Broadening Wireless Horizons

# Top Global Wireless LAN
## Mobile Bridge User Guide

# CONTENT

# Foreword

This section describes the objectives, audience and conventions of the Top Global Mobile Bridge User Guide.

## Objectives

This brochure explains the steps for initial setup and basic configuration of the Mobile Bridge. This brochure also provides troubleshooting information and detailed specifications.

## Audience

This brochure is for the person installing and configuring the Top Global Mobile bridge 8000 for the first time. The installer should be familiar with network structures, terms, and concepts.

## Conventions

This brochure uses the following conventions to convey instructions and information:

- Tools and keywords are in boldface type.

Note

Means reader take note. Notes contain helpful suggestions or references to materials not contained in this manual.

Warning

**The warning symbol means danger.** You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

## Obtaining Documentation

The following sections explain how to obtain documentation from Top Global.

## World Wide Web

You can access the most current Top Global documentation on the World Wide Web at the following URL: http://www.chinatopglobal.com

# 1. Introduction

## 1.1 Overview

- Advanced Features of Mobile Bridge 8000
- Network architecture
- Specification

## 1.2 Advanced Features of Mobile Bridge 8000

MB8000 has the most state-of-art system architecture design based on its rich network protocol features, reliable system level performance, optimized hardware design architecture, solid wireless security algorithms, and very competitive product price. It is a most leading Mobile Bridge design in the industry supporting dual radio mode.

People can access network resources anytime anywhere by using this technology. However, wired connection is still a necessity to the MB devices in most WLAN systems, and this restricts the application of WLAN systems. Now, with the Mobile Bridge (MB8000) which is the innovation of Top global, things become different. MB8000 is the first wireless product combining WLAN with GPRS/CDMA 1x/3G. It offers the WLAN solution of a real wireless system.

TOP Global MB-8000 supports ESSID suppression, WEP (RC4) encryption and 802.1x port-based authentication. With 802.1x, TOP Global MB-8000 can generate different WEP keys dynamically for different clients and different sessions. The most advanced security design makes wireless data safe enough to satisfy anyone’s need.

802.11a standard makes high speed wireless network up to 54Mbps, ideal for environments where extra channel capacity is required in a highly dense environment and bandwidth hungry applications such as video conferencing. TOP Global MB-8000 uses slot design to provide ability for upgrading from 2.4G to 5G platform by simply changing the radio card and upgrading firmware, thus offering owners of existing wireless networks investment protection as they migrate towards next-generation WLAN technology.

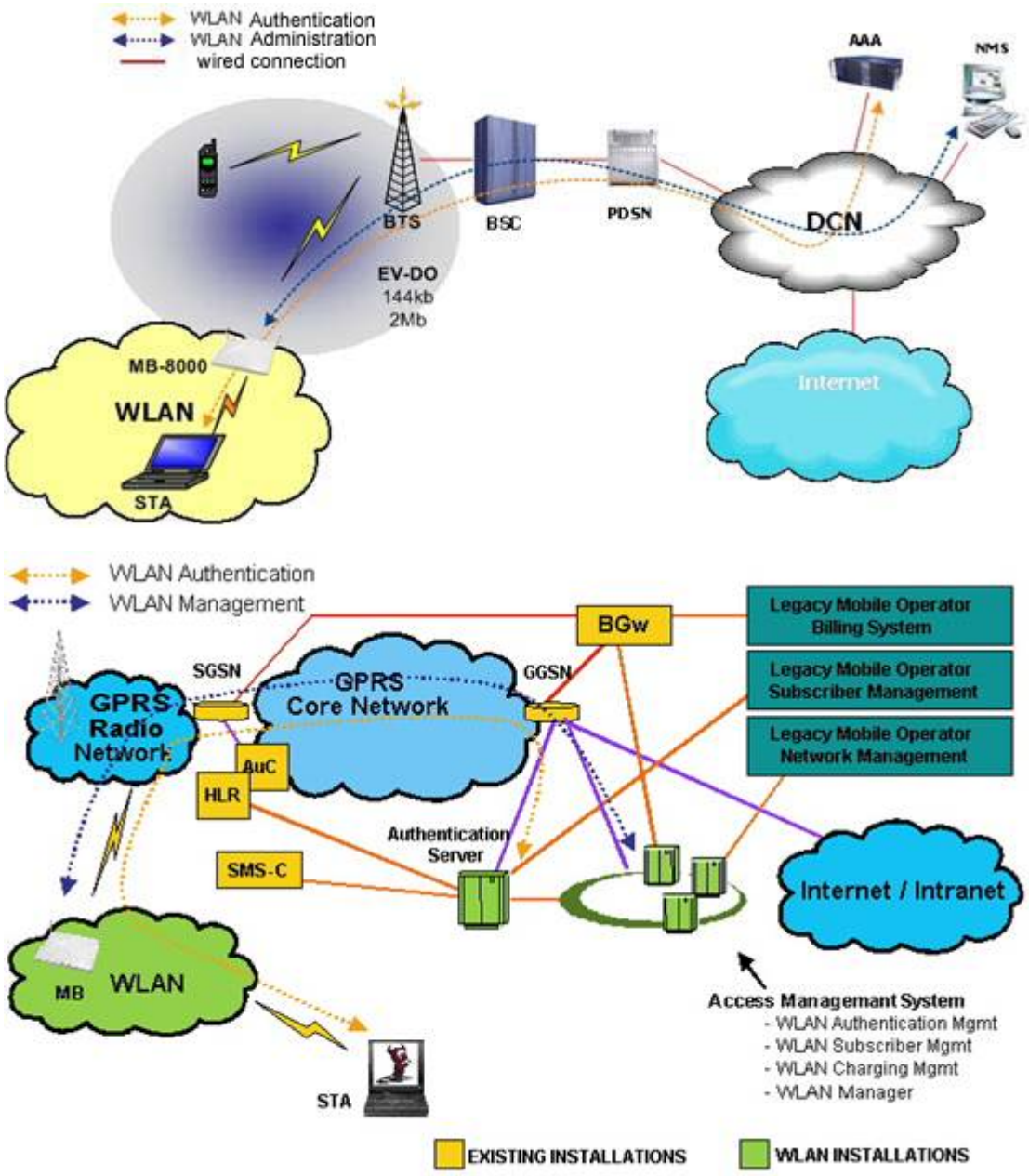
New application rises after new technologies appear. TOP Global MB-8000 can construct wireless backbone in open area such as super-market, warehouse, airport and seaport. Wireless to wireless network backbone extends covering range of enterprise networks. Network applications become richer and more flexible.

## 1.3 Network Architecture

Figure 1-1 illustrates a typical configuration for internet access via MB-8000 .

Figure1- 1

***Standalone wireless network access infrastructure(CDMA1X and GPRS)***




## 1.4 Specification

***Table 1-1 Mobile Bridge Specifications***

| Category | Specification |
|---|---|
| **Hardware** | |
| Dimensions (HXWXL) | 2.7 cm X 13 cm X 25.4cm<br>1.1 in X 5.1in X 10 in |
| Weight | 1.25Kg (2.75 lb) |
| Power | 100/240 VAC high quality and worldwide safety approval |
| Operating | 0° to 50°C (32° to 122°F) @ 20 to 90% relative humidity |
| Transport | -40° to 60°C (-40° to 140°F) @ 15 to 95% relative humidity (no condensation allowed) |
| Storage | -10° to 60°C (14° to 140°F) @ 10 to 90% relative humidity (no condensation allowed) |
| Ethernet interface | Dual 10/100 Base-T, RJ-45 female socket |
| Wireless interface | IEEE 802.11b/a/g, MiniPCI slots for radio NIC |
| PC CARD interface | Dual PC card architecture for GPRS/CDMA1x/EVDO/UMTS network |
| Serial interface | 8-Pin Female miniDin RS232 connector |
| 4 LEDs | Power<br>Ethernet Activity port A(LAN)<br>Ethernet Activity port B(WAN)<br>Wireless Activity GPRS/CDMA/3G(WWAN)? |
| MTBF | 244,048Hrs |
| **Software** | |
| | ● Boot Loader and Power On Self Tests (POST)<br>● MB-8000 executable program (MB Image)<br>● CLI compatible with generic Telnet and Terminal clients.<br>● Serial port Interface is compatible with most ASCII terminal programs (such as HyperTerminal)<br>● HTTP Interface compatible with web browsers equivalent to Microsoft Internet Explorer 4.0 and Netscape 4.0 and higher. |
| **Radio** | |
| Channel frequencies | Table 1-2 shows the channel allocations that vary from country to country. Values listed in bold font indicate default channels and frequencies. |
| Wireless Range | Table 1-3 shows typical range values for various environments |

***Table 1-2 IEEE 802.11b Channel Sets***

| Channel ID | FCC/World （MHz） | ETSI （MHz） | France （MHz） | Spain （MHz） | Japan （MHz） |
|---|---|---|---|---|---|
| 1 | 2412 | 2412 | — | — | 2412 |

| | | | | | |
|---|---|---|---|---|---|
| 2 | 2417 | 2417 | — | — | 2417 |
| 3（default-most countries） | 2422 | 2422 | — | — | 2422 |
| 4 | 2427 | 2427 | — | — | 2427 |
| 5 | 2432 | 2432 | — | — | 2432 |
| 6 | 2437 | 2437 | — | — | 2437 |
| 7 | 2442 | 2442 | — | — | 2442 |
| 8 | 2447 | 2447 | — | — | 2447 |
| 9 | 2452 | 2452 | — | — | 2452 |
| 10 | 2457 | 2457 | 2457 | 2457 | 2457 |
| 11（default-most countries） | 2462 | 2462 | 2462 | 2462 | 2462 |
| 12 | — | 2467 | 2467 | — | 2467 |
| 13 | — | 2472 | 2472 | — | 2472 |
| 14 | — | — | — | — | 2484 |

***Table 1-3 Wireless communications ranges***

| Range | 11Mbs | 5.5Mbs | 2Mbs | 1Mbs |
|---|---|---|---|---|
| Open Office | 160m (525ft) | 270m (885ft) | 400m (1300ft) | 550m (1750ft) |
| Semi-Open Office | 50m (165ft) | 70m (230ft) | 90m (300ft) | 115m (375ft) |
| Closed Office | 25m (80ft) | 35m (115ft) | 40m (130ft) | 50m (165ft) |
| Receiver Sensitivity | -82dBm | -87dBm | -91dBm | -94dBm |
| Delay Spread (at FER of <1%) | 65ns | 225ns | 400ns | 500ns |

**NOTE:**

The range values listed in the Communications Range Chart are typical distances as measured in the development laboratories. These values provide a rule of thumb and may vary according to the actual radio conditions at the location where the product is used.

# 2. Install the MB-8000

## 2.1 Overview

Installing the Top Global MB-8000 is easy. Follow the quick steps below to power up your wireless network:

1. Verify kit Contents.
2. Write Down Product Identification.
3. Mounting Guidelines.
4. Power up the MB-8000.
5. LED Indicators
6. Install the WaveNET Manager Software
7. Assign IP Address using the WaveNET Manager
8. Installation Requirements

## 2.2 Verify Kit Contents

Your MB-8000 kit includes the following components, similar to those depicted in Figure 2-1.

Figure2- 1***MB-8000 Kits Contents***


1. MB-8000 cover (front looking）
2. Power supply
3. MB-8000 cover (back looking)
4. CD

**Note:**

When shipped from the factory, a Mini-PCI Card has been built into MB-8000. Mini PCI Card is a wireless network card with integrated radio modules and antennas (2.4 GHz). The card complies with the IEEE 802.11b and Wi-Fi ™ standards on wireless LANs. Top Global MB-8000 can insert another card that complies with 802.11a standard instead of 802.11b Mini PCI Card optionally.

## 2.3 Write Down Product Identification

Before you proceed with your MB-8000 placement and installation, write down the following MB-8000 information.

- Serial Number
- MAC address

## 2.4 Mounting Guidelines

MB-8000 can be mounted on a wall-like vertical surface , or placed on a flat surface such as a table. It can also be mounted on the ceiling.

Figure2- 2***the backboard of the MB-8000***

**Observe these requirements when mounting the unit:**

- If not using Active Ethernet, connect the unit to a grounding type AC wall outlet (100-240 VAC), using the standard power cord supplied with the unit.
- Placement must allow for easy access to disconnect the unit from the AC wall outlet if necessary.
- Do not cover the unit or block the airflow to the unit with any other objects.
- Keep the unit away from excessive heat and humidity and keep the unit free from vibration and dust.
- Installation must at all times conform to local regulations.
- Customer provided Cat 5 Ethernet cable shall be Plenum rated if the unit is installed above a false ceiling, and the cable must never exit the building.
- When the MB-8000 will be connected to an outdoor antenna system, consult the documentation that came with the outdoor antenna kit for additional regulatory information, safety instructions and installation requirements.

**Antenna placement**

There are two antennas mounted on both side of the MB-8000. The antennas can be adjusted easily.

The MB-8000 device has been designed for indoor placement. You can connect the device to an outdoor antenna installation using an optional antenna kit. Refer to the antenna installation guide for instructions on selecting the proper antenna.

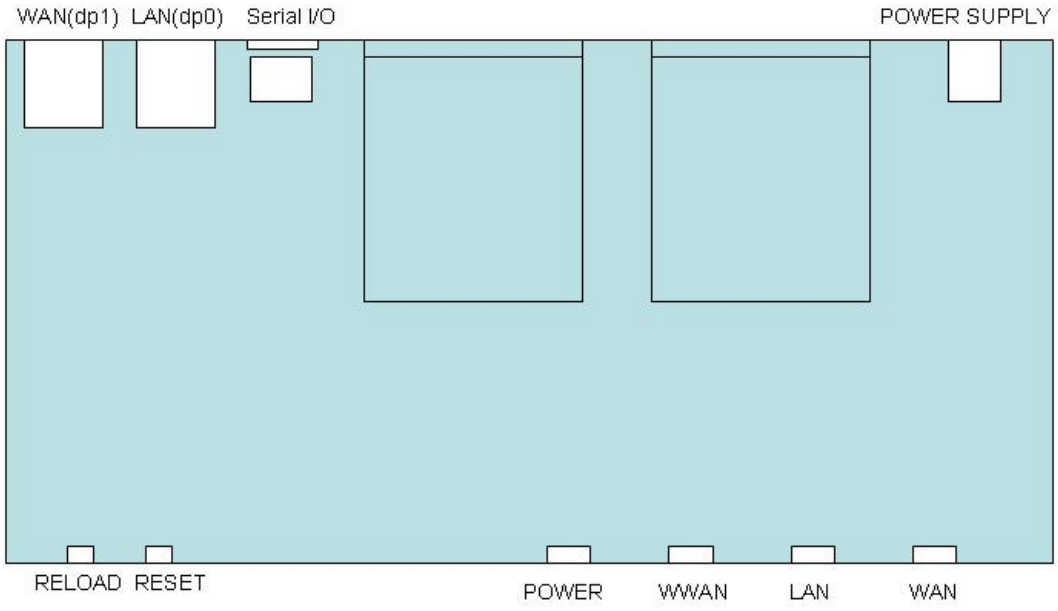
## 2.5 Power up the MB-8000

connect the power supply.(see Figure 2-3).

Figure2- 3***Ports description***


a. Power
b. WLAN ANTENNA
c. PC CARD B(option)
d. PC CARD A
e. Serial Port
f. Ethernet Interface B(LAN)
g. Ethernet Interface A(WAN)

Figure2- 4




**MB8000 TOP VIEW**

The MB-8000 power supply accepts any input AC voltage in the range of 100-240 VAC.

**WARNING:**

*For your own safety, use only the power cord supplied with the unit. Insert it in a grounded AC outlet. When using the unit in combination with outdoor antennas, the grounding of the AC outlet must be connected to the safety grounding system of the outdoor antenna system and the lightning arrestor.*

*When using Active Ethernet, which supplies power over the Ethernet cable, the MB-8000 is not connected to a local power outlet. For more information about Active Ethernet, contact your reseller.*

## 2.6 LED Indicators

MB8000 has five two-color LEDs to indicate the status of its performance. The follow table shows the status when the MB-8000 is configured successfully and running properly.

***Table 2-1 Normal LED Indications(Use WWAN to Connect to Internet and No WAN)***

| WAN | LAN | WWAN | POWER |
|---|---|---|---|
| n/a | Green flash:<br>100M data activity<br>Red flash:<br>10M data activity | Green if PCMCIA card is present,Red if not | Green when MB8000 has started up |

***Table 2-2 Normal LED Indications (Ethernet Interface B is used)***

| WAN | LAN | WWAN | POWER |
|---|---|---|---|
| Green flash:<br>100M data activity<br>Red flash:<br>10M data activity | Green flash:<br>100M data activity<br>Red flash:<br>10M data activity | Green if PCMCIA card is present,Red if not | Green when MB8000 has started up |

# 3. Management

## 3.1 Overview

- Management Options
- Web-based Management Interface
- Command Line Interface

## 3.2 Management Options

Top Global MB-8000 provides both web-based interface and Command Line Interface(CLI) for system management. This section only covers the web-based Interface. For more information about CLI, please refer to the “Command Line Interface Reference Manual”.

## 3.3 Web-based Management Interface

MB-8000 provides a web server for web-based management. This section will show you how to visit MB-8000’s web site.

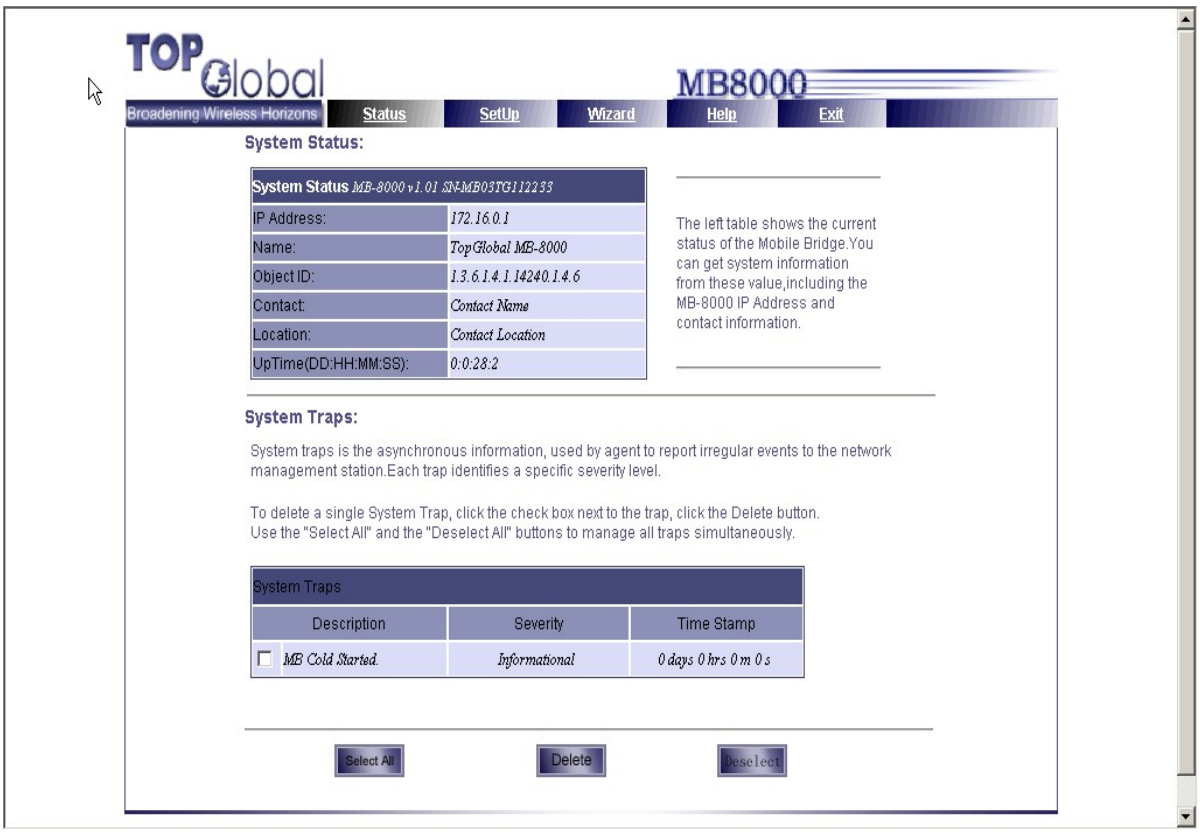
1. Open your browser and enter the MB-8000’s IP address in the address bar.
2. Press the **ENTER** key. Result: The MB-8000 ***Login*** dialog box appears.

Figure3- 1***Login Dialog Box***


**NOTE:**
Default user name: public
Default password: public

3. if authentication is OK, the home page of MB-8000’s web site will be displayed(Figure 3-2).

Figure3- 2 ***MB-8000’s home page***




There are four main categories of MB-8000's web site: **status, set up, wizard and help.** The following section will explain each of them in detail.

### 3.3.1 Status

View your system information in status area.
The ***status*** area includes two sub-areas : **system status** and **system traps**.

— **System status** provides system level information, including the MB-8000's ip address and contact information.

— **System traps** report irregular events to the network management stations. Each trap identifies a specific severity level.

To delete a single system trap, choose the check box next to the trap and then press **Delete** button.
To manage all traps simultaneously , use the **Select All** and the **Deselect All** buttons.
For more information about system traps, refer to "Troubleshooting" of the user guide.

## 3.3.2 Set Up

Modify Basic and Advanced settings in **Set up** area.
The Set up area includes four sub-areas: **Basic, Advanced, Tools** and **Monitor**

### 3.3.2.1 Basic

**Basic** includes the most primary configurations for MB-8000 .
There are three main categories of basic settings:

- Network Setting
- Local User Base Setting
- Wireless Card Setting

#### 3.3.2.1.1 Network Setting

Network Setting includes the most primary network configurations for MB-8000 .
There are three sub-options of network settings:

- Local IP Configure
- WAN Configure
- DNS Configure

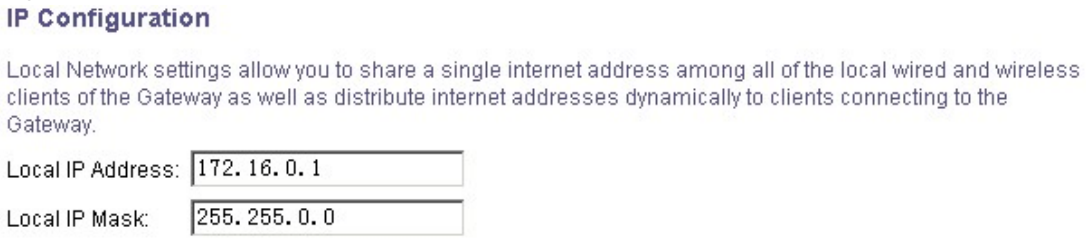
### Local IP Configure

- **IP Configure**

  Local IP Address: This parameter represents the IP Address of the wireless LAN. The default IP address is 172.16.0.1.

  Local IP Mask: This parameter represents the subnet mask of the wireless LAN. The default subnet mask is 255.255.0.0.

Figure3- 3




- **DHCP Server Configure**

  DHCP Server Status: This parameter indicates whether the DHCP server is enabled or disabled in MB-8000. If DHCP is disabled, each client device must be manually configured with a

unique and static Internet (IP) address.

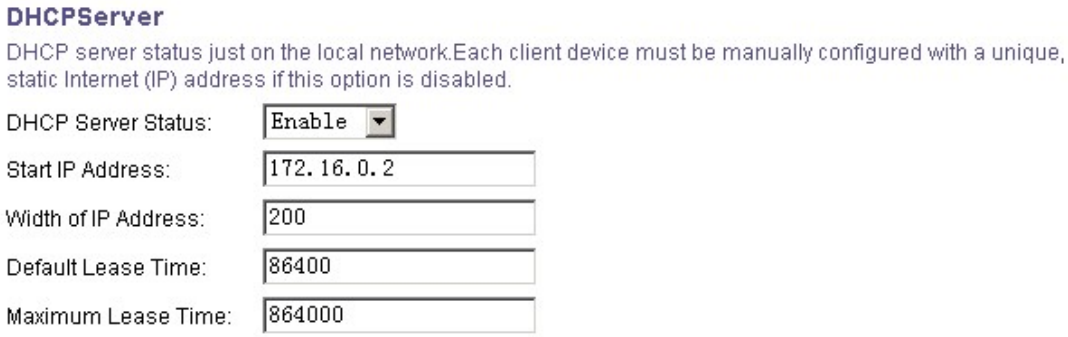
Start IP Address: the start IP address for the DHCP IP address pool.

Width of IP Address: the width of DHCP IP address pool.

Default Lease Time: the default lease time in seconds for the IP address assigned by the DHCP server to the DHCP client.

Maximum Lease Time: the maximum lease time in seconds for the IP address assigned by the DHCP server to the DHCP client.

Figure3- 4




## WAN Configure

WAN Configure allow each device on the local network to share a single broadband connection to the Internet using Network Address Translation (NAT firewall).

**WAN Status**: This parameter indicates whether WAN connection is enabled or disabled. If WAN status is set to disabled, the unit will perform as a simple network bridge, and the other parameters on this page could not be configured.

**Wireless WAN Status:** this parameter indicates whether wireless wan connection is enabled or disabled.

MB000 supports double cards, which can either be used as GPRS, CDMA, or UMTS Communication mode. In the following two tables (see figure 3-5), you can set the parameters to finish Wireless WAN configuration.

Card status: this parameter indicates whether this card is enabled or disabled.

Phone Number: this parameter is used to provide a phone number to modem

User Name: this parameter is used to provide a user name to modem

Password: this parameter is used to provide a password to modem

Initial Parameter: this parameter is used to initialize modem

*For example:*
*When using GPRS in China, the default setting is:*
*Phone Number: *99***1#*
*User Name: vxTarget*
*Password: vxTarget*
*Initial Parameter: at+cgdcont=1,"IP","cmnet","",0,0*

*When using CDMA1x in China, the default setting is:*
*Phone Number: #777*
*User Name: card*
*Password: card*
*Initial Parameter: atz\r*

*When using UMTS in China, the default setting is:*
*Phone Number: #99#*
*User Name: card*
*Password: card*
*Initial Parameter: AT+CGDCONT=3,"IP","","0.0.0.0"*

Wired WAN Status: Select a kind of wired connection to Internet by setting this parameter. The valid values are:

- PPPoE
- LAN (static)
- LAN (by DHCP)
- None

If you use a special connection application which requires you to input a username and password in order to access the internet over your ADSL or cable modem connection, you are likely using a technique called PPP over Ethernet (PPPoE).

If you received IP address, subnet mask and Gateway settings from your Internet Service Provider (ISP), select Manual IP Addressing and fill out the fields below with the static address information provided by your ISP.

Figure3- 5

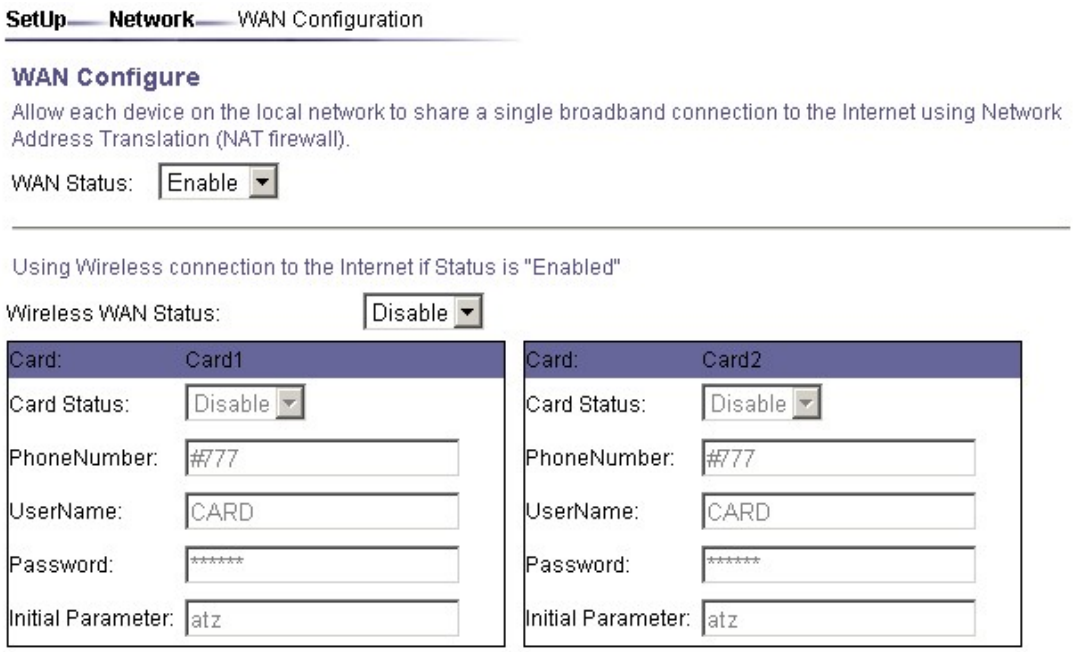
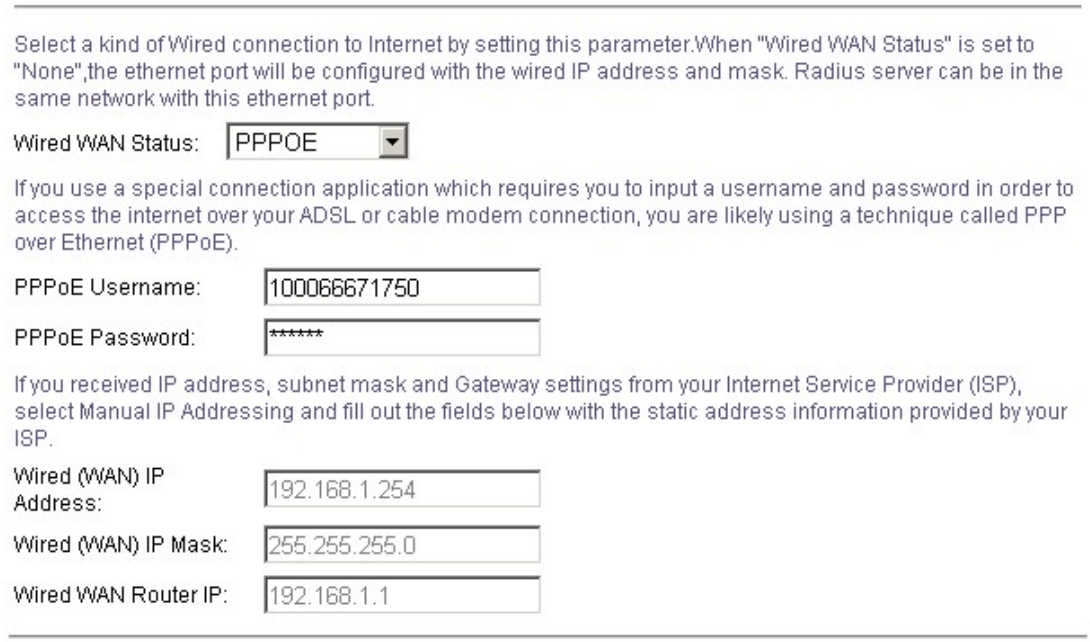



Figure3- 6




PPPoE Username: This parameter is used to configure the username for PPPoE which given by ISP. It can be configured only if the WAN status is "enable" and the Wired WAN Status is "PPPoE".

PPPoE Password: This parameter is used to configure the password for PPPoE which given by ISP. It can be configured only if the WAN status is "enable" and the Wired WAN Status is "PPPoE".

Wired WAN IP Address: This parameter represents the ip address of the wired WAN.

The default IP address is 192.168.0.254 This parameter can be configured only if the WAN status is “enable” and the Wired WAN Status is “LAN Static”.

Wired WAN IP Mask: This parameter represents the subnet mask of the wired WAN. This parameter can be configured only if the WAN status is “enable” and the Wired WAN Status is “LAN Static”.

Wired WAN Router IP: This parameter represents the ip address of the wired WAN gateway. This parameter can be configured only if the WAN status is “enable” and the Wired WAN Status is “LAN Static”.

## DNS Configure

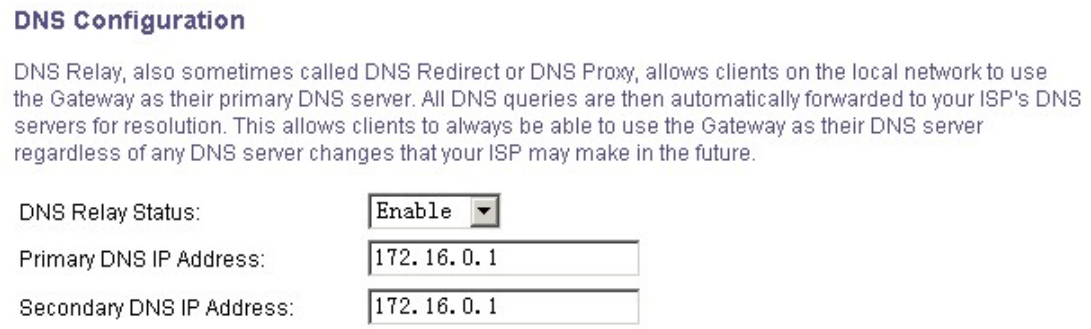
DNS Relay, also called DNS Redirect or DNS Proxy, allows clients on the local network to use the gateway as their primary DNS server. In this way, all DNS queries from clients are sent to MB-8000 and then automatically forwarded to your ISP's DNS servers by MB-8000. This allows clients to always be able to use the gateway as their DNS server regardless of changes in DNS server that your ISP may make in the future.

DNS Relay Status: This parameter indicates whether DNS relay is enabled or disabled.

Primary DNS IP Address: This parameter represents the IP address of the primary DNS server. If DNS relay is enabled, this parameter should be the IP address of MB-8000’s IP address.

Secondary DNS IP Address: This parameter represents the IP address of the secondary DNS server. If DNS relay is enabled, this parameter should be the IP address of MB-8000’s IP address.

Figure3- 7




### 3.3.2.1.2 Local User Base Setting

The local user base section allows you to add, edit or delete users which are allowed to access internet via MB-8000.

- **Local User Base Status.** This parameter indicates whether user authentication using local user base is enabled or disabled.

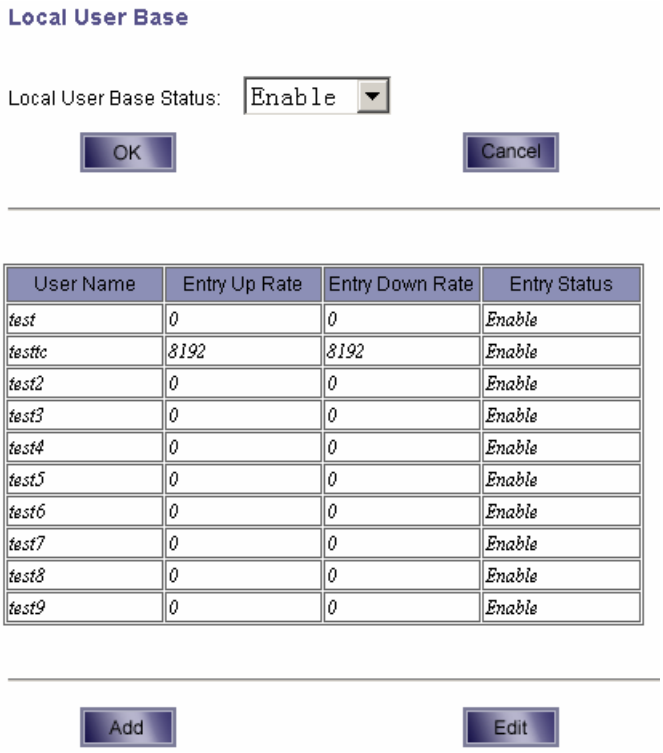
**Add an Entry to the Local User Base**

1. Click the Add button in the Local User Base table.
2. Enter the user name and password for each user .
3. Enter entry uprate and downrate for each user for the sake of flow control.

**Disable or Delete an Entry in the Local User Base Table**

1. Click the Edit button in the Local User Base Table.
2. Select the user entry you want to disable or delete
3. choose “Disable” or “Delete” in the user’s entry status.
4. click OK

Figure3- 8




### 3.3.2.1.3 Wireless Card Setting

The following description is the same for the tabs that relate to Mini-PCI Card Slot of your MB-8000 equipped with a Mini-PCI Card.

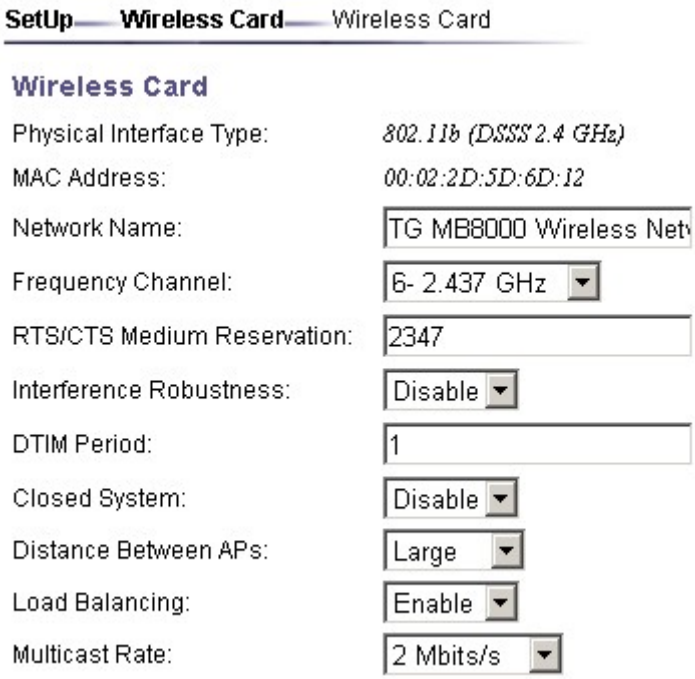
- **If the Mini-PCI card is 802.11b Wireless card,**
  - **Physical Interface Type.** A read-only field listing the type of the Mini-PCI card.
  - **MAC Address**. A read-only field listing the MAC Address of the Mini-PCI Card.
  - **Network Name**. network name for each Mini-PCI Card. This is the same name with the one used by Client Manager software.
  - **Frequency Channel**. the desired frequency channel for card. Ensure that it's not used by the nearby devices.
  - **RTS/CTS Medium Reservation**. This value affects message flow control, and should not be changed under normal circumstances.
  - **Interference Robustness**. Enable this option if other electrical devices may be interfering with the wireless signal.
  - **DTIM Period**. Deferred Traffic Indicator Map (DTIM) is used with clients that use power management. DTIM should be left at the default value.
  - **Closed System**. A closed system means that only clients that know the MB-8000's network name can access MB-8000's wireless network. When this parameter is set to **Disable**, MB-8000 can be accessed by any clients who use network name "ANY".
  - **Distance Between MBs**. Set to **Large**, **Medium**, or **Small**, depending on the

site survey for your system. The distance value is related to the **Multicast Rate** (described next). In general, the larger distance is, the lower average speed systems will operate at.

– **Load Balancing.** This parameter indicates whether load balancing is enabled or disabled.

– **Multicast Rate**. the rate of multicast messages. This parameter is related to the **Distance Between MBs** parameter (see above).

Figure3- 9




## 3.3.2.2 Advanced

**Advanced** sub-area provides functionalities including security management, user management, user authentication and accounting.

There are three main categories of advanced settings:

- Management
- Security
- Bridge

### 3.3.2.2.1 Management

There are two sub-options of management:

- Password
- Service

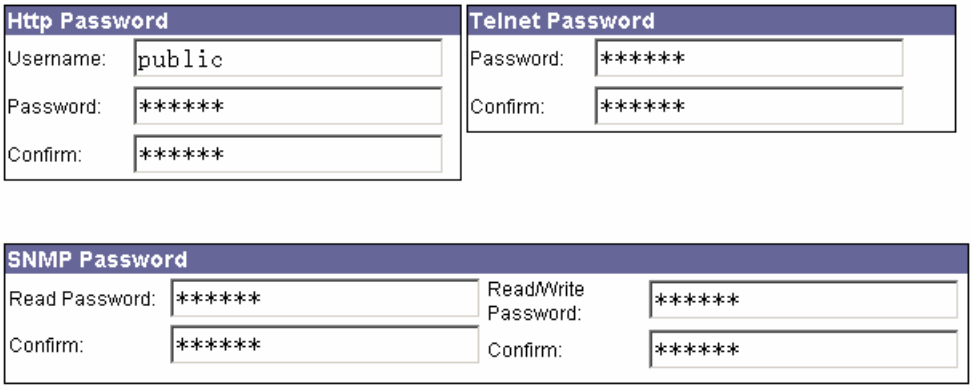
## Password

Http Password:
User name and password for login in MB-8000's web server.

Telnet Password:
User name and password for login in MB-8000's telnet server.

SNMP Password:
User name and password for login in MB-8000's SNMP agent.

Figure3- 10




## Service

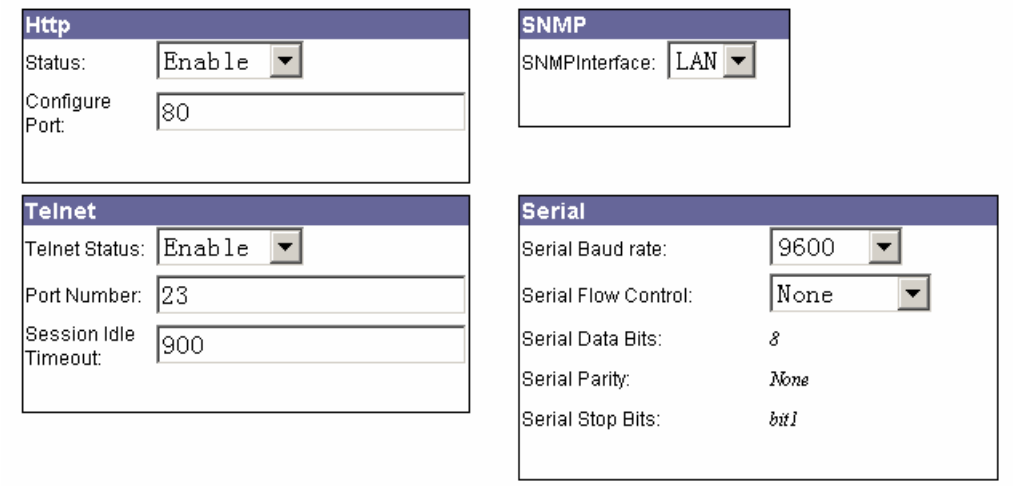
Http:
Enable or disable MB-8000's web server and configure its server port .

Telnet:
Enable or disable MB-8000's telnet server and configure its server port and session idle timeout. If user stays idle over timeout, MB-8000 will logout the user automatically.

SNMP:
Choose the network interface of SNMP agent .

Serial:
Configure the speed and data format of serial connection.

Figure3- 11




#### 3.3.2.2.2 Security

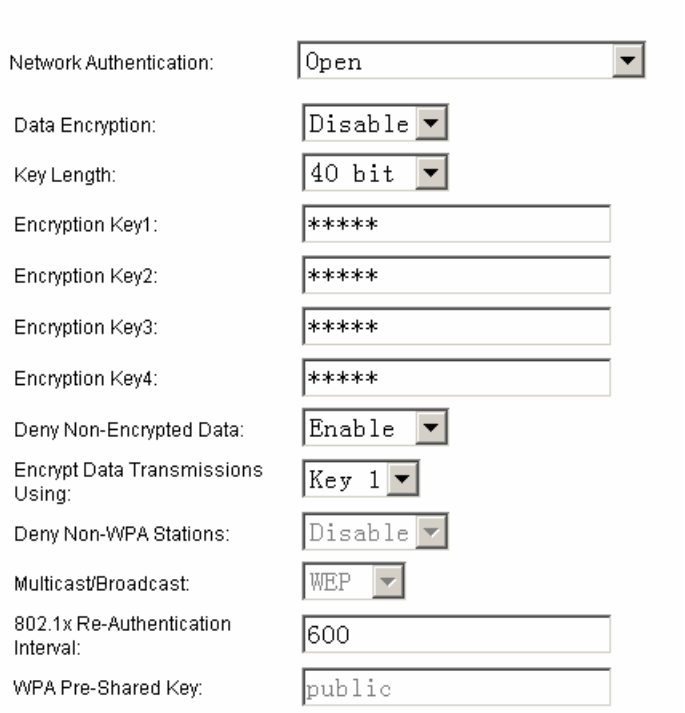
There are four sub-options of security:

- Encryption
- Radius
- Mac Access
- Web Portal

## Encryption

Encryption configuration defines what security protocol to adopt in WLAN. Available security protocol in MB-8000 includes 802.1x, WPA and 128-bit WEP.

Figure3- 12

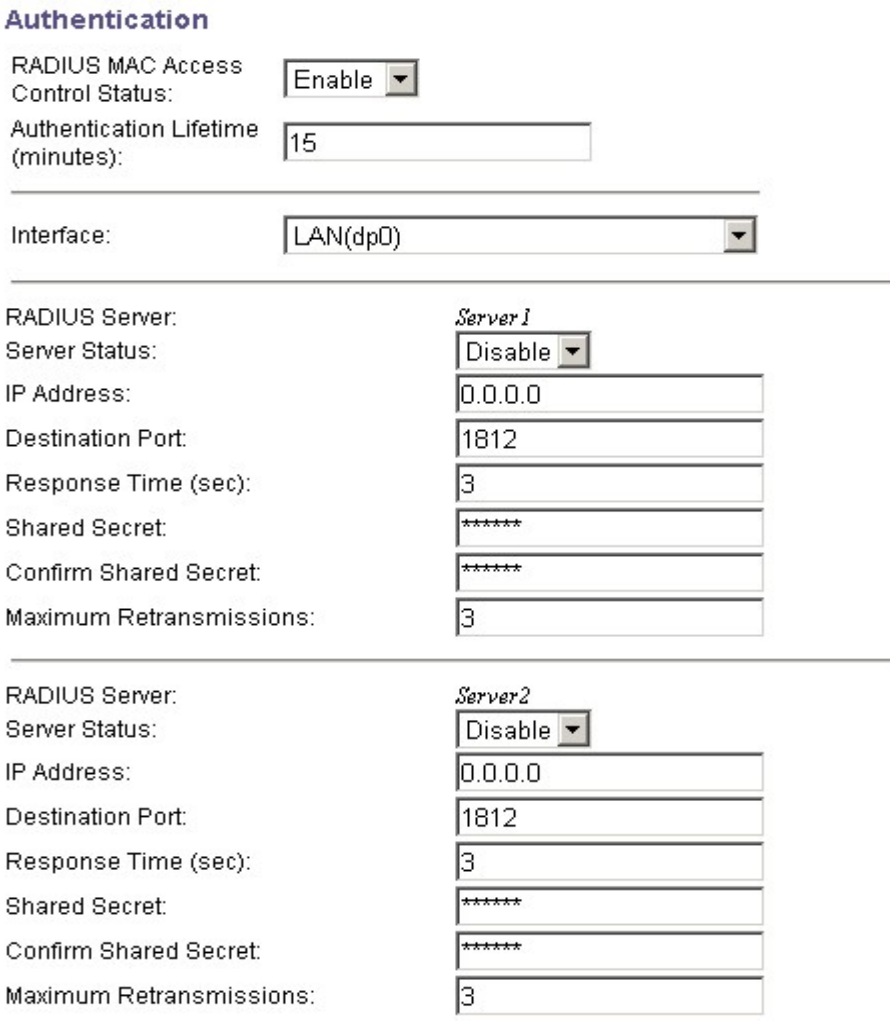



## Radius

A RADIUS server is one that contains central user databases which identify which user is allowed to access the wireless network. The information for primary RADIUS server is mandatory if user authentication by RADIUS will be used. The information for backup RADIUS server is optional.

- **RADIUS MAC Access Control Status.** This parameter indicates whether user authentication by RADIUS is enabled or disabled.
- **Interface.** The network interface that will be used for communicating with RADIUS server.
- **Authorization Lifetime (minutes).** The time before when automatical re-authentication will be performed. The default value is 15 minutes.
- **Server Status.** The status of RADIUS server.
- **IP Address. T**he IP address of RADIUS server.
- **Destination Port.** The listen port of RADIUS server. The default value is 1812 or 1813.
- **Response Time (sec).** The maximum time to wait for the authentication response from RADIUS server.
- **Shared Secret.** Shared secret between RADIUS server and MB-8000.
- **Maximum retransmissions.**The maximum number of times an authentication may be retransmitted.

Figure3- 13




Note：

For RADIUS authentication interface, there are three options to be selected:

---LAN(dp0) see Figure3-14 for the proper connection

---WAN(dp1) see figure3-15 for the proper connection

---Wireless WAN(PPP) see figure3-16 for the proper connection

PPPOE(dp1) see figure3-15 for the proper connection

Figure3- 14

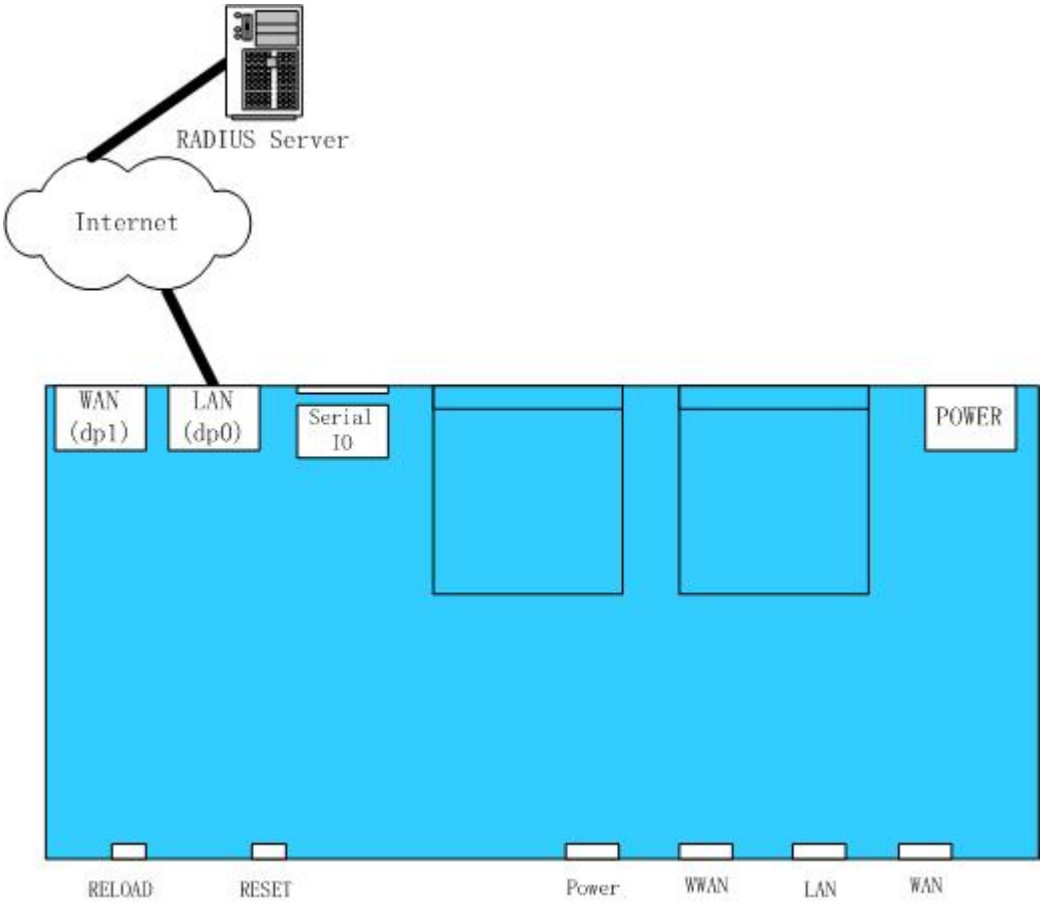

RADIUS Server
Internet
WAN
(dp1)
LAN
(dp0)
Serial
IO
POWER
RELOAD
RESET
Power
WWAN
LAN
WAN

Figure3- 15

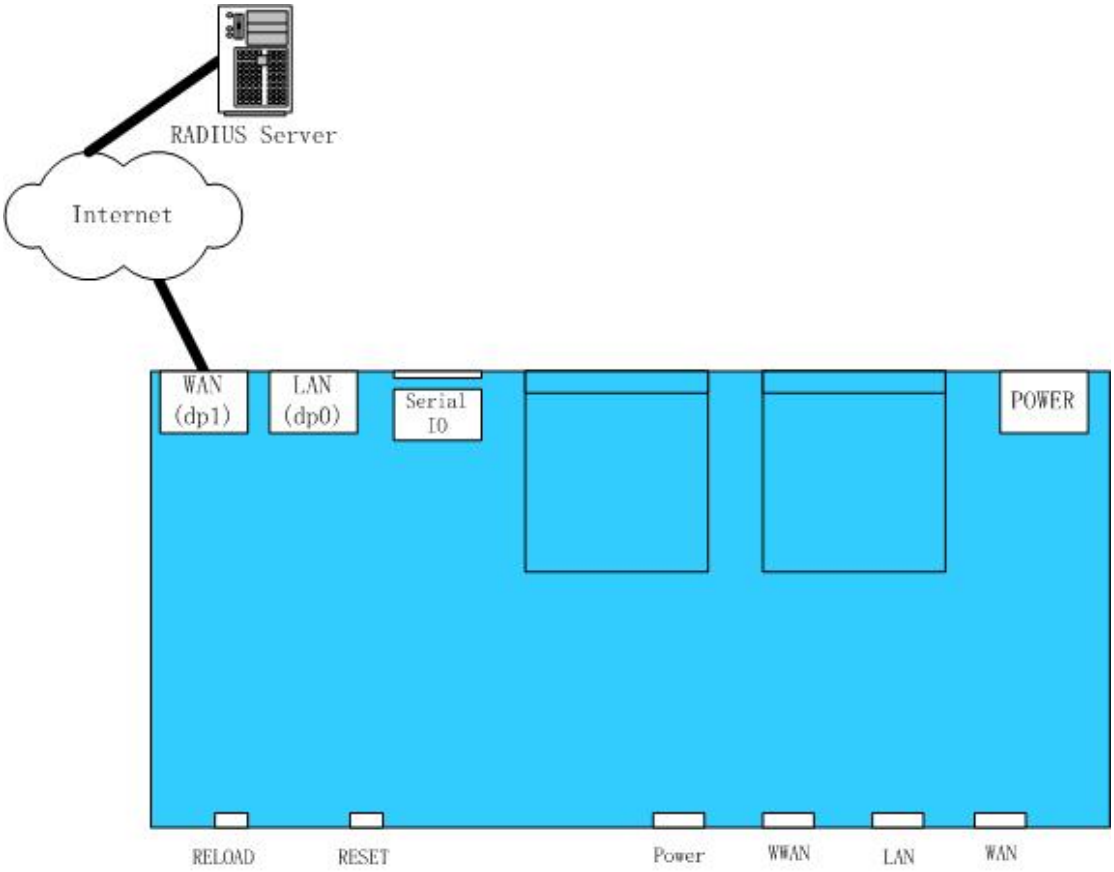
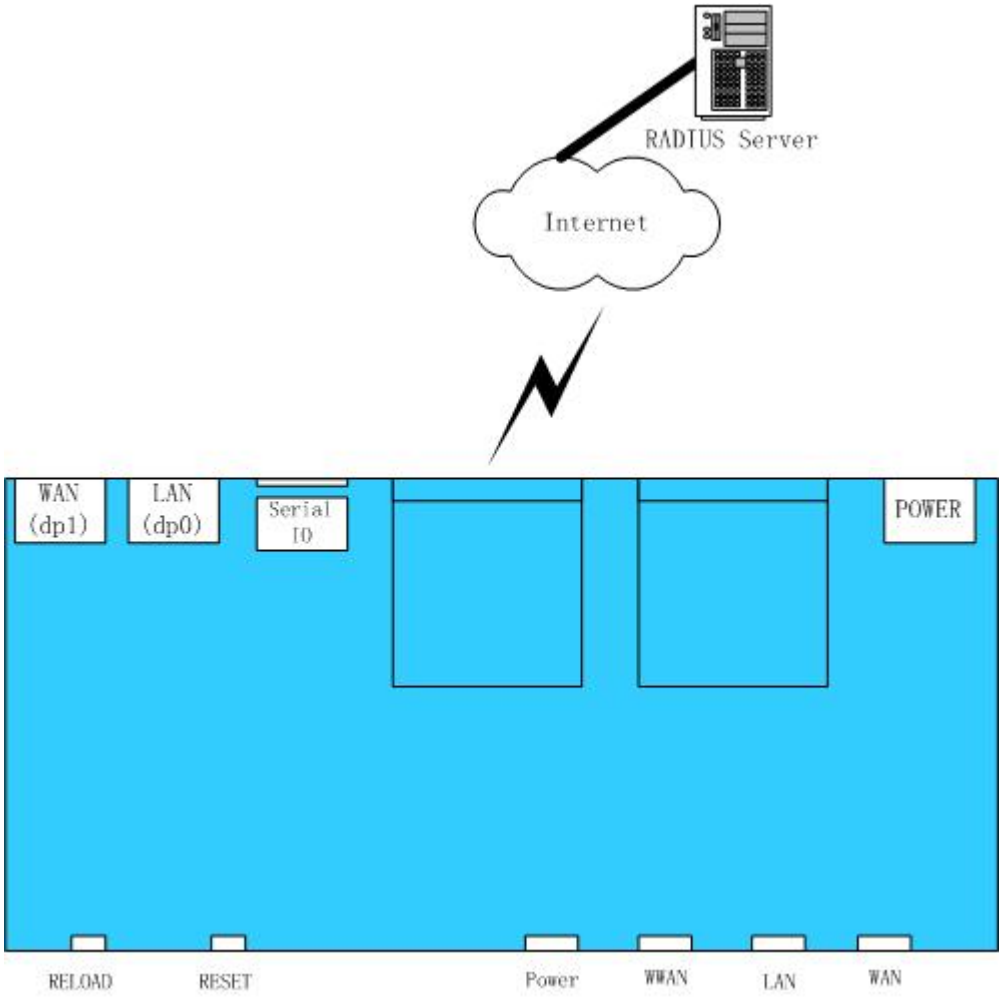

RADIUS Server
Internet
WAN
(dp1)
LAN
(dp0)
Serial
I0
POWER
RELOAD
RESET
Power
WWAN
LAN
WAN

Figure3- 16




## MAC access

The MAC access section allows you to add, edit or delete users which are allowed to access MB-8000. Users are identified by their MAC address.

- **Access control Status.** This parameter indicates whether access control by MAC address is enabled or disabled.
- **Access control Operation Type.** Choose between **Allow** and **Deny.** This determines how the stations identified in MAC Access Table is filtered

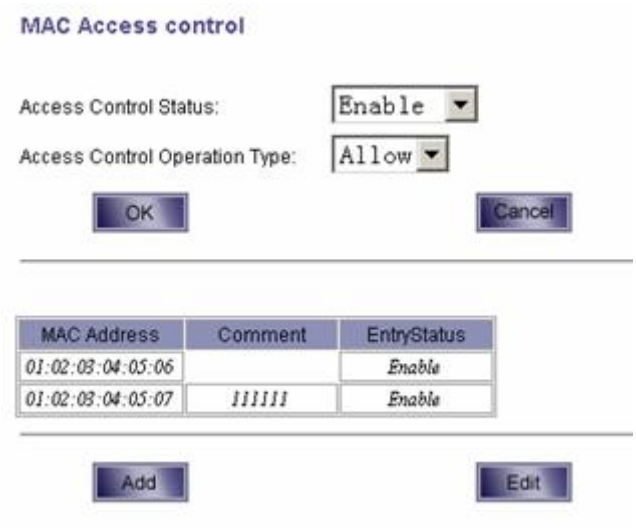
**Add an Entry to the MAC Access Control Table**

4. Click the Add button in the MAC Access Control table.
5. Enter the MAC Address of the client station.
6. Add a comment as needed. Entries are automatically enabled.

**Disable or Delete an Entry in the MAC Access Control Table**

5. Click the Edit button in the MAC Access Control Table.
6. Select the MAC Address you want to disable or delete
7. click OK

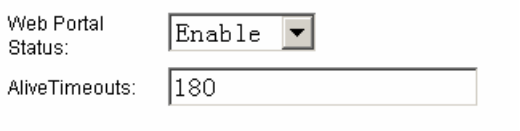
Figure3- 17




## Web Portal

Web portal is an authentication method which authenticates users by requiring them to input user name and password on web pages.

Figure3- 18




—**Web Portal Status.** This parameter indicates whether web portal is enabled or disabled.

—**Alive Timeouts (Seconds)**. The idle time before when a user will be automatically logout by MB-8000.

## 3.3.2.3 Tools

**Tools** provides functionalities including files downloading/uploading, MB-8000 rebooting or reloading control.

### 3.3.2.3.1 Download&Upload

Download and upload tools enable files downloading or uploading between MB-8000 and TFTP server.

Files downloadable includes configuration file(Config), MB Image(Img), Bsp boot

loader(BspBl), logon web page(Logo), server certificate file(ServerCert), server private key file(PrivateKey) and Certificate Authority certificate file(CAcert).
Files uploadable includes configure file(Config).
NOTE:
**1)** A TFTP server must be running and configured to point to the directory containing the target file. The default MB Image is located at C:\ProgramFiles\TopGlobal\WaveNET\. If you don't have a TFTP server installed on your system, install the TFTP server first.

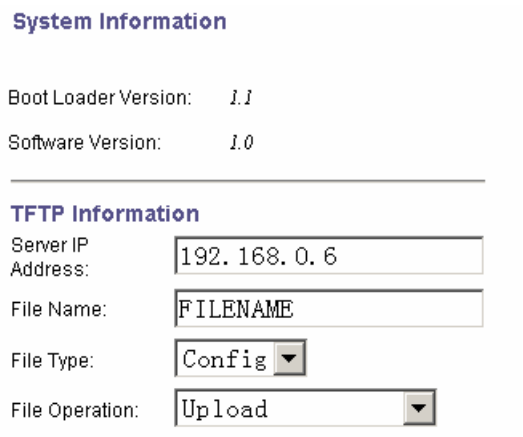
**2)** Before you can download or upload file successfully, you must sure the physical connection has exited between TFTP server and the corresponding interface in the same subnet. For example， you set MB wired WAN IP address with 192.168.0.254,and your MB's local IP address is 172.16.0.1. If your TFTP sever' IP address is 192.168.0.*, you must select the WAN(dp1)( see figure 2-4) interface to connect your Ethernet cabal, because they are in the same subnet. If your TFTP server's IP address is 172.16.0.*, don't forget to change the connection interface to dp0. (see figure 2-4)
— **Server IP Address**. The ip address of TFTP server.

— **File Name**. Name of the target file.

— **File Type**. Type of the target file. Possible file type includes:
- **Config** . Configuration file containing information such as system name and contact name.
- **Img**. MB Image (executable program).
- **BspBl**. Boot loader.
- **Logo**. Logo web page(.html file)
- **ServerCert**. Server certificate file(.pem file)**.**
- **PrivateKey.** Server private key file(.pem file).
- **CAcert for** Certificate Authority certificate file(.cer file).

– **File Operation**. File operation type including **Download**, **Upload** or **Download & Reboot**. You should reboot the MB-8000 after downloading files.

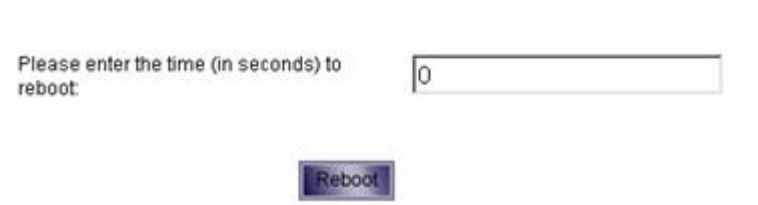
Figure3- 19




#### 3.3.2.3.2 Reboot

**Reboot** operation saves configuration changes (if any) before reset MB-8000 . Note that **Reset**, covered below, does not save configuration changes.
Set the time to reboot as zero will cause an immediate reboot.

Figure3- 20




#### 3.3.2.3.3 Reload

Reload operation restores the MB-8000 configuration to factory default values. The MB-8000 may also be reload from the **RELOAD** button on indicator side of the unit. Since this will reset the current MB-8000 IP address, a new IP address must be assigned. For more information ,please refer to “Initialization”.

### 3.3.2.4 Monitor

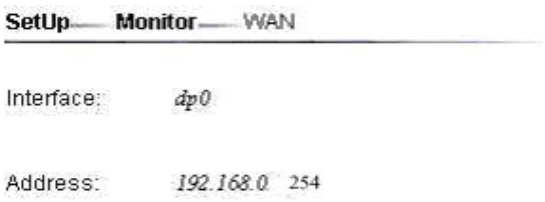
**Monitor** provides tools including link activity test, WAN interface monitoring and router table monitoring.
There are three sub-areas of monitor:

- Wan
- Router
- Link status

#### 3.3.2.4.1 Wan

WAN interface monitoring tool shows whether WAN interface works normally or not .If the address is valid, the interface works normally, otherwise abnormally.

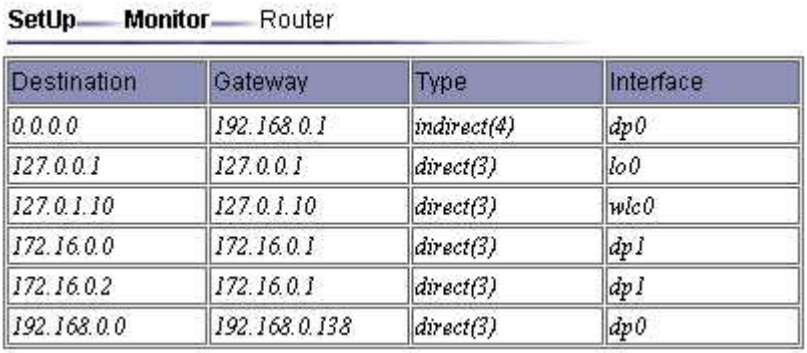
Figure3- 21




#### 3.3.2.4.2 Router

Router shows the route table of MB-8000. We assume that you know router protocols well

Figure3- 22

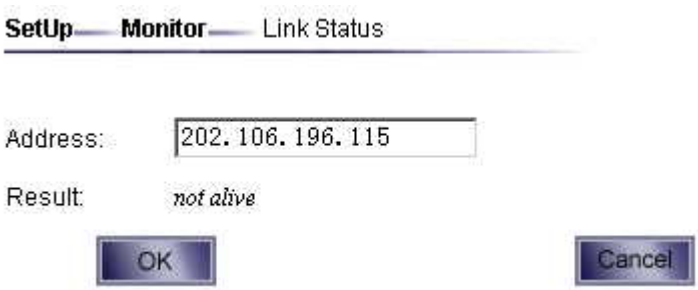



| Destination | Gateway | Type | Interface |
|---|---|---|---|
| 0.0.0.0 | 192.168.0.1 | indirect(4) | dp0 |
| 127.0.0.1 | 127.0.0.1 | direct(3) | lo0 |
| 127.0.1.10 | 127.0.1.10 | direct(3) | wlc0 |
| 172.16.0.0 | 172.16.0.1 | direct(3) | dp1 |
| 172.16.0.2 | 172.16.0.1 | direct(3) | dp1 |
| 192.168.0.0 | 192.168.0.138 | direct(3) | dp0 |

#### 3.3.2.4.3 Link Status

Link tests whether a link is active by pinging the target ip address. Depending on whether the target IP address is available, the result will show *alive* or *not alive*

Figure3- 23

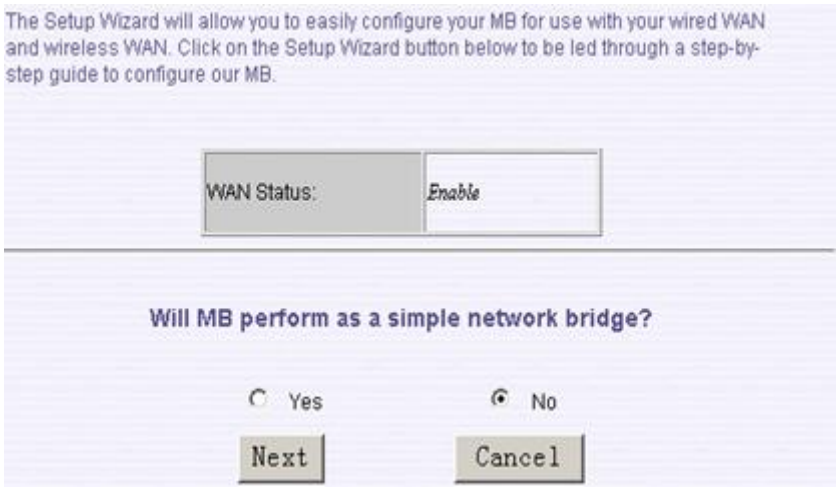

SetUp
Monitor
Link Status
Address:
202. 106. 196. 115
Result:
not alive
OK
Cancel

### 3.3.3 Wizard

The Setup Wizard will guide you step-by-step to configure your MB-8000 for use with your wired WAN and wireless WAN.

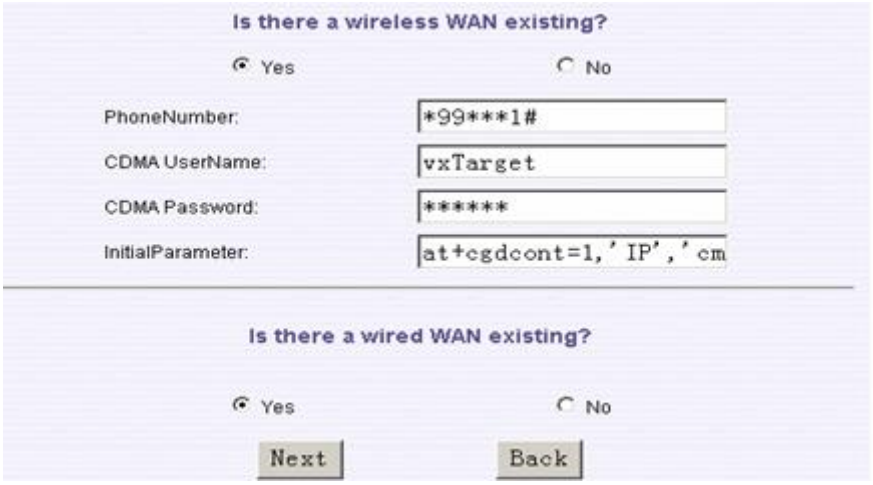
Step 1. Choose in what kind of mode will MB-8000 work in.
If you want MB-8000 to work just as a network bridge with no WAN supported, no further configuration is needed. Just choose “yes” to finish the configuration. If you want MB-8000 to work as an access point with WAN supported, choose “no” to continue the succeeding configuration.

Figure3- 24




Step 2. Choose whether wireless WAN or wired WAN is present.

Figure3- 25



In this page, there will be four different results depending on your choice.

| Is wireless WAN present | Is wired WAN present | Result |
|---|---|---|
| No | No | No WAN is present, MB-8000 will perform as a simple network bridge |
| Yes | No | only wireless WAN is present, MB-8000 will access internet with wireless WAN interface |
| No | Yes | only wired WAN is present, MB-8000 will access internet with wired WAN interface |
| Yes | Yes | Both wireless WAN and wired WAN are present, MB-8000 will access internet with wired WAN prior to wireless WAN . |

If you choose “No” and “No” , it means that no WAN is present and the MB-8000 will work as a simple network bridge and no further configuration is needed. Click “Next” button, the following page will be displayed.

Figure3- 26


Click “Finish” button to finish the wizard.

If you choose “Yes” and “No” , it means that only wireless WAN is present. Inputting the phone number, user name , password and initial parameter, then click “Next” button, the following page will be displayed.

Figure3- 27

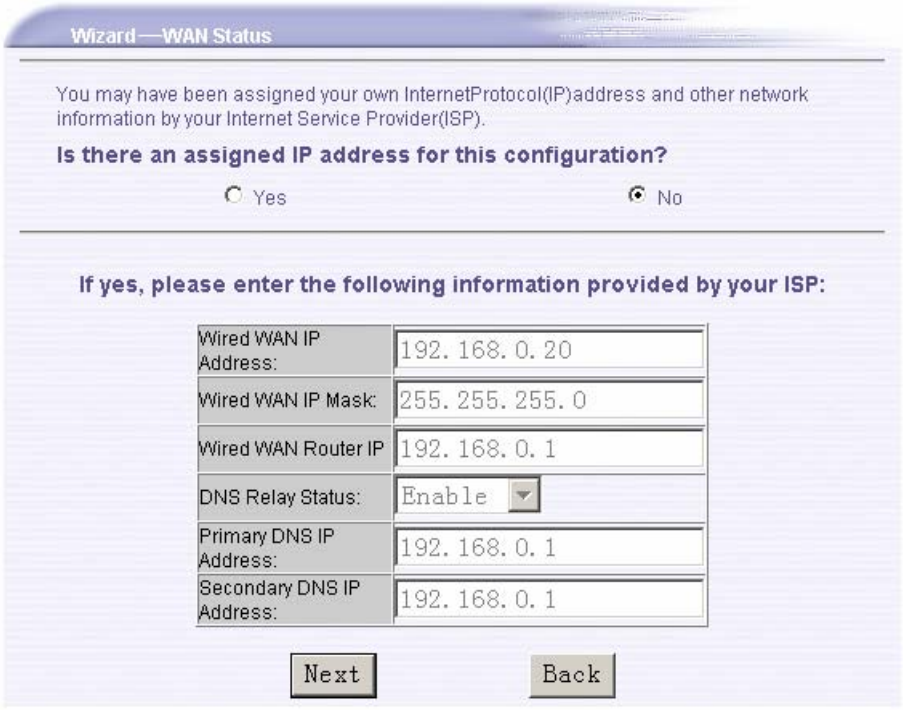

Click “Finish” button to finish the wizard.

If you choose “yes”,“yes” or “no”, “yes” , it means that wired WAN is present and you need

to use Step 3 to further configure the wired WAN.

Step 3. Configure your wired WAN with static IP address.

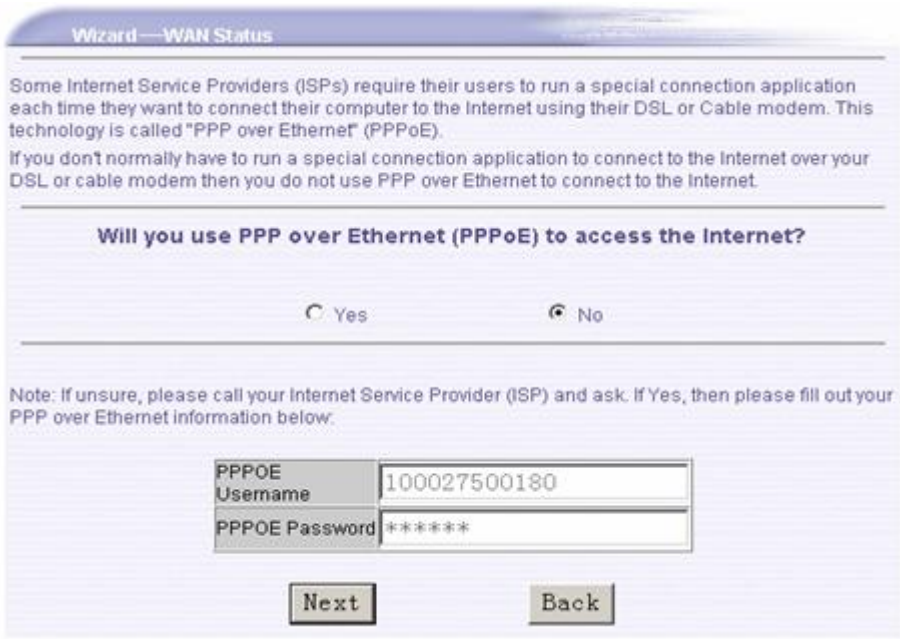
Figure3- 28




In this page, choose “yes” if MB-8000 has been assigned a static IP address by ISP. When you finish it, click “next” to meet the finish page and complete the wizard. If there is not a static IP address assigned , choose “no” and click “next” to go to Step 4 for succeeding configuration.

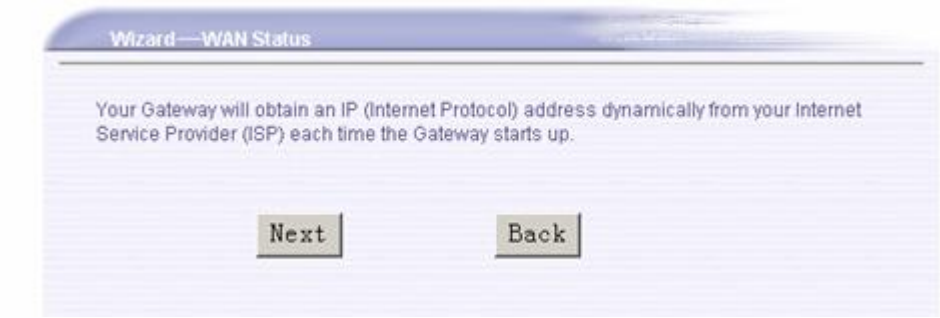
Step 4. Configure wired WAN with dynamical ip address

Figure3- 29



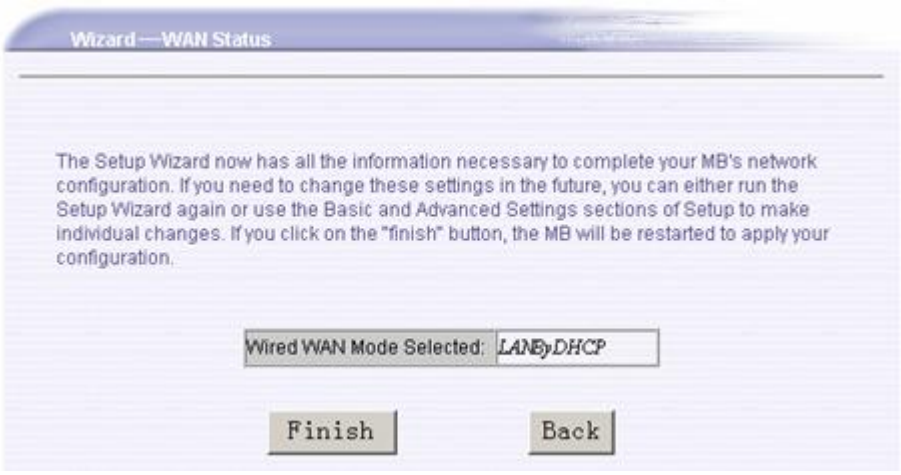

In this page, you choose “yes” and input PPPoE user name and password if you want to use PPPoE for dynamic ip address assigning. If you choose “no”, your gateway will obtain an IP address dynamically from your Internet Service Provider each time the gateway starts up.

Figure3- 30




When you finish the configuration, you will meet the finish page. Click “finish” button to reboot MB-8000 .

Figure3- 31




### 3.3.4 Help

Get additional information in Help area.
Help file is attached to the CD-ROM of MB-8000. By entering **X(X is the Driver of the CD-ROM):\Docs\English\UG_MB_8000_eng.pdf** in the **Help Link box**, you can activate the **Help** link on other pages.

## 3.4 Command Line Interface

The Command Line Interface (CLI) provides a set of predefined commands. Each command statement is composed of CLI commands and the parameters. For example, when downloading a file, administrators enter the **download** command along with TFTP server ip address, file name, and file type parameters.

- If necessary, use the CLI with your computer serial port to initialize the proper ip address for your network. For more information about initializing your unit, please refer to “Initialization”.
- The CLI provides configuration and management access for most generic Telnet and Terminal clients. Use the CLI through your computer serial port, over your LAN, through the Internet, or with a "crossover" Ethernet cable connected directly to your computer.

The “Command Line Interface Reference Manual”, contained on the installation CD-ROM provides more information about using the CLI.

# 4.Secure Socket Layer (SSL)

## 4.1 Overview

- introduction to SSL
- Server certificate and private key download for MB-8000
- CA certificate download for MB-8000
- CA certificate install for MB-8000's client
- CA certificate uninstall for MB-8000's client

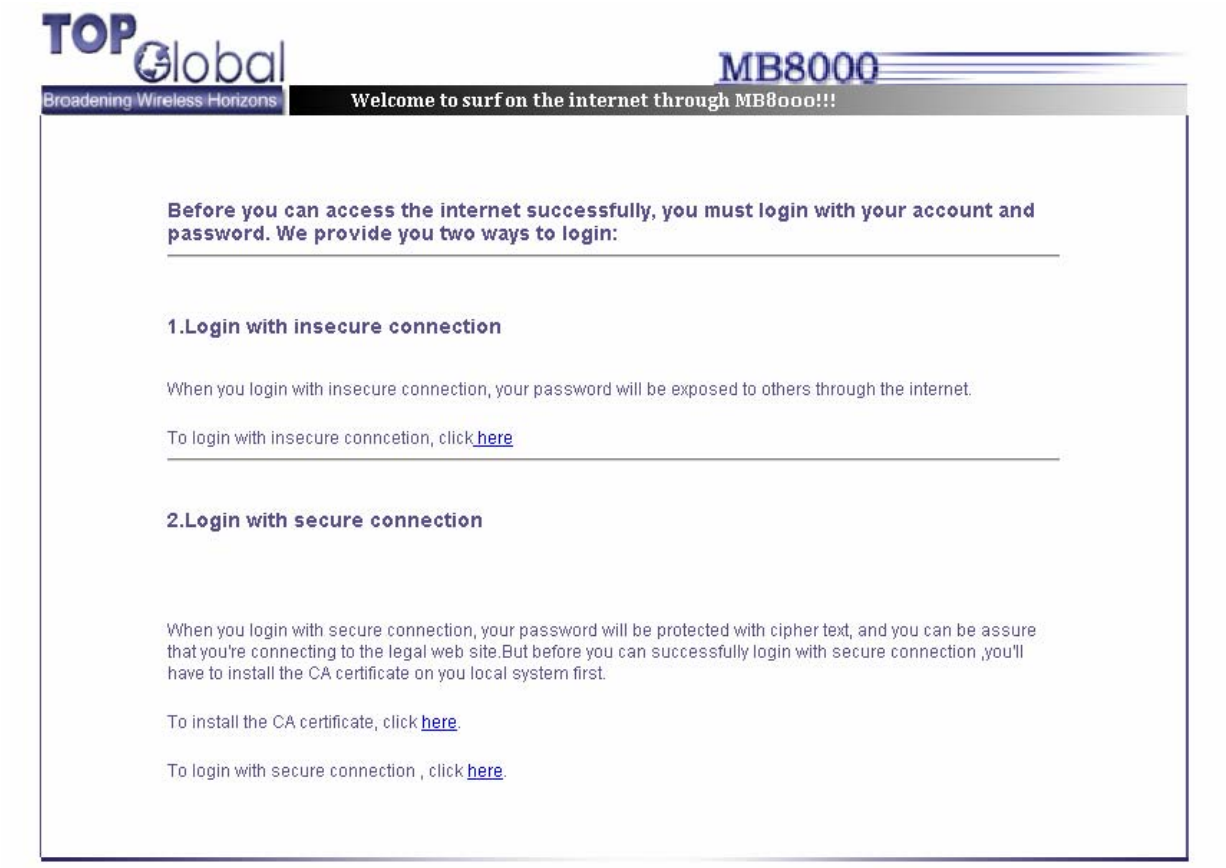
## 4.2 Introduction to SSL

MB8000 supports SSL capability to provide secure network connections. By authenticating server before connecting to it, man-in-the-middle attack can be avoided. SSL also provides data encryption and integrity check.

Server authentication is based on server's certificate. Certificate is a digital identity card and it's issued by CA (certificate Authority). CA certificate is necessary to verify the validity of other certificates which issued by it. Therefore it's required that server should be issued a valid certificate from some CA which is trusted by user.

SSL is presented for login by web to launch a secure login with SSL. For user, what's need is simply choosing "To login with secure connection" in the test.htm page (Figure 4-1. But if you haven't installed the CA certificate on your local system, you should install it at first, or you will always see an "untrusted root certificate "prompt every time you login. To install or uninstall CA certificate in user's local system, please refer to the "CA certificate install" and "CA certificate uninstall" topics for more infomation). For administrator of MB8000, it's required to download the server certificate file, server private key file and CA certificate file into MB8000 respectively. Please refer to the "server certificate download for MB800" and "CA certificate download for MB8000" topics for more information.

Figure4- 1




## 4.3 Server Certificate and Private Key Download for MB-8000

The following steps will guide you how to download server certificate file and private key file from TFTP server to MB-8000.

Step 1. applying for a server certificate and private key from a third party Certificate Authority

Note: currently only .pem file is supported. Certificate and private key file in pem format can be generated with openssl software. Don't store certificate and private key in one file. Store them separately.

Step 2. downloading server certificate file and private key file into MB8000 respectively

. Open page http://172.16.0.1/download.htm , configuring as the following example

*server IP Address:192.168.0.1*

*File name: server-cert.pem*

*File Type: ServerCert*

*File operation: Download*

Then press OK to download certificate file.

. Open page http://172.16.0.1/download.htm , configuring as the following example
*server IP Address:192.168.0.1*
*File name: server-key.pem*
*File Type: PrivateKey*
*File operation: Download*
*Server key password: topglobal(default value)*
Then press OK button to download private key file.

Note: server key password is used to protect server-key.pem file from being read by others. Keep this item as blank if no password provided.

## 4.4 CA Certificate Cownload for MB-8000

The following steps will guide you how to download CA certificate file from TFTP server to MB-8000.

Step 1. Open page http://172.16.0.1/download.htm , configuring as the following example
*server IP Address:192.168.0.1*
*File name: cacert.cer*
*File Type: CACert*
*File operation: Download*
Then press OK to download certificate file.

## 4.5 CA Certificate Install for MB-8000's Client

The following steps will show you how to install the CA certificate in user's local system:
Step 1. choose "To install the CA certificate" on the test.htm page (Figure 4-1)

Step 2. click "open" button in the file download dialog box (Figure 4-2)

Step 3.choose "install certificate" of the Certificate dialog box (Figure 4-3), it will guide you into the certificate installation wizard

Step 4. choose "Next" of the certificate import wizard 1 (Figure 4-4)

Step 5.choose "automatically select the certificate store based on the type of certificate" of the certificate import wizard 2 (Figure 4-5)

Step 6. choose "finish" of the certificate import wizard 3 (Figure 4-6)

Step 7. read the content of the certificate and make sure it can be trusted (*warning: an*

*untrusted CA would bring you great threat!*) choose “yes” of root certificate store (Figure 4-7) to actually install the certificate

Step 8. certificate installation finished (Figure 4-8)

Figure4- 2

file download dialog box

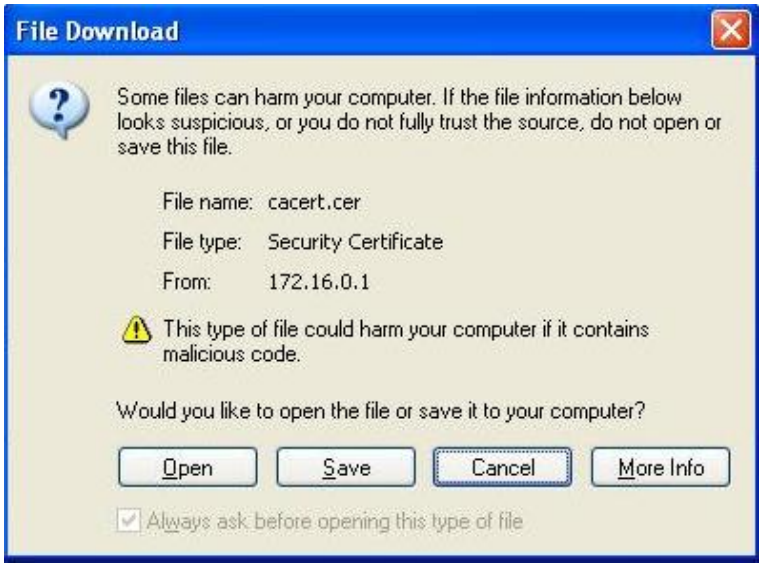



Figure4- 3certificate dialog box

Figure4- 4certificate import wizard 1


Figure4- 5certificate import wizard 2


Figure4- 6certificate import wizard 3


Figure4- 7root certificate store


Figure4- 8certificate import wizard 4


## 4.6 CA Certificate Uninstall for MB-8000's Client

to uninstall the CA certificate from user's local system, simply refer to "internet options->content->certificates->trusted root certification", and remove the certificate you just installed.

# 5. Troubleshooting

## 5.1 Overview

- Introduction
- Reset to Factory Default procedure
- Force Reload Procedure

## 5.2 Introduction

This section helps you locate problems related to MB-8000 setup. The most common installation problems relate to IP Addressing. For example, without the TFTP server IP Address, you will not be able to download the MB Image to the MB-8000.

IP Address management is fundamental. We suggest you create a chart to document and validate the IP addresses for your system.

If the password is lost or forgotten, you will need to reset the MB-8000 to default values. The **Reset to Factory Default** procedure resets configuration settings, but does not change the current MB Image. The **Forced Reload** procedure erases the current MB Image if you need to download a new image.

It is useful to set up the serial port and use your terminal emulator to monitor MB-8000 activity. Serial port setup is described in “Troubleshooting”.

## 5.3 Reset to Factory Default Procedure

Use this procedure to reset the network configuration values, including the MB-8000 IP Address, Subnet Mask, and so on. The current MB Image is not deleted. This procedure may be required if the MB-8000 password is forgotten.

Press and hold the **RELOAD** button for about 30 seconds. Result: The MB-8000 reboots, and the factory default network values are restored.

## 5.4 Forced Reload Procedure

Use this procedure to force the MB8000 back to default network configuration values and

download a new AP Image. This procedure may be required when the password is forgotten or the current AP Image is missing or corrupted.
In this procedure, use the Bootloader CLI over the serial port to set the IP Address and download a new AP Image.

**Download procedure**

1. To download the MB Image, you will need an Ethernet connection to the computer on which the TFTP server resides. This can be any computer on the LAN, or connected to the MB8000's "LAN" port with a "crossover" Ethernet cable.
2. Then, connect the MB8000 to the computer with a standard serial cable and use a terminal client, such as HyperTerminal.
3. Before starting, you need to know the MB8000 IP Address, Subnet Mask,the TFTP Server IP Address, and the AP Image file name.
4. Start TFTP Server, and ensure the new MB Image file is in the TFTP directory.
5. Open your terminal emulator, and set the following connection properties, then connect.
_ Com Port: <COM1, COM2, etc., depending on your computer>
_ Baud rate: 9600
_ Data Bits: 8
_ Stop bits: 1
_ Flow Control: None
_ Parity: None
6. Enable the "ASCII Setup" settings by selecting "Send line ends with line feeds". Result: HyperTerminal sends a line return at the end of each line of code.
7. After finishing this preparation, make the MB power up.
8. Press the RESET button.
9. Press and hold the RELOAD button for about 30 seconds until the POWER LED turns amber. Result: The MB8000 deletes the current MB Image and Configuration files. The Bootloader CLI becomes active, like this: [Device name]>
10. From the HyperTerminal, enter CLI Commands to set the IP Address and download an AP Image.
Enter only the following statements.
[Device name]> set ipaddr <MB IP Address>
[Device name]> set ipsubmask <Subnet Mask>
[Device name]> set tftpipaddr <TFTP Server IP Address>
[Device name]> set tftpfilename <AP Image File Name>
[Device name]> reboot
Result: The MB8000 will reboot and then download the image file. Observe the TFTP display and you should see downloading activity begin after a few seconds.

# Documenting Your Configuration

## Default MB-8000 Settings

The following table lists the settings defined at the factory for all MB-8000 units, and provides a place to enter values for your system.

| Item | | Default Value | My System Value |
|---|---|---|---|
| System Name | | Device name | |
| wireless LAN IP Address | | 172.16.0.1 | |
| wireless LAN Subnet Mask | | 255.255.0.0 | |
| LAN(dp0) IP Address | | 172.16.0.1 | |
| LAN(dp0) LAN Subnet Mask | | 255.255.0.0 | |
| WAN(dp1) IP Address | | 192.168.0.254 | |
| WAN(dp1) Subnet Mask | | 255.255.255.0 | |
| Network Name of wireless LAN(SSID) | | TG MB8000 Wireless Network | |
| DHCP Server Status | | Enabled | |
| Image File Name | | FILENAME | |
| Read Password | | Public | |
| Read/Write Password | | Public | |
| CLI Password | | Public | |
| Medium Reservation | | 2473(Disabled) | |
| Transmit Rate | | Auto Rate Select | |
| Wireless WAN default setting: | phone number | "#777" | |
| | username | "card" | |
| | password | "card" | |
| | Init string | "atz\r" | |

## Recording Unique Settings

Use the following form to record configuration settings specific to your configured MB-8000.

**General Information**

| Item | Information |
|---|---|
| Install Date: | |
| Project Name: | |

| | |
|---|---|
| Unit Location: | |
| Network Administrator name: | |
| Network Administrator phone: | |
| Network Administrator e-mail: | |
| Completed by: | |
| Organization: | |

**SNMP information**

| Item | Information |
|---|---|
| Read Password: | |
| Read/Write Password: | |
| Trap Host IP Address (optional): | |
| Trap Host Password (optional): | |

**RADIUS information**

| Item | Information |
|---|---|
| Authentication Server IP Address: | |
| Authentication server Destination Port for Authorization: | |
| RADIUS Shared Secret: | |

# Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) this device may not cause harmful interference.
(2) This device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Any change to the equipment will void FCC grant.

Note: This equipment has been tested and found to comply with the limit of part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
--Reorient or relocate the receiving antenna.
--Increase the separation between the equipment and receiver.
--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
--Consult the dealer or an experienced radio/TV technician for help

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.