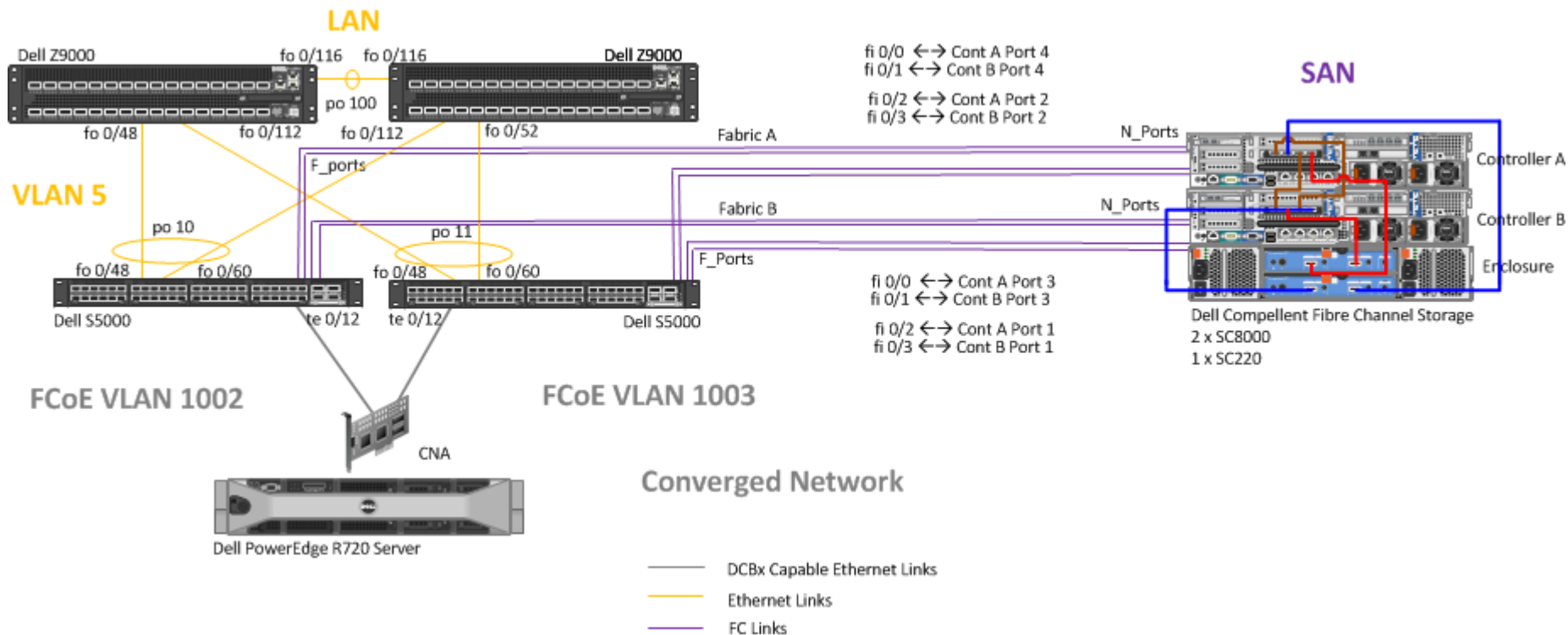
Full Fabric (FCF) Mode



## Moving to a converged network/infrastructure with Dell S5000 in Full Fabric mode



# Lab Topology





# 3-step Deployment Process



# Converged Network with Dell S5000 (FCF mode)

## **1. Configure CNA**

- a. Install CNA Drivers
- b. Enable FCoE on CNA
- c. Select multipathing policy
- d. Configure LAN settings (VLAN, IP Address, Gateway, etc)

## **2. Configure S5000 (and MXL/IOA as FCoE Transit if using blade servers)**

## **3. Update/Create appropriate S5000 FC zoning and storage information**

- by default all devices cannot see and talk to each other
- NPIV enabled by default
- create zone
- activate zone



# Broadcom 57810 CNA Configuration

- Enable FCoE

The screenshot displays the Broadcom Advanced Control Suite 4 interface. The Explorer View on the left shows the network topology, including Hosts, Adapter 1 (BCM57810 B0), and Port 0. The Hardware and Resource Configuration Wizard is open, showing the configuration for Port 0. The wizard is titled "Configure Resources" and "Modify Resources." The "Port 0" tab is selected, and the "Function 0" is also selected. The "Protocols" section shows "Ethernet/Ndis" and "iSCSI" as disabled, and "FCoE" as enabled. The "Resource Reservations" section shows "Pre-Allocated Resources" as disabled, and "TCP Offload Engine (TOE)" as disabled. The "Maximum TCP Offload Engine (TOE)" is set to 0, "Maximum iSCSI Offload Engine" is set to 0, "iSCSI Pending Tasks Per Connection" is set to 0, "Memory Consumption(%)" is set to 100, and "TOE RSS" is set to Disabled. The "button to configure" is visible at the bottom right of the wizard.

**Broadcom Advanced Control Suite 4**

File View Action Filter Context Tools Teams iSCSI Help

Filter: ALL VIEW Configurations Advanced Licenses Resource Reservations

Explorer View

Hosts

DDDZDHY1

Adapter 1: BCM57810 B0

Port 0

[0127] Broadcom BCM57810 NetXtreme II 10 GbE #127

[0017] Broadcom BCM57810 NetXtreme II 10 GbE (NDIS VBD Client) #127

**Hardware and Resource Configuration Wizard**

Configure Resources  
Modify Resources.

**Port 0**

**Function 0**

Property	Value
<b>Protocols</b>	
Ethernet/Ndis	<input checked="" type="checkbox"/> Enabled
iSCSI	<input type="checkbox"/> Disabled
FCoE	<input checked="" type="checkbox"/> Enabled
<b>Resource Reservations</b>	
<b>Pre-Allocated Resources</b>	
TCP Offload Engine (TOE)	<input type="checkbox"/> Disabled
Maximum TCP Offload Engine (TOE)	0
Maximum iSCSI Offload Engine	0
iSCSI Pending Tasks Per Connection	0
Memory Consumption(%)	100
TOE RSS	Disabled

**button to configure**

Apply Reset

Reset < Back Next > Cancel

**BROADCOM**

**BACS4**

# Broadcom 57810 CNA Configuration

- No NPAR with FCoE Enabled

(NPAR is optional)

The screenshot displays the Broadcom Advanced Control Suite 4 (BACS4) software interface. The main window is titled "Broadcom Advanced Control Suite 4" and features a menu bar with options: File, View, Action, Filter, Context, Tools, Teams, iSCSI, and Help. Below the menu bar, there is a "Filter: ALL VIEW" dropdown and a "Configurations" dropdown menu. A "Multi-Function" checkbox is checked.

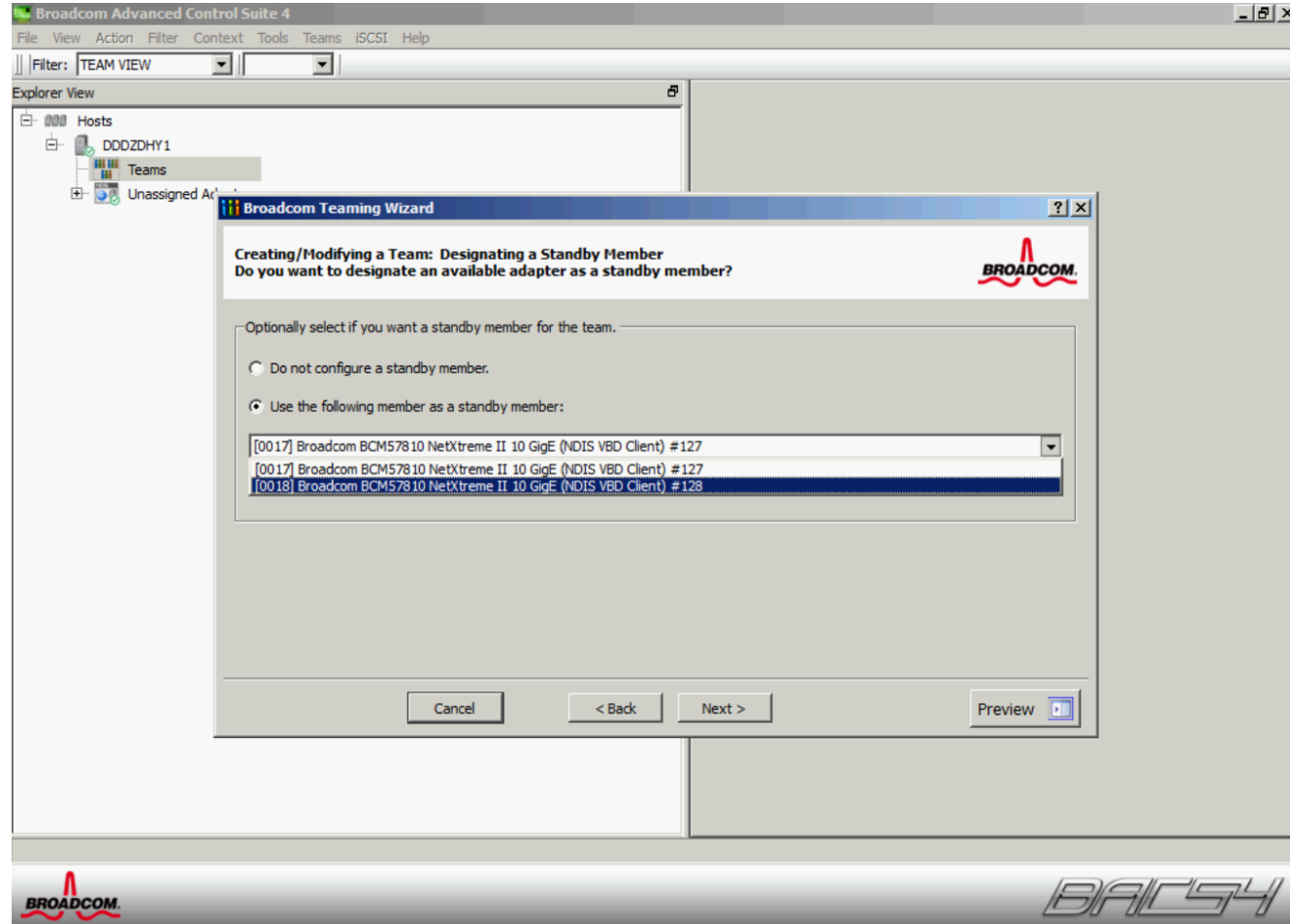
The "Explorer View" on the left shows a tree structure of hosts and adapters. The host "DDDZDHY1" is expanded, showing "Adapter 1 : BCM57810 B0". Under this adapter, two ports are listed: "Port0" and "Port1". "Port0" is further expanded, showing three sub-ports: "[0127] Broadcom BCM57810 NetXtreme II 10 GigE #127", "[0017] Broadcom BCM57810 NetXtreme II 10 GigE (NDIS VBD Client) #127", and "[0006] Broadcom BCM57810 NetXtreme II 10 GigE FCoE Adapter #127". "Port1" is also expanded, showing three sub-ports: "[0128] Broadcom BCM57810 NetXtreme II 10 GigE #128", "[0018] Broadcom BCM57810 NetXtreme II 10 GigE (NDIS VBD Client) #128", and "[0007] Broadcom BCM57810 NetXtreme II 10 GigE FCoE Adapter #128". Below the ports, "Adapter2" and "Adapter3" are listed.

The right side of the interface has two tabs: "Information" and "Configurations". The "Configurations" tab is active, showing a table with two columns: "Property" and "Value". The table contains one row: "+ Multi-Function". Below the table, there is a button labeled "Click the button to configure". At the bottom of the interface, there are two buttons: "Apply" and "Reset".

The Broadcom logo is visible in the bottom left corner, and the "BACS4" logo is in the bottom right corner.

# Broadcom 57810 CNA Configuration

- Configure LAN Settings



# Broadcom 57810 CNA Configuration

- Configure LAN Settings

The screenshot displays the Broadcom Advanced Control Suite 4 interface. The Explorer View on the left shows a tree structure under 'Hosts' > 'DDDZDHY1' > 'Teams' > 'Team 1'. Under 'Team 1', there are 'BASP Virtual Adapters' (including 'VLAN 5 ([0028] BASP Virtual Adapter)'), 'Primary Adapters' (including '[0018] Broadcom BCM57810 NetXtreme II 10 GigE (NDIS VBD Client) #128'), and 'Standby Adapters' (including '[0017] Broadcom BCM57810 NetXtreme II 10 GigE (NDIS VBD Client) #127').

The right pane shows the 'Team Properties' for 'Team 1', with 'Team Type' set to 'Smart Load Balancing(TM) and Failover'. Below this, the 'Internet Protocol Version 4 (TCP/IPv4) Properties' dialog is open, showing the 'General' tab. The 'Obtain an IP address automatically' radio button is selected. The 'Obtain DNS server address automatically' radio button is also selected. The 'Validate settings upon exit' checkbox is unchecked.

**Team Properties**

Property	Value
Team Name	Team 1
Team Type	Smart Load Balancing(TM) and Failover

**Internet Protocol Version 4 (TCP/IPv4) Properties**

**General**

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 5 . 0 . 0 . 3

Subnet mask: 255 . 255 . 255 . 0

Default gateway: 5 . 0 . 0 . 30

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: 10 . 11 . 0 . 1

Alternate DNS server: 10 . 11 . 0 . 2

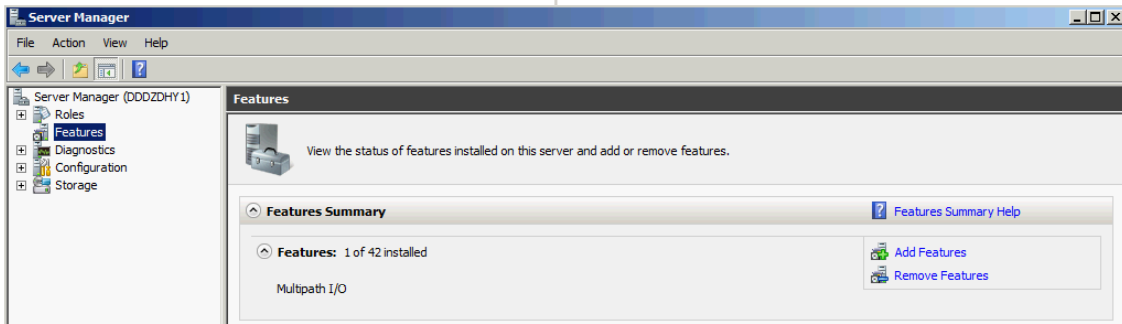
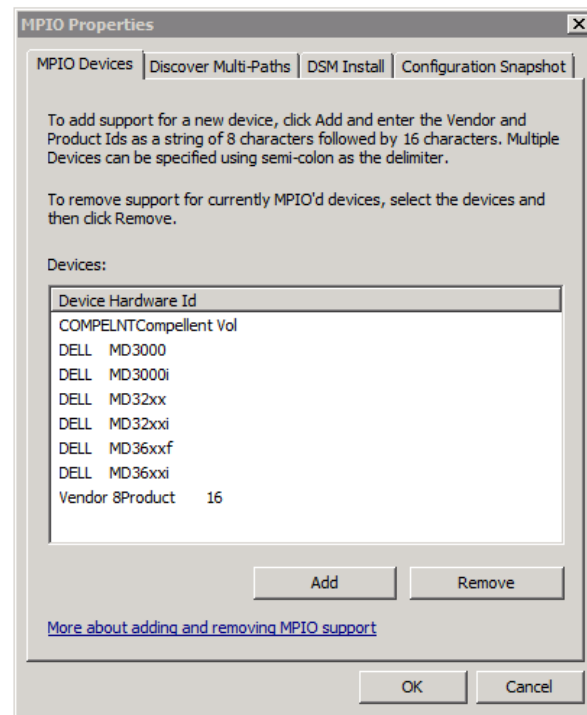
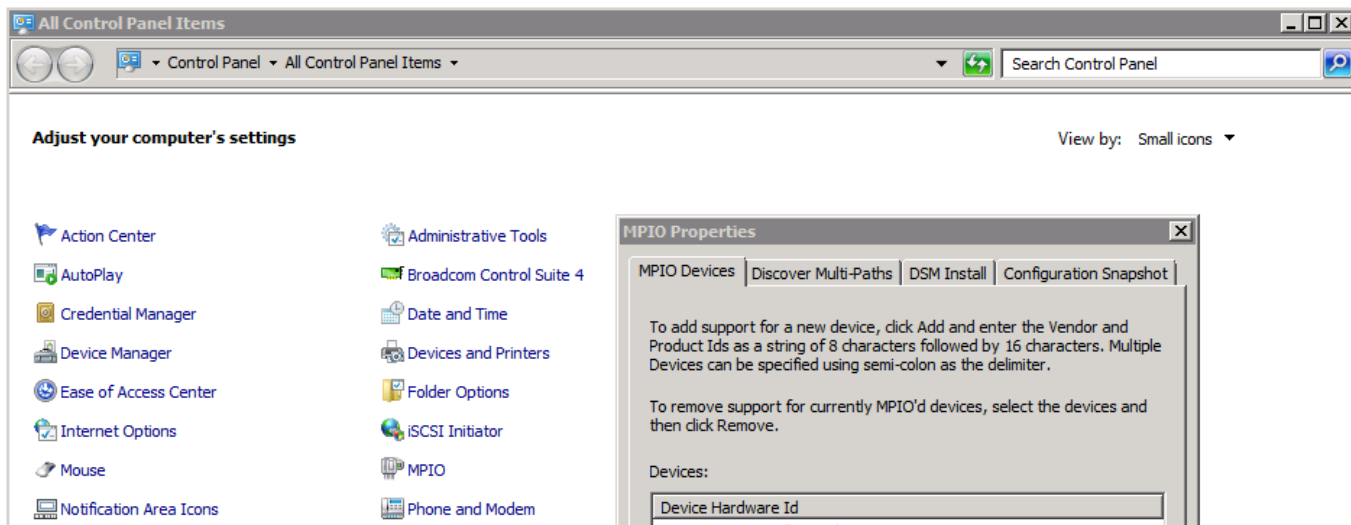
☐ Validate settings upon exit

Advanced...

OK Cancel

# Broadcom 57810 CNA Configuration

- Enable MPIO Feature



# Broadcom 57810 CNA Configuration

- Set MPIO Policy

On Microsoft Windows 2008 R2 Enterprise the Compellent SC8000 controller uses Microsoft Multipath I/O (MPIO) for load balancing over ports.

The screenshot displays the Windows 2008 R2 Computer Management console. The left pane shows the 'Storage' tree with 'Disk Management' selected. The main pane shows a list of volumes:

Volume	Layout	Type	File System	Status	Capacity	Free Space
DATAPART1 (D:)	Simple	Basic	NTFS	Healthy (OEM Partition)	39 MB	39 MB
Finance_Data_Compellent (T:)	Simple	Basic	NTFS	Healthy (Page File, Logical Drive)	20.00 GB	365.33 GB
OS (C:)	Simple	Basic	NTFS	Healthy (Primary Partition)	40.00 GB	40.00 GB
RECOVERY	Simple	Basic	NTFS	Healthy (Boot, Crash Dump, Primary Partition)	3.00 GB	3.00 GB

Below the volume list, the 'Disk 0' and 'Disk 1' properties are shown. Disk 0 is a 408.37 GB Basic disk with partitions RECOVERY (3.00 GB NTFS) and OS (C:) (40.00 GB NTFS). Disk 1 is a 20.00 GB Basic disk with partition Finance\_Data\_Compellent (T:) (20.00 GB NTFS). A CD-ROM 0 (DVD (E:)) is also listed with 'No Media'.

The 'DATAPART1 (D:) Properties' dialog box is open, showing the 'MPIO' tab. The 'Select the MPIO policy:' dropdown is set to 'Round Robin'. The description states: 'The round robin policy attempts to load balance I/O across all processing paths.' The 'DSM Name' is 'Microsoft DSM'. The 'This device has the following paths:' table shows four active paths:

Path Id	Path State	Weight
77100010	Active/Optimized	
77100011	Active/Optimized	
770f0011	Active/Optimized	
770f000d	Active/Optimized	

Buttons for 'Edit...', 'Apply', 'OK', and 'Cancel' are visible at the bottom of the dialog.



# Configure Dell S5000

1. Configure your typical LAN settings for the connections going upstream from the MXLs to the S6000s
2. Configure the interface connected to the CNA as portmode hybrid as it will carry both tagged and untagged traffic. Tag it in the respective VLAN for LAN traffic. It should be untagged on the default VLAN for FCoE control or FIP traffic.
3. Enable Full fabric Fibre Channel capabilities
  - > feature fc
  - > fc switch-mode fabric-services
4. Create the FCoE VLAN
  - > interface vlan 1002



# Configure Dell S5000

## 5. Create your DCB and FCoE Maps and apply them to the respective interfaces

- DCB-MAP applied to interface going to CNA
- FCOE-MAP applied to interface going to CNA FC interfaces (default FCoE Map created)

```
> dcb-map SAN_DCB_MAP
> priority-group 0 bandwidth 60 pfc off
> priority-group 1 bandwidth 40 pfc on
> priority-pgid 0 0 0 1 0 0 0 0
> exit
```

```
> fcoe-map default_full_fabric
> fabric-id 1002 vlan 1002
> fc-map 0efc02
> exit
```

```
> interface range fibreChannel 0/0 – 11
> no shut
```

```
> interface tengigabitethernet 0/12
> dcb-map SAN_DCB_MAP
> fcoe-map default_full_fabric
> no shutdown
> exit
```



# Dell S5000 Zoning Configuration

```
> fc zone Finance_Server
> member 20:01:00:0a:f7:06:90:61
> member 50:00:d3:10:00:ed:b2:3d
> member 50:00:d3:10:00:ed:b2:43
> member 50:00:d3:10:00:ed:b2:3b
> member 50:00:d3:10:00:ed:b2:41
> exit

> fc zoneset Compellent_Access
> member Finance_Server
> exit

> fcoe-map default_full_fabric
> fc-fabric
> activate-zoneset Compellent_Access
> exit
```

```
Dell_S5000_1#show fc zoneset active
```

```
Active Zoneset: Compellent_Access
```

ZoneName	ZoneMember
=====	
Finance_Server	
	*20:01:00:0a:f7:06:90:61
	*50:00:d3:10:00:ed:b2:3d
	*50:00:d3:10:00:ed:b2:43
	*50:00:d3:10:00:ed:b2:3b
	*50:00:d3:10:00:ed:b2:41

```
Dell_S5000_1#
```



# Allow server access to storage volume

**DELL** Compellent **Storage Center 60850**

Storage Management View Refresh Help

Properties Map Volume to Server Remove Mappings from Server Add HBAs to Server Remove HBAs from Server Create

Storage Center 60850

- Storage
- Servers
  - Finance\_Server**
- Disks
- Controllers
- UPS
- Enclosures
- Racks
- Remote Systems
- Users

**Finance\_Server**

General Server HBAs Connectivity Mapping Volumes Charts

Refresh Set Update Frequency Find Scroll Setting Add HBAs to Server

Type	Server Port	Status	Connectivity
FC	10008C7CFF307D28	Up	Connected
FC	10008C7CFF307D29	Up	Connected





The power to do more