Mellanox OFED for Windows (WinOF)

Installation Guide

Rev 4.2

www.mellanox.com

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Mellanox Technologies
350 Oakmead Parkway, Suite 100
Sunnyvale, CA 94085
U.S.A.
www.mellanox.com
Tel: (408) 970-3400
Fax: (408) 970-3403

Mellanox Technologies, Ltd.
Beit Mellanox
PO Box 586 Yokneam 20692
Israel
www.mellanox.com
Tel: +972 (0)4 909 7200 ; +972 (0)74 723 7200
Fax: +972 (0)4 959 3245

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1 Introduction

This Installation Guide addresses the Mellanox WinOF driver Rev 4.2 package distributed for Windows Server 2012 (x64).

Mellanox WinOF is composed of several software modules that contain an InfiniBand and Ethernet driver. The Mellanox WinOF driver supports Infiniband and 40/10GB Ethernet ports. The port type is determined upon boot based on card's capability and user setting.

1.1 Hardware and Software Requirements

1.1.1 Hardware Requirements

- Required Disk Space for Installation
  - 100 MB

1.1.2 Supported Network Adapter Cards

Mellanox WinOF Rev 4.2 for Windows 2012 supports the following Mellanox network adapter cards:

- ConnectX®-2 /ConnectX®-2 EN/SDR/DDR/QDR
- ConnectX®-3/ConnectX®-3 EN/FDR/FDR10/QDR

1.1.3 Software Requirements

- Operating Systems
  - Windows Server 2012 (64 bits only)

The Operating Systems above must run with administrator privileges.

2 Downloading MLNX_WinOF

Follow these steps to download the appropriate .exe to your machine.

Step 1 Verify the machine architecture.

1. Open a CMD console (Click start-->Run and enter CMD).
2. Enter the following command:

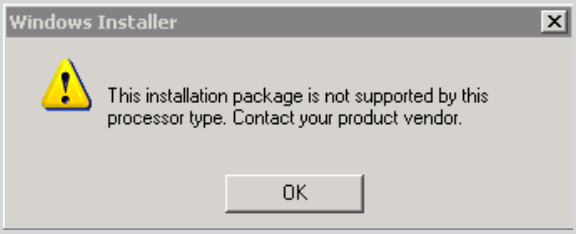
```
> echo %PROCESSOR_ARCHITECTURE%
```

- On an x64 (64-bit) machine, the output will be “AMD64”.

Step 2. Go to the MLNX_WinOF for Windows Web page at http://www.mellanox.com --> Products --> Software/Drivers --> InfiniBand & VPI SW/Drivers --> Windows SW/Drivers

Step 3. Download the appropriate .exe according to the architecture of your machine (see Step 1). The .exe’s name is in the following format MLNX_VPI_win8_x64_4_2.exe.

If you download and attempt to install the incorrect .exe, the installation wizard will not allow it. For example, if you try to install a 64-bit .exe on a 32-bit machine, the wizard will display the following (or a similar) error message:



3 Extracting Files without Running Installation

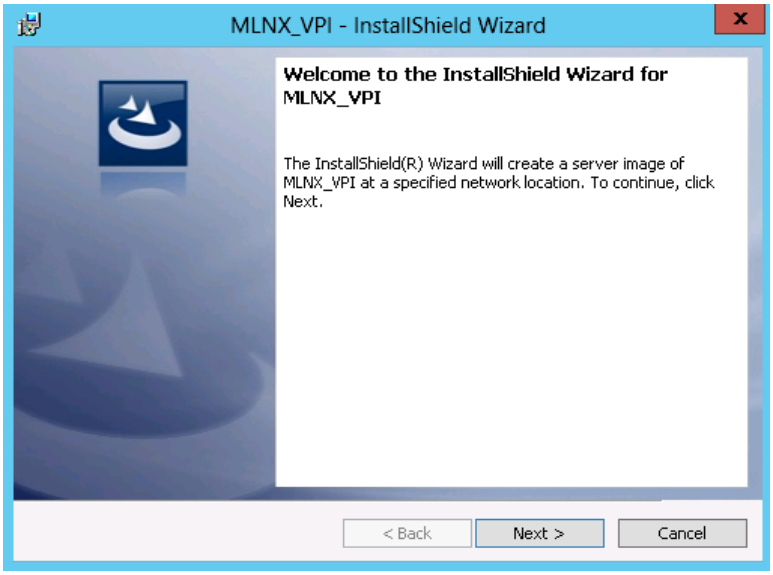
Follow these steps to extract the files without running installation.

Step 1 Open a CMD console (Click start-->Run and enter CMD).

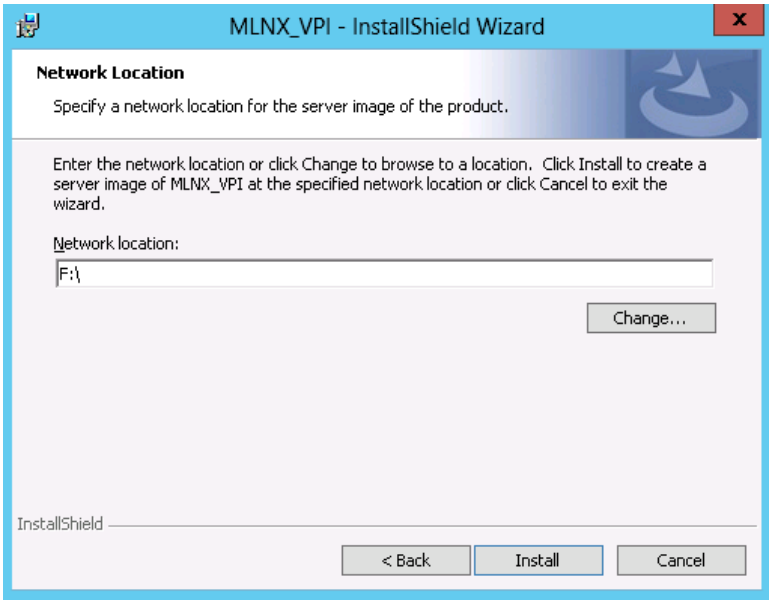
Step 2. Enter the following command:

```
MLNX_VPI_win8_x64_4_2.exe/a
```

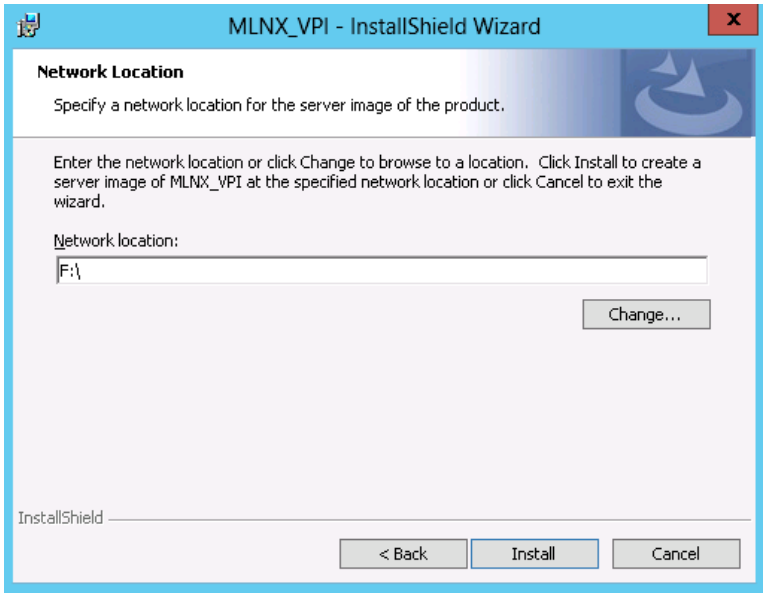
Step 3. Click Next to create a server image:



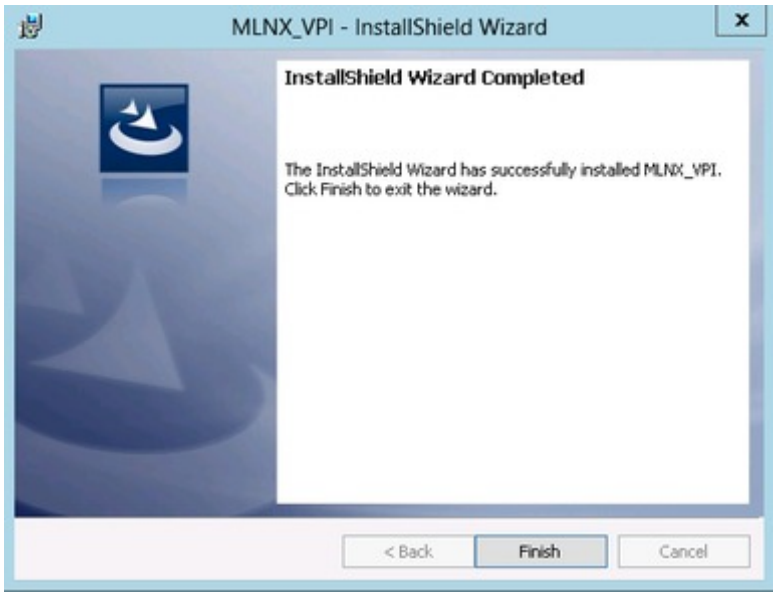
Step 4. Click Change and specify the location in which the files are extracted:



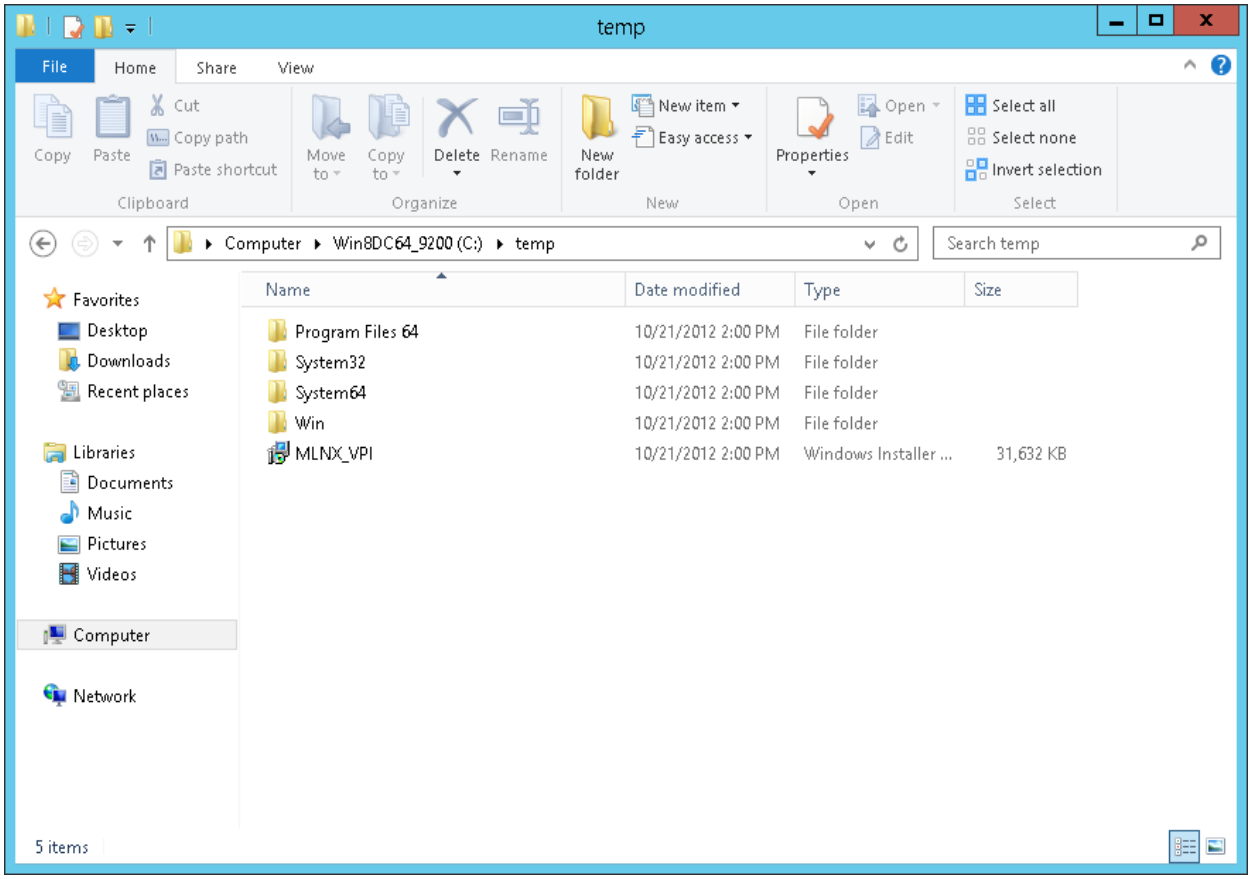
Step 5. Click Next to install to this folder, or click Change to install a different folder.:



Step 6. To complete the installation, click Finish:



Step 7. Go to the chosen location and search for the extracted files:



4 Installing MLNX_WinOF

This sections provides instructions for two types of installation:

- "Attended Installation"

  An installation procedure that requires frequent user intervention.

- "Unattended Installation"

  An automated installation procedure that requires no user intervention.

Both the Attended and the Unatten0ded installation require administrator privileges on the machine.

4.1 Attended Installation

The following is an example of a MLNX_WinOF x64 installation session.

Step 1 Double click the .exe and follow the GUI instructions to install MLNX_WinOF.

To configure your setup to contain the logs option, please run the following command after opening a CMD console:

```
MLNX_VPI_win8_x64_4_2.exe /v"/l*vx [LogFile]"
```

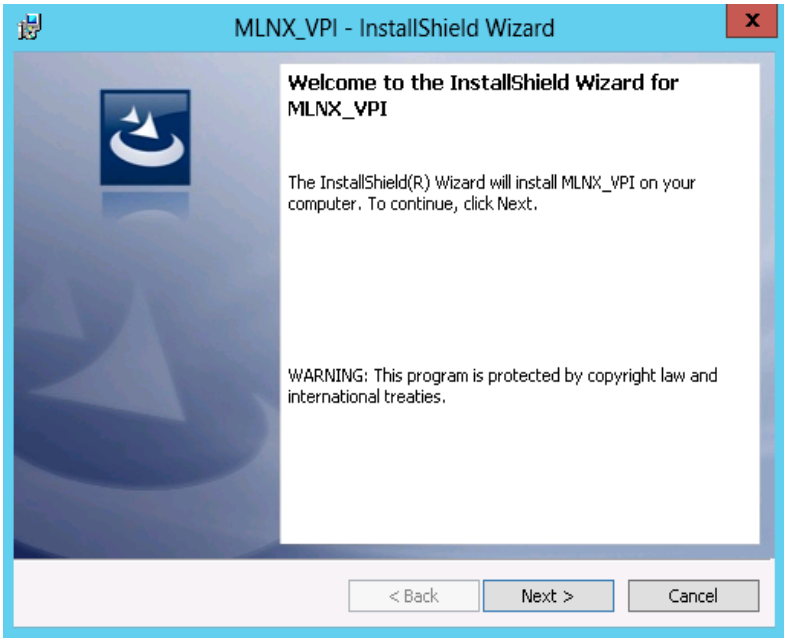
If you do not want to upgrade your firmware version, run the following command:

```
MLNX_VPI_win8_x64_4_2.exe /v" MT_SKIPFWUPGRD=1"
```

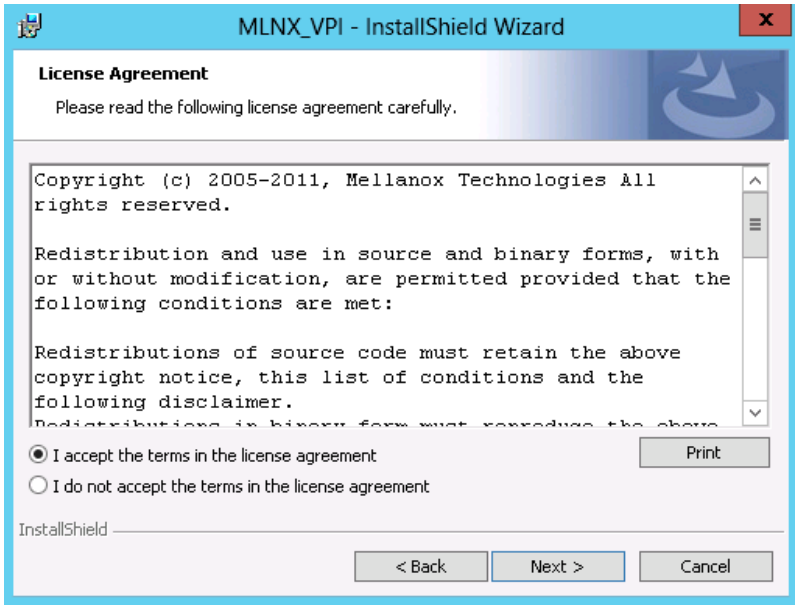
For further help, please run:

```
MLNX_VPI_win8_x64_4_2.exe /v" /h"
```

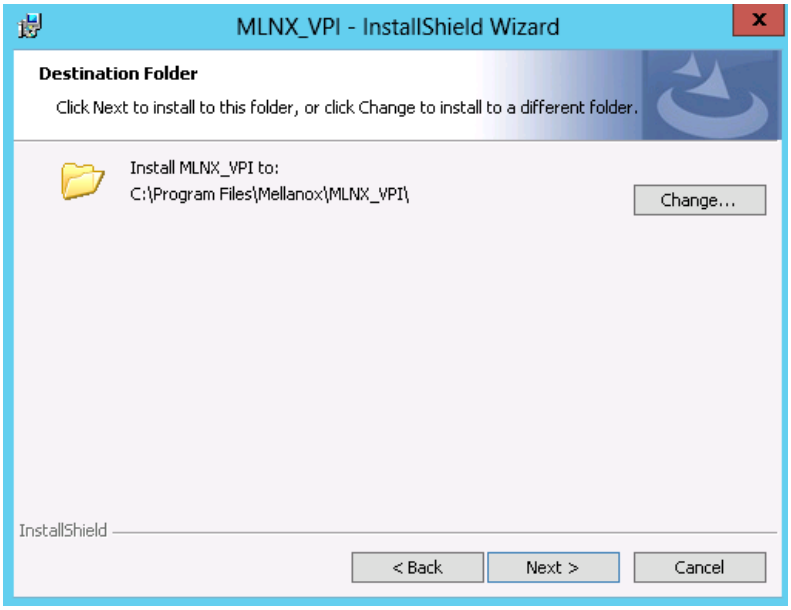
Step 2. Click Next in the Welcome screen.



Step 3. Select "I accept the terms in the license agreement" and click Next.

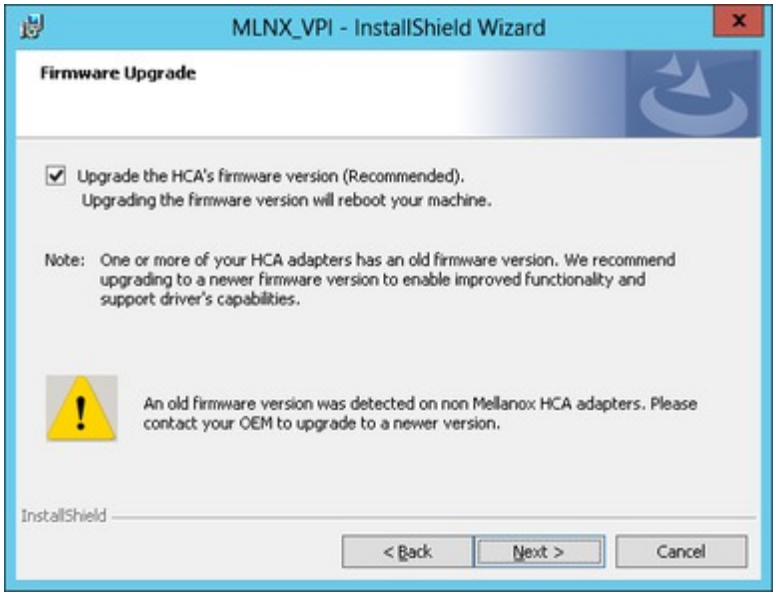


Step 4. Choose the destination folder for the installation.

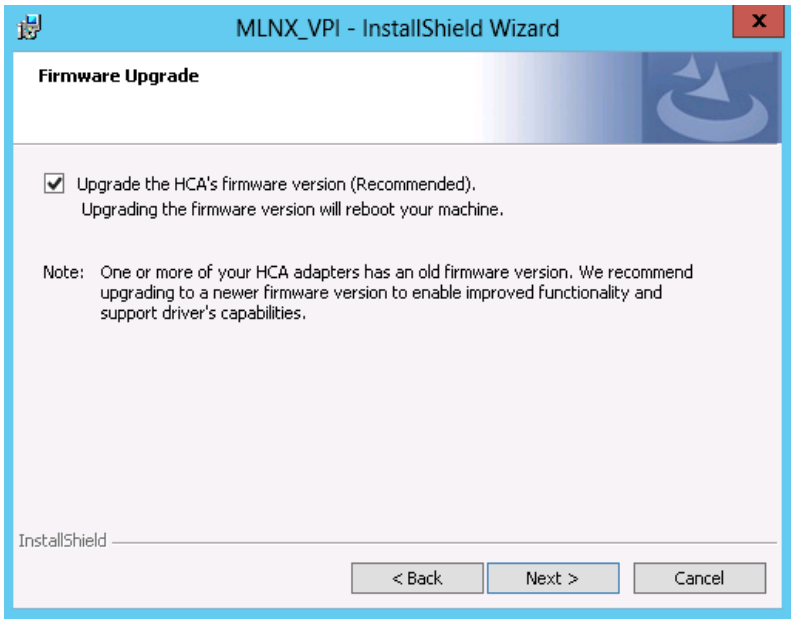


If the firmware version is up to date regardless of the used device (OEM, Mellanox or both), please see Section Step 6. and on. Otherwise, the screens bellow will be displayed if a firmware upgrade is required.

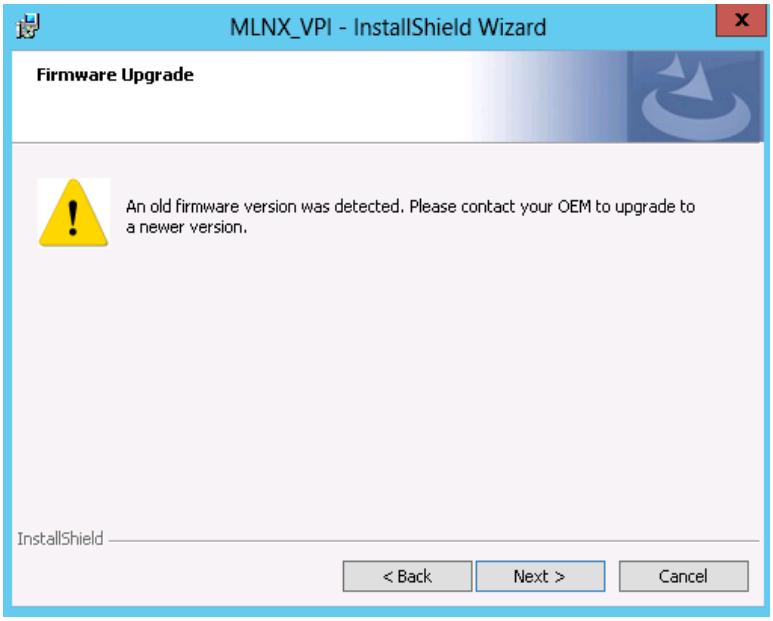
- If you are using both a Mellanox and an OEM device that require a firmware upgrade, the following window will be displayed:



- If you are using a Mellanox device that requires a firmware upgrade, the following window will be displayed:

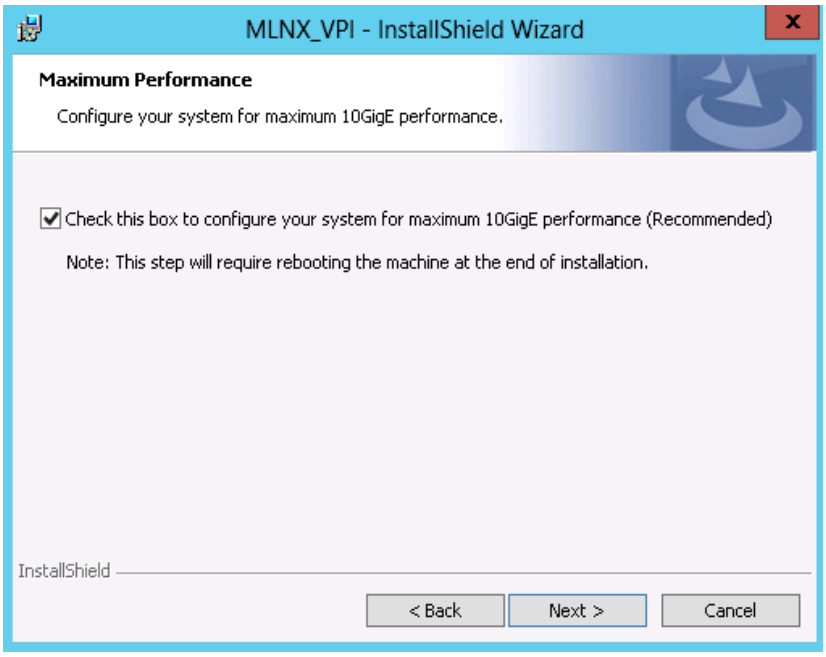


- If you are using an OEM device that requires a firmware upgrade, the following window will be displayed:



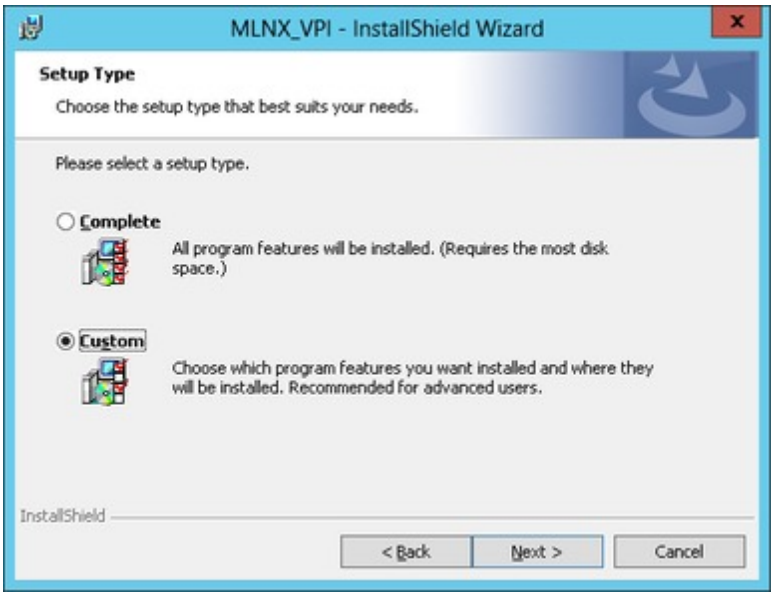
Step 5. Configure your system for maximum 10GigE performance by checking the maximum performance box.

If you check the maximum performance box (see figure below), you will need to reboot your system at the end of installation.



Regardless of the device used, upon choosing Next follow step 5 and on.

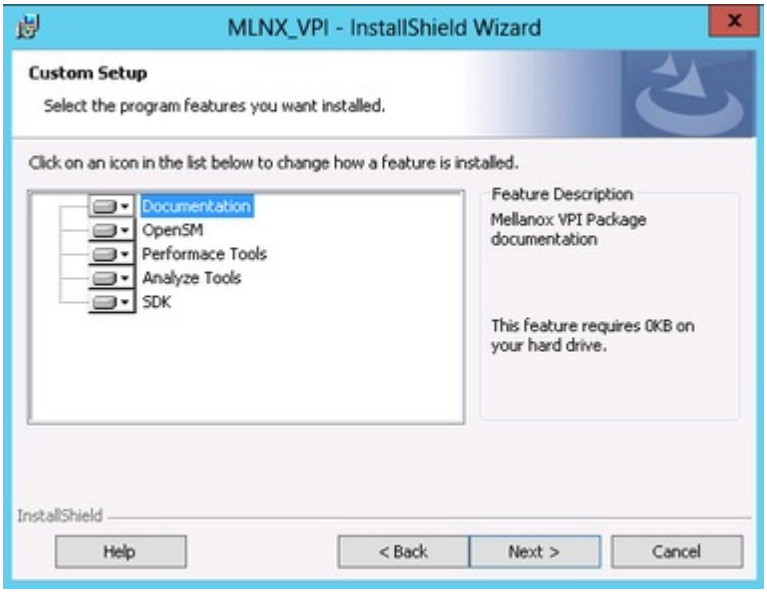
Step 6. If you choose the Custom setup type, follow Step a and on, on page 13



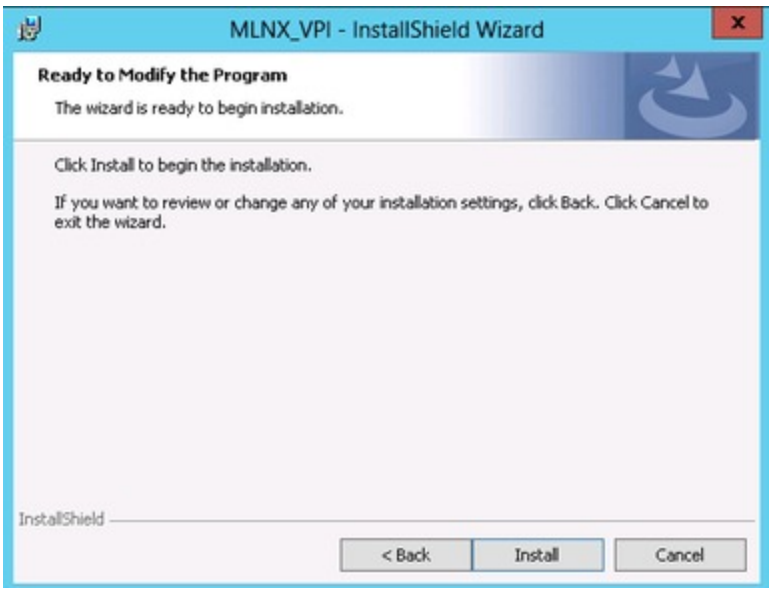
Step a. Select the desired program feature.

- Documentation: contains the User Manual and Installation Guide (it is not included in this package)
- OpenSM - installs windows SM that is required to mange the subnet. In general, the SM is used from the managed switch. You can download the SM for test purpose Performances tools - install the performance tools that are used to measure the IB performance in user environment

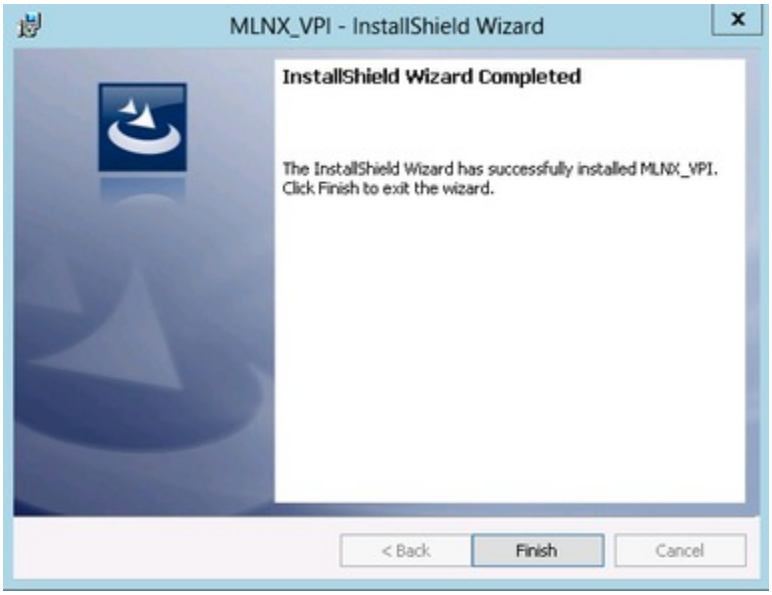
- Analyze tools - installs the tools that can be used to diagnosing and analyzing the IB environment
- SDK - contains the libraries and DLLs for developing IB application over IBALok



Step b. Click Install to start the installation.



Step 7. To complete the installation, click Finish.



4.2 Unattended Installation

To perform a silent/unattended installation, open a CMD console (click Start->Run and enter 'cmd') and enter the following command:

```
MLNX_VPI_win8_x64_4_2.exe /S /v"/qn"
```

To configure your setup to contain the logs option, please run the following command:

```
MLNX_VPI_win8_x64_4_2.exe /S /v"/qn" /v"/l*vx [LogFile]"
```

If you do not want to upgrade your firmware version, run the following command:

```
MLNX_VPI_win8_x64_4_2.exe /S /v"/qn" /v" MT_SKIPFWUPGRD=1"
```

For further help, please run:

```
MLNX_VPI_win8_x64_4_2.exe /v" /h"
```

For all command options, enter 'MLNX_VPI_WinOF-4_2_0_win8_x64.exe'.

5 Upgrading MLNX_WinOF

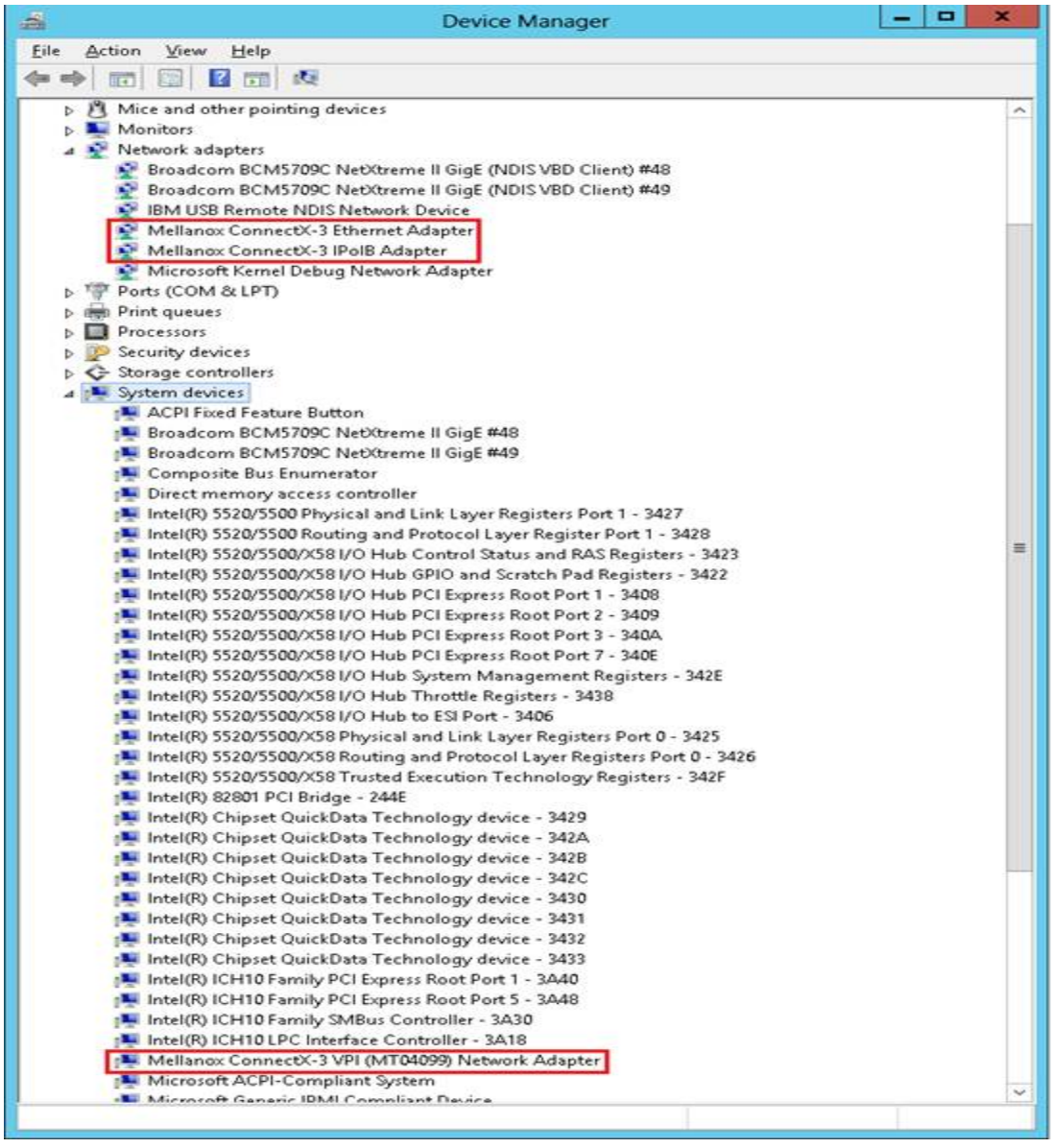
If you have an older MLNX_WinOF package already installed in your machine, to upgrade it you can run the new MLNX_WinOF package and it will automatically upgrade your current version by fully uninstalling your previous product and install the new package instead.

The upgrade removes all existing network interfaces. If you use static IP address, VLAN, LBFO or the interface is used by Hyper-V, you need to reconfigure your driver after the upgrade.

6 Installation Results

The installed MLNX_WinOF for Windows package is located under the directory selected in Step 4 of Section 4.1. (The default installation folder is Program Files\Mellanox\MLNX_WinOF.)

Upon installation completion, additional network adapters are added to the Device Manager and can be displayed when opening it. To see the Mellanox network adapters devices, and the Ethernet or IPoIB network device (depending on the used card) for each port, display the Device Manager and expand “System devices” and “Network adapters”.



6.1 OpenSM Activation

OpenSM is a service required by managed networks in InfiniBand environments, and must be activated in one of the machines running on the subnet, otherwise the interface link will not come up. If the cards are connected to a managed network, there is no need to run OpenSM. Only one OpenSM should run per subnet.

In Ethernet interfaces, running OpenSM is not required.

Opensm is not run as a service during installation. The reason is that since the SM should get the GUID parameter to decide which port it works on, setting it in setup will lead it to work only for first port and not for others. In order to run OpenSM as a service, assuming the package was installed in default path, use:

```
sc create opensm binPath= "c:\Program Files\Mellanox\MLNX_VPI\IB\Tools\opensm.exe"

To start the service run: sc start opensm
```

For further information, please refer to the “OpenSM - Subnet Manager” chapter in the User Manual.

7 Uninstalling MLNX_WinOF

7.1 Attended Uninstall

To uninstall MLNX_WinOF on a single node, perform one of the following options:

1. Click Start-> Control Panel-> Programs and Features-> MLNX_WinOF-> Remove. (NOTE: This requires elevated administrator privileges – see Section 1.1.2, "Supported Network Adapter Cards," on page 4 for details.)
2. Double click the .exe and follow the instructions of the install wizard.
3. Click Start-> All Programs-> Mellanox Technologies-> MLNX_WinOF-> Uninstall MLNX_WinOF.

7.2 Unattended Uninstall

To uninstall MLNX_WinOF in unattended mode, perform the following:

Step 1 Open a CMD console

Step 2. Enter the following command:

```
MLNX_VPI_win8_x64_4_2.exe /S /x /v"/qn"
```

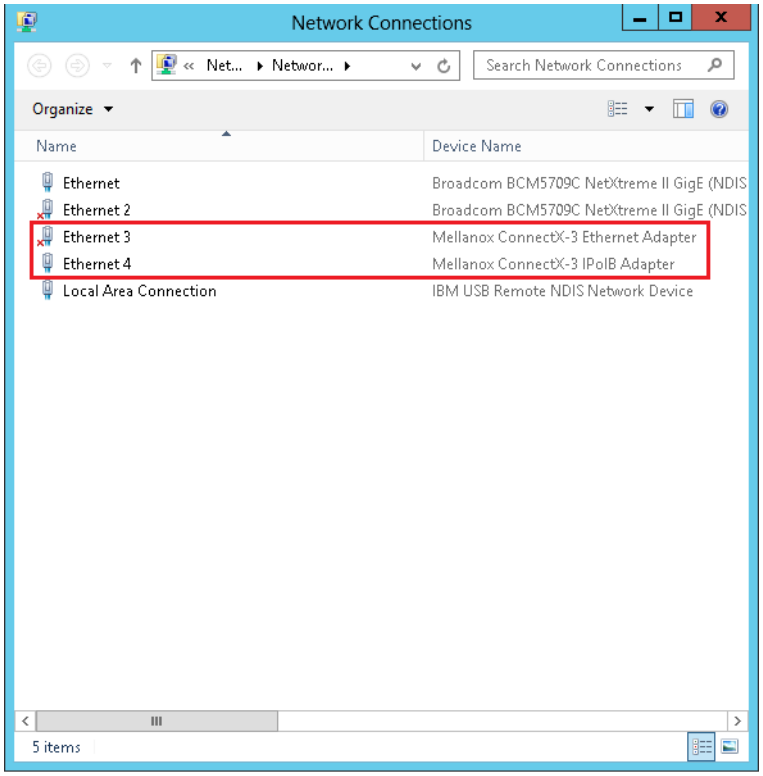
For all command options, enter 'MLNX_VPI_WinOF-4_2_0_win8_x64.exe'.

8 Assigning Port IP After Installation

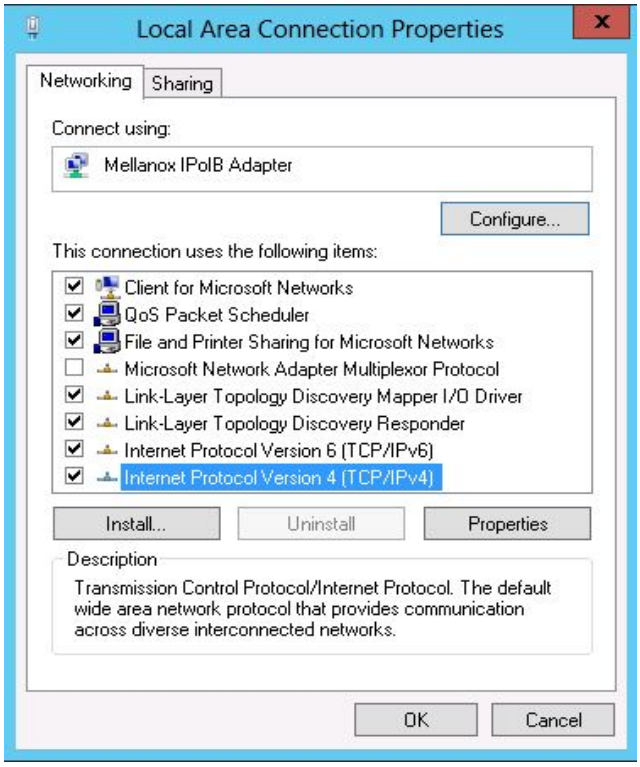
By default, your machine is configured to obtain an automatic IP address via a DHCP server. In some cases, the DHCP server may require the MAC address of the network adapter installed in your machine. To obtain the MAC address, open a CMD console and enter the command ‘ipconfig /all’ ; the MAC address is displayed as “Physical Address”.

Configuring a static IP is the same for both IPoIB and Ethernet adaptors. To assign a static IP addresses to a network port after installation, perform the following steps:

Step 1 Open the Network Connections window. Locate Local Area Connections with Mellanox devices.

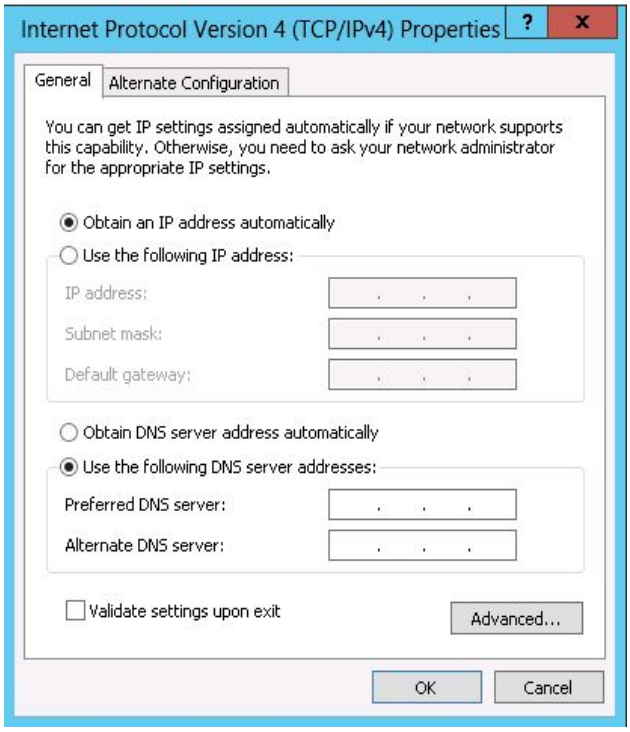


Step 2. Right-click a Mellanox Local Area Connection and left-click Properties.



Step 3. Select Internet Protocol Version 4 (TCP/IPv4) from the scroll list and click Properties.

Step 4. Select the "Use the following IP address:" radio button and enter the desired IP information. Click OK when you are done.



Step 5. Close the Local Area Connection dialog.

Step 6. Verify the IP configuration by running ‘ipconfig’ from a CMD console.

```
> ipconfig
...
Ethernet adapter Local Area Connection 4:

   Connection-specific DNS Suffix  . :
   IP Address. . . . . . . . . . . . : 11.4.12.63
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . :
...
```

9 Booting Windows from an iSCSI Target

9.1 Configuring the Target Machine

To configure target machine, perform the following steps:

1. Install Mellanox VPI drivers
2. Install an iSCSI Target software e.g StartWind
3. Select the desired port for the iSCSI deployment
4. Assign static IP address (e.g. 11.4.12.65)
5. Add DHCP role and bind it to the iSCSI deployment port
6. (Recommended) Add DHCP options:
   a. Go to DHCP console (Administrative tools -> DHCP) and right click Scope Options
      1. Choose Configure Options
      2. Check the 017 Root Path option
      3. Enter your root-path in the String value field

      Assuming the target IP is: 11.4.12.65

      Target Name: iqn:2011-01:iscsiboot

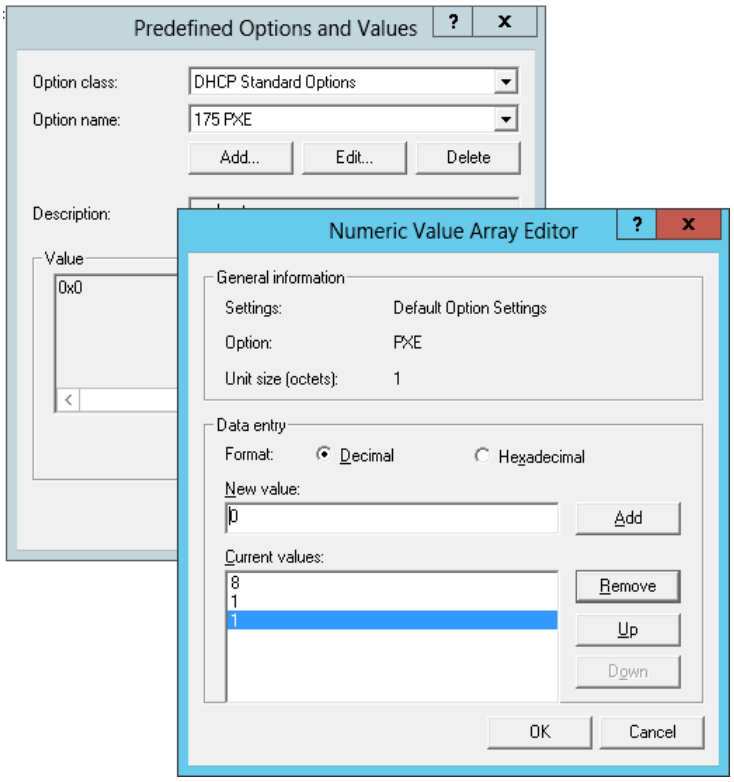
      The root path should be: iscsi:11.4.12.65::::iqn:2011-01:iscsiboot
   b. Go to DHCP console (Administrative tools -> DHCP) and right click your IP protocol (IPv4/IPv6)
      1. Choose Set Predefined Options
      2. Click Add
      3. Fill in the Option Type as follow:

      Option Name: pxe

      Code: 175

      Description: sanboot

      Select Array
      4. Click OK
      5. Choose Edit Array
      6. Remove the existing number and add 1, 1, 8. After each number click Add
      7. Click OK



8. Go to Scope Options and choose Configure Options
9. Select Add Option 175

This method is fully supported for Ethernet drivers, but not supported for IPoIB in Windows VPI Rev 4.2.

9.2 Configuring the Client Machine

1. Prior to configuring your client, verify the following:
   a. The card is burned with the correct Mellanox FlexBoot version

      For Ethernet you need to burn the card (if the machine is connected back to back to target) with Ethernet FlexBoot. Otherwise use the VPI FlexBoot
   b. The Mellanox card is burned with the correct FW for your system
2. Change BIOS settings and change boot order to:
   - MLNX NIC
   - CD-ROM
3. Unplug the machine's Hard Disk
4. Prepare the drivers' package and copy it into a USB
   a. For Ethernet make sure you have

- Mlx4_bus driver package
- Mlx4eth6 driver package

  Go to www.mellanox.com > Products > Adapter IB/VPI SW > Windows SW/Drivers to download drivers.

b. For IPoIB make sure you have

- Mlx4_bus driver package
- IPoIB driver package

9.3 Installing iSCSI

1. Insert the setup CD-ROM and reboot
2. During system start up, invoke Mellanox PXE network boot (Flexboot) and enter the Flexboot CLI by pressing the CTRL+B following the "Initializing Devices" message.
   For further information, please refer to Flexboot User Manual, CLI chapter.
3. Type "dhcp net0" in case of booting with port#1 or "dhcp net1" in case of port#2.
4. Type "sanboot ${root-path}"
5. The first time the machine tries to connect and boot from the iSCSI disk it fails and the following message is displayed: "not an executable image (0x2e852001)". The message can be safely ignored as the machines has successfully been connected to the target, just the disk is yet unbootable.
6. Type "exit"
7. The windows install process will start from the CD-ROM
8. Press "Install Now" to start the windows installation.
9. Choose the desired windows server
10. Press Custom
11. Click Load Driver and supply the driver package (according to ETH or IB). For Ethernet driver, perform the following:
    a. Click Load Driver
    b. Click Browse
    c. Go to the directory with the file mlx4_bus.inf and select it.
    d. Click Next
    e. Click Load Driver
    f. Click Browse
    g. Go to the directory with the mlx4eth6.inf, and select it. (An adapter card called "Mellanox ConnectX 10Gb Ethernet Adapter" should be displayed

12. Choose the new disk: "disk 1 unallocated space 11.7G"
13. Click Next

For more information please refer to:

http://technet.microsoft.com/en-us/library/ee619733(WS.10).aspx

For more details on how to boot from a SAN using a Mellanox adapter card, please refer to:

http://www.etherboot.org/wiki/sanboot.