PLANET

MAP-2000 / MAP-2000R

MAP-2100

Mesh Network Manager (MnM) Management Utility – User manual

Rev 2.6.2

March 2006

Contents:

1 Overview

Mesh Network Manager (MnM) is user-friendly graphical interface, Java-based software application developed by the PLANET Technology Corp.

A picture is worth a thousand words, by having a management-software that provides great visual over the whole network, the user has a better and easier understanding regarding the network. Generally, the MnM is capable of performing the monitor and management functions on the network. User can view the network within the coverage area or even remotely, via a WAN connection. Besides, network administrators can also perform configuration on the node by using the Mesh Node Manager through the secure and standard SNMP protocol.

This documentation basically describes the installation and operation of the MnM v2.6.2, as well as some configuration guide on the node.

2 Installation and Un-installation

This Section provides a step-by-step installation and un-installation guide for the Mesh Network Manager (MnM) Management Suite.

2.1 To install the MnM Management Utility

To install the MnM Management Utility on your terminal, grab the *MnM_Installer.exe* application file found on the accompanying disk to any desired directory. Double-click the application file to start up the installation. After completely extracting, a loading window would show on the screen, as illustrated:

Figure 2.1: Loading page when opening the installer.

Once loaded, the installation wizard will be started up. Follow the simple steps directed by the wizard: (* Refer to the following screen shots)

1. Introduction – A brief introduction regarding the installer
2. Choose Install Folder – Select the desired directory to locate the software application.
3. Choose Shortcut Folder – Set the shortcut path.

4. Pre-Installation Summary – A review of the installation settings before starting the installation.
5. Installing – Display the progress of the installation.
6. Install Complete – Indicate the installation has been completed.

Figure 2.2: Installing application - Introduction

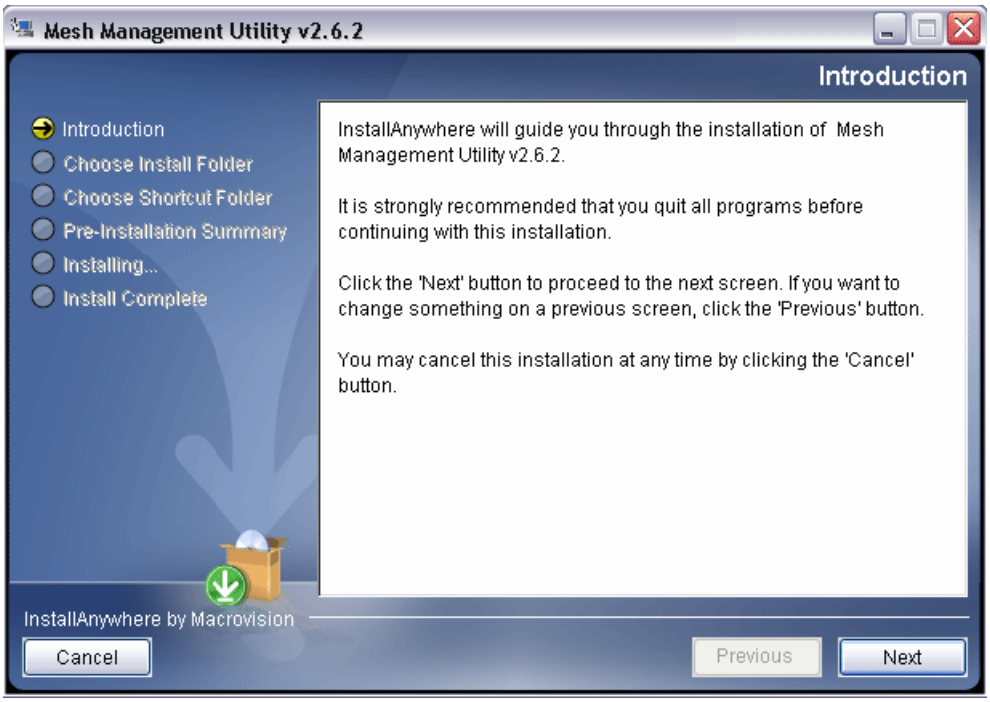


Figure 2.3: Installing application – Introduction

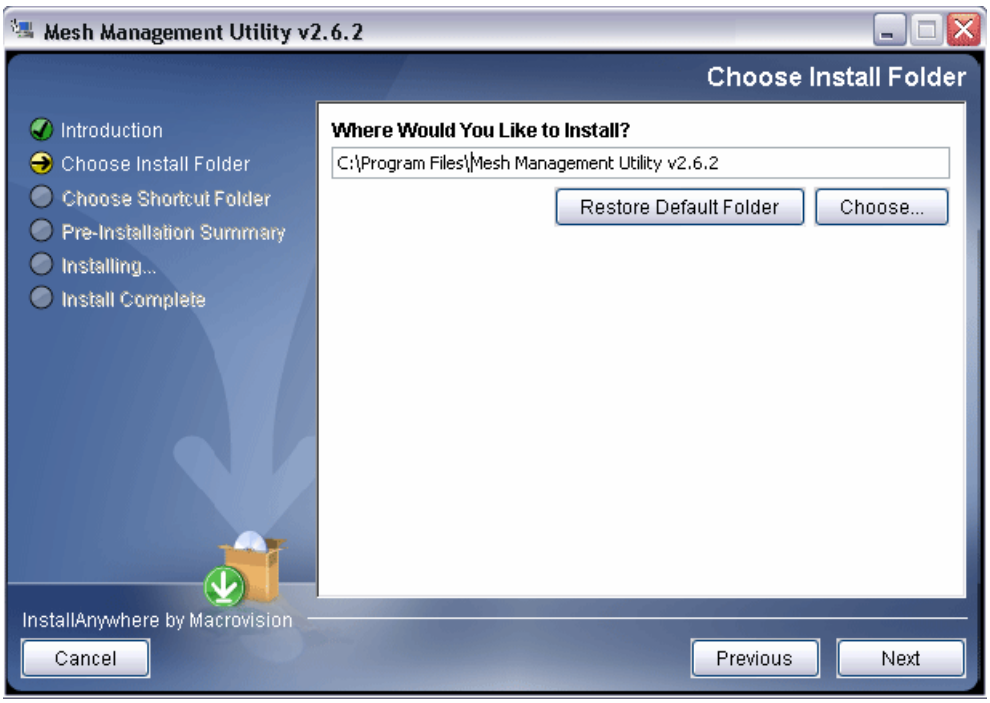


Figure 2.4: Installing application – Choose Shortcut Folder

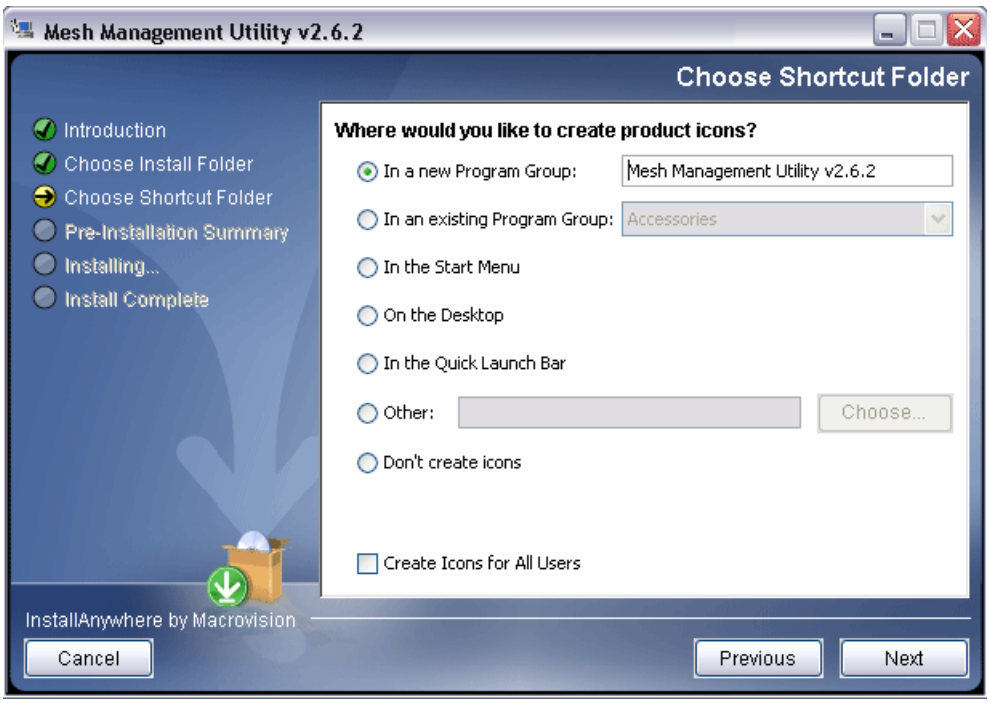


Figure 2.5: Installing application – Pre-Installation Summary

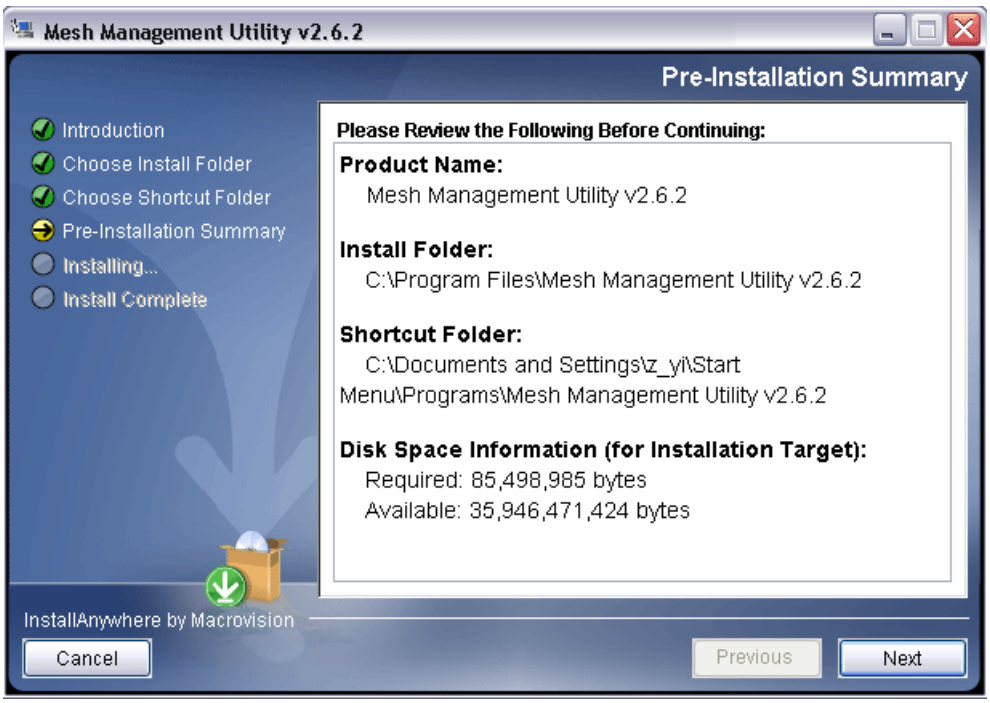


Figure 2.6: Installing application – Installing

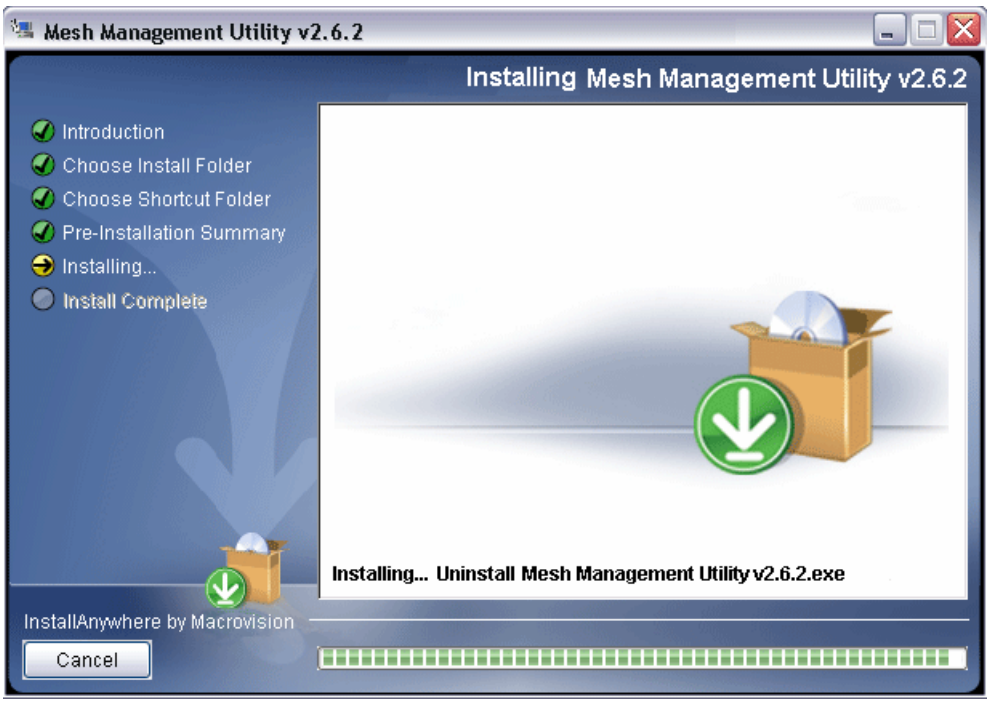
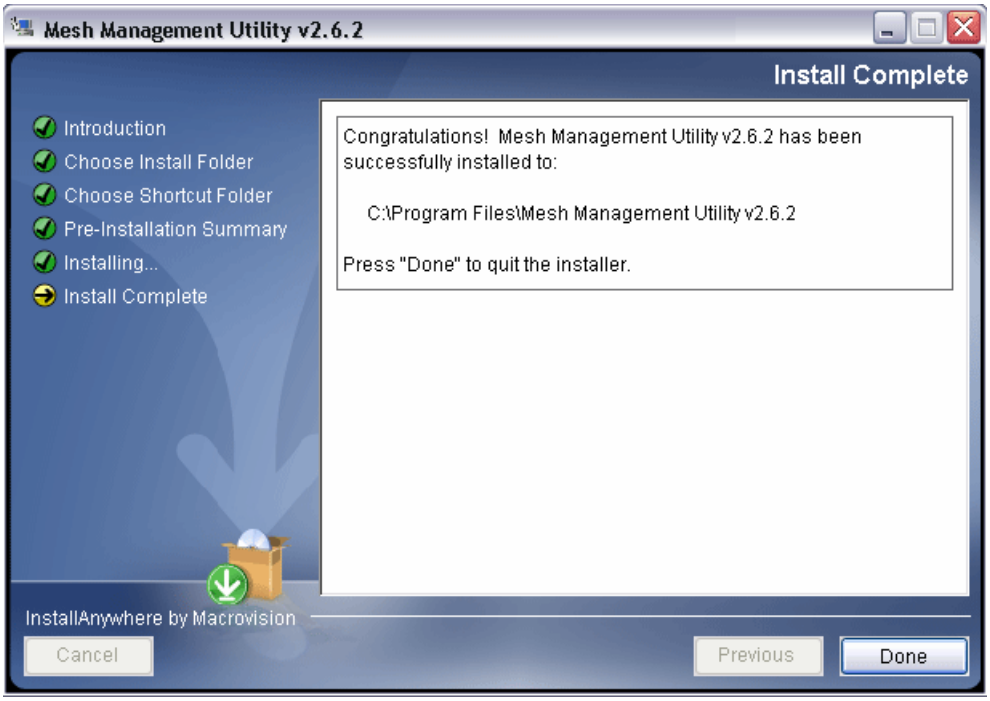


Figure 2.7: Installing application – Install Complete



After complete the steps, you can start up the MnM Management Utility from the shortcut created.

2.2 To Uninstall the MnM Management Utility

The MnM Management Utility Uninstaller wizard is built along with the application. You can uninstall the application by activate the wizard, namely *Uninstall MnM Management Utility v2.x.x.exe*, which is located in the program folder. Follow the three simple steps:

1. Introduction – About the uninstaller. The un-installation will be started once the **Uninstall** button is hit.
2. Uninstalling – The un-installation is in progress. Note that every files and folder created during the installation will be removed. (e.g. *Record* folder is created after the program runs, hence it will not be removed)
3. Uninstall Complete – Un-installation completed successfully.

Figure 2.8: Uninstalling Application – Introduction

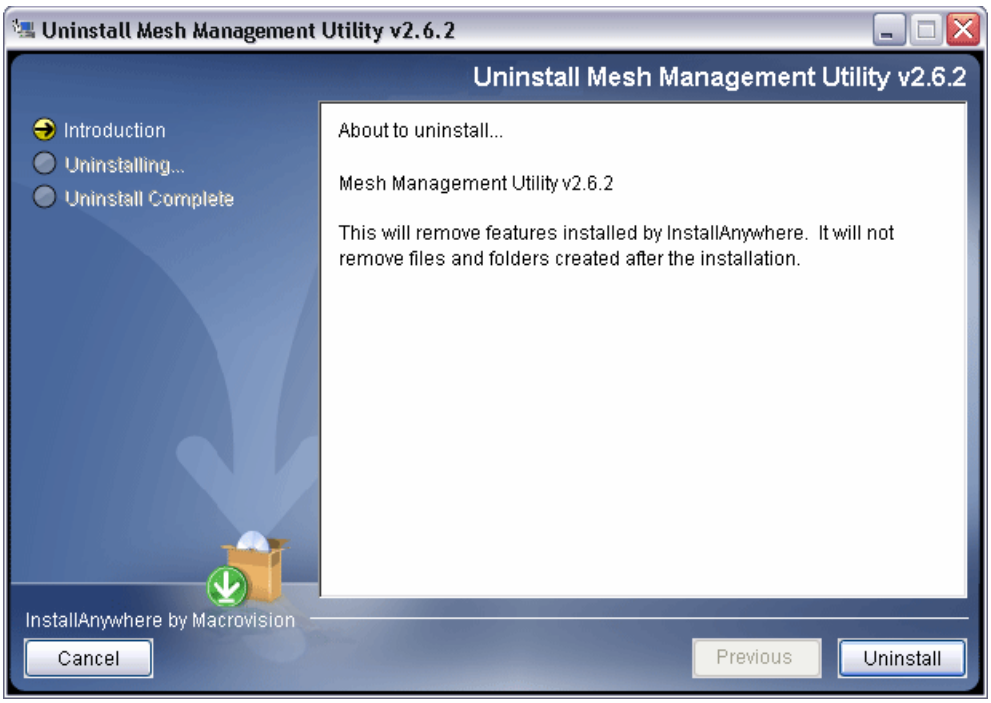


Figure 2.9: Uninstalling Application – Uninstalling

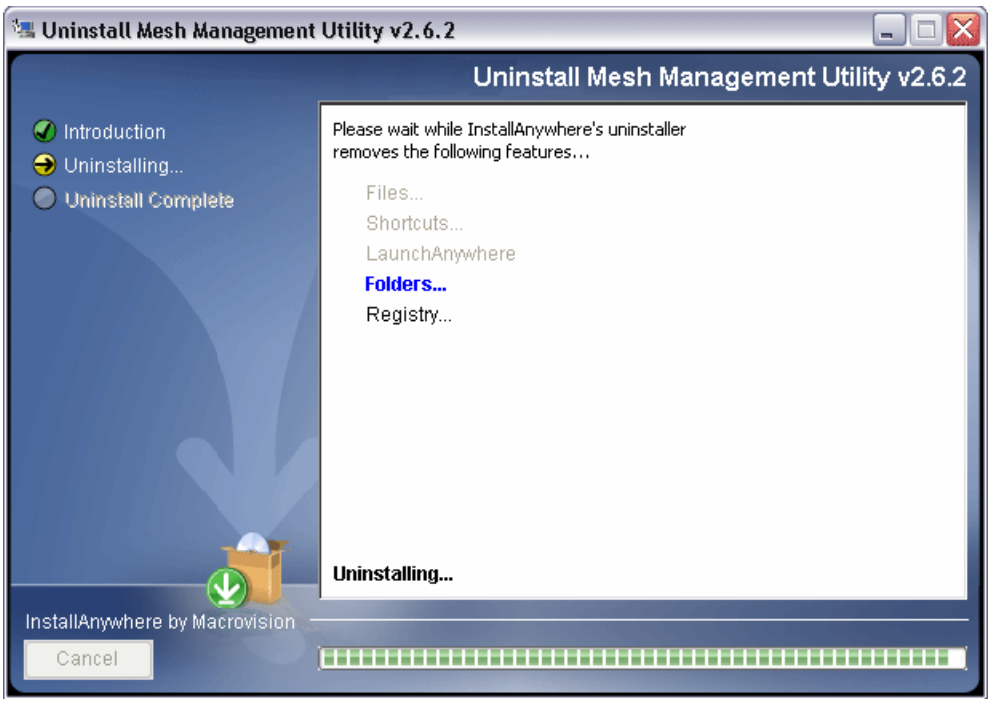
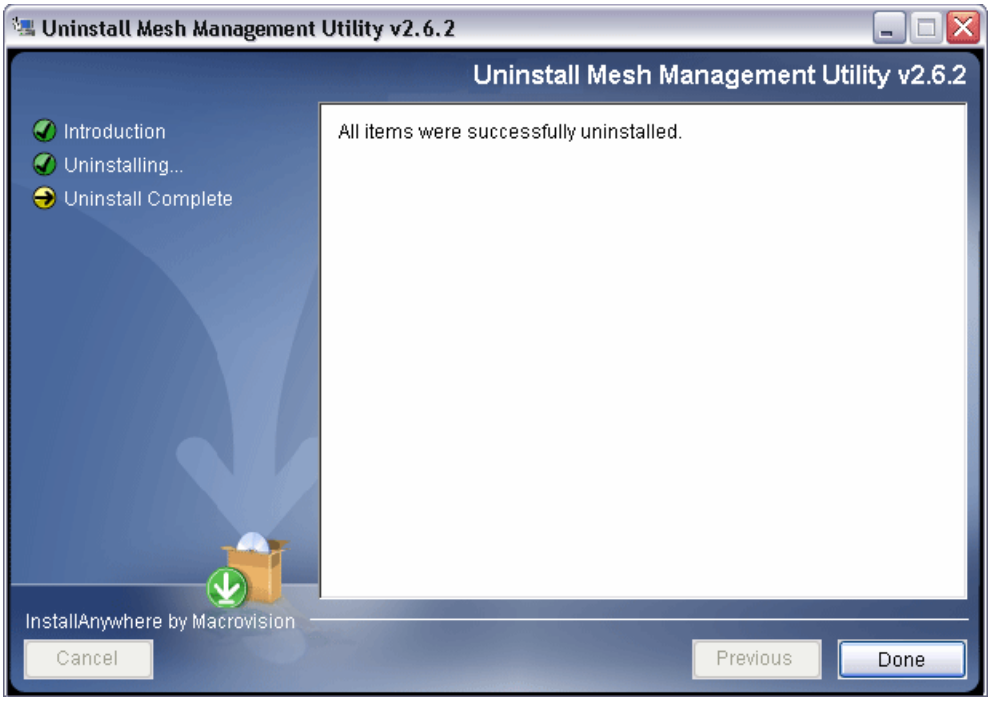


Figure 2.10: Uninstalling Application – Uninstall Complete



3 How to use Mesh Network Manager (MnM)

This Section describes every single feature and operation of the Mesh Network Manager in details, in order to let the user to get familiar and comfortable when working with this graphical interface application effortlessly. Refer to the table below to get the definition of each button in the MnM toolbar:-

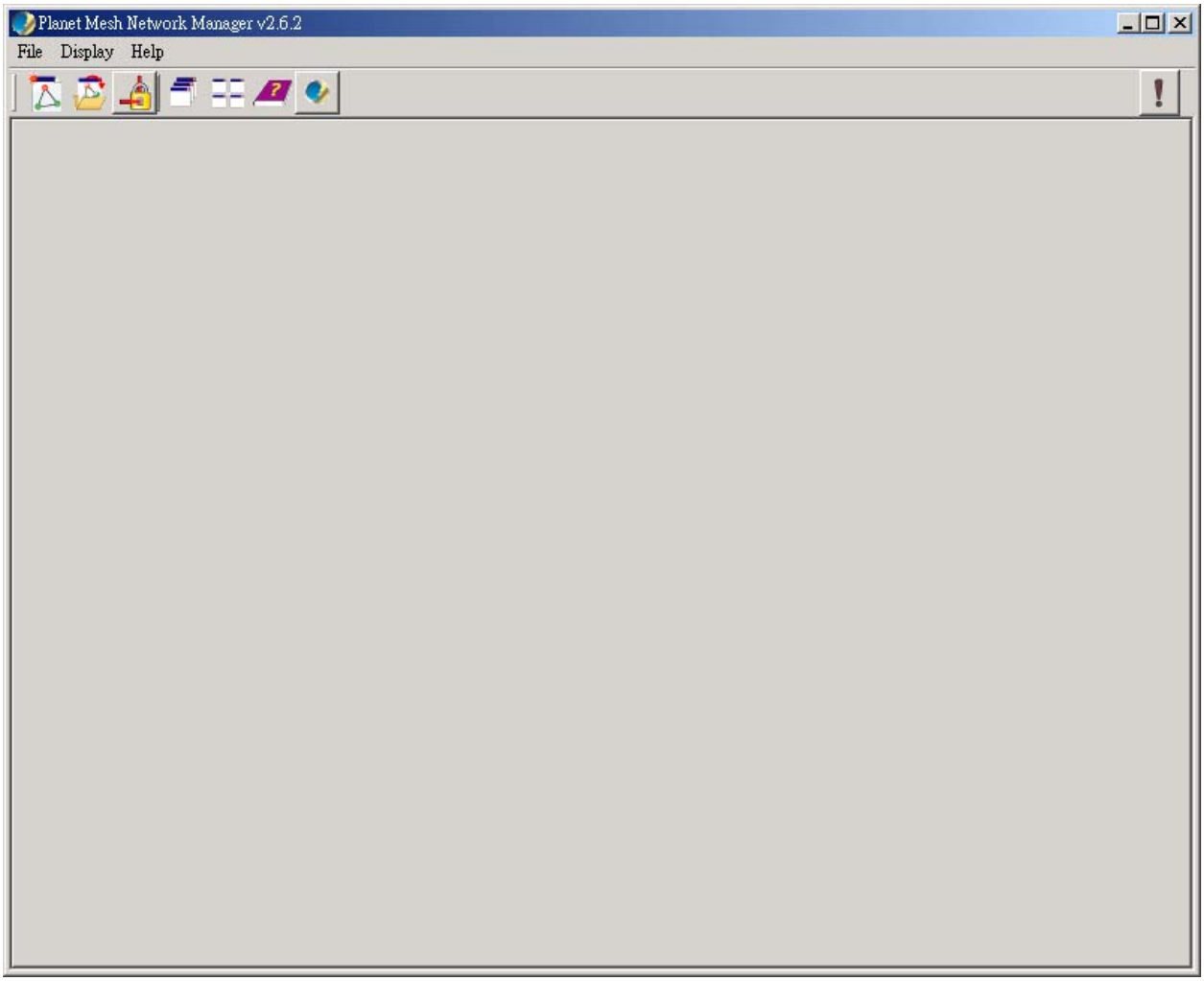
Table 3.1: MnM Buttons Table

Button	Name/Function
	*Create New Scanner* – Create a new network scanner to place in the MnM
	*Load Scanner* – Load a pre-saved network scanner from the desired file
	*Set Up VPN Connection* – Open the Dial-up window to set-up a Virtual Private Network connection
	*Show Frames in Cascade* – Arrange network scanners in cascade form
	*Show Frames in Tile* – Arrange network scanners in overlay form
	*Open Topology Legends* – Open the topology legends window
	*About Mesh Network Manager* – Open the about box of the Mesh Network Manager. The icon can be customized
	Show Trap Viewer – Open the Trap Viewer. Note that the icon would change its color depends on situation. Brown color indicating the Trap Viewer is off; Yellow indicating the Trap Viewer is on; while Red color shows a new trap is being caught

3.1 Start-Up MnM

After completing the installation, the MnM can be set-up easily by clicking on the shortcut at the path predefined. A snapshot of the MnM is shown at the following figure:

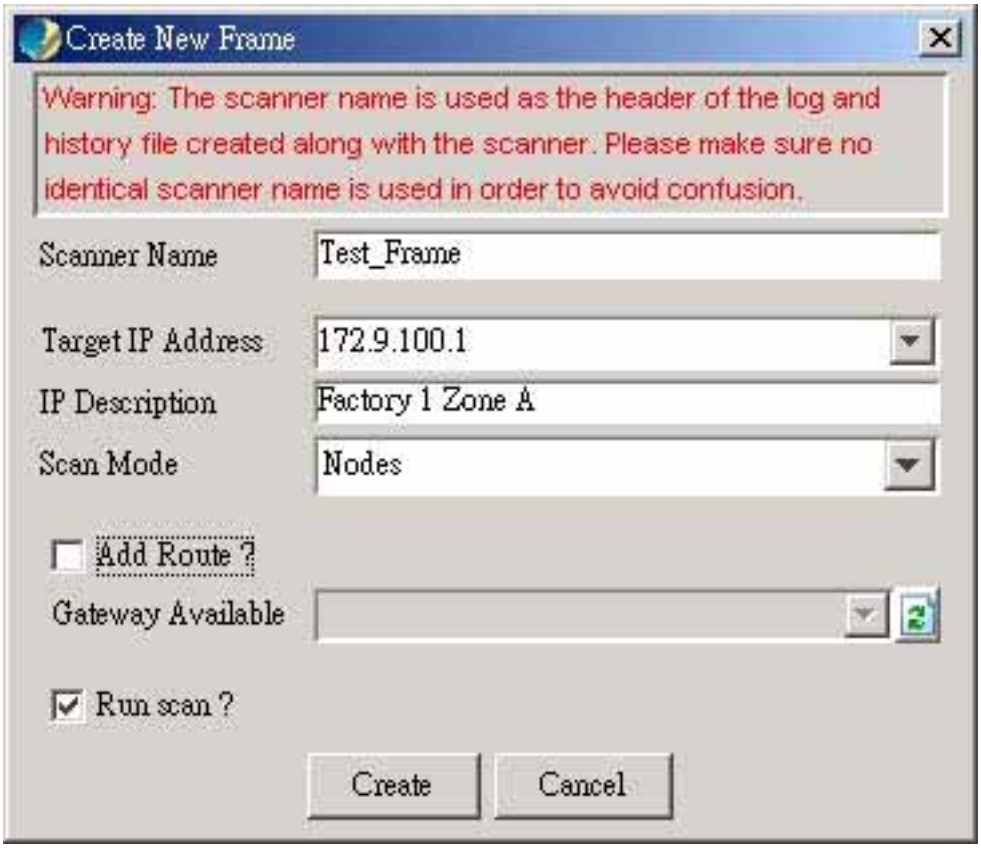
Figure 3.1: MnM Overview



In order to start scanning for a network, select the **Create New Scanner** button, or choose *File* > *Create New Scanner* from the menu bar. This step would popup a window to prompt user to enter the relevant information regarding the network scanner before adding it to the MnM. For more details about the *Create New Frame* window please refer to Create New Scanner.

On the other hand, if user has a pre-saved network scanner profile, it can be loaded to regenerate the previous scanner with its settings. In order to load a scanner, select *File > Load Scanner* option from the MnM menu bar, or click on the **Load Scanner** button at the toolbar. Please refer to Load Scanner.

Figure 3.2: Create New Frame



3.2 Create New Scanner

As mentioned previously, a popup window would appear before a new network scanner is added into the MnM. The *Create New Frame* window prompts user to select the relevant settings of the scanner. The parameters of the window:

- Scanner Name

- Target IP Address
- IP Description
- Scan Mode
- Add Route?
- Gateway Available
- Run Scan

Scanner Name

This is a compulsory field, where the scanner name will also be used as the header of the log and history file created along with the scanner. Hence, users are strictly prohibited from creating scanners with identical name, or using special character (!,@, #, $, .. etc) to name the scanner, in order to avoid system confusion.

Target IP Address

The scanner will start to scan through this IP Address if the **Run Scan** option is checked. The input can be selected from the list of IP Address saved previously or enter a new one. Note that this field is empty at the initial start-up. The IP Address and its corresponding IP Description will be saved into memory once a new scanner is created.

IP Description

The **IP Description** is used as a short description referring to the target IP Address. This field can be edited by pressing any key at the **Target IP Address** column.

Scan Mode

The **Scan Mode** has two options: *Nodes* or *Target IP Only*. *Nodes*, the default mode, would cause the scanner to scan through every single nodes discovered throughout the scanning process, whereas the latter will lead the scanner to scan only the **Target IP Address**. The scan result will be used as the source to plot the topology map.

Add Route?

Check this option to enable the **Gateway Available** field. Enable this field **only** when there are more than one VPN Connection is set up. For more description about the VPN Connection please refer to Dial VPN Connection.

Gateway Available

This field listed the available gateway IP Addresses found in this terminal. User may need to select the appropriate IP Address accordingly (if more than one VPN Connection is set up), in order to set a correct path for the scanner. Note that the manager itself will detect the available VPN Connection set up in the terminal and grab their gateway IP automatically. An empty list indicates that no VPN connection is set up. In order to refresh the list, click on the **Refresh** button, at the right of the list.

Run Scan

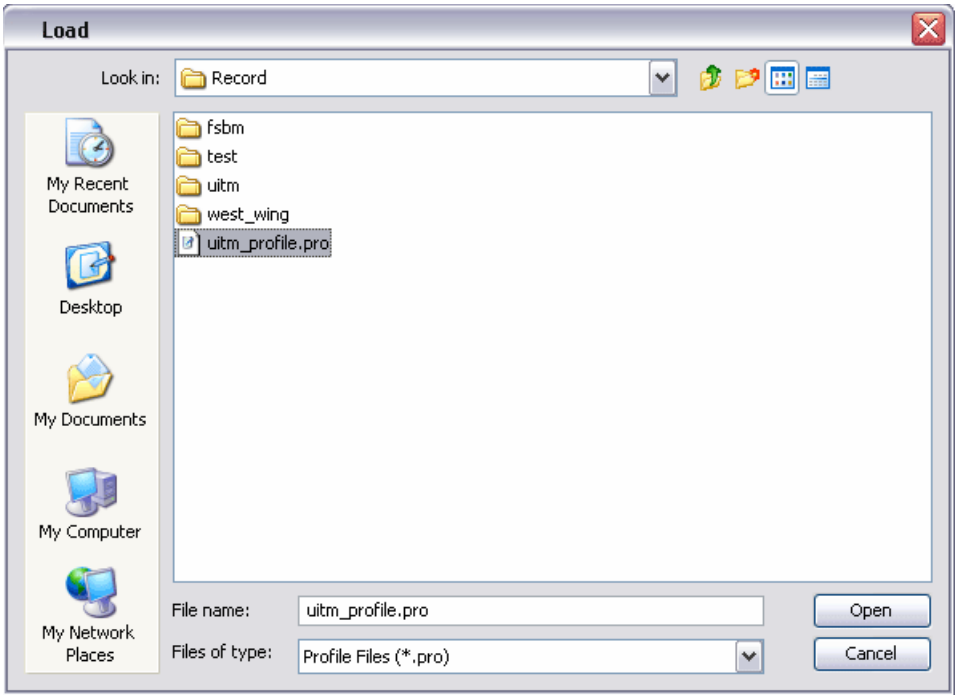
Check this checkbox if the user wishes to start the scanning process once the network scanner is created. Disable the **Run Scan** would cause the settings on the *Target IP Address, IP Description, Scan Mode,* and route settings to be neglected.

Select the **Create** button once the setting is completed. A new network scanner will be created and added to the MnM. While clicking on the **Cancel** button will close the window and neglect all the settings that have been done.

3.3 Load Scanner

If the user would like to reopen the scanner which has been used before, load the .pro file saved previously by selecting the **Load Scanner** button from the MnM toolbar. This action will open a file chooser window, where user can search the profile from.

Figure 3.3: Load Scanner Window



Select the profile (.pro file) and click on the **Open** button, then the scanner will be opened and run.

3.4 Save Settings / Save Settings As..

Once the scanner started the scanning process, the settings can be saved into a .pro file, as a profile. The following settings and data will be stored:

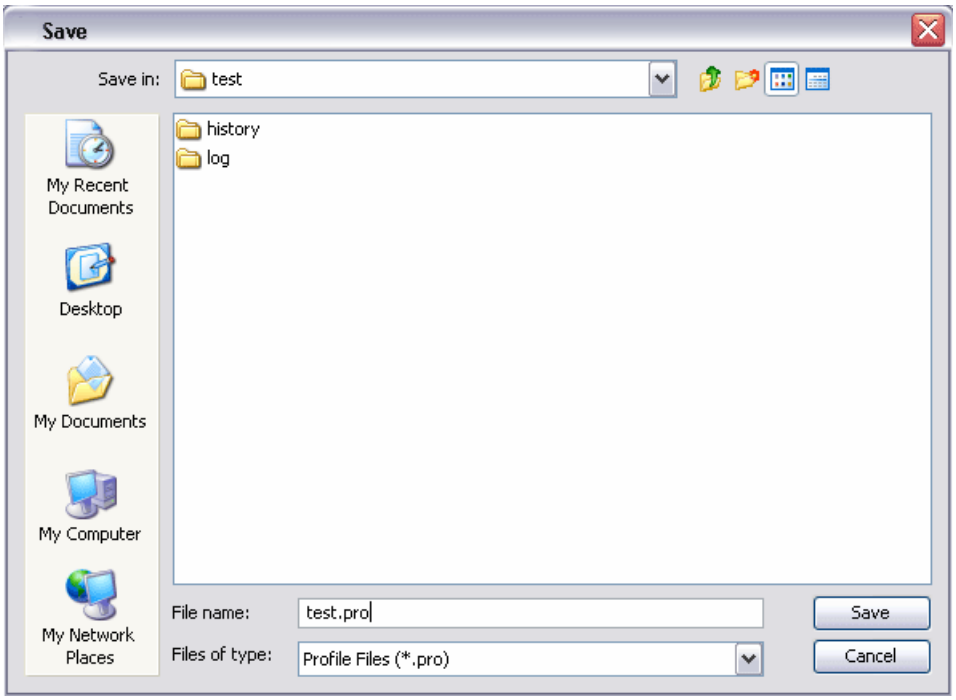
- Target IP Address
- Scan Mode
- Plot Mode
- Topology Map Refresh Interval
- Link Properties Refresh Interval
- Location path and name of the map's background image file
- Nodes' details (e.g. Location name, coordinate on the map)

By Selecting *File > Save Settings* from the network scanner menu bar, the settings will be saved, by default, to the Record folder created along with the network scanner. The location path of the profile:

.*MNM_PATH*\Record*SCANNER_NAME**PROFILE_NAME*.pro

On the other hand, if user wishes to save the profile to elsewhere, he/she may select the *File > Save Settings As..* item from the network scanner menu bar. This action will open a file chooser window, where user can choose the desired location to place the profile.

Figure 3.4: Save Profile Window



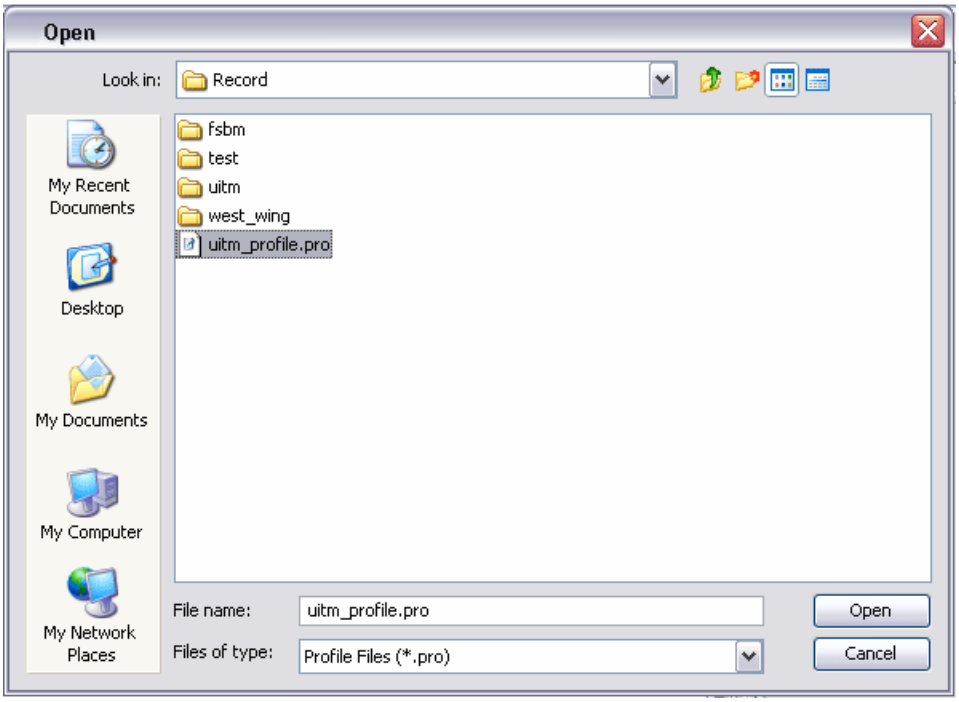
By default, the saved profile will be named with the scanner name as header and follow with "_profile.pro". The profile name, however, can be changed upon user's wish. The extension of the file should be ".pro".

3.5 Load Settings

In order to load a profile to an existing scanner, user can select *File > Load Settings* option from the menu bar of the network scanner to open a file chooser window. Search for the .pro file saved previously and click on the

Open button. The settings will be loaded into the scanner and the scanning process will be started immediately.

Figure 3.5: Load Setting Window



3.6 Import Background Image

This option enabled the MnM to import an image file to be used as the topology map background image. Click on the *File > Import Background* option from the menu bar to open a file chooser window. Choose the desired image file and click the **Open** button. Image file type such as JPEG, GIF and PNG are all acceptable.

Note that the background image is shown only when the *Coordinate* option of *Plot Mode* is used (Please refer to Plot Mode).

3.7 Panes

As overall, the MnM network scanner can be divided into 4 major portions,

- *Topology Map,*
- *Mesh Node Settings* Pane,

- *Link Properties* Pane,
- *Message Pane*

as illustrated at the next page.

Topology Map (I)

Displays the nodes and how they are linked physically. For more details please refer to View Topology.

Mesh Node Settings Pane (II)

Lists the parameters such as the node name, IP Address, Location and so forth, provided the admin SNMP keyword is known. The legend of the Topology Map is also located in this pane. For more details please refer to View and Configure Node.

Link Properties Pane (III)

Displays the node and access point information, such as the number of clients and signal strength. For more details please refer to Link Properties Pane.

Message Pane (IV)

Display the node connection status and log the time and date of the node status. For more details please refer to Message Pane.

All panes, excluding the Topology Map are closable, by clicking the cross button at the right top corner at each panes. To reopen the closed pane, select *View* from the network scanner menu bar and check the desired pane.

Figure 3.6: Network Scanner Overview

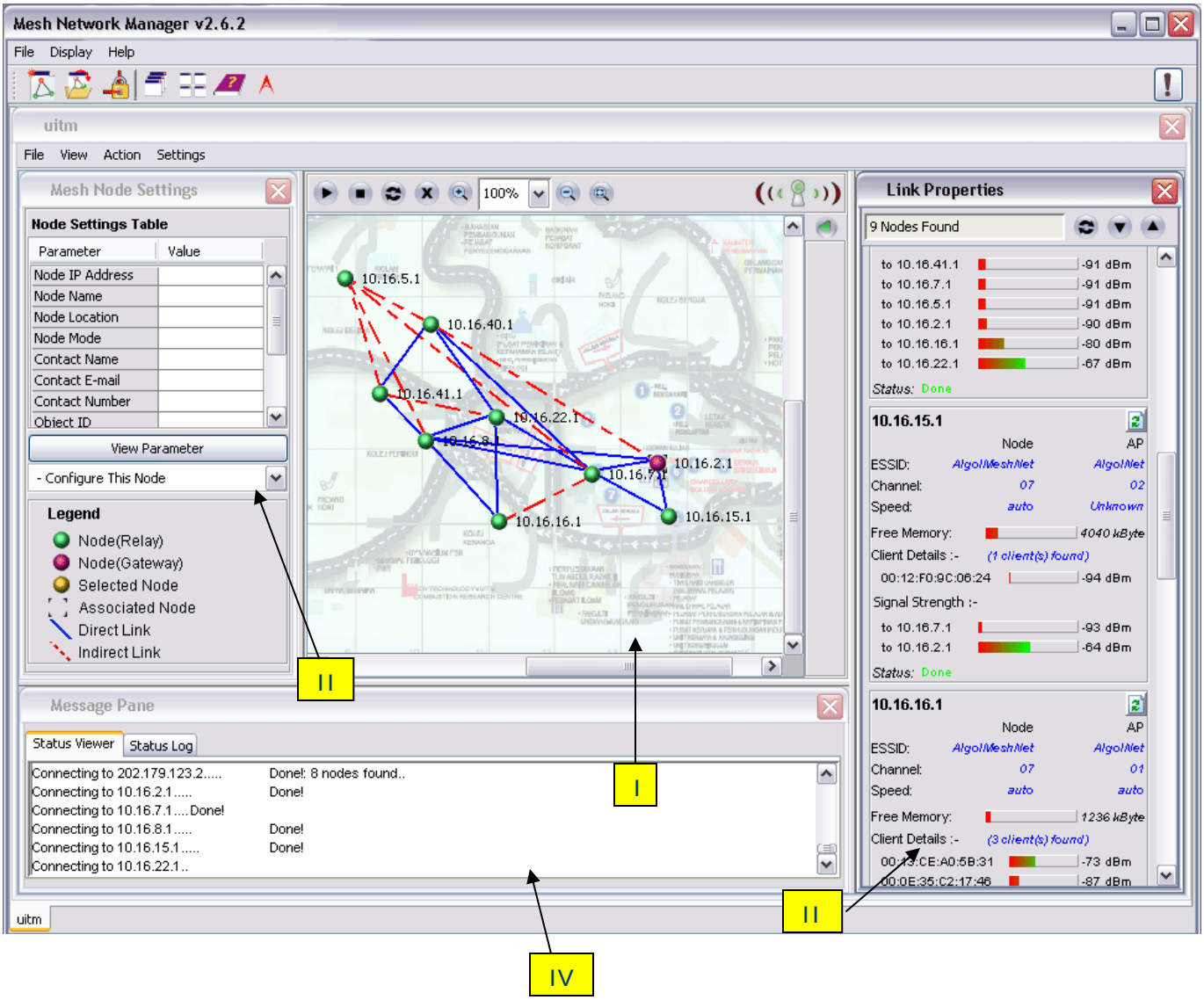
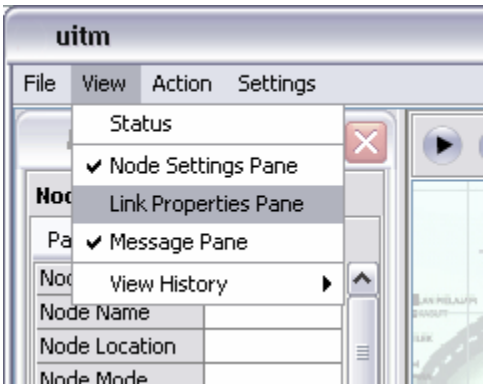


Figure 3.7: View option on the menu bar



The toolbar of the network scanner is located at the north of the topology map. The following table illustrates the function of buttons in the toolbar.

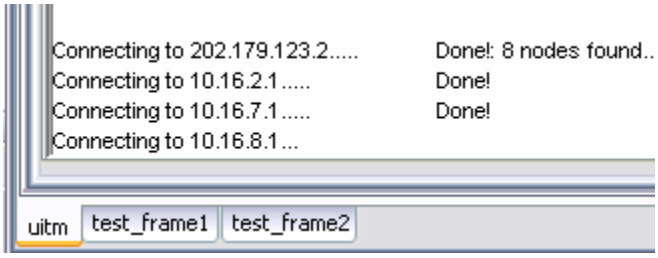
Table 3.2: Network Scanner Buttons Table

Button	Name/Function
	Start Scan – Start the network scanning.
	Stop Scan – Stop the network scanning.
	Refresh/Resume – Refresh the map, or resume the stopped scan.
	Clear Screen – Clean up the map
	Zoom In – Resize the topology map to a larger size (Not applicable in *Random* plot mode).
	Zoom Out – Resize the topology map to a smaller size (Not applicable in *Random* plot mode).
	Zoom Fit – Resize the topology map to a size that fit to the screen size (Not applicable in *Random* plot mode).

3.8 Scanner View

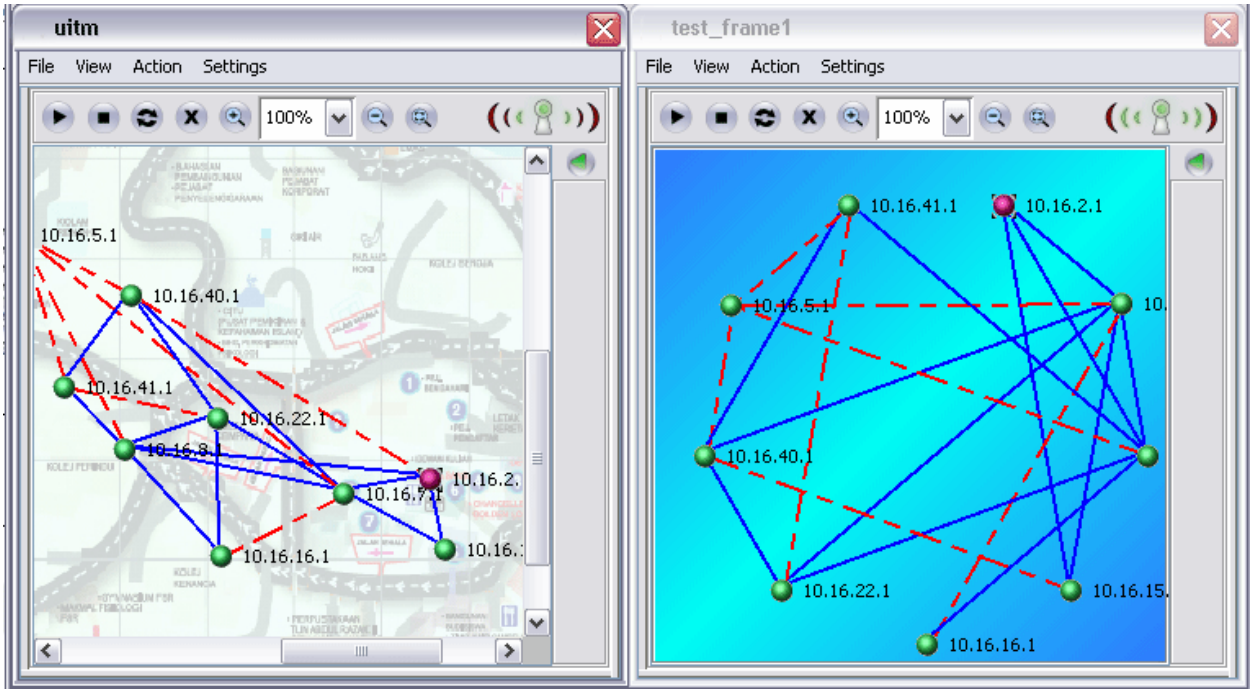
When more than one network scanner is opened, all the frames will be arranged in cascade form, by default, where the new frame will be located at the top of other frames. User can clock on the tabs at the bottom of the scanner in order to switch between the frames.

Figure 3.8: Network Scanner Tabs (Cascade View)



In order to change the form of displaying the scanners, user may select *Display* > *Tile* from the menu bar, or click on the **Tile**, , button on the MnM toolbar. All frames will be aligned in grid format as shown at the following figure. With this form of displaying, all the closable panes will be minimized.

Figure 3.9: Network Scanners in Tile View



The manager can be switched back to the cascade mode by selecting *Display > Cascade* from the MnM menu bar, or click on the **Cascade** button, , on the toolbar.

3.9 View Topology

In order to view the node topology, click on the **Play** button, or select *Action > Start* from the menu bar to begin the scanning process. The MnM will plot the topology through the scan results obtained from every node it detected. In case where the scanner is unable to get results from a node, a warning message will be printed at the message pane, indicating the plotting result might not be a complete one.

For the initial scan of the network scanner, a window would popup to insist the user to enter the target IP Address that the application will scan through. This window only appears once when the application starts. In order to change the target IP, please refer to Change Target IP Address.

The application will connect to the network and scan through the target IP Address, then plot the topology according to the scan result. When the program is started to scan, the loading indicator will turn to green color.

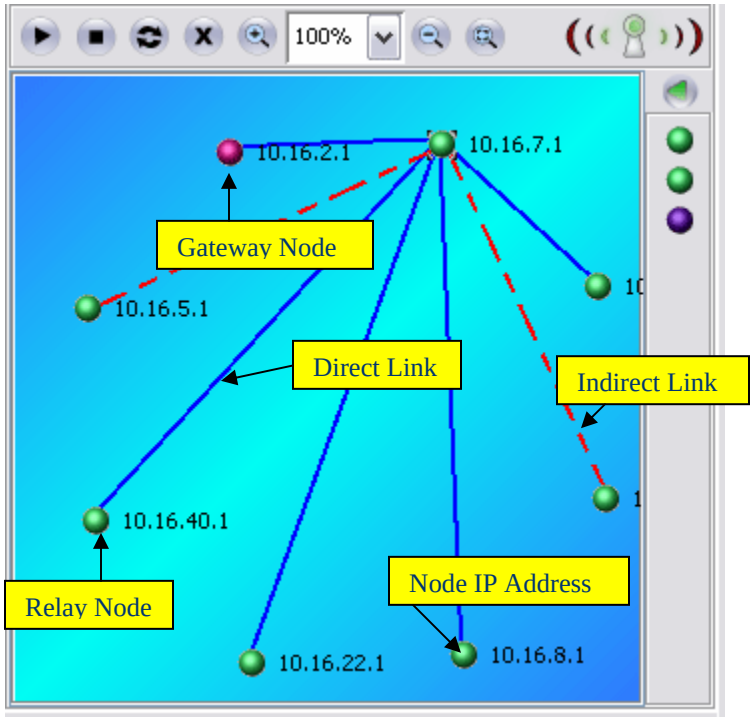
Figure 3.10: Indicator when scan is running

Whereas to stop the scanning, user can hit on the **Stop** button, or selecting *Action > Stop* from the menu bar. The network scanner will stop updating the latest topology immediately, and the loading indicator will turn to red, as shown:

Figure 3.11: Indicator when scan is stopped

The map is displaying "live" data. It will automatically refresh the map whenever there is a change in the topology. An example of the topology map is illustrated at the following figure:

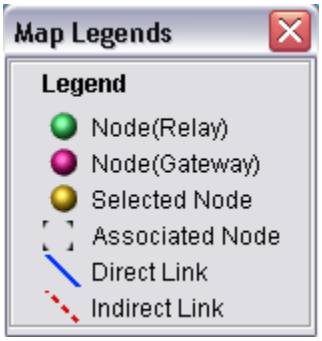
Figure 3.12: Sample Topology Map



3.10 Legend

The legend of the topology map is attached at the south of the *Mesh Node Settings* Pane. However, since all the closable panes are disabled when the MnM is displaying the scanners in tile mode, the legends will be hidden as well. Thus, an alternative method is available, by selecting *Help* > *Legends* from the menu bar, or hit on the **Legend** button on the toolbar, to open the legend window.

Figure 3.13: *Map Legends*



3.11 Refresh Topology

The topology map can be refreshed by click on the **Refresh** button, or selecting *Action* > *Refresh* from the menu bar. This button is also used to resume the map when the scan is paused when viewing a node.

3.12 Clear Topology

The topology map can be cleared by hit on the **Clear** button, or selecting *Action* > *Clear* from the menu bar. Clearing the map does not remove or shut down the node. Instead this action only clear the map in case the map fails to repaint successfully. The map will be resumed soon after the next scanning process is completed. Alternatively, user can select the **Refresh** button.

3.13 Zoom Map

This feature enables the topology to be resized as necessary. The zoom feature consists:

- Zoom In
- Zoom Out
- Zoom Fit

Zoom In

Press the **Zoom In** button, or select *Action* > *Zoom In* from the menu bar will enlarge the map by 25% from its current size.

Zoom Out

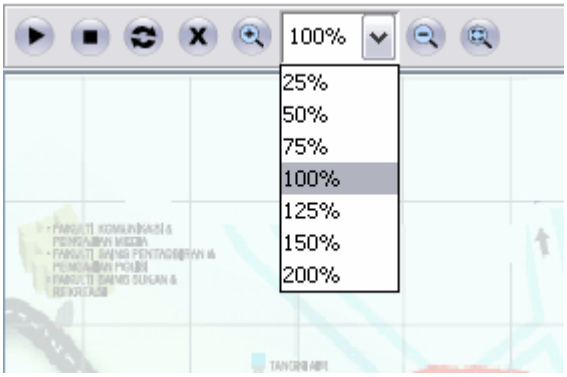
Press the **Zoom Out** button, or select *Action* > *Zoom Out* from the menu bar, inversely, will reduce the size of the map by 25%.

Zoom Fit

This option enables the map to be zoomed to a size that fit to the current window size. Instead of using this button, user can select this option from *Action* > *Zoom Fit* from the menu bar as well.

Besides, notice that there is a drop down lost in between the **Zoom In** and **Zoom Out** button. This drop-down list is used for zooming purpose as well, as it enabled users to resize the topology map according to the percent stated in the list. Note that, however, this feature applies only to the *Coordinate* plot mode.

Figure 3.14: Topology Map Zooming Scale



3.14 Link Properties Pane

The pane that located at the east of the topology map is the *Link Properties Pane*. It displays the information of every node, as well as the links among the nodes in the map. Each node will have a properties box. The pane will

download the information from the nodes once they were added to the topology. The following details are displayed for each node in a properties box:

- ESSID (both Node & AP)
- Channel (both Node & AP)
- Speed in Mbps (both Node & AP)
- Memory Status of the node
- Clients and their details:
  - Device Address
  - Signal Strength (dBm)
  - MLR information (IP Address, Current CN, Previous CN)*
- Links of the node in the topology map and their details:
  - Destination IP Address
  - Signal Strength (dBm)

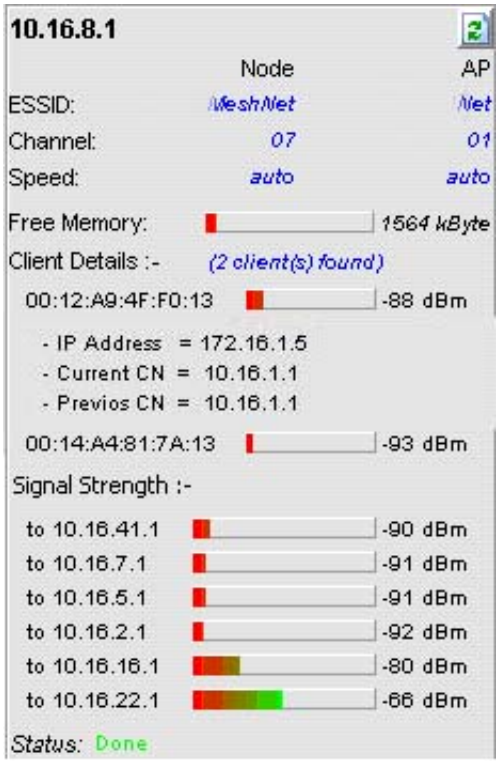
The pane itself will be refreshed at a specific time interval or whenever there is a change of number of nodes discovered by the scan. The time interval can be set by choosing an item from the *Settings > Link Properties Refresh Interval.* The **Refresh** button, , on each of the node properties box can be used to manually refresh the data for that particular node. On the other hand, if the user wishes to refresh every node properties in the pane, click on the **Refresh All** button, , at the top of the pane. The status of the properties box will be shown at the status bar, which located at the bottom of each box.

Note that the MLR information of the client is hidden. They will only show up when the client's MAC Address is clicked. For the node that does not support mobile IP feature instead, clicking on the MAC Address does not give any response. *

All the clients and signal strength bar can be expand or collapse by using the *Client Details* and *Signal Strength* label in the properties box. Besides, the whole box can also be collapsed by hitting on the node IP Address at the top.

* Depend on firmware version

Figure 3.15: Link Properties Box



3.15 Message Pane

The message pane consists of two pages:

- Status Viewer
- Status Log

Status Viewer

The Status Viewer displays the current status of the MnM network scanner, such as the connection status and the error message. These messages will be logged into a text file for future reference. These files are stored in a specific folder created along with the network scanner, which is named by its scanner name. The path of the log files:

.*MNM_PATH*\Record*SCANNER_NAME*\log*Log File Name*.txt

Status Log

The Status Log pane shows the time and date of the status when a node is added or removed from the topology map.

Figure 3.16: Status Viewer

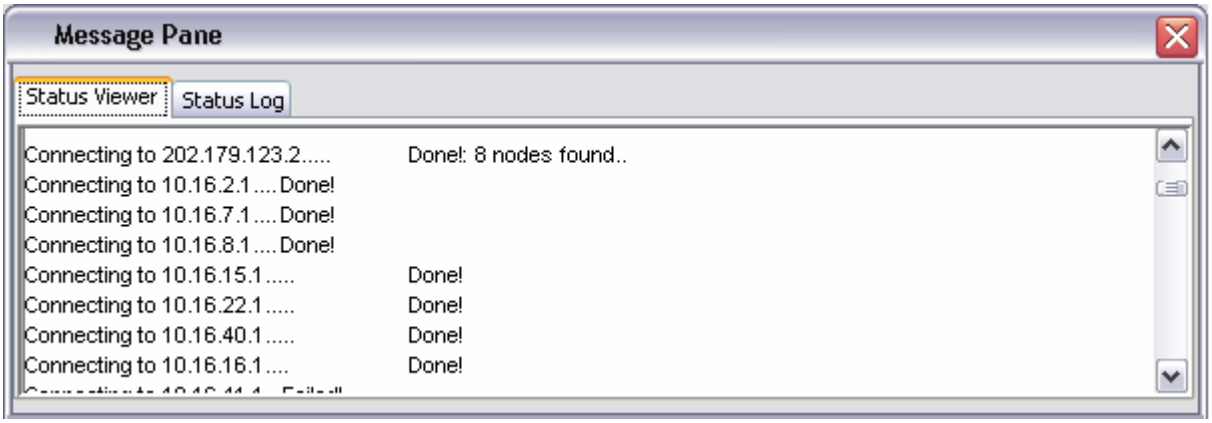
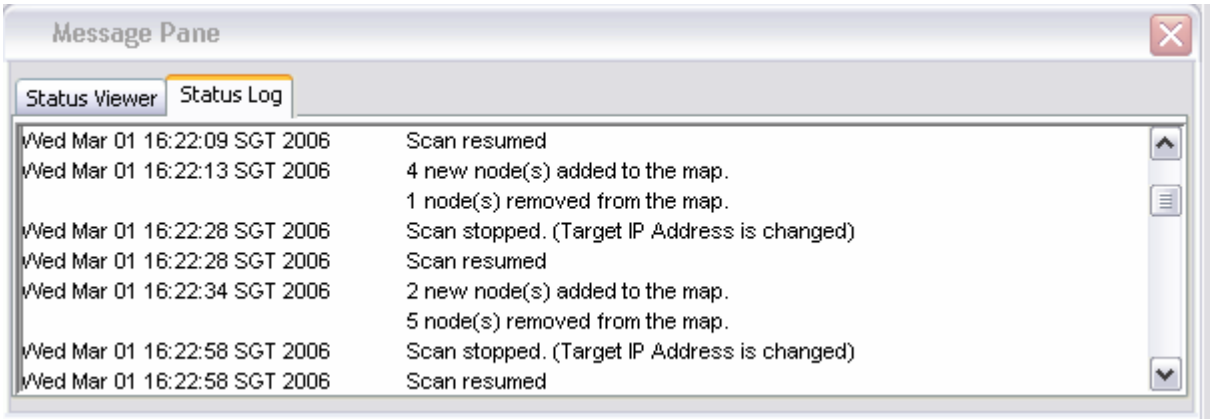


Figure 3.17: Status Log

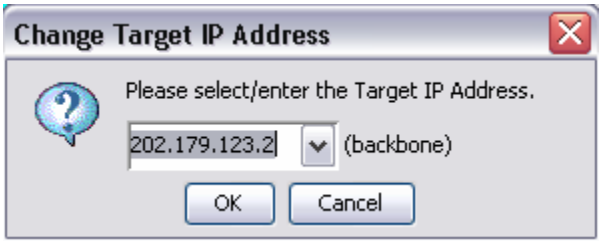


3.16 Change Target IP Address

This option is available at the menu bar of the network scanner. Selecting the *Settings > Target IP Address* will open a dialog box that prompt user to enter or change the target IP Address.

User can enter a new IP Address or select one, which is saved previously, from the list. Each newly entered IP Address will be stored in the memory and listed at the top of the list. To edit the existing IP Address's description, user can press any key in the list. Hit the **OK** button will stop and resume the scanning process with the new target IP Address. To cancel the change, click on the **Cancel** button.

Figure 3.18: Change Target IP Address



3.17 Scan Mode

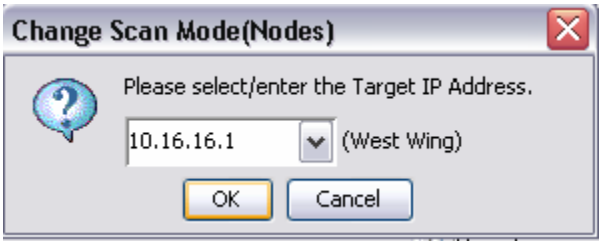
There are two options available for *Scan Mode*, which is *Nodes* and *Target IP Only.* For more details regarding the options please refer to Create New Scanner.

User may perform the change of scan mode by selecting the

- *Settings* > *Scan Through* > *Nodes,* or
- *Settings* > *Scan Through* > *Target IP Only,*

to invoke the following dialog box:

Figure 3.19: Change Scan Mode



Click the **Ok** button will stop and resume the scanning process with the new scan mode and target IP Address, as selected in the list. To cancel the change, hit the **Cancel** button.

3.18 Plot Mode

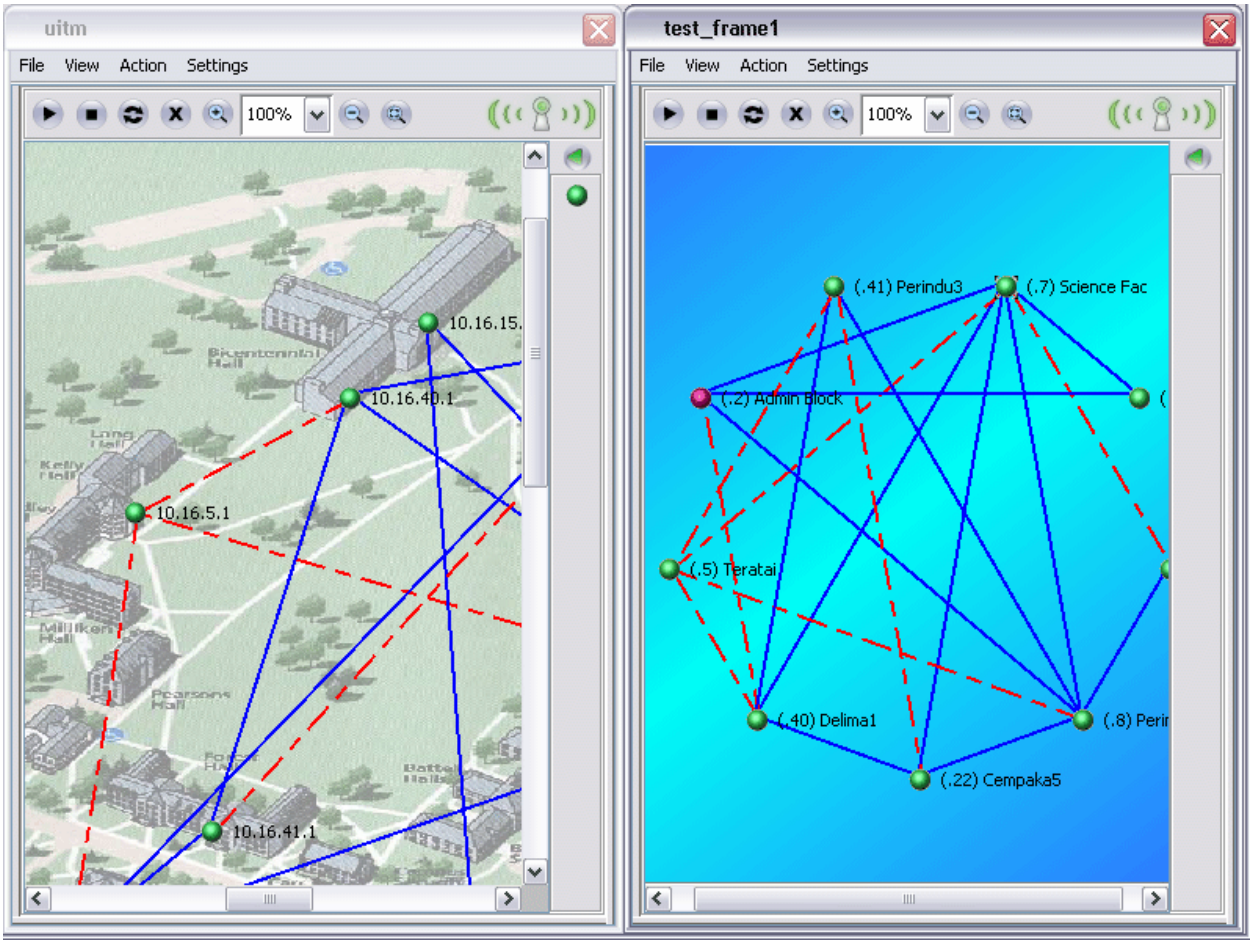
Two options are available, *random* and *coordinate*. By using the first option (*Settings* > *Plot Mode* > *Random*), the nodes will be plotted on the topology

map randomly, where the distance between each nodes does not indicate the actual distance between the nodes.

Whereas if the latter is selected (*Settings > Plot Mode > Coordinate*), user can arrange the nodes on the map to any desired coordinate. User can import a map as a background image for the topology map with this option (Please refer to Import Background Image).

Please note that when a node is discovered by the network scanner for the first time, the node will be placed at the top left corner of the map. In order to place the node to a specified location on the map, unlock the node by uncheck the *Settings > Lock Node Position* option at the menu bar, then drag and drop to a new location. After ensuring every node is at a proper position, check the *Settings > Lock Node Position* option to lock the node on their coordinate. This step is to prevent the nodes from removing unintentionally. The coordinate of the nodes will be stored into memory automatically, so these nodes know where they should be plotted at the future scan.

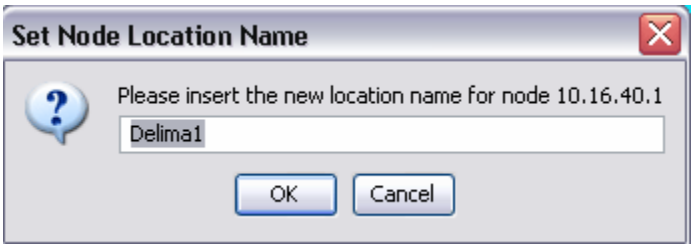
Figure 3.20: Difference between Random and Coordinate Plot Mode



3.19 Show IP Address/Location Name

User may switch the label of the nodes at the topology map from IP Address to Location Name. In order to display the location name, user can select the *Settings > Show Location Name*, from the menu bar. Since the program is unable to return the nodes' location name, therefore user may need to enter the name when the nodes are detected for the first time. To set the nodes name, click on the nodes and choose the *Action >Node Action > Change Node Location Name*, to open the dialog shown below:

Figure 3.21: Set Location Name of the Node



Enter the desired name and click the **OK** button, then it will be saved into memory. Notice that the location name is started with a bracket, which displaying the third byte of the node's IP Address. Inversely, to display the IP Address, select the *Settings* > *Show IP Address* from the menu bar.

The difference between the two is illustrated by the figure at the next page. The figure at the left side displaying the node showing the IP Address, whereas the figure at the right side displaying the node with location names.

3.20 Refresh Interval

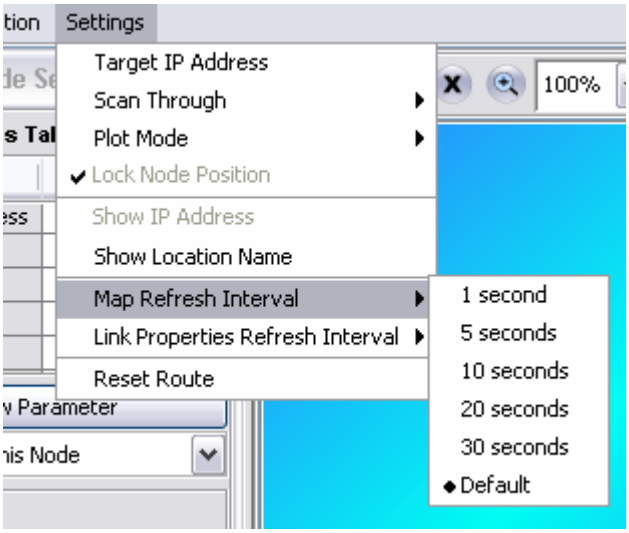
The refresh time interval of the topology map can be altered through selecting the *Settings* > *Map Refresh Interval* from the menu bar of the network scanner. The following options are available:

- *1 second*
- *5 seconds*
- *10 seconds*
- *20 seconds*
- *30 seconds*
- *Default (5 seconds)*

Figure 3.22: Difference between Showing Node Location Name and IP Address

Choose one from the list and the scanning process will be stopped and resumed with the new refresh interval.

Figure 3.23: Topology Refresh Interval



3.21 View History

The MnM will record the status of each node once it started to scan. Any node that has changed the status from “Up” to “Down” will be listed in the *Node Record* column (right to the topology map). By default the column is hidden. It can be expended or hidden by click on the title bar of the column. The record with purple color indicates that the current status of the node is down, while the green color shows the node is up again.

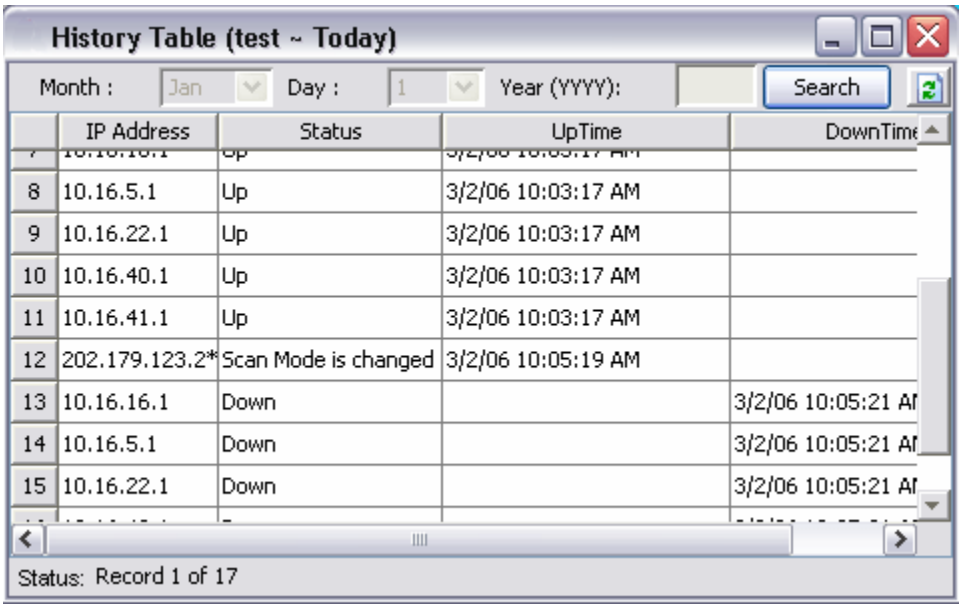
User may clear the record by clicking on the desired IP Address or button on the *Node Record* column.

To view a more detail node records, select the *View* > *View History* from the menu bar. Two options are available:

- *Today*
- *Search by Date*

Selecting any of the two options will open a new window, *History Table*.

Figure 3.24: History Table



This window enable user to view every changes of the topology happened during the MnM is running. The table lists the IP Address, status and the uptime or downtime of the nodes. The table will record the change did on

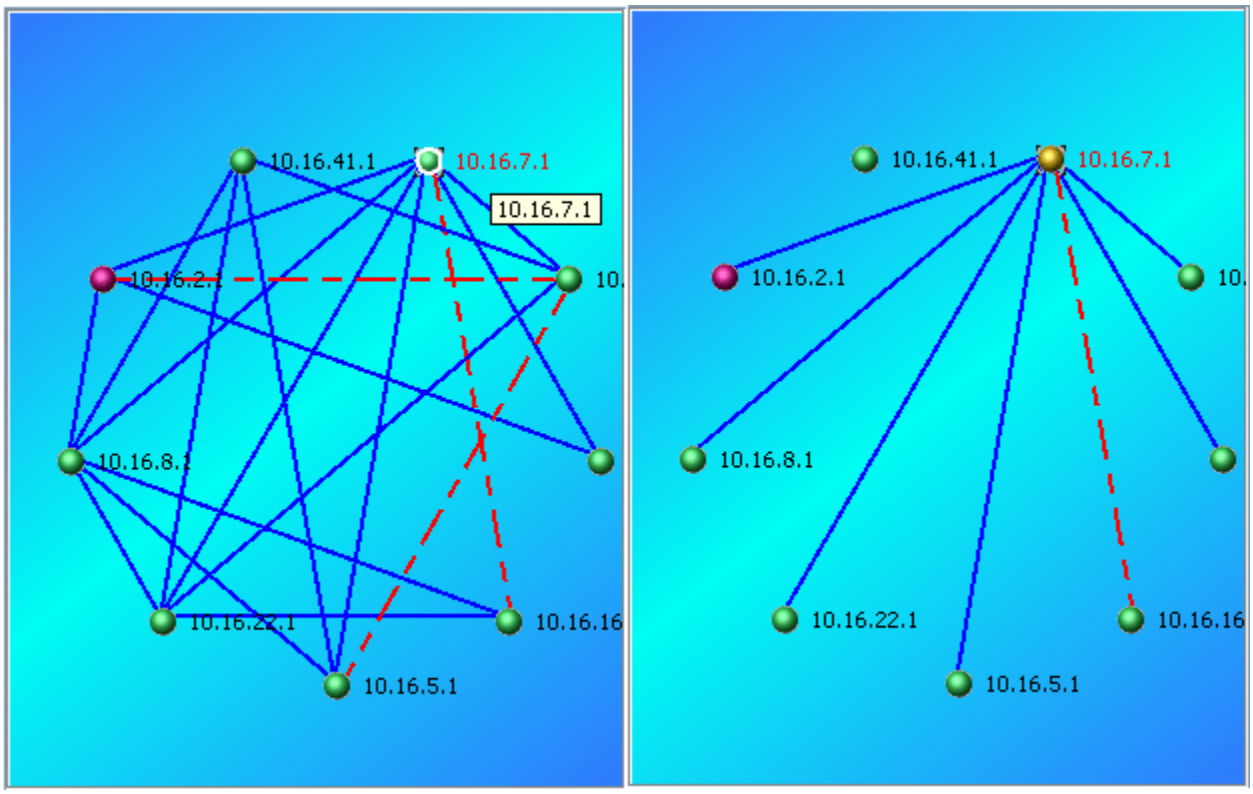
the MnM Network Scanner such as change of scan mode or target IP Address as well.

In order to view the previous history recorded by the same Network Scanner at another date, user can select the second option, *Search by Date*. This option will enable the date field on the top of the history table window. User can enter the specific date then click on the *Search* button to open records. Note that the IP Address with an asterisk (*) is the target IP Address that the network scanner is scanning through.

3.22 View and Configure Node

In order to view or edit the settings of each single node, simply click on the desired node. The map will omit other links regardless to the selected node, showing only the links of the selected node. The selected node will change its color to gold. Please refer to the following figures:

Figure 2.25: Select a Node



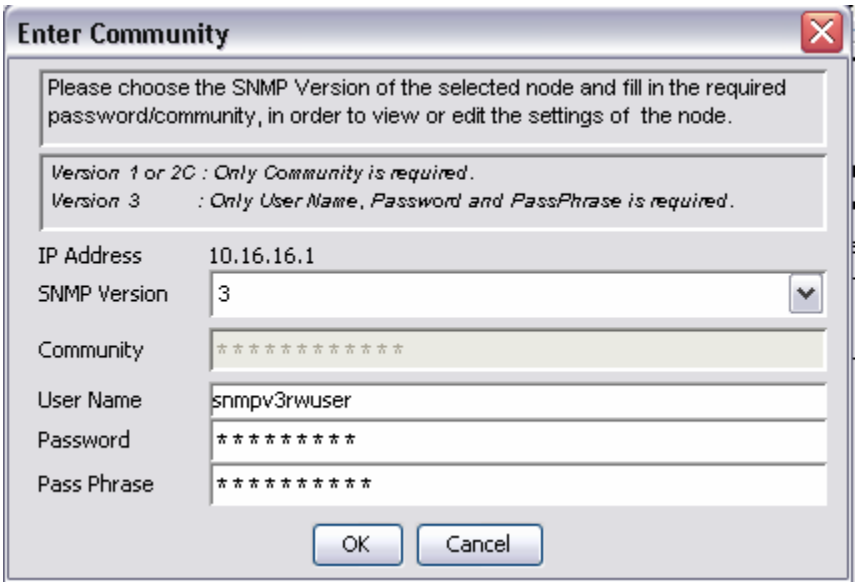
The MnM supports SNMP version 1, 2c and 3. A window would popup when user is trying to access into the node, to prompt user for the SNMP

passwords. User must enter the correct password in order to view or edit the node settings. For version 1 and 2c, user is only required to enter the correct community, whereas for version 3, the username, password, and pass phrase are required.

The default passwords:

- *Community (Read-Only): public*
- *Community (Read-Write): private*
- *User Name (Read-Only): snmprouser*
- *User Name (Read-Write): snmprwuser*
- *Password: snmppassword*
- *Pass Phrase: snmppassphrase*

Figure 2.26: Community Prompt



User is advised to change the SNMP passwords once they had logged into the node. Please refer to Config > Management > SNMPPassword.

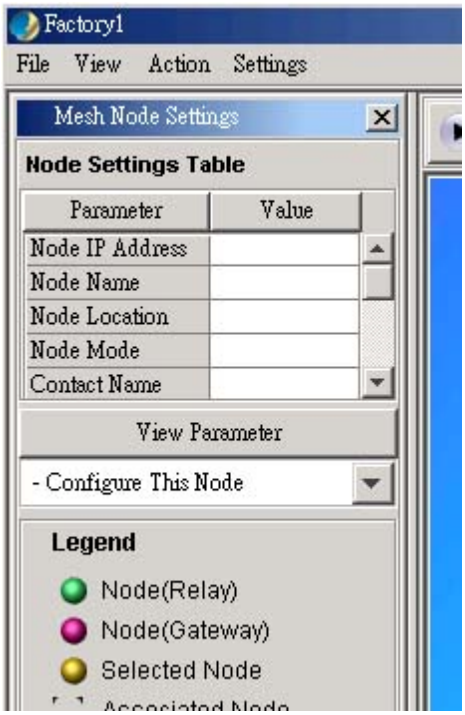
If user would like to view the parameters of the node, click on the *View Parameter* button at the bottom of the *Node Settings Table* in the *Mesh Node Settings* Pane. Then the window will appear on the screen to prompt user to key-in the SNMP Version and Passwords. Click **OK** after entered the

password(s). If the passwords are correct, the parameters will be shown on the *Node Settings Table* (Please refer to the figure at the next page).

In order to perform configurations on the node, user can select one of the two options from the *Configure This Node* drop-down list:

- Open Node Manager – Please refer to Mesh Node Manager.
- Browse – Start-up the web-based configuration page of the node.

Figure 2.27: Mesh Node Settings Table



On the other hand, user can perform these actions through the menu item *Action > Node Action.* Note that the *Node Action* option is only enabled when the node is selected. To resume the topology map back to scanning mode, double clock on the map or hit the **Refresh** button at the toolbar.

3.23 Create VPN Connection

If user would like to scan a network through the backbone line (WAN), a VPN Connection is required in order to make the communication between the network scanner and the nodes discovered possible through the VPN Server.

To create a new VPN Connection, use the *New Connection wizard* of Windows. In order to start-up the wizard, open the *Network Connections* Page (*Start Menu > Control Panel > Network Connections),* then select *New Connection Wizard*. When the wizard turn up, follow the following steps to do the set up: (*refer to the following screen shots)

1. Introduction – Welcome page of the wizard
2. Network Connection Type – Select *Connect to the network at my workplace* and click **Next**
3. Network Connection – Select *Virtual Private Network* and click **Next**
4. Connection Name – Enter a desired Connection Name and hit **Next**
5. Public Network – Select *Do not dial initial connection* and press **Next**
6. VPN Server Selection – Enter the host name or IP Address of the VPN Server that you would like to connect to, and hit **Next**
7. Complete – Click **Finish** to complete the set up

Figure 2.28: Create VPN – Introduction

Figure 2.29: Create VPN – Network Connection Type

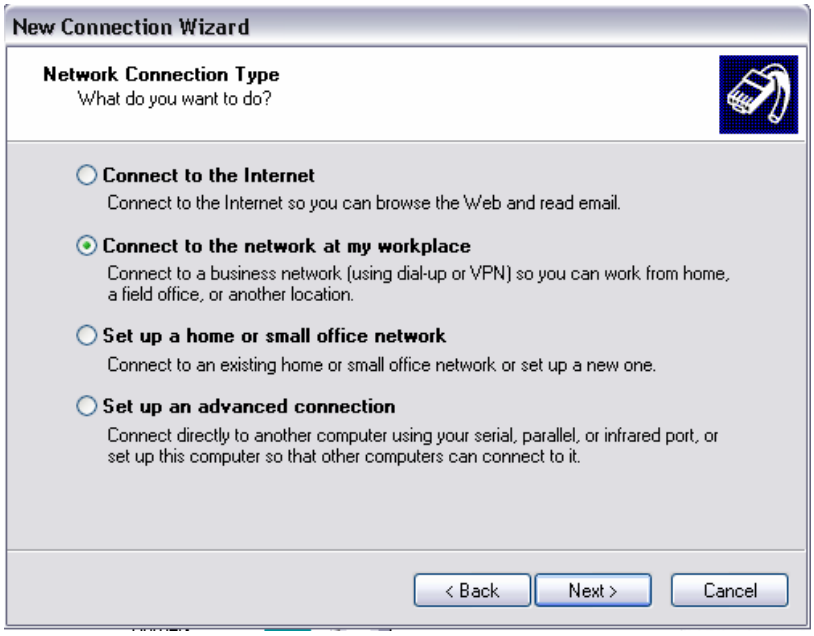


Figure 2.30: Create VPN – Network Connection

Figure 2.31: Create VPN – Connection Name

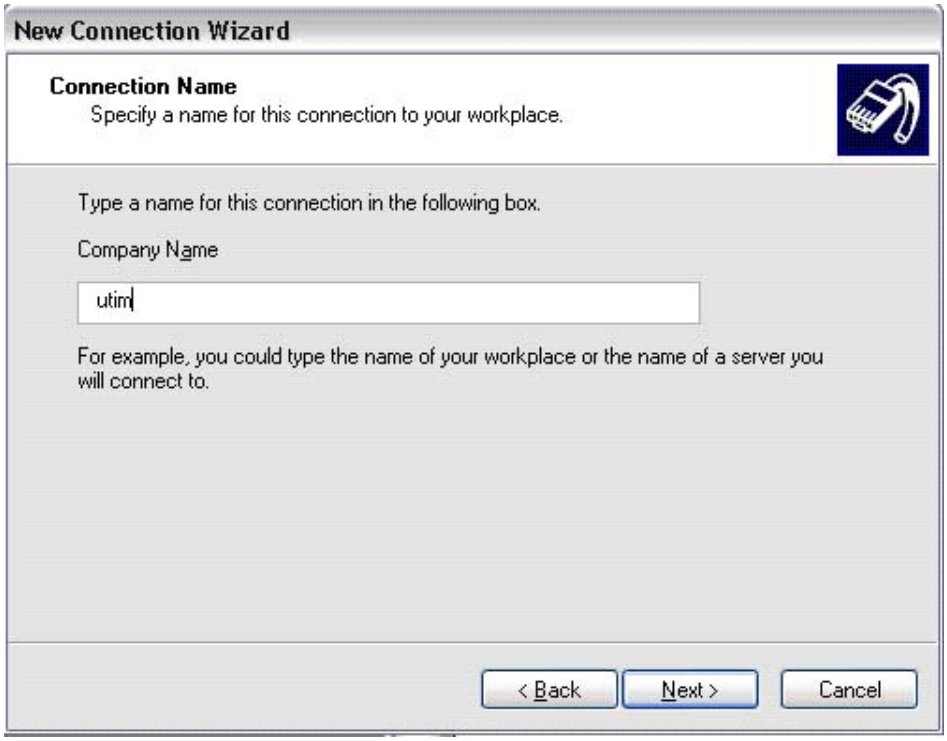


Figure 2.32: Create VPN – Public Network

Figure 2.33: Create VPN – VPN Server Selection

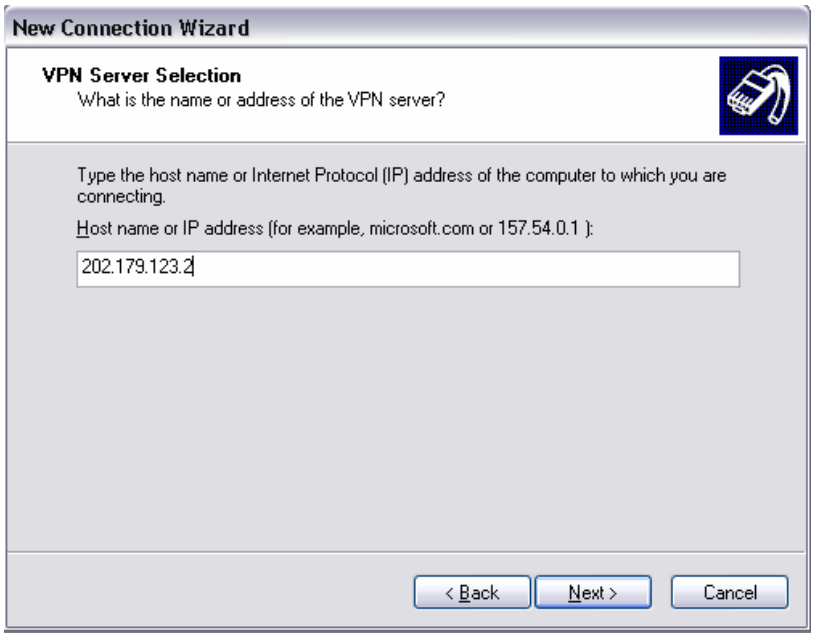


Figure 2.34: Create VPN - Complete

After the shortcut is created, user is required to go to the *Properties* of it, by right-click on the shortcut icon and then choose from the popup window. Alternatively, it can open from the *Connect* page*, as shown:*

Figure 3.35: Open VPN Connection Properties Page

At the *Connection Properties* window, perform the following steps:

1. Select the *Networking* Tab at the top of the page
2. Select the *Internet Protocol (TCP/IP)* from the available list
3. Hit the **Properties** button to configure the item's properties
4. At the TCP/IP Properties Window, select the **Advanced..** button, another window (*Advanced TCP/IP* Settings) would popup.
5. At this window, make sure the *Use default gateway on remote network* option is unchecked and click the **OK** button.

The configuration of the VPN connection is done.

Figure 3.36: VPN Connection Properties

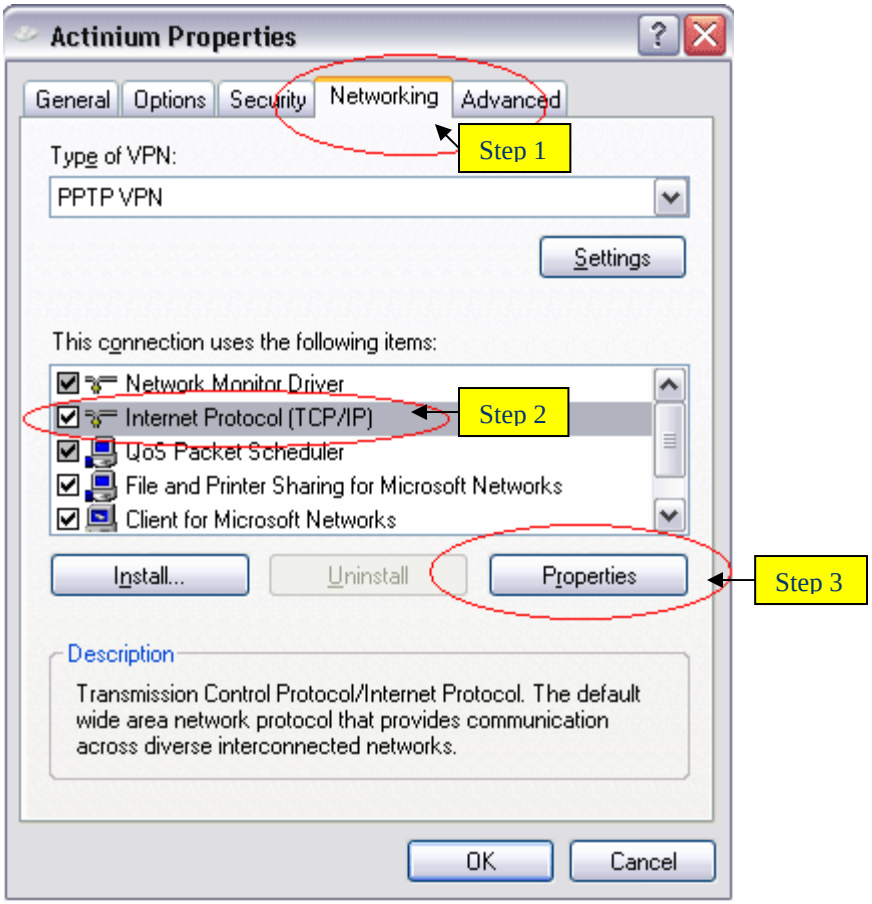
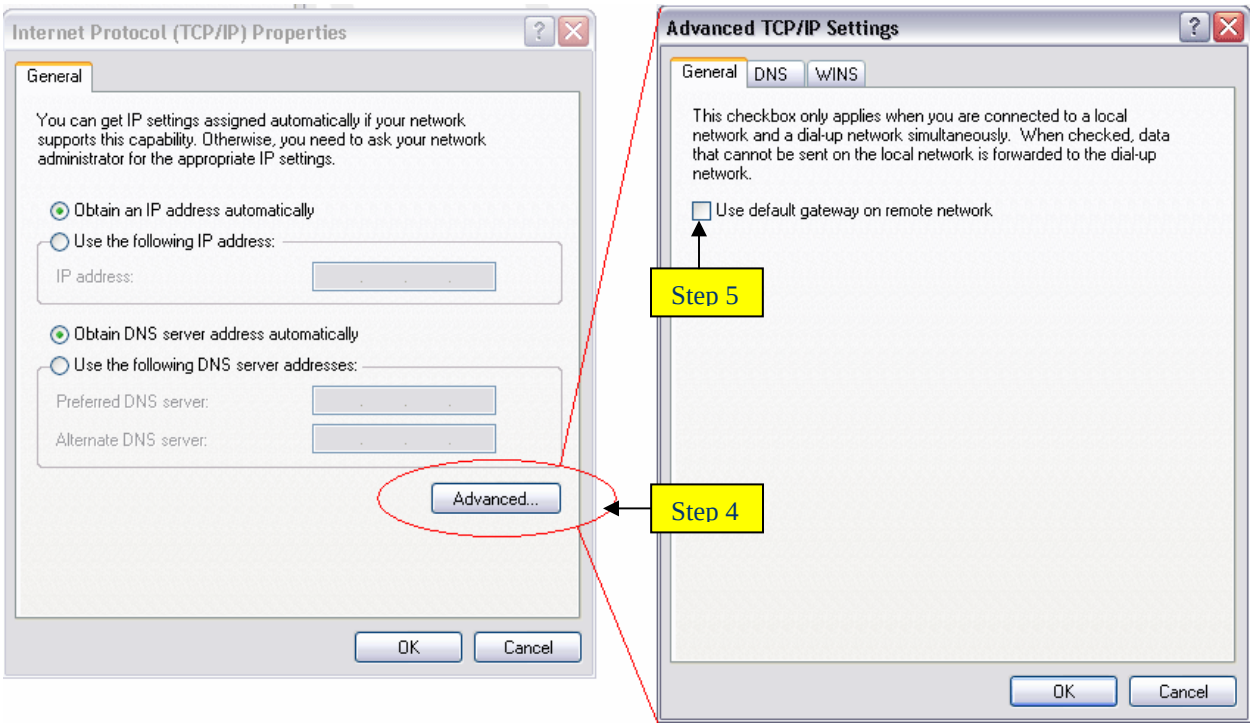


Figure 3.37 TCP/IP Properties Window



3.24 Dial VPN Connection

In order to dial a VPN Connection to a remote VPN Server, click on the **Set up VPN Connection** button at the MnM toolbar. A window would appear at the screen as illustrated by the figure below:

Figure 3.38: Dial VPN Connection

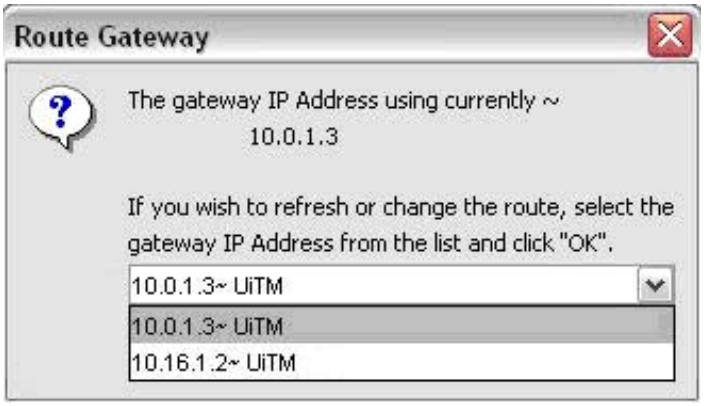
Key in the connection name as preset at step 4 of the Create VPN Connection, as well as the username and password, then hit the *Dial* button. The status bar at the bottom of the table is showing the status of the connection. Once connected, the window will be closed.

3.25 Reset Route

When more than one VPN Connection is started up, the problem of confusion for the network administrator may be occurred. Thus user is required to set route for the specified Network Scanner. Setting route at the scanner will set the nodes at that scanner route only to the gateway selected. Therefore, setting a wrong VPN gateway to a scanner would cause the scanner failed to plot the network topology correctly.

This setting is available at the menu bar of the MnM Network Scanner (*Settings* > *Reset Route*). A window will pop up on the screen, as illustrated:

Figure 3.39: Network Scanner Status



The window will show the VPN Gateway that the current route setting the network scanner is using. If the user is desired to change or refresh the current route, the VPN gateway can be chosen from the drop down list, which are detected by the MnM, then click on the **OK** button.

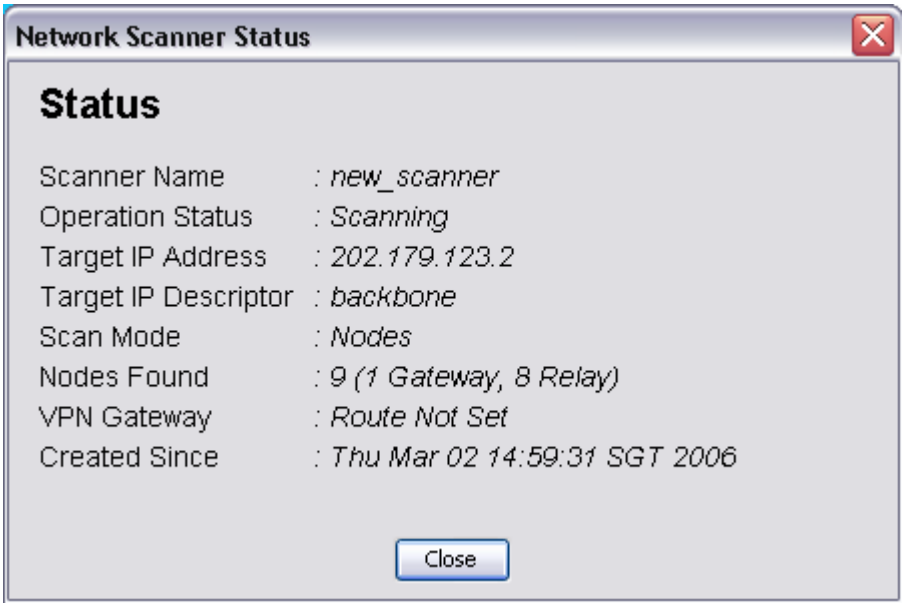
3.26 Login

If the user is using the MnM (wirelessly) within the network coverage area, they may face the problem that the network scanner failed to download data from the node, due to the client restriction. Therefore, in order to solve this problem, user may need to login to the network by opening any of the web-browser. The browser will redirect the user to the login page of the customized mesh network. If the login is successful then the MnM will manage to scan and plot the topology map.

3.27 View Status

User can view the status of the MnM Network Scanner by selecting the *View > Status* from the menu bar. This will open a dialog box displaying the scanner information, such as the scanner name, target IP Address, scan mode and so forth. The dialog box is shown as below:

Figure 3.40: Network Scanner Status



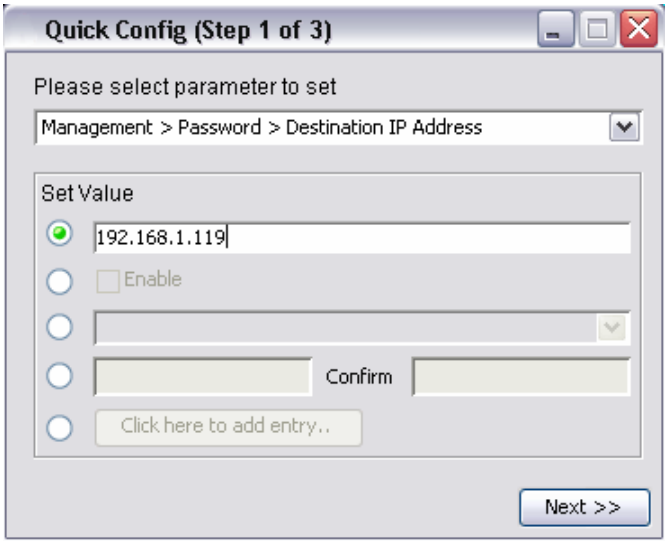
3.28 Quick Config

The feature is used to configure the node scanned by the MnM in a more straight away and simpler method. By this method, user needs not to run the Mesh Node Manager to configure the node. On the other hand, *Quick Config* allows configuration of multiple nodes simultaneously. This feature will be run in wizard form. In order to run the *Quick Config*, select *Action> Quick Config.* from the network scanner menu bar.

- Step 1:

  The first step urges the user to select the parameter to configure and the value to set. The drop down list at the top consists of the list of parameters.

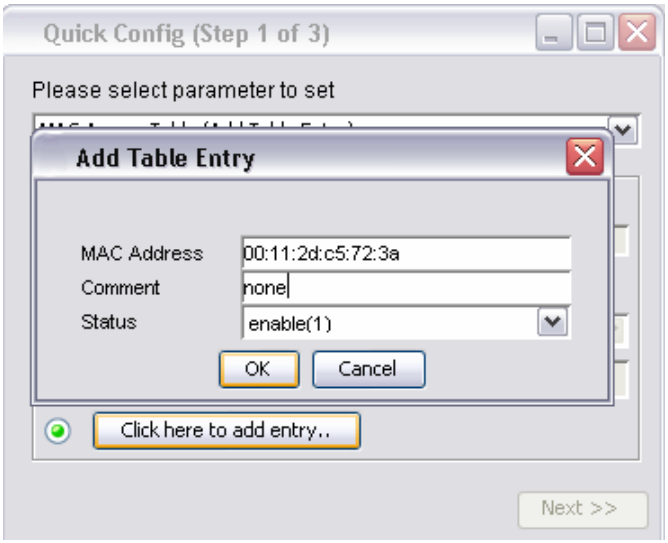
  Figure 3.41: Quick Config. Step 1



Select the desire one from the list and enter the value required at the bottom portion. Click **Next** button to proceed.

Note: For the table entry type value, click on the **Click here to add entry** button to invoke a window that to prompt user to enter the table parameters, as shown:

Figure 3.42: Quick Config. Step 1 (Table Entry)

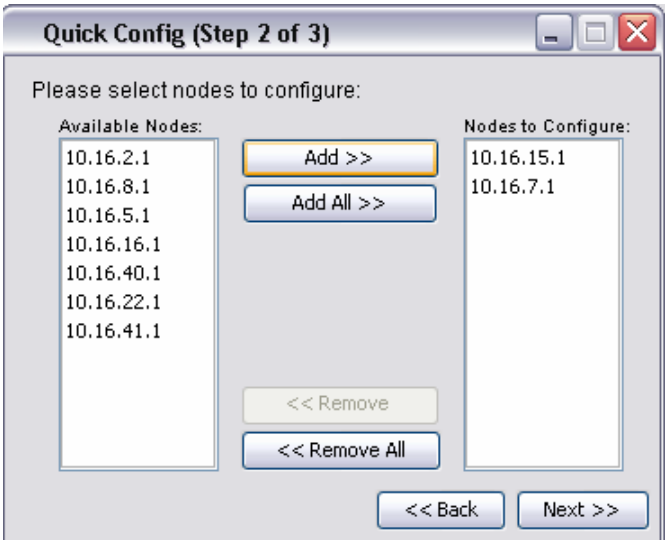


- Step 2:

At this step the user will be prompted to select the node/nodes to be configured. As stated previously, multiple nodes configuration concurrently is allowed. Select the nodes available from the *Available Nodes* column (left)

and use the **Add** or **Add All** button to move the desired unit to the *Nodes to Configure* column (right). Conversely, use the **Remove** and **Remove All** button to remove the nodes from the *Nodes to Configure* column. Click **Next** button to proceed to next step or **Back** button to back to the previous step.

Figure 3.43: Quick Config. Step 2



- Step 3:

Enter the SNMP password before setting the values. For more details regarding this step refer to View and Configure Node. Select the **Set** button to start the configurations of the nodes.

- Step 4:

This page displaying the status of the configurations for each node.

The ✓ sign indicating the configuration on that particular node is successful, while the ✗ sign shows that the setting was failed. After the configuration is done, user may click the **Configure another parameter** button to back to the first step of the Quick Config Wizard to configure another parameter, or select the **Proceed** button to proceed to the reboot page.

Figure 3.44: Quick Config. Step 3

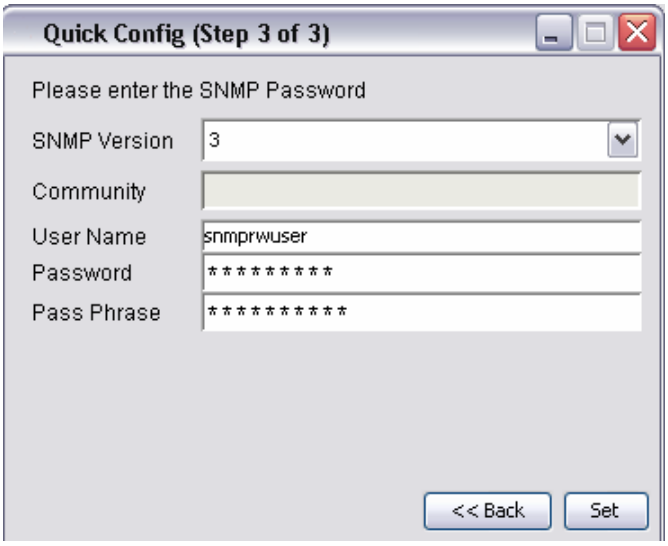
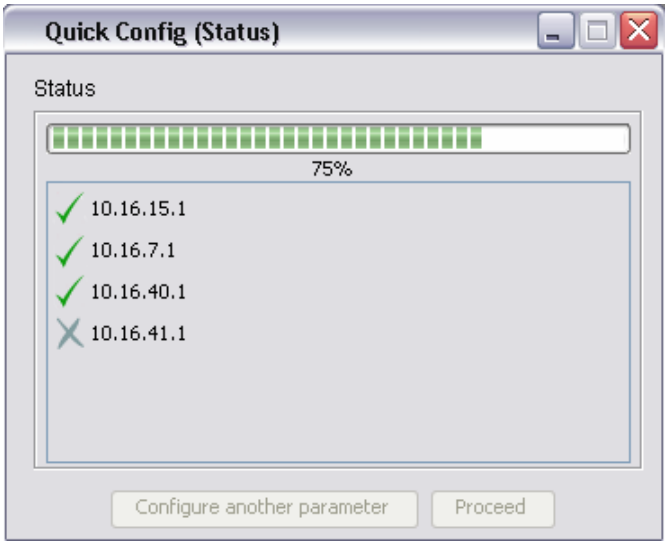


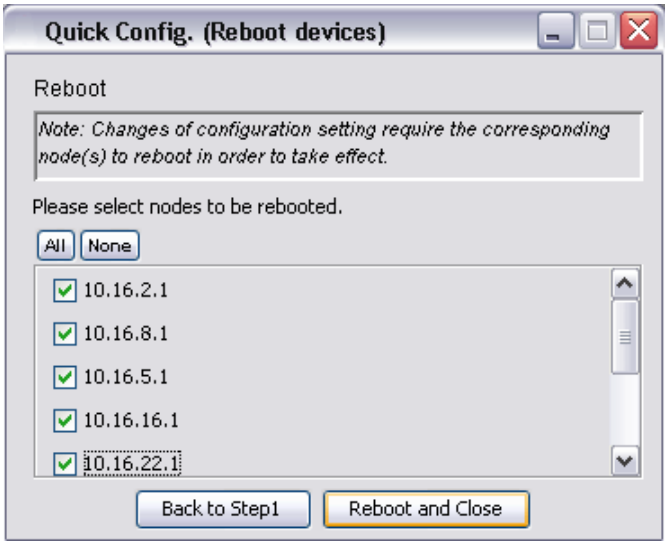
Figure 3.45: Quick Config. (Status)



Step 5:

After configure all the desire settings, the AP device is required to be rebooted in order for the changes to take effect. Select the check box of the correspond node that need to reboot, and click on the **Reboot and Close** button. Select the **All** button to select all the nodes, whereas the **None** button will unselect all devices. Beware that rebooting the AP Unit would cause the user currently connected to them lose their connection, and the whole process would take approximately 60 seconds.

Figure 3.46: Quick Config.(Reboot)



3.29 Trap Viewer

The MnM provides user another useful feature, which is the *Trap Viewer.* The *Trap Viewer* is able to catch the alarms (SNMP Traps) generated by the access point, as well as the *Memory Critical* alarm, and display in the table. To open the *Trap Viewer* window, click on **Trap** button located at the right of the MnM toolbar.

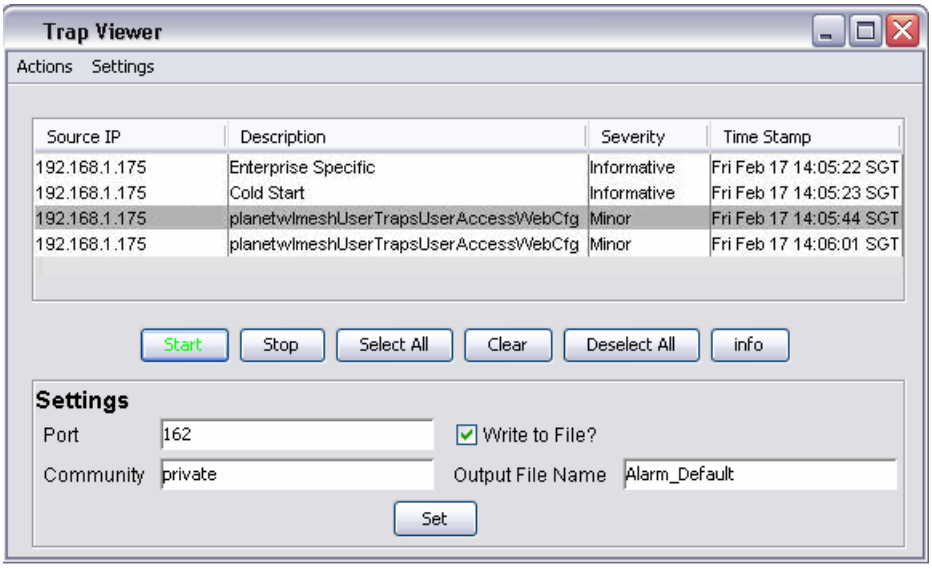
In order to start up the trap listener, click on the **Start** button, or else, user can right click on the **Trap** button and choose the *Start Receive Trap* option in order to start listen to the trap without open the Trap Viewer window, as illustrated below:

Figure 3.47: Start Receive Trap

The button, ❗, is also act as an indicator. When the trap listener is started and in the ready mode, the button will change to yellow color, ❗; while the blinking button, ❗, indicates that a new trap is caught.

Note that when a *Memory Critical* alarm is caught, means that the flash memory of the node has dropped to less than 1M bytes, an alarm audio signal will be played along with the indicators.

Figure 3.48: Trap Viewer Overview



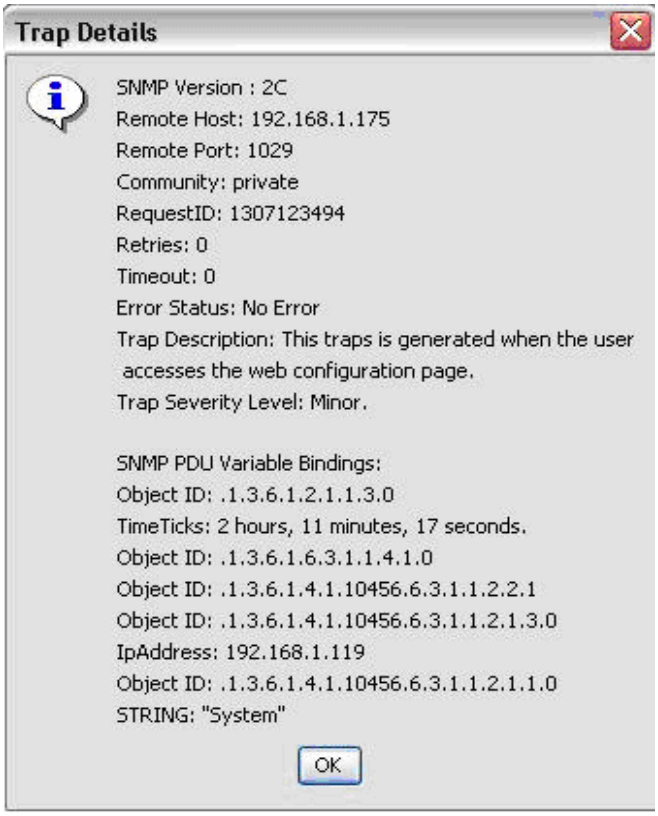
This table is a read-only table, which displays the trap's source IP Address, description, severity and the time when the trap or alarm was caught. These alarms should be deleted once they were reviewed and resolved, by clicking the **Clear** button. However, the MnM provides user an option to write the traps captured into a file. In order to do that, click the *Write to File* checkbox and enter the file name at the *Output File Name*, provided at the *Settings* column, then select the **Set** button. The file will be stored at following path:

.*MNM_PATH*\TrapLog\

Besides, the *Settings* column also enable user to alter the port number to listen to the traps and the community of the SNMP agent.

In order to view the details regarding the traps in the table, select the desire entry and click on the **info** button. A window would popup and displays the details.

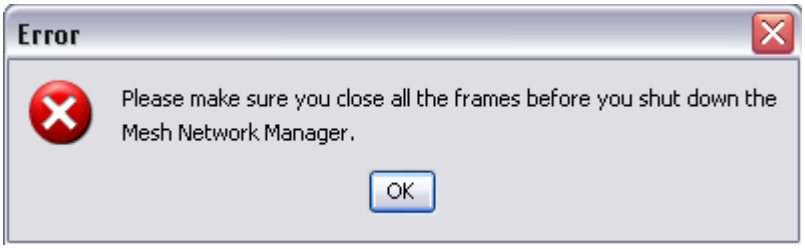
Figure 3.49: Trap Details



3.30 Closing MnM

User can shut down the MnM by selecting the *File* > *Exit*, or the **Close** button at the right top corner of the MnM, provided all the network scanners in the MnM has been closed before this. Otherwise the following dialog box would appear on the screen:

Figure 3.50: Error Message when Closing MnM



The reason for this method of shutting down is to prevent any accidentally shut down that would cause the loss of information regarding the network.

4 Mesh Node Manager

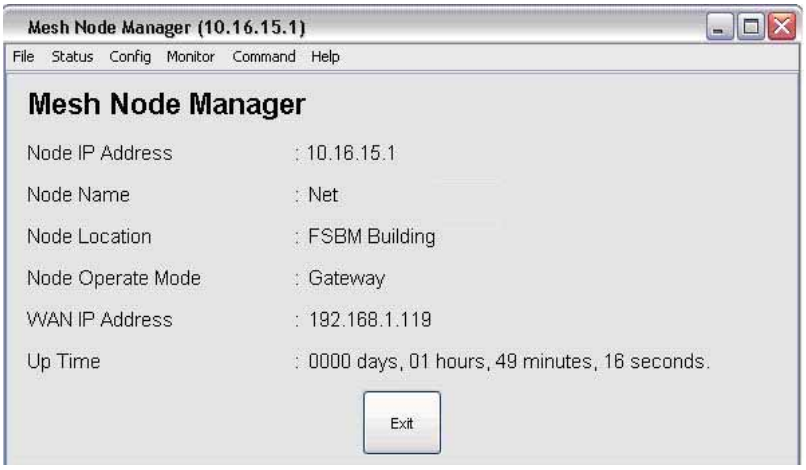
4.1 Introduction

This section provides the details about the configuration on the mesh node using Mesh Node Manager. The Mesh Node Manager is one of the functions of the MnM, where user can activate it in order to perform any setting on the node. Various configurations can be done, including network settings, VPN client setting, WLAN interfaces setting etc. Further more, this application supports some action command such as reboot and reset the device. The Manager consists of six different submenus:

- File
- Status
- Config
- Monitor
- Command
- Help

Each submenu will be further described at the incoming sections. The following figure illustrates the overview of the Mesh Node Manager.

Figure 4.1: Mesh Node Manager Overview



4.2 File

4.2.1 File > Change SNMP Password

This option enable user to change the SNMP Password in case when the user desire to change the password from read-only password to read-write password, or change the SNMP Version.

Figure 4.2: Change SNMP Password

The Change Community window consists of the following parameters:

- IP Address
- SNMP Version
- Community
- User Name
- Password
- Pass Phrase

IP Address

This read-only field shows the IP Address of the current node

SNMP Version

The Version of SNMP using to read and write data from/to the node. Two options are available: 1 or 2C and 3

Community

The key word for the SNMP, which is required only if Version 1 or 2c is selected as the SNMP Version

User Name

The admin user name that given permission to perform the SNMP action

Password

The authentication password. The default authentication method used is MD5

Pass Phrase

The privacy pass phrase that must be more than 8 characters

4.2.2 File > Exit

Shut down the Mesh Node Manager.

4.3 Status Menu

4.3.1 Status > System

This submenu is basically a read-only page, provides user a brief summary regarding the MLR Node. In order to configure the fields in this frame please refer to *Configuring System Settings* at the coming section.

The parameters at the System page:

- Node Name
- Node Location
- Node Operation Mode
- Status
- Contact Name
- Contact Email
- Contact Phone
- Object ID
- Up Time

Node Name
A generic name for the MLR Node

Node Location
A generic physical location of the MLR Node

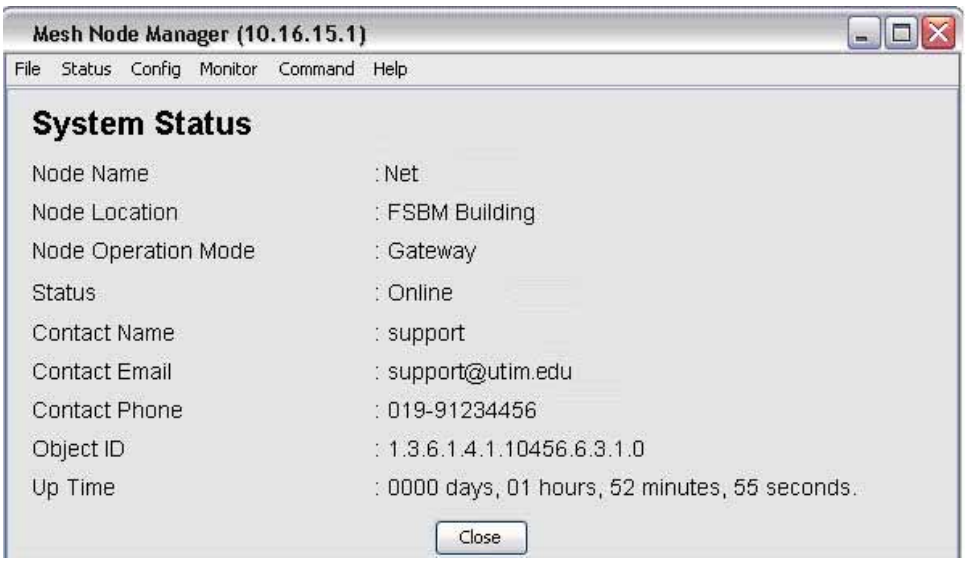
Node Operation Mode
The type of the node is operating in, which can be *Gateway* or *Relay*

Status
The node operation mode, which can be *Online* or *Offline*

Contact Name
A generic name of the network administrator

Contact Email
A generic E-mail Address of the network administrator

Figure 4.3: Status > System



Contact Phone

A generic phone number of the network administrator

Object ID

The Object ID (OID) of the MLR Node specified to support the SNMP service

Up Time

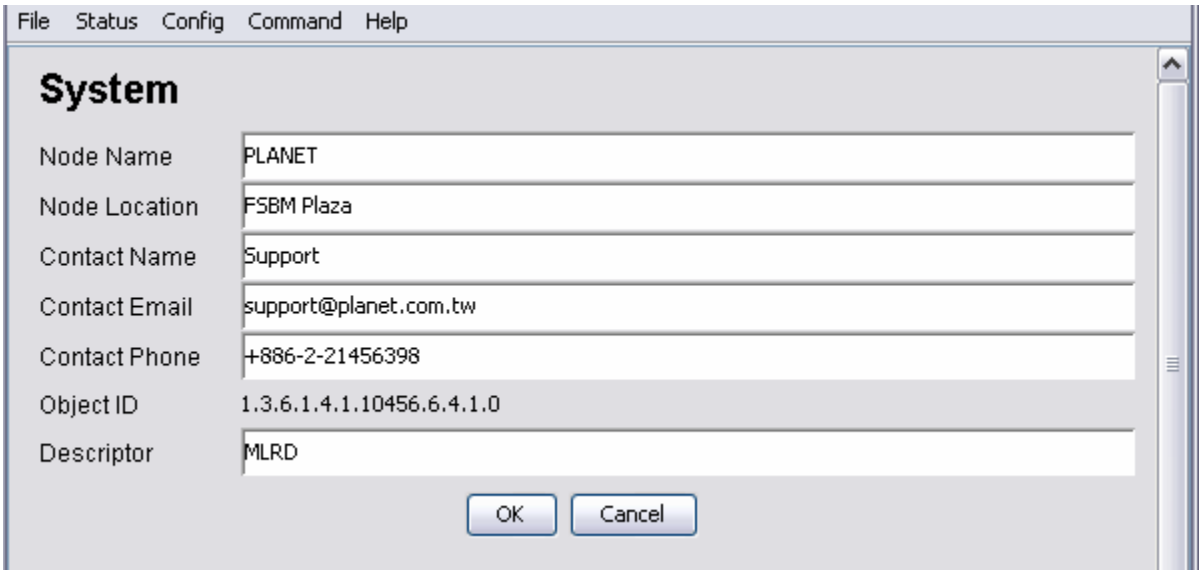
A real-time field that displaying the period of the node since it is turned on

4.4 Config Menu

4.4.1 Config > System

System panel is used to configure the System settings such as the administrator name and contact information, as mentioned at the Status > System.

Figure 4.4: Config > System



The only extra parameter:

- Descriptor

Descriptor

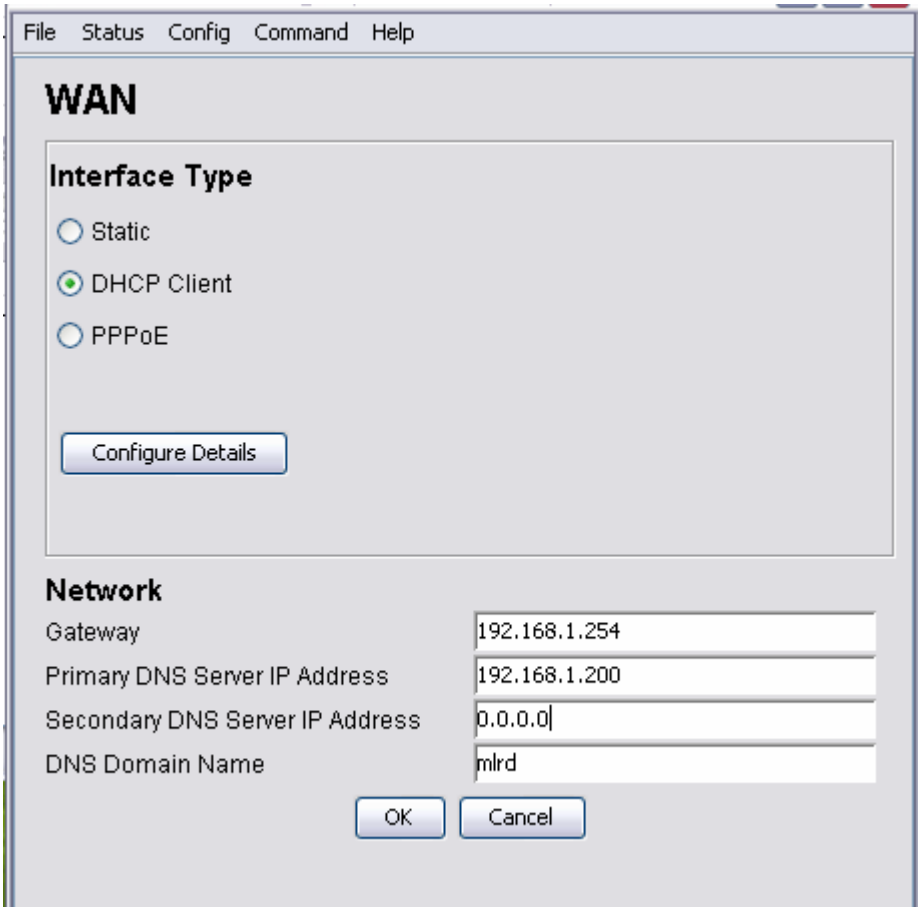
A short description regarding this managed device.

4.4.2 Config > Network > WAN

This panel consists of two parts: the upper part allow user to select the WAN Interface type to use and the lower part is used to configure the network settings. In order to select a WAN Interface, select on the desired type and type the **Configure Details** button. This panel is disabled for the relay nodes. The figures are shown at the following.

This network setting portion enables the configurations on the DNS (Domain Name Service). This feature translates the domain name into IP Address form, which recognized by the Internet. The translation is done through its own server. If the primary server failed to perform the translation, the secondary server will take over the process.

Figure 4.5: Config > Network > WAN



The parameters of the *Network* panel:

- Gateway
- Primary DNS Server IP Address
- Secondary DNS Server IP Address
- DNS Domain Name

Gateway

Specify the gateway for the static IP Address

Primary DNS Server IP Address

Specify the IP Address of the primary DNS Server for this device

Secondary DNS Server IP Address

Specify the IP Address of the secondary DNS server for this device

DNS Domain Name

Specify an optional domain name for the DNS client

Choose the desired *Interface Type* and hit the **Configure Details** button will lead to the configuration page for the specific interface type.

4.4.2.1 Config > Network > WAN > Static

This interface type is used when user desire to specify an IP Address to the node.

The parameter of this panel:

- Status
- IP Address
- Netmask

Status

This is a read-only field that displays the status of the Static WAN IP Configuration. The Static WAN IP will be disabled if the PPPoE or DHCP-Client interface is enabled.

IP Address

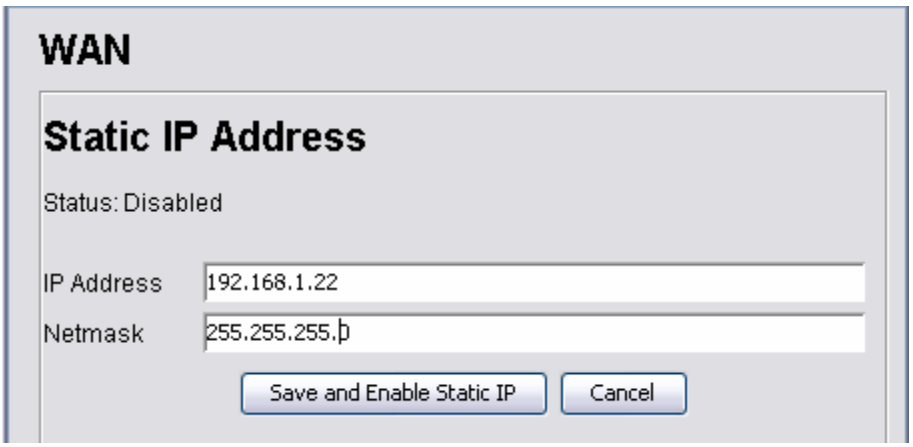
The IP Address of the Static WAN IP Address

Netmask

The net mask corresponding to the Static WAN IP Address

Click on the **Save and Enabled Static IP** button to enable this type

Figure 4.6: Config > Network > WAN > Static



4.4.2.2 Config > Network > WAN > DHCP Client

This option would dynamically allocate an IP to the node.

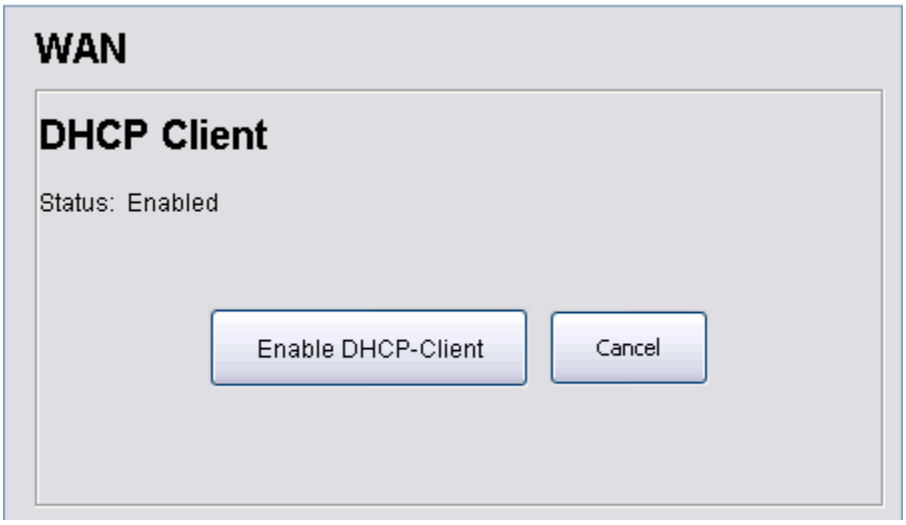
The parameters of this interface type:

- Status

Status

Display the status of the DHCP-Client Interface Type. This field is read-only and will be disabled if either Static WAN IP or PPPoE is enabled

Figure 4.7: Config > Network > WAN > DHCP-Client



Click on the **Enable DHCP-Client** button to enable this *Interface Type.*

4.4.2.3 Config > Network > WAN > PPPoE

PPPoE is used to create a point to point link.

The parameters of this options:

- Status
- Authentication Type
- User Name
- Password
- Enable CHAP
- CHAP Username
- CHAP Password

Status

This read-only field displaying the status of this interface type, where it will be disabled if Static IP or DHCP-Client mode is enabled

Authentication Type

Specify the authentication type for PPPoE. The available options are PAP and CHAP

Username

Specify the user name of the authentication

Password

Specify the password of the authentication corresponding to the username

Enable CHAP

To enable or disable the server side of the authentication

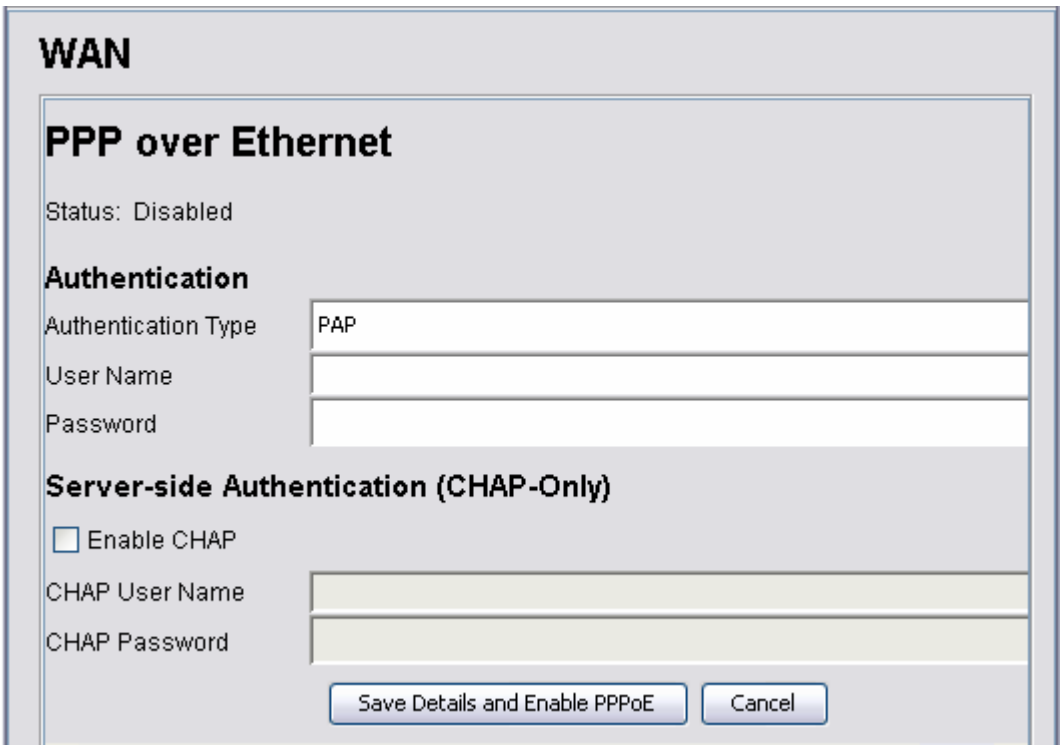
CHAP Username

Specifies the username of the server-side of the authentication

CHAP Password

Specifies the password of the server-side of the authentication, corresponding to the CHAP Username

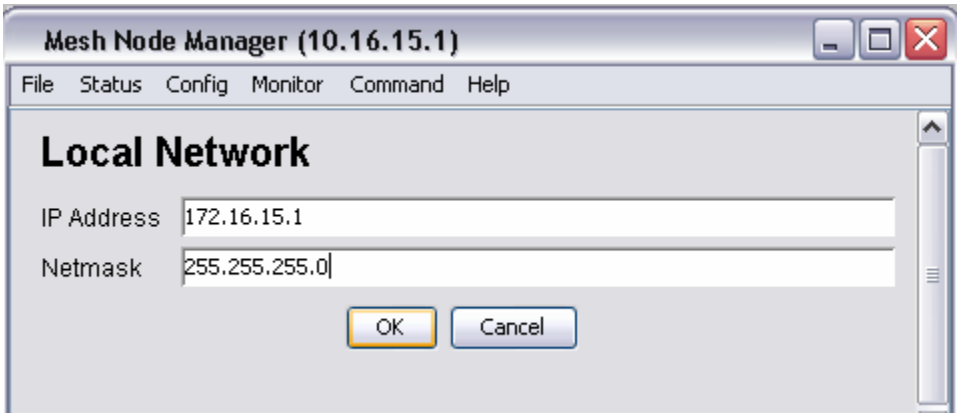
Figure 4.8: Config > Network > WAN > PPPoE



4.4.3 Config > Network > Local Network

This submenu defines the Bridge IP address as shown at the following figure. User may set the Bridge IP Address and its corresponding netmask at this page.

Figure 4.9: Config > Network > Local Network



The parameters of this options:

- IP Address

- Netmask

IP Address

Specify the bridge IP Address

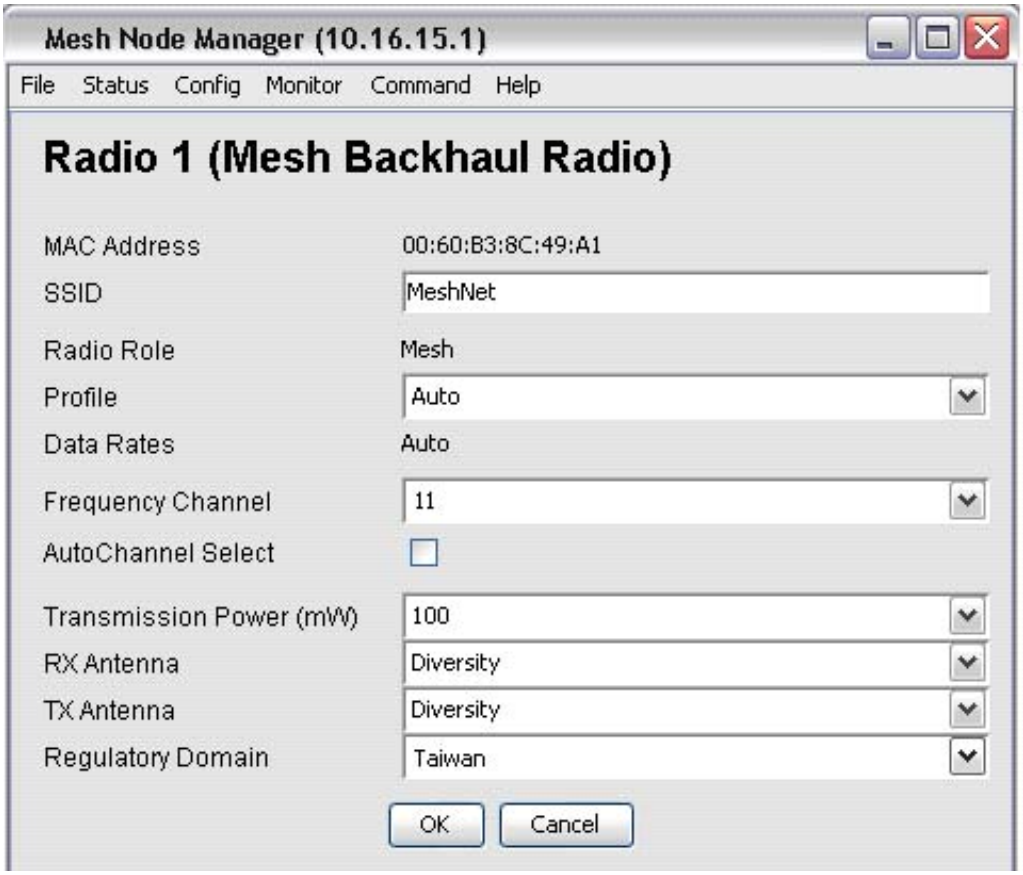
Netmask

Specify the network mask for the Bridge IP Address

4.4.4 Config > Network > WLAN

This submenu defines the configurations to the two wireless LAN interfaces embedded in the mesh node, which are Radio1 (Mesh Backhaul Radio) and Radio2 (Access Point Radio). The WLAN devices settings include the WLAN network settings such as SSID (Service Set Identifier), data rates, transmit and receive antenna, etc. The configurations can be done in order to fine tune the wireless connectivity of the node, to achieve the optimize performance.

Figure 4.10: Config > Network > WLAN > Radio 1



The parameters of this options:

- MAC Address
- SSID
- Radio Role
- Profile
- Data Rates
- Frequency Channel
- Auto Channel Select
- Transmission Power
- Rx Antenna & Tx Antenna
- Regulatory Domain

MAC Address

This read only field displays the MAC Address of the wireless interface (WLAN1 – backbone radio)

SSID

Service Set Identifier (SSID) is a unique value that defines the name for a wireless network. This value will be shown when the network is found by a device

Radio Role

A read only field that showing the radio role of the WLAN Radio, which is *Mesh* and *Access Point* for Radio 1 and Radio 2, respectively.

Profile

Contain a drop-down list of wireless interface that available for the device, which are:

- Auto
- 802.11a (Default)
- 802.11b
- 802.11g

Data Rates

This field specifies the data rates supported by the interface. The available options:

- Auto

Frequency Channel

User can choose the frequency channel to be used from the list. The item in the list is varied depending on the WLAN Card using

Auto Channel Select

Tick this check box to enable the wireless auto-channel select feature.

Transmission Power

Select the most effective transmission power for the wireless PCI card. The available values are:

- 10
- 20
- 50
- MAX (Default)

Rx Antenna & Tx Antenna

Choose the option for the Receiving and Transmitting Antenna:

- Diversity (Default)
- No Diversity

Regulatory Domain

The list of option for regulatory domain is provided depending to the WLAN card used by the host system. This option is not available for WLAN Radio 2

4.4.5 Config > Network > Node to Node

This submenu defines the setting on the node, as well as the *Filtered Device Table.* The parameters:

- Auto IP Configuration
- IP Address
- Netmask
- Enable Node Traffic Encryption
- Encryption Key
- Enable Enhanced Traffic Encryption
- AES Key

Auto IP Configuration

Check this option to enable the Auto IP configuration. The IP Address will be assigned to the node dynamically. If the field is enabled, then the following *IP Address* and *Netmask* will be disabled.

IP Address

The IP Address of the node if configured manually

Netmask

The netmask for the IP Address defined above

Enable Node Traffic Encryption

Check the box given to enable the node traffic encryption. The 128bit key Encryption Key will be disabled if this option is not checked.

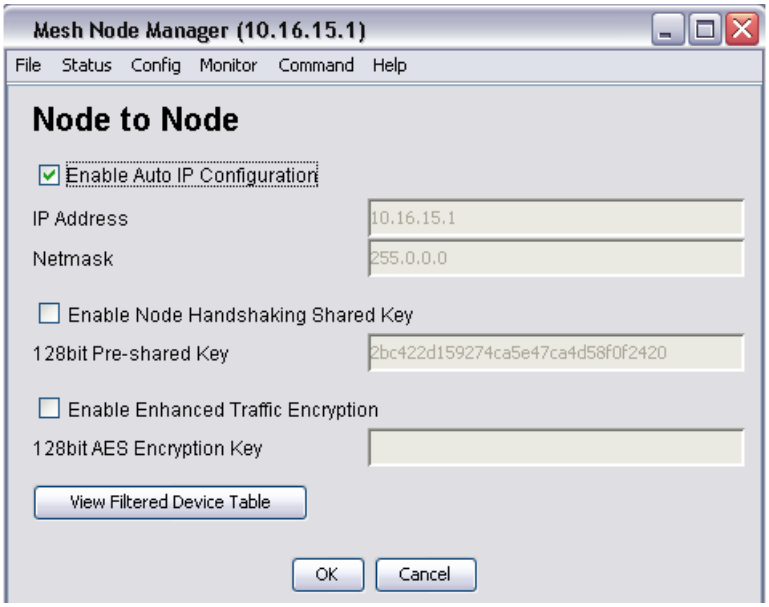
Encryption Key

Enter the encryption key here. The Key must be in HexString and its length must be 32

Enable Enhanced Traffic Encryption

Check the box given to enable the Enhanced Traffic Encryption. The 128bit AES Encryption Key will be disabled if this option is not checked.

Figure 4.11: Config > Network > Node to Node



AES Key

Enter the AES Encryption key here. The Key must be in HexString and its length must be 32

Click on the **View Filtered Device Table** button to open the *Filtered Device Table.*

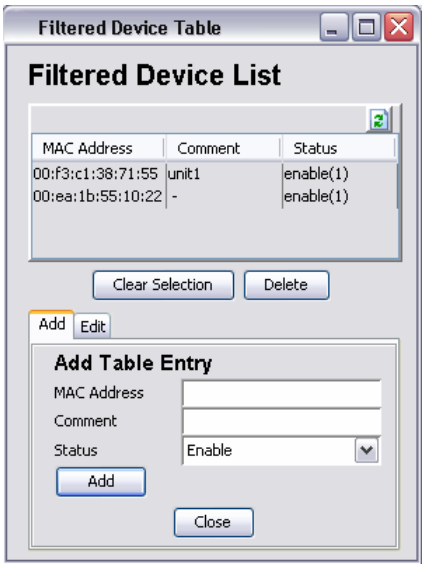
4.4.5.1 Config > Network > Node to Node > Filtered Device Table

The *Filtered Device Table* lists the MAC Address of the device that to be filtered from the network. In order to add an entry to the table, fill in the column provided at the bottom of the table and click the **Add** button. Similarly, if user would like to edit the table entry, change the panel below to the edit panel, select an entry from the table and click the **Edit** button after edit the entry. To delete an entry instead, select the desired row and hit the **Delete** button.

The columns in the table:

- MAC Address
- Comment
- Status

Figure 4.12: Config > Network > Node to Node > Filtered Device Table



MAC Address

The MAC Address of the device to be filtered from the node's network

Comment

An optional field to specifies the comment of this table entry

Status

To enable or disable the correspond table entry

4.4.6 Config > Network > Route

This section describes about the parameters for the Route table. The parameters of this panel:

- Enable Route Table
- Route Table

Enable Route Table

Check this checkbox to enable the use of Route Table

Route Table

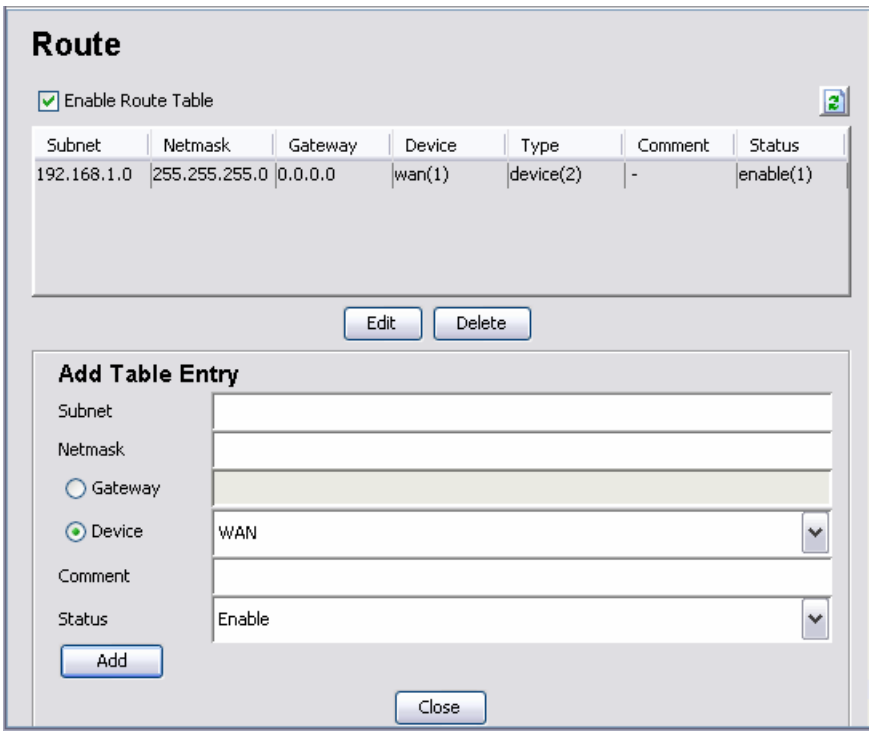
Displaying the current active entry in this device.

4.4.6.1 Config > Network > Route > Route Table

This table consists of seven columns:

- Subnet
- Netmask
- Gateway
- Device
- Gateway/Device
- Comment
- Status

Figure 4.13: Config > Network > Route



Subnet

Specifies the Subnet IP Address of the route

Netmask

Specifies the Netmask corresponding to the *Subnet* IP Address of the route

Gateway

Specifies the gateway IP Address for this route

Device

Specifies the route devices for this entry. Two options are available:

- WAN (Only available when the mode of the node is *Gateway*)
- Bridge
- VPN (Only available when the mode of the node is *Gateway*)
- Mesh

Gateway / Device

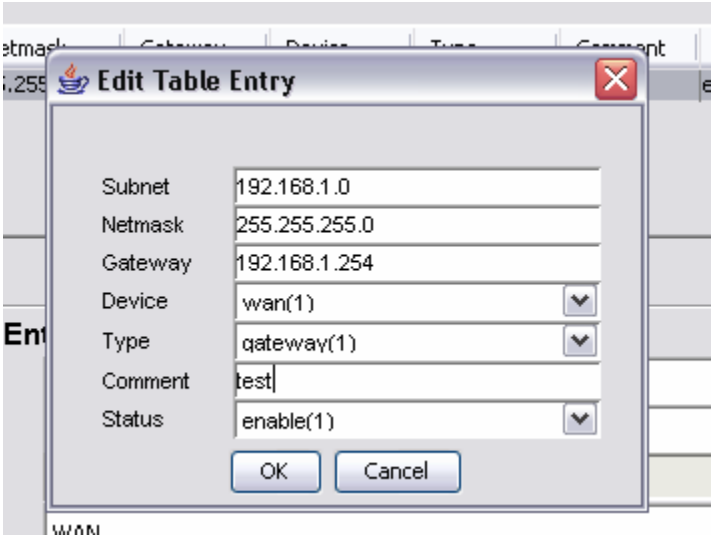
Specifies whether the entry is using the *Gateway* or *Device* option

Status

Specifies the status of this entry, which can be *Enable* or *Disable*

In order to add a new entry to the *Route Table*, fill in the parameters required at the bottom of the table, and click the **Add** button. On the other hand, if user wishes to edit the value or delete the existing entry in the table, select the desired row and click **Edit** and **Delete** button, respectively.

Figure 4.14: Edit Route Table Entry



4.4.7 Config > Security > MAC Access

This feature can be used to deny or allow network access to certain clients, who are associated to the node. The *MAC Access Control* table is to stored the list of user's MAC Address to be denied or allowed from the network

The parameter under this panel:

- Enable MAC Access Control
- Operation Type

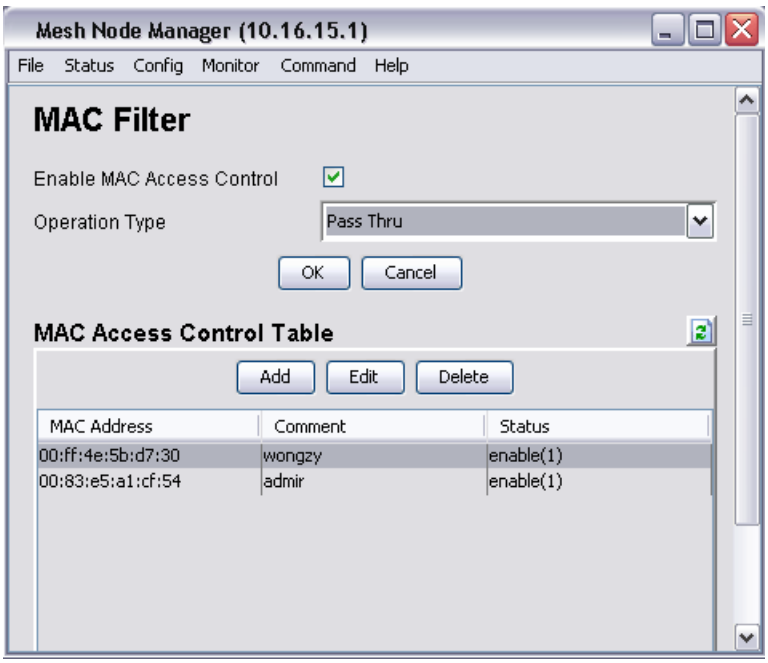
Enable MAC Access Control

This option provide user a selection to enable or disable the MAC Access Control feature

Operation Type

Use the drop down list to select the type of operation, whether to *block* or *pass through* the entries in the *MAC Access Control* table

Figure 4.15: Config > Security > MAC Access



4.4.7.1 Config > Security > MAC Access > MAC Access Control Table

The devices specifies in the table will be blocked or passed though from the network depending to the type of operation set previously. To add an entry to the *MAC Access Control* Table, click the **Add** button and fill in the data in the window pop-up. To edit or delete a table entry, select the desired row and click on **Edit** or **Delete** button. The **Refresh** button at the top of the MAC Access Control Table is to reload the table. The columns in this table are:

- MAC Address
- Comment
- Status

MAC Address

The MAC Address of the device to be added into the table

Comment

An optional field to comment regarding the table entry

Status

The status of this table entry, which can be *Enable* or *Disable*

4.4.8 Config > Security > Encryption and Authentication

This panel provides the selection over 8 kinds of authentication and encryption. The following figures illustrate how different combination of authentication and encryption can be selected from this panel.

The parameters of this panel:

- Mode
- 128 bits Key
- 64 bits Key
- WPA-PSK Pre-shared Key

Mode

The modes of authentication and encryption available:

- Node (refer to Figure 3.16)
- WEP 64 (refer to Figure 3.17)
- WEP 128 (refer to Figure 3.17)
- dot1x64 (refer to Figure 3.17)
- dot1x128 (refer to Figure 3.17)
- WPA-TKIP (refer to Figure 3.18)
- WPA-PSK-TKIP(refer to Figure 3.18
- WPA-CCMP(AES) (refer to Figure 3.18
- WPA-PSK-CCMP(AES) (refer to Figure 3.18

128 bits Key

This field is specifically for authentication mode of *WEP 128*. The value should be Hex String and must not more than 26 characters

64 bits Key

This field is specifically for authentication mode of *WEP 64*. The value should be Hex String and must not more than 10 characters

WPA-PSK Pre-shared Key

This field is specifically for authentication mode of *WPA-PSK-TKIP* or *WPA-PSK-CCMP (AES).* The pre-shared key must more than 7 and less than 64 characters

Figure 4.16: Authentication & Encryption (None)

Figure 4.17: Authentication & Encryption (WEP / 802.1x)

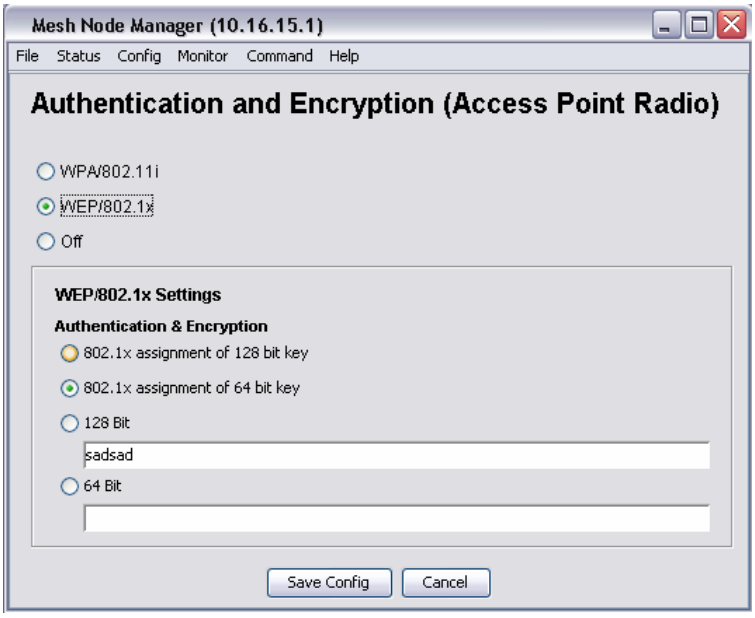
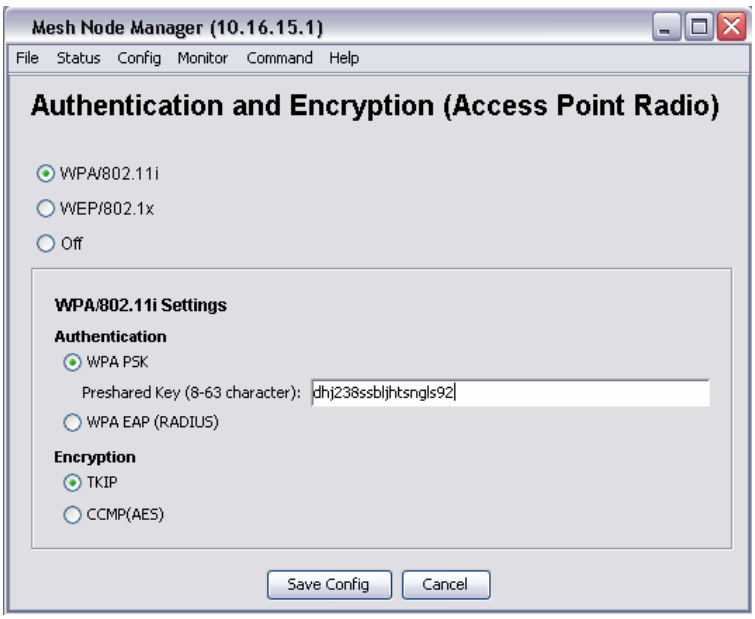


Figure 4.18: Authentication & Encryption (WPA / 802.11i)



4.4.9 Config > Services > DHCP Server

The DHCP server in the node allows for dynamic IP Address assignment to both wireless clients and wired hosts. Two tables are available under this submenu, which are *IP Pool Table* and *Fixed IPs Table.* The parameters in the DHCP Server panel:

- Enable DHCP
- Domain Name
- Netmask
- Gateway
- Primary DNS
- Secondary DNS

Enable DHCP

Choose to enable or disable the DHCP Server feature

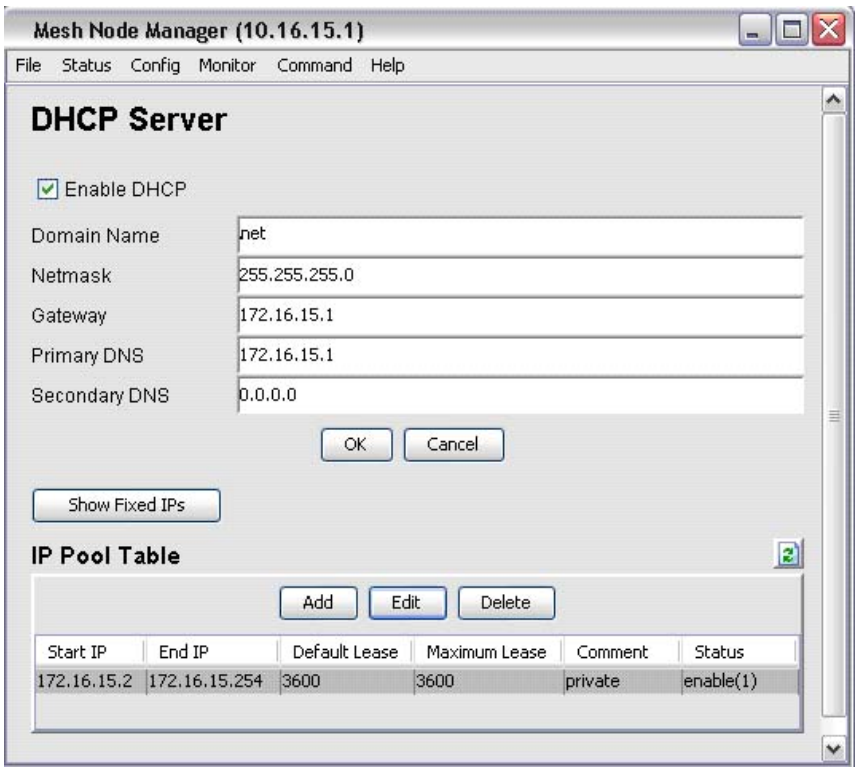
Domain Name

An optional domain of the DHCP server

Netmask

The netmask of the DHCP server subnet

Figure 4.19: Config > Services > DHCP Server



Gateway

The gateway IP Address of the subnet

Primary DNS

The IP Address of the primary DNS server of the subnet

Secondary DNS

The IP Address of the backup DNS server of the subnet

4.4.9.1 Config > Services > DHCP Server > IP Pool Table

This is the table of IP pool. To add an entry to the *IP Pool* Table, click the **Add** button and fill in the data in the window popup. In order to edit or delete instead, select the desired row and hit the **Edit** or **Delete** button respectively.

The columns in this table:

- Start IP Address
- End IP Address

- Default Lease Time
- Maximum Lease Time
- Comments
- Status

Start / End IP Address

Define the range of IP Address to be used for the particular subnet

Default Lease Time

The default duration of a DHCP client (host) retains its current IP Address. Once the lease period is up, the DHCP client requests a new IP Address

Maximum Lease Time

The maximum duration of a DHCP client (host) retains its current IP Address

Comments

An optional comment regarding the corresponding table rows

Status

Define the status of the table row status, which can be *Enable* or *Disable*

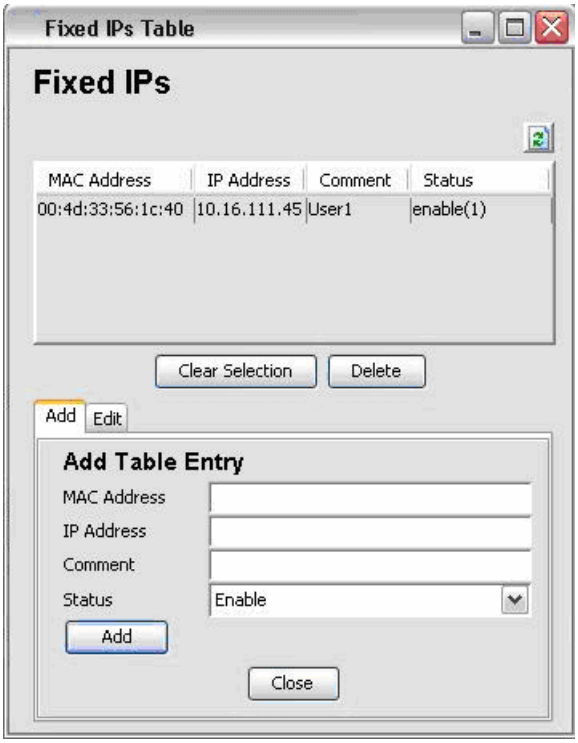
4.4.9.2 Config > Services > DHCP Server > Fixed IPs Table

Fixed IPs Table lists the IP Addresses that have been fixed to certain device, which indicated by the MAC Addresses in this table. In order to add an entry to the table, fill in the column provided at the bottom of the table and click the **Add** button. Similarly, if user would like to edit or delete the table entry, change the panel below to the edit panel, select an entry from the table and click the **Edit** or **Delete** button after edit the entry.

The columns in this table:

- MAC Address
- IP Address
- Comments
- Status

Figure 4.20: Config > Services > DHCP Server > Fixed IPs Table



MAC Address

The MAC address of the fixed IP device

IP Address

The IP Address to be fixed to the device with the above *MAC address*

Comments

Optional comment regarding the correspond entry

Status

Status of the correspond entry

4.4.10 Config > Services > Firewall

The firewall is used as a security wall to block certain access. The firewall rules can be defined and added by the user via this panel. The available parameters:

- Firewall Mode
- Default Policy

Firewall Mode

This field is used to define the whether to enable the firewall feature

Default Policy

Set the default policy here, which decide to accept or deny the *Firewall Rules* table rules

Figure 4.21: Config > Services > Firewall

4.4.10.1 Config > Services > Firewall > Firewall table

Select the **Add Rule** Button will open an Add Firewall Rule Window, where user can set the rules via it. In order to edit the firewall rule, user must select an entry that is desired to change before click on the **Edit** button. The move an entry up or down in the table, use the arrow button at the left side of the table. The snapshot of the *Add Firewall Rule* window is shown at the following page.

The parameters in this table include:

- Source IP Address & Netmask
- Destination IP Address & Netmask
- Source Interface
- Destination Interface
- Protocol
- Start & End Port

- ICMP Type
- Limit
- Target
- Comment
- Status

Figure 4.22: Firewall (Add Rule)

Source IP Address & Netmask

Specifies the source IP Address with its netmask. If the source IP is left empty, it will be set to default value (0.0.0.0, with mask 0.0.0.0). The default value of the Source Netmask is 255.255.255.255

Destination IP Address & Netmask

Specifies the destination IP Address with its netmask. If the destination IP is left empty, it will be set to default value (0.0.0.0, with mask 0.0.0.0). The default value of the Source Netmask is 255.255.255.255

Source Interface, Destination Interface

These fields specify the *Source* and *Destination Interface*, respectively. The available selections are:

- Any
- WLAN/LAN
- WAN (Only available for Gateway node)
- Link

Protocol

This parameter is used to specify the protocol to use. User can select from the drop down list or fill in the port number at the column provided. If the column is left empty the selected option at the drop down list will be used.

Start & End Port

These columns is use to specify the range of port numbers to be reserved when protocol type *TCP (6)* or *UDP (17)* is selected

ICMP Type

This field is only necessary when protocol type *ICMP (1)* is selected. User can select from the drop-down list of key in the type number into the column provided next to the drop down list

Limit

Specify the limit of packet traffic

Target

Define the type of target, the available options are:

- Accept
- Deny
- Free

Comment

An optional comment regarding the correspond rule

Status

Define the status of the rule, which can be *Enable* or *Disable*

4.4.11 Config > Services > NAT

The NAT enables a node to use more internal IP addresses. When they are used internally only, the conflict with IP addresses used by other nodes will be solved.

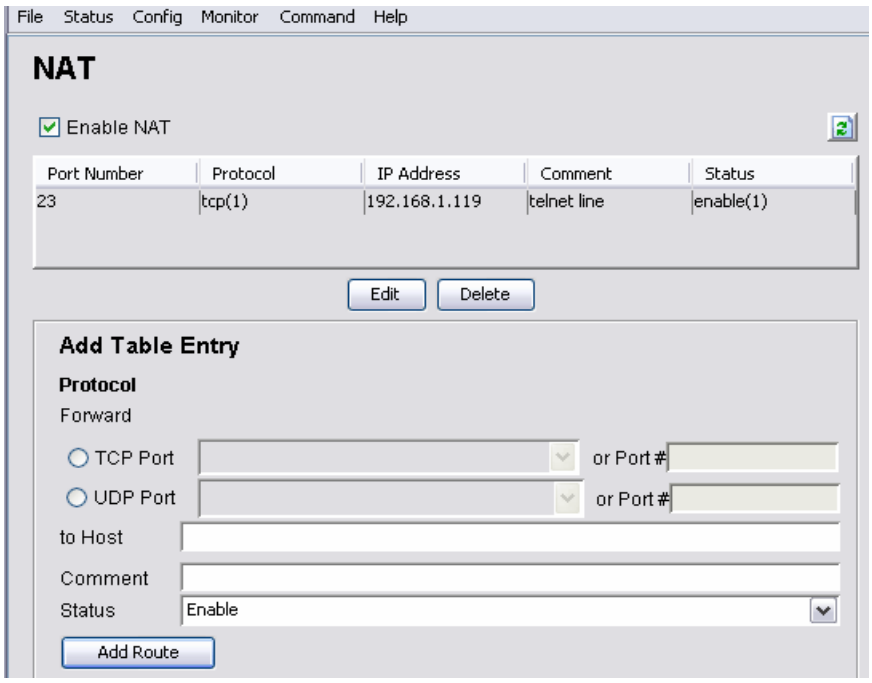
The parameters of NAT panel:

- Enable NAT

Enable NAT

Check the checkbox available to enable or disable this feature

Figure 19.23: Config > Services > NAT



4.4.11.1 Config > Services > NAT > NAT Table

The NAT Table specifies the static route. In order to add an entry to the table, press the **Add Route** button, while hit the **Edit** or **Delete** button to edit or remove a desired entry from the NAT Table. The **Refresh** button at the top of the table can be used to reload the table.

The parameters in with this feature:

- Port

- Protocol
- IP Address
- Comment
- Status

Port

This field specifies the port number to forward to. User can enter the value to the column provided, or choose a port from the drop-down list

Protocol

Choose the protocol for the table entry. The available choice:

- TCP
- UDP
- Both

IP Address

Enter the IP Address of the destination host at this column

Comment

An optional comment about the correspond table entry

Status

Define the status of the table entry, which can be *Enable* or *Disable*

4.4.12 Config > Services > VPN Server

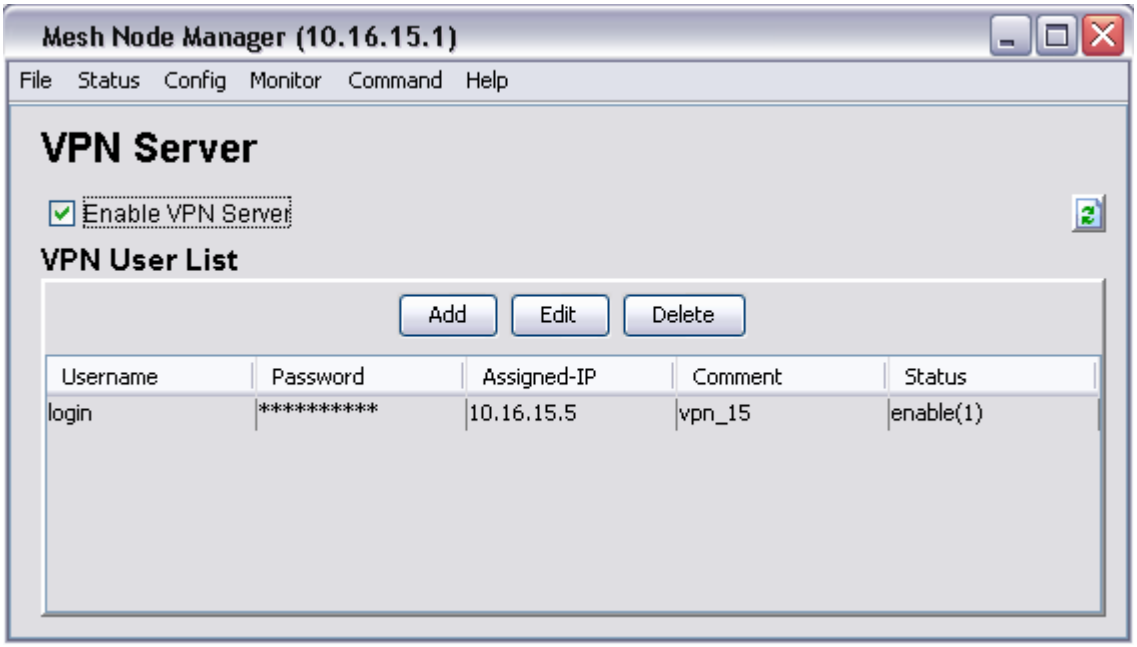
This panel is used to configure the VPN Server in the node, where user can be added into the *VPN User list* with an assigned IP Address. The parameter in the panel:

- Enable VPN Server

Enable VPN Server

Tick the relevant checkbox to enable this feature

Figure 4.24: Config > Services > VPN Server



4.4.12.1 Config > Services > VPN Server > VPN User List

The list is used to display and set the list of VPN user with the IP Address assigned to them. The table consists of the columns:

- Username
- Password
- Assigned-IP
- Comment
- Status

Username

The username given by the VPN user

Password

The password corresponds to the username. This value will be hidden from the user

Assigned-IP

The IP Address to be assigned to that particular user

Comment

An optional comment regarding the table entry

Status

Define the status of the correspond table row, which can be *Enable* or *Disable*

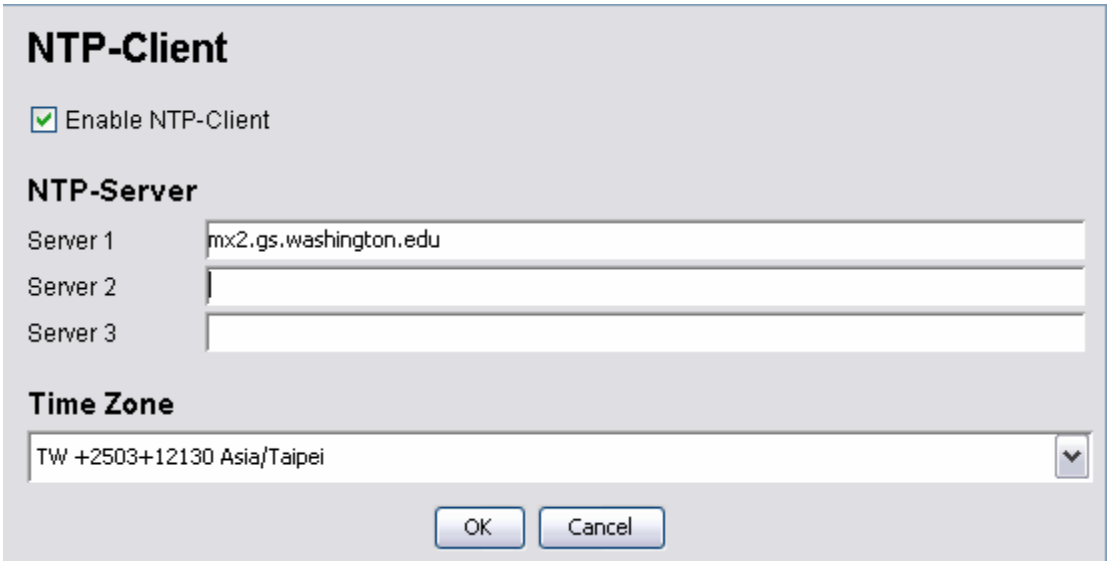
4.4.13 Config > Services > NTP-Client

The NTP is a protocol that used to synchronize the clocks of computers to some time reference. In this case it is used to synchronize the time of different nodes

Parameters at this page:

- Enable NTP-Client
- Server 1
- Server 2
- Server 3
- Time Zone

Figure 4.25: Config > Services > NTP-Client



Enable NTP-Client

Enable of disable the NTP-client feature

Server 1, Server 2, Server 3

The network will connect to the NTP server 1, while Server 2 and 3 are used as back up servers.

Time Zone

Choose the desired time zone from the list available

4.4.14 Config > Services > QoS

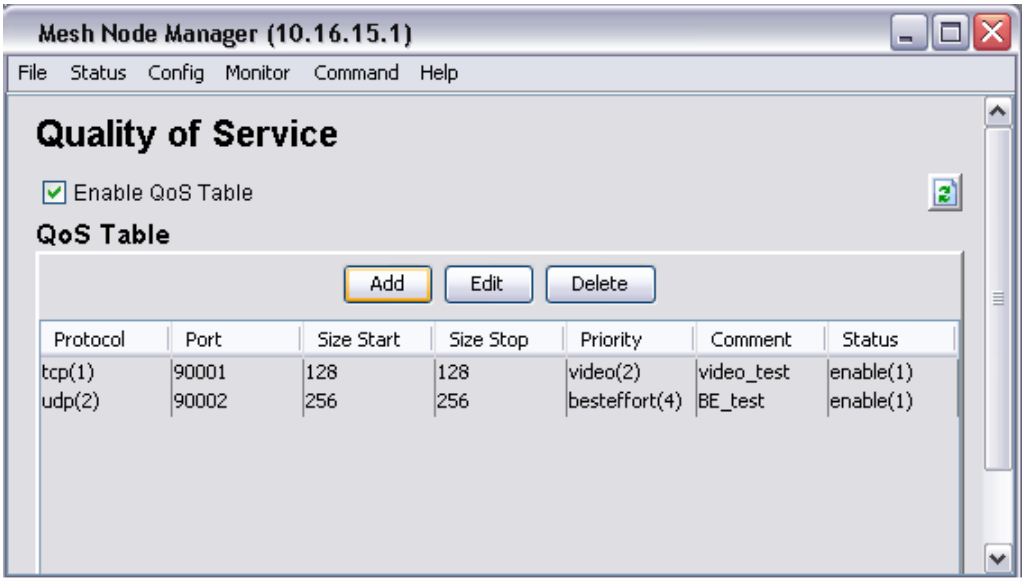
QoS is the abbreviation of Quality of Service. This feature basically is intended to prioritize the packet. A packet that matched with any of the QoS Table entry would be prioritizing according to the value of *Priority* at that entry. The parameter in this panel:

- Enable QoS Table

Enable QoS Table

Select the check box in order to enable the use of QoS feature

Figure 4.26: Config > Services > QoS



4.4.14.1 Config > Services > QoS > QoS Table

In order to add an entry to the table, press the **Add** button, while hit the **Edit** or **Delete** button to edit or remove a desired entry from the *QoS* Table. The **Refresh** button at the top of the table can be used to reload the table.

The columns of the QoS Table:

- Protocol
- Port
- Size Start
- Size Stop
- Priority
- Comment
- Status

Protocol

Specifies the protocol of the QoS entry

Port

Specifies the port number to be used. User can key-in "-1", in order to disable this field

Size Start / Stop

Specifies the range of size of the packet. Note that these values must be in the range of 1 to 1500. To disable the field, enter "-1"

Priority

Define the priority of the entry to be given. The available choices are:

- Background
- Video
- Voice
- Best Effort

Comment

An optional field to enter the comment regarding the table entry

Status

Define the status of the table entry, which can be *Enable* or *Disable*

4.4.15 Config > Services > Traffic Shaping

User can define the speed of download and upload of the device with this feature. The parameters of this feature are:

- Enable Traffic Shaping
- Default Upload
- Default Download

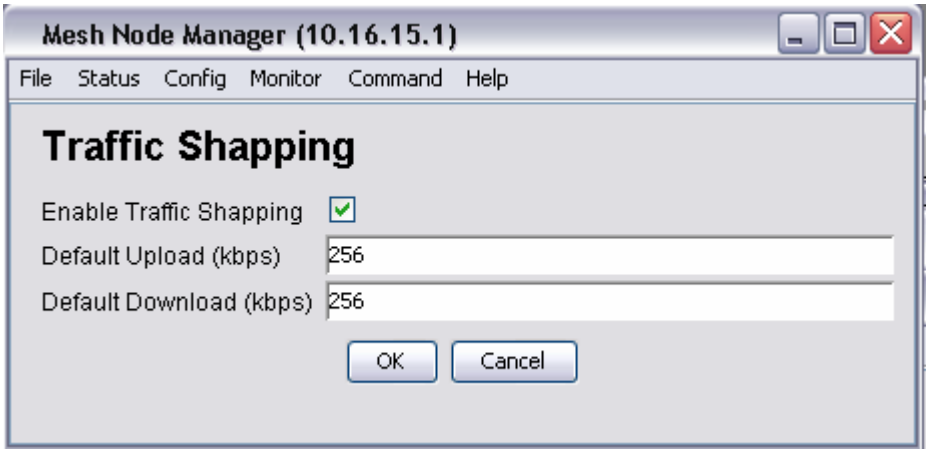
Enable Traffic Shaping

This field is used to enable or disable the traffic shaping feature

Default Upload / Download

Define the default upload or download data rates of the device in kbps (kilo bit per seconds) at the column provided. The default value for both field are 256 kbps

Figure 4.27: Config > Services > Traffic Shaping



4.4.16 Config > Services > Mobile IP

User can use this panel to configure the mobile IP feature of the node. The available parameters are:

- Enable Transparent Mobile IP Service
- Mobile IP Community
- Mobile Location Register Address

Figure 4.28: Config > Services > Mobile IP

Enable Transparent Mobile IP Service

Tick the checkbox to enable the Mobile IP feature

Mobile IP Community

The network name of the MLRD

Mobile Location Register Address

The address of the Mobile Location Register

4.4.17 Config > Management > SNMP Password

This panel is basically separate to three different sections. The upper panel is used to change or reset the SNMP v1, v2c and v3 passwords. User can edit the password by entering the new password in the corresponding space, retype in the confirm space, and click on the *Change* button

The parameters at this section

- Read-Only Community
- Read-Write Community
- Read-Only Username
- Read-Write Username
- Password
- Pass Phrase

For further details regarding these parameters, please refer to File > Change SNMP Password. The middle panel is to configure the Access control of the SNMP. Click the **Set Access Config** button to load the settings.

The parameters at this section:

- From LAN/WLAN Interface
- From WAN Interface
- From Backbone Interface
- From VPN Interface
- From Network Interface
- Subnet
- Netmask

From LAN/WLAN Interface

Check the checkbox to allow the access from the bridge device to SNMP

From WAN Interface

Check the checkbox to allow the access from WAN device to SNMP

From Backbone Interface

Check the checkbox to allow the access from backbone to SNMP

From VPN Interface

Check the checkbox to allow the access from VPN device to SNMP

From Network Interface

Check the checkbox to allow network to access the SNMP

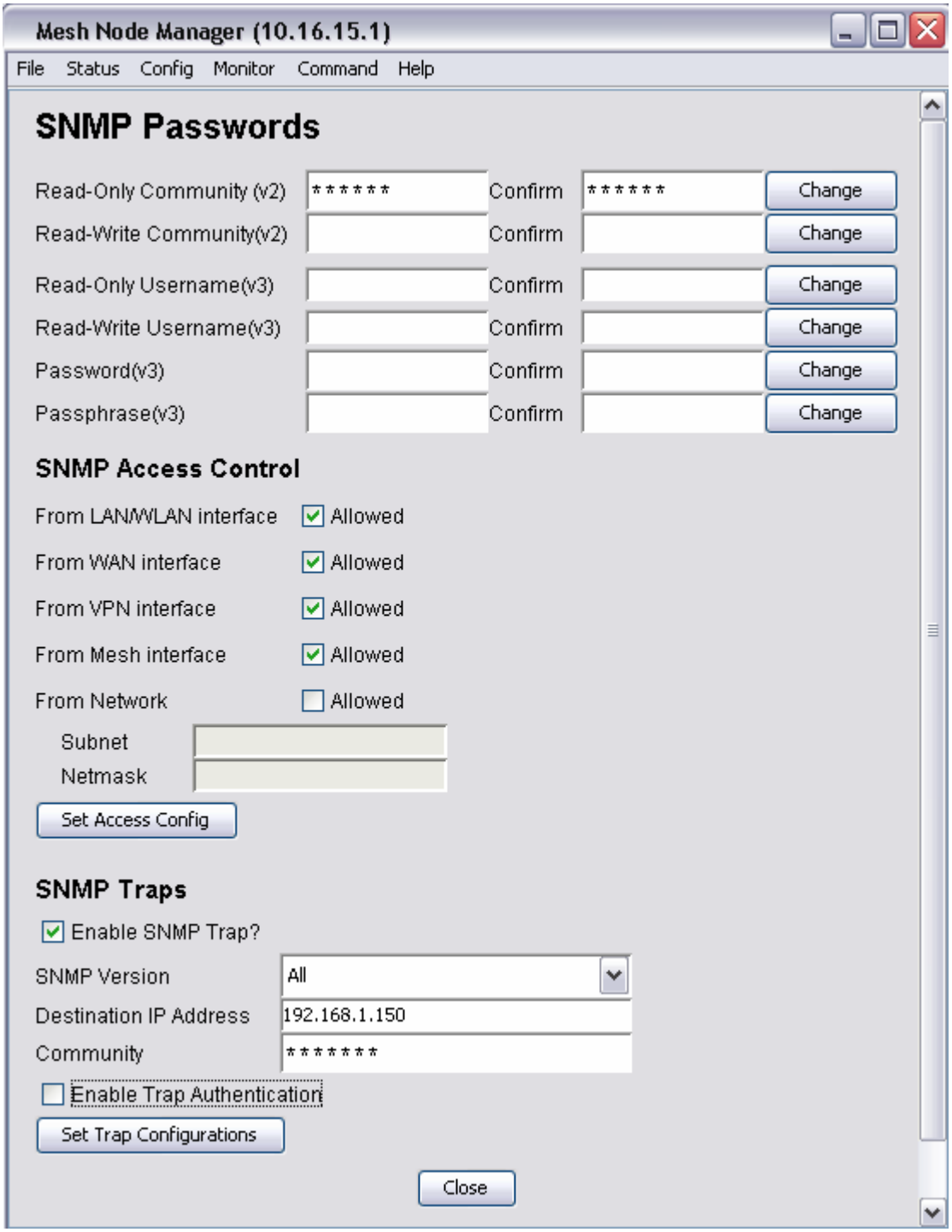
Subnet

The Subnet IP Address of the allowed network. This field is disabled if *From Network Interface* is disabled

Netmask

The Netmask, corresponding to the Subnet IP Address, of the allowed network

Figure 4.29: Config > Management > SNMP Password



The bottom panel allowed user to configure details regarding the SNMP Trap. Click on the **Set Trap Configurations** button to enable the settings.
The parameters at this section

- Enable SNMP Trap

- SNMP Trap Version
- Destination IP Address
- Community
- Enable Trap Authentication

Enable SNMP Trap

Check this option to enable the use of SNMP Traps

SNMP Trap Version

Specifies the SNMP version used for the SNMP Trap. Three options are available: SNMP v1 or v2c, SNMP v3, and both

Destination IP Address

Specifies the destination IP Address to send the trap message to. Fill in the IP Address of the Trap Viewer will enable the Trap Viewer to capture the trap release by this node

Community

Specifies the secret password refer to the SNMP Trap.

Enable Trap Authentication

Check the checkbox to enable the sending of trap when authentication failure occurs

4.4.18 Config > Management > Access Control

User is able to configure the access control of the web-based configuration page at this page. The parametes of the Access Control are:

- From LAN/WLAN Interface
- From WAN Interface
- From Backbone Interface
- From VPN Interface
- From Network Interface
- Subnet
- Netmask

From LAN / WLAN Interface

Check the checkbox to allow the access from the bridge device to SNMP

From WAN Interface

Check the checkbox to allow the access from WAN device to web-configuration

From Backbone Interface

Check the checkbox to allow the access from backbone to web-configuration

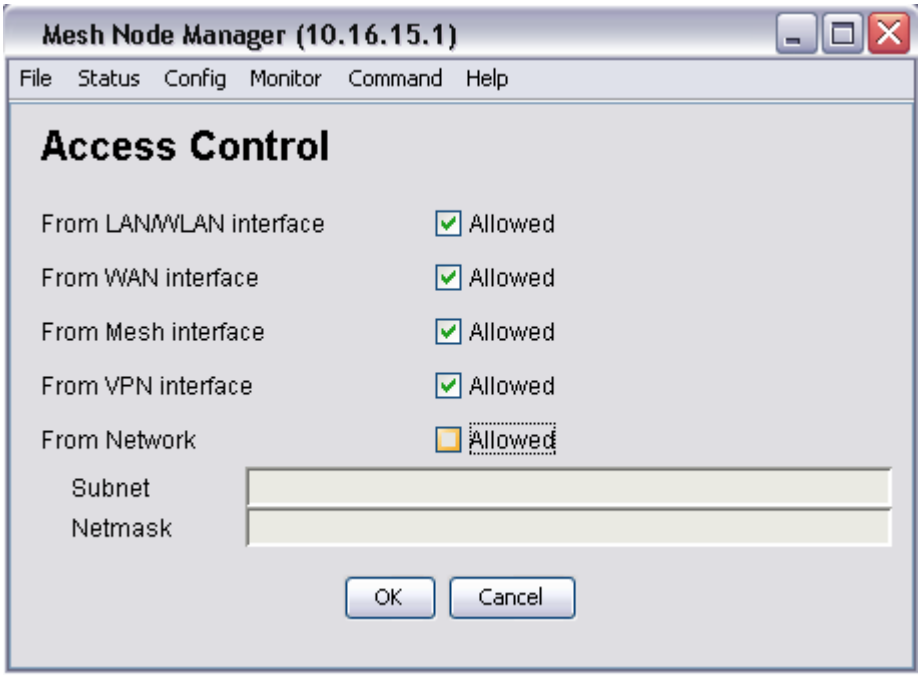
From VPN Interface

Check the checkbox to allow the access from VPN device to web-configuration

From Network Interface

Check the checkbox to allow network to access the web-configuration

Figure 4.30: Config > Management > Access Control



Subnet

The Subnet IP Address of the allowed network. This field is disabled if *From Network Interface* is disabled

Netmask

The Netmask, corresponding to the Subnet IP Address, of the allowed network

4.4.19 Config > Management > Remote Syslog

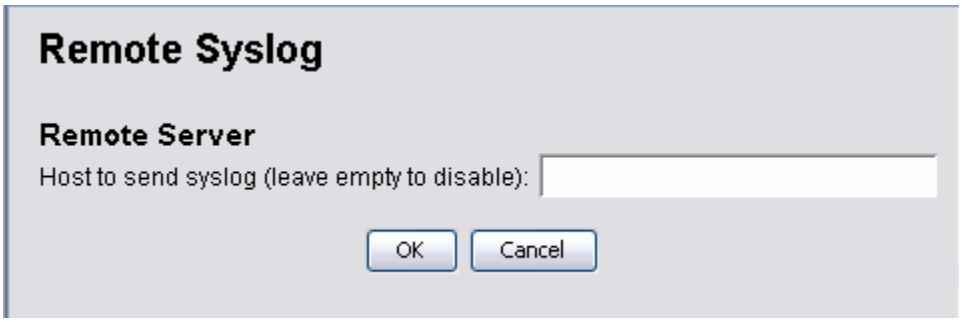
This submenu is desired to set the remote syslog server IP Address, who is receiving the system message from the node. The only parameter for this feature:

- Host to send syslog

Host to send syslog

Enter the IP Address of the syslog server at the column provided. In order to disable this feature, please leave the field empty

Figure 4.31: Config > Management > Remote Syslog



4.4.20 Config > User-Login > Login

At this page, user can set the login parameters that required when log on to the network. The available settings:

- Require User Login
- Enable Zero-Config
- Enable Pop-push
- Enable IAPP
- Redirect Address

- External Login Server
- Enable Link Alert
- Change WLAN1 ESSID to
- Update Interval
- Idle Timeout
- Auto Re-login
- Session Timeout
- HTTPS Allowed
- HTTPS Port
- HTTP Allowed
- Language

Require User Login

Disable this checkbox would cause the network to allow the user to log into it without signing in

Enable Zero-Config

Check this checkbox would enable the use of zero-config

Enable Pop-push

Enable this checkbox would enable the pop-push feature of mail

Enable IAPP

Tick this checkbox would enable the inter hotspot authentication (IAPP) feature

Redirect Address

Login user will be redirect to the webpage specified by this field

External Login Server

Specify the external login server IP Address at this field. In order to disable this feature, leave the field empty

Enable Link Alert

Link alert is a feature that enables the node to scan for gateway node available. Check the corresponding box to enable the feature

Figure 4.32: Config > User-Login > Login

Change WLAN1 ESSID to

If the node is unable to search any gateway node around it, provided the link alert is enabled, then the ESSID of the WLAN1 will be changed to the value entered in this field

Update Interval

The time interval for a node to perform the link-alert feature, in seconds

Idle Timeout

The amount of time (in seconds) to wait before declares the user is in idle mode and logout

Auto Re-login

Enable this checkbox to require user to re-login once he/she is being log out after idle mode

Session Timeout

The amount of time (in seconds) to wait before declares the session timeout for the user

HTTPS Allowed

Enable this field to allow the user to login through HTTPS port

HTTPS Port

If the *HTTPS Allowed* is checked, this field is required, where it specifies which port of HTTPS is the captive portal

HTTP Allowed

Enable this checkbox to allow the user to login through HTTP

Language

The language of the custom login success page

4.4.21 Config > User-login > RADIUS

The RADIUS server is used to authenticate the client who log on to it. It also acts as a database to store the client's ID, password and so forth. The parameters at this page:

- Primary RADIUS Server / Secret
- Secondary RADIUS Server / Secret
- Default Idle Timeout
- Default Session Timeout
- NAS-Identifier
- Called Station ID

- NAS Port
- NAS Port Type
- Primary Authentication Port
- Secondary Authentication Port
- Primary Accounting Port
- Secondary Accounting Port
- Update Interval for RADIUS

Primary RADIUS Server / Secret

These fields specify the IP Address of the primary RADIUS Server and its corresponding secret key word. The *Confirm* field is to re-type the secret word

Secondary RADIUS Server / Secret

These fields specify the IP Address of the backup RADIUS Server and its corresponding secret key word. The *Confirm* field is to re-type the secret word

Default Idle Timeout

This item specifies the amount of time to wait when the sever is in idle mode before timeout

Default Session Timeout

This item specifies the amount of time for the session timeout of the RADIUS server

NAS-Identifier

The NAS Identifies is a string that use to identify the NAS originating the Access-Request

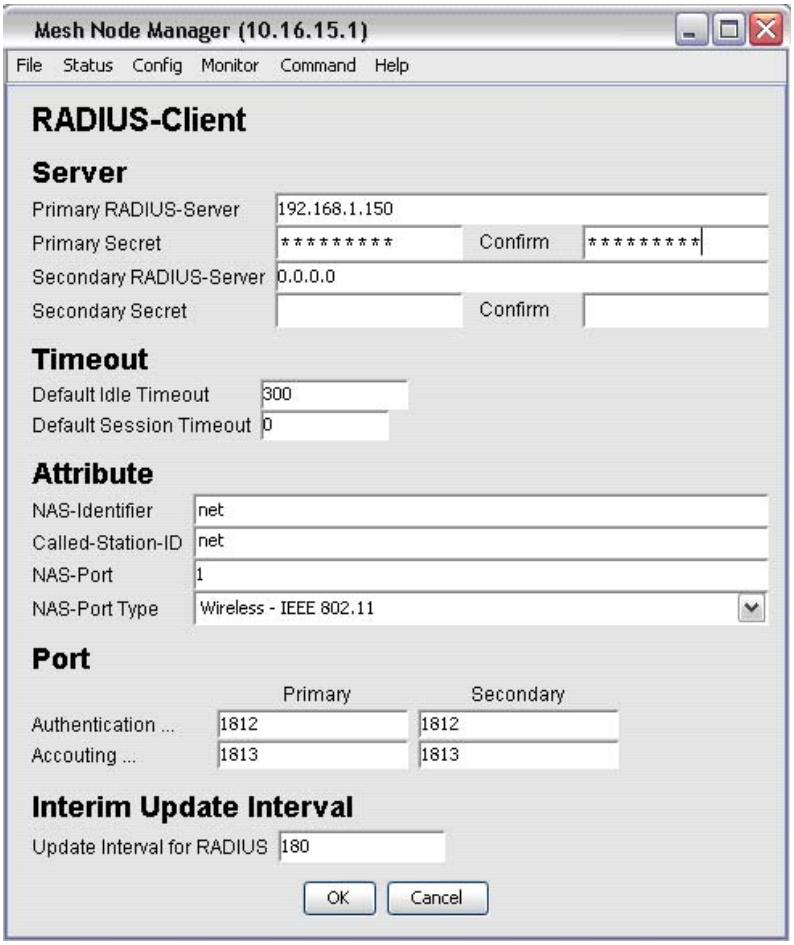
Called Station ID

The called station ID allows the NAS to send in the Access-Request packet the phone number that the user called

NAS Port

This field specifies the physical port number of the NAS, which is authentication the user

Figure 4.33: Config > User-Login > RADIUS



NAS Port Type

The NAS Port Type defines the type of the physical port of the NAS, which is authenticating the user. It can be used instead of or in addition to the NAS Port field

Primary Authentication Port

The authentication port number used by the primary RADIUS Server

Secondary Authentication Port

The authentication port number used by the backup RADIUS Server

Primary Accounting Port

The accounting port number used by the primary RADIUS Server

Secondary Accounting Port

The accounting port number used by the backup RADIUS Server

Update Interval for RADIUS

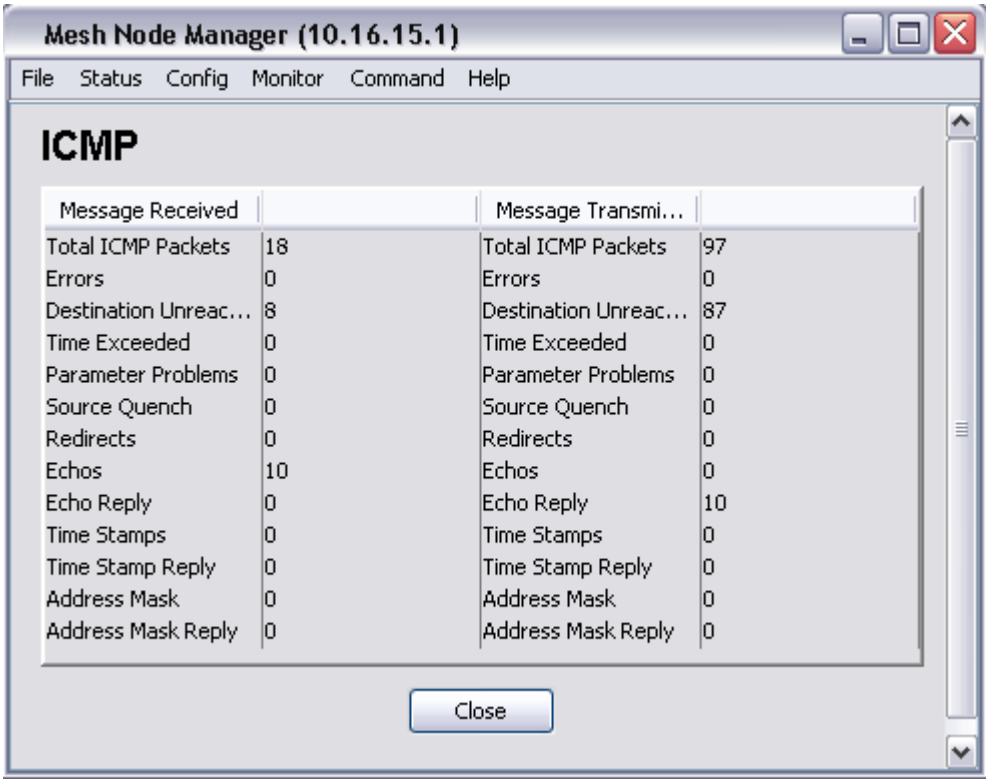
This field specifies the update interval (in seconds) for RADIUS accounting purpose. The interval should be in the range of 30 and 1800

4.5 Monitor Menu

4.5.1 Monitor > ICMP

This monitor item provides the statistic of the Internet Control Message Protocol

Figure 4.34: Monitor > ICMP

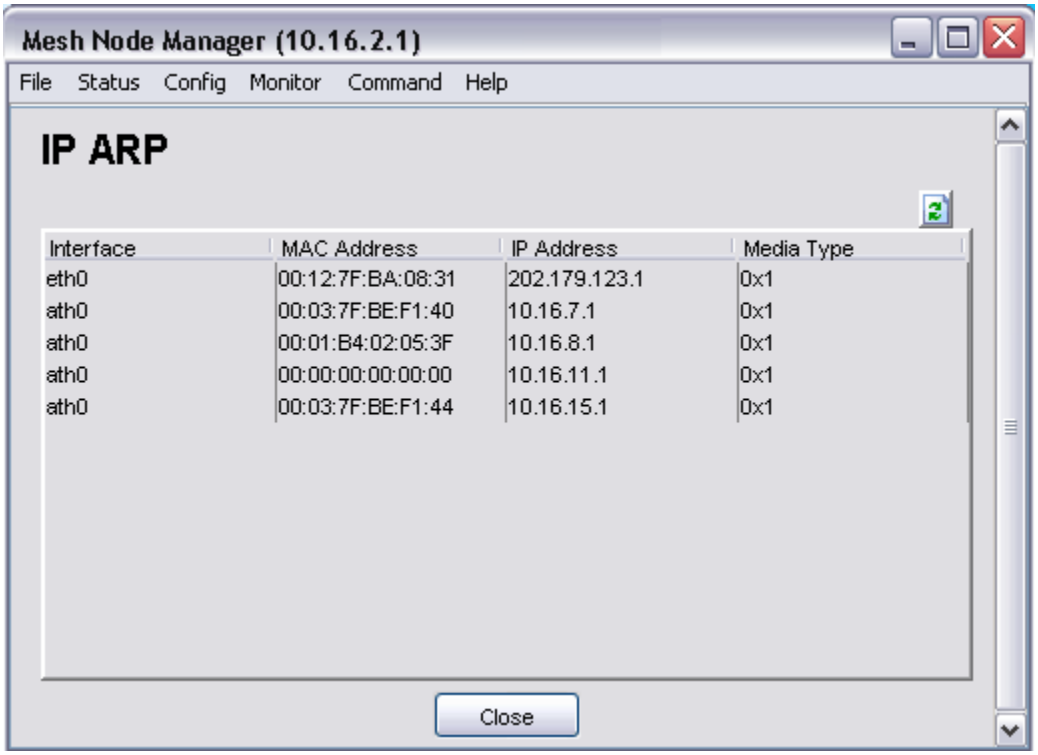


Message Received		Message Transmi...	
Total ICMP Packets	18	Total ICMP Packets	97
Errors	0	Errors	0
Destination Unreac...	8	Destination Unreac...	87
Time Exceeded	0	Time Exceeded	0
Parameter Problems	0	Parameter Problems	0
Source Quench	0	Source Quench	0
Redirects	0	Redirects	0
Echos	10	Echos	0
Echo Reply	0	Echo Reply	10
Time Stamps	0	Time Stamps	0
Time Stamp Reply	0	Time Stamp Reply	0
Address Mask	0	Address Mask	0
Address Mask Reply	0	Address Mask Reply	0

4.5.2 Monitor > IP ARP

This submenu provides the information regarding the IP Address Resolution table. In order to refresh the table, press the **Refresh** button at the right top corner of the table.

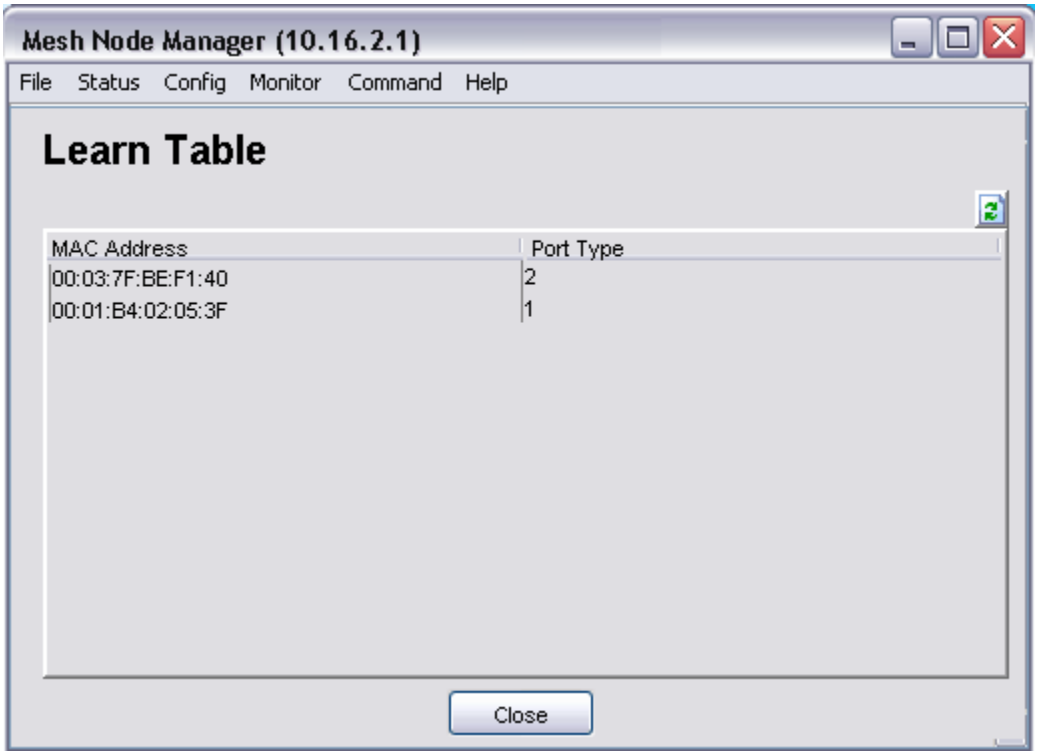
Figure 4.35: Monitor > IP ARP



4.5.3 Monitor > Learn Table

This page displays the entries that have been learned by the access point bridge in the Learn Table. In order to refresh the table, press the **Refresh** button at the right top corner of the table.

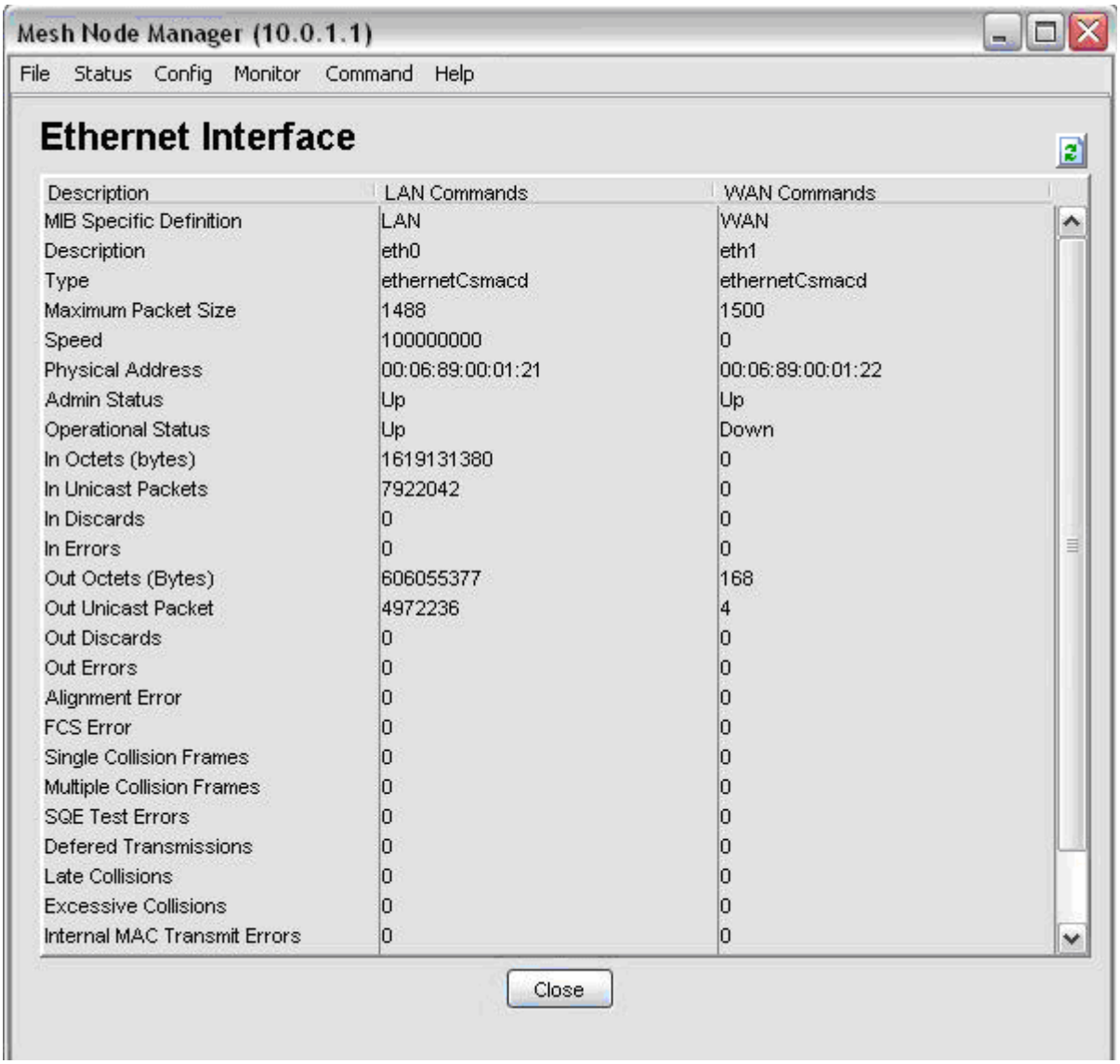
Figure 4.36: Monitor > Learn Table



4.5.4 Monitor > Interfaces > Ethernet

This table displays a list of parameters and statistic regarding the two Ethernet interfaces, LAN and WAN of the node.

Figure 4.37: Monitor > Interfaces > Ethernet

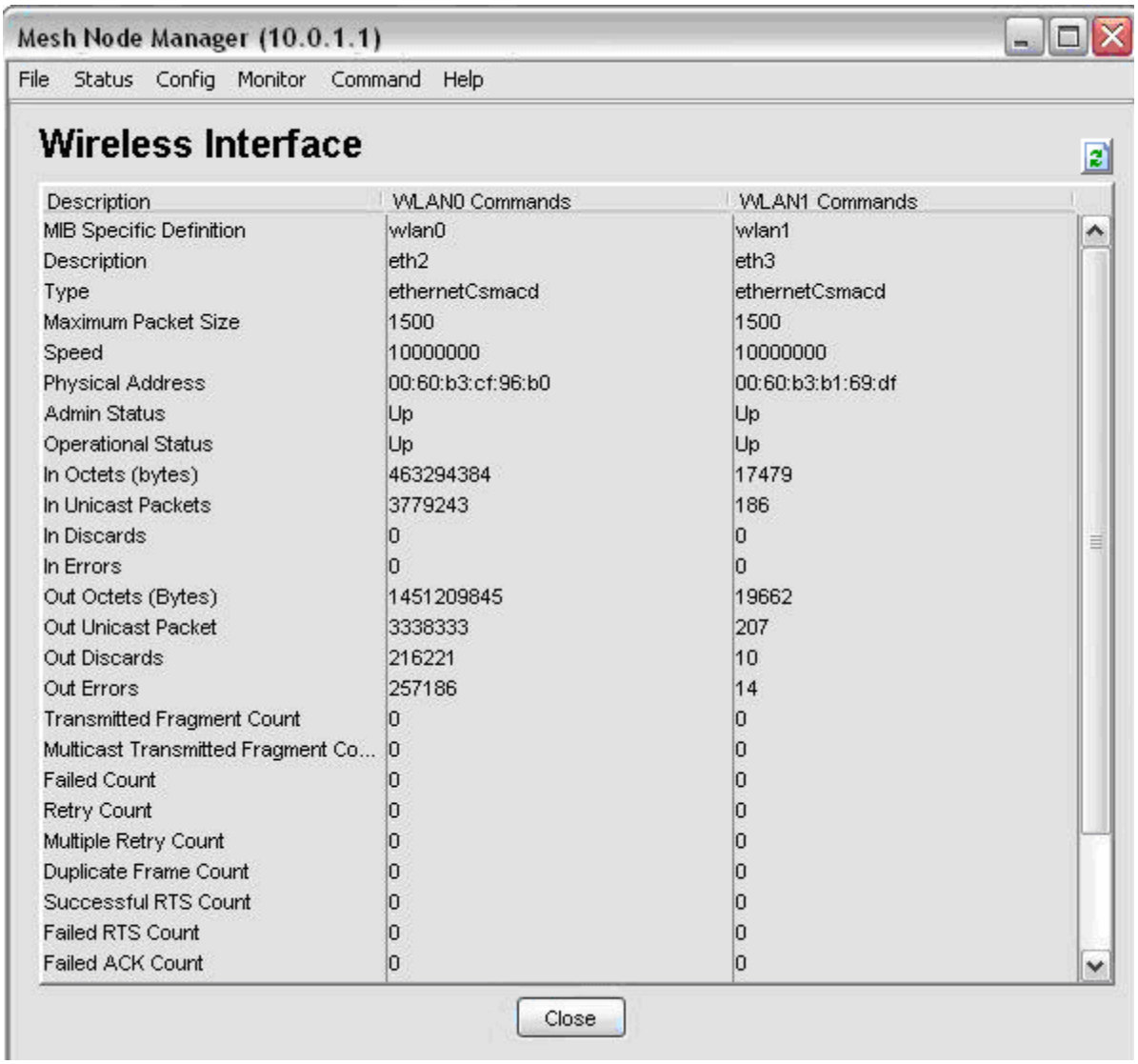


Description	LAN Commands	WAN Commands
MIB Specific Definition	LAN	WAN
Description	eth0	eth1
Type	ethernetCsmacd	ethernetCsmacd
Maximum Packet Size	1488	1500
Speed	100000000	0
Physical Address	00:06:89:00:01:21	00:06:89:00:01:22
Admin Status	Up	Up
Operational Status	Up	Down
In Octets (bytes)	1619131380	0
In Unicast Packets	7922042	0
In Discards	0	0
In Errors	0	0
Out Octets (Bytes)	606055377	168
Out Unicast Packet	4972236	4
Out Discards	0	0
Out Errors	0	0
Alignment Error	0	0
FCS Error	0	0
Single Collision Frames	0	0
Multiple Collision Frames	0	0
SQE Test Errors	0	0
Defered Transmissions	0	0
Late Collisions	0	0
Excessive Collisions	0	0
Internal MAC Transmit Errors	0	0

4.5.5 Monitor > Interfaces > Wireless

This table displays a list of parameters and statistic regarding the two Wireless interfaces, WLAN0 and WLAN1 of the node.

Figure 4.37: Monitor > Interfaces > Wireless



Description	WLAN0 Commands	WLAN1 Commands
MIB Specific Definition	wlan0	wlan1
Description	eth2	eth3
Type	ethernetCsmacd	ethernetCsmacd
Maximum Packet Size	1500	1500
Speed	10000000	10000000
Physical Address	00:60:b3:cf:96:b0	00:60:b3:b1:69:df
Admin Status	Up	Up
Operational Status	Up	Up
In Octets (bytes)	463294384	17479
In Unicast Packets	3779243	186
In Discards	0	0
In Errors	0	0
Out Octets (Bytes)	1451209845	19662
Out Unicast Packet	3338333	207
Out Discards	216221	10
Out Errors	257186	14
Transmitted Fragment Count	0	0
Multicast Transmitted Fragment Co...	0	0
Failed Count	0	0
Retry Count	0	0
Multiple Retry Count	0	0
Duplicate Frame Count	0	0
Successful RTS Count	0	0
Failed RTS Count	0	0
Failed ACK Count	0	0

4.6 Command Menu

4.6.1 Command > Upload/Download

The Mesh Node Manager also provides the download and upload file feature to the node. The following section describes the parameters of this pane

The parameters at this panel:

- Server IP Address
- File Name
- File Type
- Operation Type

Server IP Address

Specifies the TFTP Server IP Address

File Name

Specifies the file name to be downloaded or uploaded

File Type

Select the file Type. The available options are Config file and Firmware image

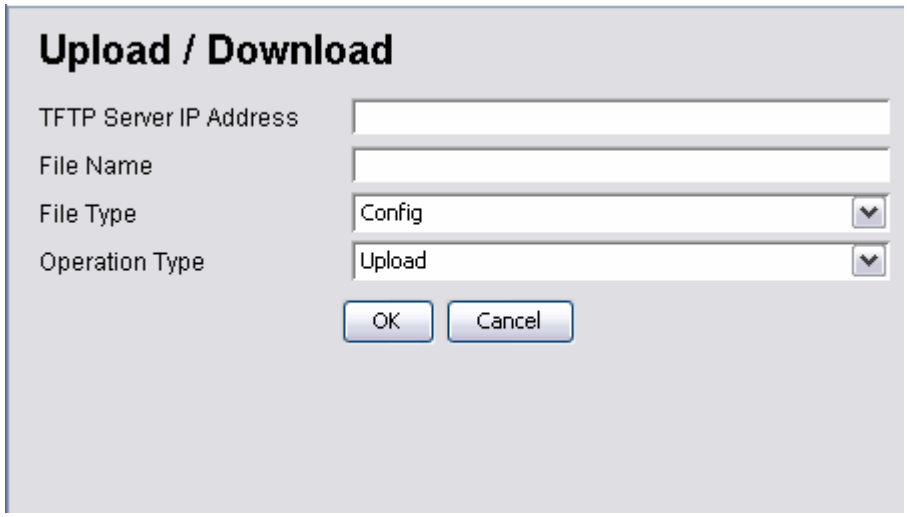
Operation Type

Choose the type of operation to perform:

- Upload
- Download
- Download and Reboot

After enter the parameters, click on the **OK** button to start performing the command.

Figure 4.38: Command > Upload/Download



4.6.2 Command > Reboot

After configure the settings using Network Manager, the node must be rebooted before the settings take effect. However, beware that the reboot process would cause all the user who are currently connected to the network lose their connection until the unit has completely restart-up and resume.

Parameter to set at this panel:

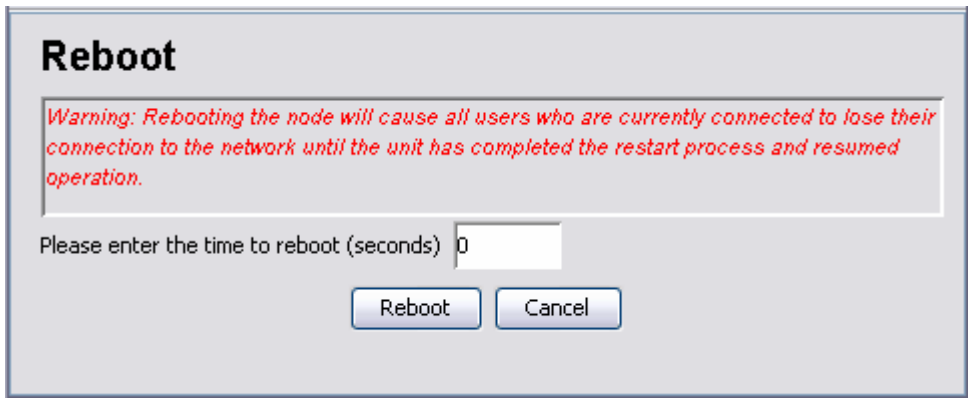
- Time to Reboot

Time to Reboot

Specifies the time to delay before the reboot take place, in seconds

Click the **Reboot** button to execute the command.

Figure 4.39: Command > Reboot



4.6.3 Command > Reset

Through this submenu, user may set the node back to its default factory settings. However performing the reset would cause all the settings done previously lost permanently.

Click the **Reset to Factory Default** button to execute the command.

Figure 4.40: Command > Reset Factory Settings