Configuring FCoE for Vmware* ESXi* 5.0

October 2011
Revision 1.11
Revision History & Legal Information

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<th>Version</th>
<th>Date</th>
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<tr>
<td>1.0</td>
<td>July 2011</td>
<td>Initial Release</td>
</tr>
<tr>
<td>1.1</td>
<td>October 2011</td>
<td>Minor Updates</td>
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<tr>
<td>1.11</td>
<td>October 2011</td>
<td>Corrected controller name</td>
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Requirements
• **Hardware:**
  --Intel Ethernet X520 Server Adapter (Intel® 82599 Ethernet Controller)
  --Server Platform with an available PCI-Express x8 slot

• **Network Infrastructure:**
  --FCoE-Capable Cisco* Nexus* 5000 Series Switch or Brocade* 8000 Switch
  --EMC* or NetApp* (FC or FCoE) target

• **Assumptions:**
  --FCoE feature provisioned and configured on FCoE-Capable Switch
  --Access to Fabric Manager Software for FCoE Switch
  --Access to Target Management Software
  --Access to VMware* ESXi* 5.0
  --Access to VMware VI Client software
Overview of Configuring FCoE
1. Install Intel® Ethernet X520 Server Adapter in a Server Under Test (SUT)
2. Install VMware ESXi 5.0 on SUT
3. Create vSwitch via VI client GUI or ESXi Console (Required for DCB communication)
4. Bind Intel® Ethernet X520 Server Adapter NIC ports to the newly created vSwitch
5. Initiate FCoE Adapter discovery via VI Client or ESXi console
6. Create a Zone using Fabric Manager:
   • Add ESXi host to the Zone
   • Add Storage target to the Zone
   • Insert Zone to the Zone-set
   • Enable Zone-set
7. Register ESXi host with Storage Target
8. Assign LUN(s) to the ESXi host
9. Refresh Storage using ESXi host Configuration tab via VI client to start using newly assigned LUN(s)
Configuring FCoE Using the ESXi VI Client

Note: Either the VI Client (with GUI) or the ESX console can configure FCoE. Both methods are described in this document.
Creating the vSwitch via the VI Client

Click on “Add Networking” for creating a new switch
Creating the vSwitch via the VI Client (cont.)

Click on "Next". Choose defaults provided by the wizard.
Creating the vSwitch via the VI Client (cont.)

Select Intel 10Gb NIC to be assigned to new vSwitch.
Creating the vSwitch via the VI Client (cont.)

Choose a name for vswitch. We named it "VM Network 2".
Creating the vSwitch via the VI Client (cont.)

Click on "Finish" to complete the vSwitch creation.
Creating the vSwitch via the VI Client (cont.)

Shows newly created vswitch named vswitch22. vSwitch is required for DCB communication. DCB is required for FCoE to be functional.
FCoE Adapter Discovery via the VI Client

Click on “Add” link to start FCoE adapter creation, discover and fabric login process.
FCoE Adapter Discovery via the VI Client (cont.)

Select "Add Software FCoE Adapter" link to start FCoE Adapter Creation, discovery and fabric login process.
FCoE Adapter Discovery via the VI Client (cont.)

Select appropriate vmnicX for FCoE traffic. In this case we chose vmnic2.
FCoE Adapter Discovery via the VI Client (cont.)

“vmhbaXX” will show in Storage Adapter view upon Successful FCoE adapter creation and fabric login.
FCoE Adapter Discovery via the VI Client (cont.)

LUNs from a target will show in Storage view of VI Client. Assuming - Zoning is completed via Fabric Manager and LUNs are assigned to FCoE initiator using EMC Unisphere or Navisphere tools.
Configuring FCoE Using the ESXi Console

The following steps configure FCoE on ESXi 5.0 using the ESX console.

Note: The VI Client (GUI) can also be used to configure FCoE. Using the client GUI is described elsewhere in this document.
Creating the vSwitch via the ESXi Console

At the ESXi console command prompt enter the following:

```bash
~ # esxcfg-vswitch --add vswitch22
~ # esxcfg-vswitch --link vmnic2 vswitch22
```

- The first command creates a vSwitch.
- The second command binds an Intel® Ethernet X520 NIC port to vswitch22.

(On the following screen, the commands are separated by listings.)
Creating the vSwitch via the ESXi Console (cont.)

```bash
~ # esxcfg-vswitch --add vswitch22
~ # esxcfg-vswitch -l
Switch Name  Num Ports  Used Ports  Configured Ports  MTU  Uplinks
vSwitch0     128        3           128              1500  vmnic0

<table>
<thead>
<tr>
<th>PortGroup Name</th>
<th>VLAN ID</th>
<th>Used Ports</th>
<th>Uplinks</th>
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<tr>
<td>VM Network</td>
<td>0</td>
<td>0</td>
<td>vmnic0</td>
</tr>
<tr>
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<td>0</td>
<td>1</td>
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Switch Name  Num Ports  Used Ports  Configured Ports  MTU  Uplinks
vswitch22    128        1           128              1500

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~ # esxcfg-vswitch --link vmnic2 vswitch22
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Switch Name  Num Ports  Used Ports  Configured Ports  MTU  Uplinks
vswitch22    128        2           128              1500  vmnic2

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~ #
```
Creating the vSwitch via the ESXi Console (cont.)

At the ESXi console type

```
esxcfg-fcoe -d vmnic2
esxcfg-fcoe -l
```

- The first command starts the process for creating the FCoE adapter and fabric login.
- The second command sends a query to determine if the FCoE fabric login is completed.

The screen on the following slide shows the commands and results.
Creating the vSwitch via the ESXi Console (cont.)
Completing the vSwitch via the ESXi Console

1. Complete following steps once the FCoE Adapter creation and subsequent fabric login is successful.

2. Create a Zone using Fabric Manager:
   - Add ESX host to the Zone
   - Add Storage target to the Zone
   - Insert Zone to the Zone-set
   - Enable Zone-set

3. Register ESX host with Storage Target.

4. Assign LUN(s) to the ESX host.

5. Refresh Storage using ESX host Configuration tab via VI client to start using newly assigned LUN(s).

This completes the configuration process.