HP Discover 2013 HOL 2653 HP Virtual Connect 4.01 features and capabilities

Lab Guide



HP Virtual Connect 4.01 features and capabilities

Lab Guide

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June 2013

Accessing the LAB environment and using the Domain Creation Wizard

Objectives

After completing this lab, you should be able to:

- Access the remote lab network
- Use the Domain Setup Wizard to create a Virtual Connect (VC) domain
- Delete a default server profile
- Delete the Networks
- The SAN Fabrics will remain and be used in a later Lab

Introduction

In this lab, you will gain access to the Remote LAB equipment. Each POD consists of a c7000 enclosure with FlexFabric modules in Bays 1 and 2, a pair of HPN 5820 LAN switches and shared access to both EVA and 3PAR SAN. Each POD has full control over their dedicated c7000 and Virtual Connect Domain.

You will then use the Virtual Connect Manager (VCM) setup wizards to perform the first-time configuration of a VC domain. These wizards can also be used after a VC domain has been created. The Domain Setup Wizard is the wizard you use during this lab exercise. This wizard automatically invokes several other wizards for you, including the Network Setup, Fibre Channel Setup, and Server Profile Setup wizards.

Important

1

When running the Domain Setup Wizard, make note of the MAC address, World Wide Name (WWN), and server serial number ranges you configure.

During this lab you will also delete the server profile, Network and SAN Fabrics created as this lab is intended to provide experience with lab access and the Domain Creation Wizard.

In this lab environment, you will use HP predefined (software-assigned) values for MAC addresses, WWNs, and server serial numbers. The particular range you will use is based on your student group number, which is referred to as your *POD ID*.

Exercise 1 - Accessing the remote lab network

Student Access

The lab environment is located in a remote data center and consists of 12 c7000 blade enclosures, FlexFabric and supporting LAN and SAN connectivity.



Each POD is configured with a c7000 Blade enclosure, TWO FlexFabric modules and TWO 5820 10Gb LAN switches configured in an IRF cluster. An EVA SAN is connected through FlexFabric ports X1 and X2 to a Brocade SAN fabric and a 3PAR storage array is directly connected to the FlexFabric Modules, port X3, for "FLAT SAN" connectivity.



Student access is provided through two terminal servers (TS1 or TS2) using Remote Desktop Services and a Windows login account assigned based on the POD ID. A common password is used for all login accounts. *<The instructor will provide the password>.*

There are two RDC servers implemented as Windows 2008 R2 virtual machines that are Internet-visible. Two RDC servers are provided for use, TS1 and TS2.

- All odd numbered PODs will use TS1
- All even numbered PODs will use TS2

RDC Terminal Servers				
Name	External IP Address	TCP Port	Internal IP Address	Default Gateway
TS1.cinetworking.lab	69.74.245.21	5001	172.20.200.14/16	172.20.0.1
TS2.cinetworking.lab	69.74.245.21	5002	172.20.200.15/16	172.20.0.1

 On the desktop of the LAB PC, open a Remote desktop Connect and enter the IP address and port number of the Terminal Server assigned to you, based on POD number.

Student logins are shown in the table below.

Remote Desktop Servers: Windows Login Accounts				
POD ID	User Name	Password		
21	CINETWORKING\pod-21	<instructor-defined></instructor-defined>		
22	CINETWORKING\pod-22	<instructor-defined></instructor-defined>		
23	CINETWORKING\pod-23	<instructor-defined></instructor-defined>		
24	CINETWORKING\pod-24	<instructor-defined></instructor-defined>		
25	CINETWORKING\pod-25	<instructor-defined></instructor-defined>		
26	CINETWORKING\pod-26	<instructor-defined></instructor-defined>		
27	CINETWORKING\pod-27	<instructor-defined></instructor-defined>		
28	CINETWORKING\pod-28	<instructor-defined></instructor-defined>		
29	CINETWORKING\pod-29	<instructor-defined></instructor-defined>		
30	CINETWORKING\pod-30	<instructor-defined></instructor-defined>		
31	CINETWORKING\pod-31	<instructor-defined></instructor-defined>		
32	CINETWORKING\pod-32	<instructor-defined></instructor-defined>		

- 2. Once logged in, access the HP Onboard Administrator (OA) of your enclosure by opening a web browser.
- 3. Specify the URL listed in the following table that corresponds to your assigned student POD ID, verify you have the correct POD ID when launching the shortcut.

Note

The third octet of the IP address corresponds to your POD ID.

POD ID	URL
21	https://172.20.21.100
22	https://172.20.22.100
23	https://172.20.23.100
24	https://172.20.24.100
25	https://172.20.25.100
26	https://172.20.26.100
27	https://172.20.27.100
28	https://172.20.28.100
29	https://172.20.29.100
30	https://172.20.30.100
31	https://172.20.31.100
32	https://172.20.32.100

4. Unless otherwise indicated by the instructor, enter the following user credentials to log in to the Onboard Administrator of your enclosure. (Do NOT change this or any password) and ensure only your enclosure is selected in the tab to the left.

User Name: admin Password: hpinvent



- 5. In the navigation pane, click the following links to examine the components installed in your enclosure:
 - Device Bays
 - Interconnect Bays

- 6. Access Virtual Connect Manager. In the navigation pane, click **Virtual Connect Manager**.
- 7. Unless otherwise indicated by the instructor, enter the following user credentials to log in.



Virtual Connect Manager: Factory-assigned Passwords				
POD	Module	IP Address	User Name	Password
21	1	172.20.21.118	Administrator	YZJRR92G
21	2	172.20.21.119		FQVJ9DMY
22	1	172.20.22.118	Administrator	FQRZ39M6
22	2	172.20.22.119		YR8V60B8
23	1	172.20.23.118	Administrator FFK	X5WF98F8
25	2	172.20.23.119		FFKNR4WS
24	1	172.20.24.118	Administrator	SWBYONFM
	2	172.20.24.119		HKGSQ8FM
25	1 172.20.25.118 Adr 2 172.20.25.119 Adr	Administrator	F69R6V4K	
25		Administrator	XXMJRZP3	
26	1	172.20.26.118	Administrator	B605GJW4
20	2	172.20.26.119		XF5TZHCP
27	1 172.20.27.118	Administrator	297TD48Z	
	2	172.20.27.119		KBP59QY9

28	1	172.20.28.118	Administrator	FGH3J0VZ
	2	172.20.28.119		YR690W9H
29	1	172.20.29.118	Administrator	T7FDBM4Y
	2	172.20.29.119		2JHQYDZ6
30	1	172.20.30.118	Administrator	65SW07XW
	2	172.20.30.119		QQRZ0C3K
31	1	172.20.31.118	Administrator	J5NN2T4V
	2	172.20.31.119		G2TZ8NQ7
32	1	172.20.32.118	Administrator	7HZYKT2G
	2	172.20.32.119		Q69R4YMZ

8. If the following window displays, then no VC domain currently is configured for your enclosure, proceed to Exercise 2.

IP Virtual Connect Manager

HP Virtual Connect Domain Setup Wizard

Configure the HP Virtual Connect Domain

Welcome

Finish

Welcome to Domain Setup Wizard

 Welcome
 This wizard provides assistance in setup of the HP Virtual Connect Manager. HP Virtual Connect manages connectivity for HP BladeSystem enclosures.

 General Settings
 This enclosure is HP Virtual Connect ready. You may use this wizard to create a new Virtual Connect Domain that includes this enclosure.

Prover your mouse over these icons for helpful hints!

Exercise 2 — Running the Domain Setup Wizard

In this exercise, you will use the Domain Setup Wizard, which starts automatically upon the first login to the Virtual Connect Manager web interface. You will be creating a Virtual Connect domain consisting of just your assigned enclosure at this time.

This wizard also invokes setup wizards for configuration of network, Fibre Channel, and server profile elements. These additional wizards will be used, but only to configure the minimum settings. Any of the Ethernet network, Fibre Channel SAN fabrics, and server profiles that you will need during the exercises that follow will be defined as you go through each exercise.

 After you log in to the VCM, the welcome window of HP Virtual Connect Domain Setup wizard displays automatically. Click Next.

Note

This window displays automatically when the VC Ethernet module is at the factory-default settings. If this window does not display, contact your instructor for directions before proceeding.



Specify the user name and password of the local OA Administrator account. Then click **Next**. (the OA login is "admin" and the password is "hpinvent"

(p) HP Virtual Con	nect Mr. User : Administrator Home Sign Out
HP Virtual Connect Configure the HP Virtual Connect D	Domain Setup Wizard
Step 1.1 of 4 Welcome Enclosure Import/Recovery Local Enclosure	Local Enclosure To manage the connectivity for this enclosure, Virtual Connect will need to communicate with the Onboard Administrator. Please enter the Administrator user name and password for the remote Onboard Administrator.
General Settings Local User Accounts Finish	Warning: Once you import this remote enclosure the Onboard Administrator (OA) IP address must not change. You must either assign a static IP address or configure it appropriately via your DHCP server. Additionally, Virtual Connect creates a local user named "vcmuser" on the OA module. You should not modify the credentials for this user. Finally, you must not change the "local users" authentication setting for the OA module.
	Required Field*
	OA IP Address:* Local Enclosure
	OA User Name:* admin
	OA Password:*
	Next > Cancel

Note

The account used to import the enclosure must be the local OA Administrator of the imported enclosure. A Lightweight Directory Access Protocol (LDAP) account is not supported and will cause the operation to fail.

 You will be creating a new Virtual Connect Domain. The option to Create a new Virtual Connect domain by importing this enclosure should be enabled by default. Ensure that it is and click Next.

MP Virtual Con	nect Manage User : Administrator Hone Sign Out	
HP Virtual Connect Configure the HP Virtual Connect E	Domain Setup Wizard	?
Step 1 of 4 Welcome Enclosure Import/Recovery General Settings Local User Accounts	Enclosure Import/Recovery Virtual Connect Is ready to either create a new or recover a previously defined Virtual Connect domain. When performing this operation, the enclosure will be examined. • Please do not insert or remove any modules during this operation. • If recovering a domain, please ensure that all servers have been powered down prior to the recoverse datement	
rnish	Enclosure ID Enclosure Name Enclosure Serial Number Rack Name OA IP Address Status Image:	
	To continue, select the operation you wish to perform and select the "Next" button. C Create a new Virtual Connect domain by importing this enclosure. C Restore a Virtual Connect domain using an externally-saved configuration file.	
	Previous Next > Cancel	ī

Important
 Do not enable double dense blade support.

3. By creating a domain, you disable all outbound traffic until at least one VC network and one server profile are defined, and the server profile is assigned to a server bay. Click **Yes** to confirm. The import process will take a few minutes, note the progress indicator at the bottom of the page.

	Confirm
?	This step will disable network access to all blade servers in the enclosure until Virtual Connect Networks are configured and Virtual Connect Server Profiles have been applied to the servers. Are you sure you want to continue?
	Yes No

4. The next window simply shows the number of blades and I/O modules in the enclosure. The listing you see might differ from the following example depending on the number of VC Ethernet modules, VC Fibre Channel modules, and server blades installed in the enclosure you are using. Click **Next**.

IP Virtual Conne	ect Manager					User : Admi Home Sig	nistrator n Out
HP Virtual Connect D Configure the HP Virtual Connect Dom	omain Setup Wiz	ard					0
Step 1.1 of 4 Welcome Enclosure Import/Recovery Import Status General Settings	Import Status The enclosure(s) import was information. Enclosure Import Status	: successful. Please review t	te Enclosure Import Status below for	further			
Locil User Accounts Finish	Enclosure Name PC0-21	Ethernet Modules 2	Hisre Channel Modules	Unknown Modules	Physical Servers 3		
						-	Next > Cancel

5. Specify PODnn_vc_domain or other name of your choosing for the name of your VC domain, substituting your POD ID for nn. Then click **Next**.

HP Virtual Conne	act Manager	User : Administrator Home Sign Out
HP Virtual Connect D Contigure the HP Virtual Connect Dor	Domain Setup Wizard	۵
Step 2 of 4	General Settings	
Vielcome Enclosure Import/Recovery	Name of Virtual Connect Domain: PCD-21_vc_domain (up to 31 characters).	
General Settings		
Local User Accounts Finish		
		Previous Next > Cancel

6. To get a sense of the role-based user accounts capability, add four types of user accounts to your domain. To define a user account, click **Add User** and then specify the information from the following table. Click **Add User** to save the changes and add the next user account. When finished, click **Done**.

MP Virtual Connect Manager			User Hom	: Administrato e Sign Out	r
HP Virtual Connect Domain Setup & Configure the HP Virtual Connect Domain	Wizard				
Step 3 of 4 Local User Account Welcome Enclosure Import/Recovery General Settings Local User Accounts Local User Accounts Domain. In certain accounts	Ints user accounts can be established for n addition to the default 'Administrator' iministrative privileges. All accounts ce	administering various compo account, user-defined acco in view status of all objects	nents of a Virtual Conr unts can be restricted t	ect o	
User Name Pri	vileges	Full Name Contact	Account Status	Delete	Advanced
Administrator Don	nan, Network, Storage, Server		Previous	A Next >	Cancel

Virtual Connect M Configure the HP Virtual Connect	lanager Domain S t Domain	etup Wizard	
Step 3.1 of 4 Welcome Enclosure Import/Recovery General Settings Local User Accounts User Settings Enish	User Settings	new user information and permissions. After each user entry press Add User. cess Done to go back.	
	Username: Password: Password: Full Name: Contact: Role s: Z Al Domain Network Storage User Enabled: Ub		

Username	Password	Role
admin	hpinvent	All
server	hpinvent	Server
network	hpinvent	Network
storage	hpinvent	Storage

Important

Both usernames and passwords are case-sensitive.

7. Click Done to close the Local User Account window.

- 8. Click the **Advanced** button, you will notice the expanded Password and IDEL Session Timeout parameters. Set the timeout to a value of 30 minutes and enable the "Delete Confirmation Preference" check box at the bottom of this screen, with this selected, during object deletion, VC will auto populate the name of the object being deleted.
 - Note

Prior to Firmware release 4.01, the GUI session did not have a configurable timeout value, however, the CLI timed out after 15 minutes of inactivity. The default GUI and CLI timeout value is set to 15 minutes. If set to "0" neither the GUI nor the CLI will timeout. Try setting the timeout value to 30 minutes.

Iser Accounts						_	
	Administrator	Roles Domain, Network, Storage, Server	Role Operations Full Name Port Monitoring, Firmw are Update (VCSU), Restore Domain Configuration, Save	Contact Account Status Enabled	Add Us	er	
	admin	Domain, Network, Storage, Server	Domain Configuration, Export Support Files Port Monitoring, Firmw are Update (VCSU), Restore Domain	Enabled	×		
	server	Server	Configuration, Save Domain Configuration, Export Support Files Port Monitoring	Enabled	×		
	netw ork	Netw ork	Port Monitoring	Enabled	×		
	storage	Storage		Enabled	×		
	C Requ	aire Strong Passwords	Enable Local Users Caution: If you disable loc remote authentication serv Connect Manager.	al user authentication be ices, you will not be able	fore properly setting up to login to the Virtual	2	
	Idle User Session T Note: Cha user sess disabled	ssion Timeout [2] Timeout: [15(10 - 1440 minutes) anging this setting affects current and new sions. The session timeout can be by setting it to Zero(0).	Primary Remote Authe	ntication Method	NE 💌		
	Delete Confi	rmation Preference Populate Name During Delete					
	Confirmat	ion					

9. Click Next to close the Local User Account window.

10. The completion window for the Domain Setup Wizard displays. Leave the Start the Network Setup Wizard check mark enabled and **click Finish**.



11. When the Welcome to the Network Setup Wizard window displays, read the information provided and then **click Next**.

HP Virtual Connect Manager	User : Administrator Home Sign Out
Virtual Connect Manager Network Setup Wizard Configue the Ethernit Network Seturgs	۵
Welcome to the Network Wizard	
Using this wizard you can: Assign the MAC addresses used by server blade Ethernet network adapters within the Virtual Connect Domain configure the Server VLAN Tagging Support Configure Multiple Networks Link Speed Settings Define external network connections that are dedicated to a specific Ethernet network Define external network connections with shared uplinks that carry multiple Ethernet networks (via use of VLAN tags)	
To continue, cick "Hext".	
Current Progress: Step 1 of 8	Hert > Cancel

12. Click **Use Virtual Connect assigned MAC addresses** to allow VC to manage hardware addresses. Then **click Next.**

(7) HP Virtual Connect Manager	User : Administrator Home Sign Out
Virtual Connect Manager Network Setup Wizard Centgure the Ethernet Network Settings	D
MAC Address Settings	
HP Virtual Connect can assign the MAC Addresses used by server blade Ethernet network adapters within the Virtual Connect Domain.	
Server Blade MAC Addresses	2
Ute VMuX Convert assigned MAC Addresses Use the state; hotps-defail MAC Addresses	
Select Type and Range of MAC Addresses	
Type: IP Pre-defined IP IP Range: HP Pre-defined 21 IS IS MAC doat MAC truit MAC truit ISA 00-17-46-77-50-00 00-17-46-77-50-FF IS IS	
Ensure that each 'Vitual Connect durain uset a unique range of MAC addresses This setting can not be changed after server profiles are defined	
To continue, click "Next".	
Current Progress: Step 2 of 8	< Previous Heat

 In the Type drop-down list, select HP Pre-Defined. Based on your POD ID, select HP Defined: nn for Range, where nn corresponds to your POD ID. Then click Next. Refer to the following table to determine your HP-Defined range identifier.

(?) HP Virtual Connect Manager	User : Administrator Hone Sign Out
Virtual Connect Manager Network Setup Wizard	۵
MAC Address Settings	
HP Virtual Connect can assign the MAC Addresses used by server blade Bihernet network adapters within the Virtual Connect Domain.	A
Server Blade MAC Addresses	
Use Virkuil Connect assigned MAC Addresses Use the static, factory-default MAC Addresses Select Type and Range of MAC Addresses	
Name Important and the set of the se	
Ensure that each Virtual Connect domain uses a unique range of MAC addresses This setting can not be charged after server profiles are defined	Ŧ
To continue, dick "Next".	
Current Progress: Step 2 of 8	<previous heat="" =""> Cancel</previous>

POD ID	Enclosure	Range	Begin and End
21	1	HP-Defined: 21	00-17-A4-77-50-00 to 00-17-A4-77-53-FF
22	2	HP-Defined: 22	00-17-A4-77-54-00 to 00-17-A4-77-57-FF
23	3	HP-Defined: 23	00-17-A4-77-58-00 to 00-17-A4-77-5B-FF
24	4	HP-Defined: 24	00-17-A4-77-5C-00 to 00-17-A4-77-5F-FF
25	5	HP-Defined: 25	00-17-A4-77-60-00 to 00-17-A4-77-63-FF
26	6	HP-Defined: 26	00-17-A4-77-64-00 to 00-17-A4-77-67-FF
27	7	HP-Defined: 27	00-17-A4-77-68-00 to 00-17-A4-77-6B-FF
28	8	HP-Defined: 28	00-17-A4-77-6C-00 to 00-17-A4-77-6F-FF
29	9	HP-Defined: 29	00-17-A4-77-70-00 to 00-17-A4-77-73-FF
30	10	HP-Defined: 30	00-17-A4-77-74-00 to 00-17-A4-77-77-FF
31	11	HP-Defined: 31	00-17-A4-77- 78-00 to 00-17-A4-77-7B-FF
32	12	HP-Defined: 32	00-17-A4-77-7C-00 to 00-17-A4-77-7F-FF

Important

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Selecting an HP range that another student team is using will cause a conflict on the network. This is important to note when designing a Virtual Connect solution for customers. If the customer has several or plans to implement several Virtual Connect based enclosures, the customer needs to ensure that each enclosure is configured with a unique MAC address range.

14. Confirm that a correct non-conflicting address range has been selected by entering confirm. Then click **OK**.

Confirmation					
Â	Confirm that no other Virtual Connect modules on the network use HP Pre-defined range between [00-17-A4-77-50-00 to 00-17-A4-77- 53-FF], by entering 'confirm'.				
Range	confirm				
	OK Cancel				

15. On the Server VLAN Tag Settings screen, the default VLAN Capacity setting is Expanded VLAN capacity. Also, notice the Multiple Networks Link Speeds Setting. Click Next 16. Select Connect with Uplinks to a single network and **click next**.

Mp HP Virtual Connect Manager User : Administration of the Sign Out	ator t
Virtual Connect Manager Network Setup Wizard Configure the Ethernet Network Settings	
Select Network Connection Type	
You can define external network connections that are dedicated to a specific Ethernet network, or connections with shared uplinks that carry multiple Et use of VLAN tags).	hemet networks (via
What type of network connection would you like to create?	
Ocnnection with uplink(s) dedicated to a single network	
O Connection with uplink(s) carrying multiple Ethernet networks and/or an FCoE network (using VLAN tagging) 👔	
O I do not want to create a network connection at this time.	
To continue, click "Next".	
Current Progress: Step 4 of 8	Next > Cancel

17. In the define a single network screen create a network called Network-1. Do not enable SmartLink or VLAN Tunneling, add Uplink X4 from Bays 1 and 2 modules and Click Create Network. Then **Click Create Network** on the following screen.

HP Virtual	Connect Ma	anager					A	1	User:Adr Home Si	ninistrator gn Out		
irtual Connec	tt Manager I twork Settings	Networ	k Setup Wiza	ď								?
Define Single Ne	twork Connect	tion										
Network												
Network Name Network-1												
Colornone	Labels 7	lype to add / pe to add Ne	Vetwork Labels]				_		
Smart Link Prive Advanced Network	vate Network En Settings Ports	able VLAN	Tunneling									
Port	Port Role	Port Stat	us		Connector Type	Connected To	F	ND Sp	eed/Duplex	Action		
POD-21 Bay 1: Port X4	NA	Ο ι	inked	10 Gb	SFP-DAC	POD21 (Ten-GigabitEthern	et1/0/1)	🔍 Aut	0	Delete		
POD-21 Bay 2: Port X4	NA	0 L	inked	10 Gb	SFP-DAC	POD21 (Ten-GigabitEthern	et2/0/1)	Aut	0	Delete		
Connection Mode:	 Auto 	ACP Time	r: 💿 Domain Default, S	hort (1 sec)								
	Failover		Short (1 sec)									
			O Long (30 sec)									۳
Define a Network conne	ction, then click 'Crea	ate Network	·.									
Current Progress: S	itep 5 of 8							< Pre	vious	reate Nets	work > Cance	ł
												•

18. The completion window for the Network Setup Wizard displays. Leave the Start the Fibre Channel Setup Wizard check box selected and then **click Finish**.

Device International Provided Advantages	User : Administrator Home Sign Out
Virtual Connect Manager Network Setup Wizard Configure the Ethernet Hetwork Settings	۵
Finish	
You have completed the Network Setup Wizard. At any point, you can define additional network connections by using the Define Network' or Define Shared Uplink Set' links also define networks by using the Define' pull-down menu.	from the home page. You can
The next step in setting up your Virtual Connect domain is storage configuration. This step must be done by a user that has 'storage' privileges.	
 If you wish to continue with storage configuration, click Finish' to complete this wizard and launch the Fibre Channel Setup Wizard. If you do not wish to setup storage configuration at this time, uncheck the check box below and click Finish' to complete this wizard. You will be taken to the Virtual you can access the Fibre Channel Setup Wizard from the Virtual connect home page and from the Tools' pull-down menu. 	Connect home page. In the future
Start Fibre Channel Setup Wizard	
To continue, click "Pinish".	
Current Progress: Step 8 of 8	Finish

 When the Welcome to Fibre Channel Setup Wizard screen displays, click Next.

(b) HP Virtual Connection	HP Virtual Connect Manager					
Virtual Connect Man Configure the Fibre Channel Settings	ager Fibre Channel Setup Wizard	۵				
Vetcore Vorsi Vide Name(WWR) Settings Define Fabric Pinish	Welcome to Fibre Channel Setup Wizard This wbard will essist you in configuring this 'What Connect domain to support server blade connections to Fibre Channel stercorner. Industry of the setup					
		Post > Cancel				

20. Select the **Yes, I would like to use Virtual Connect assigned WWNs** button to allow VC to manage Fibre Channel World Wide Names. Then click **Next**.

(6) HP Virtual Conn	nect Manager	User - Administrator Home Sign Out
Virtual Connect Man Configure the Fibre Channel Settings	nager Fibre Channel Setup Wizard	٥
Step 1 of 3 Vielone Violar Vide Name(VWN) Defree Fabric Preish	World Wide Name(WWI) Setting: If Volut Connect can assign Fiber Channel World wide Names (WMNs) used by server blade Fiber Channel host bus subpress within the Vihual Connect Domain. By configuring Vihual Connect Domain. Warning: Configuring Vihual Connect Domain Status Warning: Configuring Vihual Connect Status Warning: Configuring Vihual Connect Status Warning: Configuring Vihual Connect Status Warning: Loward	
		Previous Hpat > Cancel

21. From the Type drop-down list, select HP Pre-Defined. Refer to the following table to determine your HP-Defined range identifier. Based on your POD ID, select HP Defined: nn for Range, where nn corresponds to your POD ID. Then click Next.

(5) HP Virtual Connect	t Manager Uter: Administrator	
Domain Status 🖃	Define + Configure + Tools + Help +	
O O ▼ ▲ ▲ O 0 Domain 0 0 0 0 0 0	Fibre Channel Settings	. 2
Status View Legend	VWN Settings Misc.	
Find Configuration Items. 2	HP Virtual Connect can assign "Fare Channel World wide Names (WWNs) used by server blade Fare Channel host bus adapters within the Virtual Connect Donain.	
Domain Settings 🔲 🗖 🔺	By configuring Vatual Connect to assign WWAIs in server blades, a system can maintain a consistent storage identity (WMIs) even when the underlying server	
Configuration	hardware has been changed. This allows server teades to be replaced without affecting the external Pare Channel SAN administration.	
IP Address	Servor Blade WMI Addresses	
Enclosures		
Backup/Restore	Use Vitual Connect estigned WWRI Addresses	
Storage Mgmt Credentials	Use the static, factory-default WWW Addresses	
SNMP Configuration	Select range of WWN Addresses	
System Log		
Stacking Links	Type: HP Pre-defined	
Users/Authentication	Ranger: HP Pre-defined 21 Use the range that corresponds to your group #	
Ethernet	See table below	
Hore Channel	VVVV SBL VVVV DA	
www.settings	50.06.08.00.00.02.82.00 50.06.08.00.00.02.85.FF	
Logical Configuration		
Cogical Configuration		
Ethernet Networks	Prouve that each Virtual Connect donain uses a uplace range of world, wide pages	
Shared Unlink Sete		
SAN Fabrica	Tras setting can not be changed after server profes are defined	
Network Access Groups		
Hardware Configuration		
Hardware Overview	Apply Cancel	

POD ID	Enclosure	Range	Begin and End
21	1	HP-Defined: 21	50:06:0B:00:00:C2:B2:00 to 50:06:0B:00:00:C2:B5:FF
22	2	HP-Defined: 22	50:06:0B:00:00:C2:B6:00 to 50:06:0B:00:00:C2:B9:FF
23	3	HP-Defined: 23	50:06:0B:00:00:C2:BA:00 to 50:06:0B:00:00:C2:BD:FF
24	4	HP-Defined: 24	50:06:0B:00:00:C2:BE:00 to 50:06:0B:00:00:C2:C1:FF
25	5	HP-Defined: 25	50:06:0B:00:00:C2:C2:00 to 50:06:0B:00:00:C2:C5:FF
26	6	HP-Defined: 26	50:06:0B:00:00:C2:C6:00 to 50:06:0B:00:00:C2:C9:FF
27	7	HP-Defined: 27	50:06:0B:00:00:C2:CA:00 to 50:06:0B:00:00:C2:CD:FF
28	8	HP-Defined: 28	50:06:0B:00:00:C2:CE:00 to 50:06:0B:00:00:C2:D1:FF
29	9	HP-Defined: 29	50:06:0B:00:00:C2:D2:00 to 50:06:0B:00:00:C2:D5:FF
30	10	HP-Defined: 30	50:06:0B:00:00:C2:D6:00 to 50:06:0B:00:00:C2:D9:FF
31	11	HP-Defined: 31	50:06:0B:00:00:C2:DA:00 to 50:06:0B:00:00:C2:DD:FF
32	12	HP-Defined: 32	50:06:0B:00:00:C2:DE:00 to 50:06:0B:00:00:C2:E1:FF

Important

١

Selecting an HP range that another student team uses will cause a conflict on the network. The equivalent concern mentioned previously for ensuring that unique Ethernet MAC address ranges are used applies here.

22. Confirm the correct non-conflicting address range has been selected by entering confirm. Then click **OK**.



23. Select the **Define Fabrics** button and click **Next**.

🍈 HP Virtual Co		User:Administrator Home Sign Out		
Virtual Connect Ma Configure the Fibre Channel Setti	anager Fibre Channel Setup Wizard			2
Step 2 of 3	Define Fabric			
Welcome World Wide Name (WWN) Settings	C Define Fabric			
Define Fabric				
Finish C I do not want to create SAN Fabrics at this time.				
		Previou	s Next>	Cancel

24. Create a SAN Fabric called SAN-A, leave type as Fabric Attached and select port X1 on Bay 1, click Apply, then create a second Fabric called SAN-B and use port X1 on Bay 2 module, **Click Apply**

Virtual Connect M Configure the Fibre Channel Set	lanager Fibre Channel Setup Wizard	
Step 2.1 of 3 Welcome World Wide Name (WWN) Settings Define Fabric Define SAN Fabric	Define SAN Fabric Each FC-capable module can be connected to one or more external Fibre Channel SAN fabrics. Below you can define a single Virtual Connect SAN Fabric, give it a name, and then select the external uplink ports to connect the server to the data center SAN. Be sure that all uplink ports that you want to include are attached to the same external Fibre Channel SAN.	
	Fabric Name Fabric Type Login Re-Distribution Configured Speed Advanced SAN-A FabricAttach ▼ MANUAL Auto ▲	
	Enclosure Uplink Ports Uplink Port Bay Port Status Speed Connected To Delete	
	Upink Port X1 1 Z DISABLED AUTO 00:00:00:00:00:00:00 X Add Port -	
	Apply	Cance

25. Select No, I have defined all available Fabric and **click Next**. The red x on SAN-B will go away once the next button has been pressed.

IP Virtual Connect Manager								
Virtual Connect Man Configure the Fibre Channel Settings	ager Fibre Channel Setup Wizard		2					
Step 2.1 of 3 Welcome	Defined SAN Fabrics							
World Wide Name (WWN) Settings	SAN Fabrics	Port Information	Uplink Ports					
Define Fabric	Status SAN Fabric Fabric Type Login Re-Distributi	on Status Connected To	Enclosure Bay Port					
Defined SAN Fabrics	OK SAN-A FabricAttach MANUAL	OK 8 Gb 10:00:05:33:53:5c:ad	POD-21 1 X1					
Finish	Failed SAN-B FabricAttach MANUAL	Disabled INCOMPATIBLE 00:00:00:00:00:00:00:00	POD-21 2 X1					
	The above table lists the SAN Fabrics currently defined for this fabrics? C Yes, I would like to define additional fabrics Flor, I have defined all available fabrics	irtual Connect domain. Would you like to define additional						
			Previous Next > Can					

26. The completion window for the Fibre Channel Setup Wizard displays. Leave the check mark for **Start the Server Profile Setup Wizard** enabled and then **click Finish**.



27. At the Welcome screen, read the information and then **click Next**.

Virtual Connect Manager Server Profile Wizard		۵
Welcome to the Server Profile Wizard		
Using this wizard you can:		
 Configure Serial Number (Logical) Settings (if applicable) 		
Create a server profile definition which identifies the server connectivity by creating and configuring network and storage connections		
 Create unassigned server profiles or assign the profiles by selecting device bays 		
 Edit the profile names for each profile that will be created 		
Note: Cnce created, the individual profilea may be edited independently		
🔥 Before continuing, please ensure that the following tasks have been performed:		
 The Network Setup Wizard has been completed 		
 The Fibre Channel Setup Wizard has been completed (if applicable) 		
 All servers to be configured using this wizard are powered-off 		
To continue, click "Next".		
Current Progress: Step 1 of 6		Higt> Cancel
	internet	+ 100% +

28. Select the Use Virtual Connect assigned Serial Numbers (Logical) button to allow VC to manage serial numbers. From the Type drop-down list, select HP Pre-Defined. Refer to the following table to determine your HP-Defined range identifier. Based on your POD ID, select HP Defined: nn for Range, where nn corresponds to your POD ID. Click Next.

W III with connect manager	Home I Sprox
/irtual Connect Manager Server Profile Wizard	
Serial Number Settings	
# Virtual Connect can assign Sanial Numbers to blades within the Virtual Connect Domain.	
ierial Nanders	
Use VMsul Connect estimated Servid Numbers	
Use the static, factory-default Serier Numbers	
Select Type and Range of Serial Humbers	
Type If Ptr-defined Image: Section of Sect	
Consumbled each Visitual Connect downer ware a visitual renge of Senal Numbers. Senal Numbers can be change from hocksy-default to VC assigned after profile creation. Noverwer, where profile conduct the reneware in of box. Uses Cethod samil number ranges may be expanded after profile creation. Revenue, the ranges hay not be chanke.	
la contrue, cicki Twert	Throken Bryt. Coor

POD ID	Group	Range
21	21	HP-Defined: 21
22	22	HP-Defined: 22
23	23	HP-Defined: 23
24	24	HP-Defined: 24
25	25	HP-Defined: 25
26	26	HP-Defined: 26
27	27	HP-Defined: 27
28	28	HP-Defined: 28
29	29	HP-Defined: 29
30	30	HP-Defined: 30
31	31	HP-Defined: 31
32	32	HP-Defined: 32

Important

Selecting an HP range that another student team uses will cause a conflict on the network. The equivalent concern mentioned previously for ensuring unique Ethernet MAC address and WWN ranges are used applies here.

29. Confirm the correct non-conflicting address range has been selected by entering confirm. Then **click OK**.

	Confirmation
4	Confirm that no other Virtual Connect modules on the network use HP Pre-defined range between [VCX0000K00 to VCX0000KZZ], by entering 'confirm'.
Range	confirm
	OK

30. At the next screen you will create a profile that will be used as a template and could be assigned to one or many server bays. Click on the Unassigned network for NICs 1 and 2 and assign the network as Network-1. Do not edit the Network Speed at this time. In the FCoE HBA Connections space, assign Bay 1 Port to SAN-A and the bay 2 port to SAN-B. **Click Next**

te and Deploy Server Profiles					
este Cerver Brofile de	finition				
Profile					
ofile Name	Network Access Grou	Advanced Profil	le Settings		
lit profile names in an upco	ming step 🛛 Default 💌 🔹				
themet Adapter Conne	ections				
ort Network Name	Statu Port Speed Type	PXE	Multicast Filter	MAC	Ac
Network-1	PREFERRED	USE-BIOS	None	VC-DEFINED	
Network-1	PREFERRED	USE-BIOS	None	VC-DEFINED	
Add					
SCSI HBA Connections	i				
CoE HBA Connections	i				
ort Connect: FC SAN / FCo	E Network Name Type	Status Port Sp	peed Type VWVPN	MAC	Action
Bay1 SAN-A	SAN	PREF	ERRED VC-DEFINED	O VC-DEFINE	:D
Bay 2 SAN-B	SAN	PREF	ERRED VC-DEFINED	VC-DEFINE	D Delete

31. On the Configure how server profiles will be created screen, assing the profile to Bay 1 only. Click **Next.**

nfigure how	server pro	ofiles will be	created						
Assign profil Leave profile	es to specifi es unassigne	ic server bay: ed for now	5						
POD-21	bays for se	erver profile	assignmer	nt]
				Ali 🔲					
	Bay 1 ProLiant BL460c G7	Bay 2 ProLiant BL460c G7	Bay 3 EMPTY	Bay 4 EMPTY	Bay 5 EMPTY	Bay 6 EMPTY	Bay 7 EMPTY	Bay 8 EMPTY	
Upper 📃									
	Bay 9	Bay 10	Bay 11	Bay 12	Bay 13	Bay 14	Bay 15	Bay 16	
	ProLiant BL460c G7	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	
Lower 🗌									

32. In the Name Server profile screen – Base Name – Type POD-xx_, where xx is your POD# and **Click Create Profiles**.

HP Vir	rtual Connect Manag	er		User:Administrator Home Sign Out
	nnect Manager Serv Server Profiles	er Profile Setup Wizard		2
Name Server	r Profiles			
 Use the 	base name to create a comm	ion base name for the server profiles		
 As neces 	ssary, edit each profile name	individually		
	POD-21			
Base name:	POd-21_)		
Device Bay	Profile Name			
1	POd-21_01]		
To continue, click "	"Create Profiles".			
Current Progres	ss: Step 5 of 6		< 1	Previous Create Profiles Cancel
-				

33. The Profile(s) will be created and assigned to the bay identified.

IP Virtual Connect Manage	T	User : Administrator Home Sign Out	
Virtual Connect Manager Serve Create and Deploy Server Profiles	r Profile Setup Wizard		2
Server Profile creation			
Please wait while the requested server pro-	files are being created. Use the table below to monitor th	e progress and creation status of each server profile	6.
Profile Name	Profile creation status		
POd-21_01	In progress		
Please wait while the server profiles are being created.			
Current Progress: Step 6 of 6		Start Ov	er Finish

34. Once the profiles have been created **Click Finish**.

MP Virtual Connect M	lanager Ver: Administrator Home Sign Out	
Virtual Connect Manager Create and Deploy Server Profiles	Server Profile Setup Wizard	?
Server Profile creation		
Please wait while the requested se	erver profiles are being created. Use the table below to monitor the progress and creation status of each server profile.	
Profile Name	Profile creation status	
Pod-21_01	Profile created and assigned successfully 🔮	
Click 'Start Over' to create more profiles. Click	k "Finish' to return to the Virtual Connect Home page.	
Current Progress: Step 6 of 6	Start Over F	inish

- 35. At this point the Domain has been created, along with the SAN Fabric and a server profile.
- 36. Tour around the VC domain and become familiar with the UI, before moving to Exercise 3.

Exercise 3 — Deleting the server profile

In this exercise, you are asked to delete the server profile and Network created by the Wizard. This server profile will not actually be used in labs that follow. When a server profile is needed, you will be asked to go through the steps to define one to develop familiarity with that process.

Important

Deleting this server profile is necessary to ensure that subsequent labs work appropriately based on the lab environment assumptions. Specifically, for servers that will boot from SAN, you want to ensure that the first set of WWNs is allocated to the server profile you explicitly create (in a later lab).

1. Under **Connections** in the navigation pane of the Virtual Connect Manager, click **Server Profiles**.



2. In the main window, click the arrow in the **Action** column for the profile to be removed. Then click **Delete**.

D HP Virtual Connect	Manager						3
Domain Status	Define + Configure +	Toola + Help +					
O Domain Status View Legend	Server Profiles						
	Show: Server Profile:						
Find Configuration Nerma 7	Stelus Profile None	Par	mer LUD	Server Day Assignment	MAC	eneres .	Network Access Grove, Aution
Domain Stitlings TE IS A Configuration IP Address Enclowures Backup-Reatore Storage Mgmt Credentials	POB-21_81	•	0	POD-21: Bay 1 (PecLard BL-601: 07)	VC-DEFINED	VC-DEFINED	Default
SHMP Configuration System Log Stacking Links							
Ethernet							
Server Serial Humbers							
Connections							
Server Profiles Ethernet Networks Shared Uplink Sets SAN Fabrics Network Ascess Groups							
Hardware							
Overview							
POB-21	+ Add						

3. When asked to confirm, enter the profile name to be deleted. Click **OK**.

Define 🗸	· Configure -	Tools -	Help 🔻						
Serve	er Profiles								?
Show:	Server Profiles								
Status	Profile Name			Power	UD	Server Bay Assignment	MAC	www.n	
0	P0B-21_01			٠	0		VC-DEFINED	VC-DEFINED	D
						Confirmation			
				Prof	île Nam	To delete the Profile, confirm by typing in the selected Profile name 'POD-21_01' that you wish to delete. e: POD-21_01			
				L	_	OK Cancel			

4. The listing of server profiles should now be empty.

v. Server Profiles			
us Frofile Name	Power UD Server Bay Assignment	MAC YWW	N Network Access Group Action

Exercise 4 — Deleting the Network

In this exercise, you are asked to delete the networks created by the Network Wizard. In order to delete a network, you must ensure no profiles are using the network, as we already deleted the last profile, we know to be true. We no longer require this network as later labs will create different networks.

- 1. Under **Connections** in the navigation pane of the Virtual Connect Manager,, click **Ethernet Networks**.
- 2. Left click on the network, so the blue bar appears, then right click and select Delete. Alternatively, scroll to the far right and click the Edit/Delete drop down.
- 3. Type "delete" in the dialog box that appears to confirm the deletion

ternal Connections	Server Conn	nections						
Status Ethernet Netw	rorks	Тур	e PII	D S	Shared Uplink Set (VLAN ID)	Overall Port Status (count)	Cor
Network-1		ENE	ат ((Edit Add Delete Settings	© (2)		SFP
1					About Adobe Flash Player 11.1.102.55			
Verview	ork-1 it m Delete	3			About Adobe Flash Player 11.1.102.55			
Verview plink Ports	ork-1 t Treete	e Port: Bay 1 X4 (Status: Linked Speed: AUTO Port Role: AUTO	POD-2 Active	21)	About Adobe Flash Player 11.1.102.55 Connector Type: SFP-DAC Connector To POD21 (Ten- GigabitEthemet1/W SpeedDuplex: 10 Gb/FULL	1)	0	
Verview Jplink Ports	ork-1	e Port: Bay 1 X4 (Status: Linked Speed: AUTO Port Role: AUT Port: Bay 2 X4 (Status: Linked Steed: AUTO	POD-1 Active 0 POD-1 Stand	21) 21) lby	About Adobe Flash Player 11.1.102.55 Connector Type: SFP-DAC Connected To: POD21 (Ten- GigabilEthemet1/0/ Speed/Duplex: 10 Gb/FULL Connector Type: SFP-DAC Connected To: POD21 (Ten- GigabilEthemet2/0/	1) 1)	0	

Summary

During this lab exercise you accessed the remote lab and you defined a VC domain using the Virtual Connect Manager's Domain Setup Wizard. Your VC domain consists of a single HP BladeSystem c7000 enclosure and includes:

- Two Virtual Connect FlexFabric modules
- Several server blades

The VC domain has been configured to use HP predefined ranges for Ethernet MAC addresses. The Server VLAN Tagging Support parameter was set by default to Expanded VLAN Capacity mode to provide the extensive and configurable VLAN management strategy used in later lab exercises. This includes defining Shared Uplink Sets and assigning multiple VLANs to a Network Connection, which will be discussed in a later lab.

A Simple vNet was created as was redundant SAN Fabric connections.

You also created a Server Profile, using the profile creation wizard and connected it to the LAN and SAN connections created earlier.

Implementing a Simple vNet

Objectives

After completing this lab, you should be able to:

- Define a simple HP Virtual Connect (VC) network and assign two uplink ports connecting from two different VC Ethernet modules
- Configure the Network Preferred and Maximum speed settings
- Examine the status of the uplink ports corresponds to an active/standby mode of operation
- The Network and server profile created in this lab will be used in the following lab.

Introduction

In this lab, you will use Virtual Connect Manager (VCM) to create an Ethernet Network that is commonly referred to as a *vNet*. Within VCM, a vNet is listed under the folder named Ethernet Networks in the navigation pane.

If no VLAN support is required, or if support for a single specific VLAN is needed, a vNet is a very simple network to configure and manage within Virtual Connect. A simple vNet is used to pass untagged frames between server NIC and external switch. In this case the network switch port would be configured as untagged or as an Access port, any/all VLAN tagged frames will be dropped.

However, a vNet can also be used to pass many VLANs (a VLAN Tunnel) without modifying the VLAN tags, and therefore can function as a transparent VLAN passthrough or tunnel. The vNet tunnel has no limit to the number of VLANs it can support when configured for Tunnel VLAN Tags mode. In this case the network switch port would be configured as tagged or as a VLAN Trunk port, of the VLANs passed through a tunnel, one VLAN could be untagged.

No special upstream switch configuration is typically required for this scenario, only that the switch port be untagged in the VLAN that transports the untagged traffic.

This initial VC network involves using a single uplink port, (per VC module) connecting to an upstream switch. This lab is focused on vNet and profile configuration, a server profile will be used to examine the new Min/Max NIC speed setting which are configured within each network.
Network diagrams



Physical view of the LAN connections

The Ethernet cables connecting the Virtual Connect Ethernet modules to the upstream LAN switches are already attached. All required switch configuration has been completed before the beginning of class.

Unless otherwise specified by the instructor, you will use port X4 on each of the two Virtual Connect FlexFabric modules installed in Bays 1 and 2 of the enclosure for this lab.



Logical view of the VC network configuration

This diagram shows a logical view of the VC network configuration. You can specify any name you want for the vNet you configure. In this diagram, **PODnn-VNet** is used, where **nn** represents the POD ID.

For this lab, the upstream switches are configured such that the connected ports are untagged members of VLAN 1. This implies that any traffic for VLAN 1 is transmitted as untagged Ethernet frames.

-

Exercise 1 — Defining a VC Ethernet network

In this exercise, you use Virtual Connect Manager to define an Ethernet network representing a simple vNet.

- 1. Open a web browser and access the Virtual Connect Manager home page using the IP address (for your POD) used in the previous lab.
- 2. Login using the "admin" account created in LAB 1

The login should be "admin" with the password "hpinvent"

Note
If you have trouble logging in with this account, use the Administrator account
and password provided in LAB 1

3. From the Virtual Connect Manager home page, in the toolbar, select **Define** \rightarrow **Ethernet Network**.



 For the Network Name, enter PODnn-vNet1, where nn is your POD ID. Add the first external uplink port by clicking Add Port > <enclosure-name> Bay 1 > Port X4 (Linked).

)						
This	port is from th	ne VC FlexFabric	module in i	ntercor	nect Ba	y 1 .	
Impo If yo	rtant u do not have	e a (Linked) status	, have the i	nstructo	or ensure	e that the sw	itch
ports	s are in an UF	° state.					
fine 🔻 Conf	igure + Tools + H	lelp v		_	_		-
efine Eth	ernet Network	C					
Network							
Network Name							
POD-21-vNet1							
	none Labels	Time to add Network Labels]			
		ype to add Network Labels					
Smart Link	Drivete Network						
	stwork Settings	Shabe YEAR rannoing					
Advanced Ne							
Advanced Ne							
External Up	link Ports						
External Up	link Ports	Port Status	Coni	nector Type (Connected To	F	- ND
External Up Port	Port Role	Port Status	Coni	nector Type	Connected To	F	
Port Connection M	Port Role Ode: Auto Failover	Port Status LACP Timer: Domain Defe Short (1 sec	Coni ault, Short (1 sec) ;)	nector Type (Connected To	F	- ND
External Up Port Connection M	Port Role Port Role ode: Auto Failover	Port Status LACP Timer: Domain Defe Short (1 sec Long (30 se	Conr ault, Short (1 sec) ;) c)	nector Type (Connected To	3	
External Up Port Connection M Add Port	Poink Ports Port Role Ode: Auto Failover	Port Status LACP Timer: Domain Defa Short (1 sec Long (30 sec	Con ault, Short (1 sec) ;) c)	nector Type C	Connected To	r	
External Up Port Connection M Add Port PO-21	olink Ports Port Role ode: Auto Failover Bay 1	Port Status LACP Timer: Domain Defa Short (1 sec Long (30 se Port X2 (INCOMPATIE	Con ault, Short (1 sec) :) c) 3LE)	nector Type	ionnected To		210
External Up Port Connection M Add Port POD-21	Port Role Ode: Auto Failover Bay 1 Bay 2	Port Status LACP Timer: Domain Defe Short (1 sec Long (30 se Port X2 (INCOMPATIE Port X3 (INCOMPATIE Port X3 (INCOMPATIE	2001 2011 2011 2011 3LE) ▲ 3LE) ▲	nector Type	Connected To		
External Up Port Connection M Add Port POD-21	Plink Ports Port Role ode: Auto Failover Bay 1 Bay 2	Port Status LACP Timer: Domain Defa Short (1 sec Long (30 se Port X2 (INCOMPATIE Port X3 (INCOMPATIE Port X4 (LINKED)	Con ault, Short (1 sec) ;) c) 3LE)	nector Type	Connected To		

5. Add the second external uplink port by clicking **Add Port section <enclosure**name> Bay 2 > Port X4 (Linked). Then click **Add** to save your changes.

ne ▼ Configure ▼	Tools - H	elp -			
fine Ethernet	Network				
etwork					
letwork Name DD-21-vNet1					
olornone	Labels 7	Type to add Network Labels pe to add Network Labels			-
					-
Smart Link Private N Advanced Network Setti	letwork 🗌 El ngs	nable VLAN Tunneling			
Smart Link Private I Advanced Network Setti xternal Uplink Por	letwork 🗌 Ei ngs ts Port Role	nable VLAN Tunneling Port Status	Connector Ty	ype Connected To	- PID
Smart Link Private N Advanced Network Sett xternal Uplink Por ort OD-21 ay 1: Port X4	Port Role	Port Status	Connector Ty 10 Gb SFP-DAC	rpe Connected To POD21 (Ten-GigabitEthernet1/0/1;	
Smart Link Private I Advanced Network Sett Iternal Uplink Por ort DD-21 ay 1: Port X4 Innection Mode: ()	Port Role NA	Port Status Linked LACP Timer: Domain Default	Connector Ty 10 Gb SFP-DAC Short (1 sec)	/pc Connected To POD21 (Ten-GigabitEthernet1/0/1)	
Smart Link Private I Advanced Network Sett Sternal Uplink Por ort OD-21 ay 1: Port X4 Innection Mode: O	Port Role NA Auto Failover	Port Status Port Status Linked LACP Timer: Domain Default, Short (1 sec)	Connector Ty 10 Gb SFP-DAC Short (1 sec)	/pc Connected To POD21 (Ten-GigabitEthernet1/0/1)	PID A
Smart Link Private I Advanced Network Sett stemal Uplink Por ort DD-21 ay 1: Port X4 nnection Mode: •	Port Role NA Auto Failover	Port Status Port Status Linked LACP Timer: Domain Default, Short (1 sec) Long (30 sec)	Connector Ty 10 Gb SFP-DAC Short (1 sec)	rpe Connected To POD21 (Ten-GigabitEthernet1/0/1)	
Smart Link Private I Advanced Network Setti sternal Uplink Por oft DD-21 ay 1: Port X4 onnection Mode: O	Port Role NA Auto Failover	Port Status C Linked LACP Timer: Short (1 sec) Long (30 sec)	Connector Ty 10 Gb SFP-DAC Short (1 sec)	(pe Connected To POD21 (Ten-GigabilEthernet1/0/1)	
Smart Link Private N Advanced Network Setti sternal Uplink Por ort DD-21 ay 1: Port X4 Innection Mode: Image I Id Port	Port Role NA Auto Failover	Port Status Port Status Linked LACP Timer: Domain Default Short (1 sec) Long (30 sec) Port X2 (INCOMPATIBLE	Connector T 10 Gb SFP-DAC Short (1 sec)	/pe Connected To POD21 (Ten-GigabitEthernet1/0/1)	PID A
Smart Link Private I Advanced Network Setti kternal Uplink Por ort OD-21 iay 1: Port X4 ponnection Mode: • Id Port DD-21	Port Role NA Auto Failover	Port Status Port Status Linked LACP Timer: Short (1 sec) Long (30 sec) Port X2 (INCOMPATIBLE Port X3 (INCOMPATIBLE	Connector T 10 Gb SFP-DAC Short (1 sec)	/pe Connected To POD21 (Ten-GigabitEthernet1/0/1)	PID A

6. **Click** on the Advanced Network Settings check box, then click on Preferred and set the speed to 2Gb. Click on Maximum and set the speed to 7Gb.

7. Click Apply

Define 🕶 Configure 🕶 Tools 🕶 Help 🕶	
Define Ethernet Network	
Network	
Network Name	
Color Type to add Network Labels Type to add Network Labels Type to add Network Labels	
Smart Link Private Network Enable VLAN Tunneling Advanced Network Settings	
Set preferred connection speed 2 Selected Speed: 2 Gb	
0.1 Gb 7 Gb	
Selected Speed: 7 👶 Gb	
0.1 Gb 10 Gb	
	Apply Cancel

- 8. In the following window, click **Apply** to save your changes. This results in a redundant link topology (an Active/Standby network) for the vNet. One uplink port is the active port and the other operates as a standby port.
- 9. Edit the vNet and verify that both uplinks were added and that the Advanced Speed sets were configured.

Exercise 2 — Examining the status of the uplink ports

- In the navigation pane Hardware Configuration section, expand PODxx>Interconnect Bays. In the main window, click Bay 1 (LAN+SAN), which contains a VC FlexFabric module.
- 2. Select the Uplink Posts tab and examine the status of port X4 and notice the LAG ID and MAC address of the upstream switch.

For this VC network, a single uplink port of the Virtual Connect FlexFabric module in Bay 1 is used to connect to the upstream switch, an additional uplink is provided for redundancy and fail-over.

Technically, from the Virtual Connect perspective there are two uplinks available to this VC network, one on each FlexFabric module. Only one is allowed to be active in this scenario; otherwise, there would be the potential for a network loop and the need to use a protocol such as Spanning Tree to manage the network loop, which Virtual Connect does not implement. Instead, by ensuring that at one uplink is active (in this scenario); Virtual Connect prevents a network loop from occurring. If the first network switch or cable were to fail, VC would failover to the standby uplink, by making it active. As you can see from the status windows, the second uplink is in a standby state. Similarly, if there were additional **individual** uplinks assigned to this VC network, they would operate in a standby mode as well. This behavior is identical to the functionality provided to server ports that are configured as members of a network fault-tolerant (NFT) NIC team.

Define 🔻	Configure 🔻	Tool	s v Help v						
Bav 1	Bay 1 (HP VC FlexFabric 10Gb/24-Port Module)								
•	,					,			
Genera	al Information	Uplin	nk Ports	Server Po	rts MAC /	Address Tabl	le I	GMP Multicast Groups	Name Server
Uplink i	Port Information	n (Enet))						
Label	Network(s)	Status			Connector Ty	pe LAG ID	Conn	ected To	Detailed Stats / Info
Port X2			Incompatible	0 Mb	SFP-FC		Unkno	wn ()	Detailed Stats / Info
Port X3			Incompatible	0 Mb	SFP-FC		Unkno	w n ()	Detailed Stats / Info
EPort X4	POD-21-vNet1	🛇 ок	Linked/Active	10 Gb	> SFP-DAC	26	POD21	(Ten-GigabitEthernet1/0/1)	Detailed Stats / Info
Port X5			Linked	10 Gb	SFP-DAC		POD21	(Ten-GigabitEthernet1/0/2)	Detailed Stats / Info
Port X6			Linked	10 Gb	SFP-DAC		POD21	(Ten-GigabitEthernet2/0/3)	Detailed Stats / Info
Port X7			Linked	10 Gb	SFP-DAC		VcD_6	6ca2470b196e (X7)	Detailed Stats / Info
Port X8	Stacking Link	🛇 ок	Linked	10 Gb	Internal	27	VCEF)	(TW21120011 (X8)	Detailed Stats / Info
Uplink i	Port Information	n (FC)							
Port \	www		SAN Fabric	Port Spe	ed Setting	Connector S	tatus	Connected To	Detailed Stats / Info
X1 2	20:00:00:11:0a:02	2:2a:dc	SAN-A	8 Gb		Logged In		10:00:00:05:33:53:5c:ad	Detailed Stats / Info

3. In the Hardware Configuration section of the navigation pane, expand **POD**xx>Interconnect Bays. In the main window, click Bay 2 (LAN+SAN), which contains a VC FlexFabric module.

	Define 🖥	- Configure -	Too	ls v Help v						
ł	Bay :	2 (HP VC	Flex	abric 10	Gb/24	-Port M	odule)			
	Gene	ral Information	Upli	nk Ports	erver Por	ts MAC .	Address Tab	le I	GMP Multicast Groups	Name Server
	Uplink	Port Informatio	n (Enet)						
	Label	Network(s)	Status			Connector T	ype LAG ID	Conn	ected To	Detailed Stats / Info
	Port X2	2		Incompatible	0 Mb	SFP-FC		Unkno	ow n ()	Detailed Stats / Info
	Port X3	l		Incompatible	0 Mb	SFP-FC		Unkno	ow n ()	Detailed Stats / Info
\leq	Port X4	POD-21-vNet1	🕗 ок	Linked/Standby	10 Gb	> SFP-DAC	26	POD2	1 (Ten-GigabitEthernet2/0/1)	Detailed Stats / Info
	Port X5	;		Linked	10 Gb	SFP-DAC		POD2	1 (Ten-GigabitEthernet2/0/2)	Detailed Stats / Info
	Port X6	;		Linked	10 Gb	SFP-DAC		POD2	1 (Ten-GigabitEthernet1/0/3)	Detailed Stats / Info
	Port X7	,		Linked	10 Gb	SFP-DAC		VcD_	6ca2470b196e (X7)	Detailed Stats / Info
	Port X8	Stacking Link	🕗 ок	Linked	10 Gb	Internal	27	VCEF	XTW21120010 (X8)	Detailed Stats / Info
	Unlink	Dort Informatio	n / EC)							
	Port	WWN	1110)	SAN Fabric	Port Spee	ed Setting	Connector S	tatus	Connected To	Detailed Stats / Info
	X1	20:00:00:11:0a:0	2:2a:dd	SAN-B	8 Gb		Logged In		10:00:00:05:33:51:49:8d	Detailed Stats / Info

About active/standby operation

By connecting an uplink from each module to a vNet, you have provided a redundant path to the network. Because each uplink originates from a different VC Ethernet module, one uplink is active and the second is in standby mode. This configuration enables you to lose an uplink cable, an upstream switch, or depending on how the NICs are configured at the server (teamed or unteamed), even a VC Ethernet module. The VC FlexFabric modules are connected internally using two 10Gb connections, allowing network traffic to flow between the modules and out to the network.

About Smart Link

In this configuration, the Smart Link parameter should **not** be enabled on the vNet. Smart Link is used to turn off downlink ports to servers within Virtual Connect if **all** available uplinks to a VC network (simple vNet or a Shared Uplink Set) are down. You will use Smart Link in a later lab exercise.

Exercise 3 — Creating a server Profile

In this exercise, you will create a server profile and connect it to your network. You will also validate the new Min/Max NIC speed feature.

- 4. From the Virtual Connect Manager home page.
- 5. In the server area select Define Server Profile,



- Create a server Profile called POD-xx_01 where **nn** is your POD ID and connect both the default NICs to the Network created earlier. Do not connect to the SAN fabric.
- 7. Apply the profile to the server in Bay 1

	Configure • 1	oois - Heip -							
Edit S	erver Profile	e: POD-21_01							2
Profile	•								
Profile Na	ame	Network Access Gro	up Status Seria	Number	Server Ul	JID			
POD-21_	D1	Default 💌 🕈	○ VCX0	000K00	b855eea3-	9dac-4553-a800-2d	a60ac1b948		
Etherr	iet Adapter Coi	nnections							
Port I	Network Name	Statu Port Speed 1	ype Allocated Po	rt PXE	Multicast Filter	MAC		Mapping	Action
1 F	OD-21-vNet1	PREFERR	ED 2 Gb - 7 G	b USE-BI	None	00-17-A	4-77-50-02	LOM:1-a => Bay 1:d1:v1	
2 F	OD-21-vNet1	PREFERR	ED 2 Gb - 7 G	b USE-BI	None	00-17-A4	4-77-50-04	LOM:2-a => Bay 2:d1:v1	
+ Add									
ISCSI	HBA Connectio	ons							÷
FCoE	HBA Connectio	ons							+
Assig	n Profile to Se	rver Bay							
Enclosur			Model			Status Powe	er UID		
P	OD-21	Bay 1	▼ ProLiant	BL460c G7	USE115931X	0	۲		
							Apply	Apply & Close	Cancel

- 8. Note the speed that each NIC is configured for. Both the Min. and Max.
- 9. Use the Custom speed setting and attempt to change the speed of the NIC to a Higher Speed. Click on PREFFERED and select Custom and change the NIC speed. What is Max speed you can set the NIC to?
- 10. Leave the Speed set to Preferred and save any changes made to the server profile.
- 11. Edit the Network, under Advanced Settings, change the preferred speed to 4Gb and the Maximum speed to 10Gb and save the changes.
- 12. Go back to the server Profile and determine whether these changes have taken effect. You will need to make a change to the profile and apply it, before these changes will take effect.
- 13. What is the Min speed now?
- 14. What is the Max speed now?

Exercise 4 — Validating Network Connectivity

In this exercise, you will use the OA and iLO to connect to and boot the server in bay 1, then verify that it has received an IP Address from the network.

- 1. From the web browser access the OA home page for your POD.
- 2. You will notice that the server in Bay 1, have no exclamation mark over it, this indicates the server is ready to use and has a Virtual connect profile assigned, the other servers in the enclosure, do not have profiles assigned at this time.

Wizards 🔻 Options 👻 Help 👻			
Rack Overview - RACI	K-1		
Rack Topology Rack Power an	nd Thermal		
Enclosure: POD-21			
Front View	Rear View	Enclosure Name:	POD-21
2 - 2 C	$ \oplus \oplus \oplus \oplus \oplus $	Serial Number:	USE115931V
		Part Number:	507019-B21
		Asset Tag: UID State:	
			• on
		Insight Disp	blay
6		Virtual Connect Mar	ager
		VC Domain Name: P	OD-21_VC_domain

3. Click on the server in Bay and select the Virtual devices tab and press "Momentary Press". As the server is booting, Select "Integrated Remote Console" from below and open an iLO Session with the server.

Wizards - Options - Help -						
Device Bay Information - ProLiant B	L460c G7 (Bay 1)			📕 Print	? Help
Status Information Virtual Devices Bo	oot Options IML Log			➡ POD-21	_	_
Virtual Pow er				Front View		
The server in this bay is currently Off	entary Press					
UID Light: Use the button below to toggle the state of the server's operation is being performed on the server and should not be in	s UID Light. Note: When the UI aterrupted.	D Light is in a blink state, a cri	itical	3		
Off Toggle On/Off				Rear View		
DVD Drive: Indicate how this server should connect to the enclo remote console may be required after the DVD drive is connect	osure's shared DVD drive. Plea ed. Use the links below to acc	ase note that interaction with th ess the iLO's remote console.	he server's			
Connect to Device:	iLO DVD Status	Device or Image URL		2 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1 × 🔁 x 🚍 x
Disconnect Blade from DVD/iso	Disconnected				\mathbb{D}	
			Apply	20.0.0		
Integrated Remote Console Access-the system KVM-end Control Virtual Pow er & Media fron note: this may not be supported on all operating systems. Please	n a single console (requires Ac check official ILO operating sy	tiveX and Microsoft Internet Exp stem support.	plorer). Please			
Remote Console Access the system KVM from a remote console. This requires a be supported on all operating systems. Rease check official iLO	Java Virtual Machine Runtime operating system support.	Environment (JRE). Please note	e: this may not			

4. You will notice that the server power indicator light is now GREEN.



- 5. Login to Windows using the "Administrator" account with password "HP1 nvent".
- Once the server has booted, log in to the Windows OS through the iLO, open a COMMAND windows and type IP Config, verify that the server has a DHCP provided address on subnet 172.20.x.x, then ping the OA address at 172.20.xx.100, were xx is you POD ID.

Recycle Bin	
putty	CAdministrator: Command Prompt Hedia State Media disconnected Connection-specific DNS Suffix . : Tunnel adapter Teredo Tunneling Pseudo-Interface: Connection-specific DNS Suffix . : IPv6 Address
	I
🕅 Start 🛛 🚠	🛿 🍃 🔤 🕅

7. Optionally, if you wish to test Virtual Connect Uplink fail-over and the effect it has on the server, you could start a ping -t 172.20.xx.100 in a command window, then Edit the vNet and drop the "Active" uplink and save the network.

Watch the PING and see what the response is. Then add the link back in and save the vNet. Watch to see whether this link becomes active again, or remains as a standby link.

8. When you have completed this activity shut the server OS down gracefully.

Summary

By connecting two uplinks from this vNet through two different VC FlexFabric modules to the upstream switches, you have provided a redundant path to the network. Because each uplink originates from a different VC FlexFabric module, one uplink is active and the second is in standby mode.

This configuration provides the ability to lose an uplink cable, network switch, or depending on how the NICs are configured at the server (teamed or unteamed), even a VC FlexFabric module.

Notice that you were not asked to enable the Smart Link parameter for this vNet. In this type of configuration, Smart Link should not be enabled. Smart Link is used to turn off downlink ports within Virtual Connect, if all available uplinks to a VC network (vNet or Shared Uplink Set) are down.

You configured and experimented with the new Min/Max NIC speed setting. This new feature provides the ability to oversubscribe NIC downlinks, which we previously did not provide.

Implementing Boot from SAN with FlexFabric Lab 3

Objectives

After completing this lab, you will be able to:

- Define a server profile for a host that will boot from SAN.
- Verify that the host boots into Microsoft Windows.
- Move a server profile from one server bay to another server bay in the Virtual Connect domain and verify server operation.

Description

In this lab exercise, you use Virtual Connect Manager to define a server profile that uses the Boot from SAN (BFS) capability. The Virtual Connect SAN Fabrics you implemented in the previous lab exercise are used for this activity. As part of the environment preparation you delete the existing server profiles and defined a new profile with two FlexNIC connections and two FlexHBA connections.

You verify the Windows host boots from SAN successfully and that you can ping the default gateway for one of the VLANs you also assign to the server profile. Then, you move the server profile to another server bay of the Virtual Connect domain and verify proper operation for that server.

Important: This lab requires that you delete the existing server profiles. The reason is that the BFS entries on the SAN controller are preconfigured. The BFS definitions require a server's WWPN be provided, which in our lab environment is based on particular WWNs associated with your Virtual Connect domain. Specifically, the Virtual Connect-defined WWNs associated with your assigned range based on your POD ID. If the wrong WWN is presented from the server profile to the storage controller, then the Boot from SAN request will fail

Network Diagrams



Figure 1: Physical view of the Fibre Channel connections

For this scenario, both Virtual Connect FlexFabric modules are used and two uplinks from each module are connected to the Fibre Channel SAN switches. Your previously defined Shared Uplink Sets will also be used.



Figure 2: Logical View of the Virtual Connect Networks and SAN Fabric Configurations

The Virtual Connect server profile will consist of two FlexNIC connections and two FlexHBA connections. The server profile you define in this lab will use two VLANs previously assigned to the Shared Uplink Sets. One VLAN will be assigned to a FlexNIC mapped to Network Connection 1, and the other VLAN to a FlexNIC mapped to Network Connection 2. The Fibre Channel SAN Fabrics will be assigned to two Fibre Channel over Ethernet (FCoE) host bus adapter (HBA) connections in the server profile. For, the FCoE connections, you will also specify a target World Wide Port Name (WWPN) and LUN identifier.

Verification of network access will involve ensuring IP addresses are assigned to the server ports followed by pinging the switch operating as a default gateway. For this simple network environment, you will only verify access to VLAN 10. Initially, you assign the server profile to the server in bay 1, and then then bay 2.

Exercise 1 – Modifying a Server Profiles to Support Boot from SAN

In this exercise, you use the Virtual Connect Manager (VCM) to modify the server profile created in lab 1. When modifying a server profile on a VC Ethernet module that will be used with a server supporting FlexFabric ports (or NICs), you have the option of allocating bandwidth across one to four NICs, or one to three NICs and a FC HBA. In this exercise, you will edit the existing profile and ADD SAN connections, and then configure those connections for Boot to SAN.

- 1. Open a web browser and access the OA for your POD, verify the servers in Bays 1 and 2 are shutdown.
- 2. Open a web browser and access the Virtual Connect Manager home page and log in using the admin account created in lab 1.
- 3. In the left tree view, under connections, click on server profiles.
- 4. Your profile should be shown in the right pane, select the profile and edit it.

IP Virtual Connect	Manag	er					2	User : admin Home Sign Out	
Dormain Status	Define +	Configure +	Tools +	Help +					
O Domain Status View Legend	Serve	r Profiles							
♥ ▲ Ø ● 0 0 0 0 0 0	Show:	Server Profiles	1						
Find Configuration Items. 7 Domain Settings	Status	Profile Name		_		Record Capital grant	VC DEEINED	MC DEFINED	Network Access Gr
Configuration	_	100-21_01	_	_	·	POD-21: Day 1 (Problem biology 07)	10-DEFINED	VO-DEFINED	Denden
IP Address									
Enclosures									
Backup/Restore									
Storage Mgmt Credentials									
SNMP Configuration									
System Log									
Stecking Links									
Users/Authentication									
Ethernet									
Fibre Channel									
Server Serial Humbers									
Connections									
Server Profiles									
Ethernechennetks									
Shared Uplink Sets									
SAN Fabrics									
Network Access Groups									
Hardware									
Overview									
POB-21	+ Add								

5. From the Edit Server profile page, under FCoE HBA Connections, for Bay 1 select SAN-A and for Bay 2 select SAN-B. The speed should default to 4Gb Min. and 8Gb Max.

Port	Bay	FC SAN Name
1	1	SAN-A
1	2	SAN-B

6. In the FCoE HBA Connections section, assign the information listed in the following table.

Note: For the blade server you are working with, Port 1 corresponds to FlexNIC 3 (LOM:1-b) and Port 2 corresponds to FlexNIC 4 (LOM:2-b).

FCo	FCoE HBA Connections							
Port	Connecte	FC SAN / FCoE Network Name	Туре	Status	Port Speed Type	WWPN	MAC	
1	Bay 1	SAN-a	SAN	0	PREFERRED	VC-DEFINED	VC-DEFINED	
2	Bay 2	SAN-b	SAN	0	PREFERRED	VC-DEFINED	VC-DEFINED	
+ A	+ Add							
🗌 Fik	re Channel	Boot Parameters						

- 7. Click the **Fibre Channel Boot Parameters** checkbox to enable it. Then select **Primary** for Port 1 and **Secondary** for Port 2.
- 8. Once you check the Fibre Channel Boot Parameters checkbox, the FCoE HBA Connections Box appears. Enter the Boot parameters from the table below.
- 9. Set USE-BIOS for ports 1 and 2 to Primary and Secondary, respectively.

FCoE HBA Connections						
Port	SAN Boot	Target Port Name (/W/VPN)	LUN			
1	USE-BIOS					
2	USE-BIOS					
		Apply	Cancel			

The dialog window shown above appears.

10. Specify the following information.

Port 1	
Use BIOS	Primary
Target Port Name (WWPN)	50:01:43:80:04:C9:A6:F8
LUN	1
Port 2	
Port 2 Use BIOS	Secondary
Port 2 Use BIOS Target Port Name (WWPN)	Secondary 50:01:43:80:04:C9:A6:FD

The target world-wide port name (WWPN) is that of a storage controller as opposed to the WWPN of a SAN switch.

FCoE HBA Connections						
Port	SAN Boot	Target Port Name (/W/PN)	LUN			
1	PRIMARY	50:01:43:80:04:C9:A6:F8	1			
2	SECONDARY	50:01:43:80:04:C9:A6:FD	1			
		30.01.43.00.04.03.00.12				
		Apply	Cancel			

11. Click Apply to save the Boot from SAN settings.

FCoE HBA Connections		_		
	Bay 1 (ProLiant BL460c G7)			
Port Connect: FC SAN / FCoE Network I	Bay 2 (ProLiant BL460c G7)	peed Type	WWPN	MAC
1 Bay1 SAN-a	Bay 3 (EMPTY)	FERRED	VC-DEFINED	VC-DEFINED
2 Bay 2 SAN-b	Bay 4 (EMPTY)	FERRED	VC-DEFINED	VC-DEFINED
	Bay 5 (EMPTY)			
+ Add	Bay 6 (EMPTY)			
	Bay 7 (EMPTY)			
Fibre Channel Boot Parameters	Bay 8 (EMPTY)			
	Bay 9 (ProLiant BL460c G7)			
Assign Profile to Server Bay	Bay 10 (EMPTY)			
	Bay 11 (EMPTY)			
Enclosure Server	Bay 12 (EMPTY)	SN	Status	Power UID
Unassign	Bay 13 (EMPTY)		0	0 0
Unassigned	Bay 14 (EMPTY)			
POD21	Bay 15 (EMPTY)			
	Bay 16 (EMPTY)	•		

- 12. In the Assign Profile to Server Bay section, click the down arrow and then click PODnn > Bay 1 (ProLiant 460c Gen7).
- 13. Then click Apply to save the changes to the server profile.

redie Name	ork Access Group Status Sanial Nava	ter Server UUD			
00-21_01	faul - 🔄 📀 VCX0000K0	0 b855eea3-0dac-455	3-x300-23x50x:11/948		
themet Adapter Connectio	ns				
fort Network Name	Statu Port Speed Type	Allocated Part Spee PAE	Muticast Filter MA	<u>e</u>	Mapping A
POD-21-vNet1	O PREFERRED	4 Ob - 10 Ob USE-BIO	None 00-1	7-A4-77-50-02	LOM:1-a => Bay 1:d1 v1
POD-21-vNet1	PREFERRED	4 Gb - 10 Gb USE-BIOI	None 00-1	7-A4-77-50-04	LOM:2-a => Bay 2:d1:v1
CoE HBA Connections					
ort Connects FC SAN / FCoE Net-	work Name Type	Status Port Speed Type	Alocated VWVPN	MAC	Mapping Action
Bay1 SAN-A	SAN	O PREFERRED	Not Alloc: 50:06:08:00:00:02:82:00	00-17-A4-77-50-00	LOM:1
Bay 2 SAMLB	SAN	PREFERRED	Not Alloc: 50:08:08:00:00:02:02:02	00-17-A4-77-50-01	LOM:2 Detet
0012 0000					
- Add					
Add Fibre Channel Boot Parameters					
Add Fibre Channel Boot Parameters					
• Add • Refer Channel Boot Parameters ssign Profile to Server Ba	w.				

14. Examine the Mapping column for the Ethernet and FCoE connections.

Notice that LOM:1-a and LOM:2-a are mapped to the two Ethernet FlexNICs, and LOM:1-b and LOM:2-b are mapped to the two FCoE FlexHBAs.

Also, notice the Allocated Port Speed column for the FlexNICs and FlexHBAs. Since the FlexHBA connections take precedence in terms of initial bandwidth allocation, 4 Gb has been allocated as the minimum speed. Since FCoE in Virtual Connect supports speeds of 1, 2, 4 and 8 Gb, the maximum speed allowed will be 8 Gb.

The FlexNICs are therefore allocated the remaining bandwidth of each physical adapter, which is 6 Gb.

15. Click Cancel to close the Server Profile window.

Exercise 2 - Power-on the Server and Verify Boot from SAN Operation

In this task, you use the Onboard Administrator (OA) management interface to examine the status of the server in bay 1. You then power on the server to cause the server profile to be activated. You also examine the IP addresses assigned to the FlexNICs through DHCP.

- 1. Go to the browser window you have for the OA.
- 2. In the navigation pane, click Enclosure Information > Device Bays > 1 to view the status of the server blade in Device Bay 1.
- 3. Click the Information tab.

Wizards 🗸 Options 🗸 Help	v							
Device Bay Information - ProLiant BL460c G7 (Bay 1)								
Status Information	Virtual Devices	Boot Options	IML Log					
Davica Information								
Plada Turna	Conver Plade							
	Server blade							
Product Name	ProLiant BL460c G7							
Part Number	603718-B21							
System Board Spare Part Number	605659-001							
Serial Number	USE1159329							
Serial Number (Logical)	VCX0000V00							
UUID	37333036-3831-5355-4531-313539333239							
UUID (Logical)	7FEAACD8-92EA-42B0-9D29-B26528F6B1B0							
BIOS Asset Tag								
- Server Name								
ROM Version	127 05/05/2011							
Server NIC Information	Device ID							
FlexFabric Embedded Ethernet								
Ethernet FlexNIC LOM:1-a	00:17:A4:77:7C:02							
FCoE FlexHBA LOM:1-b	50:06:0B:00:00:C2:DE:00							
Ethernet FlexNIC LOM:1-c	98:4B:E1:71:73:BA							
Ethernet FlexNIC LOM:1-d	98:4B:E1:71:73:BB							
Ethernet FlexNIC LOM:2-a	00:17:A4:77:7C:04							
FCoE FlexHBA LOM:2-b	50:06:0B:00:00:C2:DE:02							
Ethernet FlexNIC LOM:2-c	98:4B:E1:71:73:BE							
Ethernet FlexNIC LOM:2-d	98:4B:E1:71:73:BF							

4. Examine the server NIC information.

Notice that all 8 connections are represented here, 6 FlexNICs and 2 FlexHBAs. The other 4 FlexNICs that you did not explicitly configure are presented to the blade server Operating System. These additional 4 LAN Connections that would appear in Windows, or vmnics in VMware ESXI, can be ignored.

5. Click the Virtual Devices tab. At this point, the server is powered off, which allowed you to assign the server profile previously.

Status	Information	Virtual Devices	Boot Options	IML Log			
Virtual Power							
The server in	The server in this bay is currently Off						
		. I	Iomentary Press				
			V				

6. Click Momentary Press to power on the server.

You can also access the Virtual Power feature through the Virtual Connect Manager interface, but going through the OA also gives you easy access to the Remote Console functionality of the HP integrated Lights-Out (iLO).

7. To access the Windows Server console, in the navigation pane of the OA, click iLO under the folder entry for Device Bay 1.

Wizards 👻 Options 👻 Hel	Wizards 👻 Options 👻 Help 👻							
iLO - Device Bay 1								
Processor Information Event Log								
Management Processor Info	rmation							
Name	ILOUSE1159329							
Address	172.20.7.102							
MAC Address	98:4B:E1:5E:F1:43							
Model	iL03							
Firmware Version	1.28 Jan 13 2012							
iLO Remote Management								
Clicking the links in this section require an iLO username or particular the section of the sec	on will open the requested iLO sess assword to be entered.							
If your browser settings prever	nt new popup windows from opening,							
Web Administration Access the iLO web user inter	face.							
Integrated Remote Console Access the system KVM and c Please note: this may not be su	entrol Virtual Power & Media from a ported on all operating systems. Pl							
Remote Console Access the system KVM from may not be supported on all op	a remote console. This requires a Ja erating systems. Please check offici							

- 8. In the iLO Device Bay window, perform one of the following actions.
 - 1) If you are using Internet Explorer, click **Integrated Remote Cons**ole.
 - 2) If you are using Firefox, click **Remote Console**.



To verify the Emulex BIOS configuration was modified by the Server Profile you examine the settings applied to the adapters by Virtual Connect. During the POST processing stage, you will see a prompt to "Press any key to see POST Messages."

Note: It is important to watch for the message and respond or you will have to go through the boot process again.

9. Press the <Space> bar or any other key to view the Option ROM messages.



- 10. Watch for the Emulex OneConnect FCoE BIOS messages.
- 11. Press <Alt>-e or <Ctrl>-e as instructed on the screen to access the Emulex BIOS configuration utility.



12. Highlight the top adapter using the keyboard arrow keys and press <Enter> to view its configuration.



13. Arrow down to Configure Boot Devices and press <Enter> to view its configuration.

	Emulex OneConn	ect FCoE BIOS l	Jtility,≯	(A4.03a0		
01: NC553i: Mem Base: Fi Port Name: ! Vlan ID: 10	BC00000 Firmware 50060B0000C27600 01 DCBX mode: CE	Bus Version: 4.1.4 Noč E mode	s#: 02 Dev 102.8 le Name:	¤#: 00 Fun BIOS: E 50060B000	c#: 02 nabled 0C27601	
	List	of Saved Boot I)evices:			
1. 0 2. 0 3. 0 4. 0 5. 0 6. 0 7. 0 8. 0	sed DID:000000 nused DID:000000	WWPN: 50014380 WWPN: 0000000 WWPN: 00000000	04C9A6F8 00000000 00000000 00000000 00000000 0000	LUN:01 P LUN:00 LUN:00 LUN:00 LUN:00 LUN:00 LUN:00 LUN:00 LUN:00	rimary Boot	
<pre><t/time="compare: compare: compare</td></pre>						

- 14. Compare the WWPN displayed with the value you entered for Port 1 when you configured the Boot from SAN settings in the server profile.
- 15. Press <Esc> twice to return to the Emulex Adapters in the System menu.



16. Use the arrow keys to choose the second adapter and repeat the previous steps to view the WWPN of its target controller.

Em	llex OneConnect FCoE BIOS Utility, XA4.03a0						
02: NC553i: Mem Base: FBBA0000 Firmware Version: 4.1.402.8 BIDS: Enabled Port Name: 50060B0000C27602 Node Name: 50060B0000C27603 Vlan ID: 1001 DCBX mode: CEE mode							
	List of Saved Boot Devices:						
1. Used	DID:000000 WWPN:50014380 04C9A6FD LUN:01 Primary Boot						
2. Unused	DID:000000 WWPN:00000000 000000000 LUN:00						
3. Unused	DID:000000 WWPN:00000000 000000000 LUN:00						
4. Unused	DID:000000 WWPN:00000000 000000000 LUN:00						
5. Unused	DID:000000 WWPN:00000000 00000000 LUN:00						
6. Unused	DID:000000 WWPN:00000000 00000000 LUN:00						
7. Unused	DID:000000 WWPN:00000000 00000000 LUN:00						
8. Unused	DID:000000 WWPN:00000000 000000000 LUN:00						
	<1/4> to Highlight, <enter> to Select</enter>						
Copuri	ht (c) 1997-2012 Emulex. All rights reserved.						

- 17. Compare the WWPN displayed with the value you entered for Port 2 when you configured the Boot from SAN settings in the server profile.
- 18. Press <Esc> three times to display the reboot prompt.



19. Then type "Y" to reboot the system.

ProLiant - 172.	20.21.102		- D ×
Bower Switch Virtu	al Drives Keyboard		
6			
/	H	P ProLiant	
HP Power Pro Power Regul	ofile Mode: Balanced Power and ator Mode: Dynamic Power Savi	Performance ng:	
Advanced M Redundant R Inlet Ambien	temary Protection Mode: Advanc OM Detected - This system conto t Temperature: 14C/57F	ed ECC Support ins a valid backup system ROM.	
SorverEngine Copyright (C	s 10Gb UNDI, PXE-2.0 BIOS v3 2006-2011 ServerEngines Cor	10.4.281.0 poration	
Controller St	atus: Init done		
Configuring	ServerEngines Controller Using D Press any key to view Option	MTF CLP.	
F9 = Setup	FI1 = Boot Menu		
1024 x 768	POST Code: PE2C	M	🗿 R04 🛛 🔿 🔿 🥹

- 20. To verify that the HBA BIOS loads during the POST processing stage, watch again for the prompt to "Press any key to see POST Messages."
- 21. Press the <Space> bar or any other key to view the Option ROM messages.

ApproLiant - 172.20.21.102			. O X
Bower Switch Virtual Drives Keyboard			
Emulex OneConnect FCoE BIOS, Version 4 Copyright (c) 1997-2010 Emulex. All ri	.02a7 ghts reserved.		
Press (Alt E) or (Ctrl E) to enter Emu utility. Press (s) to skip Emulex BIOS	lex BIOS configura	tion	
Using CLP data for CNA boot targets an	d port enablement.		
Installing Emulex BIOS Bringing the Link up, Please wait Link Up : Physical Link Established. Bringing the Link up, Please wait Link Up : Physical Link Established. Adapter 1 NC553i: S_ID:010D0	1 PCI Bus, Device	, Function	(02,00,02)
DID:010F00 WWPN:5001438004C9A6F8 LUN	:01		
Adapter 2 NC553i: S_ID:010D0	1 PCI Bus, Device	, Function	(02,00,03)
Emulex BIOS is installed successfully! Slot 0 HP Smart Arrag P410i Controlle	11 F	`	<f9 =="" setup=""></f9>
720 x 400			🔬 RC4 🛛 🔿 🎯

- 22. View the messages that display to verify that the Emulex adapter BIOS is installed successfully.
- 23. Wait for the server to boot from SAN and load the Windows OS.

Exercise 3 - Examine the Server's Network Status

In this task, you verify that IP addresses have been assigned to the two FlexNICs of your blade server through DHCP.

- 1. When the Windows login screen displays, move the mouse to the top of the iLO window and click Keyboard > CTRL+ALT+DEL.
- 2. Log in to Windows with the credentials administrator / HP1nvent.
- 3. Click Start > All Programs > Administrative Tools > Server Manager.
- 4. In the Server Manager window, in the navigation pane, click Server Manager.
- 5. In right-side pane, click View Network Connections.
- 6. In the Network Connections window, right-click an active connection and click Status.
- 7. Right-click an active connection and in the drop-down menu, click Status.

IPv4 Connectiv	vity:	Internet
IPv6 Connectiv	vity:	No Internet access
Media State:		Enabled
Duration:		00:10:35
Speed:		10.0 Gbps
]	
Activity]	
Activity	Sent —	Received
Activity Rytes:	Sent — 17,069	Received

Notice that the Speed field corresponds to the Virtual Connect maximum speed for the FlexNIC, not the minimum.

8. To verify that an IP address has been assigned to the server's FlexNIC, click Details.

Property	Value
Connection-specific DN	
Description	HP NC553i Dual Port FlexFabric 10Gb Co
Physical Address	00-17-A4-77-7C-02
DHCP Enabled	No
IPv4 Address	172.20.32.1
IPv4 Subnet Mask	255.255.0.0
IPv4 Default Gateway	172.20.0.1
IPv4 DNS Server	42.2.2
IPv4 WINS Server	
NetBIOS over Topip En	Yes
Link-local IPv6 Address	fe80::d0b8:e4f1:a56:98e1%11
IPv6 Default Gateway	
IPv6 DNS Server	
4	,

```
- 🗆 ×
 🗪 Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
                                                                                                                          ٠
C:\Users\Administrator>ping 172.20.0.1
Pinging 172.20.0.1 with 32 bytes of data:
Reply from 172.20.0.1: bytes=32 time=515ms TTL=255
Reply from 172.20.0.1: bytes=32 time=2ms TTL=255
Reply from 172.20.0.1: bytes=32 time=2ms TTL=255
Reply from 172.20.0.1: bytes=32 time=2ms TTL=255
Ping statistics for 172.20.0.1:
Packets: Senk = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 515ms, Average = 130ms
C:\Users\Administrator>
```

- 9. Open a Command Prompt window and ping the default gateway using the address found in the details window.
- 10. Close the application windows and exit the Remote Console.

Exercise 4 - Move the Server Profile to another Blade Server

In this task, you move the server profile, which is currently assigned to the first blade server, to the second blade server. Before you can move a server profile, you must first power off the blade server to which the server profile is currently assigned. Then, you reassign the server profile to the second blade server and power on that second server.

In this task, to power off the server blade, you will use the power button feature from within Virtual Connect Manager.

D-6	C E	T I -	11-1-
1.	From the v	irtual Co	mneet manager, in the navigation pane, click Server Promes .
1	From the V	intual Ca	nnact Managar in the navigation name click Conver Drofiles

Define 🤜	🖌 Configure 🚽	lool	S 🔻	Help 🗸						
Server Profiles										
Show:	Server Profiles		•							
Status	Profile Name	Power	UID	Server Bay Assignment	MAC	WWN	Network Access Group	Action		
0	Profile_BFS	0		POD21: Bay 1 (ProLiant BL460c G7	VC-DEFINED	VC-DEFINED	Default	Edit 💌		

In the Server Bay Assignment column, click the link to the server. 2.

efine 👻 Configure 👻 Tools 👻 Help 👻									
POD21: Bay 1 (ProLiant BL460c G7)									
Device Bay Status - Bay # 1									
Overall Status:	🖉 ок								
Hardware Status:	📀 Normal								
VC Status:	🖉 🛇 ок								
Assigned Server Profile:	Profile_BFS								
Enclosure Name:	POD21								
UID:									
Power Status/Control:	On On								
		Momentary Press	Press and Hold						

3. To power off your server, click **Momentary Press**.

The server should now be powered off.

- 4. To reassign the server profile to a different blade server, in the navigation pane click **Server Profiles**.
- 5. Under the Action column, click **Edit**.
- 6. Scroll down to the Assign Profile to Server Bay section, click the down arrow on the server selection box and reassign the profile to the blade server in Device Bay 2.
- 7. Then click **Apply & Close**.
- 8. Power on the second blade server that now has the server profile assigned by clicking the link to the server in the Server Profiles window. Click **Momentary Press** to power on the server.

The server should now be powered on. The system personality should now be migrated to the server in Device Bay 2. You should be able to verify that the Virtual Connect-defined MAC and WWN addresses have in fact migrated to the second server.

9. You can use the procedures described in the previous steps to start an iLO Remote Console session with the blade server in device bay 2 and verify Boot from SAN operation and network connectivity.

Summary

During this lab exercise, you used the Virtual Connect Manager to define a Virtual Connect server profile that used the Boot from SAN (BFS) capability. The Virtual Connect SAN Fabrics you implemented in the previous lab exercise were used for this activity. As part of the environment preparation you deleted existing server profiles and defined a new profile with two FlexNIC connections and two FlexHBA connections.

You verified the Windows host booted from SAN successfully and that you could ping the default gateway for one of the VLANs you also assigned to the server profile. Then, you moved the server profile to another server bay of the Virtual Connect domain and verified proper operation for that server.

Implementing Shared Uplink Sets (Optional)

Objectives

After completing this activity, you should be able to:

- Define two redundant shared uplink sets (SUSs)
- Delete two Virtual Connect (VC) networks
- Examine the status of the uplink ports

Introduction

In this lab, you will configure Virtual Connect to support two Shared Uplink Sets (SUS) that will provide redundant access to the data center network. Each SUS will have a pair of uplink ports (port trunk) assigned to it, uplinks initiated from each module will be connected using Link Aggregation (LACP). In addition, each SUS will support one untagged VLAN and several tagged VLANs.

Network diagrams



Physical view of the LAN connections

In this lab, both port trunks are active because they are assigned to separate SUSs. In additional, it should be noted that each SUS' uplinks are split across both network switches, this is accomplished as the switches are in a cluster, using HP's IRF technology. Additional uplinks could be added to improve uplink bandwidth and network availability.



Logical view of the VC network configuration

SUS1-A uses the port trunk comprising the uplink ports from the VC FlexFabric module in Bay 1; SUS1-B uses the port trunk comprising uplink ports from the VC FlexFabric module in Bay 2. Because two separate collections of VC networks are involved as a result of the SUSs, Virtual Connect allows each port trunk to operate in an active state.

Exercise 1 — Defining two redundant Shared Uplink Sets

In this exercise, you will define two SUSs that will function as redundant networks. This is accomplished by assigning the SUSs to the same uplink ports. As part of the procedures for defining an SUS, you will assign uplink ports and will also define the VLANs the SUS will support. You will be able to define VLAN identifiers for various VC networks that will comprise each SUS.

1. In the toolbar, click **Define**. Then in the drop-down menu, click **Shared Uplink Set**.



- 2. From the Define New Shared Uplink Set screen, follow these steps:
 - a. For the Uplink Set Name, enter PODnn-SUS1-A where nn is your POD ID.
 - Add the first external uplink port by clicking the Add Port section
 <enclosure-name> Bay 1 → Port X5
 (Linked)

Defi	ine 👻 Configur	e v Too	ols Help	•									
De	Define Shared Uplink Set												
E	thernet Shar	ed Exte	rnal Uplin	k Set									
ſ	plink Set Name												
PO	D21-SUS1-A												
E	xtemal Uplini	k Ports											-
P	ort		Port Role	Port S	Status			Connector Ty	pe Connected To		PID	Speed/Duplex	Action
P B	OD-21 ay 1: Port X5		NA	0	Linked		10 Gb	SFP-DAC	POD21 (Ten-Gigat	itEthernet1/0/2)	۲	Auto	Delete
Co	onnection Mode:	💿 Auto	LAC	CP Time	r: 💿 Domain D	efault, Short (1	sec)						
		🔿 Failov	er		O Short (1 s	ec)							
_					🔿 Long (30	sec)							
A	id Port					Ì	ľ						
PO	DD-21	» E	ay 1	» F	Port X2 (INCOMPA	TIBLE)							
		E	ay 2	» k	Port X3 (INCOMPA	TIBLE)							
				F	Port X6 (LINKED)								
l				F	Port X7 (LINKED))							
													_
	Associated F	CoE Net	work (VLA	AN tag	ged)								
											+*	udd 🥜 Edit 🧌	' Delete
	Associated N	etworks	(VLAN ta	gged)									-
												🕂 Add 🍵	Delete
	Network N	Varne			N	/LAN ID	Na	tive	Smart Link	Private Network		Action	
c. Add the second external uplink port by clicking the Add Port section <enclosure-name> Bay 1 → Port X6

efine 👻 Configure 👻 Tools 👻 Help 👻						
Define Shared Uplink Set						
Ethernet Shared External Uplink Set					_	
Uplink Set Name						
POD21-SUS1-A						
External Uplink Ports						
Port Port Role Port Status		Connector Type	Connected To	PID Speed/Duplex	Acti ^{uplex}	Actio
POD-21 (enc0): Bay 1: Port NA 🛛 🛇 Linked	10 Gb	SFP-DAC	38:22:d6:35:66:f1(Ten-Gig	Auto	Dele	Delet
POD-21 (enc0): Bay 1: Port NA 📀 Linked	10 Gb	SFP-DAC	38:22:d6:35:66:f1(Ten-Gig	Auto	Dele	Delet
onnection Mode: Auto 👻						
Add Port						
POD-21 (enc0) »						
Add						
Associated Networks (VLAN tagged)						
				🕂 Add 🏢	Delete	
Network Name	VLAN Native	Smart Link	Private Netwo	ork Action		r Delete
					ld 🥤) Delete
				Арру	ancel	
Note						

Both ports are from the VC FlexFabric module in Interconnect **Bay 1**.

3. These are the VLANs that will be configured within this SUS.

Network Name	VLAN ID	Native	Smart Link
Default-VLAN-A	1	checked	Checked
PODnn-VLAN10-A	10		Checked
PODnn-VLAN20-A	20		Checked
PODnn-VLAN30-A	30		Checked
PODnn-VLAN40-A	40		Checked
PODnn-VLAN50-A	50		Checked

These networks are essentially just VC networks that will be listed under the Ethernet Networks folder of the navigation pane. In contrast to the VC networks you defined in previous lab exercises, these VC networks will be "assigned" to an SUS. That is, these networks are not simple vNets.

- About the Native Parameter Only one network can have the Native option checked (that is, enabled in an SUS. This option indicates that the VLAN carries untagged frames only. In general, a given physical or logical link (port trunk) can transport at most one untagged VLAN. Hence, the SUS assigned one or more uplinks must operate according to that fundamental network rule.
- About the Smart Link Parameter In this configuration, the Smart Link parameter is enabled on each of the VC networks that you define for this SUS. Smart Link will monitor the state of the uplinks and will turn off downlink ports to servers within Virtual Connect if all available uplinks assigned to a VC network are down.
- 4. To add the Default network, click **Add Network** and then specify the information from the table.

efine + Configure +	Uplink Set	elp v						_
	00000	•						
Ethernet Shared	i External Upl	link Set						
OD21-SUS1-A								
External Oplink P	orts							
Port	Port Role	Port Status	10 Gb	Connector Type SEP-DAC	Connected To	PID	Speed/Duplex	Actio
Bay 1: Port X5	190	- Lindu	10.00	0.15050	i obzi (ren-organitztrenieth02)		1940	Dele
POD-21 Bay 1: Port X6	NA	Linked	10 Gb	SFP-DAC	POD21 (Ten-GigabitEthernet2/0/3)	۲	Auto	Dele
Connection Mode: 🧕	Auto L	ACP Timer: 💿 Domain Default	, Short (1 sec)					
C) Failover	O Short (1 sec)						
		 Long (30 sec) 						
Add Port								
POD-21	»							
Associated FCo	E Network (V	LAN tagged)						
							ua eran @	Dolo
						111	wuu 🎤 Eult 🔛	Dele
Associated Net	works (VLAN	tagged)						
							+ Add 🗎	' Dele
		1.5.01						

5. Enter the name for the "Default" network, and then specify the information from the table. Optionally, select Advanced and set the Preferred and Maximum Speeds.

SSOCIALES NELWOIKS (VERN LA	33cm)	
/ould you like to add		
) a single Associated Network 🔾) multiple Associated Networks	
Network Name * Default-VLAN-A		
Color none Labels	Type to add Network Labels	
	Type to add Network Labels	
🖌 Native 🕑 Smart Link 🗌 Private	e Network	
Native Y Smart Link Private Image: Advanced Network Settings Image: Set preferred connection speed Setected Speed: Image: Set preferred connection speed	2 Network	
Native Smart Link Private Advanced Network Settings Set preferred connection speed Selected Speet: 0.1 G 0.	2 Network	
Image: Second	2 Network	

- 6. Scroll to the bottom of the page and **Click Apply.**
- 7. In the shared Uplink Sets Screen, select to Edit the SUS you just created as additional Networks will be added to this SUS.
- 8. Under the Associated Networks (VLAN tagged) box Click ADD

dit Shared	Uplink Set: F	POD21-SUS1-A				_		
Ethernet Shal	red External Up	link Set Status PID						
External Uplin	ik Ports							
Port	Port Role	Port Status		Connector Type	Connected To	PID	Speed/Duplex	Action
POD-21 Bay 1: Port X5	NA	Linked-Active	10 Gb	SFP-DAC	POD21 (Ten-GigabitEthernet1/0/2)	۲	Auto	Delete
POD-21 Bay 1: Port X6	NA	Linked-Active	10 Gb	SFP-DAC	POD21 (Ten-GigabitEthernet2/0/3)	۲	Auto	Delete
Connection Mode: Add Port	* • Auto L O Failover	LACP Timer: Domain Default, Short (1 sec) Long (30 sec)	Short (1 sec)					
Associated F	COE NETWORK (V	LAN taggeaj				+	Add 🧪 Edit 🥤) Delete
Associated N	Networks (VLAN	tagged)				(+ Add 1	Delete

- 9. Under the Associated Networks (VLAN tagged) box Click ADD, when the windows opens, select the "multiple Associated Networks" radio button. The ability to create multiple networks in a single action was added to Virtual Connect in firmware release 3.70. The Advanced Networks Settings feature was added in release 4.01.
- 10. Scroll down and **click Apply.**

sociated Networks (VLAN tagged)	
Vould you like to add) a single Associated Network	
Network Name POD-21-VLAN + VLAN ID + _A Sample network name: POD-21-VLAN50-A VLAN ID(s) * 10,20,30,40,50 ?	
Color Color Type to add Network Labels Type to add Network Labels	
Smart Link Private Network	
Advanced Network Settings Set preferred connection speed	
Advanced Network Settings Set preferred connection speed Selected Speed 0.1 Gb 10 Gb	
Advanced Network Settings Set preferred connection speed Selected Speed: 10 Gb Set maximum connection speed Selected Speed: 10 Gb 10 Gb	·
Advanced Network Settings Set preferred connection speed 2 Selected Speed: 4 Gb 0.1 Gb 10 Gb Selected Speed: 10 Gb Selected Speed: 10 Gb Ob 0.1 Gb 0.1 Gb 10 Gb	
Advanced Network Settings Set preferred connection speed Setced Speed: 4 4 6b 0.1 Gb 10 Gb Setected Speed: 10 Gb Setected Speed: 10 Gb Setected Speed: 10 Gb 0.1 Gb 10 Gb 0.1 Gb 10 Gb 0.1 Gb 10 Gb Default > Default >	
Advanced Network Settings Set preferred connection speed Selected Speet: 4 10 Gb 0.1 Gb Selected Speet: 10 Gb Selected Speet: 10 Gb Selected Speet: 10 Gb 0.1 Gb 10 Gb 0.2 Gb 10 Gb 0.4 Gb 10 Gb 0.5 How more start access group names Default × = e letters or numbers ('a', '2', 'e', 'hag', 'default')	

11. After you complete the data entry, the Associated Networks section of the window should display as follows.

Asso	Associated Networks (VLAN tagged)									
					+	- Add 🏦 Delete				
	Network Name		Native		Private Network	Action				
	Default-VLAN-A	1	true	true	false	Edit 💌				
	POD-21-VLAN10-A	10	false	true	false	Edit 👻				
	POD-21-VLAN20-A	20	false	true	false	Edit 💌				
	POD-21-VLAN30-A	30	false	true	false	Edit 💌				
	POD-21-VLAN40-A	40	false	true	false	Edit 💌				
	POD-21-VLAN50-A	50	false	true	false	Edit 📼				

12. Verify that **Smart Link** is enabled for each network, but **Native** is only enabled for the first network (Default-VLAN-A). **The Click Apply.**

- 13. To define the second Shared Uplink Set, we will COPY the SUS you just created. In the Logical Configuration section of the navigation pane, click the Shared Uplink Sets entry to go to the Shared Uplink Sets page.
- 14. In the Shared Uplink Sets window, Left click on SUS you just created and **Click COPY.**

Define - Configure - Tools - Shared Uplink Sets	Help v				
External Connections Ass	ociated Networks				
					Action
🛇 🌘 POD21-SUS1-A	faise 🛇 Lini	ked-Active 10 Gb	SFP-DAC SFP-DAC	POD-21: Bay 1: Port X5 POD-21: Bay 1: Port X6	Edit 💌
+ Add	Add Delete Copy				
	Settings Global Settings About Adobe Flash Playe	ər 11.1.102.55			

- 15. In the Shared Uplink Sets window, Left click on SUS you just created and **Click COPY.**
- 16. In the "Copy Shared Uplink Set" dialog box, Chance the SUS Name to end in "B", select Replace "last" instance of "A" with "B". Scroll down and under ADD ports, Select ports X5 and X6 from Bay 2, Click OK

		Copy Shared Uplink Se	t				
Charad	Inlink Cat Name						
Shared	Jplink Set Name						
Name POD2	21-SUS1-B						
Associate	ed Networks (VL	ANs)					
Replace 1	ast 👻 instance(s) o	f A with	в				
<u> </u>							
POD21-SUS	1-A Original	POD21-S	US1-B Copy				
Default-VL	AN-A	Default-	VLAN- <u>B</u>				
POD-21-VL	LAN10-A	POD-21	-VLAN10- <u>B</u>				
POD-21-VL	LAN20-A	POD-21	-VLAN20- <u>B</u>				
POD-21-VI	LAN30- <u>A</u>	POD-21	-VLAN30- <u>B</u>				
		DOD 21	POD-21-VLAN40- <u>B</u>				
POD-21-VL	LAN40-A	F00-21					
POD-21-VL POD-21-VL	LAN40- <u>A</u> LAN50- <u>A</u>	POD-21	-VLAN50- <u>B</u>				
POD-21-VL POD-21-VL POD-21-VL	LAN40- <u>A</u> LAN50- <u>A</u> Uplink Ports	POD-21 POD-21	-VLAN50-B Connector Type	Connected To			
POD-21-VL POD-21-VL POD-21-VL POT Port	Uplink Ports	PoD-21 POD-21 POD-21 Port Status Timer: O Domain Default, Short (-VLAN50-B Connector Type	Connected To			
POD-21-VI POD-21-VI POD-21-VI POT Port	Uplink Ports Port Role O Auto LACP O Failover	Port Status Timer: Domain Default, Short (Short (1 sec)	-VLAN50-B Connector Type	Connected To			
POD-21-VI POD-21-VI POD-21-VI POD-21-VI	LAN40- <u>A</u> LAN50- <u>A</u> Uplink Ports Port Role O Auto LACP O Failover	Port Status Timer: Domain Default, Short (Short (1 sec) Long (30 sec)	-VLAN50-B Connector Type	Connected To			
POD-21-VI POD-21-VI POD-21-VI Port nection Mode:	LAN40- <u>A</u> LAN50- <u>A</u> Uplink Ports Port Role O Auto LACP O Failover	Port Status Timer: Domain Default, Short (Short (1 sec) Long (30 sec)	-VLAN50- <u>B</u> Connector Type	Connected To			
POD-21-VL POD-21-VL POD-21-VL Port nection Mode:	LAN40- <u>A</u> LAN50- <u>A</u> Uplink Ports Port Role O Auto LACP O Failover	Port Status Timer:	-VLAN50- <u>B</u> Connector Type	Connected To			
POD-21-VI POD-21-VI POD-21-VI POT Port Port	LAN40- <u>A</u> LAN50- <u>A</u> Uplink Ports Port Role O Auto LACP Failover	Port Status	-VLAN50- <u>B</u> Connector Type	Connected To			
POD-21-VI POD-21-VI POD-21-VI Port nection Mode:	LAN40- <u>A</u> LAN50- <u>A</u> Uplink Ports Port Role O Auto LACP Failover Bay 1 Bay 2	Port Status	Connector Type	Connected To			
POD-21-VI POD-21-VI POD-21-VI Port nection Mode:	LAN40- <u>A</u> LAN50- <u>A</u> Uplink Ports Port Role O Auto LACP Failover Bay 1 Bay 1 Bay 2	Port Status Port Status Port Status Port X2 (INCOMPATIBLE) Port X3 (INCOMPATIBLE) Port X5 (LINKED)	-VLAN50- <u>B</u> Connector Type I sec)	Connected To			
POD-21-VI POD-21-VI POD-21-VI Port nection Mode:	LAN40- <u>A</u> LAN50- <u>A</u> Uplink Ports Port Role O Auto LACP O Failover Bay 1 Bay 2	Port Status Port Status Timer: Port X2 (INCOMPATIBLE) Port X3 (INCOMPATIBLE) Port X3 (INCOMPATIBLE) Port X3 (INCOMPATIBLE) Port X3 (INCOMPATIBLE) Port X3 (INCOMPATIBLE) Port X3 (INCOMPATIBLE) Port X3 (INCOMPATIBLE) Port X3 (INCOMPATIBLE) Port X5 (INKED) POR	-VLAN50- <u>B</u> Connector Type	Connected To			

Exercise 2 — Examining the status of the uplink ports

In the navigation pane Hardware Configuration section, click <enclosure-name>
 Interconnect Bays. Then in the main window, click the Bay 1 (LAN+SAN) link, which contains a VC FlexFabric module.

IP Virtual Connect	Manager		
Domain Status 📃	Define 🕶 Configure 👻 Tools 👻 Help 👻		
ODomain Status View Legend	Interconnect Bays		
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0 0 0 0 0	Interconnect Bays Status		
Find Configuration Items. ?	Rack Name: RACK-1		
Users/Authentication	Enclosure Name: POD-21		
Local Users			
LDAP Settings	Interconnect Bays Summary		
Radius Settings	Bay Number Status Module	Power	Firmware Version
TACACS+ Settings	Bay 1 (LAN+SAN) OK HP VC Hext-abric 10Gb/24-Port Module	V On	4.01 2013-05-21117:12:132
Role Management	Bay 2 (LAN+SAN) OK HP VC FlexFabric 10Gb/24-Port Module	Se On	4.01 2013-05-21117:12:132
SSL Certificate			
SSH Administration			
Web SSL Configuration			
Ethernet			
Fibre Channel			
Server Serial Numbers			
Connections			
Server Profiles			
Ethernet Networks			
Shared Uplink Sets			
SAN Fabrics			
Network Access Groups			
Hardware			
Overview			
POB-21			
Interconnect Bays			
Device Bays			
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2. Notice on the Uplinks Tab that Bay 1: Port X5 and Bay 1: Port X6, which are assigned to Shared Uplink Set PODnn-SUS1-A, have the same LAG ID. This shows that Virtual Connect has formed a Link Aggregation Control Protocol (LACP) link aggregation group (LAG) with these two uplink ports. Also notice that the uplink ports are both in the Active state, which you would expect because they are in the same port trunk. If the LAG IDs are not the same or one of the links is in standby, contact your instructor for assistance.

Define 👻	Configure 👻	Tools 🔻	Help 🔻	
Bay 1	(HP VC F	lexFabr	c 10Gb/24-Port	Module)

Gene	ral Information	Uplin	k Ports	erver Po	orts MAC Ad	ldress Tabl	el	IGMP Multicast Groups	Name Server
Uplink	Port Information	(Enet)							
Label	Network(s)	Status			Connector Typ	e LAG ID	Conn	ected To	Detailed Stats / Info
Port X3	3		Incompatible	0 Mb	SFP-FC		Unkno	w n ()	Detailed Stats / Info
Port X4	POD-21-vNet1	📀 ок	Linked/Active	10 Gb	SFP-DAC	26	POD2	1 (Ten-GigabitEthernet1/0/1)	Detailed Stats / Info
Port X	POD21-SUS1-A	📀 ок	Linked/Active	10 Gb	SFP-DAC	25	POD2	1 (Ten-GigabitEthernet1/0/2)	Detailed Stats / Info
Port X8	POD21-SUS1-A	📀 ок	Linked/Active	10 Gb	SFP-DAC	25	POD2	1 (Ten-GigabitEthernet2/0/3)	Detailed Stats / Info
Port X	,		Linked	10 Gb	SFP-DAC		VcD_	6ca2470b196e (X7)	Detailed Stats / Info
Port X8	3 Stacking Link	📀 ок	Linked	10 Gb	Internal	27	VCEF	XTW21120011 (X8)	Detailed Stats / Info
Uplink	Port Information	(FC)							
Port	WWN		SAN Fabric	Port Sp	eed Setting C	onnector S	tatus	Connected To	Detailed Stats / Info
X1	20:00:00:11:0a:02:	2a:dc	SAN-A	8 Gb	L	ogged In		10:00:00:05:33:53:5c:ad	Detailed Stats / Info
X2	20:01:00:11:0a:02:	2a:dc	SAN-A	8 Gb	Ŀ	ogged In		10:00:00:05:33:53:5c:ad	Detailed Stats / Info

3. Repeat Step 1, choosing instead **Bay 2**, which contains the second VC Flex-Fabric module.

Define	- Configure -	Tool	s v Help v						
Bay	2 (HP VC I	FlexF	abric 10	Gb/24	4-Port M	odule)			
Gene	ral Information	Uplin	nk Ports	Server Po	orts MAC A	Address Tal	ble	GMP Multicast Groups	Name Server
Uplink	Port Information	(Enet))						
Label	Network(s)	Status			Connector Type	LAG ID	Con	nected To	Detailed Stats / Info
Port X3			Incompatible	0 Mb	SFP-FC		Unkn	ow n ()	Detailed Stats / Info
Port X4	POD-21-vNet1	📀 ок	Linked/Standb	y 10 Gb	SFP-DAC	26	POD2 Gigat	1 (Ten- bitEthernet2/0/1)	Detailed Stats / Info
Port X5	POD21-SUS1- B	🕗 ок	Linked/Active	10 Gb	SFP-DAC	25	POD2 Gigat	1 (Ten- bitEthernet2/0/2)	Detailed Stats / Info
Port X6	POD21-SUS1- B	📀 ок	Linked/Active	10 Gb	SFP-DAC	25	POD2 Gigat	1 (Ten- bitEthernet1/0/3)	Detailed Stats / Info
Port X7			Linked	10 Gb	SFP-DAC	;	VcD_	6ca2470b196e (X7)	Detailed Stats / Info
Port X8	Stacking Link	📀 ок	Linked	10 Gb	Internal	27	VCEF	XTW21120010 (X8)	Detailed Stats / Info
Uplink	Port Information	(FC)							
Port	WWN		SAN Fabric	Port Spe	ed Setting	Connector	Status	Connected To	Detailed Stats / Info
X1	20:00:00:11:0a:02	2a:dd	SAN-B	8 Gb		Logged In		10:00:00:05:33:51:49:8d	Detailed Stats / Info
X2	20:01:00:11:0a:02	2a:dd	SAN-B	8 Gb		Logged In		10:00:00:05:33:51:49:8d	Detailed Stats / Info

Similar to the first Shared Uplink Set, notice that Bay 2: Port X5 and Bay 2: Port X6, which are assigned to Shared Uplink Set PODnn-SUS1-B, have the same LAG ID. This shows that Virtual Connect has also formed an LACP LAG with these two uplink ports. If the LAG IDs are not the same or one of the links is in standby, contact your instructor for assistance. Also, even though both Bay 1 and Bay 2 module SUS have the SAME LAG ID, all ports have and ID of 25,

these are TWO separate link aggregation groups, one on module Bay 1 and another on the module in Bay 2.

Like the other Shared Uplink Set, the uplink ports are both in the Active state, just like those assigned to PODnn-SUS1-A. This is because this port trunk used by PODnn-SUS1-B is distinct from the port trunk used by PODnn-SUS1-A.

4. While in the Bay 2 module page, take a look at some of the other tabs on this page, such as Server Ports,

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av 1 (H	IP VC FI	exEabric 10Gb/2	4-Port N	Iodule	<i>.</i>)				
ay i (ii				Todale	•)				
onoral Info	ormation	Unlink Porte Server D	orte MAC	Address	Table		Iticaet Croune	Name	Server
Sellerariin	ormation		MIAG	Audiess	Table	IGMIF MU	nicast Groups	Wallie	301 101
erver Ports	•								
Label	Flex NIC	Physical Server	Network	SAN Fabric	SAN Uplink Port	Profile	Status		Detailed Stats / Info
Port d1	DCC State: N	/A,Ver.:N/A,Speed:0Mb							Detailed Stats / In
	LOM:1-a	Device Bay 1 (ProLiant BL460c G7)					Not Linked	0 Mb	Detailed Stats / In
	LOM:1-b	Device Bay 1 (ProLiant BL460c G7)					Not Linked	0 Mb	Detailed Stats / In
	LOM:1-c	Device Bay 1 (ProLiant BL460c G7)					Not Linked	0 Mb	Detailed Stats / Ir
	LOM:1-d	Device Bay 1 (ProLiant BL460c G7)					Not Linked	0 Mb	Detailed Stats / In
ortd2 DC	C State: Avai	lable, Ver.: 1.0, Speed: 10 G	b						Detailed Stats / In
	LOM:1-a	Device Bay 2 (ProLiant BL460c G7)	POD-21- vNet1			POD- 21_01	Linked	4 Gb - 10 Gb	Detailed Stats / In
	LOM:1-b	Device Bay 2 (ProLiant BL460c G7)		SAN-A	X1	POD- 21_01	Logged in	4 Gb - 8 Gb	Detailed Stats / In
	LOM:1-c	Device Bay 2 (ProLiant BL460c G7)					Not Linked	0 Mb	Detailed Stats / In
	LOM:1-d	Device Bay 2 (ProLiant BL460c G7)					Not Linked	0 Mb	Detailed Stats / In
Port d3							Administratively Disabled	0 Mb	Detailed Stats / In
Port d4							Administratively Disabled	0 Mb	Detailed Stats / In
Port d5							Administratively Disabled	0 Mb	Detailed Stats / In
Port d6							Administratively Disabled	0 Mb	Detailed Stats / In
Port d7							Administratively Disabled	0 Mb	Detailed Stats / In
Port d8							Administratively Disabled	0 Mb	Detailed Stats / In

5. And MAC address Table etc.

Bay 1 (HP VC FlexFabric 10Gb/24-Port Module) Ceneral Information Uplink Ports MAC Address Table CMP Multicast Groups Name Server NAC Address Table CMP Multicast Groups Name Server NAC Address Type LAG VLAN ID Network (pp) NAC Address Table CMP Multicast Groups Name Server NAC Address Type LAG VLAN UND Network (pp) Server Ports Name Server NAC Colspan="2">Calspan="2" Colspan="2" Colspan="2" Colspan="2" La GM Port(s) encorspan="2" (ligg) 78ACC072550 Learned 27 1 Default-VLAN-Bs enc011ag25 X5, X6 enc011ag25 X5, X6 enc011ag25 X5, X6 enc011ag26 X4 enc011ag26 X4 enc011ag26 X4 enc011ag26 X4 enc011ag26 X4 enc011ag26 X5, X6 <td< th=""><th>Define 👻</th><th>Configure 👻 Tools 👻</th><th>Help -</th><th></th><th></th><th></th><th></th><th></th><th></th></td<>	Define 👻	Configure 👻 Tools 👻	Help -						
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Ceneral Information Uplink Ports Server Ports MAC Address Table KdMP Multicast Groups Name Server MAC Address Table	Bay 1	(HP VC FlexFa	DUL 2110	D/24-P0	ort ivioau	ie)			
General Information Uplink Ports Server Ports MAC Address Table KAM PMulticast Groups Name Server MAC Address Table Port MAC Address Type LAG VLANID Network (lig) 38:220:635:5A:53 Learned 25 20 POD:21-VLAN20-A enc0:11ag25 X4 (lig) 78:AC:07:22:5D:8 Learned 27 1 Default-VLAN-Bs enc0:11ag25 X5, X6 (lig) 78:AC:07:22:5D:8 Learned 27 1 Default-VLAN-Bs enc0:11ag27 X8 (lig) 78:AC:07:21:5D:8 Learned 27 1 Default-VLAN-Bs enc0:11ag27 X8 (lig) 78:AC:07:21:6D:8 Learned 27 1 Default-VLAN-Bs enc0:11ag27 X8 (lig) 78:AC:07:21:6D:8 Learned 27 1 Default-VLAN-Bs enc0:11ag27 X8 (lig) 98:4BE:17:67:33 Learned 27 1 Default-VLAN-Bs enc0:11ag27 X8 (lig) 98:4BE:17:697:38 Learned </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
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Exercise 3 — Creating a server profile

In this exercise, you will create a new server profile to be configured with multiple networks and SAN connections. This server profile will be used to connect an ESX host to the network. For this exercise, you will use the server in Bay 9 of you c7000 enclosure.

- 1. Open a web browser and access the Virtual Connect Manager home page.
 - Important

In the previous LAB if you created a server profile and assigned networks to it, that profile should still be applied to the server in Bay 2 and booting to SAN. Do NOT delete that profile

2. In the Virtual Connect Manage Home page, click Define Server Profiles.



 Create new server profile as shown in the graphic below. In the Ethernet Adapter Connections box, **click ADD** to add four additional NICs, for a total of 6 NICs. Connect the Ports (NICs) as follows;

Define	 Configure + Tools 	- Help -								
Edit	Server Profile:	ESX-9								
Pro	file									
Profil	None	Network Access Group St	stus Serial Numb	er Server	uup					
ESX-5		Default 💌 🔁	VCX0000K0	a6e016	15-1924-4401-0k	56b-12a0207dc0b2				
Eth	ernet Adapter Conne	ctions								
Port	Network Name	Statu Port Sp	sed Type	Allocated Port Spee .	PM	Multicast Filter	MAC		Mapping	Action
1	Default-VLAN-A	PREFE	RRED	100 Mb - 10 Gb	USE-BIOS	None	00-17-A4-77-50-	08	LOM:1-a => Bay 1:d	iort.
2	Default-VLAN-B	Ø PREFE	RRED	100 Mb - 10 Gb	USE-BIOS	None	00-17-A4-77-50-	0A	LOM:2-a => Bay 2:8	201
3	Multiple Networks	😒 🛛 PREFE	IRRED	Not Allocated	USE-BIOS	None	00-17-A4-77-50-	00	LOM:1-c => Bay 1:dt	ing.
4	Multiple Networks	😒 🙆 PREFE	RRED	Not Allocated	USE-BIOS	None	00-17-A4-77-50-	0E	LOM:2-c => Bay 2:d	6x3
5	POD-21-VLAN10-A	PREFE	RRED	NotAllocated	USE-BIOS	None	00-17-A4-77-50-	10	LOM:1-d => Bay 1:d	kr4
8	POD-21-VLAN10-B	PREFE	RRED	Not Allocated	USE-BIOS	None	00-17-A4-77-50-	12	LOM 2-d => Bay 2:d	Evil Delete
+ A	ld									
ISC	BI HBA Connections									+
FCo	E HBA Connections									
Port	Connects FC SAN / FCoE	Network Name	Туре	Status Port Speed	і Туре	Allocated vWVPN		MAC		Apping Action
1	Bay 1 SAN-A		SAN	PREFERI	RED	4 Gb - 8 C 50:06:08:00:00:C2:	92:04	00-17-A4-77-50-06	L	OM:1
2	Bay 2 SAN-B		SAN	PREFER	RED	4 Gb - 8 C 50:06:08:00:00:C21	82.06	00-17-A4-77-50-07	L	OM:2 Delete

- 4. Connect the SAN ports to SAN-A and SAN-B.
- 5. NIC Ports 3 and 4 are connected to Multiple VLANs, as shown in the following two graphics. When multiple networks are connected to a server NIC port using the Multiple Networks connections, the VLAN tags are forwarded to the server NIC. One VLAN could be defined as untagged. NIC port 3 is connected to networks associated with POD-xx-SUS 1-A which uses uplinks from Bay 1.

Define ▼ Configure ▼ Tools ▼ Help ▼				
Edit Server Profile: ESX-9				
ESX-9 Default V	2 VCX0000K01 at	5e816f6-1924-4401-8b5b-12a8287dc	362	
Ethemet Adapter Connections				
Server VLAN Tag to vNet Mappings 👔				
Force the same VLAN mappings as in the Shar	ed Uplink Set POD21-SUS1-A			
Networks not in mapping		Networks in mapping (4 ma Oran and drop networks to incl	pped; limit is 162) ude them or remove ti	hem from the manning
		vNet Name	Stat Serve	er VLAN Id Untagg
All AC D-F G-I J-L M-O F	-R 3-V W-Z U-3 4-6 7-9	POD-21-VLAN20-A		20
€ Default-VLAN-A	٢	POD-21-VLAN30-A	0	30
DOD-21-VLAN10-A	٢	POD-21-VLAN40-A	0	40
		POD-21-VLAN50-A	0	50
E List	Detail			

6. NIC port 4 is connected to networks associated with PODxx-SUS1-B which uses uplinks from Bay 2.

Network Access C	roup Status Serial Nu	Limber				
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		inui 8	a6e816f6-1924-4401-8b5b-12a8287dc	3b2		
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o vNet Mappings 📳						
AN mappings as in the Share	d Uplink Set POD21-SUS1	1-8				
ipping			Networks in mapping (4 ma	pped; limit is 16	i2) vo thom from	the man
relea			vNet Name		erver VI AN	d Linted
F G-I J-L M-O P-	R S-V W-Z 0-3	4-6 7-9	The traine			
			POD-21-VLAN20-B	0	20	
VLAN-B		0	POD-21-VLAN30-B	0	30	
-VLAN10-B		0	POD-21-VLAN40-B	0	40	
			POD-21-VLAN50-B	0	50	
	Connections ovviet Mappings ovviet Mappings Is In mappings as in the Share apping Itered F G-I J-L M-O P- - VLAN-B I-VLAN10-B	r Connections ovNet Mappings at the Shared Uplink Set POD21-SUS apping teredF G-I J-L M-O P-R S-V W-Z D-3	r Connections ovNet Mappings ? LAN mappings as in the Shared Uplink Set POD21-SUS1-B apping tered	or Viet Mappings Imappings LAN mappings as in the Shared Uplink Set POD21-SUS1-B apping Imapping tered Imapping IF G-1 J-L M-O P-R S-V V/LAN-B Image I-VLAN10-B Image Image POD-21-VLAN20-B POD-21-VLAN30-B POD-21-VLAN40-B POD-21-VLAN50-B Image	Networks in mapping (4 mapped; limit is 16 Difference Anneppings as in the Shared Uplink Set poD21-SUS1-B Apping Itered Networks in mapping (4 mapped; limit is 16 Drag and drop networks to include them or removed IF G-1 J-L M-O P-R S-V W-Z 0-3 4-6 7-9 VLAN-B O POD-21-VLAN20-B O POD-21-VLAN30-B O POD-21-VLAN30-B O POD-21-VLAN50-B O	Itered Networks in mapping (4 mapped; limit is 162) Drag and drop networks to include them or remove them from the server VLANI IF G-I J-L M-O P-R S-V W-Z 0-3 4-6 7-9 VLAN-B IV-LAN10-B IV-LAN10-B

- 7. Apply the network configuration, assign the profile to the server in Bay 9.
- 8. Power on the server in Bay 9 and open an iLO connection to it. Once the server boots to ESXi, Press F2 on the ESX server screen and log in to ESXi as "root" with the password "hpinvent".
- 9. Select TEST Management Network and verify a successful PING to the address 172.20.0.1.



10. From Windows, log in to vCenter using the "Windows session credentials" and find your POD, under Student PODs. Verify that vCenter can see your ESXi host. Select the host and Click on the Configuration tab, then select Networking and verify that ALL SIX NICs are connected as shown below.



- Time permitting, you can optionally start one of the VMs on this server, then move the VM between VLANs and verify that Virtual Connect is trunking the configured VLANs to this vSwitch.
- 12. Once complete, shut down the ESX host gracefully and close the iLO session.

Exercise 4 — Deleting the server Profile and VC networks

In this exercise, you will ALL previously created Profiles and Networks that were created in earlier labs as they will not be required in the next lab.

- 1. Open a web browser and access the Virtual Connect Manager home page.
- 2. In the navigation pane Logical Configuration section, click Server Profiles.

Logical Configuration
Server Profile
Ethernet Networks
Shared Uplink Sets
SAN Fabrics
Network Access Groups
Hardware Configuration
Hardware Overview
🛨 POD-21

3. In the Server Bay Assignment column, click the link to the server in Bay 1.



4. Click **Momentary Press** to power-off the server. Repeat these steps to shut down all servers.



5. In the Connections section in the navigation pane, click **Server Profiles** to go to the Server Profile page.

Connections
Server Profiles
Ethernet Networks
Shared Uplink Sets
SAN Fabrics
Network Access Groups
Hardware
Overview
POD-21
Interconnect Bays
Device Bays

6. Ensure all servers have shut down, if they don't shut down right away, log in their iLO and verify that the OS is shutting down, shutdown manually through the iLO if needed. The do the same for the remaining profiles.

7. Left click on the ESX profile, the expose the "blue bar", right click on the blue bar area and select Delete to delete the profile.

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0	POD-21_01		Add Delete				oLiant BL460c G7)	VC-DEFINED
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- 8. As will require the use of uplinks X4 from each of the FlexFabric modules for the next lab, we will need to delete the network created in an earlier lab, POD-xx-vNet 1.
- 9. In the left tree view, select Ethernet Networks, in the right pane scroll down to expose the network POD-xx-vnet1, where xx=your POD ID. Left click on the network to expose the Blue Bar, then right click and select Delete.

Define - Configure - Tools - H Ethernet Networks	elp 🕶				
External Connections Server Conn	ections				
				🕂 😭 Delete 🍸 Filt	er
Status Ethernet Networks	Type PID	Shared Uplink Set (VLAN ID)	Overall Port Status (count)	Connector Type (count) Action	
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Summary

In this lab, you created two independent Share Uplink Sets (SUSs), each using uplink ports from a separate VC FlexFabric module. PODnn-SUS1-A uses two uplink ports from the FlexFabric module in Bay1, and PODnn-SUS1-B uses two uplink ports from the VC FlexFabric module in Bay2.

By defining the SUSs in this manner, you have set up separate and redundant connections from Virtual Connect to the upstream switches. When a server profile is assigned these SUSs, the NICs can connect to VLANs accessed through each VC Ethernet module. This enables you to create an active/active uplink scenario.

Alternatively, you could have created a single SUS and assigned both of these port trunks to the same SUS. However, this would have provided an active/standby uplink scenario.

With the Enhanced VLAN Capacity parameter enabled, which is the current setting in your VC domain, you can create an SUS that contains all the VLANs you might potentially present to a collection of servers. Then you can present selected VLANs to each operating system instance running on the server when you have an implementation involving a vSwitch such as with VMware ESXi. The vSwitch can separate the VLANs and present them to the guest operating system instances. By using Mapped VLAN Tags and an SUS, you minimize the number of uplink ports required for such a situation.

Normally, Virtual Connect tags all frames presented to the server NICs by an SUS - unless the Native check box is selected for one of the networks. In such a case, any untagged frames leaving the server would be placed on the network designated as the native VLAN.

You then deleted the all server profiles and network created in an earlier lab.

Implementing Shared Uplink Sets (with FCoE)

Objectives

After completing this activity, you should be able to:

- Define two shared uplink sets (SUS')
- Add FCoE networks to the SUS'
- Assign FCoE connects to a server profile
- Examine the status of the uplink ports

Note: This lab includes the steps required to configure Virtual Connect release 4.01 for Dual Hop FCoE. The switches currently provided in this LAB environment do not support Dual Hop FCoE, therefore the final steps of proving connectivity will not be provided, however; the steps for configuring a Nexus switch for Dual Hop FCoE are provided in the LAB Appendices.

Introduction

In this lab, you will configure Virtual Connect to support two SUSs that will provide redundant access to the data center network and SAN Fabrics for FCoE connections. Each SUS will have one uplink port assigned to it. In addition, each SUS will support one untagged VLAN, several tagged VLANs and one tagged FCoE VLAN.

Virtual Connect Dual Hop FCoE

Dual-Hop FCoE support is a new feature provided in firmware release 4.01. This new feature allows the FCoE traffic to be propagated out of the enclosure to an external bridge which will handle the conversion of FCoE to FC traffic.

This feature is described as FCoE Dual Hop because there are two FCoE 'hops' between the server and the storage – the VC Module and the external FCoE -> FC bridge that connects the HP Virtual Connect modules to the storage. No additional external bridges are currently allowed in this configuration in order for Virtual Connect to guarantee the lossless of the FCoE connection.

Virtual Connect Requirements

Dual-Hop FCoE with HP Virtual Connect is currently supported with the following modules when running Virtual Connect firmware release 4.01 or later:

- HP Virtual Connect FlexFabric 10Gb/24-port Module
- HP Virtual Connect Flex-10/10D Ethernet Module

Converged Shared Uplink Sets (SUS) Details and Restrictions

- FCoE-capable Shared Uplink Sets (SUS) can contain both the FCoE network and non-FCoE networks.
- FCoE-capable SUS can support port aggregation (802.3ad).
- FCoE-capable SUS can support only one FCoE network.
- FCoE-capable SUS must always contain ports from a single VC module.

Note: For Multi Enclosure (ME) environments, all corresponding ports in remote enclosures will be included in the same SUS. (e.g. selecting enc0:bay1:X1 means bay1:X1 in all remote enclosures is also included).

Port limitations

- The VC FlexFabric modules can only support FCoE on uplink port X1 to X4.
- The VC Flex-10/10D modules can support FCoE on ALL uplink ports (X1-X10)



Note: SFP+ LR transceivers are not supported on FCoE VC uplinks.

Virtual Connect Limitations

- Only Dual-Hop FCoE is supported by HP at this time
- Only Active/Active SUS configurations are supported for FCoE
- Stacking of a FCoE configured SUS is not supported
- FCoE-capable Shared Uplink Set (SUS) can be used to allow concurrent Ethernet and FCoE traffic, but only one of the networks in the SUS can be an FCoE Network
- Only one FCoE network can be associated with any single set of uplink ports



Dual-Hop FCoE Split FC & Ethernet at Top of Rack FCoE switch

Virtual Connect SUS configuration when using FCoE





Active-Active FCoE Virtual Connect Configuration

Note: FCoE-capable Shared Uplink Sets must always contain ports from a single VC module in order to maintain the SAN-A/B isolation.

FCoE-capable Shared Uplink Set configuration support



Note: FCoE-capable Shared Uplink Sets must always be connected to a single Top of Rack switch in order to maintain the SAN-A/B isolation.



FCoE-capable Shared Uplink Set LACP configuration support

Network diagrams



Example of Physical view of the LAN connections

In this lab, both port trunks are active because they are assigned to separate SUSs. Although it is not done in this lab, additional uplinks could be used to increase uplink bandwidth and provide additional availability.

FCoE-SUS 1-A uses the port trunk comprising the uplink port X4 from the VC FlexFabric module in Bay 1; FCoE-SUS 1-B uses the port trunk comprising uplink port X4 from the VC FlexFabric module in Bay 2. Because two separate collections of VC networks are involved as a result of the SUSs, Virtual Connect allows each port trunk to operate in an active state.

Exercise 1 — Defining two redundant Shared Uplink Sets for use with FCoE Networks

In this exercise, you will define two SUSs that will function as redundant networks and provide support for both Ethernet and FCoE connections. As part of the procedures for defining an SUS, you will assign an uplink port and will also define the VLANs the SUS will support, as this is a FlexFabric module, FCoE is only supported on Ports X1-X4, you will use port X4 on each module. You will be able to define VLAN identifiers for various VC networks that will comprise each SUS.

 In the toolbar, click **Define**. Then in the drop-down menu, click **Shared Uplink** Set.



- 2. From the Define New Shared Uplink Set screen, follow these steps:
 - a. For the Uplink Set Name, enter FCOE-SUS1-A.

b. Add the first external uplink port by clicking the Add Port section <enclosure-name> Bay 1 → Port X4 (Linked)

Ethernet Shar	ed Exte	ernal Upl	ink Set							
Uplink Set Name										
CoE-SUS1-A										
External Uplini	k Ports									
Port		Port Role	Port S	atus			Connector Type	Connected To	PID Speed/Duplex	Act
onnection Mode:	 Auto 	L	ACP Tim	er: 💿 Domair	Default, Short	(1 sec)		,		,
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Define Configure & Tools & Help +

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D-21 (enc0): Bay 1: Port NA 🥥 Linked	10 Gb	SFP-DAC	38:22:d6:35:66:f1(Ten-Gig	Auto	Dele
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Network Name	VLAN Native	Smart Link	Private Netwo	ork Acti	ion
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The port above is from the VC FlexFabric module in Interconnect **Bay 1**.

Network Name	VLAN ID	Native	Smart Link
VLAN 1-A	1	checked	Checked
VLAN10-A	10		Checked
VLAN20-A	20		Checked
VLAN30-A	30		Checked
VLAN40-A	40		Checked
FCoE-A	50		N/A

4. These are the VLANs that will be configured within this SUS.

These networks are essentially just VC networks that will be listed under the Ethernet Networks folder of the navigation pane. In contrast to the VC networks you defined in previous lab exercises, these VC networks will be "assigned" to an SUS. That is, these networks are not simple vNets.

- About the Native Parameter Only one network can have the Native option checked (that is, enabled in an SUS. This option indicates that the VLAN carries untagged frames only. In general, a given physical or logical link (port trunk) can transport at most one untagged VLAN. Hence, the SUS assigned one or more uplinks must operate according to that fundamental network rule.
- About the Smart Link Parameter In this configuration, the Smart Link parameter is enabled on each of the VC networks that you define for this SUS. Smart Link will monitor the state of the uplinks and will turn off downlink ports to servers within Virtual Connect if all available uplinks assigned to a VC network are down.

4. To add the Default network, click **Add Network** and then specify the information from the table.

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5. Enter the name for the "Default" network, and then specify the information from the table. Optionally, select Advanced and set the Preferred and Maximum Speeds.

Define Shared Uplink Set										
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6. Scroll to the bottom of the page and **Click Apply.**

- 7. In the shared Uplink Sets Screen, select to Edit the SUS you just created as additional Networks will be added to this SUS.
- 8. Under the Associated Networks (VLAN tagged) box Click ADD

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dd Port lay 1 Associater Network Narr Associater	> d FCoE N ne: FCoE-A d Networf	etwork (VLAN	C Long (30 tagged) VLAN Jed)	D: 50	↓ Native	Smar	t Link	Private Network	+ Add > Edit	î De
dd Port Associater Network Narr Network Narr Network VLAN	> d FCoE N ne: FCoE-A d Network ork Name 41-A	etwork (VLAN <s (vlan="" tagg<="" td=""><td>C Long (30 tagged) VLAN jed)</td><td>D: 50 VLANID 1</td><td>↓ Native True</td><td>Snar true</td><td>t Link</td><td>Private Network false</td><td>+ Add / Edit + Add Actor Edit (</td><td>Del</td></s>	C Long (30 tagged) VLAN jed)	D: 50 VLANID 1	↓ Native True	Snar true	t Link	Private Network false	+ Add / Edit + Add Actor Edit (Del

9. Under the Associated Networks (VLAN tagged) box **Click ADD**, when the windows opens, select the "multiple Associated Networks" radio button. The ability to create multiple networks in a single action was added to Virtual Connect in firmware release 3.70. The Advanced Networks Settings feature was added in release 4.01.

10. Scroll down and **click Apply.**

Define 🔻	Configure 👻 Tools 👻 Help 👻
Defin	Shared Uplink Set
We	uld you like to add a single Associated Networt 💿 multiple Associated Networks
	twork Name VLAN + VLAN ID + -A mple network name: VLAN40-A AN ID(s) * 10,20,30,40 ?
	Color none Labels Type to add Network Labels Type to add Network Labels
) The Native VLAN setting supported only when adding or editing a single Associated Network
	Advanced Network Settings
	Set preferred connection speed ?
	Selected Speed: 6 0
	0.1 Gb 10 Gb
	Set maximum connection speed ?
I	

11. After you complete the data entry, the Associated Networks section of the window should display as follows.

Associated FCoE Network (VLAN tagged)									
	+								
Netwo	rk Name: FCoE-A	/LAN ID: 50							
Asso	ciated Networks (VLAN tagged)								
						🕇 Add 🏦 Delete			
	Network Name	VLAN ID 🗸	Native	Smart Link	Private Network	Action			
	VLAN1-A	1	true	true	false	Edit 📼			
	VLAN10-A	10	false	true	false	Edit 📼			
	VLAN20-A	20	false	true	false	Edit 📼			
	VLAN30-A	30	false	true	false	Edit 👻			
	VLAN40-A	40	false	true	false	Edit 👻			

12. Verify that **Smart Link** is enabled for each network, but **Native** is only enabled for the first network (Default-VLAN-A). **The Click Apply.**

Apply Cancel

- 13. To define the second Shared Uplink Set, we will COPY the SUS you just created. In the Logical Configuration section of the navigation pane, click the Shared Uplink Sets entry to go to the Shared Uplink Sets page.
- 14. In the Shared Uplink Sets window, Left click on SUS you just created and **Click COPY.**

Define	▼ C	onfigure 👻 Toe	ols - Help -							
Shai	red	Uplink Sets	;							
Ext	ernal C	Connections	Associated Netwo	rks						
Share	ed Uplin	k Set	Has FCoE	Port	Status		Connector Type	Uplin	ık Port	Action
0	۲	POD21-SUS1-A	false	0	Linked-Active	10 Gb	SFP-DAC	0	POD-21: Bay 1: Port X5	Edit 💌
				0	Linked-Active	10 Gb	SFP-DAC	0	POD-21: Bay 1: Port X6	
0		POD21-SUS1-B	false	0	Linked-Active	10 Gb	SFP-DAC	0	POD-21: Bay 2: Port X5	Edit 💌
				0	Linked-Active	10 Gb	SFP-DAC	0	POD-21: Bay 2: Port X6	
0	۲	FCoE-SUS1-A	true	0	Linked-Active FCoE Active	10 Gb	SFP-DAC	0	POD-21: Bay 1: Port X4	Edit 💌
+ Ad	d			>	Edit Add Delete Copy Settings Global Settings About Adobe Flash Playe	r 11.1.102	.55			

15. In the Shared Uplink Sets window, Left click on SUS you just created and **Click COPY.**

16. In the "Copy Shared Uplink Set" dialog box, Change the SAS Name to end in "B", select Replace "last" instance of "A" with "B". Scroll down and under ADD ports, Select port X4 from Bay 2, Click OK

	Copy Shared Uplink Set		
1 Shared Uplink Set Name			
Name FCoE-SUS1-B			
Associated Networks (VLANs)		
Replace last - instance(s) of	A with B		
FCoE-SUS1-A Original	FCoE-SUS1-B	 Сару	
VLAN1- <u>A</u>	VLAN1- <u>B</u>		
VLAN10- <u>A</u>	VLAN10- <u>B</u>		
√LAN20- <u>A</u>	VLAN20- <u>B</u>		
VLAN30- <u>A</u>	VLAN30- <u>B</u>		
VLAN40- <u>A</u>	VLAN40- <u>B</u>		
FCoE-A	FCoE- <u>B</u>		
3 External Uplink Ports Port U Port Role Enclosure	Port Status	Connector Type	Connecte
Connection Mode: Auto LACP Timer:	 Domain Default, Short (1 sec) 		
🔘 Failover	O Short (1 sec)		
	🔿 Long (30 sec)		
Add Port			
Bay 1 > Port X3			
Bay 2 Port X4			
		ок	Cancel

- 17. In the Shared Uplink Set s window, Left click on SUS you just created and **Click COPY.**
- 18. In the "Copy Shared Uplink Set" Table view, not that the new Shared Uplink Sets are present, along with the original Shared Uplink Sets created earlier. Also, notice the difference between the Shared Uplink Sets, under the "Has FCoE" column, the New SUS' have FCoE active

efine Shar	v c	onfigure - Tools Uplink Sets	▪ Help ▪					
Exte	ernal C	Connections As	ssociated Netwo	orks				
Share	d Uplini	k Set	Has FCoE	Port Status		Connector Type	e Uplink Port	Action
0	۲	POD21-SUS1-A	false	Cinked-Active	10 Gb	SFP-DAC	O POD-21: Bay 1: Port X5	Edit 💌
				Linked-Active	10 Gb	SFP-DAC	POD-21: Bay 1: Port X6	
0	۲	POD21-SUS1-B	false	Linked-Active	10 Gb	SFP-DAC	OD-21: Bay 2: Port X5	Edit 📼
				🛇 Linked-Active	10 Gb	SFP-DAC	POD-21: Bay 2: Port X6	
0	۲	FCoE-SUS1-A	true	Linked-Active FCoE Activ	e 10 Gb	SFP-DAC	OD-21: Bay 1: Port X4	Edit 💌
0	۲	FCoE-SUS1-B	true	Linked-Active FCoE Activ	e 10 Gb	SFP-DAC	POD-21: Bay 2: Port X4	Edit

Exercise 2 — Examining the status of the uplink ports

In the navigation pane Hardware Configuration section, click <enclosure-name>
 Interconnect Bays. Then in the main window, click the Bay 1 (LAN+SAN) link, which contains a VC FlexFabric module.

hp HP Virtual Connect Manager								
Domain Status 📃	Define 🕶 Configure 👻 Tools 👻 Help 👻							
ODomain Status View Legend	Interconnect Bays							
🖸 🔻 🛆 🙆 🕄		_						
0 0 0 0 0	Interconnect Bays Status							
Find Configuration Items. ?	Rack Name: RACK-1							
Users/Authentication	Enclosure Name: POD-21							
Local Users								
LDAP Settings	Interconnect Bays Summary							
Radius Settings	Bay Number Status Module	Power	Firmware Version					
TACACS+ Settings	Bay 1 (LAN+SAN) OK HP VC Hext-abric 10Gb/24-Port Module	V On	4.01 2013-05-21117:12:132					
Role Management	Bay 2 (LAN+SAN) OK HP VC FlexFabric 10Gb/24-Port Module	Se On	4.01 2013-05-21117:12:132					
SSL Certificate								
SSH Administration								
Web SSL Configuration								
Ethernet								
Fibre Channel								
Server Serial Numbers								
Connections								
Server Profiles								
Ethernet Networks								
Shared Uplink Sets								
SAN Fabrics								
Network Access Groups								
Hardware								
Overview								
POB-21								
Interconnect Bays								
Device Bays								
•								

2. Notice that Bay 1: Port X4 which is assigned to Shared Uplink Set FCoE-SUS1-A and is Active with FCoE.

efine - Configure - Tools - Help - Bay 1 (HP VC FlexFabric 10Gb/24-Port Module)								
Gene	ral Information	Upl	ink Ports	Server Ports	MAC Add	ess Table	IGMP Multicast Groups	Name Server
Uplink	Port Informatio	on (Enet	1)	_	_	_		
Label	Network(s)	Status			Connect Type	or LAG ID	Connected To	Detailed Stats / Info
Port X3			Incompatible	0 Mb	SFP-I	C	Unknow n ()	Detailed Stats / Info
Port X4	FCoE-SUS1-A	🛇 ок	Linked/Active/ Active	FC0E 10 G	b SFP-D	AC 26	POD21 (Ten- GigabitEthernet1/0/1)	Detailed Stats / Info
Port X5	POD21-SUS1- A	🛇 ок	Linked/Active	10 G	b SFP-D	AC 25	POD21 (Ten- GigabitEthernet1/0/2)	Detailed Stats / Info
Port X6	POD21-SUS1- A	🛇 ок	Linked/Active	10 G	b SFP-D	AC 25	POD21 (Ten- GigabitEthernet2/0/3)	Detailed Stats / Info
Port X7			Linked	10 G	b SFP-D	AC	VcD_6ca2470b196e (X7)	Detailed Stats / Info
Port X8	Stacking Link	📀 ок	Linked	10 G	b Interr	al 27	VCEFXTW21120011 (X8)	Detailed Stats / Info
Uplink Port Information (FC)								
Port	WWN		SAN Fabric	Port Speed Se	etting Cor	nector Status	B Connected To	Detailed Stats / Inf
X1	20:00:00:11:0a:0	2:2a:dc	SAN-A	8 Gb	Log	jed In	10:00:00:05:33:53:5c:ad	Detailed Stats / Info
X2	20:01:00:11:0a:0	2:2a:dc	SAN-A	8 Gb	Log	jed in	10:00:00:05:33:53:5c:ad	Detailed Stats / Info

- 3. Repeat Step 1, choosing instead **Bay 2**, which contains the second VC Flex-Fabric module.
- 4. While in the Bay 2 module page, take a look at some of the other tabs on this page, such as Server Ports.

Exercise 3 — Creating a server profile

In this exercise, you will create a new server profile to be configured with a single network connection and an FCoE Storage connection to the SAN. This server profile will be used to connect a a locally booted Windows host to the network. For this exercise, you will use the server in Bay 1 of your c7000 enclosure.

- 3. Open a web browser and access the Virtual Connect Manager home page.
 - Important

As previously stated, the switches connected to this lab do not support dual hop FCoE, so proving the connection will not be possible at this time.

5. In the Virtual Connect Manage Home page, click Define Server Profiles.

Define 👻 Configure 👻	Tools ▼ Help ▼								
HP Virtual Connect Home									
Server	Manage Server Profile Wizard <u>Define Server Profile</u> Serial Number Settings	View All Server Profiles Assigned Server Profiles Unassigned Server Profiles							
Network	Manage Advanced Network Settings Define a Network Define a Shared Uplink Set Network Setup Wizard Define Network Access Group Quality of Service(QoS)	View Port Monitoring Netw ork Settings SNMP Settings Quality of Service(QoS)							
Storage	Manage Fibre Channel SAN Fabrics Fibre Channel Setup Wizard Define SAN Fabric	View Fibre Channel Settings SNMP Settings							
Domain	Manage SSL Certificate Web SSL Configuration Backup Domain Configuration Restore Domain Configuration Local User Accounts	View System Log LDAP Server Settings SSH Administration RADIUS Settings TACACS+ Settings Role Management							

6. Create new server profile as shown in the graphic below. In the Ethernet Adapter Connections box Assign Port 1 VLAN1-A and Port 2 to VLAN1-B. Connect the FCoE HBA ports to FCoE-A and FCoE-B, assign the profile to Bay 1 and **Click Apply.**

Profile	2							
Profile Na Profile_01	ne Network Access Group Default • 2		Advanced Profile Settings					
Ethem	et Adapter Connections							
Port 1	letwork Name	Statu	Port Speed Type		PXE	Muticast Filter	MAC	٨
1 V	LAN1-A	۲	PREFERRED		USE-BIOS	None	VC-DEFINED	
2 V	LAN1-B	۲	PREFERRED		USE-BIOS	None	VC-DEFINED	
+ Add								
+ Add	HBA Connections							
H Add ISCSI I Port 1	HBA Connections		Statu Part Speed Type			Boot Setting MAC		Ac
+ Add ISCSII Port 1 + Add	HBA Connections		Statu Part Speed Type			Bood Setting MAC		A
+ Add ISCSII Pod 1 + Add FCoE I	HBA Connections envois losse HBA Connections		Statu Part Spreed Type			Boxt Seting MAC		A
+ Add ISCSII Port 1 + Add FCOE I Port	IBA Connections elevoit Taxe HBA Connections Gravet, P.C. Stay (Food Tealwoot Taxes		Statul Part Spreed Type	Status	Port Speed Type	Bool Setting MAC	млс	A
+ Add ISCSII Port 1 + Add FCoE I Port 1 E	HBA Connections encode Name HBA Connections Connect: FC SAM FCoE Network Name 1291 TCOE-CA		Statul Part Speend Type Type FCOE	Status	Part Speed Type PREFERRED	bloct Setting MAC	WAS VO-DEFINED	Ador

7. As the Upstream switch is not configured for FCoE connections, the SAN connections will present in an error state.

Summary

In this lab, you created two independent Share Uplink Sets (SUSs), each using uplink ports from a separate VC FlexFabric module. FCoE-SUS1-A uses one uplink port from the FlexFabric module in Bay1, and FCoE-SUS1-BB uses one uplink port from the VC FlexFabric module in Bay2.

By defining the SUSs in this manner, you have set up separate and redundant connections from Virtual Connect to the upstream switches. When a server profile is assigned these SUSs, the NICs can connect to VLANs accessed through each VC Ethernet module. This enables you to create an active/active uplink scenario.

You then define an FCoE VLAN within each SUS and created a Server profile to utilize both the LAN and FCoE connections.

This lab was intended to show the steps required to configure Virtual Connect release 4.01 to utilize FCoE (Dual hop) to an external switch that supports FCoE connections. The Appendix that follows this lab provides the commands required to configure a Nexus 5000 switch to support these connections.

Appendices Dual-Hop FCoE with Nexus 5xxx Series ToR switch in FCF mode

The Nexus switches operate as Fiber Channel Forwarders (FCF). This is the default Cisco Nexus 5xxx Series switches mode, it's also called the fabric mode. In this mode, the switch provides standard Fibre Channel switching capability and features.



Figure 1 - Cisco Nexus 5xxx switches operating as FC Forwarder (FCF)

FCF mode recommendations:

Nexus switches must either bridge to native FC infrastructure or directly connect to FC/FCoE-based Storage devices. Refer to the Cisco Nexus or Storage vendor interoperability Matrix.

When bridged to a native FC infrastructure, it is mandatory to use Cisco MDS directors or fabric switches in order to provide interoperability between fabrics.



Figure 2 - Physical view

Requirements

Minimum NX-OS version 5.2(1)N1(3).

FCoE requires the Nexus Storage Protocols Services license (FC_FEATURES_PKG).

Note: The license is an option which is activated when the Nexus switch is shipped from Cisco.

Guidelines

To increase the FCoE traffic identification and to better control the span of this traffic over the Ethernet network, it is recommended to use different FCoE VLANs and VSANs numbers between the two fabrics.

The FCoE VLAN should be dedicated to FCoE traffic (i.e. it should not carry IP traffic).

The FCoE VLAN must not be configured as a native VLAN (the VLAN that carries untagged traffic on trunk ports, by default VLAN 1).
Interfaces connecting to VC must be configured as **trunk** ports and **STP edge ports**. (STP does not run on FCoE VLANs between FCFs (VE_Ports) but does run on FCoE VLANs towards the host (VF_Ports)).

Nexus configuration when using a single VC to Nexus link

Details about the configuration:

- Interfaces eth1/5 are connected to the VC modules.
- Interfaces fc2/1 are directly connected to Cisco MDS 9148 switches.
- VLAN IDs 200 and 201 are used for the FCoE networks.
- VLAN IDs 1, 10 and 20 are the standard Ethernet networks (non-FCoE networks).
- The vfc interface (virtual Fibre Channel interface) binds to eth1/5.



Figure 3 - Physical diagram

Nexus switch-A configuration

- Upgrade the first Nexus switch with minimum System version 5.0(2)N2(1) (enter: show version)
- Enable FCoE on the switch:

0

0

0

0

- o conf t
 - feature fcoe
- Map a VSAN for FCoE traffic onto a VLAN:
 - vlan 200
 - o fcoe vsan 200
- Create a virtual Fibre Channel interface to carry the FCoE traffic through eth1/5:
 - o interface vfc 2005
 - bind interface ethernet 1/5
 - o no shutdown
- Create the VLANs for the IP traffic:
 - vlan 1,10,20
- Create a trunk on the interface to pass the FCoE (VLAN 200) and Ethernet traffic (VLAN 1,10,20):
 - o interface Ethernet1/5
 - o description FCoE uplink to FlexFabric
 - o switchport mode trunk
 - switchport trunk allowed vlan 1,10,20,200
 - spanning-tree port type edge trunk
- Assign the vfc interface to the appropriate VSAN:
 - o vsan database
 - o vsan 200
 - vsan 200 interface vfc 2005
- Configure the interface connected to the datacenter LAN:
 - o interface eth 1/17
 - switchport mode trunk
 - o switchport trunk allowed vlan 1,10,20
- Configuration of the zone:
 - a. Create zones:
 - o zone name fcoe-zone vsan 200
 - o member pwwn 21:53:00:02:ac:00:15:9d {This is the WWN of the first 3PAR controller port}
 - member pwwn 50:06:0b:00:00:c3:1a:20 {This is the WWN of the Blade FlexFabric Adapter port 1}
 - b. Create zoneset:
 - zoneset name zoneset1 vsan 200
 - o member fcoe-zone
 - c. Activate zoneset:
 - o zoneset activate name zoneset1 vsan 200

Nexus switch-B configuration

- Upgrade the second Nexus switch with minimum System version 5.0(2)N2(1) (enter: show version)
- Enable FCoE on the switch:

0

0

0

- o conf t
 - feature fcoe
- Map a VSAN for FCoE traffic onto a VLAN:
 - o vlan 201
 - o fcoe vsan 201
- Create a virtual Fibre Channel interface to carry the FCoE traffic through eth1/5:
 - o interface vfc 2005
 - o bind interface ethernet 1/5
 - o **no shutdown**
- Create the VLANs for the IP traffic:
 - vlan 1,10,20
- Create a trunk on the interface to pass the FCoE (VLAN 200) and Ethernet traffic (VLAN 1,10,20):
 - interface Ethernet1/5
 - o description FCoE uplink to FlexFabric
 - o switchport mode trunk
 - switchport trunk allowed vlan 1,10,20,201
 - spanning-tree port type edge trunk
- Assign the vfc interface to the appropriate VSAN:
 - o vsan database
 - o vsan 201
 - vsan 201 interface vfc 2005
- Configure the interface connected to the datacenter LAN:
 - o interface eth 1/17
 - o switchport mode trunk
 - o switchport trunk allowed vlan 1,10,20
- Configuration of the zone:
 - a. Create zones:
 - o zone name fcoe-zone vsan 201
 - member pwwn 20:53:00:02:ac:00:15:9d {This is the WWN of the second 3PAR controller port}
 - member pwwn 50:06:0b:00:00:c3:1a:22 {This is the WWN of the Blade FlexFabric Adapter port 2}
 - b. Create zoneset:
 - o zoneset name zoneset1 vsan 201
 - o member fcoe-zone
 - c. Activate zoneset:
 - o zoneset activate name zoneset1 vsan 201

Nexus configuration when using a port channel between VC and Nexus

Details about the configuration:

- Interfaces eth1/5 and eth1/6 are connected to the VC modules.
- Interfaces **fc2/1** are directly connected to Cisco MDS 9148 switches.
- VLAN IDs 200 and 201 are used for the FCoE networks.
- VLAN IDs 1, 10 and 20 are the standard Ethernet networks (non-FCoE networks).
- The vfc interface (virtual Fibre Channel interface) binds to the Port Channel 200 configured with eth1/5 and eth1/6.



Figure 4 - Physical diagram

Nexus switch-A configuration

- Upgrade the first Nexus switch with minimum System version 5.0(2)N2(1) (enter: show version)
- Enable FCoE and LACP on the switch:
 - o conf t
 - o feature fcoe
 - o feature lacp
- Map a VSAN for FCoE traffic onto a VLAN:
 - o vlan 200
 - o fcoe vsan 200
- Create a port channel with eth1/5 and eth1/6 with the same LACP Timer as defined by default in the Virtual Connect Domain:
 - Interface ethernet 1/5
 - o channel-group 200 mode active
 - o lacp rate fast
 - o interface ethernet 1/6
 - o channel-group 200 mode active
 - o lacp rate fast
- Create the VLANs for the IP traffic:

0

- vlan 1,10,20
- Create a trunk on the port channel interface to pass the FCoE (VLAN 200) and Ethernet traffic (VLAN 1,10,20):
 - o interface port-channel 200
 - switchport mode trunk
 - switchport trunk allowed vlan 1,10,20,200
 - spanning-tree port type edge trunk
- Create a virtual Fibre Channel interface to carry the FCoE traffic through the port channel:
 - o interface vfc 2005
 - o bind interface port-channel 200
 - o no shutdown
- Assign the vfc interface to the appropriate VSAN:
 - o vsan database
 - o vsan 200
 - o vsan 200 interface vfc 2005
- Configure the interface connected to the datacenter LAN:
 - o interface eth 1/17
 - o switchport mode trunk
 - switchport trunk allowed vlan 1,10,20
- Configuration of the zone:
 - a. Create zones:

0

- o zone name fcoe-zone vsan 200
- member pwwn 21:53:00:02:ac:00:15:9d {This is the WWN of the first 3PAR controller port}
- member pwwn 50:06:0b:00:00:c3:1a:20 {This is the WWN of the Blade FlexFabric Adapter port 1}
- b. Create zoneset:
 - o zoneset name zoneset1 vsan 200
 - o member fcoe-zone
- c. Activate zoneset:
 - o zoneset activate name zoneset1 vsan 200

Nexus switch-B configuration

- Upgrade the first Nexus switch with minimum System version 5.0(2)N2(1) (enter: show version)
- Enable FCoE and LACP on the switch:
 - o conf t
 - o feature fcoe
 - o feature lacp
- Map a VSAN for FCoE traffic onto a VLAN:
 - o vlan 201
 - o fcoe vsan 201
- Create a port channel with eth1/5 and eth1/6 with the same LACP Timer as defined by default in the Virtual Connect Domain:
 - Interface ethernet 1/5
 - o channel-group 200 mode active
 - o lacp rate fast
 - o interface ethernet 1/6
 - o channel-group 200 mode active
 - o lacp rate fast
- Create the VLANs for the IP traffic:

0

- vlan 1,10,20
- Create a trunk on the port channel interface to pass the FCoE (VLAN 200) and Ethernet traffic (VLAN 1,10,20):
 - o interface port-channel 200
 - o switchport mode trunk
 - switchport trunk allowed vlan 1,10,20,201
 - o spanning-tree port type edge trunk
- Create a virtual Fibre Channel interface to carry the FCoE traffic through the port channel:
 - o interface vfc 2005
 - o bind interface port-channel 200
 - o no shutdown
- Assign the vfc interface to the appropriate VSAN:
 - o vsan database
 - o vsan 201
 - vsan 201 interface vfc 2005
- Configure the interface connected to the datacenter LAN:
 - o interface eth 1/17
 - o switchport mode trunk
 - o switchport trunk allowed vlan 1,10,20
- Configuration of the zone:
 - a. Create zones:

0

- o zone name fcoe-zone vsan 201
- member pwwn 20:53:00:02:ac:00:15:9d {This is the WWN of the second 3PAR controller port}
- o member pwwn 50:06:0b:00:00:c3:1a:22 {This is the WWN of the Blade FlexFabric Adapter port 2}
- b. Create zoneset:
 - o zoneset name zoneset1 vsan 201
 - member fcoe-zone
- c. Activate zoneset:
 - o zoneset activate name zoneset1 vsan 201
- Rev. 1.1
- © Copyright 2013 Hewlett-Packard Development Company, L.P

Configuring Virtual Connect QoS

Objectives

After completing this activity, you should be able to:

Configure Virtual Connect for QoS

Introduction

In this lab, you will configure Virtual Connect for QoS support. The default configuration for Virtual Connect is QoS pass-through. In this lab you will enable QoS with Lossless FCoE. to support two SUSs that will provide redundant access to the data center network. Each SUS will have a pair of uplink ports (port trunk) assigned to it. Each SUS will support one untagged VLAN and several tagged VLANs.

In addition, QoS will be configured within Virtual Connect to coincide with the QoS configuration of the upstream switch.



Network diagrams

Physical view of the LAN connections

In this lab, both port trunks are active because they are assigned to separate SUSs. Although it is not done in this lab, additional uplinks could be used to increase uplink bandwidth and provide additional availability. FCoE-SUS 1-A uses the port trunk comprising the uplink port X4 from the VC FlexFabric module in Bay 1; FCoE-SUS 1-B uses the port trunk comprising uplink port X4 from the VC FlexFabric module in Bay 2. Because two separate collections of VC networks are involved as a result of the SUSs, Virtual Connect allows each port trunk to operate in an active state.

Exercise 1 — Configuring QoS

To change the QoS config type inside the GUI you need to visit the Quality of Service (QoS) section from the configuration bar. All changes in this area have VC domain wide responsibilities.

Define 👻	Configure - Tools - Help	•	
	Domain Settings		
HP V	Ethernet Network Settings sFlow Settings		2
Server	Quality of Service(QoS)	e Wizard	View All Server Profiles
	Fibre Channel Settings Serial Number Settings Local User Accounts	r Profile r Settings	Assigned Server Profiles Unassigned Server Profiles
×	Certificate Administration		View
Advanced Ne Define a Shar Network Setu Define Network Quality of Ser		letwork Settings work ared Uplink Set tup Wizard rork Access Group ervice(QoS)	Port Monitoring Network Settings SNMP Settings Quality of Service(QoS)

Under the QoS section you select the QoS configuration type. This specifies the QoS operation mode. The default mode is "Pass-through". If FCoE is not being used, select Custom (without FCoE Lossless), by doing so, you free up an extra queue that would normally be assigned to Lossless FCoE. However; if FCoE connections have been created or will be used, then select Custom (with FCoE Lossless). For this lab, select Custom (with FCoE Lossless)

?	
Apply	Cancel
	Apply

Note: You cannot switch to Custom (without FCoE Lossless) when the domain has a fabric associated with an FCoE capable interconnect module, a Shared Uplink Set has an associated FCoE network, or a server profile has an FCoE connection.

Configuring the QoS Traffic Class

The next section is only available when you have not chosen the "Custom (with Lossless FCoE)" QoS configuration type. Once selected, you will see the following menu option where you have the possibility to enable specific queues, define the minimum and maximum bandwidth per queue and the associated 802.1 p (COS) priority.

GUI QoS Cor	nfiguration Type
-------------	------------------

Traffic Classes Ingress	Traffic Classifiers				
Traffic Classes 2					
Name	Real Time	Share	Max Share	Egress DOT1P Priority	Enable
FCoE_Lossless		Per Connection*	Per Fabric*	3	_
Best_Effort		65	100	0	
Medium		25	100	2	 ✓
Class1		0	100	0	
Class2		0	100	0	
Class3		0	100	0	
Class4		0	100	0	
Real_Time	✓	10	10	5	Image: A start of the start
* For the ECoF I ossless traffic class, the Share is based on the	a profile connection configuratio	in and the Max Share	is based on the fab	ric configuration	
* For the FCoE_Lossless traffic class, the Share is based on the	profile connection configuratio	n and the Max Share	is based on the fab	ric configuration.	

The "Share" parameter defines the available bandwidth per output queue. The sum of all individual Share values must be 100. If you add more bandwidth to a specific queue the requested bandwidth is deducted from the "Best_Effort" traffic class. The "Best_Effort" Share is therefore not changeable because it automatically receives the remaining unallocated bandwidth.

GUI QoS	bandwidth	share
---------	-----------	-------

Traffic Classes Ingress	Traffic Classifiers				
affic Classes 💿					
me	Real Time	Share	Max Share	Egress DOT1P Priority	Enabled
E_Lossless		Per Connection*	Per Fabric*	3	
t_Effort		65	100	0	
lium		25	100	2	V
ss1		0	100	0	
382		0	100	0	
ss3		0	100	0	
384		0	100	0	
I_Time	✓	10 👦	10	5	V
	profile connection configuratio	n and the Max Share i	e bacad on the fab	ric configuration	

Note: For the "FCoE_Lossless" traffic class the "Share" is based on the FCoE HBA configuration inside a server profile and must also be considered.

Note: The "Share" parameter cannot be zero for enabled traffic classes.

With the "Max Share" parameter you can specify the maximum bandwidth per traffic queue. By default all vales are configured to 100 which means that 100% of the uplink or server-link bandwidth could be used when other queues do not consume there guaranteed bandwidth.



Custom (Custom Custom Custom Cost Configuration Type:	(with FCoE Lossless)		R	eset ?		
Traffic Classes	Ingress Traffic Classifie	rs				
Traffic Classes 💿						
Name		Real Time	Share	Max Share	Egress DOT1P Priority	Enabled
FCoE_Lossless			Per Connection*	Per Fabric*	3	
Best_Effort			65	100	0	
Medium			25	100	2	✓
Class1			0	100	1	
Class2			0	100	0	
Class3			0	100	0	
Class4			0	100	0	
Real_Time		V	10	10	5	✓
* For the ECoE Lossless traffic class, the Sha	are is based on the profile connection	o configuratio	n and the Max Share	is based on the fabri	c configuration	
		reeninguruue	in and the max entire		o configuration.	
					Apply	Cancel

Note: Max Share must be >= Share

Each individual Traffic class has an associated 802.1p (COS) priority. If some 802.1p values (0-7) are not assigned to a specific traffic class, the traffic class gets processed by the "Best_Effort" class. All other Traffic Classes can only be used by one 802.1p priority.

oS Configuration Type: Custom (with FCoE Lossiess)						
Traffic Classes	Ingress Traffic Clas	sifiers				
Traffic Classes 🙎						
Name		Real Time	Share	Max Share	Egress DOT1P Priority	Enabled
FCoE_Lossless			Per Connection*	Per Fabric*	3	
Best_Effort			65	100	0	
Medium			25	100	2	V
Class1			0	100	0	
Class2			0	100	0	
Class3			0	100	0	
Class4			0	100	0	
Real_Time		✓	10	10	5	
	1. h				2	5
* For the FCOE_LOSSIESS traffic class, the Sha	re is based on the profile conn	ection configuratio	n and the Max Share	s based on the fabr	4	
					5	
					6	Cancel
					7	-

Note: Please make sure that if you use FCoE on uplinks, the FCoE traffic from the upstream device is already marked with an 802.1p value of 3 when it reaches the VC module as you cannot change this setting in Virtual Connect.

Exercise 2 - Configuring the QoS Ingress Traffic Classifier

In this section you can define what QoS marking will be trusted when packets are received and how the 802.1 p and DSCP mapping is handled.

GUI QoS Ingress Traffic Classifier						
Traffic Classes	Ingress Taffic Classifiers					
Ingress Traffic Classifiers 🔹						
Classification for up	links DOT1P					
Classification for do	wnlinks DSCP/DOT1P*					
* When DSCP and DOT1P are	both in use, DSCP will be used to classify IP traffic and DOT1P will be used for non-IP traffic.					
DOT1P Mapping						
Ingress DOT1P Value	Traffic Classes	Egress DOT1P Priority				
0	Best_Effort	0				
1	Best_Effort	0				
2	Medium	2				
3 (Non-FCoE traffic)	Medium	2				
3 (FCoE traffic)	FCoE_Lossless	3				

You must first you specify what priority values you trust when packets are received from the up- or downlinks (server-links).

You have the choice to select between:

- 802.1 p (COS value inside the Layer2 VLAN tag)
- DSCP (Differentiated services code point inside a Layer 3 IPv4 header)
- DSCP/802.1p (When DSCP and DOT1P are both in use, DSCP will be used to classify IP traffic and DOT1P will be used for non-IP traffic)

Ingress Traffic Classifiers
Classification for uplinks
Classification for downlink
When DSCP and DOT1P are both in
DSCP/DOT1P *

GUI QoS bandwidth max share

Exercise 3 - Configuring the QoS Ingress Traffic Mappings

You can overwrite the egress 802.1q field based on the ingress 802.1p or DSCP values. In the next two screenshots you can see how to map the marked ingress traffic to a specific VC Traffic Class. The system will then automatically apply the corresponding egress 802.1 p value to this traffic.

DOT1P Mapping						
Ingress DOT1P Value	Traffic Classes	Egress DOT1P Priority				
0	Best_Effort	0				
1	Best_Effort	0				
2	Medium	2				
3 (Non-FCoE traffic)	Real_Time	2				
3 (FCoE traffic)	Class1	3				
4	Class2 (Disabled)	2				
5	Real_Time	5				
6	Real_Time	5				
7	Real_Time	5				

GUI QoS	802.1p	mapping
---------	--------	---------

Note: Non FCoE traffic with an 802.1 p value of 3 is enforced to use a different value. This is done to protect FCoE against other traffic.

fic Classes		
st_Effort	N	-
t_Effort	45	^

GUI QoS DHCP	mapping
--------------	---------

DSCP Mapping		
Ingress DSCP Value		Egress DOT1P Priority
DSCP 10, AF11	Best_Effort	0
DSCP 12, AF12	Best_Effort	0
DSCP 14, AF13	Medium	0
DSCP 18, AF21	Real_Time	2
DSCP 20, AF22	Class1	2
DSCP 22, AF23	Class2 (Disabled)	2
DSCP 26, AF31	Medium	2
DSCP 28, AF32	Medium	2
DSCP 30, AF33	Medium	2
DSCP 34, AF41	Medium	2
DSCP 36, AF42	Medium	2
DSCP 38, AF43	Medium	2
DSCP 46, EF	Real_Time	5
DSCP 0, CS0	Best_Effort	0
DSCP 8, CS1	Best_Effort	0
DSCP 16, CS2	Medium	2
DSCP 24, CS3	Medium	2
DSCP 32, CS4	Medium	2
DSCP 40, CS5	Real_Time	5
DSCP 48, CS6	Real_Time	5
DSCP 56, CS7	Real_Time	5
All other values	Best_Effort	0

Configuring the FCoE Network Bandwidth via GUI

For FCoE enabled uplink the "FCoE_Lossless" Traffic Class has a fixed configured value of 50% bandwidth share and max = 100% assigned.



FCoE bandwidth overview

FCoE bandwidth overview, as configured within the server profile.

FCo	fCoE HBA Connections											
Part	Cornect	FC SAN / FCoE Network Name	Type	Status	Port Spred Type	Alocatest Fort Speed.	1997 Mars	MAC	Weering Action			
1	Bay 1	FCoE-A	FCOE	۵	PREFERRED	4 Gb - 8 Gb	50.06:08:00:00:C2:82:00	00-17-A4-77-50-00	LOM:1			
2	Bay 2	FCoE-B	FCOE	0	PREFERRED	4 Gb - 8 Gb	50.06:08:00.00:C2:82:02	00-17-A4-77-50-01	LOM:2 Delete			

Note: the fabrics are showing as RED/error state as the upstream switch has not been configured to support FCoE/SAN connections, once the switch is configured then sate of the fabrics will be green.

Summary

In this lab you changed from the default Virtual Connect QoS configuration to QoS with Lossless FCoE. You then proceeded to configure the various queue settings within Virtual Connect.

Appendices – CLI Commands

Configuring the QoS Config Type via CLI

The following command can be copied and pasted into an SSH based CLI session with Virtual Connect:

Set QoS Config Type to Passthrough set qos Passthrough

or

Set QoS Config Type to Custom with FCoE Lossless class set qos CustomWithFCoE

or

Set QoS Config Type to Custom no FCoE Lossless class set qos CustomNoFCoE

Configuring the QoS Traffic Class via CLI

Set QoS Config Traffic classes

set qos-class Medium Enabled=true RealTime=false Share=25 EgressDOT1P=2 MaxShare=100 set qos-class Real_Time Enabled=true RealTime=true Share=10 EgressDOT1P=5 MaxShare=100 set qos-class Class1 Enabled=false RealTime=false MaxShare=100 set qos-class Class2 Enabled=false RealTime=false MaxShare=100 set qos-class Class3 Enabled=false RealTime=false MaxShare=100 set qos-class Class4 Enabled=false RealTime=false MaxShare=100 set qos-class Class4 Enabled=false RealTime=false MaxShare=100 set qos-class Best_Effort MaxShare=100

Configuring the QoS Ingress Traffic Classifier via CLI

Set QoS Ingress Traffic Classifier set qos-classifier Downlinks Classifiers=DOT1P,DSCP set qos-classifier Uplinks Classifiers=DOT1P

Configuring the QoS Ingress Traffic Mapping via CLI

Set QoS Ingress Traffic Mapping set qos-map DOT1P Class=Best_Effort Values="0-7" set qos-map DOT1P Class=Best_Effort Values="0,1" set qos-map DOT1P Class=Medium Values="2,3,4" set qos-map DOT1P Class=Real_Time Values="5,6,7"

set qos-map DSCP Class=Best_Effort Values="AF11-CS7" set qos-map DSCP Class=Best_Effort Values="AF11,AF12,AF13,CS0,CS1" set qos-map DSCP Class=Medium Values="AF21,AF22,AF23,AF31,AF32,AF33,AF41,AF42,AF43,CS2,CS3,CS4" set qos-map DSCP Class=Real_Time Values="CS5,CS6,CS7,EF"

Implementing Direct Attached SAN Fabrics

Objectives

After completing this lab, you should be able to:

- Implement a redundant Virtual Connect (VC) SAN fabric configuration
- Examine the status of the VC FlexFabric modules and uplink ports connecting to the Fibre Channel switches

Introduction

In this lab, you will augment the basic VC Fibre Channel configuration you set up in the previous lab by implementing a second VC SAN fabric that will support redundant access to the SAN. This will enable you to see how you can create additional VC SAN fabrics for connectivity to other SAN islands.



Physical view of the Fibre Channel connections without SAN Fabric

The Fibre Channel cables connecting your Virtual Connect FlexFabric modules to the upstream Fibre Channel switches might already be attached. Note that only Ports X1-X4 can be configured for connections other than Ethernet. Any necessary switch configuration tasks will have been completed before the beginning of class.

For this scenario, both VC FlexFabric modules are used and one uplink (port X3) from each module are connected directly to the 3PAR Fibre Channel SAN.

Exercise 1 — Defining Virtual Connect Direct Attached SAN fabrics

In this exercise, you will use Virtual Connect Manager to define a Virtual Connect direct Attached SAN connection to a 3PAR SAN. The VC SAN fabric is a configuration element that identifies one or more uplinks of a Virtual Connect Fibre Channel module used to connect to a SAN.

- 1. Open a web browser and access the Virtual Connect Manager home page.
- 2. From the Virtual Connect Manager home page, in the toolbar, select $\textbf{Define} \rightarrow \textbf{SAN Fabric}.$



3. For the Fabric name, enter Direct-SAN_A. Add a single external uplink port by clicking **Add Port** → **Bay 1** → **Port X3**.

Note

This port is from the VC FlexFabric module in interconnect **Bay 1**.

Define - Configure - 1 Define SAN Fabri	Fools + Help +				
Fabric					
Fabric Name	Fabric Type	Login Re-Distribution	Configured Speed		
Direct-SAN-A	FabricAttach		Auto 👻		
Enclosure Uplink P	orts				
Uplink Port Enclosure	Bay Port Status	Connected To Action			
Add Port		ר ר			
Bay1 >	Port X3				
Bay 2 >	*	J			
				ture to	C

4. Before Clicking Apply, select DirectAttach in the Fabric Type Box.

Define 👻 Configure 👻	Tools 👻 Help 👻			
Define SAN Fabi	ric			
Fabric				
Fabric Name	Eabric Type	Login Re-Distribution	Configured Speed	
Direct-SAN-A	DirectAttach	▼ N ⁴ .	Auto	
Enclosure Uplink	Ports			
Uplink Port Enclosure	Bay Port Status	Connected To Action		
Uplink Po POD-21	1 🛛 0 Gb	00:00:00:00:00:00:00 <u>Delete</u>		
Add Port				
			Ар	ply Cancel

5. Click the Show Advanced Settings box and configure the Preferred and Maximum bandwidth setts as shown, then **click apply.**

Fabric					
Fakric Name Direct-SAN-A	Fabric Type	Login Re-Di	strikution [Configured Speed	Show Advanced Settings Image: Selected Speed Image: Selected Speed <t< th=""></t<>
Enclosure Uplink Po	rts				
Uplink Port Enclosure Jplink Po POD-21	Bay Port Status	Connected To 00:00:00:00:00:00	Action O(<u>Delete</u>		
Add Port					

6. In the Define SAN Fabrics window, click the + Add link. To define the second fabric.

Define 👻	Configure 👻	Tools v Help v								
SAN F	abrics									
Extern	al Connections	Server Connections								
Status	SAN Fabric	Fabric Type	Login Re-Distribution	Port	Status	Connected To	Enclosure	Bay	Port	Action
0	SAN-A	FabricAttach	MANUAL	0	8 Gb	10:00:00:05:33:53:5c:ad	POD-21	1	X1	Edit 💌
				0	8 Gb	10:00:00:05:33:53:5c:ad	POD-21	1	X2	
0	SAN-B	FabricAttach	MANUAL	0	8 Gb	10:00:00:05:33:51:49:8d	POD-21	2	X1	Edit 👻
				0	8 Gb	10:00:00:05:33:51:49:8d	POD-21	2	X2	
0	Direct-SAN-A	DirectAttach	NA	0	8 Gb	20:51:00:02:ac:00:15:2c	POD-21	1	X3	Edit 📼
+ Add										

7. For the Fabric Name, enter Direct-SAN_B. Add a single external uplink port by clicking the Add Port window **Bay 2** \rightarrow **Port X3**.

Note	
This port is from the VC FlexFabric modu	le in interconnect Bay 2 .

Click **Add** to save your changes.

Define 👻 Configure 👻	Tools - Help -			
Define SAN Fab	oric			
Fabric				
Fabric Name	Fabric Type	Login Re-Distribution	Configured Speed	
Direct-SAN-B	FabricAttach	MANUAL	Auto	
Enclosure Uplink	Ports			
Uplink Port Enclosure	Bay Port Status	Connected To Action		
Add Port	_	<u>ר</u>		
Bay 2	» Port X3	J		
				Apply Cancel

8. Before Clicking Apply, select DirectAttach in the Fabric Type Box.

Fabric					
Fabric Name	Eabric Type	Login Re-Distribution	Configured Speed	Show Advanced Settings	
Direct-SAN-A	DirectAttach	▼ N4.	Auto 👻		
Enclosure Uplink	Ports				
Uplink Port Enclosure	Bay Port Status	Connected To Action			
Iplink Po POD-21	1 🛛 0 Gb	00:00:00:00:00:00:00 <u>Delete</u>			
dd Port					

9. Click the Show Advanced Settings box and configure the Preferred and Maximum bandwidth setts as shown, then **click apply.**

				-	
-aono Name	Fabric Type DirectAttach	Login Re-Jus	Tribution Configu	red Speed Solution Solut	arced settings referred FCoE Connection Speed 2 Speed: 4 0 Gb 8 Gb aximum FCoE Connection Speed 2 Speed: 6 0 Gb 8 Gb
Enclosure Uplink	Ports			· · · · · · · · · · · · · · · · · · ·	
	Bay Port Status	Connected To	Action		
Uplink Port Enclosure	2 0 Gb	00:00:00:00:00:00:00:0	0 <u>Delete</u>		
Uplink Port Enclosure					

10. Confirm both the new DirectAttach SAN Fabrics have been created and are connected.

Define 👻	Configure 👻 T	ools v Help v								
SAN F	abrics									
Extern	al Connections	Server Connections								
Status	SAN Fabric	Fabric Type	Login Re-Distribution	Port	Status	Connected To	Enclosure	Bay	Port	Action
0	SAN-A	FabricAttach	MANUAL	0	8 Gb	10:00:00:05:33:53:5c:ad	POD-21	1	X1	Edit 📼
				0	8 Gb	10:00:00:05:33:53:5c:ad	POD-21	1	X2	
0	SAN-B	FabricAttach	MANUAL	0	8 Gb	10:00:00:05:33:51:49:8d	POD-21	2	X1	Edit 💌
		_		0	8 Gb	10:00:00:05:33:51:49:8d	POD-21	2	X2	
0	Direct-SAN-A	DirectAttach	NA	0	8 Gb	20:51:00:02:ac:00:15:2c	POD-21	1	ХЗ	Edit 📼
0	Direct-SAN-B	DirectAttach	NA	0	8 Gb	21:51:00:02:ac:00:15:2c	POD-21	2	ХЗ	Edit 💌
+ Add										

Exercise 2 — Examining the status of the VC FlexFabricI module and uplink ports

 In the Hardware Configuration section of the navigation pane, expand <enclosure-name> > Interconnect Bays. Then click the link for Bay 1.

Domain Status 📃	Define 👻 Configure 🕯	🕶 Tools 👻	Help 🗸					
○ ○ ▼ ▲ ▲ ○ ④	Interconnect B	avs						
Domain 0 0 0 0 0 0	Intervoluteor Bays							
Status View Legend	Interconnect Bays Sta	tus						
Find Configuration Items. ?	Status:		⊘ ок					
Domain Settings 🛛 🖽 🗔	Rack Name:		RACK-1					
Configuration	Enclosure Name:		POD-21					
IP Address								
Enclosures	Interconnect Bays Sur	mmary						
Backup/Restore	Bay S	Status Mc	odule	Power	Firmware Version:			
Storage Mgmt Credentials	Bay 2 (LANSS)	≥uk (j	HP VC FlavEabria 100b/24 Part Madula	⊎ On	3.30 2011-00-23103.32.232			
SNMP Configuration	Day 2 (LANTSAR)	∕ok (HP VC Hexhabric 1036/24-Port Module	Se On	3.30 2011-06-25103.52.232			
System Log								
Stacking Links								
Users/Authentication								
Ethernet								
Fibre Channel								
WWN Settings								
Server Serial Numbers								
Logical Configuration								
Server Profiles								
Ethernet Networks								
Shared Uplink Sets								
SAN Fabrics								
Network Access Groups								
Hardware Configuration								
Hardware Overview								
POD-21								
Interconnect Bays								
Device Bays								

2. From the Uplink Ports tab, Examine the status of the FlexFabric interconnect module. Scroll down to the Uplink Information (FC) section to view the status of uplink port X3 of this VC FlexFabric module.

Define -	Configura	Tee	le – Hele –							
Define -		- 100	is v neip v							
Bay 1	3ay 1 (HP VC FlexFabric 10Gb/24-Port Module)									
General Information Uplink Ports Server Ports MAC Address Table IGMP Multicast Groups Name Server										
Uplink	Port Informatio	n (Enet	:)							
Label	Network(s)	Status			Connector Type	LAG ID	Connected To	Detailed Stats / Info		
Port X4	FCoE-SUS1-A	🕗 ок	Linked/Active/F Active	CoE 10 Gb	SFP-DAC	26	POD21 (Ten- GigabitEthernet1/0/1)	Detailed Stats / Info		
Port X5	POD21-SUS1- A	🕗 ок	Linked/Active	10 Gb	SFP-DAC	25	POD21 (Ten- GigabitEthernet1/0/2)	Detailed Stats / Info		
Port X6	POD21-SUS1- A	🕗 ок	Linked/Active	10 Gb	SFP-DAC	25	POD21 (Ten- GigabitEthernet2/0/3)	Detailed Stats / Info		
Port X7			Linked	10 Gb	SFP-DAC		VcD_fb5c574c3070 (X7)	Detailed Stats / Info		
Port X8	Stacking Link	🕗 ок	Linked	10 Gb	Internal	27	VCEFXTW21120011 (X8)	Detailed Stats / Info		
Uplink	Port Informatio	n (FC)								
Port	WWN		SAN Fabric	Port Speed Se	tting Connect	or Status	Connected To	Detailed Stats / Info		
X1 3	20:00:00:11:0a:02	2:2a:dc	SAN-A	8 Gb	Logged in	1	10:00:00:05:33:53:5c:ad	Detailed Stats / Info		
X2 2	20 <u>:01:00:11:0a:0</u> 2	2:2a:dc	SAN-A	8 Gb	Logged in	1	10:00:00:05:33:53:5c:ad	Detailed Stats / Info		
X3 :	20:02:00:11:0a:02	2:2a:dc	Direct-SAN-A	8 Gb	Logged In	1	20:51:00:02:ac:00:15:2c	Detailed Stats / Info		

Notice the WWN that is assigned to each uplink port of the Fibre Channel module port, which is listed in the WWN column. The WWN of the upstream Fibre Channel switch is listed in the Connected To column for the Fabric Attached Fabrics and the controller port address of the 3PAR is shown for the Direct Attached fabric.

Exercise 3 – Modifying a Server Profiles to Connect to the SAN

In this exercise, you use the Virtual Connect Manager (VCM) to modify the server profile created in lab 1. When modifying a server profile on a VC Ethernet module that will be used with a server supporting FlexFabric ports (or NICs), you have the option of allocating bandwidth across one to four NICs, or one to three NICs and a FC HBA. In this exercise, you will edit the existing profile and ADD SAN connections, and then configure those connections for Boot to SAN.

- 1. Open a web browser and access the OA for your POD, verify the servers in Bays 1 and 2 are shutdown.
- 2. Open a web browser and access the Virtual Connect Manager home page and log in using the admin account created in lab 1.
- 3. In the left tree view, under connections, click on server profiles.
- 4. Your profile should be shown in the right pane, select the profile and edit it.

IP Virtual Connect	Manage	er					2	User : admin Home Sign Out		
Domain Status	Define +	Configure -	Tools - Help	-						
O Domain Status View Legend	Serve	r Profiles							Ľ	
♥ ▲ Ø 0 0 0 0 0 0 0	Show:	Server Profiles								
Find Configuration Items. 7	Stabut	Profile Name		Percent		error to take the		- ALLAN	Network Acro	ess Gro
Domain Settings 📑 🕞	-	POB-21_01		0	0	POD-21: Bay 1 (ProLiant BL460c 07)	VC-DEFINED	VC-DEFINED	Default	>
Configuration	-	_		_						
IP Address										
Enclosures										
Backup Restore										
Storage Mgmt Credentials										
SNMP Configuration										
System Log										
Stacking Links										
Users/Authentication										
Ethernet										
Fibre Channel										
Server Serial Numbers										
Connections										
Server Profiles										
Elligner normorks										
Shared Uplink Sets										
SAN Fabrics										
Network Access Groups										
Hardware										
Overview										
P00-21	+ Add									

5. From the Edit Server profile page, under FCoE HBA Connections, for Bay 1 select SAN-A and for Bay 2 select SAN-B. The speed should default to 4Gb Min. and 8Gb Max.

Port	Bay	FC SAN Name
1	1	Direct-SAN-A
1	2	Direct-SAN-B

6. In the FCoE HBA Connections section, assign the information listed in the following table.

Note: For the blade server you are working with, Port 1 corresponds to FlexNIC 3 (LOM:1-b) and Port 2 corresponds to FlexNIC 4 (LOM:2-b).

FCo	Е НВА С	onnections								
Port	Connecte	FC SAN / FCoE Network Name	Туре	Status	Port Speed Type	Allocated	WWPN	MAC	Mapping	Action
1	Bay 1	Direct-SAN-A	SAN	0	PREFERRED	4 Gb - 8 (50:06:0B:00:00:C2:B2:00	00-17-A4-77-50-00	LOM:1-b => Bay 1:d1:v2	
2	Bay 2	Direct-SAN-B	SAN	0	PREFERRED	4 Gb - 8 (50:06:0B:00:00:C2:B2:02	00-17-A4-77-50-01	LOM:2-b => Bay 2:d1:v2	<u>Delete</u>

- 7. In the Assign Profile to Server Bay section, click the down arrow and then click PODnn > Bay 1 (ProLiant 460c Gen7).
- 8. Then click Apply to save the changes to the server profile.

Define +	Configure + Tools + Help +								
Edit Se	erver Profile: POD-21_0	1							
Profile	,								
Profile No POD-21_0	ne Network Acce H Default	ss Group Status Serial Number	Server	1110 Ie-dead-4be0-bi	b45-5268999e9dc1				
Ethem	et Adapter Connections								
Port N	letwork Name	Statu Port Speed Type	Allocated Port Spee	PXE	Muticast Filter	MAC		Mapping	Action
1 D	efault-VLAN-A	PREFERRED	4 Gb - 10 Gb	USE-BIOS	None	00-17-A4-77-5	50-02	LOM:1-a => Bay 1:d1:v1	
2 D	efault-VLAN-B	PREFERRED	4 Gb - 10 Gb	USE-BIOS	None	00-17-A4-77-5	50-04	LOM:2-a => Bay 2:d1:v1	
+ Add									
ISCSI H	IBA Connections								
Port N	kdwork Name	Statu Port Speed Type	Allocated	ort Speed (M	Boot Setting MAC			Mapping	Action
+ Add									
FCoE	HBA Connections								
Port 0	Connect: FC SAN / FCoE Network Name	е Туре	Status Port Speed	Туре	Allocated VANEN		MAC	Mapping	Action
1 B	lay 1 Direct-SAN-A	SAN	PREFERI	RED	4 Gb - 8 C 50:06:00:00:00	2:82:00	00-17-A4-77-50-00	LOM:1-b => Bay 1:d1:v2	
2 B	lay 2 Direct-SAN-B	SAN	PREFERS	RED	4 Ob - 8 C 50:06:08:00:00:0	02:82:02	00-17-A4-77-50-01	LOM:2-b => Bay 2:d1:v2	Delete

9. Examine the Mapping column for the Ethernet and FCoE connections.

Notice that LOM:1-a and LOM:2-a are mapped to the two Ethernet FlexNICs, and LOM:1-b and LOM:2-b are mapped to the two FCoE FlexHBAs.

Also, notice the Allocated Port Speed column for the FlexNICs and FlexHBAs now shows a Preferred or Min. speed and a Maximum speed. The FlexHBA connections have an initial bandwidth allocation of 4 Gb and can burst to 8Gb. The NIC is configured for 4Gb and could burst to 10Gb.

10. Click Cancel to close the Server Profile window.

Exercise 4 - Power-on the Server and Verify SAN Connectivity

In this task, you use the Onboard Administrator (OA) management interface to examine the status of the server in bay 1. You then power on the server to cause the server profile to be activated. You also examine the IP addresses assigned to the FlexNICs through DHCP.

- 1. Go to the browser window you have for the OA.
- 2. In the navigation pane, click Enclosure Information > Device Bays > 1 to view the status of the server blade in Device Bay 1.
- 3. Click the Information tab.

Wizards 🗸 Options 🗸 Help	· •				
Device Bay Inform	ation - ProLiar	nt BL460c G7 (Bay 1)			
Status Information	Virtual Devices	Boot Options IML Log			
Device Information					
Blade Type	Server Blade				
Manufacturer	HP				
Product Name	ProLiant BL460c G7				
Part Number	603718-B21				
System Board Spare Part Number	605659-001				
Serial Number	USE1159329				
Serial Number (Logical)	VCX0000V00				
UUID	37333036-3831-5355-4531-313539333239				
UUID (Logical)	7FEAACD8-92EA-42B0-9D29-B26528F6B1B0				
BIOS Asset Tag					
Server Name					
ROM Version	127 05/05/2011				
	Deuter ID				
Server NIC Information	Device ID				
Ethornot EloxNIC LOM:1 a	00-17-04-77-70-02				
ECoE EloxHBA LOM:1-b	50-06-0B-00-00-C2-DE-00				
Ethernet ElexNIC LOM:1-c	98:4B:F1:71:73:BA				
Ethernet FlexNIC LOM:1-d	98:4B:E1:71:73:BB				
Ethernet FlexNIC LOM:2-a	00:17:A4:77:7C:04				
FCoE FlexHBA LOM:2-b	50:06:0B:00:00:C2:DE:02				
Ethernet FlexNIC LOM:2-c	98:4B:E1:71:73:BE				
Ethernet FlexNIC LOM:2-d	98:4B:E1:71:73:BF				

4. Examine the server NIC information.

Notice that all 8 connections are represented here, 6 FlexNICs and 2 FlexHBAs. The other 4 FlexNICs that you did not explicitly configure are presented to the © Copyright 2013 Hewlett-Packard Development Company, L.P L6–12 blade server Operating System. These additional 4 LAN Connections that would appear in Windows, or vmnics in VMware ESXI, can be ignored.

5. Click the Virtual Devices tab. At this point, the server is powered off, which allowed you to assign the server profile previously.

Status	Information	Virtual Devices	Boot Options	IML Log
Virtual Power				
The server in	this bay is currently C	Vff		
		Μ	lomentary Press	

6. Click Momentary Press to power on the server.

You can also access the Virtual Power feature through the Virtual Connect Manager interface, but going through the OA also gives you easy access to the Remote Console functionality of the HP integrated Lights-Out (iLO).

7. To access the Windows Server console, in the navigation pane of the OA, click iLO under the folder entry for Device Bay 1.

Wizards ▼ Ontions ▼ Hel	n v					
iLO - Device Bay 1						
Processor Information	Event Log					
Management Processor Info	ormation					
Name	ILOUSE1159329					
Address	172.20.7.102					
MAC Address	98:4B:E1:5E:F1:43					
Model	iL03					
Firmware Version	1.28 Jan 13 2012					
iLO Remote Management Clicking the links in this section require an iLO username or particular	on will open the requested iLO sess. sssword to be entered.					
If your browser settings prever	nt new popup windows from opening,					
Web Administration Access the iLO web user inter	Web Administration Access the iLO web user interface.					
Integrated Remote Console Access the system KVM and o Please note: this may not be su	Integrated Remote Console Access the system KVM and control Virtual Power & Media from a Please note: this may not be supported on all operating systems. Ple					
Remote Console Access the system KVM from a may not be supported on all op	a remote console. This requires a Jar erating systems. Please check officia					

- 8. In the iLO Device Bay window, perform one of the following actions.
 - 1) If you are using Internet Explorer, click Integrated Remote Console.
 - 2) If you are using Firefox, click **Remote Console**.



To verify the Emulex BIOS configuration was modified by the Server Profile you examine the settings applied to the adapters by Virtual Connect. During the POST processing stage, you will see a prompt to "Press any key to see POST Messages."

Note: It is important to watch for the message and respond or you will have to go through the boot process again.

9. Press the <Space> bar or any other key to view the Option ROM messages.

🖗 ProLiant - 172.20.7.102	
Power Switch Virtual Drives Keyboard Help	
iLO 3 Advanced iLO 3 v1.28 Jan 13 2012 172.20.7.102	
Emulex 10Gb UNDI, PXE-2.0 BIOS v4.1.402.8 Copyright (C) 2006-2012 Emulex Corporation	
◀◀◀ Press <ctrl><p> for PXESelect(TM) Utility ▶▶▶</p></ctrl>	
Controller#0 Port#1 Base 0xFBCA0000 at Bus:02 Dev:00 Fun:00 Controller#0 Port#2 Base 0xFBC40000 at Bus:02 Dev:00 Fun:01 - InitializingDone.	
Emulex OneConnect FCoE BIOS, Version 4.03a0 Copyright (c) 1997–2012 Emulex. All rights reserved.	
Press (Alt E> or (Ctrl E> to enter Emulex BIOS configuration utility. Press (s> to skip Emulex BIOS	
Using CLP data for CNA boot targets and port enablement.	
Installing Emulex BIOS	(F9 = Setum)
720 x 400 POST Code: FE2C	€ RC4 ●●●

- 10. Watch for the Emulex OneConnect FCoE BIOS messages.
- 11. Press <Alt>-e or <Ctrl>-e as instructed on the screen to access the Emulex BIOS configuration utility.



12. Highlight the top adapter using the keyboard arrow keys and press <Enter> to view its configuration.

ProLiant - 172.20.21.102 Power Switch Virtual Drives Keyboard Help	
Emulex OneConnect FCoE	BIOS Utility, XA4.03a0
01: NC553i: Mem Base: FBC00000 Firmware Version: Port Name: 50060B0000C2B200 Vlan ID: 1001 DCBX mode: CEE mode	Bus#: 02 Dev#: 00 Func#: 02 4.1.450.7 BIDS: Enabled Node Name: 50060B00000C2B201
Enable/Disable Boot	from SAN
Scan for Target Dev Reset Adaptor Defe	
Configure Boot Devi	
Configure DCBX mode	
Configure FCF CEE F	arameters
Configure FCF CIN F	Parameters
Configure Advanced	Adapter Parameters
Enter <esc> to</esc>	Previous Menu
<†/↓> to Highlight,	, <enter> to Select</enter>
Copyright (c) 1997-2012 Emm	llex. All rights reserved.
720 x 400	📉 🖩 🕨 🔹 🔿 🕲

13. Arrow down to Configure Boot Devices and press <Enter> to view its configuration.

ProLiant - 172.20.21.102 Power Switch Virtual Drives Keyboard Help	_ 🗆 ×
Emulex OneConnect FCoE BIOS Utility, XA4.03a0	
01: NC553i: Bus#: 02 Dev#: 00 Func#: 02 Mem Base: FBC00000 Firmware Version: 4.1.450.7 BIOS: Disabled Port Name: 50060B00000C2B200 Node Name: 50060B0000C2B201 Vlan ID: 1001 DCBX mode: CEE mode Node	
Devices Present on This Adapter:	
01. DID:110200 WWPN:20510002 AC00152C LUN:00 3PARdataVV 3	110
Enter (Esc) to Previous Menu	
Copyright (c) 1997-2012 Emulex. All rights reserved. 720 x 400	

- 14. Compare the WWPN displayed with the value you entered for Port 1 when you configured the Boot from SAN settings in the server profile.
- 15. Press <Esc> twice to return to the Emulex Adapters in the System menu.



16. Use the arrow keys to choose the second adapter and repeat the previous steps to view the WWPN of its target controller.

🖗 ProLiant - 172.20.21.102	_ 🗆 ×
Power Switch Virtual Drives Keyboard Help	
Emulex OneConnect FCoE BIOS Utility, XA4.03a0	
02: NC553i: Bus#: 02 Dev#: 00 Func#: 03 Mem Base: FBBA0000 Firmware Version: 4.1.450.7 BIDS: Enabled Port Name: 50060B0000C2B202 Node Name: 50060B0000C2B203 Vlan ID: 1001 DCBX mode: CEE mode	
Devices Present on This Adapter:	
01. DID:120200 WWPN:21510002 AC00152C LUN:00 3PARdataUV	3110
Enter <esc> to Previous Menu</esc>	
720 x 400 🙀 🖉 🖉 🥵 🥵 🕅 🕅 🕅	

- 17. Compare the WWPN displayed with the value you entered for Port 2 when you configured the Boot from SAN settings in the server profile.
- 18. Press <Esc> three times to display the reboot prompt.



- 19. Then type "Y" to reboot the system.
- 20. Go back to the OA and shut the server down.

Summary

During this lab, you defined a pair of Direct Attached Virtual Connect SAN fabrics to a 3PAR array. You were able to connect to that array through the HBA in the server and see the controllers on the fabric. The next step could be to configure Boot to SAN and install an OS, or simply connect to and mount a LUN from a locally installed OS.