



## **Connexan Enterprise iSCSI Target (CiT™) Installation and Configuration**

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### **Abstract**

This white paper describes the installation procedure for the CiT™ as well as basic initial configuration. Before installing the CiT™ it is highly recommended that the CiT™ Best Practices document is reviewed.

# Contents

Connexan Enterprise iSCSI Target (CiT™) Installation and Configuration .....	1
Abstract .....	1
Contents .....	2
Installation Preparation and System Prerequisites .....	3
Installing the CiT™ .....	4
CiT™ Device Options Overview .....	8
Image File Device .....	8
RAM Drive Device .....	8
Virtual DVD .....	8
SPTI Device .....	8
IBVolume Device .....	8
Mirror (RAID 1) Device .....	8
Disk Bridge Device .....	8
Managing the CiT™ .....	9
Starting the Management Console .....	9
Logging in to the Management Console .....	10
Creating an iSCSI Device (iSCSI LUN Creation) .....	11
IBVolume Device Creation .....	12
Updating CiT™ Licensing and Registration .....	17
Testing a Newly Created CiT Device .....	18

## Installation Preparation and System Prerequisites

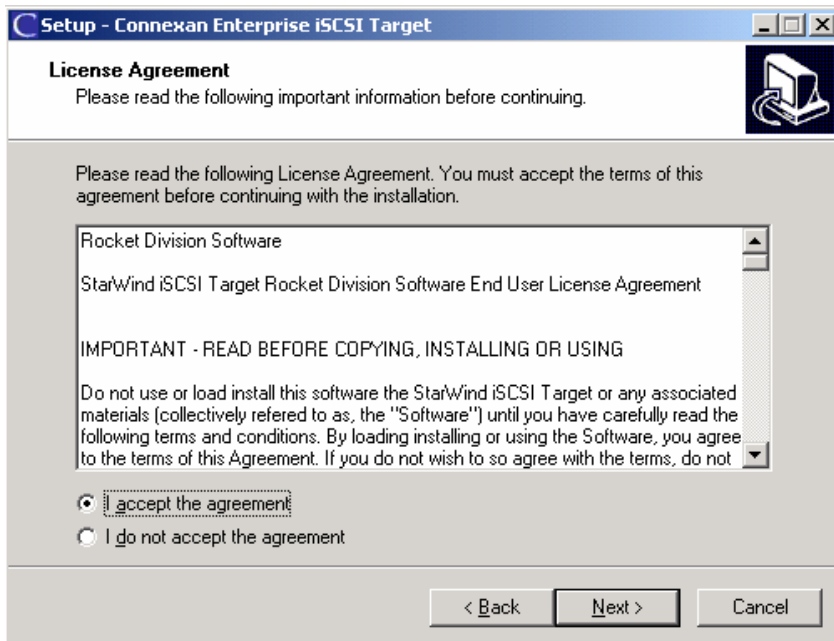
- Read and understand the CiT™ Best Practices Document
- Acquire the CiT installation executable, ConnexaniSCSITarget.exe
- The raw LUNs to be used and presented by the CiT must be defined, zoned (if appropriate), and accessible to the CiT server(s) in order to create iSCSI target devices. Proper creation of raw LUNs should be confirmed using Windows Disk Management services.
- OPTIONAL: For immediate test of iSCSI device creation, obtain an iSCSI initiator application such as the Microsoft Software iSCSI initiator available from <http://www.microsoft.com/downloads/>

## Installing the CiT™

Begin by opening the 'ConnexaniSCSITarget.exe' installation file. The installation welcome screen should appear. Click 'Next'.

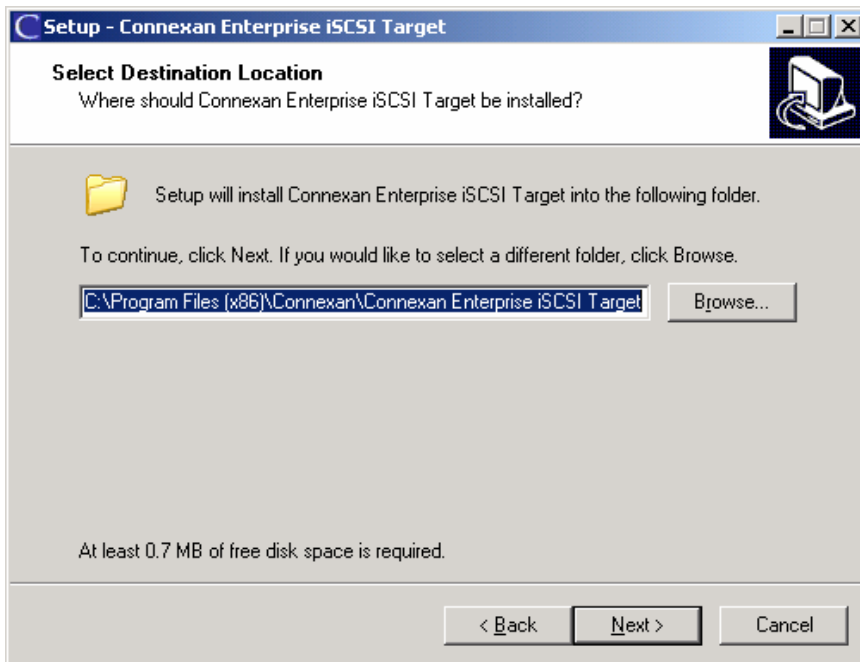


On the following screen, accept the license agreement and click 'Next'.

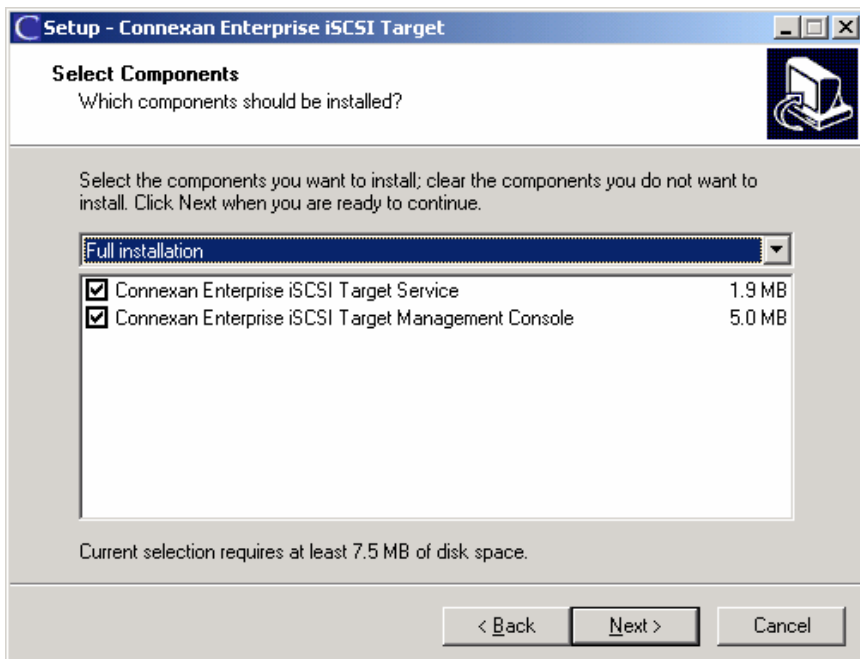


Click 'Next' again to accept the default destination installation directory or enter an alternative location. The default installation directory is:

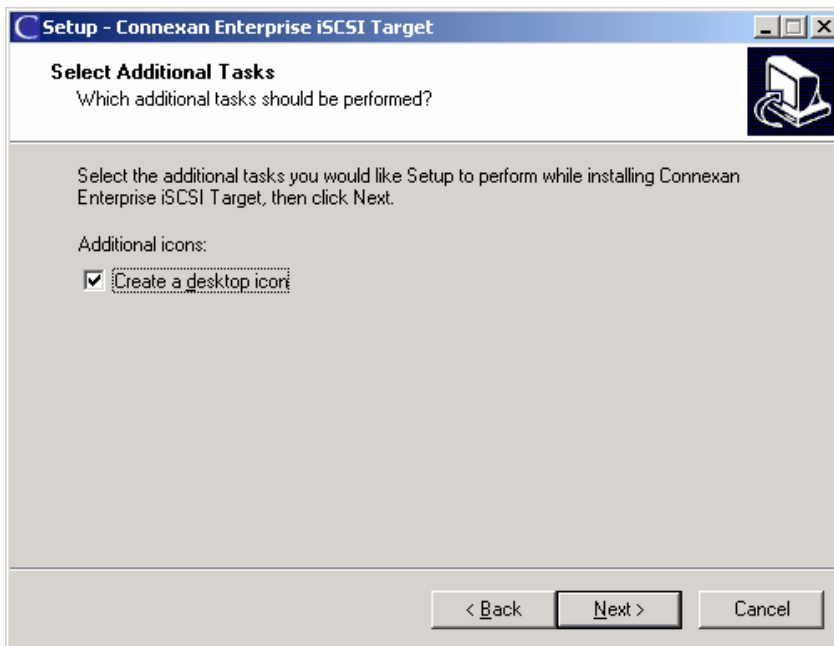
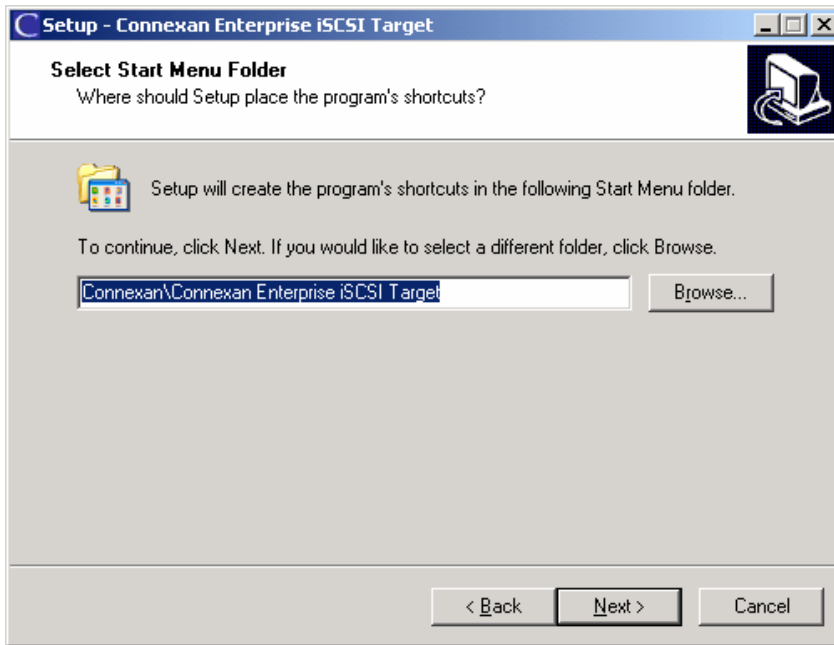
C:\Program Files (x86)\Connexan\Connexan Enterprise iSCSI Target



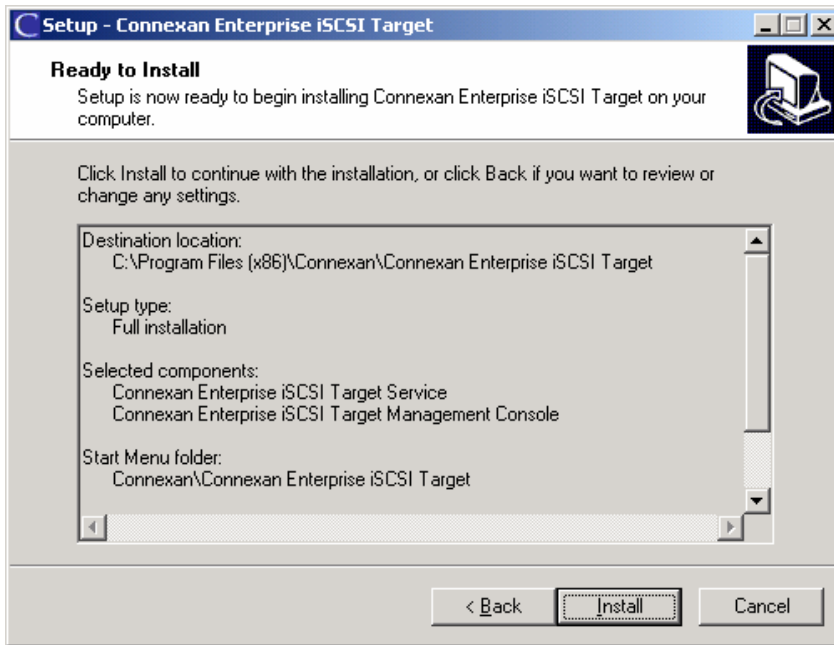
By default, both the iSCSI Target Service and iSCSI Target Management Console will be installed. Modify if necessary, and click 'Next' to continue.



The following two screens allow specification of the destination folder of CiT shortcuts and the creation of a desktop icon. Click 'Next' and 'Next', while selecting the options as desired.



The next screen displayed shows a summary of the installation options. Click 'Install' to complete.



Wait several minutes as the installation is performed. If successful, a summary screen, such as the following, will be displayed. Click 'Finish' to end the installation process.



## CiT™ Device Options Overview

The CiT supports a multitude of Device options. A brief overview is:

**Image File Device** – An Image File Device (IMG) is a provisioned file of a user-specified size (up to the available space on existing physical disk on the CiT Storage Node). IMG Devices require that an NTFS formatted volume is accessible to the CiT Storage Node. IMG Devices then store their data in large IMG files on that NTFS volume. Multiple volumes can be used, and multiple IMG Devices can be assigned to each NTFS volume. Connexan recommends that the NTFS volume be formatted with an Allocation Unit Size of 32KB or 64KB for best performance.

**RAM Drive Device** – The RAM Drive Device (RDD) allocates memory on the CiT Storage Node as disk capacity presented to an iSCSI Initiator client system. The data is stored in RAM on the CiT Storage Node and is volatile. If the CiT Storage Node is rebooted, loses power, or shuts down for any other reason, the data on the RDD will be lost. RDD's are not recommended for storage of data to be retained or any critical data.

**Virtual DVD** – The Virtual DVD (vDVD) allows the CiT Storage Node to share ISO and MDS formatted images as physical devices. The ISO or MDS can then be mounted as a physical CD or DVD drive on iSCSI Initiator Client systems.

**SPTI Device** – SCSI Pass Thru Interface. This option allows the sharing of a physical disk device via the CiT. The disk is directly physically mapped and shared to an iSCSI Initiator. If the disk contains existing data it will be lost and reallocated to the iSCSI Initiator to which it is presented. Presently the SPTI Device is only supported when the Initiator system is using NTFS. There are known issues when attempting to use VMFS, EXT3, or other UNIX/Linux variant file systems to access an SPTI Device.

**WARNING: Attempting to assign an SPTI Device to a VMFS/UNIX/Linux filesystem can result in partition and data corruption on the CiT Storage Node! Do not attempt to use SPTI with VMFS/UNIX/Linux filesystems!**

**IBVolume Device** – Incremental Block Volume (IBV) Devices are similar to IMG Devices. The difference is that IBV Devices grow as data is written and start with a minimum amount of required physical storage. IBV Devices allow storage over commitment. For example, an NTFS volume with 100GB of space could hold an IBV Device 500GB in size, provided it has not already grown past 100GB. This allows the storage administrator to assign more disk than has been currently purchased, and simply migrate the IBV Devices to larger NTFS volumes when they have outgrown the capacity of their initial physical space. Storage over commitment is growing trend in the industry and allows for greater flexibility of physical disk capacity. Please read the description of Image File Devices for more information on IBV Devices and their **limitations**.

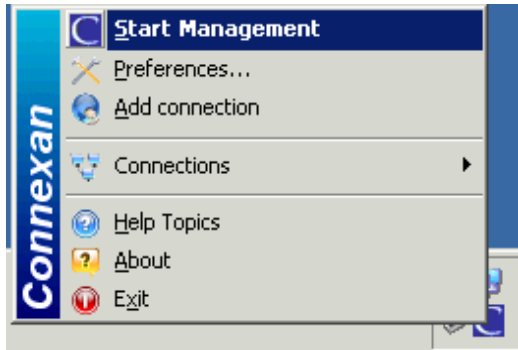
**Mirror (RAID 1) Device** – Mirror Devices are IMG Devices with the ability to be mirrored and/or replicated to another CiT Storage Node. Mirror Devices are only support when using the Connexan iSCSI Initiator (C2i).

**Disk Bridge Device** – The Disk Bridge Device (DBD) is equivalent to an SPTI Device, except that it is masked via a thin emulation layer as an SCSI device. The DBD adds the ability to mask the physically shared storage media as a SCSI device. This is useful for presenting SCSI-based pass thru devices using the CiT to systems that do not support IDE and SATA technologies but when they are the physical technology being shared. It is also useful for presenting pass-thru devices to systems such as VMware's ESX server, although, it is generally recommended that only IBVolumes are used with VMware ESX.

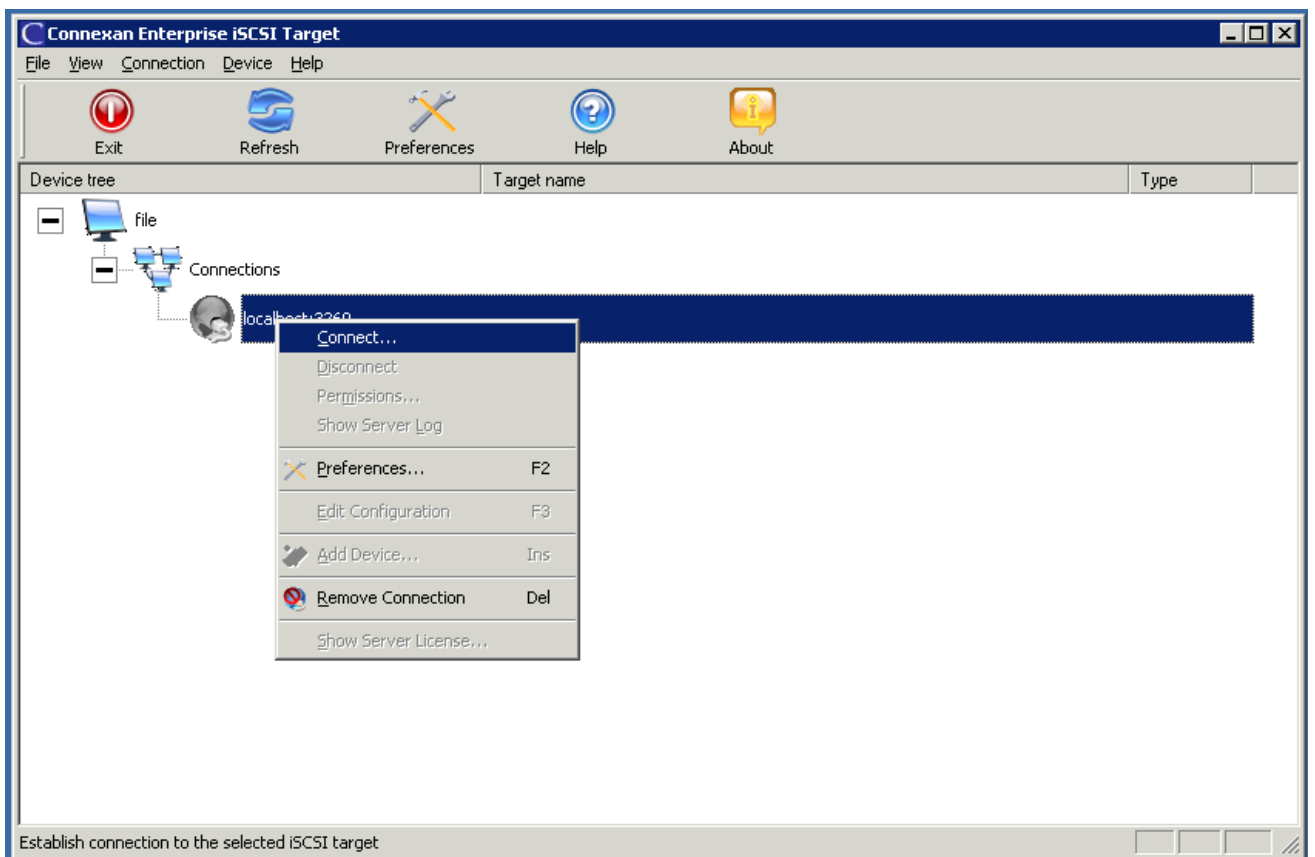
## Managing the CiT™

### Starting the Management Console

After installing the CiT™, start the management interface by right-click the Connexan icon in the lower right task tray and selecting Start Management.

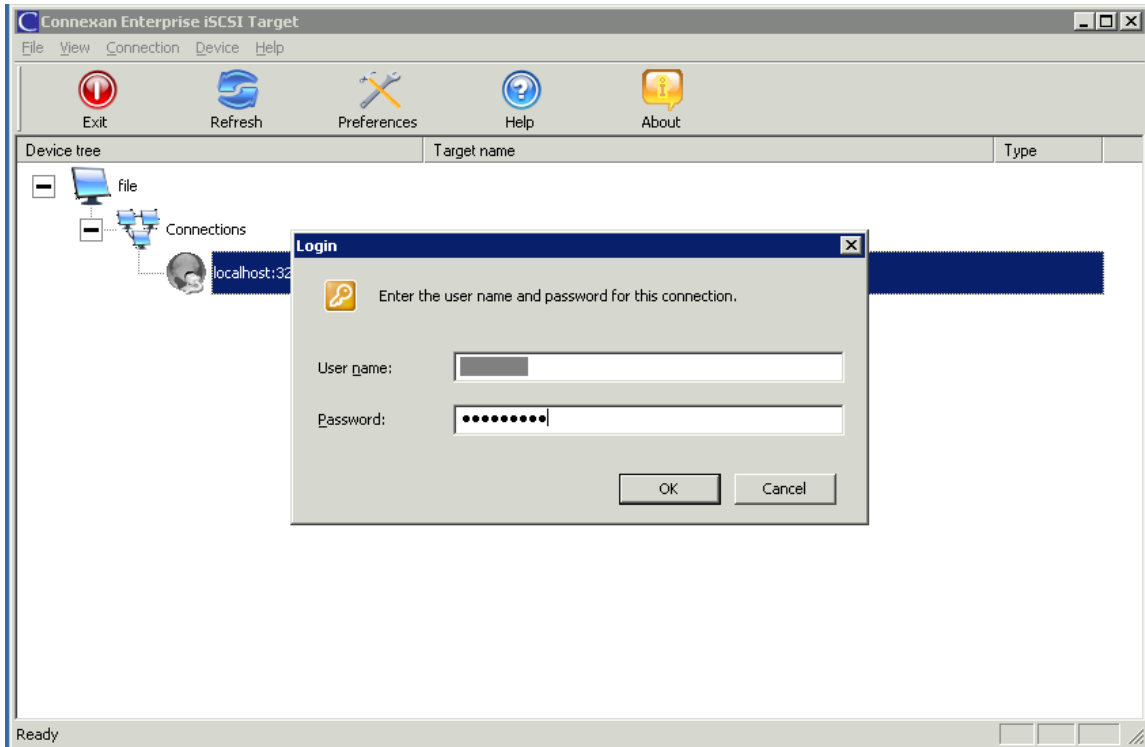


From the CiT Management window, right-click the host to manage (in this case, the local computer), and click Connect.



## Logging in to the Management Console

**NOTE:** The default login user name and password are “test” and “test”.



After successful connection to a managed host, the host's icon will change from being grey to blue and white.



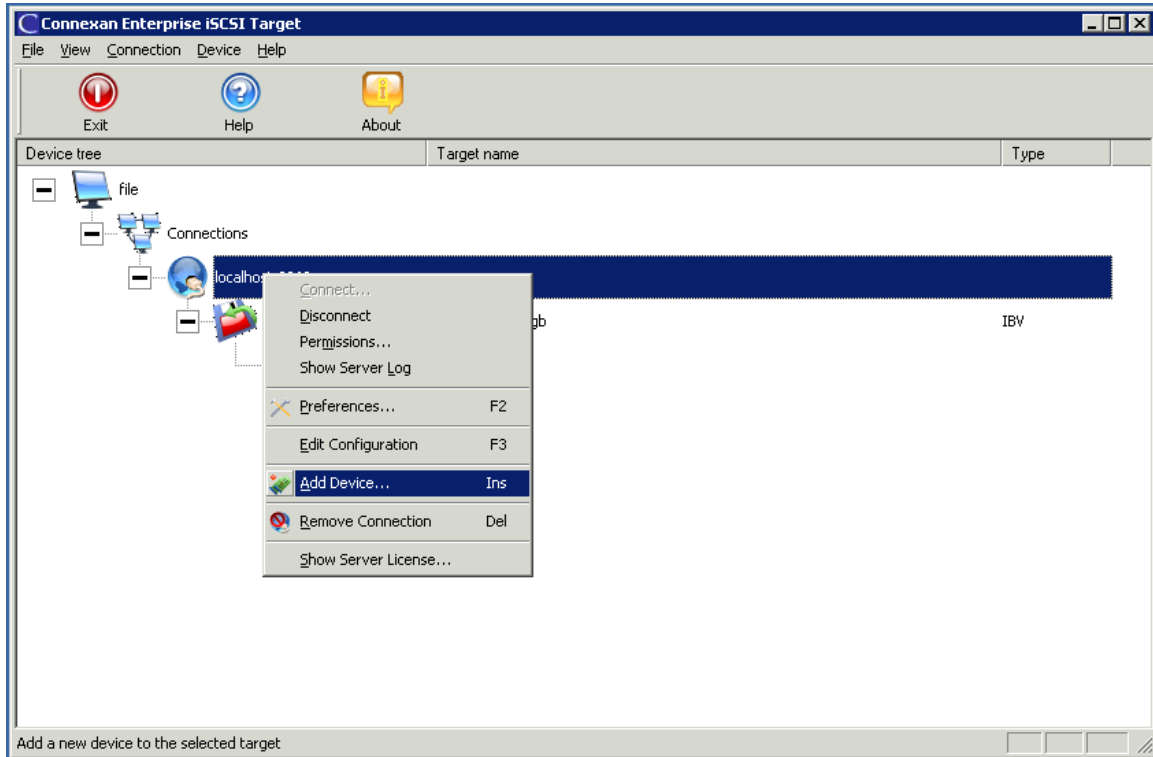
Disconnected



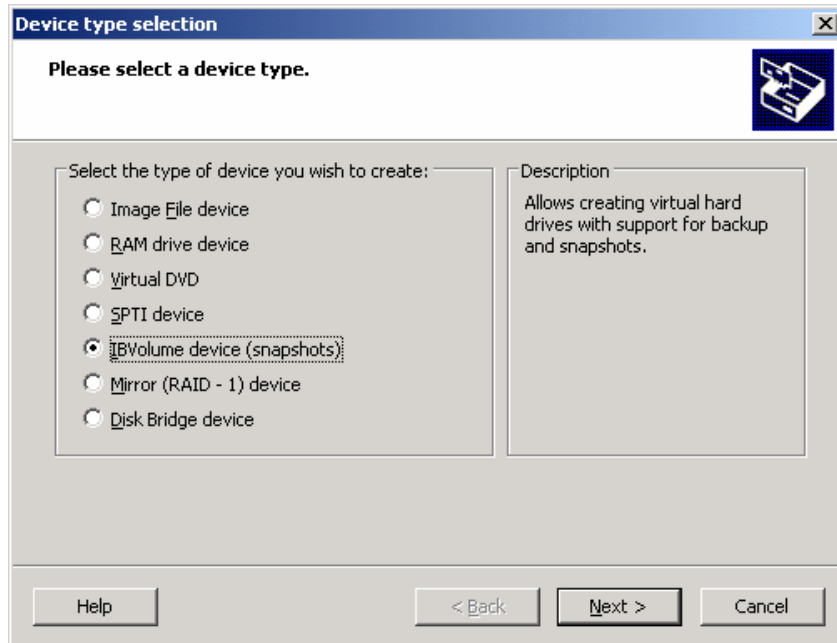
Connected

## Creating an iSCSI Device (iSCSI LUN Creation)

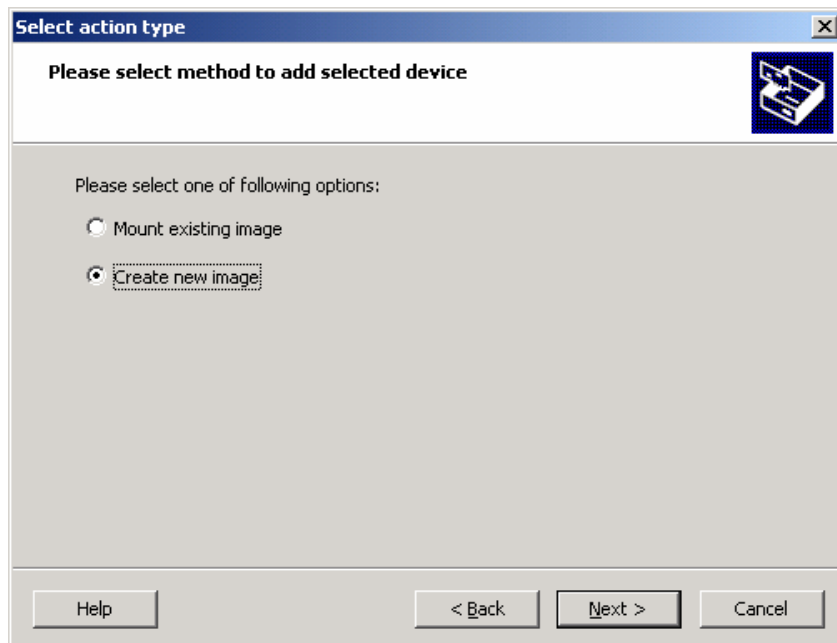
Once connected, Devices can be added to be presented as volumes to iSCSI Initiator clients.



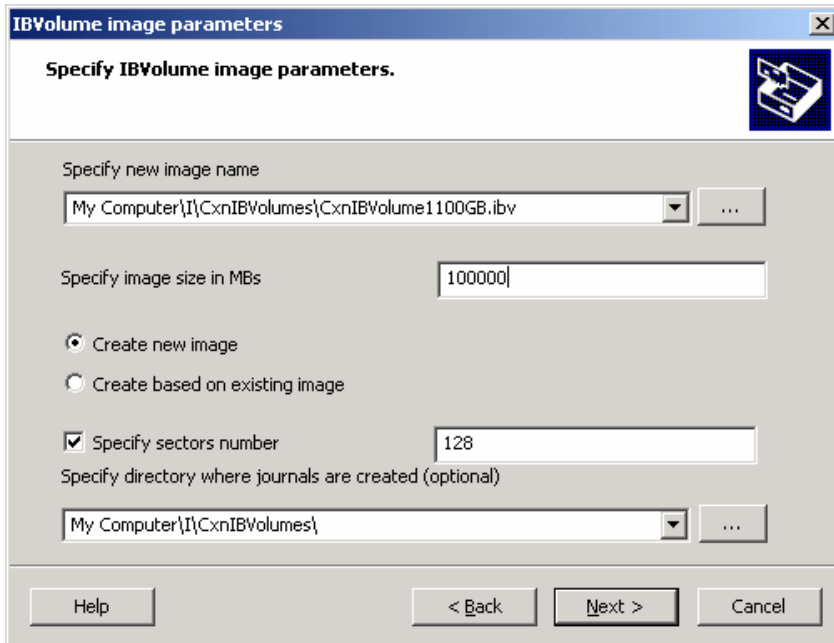
## IBVolume Device Creation



It is possible to either create a new iSCSI device image or mount a device from an existing image. Mounting an existing image will be covered in a later section on device back-up and recovery.

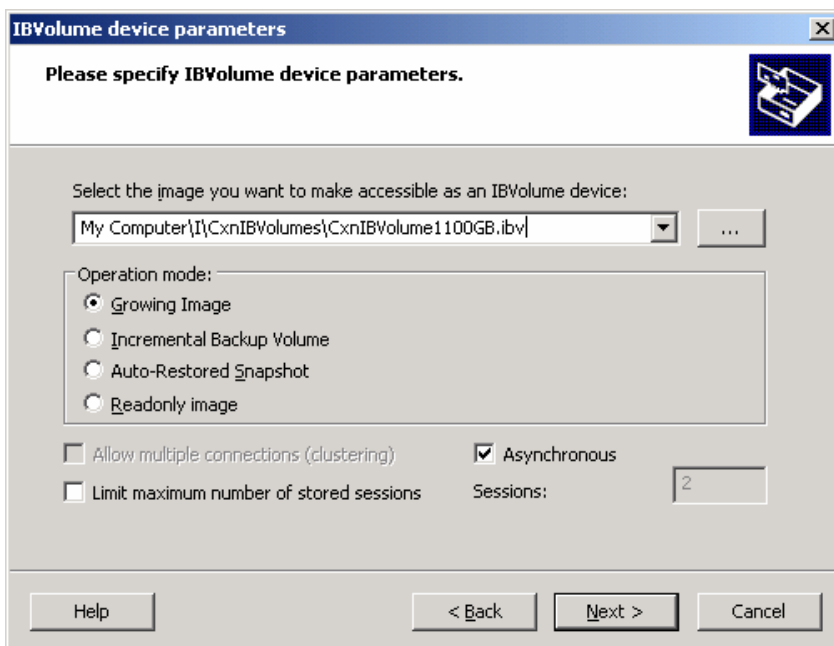


Data for the IBV file will reside on an Windows NTFS image file. To create a new image, click 'Next' to continue and begin entering configuration information on the IBV image parameters screen. Advanced options may be specified in order to allowing cloning of an existing image. The screenshots below follow the advanced options path. Begin by entering an image filename along with the full directory path to the file. **NOTE: The new image name MUST have the .ibv suffix.** Choose the desired image size, specified in MBs. For example, a 100GB iSCSI LUN would be specified as 100000. The default number of sectors is 8; however, Connexan recommends a value of 128 for optimal performance.



The screenshot shows the 'IBVolume image parameters' dialog box. The title bar reads 'IBVolume image parameters'. The main heading is 'Specify IBVolume image parameters.' Below this, there are several input fields and options: 'Specify new image name' with a dropdown menu showing 'My Computer\I\CxnIBVolumes\CxnIBVolume1100GB.ibv' and a browse button; 'Specify image size in MBs' with a text box containing '100000'; two radio buttons for 'Create new image' (selected) and 'Create based on existing image'; a checked checkbox for 'Specify sectors number' with a text box containing '128'; and 'Specify directory where journals are created (optional)' with a dropdown menu showing 'My Computer\I\CxnIBVolumes\' and a browse button. At the bottom, there are buttons for 'Help', '< Back', 'Next >', and 'Cancel'.

After clicking 'Next', the device parameters screen is displayed.



The screenshot shows the 'IBVolume device parameters' dialog box. The title bar reads 'IBVolume device parameters'. The main heading is 'Please specify IBVolume device parameters.' Below this, there are several input fields and options: 'Select the image you want to make accessible as an IBVolume device:' with a dropdown menu showing 'My Computer\I\CxnIBVolumes\CxnIBVolume1100GB.ibv' and a browse button; a group box for 'Operation mode:' containing four radio buttons: 'Growing Image' (selected), 'Incremental Backup Volume', 'Auto-Restored Snapshot', and 'Readonly image'; a checked checkbox for 'Asynchronous'; a checkbox for 'Allow multiple connections (clustering)'; a checkbox for 'Limit maximum number of stored sessions'; and a 'Sessions:' text box containing '2'. At the bottom, there are buttons for 'Help', '< Back', 'Next >', and 'Cancel'.

**Growing Image** - Uses single journal for all sessions. This mode is suitable for creating large disks with good utilization of physical disk space. Maximum number of stored sessions can be specified.

**Incremental Backup Volume** - Uses new journal for each session. Good for creating snapshots and backups. Journal switching period can be specified for Incremental Backup Volume mode. Maximum number of stored sessions can be specified

**Auto-Restored Snapshot** - All changes made during the session are discarded upon start of new session.

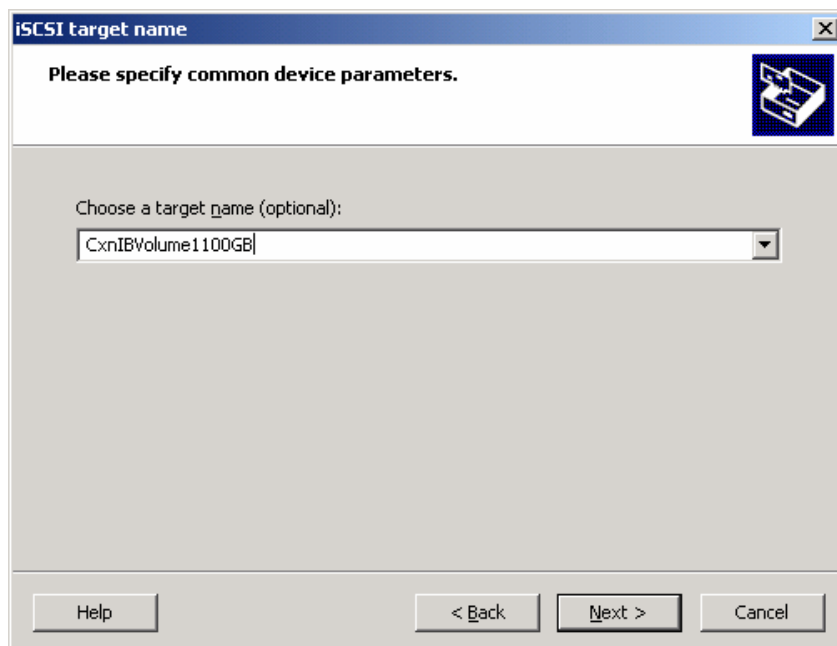
**Readonly** - Images are mounted in readonly mode

It is possible to benefit from asynchronous mode on striped volumes; however, Connexan recommends the 'Asynchronous' field be unchecked in normal operation.

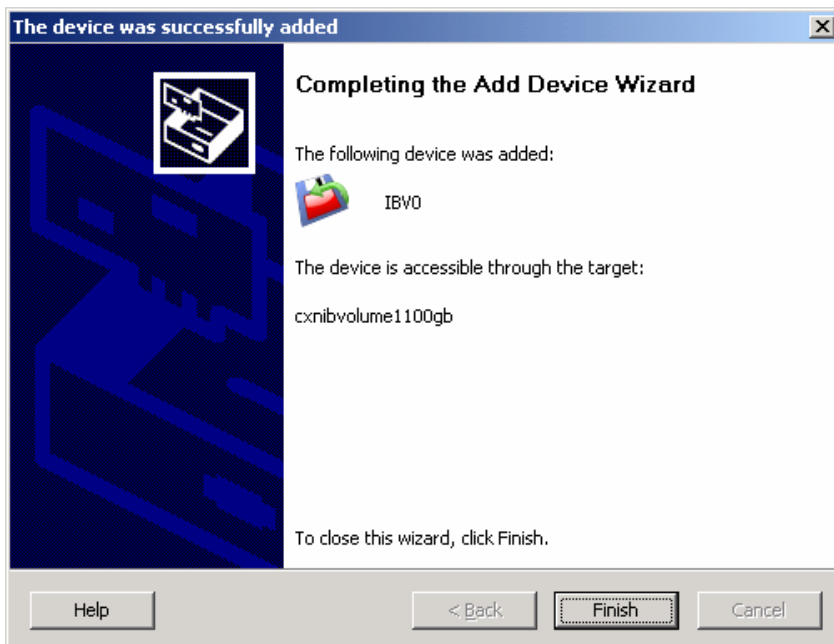
Asynchronous mode allows several disk requests to be executed at one time. The Synchronous mode allows only one disk request to be committed at a given time and other requests must wait until the current one finishes. On a RAID array or with SCSI disks the asynchronous mode could give much better performance than using the synchronous mode. Connexan recommends always using asynchronous unless you're configured on a single IDE drive with multiple client initiators accessing the target.

Notice that the 'Allow multiple connections (clustering)' option is disabled. This property, if desired, will be enabled manually after device creation. Click 'Next' to continue and choose a name for the new iSCSI device.

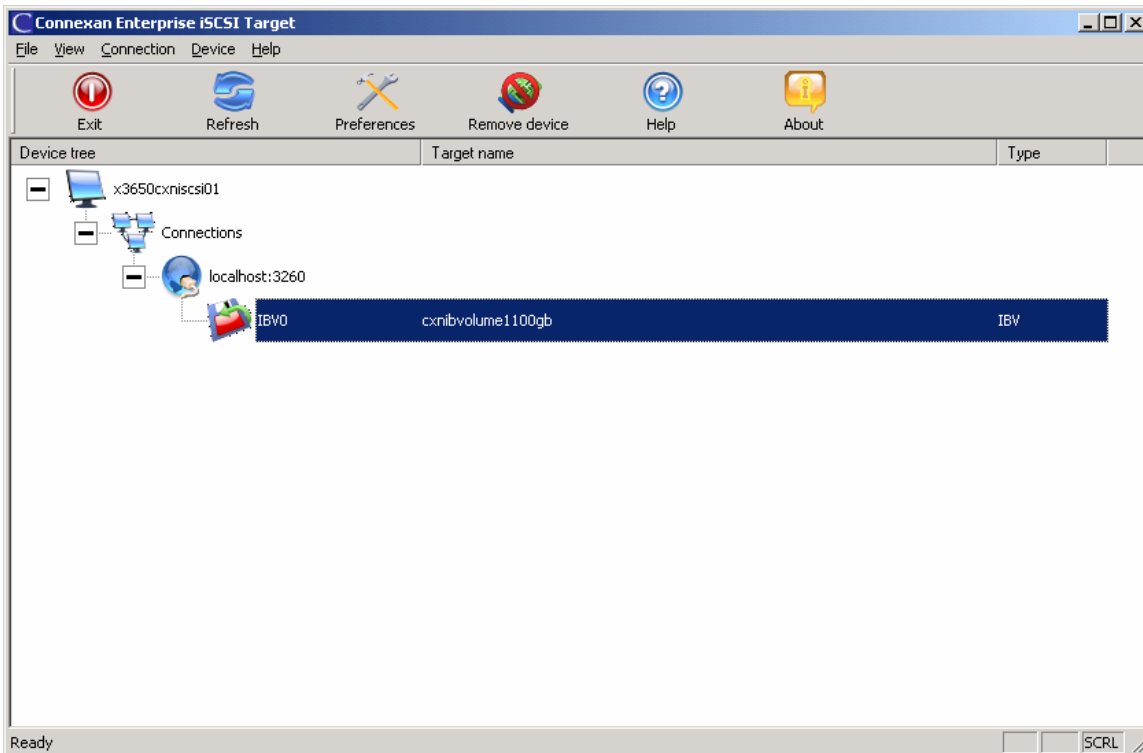
NOTE: The iSCSI device name may NOT include special characters including '\_'. If an invalid .ibv filename or an illegal device name were entered, final device creation will fail.



The next screen will include a brief summary of the device configuration. If acceptable, click 'Next' to continue and then 'Finish' on the final screen to complete device creation.

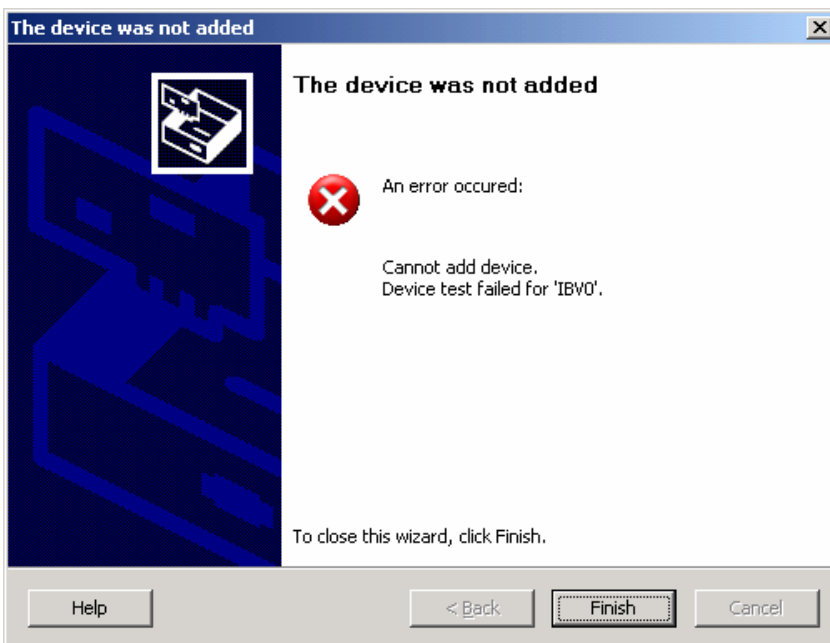


If all parameters were valid and the device creation was successful, the new device should appear in the CiT management console.



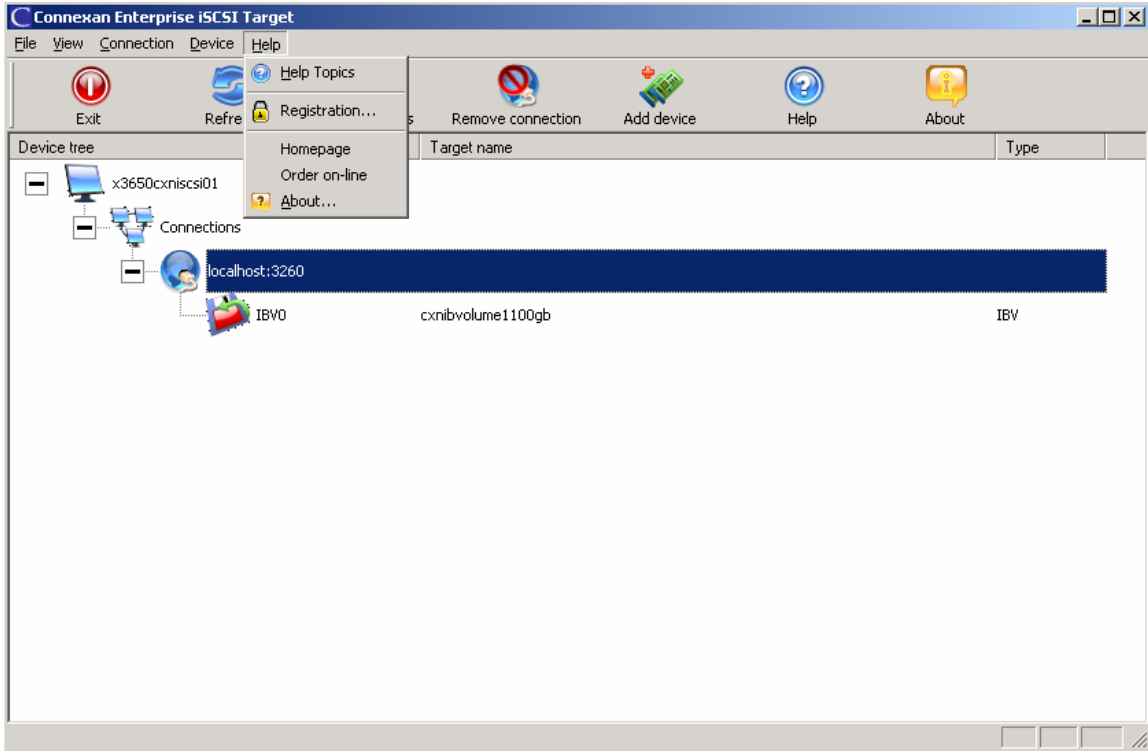
### Error code when not using proper .ibv extension

If the screen below appears during final device creation, an invalid .ibv filename or device name is most likely the cause. The iSCSI device name may NOT include special characters, including '\_'. To recover from this situation, go to the intended device creation directory (i.e. location of the new .ibv image file) and delete any files created in during the initial try. Repeat the device creation steps with valid filenames.

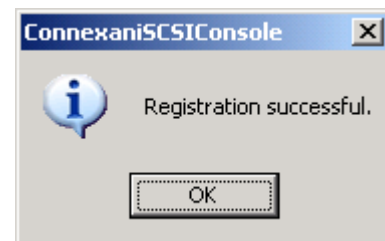
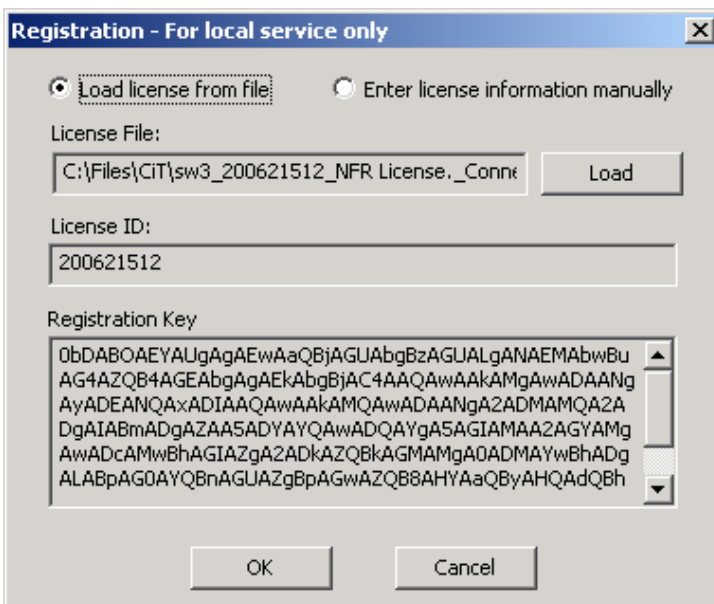


## Updating CiT™ Licensing and Registration

To update the license file and registration, select the appropriate CiT server instance in the management console. Next, go to the 'Help' menu and select the 'Registration' option.



This will open the license file selection window. For typical use, click the 'Load' button to browse to your appropriate .swk license file and click 'Ok'. If the file is valid, a 'Registration successful' pop-up will be displayed.

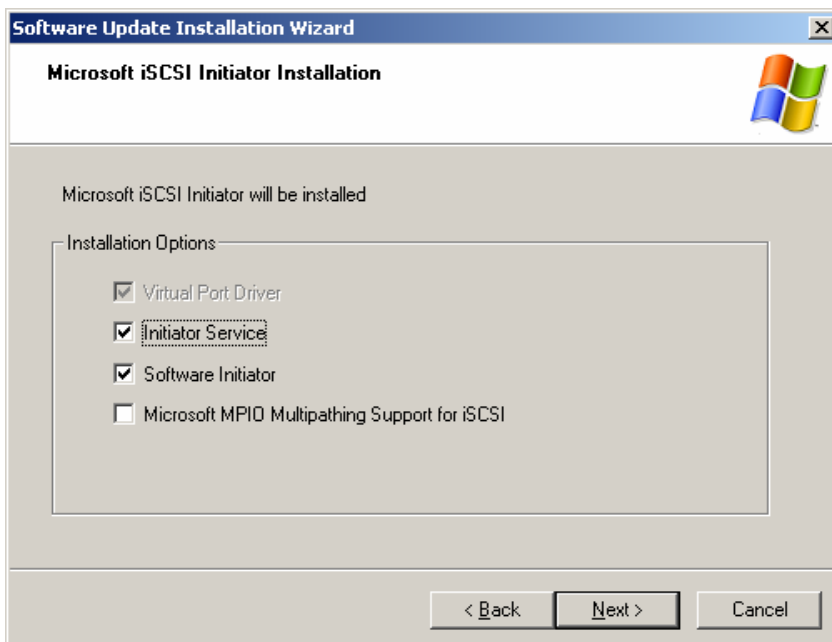
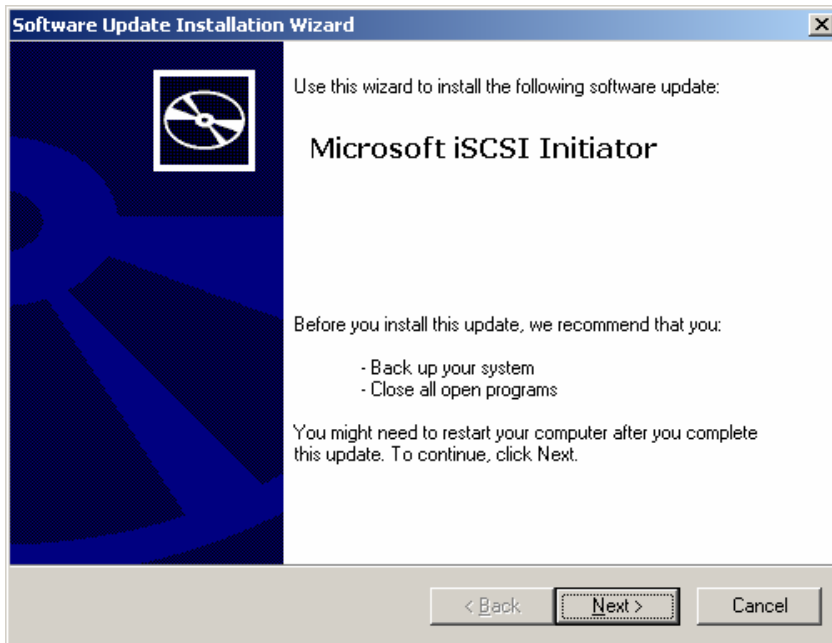


## Testing a Newly Created CiT Device

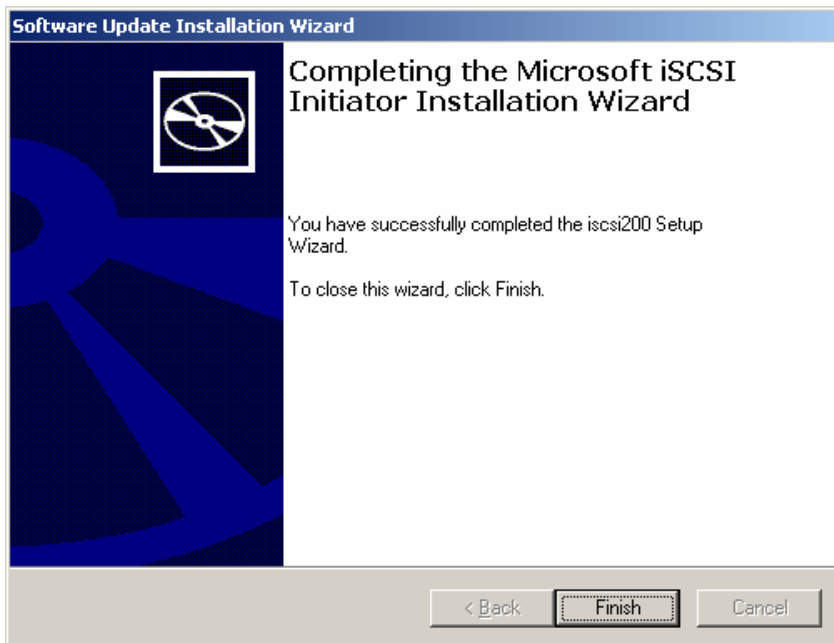
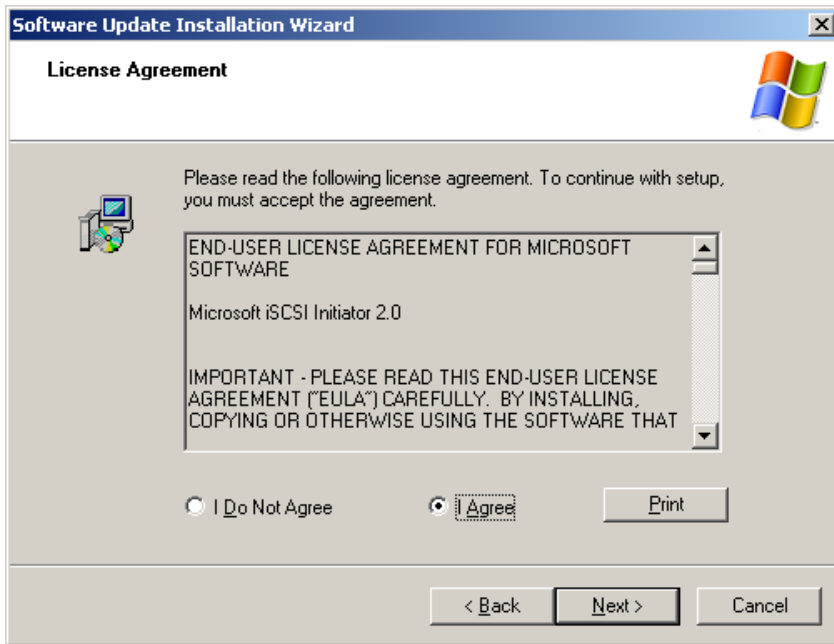
Connexan recommends testing connectivity to the newly created CiT device using an appropriate iSCSI software or hardware initiator.

A simple test scenario is to install Microsoft's iSCSI Software Initiator, available from <http://www.microsoft.com/downloads/>, and access the CiT device. Below are series of steps to test connectivity.

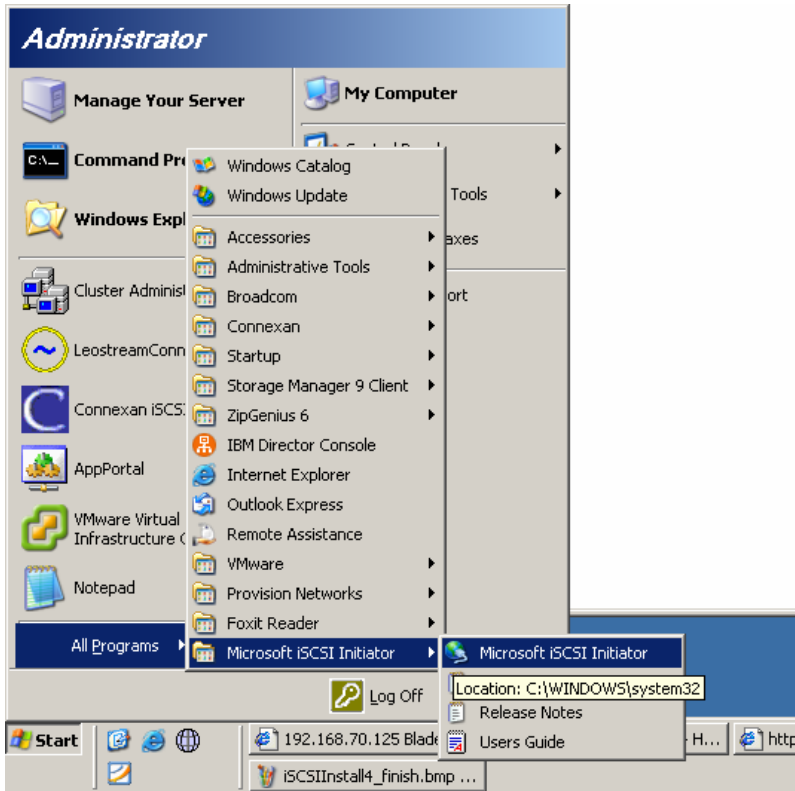
After downloading the appropriate files, begin the installation process by running the MS iSCSI Initiator install executable. Click 'Next' to continue and install the Initiator Service and Software Initiator options.



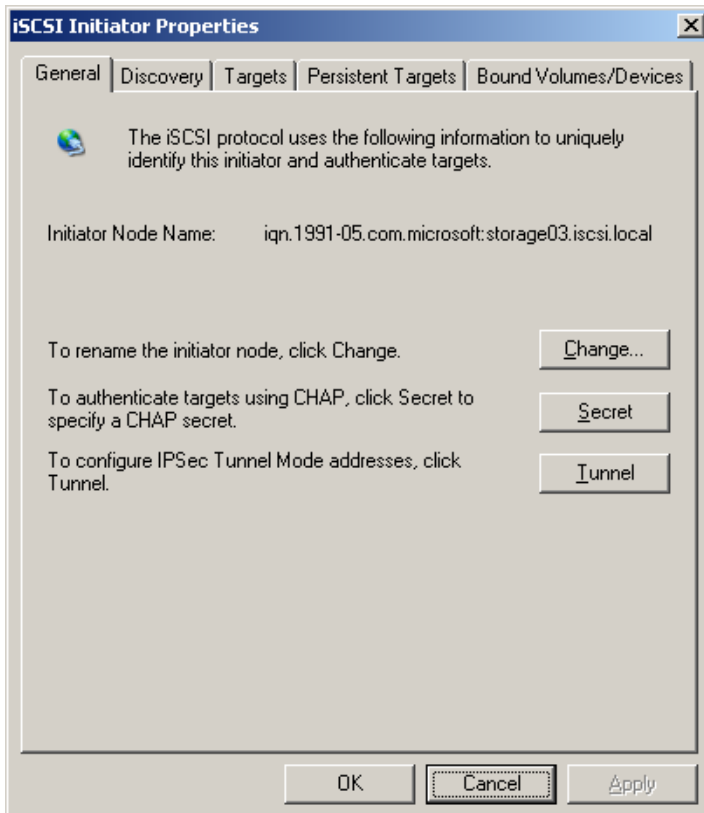
Agree to the license agreement, click 'Next', and proceed by clicking the 'Finish button'.



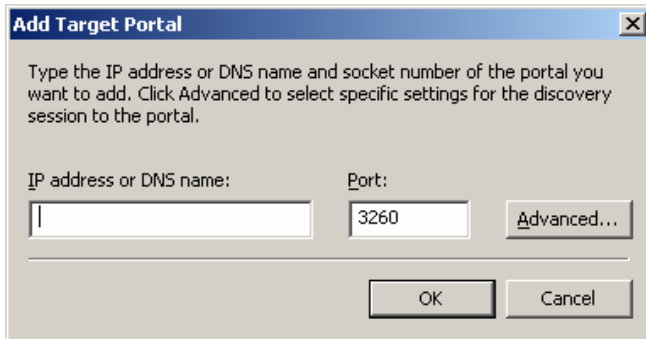
After finishing the installation, open the Microsoft iSCSI Initiator application, now located under the Start Menu.



This will open the iSCSI Initiator Properties window, as shown below. A default Initiator Node Name will be specified. Defaults are acceptable.



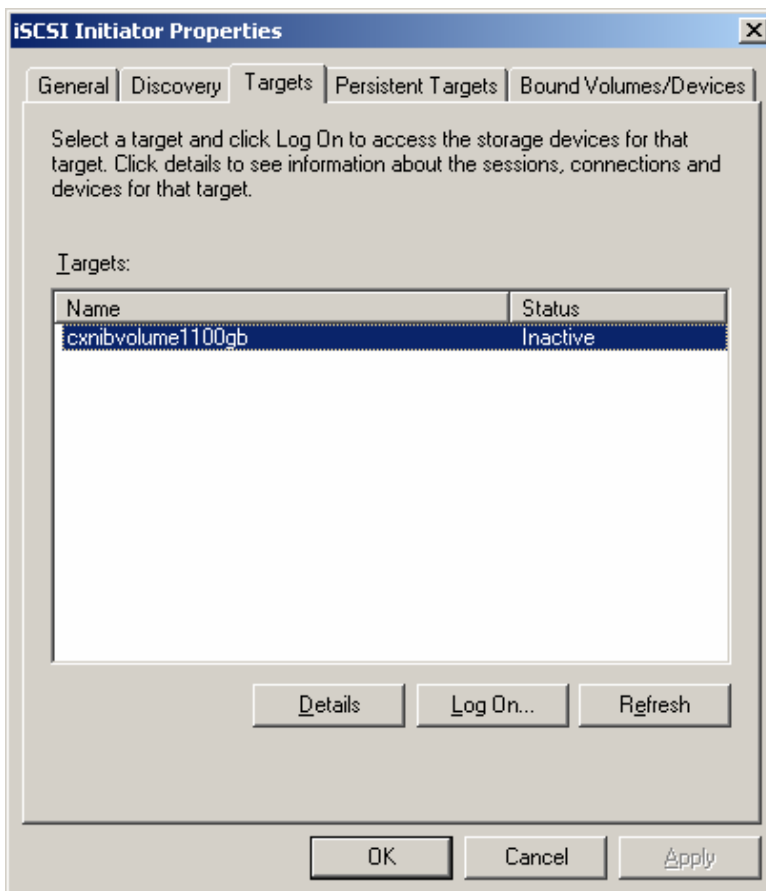
Click on the Discovery tab and click the “Add” button in order to enter the IP address information of the CiT server.



The "Add Target Portal" dialog box contains the following elements:

- Instructional text: "Type the IP address or DNS name and socket number of the portal you want to add. Click Advanced to select specific settings for the discovery session to the portal."
- Input fields: "IP address or DNS name:" (empty text box) and "Port:" (text box containing "3260").
- Buttons: "Advanced...", "OK", and "Cancel".

Proceed to the Targets tab. If the connection to CiT server was successful, the newly created iSCSI device should be listed in the targets window.



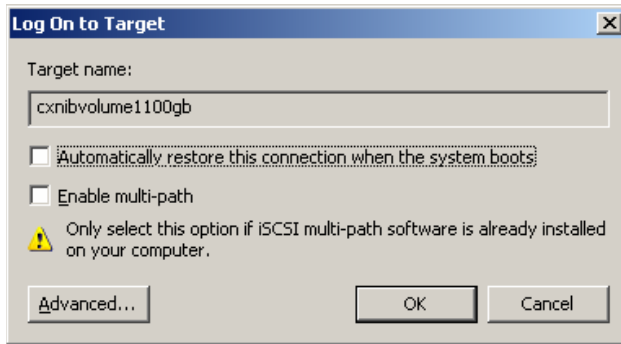
The "iSCSI Initiator Properties" dialog box shows the "Targets" tab with the following details:

- Instructional text: "Select a target and click Log On to access the storage devices for that target. Click details to see information about the sessions, connections and devices for that target."
- Targets list table:

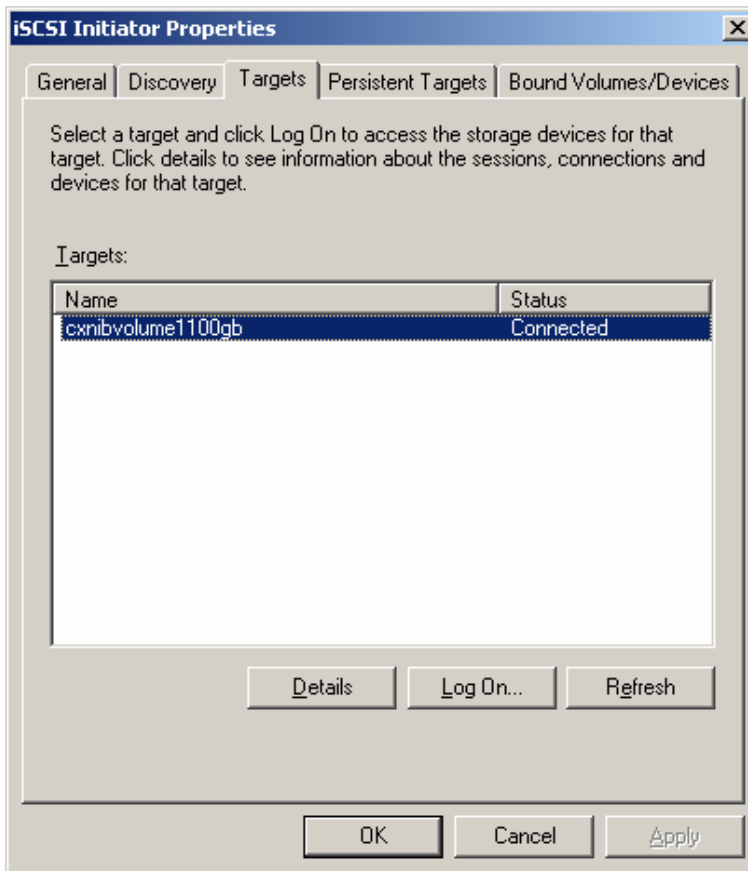
Name	Status
cxnibvolume1100gb	Inactive

- Buttons: "Details", "Log On...", "Refresh", "OK", "Cancel", and "Apply".

Note the device is listed as inactive. In order to activate the connection, select the new device and click the Log On button. Automatic restoration of the connection can be selected as desired. As this sequence is for test, selecting this option is not necessary.



After successful logon, the new device should be listed as connected.



This process should complete the connection of the MS Software iSCSI Initiator with the newly created CiT device. In other words, the iSCSI initiator server should now have access to the iSCSI device being presented. To verify, go to the Disk Management panel on the iSCSI initiator server. The new iSCSI LUN should be visible. If it is not, click Actions, Rescan Disks. Sometimes there is a delay on the Windows client initiator and it may take a few minutes before a Rescan Disks operation successfully identifies and displays the new iSCSI LUN.