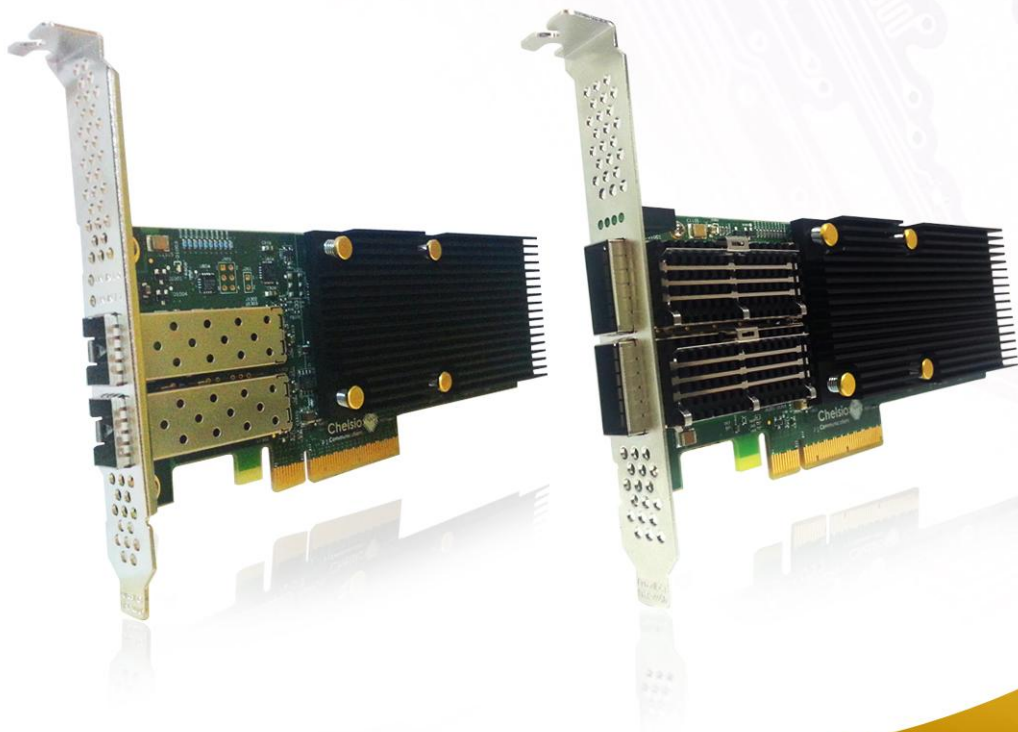




# Chelsio T5/T4 Unified Wire for Windows

## Installation and User's Guide



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## Version History

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1.0.0	10/10/2011
1.0.1	10/18/2011
1.0.2	10/25/2011
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1.1.0	06/24/2013
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1.1.2	07/23/2013

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## I. Chelsio Unified Wire

---

## 1. Introduction

Thank you for choosing Chelsio T5/T4 Unified Wire adapters. These high speed, single chip, single firmware cards provide enterprises and data centers with high performance solutions for various Network and Storage related requirements.

The Terminator 5 (T5) is Chelsio's next generation of highly integrated, hyper-virtualized 40/10GbE controllers. The T5 is built around a programmable protocol-processing engine, with full offload of a complete Unified Wire solution comprising NIC, TOE, iWARP RDMA, iSCSI, FCoE and NAT support. It scales true 40Gb line rate operation from a single TCP connection to thousands of connections, and allows simultaneous low latency and high bandwidth operation thanks to multiple physical channels through the ASIC.

The T4 adapters can fully offload TCP, UDP, iSCSI, iWARP and FCoE over a single Unified Wire. The adapters also fully support SR-IOV, EVB/VNTag, DCB, Traffic Management and Filtering.

Ideal for all data, storage and high performance clustering applications, the T5/T4 Adapters enable a unified fabric over a single wire by simultaneously running all unmodified IP sockets, Fibre Channel and InfiniBand applications over Ethernet at line rate.

Designed for deployment in virtualized data centers, cloud service installations and high performance computing environments, Chelsio T5/T4 adapters bring a new level of performance metrics and functional capabilities to the computer networking industry.

### 1.1. Features

---

Chelsio's Unified Wire is an easy to use wizard that lets you install Chelsio's Ethernet and iSCSI drivers and Unified Wire Manager with a few mouse clicks. The interactive installer has been developed for both novice and advanced users.

The Unified Wire Installer installs the following Chelsio drivers and software:

- **T5/T4 NDIS function driver**
- **T5/T4 iSCSI Storport Miniport driver**
- **T5/T4 FCoE Storport Miniport driver**
- **Unified Wire Manager (UM)**

Please refer to their respective sections for more information.

 **Note** *Chelsio T5/T4 NDIS function driver supports NIC, NDK and ND functionalities.*

## 1.2. Hardware Requirements

---

The Chelsio T5/T4 Unified Wire supports all x86 (i386) architectures supporting PCIE (x4, x8) slots.

- AMD CPUs, 32-bit and 64-bit (x86/x86\_64/amd64)
- Intel CPUs, 32-bit and 64-bit (x86/x86\_64)

**Note** *The Chelsio Unified Wire supports 3.3v PCI bus only. Running an adapter on a PCI x4 slot is not recommended as performance will be significantly reduced by the limitations of PCI.*

## 1.3. Software Requirements

---

The Chelsio T5/T4 Unified Wire software has been developed to run on Windows based platforms. To know more about the complete list of versions supported by each driver/software, please refer to their respective sections.

## 1.4. Package Contents

---

Chelsio T5/T4 Unified Wire Software package comes with an interactive installer and support documentation. The documentation, consisting of README, Release Notes and User's Guide (this document), can be found in the <system\_drive>\ChelsioT4\docs\ directory after installing Chelsio Unified Wire.




## 2. Hardware Installation

1. Shutdown/power off your system.
2. Power off all remaining peripherals attached to your system.
3. Unpack the Chelsio adapter and place it on an anti-static surface.
4. Remove the system case cover according to the system manufacturer's instructions.
5. Remove the PCI filler plate from the slot where you will install the Ethernet adapter.
6. For maximum performance, it is highly recommended to install the adapter into a PCIE x8 slot.
7. Holding the Chelsio adapter by the edges, align the edge connector with the PCI connector on the motherboard. Apply even pressure on both edges until the card is firmly seated. It may be necessary to remove the SFP (transceiver) modules prior to inserting the adapter.
8. Secure the Chelsio adapter with a screw, or other securing mechanism, as described by the system manufacturer's instructions. Replace the case cover.
9. After securing the card, ensure that the card is still fully seated in the PCIE x8 slot as sometimes the process of securing the card causes the card to become unseated.
10. Connect a fiber cable, multi-mode for short range (SR) optics or single-mode for long range (LR) optics, to the 40/10Gb Ethernet adapter or regular Ethernet cable for the 1Gb Ethernet adapter.
11. Power on your system.
12. Verify if the adapter was installed successfully. To do so, open **Device Manager** in **Control Panel**.
13. Under **Other devices** section, Chelsio adapter should be listed as **Ethernet Controller**. If the adapter is not listed, right-click on the system name or click on the **Actions** menu and select **Scan for hardware changes**

For Chelsio adapters, the physical functions are currently assigned as:

- Physical functions 0 - 3: for the SR-IOV functions
- Physical function 4: for all NIC functions of the card
- Physical function 5: for iSCSI
- Physical function 6: for FCoE
- Physical function 7: Currently not assigned

14. Once the Unified Wire package is installed, open **Device Manager** again. Expand **Network adapters** section and now Chelsio adapter should be listed.

 **Note** *Network device names for Chelsio's physical ports are assigned using the following convention: the port farthest from the motherboard will appear as the first ethernet network interface. However, for T580-LP-CR and T420-BT adapters, the association of physical ethernet ports and their corresponding network device names is opposite. For these adapters, the port nearest to the motherboard will appear as the first network interface.*

## 3. Software/Driver Installation

The following section explains the installation procedure for Chelsio Unified Wire drivers along with Unified Manager (UM).

### 3.1. Pre-requisites

---

#### 3.1.1. Unified Wire Installer

Please download and install the latest Microsoft Visual C++ Redistributable Packages for Visual Studio (x86 and x64) before running the installer.

#### 3.1.2. Unified Wire Manager

Chelsio Unified Wire Installer has been designed to install Unified Wire Manager (UM) along with other drivers by default. Based on the Windows version running on the system, the three UM components, i.e. Management Agent, Client and Station, will be installed and hence no separate installation is required. If an older version of UM exists, the Installer will upgrade it to the current version.

Please ensure that the following requirements are met, before proceeding with the installation.

#### 3.1.3. Management Agent

If you wish to install Management Agent, please make sure that **Microsoft .Net Framework 3.5** is installed before proceeding with the installation

#### 3.1.4. Management Station

If you wish to install Management Station, please make sure that the following requirements are met before proceeding with the installation:

1. Install **Python 2.6.6 (32-bit)**.
2. Ensure that the path to python binary (typically "C:\Python26"), is added to PATH system variable.
3. Install **Apache HTTP Server 2.2** with SSL
4. If the Apache Server is running, it should be stopped before starting the installation process.



*This release of Chelsio Unified Wire doesn't support the Web-based management station (Web GUI) component. Please use the CLI client to manage and configure agents.*

## 3.2. Installing Unified Wire

Before proceeding, please uninstall any previous versions of Unified Wire using “Programs and Features” in the Control Panel or installer application of the installed version.

1. Run the **ChelsioUwire-x.x.x.x.exe** installer application.
2. Click the **Next** button for the Chelsio End User License Agreement Window.

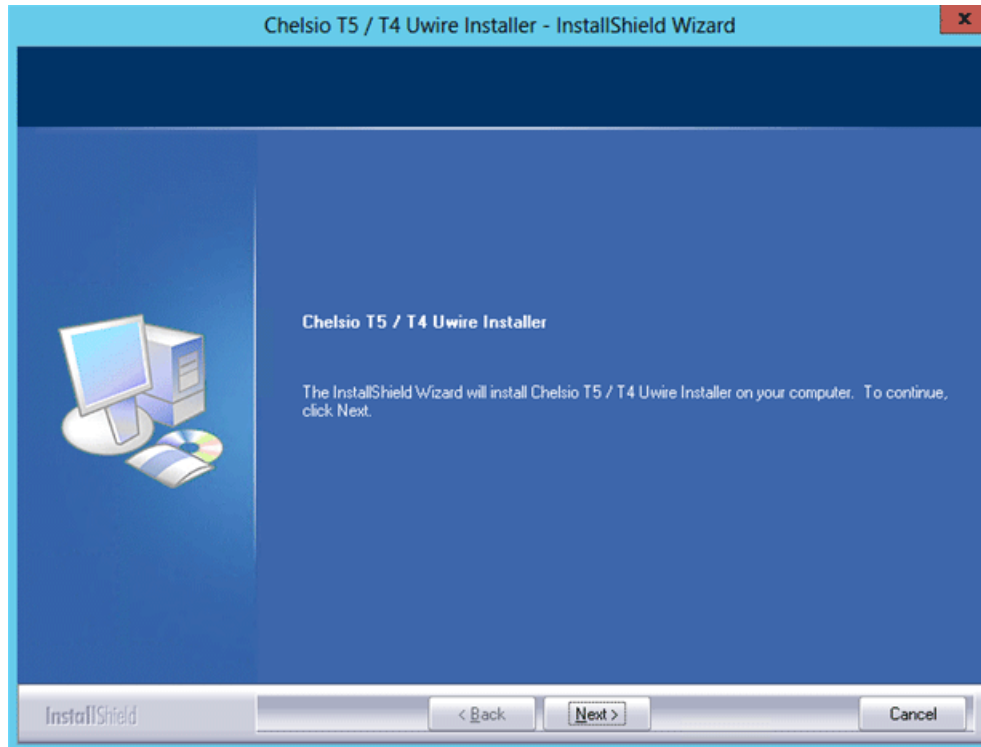


Figure 3.2 (a) – Unified Wire Installer welcome window

3. Select the radio button **I accept the terms of the license agreement** and click **Next**.

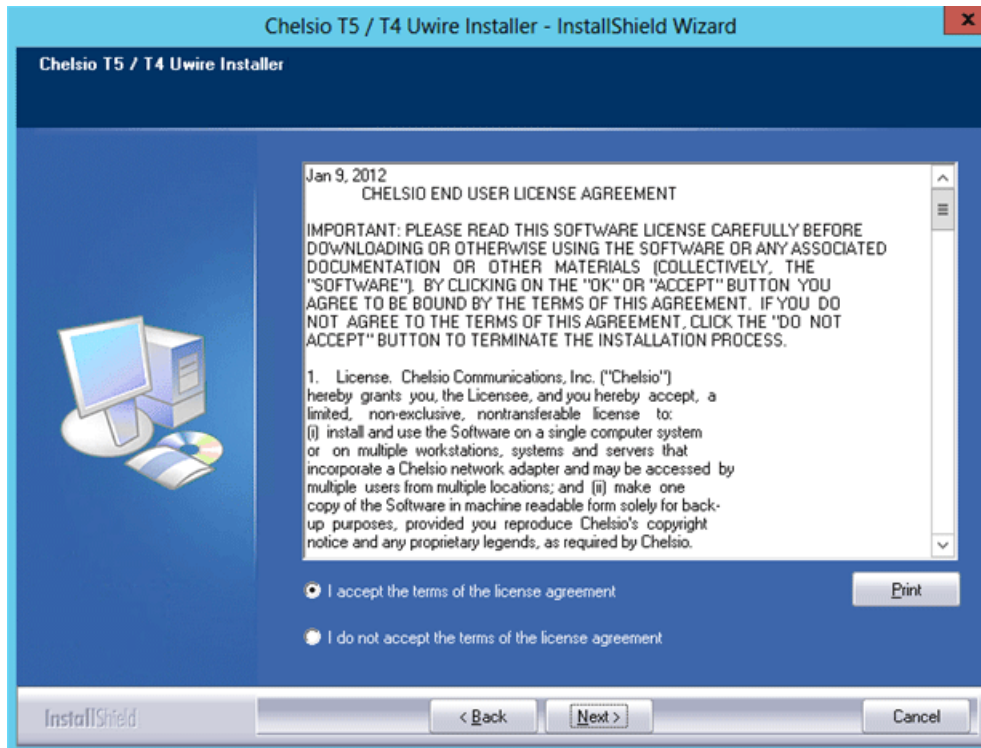
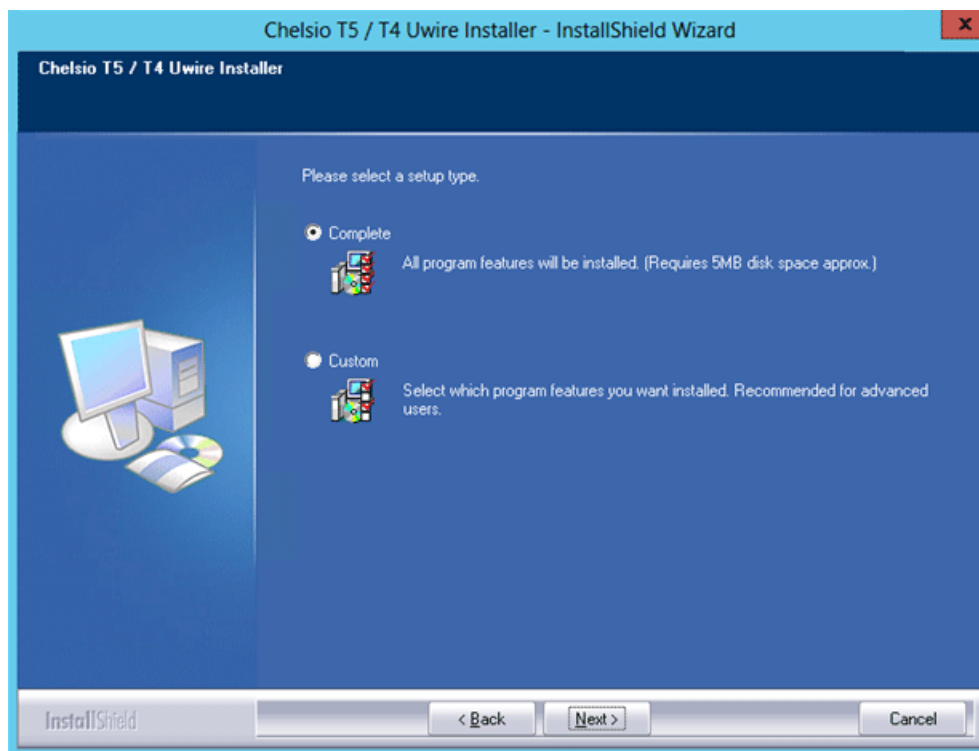


Figure 3.2 (b) – Chelsio EULA window

4. Now, either select **Complete** for complete package installation or else select **Custom** radio button to customize the installation.



*Figure 3.2 (c) – Select setup (installation) type*

- i. If you select **Custom**, you can choose whether to install iSCSI or FCoE driver. Please note that Chelsio Ethernet Driver (NIC and VBD) is required for iSCSI driver to work.

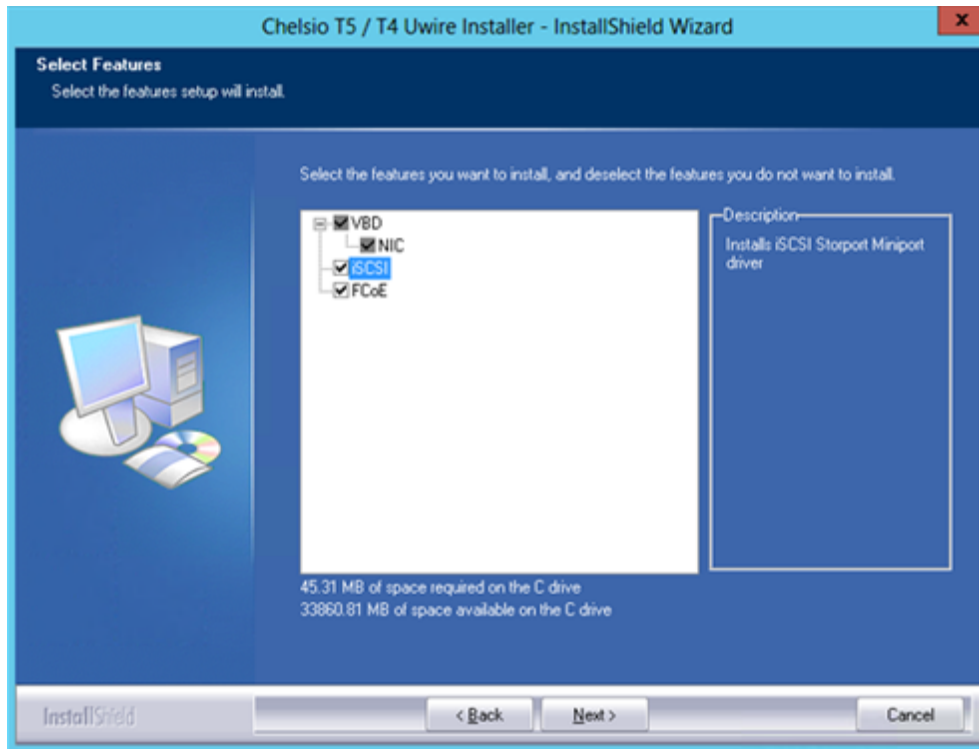
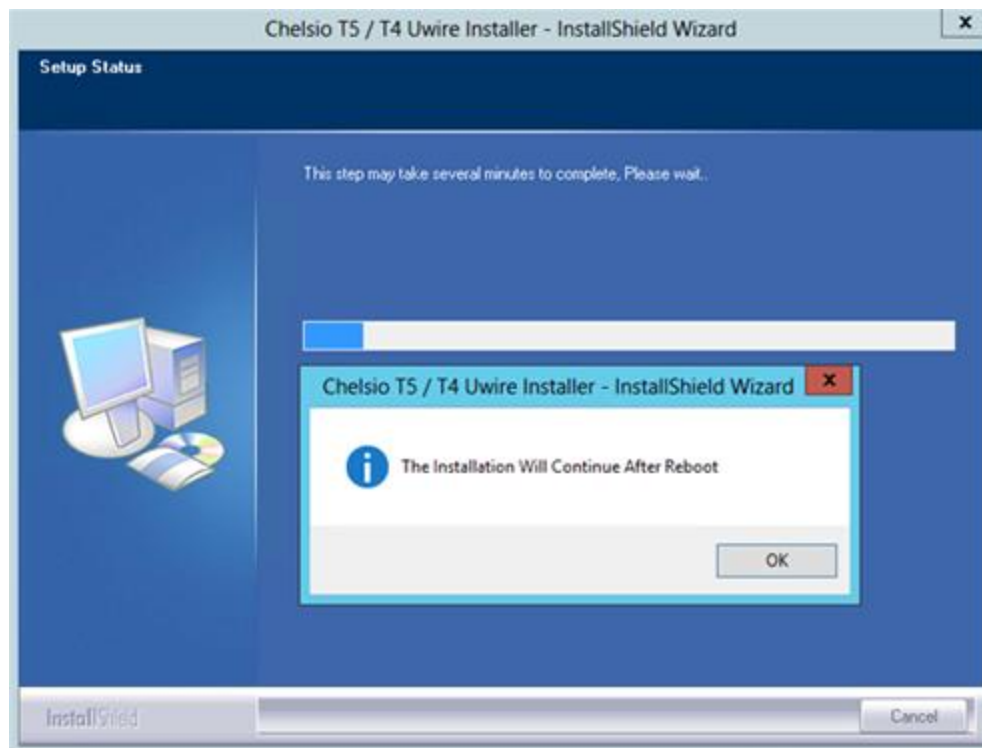


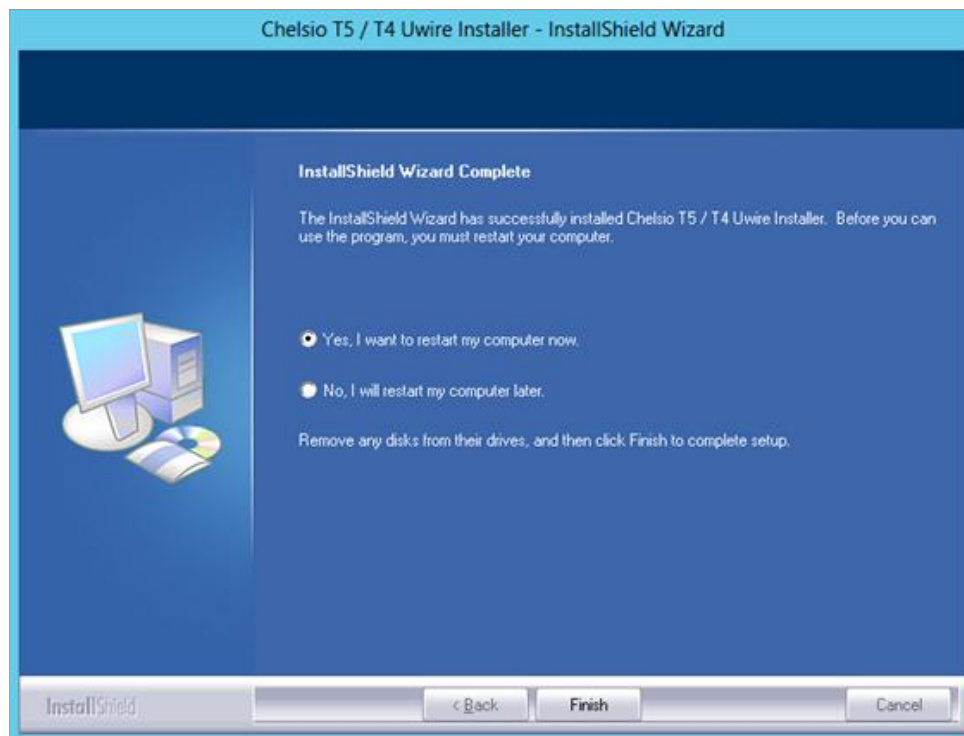
Figure 3.2 (d) – Customizing the installation

5. This step will enable test signing on the system and will appear only during first installation. If you have already run the installer before, you can skip to step 7. If not, click **OK**.



*Figure 3.2 (e) – Enabling Test-Signing*

6. Select **Yes, I want to restart my computer now** and then click **Finish**. The system will restart and installation will continue.



*Figure 3.2 (f) – Restart the system*



7. Selected drivers will now be installed.

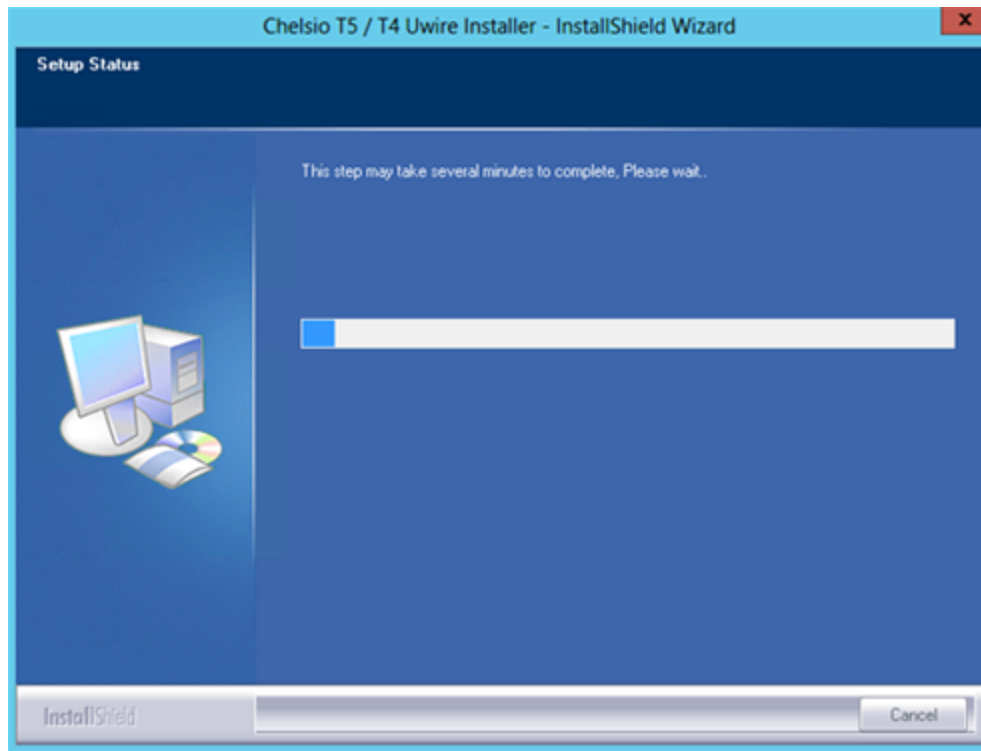


Figure 3.2 (g) – Installing drivers

8. Click on **Install this driver software anyway** when a Windows Security prompt appears.

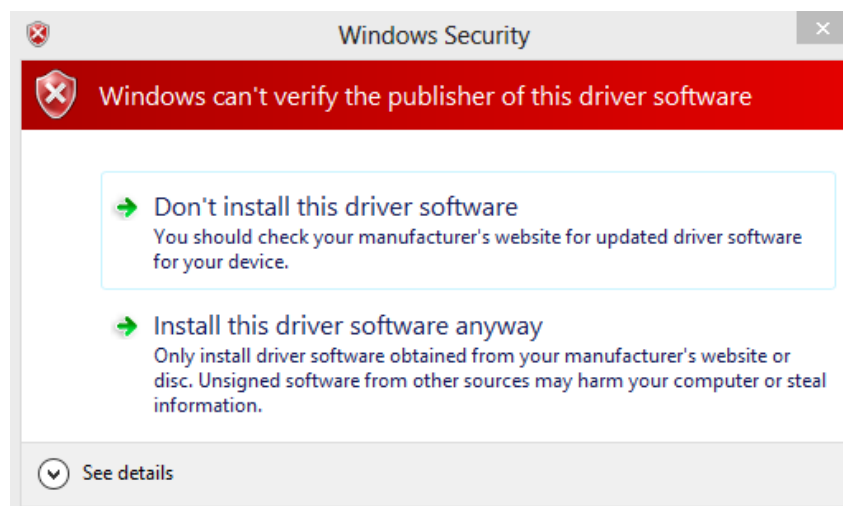
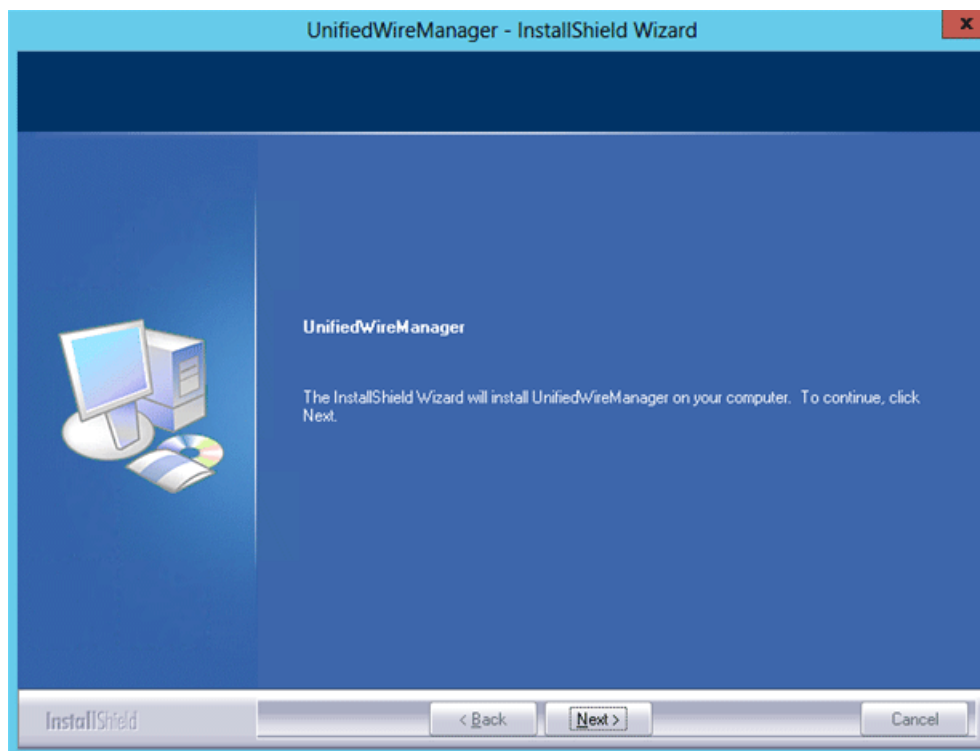


Figure 3.2 (h) – Windows Security prompt

**Note** The Windows Security prompt may appear more than once. Select **Install this driver software anyway** to continue installation.

9. After successful installation of driver(s), the Unified Wire Manager installer will be invoked. Click the **Next** button for the Chelsio End User License Agreement Window.



*Figure 3.2 (i) – UM installer welcome window*

10. Select the radio button **I accept the terms of the license agreement** and click **Next**.

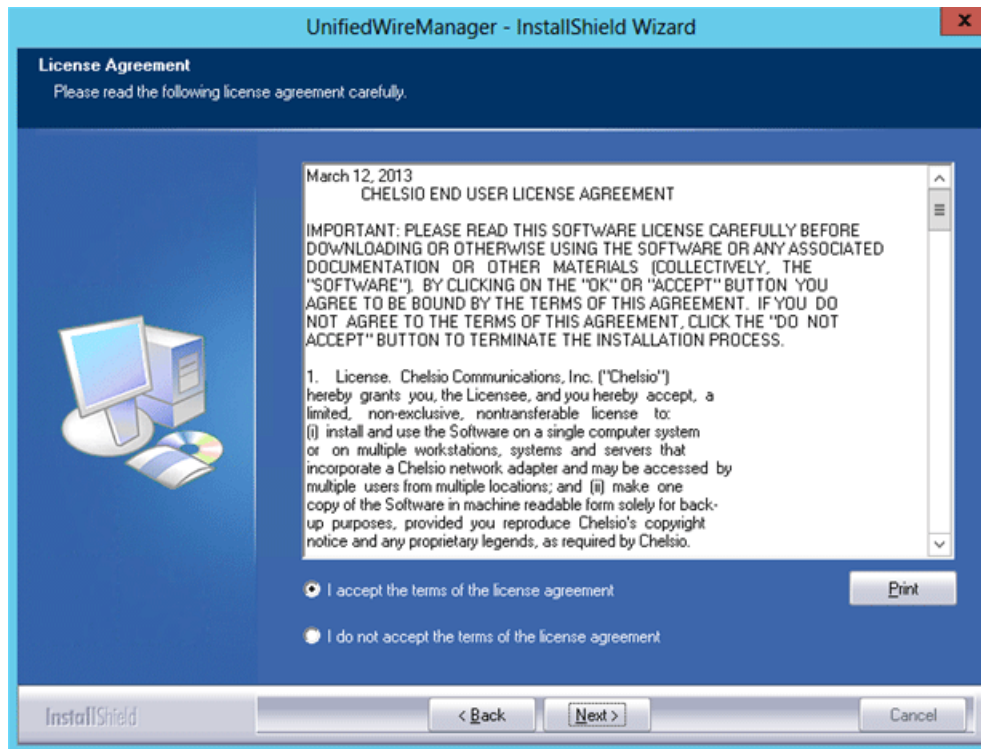


Figure 3.2 (j) – Chelsio EULA window

11. The next window will display the pre-requisites for various UM components. Ensure that they are met before proceeding. Click **Next**.

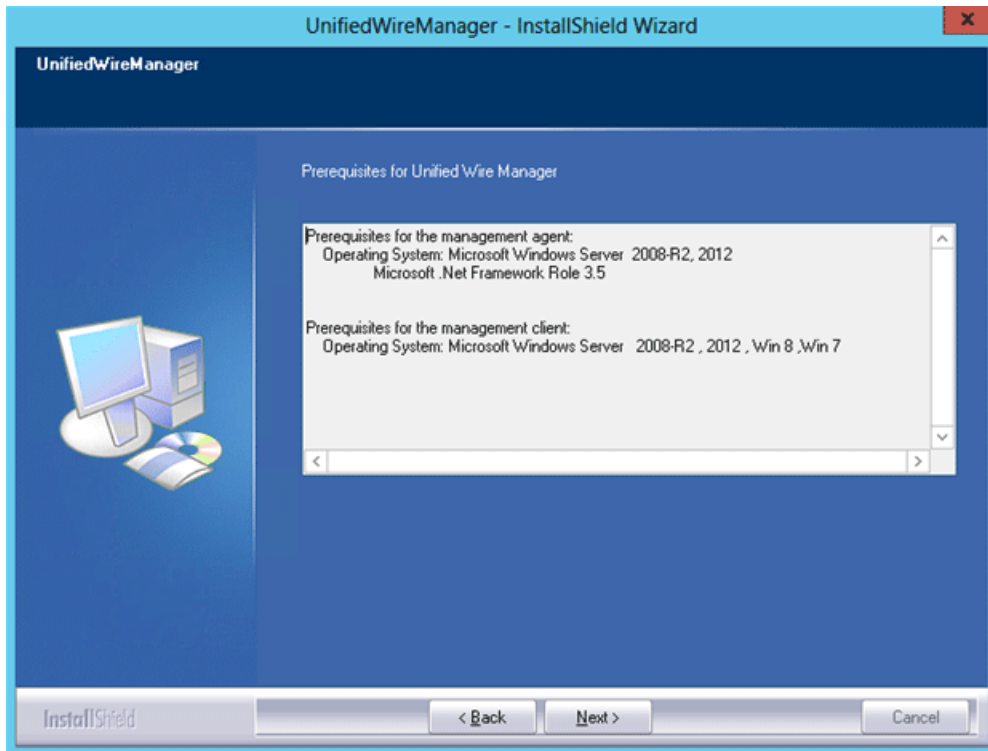
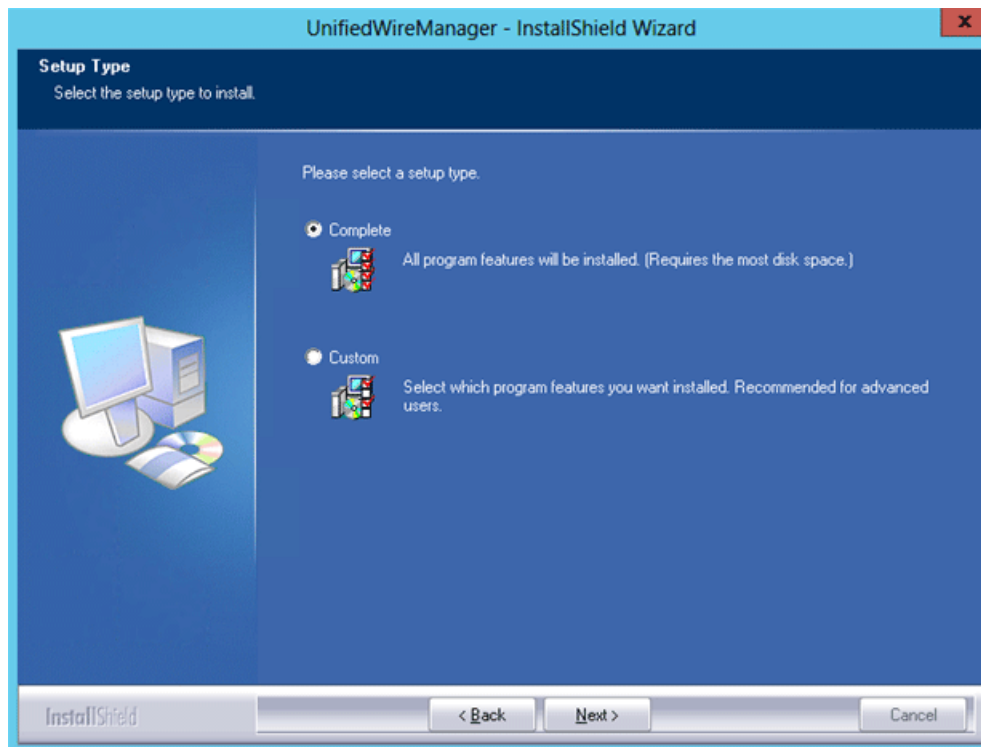


Figure 3.2 (k) – UM prerequisites window

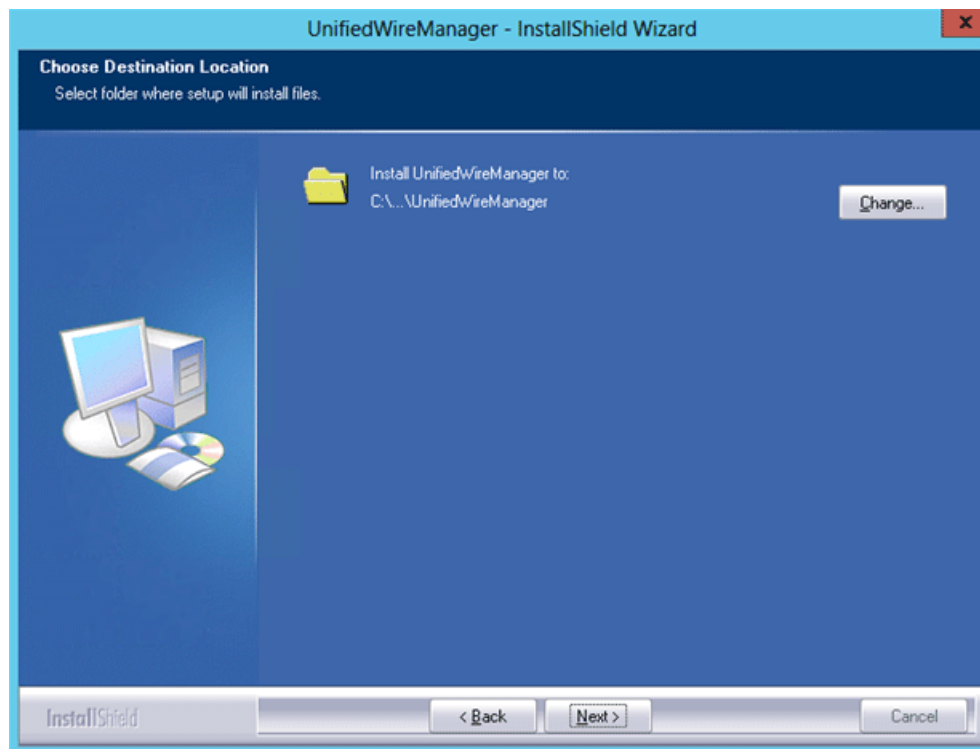
**Note** *If prerequisites mentioned are not met, installation of UM will fail. Driver installation will however continue.*

12. Now, either select **Complete** for complete package installation or else select **Custom** radio button to customize the installation. Click **Next**.



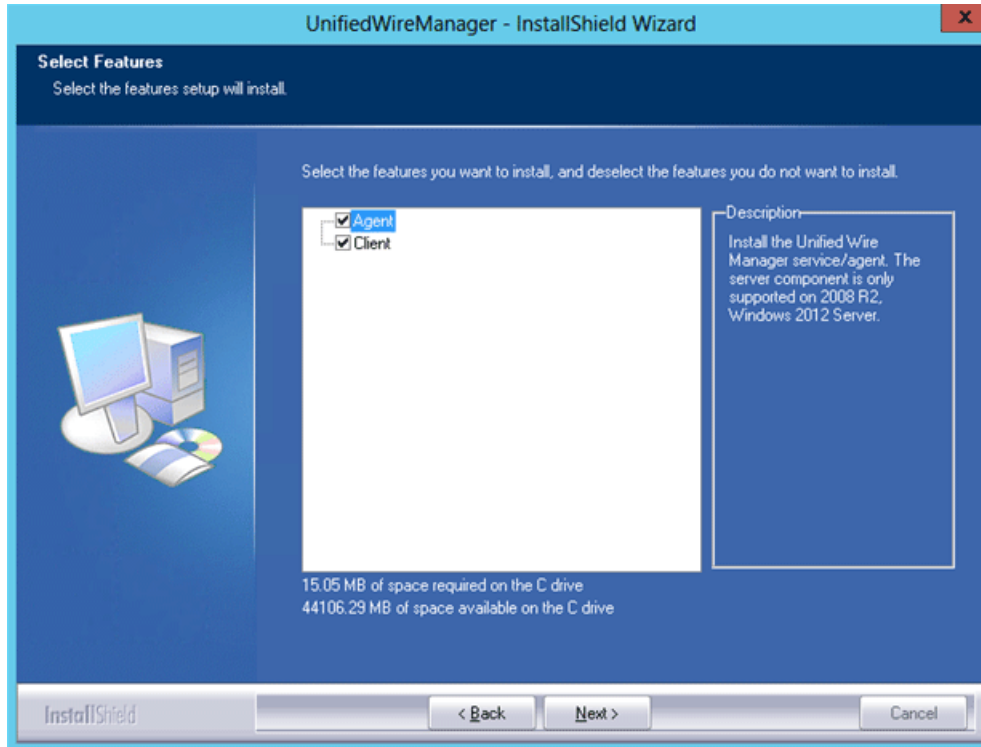
*Figure 3.2 (I) – Select setup (installation) type*

- i. If you selected **Custom**, the next window will display the location where UM will be installed by default. You can change the location by using the **Change** button or click **Next** to continue with the default path.



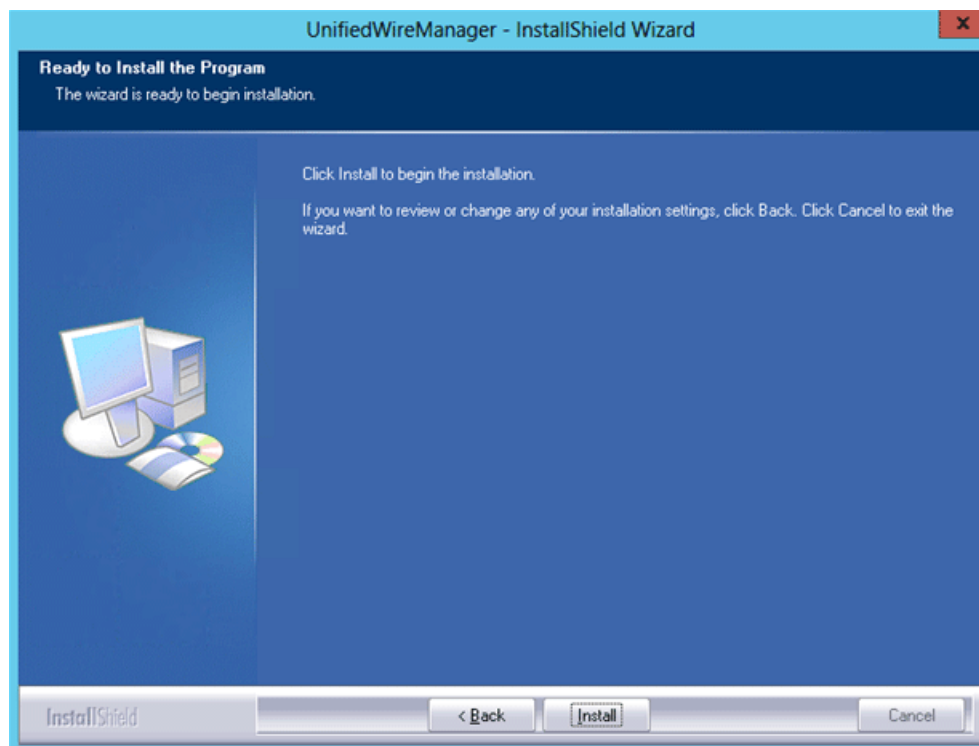
*Figure 3.2 (m) – Changing UM installation path*

- ii. Next, you can choose the UM components you wish to install. Deselect the components you don't wish to install and click **Next**.



*Figure 3.2 (n) – Selecting UM components to install*

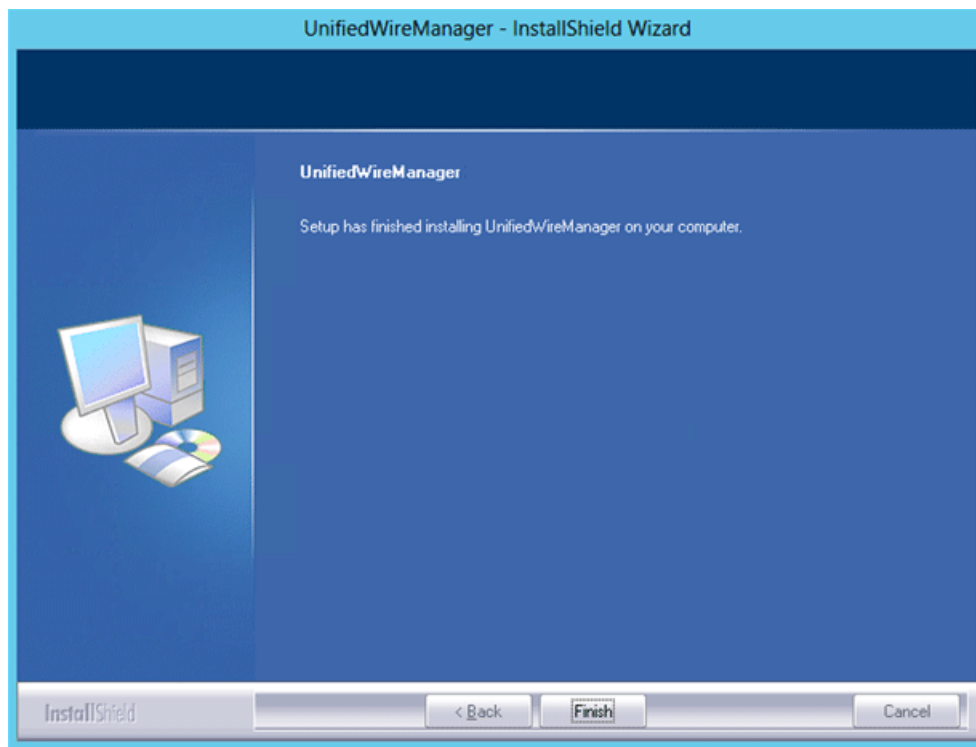
13. Click **Install** to start the installation. Unified Wire Manager will now be installed with the selected options.



*Figure 3.2 (o) – Starting UM installation*

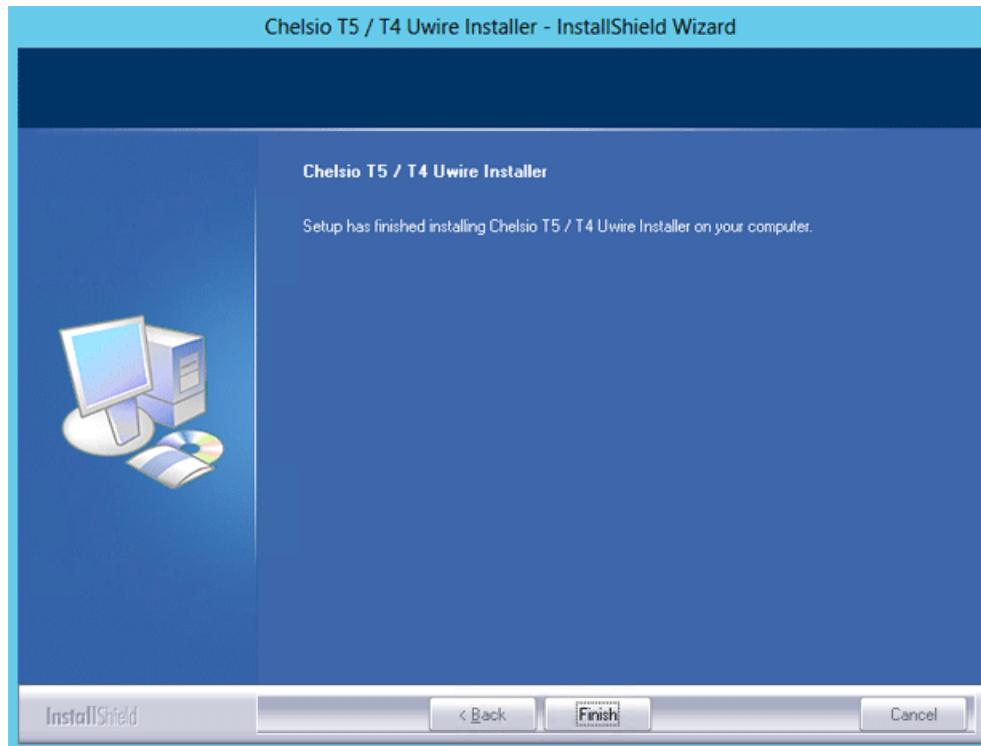


14. Select **Finish** to exit the UM Installer.



*Figure 3.2 (p) – Finishing UM installation*

15. Click **Finish** to exit from the Unified Wire Installer.



*Figure 3.2 (g) – Finishing Unified Wire installation*

## 4. Firmware Update

The driver will auto-load the T5 and T4 firmwares if an update is required. The firmware version can be verified using *cxgbtool*:

```
C:\Users\Administrator> cxgbtool nic0 version
```

## 5. Software/Driver Uninstallation

1. Run the **ChelsioUwire-x.x.x.x.exe** application.
2. Select **Modify** to add or remove features. Select **Repair** to repair the previous installation. Select **Remove** to uninstall the application. After you have selected the appropriate option, click **NEXT**.

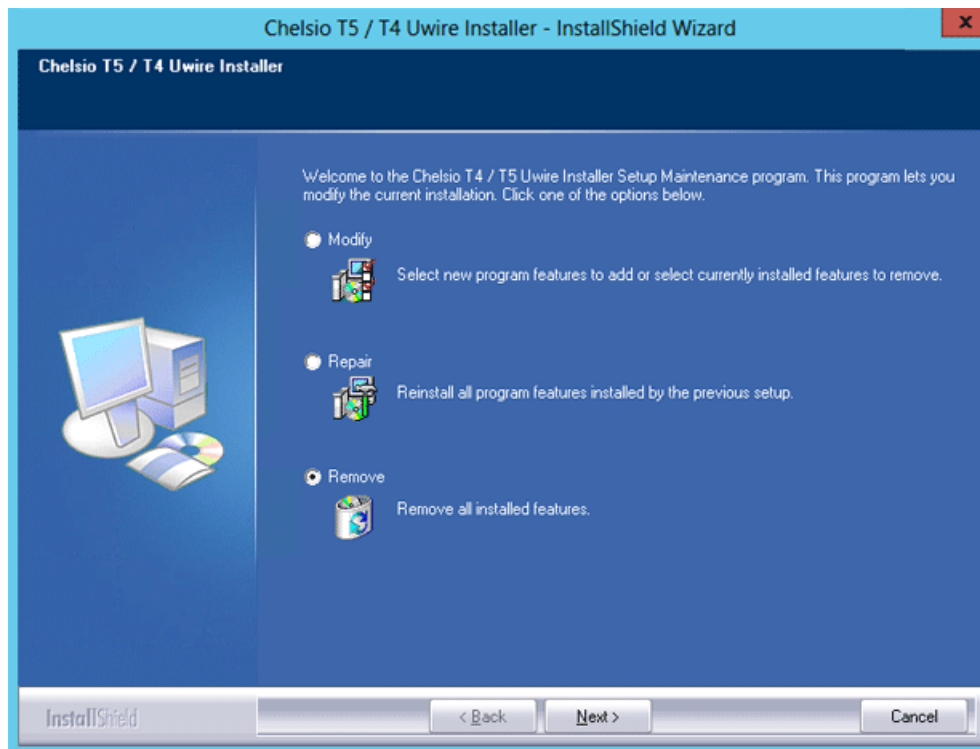


Figure 5 (a) – Selecting maintenance option

3. Click on the **Finish** button to exit from the installer.

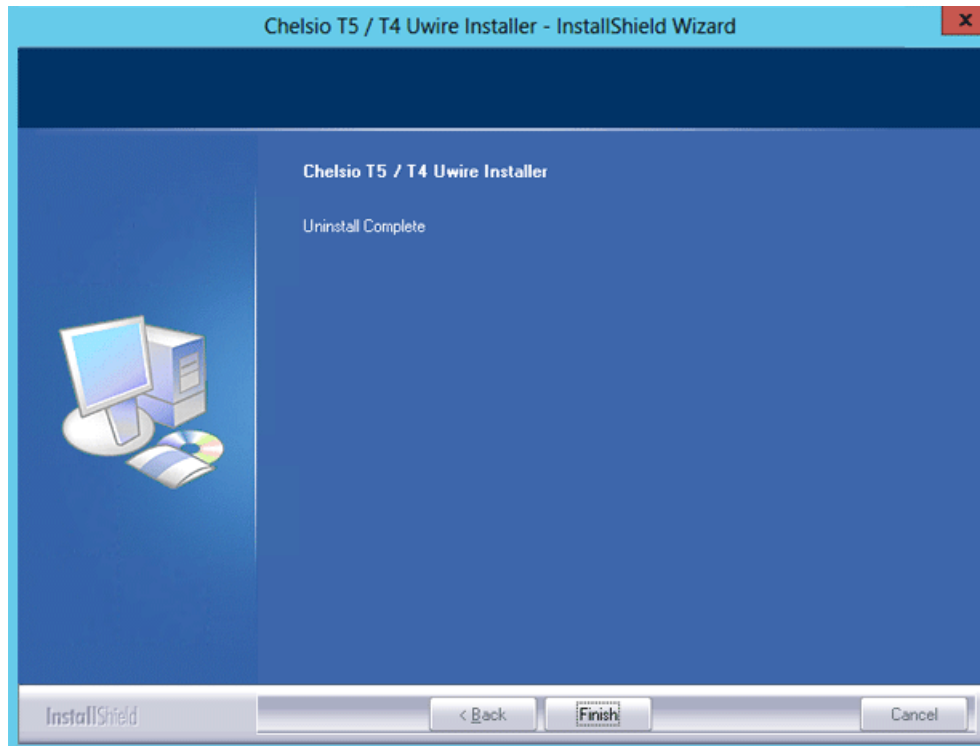


Figure 5 (b) – Finishing uninstallation

- Note** You can un-install the driver using the installer only if you have installed the driver using it.
- Note** Uninstalling Unified Wire package using the above method will not uninstall Unified Wire Manager. You will have to manually uninstall it using “Programs and Features” in the Control Panel.

## 6. Software/Driver Update

For any distribution specific problems, please check README and Release Notes included in the release for possible workaround.

Please visit Chelsio support web site <http://service.chelsio.com/> for regular updates on various software/drivers. You can also subscribe to our newsletter for the latest software updates.

## II. NDIS Function

## 1. Introduction

Chelsio's T5/T4 series of Unified Wire Adapters provide extensive support for NIC operation, including all stateless offload mechanisms for both IPv4 and IPv6 (IP, TCP and UDP checksum offload, LSO - Large Send Offload aka TSO - TCP Segmentation Offload, Network Direct and assist mechanisms for accelerating LRO - Large Receive Offload).

### 1.1. Hardware Requirements

---

#### 1.1.1. Supported Adapters

The following are the currently shipping Chelsio Adapters that are compatible with Chelsio NDIS driver:

- T580-LP-CR
- T520-LL-CR
- T520-SO-CR\*
- T520-CR
- T540-CR
- T420-CR
- T440-CR
- T422-CR
- T420-SO-CR\*
- T404-BT
- T440-LP-CR
- T420-BT
- T420-LL-CR
- T420-CX

\* Network Direct Functionality not supported

### 1.2. Software Requirements

---

#### 1.2.1. Windows Requirement

Currently Chelsio T5/T4 NDIS Function driver is available for Windows Server 2012.



## 2. Software/Driver Configuration and Fine-tuning

### 2.1. Assigning IP address to the Chelsio Network Adapter

1. Double click on the Network Connections icon and choose the Chelsio card entry and double click it.
2. Click on the Properties button from the Local Area Connection X Status.
3. Select "Internet Protocol (TCP/IP)" from the list and click on Properties button below it.
4. From the Internet Protocol (TCP/IP) Properties window, assign an IP Address (e.g. 192.169.1.10) and subnet mask (e.g. 255.255.255.0).
5. Click on Ok and close on the other window.
6. Check to see if you can ping to some other address on this subnet.

### 2.2. Advanced Configuration

The Chelsio Network driver provides advanced configuration options under the Device Properties. In the Network Connections window, select the Chelsio Adapter's Local Area Connection interface (right-click -> properties). Click the **Configure** button.

#### 2.2.1. VBD Driver Parameters

To see all tunable VBD driver parameters, open the **Device Manager** (Start > Control Panel -> System & Security-> System -> Device Manager), click on the **System Devices**, double click on the **Chelsio T5/T4 40G/10G Bus Enumerator**, and then click the **Advanced** tab.

- **Max VMQueues:**
  - *Description:* Specifies the maximum number of virtual machine queues.
  - *Value:* 0-16
  - *Default:* 4
- **Nic Port x:**
  - *Description:* Enables/Disables the Nic port x.
  - *Value:* Enabled | Disabled
  - *Default:* Enabled
- **Port x Speed & Duplex:**
  - *Description:* Specifies the Port x operation speed and mode.
  - *Value:*
    - 100Mbs/Full Duplex
    - 1Gbps/Full Duplex
    - Auto Detect
  - *Default:* Auto Detect



*This parameter is valid only for 1G port. User can specify any of the above 1G or 100M full duplex modes. If Auto-Detect is selected, the 1G port will do auto-negotiation.*

- **iScsi Port x:**

- *Description:* Enables/Disables the iScsi port x.
- *Value:* Enabled | Disabled
- *Default:* Disabled

### 2.2.2. NDIS Miniport Driver Parameters

To see all tunable NDIS Miniport Driver parameters, open the **Device Manager** (Start > Control Panel -> System & Security-> System -> Device Manager), click on the **Network adapters**, double click on any **Chelsio Network Adapter**, and then click the **Advanced** tab.

- **Flow Control:**

- *Description:* Enable or disable the receipt or transmission of PAUSE frames. If Rx is enabled, all incoming PAUSE frames will be honored. If Tx is enabled, the HW will send PAUSE frames when its MAC Rx FIFO usage is beyond a high-watermark. If Disabled option is selected, no PAUSE will be sent. When Rx MAC FIFO gets full, further ingress packets will be dropped. If Rx & Tx Enabled is selected, both Rx and Tx options will be enabled.
- *Value:*
  - Disabled
  - Rx & Tx Enabled
  - Rx Enabled
  - Tx Enabled
- *Default:* Rx & Tx Enabled

- **IPv4 Checksum Offload:**

- *Description:* Allows the checksum to be computed by the adapter for IPV4 packets.
- *Value:*
  - Disabled
  - Rx & Tx Enabled
  - Rx Enabled
  - Tx Enabled
- *Default:* Rx & Tx Enabled

- **Jumbo Packet (Maximum Transmission Unit):**

- *Description:* Specifies the Maximum Transmission Unit (MTU) value.
- *Value:* 1500-9000
- *Default:* 1500

- **Large Send Offload V2 (IPv4):**
  - *Description:* Allows for configuring Large Send Offload (LSO) using version 2 for the IPv4 traffic.
  - *Value:* Enabled | Disabled
  - *Default:* Enabled
- **Large Send Offload V2 (IPv6):**
  - *Description:* Allows for configuring Large Send Offload (LSO) using version 2 for the IPv6 traffic.
  - *Value:* Enabled | Disabled
  - *Default:* Enabled
- **Locally Administered Address:**
  - *Description:* Specifies a new MAC address for the port. If Not Present, the default MAC from EEPROM is used. If specified, the new MAC overwrites the default MAC. This specified MAC is persistent across machine reboot.
  - *Value:* Not Present | Any legal 6-byte MAC address
  - *Default:* Not Present
- **Maximum Number of RSS Queues:**
  - *Description:* For changing the number of RSS Queues.
  - *Value:* 1-8
  - *Default:* 4
- **NetworkDirect Functionality:**
  - *Description:* For enabling or disabling Network Direct Functionality.
  - *Value:* Enabled | Disabled
  - *Default:* Enabled
- **NetworkDirect Interrupt Moderation:**
  - *Description:* This parameter controls the interrupts generated during NDK traffic.
  - *Value:* Enabled | Disabled
  - *Default:* Enabled

For more information, refer <http://msdn.microsoft.com/en-us/library/windows/hardware/ff556017%28v=vs.85%29.aspx>

- **Receive Side Scaling (RSS):**
  - *Description:* This parameter controls the RSS functions. If on, the Microsoft RSS function is enabled. If off, the Chelsio RSS function is enabled.
  - *Value:* Enabled | Disabled
  - *Default:* Enabled

- **Recv Segment Coalescing (IPv4):**

- *Description:* Enables or Disables the Receive Segment Coalescing feature for IPv4 traffic. This is a receiver packets aggregating feature which helps reduce the receive host CPU load and improve throughput in a 10Gb network environment where CPU can be the bottleneck.
- *Value:* Enabled | Disabled
- *Default:* Enabled

- **Recv Segment Coalescing (IPv6):**

- *Description:* Enables or Disables the Receive Segment Coalescing feature for IPv6 traffic. This is a receiver packets aggregating feature which helps reduce the receive host CPU load and improve throughput in a 10Gb network environment where CPU can be the bottleneck.
- *Value:* Enabled | Disabled
- *Default:* Enabled

- **RSS load balancing profile:**

- *Description:* This parameter controls the RSS load balancing profile.
- *Value:* Closest Processor | Closest Processor Static | Conservative Scaling | NUMA Scaling | NUMA Scaling Static
- *Default:* Closest Processor


For more information, refer <http://technet.microsoft.com/en-us/library/hh997036.aspx>

- **Rx Ethernet Queue Size:**

- *Description:* This parameter is used to set different Rx Queue sizes. Driver ships with reasonable defaults.
- *Value:* 512-4096
- *Default:* 3072

- **Rx Offload Queue Size:**

- *Description:* This parameter is used to set different Offload Rx Queue sizes. Driver ships with reasonable defaults.
- *Value:* 256-2048
- *Default:* 512

 **Note** *This feature is not fully tested and available for experimental usage only.*

- **TCP Checksum Offload (IPv4):**

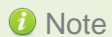
- *Description:* This parameter enables or disables computation of TCP checksum by the adapter for IPv4 packets.
- *Value:*
  - Disabled
  - Rx & Tx Enabled
  - Rx Enabled
  - Tx Enabled
- *Default:* Rx & Tx Enabled

- **TCP Checksum Offload (IPv6):**

- *Description:* This parameter enables or disables computation of TCP checksum by the adapter for IPv6 packets.
- *Value:*
  - Disabled
  - Rx & Tx Enabled
  - Rx Enabled
  - Tx Enabled
  - *Default:* Rx & Tx Enabled

- **TCP Offload:**

- *Description:* Controls the enable or disable of TCP Offload.
- *Range:* Enabled | Disabled
- *Default:* Disabled



*This feature is not fully tested. This feature is available for experimental usage only.*

- **Tx Ethernet Queue Size:**

- *Description:* This parameter is used to set different Tx Queue sizes. Driver ships with reasonable defaults.
- *Value:* 512-4096
- *Default:* 1024

- **Tx Offload Queue Size:**

- *Description:* This parameter is used to set different Offload Tx Queue sizes. Driver ships with reasonable defaults.
- *Value:* 256-4096
- *Default:* 512



*This feature is not fully tested and available for experimental usage only.*

- **UDP Checksum Offload (IPv4):**

- *Description:* This parameter enables or disables computation of UDP checksum by the adapter for IPv4 packets.
- *Value:*
  - Disabled
  - Rx & Tx Enabled
  - Rx Enabled
  - Tx Enabled
- *Default:* Rx & Tx Enabled

- **UDP Checksum Offload (IPv6):**

- *Description:* This parameter enables or disables computation of UDP checksum by the adapter for IPv6 packets.
- *Value:*
  - Disabled
  - Rx & Tx Enabled
  - Rx Enabled
  - Tx Enabled
- *Default:* Rx & Tx Enabled

- **User Mode NetworkDirect:**

- *Description:* Enable or disable Microsoft's Remote Direct memory Access (RDMA) interface for high speed, low latency networks.
- *Value:* Enabled | Disabled
- *Default:* Enabled

- **Virtual Machine Queues:**

- *Description:* Enable or disable the virtual machine queue feature on the interface.
- *Value:* Enabled | Disabled
- *Default:* Enabled

- **VLAN Identifier:**

- *Description:* Specifies the VLAN ID to be inserted.
- *Value:* 0-4094
- *Default:* 0

- **VMQ LookAhead Split:**

- *Description:* Enable or disable the ability to split receive buffers into lookahead and post-lookahead buffers.
- *Value:* Enabled | Disabled
- *Default:* Enabled

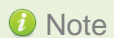
- **VMQ VLAN ID Filtering:**

- *Description:* Enable or disable the ability to filter network packets by using the VLAN identifier in the media access control (MAC) header.
- *Value:* Enabled | Disabled
- *Default:* Enabled

## 2.3. Enabling SMB Direct

SMB Direct is installed and enabled by default on Windows Server 2012 systems. RDMA functionality on Chelsio adapters will be enabled after installing the driver from the package.

You can use the following PowerShell command `Get-NetAdapterRdma` to get a list of RDMA capable interfaces in your system.



*Note* At least one adapter should indicate “RDMA Capable” true to take advantage of SMB RDMA capability.

The next step is to configure your network so that SMB server and client machines can communicate with each other. Disable firewall for Chelsio adapters when using SMB.

## 2.4. Verifying RDMA

There are number of ways to verify if RDMA is working:

### 2.4.1. Verify active connections using PowerShell

Open PowerShell window and execute the command `Get-SmbConnection`

### 2.4.2. Use Event Viewer

You can use Event Viewer to view SMB connection events. To do this:

- i. Open Event Viewer
- ii. In the console tree, expand **Event Viewer**.
- iii. Navigate to **Application and Service Logs-> Microsoft->Windows->SMBClient ->Operational**

## 2.5. Troubleshooting

If RDMA is not working in your system, please check for the following:

- Operating system version should be Windows Server 2012.
- Verify network interface configurations on both sides.
- Please ensure that the interfaces are reachable using `ping` command.

- In the Event Viewer (on the client side), please ensure that the traffic running is not over TCP.
- Verify that SMB driver is loaded and working. Open PowerShell window and execute the following command :

```
C:\Users\Administrator> driverquery.exe | findstr /I smb
```

- Verify that Chelsio driver is loaded and working. Open PowerShell window and execute the following command :

```
C:\Users\Administrator> driverquery.exe | findstr /I chel
```

- Confirm that traffic is running over Chelsio adapter.
- Look for potential errors in Event Log.



Note

*Please configure the Microsoft firewall to allow traffic between the SMB clients and server.*



## III. iSCSI Storport Miniport

## 1. Introduction

The Chelsio T5/T4 series Adapters support iSCSI acceleration and iSCSI Direct Data Placement (DDP) where the hardware handles the expensive byte touching operations, such as CRC computation and verification, and direct DMA to the final host memory destination:

- **iSCSI PDU digest generation and verification**

On transmitting, Chelsio h/w computes and inserts the Header and Data digest into the PDUs. On receiving, Chelsio h/w computes and verifies the Header and Data digest of the PDUs.

- **Direct Data Placement (DDP)**

Chelsio h/w can directly place the iSCSI Data-In or Data-Out PDU's payload into pre-posted final destination host-memory buffers based on the Initiator Task Tag (ITT) in Data-In or Target Task Tag (TTT) in Data-Out PDUs.

- **PDU Transmit and Recovery**

On transmitting, Chelsio h/w accepts the complete PDU (header + data) from the host driver, computes and inserts the digests, decomposes the PDU into multiple TCP segments if necessary, and transmit all the TCP segments onto the wire. It handles TCP retransmission if needed.

On receiving, Chelsio h/w recovers the iSCSI PDU by reassembling TCP segments, separating the header and data, calculating and verifying the digests, then forwarding the header to the host. The payload data, if possible, will be directly placed into the pre-posted host DDP buffer. Otherwise, the payload data will be sent to the host too.

### 1.1. Hardware Requirements

---

#### 1.1.1. Supported Adapters

The following are the currently shipping Chelsio Adapters that are compatible with the iSCSI Storport Miniport:

- T520-LL-CR
- T580-LP-CR
- T520-CR
- T540-CR
- T420-CR
- T440-CR
- T422-CR
- T404-BT

## **1.2. Software Requirements**

---

### **1.2.1. Windows Requirement**

Currently iSCSI Storport Miniport driver is available for Windows Server 2012.

## 2. Software/Driver Configuration and Fine-tuning

### 2.1. Assigning Driver Properties

Follow the steps to assign IP, Subnet Mask, Default Gateway and VLAN IDs on port 0.

1. Open Device Manager, right click on the **Chelsio iSCSI Initiator** and click on **Properties**.

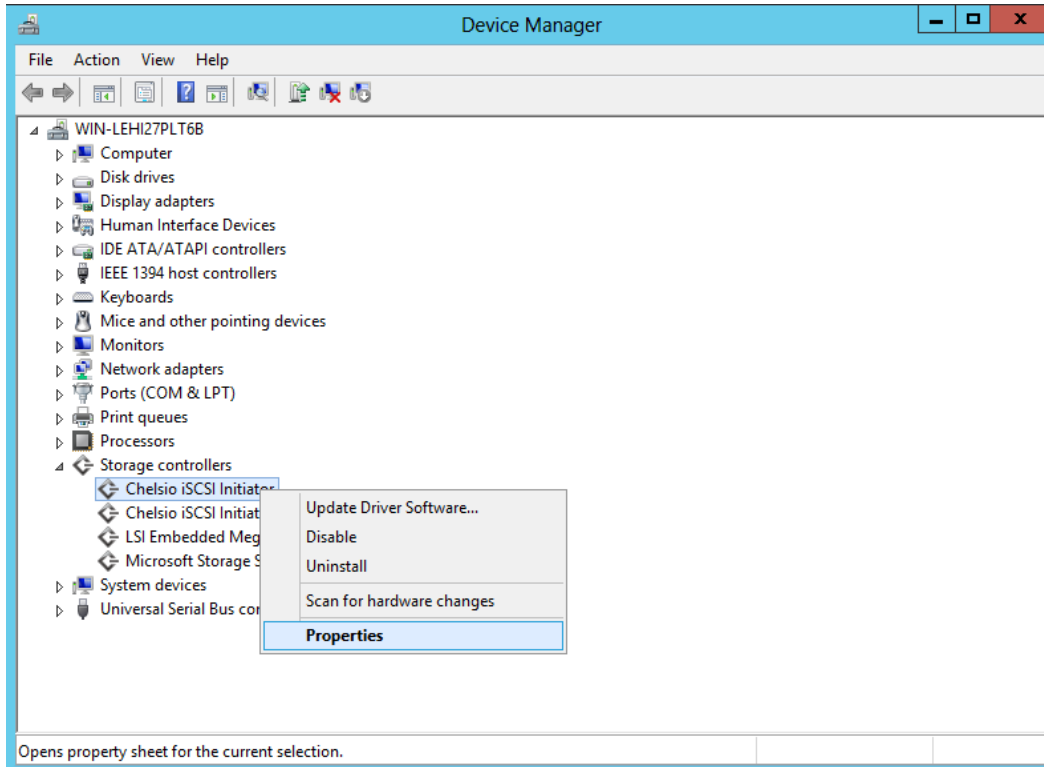


Figure 2.1 (a) – Device Manager

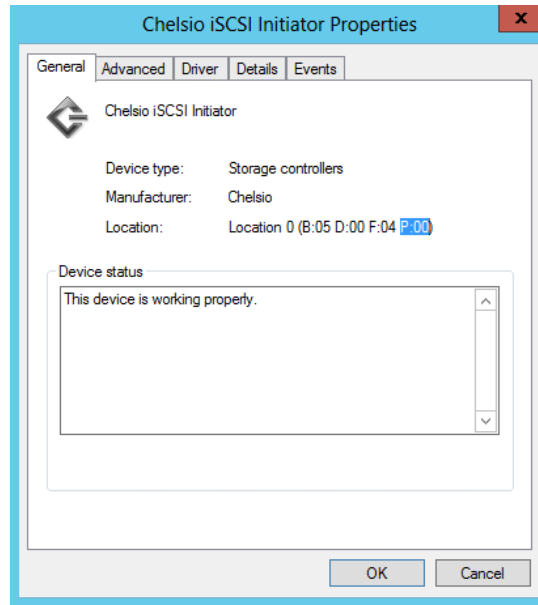


Figure 2.1 (b) – Chelsio physical port properties

2. Click on **Advanced** tab and select IP option and add IP. Similarly add subnet mask and default gateway.

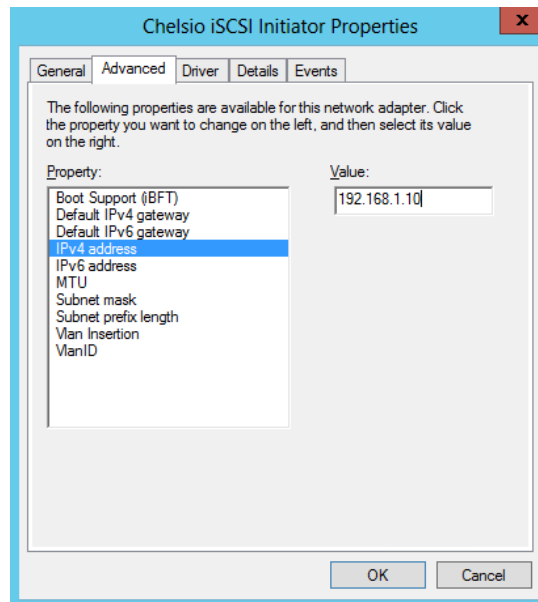


Figure 2.1 (c) – Assigning IPv4 address

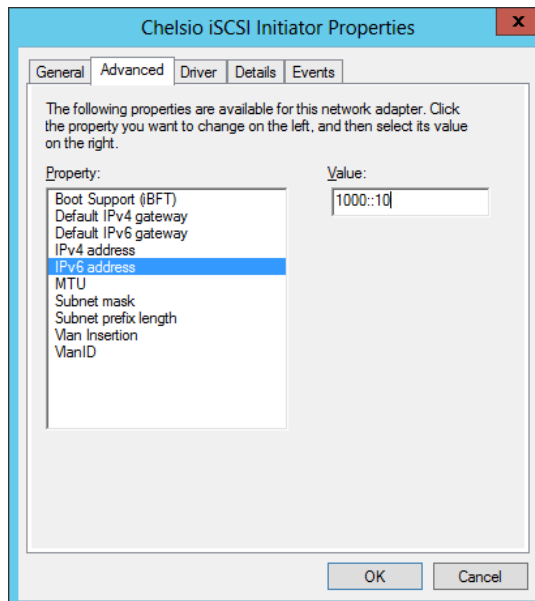


Figure 2.1 (d) – Assigning IPv6 address

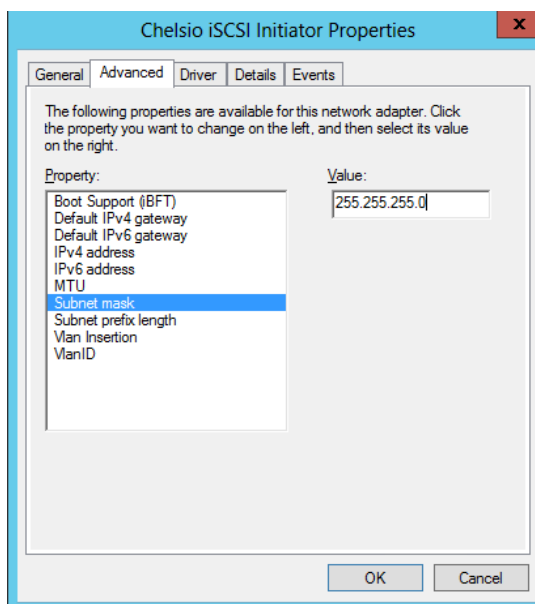


Figure 2.1 (e) – Adding Subnet mask

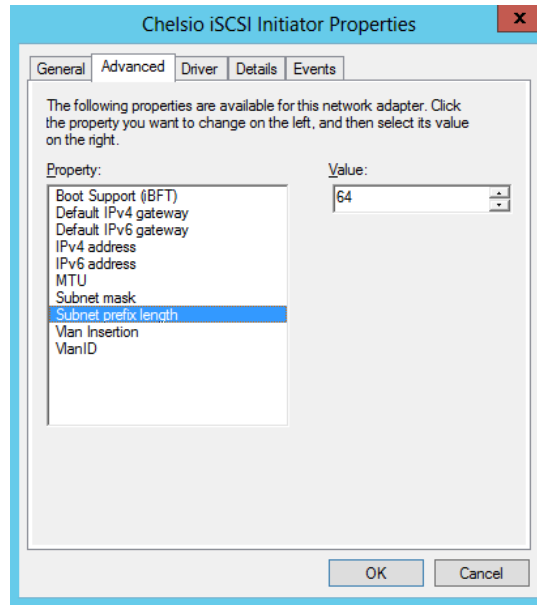


Figure 2.1 (f) – Adding Subnet prefix length

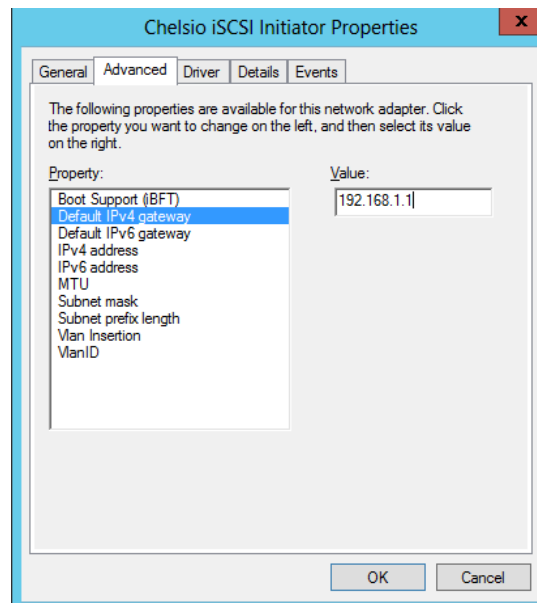


Figure 2.1 (g) – Adding Default IPv4 gateway

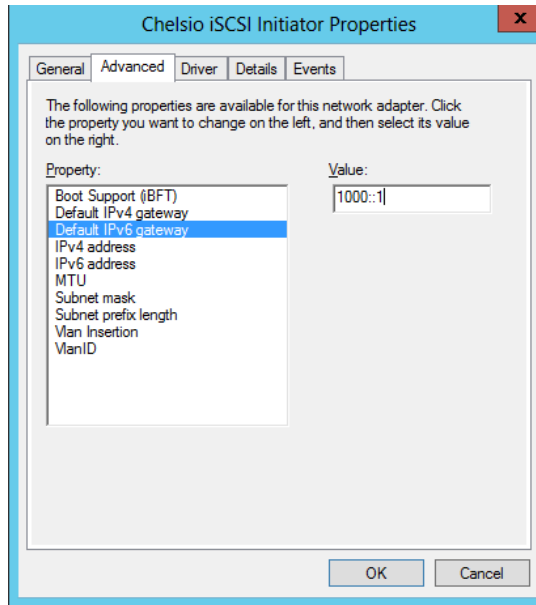


Figure 2.1 (h) – Adding Default IPv6 gateway

3. Select MTU and assign value as per requirement.

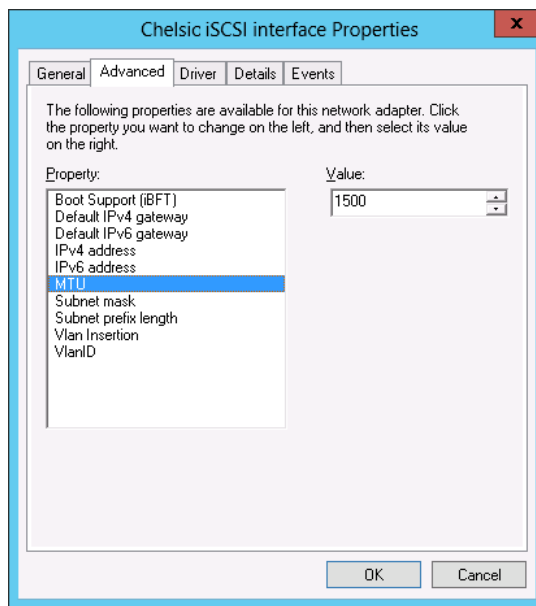


Figure 2.1 (i) – Setting MTU



- VLAN is disabled by default, so to enable VLAN, click on “Vlan Insertion” and select value as “Enabled”.

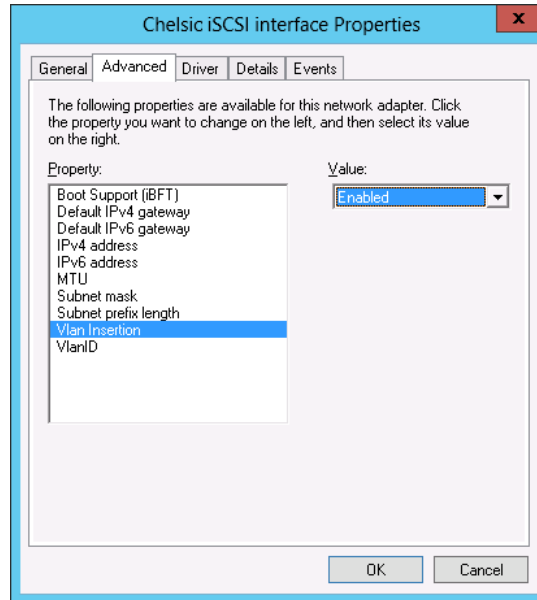


Figure 2.1 (j) – Enabling VLAN

- Assign the required VLAN ID and click **OK**.

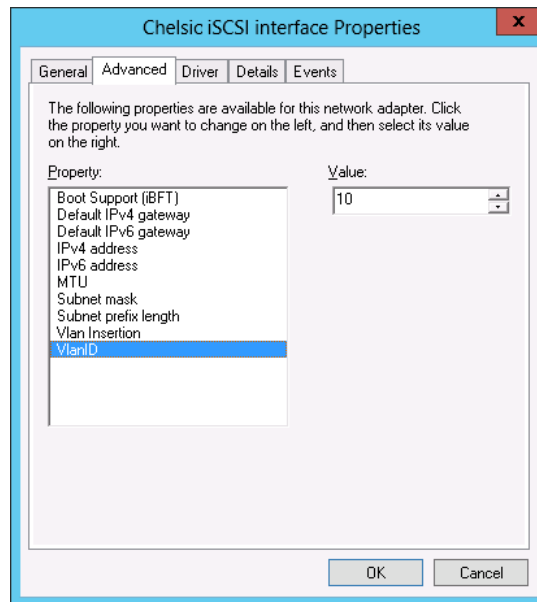


Figure 2.1 (k) – Assigning VLAN Id

**Repeat the above mentioned steps to assign these driver properties on other ports.**

## 2.2. iSCSI Target Discovery and Login

Before target discovery, make sure a static IP address is assigned in the Device Manager to the respective Chelsio T5/T4iSCSI node.

Following are the set of instructions to discover the target and login to it using the Chelsio T5/T4 iSCSI interface:

1. To start the Initiator configuration, go to Control Panel and click on the **iSCSI Initiator** option.

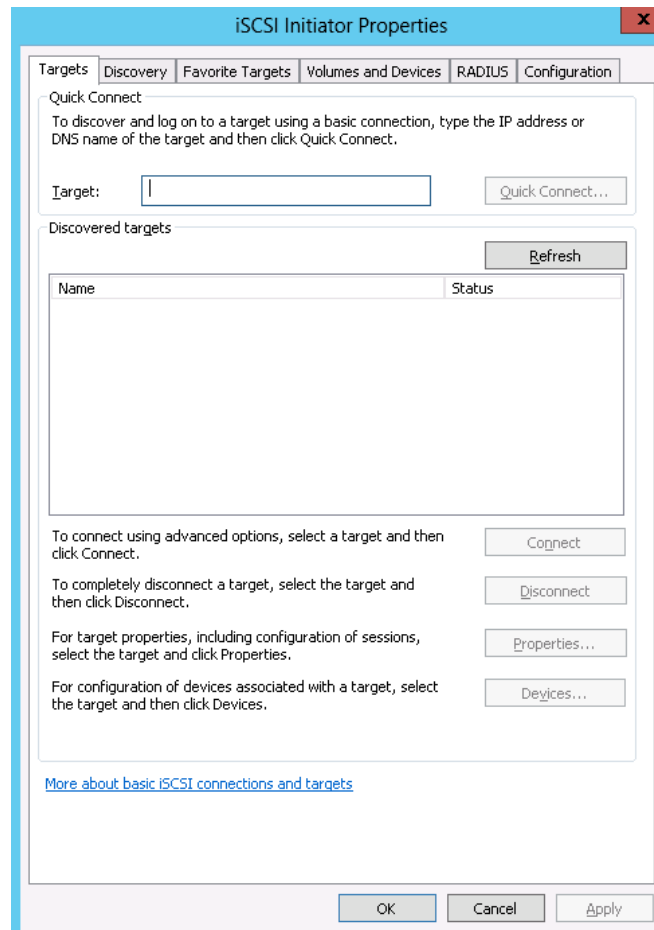


Figure 2.2 (a) – iSCSI Initiator Properties: Targets tab

2. Choose the **Discovery** tab and click on **Discover Portal**.

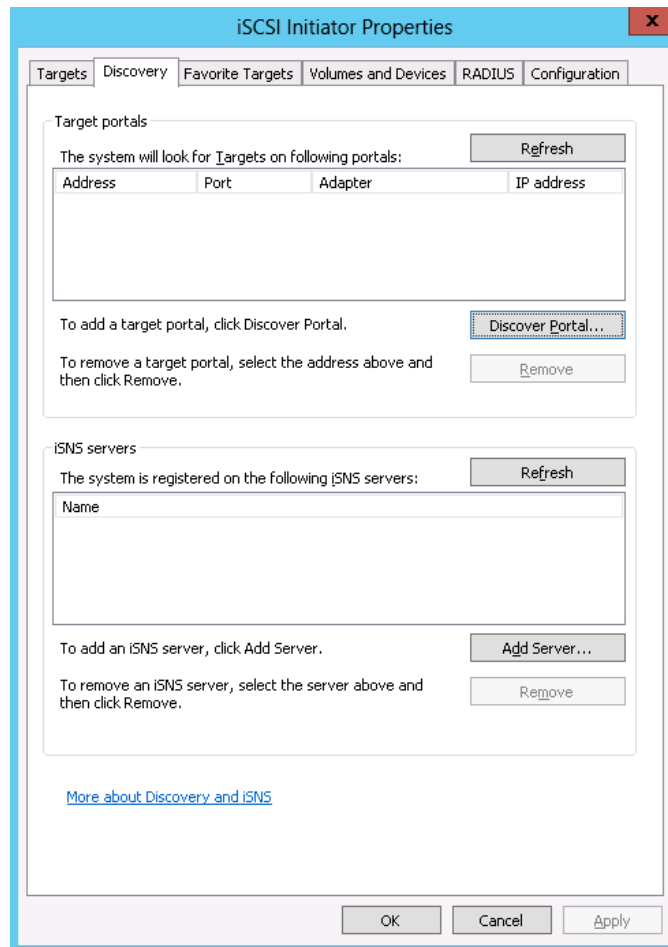


Figure 2.2 (b) – iSCSI Initiator Properties: Discovery tab

3. Click on the **Advance** button.

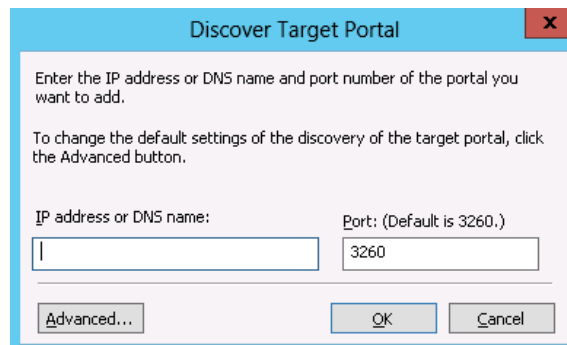


Figure 2.2 (c) – Discovery Target Portal window

4. In the **Advance Settings** window, select **Chelsio iSCSI Initiator** as the local adapter.

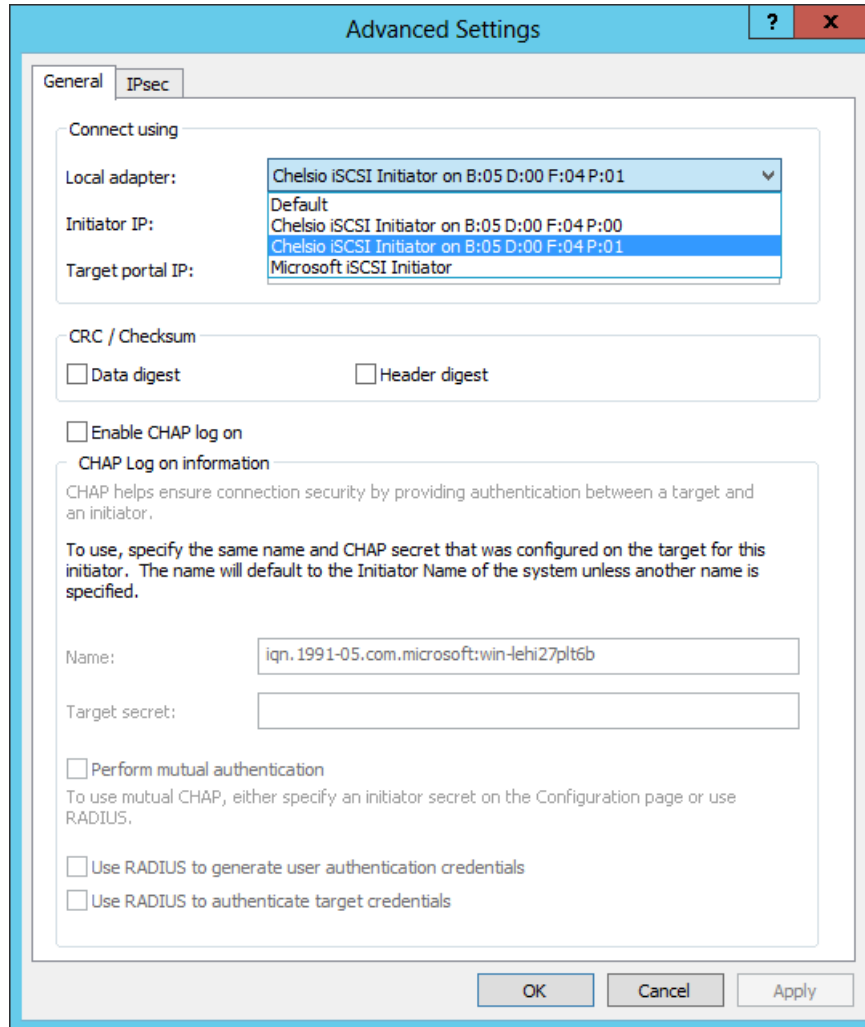


Figure 2.2 (d) – Discovery Target Portal Advanced Settings: Selecting Local adapter

5. Select the corresponding Chelsio Terminator iSCSI Interface IP as the Target portal IP and click **OK**.

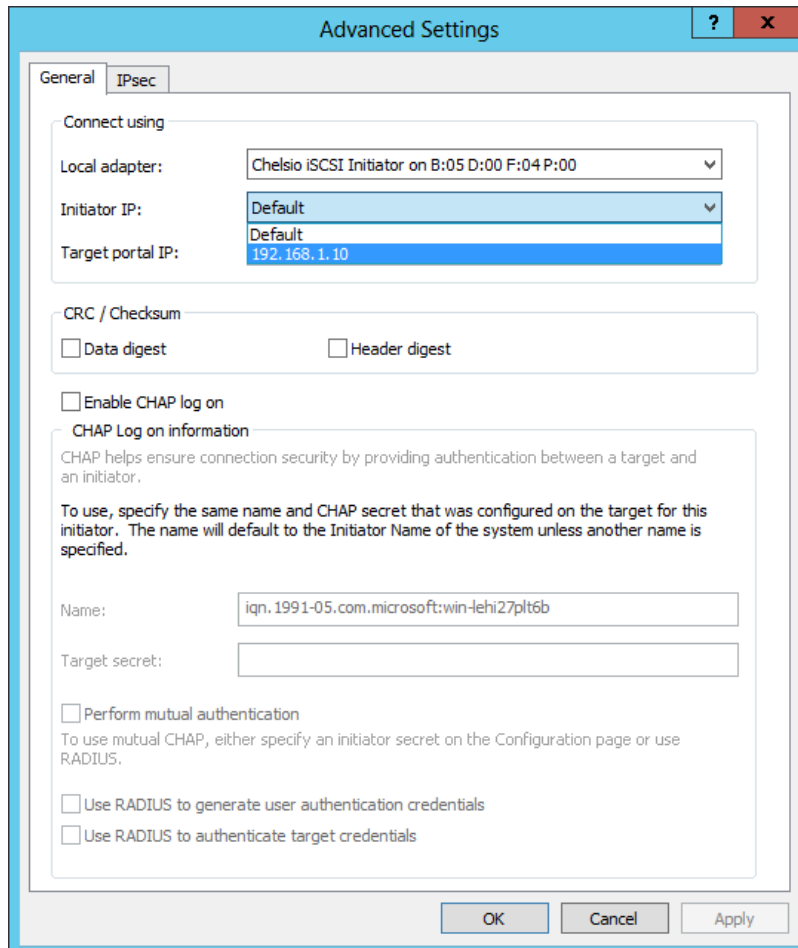


Figure 2.2 (e) – Discovery Target Portal Advanced Settings: Specifying Target portal IP

6. Enter the IP address (DNS name not supported) of the target machine and the corresponding port number and click **OK** on the **Discover Target Portal** Window. Note that the default port number for iSCSI traffic is 3260.

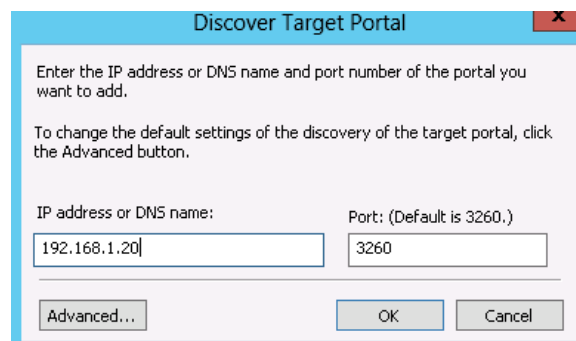


Figure 2.2 (f) – Adding Target portal

7. Once the target portal is added, the following settings will be displayed.

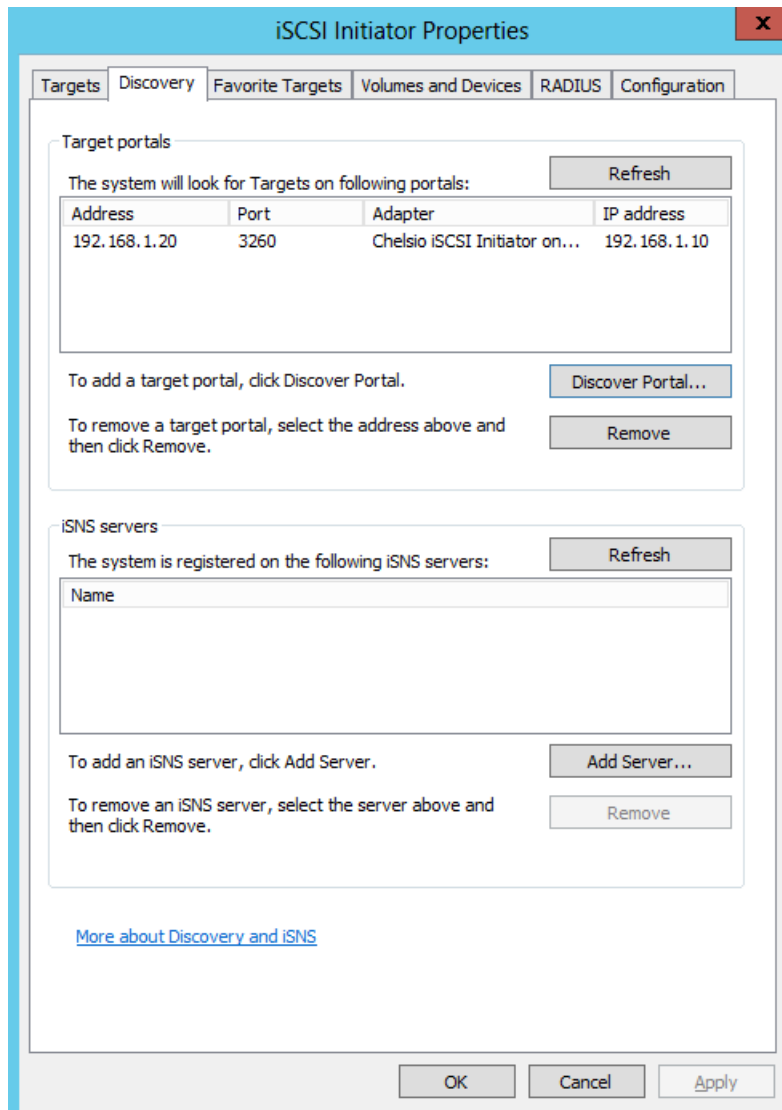


Figure 2.2 (g) –Target portal added

- Click on the **Targets** tab to see the list of targets available, choose a particular target and click on **Connect**.

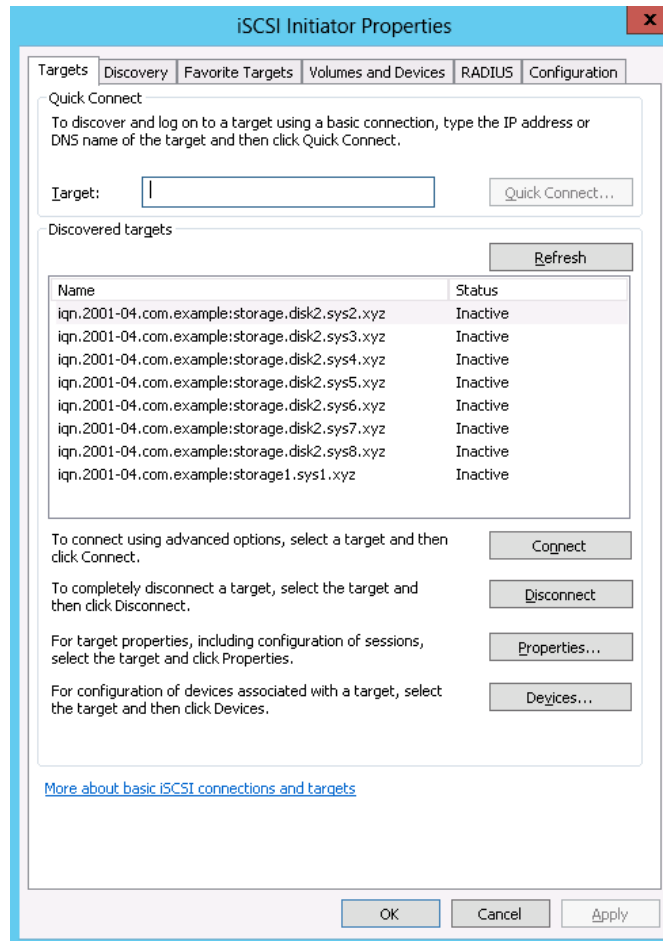


Figure 2.2 (h) – Targets tab displaying list of available targets

- A window pops up showing the Target Name, Click **OK**.

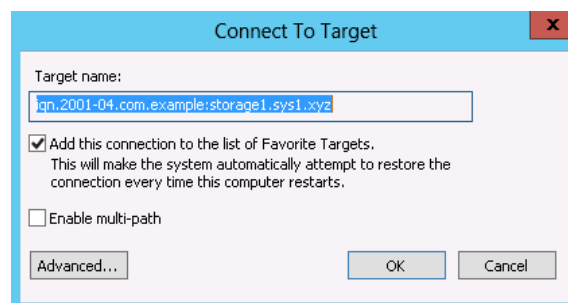


Figure 2.2 (i) – Connecting to Target

10. After logging to the target, the state of the target will change from *Inactive* to *Connected*.

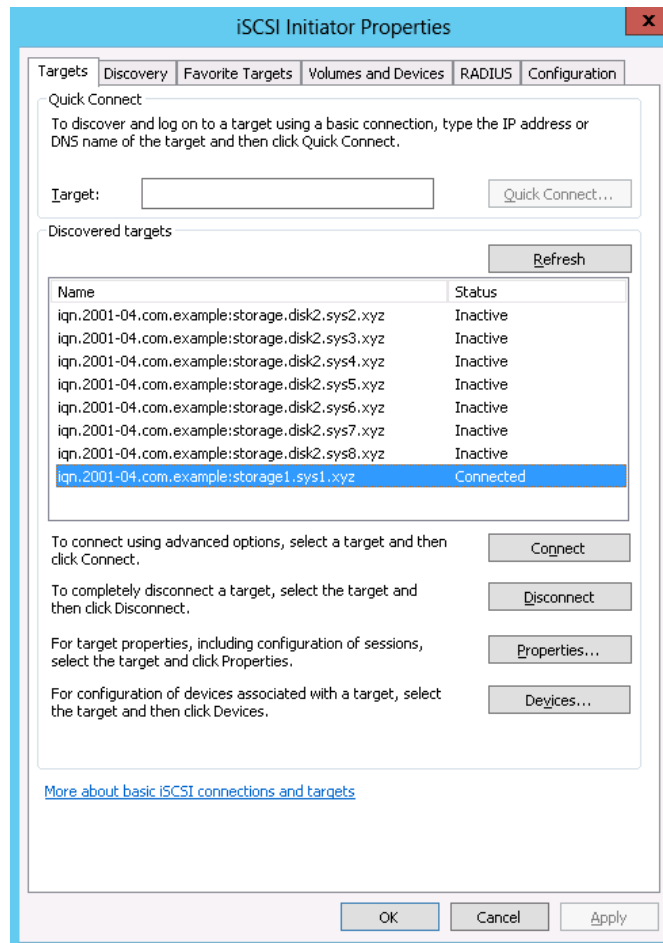


Figure 2.2 (j) – iSCSI target connected



11. After successful login, go to **Disk Management** and make the respective volume online.

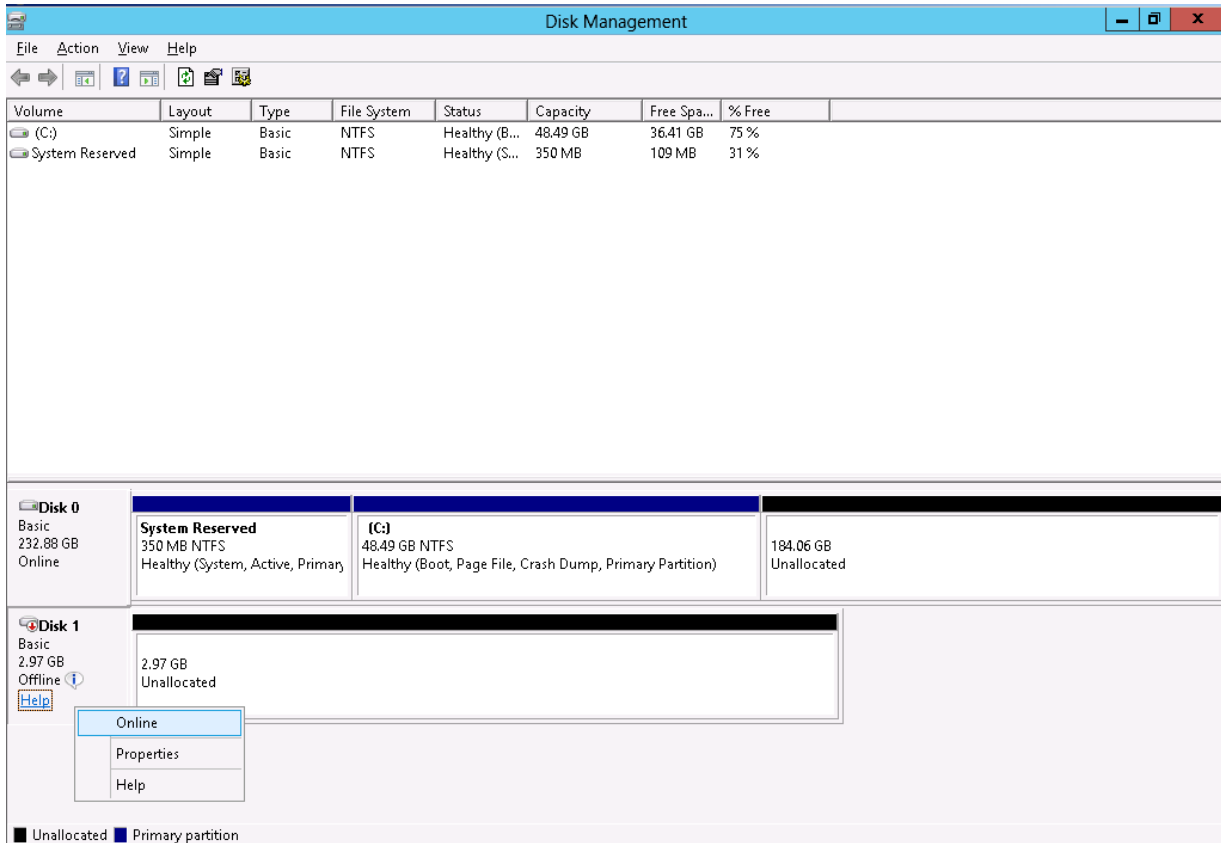


Figure 2.2 (k) – Disk Management: making volume online

## IV. FCoE Storport Miniport

## 1. Introduction

Fibre Channel over Ethernet (FCoE) is a mapping of Fibre Channel over selected full duplex IEEE 802.3 networks. The goal is to provide I/O consolidation over Ethernet, reducing network complexity in the Datacenter.

Chelsio FCoE initiator maps Fibre Channel directly over Ethernet while being independent of the Ethernet forwarding scheme. The FCoE protocol specification replaces the FC0 and FC1 layers of the Fibre Channel stack with Ethernet. By retaining the native Fibre Channel constructs, FCoE will integrate with existing Fibre Channel networks and management software.

### 1.1. Hardware Requirements

---

#### 1.1.1. Supported Adapters

The following are the currently shipping Chelsio Adapters that are compatible with Chelsio FCoE storport miniport driver:

- T520-CR
- T520-LL-CR
- T420-CR
- T440-CR
- T422-CR
- T404-BT
- T420-BT
- T420-LL-CR
- T440-LP-CR
- T420-SO-CR

### 1.2. Software Requirements

---

#### 1.2.1. Windows Requirement

Currently Chelsio FCoE storport miniport driver is available for Windows Server 2012.

## 2. Configuration and Fine-tuning

### 2.1. Configuring Cisco Nexus 5010 switch

#### 2.1.1. Configuring the DCBX parameters

**Note** *By default the Cisco Nexus switch enables DCBX functionality and configures PFC for FCoE traffic making it no drop with bandwidth of 50% assigned to FCoE class of traffic and another 50% for the rest(like NIC). If you wish to configure custom bandwidth, then follow the procedure below*

In this procedure, you may need to adjust some of the parameters to suit your environment, such as VLAN IDs, Ethernet interfaces, and virtual Fibre Channel interfaces.

To enable PFC, ETS, and DCB functions on a Cisco Nexus 5000 series switch:

1. Open a terminal configuration setting.

```
Switch# config terminal
switch(config)#
```

2. Configure qos class-maps and set the traffic priorities: NIC uses priority 0 and FCoE uses priority 3.

```
Switch(config)#class-map type qos class-nic
Switch(config-cmap-qos)# match cos 0
Switch(config-cmap-qos)# class-map type qos class-fcoe
Switch(config-cmap-qos)# match cos 3
```

3. Configure queuing class-maps.

```
Switch(config)#class-map type queuing class-nic
Switch(config-cmap-que)#match qos-group 2
```

4. Configure network-qos class-maps.

```
Switch(config)#class-map type network-qos class-nic
Switch(config-cmap-nq)#match qos-group
```

5. Configure qos policy-maps.


```
Switch(config)#policy-map type qos policy-test
Switch(config-pmap-qos)#class type qos class-nic
Switch(config-pmap-c-qos)#set qos-group 2
```

6. Configure queuing policy-maps and assign network bandwidth. Divide the network bandwidth between FCoE and NIC traffic.

```
Switch(config)#policy-map type queuing policy-test
Switch(config-pmap-que)#class type queuing class-nic
Switch(config-pmap-c-que)#bandwidth percent 50
Switch(config-pmap-c-que)#class type queuing class-fcoe
Switch(config-pmap-c-que)#bandwidth percent 50
Switch(config-pmap-c-que)#class type queuing class-default
Switch(config-pmap-c-que)#bandwidth percent 0
```

7. Configure network-qos policy maps and set up the PFC for no-drop traffic class.

```
Switch(config)#policy-map type network-qos policy-test
Switch (config-pmap-nq)#class type network-qos class-nic
Switch(config-pmap-nq-c)#pause no-drop
```

 **Note** *By default FCoE is set to pause no drop. In such a trade off, one may want to set NIC to drop instead.*

8. Apply the new policy (PFC on NIC and FCoE traffic) to the entire system.

```
Switch(config)#system qos
Switch(config-sys-qos)#service-policy type qos input policy-test
Switch(config-sys-qos)#service-policy type queuing output policy-test
Switch(config-sys-qos)#service-policy type queuing input policy-test
Switch(config-sys-qos)#service-policy type network-qos policy-test
```

### 2.1.2. Configuring the FCoE/FC ports


In this procedure, you may need to adjust some of the parameters to suit your environment, such as VLAN IDs, Ethernet interfaces, and virtual Fibre Channel interfaces

1. Following steps will enable FCoE services on a particular VLAN and does a VSAN-VLAN mapping. These steps are not required to be done every time, unless a new mapping is required.

```
Switch(config)# vlan 2
Switch(config-vlan)# fcoe vsan 2
Switch(config-vlan)#exit
```

2. Following steps help in creating a virtual fibre channel(VFC) and binds that VFC to a Ethernet interface so that the Ethernet port begins functioning as a FCoE port.

```
Switch(config)# interface vfc 13
Switch(config-if)#bind interface ethernet 1/13
Switch(config-if)# no shutdown
Switch(config-if)#exit
Switch(config)#vsan database
Switch(config-vsan-db)# vsan 2
Switch(config-vsan-db)#vsan 2 interface vfc 13
Switch(config-vsan-db)#exit
```

 **Note** *If you are binding the VFC to a MAC address instead of an Ethernet port then make sure the Ethernet port is part of both default VLAN and FCoE VLAN*

3. Assign VLAN ID to the Ethernet port on which FCoE service was enabled in step1.

```
Switch(config)# interface ethernet 1/13
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan 2
Switch(config-if)#no shutdown
Switch(config)#exit
```

4. On the FC Ports, if a FC target is connected then perform the following steps -

```
Switch(config)#vsan database
Switch(config-vsan-db)#vsan 2
Switch(config-vsan-db)# vsan 2 interface fc 2/2
Switch(config-vsan-db)#exit
Switch(config)#interface fc 2/2
```

```
Switch(config-if)# switchport mode auto
Switch(config-if)# switchport speed auto
Switch(config-if)# no shutdown.
```

5. If you have not created a zone then make sure the default-zone permits the VSAN created, otherwise the initiator and the target on that particular VSAN although FLOGI'd into the switch will not talk to each other. To enable it, execute the below command.

```
Switch(config)# zone default-zone permit vsan 2
```

### 2.1.3. Configuring the Brocade 8000 switch

1. Configure LLDP for FCoE. Example of configuring LLDP for 10-Gigabit Ethernet interface.

```
switch(config)#protocol lldp
switch(conf-lldp)#advertise dcbx-fcoe-app-tlv
switch(conf-lldp)#advertise dcbx-fcoe-logical-link-tlv
```

2. Create a CEE Map to carry LAN and SAN traffic if it does not exist. Example of creating a CEE map.

```
switch(config)# cee-map default
switch(conf-cee-map)#priority-group-table 1 weight 40 pfc
switch(conf-cee-map)#priority-group-table 2 weight 60
switch(conf-cee-map)#priority-table 2 2 2 1 2 2 2 2
```

3. Configure the CEE interface as a Layer 2 switch port. Example of configuring the switch port as a 10-Gigabit Ethernet interface.

```
switch(config)#interface tengigabitethernet 0/16
switch(config-if-te-0/16)#switchport
switch(config-if-te-0/16)#no shutdown
switch(config-if)#exit
```

4. Create an FCoE VLAN and add an interface to it. Example of creating a FCoE VLAN and adding a single interface.

```
switch(config)#vlan classifier rule 1 proto fcoe encap ethv2
switch(config)#vlan classifier rule 2 proto fip encap ethv2
switch(config)#vlan classifier group 1 add rule 1
switch(config)#vlan classifier group 1 add rule 2
switch(config)#interface vlan 1002
switch(conf-if-vl-1002 )#fcf forward
switch(conf-if-vl-1002 )#interface tengigabitethernet 0/16
switch(config-if-te-0/16)#switchport
switch(config-if-te-0/16)#switchport mode converged
switch(config-if-te-0/16)#switchport converged allowed vlan add 1002
switch(config-if-te-0/16)#vlan classifier activate group 1 vlan 1002
switch(config-if-te-0/16)#cee default
switch(config-if-te-0/16)#no shutdown
switch(config-if-te-0/16)#exit
```

**Note** *Unlike cisco, only one VLAN ID can carry FCoE traffic for now on Brocade 8000. It is their limitation.*

5. Save the Configuration

```
switch#copy running-config startup-config
```

## 2.2. FCoE fabric discovery verification

The verification is done using “cxgbtool”. Launch the command prompt and execute the following steps:

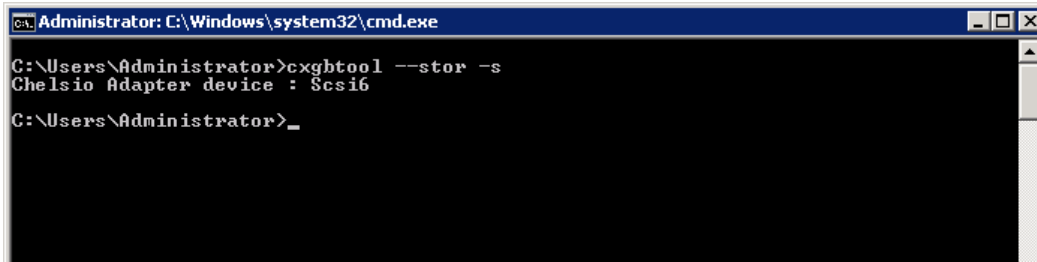
### 2.2.1. Verifying the DCBX parameters

To verify the current DCBX information being exchanged, execute the following commands using *cxgbtool*.

1. First step is to find the adapter number. Find it using the following command

```
cxgbtool.exe --stor -s
```



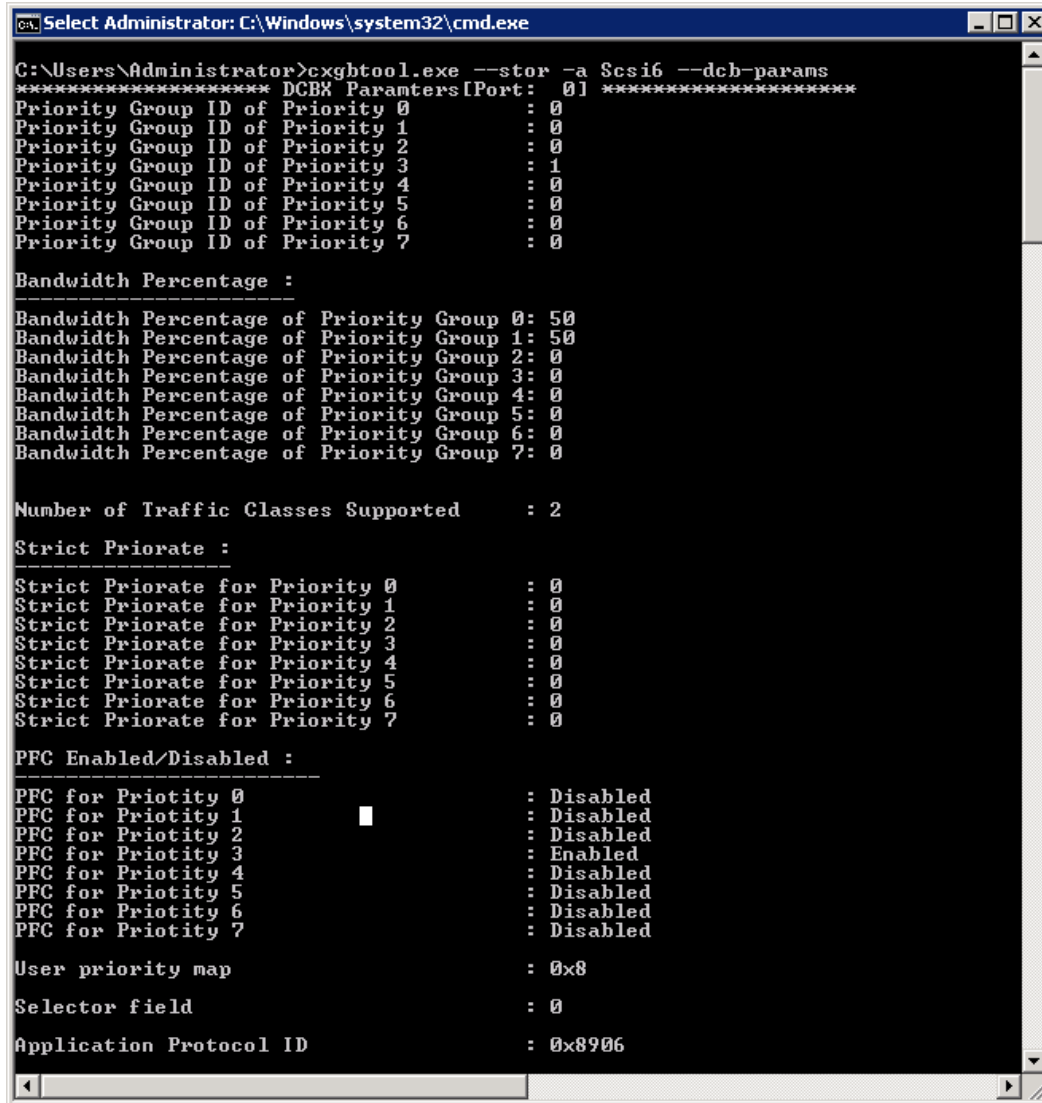


```
Administrator: C:\Windows\system32\cmd.exe
C:\Users\Administrator>cxgbtool --stor -s
Chelsio Adapter device : $csi6
C:\Users\Administrator>_
```

*Figure 2.2.1 (a) – Determining adapter number*

2. Now execute the following command to check the DCBX information.

```
cxgbtool.exe --stor -a <adapter_no> --dcb-params
```



```
cmd Select Administrator: C:\Windows\system32\cmd.exe
C:\Users\Administrator>cxgbtool.exe --stor -a Scsi6 --dcb-params
***** DCBX Parameters [Port: 0] *****
Priority Group ID of Priority 0      : 0
Priority Group ID of Priority 1      : 0
Priority Group ID of Priority 2      : 0
Priority Group ID of Priority 3      : 1
Priority Group ID of Priority 4      : 0
Priority Group ID of Priority 5      : 0
Priority Group ID of Priority 6      : 0
Priority Group ID of Priority 7      : 0

Bandwidth Percentage :
Bandwidth Percentage of Priority Group 0: 50
Bandwidth Percentage of Priority Group 1: 50
Bandwidth Percentage of Priority Group 2: 0
Bandwidth Percentage of Priority Group 3: 0
Bandwidth Percentage of Priority Group 4: 0
Bandwidth Percentage of Priority Group 5: 0
Bandwidth Percentage of Priority Group 6: 0
Bandwidth Percentage of Priority Group 7: 0

Number of Traffic Classes Supported   : 2

Strict Priorate :
Strict Priorate for Priority 0        : 0
Strict Priorate for Priority 1        : 0
Strict Priorate for Priority 2        : 0
Strict Priorate for Priority 3        : 0
Strict Priorate for Priority 4        : 0
Strict Priorate for Priority 5        : 0
Strict Priorate for Priority 6        : 0
Strict Priorate for Priority 7        : 0

PFC Enabled/Disabled :
PFC for Priotity 0                    : Disabled
PFC for Priotity 1                    : Disabled
PFC for Priotity 2                    : Disabled
PFC for Priotity 3                    : Enabled
PFC for Priotity 4                    : Disabled
PFC for Priotity 5                    : Disabled
PFC for Priotity 6                    : Disabled
PFC for Priotity 7                    : Disabled

User priority map                      : 0x8
Selector field                         : 0
Application Protocol ID                 : 0x8906
```

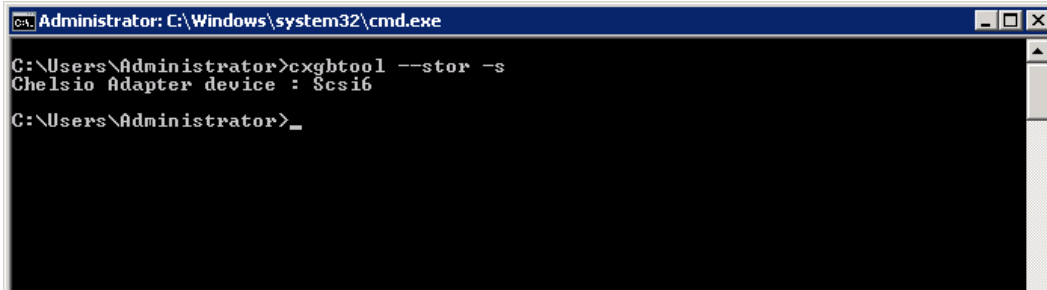
Figure 2.2.1 (b) – Checking DCBX information

## 2.2.2. Verifying FIP

Once connected to the switch, use the following commands to see if the FIP has gone through and a VN\_Port MAC address has been assigned.

1. Check for the adapter number using the following command.

```
cxgbtool.exe --stor -s
```

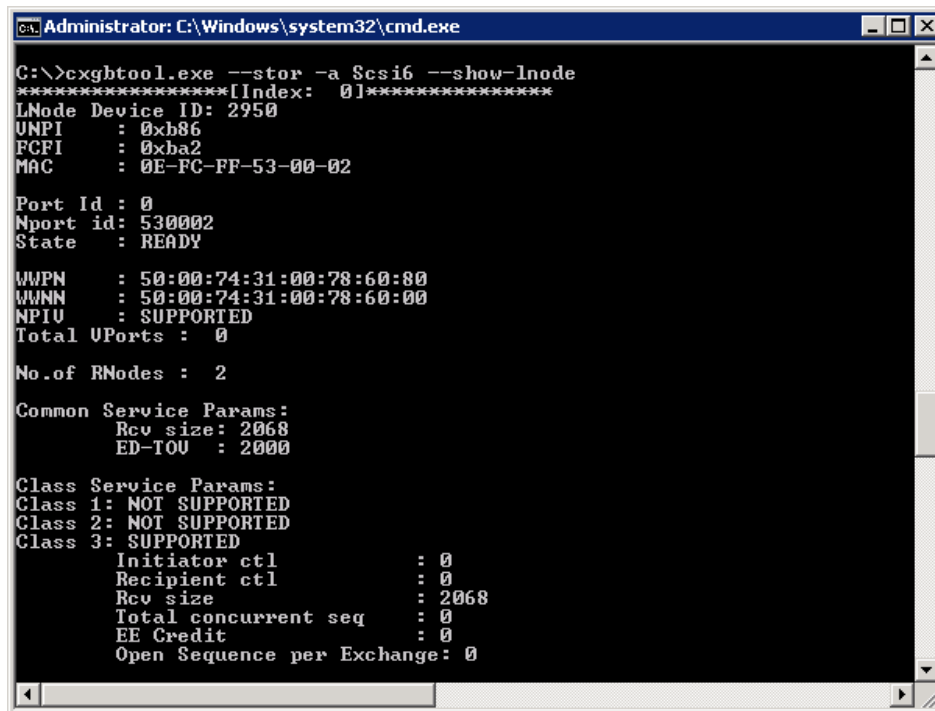


```
Administrator: C:\Windows\system32\cmd.exe
C:\Users\Administrator>cxgbtool --stor -s
Chelsio Adapter device : Scsi6
C:\Users\Administrator>_
```

Figure 2.2.2 (a) – Determining adapter number

2. Verify if all the FCoE ports are online/ready and a successful FIP has taken place using the following command and check the *State* of the port.

```
cxgbtool --stor -a <adapter_no> --show-lnode
```



```
Administrator: C:\Windows\system32\cmd.exe
C:\>cxgbtool.exe --stor -a Scsi6 --show-lnode
*****[Index: 0]*****
LNode Device ID: 2950
UNPI      : 0xb86
FCFI      : 0xba2
MAC       : 0E-FC-FF-53-00-02

Port Id : 0
Nport id: 530002
State   : READY

WWPN     : 50:00:74:31:00:78:60:80
WWNN     : 50:00:74:31:00:78:60:00
NPIU     : SUPPORTED
Total UPorts : 0

No. of RNodes : 2

Common Service Params:
  Rcv size: 2068
  ED-TOU  : 2000

Class Service Params:
Class 1: NOT SUPPORTED
Class 2: NOT SUPPORTED
Class 3: SUPPORTED
  Initiator ctl      : 0
  Recipient ctl      : 0
  Rcv size           : 2068
  Total concurrent seq : 0
  EE Credit          : 0
  Open Sequence per Exchange: 0
```

Figure 2.2.2 (b) – Verifying FIP

### 2.2.3. Verifying target discovery

There are two ways to check the targets being discovered. One is from cxgbtool and other is to directly see the target in device manager and its LUNs in disk management.

To check the summary of targets being discovered from FCoE ports, open device manger and follow the steps given below:

1. Go to **Start->Control Panel->Device Manager** or launch device manager directly from **Start->Run->devmgmt.msc** and hit enter.
2. Go to “Disk drives” section under which you will find the list of all the target-luns that are being discovered.

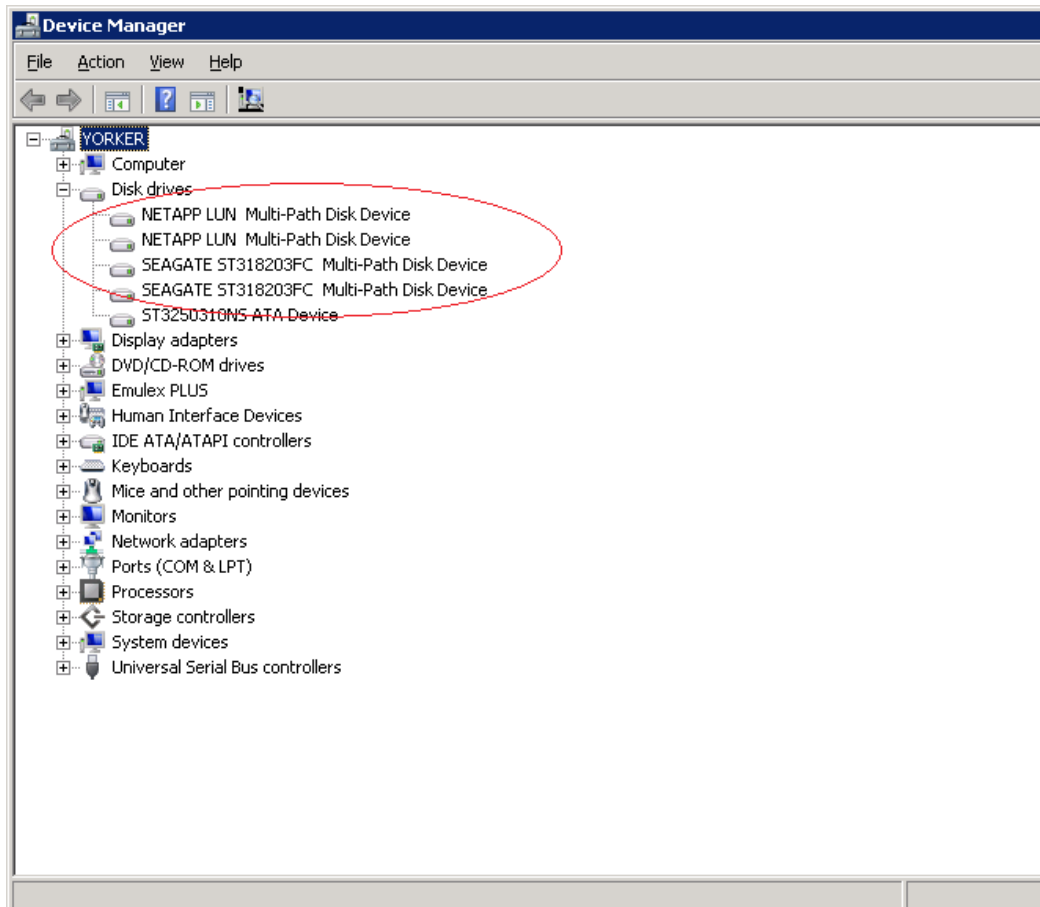


Figure 2.2.3 (a) – Discovered Target LUNs

- To bring the LUNs online, launch disk management by going to **Start->Run->diskmgmt.msc**. Right click on the LUN and select “online”.

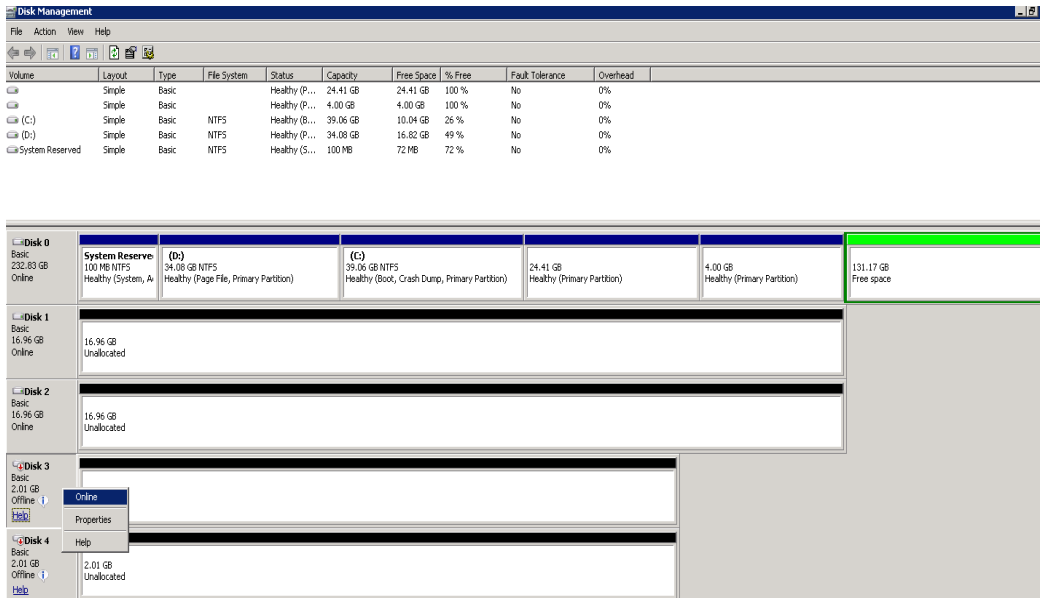


Figure 2.2.3 (b) – Bringing LUNs online

Now format the LUN by right clicking on the actual LUN and choose any of the volume types. Let’s choose a simple volume and click on next.

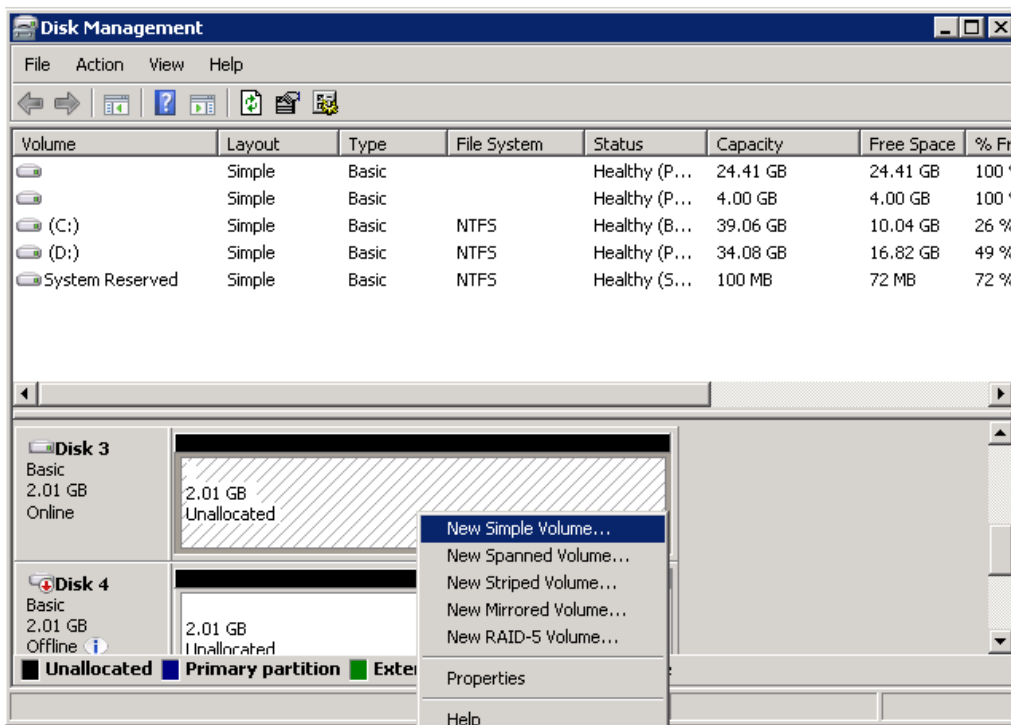


Figure 2.2.3 (c) – Formatting LUNs

4. Choose the volume size (default chooses the entire volume), assign a driver letter to the volume, choose the file system and click on finish.

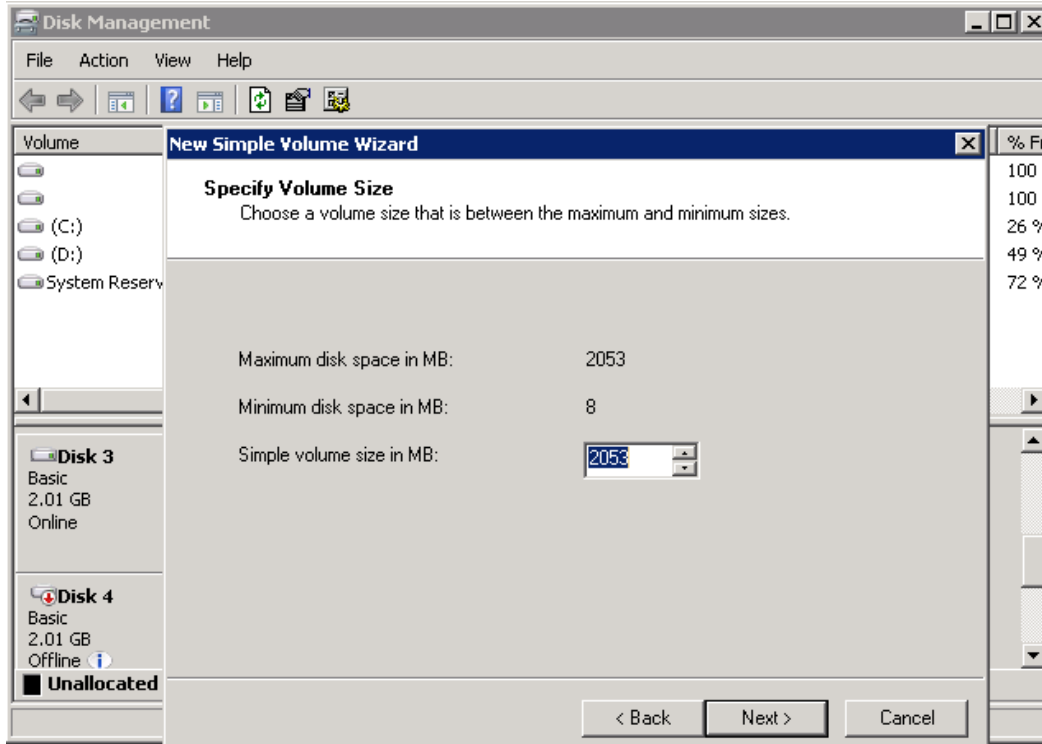


Figure 2.2.3 (d) – Specifying Volume size

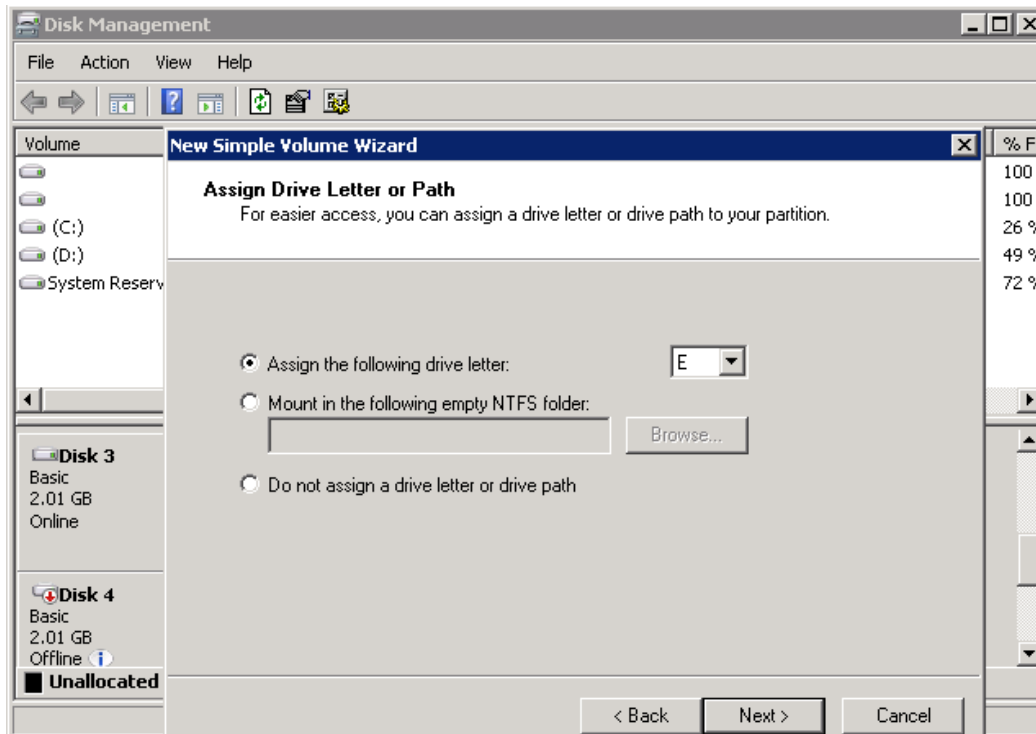


Figure 2.2.3 (e) – Assigning drive letter or path

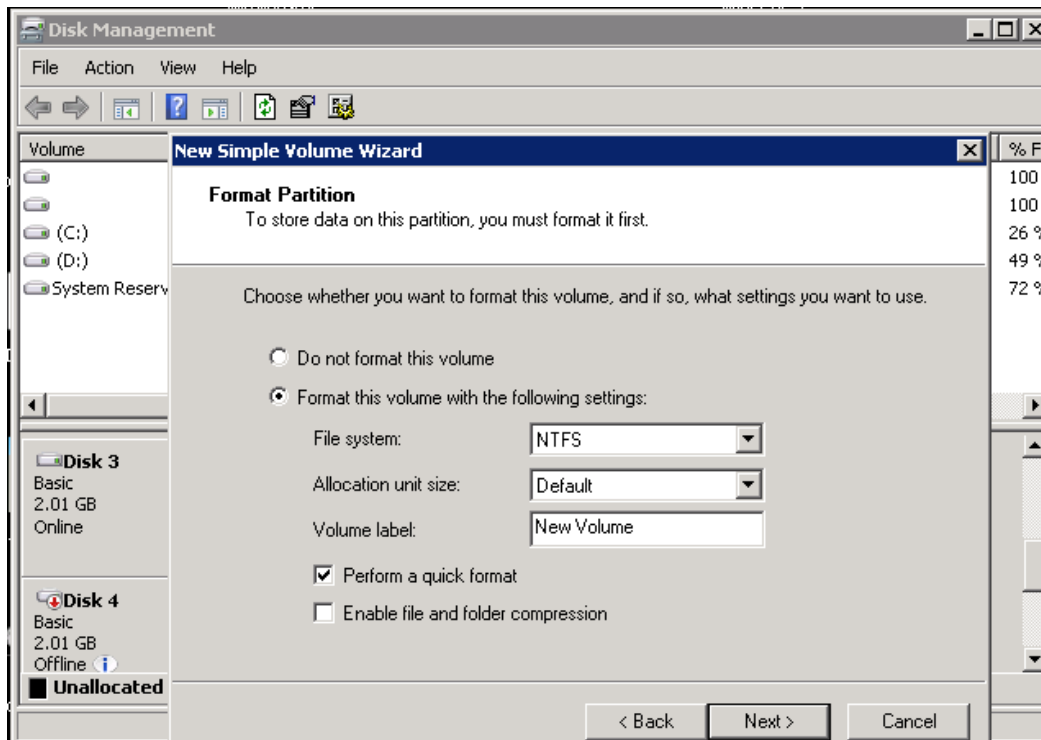


Figure 2.2.3 (f) – Formatting the partition

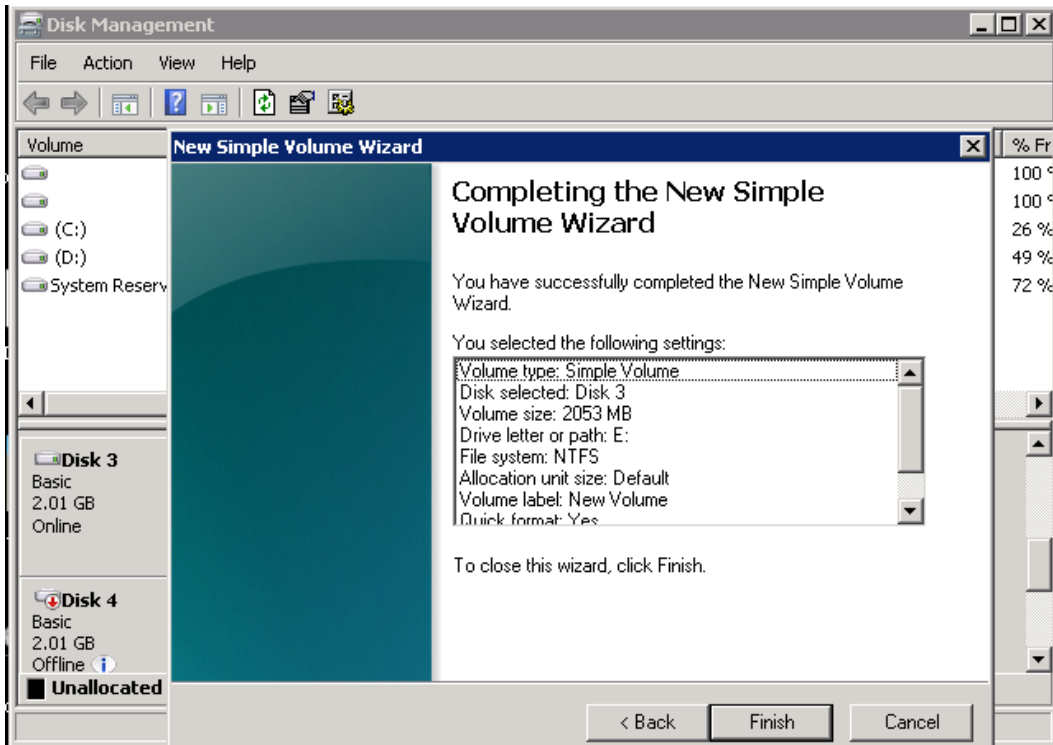


Figure 2.2.3 (g) – Completing Simple Volume Wizard



## 5. Check if the volume appears in “My Computer” window.

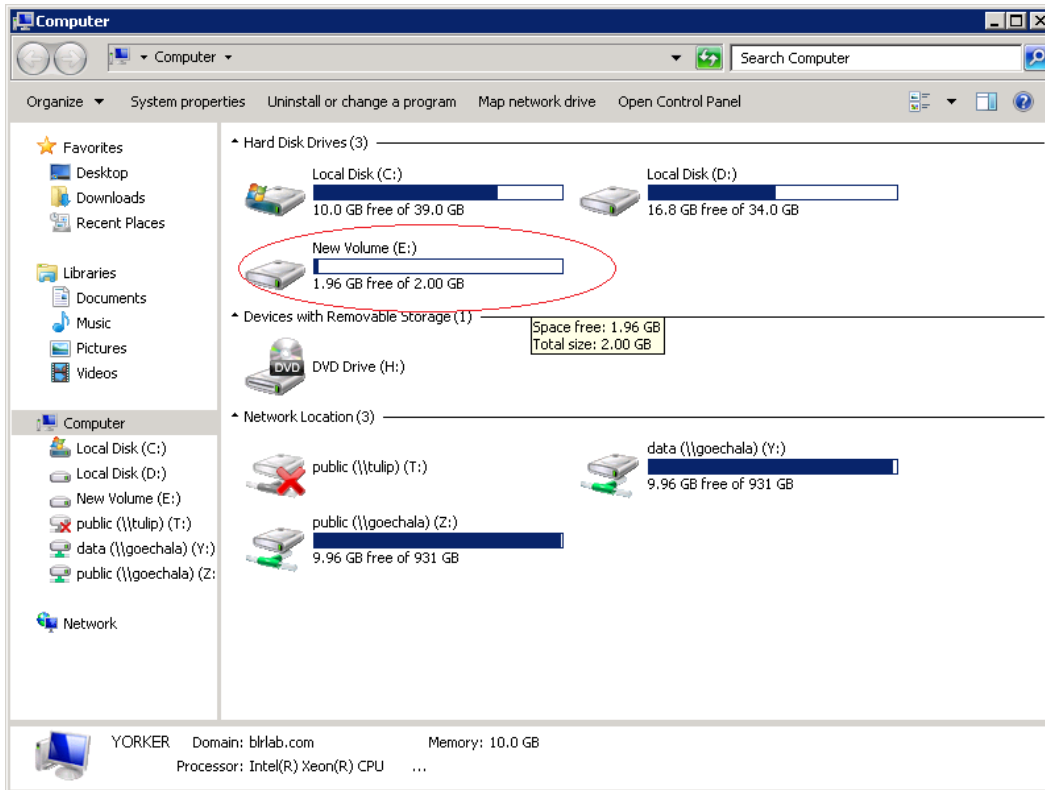


Figure 2.2.3 (h) – The newly created volume in My Computer

To check the list of targets that are being discovered from a particular FCoE port, use the following commands from cxgbtool.

## 1. Check for the adapter number using the following command.

```
cxgbtool.exe --stor -s
```

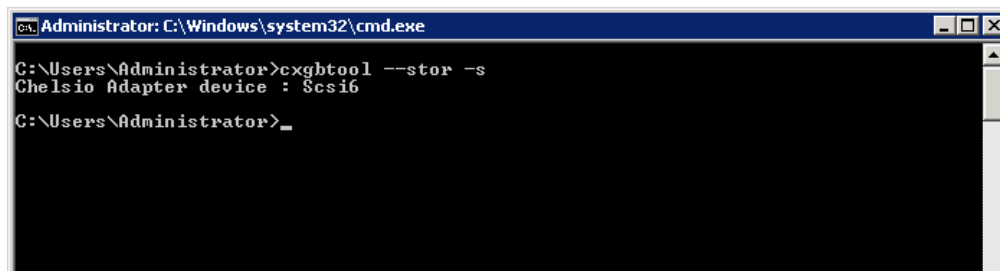


Figure 2.2.3 (i) – Determining adapter number

2. To check the list of targets discovered from a particular FCoE port. First find out the wwpn of the initiator port using the following command.

```
cxgbtool -stor -a <adapter_no> --show-lnode
```

```

Administrator: C:\Windows\system32\cmd.exe
C:\>cxgbtool.exe --stor -a Scsi6 --show-lnode
*****[Index: 0]*****
LNode Device ID: 2950
UNPI      : 0xb86
FCPI      : 0xba2
MAC       : 0E-FC-FF-53-00-02

Port Id   : 0
Nport id : 530002
State    : READY

WWPN      : 50:00:74:31:00:78:60:80
WWNN      : 50:00:74:31:00:78:60:00
NPIU      : SUPPORTED
Total UPorts : 0

No. of RNodes : 2

Common Service Params:
    Rcv size: 2068
    ED-TOU  : 2000

Class Service Params:
Class 1: NOT SUPPORTED
Class 2: NOT SUPPORTED
Class 3: SUPPORTED
    Initiator ctl      : 0
    Recipient ctl     : 0
    Rcv size           : 2068
    Total concurrent seq : 0
    EE Credit          : 0
    Open Sequence per Exchange: 0

```

Figure 2.2.3 (j) – Determining WWPN of Initiator port

3. After finding out the wwpn of the local node, to verify the list of targets being discovered, use the following command.

```
cxgbtool.exe --stor -a <adapter_no> --show-rnode --wwn=<wwpn of lnode>
```

## 2.2.4. Troubleshooting

1. Always enable LLDP on the interfaces as there won't be FCoE link up until and unless a successful LLDP negotiation happens.
2. On switch, make sure *priority-flow-control* mode is always set to *auto* and *flowcontrol* is disabled.

3. Always configure the ethernet interfaces on cisco switch in trunk mode.
4. If you are binding the VFC to MAC address in case of cisco nexus, then make sure you make the Ethernet interface part of both Ethernet VLAN and FCoE VLAN.
5. If in any case the switch-port on the cisco nexus switch is reporting “pauseRateLimitErrDisable”, then perform an Ethernet port shut/no shut.

Also note that only one FCoE function will be displayed under the “storage controllers” of the device manager irrespective of the ports a card possess. All ports will be using the same interface.

## V. Unified Wire Manager (UM)

---

## 1. Introduction

Chelsio's Unified Wire Manager is a powerful management software tool, allowing you to view and configure different aspects of the system, including Chelsio hardware installed in the system. The software includes a command line interface (CLI) tool and a web management interface (Web GUI) to help you manage all Chelsio network adapter cards on the network across multiple operating systems.

Unified Wire Manager enables the management of all aspects of the client side of the iSCSI SAN in two main areas. The ability to configure Chelsio adapter's boot option ROM without entering each individual adapter's configuration screen and manage group of iSCSI initiators remotely from a common user interface saves administrator's time considerably. Unified Wire Manager fully supports Microsoft iSCSI initiator. All supported Chelsio FCoE initiators available on Linux can be managed.

Users can manage Option ROM (PXE and FCoE) capability for Chelsio cards using various tools available in the software.

Additionally, Unified Wire Manager allows for Chelsio adapter NIC and TOE parameters to be centrally managed through the same easy-to-use user interface. It can bring interfaces up or down, tune parameters for optimal performance, and any number of administrative tasks normally done at each individual machine.

Chelsio's Unified Wire Manager is an indispensable tool for saving administrator's time for managing the network and SAN. Chelsio's high performance network adapters with its Unified Wire approach to networking can now be managed centrally in a simple and fast way!

### 1.1. Features

---

Chelsio's Unified Wire Manager is designed to provide the following features to the end-user:

- Remotely manage Chelsio adapters and various related tasks like driver installation from a single application.
- Single tool with CLI and Web interface that works across Storage, Networking and Hardware.
- Manage all Chelsio adapters installed on the system.
- Tool for FAE to debug issues on the Customer front.
- Freedom to choose various modes of management i.e. CLI or Web GUI.

## 1.2. Reference Architecture

**Chelsio's Web GUI** is a web-based management interface that lets you remotely manage several Chelsio CNAs from anywhere, at anytime on the network using a web browser. The Web GUI provides a great amount of flexibility, efficiency and accessibility to system administrators in managing the Network and SAN. The users have the freedom to access the interface using any of the major browsers available, based on individual preferences and corporate policy.

System performance degradation issues will not be observed when using the Web GUI, since it's lightweight and utilizes very less system resources.

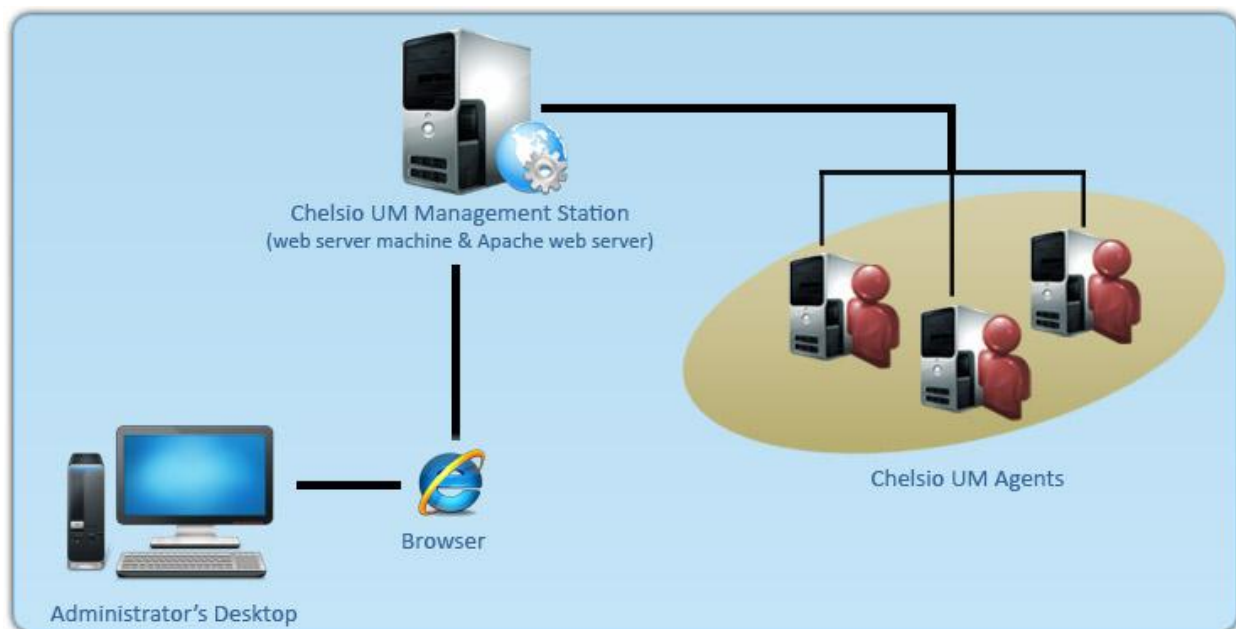


Figure 1.2 – Chelsio Unified Wire Manager with web interface (Web GUI)

## 1.3. Unified Wire Manager Components

### 1.3.1. Management Agent

The Management Agent is a binary executable, which runs as a service on the system that has at least one Chelsio card installed. It is installed along with libraries that can manage various components of the system and enabled during system startup.

### 1.3.2. Management Client

The Management Client can be used to connect to agents and manage them. Once connected you can view and configure Chelsio CNAs and related networking, storage and hardware properties. You can use either the CLI or Web GUI client to manage agents based on your

preference. It makes service requests based on the command issued by the user and returns the appropriate information.

- **CLI Client**

The **CLI Client** (*chelsio\_uwcli*) is an executable binary which allows you to manage and configure agents using the command-line interface. It is not a command shell with a prompt; it accepts all command parameters as arguments when launching it, making it script-friendly.

- **Web GUI Client**

The **Web Management Interface** (Web GUI) client is a web-based management interface which allows you to securely manage agents from anywhere using a web browser. The management interface uses a secure 256-bit encrypted HTTP connection, ensuring that authentication and configuration data are protected during transmission from the web browser to the system and vice versa. Many agents can be accessed on single interface making it very efficient & user-friendly.

Currently supported browsers are **Internet Explorer 9+**, **Mozilla Firefox 3.6.9+**, **Google Chrome 5+** and **Apple Safari 5+**.

## 1.4. Authentication and encryption

---

The Unified Wire Manager requires user authentication to manage a system. A user must have administrative privileges to manage a system. The authentication credentials, as well as all data exchanged between the CLI client or the Web GUI and the agent, are encrypted using SSL. This ensures that the data cannot be accessed when it is being transmitted over the network.

## 2. Hardware and Software

### 2.1. Supported Adapters

Following are the currently shipping Chelsio Adapters that are compatible with Chelsio Unified Wire Manager:

- **T5 Adapters**
  - T520-LL-CR
  - T520-CR
  
- **T4 Adapters**
  - T420-CR
  - T440-CR
  - T422-CR
  - T404-BT
  - T420-BT
  - T420-LL-CR
  - T440-LP-CR
  - T420-CX
  - T420-SO-CR

### 2.2. Platform/Component Matrix

The table below lists the Windows version and the supported UM components.

Version/Distribution	Supported UM Components
Windows Server 2012	Management Agent, Management Client

**Note**

*This release of Chelsio Unified Wire doesn't support the Web-based management station (Web GUI) component. Please use the CLI client to manage and configure agents.*



## 2.3. Platform/Driver Matrix

---

The table below lists the Chelsio T5/T4 drivers and their supported versions:

Chelsio driver	Version
NIC	5.1.5.1
iSCSI	5.0.0.1103

## 3. Installing Unified Wire Manager

Chelsio Unified Wire has been designed to install Unified Wire Manager (UM) by default. Hence, no separate installation is required.

## 4. Configuring Unified Wire Manager

The following section discusses advanced configuration options for Management Station component of Unified Wire Manager.

If you've already configured Management Station using the Unified Wire Installer during installation, it is already setup and you can skip this step. If you, however, decide to manually configure or make modifications to the default settings, you can follow the procedure mentioned below and make necessary changes.

### 4.1. Configuring Management Station

Follow the steps mentioned below to configure Apache Server and SSL certificate.

#### 4.1.1. Apache HTTP Server

1. Assuming that Apache HTTP Server 2.2 is installed at the default location, append the following lines in *C:\Program Files (x86)\Apache Software Foundation\Apache2.2\Conf\httpd.conf*

```
ScriptAlias /python/ "C:/Program Files (x86)/Apache Software
Foundation/Apache2.2/htdocs/chelsio/python/"

<Directory "C:/Program Files (x86)/Apache Software
Foundation/Apache2.2/htdocs/chelsio/python/">
    PythonPath ["C:/Program Files (x86)/Apache Software
Foundation/Apache2.2/htdocs/chelsio/python']+sys.path"

    SetHandler mod_python
    PythonHandler mod_python.publisher
    PythonDebug on
</Directory>

LoadModule python_module modules/mod_python.so
ThreadStackSize 8388608
```

2. Perform the following tasks in *C:\Program Files (x86)\Apache Software Foundation\Apache2.2\Conf\httpd.conf* file
  - i. Change "DocumentRoot" to "C:/Program Files (x86)/Apache Software Foundation/Apache2.2/htdocs/chelsio"
  - ii. Uncomment "LoadModule rewrite\_module modules/mod\_rewrite.so"
  - iii. Uncomment "Include conf/extra/httpd-ssl.conf"
  - iv. Uncomment "LoadModule ssl\_module modules/mod\_ssl.so"
  - v. Add the following lines:


```
RewriteEngine On
RewriteCond %{HTTPS} !=on
RewriteRule ^/?(.*) https://%{SERVER_NAME}/$1 [R,L]
```

### 4.1.2. SSL Certificate


1. Execute the following lines in command prompt and provide info to generate OpenSSL certificate and keys:

```
cd "C:\Program Files (x86)\Apache Software Foundation\Apache2.2\conf"
..\bin\openssl req -config openssl.cnf -new -out blarg.csr -keyout blarg.pem
..\bin\openssl rsa -in blarg.pem -out blarg.key
..\bin\openssl x509 -in blarg.csr -out blarg.crt -req -signkey blarg.key -
days 365
```

2. Browse to the following location:  
*C:\Program Files (x86)\Apache Software Foundation\Apache2.2\conf\extra\*
4. Open the file *httpd-ssl.conf* and make the following modifications:
  - i. Modify "SSLCertificateFile" to "C:\Program Files (x86)\Apache Software Foundation\Apache2.2\conf\blarg.crt"
  - ii. Modify "SSLCertificateKeyFile" to "C:\Program Files (x86)\Apache Software Foundation\Apache2.2\conf\blarg.key"

 **Note** *On some installation, Apache is seen to report problems regarding SSL cache. In such a case, do the following in C:\Program Files (x86)\Apache Software Foundation\Apache2.2\conf\extra\httpd-ssl.conf*

- i. *Uncomment the following line*  
*SSLSessionCache "dbm:C:/Program Files (x86)/Apache Software Foundation/Apache2.2/logs/ssl\_scache"*
- ii. *Comment the following line*  
*SSLSessionCache "shmcb:C:/Program Files (x86)/Apache Software Foundation/Apache2.2/logs/ssl\_scache(512000)"*

 **Note** *Use the Windows Event Log (Event Viewer) for troubleshooting any installation related issues.*

## 5. Verifying UM components status

The following section explains how to verify status of various UM components.

### 5.1. Verifying Management Agent

1. On the system running Management Agent, launch **Services** from the Control Panel. You can also type `services.msc` in the **Run** command. This will open the **Services** window.

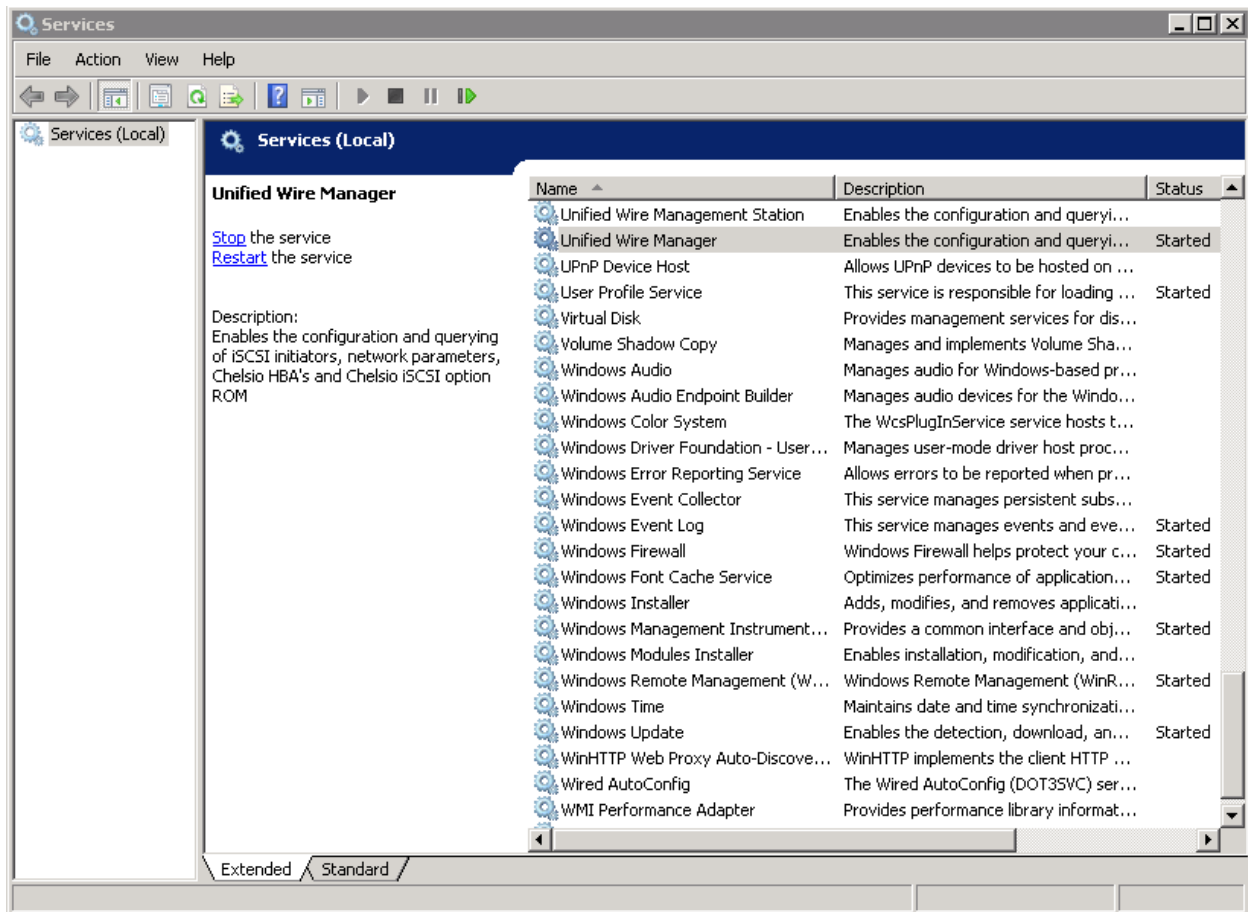


Figure 5.1(a) – Windows Services

2. Search for *Unified Wire Manager* in the list of services. You should get the options to stop and restart in the *Actions* menu on the left side, indicating that Management Agent is already running.

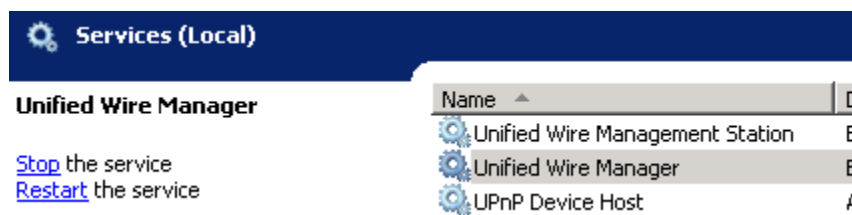


Figure 5.1(b) – Actions available for Unified Wire Manager service

## 5.2. Verifying Management Client

Execute the following query command to determine if Management Client is installed:

```
C:\Users Administrator>chelsio_uwcli.exe -V
```

The above query should confirm that Management Client is installed by displaying a similar result:

```
Unified Manager client CLI version : 2.x.yy
```

## 5.3. Verifying Management Station

1. Launch **Services** from the Control Panel. You can also type *services.msc* in the **Run** command. This will open the **Services** window.
2. Search for *Unified Wire Management Station* in the list of services. You should get the options to stop, start and restart the service in the *Actions* menu on the left side.

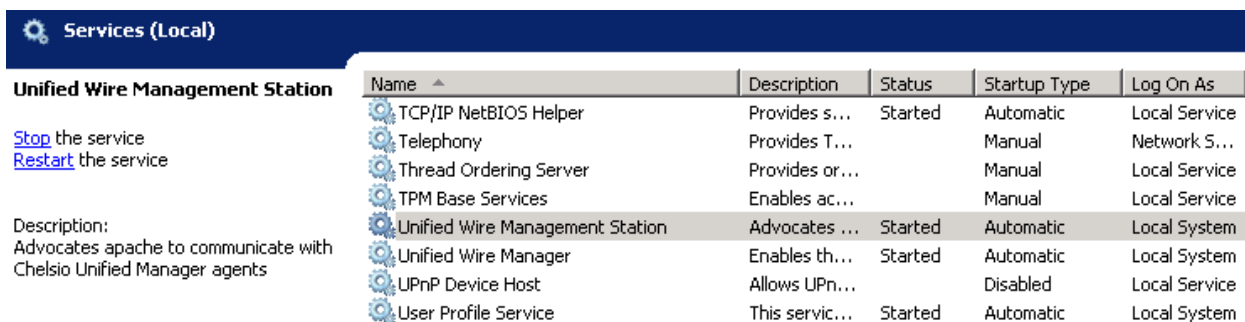


Figure 5.3 – Verifying Management Station service status



Note

*While accessing the Web Management Interface, if an error “Management Station is not running” is displayed at the log-in page, follow the above steps to restart Management Station and try again.*

## 6. Management Agent

### 6.1. Communication

The agent uses a TCP connection over IP to communicate with the client. After the connection is established, SSL (Secure Sockets Layer) encryption is enabled using the Open SSL libraries. The agent listens on a TCP port for new incoming connections from clients. This port is set to 35001 by default.

### 6.2. Service configuration

The agent is installed as a service on the system, and enabled to start on boot. The following sections will describe the procedure to configure service startup manually:

#### 6.2.1. Service startup configuration

The service name on Windows is *Unified Wire Manager* and the service startup configuration can be changed by following these steps:

1. Launch **Services** from the Control Panel. You can also type `services.msc` in the **Run** command. This will open the **Services** window.
2. Scroll and highlight the "Unified Wire Manager" service, and double-click on it.
3. Select the startup type, either "Automatic (Delayed Start)", "Automatic", "Manual", or "Disabled".

#### 6.2.2. Service start/stop/restart

1. Launch **Services** from the Control Panel. You can also type `services.msc` in the **Run** command. This will open the **Services** window.
2. Scroll and highlight the "Unified Wire Manager" service.
3. Click on **Start/Stop/Restart** to carry out the respective tasks in the Description section on the left.

### 6.3. Firewall

If the system has a firewall configured, it should be configured to allow traffic to the management agent's default TCP port configured i.e. 35001. Review the firewall documentation and configure it appropriately. If there is a firewall appliance / software protecting the network that the system is on, and you wish to connect to the system from a different network, using the client, the firewall appliance also needs to be configured appropriately.



## 7. CLI client

### 7.1. CLI Help system

---

A detailed help and usage documentation is built into the CLI, and is accessible through its help system. The help can be invoked by the usual argument of `/?` or `--help`.

#### 7.1.1. Viewing help

1. Open command prompt by typing `cmd` in the **Run** command.
2. Type `chelsio_uwcli.exe --help`. Press enter to view the built-in help.

### 7.2. Client conflict resolution

---

The CLI and Web GUI cannot manage the same system at the same time by default. This is to ensure that configuration changes being applied by one client are not interrupted by another client. Also, two different Web GUI or CLI clients cannot connect to a management agent at the same time. There is no mechanism to allow this scenario.

## 8. Web GUI client

### 8.1. Management Station

In order to access the Web Management Interface, start the Apache HTTP server, if it's not running already. Also, Cookies and Javascript must be enabled in the browser.

#### 8.1.1. Running Management Station

1. Launch **Services** from the Control Panel. You can also type `services.msc` in the **Run** command. This will open the **Services** window.
2. Search for “*Apachex.x*” in the list of services and click **Start** in the **Action** menu on the left.

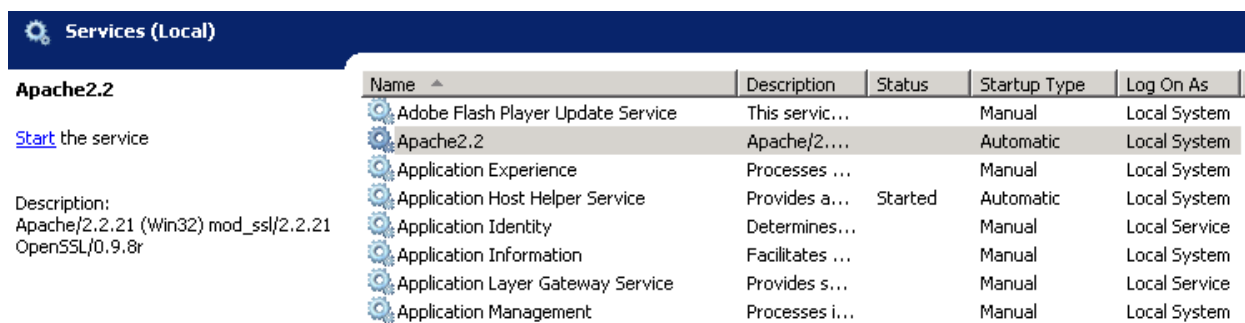


Figure 7.1.1 (a) – Starting Apache HTTP server

3. Search for “*Unified Wire Management Station*” and click **Start** in the **Action** menu on the left.

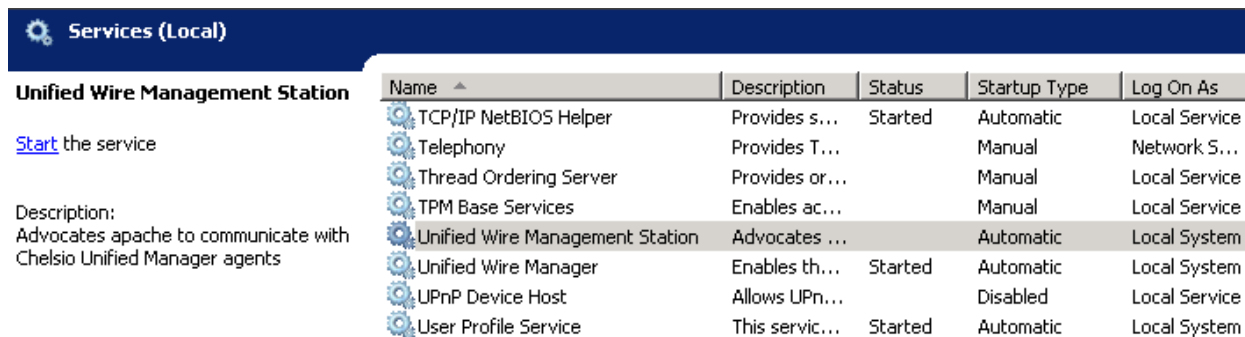


Figure 7.1.1(b) – Starting Management Station service

## 8.2. Accessing Web Management Interface

1. To access the Web GUI, type in the URL https://<management station IP address> in a web browser.
2. The security certificate used by the web server is a generic one. It may cause the following types of prompts in different browsers. You will need to select the correct option to continue.

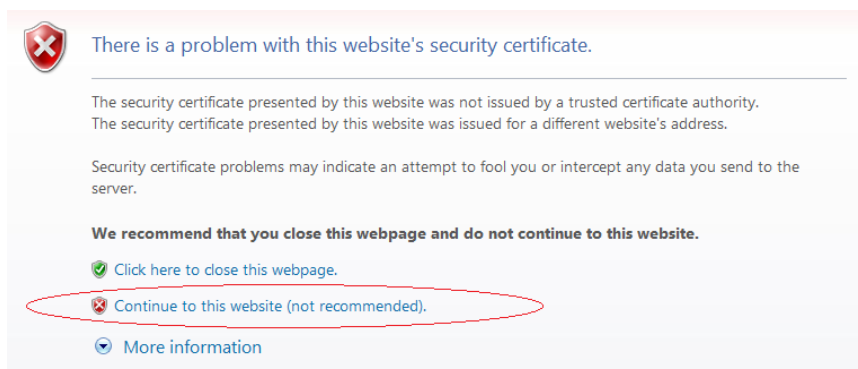


Figure 7.2 (a) - Security Certificate prompt in Internet Explorer

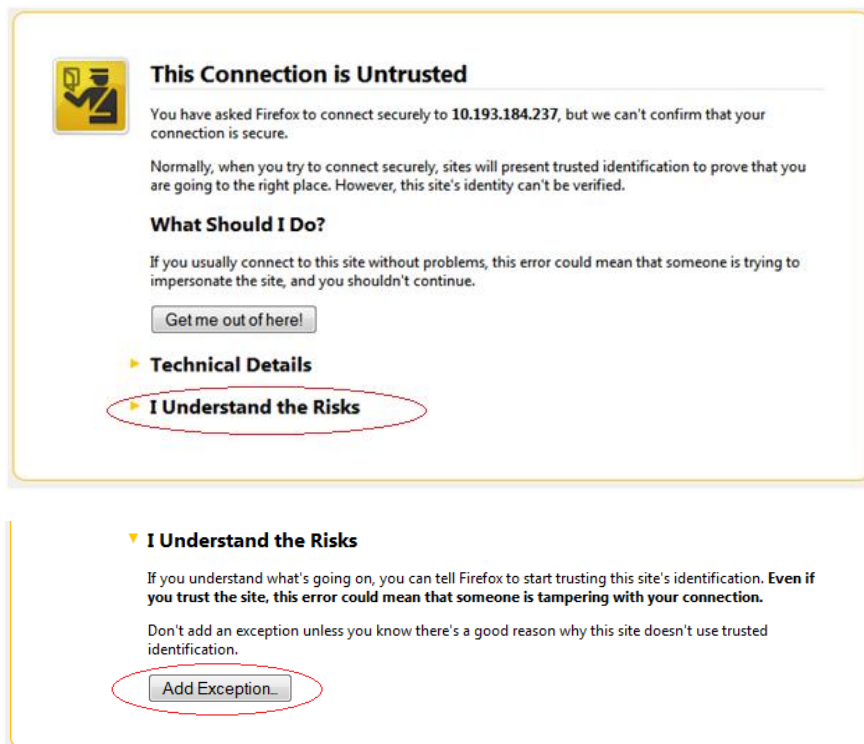


Figure 7.2 (b) - Security Certificate prompt in Mozilla Firefox

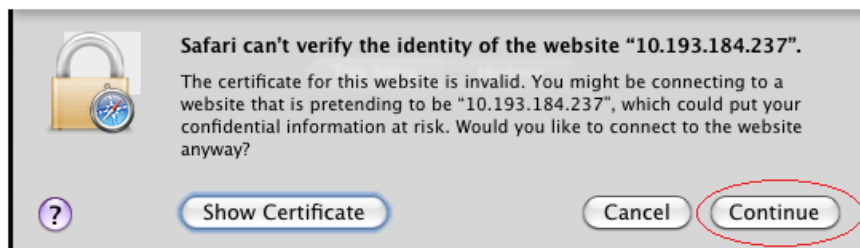


Figure 7.2 (c) - Security Certificate prompt in Apple Safari



Figure 7.2 (d) - Security Certificate prompt in Google Chrome

3. The web interface requires password authorization to be accessed. Enter the username and corresponding password that was set up on the management station system and click on the *Login* button.

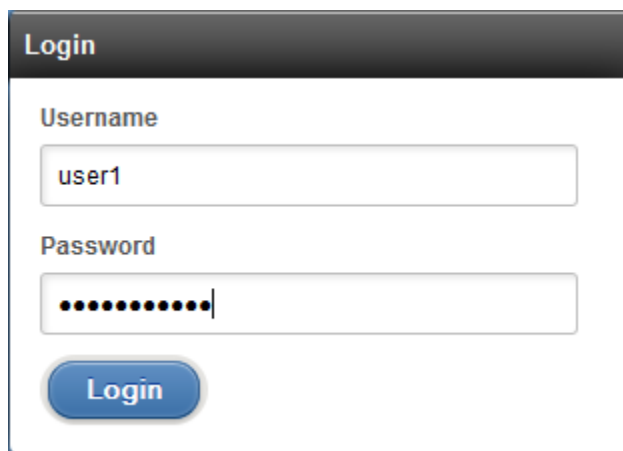


Figure 7.2 (e) - Web GUI Login page

**Note** *Not performing any operation/action for 5 minutes will result in session timeout. You will have to re-login and connect to the Agents again.*

### 8.3. Layout and Navigation

The Web Management Interface consists of the following:

- **Title bar** displaying the username on the left, Unified Wire Manager logo and name in the centre; and a Logout button on the right.
- **Menu Bar** consisting of the **Home**, **Add System**, **Remove System**, **Refresh**, **Subscribe** and **Bulk Configuration** buttons.
- The **Navigation Pane** with a cascading tree of links to various configuration modules for a UM Agent. You can navigate between connected agents and various sections of the managed agent's interface. You can view and hide the configuration modules for each Agent by clicking on the "+" and "-" links respectively
- The **Details Pane** on the right displaying panels associated with the tree menu item selected in the **Navigation Pane**. The panels can be expanded and collapsed by clicking on the panel heading.
- The **Bottom bar** has the **About** link on the right and copyright details on the left.



Figure 7.3 – Web Management Interface

## 8.4. Home page

The home page is displayed by default on launching the Web GUI. It displays **Bookmarks and History**, **Service Discovery** and **Bulk Driver Installation** modules. Options to go back to home page, add/remove system, refresh and configure email alerts are also available.

### 8.4.1. Home

This option will display the home page.

- **Bookmarks and History**

A history of the last 128 systems that were managed from this system, by the current user, will be shown here in a list. Each system's management IP address, TCP port, and Login details are also stored. This may be edited and saved. Any systems that are not required in the list may be deleted.

**Important**

**Storing login passwords for the managed systems is inherently insecure.** The passwords are encrypted, but it is still advisable to store passwords only if the system you are running the GUI client on, is secure.

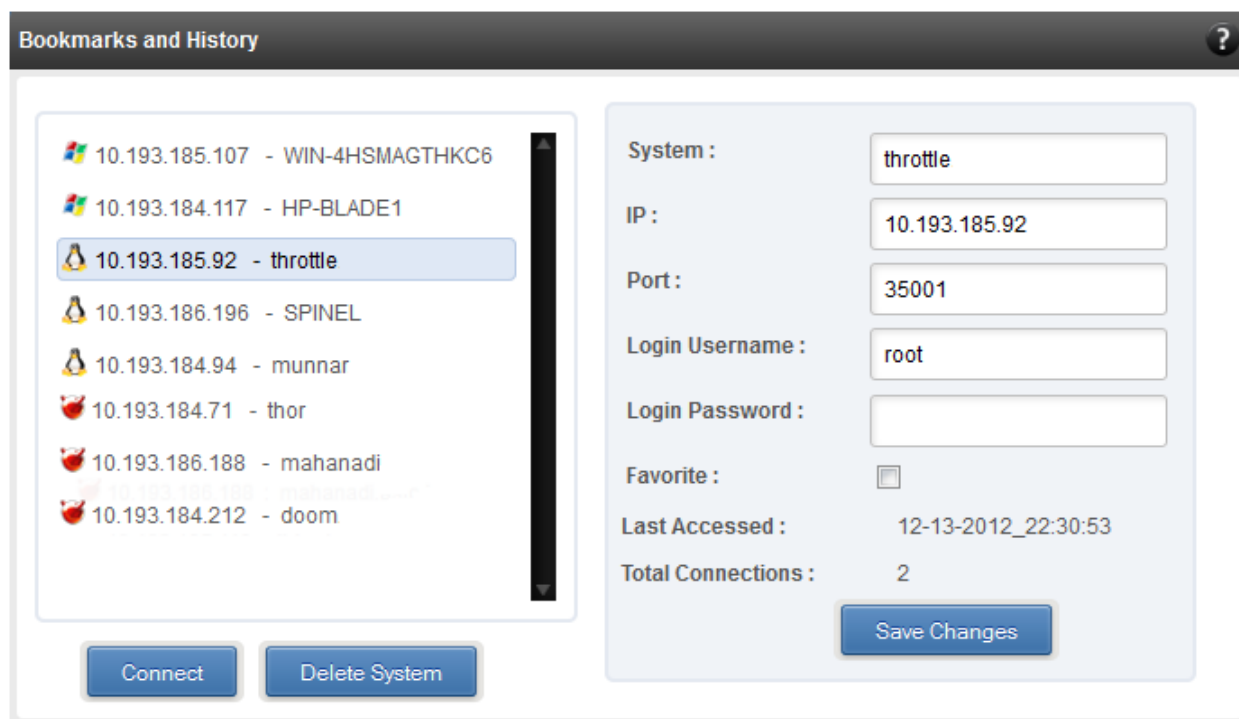


Figure 7.4.1 (a) - Bookmarks and history module

- **Connecting to a system**

Select the system from the Bookmark list and click *Connect*. Once successfully connected, the system will appear on the left pane with different related modules on the right to view and manage.

- **Deleting a system**

Select the system from the Bookmark list and click *Delete system* to remove it.



Note

*Once removed, the system will no longer appear in the Bookmarks and History module. If you wish to manage that system again, you will have to use the “Add system” option.*

- **Service Discovery**

Using this module, all the Unified Wire Manager agents connected in the same or different subnet can be discovered. One can choose to discover agents based on OS type (Linux, Windows, FreeBSD or All) or search for a particular agent if the agent's IP is known by using the **Choose the HostIP** option. The **Add Agents** button adds the selected system to the list of discovered agents in the **Bookmarks and history module**. The **Clear Agents** button resets the list of discovered agents.

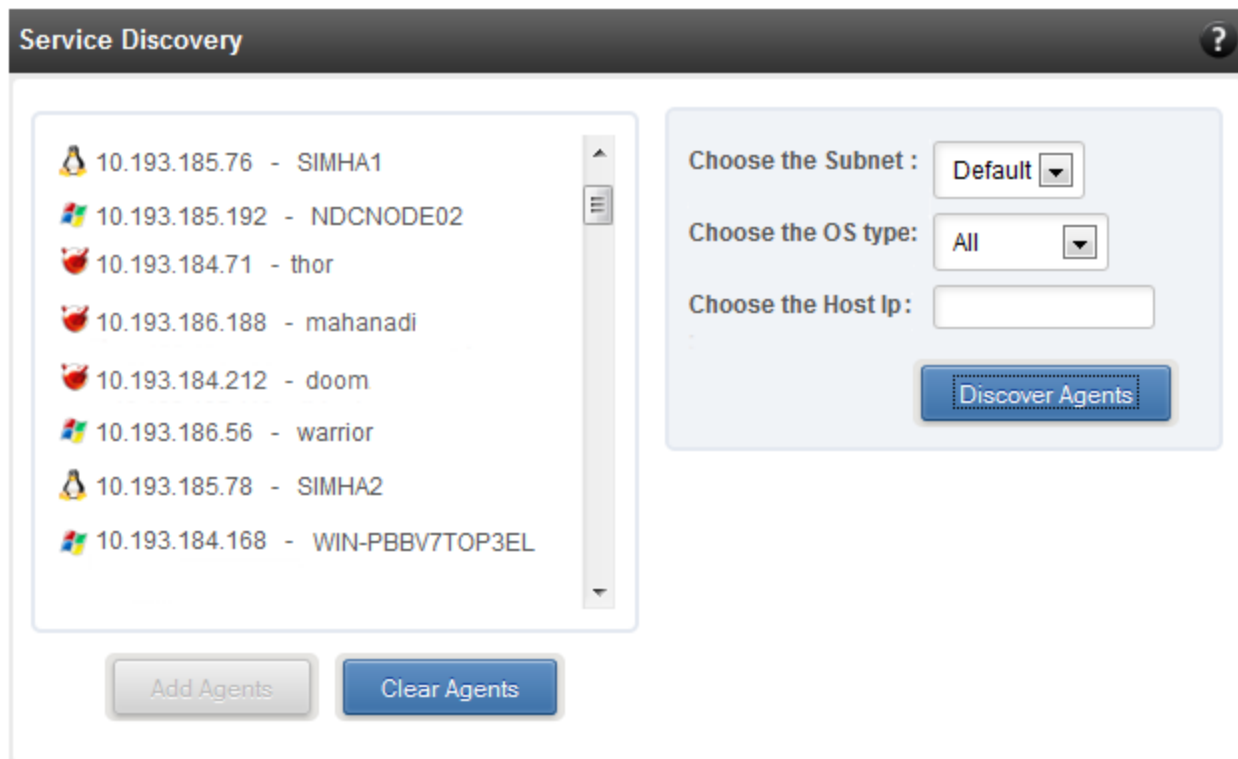


Figure 7.4.1 (b) - Services Discovery module

### • Bulk Driver Installation

This module allows you to install drivers for multiple systems simultaneously. Drivers available for installation for a particular system may differ depending on the network card and the operating system selected.

#### • Installing Driver

1. In the *Choose the card* fields, select a Chelsio card.
2. Select the operating system for which drivers are to be installed in the *Choose the OS Type* field. Systems listed in the *Bookmarks and History* pane with the selected operating system, which are not already connected, will be displayed in the list below.
3. Select a system or systems from the list and choose the driver to be installed in the *Driver Installation* section.
4. Download the appropriate driver from Chelsio's Download Center, [service.chelsio.com](http://service.chelsio.com).
5. Locate the driver package.
6. Click *Install* button to install the driver.



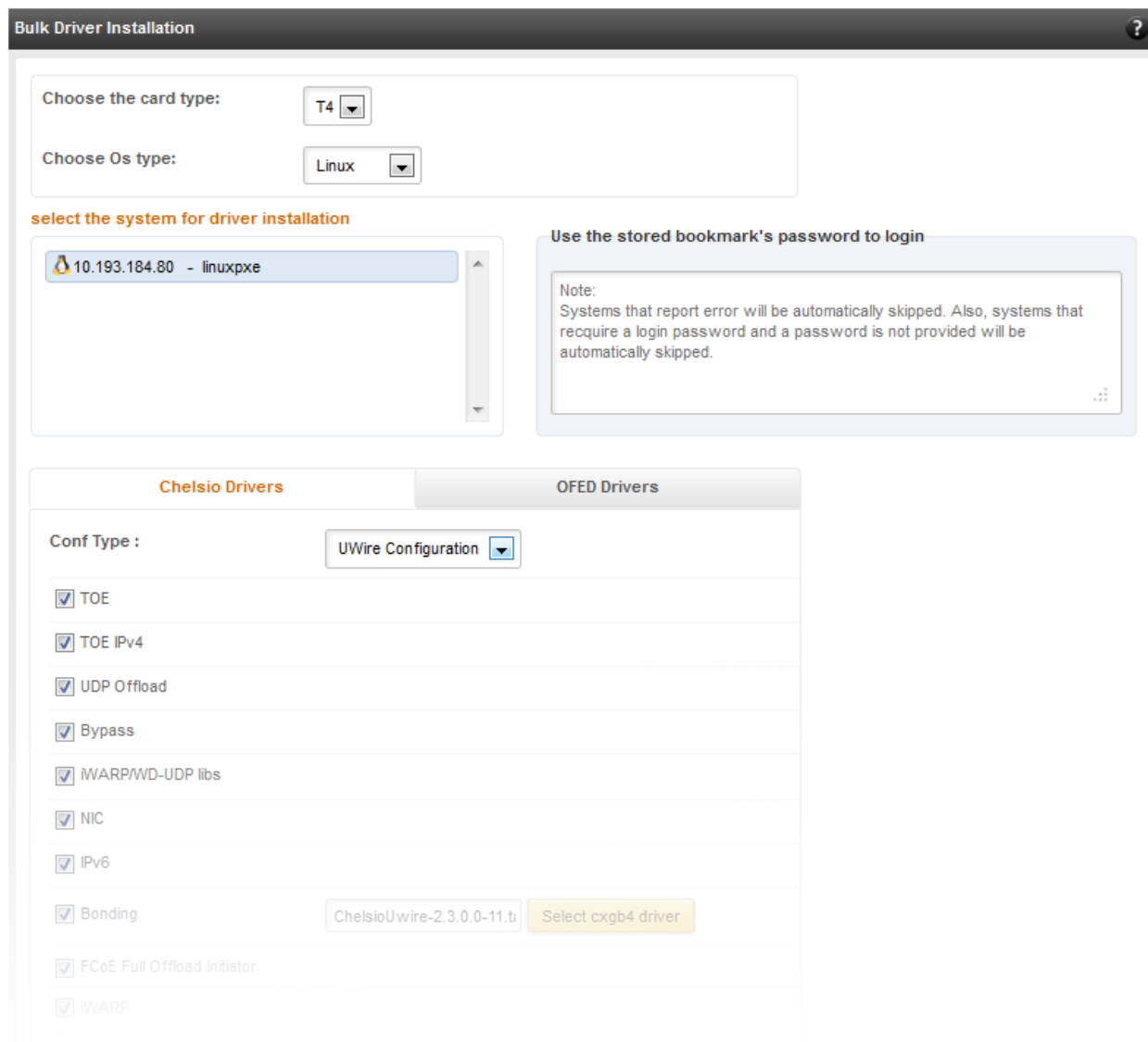


Figure 7.4.1 (c) - Bulk Driver Installation module for Linux Agent

**Note** Agents that report errors or whose passwords are not stored, will be automatically skipped during the driver installation.

### 8.4.2. Add System

Use this option to connect to new Agents using their IP or Hostname. The TCP port for connection is by default 35001. You will have to provide correct user credentials for the agent in order to connect successfully.

After connecting to the Agent, the menu bar on the left will display the connected system and its related modules.

If you deselect the 'Remember Password' option, you will be asked to enter the password every time you try to connect to the system.

The 'Add System' dialog box features a title bar with a close button. Below the title bar, there are two radio buttons: 'IP' (selected) and 'Hostname'. The 'IP address/Hostname' field contains '10.193.185.107'. The 'TCP Port' field contains '35001' and has a checked 'Default' checkbox. The 'Administrative User' field contains 'administrator'. The 'Password' field is masked with ten dots. A checked 'Remember Password' checkbox is located below the password field. At the bottom, there are two buttons: 'Connect to system' (highlighted in yellow) and 'Cancel'.

Figure 7.4.2 (a) - Adding a UM Agent

### 8.4.3. Remove System

Use this option to disconnect an Agent. To remove an agent, click on the name of the system in the tree menu in the left and click *Remove System*. Then click *Yes* to confirm.

The 'Remove System' dialog box has a title bar with the text 'Remove System'. The main content area contains the question 'Are you sure you want to remove HP-BLADE1 ?'. At the bottom, there are two buttons: 'Yes' (highlighted in yellow) and 'No'.

Figure 7.4.3 - Removing a UM Agent

#### 8.4.4. Refresh

This option can be used to reload the Web GUI or UM Agent.

To reload the Web GUI, navigate to the Home page (by clicking on the “Home” button and click Refresh. You can use this option to refresh Home page panes (Bookmarks and History, Service Discovery and Bulk Driver Installation).

To reload an Agent, click on the name of the system in the tree menu in the left and click “Refresh”. You can use this option to update any changes made to system settings like load/unload drivers.

#### 8.4.5. Subscribe (Email Alerts)

This feature is available only on the Web Management Interface.

Using this option, you can receive email alerts regarding the link status of a Chelsio Network Interface Card. This feature sends email notifications regarding the port and the card, on which the link up/down event has occurred. Not only can you configure multiple email addresses to receive notifications, but also customize the email id of the sender for troubleshooting purposes.

To subscribe to **Email Alerts**, enter the sender’s email address in the *Email address* field. It should be in the format of <name>@<domain>.<extension>. You can enter multiple email addresses for the *Recipients* field separated a comma. Enter Mail server details and ensure that the “Enable email Alerts” field is enabled. Select the Agent(s), for which you want to receive alerts and Click on **Save**.

**Email Alert**

Email address: email\_id@abc.com

Recipients: administrator1@chelsio.com,administrat

Mail Server: mailserver.abc.com

SMTP Port: 25

Services:  Network Services

Enable email alerts:  Enable

Select Systems:

- 10.193.185.107 - WIN-4HSMAGTHKC6
- 10.193.184.117 - HP-BLADE1
- 10.193.185.92 - throttle
- 10.193.186.196 - SPINEL
- 10.193.184.94 - munnar
- 10.193.184.211 - eastend
- 10.193.184.71 - thor

Save Close

Figure 7.4.5 - Subscribing to Email Alerts

### 8.4.6. Bulk Configuration

The **Bulk Configuration** page allows you to execute common configuration changes to multiple agents and their network adapters simultaneously. You can conveniently perform bulk operations like installing option ROM, setting MTU and VLAN ID, changing adapter and port parameters on various devices, without having to access multiple modules and thus saving considerable amount of administration time.

Various configurable parameters have been categorized into several modules like **Boot Configuration** module to install and erase option ROM, **Network Configuration** module to set MTU and VLAN ID, **Card Configuration** module to change driver parameters, etc.

Before accessing these modules, you will have to create **groups** and then add **members** to that group. Once done, you can select the group in the modules and the new setting will be applied to all members of that particular group.

- **Manage Groups**

This is where you can add, delete and manage groups. Use the **Create a Group** section to create a group by specifying agent's platform and group type. There are various types of groups to choose from depending on the type of configuration setting you want to change. For example, to change the MTU size of a network interface (in the Network Configuration module), create a group with group type *Network*. To install or erase option ROM on a Chelsio T4 adapter (in the Boot Configuration module), create a group with group type *t4adapter*.

Here is a list of available configuration modules and corresponding group type:

- **Boot Configuration:**t3adapter,t4adapter
- **Network Configuration:**Network
- **Card Configuration:** t3adapter,t4adapter
- **Port Configuration:**t3port, t4port
- **Bypass Configuration:** Network

After the group has been created, add members to that group using the **Add a member row** button. Depending on the group type selected, you may be asked to provide additional details for the new member. Use the **Fetch Details** button to do so and finally click **Save a member** button to add the member to the group.

To delete a group, select it from the **Select a Group** drop-down list, and click **Delete Group**. To delete a member from a group, select the group to which the member belongs, select the radio button corresponding to the member to be deleted in the **SNO** field and finally click **Delete Member(s)**.

**Create a Group**

Group Name:

Os Type :

Group Type :

Figure 7.4.6 (a) – Creating a group

**Manage Group**

Select a Group:

OS Type: WINDOWS

Group Type: t4adapter

SNO	HOSTNAME / IP	USERNAME	USERNAME	DETAILS
1	10.193.185.107	administrator	*****	Adpater Idx : 0 [ T422;CR ; PCI Location: 01:00:04 ]
2	10.193.185.86	administrator	*****	Adpater Idx : 0 [ T422;CR ; PCI Location: 02:00:04 ]

Figure 7.4.6 (b) – Managing a group

- **Boot Configuration**

Using this module, you can install option ROM or erase option ROM on Chelsio network devices. The **Set Default Boot Settings** button will reset the adapter to factory boot settings.

**Boot Configuration** ?

**Boot Configuration**

Select a group:

Figure 7.4.6 (c) – Boot Configuration module

- **Network Configuration**

In the **Network Configuration** module, you can set Maximum Transfer Unit (MTU), Virtual LAN (VLAN) ID and change the IP address type for the members (network interfaces) of the *Network*

group. MTU can be set between 1500-9000 bytes. VLAN id can be set for an adapter within the range 0-4094 (enter 0 to disable it). The IP type can be static or DHCP.

Figure 7.4.6 (d) – Network Configuration module

### • Card Configuration

The **Card Configuration** module allows you to set various adapter settings including TCP Offload. Offload settings are only available when using the TOE capable drivers (*t3\_tom* and *toecore* for T3 cards; *t4\_tom* and *toecore* for T4 cards).

DESCRIPTION	RANGE	VALUE
Max VM	[0,16]	4

Figure 7.4.6 (e) – Card Configuration module

- **Port Configuration**

In the **Port Configuration** module, you can set various port settings like enabling Tx checksum and TCP segmentation offload, setting Link speed and link duplex mode, etc. The settings depend on the device driver installed.

**Port Configuration** ?

Refresh

Select a Group: group\_t4port ▼

Group Type: t4port

OS Type: WINDOWS

**Note:**

*MIN = Minimun value a variable of type int can assume*

*MAX = Maximun value a variable of type int can assume*

DESCRIPTION	RANGE	VALUE
Link speed and link duplex	auto   100-full   1000-full	<input style="width: 100%;" type="text" value="auto"/>
Enable Disable LSO IP v4	0   1	<input style="width: 100%;" type="text" value="1"/>
Enable Disable LSO Ip v6	0   1	<input style="width: 100%;" type="text" value="0"/>
FlowControl	[0,3]	<input style="width: 100%;" type="text" value="1"/>
IP CheckSum Offload	[0,3]	<input style="width: 100%;" type="text" value="2"/>
Enable Disable Virtual Machine Queue	0   1	<input style="width: 100%;" type="text"/>
Enable Disable VMQLookAheadSplit	0   1	<input style="width: 100%;" type="text"/>
Enable Disable VMQVLanFilter	0   1	<input style="width: 100%;" type="text"/>
TCP CheckSum Offload v4	[0,3]	<input style="width: 100%;" type="text"/>
TCP CheckSum Offload v6	[0,3]	<input style="width: 100%;" type="text"/>
UDP CheckSum Offload v4	[0,3]	<input style="width: 100%;" type="text"/>
UDP CheckSum Offload v6	[0,3]	<input style="width: 100%;" type="text"/>
Max Number of Response Queue	[1,8]	<input style="width: 100%;" type="text"/>
RSS load balancing profile	[0,4]	<input style="width: 100%;" type="text"/>

Figure 7.4.6 (f) - Port Configuration module



- **Bypass Configuration**

Use the **Bypass Configuration** module to configure Chelsio's bypass adapters like B420-SR and B404-BT. For more information on different bypass modes and configurational parameters, refer **Chapter XIII. Bypass Driver** ([Click Here](#)).

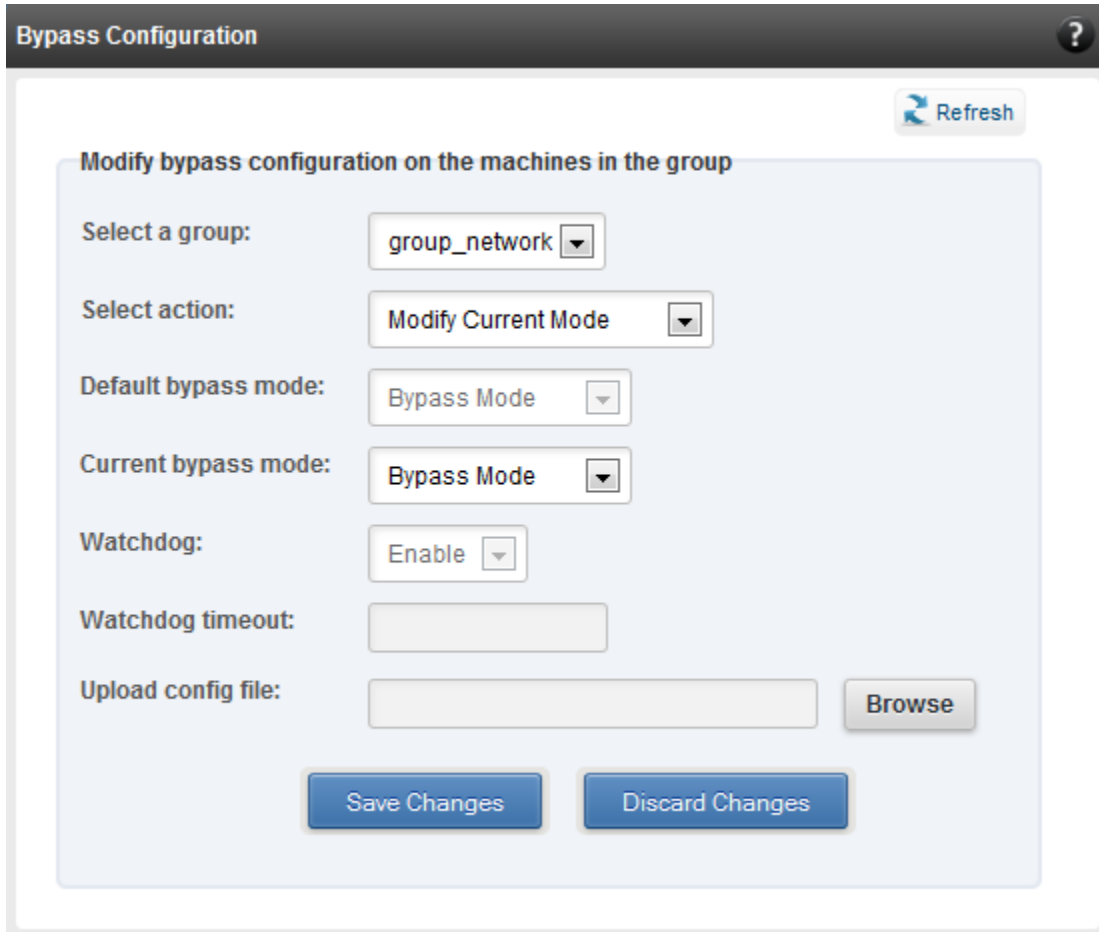


Figure 7.4.6 (g) - Bypass Configuration module

## 8.5. System page

The system page is displayed, when the system hostname / IP address is selected in the tree menu on the left. On adding a system, this item is automatically selected, and this page is displayed. The system page contains generic system and support modules which are discussed below:

### 8.5.1. System summary

This module lists the system Hostname, Operating System, platform and also gives the count of the Chelsio cards present.



The screenshot shows a window titled "System Summary" with a help icon in the top right corner. Below the title bar is a table with two columns: "PROPERTY" and "VALUE". The table contains the following data:

PROPERTY	VALUE
Hostname	shambu-dc
Connected IP:Port	10.193.184.168:35001
Chelsio Cards	1
Operating system	Windows Server 2012
Platform	x86_64 (amd64 / x64)

Figure 7.5.1 (a) - System Summary module

### 8.5.2. Drivers Installation

Using this module, one can install various Chelsio drivers for different operating systems.

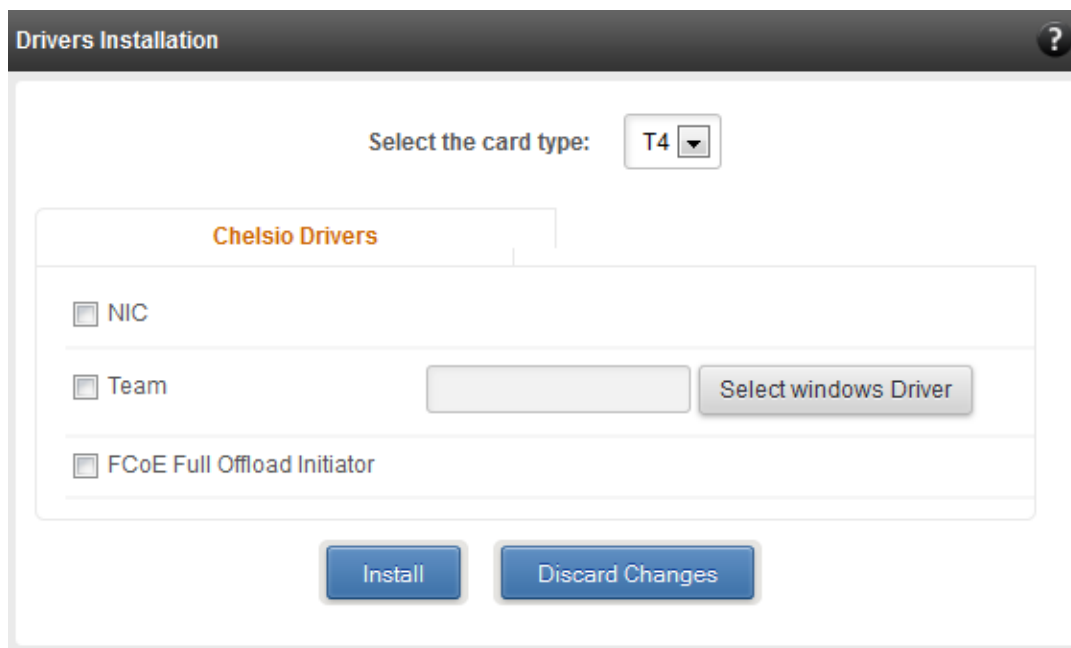


Figure 7.5.2 (a) - Drivers Installation module connected to Windows Agent

**Note** Teaming driver is not available for Windows Server 2012

### 8.5.3. Unified Manager Upgrade

Using this module you can update Management Agent. Use the “Select” button to locate the Chelsio Unified Wire Installer and then click “Install”. In order to complete the upgrade process, the system will be disconnected. Re-connect to the system again and verify the Agent version in the **Unified Wire Manager Component Versions** module. The *Server* field will display the installed Agent version.

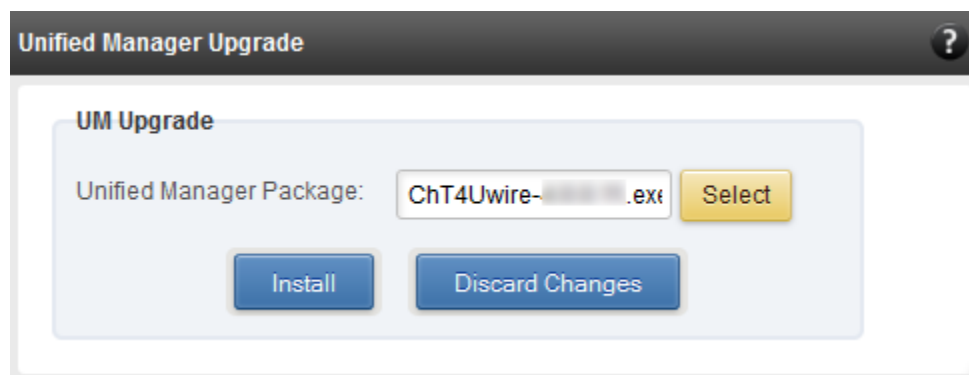
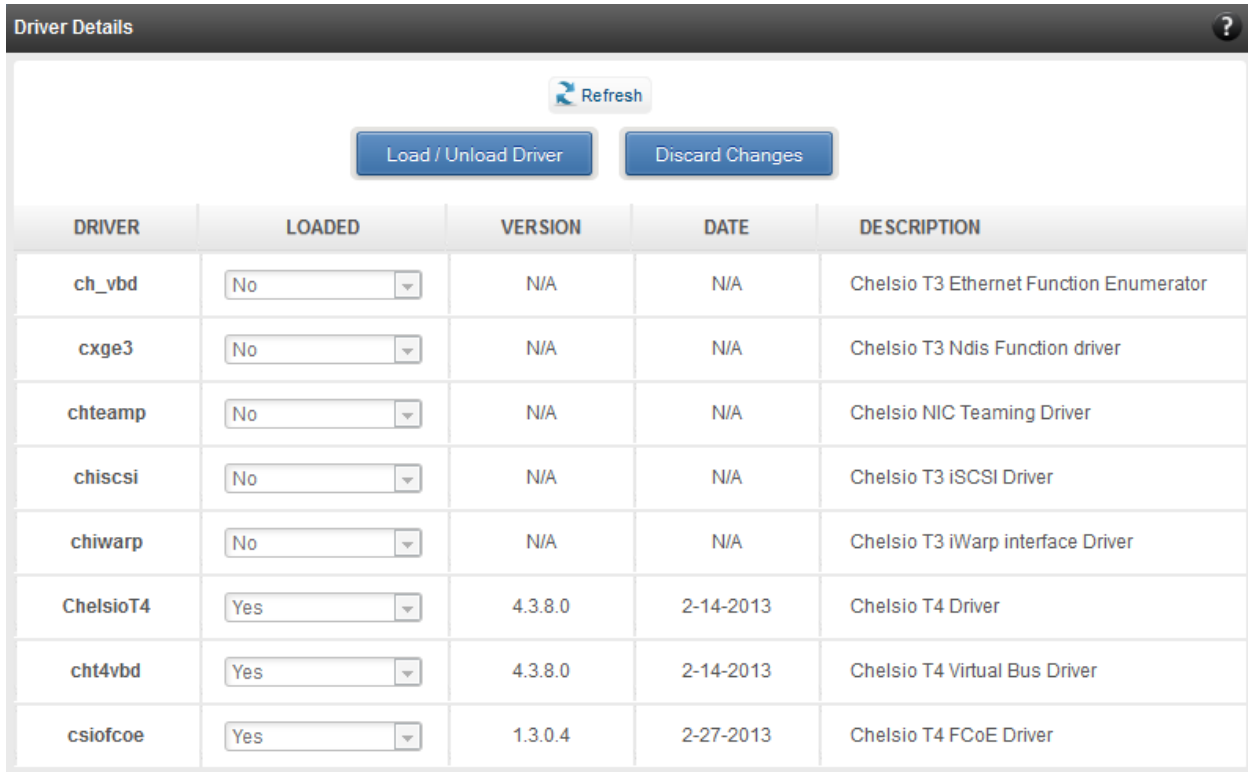


Figure 7.5.3 - Unified Manager Upgrade module

### 8.5.4. Driver Details

A list of the Chelsio device drivers installed on the system is shown in this module, with version information and the current status, whether the driver is loaded and active or not.



DRIVER	LOADED	VERSION	DATE	DESCRIPTION
ch_vbd	No	N/A	N/A	Chelsio T3 Ethernet Function Enumerator
cxge3	No	N/A	N/A	Chelsio T3 Ndis Function driver
chteamp	No	N/A	N/A	Chelsio NIC Teaming Driver
chiscsi	No	N/A	N/A	Chelsio T3 iSCSI Driver
chiwarp	No	N/A	N/A	Chelsio T3 iWarp interface Driver
ChelsioT4	Yes	4.3.8.0	2-14-2013	Chelsio T4 Driver
cht4vbd	Yes	4.3.8.0	2-14-2013	Chelsio T4 Virtual Bus Driver
csiofcoe	Yes	1.3.0.4	2-27-2013	Chelsio T4 FCoE Driver

Figure 7.5.4 - Driver Details module

### 8.5.5. System Diagnostics

Using this module, you can run various diagnostic tests on Chelsio (T3 and T4) HBAs to troubleshoot adapter related issues. Select the card(s) from the list for which you want to run the test, select the operation (type of test; you can run more than one test at a time) and click “Run Test”. After the tests are completed, the results will be displayed in a tabular format.

CARD	LED	CONTROL REGISTERS	MII REGISTERS	EEPROM	INTERNAL MEMORY
T420-CR	Success	Success	Success	Success	Success

Figure 7.5.5 - System Diagnostics module for a T4 CNA

### 8.5.6. Unified Wire Manager Component Versions

A list of the Unified Wire Manager agent components installed on the managed system is shown in this module. The versions of the components are useful in case of reporting an issue to support.



The screenshot shows a window titled "Unified Wire Manager Component Versions" with a help icon in the top right corner. The window contains a table with two columns: "COMPONENT" and "VERSIONS". The table lists the following components and their versions:

COMPONENT	VERSIONS
Server	2.4.29
msiscsi	1.1.6
winchiscsi	2.0.0
win_net	2.0.0
winteam	2.0.0
winhwlib	2.0.3
winosapi	2.0.0

*Figure 7.5.6 - Unified Wire Manager Component Versions module*

### 8.5.7. VM Configurations

The VM Configurations module allows you to view UUID and Power and Health state of Virtual Machines. You can perform various system power options like enable (start VM), disable (stop VM), reboot (restart VM), pause and suspend (save VM state).

You can perform similar actions on multiple virtual machines. To do so, click on the machine names in the list. The properties box will display the domain state of the machines selected. Now, click on any of the system power actions provided at the bottom.

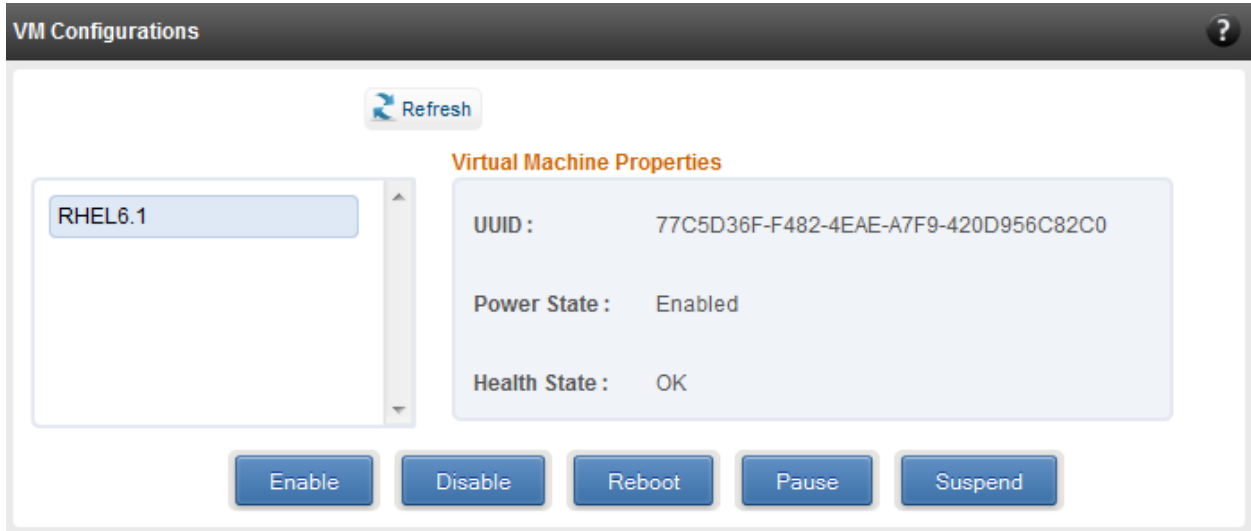


Figure 7.5.7 - VM Configurations module

### 8.5.8. Managed system application logs

The management agent logs its activities and any errors in the Event log. These logs can be obtained in this module. Only 20 entries can be obtained and viewed at a time.

**Managed System Application Logs**

Select log entries to view

Fixed Range

Custom Starting Point

✓ Logs retrieved [Hide](#)

SNO	LOG ENTRY
1	2/25/2013 01:12:55 257 Error in network library. DeviceIoControl() failed with error 87.
2	2/25/2013 00:53:48 261 Error in system library. Server is not licensed, cannot run commands.
3	2/25/2013 00:51:50 261 Error in system library. Error reading from socket:error:00000006:lib(0):func(0):EVP lib.
4	2/25/2013 00:51:43 261 Error in system library. OsApi::AuthenticateUser function failed, Reason: LogonUser function failed with error 1326, please check username and password.
5	2/25/2013 00:47:25 261 Error in system library. Server is not licensed, cannot run commands.
6	2/24/2013 22:07:30 261 Error in system library. Server is not licensed, cannot run commands.
7	2/24/2013 22:07:22 261 Error in system library. OsApi::AuthenticateUser function failed, Reason: LogonUser function failed with error 1326, please check username and password.

Figure 7.5.8 - Managed System Application Logs module for Windows Agent



## 8.6. Network page

### 8.6.1. Network summary

The **Network Summary** module provides the total number of Chelsio cards present, including the number of cards. It also provides the total number of Network interfaces including corporate and Chelsio interfaces and VLANs.



Network <span style="float: right;">?</span>	
PROPERTY	VALUE
No. Of Chelsio Cards	2
No. Of T4 Cards	1
No. Of T3 Cards	1
No. Of Network Interfaces	7

*Figure 7.6.1 - Network Summary module*

### 8.6.2. Chelsio card page

When a Chelsio card is selected in the tree menu on the left, this page is displayed. It provides details of the card and associated settings. It also displays any card specific statistics that the hardware provides. The modules available on this page are as below:

- **Card summary**

This module provides PCI, firmware and other details of the card. The card's serial number and factory MAC address is also provided for inventory purposes.

Card Summary <span style="float: right;">?</span>	
PROPERTY	VALUE
PCI ID ( Vendor : Device )	1425 : 4403
PCI bus location ( Bus : Device : Function )	01:00:04
Card Serial Number	PT18111222
Factory MAC address	00:07:43:10:71:80
Firmware Version	1.8.3.0
Ethernet Ports	4
Offload Support	Chelsio T440-CR 10G Ethernet Function Enumerator
In maintenance mode	No
Hardware is TCP Chimney offload enabled	No
Connector	10G SFP+

*Figure 7.6.2 (a) - Card Summary module for a Windows Agent*

- **TCP Offload settings (Linux & FreeBSD)**

The TCP offload settings applicable to the card are shown here. These settings are only available when using the TOE capable drivers (*t3\_tom* and *toecore* for T3 cards; *t4\_tom* and *toecore* for T4 cards). On changing the settings, the changed settings may not reflect immediately on refreshing the data. Highlight the system item in the tree menu on the left, and click "Refresh", to refresh data from the system, in case the updated settings are not being shown.

TCP Offload Settings ( Offload Card and Offload Summary Only )
?

Save or Discard Driver Settings Changes: Save Changes Discard Changes

DESCRIPTION	VALUE
TCP offload engine enabled (activated):	Yes <input type="button" value="v"/>
Direct data placement (ddp):	Yes <input type="button" value="v"/>
Soft listen backlog limit (soft_backlog_limit):	Yes <input type="button" value="v"/>
Max offloaded connections (max_conn):	40960 <input type="button" value="v"/>
Delayed ACK (delack):	0 <input type="button" value="v"/>
Max Tx payload size (mss):	-1 <input type="button" value="v"/>
Max host send buffer per socket (max_host_sndbuf):	1 <input type="button" value="v"/>
Threshold payload size in bytes for Tx (tx_hold_thres):	1048576 <input type="button" value="v"/>
Min Rx credits for RX_DATA_ACK (rx_credit_thres):	0 <input type="button" value="v"/>
Min Rx payload size in bytes for DDP activation (ddp_thres):	15360 <input type="button" value="v"/>
DDP wait for push flag (ddp_push_wait):	Yes <input type="button" value="v"/>
DDP receive coalescing (ddp_rcvcoalesce):	No <input type="button" value="v"/>

Figure 7.6.2 (b) - TCP Offload Settings module for a FreeBSD Agent

- **Device Driver settings (Windows)**

The device driver settings applicable to the card are shown here. For Chelsio T4 cards, only the *MaxVMQueues* field will be displayed. On changing the settings, the changed settings may not reflect immediately on refreshing the data. Highlight the system item in the tree menu on the left, and click "Refresh ", to refresh data from the system, in case the updated settings are not being shown.

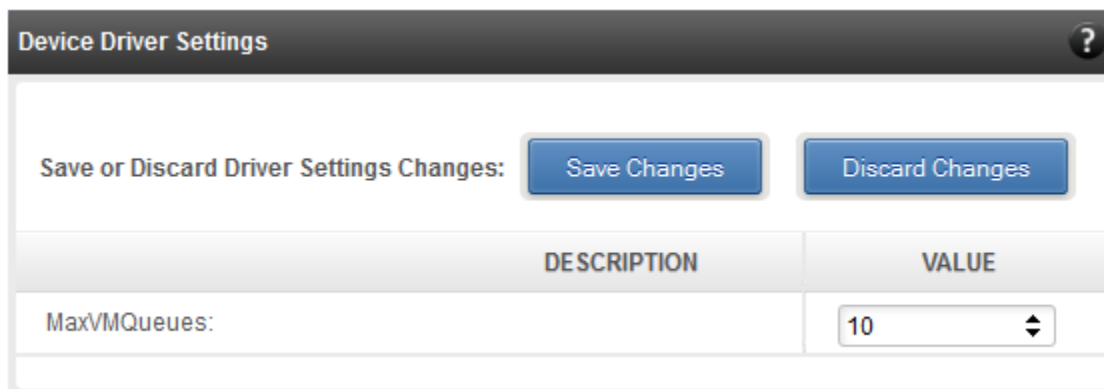


Figure 7.6.2 (c) - Device Driver Settings module for a Windows Agent

- **Card statistics**

Certain statistics are maintained on a per card basis (instead of a per port basis), since the card has a TCP/IP offload capability. The statistics are for TCP and IP protocol processing done in the card's hardware. These statistics may only be applicable if the card is TOE enabled.

STATISTIC	VALUE
OutRsts	0
InSegs	44
OutSegs	57
RetransSegs	0

Figure 7.6.2 (d) - Card Statistics module

### 8.6.2.1. Chelsio card's port

The port page is displayed on selecting a port of a Chelsio card listed in the tree menu on the left. It provides details of the port and port settings. It also displays any port specific statistics that the hardware provides. The modules available on this page are as below:

- **Port summary**

The port details such as the Ethernet adapter name, connector type and link details are shown in this module.



PROPERTY	VALUE
Port Name	Local Area Connection 89
Link	Link up

Figure 7.6.2.1 (a) - Port Summary of T4 CNA

- **Port settings**

Port settings such as MTU, Link speed and others can be set in this module. The settings depend on the device driver installed.

**Port Settings** ?

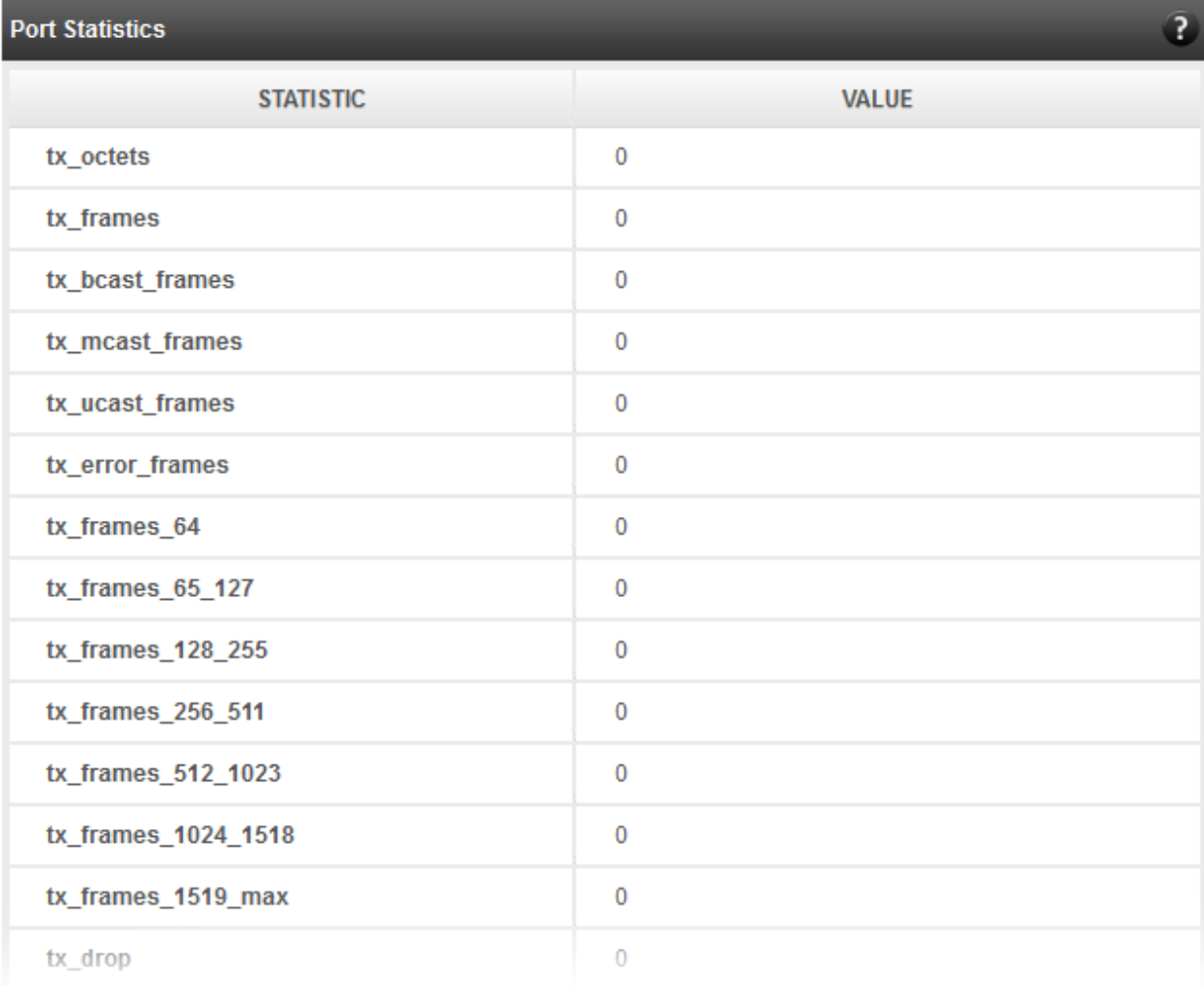
**Save or Discard Port Settings Changes:**

DESCRIPTION	VALUE
MTU (in bytes):	<input type="text" value="1500"/>
Link speed and duplex operation:	<input type="text" value="10Gb/s Full duplex"/>
Tx checksum offload enabled:	No
Rx checksum offload enabled:	No
Tx pause frame support enabled:	No
Rx pause frame support enabled:	No
Receive side scaling enabled:	<input type="text" value="Yes"/>
VLAN ID:	<input type="text" value="0"/>
Large segment offload V2 (IPv4):	<input type="text" value="Yes"/>
Large segment offload V2 (IPv6):	<input type="text" value="Yes"/>
Flow control:	<input type="text" value="Tx and Rx Enabled"/>
IPv4 checksum offload:	<input type="text" value="Tx and Rx Enabled"/>
VMQ:	<input type="text" value="Yes"/>
VMQ look ahead split:	<input type="text" value="Yes"/>
VMQ flow filtering:	<input type="text" value="Yes"/>

*Figure 7.6.2.1 (b) - Port Settings of T4 CNA*

- **Port statistics**

Ethernet statistics and additional hardware statistics for the port are displayed in this module.



The screenshot shows a window titled "Port Statistics" with a help icon in the top right corner. The window contains a table with two columns: "STATISTIC" and "VALUE". All values in the table are 0.

STATISTIC	VALUE
tx_octets	0
tx_frames	0
tx_bcast_frames	0
tx_mcast_frames	0
tx_ucast_frames	0
tx_error_frames	0
tx_frames_64	0
tx_frames_65_127	0
tx_frames_128_255	0
tx_frames_256_511	0
tx_frames_512_1023	0
tx_frames_1024_1518	0
tx_frames_1519_max	0
tx_drop	0

*Figure 7.6.2.1 (c) - Port Statistics of T4 CNA on Windows Agent*

### 8.6.3. Networking Management page

The system networking configurations are shown on this page. IP addresses, MTU, VLAN Ids, DNS and default gateway settings can be viewed and modified here. Network adapters can also be enabled or disabled as required. The modules available on this page are as below:

- **System Network configuration**

The list of network adapters on the system is displayed in a list on the left. The icon for the adapter indicates whether it is administratively enabled and if it is connected to the network. The primary IP address (IPv4) can be set for the adapter, when it is selected. There is an option to add/modify/delete additional IP addresses or aliases for the specified adapter. Use the option to add additional IP addresses with caution, since multiple IP addresses configured on the same adapter, for the same network, may result in unpredictable behavior of the system's networking stack. Maximum Transfer Unit (MTU) can be set between 1500-9000 bytes. VLAN id can also be set for an adapter within the range 0-4094 (enter 0 to disable it).

You can use the View/Set IP addresses option to add, modify or delete IP aliases.

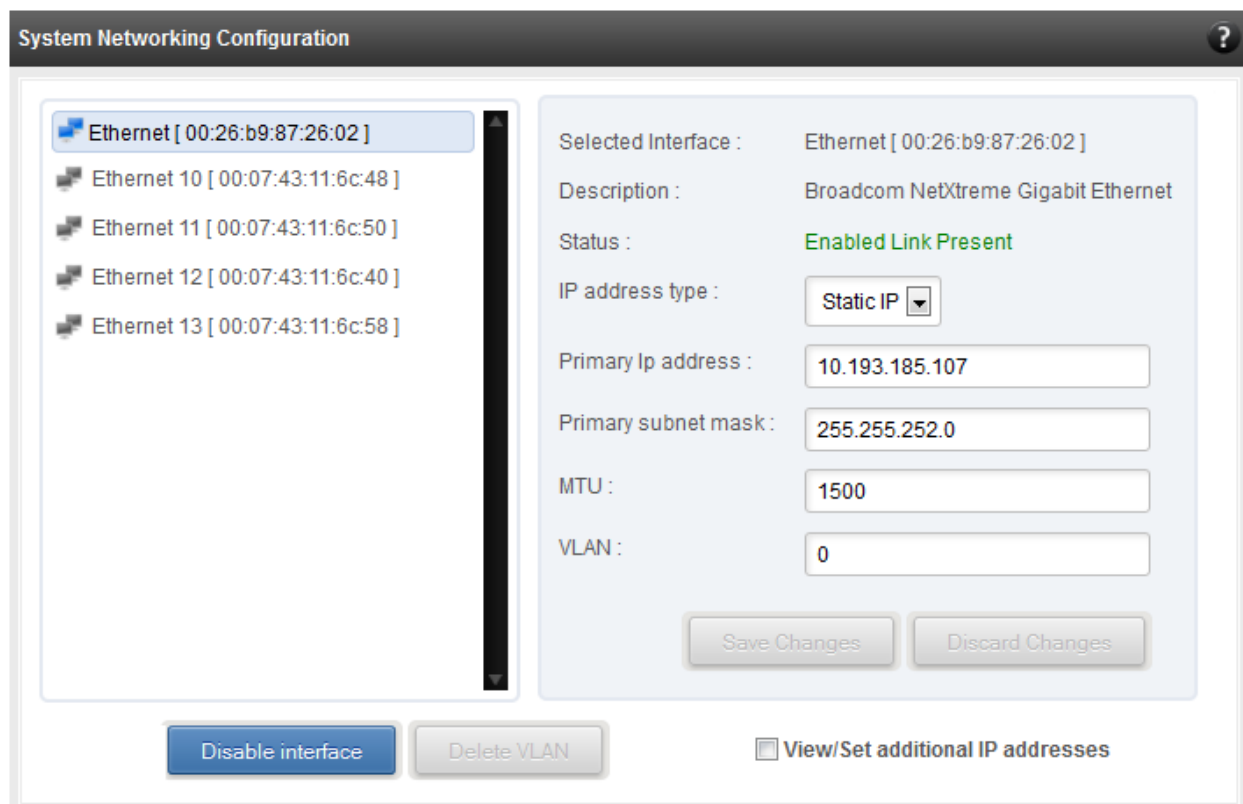


Figure 7.6.3 (a) - System network configuration module



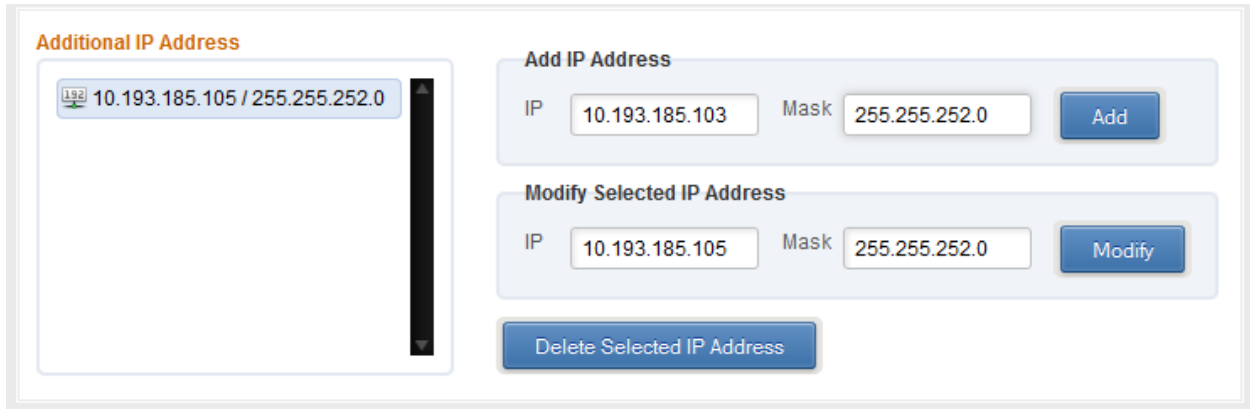


Figure 7.6.3 (b) – Managing IP aliases

- **System network statistics**

Using this module, one can generate reports based on Throughput pkts/sec and Throughput Mbs (Receive, Transmit, Bi-direction) in Table and Graph format for a network adapter. A report for hardware statistics can be generated based on different parameters, only in the Table view in the **Advanced NIC characteristics**. The **polling time** field sets the average time (in seconds) based on which the table/graph updates the report.

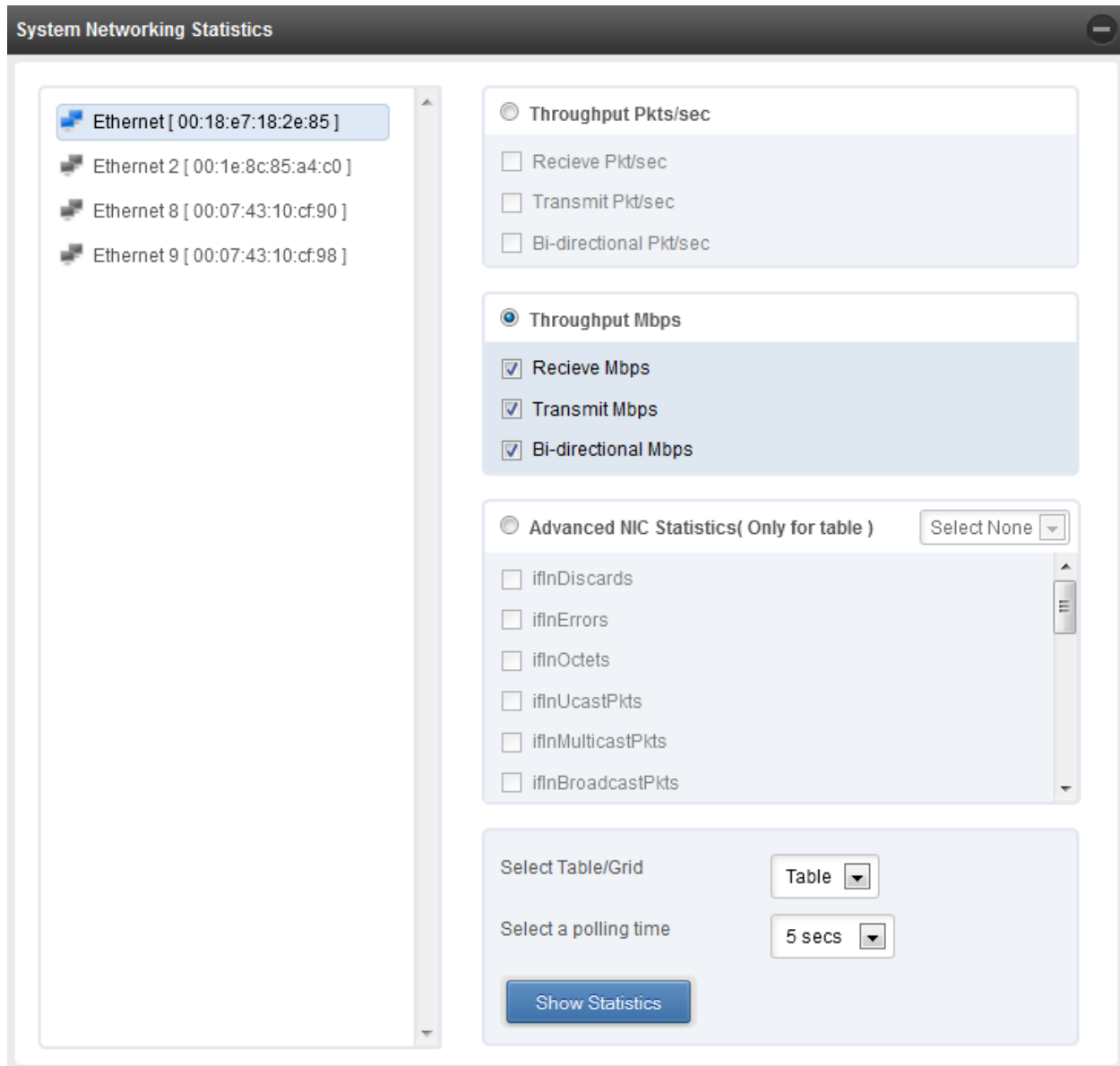


Figure 7.6.3 (c) - System network statistics module

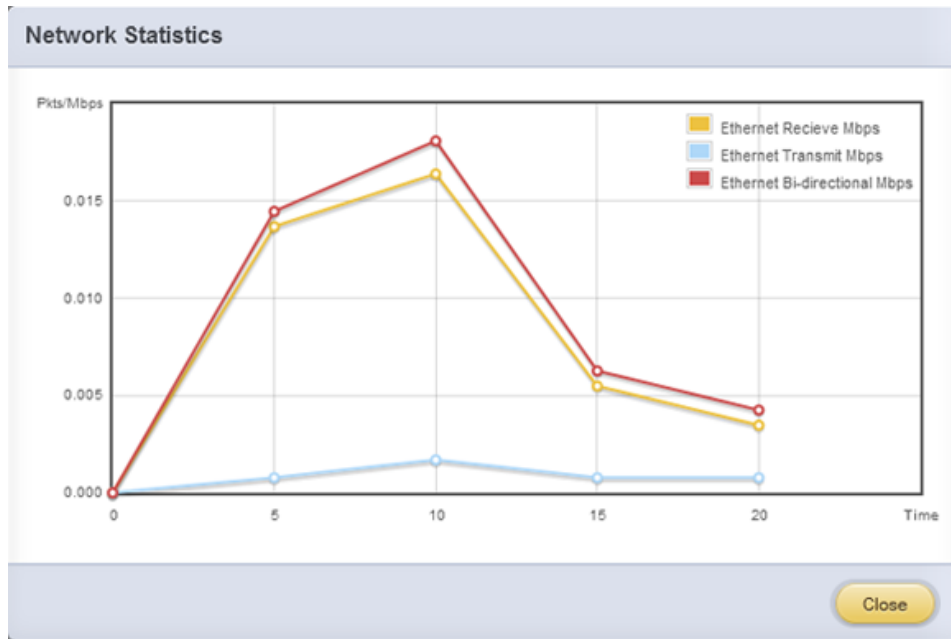


Figure 7.6.3 (d) - Network Throughput Vs Time instant Graph

Network Statistics	
	Ethernet
Recieve Mbps	0.0023536
Transmit Mbps	0.000912
Bi-directional Mbps	0.0032656

Figure 7.6.3 (e) - Network Throughput Vs Time instant Table

- **Default Gateway and DNS configuration**

The DNS servers list can be set here. The default gateway for remote networks and the Internet can also be set here. On Linux and FreeBSD, only one default gateway is allowed. On Windows, you may set multiple default gateways. Use the option to set multiple default gateways with caution, since it may cause the system to stop communicating with external networks.

The screenshot shows a configuration window titled "Default Gateway And DNS Configuration". It is divided into two main sections:

- Default Gateway Configuration:**
  - A list of gateways on the left shows "10.193.184.1" selected.
  - On the right, the "Network Adapter" is set to "Ethernet".
  - The "Modify the selected gateway" section has a text input field containing "10.193.184.1" and a "Modify Gateway" button.
  - The "Add/Set Default gateway" section includes a "Gateway IP Address" input field, a "Network Adapter" dropdown menu set to "Ethernet", and an "Add Gateway" button.
- DNS Server Configuration:**
  - A list of DNS servers on the left shows "10.193.180.20", "10.192.160.5", and "10.192.160.6".
  - On the right, the "Network Adapter" is currently empty.
  - The "Modify the selected DNS Server" section has an empty text input field and a disabled "Modify DNS Server" button.
  - The "Delete the selected DNS Server" section has a disabled "Delete DNS Server" button.
  - The "Add a DNS Server" section includes a "Server IP Address" input field, a "Network Adapter" dropdown menu set to "Ethernet", and an "Add DNS Server" button.

Figure 7.6.3 (f) - Default gateway and DNS configuration module for a Windows Agent

- **Create a network team/bond device (Linux and FreeBSD)**

A list of regular network adapters is provided here, to create a Network Team / Bond device. The available modes for the team depend on the OS teaming / bonding driver in use. On Linux the team may be created with a DHCP or Static IP address. Please check with the driver documentation for the supported modes for creating a team / bond, with offload enabled Chelsio cards. All modes may not be available with all configurations / combinations. Also, the team members can only be 2 ports of a single offload-enabled card, and not across Chelsio cards. Do not mix third party cards and offload-enabled Chelsio cards in a single team.

The screenshot displays the 'Create a Network Team/Bond Device' interface. On the left, under 'Select Team Members', there is a list of network adapters: eth9 [00:07:43:ab:cd:ef], eth10 [00:07:43:ab:cd:f7], eth0 [00:30:48:b8:51:9a], and eth1 [00:30:48:b8:51:9b]. The eth0 and eth1 adapters are selected. A 'Refresh' button is located above the configuration fields. The 'Driver Status' is 'Teaming/bonding driver is offload-capable'. The configuration fields include: Team Name (empty), Team Mode (Round-Robin), Team Priority (1. eth0, 2. eth1), IP Address Type (DHCP), Static IP Address (empty), and Static Subnet Mask (empty). A 'Create Team' button is at the bottom.

Figure 7.6.3 (g) - Create a network team/bond device module for Linux Agent

- **Network troubleshooting**

This module allows detecting and troubleshooting various network connectivity issues. The Ping utility helps to contact a system by specifying IP address, Number of ICMP packets to send and packet timeout. The result of the ping can be viewed by clicking on the **Ping Result** button. Using **TraceRoute** one can determine the route taken by packets across an IP network.

**Ping**

Destination :

No. Of ICMP Packets to send :

ICMP Packet timeout in seconds :

**Pkts Send: 4 , Pkts Recvd: 4 , AVgRtt: 5 ms** [Clear](#)

Figure 7.6.3 (h) - Ping Utility

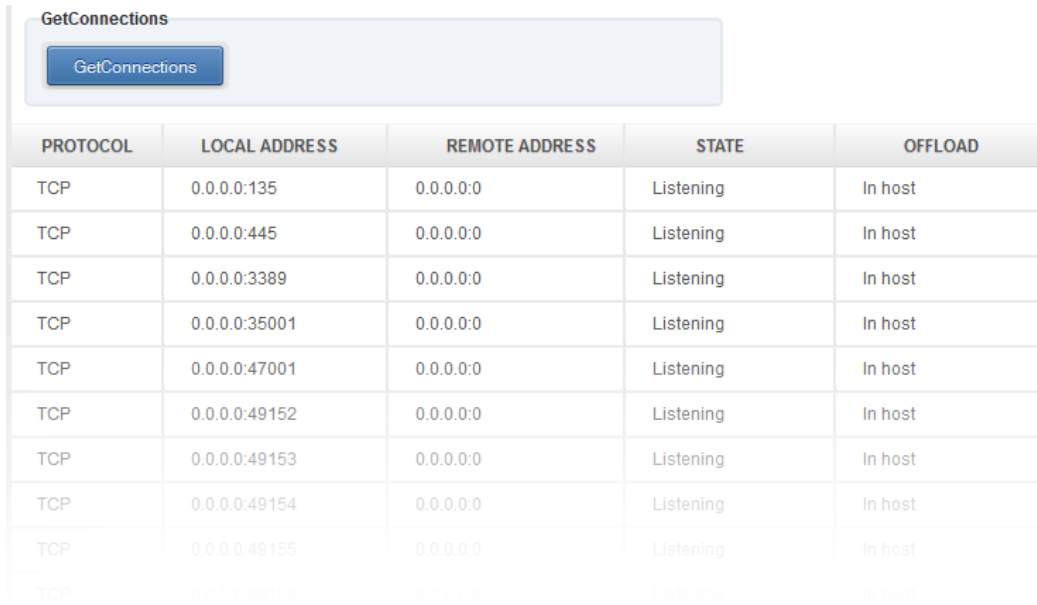
**TraceRoute**

Destination :

Hop Count	Round Trip Time	Ipv4 Address
1	2 ms	10.193.184.1
2	0 ms	10.193.177.3
3	5 ms	111.93.129.157
4	8 ms	121.241.196.101
5	3 ms	121.240.1.242
6	23 ms	172.29.250.33
7	24 ms	180.87.38.5
8	131 ms	80.231.217.17
9	130 ms	80.231.217.6
10	131 ms	80.231.154.17
11	132 ms	208.178.58.109
12	274 ms	208.178.63.114
13	272 ms	72.13.84.18

[Hide](#)

Figure 7.6.3 (i) - TraceRoute Utility



The screenshot shows a utility window titled "GetConnections" with a button labeled "GetConnections". Below the button is a table with five columns: PROTOCOL, LOCAL ADDRESS, REMOTE ADDRESS, STATE, and OFFLOAD. The table contains ten rows of data, all showing TCP connections in a listening state on various local ports, with remote addresses set to 0.0.0.0 and offload status set to "In host".

PROTOCOL	LOCAL ADDRESS	REMOTE ADDRESS	STATE	OFFLOAD
TCP	0.0.0.0:135	0.0.0.0:0	Listening	In host
TCP	0.0.0.0:445	0.0.0.0:0	Listening	In host
TCP	0.0.0.0:3389	0.0.0.0:0	Listening	In host
TCP	0.0.0.0:35001	0.0.0.0:0	Listening	In host
TCP	0.0.0.0:47001	0.0.0.0:0	Listening	In host
TCP	0.0.0.0:49152	0.0.0.0:0	Listening	In host
TCP	0.0.0.0:49153	0.0.0.0:0	Listening	In host
TCP	0.0.0.0:49154	0.0.0.0:0	Listening	In host
TCP	0.0.0.0:49155	0.0.0.0:0	Listening	In host
TCP	0.0.0.0:49156	0.0.0.0:0	Listening	In host

*Figure 7.6.3 (j) - GetConnections Utility*

### 8.6.3.1. Hypervisor

#### • Virtual Network Manager

This module allows you to view and manage virtual networks. The left pane displays a list of different virtual networks created. Clicking on a virtual network name will display related properties on the right.

If a virtual network is added to a virtual machine, a “+” link appears. Expanding the link will display the virtual machines to which the network is attached. Click on the virtual machine names to view their properties on the right.

To delete a virtual network, click on the network name and then click “Delete Switch”. If it is attached to a virtual machine, you will have to detach the virtual machine first. To do so, click on the virtual machine and click “Detach”. Similarly, detach all the virtual machines and then use the “Delete Switch” to delete the virtual network.

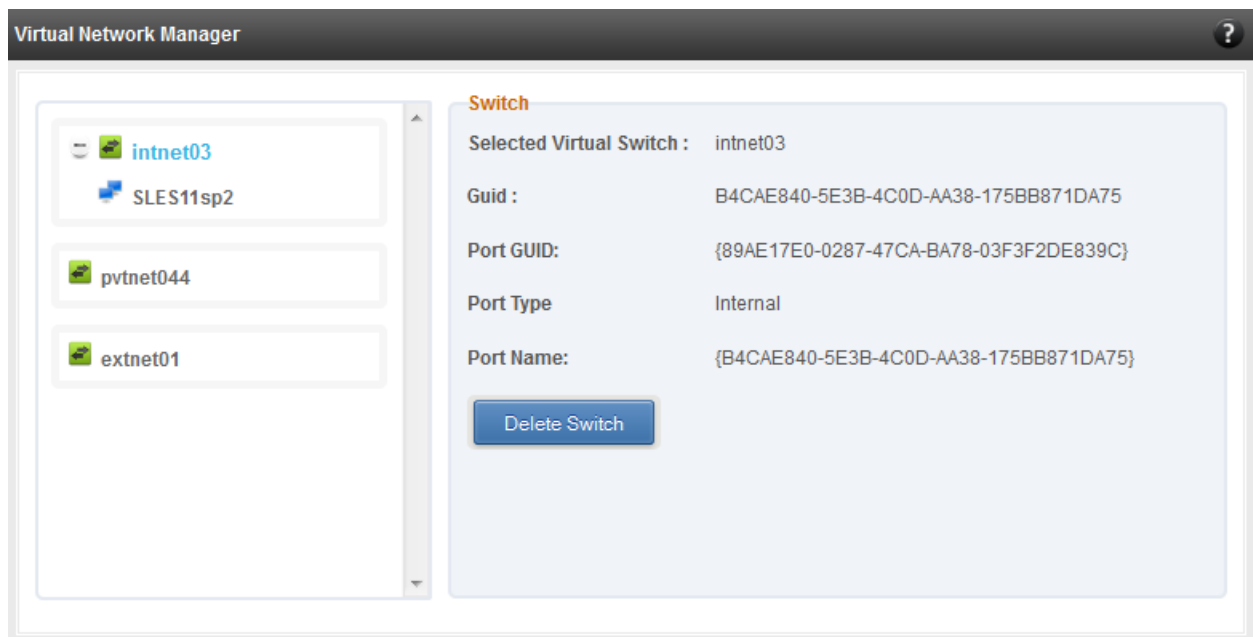


Figure 7.6.3.1 (a) – Virtual Network Manager module



- **Add Virtual Network Configuration**

There are three kinds of virtual networks you can create using this module:

- **External network:** Using this type, you can provide virtual machines access to external networks and vice versa via a physical network adapter in the host system. The virtual machines can also communicate with each other on the same virtual network.
- **Internal Network:** This type allows communication between virtual machines in the same virtual network and also between the virtual machines and the host. This type of virtual network is not bound to any physical network adapter and no access to external networks is provided.
- **Private Network:** A Private Network is similar to Internal Network in that physical adapter is not required for setup and access to external networks is not provided. However, unlike Internal Network, guest operating systems can only communicate with guest operating systems in the same private network and not with the host. The host operating system cannot access the virtual machines on private network.

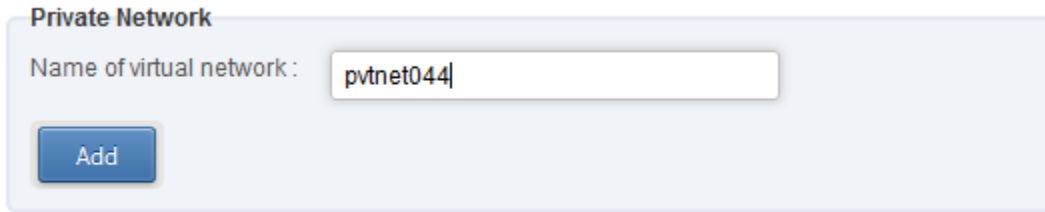
Once created, you can manage the virtual networks in the **Virtual Network Manager** module.

The screenshot shows a configuration window titled "External network". It contains two input fields: "Name of virtual network:" with the text "extnet01" and "Interface Name:" with a dropdown menu showing "Chelsio T4 10GbE Adapter #10". Below the fields is a blue "Add" button.

*Figure 7.6.3.1 (b) – Creating external virtual network*

The screenshot shows a configuration window titled "Internal Network". It contains one input field: "Name of virtual network:" with the text "intnet03". Below the field is a blue "Add" button.

*Figure 7.6.3.1 (c) – Creating internal virtual network*



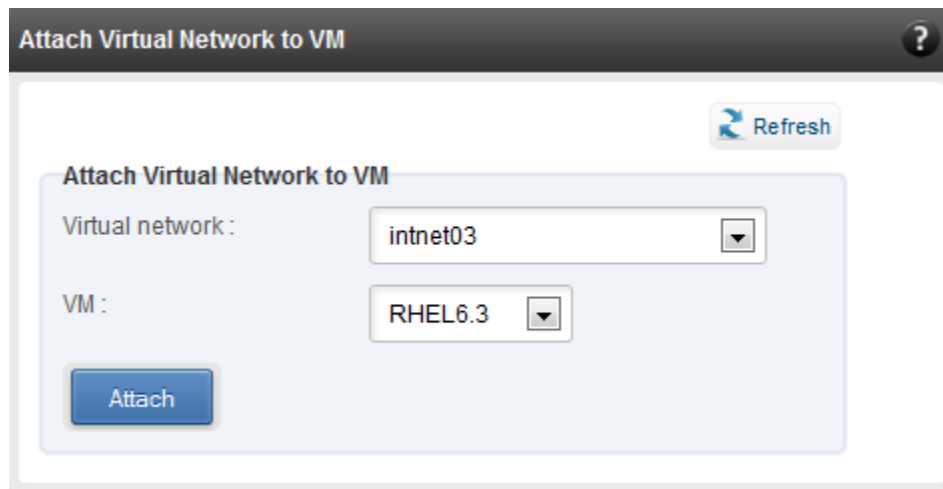
**Private Network**

Name of virtual network :

Figure 7.6.3.1 (d) – Creating private virtual network

- **Virtual Network Settings**

To attach a virtual network to a virtual machine, select the virtual network from the **Virtual Network** list and the virtual machine from the **VM** list. Finally click *Attach*.



**Attach Virtual Network to VM** ?

**Attach Virtual Network to VM**

Virtual network :

VM :

Figure 7.6.3.1 (e) – Attaching Virtual Network to VM

## 8.6.4. iWARP

- **iWARP Settings**

On Linux Agents, iWARP parameter settings for Chelsio's RDMA capable NICs (T3 and T4) can be set using this module. These settings can be set only when iWARP driver (*iw\_cxgb3* for T3; *iw\_cxgb4* for T4) is loaded. If you set any parameter for a T3 card, it applies for all the T3 cards present. Same applies for T4 cards.

On Windows Agents, only T3 HBAs are supported currently. Parameters can be set per port.

On FreeBSD Agents, only T4 CNAs are supported. iWARP parameter settings can be set only when *iw\_cxgbe* driver is loaded.

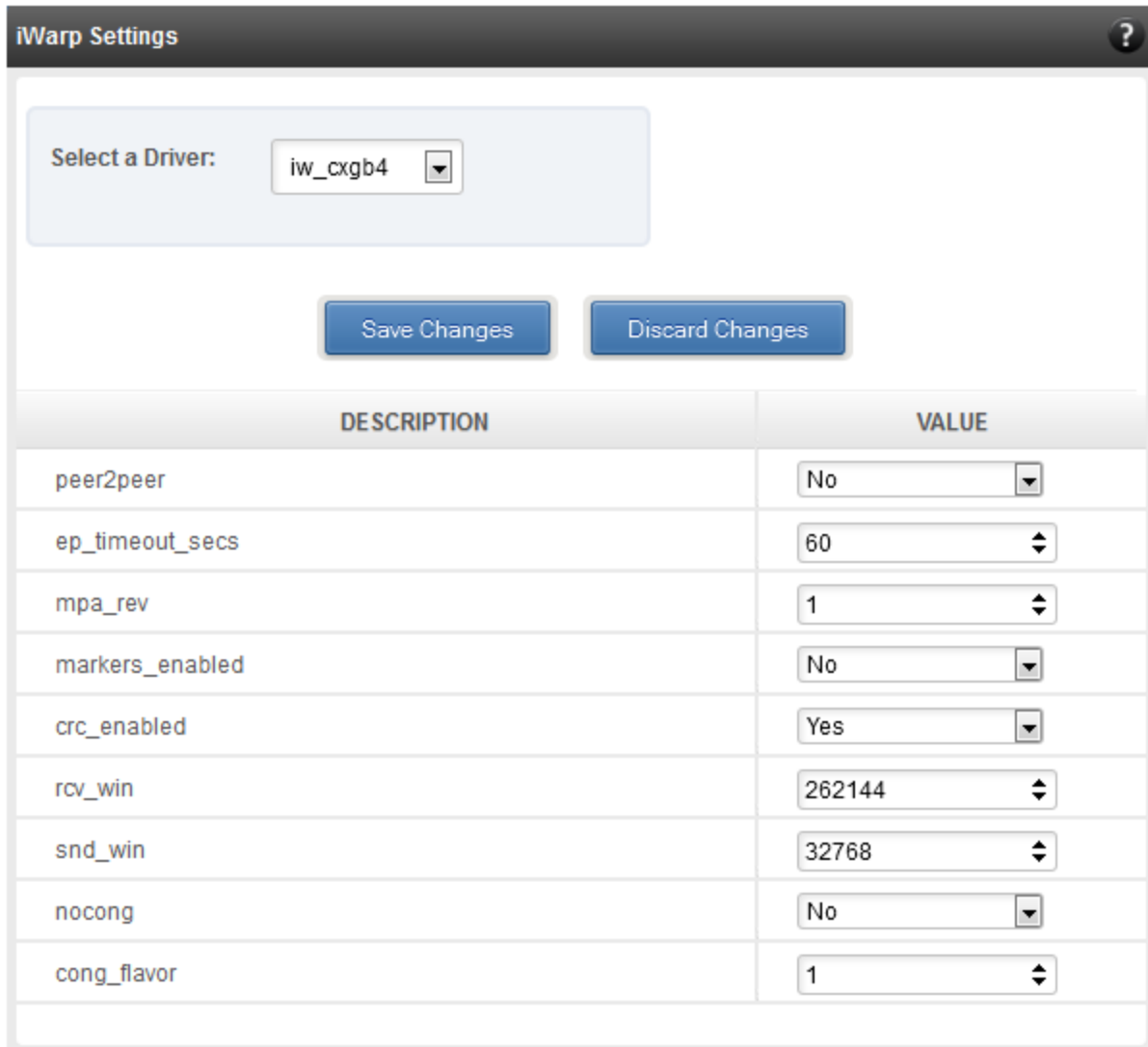
**iWarp Settings** ?

Select a Driver: iw\_cxgbe ▾

Save Changes
Discard Changes

DESCRIPTION	VALUE
peer2peer	<span style="border: 1px solid gray; padding: 2px;">No ▾</span>
ep_timeout_secs	<span style="border: 1px solid gray; padding: 2px;">60 ▾</span>
mpa_rev	<span style="border: 1px solid gray; padding: 2px;">1 ▾</span>
markers_enabled	<span style="border: 1px solid gray; padding: 2px;">No ▾</span>
crc_enabled	<span style="border: 1px solid gray; padding: 2px;">Yes ▾</span>
rcv_win	<span style="border: 1px solid gray; padding: 2px;">262144 ▾</span>
snd_win	<span style="border: 1px solid gray; padding: 2px;">131072 ▾</span>
db_delay_usecs	<span style="border: 1px solid gray; padding: 2px;">1 ▾</span>
ocqp_support	<span style="border: 1px solid gray; padding: 2px;">Yes ▾</span>
db_fc_threshold	<span style="border: 1px solid gray; padding: 2px;">2000 ▾</span>
fastreg_support	<span style="border: 1px solid gray; padding: 2px;">No ▾</span>
dack_mode	<span style="border: 1px solid gray; padding: 2px;">1 ▾</span>
c4iw_max_read_depth	<span style="border: 1px solid gray; padding: 2px;">8 ▾</span>
enable_tcp_timestamps	<span style="border: 1px solid gray; padding: 2px;">No ▾</span>
enable_tcp_sack	<span style="border: 1px solid gray; padding: 2px;">No ▾</span>
enable_tcp_window_scaling	<span style="border: 1px solid gray; padding: 2px;">Yes ▾</span>
c4iw_debug	<span style="border: 1px solid gray; padding: 2px;">Yes ▾</span>
p2p_type	<span style="border: 1px solid gray; padding: 2px;">1 ▾</span>

*Figure 7.6.4 (a) – iWARP settings for T4 CNA for FreeBSD Agent*



The image shows a window titled "iWarp Settings" with a help icon in the top right corner. Below the title bar, there is a "Select a Driver:" label followed by a dropdown menu showing "iw\_cxgb4". Below this are two buttons: "Save Changes" and "Discard Changes". The main area contains a table with two columns: "DESCRIPTION" and "VALUE".

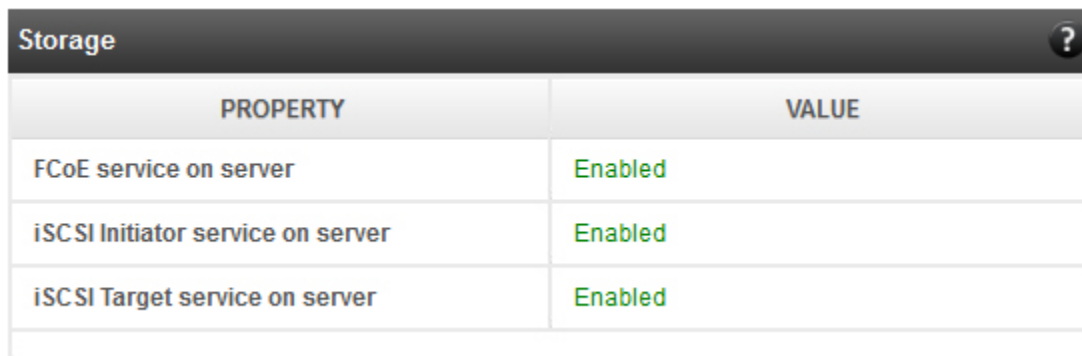
DESCRIPTION	VALUE
peer2peer	No
ep_timeout_secs	60
mpa_rev	1
markers_enabled	No
crc_enabled	Yes
rcv_win	262144
snd_win	32768
nocong	No
cong_flavor	1

Figure 7.6.4 (b) – iWARP settings for T4 CNA for Linux Agent

## 8.7. Storage

- **Storage Summary**

The **Storage** module lists the status of configuration modules under Storage section, running on the agent.



Storage	
PROPERTY	VALUE
FCoE service on server	Enabled
iSCSI Initiator service on server	Enabled
iSCSI Target service on server	Enabled

Figure 7.7 – Storage Summary Module

### 8.7.1. FCoE Initiator (Linux, Windows, XenServer)

All supported Chelsio FCoE initiators available on the operating system can be managed from this page. FCoE support is extended on Linux, Windows and XenServer platforms. Please refer to **Platform/Driver matrix** section on the list of operating systems that are supported.

- **FCoE Initiator Summary**

This module provides details about the driver installed; such as driver name and its version. The module also gives information about the number of FCoE enabled cards that are present on the machine.



FCoE Initiator Summary	
PROPERTY	VALUE
FCoE Driver	csiostor ( 1.1.0.9 )
No. of FCoE enabled cards	2
No. of FCoE Ports	6

Figure 7.7.1 (a) – FCoE Initiator Summary module for Linux Agent

### 8.7.1.1. FCoE Initiator Card

- **FCoE Card Summary**

Details pertaining to the card used such as model, firmware/hardware version etc, are provided in this module.

FCoE Card Summary	
PROPERTY	VALUE
Vendor ID	1425
Card Serial Number	PT41110672
Number of FCoE Ports	4
Manufacturer	Chelsio T440-LP-CR 10G [FCoE]
Model	T440-LP-CR
Hardware Version	T440-LP-CR 10G
Firmware Version	1.7.0.0

Figure 7.7.1.1 (a) – FCoE Card Summary module

- **FCoE Attributes**

Information such as Interrupt modes (MSI/MSI-X/INTx), SCSI mode and the card state are provided in this module.

FCoE Attributes	
PROPERTY	VALUE
Interrupt Mode	MSI-X
SCSI Mode	Initiator
State	READY

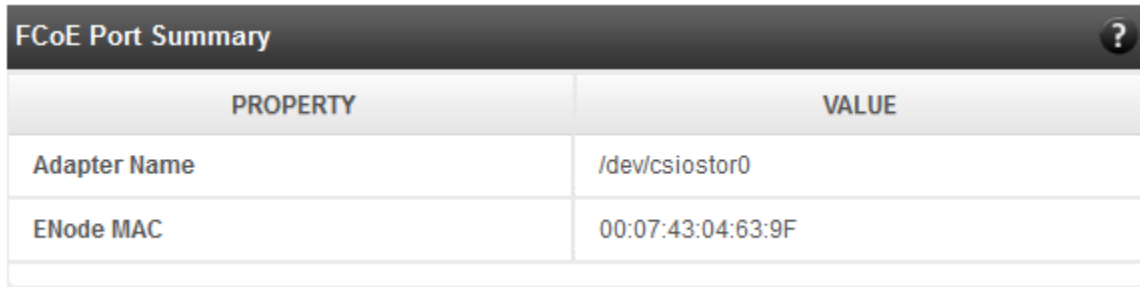
Figure 7.7.1.1 (b) – FCoE Attributes module

### 8.7.1.2. FCoE Port

This is an actual N\_Port which communicates with the fabric and performs FIP and FCoE device discovery. This page lets the user to retrieve all the FCoE specific port information and also extend NPIV management support. It contains the following sections:

- **FCoE Port Summary**

The SCSI adapter name and the underlying ENODE MAC address of the physical port can be found here.



PROPERTY	VALUE
Adapter Name	/dev/csiostor0
ENode MAC	00:07:43:04:63:9F

*Figure 7.7.1.2 (a) – FCoE Port Summary module for Linux Agent*



- **FCoE Port Attributes**

This module provides details about link status and port identifiers such as WWPN, WWNN, FC ID and NPort MAC Address. The module also contains fabric information such as fabric name, VLAN on which the FCoE service is currently running and the number of SCSI targets that are being discovered by this port. Port speed being mentioned in this section varies on the card type (10G/1G) being used. Note that only class 3 service is supported by the initiator for now and the frame size is fixed to 2128 bytes as per spec.

FCoE Port Attributes <span style="float: right;">?</span>	
PROPERTY	VALUE
State	Operational
NodeWWN	50:00:74:30:46:39:F0:00
PortWWN	50:00:74:30:46:39:F0:80
NPort MAC Address	0E:FC:03:53:00:23
Vlan ID	2
Fabric Name	20:02:00:05:73:D5:7A:C1
NPort ID	53:00:23
Type	NPort
Supported Class of Service	3
OS Device Name	/sys/class/fc_host/host119
Speed	10 GBPS
Maximum Frame Size	2128
No. of SCSI Targets	0

Figure 7.7.1.2 (b) – FCoE Port Attributes module for Linux Agent

- **FCoE NPIV management**

NPIV is a fibre channel facility allowing multiple N\_Port IDs to share a single physical N\_Port. This module allows the user to manage virtual ports on the corresponding FCoE Port.

To create a virtual port, select the option **Create** and the GUI allows two ways of creating a virtual port.

- Manual: Where the user can manually create a virtual port by providing a value to the WWPN and WWNN fields.
- Auto-generate: Where the FCoE function auto-generates a WWPN and WWNN for the virtual port.

To delete a virtual port, select the option **Delete** and select the virtual port WWPN which you want to delete and click on **delete**.

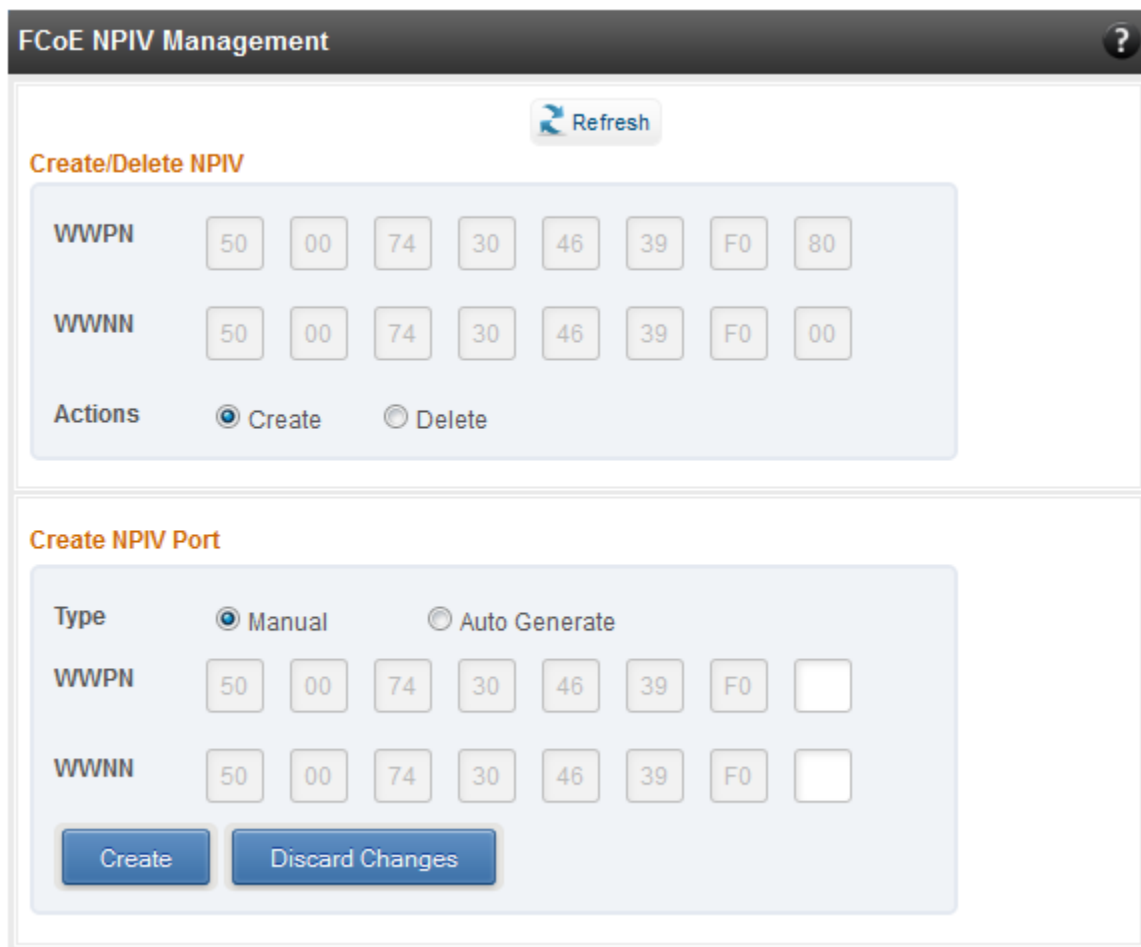


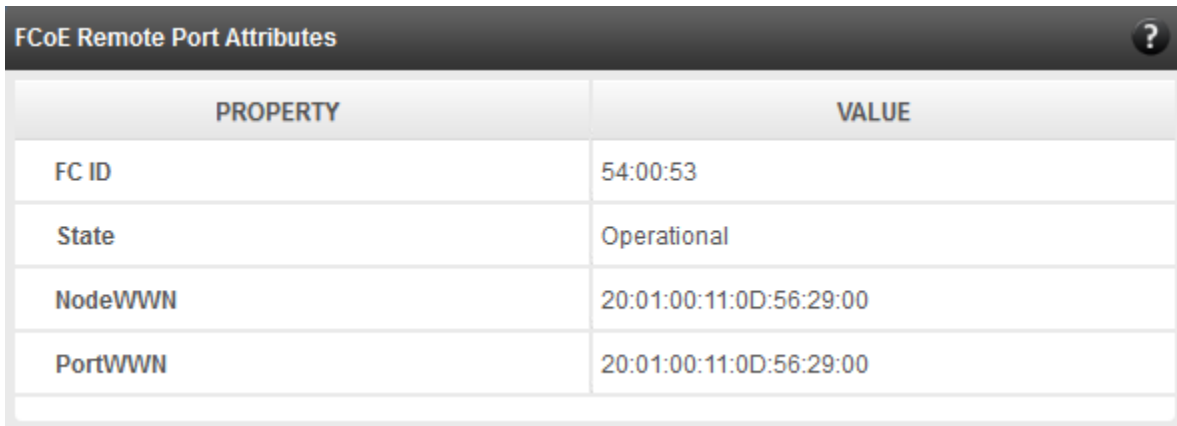
Figure 7.7.1.2 (c) – FCoE NPIV management module

### 8.7.1.3. FCoE Remote Port

Remote ports are the SCSI targets that are discovered by their respective N\_port/virtual ports. The GUI conveys the same via a tree structure so that the end user knows the initiator-target mapping.

- **FCoE Remote Port Attributes**

This module provides details about the discovered target such as target's FC ID, WWPN and WWNN so that the user can identify the discovered target accordingly.



The screenshot shows a window titled "FCoE Remote Port Attributes" with a help icon in the top right corner. Below the title bar is a table with two columns: "PROPERTY" and "VALUE". The table contains four rows of data:

PROPERTY	VALUE
FC ID	54:00:53
State	Operational
NodeWWN	20:01:00:11:0D:56:29:00
PortWWN	20:01:00:11:0D:56:29:00

Figure 7.7.1.3 (a) – FCoE Remote Port Attributes module

- **FCoE Remote Port Lun Details**

This module provides the LUN information such as size of the LUN, SCSI address, and LUN address. For Linux, the SCSI address is displayed in H:C:T:L (Host:Channel:Target:Lun) format and for Windows, it is displayed in P:B:T:L(SCSI Port:Bus:Target:Lun) format.

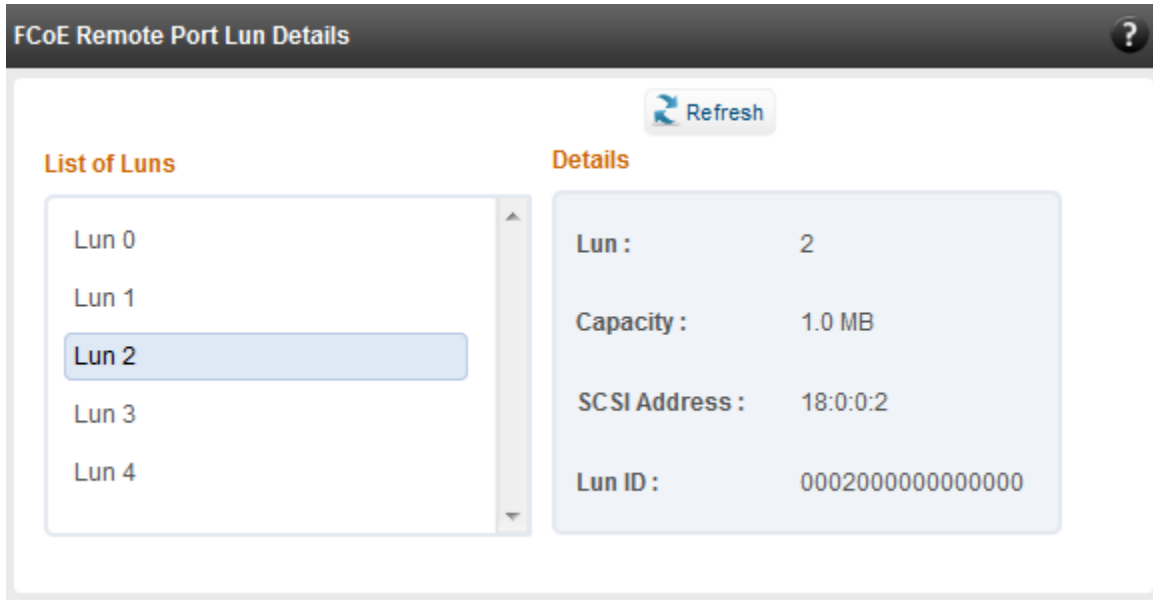


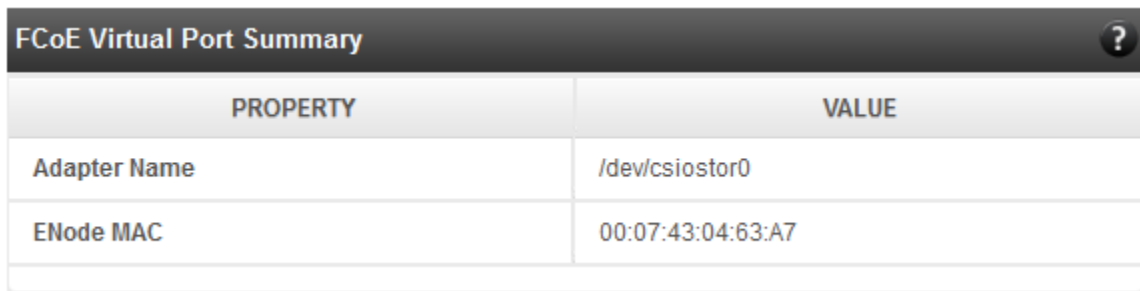
Figure 7.7.1.3 (b) – FCoE Remote Port Lun Details module

#### 8.7.1.4. FCoE Virtual Port

A virtual port allows multiple Fibre Channel initiators to occupy a single physical port, easing hardware requirements in SAN design, especially where virtual SANs are called for. The virtual ports appear under their respective N\_Ports after creation and the GUI conveys it via a tree structure so that the end user knows the N\_port-VN\_Port mapping. It contains the following modules:

- **FCoE Virtual Port Summary**

The SCSI adapter name and the underlying ENODE MAC address of the physical port can be found here.



PROPERTY	VALUE
Adapter Name	/dev/csiostor0
ENode MAC	00:07:43:04:63:A7

Figure 7.7.1.4 (a) – FCoE Virtual Port Summary module for Linux Agent

- **FCoE Virtual Port Attributes**

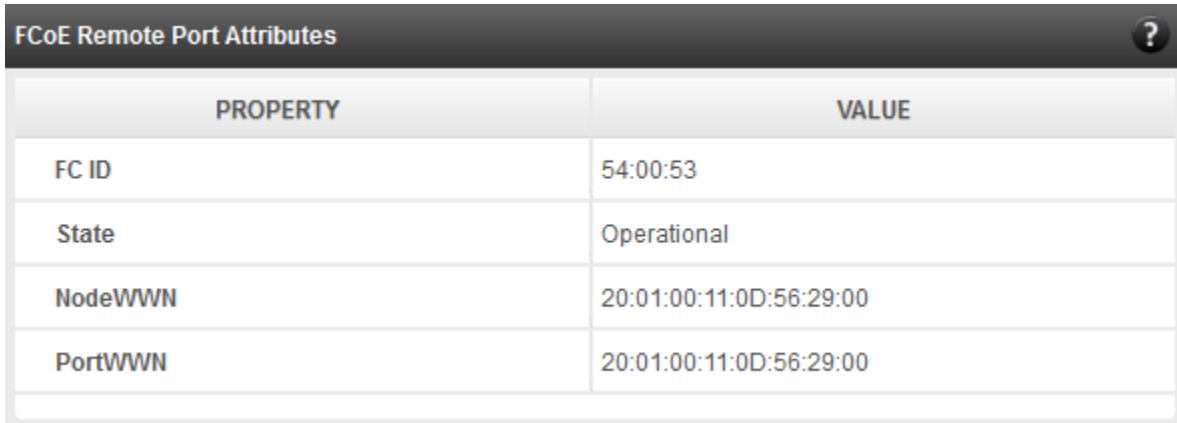
The module provides details about link status and port identifiers such as WWPN, WWNN, FC ID and Virtual NPort MAC Address. The module also contains fabric information such as fabric name, VLAN on which the FCoE service is currently running and the number of SCSI targets that are being discovered by this virtual port. Port speed being mentioned in this section varies on the card type (10G/1G) being used. Note that only class 3 service is supported by the initiator for now and the frame size is fixed to 2128 bytes as per spec.

FCoE Virtual Port Attributes	
PROPERTY	VALUE
State	Operational
NodeWWN	50:00:74:30:46:3A:71:09
PortWWN	50:00:74:30:46:3A:71:89
NPort MAC Address	0E:FC:03:77:00:1D
Vlan Id	5
Fabric Name	20:05:00:05:73:D5:7A:C1
Nport ID	77:00:1D
Type	VN_Port
Supported Class Of Service	3
OS Device Name	/sys/class/fc_host/host127
Speed	10 GBPS
Maximum Frame Size	2128
No. of SCSI Targets	1

Figure 7.7.1.4 (b) – FCoE Virtual Port Attributes module

- **FCoE Remote Port Attributes**

This module provides details about the discovered target for remote port associated with virtual port. Details such as target's FC ID, WWPN and WWNN are provided so that the user can identify the discovered target accordingly.

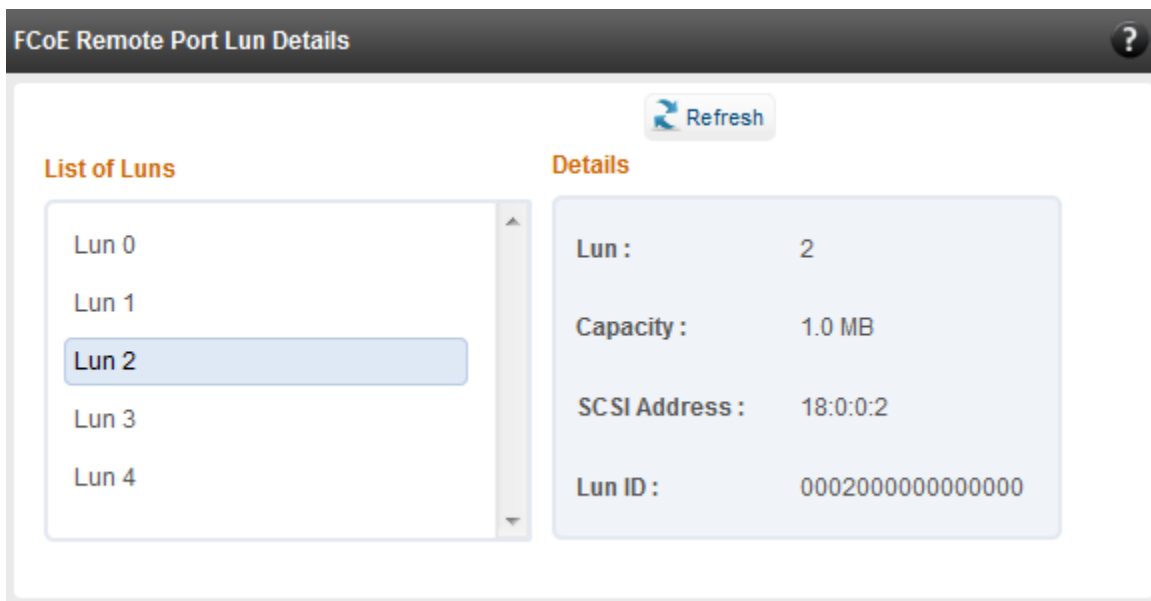


PROPERTY	VALUE
FC ID	54:00:53
State	Operational
NodeWWN	20:01:00:11:0D:56:29:00
PortWWN	20:01:00:11:0D:56:29:00

Figure 7.7.1.4 (c) – FCoE Remote Port Attributes module

- **FCoE Remote Port Lun Details**

This module provides LUN information for remote port associate with virtual port. Details such as size of the LUN, SCSI address, and LUN address are provided. For Linux, the SCSI address is displayed in H:C:T:L (Host:Channel:Target:Lun) format and for Windows, it is displayed in P:B:T:L(SCSI Port:Bus:Target:Lun) format.



FCoE Remote Port Lun Details

Refresh

**List of Luns**

- Lun 0
- Lun 1
- Lun 2**
- Lun 3
- Lun 4

**Details**

Lun : 2

Capacity : 1.0 MB

SCSI Address : 18:0:0:2

Lun ID : 0002000000000000

Figure 7.7.1.4 (d) - FCoE Remote Port Lun Details module

## 8.7.2. iSCSI initiator (Linux, Windows)

All supported iSCSI initiators can be managed from this page. The supported initiators on Windows are Microsoft and Chelsio iSCSI initiator (T4 adapters). On Linux, Open iSCSI initiator is supported. The modules available on this page are:

- **Initiator nodes**

This module lists the initiator nodes / virtual adapters configured in the initiator stack. The node can be enabled or disabled (Chelsio node cannot be disabled in Windows), and its properties can be viewed and edited in this module. In the Chelsio Linux stack, new initiator nodes can be created too. Disabling the initiator causes it to log out of any iSCSI targets that it is connected to, thus removing any disks provided by the iSCSI targets that were connected. Use the **Disable** option with caution. The CHAP authentication secret should be between 12 and 16 characters in length, and the initiator's IQN name should start with "iqn.".

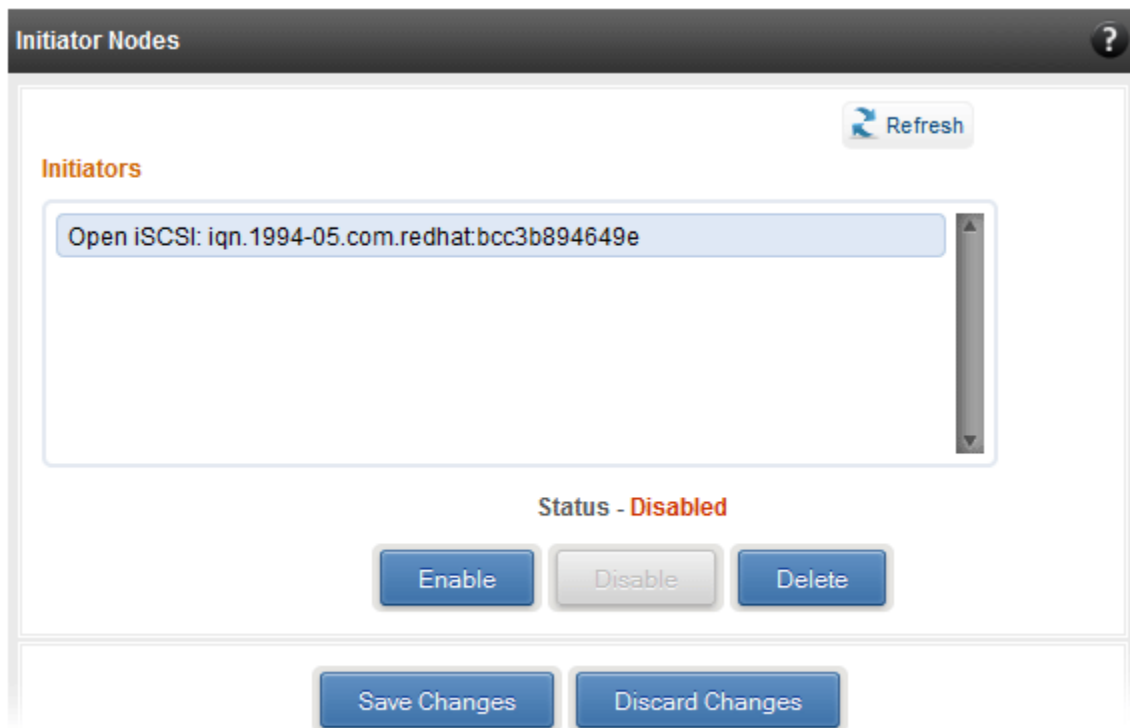


Figure 7.7.2 (a) - Open iSCSI initiator



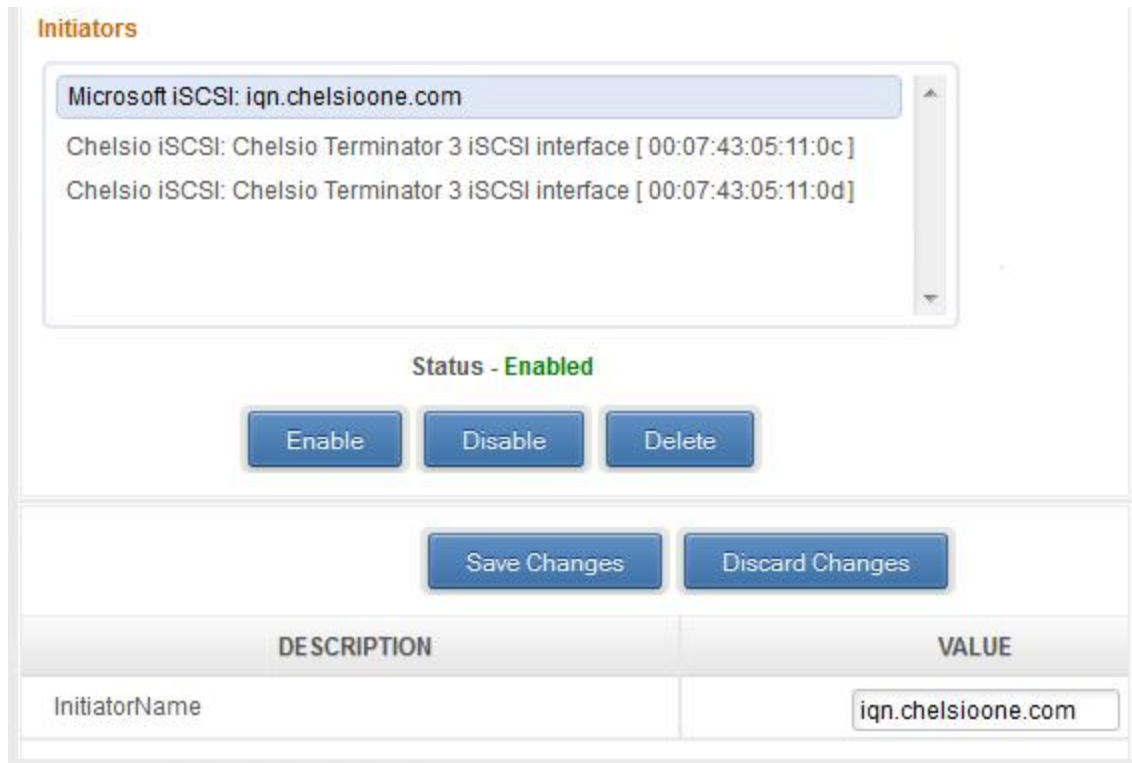


Figure 7.7.2 (b) - Microsoft iSCSI initiator

**Initiator Nodes** ?

Refresh

**Initiators**

Microsoft iSCSI: iqn.chelsioone.com

Chelsio iSCSI: Chelsio Terminator 3 iSCSI interface [ 00:07:43:05:11:0c ]

Chelsio iSCSI: Chelsio Terminator 3 iSCSI interface [ 00:07:43:05:11:0d ]

Status - Enabled

Enable
Disable
Delete

Save Changes
Discard Changes

DESCRIPTION	VALUE
IpAddress	<input style="width: 100%;" type="text" value="102.192.182.11"/>
SubnetMask	<input style="width: 100%;" type="text" value="255.255.255.0"/>
Gateway	<input style="width: 100%;" type="text" value="0.0.0.0"/>
iBFT	<input style="width: 100%;" type="text" value="Yes"/> ▼
VlanInsertion	<input style="width: 100%;" type="text" value="No"/> ▼
VlanID	<input style="width: 100%;" type="text" value="777"/> ▲▼
TCPAck	<input style="width: 100%;" type="text" value="0"/>

Figure 7.7.2 (c) - Chelsio iSCSI initiator

- **Discover targets**

iSCSI targets can be discovered by providing the IP address and TCP port (usually 3260) of the target. The discovery operation fetches the targets found at that Portal (combination of IP address and TCP port). The discovery operation also fetches all the other Portals that the target(s) are listening on. The discovered target can be deleted if required. Please note that all the Portals that the target sent are listed. The delete operation will not work on all the portals, only on the original discovery portal (the IP address and TCP Port specified when discovering the target).

**Note** *If there are any pre-existing iSCSI sessions established to the target, deletion of the target Portal from the discovered targets list will fail.*

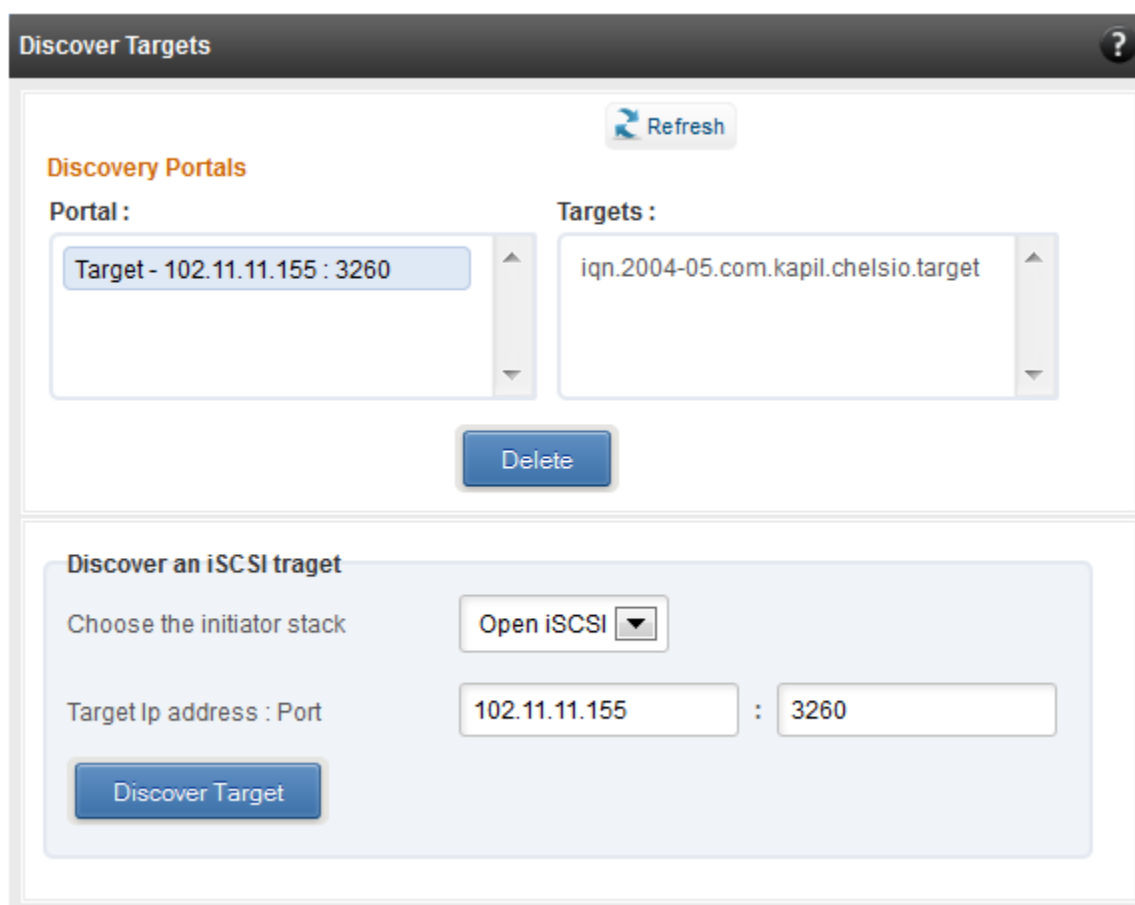


Figure 7.7.2 (d) - Discover targets module

- **Targets**

The iSCSI targets that have been discovered, or are currently connected, are listed here. You may login, logout and delete the target from the initiator's configuration. If a target is connected, the sessions and connections to the target, and the disks provided by the target will be listed.

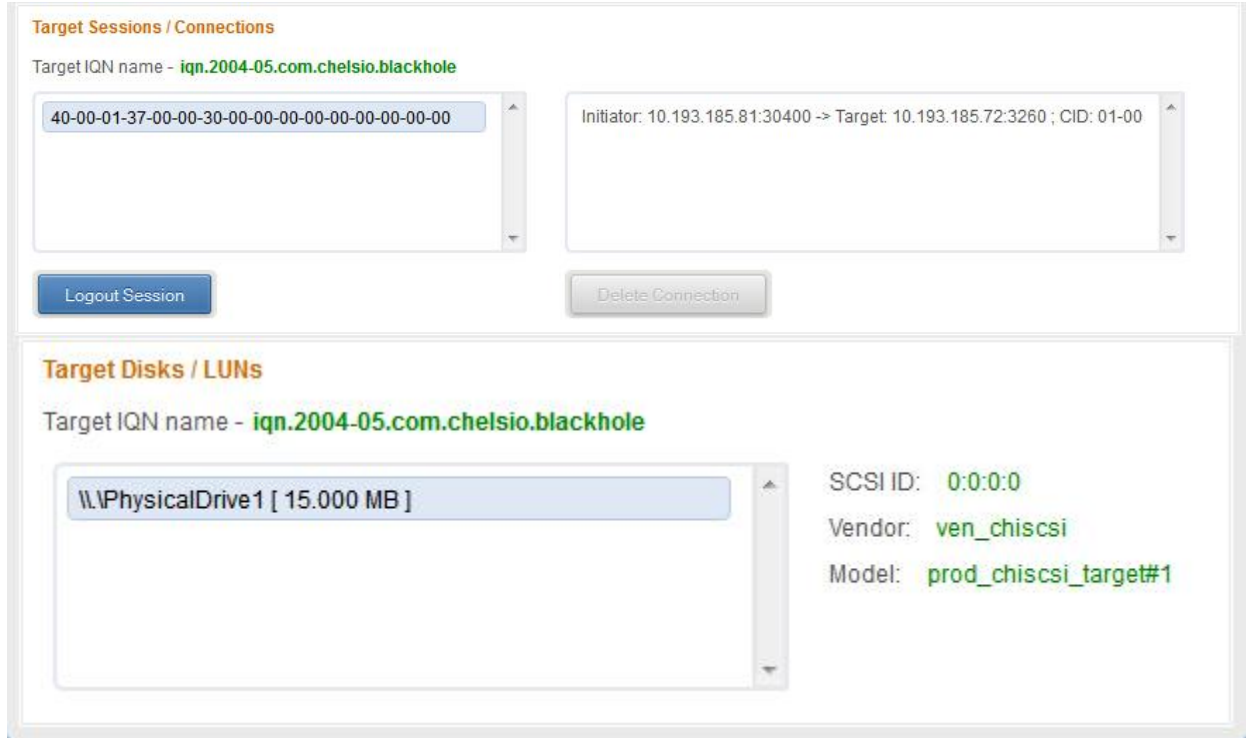


Figure 7.7.2 (e) - Targets module after logging in

### 8.7.3. iSCSI Target page (Linux)

This page allows to create new Targets and manage them (add/delete portals, add/delete LUNs, add/delete ACLs).It also provides information on Session details. Viewing and modifying Target properties is also available. The modules available on this page are as below:

- **Target Stack Globals**

This module displays various global properties of a currently connected iSCSI target. Authentication priority between CHAP and ACL can be set here.

DESCRIPTION	VALUE
Offload Mode	AUTO <input type="button" value="v"/>
Auth Order	CHAP <input type="button" value="v"/>
ACL Order	CONFIG <input type="button" value="v"/>

Figure 7.7.3 (a) - Target Stack Globals module

- **Target properties**

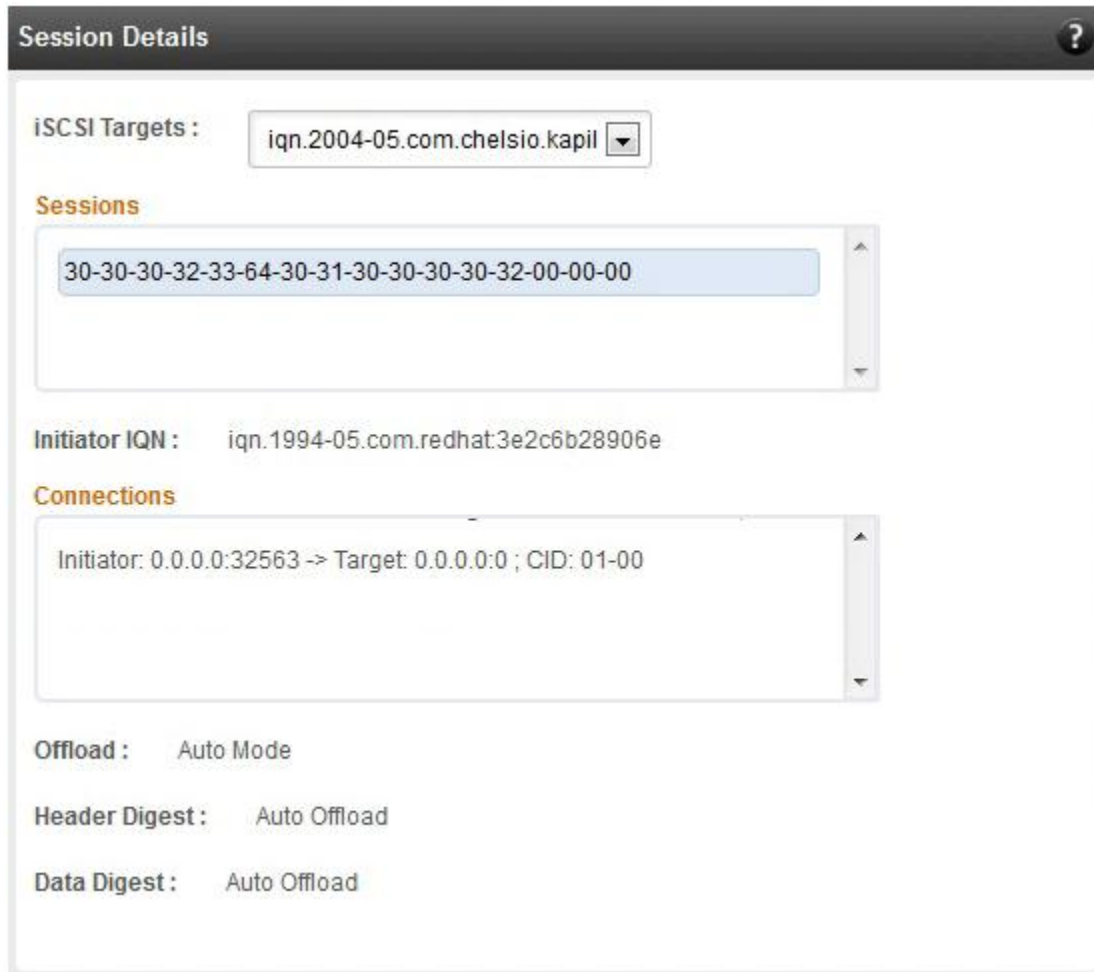
Properties such as Target name and Alias, Max Data Receive Length, Authentication mode related to a specific iSCSI target can be viewed and modified here. iSCSI targets can be started/stopped or deleted.

PROPERTY	VALUE
Target Name	iqn.2004-05.com.chelsio.ROTO
Target Alias	iscsitarget1
Max Receive Data Segment Length (in Bytes)	8192
Header Digest/Checksum	None,CRC32C
Data Digest/Checksum	None,CRC32C
Send Immediate Data / Unsolicited Data	Yes
Initial Ready To Transmit (InitialR2T)	No
Maximum Outstanding Ready To Transmits (MaxR2T)	1
Max Connections in a session	4
Target CHAP	"target_id1":"target_secret1"
Initiator CHAP	"initiator_id1":"initiator_sec1"

Figure 7.7.3 (b) - Target properties module

- **Session details**

Details including Session ID, Initiator IQN and Connections List of all discovered and currently connected iSCSI targets are listed here.



*Figure 7.7.3 (c) – Session Details module*

- **New Target Creation**

New iSCSI target can be created here by specifying the Target IQN and Target Alias name.



The screenshot shows a window titled "New Target Creation" with a help icon in the top right corner. Inside the window, there is a "Session Details" section. This section contains two text input fields: "Target IQN Name" with the value "iqn.chelsio.com" and "Target Alias" with the value "iscsitarget2". Below these fields is a blue "Save" button.

*Figure 7.7.3 (d) - New Target Creation module*



### 8.7.4. LUNs

Various Logical Units created in an iSCSI Target can be managed here. The modules available on this page are as below:

- **View/Edit iSCSI Target LUNs**

This module displays various Logical Units created in an iSCSI Target. Selected LUNs can be deleted.

The screenshot shows the 'View/Edit iSCSI Target LUNs' module. At the top, there is a header bar with the title and a help icon. Below the header, the 'iSCSI Targets' section shows a dropdown menu with 'iqn.2004-05.com.chelsio.kapil' selected and a 'Refresh' button. The 'Target Status' is 'STARTED'. The 'LUN List' section contains a single entry, '/dev/sda5'. To the right, the 'Edit LUN List' section has 'Move Up', 'Move Down', and 'Delete LUN' buttons. Below that, the 'Edit Selected LUN' section has input fields for 'LUN Name' (containing '/dev/sda5') and 'RAM Disk Size' (containing '12288'). It also has radio buttons for 'Permissions' (RO and RW, with RW selected), 'Device Type' (FILE, MEM, and BLK, with BLK selected), and 'Options' (SYNC, NULLRW, and NONEXCL, all unselected). At the bottom, there are 'Save Changes' and 'Discard Changes' buttons.

Figure 7.7.4 (a) - View/Edit iSCSI Target LUNs module

- **Add LUN**

New LUNs can be added here by providing various parameters like Target Name, Target Device and RAM Disk Size etc. RW (Read-Write) and RO (Read Only) are the two kinds of permissions that can be set. If Ram Disk is selected, then a minimum of 16 MB should be provided.

The screenshot shows a window titled "Add LUN" with a help icon in the top right corner. Inside the window, there is a "Refresh" button. Below it, there are four input fields: "iSCSI Targets" with a dropdown menu showing "iqn.2004-05.com.chelsio.kapil"; "Devices" with a dropdown menu showing "Ram Disk"; "Type" with the text "MEM"; and "RAM Disk Size (in MB)" with a text input field containing "16". At the bottom of the window, there are two buttons: "Save Lun" and "Discard Changes".

*Figure 7.7.4 (b) - Adding a new LUN*

### 8.7.5. Portal Groups

Portal details for currently connected iSCSI Targets can be viewed and added here. The modules available on this page are as below:

- **View/Edit iSCSI Target Portals**

Portal List on the left displays details of the portal group on which an iSCSI target is listening and the related info is displayed on the right under Portal Details. Selected portals can be deleted.

The screenshot shows the 'View/Edit iSCSI Target Portals' interface. At the top, there is a title bar with a question mark icon. Below the title bar, the 'iSCSI Targets' section features a dropdown menu with 'iqn.2004-05.com.chelsio.kapil' selected and a 'Refresh' button. The 'Target Status' is displayed as 'STARTED'. The main area is divided into two columns. The left column, titled 'Portal List', contains a single entry: '1@102.44.44.155:3260'. The right column, titled 'Edit Portal List', contains three buttons: 'Move Up', 'Move Down', and 'Delete Portal'. Below this is the 'Portal Details' section, which includes input fields for 'Ip Address' (102.44.44.155), 'TimeOut in mSecs' (0), 'Redirect Tag' (1), and 'TCP Port' (3260). There is also a checkbox for 'Use default iSCSI service TCP Port' which is unchecked. An 'Update List' button is located below the input fields. At the bottom of the interface, there are two buttons: 'Save Changes' and 'Discard Changes'.

Figure 7.7.5 (a) - View/Edit iSCSI Target Portals module

- **Add Portal**

New Portals can be added here by choosing the specific target and Portal IP address. The Port number should be 3260.

The screenshot shows a dialog box titled "Add Portal". In the top right corner of the dialog, there is a "Refresh" button with a circular arrow icon. The main content area contains four input fields arranged vertically. The first is a dropdown menu labeled "iSCSI Targets" with the selected value "iqn.2004-05.com.chelsio.kapil". The second is a text box labeled "IP Address" containing "102.44.44.155". The third is a text box labeled "Port" containing "3260". The fourth is an empty text box labeled "Redirect Tag". At the bottom of the dialog, there are two blue buttons: "Save Portal" on the left and "Discard Changes" on the right.

*Figure 7.7.5 (b) – Adding a new Portal*

### 8.7.6. ACLs

ACLs configured for currently connected iSCSI Targets can be managed here. The modules available on this page are as below:

- **View/Edit iSCSI Target ACLs**

This module displays details for all the ACLs configured for an iSCSI Target. Selected ACLs can be deleted.

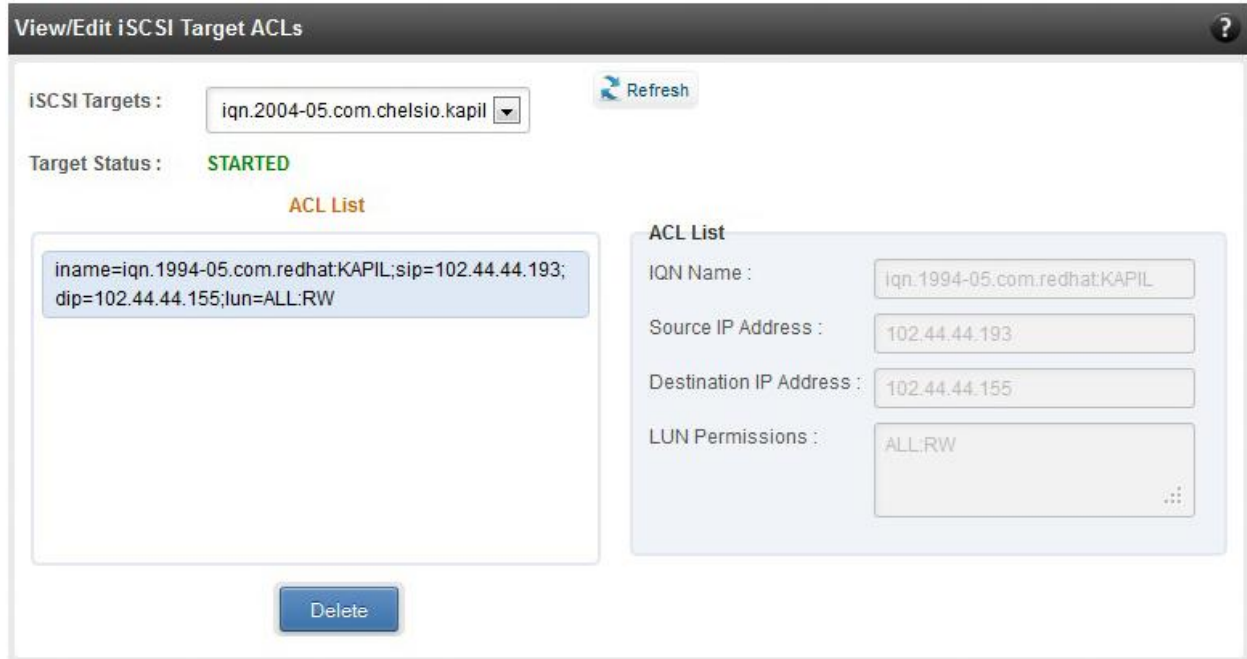


Figure 7.7.6 (a) - Target ACL operations module

- **Add ACL**

New ACLs can be configured by specifying Target name, initiator IQN name, IP address and permission type.

The screenshot shows a window titled "Add ACL" with a help icon in the top right corner. A "Refresh" button is located in the upper right area of the window. The main content area contains the following fields:

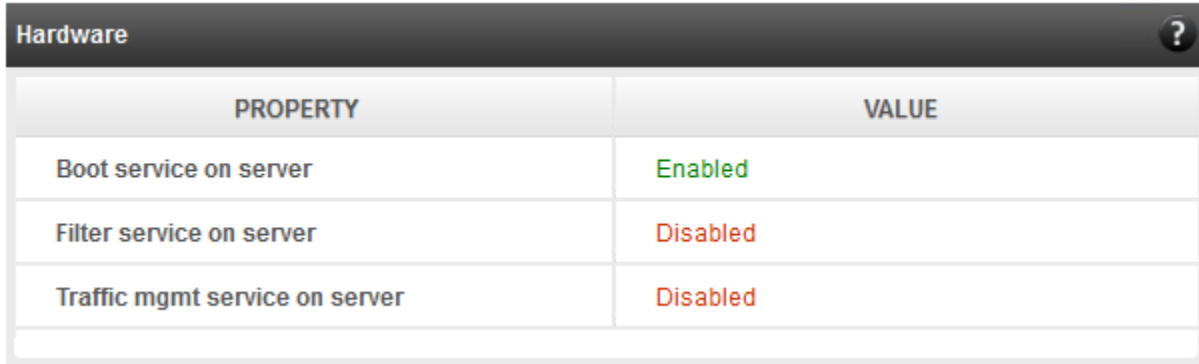
- iSCSI Targets :** A dropdown menu showing "iqn.2004-05.com.chelsio.kapil".
- IQN Name :** A text input field containing "iqn.1994-05.com.redhat:KAPIL". Below the field is the hint text "Enter Initiator IQN Name".
- Source IP Address :** A text input field containing "102.44.44.193". Below the field is the hint text "Enter Initiator source IPs separated by commas".
- Destination IP Address :** A text input field containing "102.44.44.155". Below the field is the hint text "Enter Initiator destination IPs separated by commas".
- LUN Permissions :** A text input field containing "ALL:RW". Below the field is the hint text "Enter access permissions for Initiator. eg: ALL:RW".

At the bottom of the form are two buttons: "Save Portal" and "Discard Changes".

*Figure 7.7.6 (b) - Adding new ACL*

## 8.8. Hardware Features

The **Hardware** module lists the status of configuration modules under Hardware Features section, running on the agent.



PROPERTY	VALUE
Boot service on server	Enabled
Filter service on server	Disabled
Traffic mgmt service on server	Disabled

*Figure 7.8 – Hardware module*

### 8.8.1. Filtering (Linux)

Using this page, one can control the traffic from a specific IP. The module available on this page is as below:

- **T3 Filtering configuration**

T3 Filtering options can be set only when offload driver (*t3\_tom*) is not loaded.

This module lists the various parameters which can be set while determining filtering options for a system IP. You can set the maximum number of filters and also add/delete filters. A filter with default values (the **Action** field set to **pass**; the **Protocol** field set to **any**) is created at the time of configuring the filtering module. To remove the default filter, enter 0 in the **Set Maximum Filters** field and click on **Set Filters**. The fields **IfName** and **FilterId** are mandatory. The **Action** field is set to **pass** and the **Protocol** field is set to **any** by default. Other possible values for the **Protocol** field are **tcp**, **udp** and **frag**. The **Priority** field can be used to determine the priority of a filter when Vlan ids are same. **Insert at position** features allows user to add a filter at a specified position.

FILTERID	SRCIP	DESTIP	SRCPORT	DESTPORT	VLAN	PRIORITY	MACIDX	ACTION	PROTO	QUEUE
10	0.0.0.0/0	0.0.0.0	0	0	0	0	0	Pass	Any	0

Figure 7.8.1 (a) - T3 Filtering Configuration module

**Note** Results for actions like adding a new filter or setting maximum filters make some time to reflect. Highlight the system item in the tree menu on the left, and click "Refresh system", to refresh data from the system, in case the updated settings are not being shown.



- **T4 Filtering configuration**

T4 Filtering options can be set only when offload driver (*t4\_tom*) is not loaded.

A list of pre-defined filter selection combinations is displayed. The combination *fragmentation, mpshittype, protocol, vlan, port, fcoe* is active by default. To select a different combination, highlight it in the **Combinations** list by clicking and click “Set Active Combination”.

You can create filter rules for any combination in the list. However, filter rule created only for the Active Combination will apply. To create a new rule, select a combination and click “Add a filter rule”. The **FILTERID** and **T4 CARD** fields are mandatory. After providing appropriate values for the parameters click “Save Changes”.

**Note** For a detailed explanation regarding different fields, please refer *cxgbtool manual* by running `man cxgbtool` command on Management Agent CLI.

The screenshot shows the T4 Filtering Configuration module. At the top, there is a 'Refresh' button. Below it, the 'Active Combination' is displayed as 'fragmentation, mpshittype, macmatch, vlan, port, fcoe'. A scrollable list of 'Combinations' is shown, with the current active combination highlighted. Below the list is a table with the following columns and values:

FILTERID	T4 CARD	FRAGMENTATION	MPSHITTYPE	MACMATCH	VLAN	PORT	FCOE
7	T420-SO-CR	1	1	005	0000	0	0

At the bottom of the interface, there are five buttons: 'Set Active Combination', 'Save Changes', 'Discard Changes', 'Add a Filter row', and 'Delete a Filter'.

Figure 7.8.1(b) - T4 Filtering Configuration module

## 8.8.2. Traffic Management (Linux)

Using this page, one can add/delete/modify offload policies only in the presence of offload driver (*t3\_tom* for T3 adapters; *t4\_tom* for T4 adapters).

## 8.8.3. Traffic Management configuration

The **Chelsio Card** section on the left displays all the cards available in the server and their corresponding policies on the right. Policies can be added and deleted. Policy Details displays the primitives (maximum 8) and actions which can be modified. For more details on creating policies, please refer to COP man pages.

The screenshot shows the 'Traffic Management Configuration' window. It is divided into two main sections: 'Policy List' and 'Policy Details'.

**Policy List:** This section contains a 'Refresh' button and two list boxes. The 'Chelsio Cards' list includes T404-BT, T420-CR, and T302E-CU. The 'TM Policies' list contains one policy: 'src port 22 => loffload lddp'. Below these lists are 'Add New Policy' and 'Delete' buttons.

**Policy Details:** This section is for editing a selected policy. It has a 'Rules' list containing 'src port 22'. The 'Rule Details' area shows:
 

- Primary Expression: port (dropdown)
- Qualifier: src (dropdown)
- Value: 22 (text input)
- 'Modify Rule' button
- Checkboxes for 'Select to add rule' and 'Select to modify rule'.

 The 'Actions' section includes checkboxes and dropdown menus for:
 

- Offload: Disable
- DDP: Disable
- Time Stamp: Enable
- Sack: Enable
- Bind: random
- Class: 0
- Congestion: reno

 At the bottom are 'Save Changes' and 'Discard Changes' buttons.

Figure 7.8.3 - Traffic Management Configuration module

### 8.8.4. Boot

- **T4 Save Config File (Linux)**

This module displays the current T4 configuration tuning option selected. You can also change the tuning option by selecting the config file for each option located in `/ChelsioUwire-x.x.x.x/src/network/firmware`. For instance, to select *Low latency Networking*, locate the file, `t4-config.txt`, in `/ChelsioUwire-x.x.x.x/src/network/firmware/low_latency_config` directory.

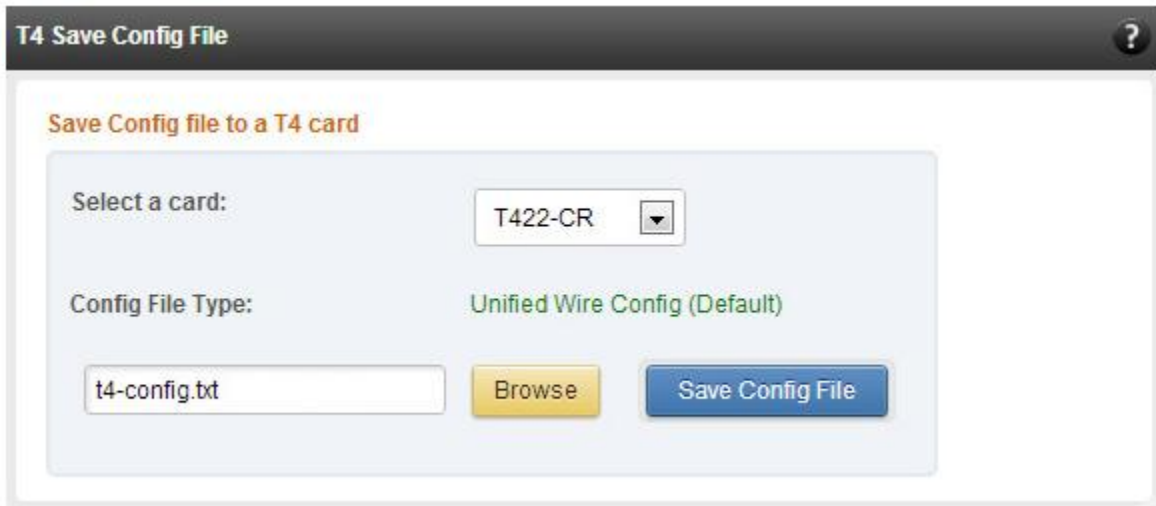


Figure 7.8.4 - T4 Save Config File module

### 8.8.5. T3 iSCSI / T3 PXE Boot Option Rom Management (Linux)

The Chelsio T3 card may be used for PXE or iSCSI boot. This module allows managing the boot capability. The Option ROM (PXE/iSCSI) may be installed to the card, or erased from the card. iSCSI boot Option ROM settings can be configured for the card here. Enable the iSCSI Option ROM only if you are planning to boot the system via iSCSI. Refer the iSCSI boot documentation for more details about its configuration.

**T3 iSCSI / T3 PXE Boot Option Rom Management** ?

Select a card: S320E-SR-X ▼

Option ROM Status - iSCSI option rom is installed [ 2.0 build 202 ] & iSCSI option rom settings are valid.

**Write iSCSI or PXE Option ROM to the card**

Browse

Write Option ROM

**Erase iSCSI or PXE Option ROM or Settings**

Erase Option ROM
Erase iSCSI boot settings

Save Changes
Discard Changes

DESCRIPTION	VALUE
Card is enabled for iSCSI boot	No ▼
Chelsio OS initiator is used for boot	No ▼
Boot initiator IQN name	<input style="width: 100%; height: 20px;" type="text"/>
Prefer header digests if available	No ▼
Prefer data digests if available	No ▼
CHAP authentication Policy	none ▼
Initiator's CHAP username	
Initiator's CHAP secret	

Figure 7.8.5 (a) - Option ROM management module for a T3 card

### 8.8.6. T4 Boot Option ROM management

This module allows managing the PXE and FCoE boot capability for Chelsio T4 cards. The Option ROM (PXE and FCoE) may be installed to or erased from the card. The version of Option ROM flashed can be viewed here.

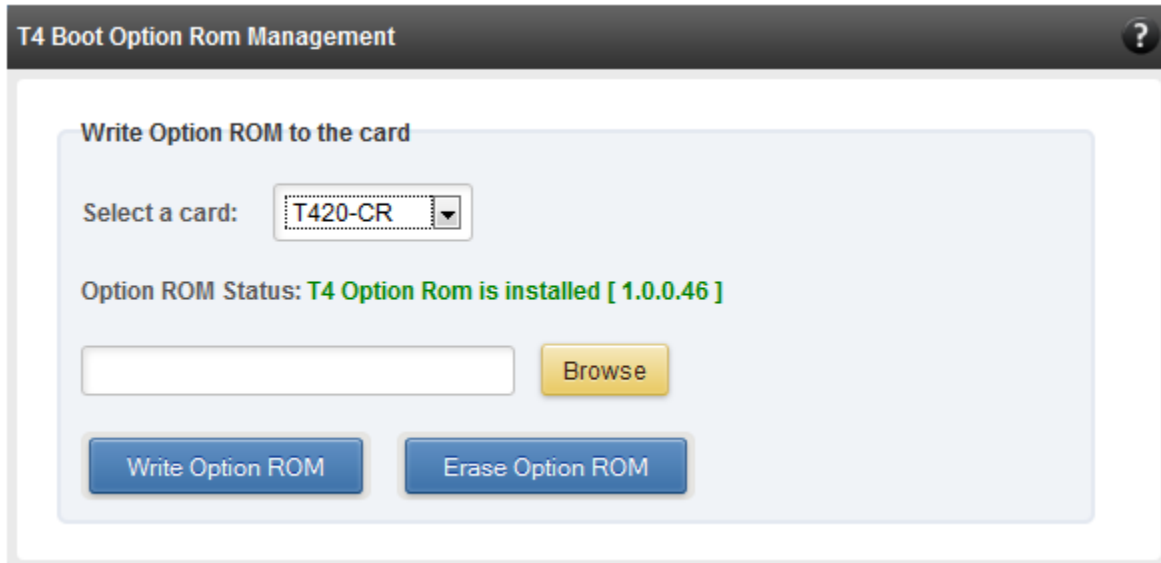


Figure 7.8.6 (a) – T4 Option ROM Management module

### 8.8.7. T4 Boot Configuration

This module can be used to view and configure T4 PXE and FCoE Option ROM settings for Chelsio T4 cards.

PXE physical functions and order of ports for PXE boot can be selected here. The same module can be used to configure FCoE Option ROM. Here port order for target discovery and discovery timeout can be set. Under the Boot section, LUN can be configured as boot device from the discovered FCoE targets.

Enable the Option ROM only if you are planning to boot the system via PXE or install the operating system on FCoE LUN.

T4 Boot Configuration
?

**Select a T4 card**

Select a T4 card: T422-CR ▼

**Adapter Configuration**

PCI BUS : 01

PCI Device : 00

Initialization Platform : Both ▼

Adapter Bios Status :  Enable  Disable

Boot mode: Enhancement ▼

EDD: 3.0 ▼

EBDA Relocation: Permitted ▼

Default :  ( Load Boot Default Settings )

Save Changes
Discard Changes

Choose Options to configure:  PXE  FCOE  iSCSI

**PXE Configuration**

Select Physical Function: 00 ▼

BIOS: Enable ▼

Vlan Id:

Save Changes
Discard Changes

**Details**

BIOS: 1.0.0.46

Ports: 4

Device Id: 4402

FW: 1.8.9.0, TP 0.1.9.1

MAC: 00:07:43:10:77:C0

Func: 00

Controller Name: T422-CR

Figure 7.8.7 (a) - PXE Boot configuration for T4 CNAs

Choose Options to configure:  PXE  FCOE  iSCSI

**FCoE Configuration**

Choose Paramter Type :  Function  Boot  Show WWPN

BIOS :  Enable  Disable

Port Order :

Discovery Time Out :

Figure 7.8.7 (b) - FCoE Boot configuration for T4 CNAs

Choose Options to configure:  PXE  FCOE  iSCSI

**iSCSI Configuration**

Choose Paramter Type :  Function  Initiator  Network  Boot Devices

BIOS :

Port Order :

Discovery Time Out :

CHAP Method:

Figure 7.8.7 (c) - iSCSI Boot configuration for T4 CNAs

### 8.8.8. Bypass (Linux)

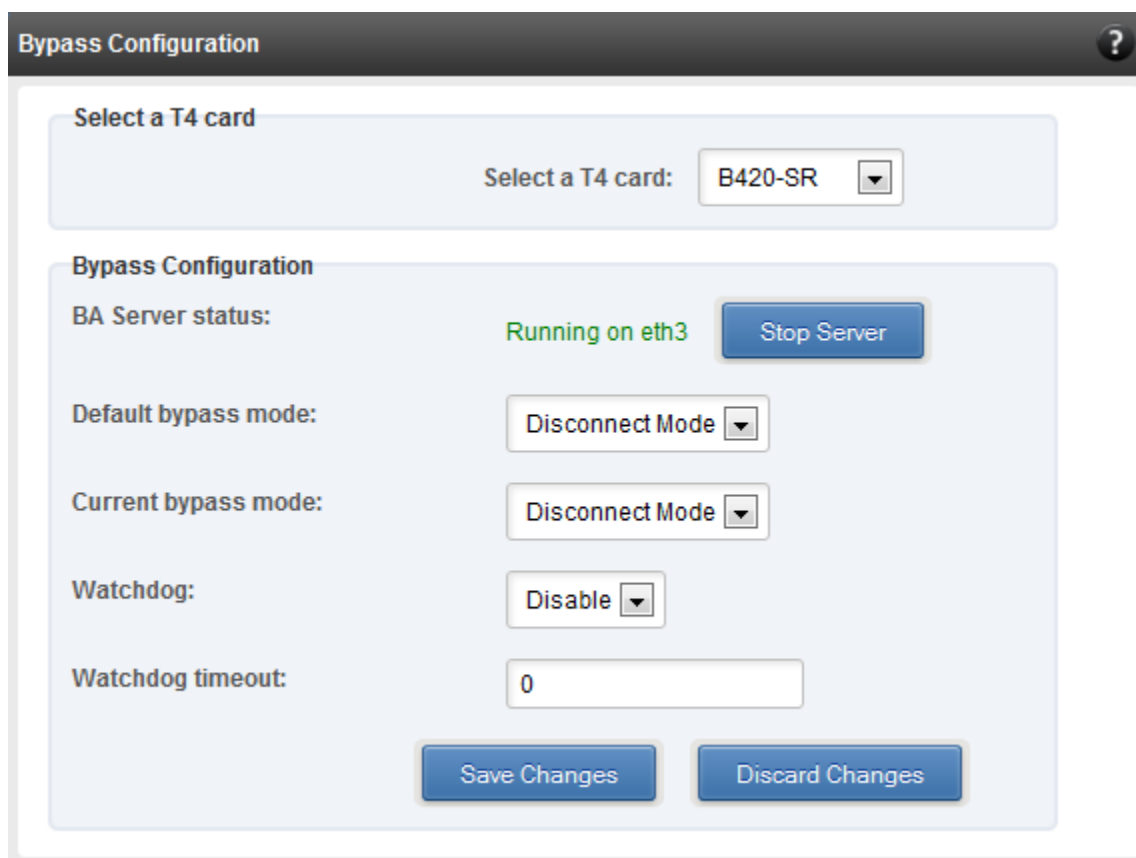
You can use the **Bypass** page to configure various settings for Chelsio's bypass adapters like setting bypass operation mode, creating rules (filters), starting/stopping BA server, etc. There are two modules available: **Bypass Configuration** and **Redirect Configuration**.

- **Bypass Configuration**

In the **Bypass Configuration** module, you can view the status and start/stop the BA server accordingly. The adapter will redirect packets using the mode specified in the **Default bypass mode** field unless otherwise specified in the **Current bypass mode**.

The **Watchdog** timer is used to ensure that if there is a software failure, the switch will enter the default state. The **Watchdog timeout** value should be provided in milliseconds.

For more information on different bypass modes and configurational parameters, refer **Chapter XIII. Bypass Driver** ([Click Here](#)).



The screenshot shows a web-based configuration interface titled "Bypass Configuration". At the top, there is a header bar with the title and a help icon. Below the header, there is a section for selecting a T4 card, with a dropdown menu currently set to "B420-SR". The main configuration area is titled "Bypass Configuration" and contains several settings:

- BA Server status:** Displayed as "Running on eth3" in green text, with a blue "Stop Server" button to its right.
- Default bypass mode:** A dropdown menu set to "Disconnect Mode".
- Current bypass mode:** A dropdown menu set to "Disconnect Mode".
- Watchdog:** A dropdown menu set to "Disable".
- Watchdog timeout:** A text input field containing the value "0".

At the bottom of the configuration area, there are two blue buttons: "Save Changes" and "Discard Changes".

Figure 7.8.8 (a) - Bypass Configuration module

- **Redirect Configuration**

In the **Redirect Configuration** module, you can set **rules** (filters), based on which the bypass adapter will redirect packets. You can group **rules** into **tables**. You can save the currently configured tables and rules for a bypass adapter into a shell script using the **Download Configuration** button.



The **Table Configuration** tab displays BA server status and the number of tables created. You can create new tables or perform various actions on the existing ones.

- **Delete table:** Delete the selected table and all the rules present in it.
- **Purge table:** Delete all the rules present in the selected table. This action will not delete the table.
- **Activate table:** Enable the selected table.
- **Deactivate table:** Disable the selected table.
- **Create table:** Create a new table. The new table created will be inactive by default. Use the **Activate table** option to enable it. You can create upto 5 tables.

In the **Rules Configuration** tab, you can add, delete and configure rules. Use the **Add a Filter row** button to add a new rule by specifying the rule id in the *INDEX* field and providing the required parameters. Finally, click **Save Changes**.

To edit an existing rule, select the corresponding checkbox, change the desired parameters and click **Save Changes**.

To delete a rule, select the corresponding checkbox and click **Delete a Filter**. Finally, click **Save Changes**. You can delete multiple rules using this method.

For more information on **Redirection**, refer **Chapter XIII. Bypass Driver** ([Click Here](#)).

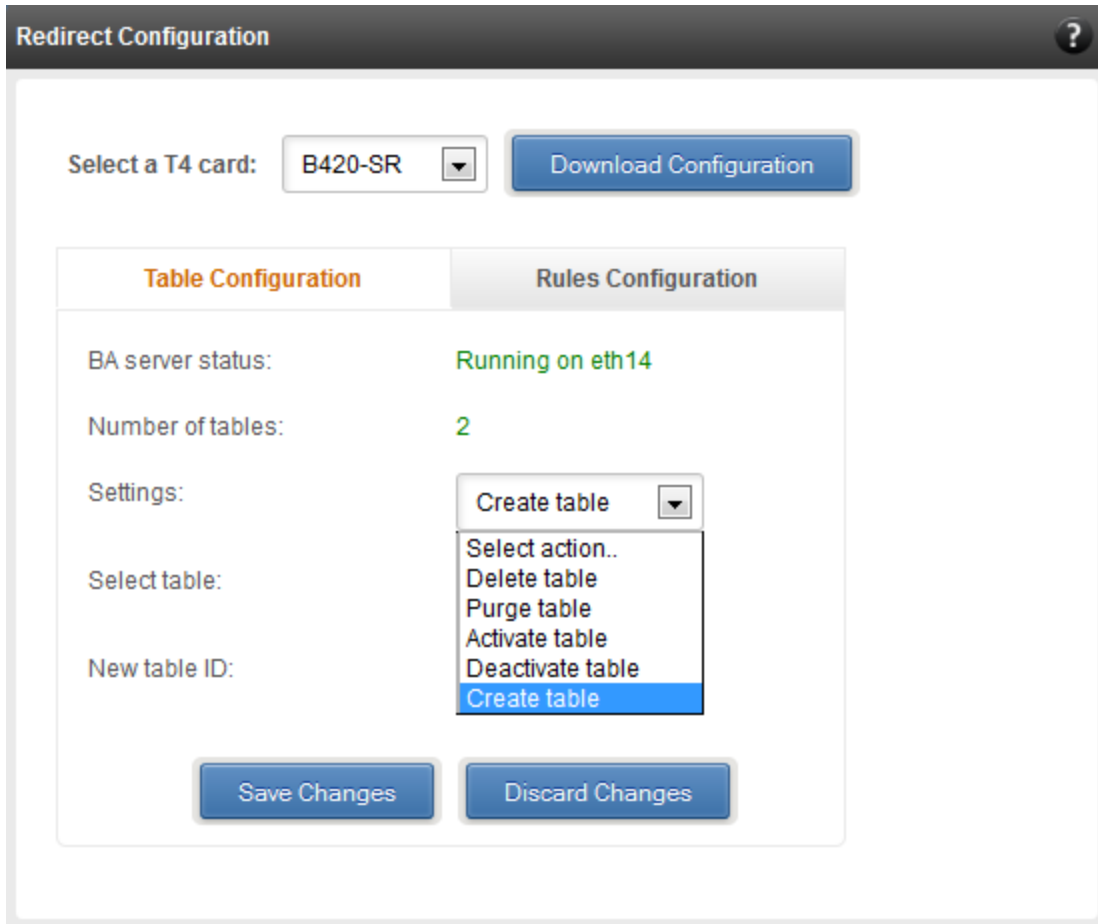


Figure 7.8.8 (b) - Redirect Configuration module: Table configuration tab

Redirect Configuration ?

Select a T4 card: B420-SR Download Configuration

Table Configuration
Rules Configuration

Select a table: Table 1 (active)

INDEX	ACTION	PORT	IPV6	PROTOCOL	SOURCE ADDRESS	SO
<input type="checkbox"/> 1	drop	0	disable	udp	102.22.22.155	255.25
<input type="checkbox"/> 2	forward	0	disable	udp	102.22.22.155	255.25
<input type="checkbox"/> 3	input	0	disable	udp	102.22.22.155	255.25
<input type="checkbox"/> 4	drop	0	disable	tcp	102.22.22.155	255.25
<input type="checkbox"/> 5	forward	0	disable	tcp	102.22.22.155	255.25
<input type="checkbox"/> 6	input	0	disable	tcp	102.22.22.155	255.25
<input type="checkbox"/> 7	forward	0	disable	icmp		
<input type="checkbox"/> 8	drop	0	disable	icmp		
<input type="checkbox"/> 9	input	0	disable	icmp		

Save Changes
Discard Changes
Add a Filter row
Delete a Filter

Figure 7.8.8 (c) - Redirect Configuration module: Rules configuration tab

### 8.8.9. T4 Egress Class Schedulers (Linux)

Schedulers can be set only when T5/T4 network driver (*cxgb4*) is loaded.

- **Egress Queue Map**

Using this module, you can bind (map) NIC (non-offloaded) Tx queues to Tx Scheduler classes.

INTERFACE NAME	CLASS ID	TX QUEUE ID	ACTION
eth13	0	0	Map

Interface Name : eth12 >> Class Id : 2 >> Tx Queue Id : 1

7.8.9 (a) - Egress Queue Map module

- **Egress Packet Scheduler**

Using this module you can configure different scheduler hierarchy levels (i.e. Class Rate Limiting, Class Weighted Round Robin and Channel Rate Limiting). Based on the parameters specified, different scheduler levels can be configured. To know more about the levels and related parameters, please refer **Traffic Management** chapter ([Click here](#)).

SCHEDULER	CHANNEL ID	INTERFACE	MODE	RATE MODE	RATE UNIT	MIN RATE	MAX RATE	PACKET SIZE	WEIGHT
0	1	eth12	Flow	Absolute	Bits (in kbps)	0	9000	0	-

Add New Rule Save Changes Discard Changes

7.8.9 (b) – Egress Packet Scheduler module

## 9. Uninstalling Unified Wire Manager

To uninstall Unified Wire Manager, use **Programs and Features** in the **Control Panel**.

## VI. Appendix

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## Chelsio End-User License Agreement (EULA)

Installation and use of the software implies acceptance of the terms in the Chelsio End-User License Agreement (EULA).

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