SANSlide
Midrange
Fibre Channel Node
User Manual
V1.3

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Manual Revision History

Revision	Date	Firmware	
1.0	April 2012	V3_04	AP
1.1	November 2012	V3_05	AP
1.2	August 2013	V3_05	AP
1.3	October 2013	V3_05	AP

Warning

The Bridgeworks SANSlide Node contains no user serviceable components. Only an authorised service centre should carry out servicing or repairs. Unauthorised repairs or modifications will immediately void your warranty.

Before you start

There are a number of additional pieces of equipment you will require for the successful installation of your Node:

Ethernet Cable

You will require a good quality cable of suitable length to go between your network access point and the Node. This should be marked as certified to Cat 5e and have a RJ45 style connector at the Node end.

Fibre Channel Interface

The Fibre Channel Node supports the use of SFP modules to connect top the Fibre Channel. You will require the correct type to connect to your existing infrastructure.

Fibre Channel Cable

In addition to the fibre channel interface, you will require a good quality cable of suitable length to go between your Node and your initiator, device or fibre channel switch.

10Gb Ethernet Cable

Depending on the configuration you have purchased you will require at least one cable from either

- Multimode Multi Mode 50/125 OM3 Patch Cable, up to 300 meters.
- Multimode Multi Mode 50/125 OM4 Patch Cable, up to 550 meters.

Or

A SFP+ Direct Attached Twin-Ax Copper interface cable, up to 5 meters.

If you are in any doubt contact your reseller for extra assistance.

Table of Contents

1.0 Introduction

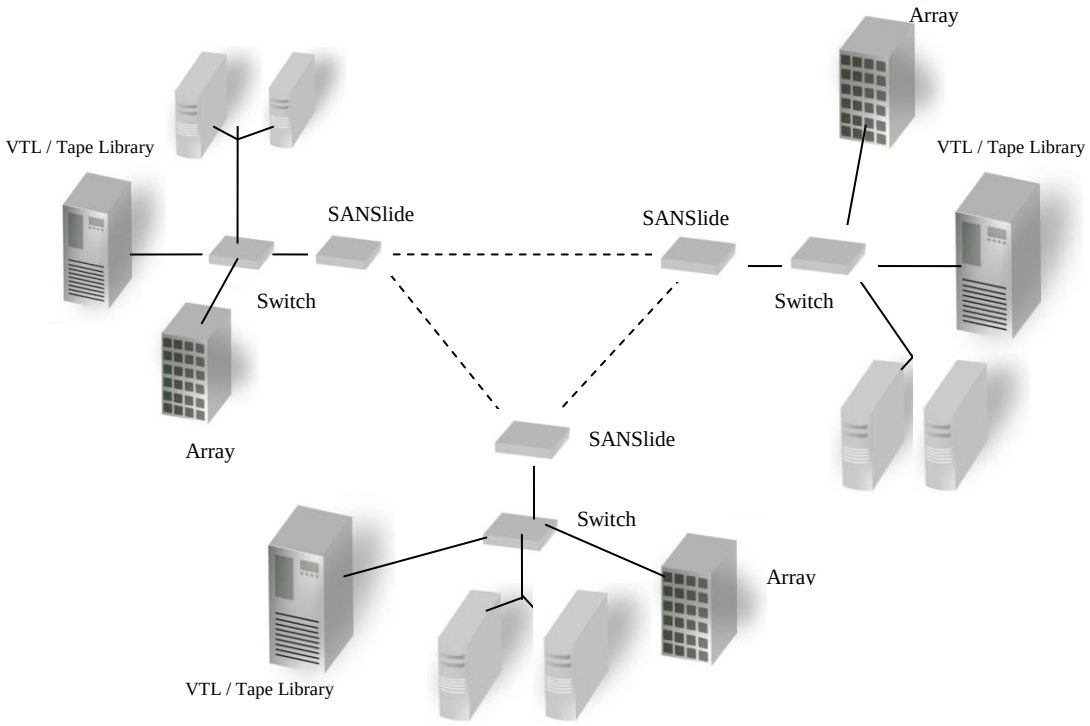
Thank you for purchasing the Bridgeworks SANSlide Node.

Bridgeworks have designed the SANSlide product to be intuitive and easy to install and configure. However, we would recommend that you work in conjunction with this manual when you first configure the SANSlide Node.

1.1 Overview

The SANSlide product range has been designed to connect storage devices over long distance, high latency TCP/IP networks with very little loss in performance. It supports all the major storage protocols such as Parallel SCSI, Fibre Channel, iSCSI and SAS. More interfaces will be added, as they become part of the mainstream storage protocols.

A SANSlide installation consists of a number of Nodes connected via a TCP/IP network as shown below.



Example SANSlide Installation

Each Node's storage interface can be configured to act either as a target interface – working in a similar mode to a storage device, or as an initiator – working in a similar mode to a server. Or, if the SANSlide Node has multiple storage interfaces, one can be configured to be an initiator and one as a target device.

A unique part of SANSlide functionality is that all the Nodes within a SANSlide installation do not have to have the same storage interface. Therefore, it is quite feasible to have the data centre Node connected to a Fibre Channel network whilst a remote Tape Library is connected via a parallel SCSI Node.

1.2 Manual Layout

This Manual has been divided into two primary sections an installation guide, and a more detailed section containing all of the functionality available to you, which is divided into sections that correspond to the web interface.

Throughout the manual symbols will be used to quickly identify different pieces of information.

	This icon represents a note of interest about a step or section of information.

	This icon represents an important piece of information.

	This icon represents a warning, care must be taken and the warning should be read thoroughly.

1.3 Definitions

- Node – A Node refers to the physical SANSlide unit you have purchased.
- Target Device – A disk or tape drive connected to a SANSlide Node
- Initiating Device – A computer or other piece of equipment, which can perform backups connected to a SANSlide Node
- Initiator Node – A Node which has both of its' ports configured to be Initiators.
- Target Node – A Node which has both of its' ports configured to be Targets.
- Remote Node – A Node, which has at least one initiating Port, which has, or is intended to have, a target device connected to it.
- Local Node - A Node, which has at least one Target Port, which has, or is intended to have, an initiating device connected to it.

2.0 Hardware Installation

2.1 Ethernet Connection

The Node can be used on the following network configurations:

- 10BaseT
- 100BaseT
- 1000BaseT (Gigabit)

It is not necessary to specify which network type you are connected to, as when powered up the Node will automatically select the correct network speed.

The connection to the Ethernet network is via an industry standard twisted pair, RJ45 copper interface on the front of the unit.

To connect the Node the Ethernet network, insert a Cat 5E cables into the connector on the unit as shown below. When the plug is in the correct position a "click" should be heard.

Rear Panel of the Node Showing Ethernet Cable Connections

2.2 Fibre Channel Interface

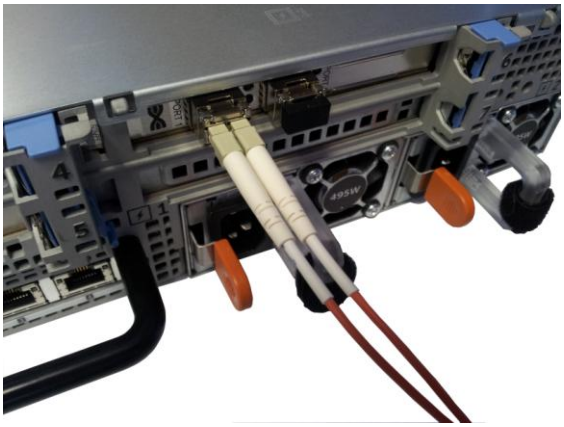
The Node can be used on the following Fibre configurations:

- 2Gb FC
- 4Gb FC
- 8Gb FC

It is not necessary to specify which network type you are connected to, as the Node will automatically select the correct network speed when first powered up.

The Node connects to the FC network via an industry Small Form-factor Pluggable (SFP) interface Module that is inserted into the SFP receptacle on the unit.

	**Note:** Only use an SFP that meet or exceed the following standards: EU: IEC/EN 60825-1, North America: FCC, CDRH



Rear Panel of the Node Showing FC Cable Connections

Insert one end of a fibre channel cable into the Node and the other end into your initiator, device or switch as required.

2.3 Connecting the 10Gb Ethernet Cables

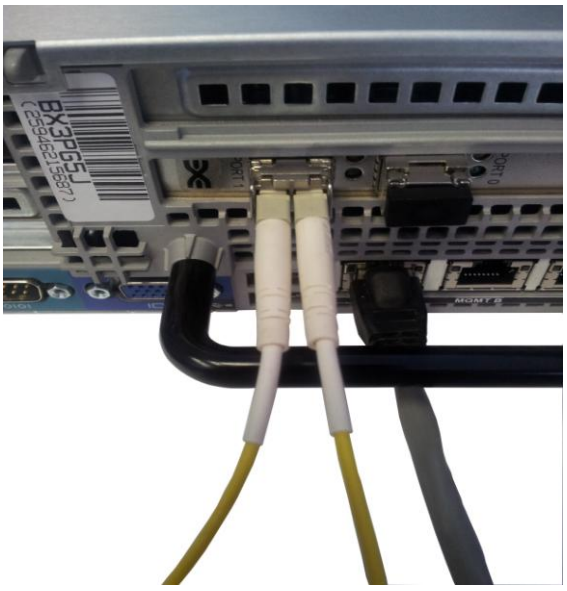
Depending on the configuration you have purchased one of two cables will be required for your product.

Small Form-factor Pluggable (SFP)
If you have purchased the card with the SFP's already connected the following cables can be used

- Multimode Multi Mode 50/125 OM3 Patch Cables up to 300 meters
- Multimode Multi Mode 50/125 OM4 Patch Cables up to 550 meters

To connect the Node to the Ethernet network, insert one or two SFPS into the unit.

Insert the multimode cables into the SFP you just inserted on the unit as shown below. When the plug is in the correct position a "click" should be heard.



Using a copper solution
If you are using a copper based solution, a SFP+ Direct Attached Twin-Ax Copper interface cable must be used. The maximum supported length of which is 5 meters.

To connect the Node to the Ethernet network, inset one or two SFP+ cables into the connector on the unit as shown below. When the plug is in the correct position a “click” should be heard.

	Note: The 10Gb Ethernet ports only support speeds of 10GB/Sec.

2.4 Connecting the Power Supply

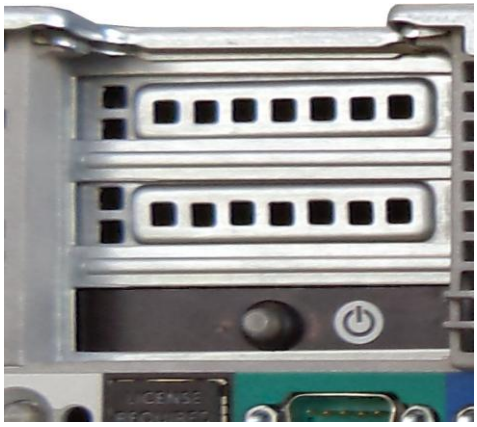
The Node contains two power supplies in a redundant supply configuration. The system evenly distributes power across both power supplies to maximise efficiency. In order to utilise this feature, please ensure that both power supplies are connected.

Before connecting the power supply to the unit, ensure the wall plug is removed or switched off. Connect the power supply to the rear of the Node as shown below and turn on the power from the wall socket.

	Note: Before powering up the Node, ensure all the peripherals are powered up and you have a connection to the network.

2.5 Powering on the Node

To turn on the Node use the switch on the opposite side to the power connector and push in the button. Whenever the Node is powered on the green LED on the back panel will be illuminated.



3.0 Using the Web Interface

Now the SANSlide Node is fully connected the primary method for configuring any option is through its web interface. The following section highlights the requirements needed to access these pages and the consistent layout used throughout.

	**Note:** The default IP address of the web interface for the Node is **http://10.10.10.10/**

3.1 Browsers

This Node supports the following browsers

- Microsoft Internet Explorer 7
- Microsoft Internet Explorer 8
- Microsoft Internet Explorer 9
- Mozilla Firefox 20
- Mozilla Firefox 21
- Mozilla Firefox 22
- Google Chrome Latest

	**Note:** JavaScript must be enabled within the web browser to use the web interfaces functionality.

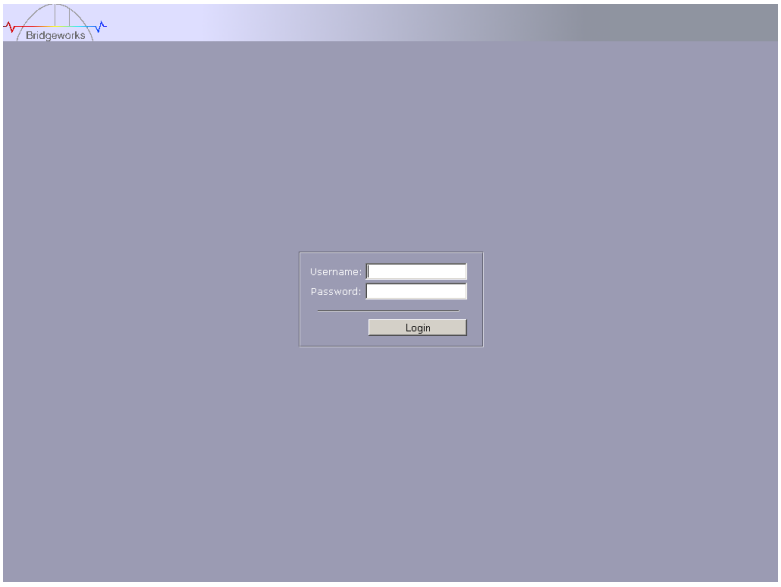
	**Important:** If you choose to use a browser that is not on the list of supported browsers Bridgeworks cannot guarantee the behaviour of the Nodes functionality.

3.2 Connecting to the Web Interface

From within your web browser, connect to the Node using the address http://10.10.10.10/ (or if you have changed this previously, the address of the left-hand network port from the bottom two).

Depending on your current network parameters, it may be necessary to change your network setting on your computer for the initial set up. See Appendix A for further help.

Once you have connected to the GUI on the Node you will see the entry page shown below.



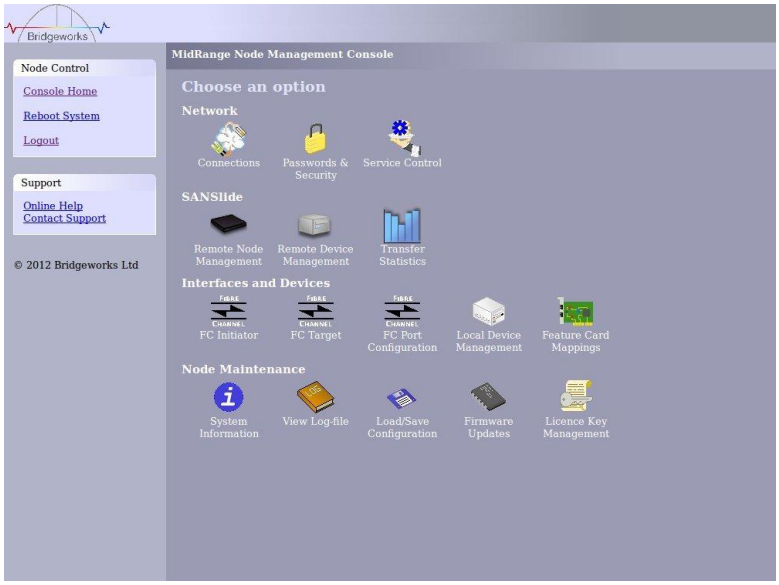
SANSlide Node Login

To access the web interface a user name and password must be used, the default of which are:

- Username: **admin**
- Password: **admin**

3.3 Management Console

The GUI will now display the root selection screen as shown below.



SANSlide Node main menu

	**Note:** Your screen may have different icons to the one shown above depending on the configuration you have purchased

You will notice the screen is split into two sections. Within the left hand panel you will observe two further panels. The upper panel “Node Control” typically remains constant wherever you are within the GUI, it allows you to reboot or logout of the GUI whilst the console home link will take you back to this screen.

	**Note:** Whenever a Reboot command is issued it can take up to a minute for the Node to become accessible again.

Within the Support section there is a link that will open up your mail service with Bridgeworks’ Email address loaded and an Online Help button. The Online help is contextually aware of which GUI page you are currently viewing and will provide you with help relevant to the display and configuration data.

4.0 Installation Set Up

To avoid travelling between sites where the Nodes are installed, Bridgeworks has included a feature within the GUI making it is possible to connect to and manage, a remote Node from another Node. However, to achieve this, the IP address of the remote Nodes WAN port must be known, therefore, the steps are divided into two sections:

- Local Configuration: these steps are preformed with you having direct access to both Nodes.
- Installed Configuration: these steps are preformed with one of the Nodes being configured in a remote location.

If at any point during the installation guide a mistake is made, or you become worried about the configuration you have entered, the Node can be restored back to factory defaults and the process can be started again, see the section 8.5 Restore to Factory Defaults.

4.1 Local Configuration

This section will take you through the steps required to configure the SANSlide Nodes so they can communicate with each other before connecting them to the storage networks and the link network. The local configuration will take you through the following steps:

- Step 1: Configuring Network Connections
- Step 2: Testing the Connection
- Step 3: Security Options (Optional)
- Step 4: Linking together the SANSlide Nodes

Once these steps have been repeated for all your Nodes, the Nodes can be moved to their permanent respective positions.

Step 1: Configuring Network Connections

The following steps will configure the networking options for your Nodes and should be completed for all Nodes.

Basic Information

The Node has Four GbE (Gigabit Ethernet) Network ports and four 10Gb Network ports. The GbE ports are located at the bottom of the back panel. The two left hand physical ports are designated as Management A and Management B and are used to access the GUI of your Node. The 10Gb network ports are located at the top of the back panel and are used for the link between Nodes.

There are two possibilities when configuring the IP addresses of the Node. Management A can be configured in one of two ways:

- DHCP - The Node will seek out the DHCP server on your network and obtain an IP address from the server each time it powers up. With this option when accessing the web interface the host name will be entered into the web browser.

- Static IP - the IP address set in this page will be the IP address the unit will use each time it powers up. The 10Gb network ports are the SANSlide connections and must have a static IP address.

It is recommended that static address be used for the SANSlide links,

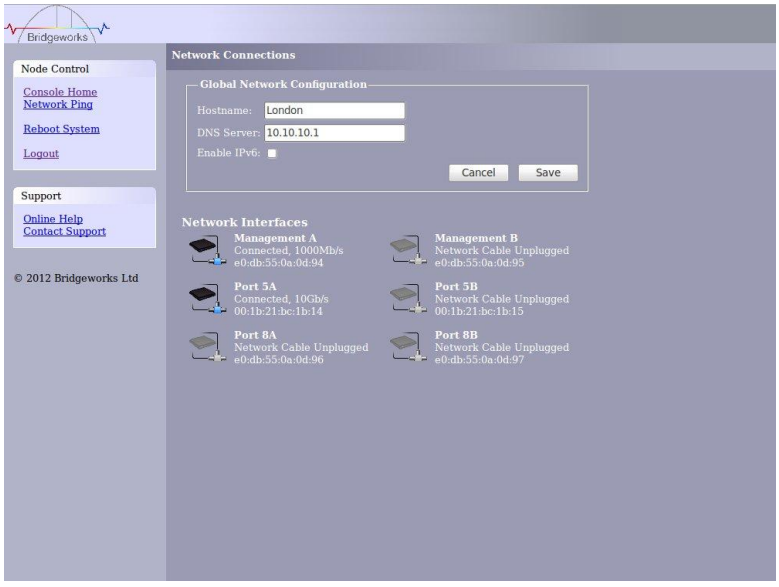
	**Note:** If you select the DHCP mode, Bridgeworks recommends you ensure your DHCP server is set to automatically update the DNS server.

Before You Begin

Depending on your current network parameters, it may be necessary to change your network setting on your computer for the initial set up. See Appendix A for further help.

Navigation

Click on the “Connections” button under the Network section of the main window. This will now bring up a new configuration page as shown below.

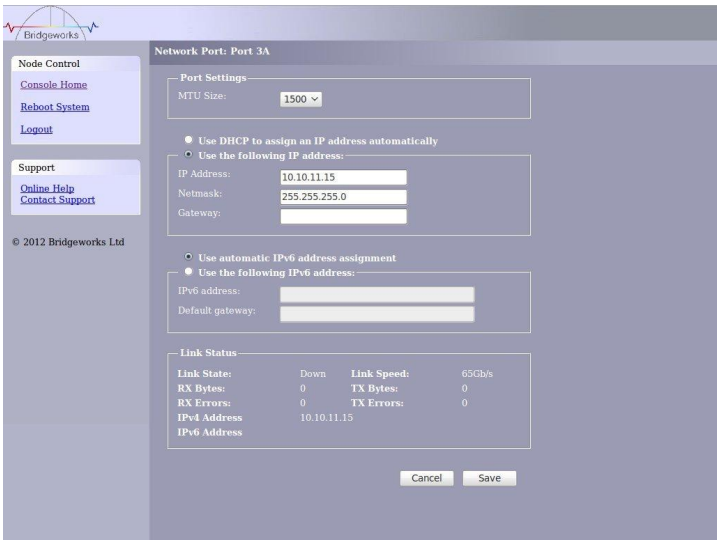


Network Connections

Procedure: Configuring network ports

	Note: If you select the DHCP mode, ensure that the hostname is changed from the default ‘Bridgeworks’ as all Nodes have this set as the default

Steps:	1.1: Enter in the Hostname field the name you wish to use to address this Node in the future. It is recommended that you use a name that is relevant to its location and/or its’ purpose. If you wish to use IPV6 click the checkbox to allow for the support of IPV6 addressing on selected network ports. 1.2: Click on the icon for the network link you wish to configure



Network Port Configuration Page

Steps:	1.3: Enter in the IP address you have chosen or select DHCP for Management A. The 10Gb network ports are used for the SANSlide connection and **must** have a static IP address. 1.4: If the Node is configured to use DHCP the net mask will be issued from the DHCP server. If you are using a static IP address, enter the net mask in to this box. This must be done for any network port not using DHCP. 1.5: Click the save button to save these parameters and then click the reboot option under “Node Control” in the left hand panel. 1.6 Reconnect to your Node with the hostname or IP address that you have just set. 1.7: Repeat step 1.1 to 1.6 for any additional Nodes and network ports you wish to configure.

	Note: None of these changes will take effect until a reboot is completed.

Result

When you next login to the web GUI you should now have to use your new network address or hostname.

Related Topics

- 5.1 Connections
- 9.2 Lost IP Address

Step 2: Testing the Connection

The following steps will verify your chosen network connections and should be completed for all Nodes.

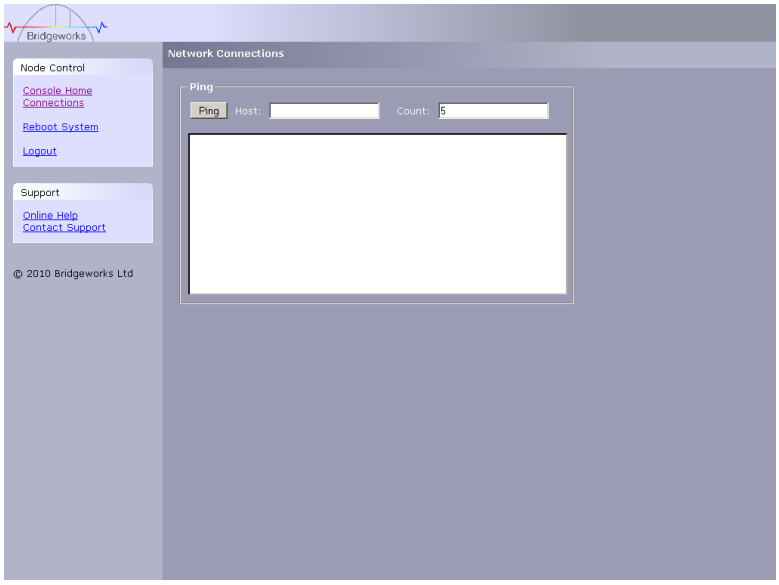
Before You Begin

If you made changes to your computer, return them to their previous setting and reconnect to the Node using the IP address or hostname, depending on which addressing mode you selected.

You will need to have to hand at least two Cat5e or better network cables.

Navigation

Select the Connections page from the root page and at the top of the left-hand column in “Node Control” you will find a link to the ping window called “Network Ping”. Select this link. The GUI will display the following screen.



Network Ping

Procedure: Testing the connection between Nodes

Steps:	2.1: Connect the Nodes together using one of the 10Gb network ports 2.2: Enter in the IP address of the 10Gb network port from the Node you are not currently accessing the Web interface from and click ping.

Result

On a successful ping the text box below the buttons should fill with text similar to that below

```
PING Address (Address): 56 data bytes
64 bytes from Address: seq=0 ttl=64 time=0.600 ms
64 bytes from Address: seq=1 ttl=64 time=0.129 ms
64 bytes from Address: seq=2 ttl=64 time=0.096 ms
64 bytes from Address: seq=3 ttl=64 time=0.143 ms
64 bytes from Address: seq=4 ttl=64 time=0.094 ms

--- Address ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 0.094/0.212/0.600 ms
```

Note: Where “Address” is the IP address you entered.

If the results of the ping match the output above this completes the initial set up, if not please retry step 1.

Related Topics

- 5.1 Connections

Step 3: Security Options (Optional)

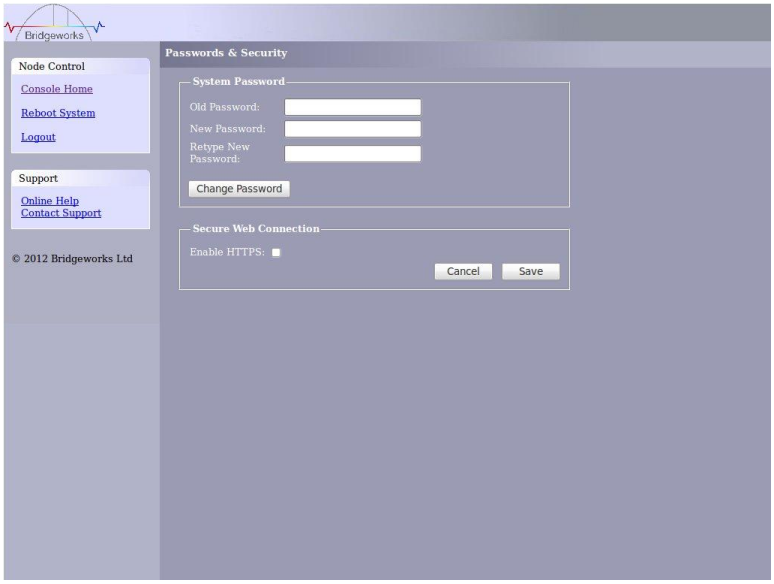
You will only need to complete this step if:

- You want to change the password from the default.
- You want to enable HTTPS.

This stage is not necessary for configuring the Nodes but for your security it is recommended to complete the following configuration changes. If you do not require these features or are going to configure them at a later stage proceed to step 4.

Navigation

Click on the “Passwords & Security” button under the Network section of the main window. This will now bring up a new configuration page.



Passwords and Security

Procedure: Changing the Admin password and enabling HTTPS

Steps:	3.1: Click the checkbox next to Enable HTTPS and click on save. A pop up message will inform you that you are going to be logged out, click “OK”. 3.2: Login to the Node again under HTTPS. 3.3: Navigate back to the “Passwords & Security” page. 3.4: Enter your existing password; the default is **“admin”** in the old password field. 3.5: Enter the new password of your choosing into the new password field. 3.6: Re-enter the new password of your choosing into the “Retype New Password” field.

Result

You are now using HTTPS within your browser; this can be verified by confirming the web address starts with https://. Depending on your browser or if you have completed these steps before, it may become necessary to accept a security certificate or specify to ignore an invalid certificate.

Once the password has been changed successfully the message “Password successfully changed” will appear.

Related Topics

- 5.2 Passwords and Security

Step 4: Linking Together the SANSlide Nodes

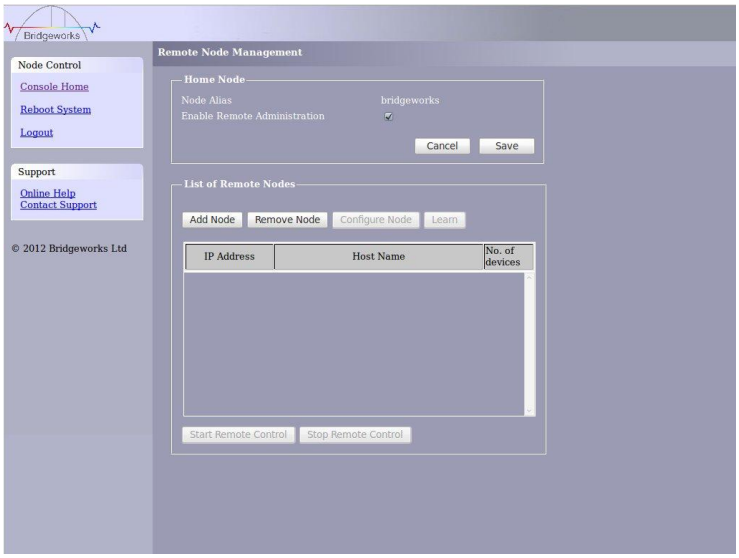
Basic Information

The IP address used to discover the Node is the address you have assigned to the WAN port on the Node you want to add.

SANSlide will always attempt to get the best performance possible for the data it is transferring, however there may be other traffic on your network that will also need to accesses a share of your links bandwidth, this is where the configuring of a SANSlide Node comes in.

Navigation

From within the root window select the Remote Node Management icon. The following screen will be displayed.

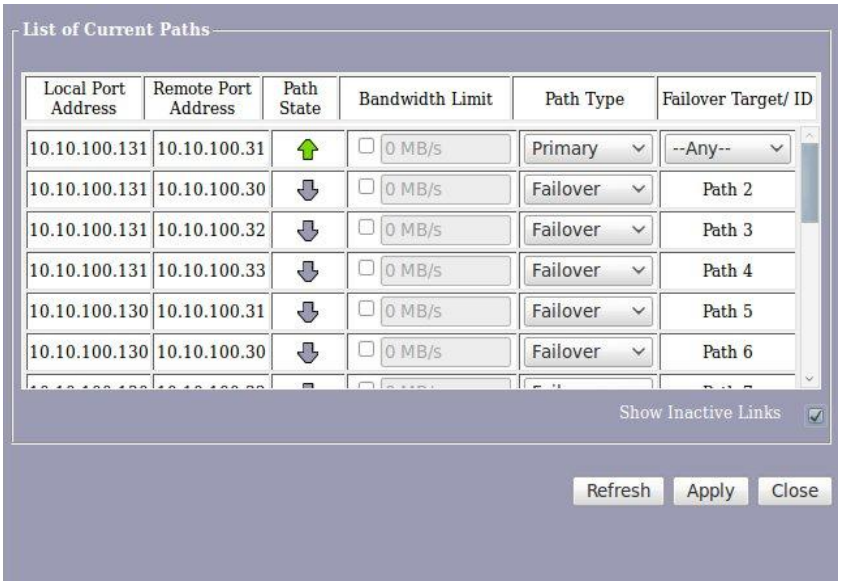


Remote Node Management

Procedure: Adding a SANSlide Node

Steps:	4.1: Click on the “Add Node” button 4.2: In the window that appears, enter the IP address of the WAN port then click the Add button. The unit will then search for the Node on the Link Network, as indicated by a blue progressing bar. 4.3: Click on “Ok” to confirm the Node. 4.4: If you have more than one Node, repeat this operation for all Remote Nodes.

	**Note:** These Nodes will be automatically saved, and will restore on reboot.



Configuring a Node

These steps are only necessary if you want to limit the amount of bandwidth SANSlide uses.

Procedure: Limiting bandwidth

Steps:	4.1: Select a Node from the Node list, when selected the background colour will become blue. 4.2: Click on the 'Configure Node' button. 4.3: In the window that appears check the "Set Transfer Limit checkbox" next to the path that you have just established. 4.4: Enter in the limiting value in Megabytes a second. 4.5: Click on "Apply" to start the limit.

	**Note:** The bandwidth limit will become instantly effective.

Result

The Remote Node(s) you have added will be displayed in the "List of Remote Nodes" list.

Related Topics

- 6.1 Remote Node Management

4.2 Installed Configuration

Now you have completed the local configuration, the Nodes can now be relocated to their remote locations and the continuation of the configuration can be done remotely.

The Installed Configuration will take you through the following steps:

- Step 5: Remotely Connecting to a Node (Optional)
- Step 6: Configuring the FC Port Types
- Step 7: Configure the Initiator Ports (Optional)
- Step 8: Configuring the Connected Hosts (Optional)
- Step 9: Configuring the FC Target Ports
- Step 10: Linking the Remote Devices to Local FC Interfaces (Optional)
- Step 11: Refreshing the Devices
- Step 12: Instigating the Learn Process

Step 5: Remotely Connecting to a Node (Optional)

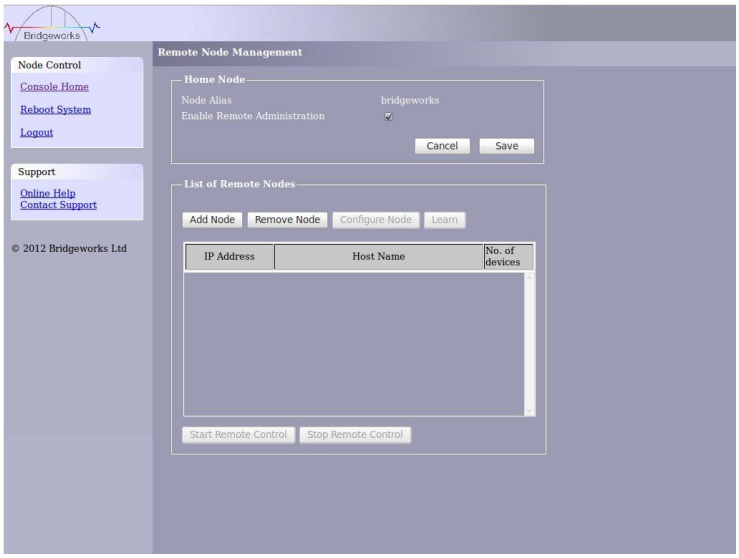
You will only need to complete this step if:

- You want to configure the settings on a Node and do not have direct access to the web interface for that Node.

During the set up of your Nodes it may not be possible to directly access the web interface on a Node, “remote control” can be used to take control of any other Node added to your local Node.

Navigation

From within the root window select the Remote Node Management icon. The following screen will be displayed.



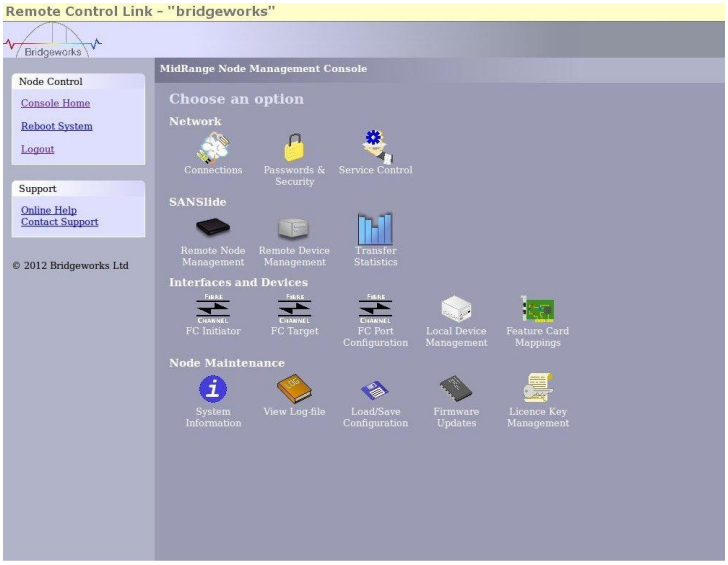
Remote Node Management

Procedure: Starting remote Node control

Steps:	5.1: Highlight the Node you wish to connect to by clicking the Node in the remote Node list. 5.2: Click the Start Remote Node Control button at the bottom of the list. 5.3: The Web Interface will now display the login screen of the remote Node as normal, login to that Node using the credentials of the remote Node. 5.4: Repeat this process with any other Nodes you may have to configure.

Result

Whenever a remote control session is underway there will be a yellow bar at the top of the web interface which will contain the name of the Node you are connected to, as illustrated below.



A remote Node under remote control

Related Topics

- 6.1 Remote Node Management

Step 6: Configuring the Fibre Channel Port Types

The following steps will configure the type of the fibre channel port and should be completed for all Nodes.

Navigation

From the root menu select the FC Port Configuration icon. The GUI will display the following screen

The screen for the Fibre Channel Port Configuration

Procedure Configuring the Fibre Channel Port Types

Steps:	6.1: For the FC ports that you wish to configure, select the required setting from the drop down box next to the port. 6.2: From the Node Control menu click the “Reboot System” link. 6.3: Repeat this process with any other Nodes you may have to configure.

Step 7: Configure the Initiator Ports (Optional)

You will only need to complete this step if:

- You want to manually set the link speed
- You want to change the ports topology

The following only needs to be completed for Nodes that you want to setup as an initiator.

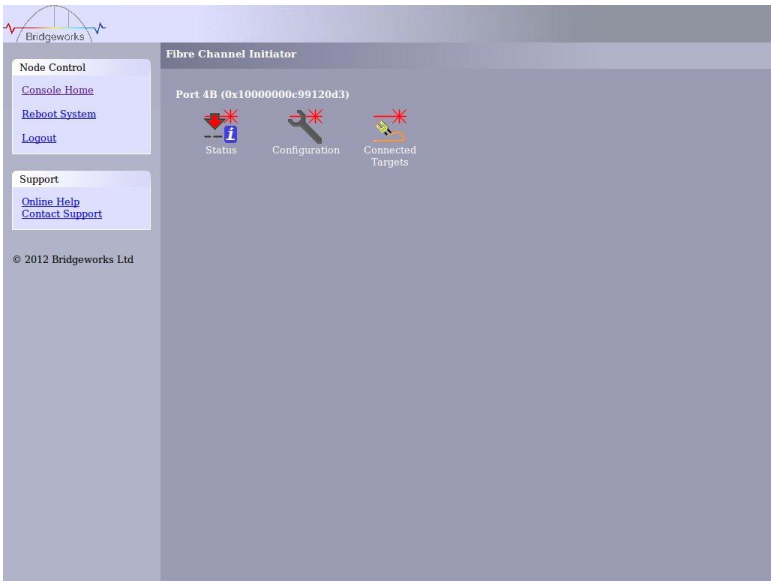
Information

The link speed pull down menu has 4 options depending on your configuration. For 4Gb Fibre Channel cards this is Auto, 4Gb/s, 2Gb/s and 1Gb/s. For 8Gb Fibre Channel cards this will be Auto, 8Gb/s, 4Gb/s and 2Gb/s. It is recommended that you leave the option set to Auto. However some SFP's do not report their speed correctly, if you are unsure set the link speed to the SFP speed.

The topology pull down menu has 3 options Auto, Loop (arbitrated Loop, FC-AL), and Point-to-Point (FC-P2P). Again the recommendation is you leave this as Auto unless you wish to force this into a know topology.

Navigation

Select the FC Initiator icon from the root menu. GUI will display the following screen.



Fibre Channel Imitator Screen

From within the screen select the port you wish to configure by clicking on the icon of a spanner under the port number. The screen will now display the following:

Fibre Channel Initiator Port Configuration screen

Procedure: Configuring the Initiator Ports

Steps:	7.1: Select the link speed you require from the drop down menu. 7.2: Select the topology you require from the drop down menu. 7.3: Click on the save button to effect these changes 7.4: Repeat for the other FC initiator ports that you want to setup. 7.5: Reboot the Node, by selecting Reboot System under the left hand menu Node Control.

	**Note:** These changes will not come into effect until a reboot is initiated.

Result

Once the reboot has completed the green LED on the front panel of the board will flash to match the speed you have set the port to.

Related Topics

- 7.2 Fibre Channel Initiator
- Appendix C LED Indicators

Step 8: Configuring the Connected Hosts (Optional)

You will only need to complete this step if:

- You want to limit the target devices presented to the Node

If all the devices connected to the Remote Node's FC interface are to be enabled on the Local Node then nothing more is required so proceed to the next step.

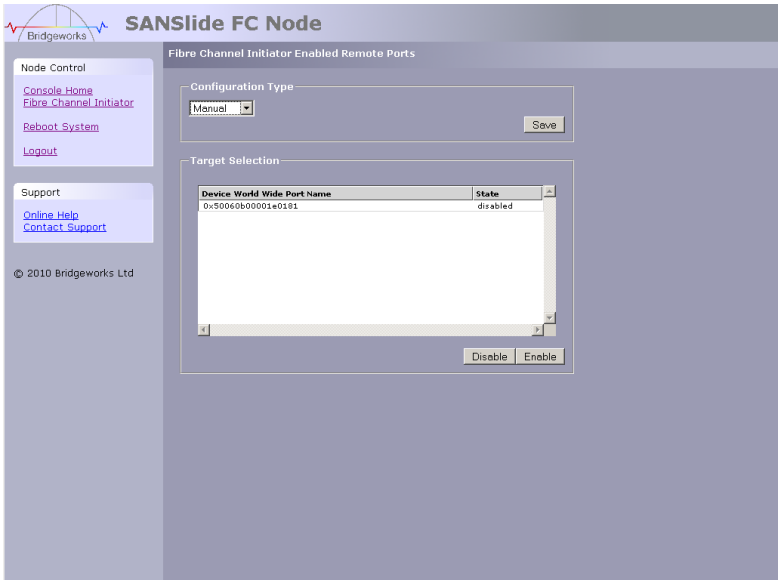
Information

All target devices are displayed by their WWN and are enabled by default until "Manual" is selected at which point all devices are disabled by default.

Navigation

From the Nodes root menu, select the FC initiator icon and then the Connected Targets icon from the second menu. The GUI will then display either of the following screens:

Fibre Channel Initiator Enabled Remote Ports Screen in Automatic Mode



Fibre Channel Initiator Enabled Remote Ports in Manual Mode

Procedure: Configuring the Connected Hosts

Steps:	
	8.1: If not already done so from the pull down menu, select manual and click save, the GUI will display the screen shown above. 8.2: To enable a target device select the device by clicking on its entry in the table. 8.3: Click the “Enable Button” at the bottom of the table. 8.4: Repeat Step 9.2 to 9.3 for any additional devices you want to enable. 8.5: Save the configuration by clicking the save button once you have made any changes.

Related Topics

- 7.2 Fibre Channel Initiator
- Appendix C LED Indicators

Step 9: Configuring the FC Target Ports

You will only need to complete this step if:

- You want to manually set the link speed
- You want to change the ports topology

If you don't require changing these settings skip to the next step.

The following only needs to be completed for Nodes that you want to setup as a target.

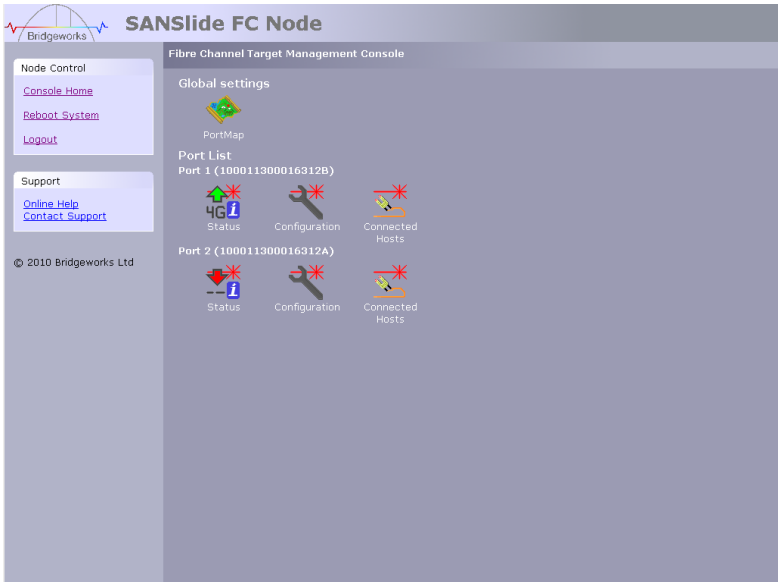
Information

The link speed pull down menu has 4 options Auto, 4Gb/s, 2Gb/s and 1Gb/s. It is recommended that you leave the option set to Auto. However some SFP's do not report their speed correctly so if you are unsure set the link speed to the SFP speed.

The topology pull down menu has 3 options Auto, Loop (arbitrated Loop, FC-AL), and Point-to-Point (FC-P2P). Again the recommendation is you leave this as Auto unless you wish to force this into a know topology.

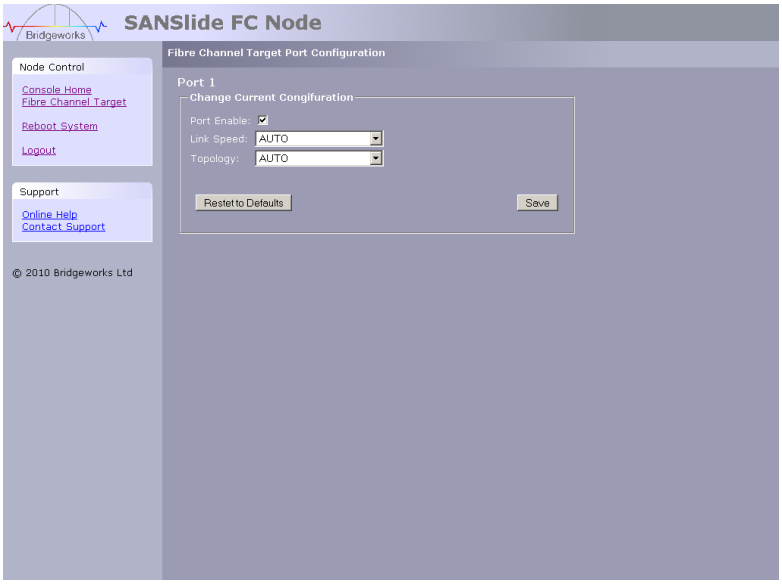
Navigation

From the root menu select the FC target icon, the GUI will display the following screen.



Fibre Channel Target Screen

From within the screen select the port you wish to configure by clicking on the icon of a spanner under the port number.



Fibre Channel Target Port Configuration Screen

Procedure: Configuring the Fibre Channel Target Ports

Steps:	9.1: Select the link speed you require, leave it as auto if you are unsure. 9.2: Select the topology you require, leave it as auto if you are unsure. 9.3: Click on the save button in order for these changes to take effect. 9.4: Repeat for the other FC Target Ports that you want to setup. 9.5: Reboot the Node, by clicking Reboot System under Node Control in the left hand menu.

	**Note:** These changes will not come into effect until a reboot is initiated.

Result

Once the reboot has completed the green LED on the front panel of the board will flash to match the speed you have set the port to.

Related Topics

- 7.3 Fibre Channel Target
- Appendix C LED Indicators

Step 10: Linking the Remote Devices to Local FC Interfaces (Optional)

You will only need to complete this step if:

- You only want to present certain target devices to specific target ports.

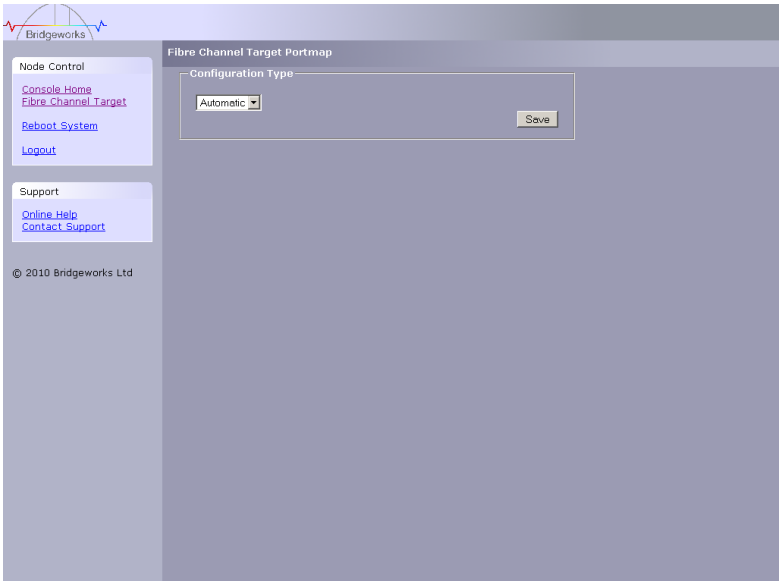
If you don't require changing these settings skip to the next step.

Information

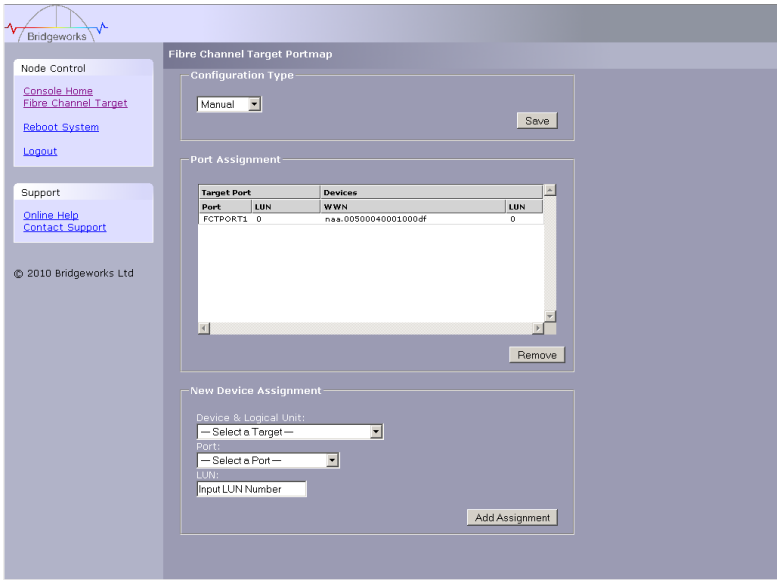
In Automatic mode the Local FC Node will map all the remote devices to both FC interfaces. For example, if the Remote Node has 4 FC devices enabled for presentation to the Local Node and the "Portmap's" "Configuration Type" is set to Automatic, all 4 devices will be present on both FC target interfaces as LUNs 0-3.

Navigation

From the FC Target menu select the portmap icon (under global settings), the GUI will display either of the following screens.



Fibre Channel Target Portmap screen in Automatic Mode



Fibre Channel Target Portmap screen in Manual Mode with a Mapping assigned

Procedure: Linking Remote Devices to Local Fibre Channel Interfaces

Steps:

Step 10.1: Change drop down menu from “Automatic” to “Manual”

Step 10.2: Click on the save button, you will then have to reboot your unit for the change to take affect and the Web interface displays extra controls.

	**Note:** At this point all devices are disabled until the assignments are added.

Steps:	10.3: Select the device you want to be assigned from the Device & Logical Unit drop down list. 10.4: Select which FC port to present the target device on from the “Port” drop down menu. 10.5: Select the LUN of the device on the FC Interface; if this is the first assignment for your chosen port then the LUN must start on 0. 10.6: Click the “Add Assignment” button. 10.7: Repeat the steps 10.3 to 10.6 for each assignment you wish to make.

	**Note:** Devices can be allocated to each port but cannot be allocated again to the same port.

Related Topics

- 7.3 Fibre Channel Target

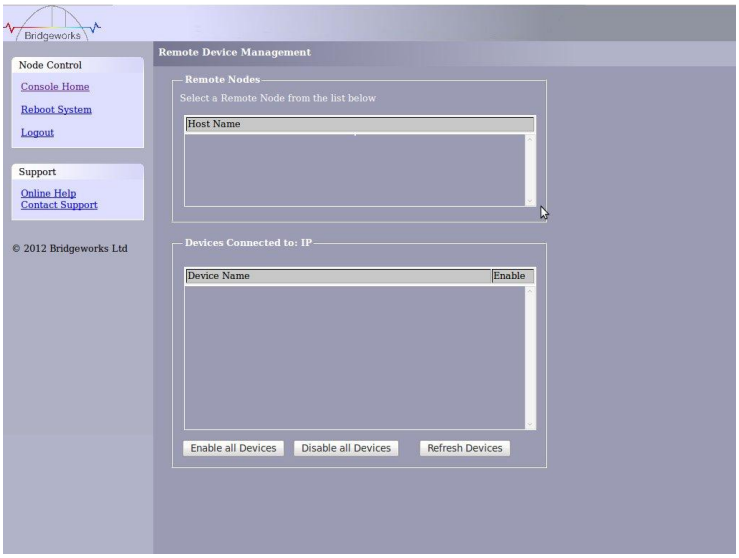
Step 11: Refreshing the Devices

Once you have configured the devices and ports it may be necessary to refresh the devices on each of your Nodes to reflect any changes made in the previous steps. This step may not be necessary but is advised to make sure your Nodes are up to date.

The following steps should be implemented for Target Nodes only.

Navigation

From the main menu select the “Remote Device Management” icon; the GUI will display the following screen.



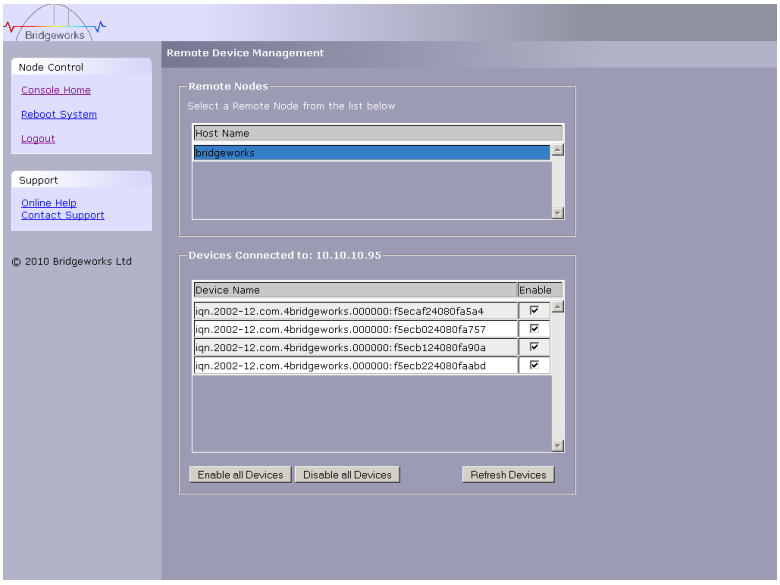
The Remote Device Management Page

Procedure: Refreshing the device list

Steps:	11.1: Select the Node you want to refresh the devices on from the “Host Name” list. When selected the Node will become blue. 11.2: Click on the “Refresh Devices” button at the bottom of the screen. The screen will go grey and a frame will appear with a blue loading bar. 11.3: Click on Ok to acknowledge the refreshed devices. 11.4: Repeat step 11.1 to 11.3 for each Node.

Result

Once completed a report will be returned informing you of the progress of the update. Every target device connected to the remote board that you have chosen to enable will be presented in the bottom list as shown below.



The Remote Device Management Page with target devices attached to a remote Node

Related Topics

- 6.2 Remote Device Management

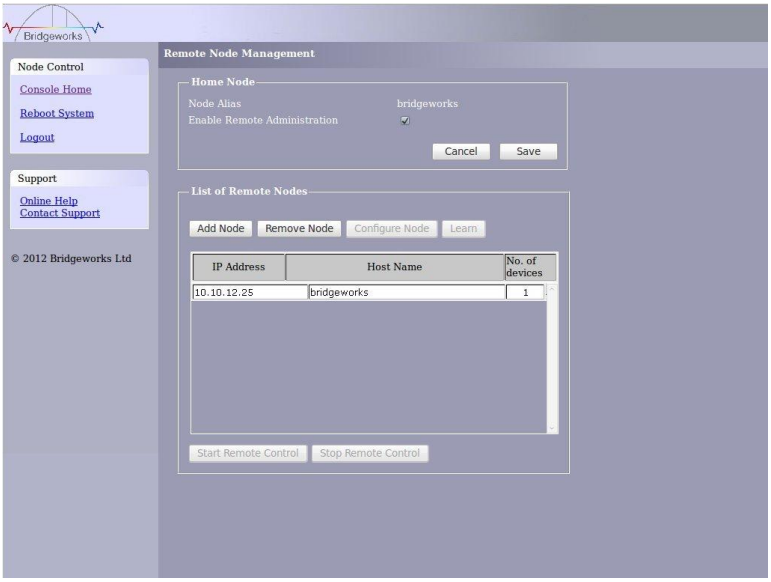
Step 12: Instigating the Learn Process

This procedure will “kick start” the Artificial Intelligence module to start learning the characteristics of the link network. Once it has completed it will store these values in memory ready for use when data transfer starts.

The Target Nodes are the only Nodes that may require the following steps.

Navigation

From the root menu select the remote Node Management icon; the GUI will display the following screen.



Remote Node Management

Procedure: Initiate a learn

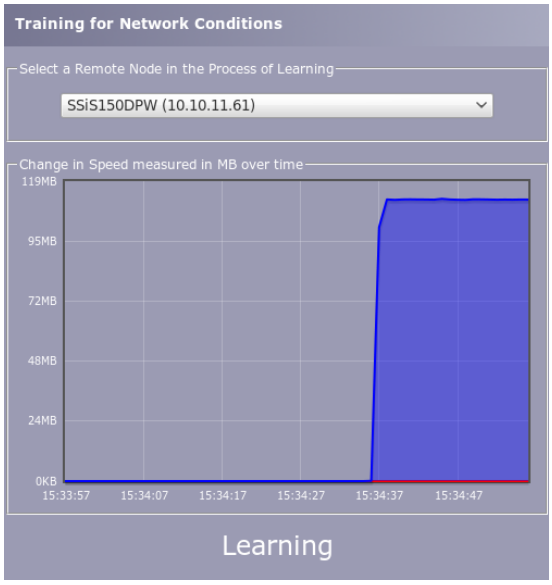
Steps:	12.1: Select the remote Node that you are going to use for the learn process from the List of Remote Nodes. 12.2: Click on the learn button just above the table.

	**Note:** The learn process can take up to 5 minutes to complete.

Steps:	12.3: Once this has completed, as indicated by the bottom text displaying “Learn Complete”, the pop-up window can be closed. 12.4: Repeat step 10 for each of the Nodes you have added.

Result

A pop up window will display the learn transfer graph and once complete will display the words learn complete at the bottom of the screen.



A Node in the process of a learn

Related Topics

- 6.1 Remote Node Management

4.3 Installation Complete

Congratulations. You have now completed the installation guide. The next section covers each of the web interfaces functionality in more detail, if this still does not provide you with enough information please contact your reseller.

5.0 Network Configuration

This section will detail the operations of the following Network Configurations:

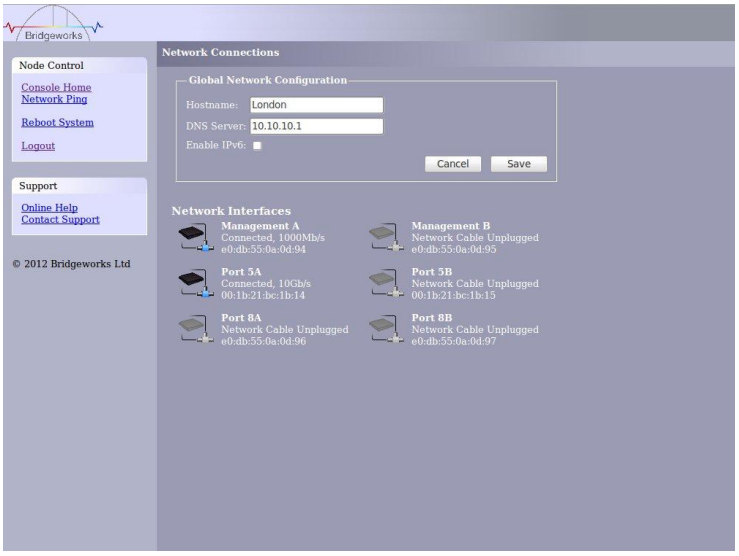
- 5.1 Connections
- 5.2 Passwords and Security
- 5.3 Network Service

5.1 Connections

This configuration page will allow the administrator to configure network interface settings and to view network statistics.

From within the main menu select the Network Control icon under the Network section

The GUI will now display the following window



0Network Connections

The SANSlide Node has four GbE network ports. Two are used for the management port and two are used for the link between the SANSlide Nodes. The two left hand physical ports are designated as Management A and Management B in the above window and the right hand ports as Port 8A and Port 8B

Setting the Hostname

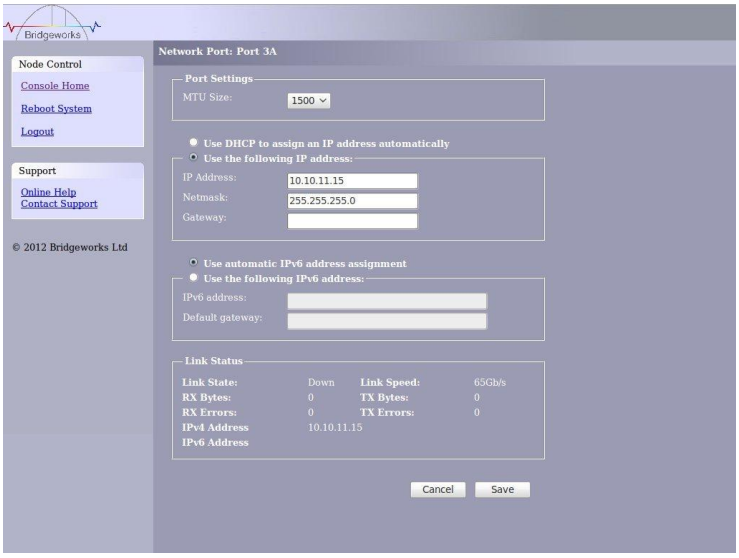
In this box enter the name you wish to use to address this Node in the future. We suggest that you use a name that is relevant to its location and/or its purpose.

	**Note:** If you select the DHCP mode, ensure your DHCP server is set to automatically update the DNS server.

Enabling IPv6

Checking this box will enable the Node to use IPv6 IP addresses. As with Ipv4, you can either choose to use DHCP or assign a static IPv6 address.

To change the settings of a specific connection, click on the connection. You will be presented with the screen as shown below where you can make changes to the connection



Network Port Configuration

Setting the MTU

Enabling larger frames on a jumbo frame capable network can improve the performance of your backup operations. Jumbo frames are Ethernet frames that contain more than 1500 bytes of payload (MTU). Before enabling jumbo frames, ensure that all the devices/hosts located on the network support the jumbo frame size that you intend to use to connect to the Node. If you experience network related problems while using jumbo frames, use a smaller jumbo frame size. Consult your networking equipment documentation for additional instructions.

Some networking switches require you to specify the size of the jumbo frame (MTU) when enabling, as opposed to a simple enable command. On these switches it might be required to add the necessary bytes needed for the frame header (i.e., header information + MTU). Typical header size is 28 bytes, so a 9000 byte MTU would translate to 9028 byte setting. Refer to your switch documentation to understand what the maximum frame size settings are for your switch.

Setting the IP Address

There are two possibilities when configuring the IP address of the Node:

- DHCP - this means the Node will seek out the DHCP sever on your network and obtain an IP address from the server each time it powers up.

- Static IP - the IP address set in this page will be the IP address the unit will use each time it powers up.

Depending on the configuration, either click the DHCP button or set the Static IP address.

	**Note:** If you select the DHCP mode, ensure your DHCP server is set to automatically update the DNS server.

Setting the Subnet Mask

If the Node is configured to use DHCP the net mask will be issued from the DHCP server. If you are using static IP address enter the IP mask in this box.

Setting an IPv6 IP Address

If IPv6 is enabled on the network connections page, here you can choose to use DHCP to automatically assign an IPv6 address, or you can set a static IPv6 address. If you choose to assign a static IPv6 address, you will also need to assign an IPv6 subnet mask.

Committing the Changes

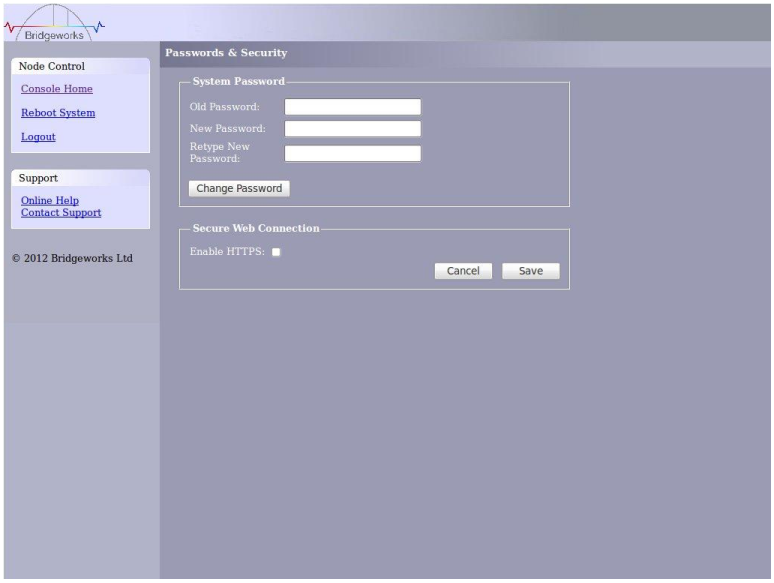
Click the save button to save these parameters and then click the reboot option in the left hand pane.

5.2 Passwords and Security

This configuration page will allow the administrator to change the access password for the GUI.

From within the main menu select the Password and Security icon under the Network section.

The GUI will now display the following window



Passwords and Security

To change your password, type the existing password and the new password into the appropriate boxes and press save.

Secure Connection – by clicking this box it will force all further transactions with the GUI to be done via a secure, encrypted HTTPS connection.

Once you have clicked this option, save the configuration and log out then log in again.

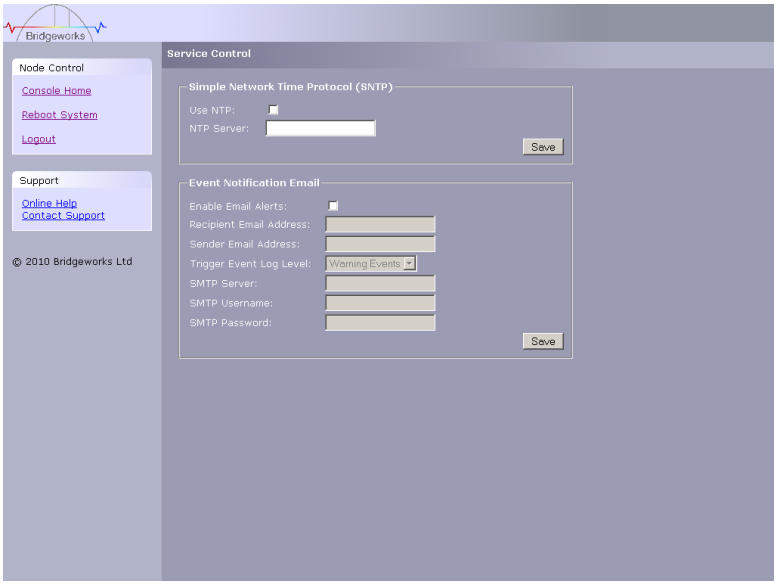
If you have lost your password please follow the steps in the Lost Password section of the Trouble Shooting chapter.

5.3 Network Services

This configuration page will allow the administrator to configure the IP addresses for the Network Time Domain.

From within the main menu select the Service Control icon under the Network section.

The GUI will now display the following window



Service Control

5.3.1 NTP

The Network Time Protocol (NTP) is a protocol for synchronising the clocks of computer systems over the IP network. This feature is particularly useful when viewing the logs to determine the time an event occurs.

To enable NTP on the Node, click the tick box and enter the IP address for the NTP Server and then click the save button.

5.3.2 Email Alerts

The SANSlide Node can notify a systems administrator when certain level log events are observed in the Nodes logs.

To enable email alerts on the Node, click the tick box next to “Enable Alerts”, this will allow you to alter the contents of the currently greyed out fields. The following fields need to be completed.

Recipient Email Address – This is the email address to which the emails will be sent.

Senders Email Address - This is the email address that emails will be sent from. This can be any address and does not have to be genuine; which is useful for email filtering. For example entering in logs@4bridgeworks.com would allow emails from this address to be filtered to a specified folder in the users email client.

Trigger Event Log Level – This allows the user to specify what severity of event will trigger the log to be emailed with Critical Events being the most severe and Warning Events being the least. For each level picked the higher level logs will also be emailed, for example selecting Error Events will also send all Critical Events.

Below are examples of events that will be sent for each log level

- Critical: The Node is running at non recommended temperatures
- Error: The Node was Unable to connect to another Node
- Warning: A Remote Controlled GUI Session has been stopped

	**Note:** For the following details consult your Network Administrator.

SMTP server – The IP address of the Mail Server that will handle the transport of the event emails.

SMTP Username – The username required to allow the use of the SMTP Server.

SMTP Password – The password required to allow the use of the SMTP Server.

6.0 SANSlide Configuration

This section will detail the operations of the following SANSlide Configurations:

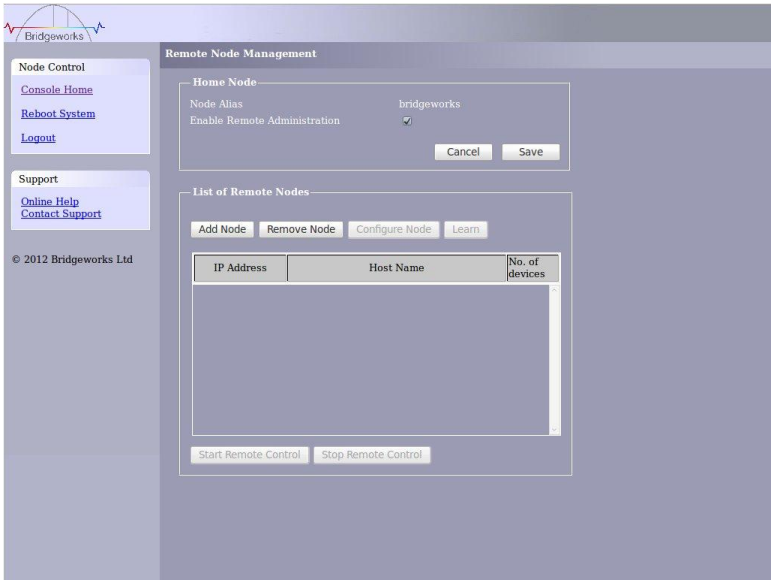
- 6.1 Remote Node Management
- 6.2 Remote Device Management
- 6.3 Transfer Statistics

6.1 Remote Node Management

This configuration page will allow the adding and removing of Nodes, the instigation of a learning cycle and the ability to take remote control of other Nodes.

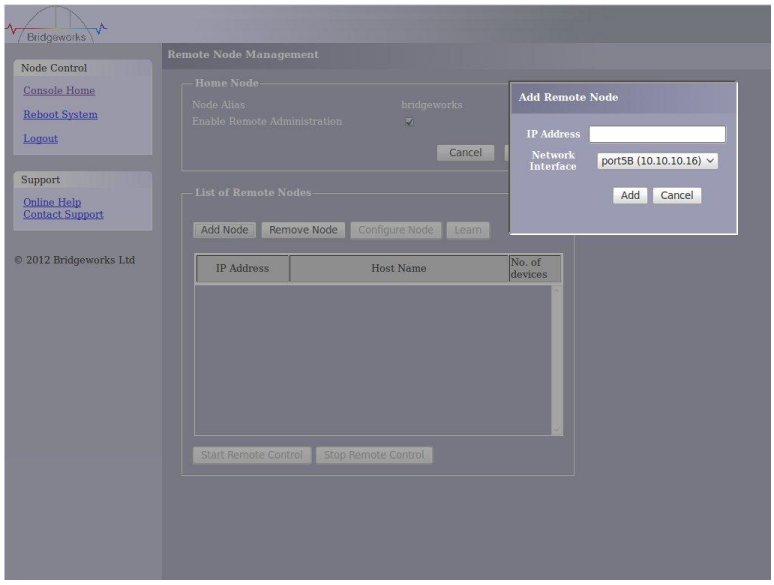
From within the main menu select the Remote Node Management icon under the Network section.

The GUI will now display the following window



Remote Node Management

To add a Node, click on the “Add Node” button and then add the IP address of the Node to be connected to in the window as shown below, finally click the Add button.

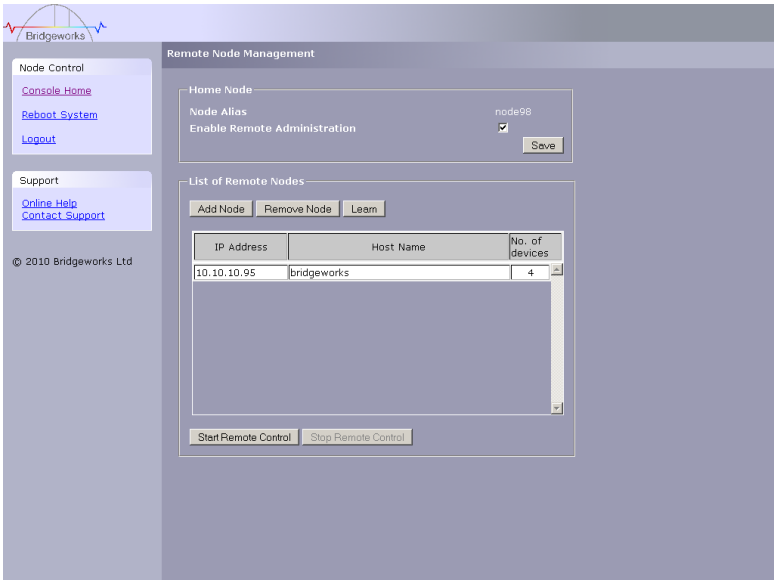


Remote Node Management: adding a Node

The unit will then search for the Node on the Link Network, which will be displayed with a progress bar.

Once completed a window will appear with the Nodes name and the number of target devices attached to that Node. Any remote Node that has been added to the local Node in this way will be automatically saved, and will restore on reboot until the Node is removed.

The remote Node should then be displayed on the remote Node list as shown below.



Remote Node Management: with a Node added

To remove a Node that has been added simply select the Node from the list you want to remove and click the Remove Node button. A confirmation box will appear, click OK to continue.

6.1.1 Remote Control

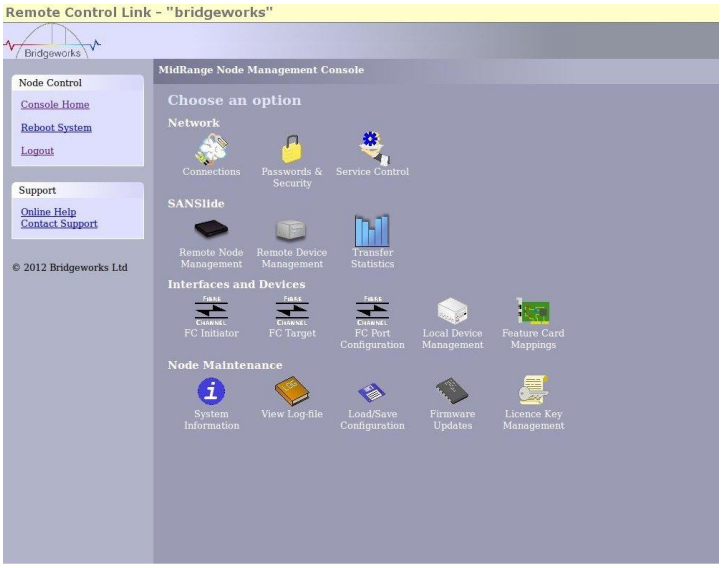
During the set up of your Nodes it may not be possible to directly access the web interface on a Node you want, “remote control” can be used to take control of any other Node added to your local Node.

To stop or allow other Nodes to take remote control of the Node you are currently using there is a checkbox within the home Node section at the top of the page. Select the checkbox if you want to allow other users to take control, deselect it if not. Once you have chosen click the save button.

Highlight the Node you wish to connect to by clicking the Node in the remote Node list and then the Start Remote Node Control button at the bottom of the list.

The web interface will now display the login screen of the remote Node as normal, and you login in the normal way using the credentials of the remote Node.

Whenever a remote control session is underway there will be a yellow bar at the top of the web interface which will contain the name of the Node you are connected to, as illustrated below.



A remote Node under Remote Control

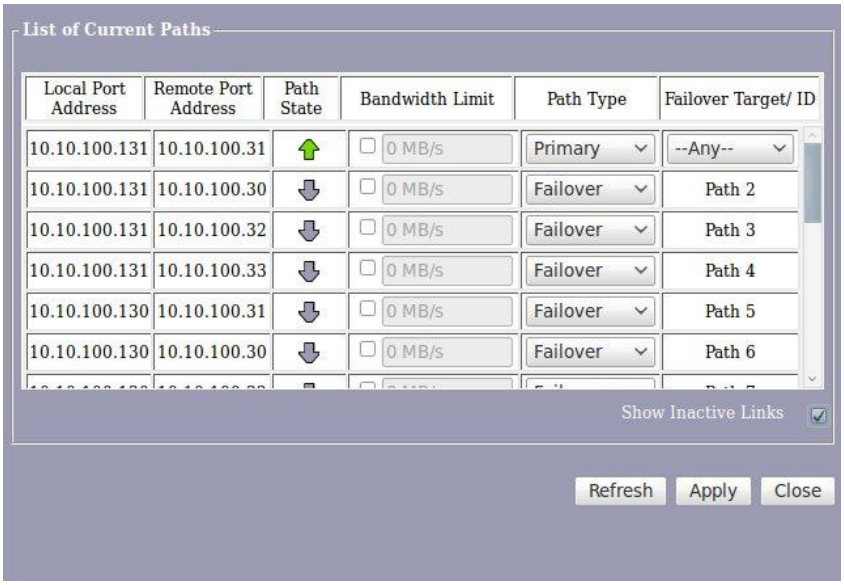
If you close down the window or tab containing the remote control session you can navigate back at any point to the Remote Node Management page on your Local Node, select the Node you had previous remote control over and click the “Reload Remote Window” button.

When you have finished configuring the remote Node, clicking “Stop Remote Control” from the Remote Node Management page will end the remote control session.

6.1.2 Configuring a Node

SANSlide will always attempt to get the best performance possible for the data it is transferring. Once a link has been established between two Nodes, they will automatically check for other available connections to each other through their WAN ports. Any available connections that are found will be set as 'failover' paths and will not be used unless the 'primary' path fails.

To change the link settings between two Nodes, click on the "Configure Node" button, an popup box will appear as shown below.



Setting Primary and Failover Paths

When you establish a link between two SANSlide Nodes, this link is set as the 'primary' path and is the default connection used by the Nodes. Once this 'primary' path is established, the Nodes will then automatically check for other available connections to each other through their WAN ports. Any possible connections that are found will automatically be set as 'failover' paths. A failover path will not be used unless the primary path fails. You can also select a Primary Failover path which will be the first one that is used in the event of a failure with the primary path. To choose a primary failover path, select the path that you wish to use from the drop down box on the far right of the path table.

	**Note:** The order in which failover paths are used is set automatically and cannot be manually changed

To change the primary path from click on the 'Path Type' drop box of the primary path and select 'Failover' from the drop down list. Click on the 'Path Type' drop box of the path that you wish to set as the new primary path and select primary from the drop down list. Click on 'Apply' to save your changes.

	**Note:** Multiple links can be assigned as primary paths, SANSlide will automatically attempt to use all available primary links simultaneously.

A green, red or grey arrow in the Path State box will indicate the state of each path.

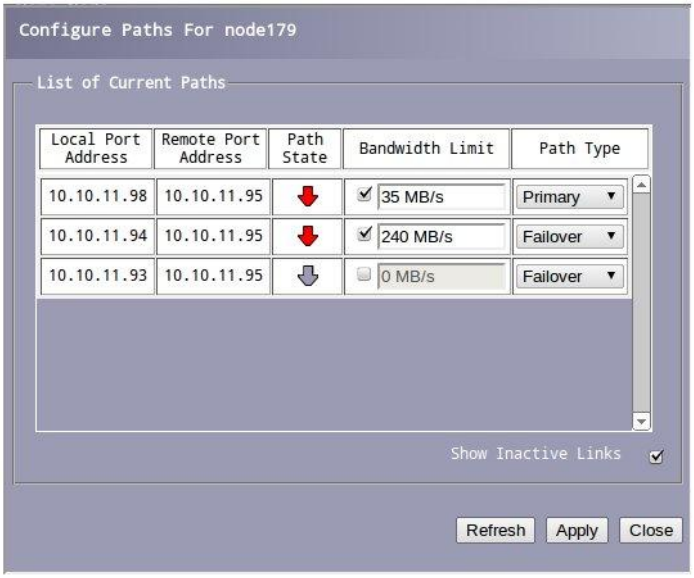
- A green arrow pointing upwards means that it is a known link that is up
- A red arrow pointing downwards means that it is a known link that is down
- A grey arrow pointing downwards means an unknown link that is down (only shown if the 'Show Inactive Links' checkbox is checked)

If a path has never been established, the link will be set as inactive and will not be shown by default. To view all possible connections that may exist between the two Nodes, check the 'Show Inactive Links'

checkbox at the bottom of the window. This will now show any possible, but never established links between the WAN ports of the two Nodes.

Limiting the Bandwidth

If there is other traffic on your network that needs to access a share of your links bandwidth you can limit the bandwidth between your Nodes. The limit is induced on a per Node, per connection bases.



To set a limit on a connection, click on the Set Node Transfer Limit checkbox next to the connection that you wish to limit, which should now allow the text box below to become editable. Type in a value you desire with a minimum possible value of one megabyte and click the OK button.

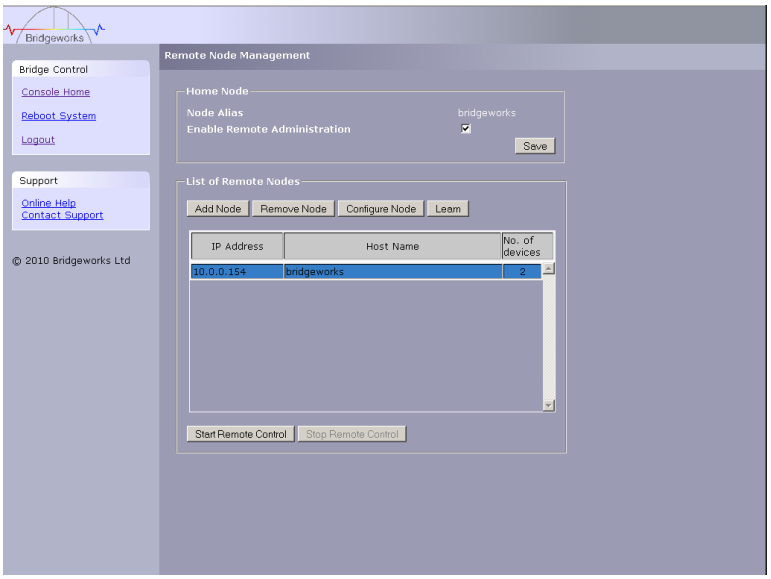
To remove a limit click on your chosen Node and click the configure Node button, uncheck the Set Node Transfer Limit checkbox on the connection that you wish to remove the limit on and click “OK”. The limit will now be lifted.

	Note: Any changes to the bandwidth limit will become instantly effective on pressing apply.

6.1.3 Learning

This procedure will “kick start” the Artificial Intelligence module to start learning the characteristics of the link network. Once it has completed it will store these values in the memory flash ready for use when data transfers start.

From the root menu select the remote Node management icon; the GUI will display the following screen.

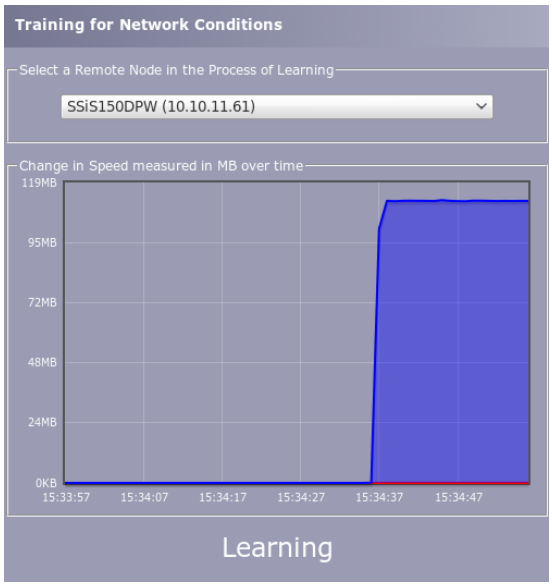


Remote Node Management

Select the remote Node that you are going to use for the learn process from the List of Remote Nodes window and then click on the learn button just above the window. You can start Multiple Nodes learning in this way simultaneously by clicking on each one and clicking learn.

	**Note:** The learn process can take up to 5 minutes to complete.

The GUI will, in another window display the learn transfer graph as shown below.



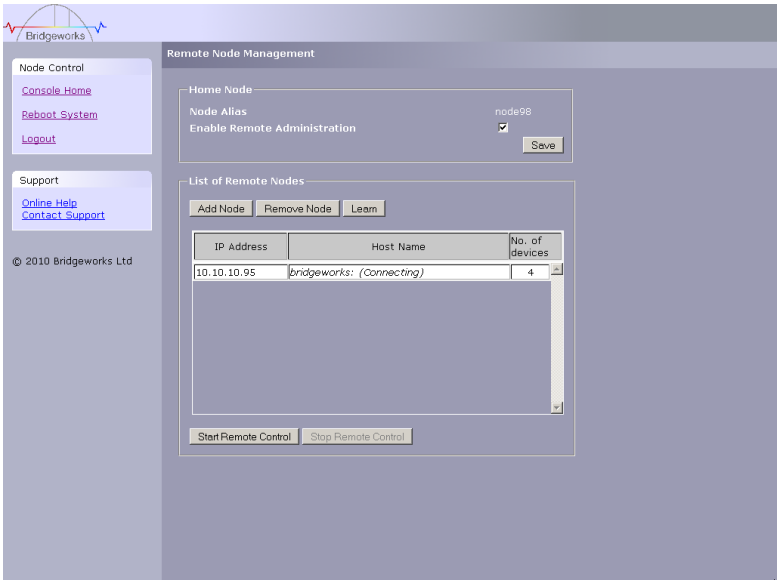
A Node in the process of a learn

Each Node in the process of a learn, can be viewed by clicking on the drop down list of Nodes and selecting the one you wish to monitor.

Once this has completed, as indicated by the bottom text displaying “Learn Complete”, the Pop-up window can be closed.

6.1.4 Restoring of a Node

When a Node has been restarted and it is in the process of re-establishing its link to another Node, the words Connecting may appear next to the Nodes name in brackets and the text will be in italics as shown below.



A Node in the process of restoring its Links

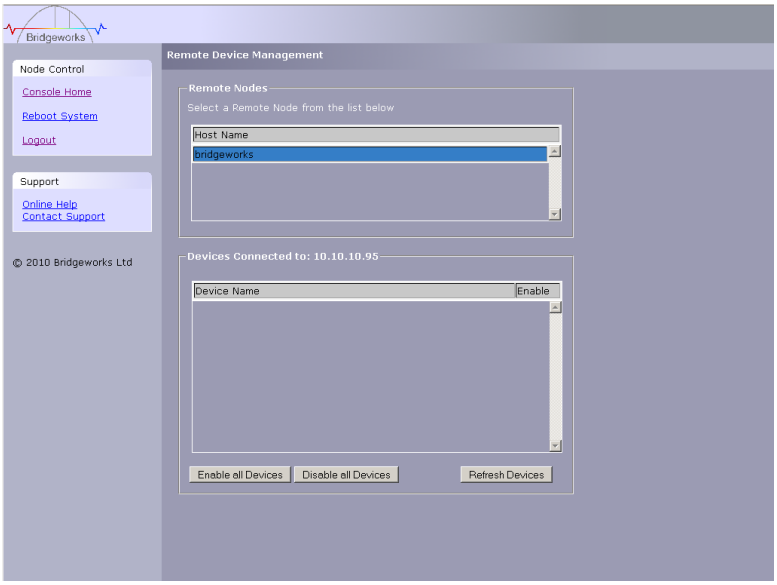
During this time it is not possible to use the features of a Node apart from remove until the connection has been established. A repeat attempt at connecting to a Node can take up to a minute and if the Node fails it will continually retry. Any newly discovered Target Devices would be added automatically.

6.2 Remote Device Management

This configuration page will allow the Adding and Removing of Nodes, the instigation of a learning cycle and the ability to take remote control of other Nodes.

From within the main menu select the Remote Node Management icon under the Network section.

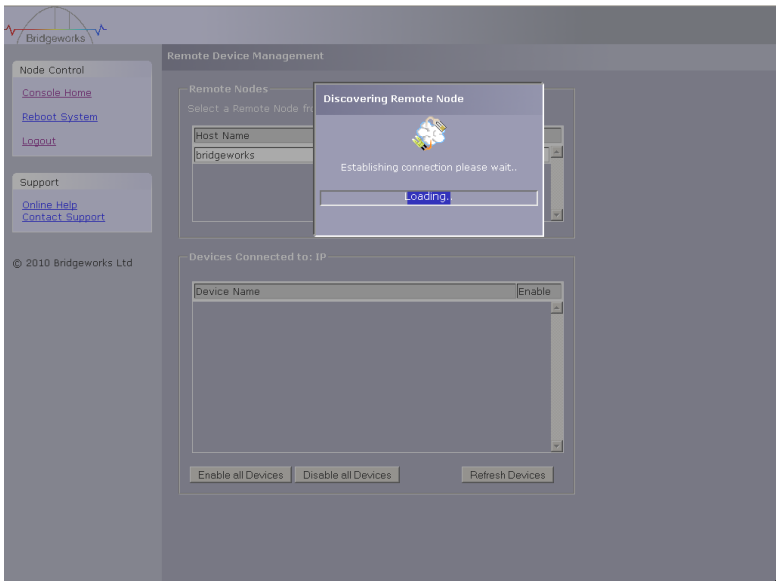
The GUI will now display the following window



Remote Device Management

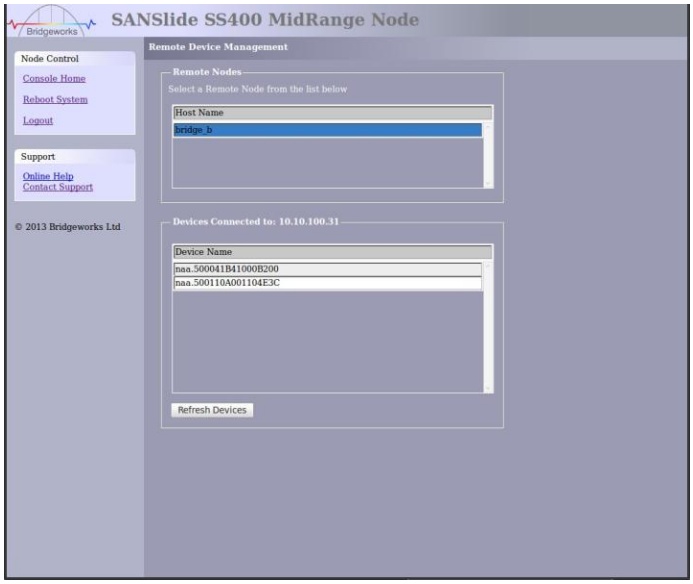
To refresh the devices on this list, select the Node you want to refresh the devices on from the “Host Name” list and click on it. When successfully selected the Node will become blue.

Click on the “Refresh Devices” button at the bottom of the screen. The screen will go grey and a frame will appear with a blue loading bar as shown below.



The Remote Device Management page in the process of an update

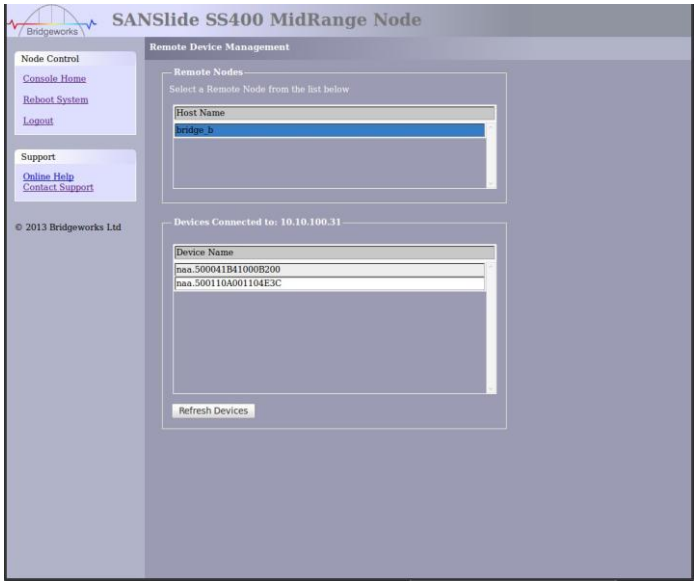
When the loading bar is complete a report will be returned informing you of the progress of the update.



The Remote Device Management Page, which has a Node with multiple Target Device

6.2.1 Restoring of Devices

When a Node has been restarted and it is in the process of re-establishing its link to another Node the word Connecting may appear next to the Nodes name, the target devices name in brackets and the text will be in italics as shown below.



The Remote Device Management page in the process Linking Together Nodes

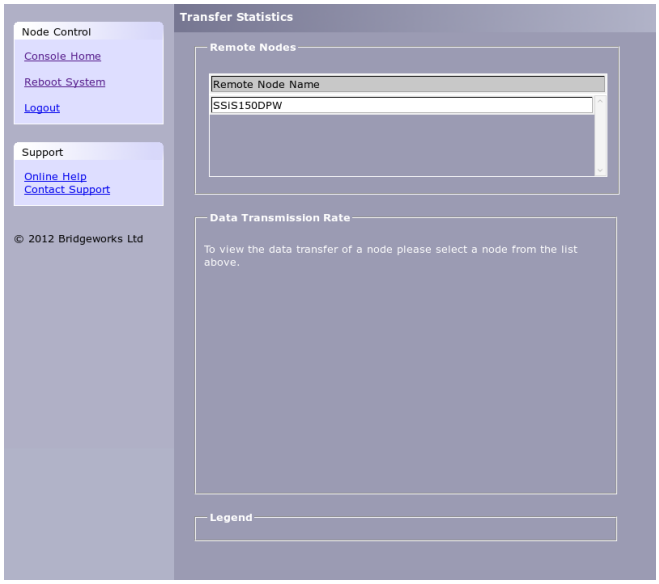
All the functionality that can be used when a Node is active can be used whilst a Node is connecting but the effects will not occur until the link is up.

6.3 Transfer Statistics

This configuration page will allow you to monitor in real time the performance of a link over the span of a minute.

From within the main menu select the Remote Node Management icon under the Network section.

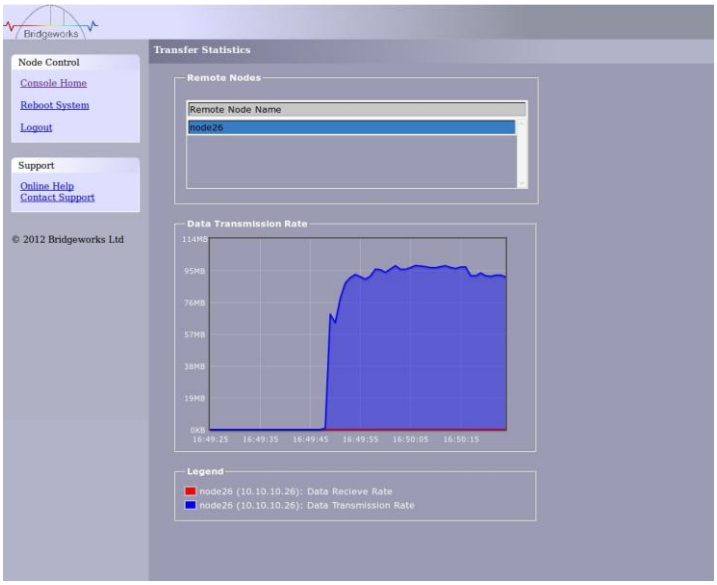
The GUI will now display the following window



The Transfer Statistics Page without a Node being selected.

This page will show you both the transmit and the receive rate for any selected Nodes, the transmit rate for a Node is in blue and the receive rate is in red. To view a Nodes transfer rate click on the name of the Node form the list and graphing will start automatically.

	**Note:** Because these parameters are always in a state of continual monitoring by the AI clicking to view these figures will not affect the performance of the data transfer.

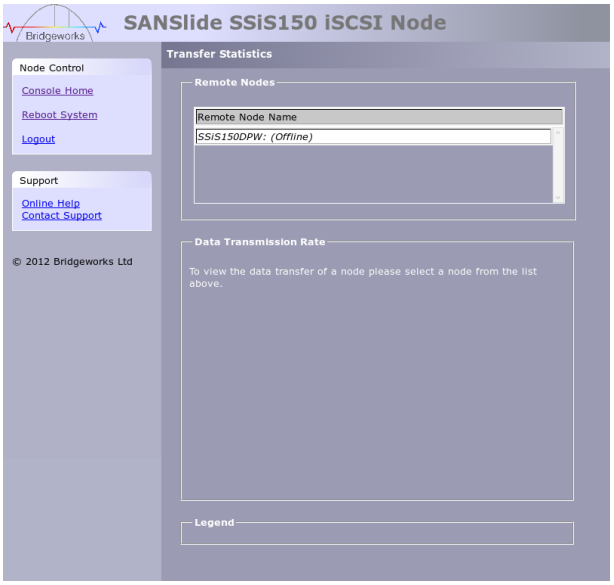


The Transfer Statistics Page with a Selected Node

To find out the IP address of a Remote Node leave the mouse over it and it will be displayed in a pop up box.

Offline

A Node will be offline if the link between two SANSlide Nodes has not been re-established after a system restart. You cannot start the monitoring of the Node until the link has been re-established.



The Transfer Statistics Page with the Node Offline

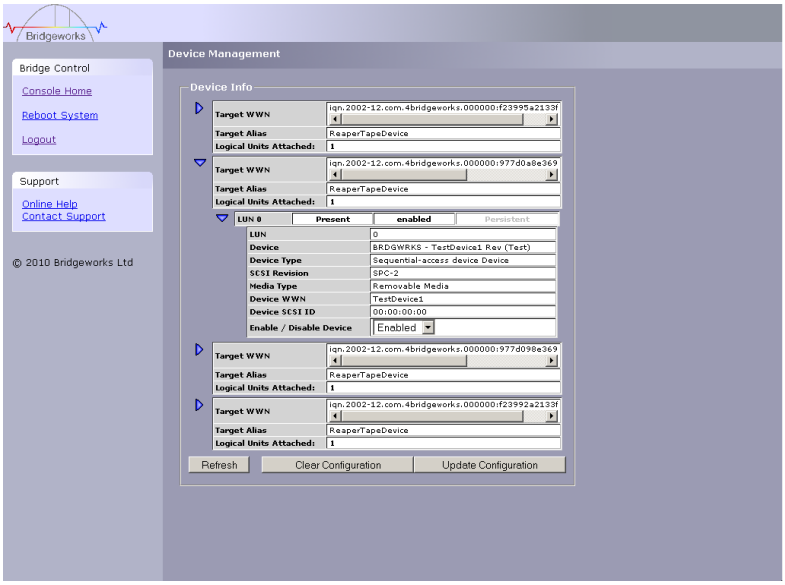
7.0 Interfaces and Devices Configuration

7.1 Local Device Management

This configuration page will allow the administrator to configure a number of parameters that control the behaviour of the devices.

From within the main menu select the Device Management section.

The GUI will now display the following window



By clicking on the blue triangle in the Device info box you can display further information about each device.
The expanded information also gives you two options
Persistent LUN - if you select this option, the device will always be presented to the interface in exactly the same way – i.e. the same LUN number. If the device is disabled or has been removed from the port it's LUN number will be reserved and not assigned to any other device.
Enable / Disable Device – This pull down menu option allows you to disable a device from appearing on the interface. This is useful if you wish to reserve a device or to take it out of commission for repair or replacement at a later date without powering down the Node.

After any changes have been made click the Update Configuration button to make the changes permanent. If at any point you want to remove those changes click the Clear Configuration button.

7.1.1 Persistent LUN

If you select the Persistent LUN option, the device will always be presented to the SCSI interface in exactly the same way – i.e. the same LUN number. If the device is disabled or has been removed from the FC port its LUN number will be reserved and not assigned to any other FC device.

7.1.2 Enabling / Disabling a Target Device

For each target device there are two possible actions, whether the device is enabled or not and if the device requires a Persistent LUN.

Each device is enabled by default. Disabling a device will prevent it from being available to another SANSlide Node or presented to an initiating device.

7.1.3 Saving

After any changes have been made click the Update Configuration button to make the changes

permanent. If at any point you want to remove those changes click the Clear Configuration button.

7.2 Fibre Channel Initiator

This configuration page will allow the administrator to configure the Fibre Channel Interface of the Node.

From within the main menu select the FC Target icon from the SCSI System section.

The GUI will now display the following window

The left hand most icons display the current state of each Fibre Channel Port.

The green / red arrow display whether the port is up or down whilst the number displays the negotiated Fibre Channel speed.

Clicking on the icon will take you into a further screen displaying more detailed information

Now select the first of the ports configuration icon

The Screen will now display the following

The link speed pull down menu has 4 options Auto, 8Gb/s, 4Gb/s, and 2Gb/s. It is recommended that you leave the option set to Auto. However some SFP's do not report their speed correctly so if you are unsure set the link speed to the SFP speed

The topology pull down menu has 3 options Auto, Loop (arbitrated Loop, FC-AL), and Point-to-Point (FC-P2P). Again the recommendation is you leave this as Auto unless you wish to force this into a know topology.

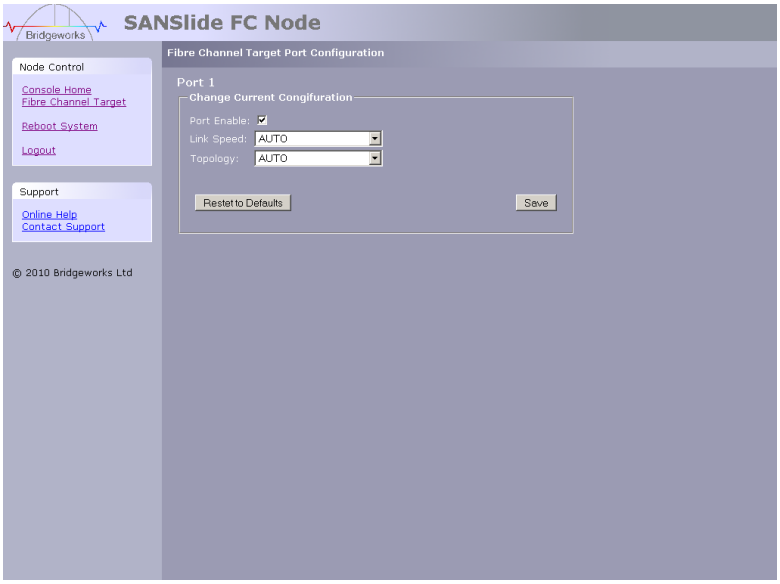
Finally save the settings using the save button and return to FC Target menu.

To enable the newly configured FC interfaces on to the SAN Network reboot the system using the reboot link in the upper left hand frame of the GUI.

7.2.1 Configuring the Fibre Channel Ports

From within the screen select the port number you wish to configure and click the Configuration icon.

The screen will now display the following



Fibre Channel Target Port Configuration

The link speed pull down menu has 4 options Auto, 8Gb/s, 4Gb/s, and 2Gb/s. It is recommended that you leave the option set to Auto. However some SFP do not report their speed correctly so if you are unsure set the link speed to the SFP speed

The topology pull down menu has 3 options Auto, Loop (arbitrated Loop, FC-AL), and Point-to-Point (FC-P2P). Again the recommendation is you leave this as Auto unless you wish to force this into a know topology.

Finally save the settings using the save button and return to FC Target menu.

To enable the newly configured FC interfaces on to the SAN Network reboot the system using the reboot link in the upper left hand frame of the GUI.

7.2.2 Configuring Devices on the Remote Node

Without any alteration to this section all the devices connected to the remote Node's SAN (FC) connection will be identified within the Node's device list. However if you only want to allow a subsection of the devices present on the Remote Nodes FC interface on the Local Node you will need to define which ones to enable.

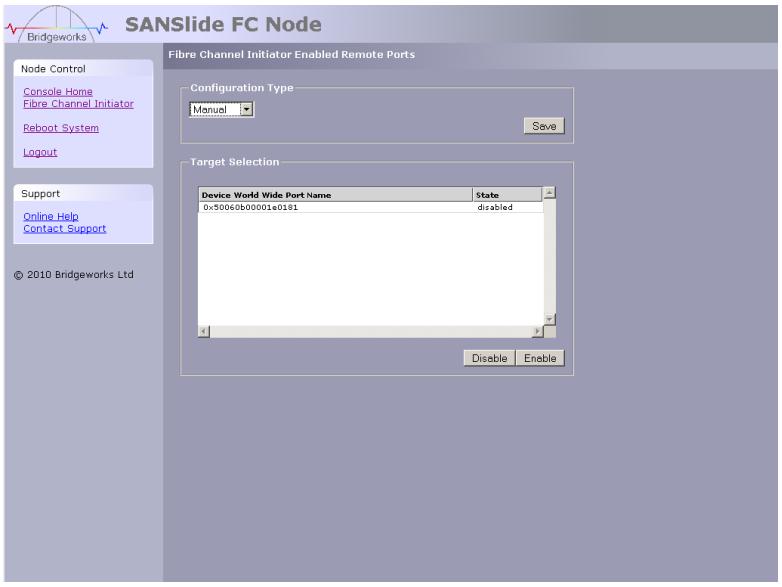
From the Remote Nodes root menu, select the FC initiator icon and then the Connected Targets icon

from the second menu.

The GUI will then display the following screen.

Fibre Channel Initiator device configuration in automatic mode

From the pull down menu select manual and the GUI will display the following screen



Fibre Channel Initiator device configuration in manual mode

All Target devices are displayed by their WWN and are enabled by default until “Manual” is selected at which point all devices are disabled by default.

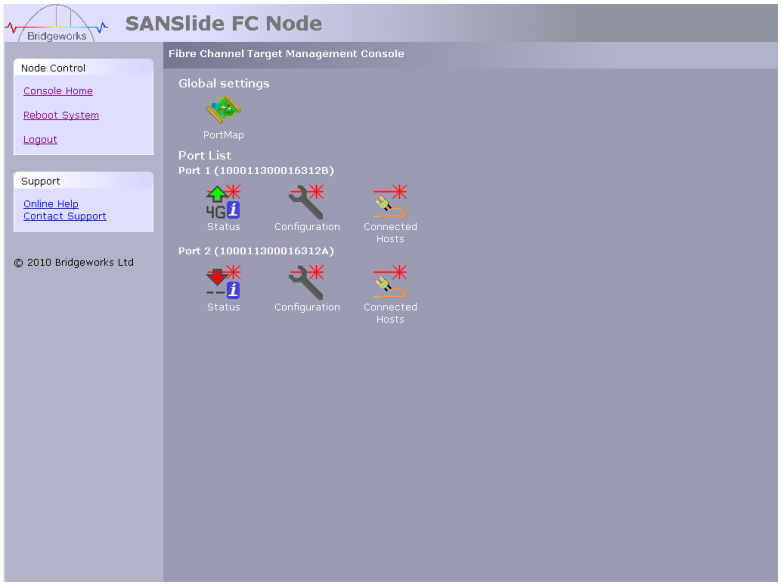
To enable a target device select the device by clicking on its entry in the table and then the “Enable Button” at the bottom of the table.

To disable a Target device select an entry from the Target Selection table and click the Disable button.

Click on the save button to effect these changes otherwise they will revert to the current setting when you exit the window.

7.3 Fibre Channel Target

From the root menu select the FC target icon and then the configuration icon The GUI will display the following screen.



Fibre Channel Target Homepage

7.3.1 Configuring the Fibre Channel Ports

From within the screen select the port number you wish to configure and click the Configuration icon.

The screen will now display the following

Fibre Channel Target Port Configuration

The link speed pull down menu has 4 options Auto, 8Gb/s, 4Gb/s, and 2Gb/s. It is recommended that you leave the option set to Auto. However some SFP do not report their speed correctly so if you are unsure set the link speed to the SFP speed
The topology pull down menu has 3 options Auto, Loop (arbitrated Loop, FC-AL), and Point-to-Point (FC-P2P). Again the recommendation is you leave this as Auto unless you wish to force this into a

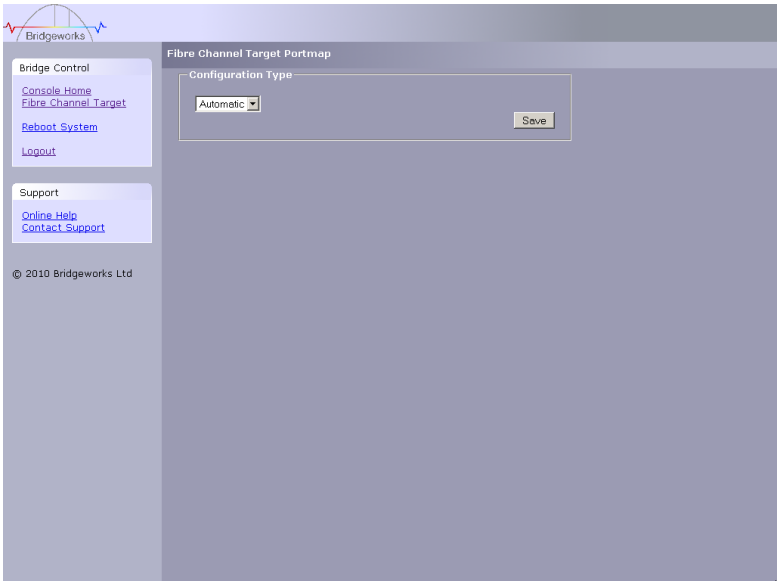
know topology.
Finally save the settings using the save button and return to FC Target menu.

To enable the newly configured FC interfaces on to the SAN Network reboot the system using the reboot link in the upper left hand frame of the GUI.

7.3.2 Linking the Remote Device to Local Fibre Channel Interfaces

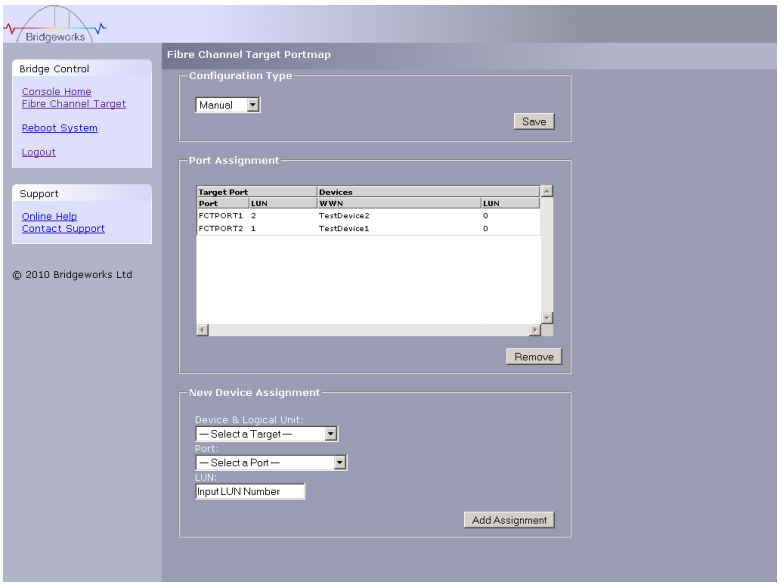
From the FC Target menu select the portmap icon (under global settings)

The GUI will display the following screen



In Automatic mode the Local Node will map all the devices to both FC interfaces. For example, if the Node has 4 FC devices enabled for presentation and the “Portmap’s” “Configuration Type” is set to Automatic all 4 devices will be present on both FC target interfaces as LUNs 0-3.

If Manual portmap configuration is selected the GUI will display the following screen.



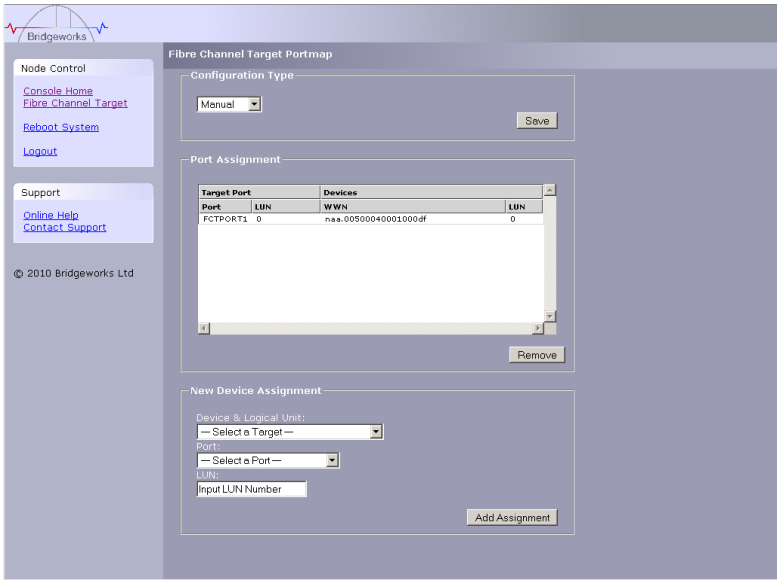
From this menu it is possible to allocate devices to one or both FC interfaces.

To enable a device

- Select the device from the Select a Target pull down menu.
- Select which FC port to present the target device.

- Select the LUN of the device on the FC Interface. If this is the first assignment for your chosen port then the LUN must start on 0.

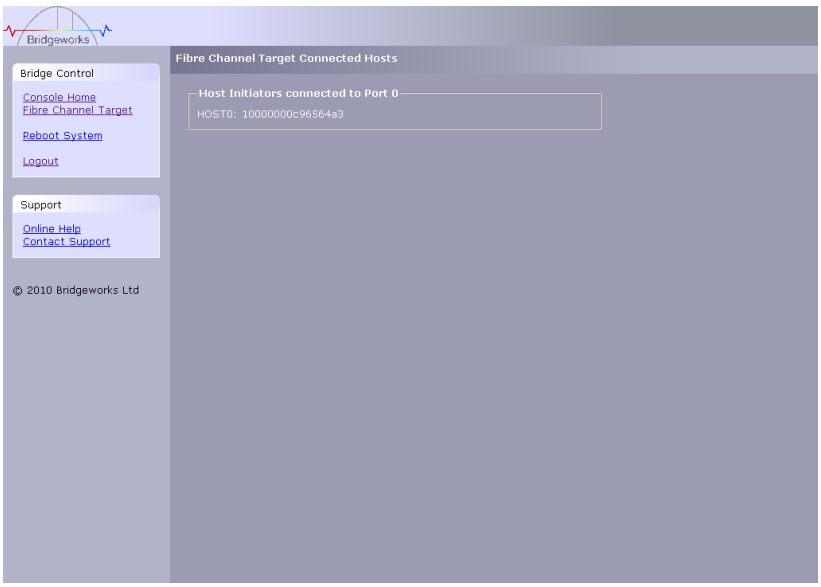
The example below shows device configured to FC port 0 as LUN 0



To remove a Mapping
Select the mapping from the table you want to remove and click the remove button.

Connected Hosts

This section lists the current connections i.e. logged on, from FC hosts.

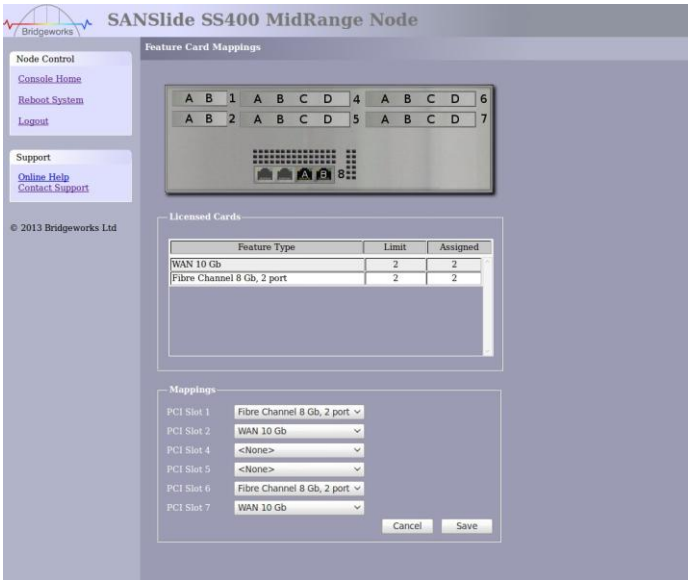


7.4 Feature Card Mappings

Once you have installed and uploaded the licence for your feature card you must reboot your Node before the feature card can be used.

The Node will try to automatically detect what feature card is in each slot and associated it with the installed keys. If you have multiple cards of the same type, you may need to manually configure the feature card mappings.

From the management console, click on the Feature Cards icon, this will take you to the feature cards mapping page as shown below.



The image at the top of the page is a graphical representation of the back of your unit. Each PCI slot on the unit is assigned a number, clearly shown on your unit and the above image.

The licensed cards table shows the cards that have been licensed for use on your node. The number in the limit column shows how many cards of this type can be installed. The number in the assigned column shows how many of these cards have been assigned to PCI slots.
Mappings

Inside the mappings box are listed the available PCI slots that your unit has. Here you can select which card is assigned to which PCI slot by clicking on the drop down box next to the PCI slot that you wish to configure and selecting the feature card that you have installed in the slot. The default is set to none, once a card is installed and the Node has been rebooted, this will change to the feature card that Node believes is in this slot. If the current selection is incorrect, you can change it by clicking on the drop down box and selecting the correct card.
Once you have set the feature card mappings, you must then press the save button and reboot your Node for the changes to take effect.

8.0 Node Maintenance

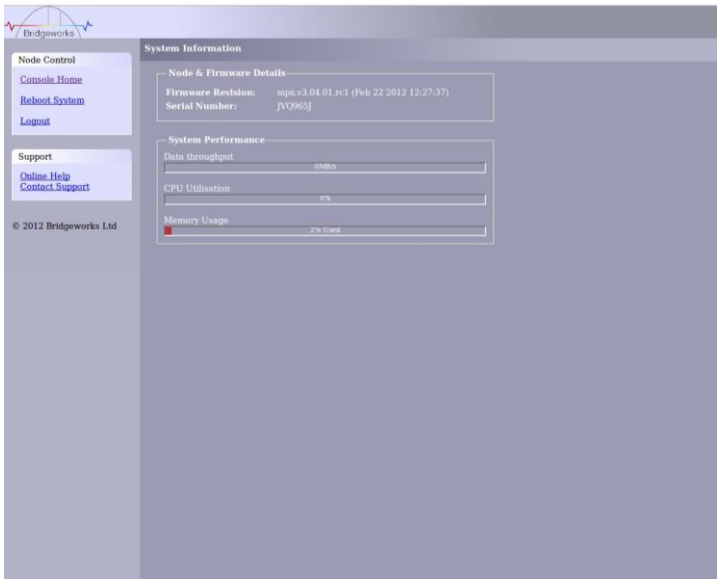
The following section describes the various pages that are available to the administrator to monitor the performance and maintain the Node. The following operations will be detailed.

- 8.1 System Information
- 8.2 System Log
- 8.3 Firmware Updates
- 8.4 Saving the Configuration to Disk
- 8.5 Restore Factory Defaults

8.1 System Information

This System information page will allow the administrator to view the Performance of the Node. From within the main menu select the System Information icon from the Node Maintenance section.

The GUI will now display the following window



Within the top window the following information is displayed

Current Firmware & Boot Loader Revision Level
Serial Number of the PCB within the Node

Within the lower window are 3 bar graphs, which provide an approximation of the follow performance parameters

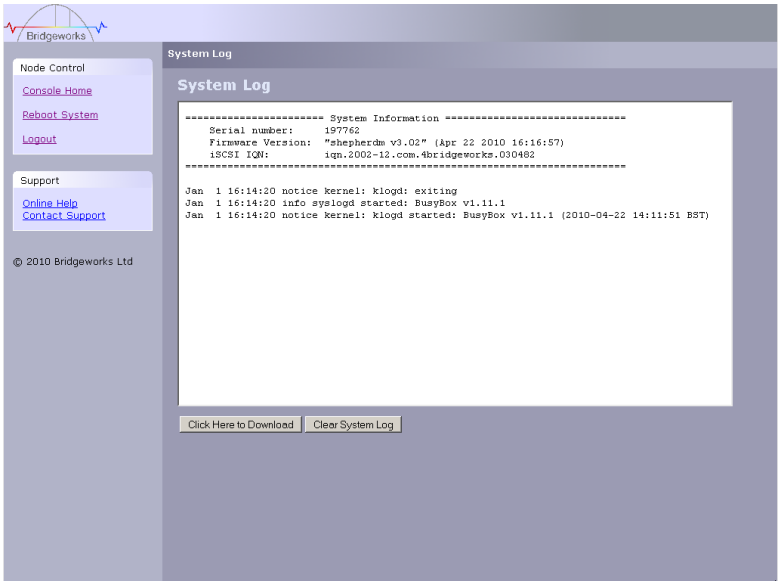
Data Throughput - This indicates the current performance in MB/s.
CPU - This indicates the percentage of the time the CPU is occupied undertaking the management and scheduling the transfer of data between the two interfaces
Memory usage - This indicates the percentage of memory used by all processes

8.2 System Log

This system information page will allow the administrator to view the log status that the Node encounters whilst running.

From within the main menu select the View Log-file icon from the Node Maintenance section.

The GUI will now display the following window



The System Log Page with the Log cleared

Below the log display pane are two options:

- Clear system logs – this will delete the current and saved logs within the Node
- Download – this will download the log files to your local disk. You may be asked by our support team to email this log file to them to aid them in any problem resolution.

8.3 Firmware Updates

From time to time it may be necessary to upgrade the firmware within the Node. New versions contain resolutions to known issues as well as new features and improvements to the functionality of the Node. It is advisable to check on the latest release on a regular basis.
Where possible firmware on two communicating SANSlide Nodes should be kept consistent.

New versions of the firmware can be downloaded from the Bridgeworks web site at:

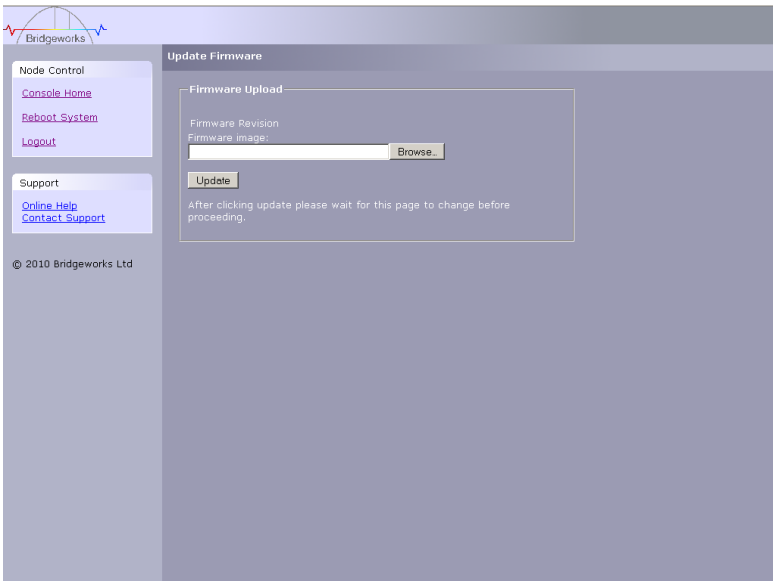
www.4bridgeworks.com/support/software.shtml

	**Warning:** Ensure you have the correct firmware for your product IF IN DOUBT ASK

The Firmware Updates page will allow the administrator to load new firmware into the Node.

From within the main menu select the Firmware Updates icon from the Node Maintenance section.

The GUI will now display the following window



The Firmware Update Page

Once you have downloaded the new firmware to a local disk drive:

- Click on the browse button to locate the file you have downloaded from the website
- Then click on the update button.

Updating the firmware will take a few minutes after which it will be necessary to reboot the system to bring the new code into memory.

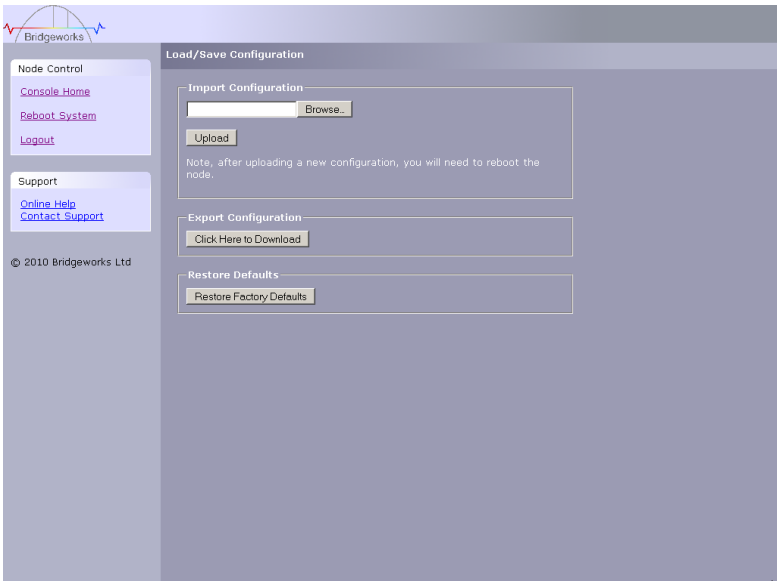
8.4 Saving the Configuration to Disk

Once you have finished configuring your Node we recommend that you save your configuration data to a local disk. By doing so you could save valuable time if the unit requires replacement or if a configuration is lost during upgrades.

It is also possible to create a “Boiler Plate” configuration and load this into each new Node as it is initialised. This can ease the rollout of multiple Nodes within an enterprise.

From within the main menu select the Load Save Configuration icon from the Node Maintenance section.

The GUI will now display the following window



The Load/Save Configuration Page

To save the configuration data click on the “Click here to Download” link from within the Export Configuration window located in the centre of the page.

Depending upon the browser you are using, select the option to “save file to disk”.

The Node will now download an encoded file that contains all the configuration settings for the Node.

To reload the configuration, click on the “Browse” button and locate the required configuration to upload into the Node. Once located click the upload button and the new configuration data will be uploaded.

Once completed, use the various configuration pages to make any further adjustments required and then reboot the system.

8.5 Restore to Factory Defaults

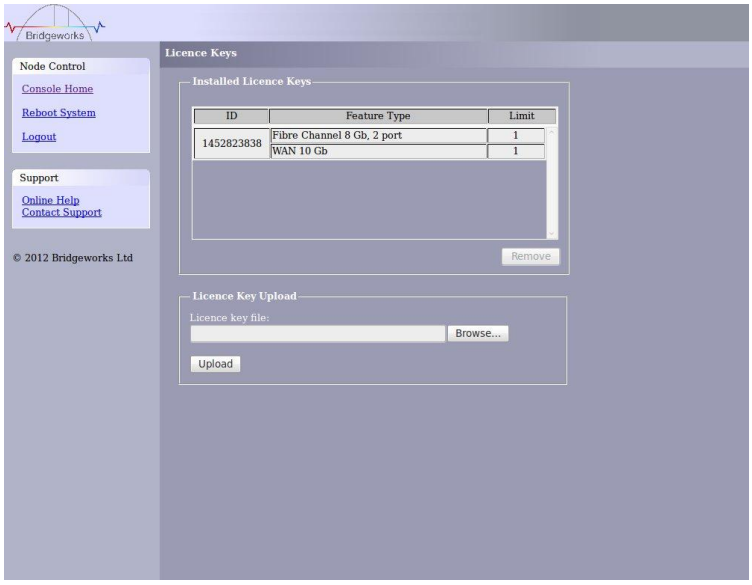
By clicking on this button all the parameters will be set back to the factory defaults. This includes IP address, hostname and passwords. We recommend that if you return the Node for maintenance that you reset to defaults to protect passwords and other sensitive information. If you are accessing your Node remotely over a SANSlide link, do not use this option as you wont be able to re-establish connection with your Node,

8.6 Licence Keys

Your SANSlide Node is upgradeable to allow new features and functions to be added to your existing unit.

Once your upgrade has been purchased and installed you will need to install the licence key for your upgrade.

To install a license key or to view your installed licence keys, click on the Licence Keys icon in the management console. You will then be taken to the Licence Key page as shown below.



The Installed Licence Keys table shows the licence keys that have been installed on your node, and the features that they enable. The number in the limit column shows how many cards of this type can be installed.

To install a licence key, click on the browse button in the Licence Key Upload box.
You are then presented with a popup box, locate the licence key file on your system and click on the open button and then click upload button on the license key page to install the key.

	**Note:** A reboot is required for your licence key to take affect

	**Note:** Any errors with your licence key will be shown in the system log

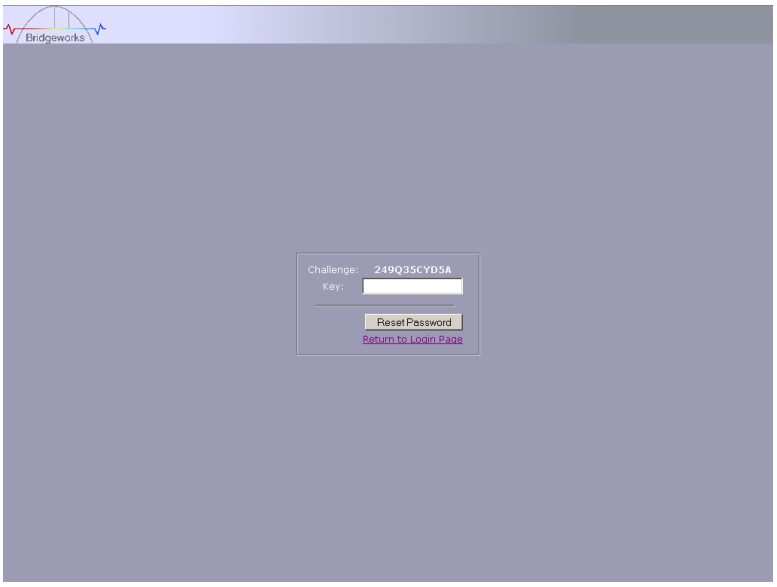
If you wish to remove a license key, select it from the table by clicking on the rows corresponding to the key you wish to remove. When a row is selected correctly, it turns a deep blue. Click remove to remove the keys from your node.

	**Note:** Multiple keys can be selected for removal, check that only the keys that you wish to remove are selected before pressing the remove button

9.0 Trouble Shooting

9.1 Lost Password

If you have lost the admin password it is possible to reset it with help from Bridgeworks.



First ensure that there is nothing entered into the user field and then type PASSWORDRESET into the password field.

The unit will respond with a challenge key.

Copy this key into an email along with your name, company and contact details – you must include your company's personnel email address for security purposes.

Send this email to support@4bridgeworks.com and a key will be returned for you to enter into the key field.

Press the reset button once you have entered the key – this will reset the admin user password back to admin.

9.2 Lost IP Address

Introduction

The utility will find any device irrespective of its IP address; this can be helpful in determining the IP address of a Bridgeworks device with an unknown IP address and for checking the number of Bridgeworks devices on a network.

Downloading LAN Scan

The utility can be downloaded from:

http://www.4bridgeworks.com/support/software.shtml

How to use LAN Scan

The utility is available under both Windows and Linux, and is a CLI based tool.

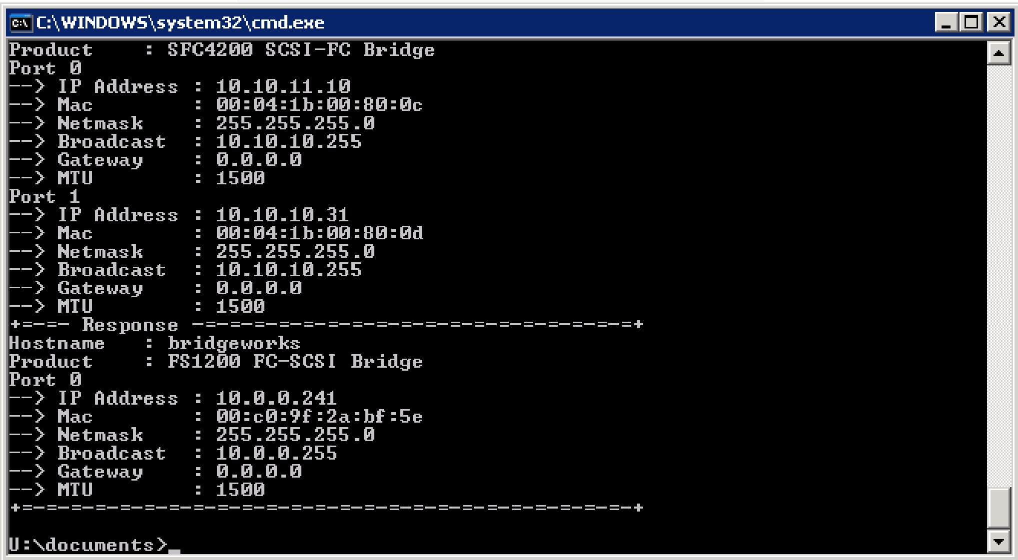
The downloaded file is in .zip format and contains the files lanscan, lanscan.exe and lanscan.bat.

For the GNU/Linux operating system the lanscan executable is needed.
For the Windows operating system the lanscan.exe and lanscan.bat files are required

Linux
Execute lanscan within a console and the output is displayed on screen.

Windows
Double click on lanscan.bat. This will create a file named lanscan.txt. Open lanscan.txt within a text editor to view the discovered Bridgeworks devices.

Typical output



```
C:\WINDOWS\system32\cmd.exe
Product     : SFC4200 SCSI-FC Bridge
Port 0
--> IP Address : 10.10.11.10
--> Mac        : 00:04:1b:00:80:0c
--> Netmask    : 255.255.255.0
--> Broadcast  : 10.10.10.255
--> Gateway    : 0.0.0.0
--> MTU        : 1500
Port 1
--> IP Address : 10.10.10.31
--> Mac        : 00:04:1b:00:80:0d
--> Netmask    : 255.255.255.0
--> Broadcast  : 10.10.10.255
--> Gateway    : 0.0.0.0
--> MTU        : 1500
+=-=- Response -=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-+
Hostname    : bridgeworks
Product     : FS1200 FC-SCSI Bridge
Port 0
--> IP Address : 10.0.0.241
--> Mac        : 00:c0:9f:2a:bf:5e
--> Netmask    : 255.255.255.0
--> Broadcast  : 10.0.0.255
--> Gateway    : 0.0.0.0
--> MTU        : 1500
+=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-+

U:\documents>_
```

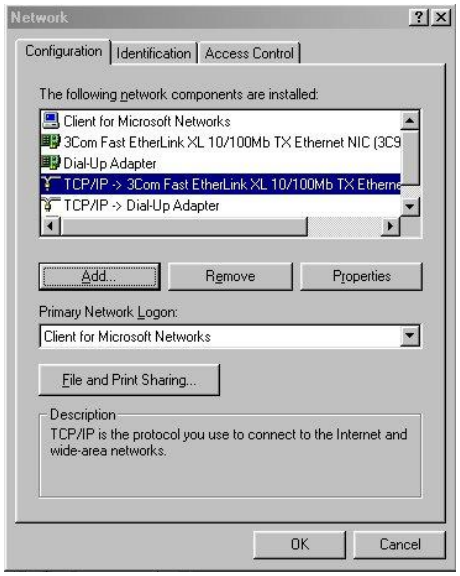
Appendix A Setting up your computer for initial set up

A1 Windows 95, 98 or NT

If your computer is running Windows 95, 98 or NT follow the instructions below. For users with Windows 2000, 2003 or XP, instructions are detailed in Appendix A2 and for Windows Server 2008, 7 or Vista, instructions are detailed in Appendix A3.

From the **Start** menu, choose **Settings** then **Control Panel**.

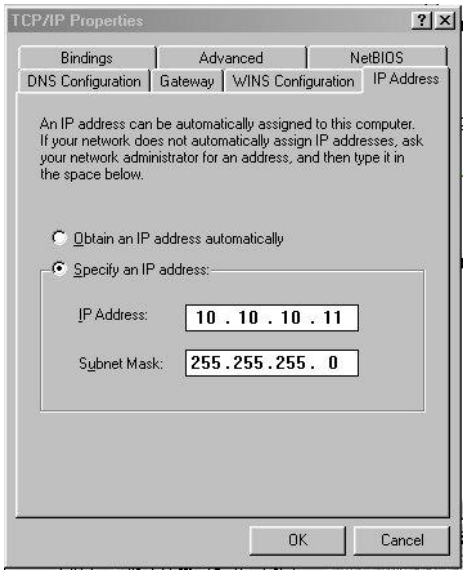
Then click the **Network** icon



In the **Network** window's **Configuration** tab,

Select the **TCP/IP** entry

Then the **Properties** Button



Click on the **IP Address** tab

Make a Note of your current set up then:

Click on the **Specify an IP** address button

Enter **10.10.10.11** into the **IP Address** field

Enter **255.255.255.0** into the **Subnet Mask** field

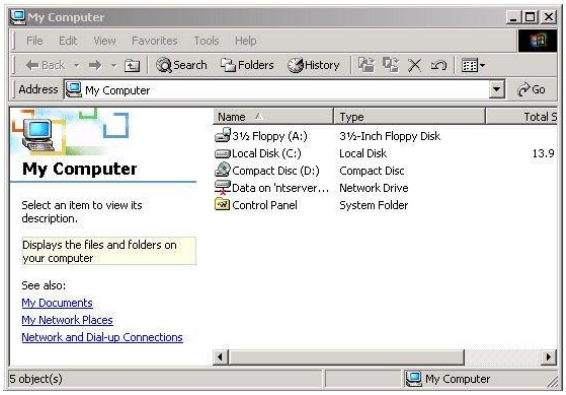
Finally click the OK button and reboot your computer.

	Note: Once you have completed the initial set up of the Node, return your computer to the original settings and reconnect to the Node.

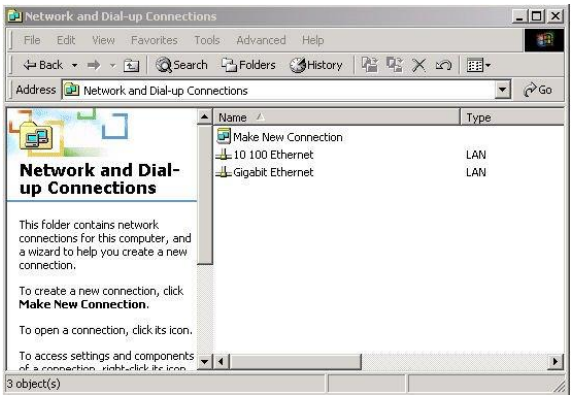
A2 Windows 2000, 2003 or XP

If your computer is running Windows, 2000, 2003 or XP follow the instructions below .For users with Windows 95, 98 or NT instructions are detailed in Appendix A1 and for Windows Server 2008, 7 or Vista, instructions are detailed in Appendix A3.

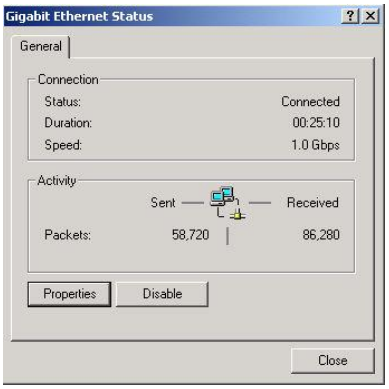
From the **Desktop** or **Start** menu, select **My Computer**



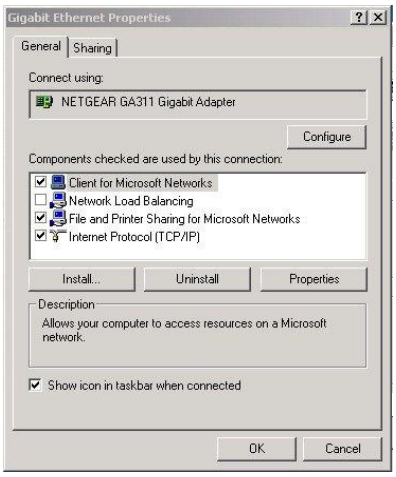
In the My Computer window select **Network and Dial-up Connections** positioned in the bottom left hand corner



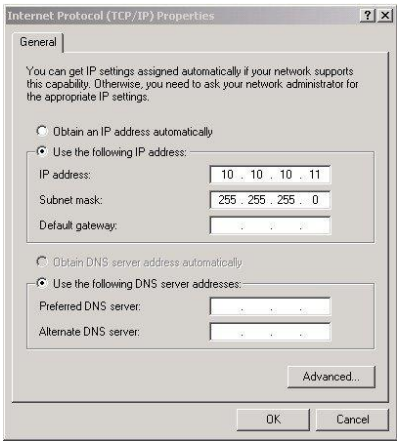
From within the displayed **Network and Dial-up Connections** select the interface connection that will be used to connect to the Node – in this example we have selected the Gigabit Ethernet interface.



A general status page will be displayed. From within this page select **Properties**



Select the **Internet Protocol** (TCP/IP) entry and then **Properties**



Make a Note of your current set up then:

Click **Use the following IP Address**

Enter **10.10.10.11** into the **IP Address** field

Enter **255.255.255.0** into the **Subnet Mask** field

Finally click the OK button.

	Note: Once you have completed the initial set up of the Node, return your computer to the original settings and reconnect to the Node.

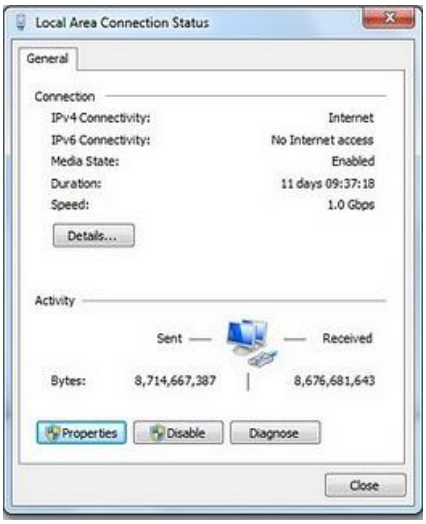
A3 Windows Vista, Server 2008 or 7

If your computer is running Windows, Vista or 7 follow the instructions below .For users with Windows 95, 98 or NT instructions are detailed in Appendix A1 and for Windows 2000, 2003 or XP, instructions are detailed in Appendix A2.

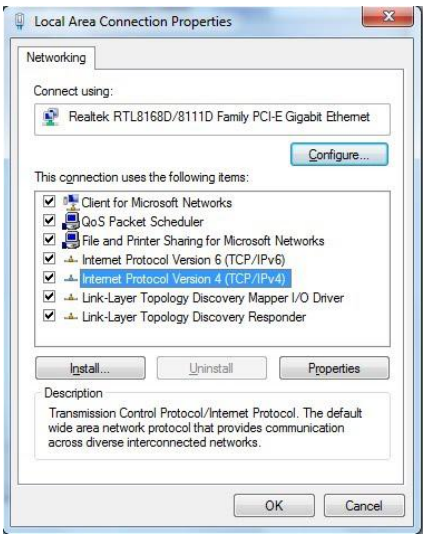
From the **Start** menu, select **Control Panel**

From the control panel select the **Network and Internet link**, followed by the **Network and Sharing Centre link**.

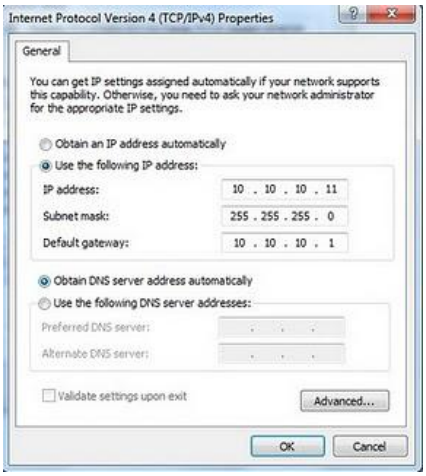
Now you can see the **Local Area connection** dialogue box. Double click Local Area Connections.



A general status page will be displayed. From within this page select **Properties**



Select the **Internet Protocol Version 4** (TCP/IP) entry and then **Properties**



Make a Note of your current set up then:

Click **Use the following IP Address**

Enter **10.10.10.11** into the **IP Address** field

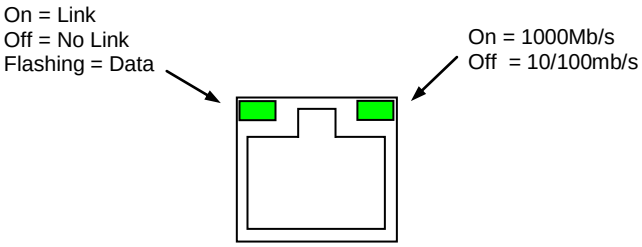
Enter **255.255.255.0** into the **Subnet Mask** field

Finally click the OK button.

	Note: Once you have completed the initial set up of the Node, return your computer to the original settings and reconnect to the Node.

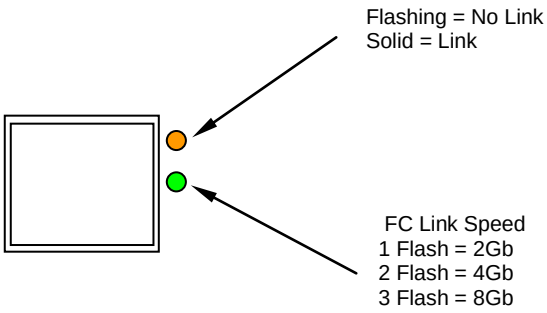
Appendix B LED Indicators

Ethernet



10GB Ethernet port

Fibre Channel



	Note: During heavy data transfers, the LED's may appear off for an extended period.

Appendix C Technical Specifications

Physical	
Form Factor	19” 2U Rack mount
Depth	755.8mm (29.75 in)
Height	87.3mm (3.44 in)
Width (with rack latches)	482mm (18.98 in)
Width (without rack latches)	444mm (17.08)
Weight	29.5Kg (64.9 lb)
Recommended minimum clearance for cooling	
Electrical	
Input voltage	110 –240V
Frequency	50 –60Hz
Input current	
Maximum Power Consumption	
Environmental	
Operating	10° to 35°C (50° to 95°F)
Non Operating	-20° to 60°C (-4°F to 140°F)
Operating Humidity	20% to 80% Non-condensing
Storage Humidity	5% to 90% Non-condensing
Operating Altitude	-15.2m to 3,000m (-50ft to 9,842ft)
Non Operating Altitude	-15.2 to 8,000m (-50ft to 26,250ft)
Fibre Channel Interface	
Physical Interface	2 SFP GBIC connectors
Speed	8Gb, 4Gb, 2Gb Auto or manual selected
Protocol	FC-AL, FC-PLDA, FC-PH, FC-FLA, FCP-SCSI, FC-FS, FC-TAPE
Topology	NL-Port, FL_Port, F_Port, N_Port
Visual Indicators	Link connection, Link Speed
Ethernet Interface	
Physical	RJ45
Speed	10, 100, 1000Mb/s
Protocol	IPv4, IPv6
Visual Indicators	Link, Activity
WAN Interface	

Physical	SFP+ Twin-Ax, 10GBase-SR Laser LC
Speed	10000Mb/s
Protocol	IPv4, IPv6, CHAP, DHCP, NTP, iSNS
Visual Indicators	Link and Link activity