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vNIC tutorial for IBM BladeCenter

How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

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Introduction

This tutorial is intended as a 'how-to' guide for configuring BladeCenter Virtual NIC (vNIC) operation using the Emulex Virtual Fabric Adapter (VFA) and the Blade Network Technologies (BNT) Virtual Fabric Switch Module (VFS).

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For the initial release of vNIC functionality for BladeCenter, configuration is accomplished using the standard management interfaces of the VFS. This guide describes implementation examples for both the Command Line Interface (CLI) and the Browser-Based Interface (BBI).

Hardware/Firmware Required:

- Emulex Virtual Fabric Adapter (49Y4235)
- BNT Virtual Fabric Switch Module for IBM BladeCenter (46C7191) with firmware build 6.1.1 or later.

It is strongly recommended that the reader of this tutorial become familiar with BladeCenter VNIC functionality by referring to the section entitled, "Virtual NICs", in the *BNT Virtual Fabric 10Gb Switch Module for IBM BladeCenter, Application Guide* (see Related Documentation on p.41).





Getting Started

This tutorial assumes basic familiarity with BladeCenter virtual NIC (vNIC) functionality as implemented by the Emulex Virtual Fabric Adapter (VFA) and the BNT Virtual Fabric Switch Module (VFS).

General characteristics of this functionality are:

- Each Server physical NIC (pNIC) port is divided into 4 virtual NICs (vNICs)
- OS configurations see eight unique NICs (2 ports X 4 vNICs)
- All vNIC parameters are configured from the VFS user interface
 - DCBX protocol is used between switch and NIC to convey configuration information
- User enables vNICs and allocates bandwidth
 - Allowable vNIC bandwidth range is 100Mbps-10Gbps
 increments of 100Mbps
 - default bandwidth setting is 2.5Gbps
 - the sum of all 4 vNICs cannot exceed 10Gbps
 - VFS to Server bandwidth metering on per vNIC per port basis
 - Server to VFS bandwidth metering on per vNIC basis
- User assigns vNIC(s) and, optionally, uplink(s) to vNIC groups
 - groups serve to isolate virtual NIC traffic flowing on the same physical port
 - existing VLANs within the customer network are not impacted
 - no forwarding occurs between uplinks assigned to vNIC groups
 - up to 32 vNIC groups supported per VFS
 - an uplink (port or trunk) can belong to only one vNIC group
 - a server port (pNIC or vNIC) can belong to only one vNIC group
 - o failover mechanism is virtual port aware







Basic Setup

Virtual Fabric Adapter (VFA) Configuration

The Emulex Virtual Fabric Adapter for IBM BladeCenter (VFA) can operate in 10Gb dual 4-port Virtual Ethernet mode (vNIC) or 10Gb dual Port Ethernet mode (pNIC). The VFA default mode is set to vNIC.

vNIC mode is enumerated by the Operating System or Hypervisor as 8 separate Ethernet devices (4 per physical port). The pNIC mode can be enabled per the instructions in the *Installation and User's Guide for Emulex Virtual Fabric Adapter (CFFh)*.

There are two 10Gb Ethernet switch environments supported, depending on the VFA mode:

- vNIC mode (default): The VFA must be paired with one or two BNT Virtual Fabric 10Gb Switch Modules (VFS) to operate. To enable VFA (virtual) Ethernet connections, the VFS must be configured for vNIC mode. The VFS configuration parameters control the speed of the individual vNIC links (in increments of 100 Mbps) and assign a collection of vNIC links to common communication groups. Unused vNIC links can be disabled. Refer to vNIC/pNIC Configuration Possibilities (p.10).
- **pNIC mode**: The VFA functions as a 10 Gb dual port Ethernet device and can be paired with any high speed IBM BladeCenter 10Gb Ethernet/CEE (HSSM). This includes VFS and non virtual fabric 10Gb Ethernet switches or pass-thru modules. No additional HSSM configuration is required when the VFA is set to operate in this mode.

Other than mode selection, the VFA has no configuration requirement for virtual NIC operation.



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

Virtual Fabric Switch (VFS) Configuration

Three basic steps are required in order to permit vNIC operation between the VFA and the VFS.

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- 1. Enable vNIC operation on the applicable blade ports
- 2. Customize the maximum bandwidth for each vNIC (optional)
- 3. Group the vNIC links into common communication groups

NOTE: if an attempt is made to enable vNIC operation on a blade port that is not capable, a warning message similar to the following is displayed on the switch Command Line Interface (CLI) and added to the switch log.

Warning: Peer does not support vNIC on port INT11

Note: if you are using the switch Browser-Based user interface (BBI), the following popup is given to alert you to this warning message.

The pag	The page at http://9.42.212.108 says: 🛛 🔀						
1	Configuration submission error detected. Click Show Log for errors.						
	ОК						



VFA/VFS vNIC Correlation

Setting up virtual connections requires an understanding of how the adapter and switch identifies the eight (8) possible vNIC devices. Table 1 illustrates the designations used.

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VFA		VFS			
PCIe Function ID	Port	I/O Bay	Port Alias (Blade slot x)	vNIC	
0	0	7	INTx.1	1	
2	0	7	INTx.2	2	
4	0	7	INTx.3	3	
6	0	7	INTx.4	4	
1	1	9	INTx.1	1	
3	1	9	INTx.2	2	
5	1	9	INTx.3	3	
7	1	9	INTx.4	4	

Table 1 - VFA/VFS vNIC Correlation table

Note: For the VFA, the PCIe Function ID can be determined by running the 'ethtool -i' command in Linux, or by viewing the Network Adapter Properties in Windows Device Manager.

What is Failover ?

When external VFS uplinks are part of a vNIC group, this feature allows the state of the external connection to directly influence the link state of all internal ports (vNICs and pNICs) which are members of the group.

When triggered, the failover mechanism operates on a 'per vNIC group' basis, thus not affecting vNICs/NICs which have no association with the failed uplink. Virtual connections within the group are disabled without bringing down the internal physical port (Refer to <u>Case 4</u> for configuration example).

Note: Refer to the *BNT Virtual Fabric 10Gb Switch Module for IBM BladeCenter, Application Guide* for a detailed explanation of how/why Failover is used during vNIC operation.



vNIC/pNIC Configuration Possibilities

The basic matrix of vNIC group possibilities is identified by considering the possible NIC types (physical, virtual) and uplink types (port, trunk). Table 2 enumerates the choices.

	Uplink	Single	Phys	Virt	
Case	Trunk	Uplink	NIČ	NIC	Comments
1					vNICs only, No Uplinks (see p.12)
2					vNICs and pNICs, No uplinks (see p.16)
3					vNICs only, One uplink (see p.21)
4					vNICs and pNICs, One uplink (w/failover) (see
					p.25)
5					vNICs only, One uplink trunk (see p.30)
6					vNICs and pNICs , One uplink trunk (see p.35)
7					pNICs only, no uplinks
8					pNICs only, one uplink
9					pNICs only, one uplink trunk

Table 2 : Combinations Matrix

Note: Cases 7-9, though permitted as vNIC groups, are typically handled by traditional VLAN configuration and are therefore not covered by this tutorial. They are included in the table for completeness.

Each of the configuration possibilities are depicted in Figure 1 on p.11. The actions required to implement Cases 1-6 are detailed in subsequent sections.

Note: For switch CLI users, script files ("VFS-vnic-scripts.zip") are available which can be used to configure the vNIC groups depicted in Figure 1. See the /cfg/gtcfg command in the BNT Virtual Fabric 10Gb Switch Module for IBM BladeCenter, Command Reference for instructions on loading these scripts via FTP or TFTP. Alternately, the configuration text can be copied and pasted directly into the CLI session.



Figure 1 – Typical vNIC Configuration Scenarios





Case 1 - vNICs only, No Uplinks

Represented as VGRP 1 in Figure 1 on p.11, this group consists solely of vNIC ports.

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Switch CLI

The following command script can be used to implement this configuration.

```
/c/virt/vnic
on
/c/virt/vnic/port INT1/vnic 2
ena
bw 50
/c/virt/vnic/port INT2/vnic 1
ena
bw 20
/c/virt/vnic/vnicgrp 1
ena
vnicvlan 127
addvnic INT1.2
addvnic INT2.1
apply
```



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

Switch BBI

Click on the 'Configure' tab, then perform the following sequence of web interface entries to implement this configuration.

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1. Enable vNIC operation. (Submit, Apply ... and Save, if you want it to persist after switch reboot.)



Figure 2 - BBI : Case 1, Enable vNIC operation



2. Enable and configure vNICs (remember to Submit and Apply).

BLADE 😼	ONFIGURE	STATISTICS	DASHBOARD	BLADE	OS
NETWORK TECHNOLOGIES	Apply Sa	ve Revert Diff	Dump	Show Log Help	Logout
16. Jan 14 23:11:31 9.42,212,108 NO	TICE server: lin	k down on port IN1	6		
BNT Virtual Fabric 10Gb Swite					^
- 🛅 System		vNI	Cs Configurati	on	
Bitch Ports					
Port-Based Port Mirroring	1.	Search Range	-		
- 🗀 Layer 2	vl	NICs(INT1.1-INT14.4	From INT1.1	To INT14.4	=
- 🛅 RMON Menu	2.	Search Options			
🗀 Layer 3	St	ate	any 💌		
- QoS	М	ax Bandwidth(0 = an	y) 0		
Access Control	vì	VIC Group(0 = any)	0		
	Se	arch Operation	or 💌	Search	
FCOE -					
	VNIC	State	vNIC Group	Max Bandwidth	1
	(INT12)	disabled	0	25	
	INT1.3	disabled	0	25	
	<u>INT1.4</u>	disabled	0	25	
Virtual Machine	INT2.1	disabled	0	25	
	<u>INT2.2</u>	disabled	0	25	
	<u>INT2.3</u>	disabled	0	25	
	<u>IN12,4</u>	disabled	0	25	

Figure 3 - BBI : Case 1, vNICs pane



Figure 4 - BBI : Case 1, vNIC INT1.2 Configuration



Figure 5 - BBI : Case 1, vNIC INT2.1 Configuration



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

3. Enable and configure the vNIC group.

	STATISTICS DASH	BOARD	BLAC	DE OS
NETWORK TECHNOLOGIES Apply	Save Revert Diff Du		Show Log	Help Logout
2. Jan 14 23:14:44 9.42.212.108 NOTICE server	: link up on port INT6			
BNT Virtual Fabric 10Gb Switch Mo			_	
System	v	NIC Groups (Configurat	ion
Switch Ports		550	1992	
Port-Based Port Mirroring	vNIC Group	State	Vlan	Failover State
🗀 Layer 2		disabled	0	disabled
🗎 RMON Menu	2	disabled	0	disabled
📄 Layer 3	3	disabled	0	disabled
QoS	4	disabled	0	disabled
Access Control	2	disabled	0	disabled
	<u>6</u>	disabled	0	disabled
FCOF	1	disabled	0	disabled
	<u>8</u>	disabled	0	disabled
	<u>9</u>	disabled	0	disabled
VNIC	10	disabled	0	disabled
General	11	disabled	0	disabled
VNICs	12	disabled	0	disabled
VNIC Groups	13	disabled	0	disabled
🛄 Virtual Machine	14	disabled	0	disabled

Figure 6 - BBI : Case 1, vNIC Groups pane



Figure 7 - BBI : Case 1, vNIC Group Configuration



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

Case 2 - vNICs and pNICs, No uplinks

Represented as VGRP 2 in Figure 1 on p.11, this group consists of vNIC and pNIC ports, but no uplink ports.

server

Switch CLI

The following command script can be used to implement this configuration.

```
/c/virt/vnic
        on
/c/virt/vnic/port INT1/vnic 3
        ena
        bw 30
/c/virt/vnic/port INT2/vnic 4
        ena
        bw 34
/c/virt/vnic/vnicgrp 2
        ena
        vnicvlan 310
        addvnic INT1.3
        addvnic INT2.4
        addport INT4
apply
```



Switch BBI

Click on the 'Configure' tab, then perform the following sequence of web interface entries to implement this configuration.

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1. Enable vNIC operation. (Submit, Apply ... and Save, if you want it to persist after switch reboot.)



Figure 8 - BBI : Case 2, Enable vNIC operation



2. Enable and configure vNICs (remember to Submit and Apply).

	ONFIGURE	STATISTICS	DASHBOARD	BLADE	OS
NETWORK TECHNOLOGIES	Apply Sa	ve Revert Diff	Dump	Show Log Help	Logout
16. Jan 14 23:11:31 9.42.212.108 NO	TICE server: lin	k down on port IN1	6		
BNT Virtual Fabric 10Gb Swite					^
🗀 System		vNI	Cs Configurati	on	
Switch Ports Switch Ports Port-Based Port Mirroring	1.	Search Range			
™ Layer 2 ™ RMON Menu	vl 2.	NICs(INT1.1-INT14.4 Search Options	From INT1.1	To INT14.4	THE REAL PROPERTY IN THE REAL PROPERTY INTO THE REAL PR
⊡ Layer 3 ⊡ QoS	St M	ate Iax Bandwidth(0 = an	any 💌 y) O		
Access Control	vi s	NIC Group(0 = any)	0	Search	
- FCOE		aich operation	01	Cocareir	
🔄 Virtualization	vNIC	State	vNIC Group	Max Bandwidth	1
	<u>INT1.1</u>	disabled	0	25	
General	INT1.2	disabled	0	25	
	INTLA	disabled	0	25	
VNIC Groups	INT21	disabled	0	25	
	INT2.2	disabled	0	25	
	INT2.3	disabled	0	25	
	(INT2.4)	disabled	0	25	

Figure 9 - BBI : Case 2, vNICs pane



Figure 10 - BBI : Case 2, vNIC INT1.3 Configuration



Figure 11 - BBI : Case 2, vNIC INT2.4 Configuration



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

3. Enable and configure the vNIC group.

BLADE CONFIGURE	STATISTICS DASH	iBOARD		
2, Jan 14 23:14:44 9.42:212.108 NOTICE server	link up on port INT6			
BNT Virtual Fabric 10Gb Switch Mo				
System	v	NIC Groups	Configurat	ion
Switch Ports		5991	0404	
Port-Based Port Mirroring	vNIC Group	State	Vlan	Failover State
"🚞 Layer 2	1	disabled	0	disabled
🖻 RMON Menu	2	disabled	0	disabled
🚞 Layer 3	3	disabled	0	disabled
QoS	4	disabled	0	disabled
Access Control	5	disabled	0	disabled
CEE	<u>6</u>	disabled	0	disabled
	1	disabled	0	disabled
Virtualization	<u>8</u>	disabled	0	disabled
	<u>9</u>	disabled	0	disabled
	10	disabled	0	disabled
General	11	disabled	0	disabled
VNICs	12	disabled	0	disabled
VNIC Groups	13	disabled	0	disabled
📄 Virtual Machine	14	disabled	0	disabled

Figure 12 - BBI : Case 2, vNIC Groups pane







Figure 13 - BBI : Case 2, vNIC Group Configuration



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

Case 3 - vNICs only, One uplink port

Represented as VGRP 3 in Figure 1 on p.11, this group consists of vNIC ports and one uplink port.

server

Switch CLI

The following command script can be used to implement this configuration.

```
/c/virt/vnic
        on
/c/virt/vnic/port INT1/vnic 3
        ena
        bw 25
/c/virt/vnic/port INT2/vnic 2
        ena
        bw 70
/c/virt/vnic/vnicgrp 3
        ena
        vnicvlan 500
        addvnic INT1.3
        addvnic INT2.2
        addport EXT2
apply
```



Switch BBI

Click on the 'Configure' tab, then perform the following sequence of web interface entries to implement this configuration.

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1. Enable vNIC operation. (Submit, Apply ... and Save, if you want it to persist after switch reboot.)



Figure 14 - BBI : Case 3, Enable vNIC operation



2. Enable and configure vNICs (remember to Submit and Apply).

BLADE 😼	ONFIGURE	STATISTICS	DASHBOARD	BLADE	OS
NETWORK TECHNOLOGIES	Apply Sa	ve Revert Diff	Dump	Show Log Help	Logout
16. Jan 14 23:11:31 9.42,212,108 NO	TICE server: lin	ik down on port IN1	Γ6		
BNT Virtual Fabric 10Gb Swite					^
🗀 System		vNI	Cs Configurati	on	
Port-Based Port Mirroring	1.	Search Range			
- 🗀 Layer 2	vl	NICs(INT1.1-INT14.4) From INT1.1	To INT14.4	=
- 🛅 RMON Menu	2.	Search Options			
🗀 Layer 3	St	ate	any 💌		
- 🔲 QoS	М	ax Bandwidth(0 = an	y) 0	_	
Access Control	vl	VIC Group(0 = any)	0		
	Se	arch Operation	or 💌	Search	
FCOE -					
	VNIC	State	vNIC Group	Max Bandwidth	<u></u>
	INT1.1 INT1.2	disabled	0	25	
	(INT1.3)	disabled	0	25	
	INT1.4	disabled	0	25	
Virtual Machine	<u>INT2.1</u>	disabled	0	25	
	(INT2.2)	disabled	0	25	
	<u>INT2.3</u>	disabled	0	25	
	<u>1N12,4</u>	disabled	0	25	

Figure 15 - BBI : Case 3, vNICs pane



Figure 16 - BBI : Case 3, vNIC INT1.3 Configuration



Figure 17 - BBI : Case 3, vNIC INT2.2 Configuration



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

3. Enable and configure the vNIC group.

	STATISTICS DASH	BOARD	BLAC	DE OS
NETWORK TECHNOLOGIES Apply	Save Revert Diff Dur	np	Show Log	Help Logout
2, Jan 14 23:14:44 9.42.212.108 NOTICE server	link up on port INT6			
BNT Virtual Fabric 10Gb Switch Mo				
🗀 System	v	NIC Groups	Configurat	ion
Switch Ports		5.991	6454	
Port-Based Port Mirroring	vNIC Group	State	Vlan	Failover State
🗀 Layer 2	1	disabled	0	disabled
RMON Menu	2	disabled	0	disabled
🗎 Layer 3	3	disabled	0	disabled
QoS	4	disabled	0	disabled
Access Control	2	disabled	0	disabled
	<u>6</u>	disabled	0	disabled
FCOF	<u>1</u>	disabled	0	disabled
	<u>8</u>	disabled	0	disabled
	2	disabled	0	disabled
	<u>10</u>	disabled	0	disabled
General	11	disabled	0	disabled
VNICs	12	disabled	0	disabled
VNIC Groups	<u>13</u>	disabled	0	disabled
🔄 Virtual Machine	14	disabled	0	disabled

Figure 18 - BBI : Case 3, vNIC Groups pane



Figure 19 - BBI : Case 3, vNIC Group Configuration



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

Case 4 - vNICs and pNICs, One uplink port (w/failover)

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Represented as VGRP 4 in Figure 1 on p.11, this group consists of vNIC and pNIC ports, and one uplink port.

Failover is enabled for this group, so if the link on EXT6 is disrupted, the VFS disables virtual ports INT1.4, INT2.1 and physical port INT3. This action facilitates NIC team failover on the server blade.

Switch CLI

The following command script can be used to implement this configuration.

```
/c/virt/vnic
        on
/c/virt/vnic/port INT1/vnic 4
        ena
        bw 40
/c/virt/vnic/port INT2/vnic 1
        ena
        bw 33
/c/virt/vnic/vnicqrp 4
        ena
        vnicvlan 727
        failover ena
        addvnic INT1.4
        addvnic INT2.1
        addport INT3
        addport EXT6
apply
```



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

Switch BBI

Click on the 'Configure' tab, and then perform the following sequence of web interface entries to implement this configuration.

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1. Enable vNIC operation. (Submit, Apply ... and Save, if you want it to persist after switch reboot.)



Figure 20 - BBI : Case 4, Enable vNIC operation



2. Enable and configure vNICs (remember to Submit and Apply).

BLADE 😼	ONFIGURE	STATISTICS	DASHBOARD	BLADE	OS
NETWORK TECHNOLOGIES	Apply Sa	ve Revert Diff	Dump	Show Log Help	Logout
16. Jan 14 23:11:31 9.42,212,108 NO	TICE server: lin	k down on port IN1	F6		
BNT Virtual Fabric 10Gb Swite					^
System		vNI	Cs Configurati	on	
Switch Ports					
Port-Based Port Mirroring	1.	Search Range			
Laver 2	vl	NICs(INT1.1-INT14.4) From INT1.1	To INT14.4	
RMON Menu	2.	Search Options			=
- 🔁 Laver 3	St	ate	any 💌		
- QoS	M	ax Bandwidth(0 = an	y) 0		
- Access Control	vl	VIC Group(0 = any)	0		
- CEE	Se	arch Operation	or 💌	Search	
FCOE		T			8
Girtualization	vNIC	State	vNIC Group	Max Bandwidth	
	<u>INT1.1</u>	disabled	0	25	
General	<u>INT1.2</u>	disabled	0	25	
(EVNICs)	<u>INT1.3</u>	disabled	0	25	
VNIC Groups	<u>INT1.4</u>	disabled	0	25	
🗀 Virtual Machine	INT2.1	disabled	0	25	
	INT2.2	disabled	0	25	
	INT2.5	disabled	0	23	
	<u>IIX12.4</u>	usdoleu	0	25	

Figure 21 - BBI : Case 4, vNICs pane



Figure 22 - BBI : Case 4, vNIC INT1.4 Configuration



Figure 23 - BBI : Case 4, vNIC INT2.1 Configuration



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

3. Enable and configure the vNIC group.

	STATISTICS DASH	BOARD	BLAC	DE OS	
NETWORK TECHNOLOGIES Apply	Save Revert Diff Dur	np	Show Log	Help Logout	
2, Jan 14 23:14:44 9.42.212.108 NOTICE server	link up on port INT6				
BNT Virtual Fabric 10Gb Switch Mo					
System	vNIC Groups Configuration				
Switch Ports			5-12-5 		
Port-Based Port Mirroring	vNIC Group	State	Vlan	Failover State	
"🚞 Layer 2	1	disabled	0	disabled	
RMON Menu	2	disabled	0	disabled	
🚞 Layer 3	3	disabled	0	disabled	
🖻 QoS		disabled	0	disabled	
🗎 Access Control	2	disabled	0	disabled	
CEE	<u>6</u>	disabled	0	disabled	
FCOE	1	disabled	0	disabled	
	8	disabled	0	disabled	
	2	disabled	0	disabled	
	10	disabled	0	disabled	
General	11	disabled	0	disabled	
VNICs	12	disabled	0	disabled	
VNIC Groups	13	disabled	0	disabled	
🦾 🧰 Virtual Machine	14	disabled	0	disabled	

Figure 24 - BBI : Case 4, vNIC Groups pane









How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

Case 5 - vNICs only, One uplink trunk

Represented as VGRP 5 in Figure 1 on p.11, this group consists of vNIC ports and one uplink trunk.

Switch CLI

The following command script can be used to implement this configuration.

```
/c/l2/trunk 1
        ena
        add EXT1
        add EXT3
/c/virt/vnic
        on
/c/virt/vnic/port INT1/vnic 1
        ena
        bw 30
/c/virt/vnic/port INT2/vnic 2
        ena
        bw 33
/c/virt/vnic/vnicgrp 5
        ena
        vnicvlan 925
        addvnic INT1.1
        addvnic INT2.2
        addtrnk 1
apply
```



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

Switch BBI

Click on the 'Configure' tab, then perform the following sequence of web interface entries to implement this configuration.

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1. Enable vNIC operation. (Submit, Apply ... and Save, if you want it to persist after switch reboot.)



Figure 26 - BBI : Case 5, Enable vNIC operation



2. Enable and configure vNICs (remember to Submit and Apply).

BLADE 😼	ONFIGURE	STATISTICS	DASHBOARD	BLADE	OS
NETWORK TECHNOLOGIES	Apply Sa	ave Revert Diff	Dump	Show Log Help	Logout
16. Jan 14 23:11:31 9.42.212.108 NO	TICE server: lii	nk down on port IN1	6		
BNT Virtual Fabric 10Gb Swite BNT Virtual Fabric 10Gb Swite		vNI	Cs Configurati	on	^
Switch Ports Sect Based Bart Mirroring	1.	Search Range			
Layer 2	vi 2	NICs(INT1.1-INT14.4) From INT1.1	To INT14.4	THE REAL PROPERTY OF
Layer 3	S	tate	any 💌		
Cos Control	N V	1ax Bandwidth(0 = an NIC Group(0 = any)	y) 0 0		
- CEE - COE	S	earch Operation	or 💌	Search	
🔄 Virtualization	VNIC	State	vNIC Group	Max Bandwidth	
	(INT1.1)	disabled	0	25	
General	<u>INT1.2</u>	disabled	0	25	
MICs)	<u>INT1.3</u>	disabled	0	25	
VNIC Groups	<u>INT1.4</u>	disabled	0	25	
🦾 📄 Virtual Machine	INT2.1	disabled	0	25	
	INT2.3	disabled	0	25	
	<u>INT2.4</u>	disabled	0	25	

Figure 27 - BBI : Case 5, vNICs pane



Figure 28 - BBI : Case 5, vNIC INT1.1 Configuration



Figure 29 - BBI : Case 5, vNIC INT2.2 Configuration



3. Enable the trunk group.

RELADE CONFIGURE STATISTIC	Diff Dump Show Log Help Logout
3. Jan 18: 0:21:35 10:90:90:0:0:0:0:91 NOTICE mgmt admin(Adm	min) login from BBI.
BNT Virtual Fabric 10Gb Switc BNT Virtual Fabric 10Gb Switc System Switch Ports	Trunk Groups Configuration
Port-Based Port Mirroring	Trunk Group State
laver 2	1 disabled
802 1x	2 disabled
FDB	3 disabled
Virtual LANs	4 disabled
Spanning Tree Groups	5 disabled
MSTP/RSTP	6 disabled
	7 disabled
Failover	
Hot Links	
Trunk Groups	<u>9</u> disabled
Trunk Hash	<u>10</u> disabled

Figure 30 - BBI : Case 5, Trunk Groups pane



Figure 31 - BBI : Case 5, Trunk Group 1 Configuration



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

4. Enable and configure the vNIC group.

	STATISTICS DASH	BOARD	BLAC	DE OS
NETWORK TECHNOLOGIES Apply	Save Revert Diff Dur	np	Show Log	Help Logout
2, Jan 14 23:14:44 9.42.212.108 NOTICE server	: link up on port INT6			
BNT Virtual Fabric 10Gb Switch Mo				
"🗀 System	vNIC Groups Configuration			
Switch Ports		5591	6454	
Port-Based Port Mirroring	vNIC Group	State	Vlan	Failover State
🗀 Layer 2	1	disabled	0	disabled
RMON Menu	2	disabled	0	disabled
🔜 Layer 3	3	disabled	0	disabled
QoS	4	disabled	0	disabled
Access Control		disabled	0	disabled
	<u>6</u>	disabled	0	disabled
	<u>7</u>	disabled	0	disabled
Virtualization	<u>8</u>	disabled	0	disabled
	2	disabled	0	disabled
VINIC	<u>10</u>	disabled	0	disabled
General	11	disabled	0	disabled
VNICs	12	disabled	0	disabled
(IVNIC Groups)	<u>13</u>	disabled	0	disabled
Virtual Machine	14	disabled	0	disabled

Figure 32 - BBI : Case 5, vNIC Groups pane



Figure 33 - BBI : Case 5, vNIC Group Configuration



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

Case 6 - vNICs and pNICs , One uplink trunk

Represented as VGRP 6 in Figure 1 on p.11, this group consists of vNIC and pNIC ports, and one uplink trunk.

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Switch CLI

The following command script can be used to implement this configuration.

```
/c/12/trunk 5
        ena
        add EXT3
        add EXT4
/c/virt/vnic
        on
/c/virt/vnic/port INT1/vnic 4
        ena
        bw 25
/c/virt/vnic/port INT2/vnic 4
        ena
        bw 10
/c/virt/vnic/vnicgrp 6
        ena
        vnicvlan 1010
        addvnic INT1.4
        addvnic INT2.4
        addport INT4
        addport INT5
        addtrnk 5
apply
```



Switch BBI

Click on the 'Configure' tab, then perform the following sequence of web interface entries to implement this configuration.

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1. Enable vNIC operation. (Submit, Apply ... and Save, if you want it to persist after switch reboot.)



Figure 34 - BBI : Case 6, Enable vNIC operation



2. Enable and configure vNICs (remember to Submit and Apply).

BLADE 🔽		STATISTICS	DASHBOARD	BLADE	OS
NETWORK TECHNOLOGIES	Apply Sav	ve Revert Diff	Dump	Show Log Help	Logout
16. Jan 14 23:11:31 9.42.212.108 NC	TICE server: lini	k down on port IN1	Γ6		
BNT Virtual Fabric 10Gb Swite					^
- 🛅 System		vNI	Cs Configurati	ion	
Switch Ports					
Dort-Based Port Mirroring	1.	Search Range			
🗀 Layer 2	vN	ICs(INT1.1-INT14.4)From INT1.1	To INT14.4	
🔲 RMON Menu	2.	Search Options			
🗀 Layer 3	Sta	ate	any 💌		
CoS	Ma	ax Bandwidth(0 = an	y) 0		
Control	vN	TC Group(0 = any)	0		
CEE	Sei	arch Operation	or 💌	Search	
FCOE					<u> </u>
Intualization	vNIC	State	vNIC Group	Max Bandwidth	
	<u>INT1.1</u>	disabled	0	25	
General	<u>INT1.2</u>	disabled	0	25	
	INT1.3	disabled	0	25	
VNIC Groups	DVT2 1	disabled	0	25	
🦾 🧰 Virtual Machine	INT2.2	disabled	0	25	
	INT2.3	disabled	0	25	
	(INT2.4)	disabled	0	25	

Figure 35 - BBI : Case 6, vNICs pane



Figure 36 - BBI : Case 6, vNIC INT1.4 Configuration



Figure 37 - BBI : Case 6, vNIC INT2.4 Configuration



3. Enable the trunk group.

	DASHBOARD BLADE OS
NETWORK TECHNOLOGIES Apply Save Revert	Diff Dump Snow Log Help Logout
3. Jan 18 0:21:35 10:90:90:0:0:0:0:91 NOTICE mgmt admin(Admir	ı) login from BBI.
BNT Virtual Fabric 10Gb Swite	
System	Trunk Groups Configuration
Switch Ports	
Port-Based Port Mirroring	Trunk Group State
🔄 Layer 2	<u>1</u> disabled
802.1x	2 disabled
EDB	<u>3</u> disabled
🗀 Virtual LANs	4 disabled
🔤 Spanning Tree Groups	(5) disabled
MSTP/RSTP	6 disabled
Failover	
Hot Links	
Trunk Groups	<u>9</u> disabled
Trunk Hash	<u>10</u> disabled

Figure 38 - BBI : Case 6, Trunk Groups pane



Figure 39 - BBI : Case 6, Trunk Group 5 Configuration



How to configure Virtual NICs using the Emulex Virtual Fabric Adapter and BNT Virtual Fabric Switch Module.

4. Enable and configure the vNIC group.

BLADE CONFIGURE	STATISTICS DASH	BOARD	BLAC	DE OS
NETWORK TECHNOLOGIES Apply	Save Revert Diff Dur		Show Log	Help Logout
2. Jan 14 23:14:44 9.42.212.108 NOTICE server	link up on port INT6			
BNT Virtual Fabric 10Gb Switch Mo				
🗂 🗀 System	vNIC Groups Configuration			
Switch Ports		5293	1452	
Port-Based Port Mirroring	vNIC Group	State	Vlan	Failover State
🛅 Layer 2	1	disabled	0	disabled
RMON Menu	2	disabled	0	disabled
🔁 Layer 3	3	disabled	0	disabled
QoS	4	disabled	0	disabled
Access Control	2	disabled	0	disabled
	<u>(</u>	disabled	0	disabled
	1	disabled	0	disabled
	<u>8</u>	disabled	0	disabled
	<u>9</u>	disabled	0	disabled
	10	disabled	0	disabled
General	11	disabled	0	disabled
VNICs	12	disabled	0	disabled
VNIC Groups	13	disabled	0	disabled
🔲 Virtual Machine	14	disabled	0	disabled

Figure 40 - BBI : Case 6, vNIC Groups pane





Figure 41 - BBI : Case 6, vNIC Group Configuration





Related Documentation

Virtual Fabric Switch (VFS) documentation is available at:

http://www.ibm.com/systems/support/supportsite.wss/brandmain?brandind=5000020

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Enter "BNT Virtual Fabric" (including the quotes) in the search box in the upper right and click the Search button. Click on the 'Publications' item in the results list and select the document of interest.

- 1) BNT Virtual Fabric 10Gb Switch Module for IBM BladeCenter, Application Guide
- 2) BNT Virtual Fabric 10Gb Switch Module for IBM BladeCenter, Command Reference
- 3) BNT Virtual Fabric 10Gb Switch Module for IBM BladeCenter, ISCLI Reference
- 4) BNT Virtual Fabric 10Gb Switch Module for IBM BladeCenter, Browser Based Interface Quick Guide

Virtual Fabric Adapter (VFA) documentation is available at:

http://www.ibm.com/systems/support/supportsite.wss/brandmain?brandind=5000020

Enter "Emulex Virtual Fabric" (including the quotes) in the search box in the upper right and click the Search button. Click on the 'Publications' item in the results list and select the document of interest.

- 5) Installation and User's Guide for Emulex Virtual Fabric Adapter (CFFh)
- 6) Emulex Virtual Fabric Adapter Release Notes