



SGI NAS

FC Plug-in User Guide

Release 3.1.x

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1 Overview

This guide describes how to use the SGI NAS FC plug-in, which continuously monitors system configuration, snapshots the system at configurable intervals without user intervention, generates intelligent reports for system administrators and support personnel, and provides the capability to revert the appliance to the (previously snapshot-ed) system configuration. ConfGuard provides enterprise-grade control and monitoring that allows system administrators to control the appliance in presence of software and configuration upgrades and updates.

1.1 Audience

The guides audience is intended for SGI NAS administrators, system administrators, users or any other involved parties.

1.2 Document conventions

SGI NAS Management Console (NMC) commands:

```
nmc: /$
```

UNIX shell commands:

```
#
```

2 Introduction

SGI NAS is a software-based storage appliance based on the Zetta File System (ZFS) from OpenSolaris. SGI NAS supports file and block storage and a variety of advanced storage features such as replication between various storage systems and virtually unlimited snapshots and file sizes.

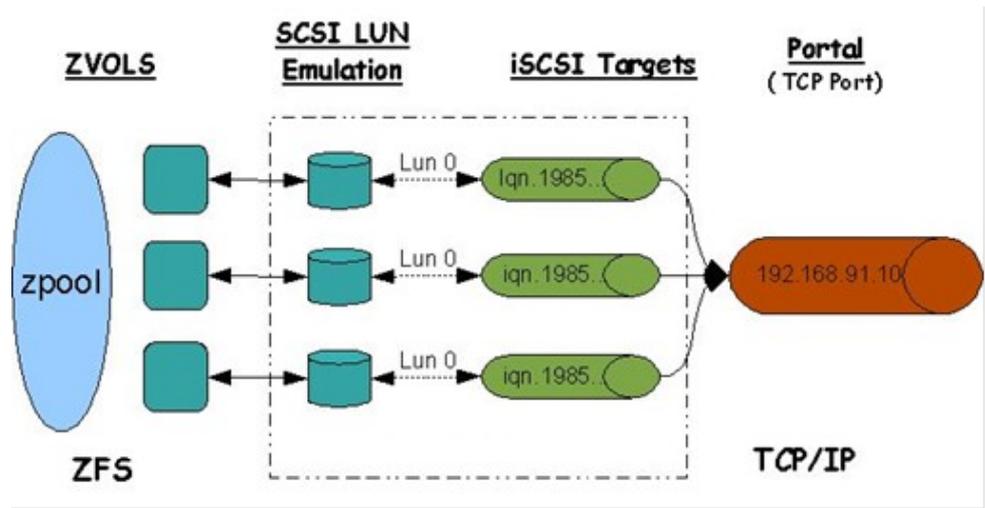
The product supports direct-attached SCSI, SAS, and SATA disks, and disks remotely connected via iSCSI, FibreChannel, or AoE protocols. Networking support includes 10/100/1G BaseT and many 10G Ethernet solutions, as well as aggregation (802.3ad) and multi-path I/O. For most installations, we recommend 100Mbps Ethernet at a minimum.

SGI NAS includes a SCSI Target module for presenting block devices via various protocols such as FibreChannel or iSCSI. SGI NAS provides iSCSI management as part of the base configuration. FibreChannel support requires the use of the additional Target FC plug-in.

Target FC is also integrated with the HA Cluster plugin, which provides high availability. This allows for various configuration information (LUN mappings, initiator and target groups, etc.) to be saved, failed over, and restored.

2.1 Functional Block Diagram

The SGI NAS SCSI Target module is the component that allows ZFS datasets (zvol) to appear as FibreChannel or iSCSI disks to their respective initiators on the attached SAN. An iSCSI example of this LUN emulation is shown here:



SCSI Target provides a GUI and command line interface to enable users to create SCSI targets using multiple protocols and to make the targets accessible by SCSI initiators.

3 SCSI Target (Managing Blocks)

A SCSI Target is a generic term used to represent different types of targets such as iSCSI or Fibre Channel. SCSI Target accesses all of the different types of targets in the same way and hence allows the same zvol to be exported to any type of target (or to multiple targets at once).

Configuring a target means making it available to the system. This process is specific to the type of target being configured.

3.1 Create Zvol

A Zvol is an emulated block device contained within a data volume. Zvols provide an easy way to expose SCSI Targets to hosts. For example, a zvol can serve as the backing store for an iSCSI target. A zvol can also be used as a swap partition.

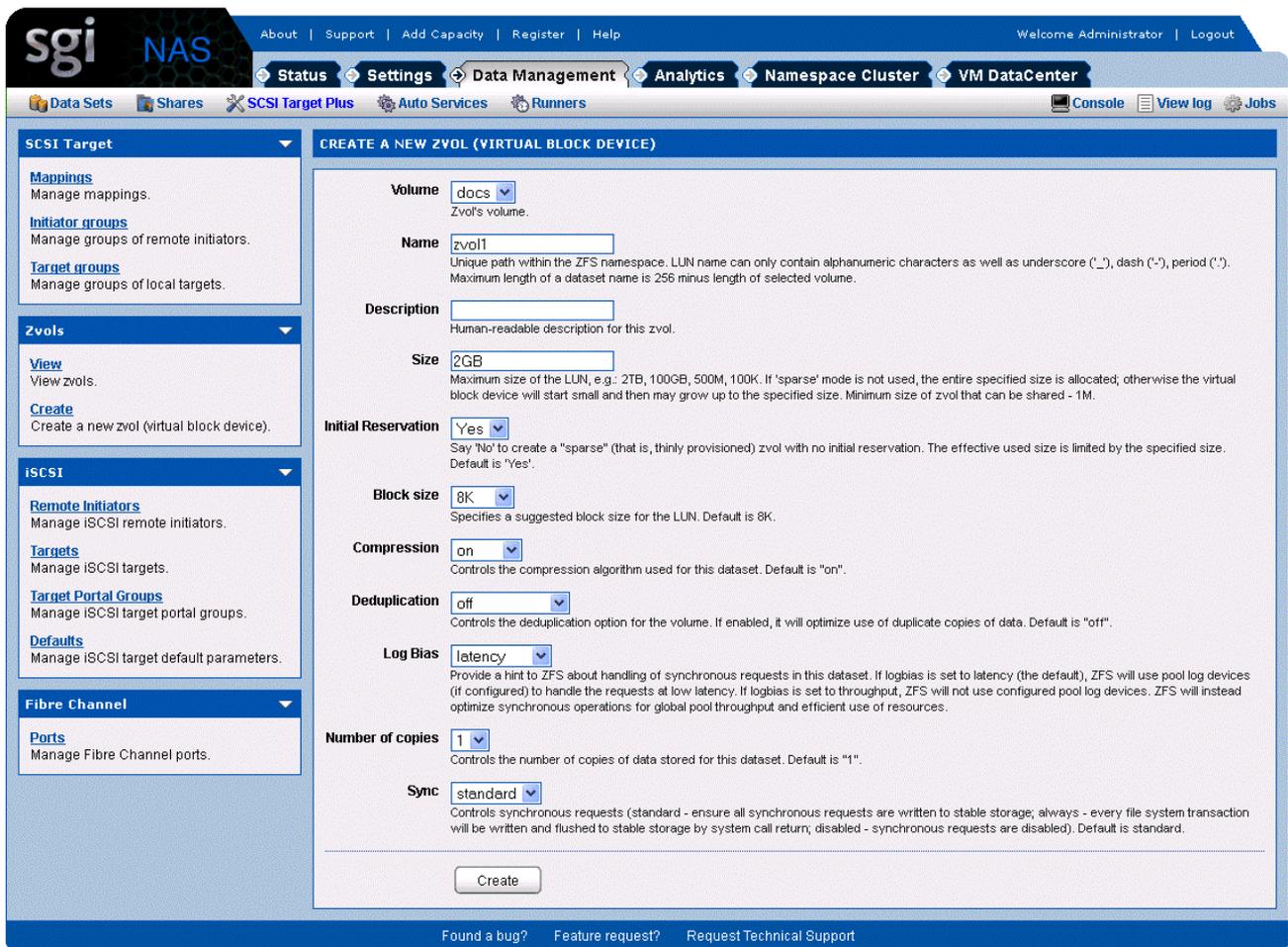
Storage services such as snapshotting and replication can be used with zvols.

Thin provisioning is supported for zvols, meaning that storage space is allocated on-demand. Here is an example using NMC to create a 5TB zvol named zvol1 within the data volume vol1:

```
nmc:/$ create zvol vol1/zvol1 -S -s 5TB
```

Alternatively you could type create zvol and follow the prompts to complete the request.

In NMV you can create a zvol on the “SCSI Target” page. You will be prompted for the data volume that will contain the new zvol, the zvol name, an optional description, and whether the zvol will have space initially reserved. The block size and maximum size is also specified. You can indicate whether the zvol data should be compressed on the backend storage and how many redundant copies should be stored.



Here is an example in NMC of setting up periodic snapshots for the zvol:

```
nmc:/$ create auto-snap zvol vol1/zvol1
```

You will then be asked to provide the snapshot frequency, retention policy, etc.

Zvol can be thin provisioned, and can be grown over time, both in terms of its effective and maximum size. A thin provisioned (also called "sparse") zvol does not allocate its specified maximum size. At creation time a thin provisioned zvol actually allocates only a minimum required to store its own metadata.

You can grow both the effective (actually used) size of the zvol by storing more data on it, and the maximum size of the zvol, by incrementing its

property called 'volsize'. In NMC, the latter is done via:

```
nmc:/$ setup zvol <zvol-name> property volsize
```

A similar function is available via the NMV web GUI.

3.2 View Zvol Properties

If a zvol is being shared over iSCSI and/or FC as a SCSI disk, the Writeback caching for that disk can be Enabled or Disabled. When Writeback caching is enabled, the disk performs better on writes but the data is not flushed to the backing store of the zpool before a write I/O is completed to the initiator. Disabling writeback caching will always ensure that data is flushed to stable storage before a write is completed. But doing so will reduce the disk write performance.

To control writeback caching select 'SCSI Target => 'View (Zvols)'. Click on the zvol name and its properties will show up. Select the desired writeback caching mode from the drop down list.

3.3 Destroy a Zvol

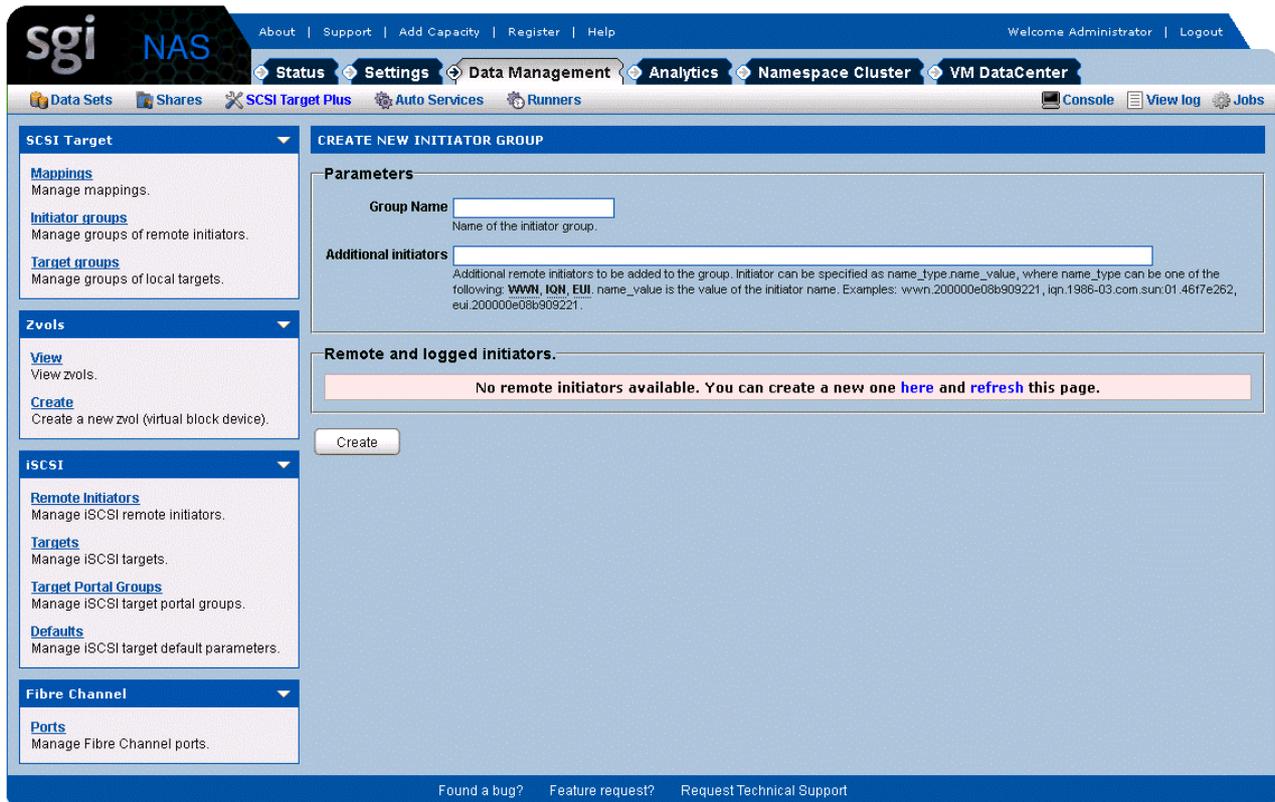
To destroy a zvol in NMC, use the command

```
nmc:/$ destroy zvol
```

3.4 Create initiator group

You can share a zvol with all remote initiators. In this case you do not need to create any initiator groups. If you want to control which initiators can see a zvol, then you need to create one or more initiator groups. Even if you intend to associate only a single initiator with a zvol, the initiator needs to be in an initiator group.

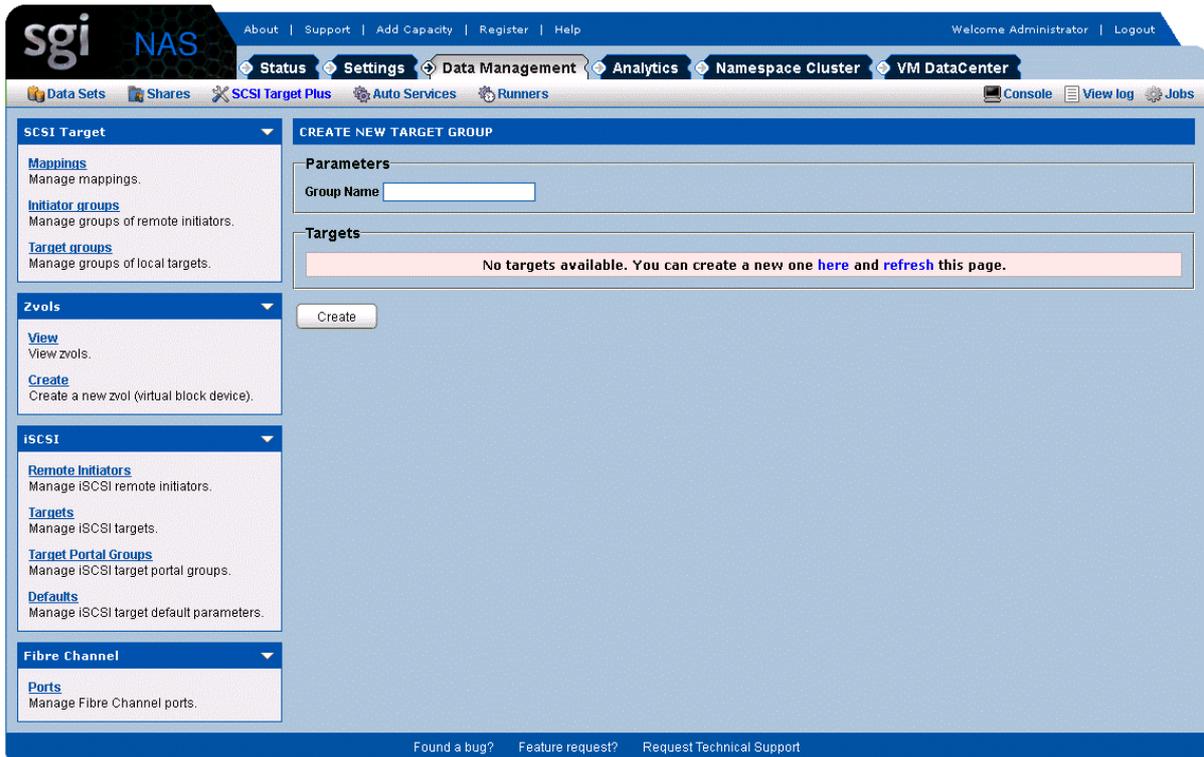
To create an initiator group in NMV, click the link Initiator Groups.



Provide a group name and a list of remote initiators for this group, and then click Create.

3.5 Create target group

You can associate a zvol with a set of targets by putting the targets in a target group. Target groups are not required. The following screen in NMV shows how to create a target group. You simply choose a group name and select the targets to be in the group.

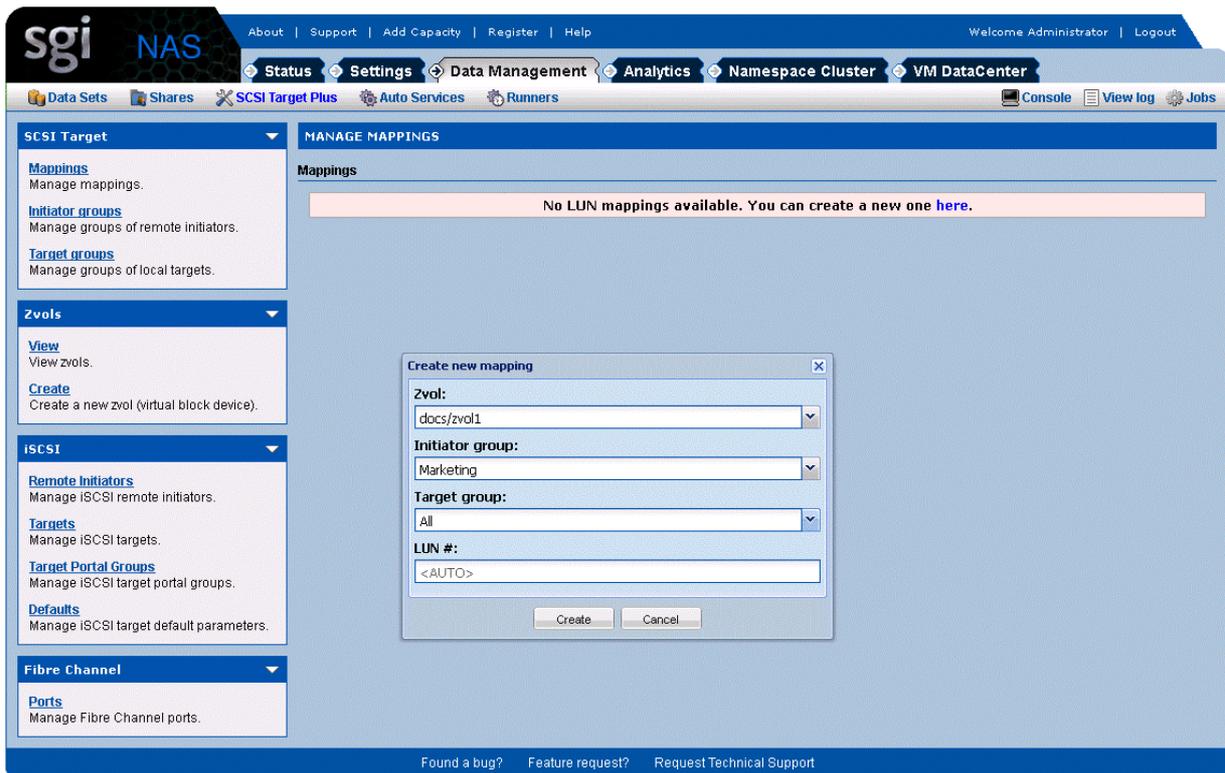


For FibreChannel, you would first make sure your port is configured in target mode, and then you would create the target group.

3.6 Create LUN mappings

LUN mappings allow you to control which remote initiators can see a zvol. A zvol is not accessible over the SAN until it has been mapped.

Here is an example in NMV of creating a LUN mapping for a zvol:



Instead of defining and choosing initiator and target groups, you can simply select “All”. However, remote iSCSI initiators will not find this target if you haven’t defined at least one iSCSI target.

When creating a LUN mapping you can choose a specific LUN id or let SGI NAS assign one automatically.

4 SCSI Target Plus

When Target FC is installed, the “SCSI Target” label in the GUI changes to “SCSI Target Plus” to indicate that we are now supporting more than the default iSCSI protocol. When selecting the “SCSI Target Plus” tab you will see a block on the left for FibreChannel with the option to configure the FibreChannel ports.



Note that with FibreChannel, unlike iSCSI, you don't configure targets. However you do configure ports, which can act as initiators or targets.

4.1 Configure FibreChannel Ports

After installing a FibreChannel HBA in the system, the associated ports on the HBA will automatically appear in the GUI. By default these ports will act as FibreChannel initiators, but typically they can be changed to be target ports.

Switching the port's mode from initiator to target is supported by most vendors, but requires the use of FibreChannel HBA-specific operations. Currently SGI NAS can switch Qlogic 4G/8G and Emulex HBAs into target mode.

The port mode can be changed in the GUI by selecting the Ports link. The ports are listed, with modes selectable from a drop-down menu.

Note that after changing the port mode a system reboot is required before the change will take effect.

The following screen shows the view in NMV after selecting the Ports link.

The screenshot displays the SGI NAS administration interface. The top navigation bar includes links for About, Support, Add Capacity, Register, and Help, along with a 'Welcome Administrator | Logout' message. The main menu features tabs for Status, Settings, Data Management, Analytics, Namespace Cluster, and VM DataCenter. Below the menu, there are icons for Data Sets, Shares, SCSI Target Plus, Auto Services, and Runners, along with Console, View log, and Jobs options.

The interface is divided into several sections:

- SCSI Target:** Contains links for Mappings (Manage mappings), Initiator groups (Manage groups of remote initiators), and Target groups (Manage groups of local targets).
- Zvols:** Contains links for View (View zvols) and Create (Create a new zvol (virtual block device)).
- iSCSI:** Contains links for Remote Initiators (Manage iSCSI remote initiators), Targets (Manage iSCSI targets), Target Portal Groups (Manage iSCSI target portal groups), and Defaults (Manage iSCSI target default parameters).
- Fibre Channel:** Contains a link for Ports (Manage Fibre Channel ports).

The main content area displays a table titled 'FIBRE CHANNEL PORTS' with the following data:

	WWN	State	ID	Mode	Speed	Supported Speeds	Model	Manufacturer
	10000000C995233E	offline		Initiator	not established	2Gb 4Gb 8Gb	LPe12002-M8	Emulex
	210000183281BB9C	online	2	Initiator	8Gb	2Gb 4Gb 8Gb	QLE2560	QLogic Corp.
	10000000C995233F	online	1	Initiator	8Gb	2Gb 4Gb 8Gb	LPe12002-M8	Emulex

At the bottom of the interface, there are links for 'Found a bug?', 'Feature request?', and 'Request Technical Support'.

In addition to setting the port mode you can also view basic port properties such as WWN, current speed, model, and manufacturer. Additional properties can be shown by clicking the “magnifying glass” on the left, as shown in this screenshot:

The screenshot shows the SGI NAS web interface. The top navigation bar includes 'Status', 'Settings', 'Data Management', 'Analytics', 'Namespace Cluster', and 'VM DataCenter'. The left sidebar has sections for 'SCSI Target', 'Zvols', 'iSCSI', and 'Fibre Channel'. The main content area is titled 'FIBRE CHANNEL PORTS' and contains a table with columns: WWN, State, ID, Mode, Speed, Supported Speeds, Model, and Manufacturer. Below the table, a detailed view for the port with WWN 'wwn.1000000C995233E' is shown, listing various properties and their values.

WWN	State	ID	Mode	Speed	Supported Speeds	Model	Manufacturer
1000000C995233E	offline		Initiator	not established	2Gb 4Gb 8Gb	LPe12002-M8	Emulex
210000183281BB9C	online	2	Initiator	8Gb	2Gb 4Gb 8Gb	QLE2560	QLogic Corp.
1000000C995233F	online	1	Initiator	8Gb	2Gb 4Gb 8Gb	LPe12002-M8	Emulex

Property	Value
info	
name	wwn.1000000C995233E
driver_version	2.50a
port_mode	Initiator
target_mode_supported	1
driver	emlxs
fw_ver	1.10a5
state	offline
os_device	/dev/cfg/fc1
current_speed	not established
model	LPe12002-M8
manufacturer	Emulex
port_id	0
port_mode_switched	0
supported_speeds	2Gb 4Gb 8Gb

Some port supports only one mode: initiator or target. For these ports you will not see drop-down box, just text.

After you have configured a port in target mode, you can use it to create a target group, as shown below.

[About](#) | [Support](#) | [Add Capacity](#) | [Register](#) | [Help](#)
Welcome Administrator | [Logout](#)

[Status](#) | [Settings](#) | [Data Management](#) | [Analytics](#) | [Namespace Cluster](#) | [VM DataCenter](#)

[Data Sets](#) | [Shares](#) | [SCSI Target Plus](#) | [Auto Services](#) | [Runners](#)
[Console](#) | [View log](#) | [Jobs](#)

SCSI Target

[Mappings](#)
Manage mappings.

[Initiator groups](#)
Manage groups of remote initiators.

[Target groups](#)
Manage groups of local targets.

Zvols

[View](#)
View zvols.

[Create](#)
Create a new zvol (virtual block device).

iSCSI

[Remote Initiators](#)
Manage iSCSI remote initiators.

[Targets](#)
Manage iSCSI targets.

[Target Portal Groups](#)
Manage iSCSI target portal groups.

[Defaults](#)
Manage iSCSI target default parameters.

Fibre Channel

[Ports](#)
Manage Fibre Channel ports.

FIBRE CHANNEL PORTS

WWN	State	ID	Mode	Speed	Supported Speeds	Model	Manufacturer
10000000C995233E	offline		Initiator	not established	2Gb 4Gb 8Gb	LPe12002-M8	Emulex
210000183281B89C	online	2	Initiator	8Gb	2Gb 4Gb 8Gb	QLE2560	QLogic Corp.
10000000C995233F	online	1	Initiator	8Gb	2Gb 4Gb 8Gb	LPe12002-M8	Emulex

wwn.10000000C995233E:

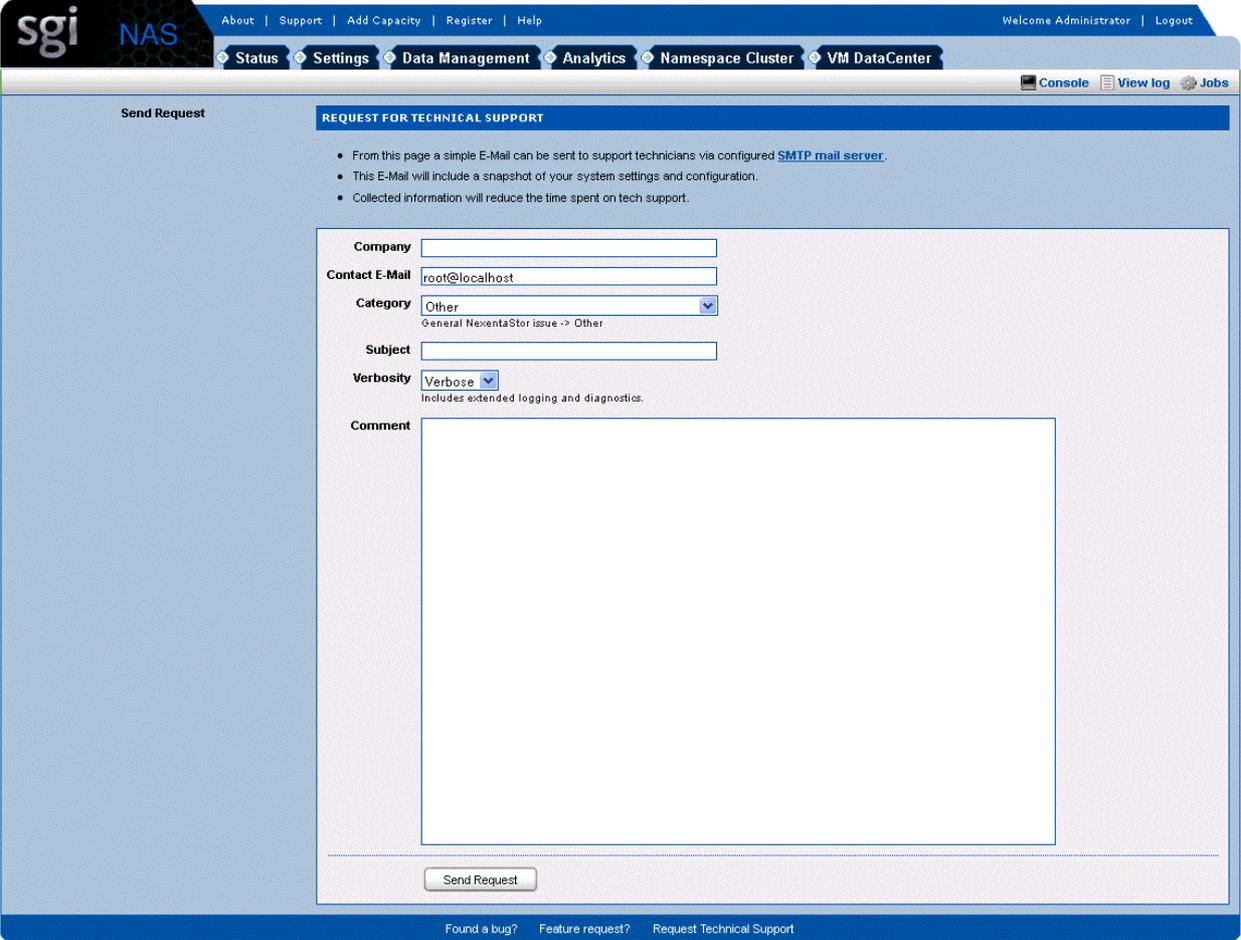
Property	Value
info	
name	wwn.10000000C995233E
driver_version	2.50a
port_mode	Initiator
target_mode_supported	1
driver	emlxs
fw_ver	1.10a5
state	offline
os_device	/dev/cfg/fc1
current_speed	not established
model	LPe12002-M8
manufacturer	Emulex
port_id	0
port_mode_switched	0
supported_speeds	2Gb 4Gb 8Gb

[Found a bug?](#) | [Feature request?](#) | [Request Technical Support](#)

5 Contact information

5.1 Support request

To contact support at SGI, click Support in NMV (shown below):



The screenshot shows the SGI NAS web interface for sending a technical support request. The page title is "REQUEST FOR TECHNICAL SUPPORT". It includes a list of instructions: "From this page a simple E-Mail can be sent to support technicians via configured SMTP mail server.", "This E-Mail will include a snapshot of your system settings and configuration.", and "Collected information will reduce the time spent on tech support." The form fields are: "Company" (empty), "Contact E-Mail" (root@localhost), "Category" (Other, with a dropdown menu showing "General NexentaStor issue -> Other"), "Subject" (empty), "Verbosity" (Verbose, with a dropdown menu showing "Includes extended logging and diagnostics."), and "Comment" (a large empty text area). A "Send Request" button is at the bottom of the form. The page footer contains links for "Found a bug?", "Feature request?", and "Request Technical Support".

or type the following NMC command:

```
nmc:/$ support
```

which will then prompt for a subject and message.

5.2 Other resources

For licensing questions, please contact your SGI sales or support representative.