Server Load Balancer

LB-8000

User's Manual

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CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Revision

PLANET Server Load Balancer User's Manual
For Model: LB-8000
Part No.: EM-LB8000

Table of Content

Preface

Thank you for purchasing **Planet Technology Corp. LB-8000**. This product is designed to provide HA solution to your cluster systems.

About This Manual

The **User Manual** provides introductory information as well as detailed instructions on how to manage LB-8000 into your network environment. It also provides the instructions on how to configure the LB-8000 in GUI mode (Graphical User Interfaces) and CLI mode (Command Line Interface). It is intended for everyone involved in installing and managing LB-8000.

This Manual applies to Planet Technology Corp. LB-8000 until otherwise notified.

Organization of This Manual

This document has seven chapters:

Chapter 1, "LB-8000 Overview" describes LB-8000 and explains its benefits and features.

Chapter 2, "Prepare Client" provides the detailed information on how we prepare client.

Chapter 3, "Setup Primary Manager" provides the detailed instructions on how we prepare primary manager.

Chapter 4, "Setup Backup Manager" provides the detailed instructions on how we prepare backup manager.

Chapter 5, "Configure Network Environment and a Cluster" describes three types of cluster which are NAT model, Direct Routing model, IP Tunneling model and configure real server and cluster in different network models.

Chapter 6, "GUI Configuration" provides the detailed information on each management function of Graphical User Interface.

Chapter 7, "CLI Configuration" provides the detailed information on each management function of command line interface.

Documentation Conventions Used in This Manual

In this manual, there are certain typographic used to simplify discussion and to help system administrator better understand the material. These conventions are described below.

Bold lowercase text is used to highlight key or table headers.

BOLD uppercase text is used for emphasis.

[Button name] is used to distinguish button names such as **[OK]**.

<Field name> is used to identify field names.

Courier New is used to distinguish commands, file names, directory names, and the output from commands.

l   Bold black circular are used to identify items that you should verify; highlight keys or procedures you should try to resolve particular problems.

Note   is used to highlight the important tips or special consideration.

Support

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Contact Us

We value your feedback. While you find errors, mistakes, or oversights within this manual, please let us know. We listen to all of our customers. Please send us your input on any aspect of our products and supporting materials.

<div align="center">

Web site: http://www.planet.com.tw

Email: support@planet.com.tw

</div>

1. LB-8000 Overview

LB-8000 L4 Server Load Balancer is a high performance layer 4 switching device that enables enterprises and ISPs to load-balance all IP-based applications and to create a High Availability (HA) web environment.

Powered by dual Xeon™ processors and equipped with Gigabit Ethernet NIC, LB-8000 is best suited for web sites or other IP-based applications with intensive traffic volumes. Direct routing mode makes sure that LB-8000 will not become the bottleneck of heavy traffic applications such as FTP or streaming.

LB-8000 is specially designed for web environment that cannot afford downtime. Embedded OS greatly enhances the reliability of LB-8000. Server health check is constantly done by LB-8000 to ensure no packet is forwarded to crashed servers. In addition, the cost of failover is minimized by ultra high-speed failover and bi-directional stateful failover. Heartbeat signals are going through both network and serial cable to prevent unnecessary failover and active-active problem.

LB-8000 is simply the best choice of server load balancers that helps you easily maximize the performance and availability of your web system at minimal costs.

1.1. Benefits

Super High Availability

LB-8000 constantly checks the server status to make sure no request from users is forwarded to malfunctioning servers. Graceful shutdown ensures no connection gets lost when users take down servers for maintenance. Moreover, the cost of failover is minimized by high-speed failover and bi-directional stateful failover. Finally, features such as *Nice Fail Back* or *Dual-path Heartbeat* effectively reduce failover costs.

Ultimate Performance

Dual Xeon processors with Hyper-Threading technology provide LB-8000 with ultra fast performance compared to other L4 switches. With Hyper-Threading technology, processor-level threading can be utilized which offers more efficient use of processor

resources for greater parallelism and improved performance on LB-8000. Besides, Gigabit Ethernet network interface gives LB-8000 maximum network capacity. Finally, for applications with huge traffic flows such as FTP or streaming, LB-8000 also supports direct routing mode to allow streaming or data flows sent back to clients without going through LB-8000.

Unlimited Scalability

LB-8000 does not put limitation on the number of clusters (a.k.a. VIP) and also the number of real servers. System admin does not need to pay extra license fees to scale the system.

Manageability

System admin can easily manage LB-8000 through Web GUI or CLI. The bi-directional sync function makes sure that configurations and logs are always the same between two LB-8000. In addition, with LB-8000, system admin can easily monitor the status of real servers through GUI. Also, system admin can manage contents in real servers through IP forwarding or VPN mechanism. Finally, email alert and SNMP trap makes sure that system admin gets informed as soon as system fault happens.

Cost Effectiveness

Not only is LB-8000 a cost-effective choice but it also helps your business avoid the possible loss due to the system downtime. Also, LB-8000 makes sure that all servers are working at full capacity, which further saving the cost of buying extra servers.

1.2. Features

Load Balancing for most IP-based Applications

LB-8000 can load-balance most IP-based applications, such as web, email, FTP or streaming. You can also apply LB-8000 to other enterprise applications that have web-based GUI, including IBM WebSphere, Cold Fusion, BEA WebLogic Servers and Sun iPlanet Servers and so on.

Multiple Load Balancing Methods

LB-8000 provides both static and dynamic modes for load-balancing servers. Static modes

contain round robin and weighted round robin. Dynamic modes include least connections and weighed least connections.

Flexible Network Configurations

LB-8000 supports NAT (network address translation), direct routing and IP tunneling configurations. System admin will be able to choose the appropriate configuration according to the applications and environment.

Server Health Check

LB-8000 regularly checks the status of each server to make sure no traffic is forwarded to the malfunctioning ones. The health check includes ARP Check (Layer 2), ICMP check (Layer 3), port check (Layer 4) and content check (Layer 7). System admin can freely define which level of health check to do.

Graceful Shutdown

The DISABLE feature helps you to take off a working server without losing any connection. LB-8000 will signal system admin when all transactions on a particular server are finished.

Redundancy of LB-8000

Active-standby mode eliminates the single point of failure. Also, fast network-based failover through heartbeat minimizes the costs of failover.

Bi-directional Stateful Failover

Real time synchronization between primary and backup LB-8000 ensures that two load balancers keep the same information about TCP connections and persistence. This state mirroring function, also called stateful failover, guarantees that no TCP connections or persistence information get lost during failover. Moreover, LB-8000 makes stateful failover bi-directional, which means stateful failover applies no matter the failover happens from primary to backup or vice versa.

Nice Fail Back

With Nice Fail Back, backup LB-8000 will become primary after failover happens. That way, even if original primary LB-8000 recovers afterwards, failover will not happen again. This feature can reduce times of failover and raise the availability of system.

Dual-path Heartbeat

Heartbeat signals between two LB-8000 are sent through both network and serial cable. Failover will not happen until backup fails to get the heartbeat signals from primary through both routes. This feature prevents unnecessary failover and avoids the problem that two LB-8000 are trying to become active (master) due to the network failure.

Synchronization of Configurations and Logs

Bi-directional sync function makes sure that primary and backup LB-8000 always keeps the same configurations and logs.

Superior Reliability and Stability

Embedded operating system provides superior reliability and stability.

Active/Passive FTP Support

LB-8000 put special efforts on FTP application. No matter active or passive FTP, in NAT or direct routing mode, LB-8000 makes sure that FTP data session goes to the same real server with FTP control session and the load can be still balanced.

ECOM Protocol

ECOM protocol makes sure the persistence is still valid when e-commerce visitors are going to SSL pages from normal web pages.

Sticky Connections

For session-based applications, to keep the integrity of session data, LB-8000 can always forward the traffic from the same IP address to the same real server.

Real Time Status Monitoring and Statistics

Through a Java Applet-based monitor, system admin can monitor the status of LB-8000, real servers and network in a real time basis.

Network Interoperability

Static route, DNS proxy and outbound NAT provide system admin maximum flexibility to fit LB-8000 into existing network environment.

Detailed Logging

LB-8000 provides detailed logging function for system, management, HA, connection and alert. System admin will be able to export log data and also monthly summary report will be sent by emails.

Email Alert

When LB-8000 or real servers fail, system admin will be informed through an alert message.

SNMP Support

LB-8000 provides its enterprise MIB and will send out TRAP messages to SNMP manager when necessary.

APC UPS Support

LB-8000 can work with APC UPS to be shutdown safely while a power problem suddenly happens on site.

Security

IP masquerade protects real servers from being exposed to Internet directly. SSH/Base64 allow system admin to manage LB-8000 safely.

GUI/CLI User Interface

System administrators can manage LB-8000 through both GUI (Graphical User Interface) and CLI (Command Line Interface).

1.3. Using LB-8000 documentations

There are two documents, Administration Guide for LB-8000 and User's Manual for LB-8000 that will provide all information on how to work with the LB-8000 machine. The detailed usages of each guide are described in the following sections:

I   Administration Guide for LB-8000

This guide provides the administrative information of the technology on LB-8000.

I   User's Manual for LB-8000

This manual provides LB-8000 overview and how to prepare network environment for

LB-8000. It also provides the user operating instructions on every screen of GUI (Graphic User Interface) system and every commands of CLI (Command Line Interface) of LB-8000.

2. Prepare Client

Before you start to install LB-8000, we suggest you to determine which network environment and network model that you prefer to use. LB-8000 supports three network models:

l   Network Address Translation Model (NAT)

l   Direct Routing Model (DR)

l   IP Tunneling Model (Tunnel)

You can browse Chapter 5 to view the detail description of these models. And here are the constraints for choosing the various flavors of these models:

	NAT	**IP Tunneling**	**Direct Routing**
Real Server OS	Any OS	Linux / UNIX	Most OS
Additional Interface	None	Tunnel Interface	Loopback Interface
		(Must have no ARP)	
Port Re-mapping	Yes	No	No
Real Server Network	Private	On Internet	Local
	(Remote or Local)		
Real Server Number	Low	High	High
Real Server Default Gateway	LB-8000	Own Router	Own Router

After you determine the network model and install the LB-8000 into your network environment, then you are ready to configure LB-8000.

LB-8000 has default IP address on its network interface:

l   Network 1 Interface (eth0): 192.168.2.1

l   Network 2 Interface (eth1): 192.168.3.1

So, when you finish the hardware installation, boot up LB-8000 and ready to configure LB-8000, we suggest you to add an alias IP that is in the same IP class on you client. For example, you can add an alias IP 192.168.2.115 which is the same IP class (192.168.2.xxx) as network 1 interface of LB-8000 on your client.

Here are the sample procedures to add an alias IP for Linux and Windows 2000 Professional.

2.1. Add alias IP for Linux:

On the console of Linux, please issue following command:

ifconfig eth0:0 192.168.2.115 netmask 255.255.255.0 up

2.2. Add alias IP for Windows 2000
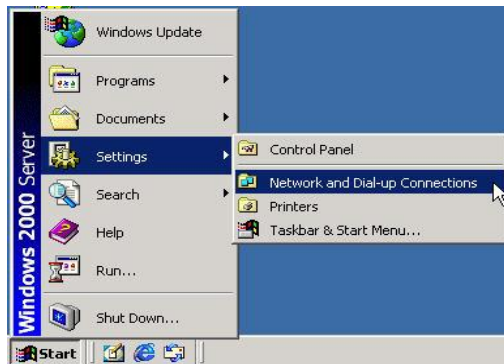
(1) Click on **[Start]** button and move the mouse to the **[Settings]** and then click on **[Network and Dial-up Connections]**.
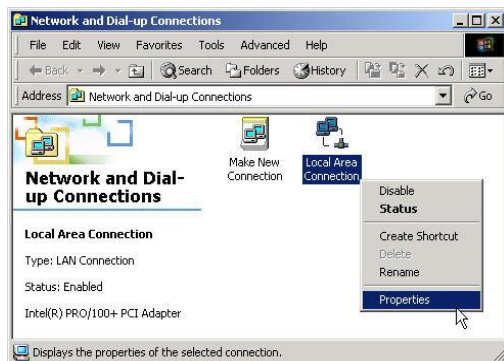
(2) Right click on **[Local Area Connection]** icon and select **[Properties]**.

(3) Select "**Internet Protocol (TCP/IP)"** and then click on [**Properties**] button.

Internet Protocol (TCP/IP) Properties ? x

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically
● Use the following IP address:

IP address:	192 . 168 . 0 . 115
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	192 . 168 . 0 . 1

○ Obtain DNS server address automatically
● Use the following DNS server addresses:

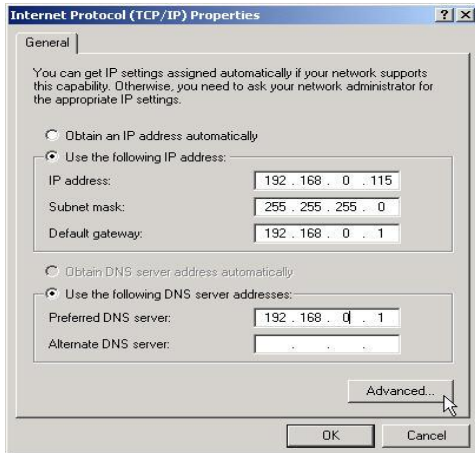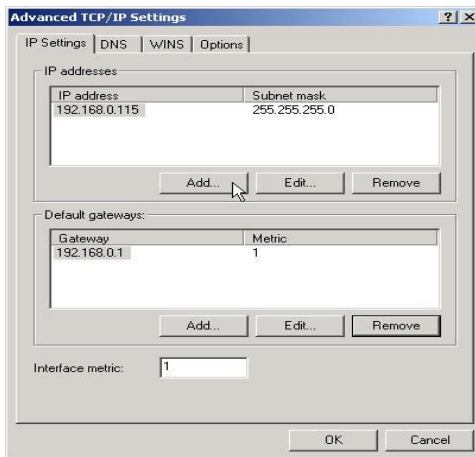| Preferred DNS server: | 192 . 168 . 0 . 1 |
| Alternate DNS server: | . . . |

Advanced...

OK   Cancel

(4) Please click on **[Advanced]** button.

Advanced TCP/IP Settings ? x

IP Settings | DNS | WINS | Options

IP addresses

| IP address | Subnet mask |
| 192.168.0.115 | 255.255.255.0 |

Add...   Edit...   Remove

Default gateways:

| Gateway | Metric |
| 192.168.0.1 | 1 |

Add...   Edit...   Remove

Interface metric: 1

OK   Cancel

(5) In this "**Advanced TCP/IP Settings**" page, please click on **[Add]** to add an IP address.

TCP/IP Address ? x

IP address: 192 . 168 . 2 . 115

Subnet mask: 255 . 255 . 255 . 0

Add   Cancel
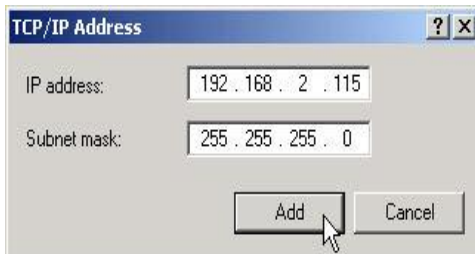
(6) Please fill in the IP address and Subnet mask in the fields and then click on **[Add]** button.
For example:
IP address: 192.168.2.115
Subnet mask: 255.255.255.0

Advanced TCP/IP Settings ? x

IP Settings | DNS | WINS | Options

IP addresses

IP address	Subnet mask
192.168.0.115	255.255.255.0
192.168.2.115	255.255.255.0

Add...   Edit...   Remove

Default gateways:

| Gateway | Metric |
| 192.168.0.1 | 1 |

Add...   Edit...   Remove

Interface metric: 1

OK   Cancel
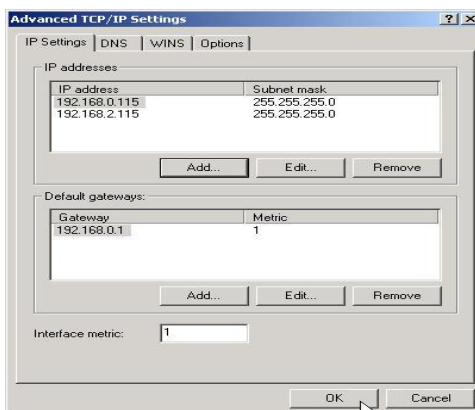
(7) After you click on **[Add]** button, in the IP addresses field will display a new IP address and then click on **[OK]** to finish the task.
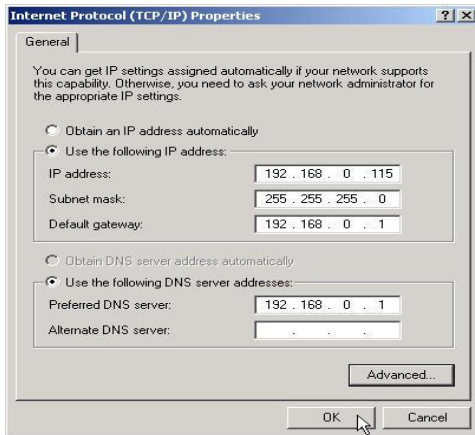
(8) Click on **[OK]** button.
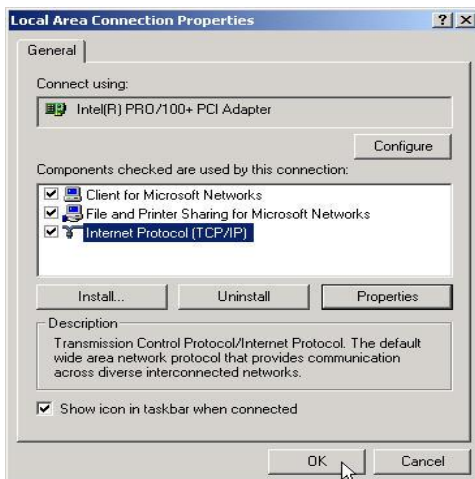
(9) Click on **[OK]** button to complete to task.
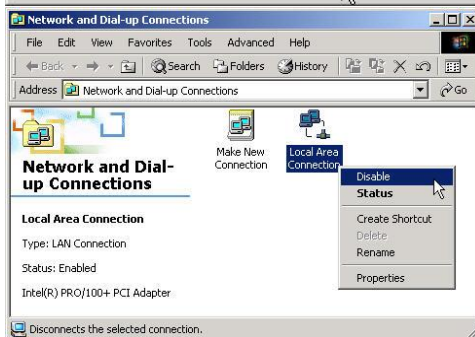
(10) Please disable this LAN connection device by right click on **[Local Area Connection]** icon.
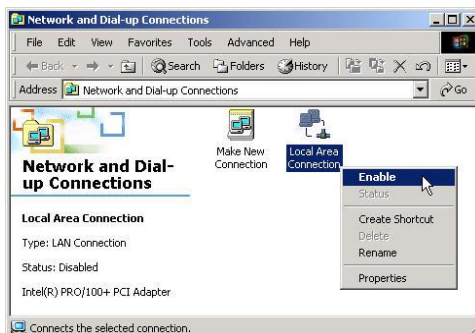
(11) Please enable this LAN connection device by right click on **[Local Area Connection]** icon again.

(12) Wait a moment for enabling "**Local Area Connection**".

3. Setup Primary Manager

The procedures of configuring primary manager are:

l   Configure network 1 interface
l   Configure network 2 interface
l   Configure the role of LB-8000

3.1. Setup by using Web GUI

Here are the sample steps of configuring primary manager with web GUI:

(1)   Use Microsoft Internet Explorer (IE)
or Netscape Navigator to connect
LB-8000. The default IP of LB-8000
is 192.168.2.1; please enter
"**http://192.168.2.1**" in the address
bar and then press **[Enter]** key.
Please wait a moment you will see
the Login screen. Enter the default
initial Login ID and Password:
"**admin**" and "**admin**" and then click
on **[Login]** button.
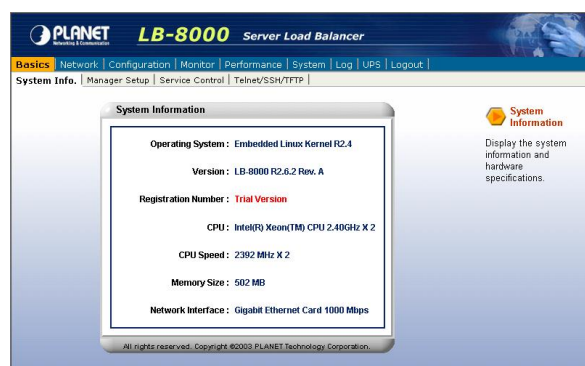
(2)   When you login, you will see the
screen like this.
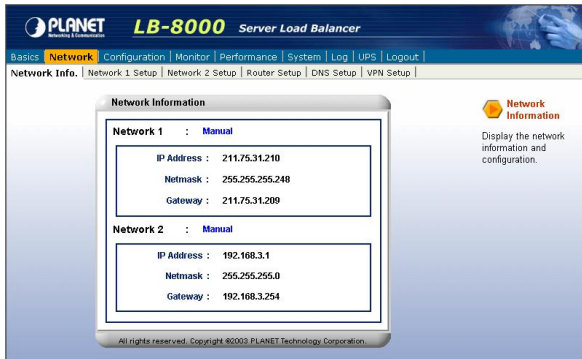
(3) On the top of the LB-8000 Graphic User Interface (GUI) is the Primary function, please click on **[Network]**.
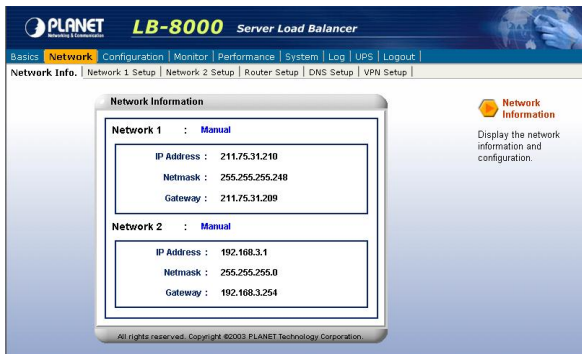
(4) After you click on **[Network]**, under the "**Network**" you will see the **[Network 1 Setup]**, please click on **[Network 1 Setup]** to setup IP address, Netmask, and Gateway.
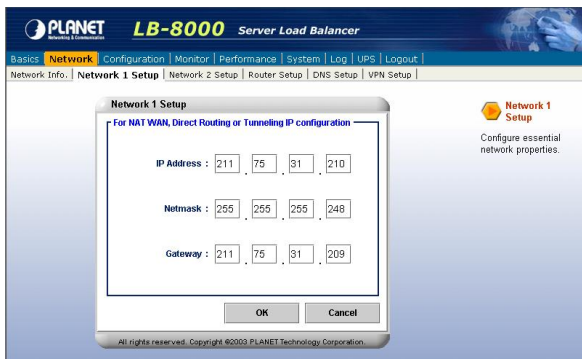
(5) Please enter IP Address, Netmask, and Gateway.

For example:
IP Address: 192.168.2.201
Netmask: 255.255.255.0
Gateway: 192.168.2.1

When you finish the task, please click on **[OK]** button.

(6) When you click on **[OK]** button and the screen will prompt up the re-login window and click on **[OK]** to re-login.

- **If you change the IP address to different class, for example, you change the IP to 192.168.4.xxx. Then system will prompt you to close your IE and find another client to login again.**
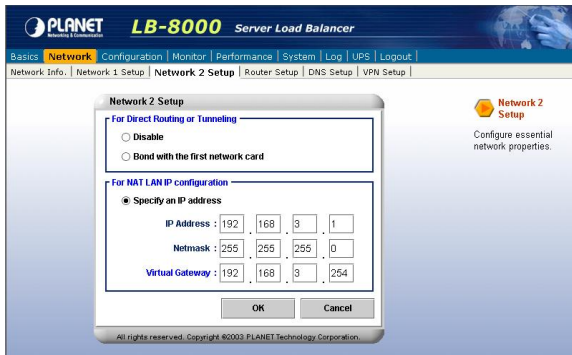
(7) After you login again, please click on **[Network]**, and under "**Network**" you will see the **[Network 2 Setup]**, please click on it.
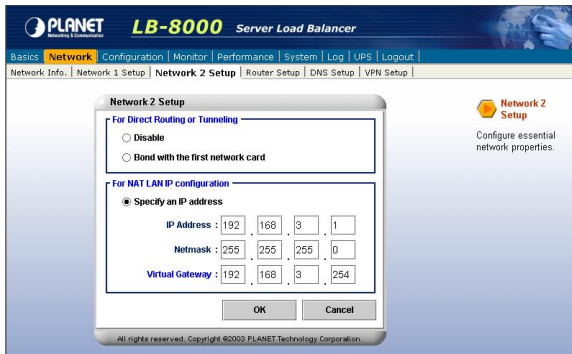
(8) In "**Network 2 Setup**" page, please choose **[Specify an IP address]** and enter the relevant information in all of fields.

For example:
IP Address: 192.168.3.201
Netmark: 255.255.255.0
Virtual Gateway: 192.168.3.254
When you finish the task, please click on **[OK]** to finish this task.

• **If you are configuring DR model or IP Tunneling model, you can either disable network 2 interface or bond with network 1 interface card.**

(9) When you click on **[OK]** button the screen will prompt up the re-login window and click on **[OK]** button to re-login.
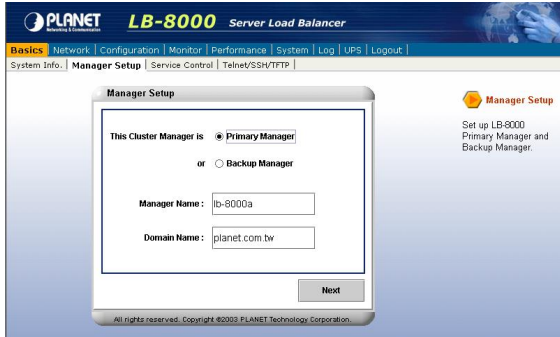
(10) After you login again, please click on **[Basics]** and then click on **[Manager Setup]** to setup primary manager. In this manager setup page, please select **[Primary Manager]** and enter the Manager Name and Domain Name in the filed. For example, "**lb8000-primary**" and "**planet.com.tw**" then click on **[Next]** button.
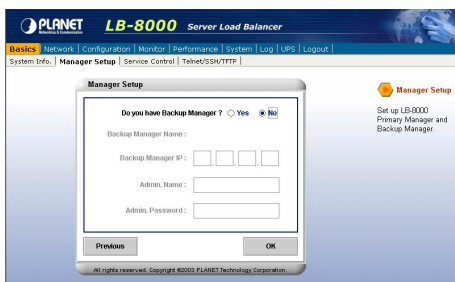
(11) In this time, we do not need to setup backup manager, so please select **[No]** and then click on **[OK]** button.

(12) Click on **[OK]** to complete primary setup task.

3.2. Setup by using CLI

Here are the sample steps of configuring primary manager with CLI:

LB-8000 R2.6.2 Rev. A - Planet Technology Corp. lb8000p login: admin Password: LB8000>	(1) Use TELNET or SSH client to connect LB-8000. The default IP of LB-8000 is 192.168.2.1; please enter "**telnet 192.168.2.1**" in the command prompt and then press **[Enter]** key. Please wait a moment you will see the Login prompt. Enter the default initial Login ID and Password: "**admin**" and "**admin**" and then you will see the CLI prompt of LB-8000.
LB8000> ifconfig Network 1 : Manual IP Address : 192.168.2.1 Netmask : 255.255.255.0 Gateway : 192.168.2.1 Network 2 : Manual IP Address : 192.168.3.1 Netmask : 255.255.255.0 Gateway : 192.168.3.254 LB8000>	(2) Now, you can issue "**ifconfig**" command to check the current network configuration.
LB8000> ifconfig eth0 192.168.2.201 255.255.255.0 192.168.2.1	(3) Please configure the IP address of network 1 interface by issuing "**ifconfig**" command plus the value of IP address, netmask and gateway. • **When you finish this configuration, system will lose the connection. You should re-connect to LB-8000 again.**
LB8000> ifconfig eth1 192.168.3.201 255.255.255.0 192.168.3.254	(4) Then, you can configure the IP address of network 2 interface by issuing "**ifconfig**" command plus the value of IP address, netmask and gateway too. • **When you finish this configuration, system will lose the connection. You should re-connect to LB-8000 again.**

LB8000> setmgr primary lb8000p planet.com.tw [setmgr] INFO: Update manager configuration is completed. LB8000> lsmgr Manager Role : Primary Manager Name : lb8000p Domain : planet.com.tw LB8000>	(5) Now, you can configure the role of LB-8000 to be primary manager by issuing "**setmgr**" command plus the name of role, the hostname and the domain name. After that you can issue "**lsmgr**" to check the result.

4. Setup Backup Manager

When network interface setting of primary manager is completed, and if you have other LB-8000 machine that would be the backup manager, then you can perform the same steps as setting primary manager to setup the backup manager.

4.1. Setup by using Web GUI

Here are the sample steps of configuring backup manager with web GUI:

(1) Use Microsoft Internet Explorer (IE) or Netscate Navigator to connect LB-8000. The default IP of LB-8000 is 192.168.2.1; please enter "**http://192.168.2.1**" in the address bar and then press **[Enter]** key. Please wait a moment you will see the Login screen. Enter the default initial Login ID and Password: "**admin**" and "**admin**" and then click on **[Login]** button.
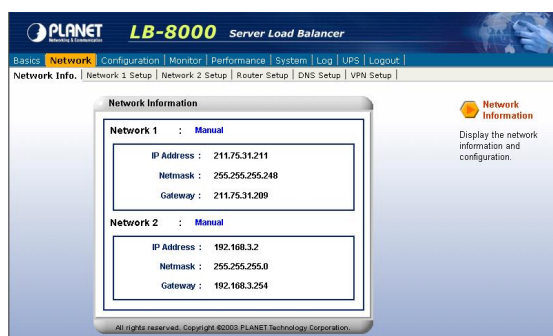
(2) On the top of the LB-8000 Graphic User Interface (GUI) is the Primary Function; please click on **[Network]**.
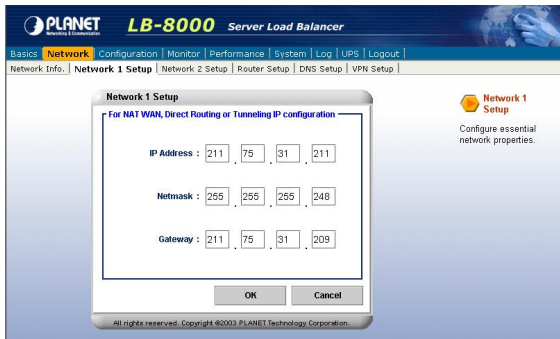
(3) After you click on **[Network]**, under the "**Network**" you will see the **[Network 1 Setup]**, please click on **[Network 1 Setup]** to setup IP address, Netmask, and Gateway.
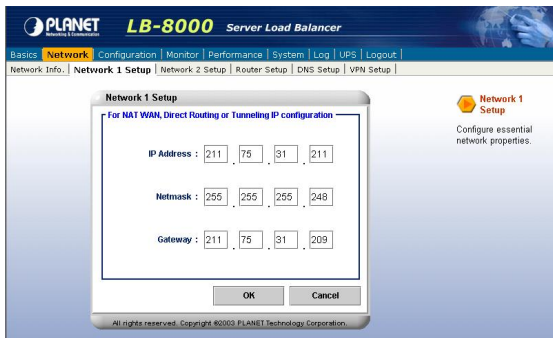
(4) Please enter IP Address, Netmask, and Gateway.

For example:
IP Address: 192.168.2.202
Netmask: 255.255.255.0
Gateway: 192.168.2.1

When you finish the task, please click on **[OK]** button.

(5) When you click on **[OK]** button, the screen will prompt up the re-login window and click on **[OK]** to re-login.
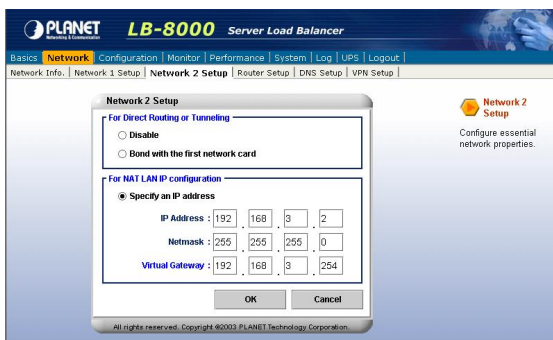
(6) After you login again, please click on **[Network]**, and under "**Network**" you will see the **[Network 2 Setup]**, please click on it.
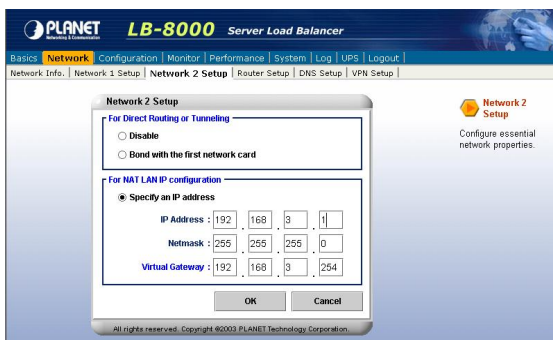
(7) In "**Network 2 Setup**" page, please choose **[Specify an IP address]** and enter the relevant information in all of fields.

For example:
IP Address: 192.168.3.202
Netmask: 255.255.255.0
Gateway: 192.168.3.254 **(Should be**

the same as primary manager)

When you finish the task, please click on **[OK]** to finish this task.

- **If you are configuring DR model or IP Tunneling model, you can either disable network 2 interface or bond with network 1 interface card.**

(8) And then screen will prompt up the re-login window and click on **[OK]** button to re-login.
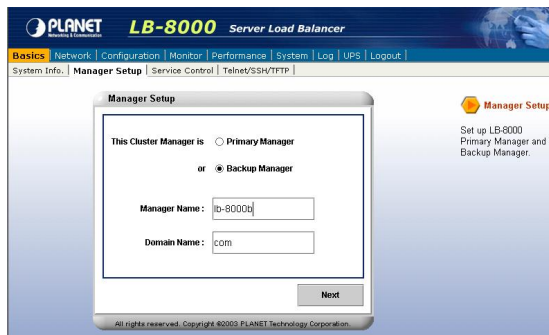
(9) After you login again, please click on **[Basics]** and then click on **[Manager Setup]** to setup backup manager. In this manager setup page, please select **[Backup Manager]** and enter the Manager Name and Domain Name in the filed. For example, "**lb8000-backup**" and "**planet.com.tw**" then click on **[Next]** button.
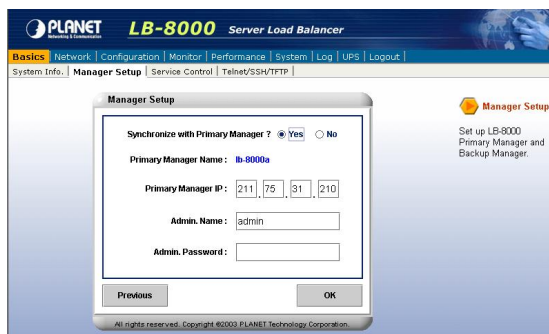
(10) In this page, please select **[Yes]** to synchronize with primary manager and enter primary manager's IP address (In this example, the IP address of primary manager is 192.168.2.201), admin name, and password in the each field and then click on **[OK]** button to finish the setting.

Cluster Management System Message ☒

ⓘ **Synchronization is completed.**

[OK]

Java Applet Window

(11) Click on **[OK]** to complete backup manager task.

4.2. Setup by using CLI

Here are the sample steps of configuring backup manager with CLI:

LB-8000 R2.6.2 Rev. A - Planet Technology Corp. lb8000 login: admin Password: LB8000>	(1) Use TELNET or SSH client to connect LB-8000. The default IP of LB-8000 is 192.168.2.1; please enter "**telnet 192.168.2.1**" in the command prompt and then press **[Enter]** key. Please wait a moment you will see the Login prompt. Enter the default initial Login ID and Password: "**admin**" and "**admin**" and then you will see the CLI prompt of LB-8000.
LB8000> ifconfig Network 1 : Manual IP Address : 192.168.2.1 Netmask : 255.255.255.0 Gateway : 192.168.2.1 Network 2 : Manual IP Address : 192.168.3.1 Netmask : 255.255.255.0 Gateway : 192.168.3.254 LB8000>	(2) Now, you can issue "**ifconfig**" command to check the current network configuration.
LB8000> ifconfig eth0 192.168.2.202 255.255.255.0 192.168.2.1	(3) Please configure the IP address of network 1 interface by issuing "**ifconfig**" command plus the value of IP address, netmask and gateway. • **When you finish this configuration, system will lose the connection. You should re-connect to LB-8000 again.**

LB8000> ifconfig eth1 192.168.3.202 255.255.255.0 192.168.3.254	(4) Then, you can configure the IP address of network 2 interface by issuing "**ifconfig**" command plus the value of IP address, netmask and gateway as well. • **When you finish this configuration, system will lose the connection. You should re-connect to LB-8000 again.**
LB8000> setmgr backup lb8000b planet.com.tw [setmgr] INFO: Update manager configuration is completed. LB8000> lsmgr Manager Role : Backup Manager Name : lb8000b Domain : planet.com.tw LB8000>	(5) Now, you can configure the role of LB-8000 to be backup manager by issuing "**setmgr**" command plus the name of role, the hostname and the domain name. After that, you can issue "**lsmgr**" command to check the result.
LB8000> lbsync 192.168.2.201 admin admin [lbsync] INFO: Synchronization between two managers is completed. LB8000> lsmgr Manager Role : Backup Manager Name : lb8000b Domain : planet.com.tw Primary Manager Name : lb8000p Primary Manager IP : 192.168.2.201 LB8000>	(6) When the setting of backup manager is completed, you must issue "**lbsync**" command with IP address, admin ID and admin password of primary manager to synchronize with primary manager. Then you can issue "**lsmgr**" command to check the result of synchronization. You will see the name and IP address of primary manager.

5. Configure Network Environment and a Cluster

The LB-8000 stores a server list with services provided by LB-8000. The LB-8000 also dynamically updates this list to ensure that the resource of the whole cluster is being utilized. This dynamically checking process ensures that workload has been distributed to the servers with a fully usage. Also, LB-8000 provides the cluster service in Network Address Translation (NAT), Direct Routing (DR), and IP Tunneling configurations. Particularly in the NAT setting, a LB-8000 serves as the local router with which more protections are added to the local network.

5.1. NAT (Network Address Translation)

NAT is a method to translate the addresses in both outgoing and incoming datagram. NAT procedure for cluster management is usually the best method for protecting the network from intrusion since LB-8000 can act as a router and firewall between WAN/LAN to send requests and response between real servers and clients. The whole network can be represented with just one real IP address. (See Figure 5-1)
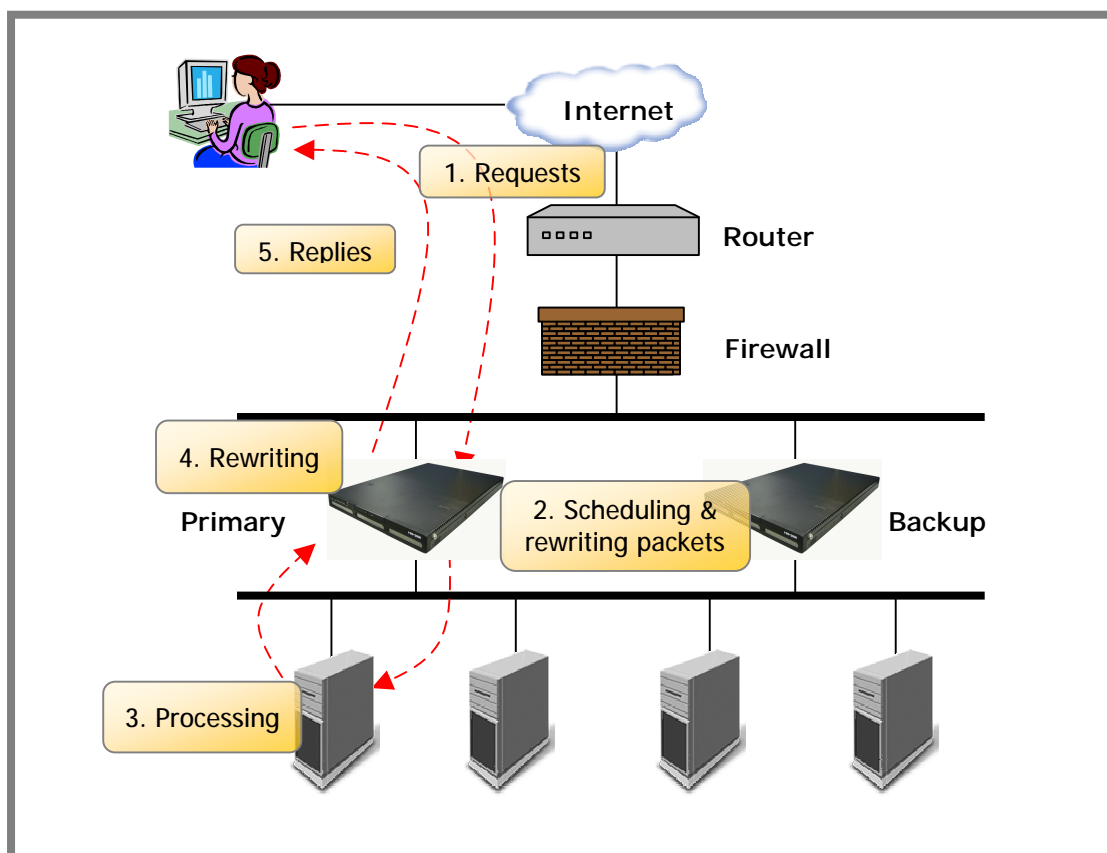
Figure 5-1 NAT Network

5.2. Configure a Cluster in NAT Mode

After the network environment settings and the network interface settings of LB-8000 are completed, you can perform the following steps to configure a cluster.

For configuring a cluster in NAT mode, you should setup following information:

l   The cluster type
l   The virtual host name
l   The virtual host IP address
l   The netmask value
l   The service type
l   The service port number
l   The persistency setting
l   The load distribution schedule. We support four types of schedules:
  n   Round Robin
  n   Weighted Round Robin
  n   Least Connection
  n   Weighted Least Connection
l   Add real server list
l   The health check method. We support:
  n   Content check for HTTP/HTTPS
  n   Port check
  n   ICMP check
  n   ARP check
  n   None (Means there is no health check)

5.2.1. Setup by using Web GUI

Here are the sample steps of configuring a cluster with web GUI:

(1)   Use Microsoft Internet Explorer (IE) or Netscape Navigator to connect LB-8000. For example, the IP of LB-8000 is 192.168.2.201; please enter "**http://192.168.2.201**"in the address bar and then press **[Enter]** key. Please wait a moment you will see

the Login screen. Enter the default initial Login ID and Password: "**admin**" and "**admin**" and then click on **[Login]** button.

(2) When you login, please click on **[Configuration]** on Primary function bar.

(3) After you click on **[Configuration]**, you will see the **[Virtual Host Setup]**, please click on it to setup Virtual Host.

(4) In **[Virtual Host Setup]** page, please select **[NAT]** and then click on **[Add]** button.
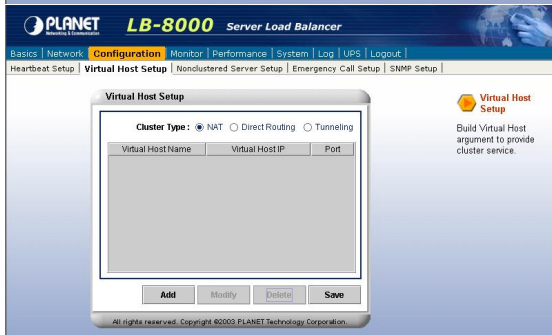
(5) Please enter the necessary information to each field. Then click on **[Real Servers]** tab to setup real servers.
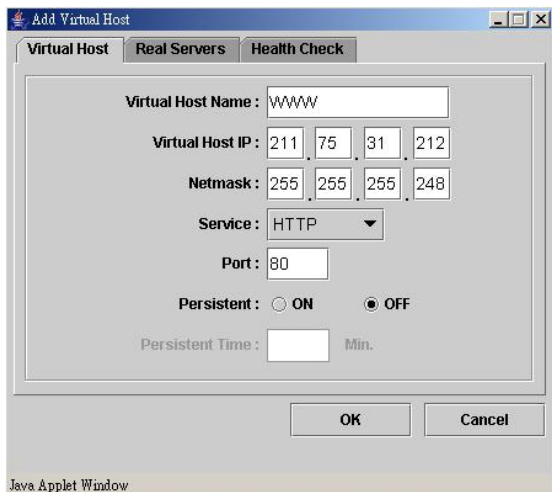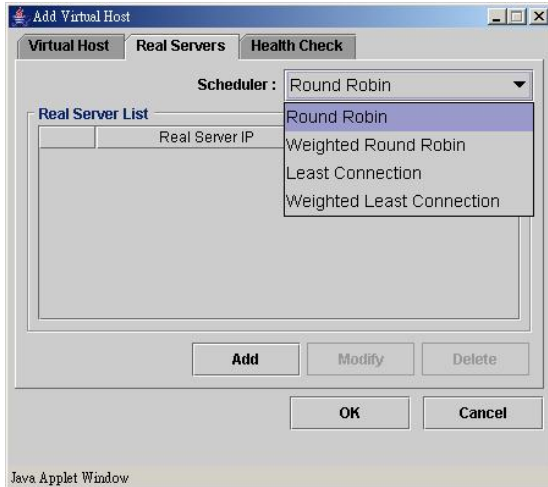
(6) Please use pull-down menu to select the scheduler. The available schedules are Round Robin, Weighted Round Robin, Least Connection, and Weighted Least Connection.

(7) Please click on **[Add]** button to add real servers.
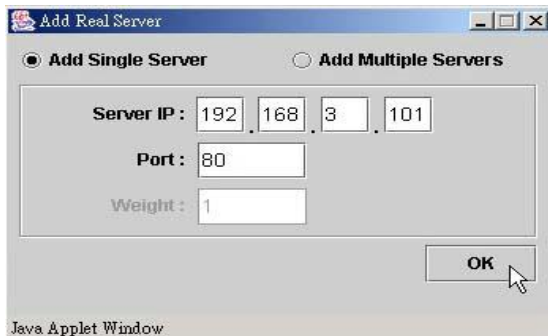
(8) In this setup window you have two choices. You can click on **[Add Single Server]** to setup a single server or click on **[Add Multiple Servers]** to setup multiple servers.
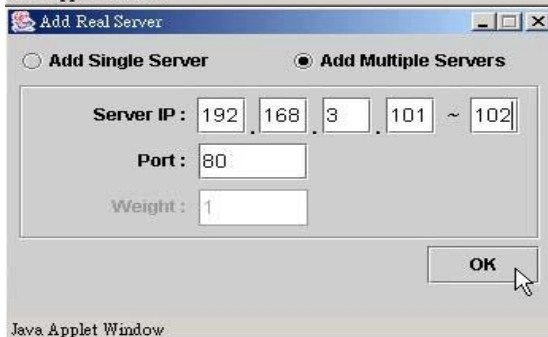
Please enter the necessary information to each field and then click on **[OK]** button.
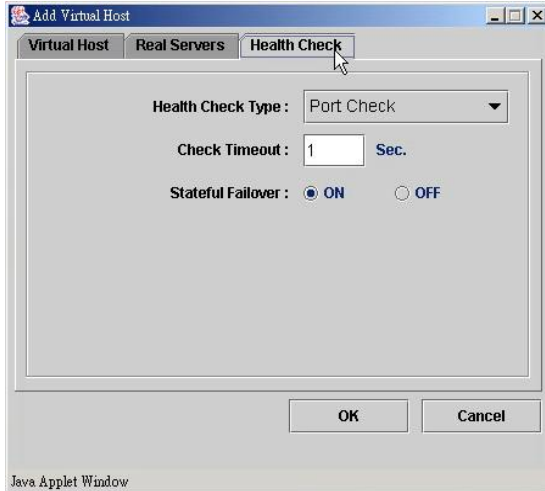
(9) Please click on **[Health Check]** tab to setup health check of real server.
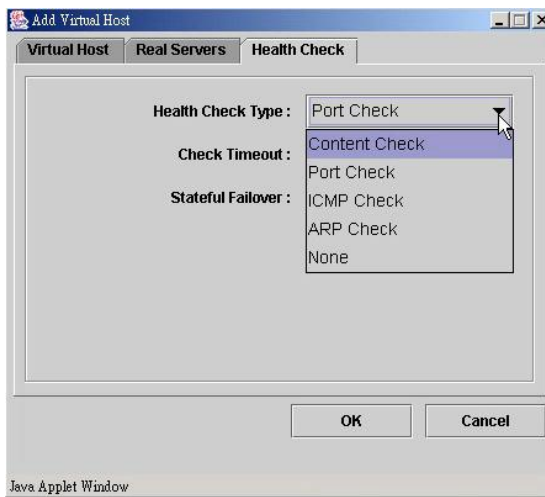
(10) Please use pull-down menu to select the health check type. The available types are Content Check, Port Check, ICMP Check, ARP Check and None.

(11) Please specify the timeout value of health check and select the option of stateful failover.

If you select "**Content Check**", you also have to specify the request page and pattern for health check.

Then click on **[OK]** button to complete this task.

(12) Please click on **[Save]** button to complete the cluster setting.

(13) When you finish the cluster configuration, please click on [**Basics**] and then click on **[Service Control]** to start LB-8000 service.

(14) In this page, please click on **[Start]** button under the LB-8000.

(15) After you click on **[Start]** button, screen will prompt up a window and then click on **[OK]** to start LB-8000 service.

(16) When you click on **[OK]**, then wait for other window prompts up and then click on **[OK]** again to wait a moment for starting LB-8000 service.

(17) In this page, under the LB-8000 you will see the Service shows "**Running**" and the State shows "**Active**" that mean you have accomplished the setting of Service Control.

5.2.2. Setup by using CLI

Here are the sample steps of configuring a cluster with CLI:

LB-8000 R2.6.2 Rev. A - PLANET Technology Corp. lb8000p login: admin Password: LB8000>	(1) Use TELNET or SSH client to connect LB-8000. For example, the IP address of LB-8000 is 192.168.2.201; please enter "**telnet 192.168.2.201**" in the command prompt and then press **[Enter]** key. Please wait a moment you will see the Login prompt. Enter the default initial Login ID and Password: "**admin**" and "**admin**" and then you will see the CLI prompt of LB-8000.
LB8000> cluster type nat [cluster] INFO: Update cluster configuration is completed! LB8000> cluster Cluster Type: NAT LB8000>	(2) Setup the cluster type as you preferred. The default cluster type is "**NAT**" model.
LB8000> cluster add www 192.168.2.100 255.255.255.0 http 80 rr 0 port 1 off [cluster] INFO: Update cluster configuration is completed! LB8000> cluster Cluster Type: NAT Virtual Host Name: WWW Virtual Host IP: 192.168.2.100 Netmask: 255.255.255.0 Service: HTTP Port: 80 Persistency: OFF Scheduler: Round Robin Health Check Type: Port Check Check Timeout: 1 Stateful Failover: OFF	(3) Create a new cluster with the following parameters by issuing "**cluster**" command: l Virtual host name l Virtual IP l The netmask of virtual IP l Service type l Service port l The schedule of load distribution l The persistence time l The type of health check

Real Server List: --- ------ Real Server IP Port Weight --- ------ LB8000>	l The timeout value of health check l The stateful failover option If you enter the type of health check to be "**content**" check, you must enter the request page and pattern to be checked.
LB8000> rs add www 192.168.3.101-102 80 1 [rs] INFO: Update real server configuration is completed! LB8000> rs Virtual Host : WWW IP Address : 192.168.2.100 Port : 80 Real Serve IP Port Weight ================================= 192.168.3.101 80 1 192.168.3.102 80 1 LB8000>	(4) Then you can add the real servers to this cluster by issuing "**rs**" command. When you add a real server, you must indicate the IP address, port number and its weight of this real server.
LB8000> lbsync [lbsync] INFO: Synchronization between two managers is completed.	(5) Please issue "**lbsync**" command to synchronize the settings between two LB-8000 managers.
LB8000> lb8000 start [lb8000] INFO: LB-8000 starts running. LB8000> lb8000 LB-8000 Service: Running State: Active LB8000>	(6) When the setting of cluster is completed, you can start the service of LB-8000 by issuing "**lb8000**" command.

5.3. Direct Routing

The virtual host IP address is shared by the real servers. LB-8000 also acts as a load balancer. LB-8000 has a virtual host configured interface, which is used to accept and route request packets to the chosen servers directly. The real server processes the requests and sends the reply directly back to the client. LB-8000 performs direct routing technique allowing servers to send responses straight back to the clients without going through LB-8000. (See Figure 5-2)

For the definition of Direct Routing, please refer to *Administration Guide for LB-8000*.
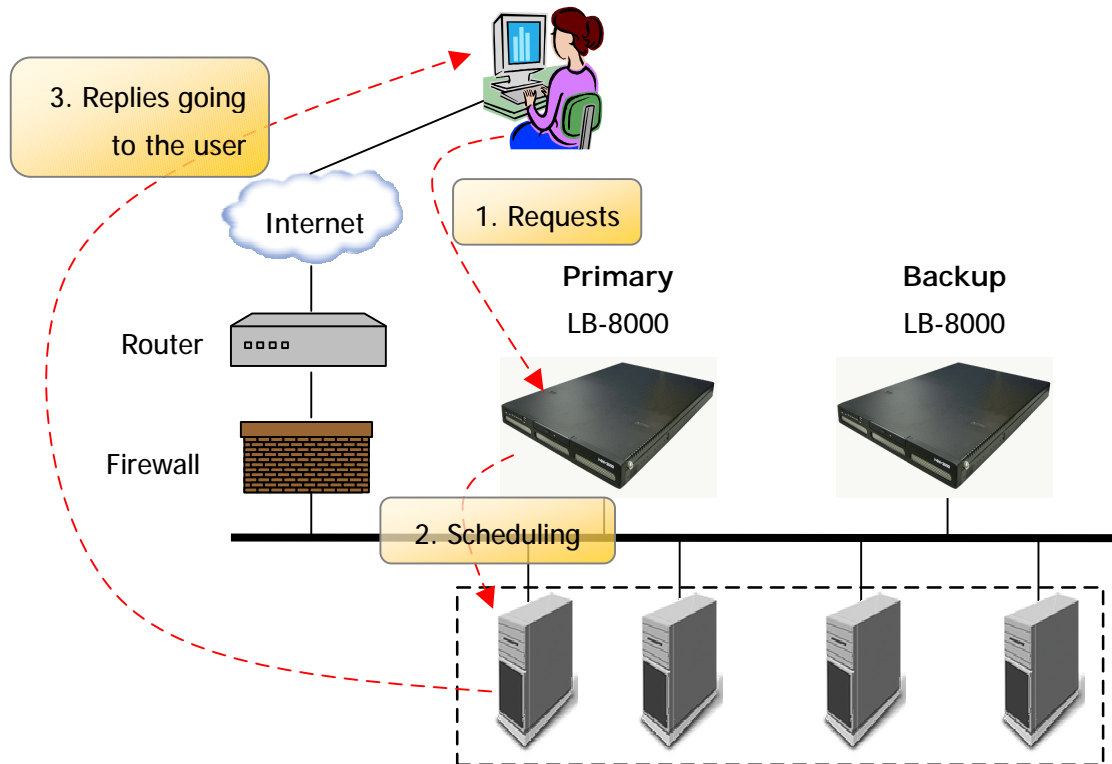
Figure 5-2   Direct Routing Network

5.3.1. Configure Linux/Unix as a real server for DR Model

We need to create an alias of the loopback adapter. This can be accomplished with the following command, for example, where 192.168.2.100 is the virtual host IP address. On the console of Linux, please issue following command:

    # ifconfig lo:0 192.168.2.100 netmask 255.255.255.255 up

The IP address is the Virtual Host IP and Netmask must be 255.255.255.255

Execute the *ifconfig* command to make sure whether the installation is successful. If the installation is successful, the following text will be shown:

    1o:0   Link encap:local loopback
    inet addr:192.168.2.100   Mask:255.255.255.255
    UP LOOPBACK RUNNING MTU:3924 Metric:1

5.3.2. Configure Windows 2000 as a real server for DR Model

We need to create a Microsoft loopback adapter.
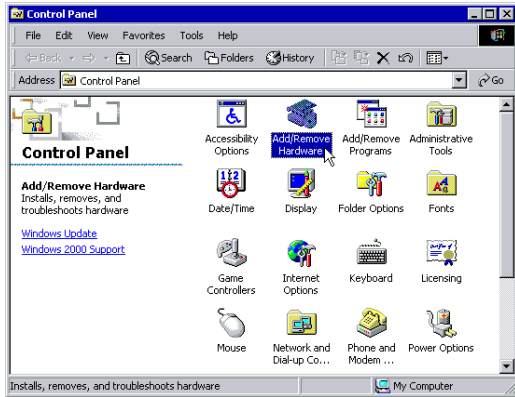
(1) Click on **[Add/Remove Hardware]** icon from control panel.

(2) On the first page of Add/Remove Hardware Wizard, please click on **[Next]** button.
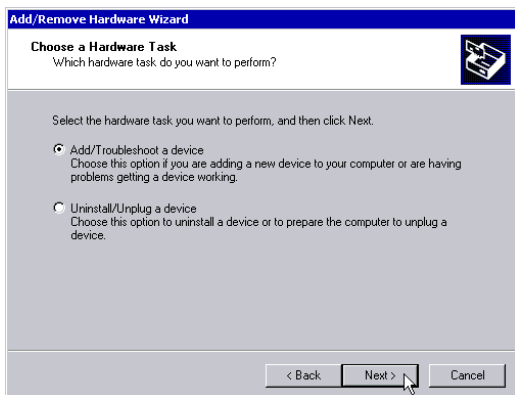
(3) Select **[Add/Troubleshoot a device]** then click on **[Next]** button.
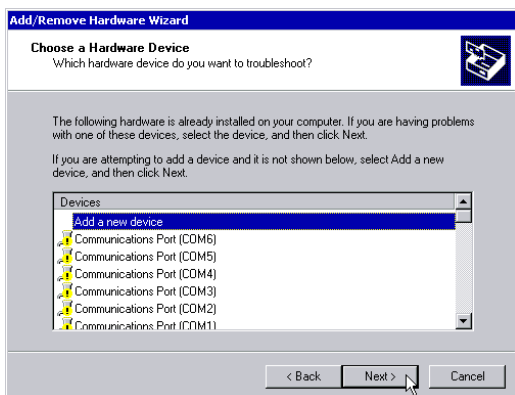
(4) When system finished searching for new device, please select **[Add a new device]** and then click on **[Next]** button.
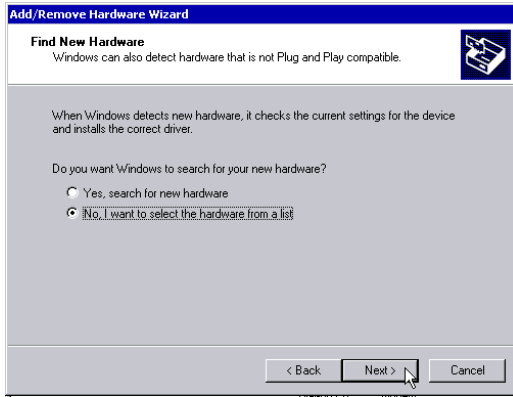
(5) Select **[No, I want to select the hardware from a list]** then click on **[Next]** button.
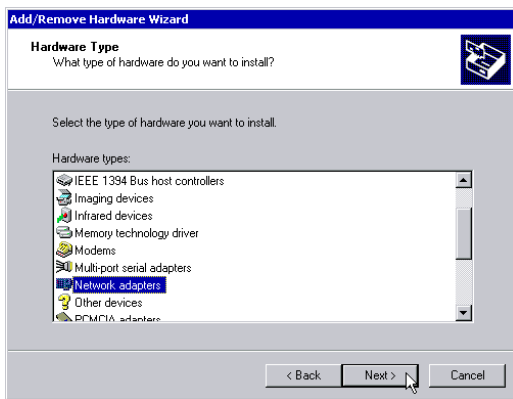
(6) Select **[Network Adapter]** then click on **[Next]** button.
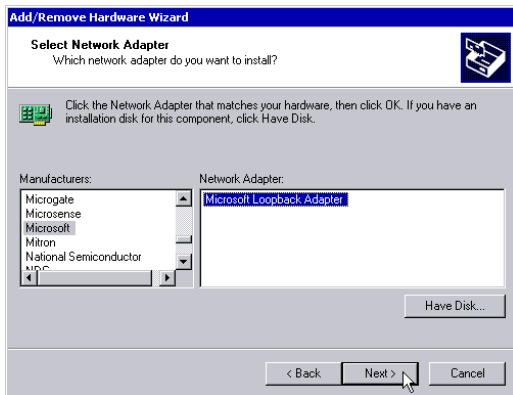
(7) Select **[Microsoft]** from manufactures, and then select **[Microsoft Loopback Adapter]** from the network adapters. Then click on **[Next]** button.
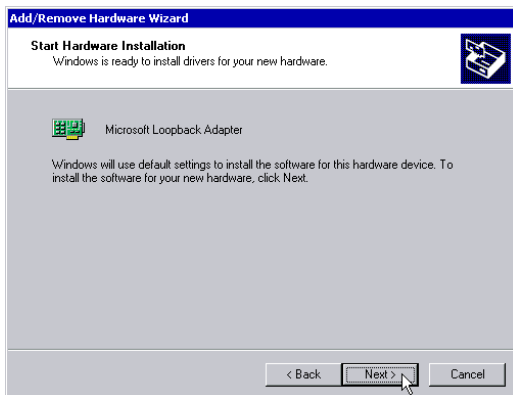
(8) Click on **[Next]** button to accept your selection.

(9) Click on **[Finish]** button.
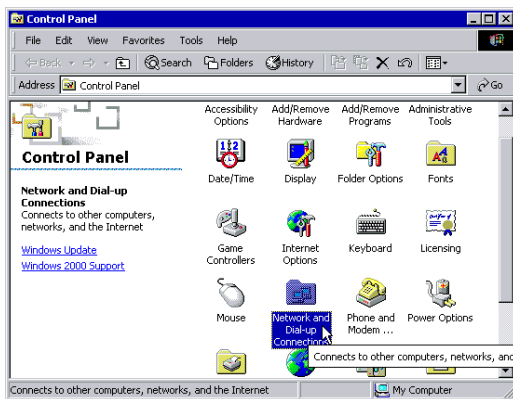
(10) Click on **[Network and Dial-up Connections]** from control panel.
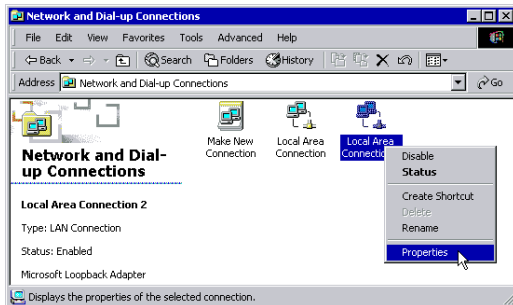
(11) Right click on **[Local Area Connection 2]** icon and select **[Properties]**.
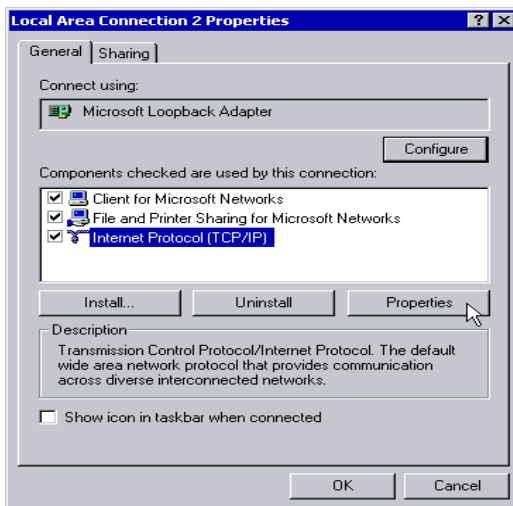
(12) Select **[Internet Protocol (TCP/IP)]** and then click on **[Properties]** button.
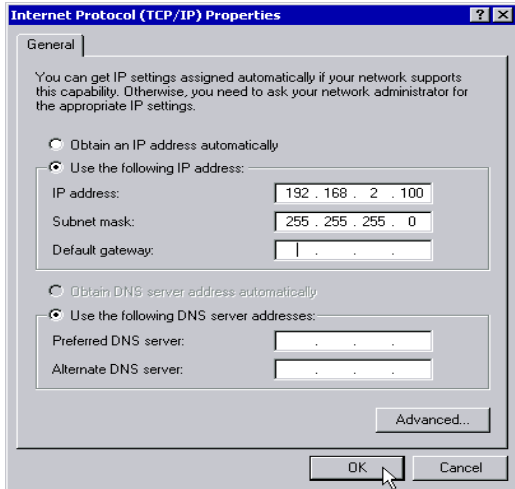
(13) Fill in the IP address with your virtual host IP and the Subnet mask. Then click on **[OK]** button.

For example:
IP address: 192.168.2.100
Subnet mask: 255.255.255.0
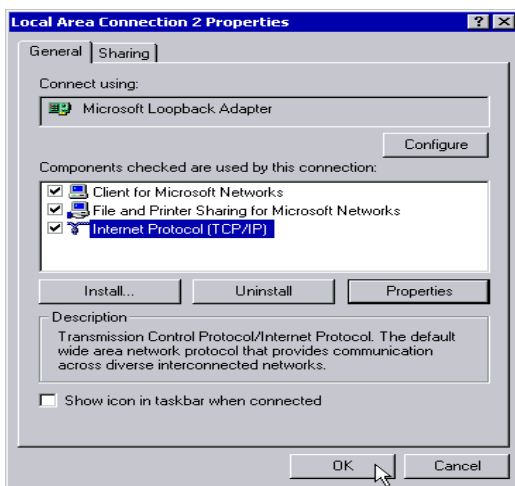
(14) Click on **[OK]** button to accept the changes.
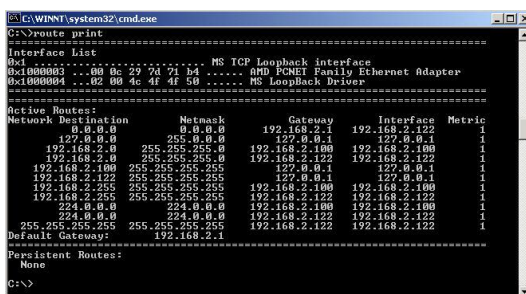
(15) Enter **Command Prompt** and key in command as "**route print**" then it will list out the **routing table**. In the **routing table**, you can find out two entries with "**Destination**" is "**192.168.2.0**".
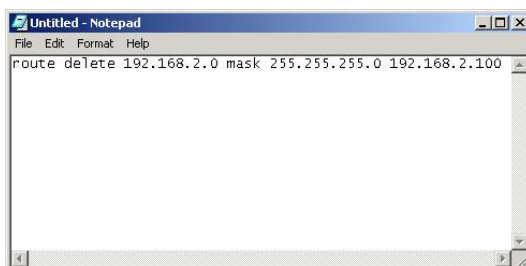
(16) Use "**Notepad**" and edit an entry as "**route delete 192.168.2.0 mask 255.255.255.0 192.168.2.100**" and save as a file as "**c:\route_del.bat**".
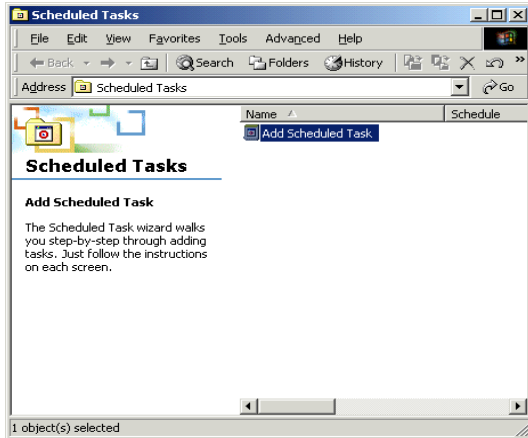
(17) Click on "**Start"**, point to "**Programs\Accessories\System Tools\Scheduled Tasked**". Click on **[Add Scheduled Task]** to add a new task.
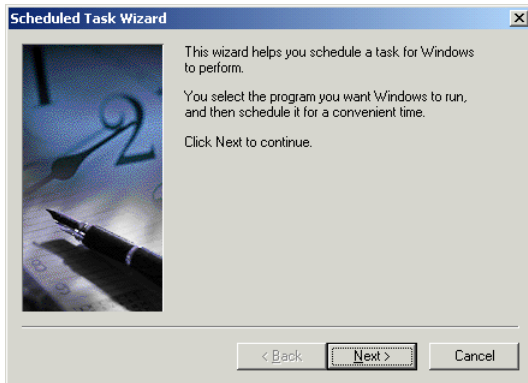
(18) Click on **[Next]** button.
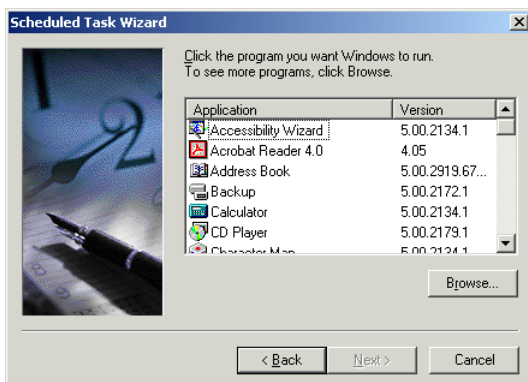
(19) Click on **[Browse]** to select the file.
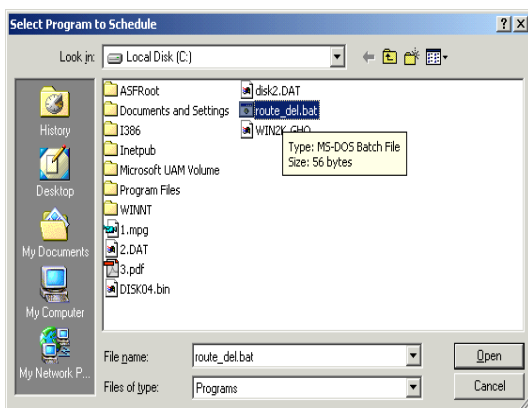
(20) Select the file "**c:\route_del.bat**".
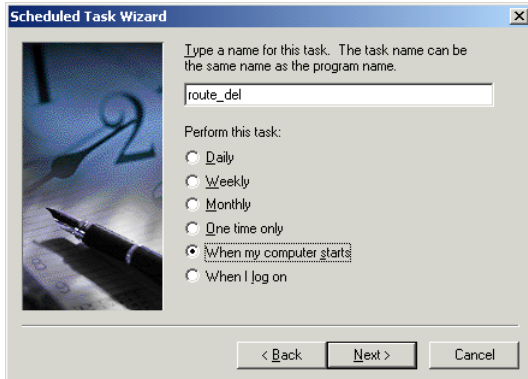
(21) In this window, select the item **[when my computer starts]**.

(22) Then, it will ask for administrator authority to enable this procedure. Please enter the user name as "**Administrator**" and its password.

(23) Click **[Finish]** and reboot the system.
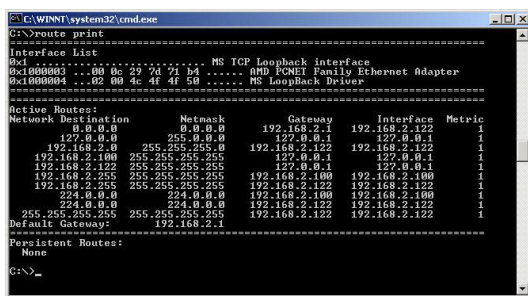
(24) After rebooting the system, enter "**Command Prompt**" and key in command as "**route print**" to list out the routing table. You can see only one "**192.168.2.0**" entry left. It means system setup successfully and can perform as a "**Direct Routing**" real server.

5.4. Configure a Cluster in Direct Routing Mode

After the network environment settings and the network interface settings of LB-8000 managers are completed, you can perform the following steps to configure a cluster.

For configuring a cluster in DR mode, you should setup following information:

l   The cluster type
l   The virtual host name
l   The virtual host IP address
l   The netmask value
l   The service type
l   The service port number
l   The persistency setting
l   The load distribution schedule. We support four types of schedules
    n   Round Robin
    n   Weighted Round Robin
    n   Least Connection
    n   Weighted Least Connection
l   Add real server list
l   The health check method. We support:
    n   Content check for HTTP/HTTPS
    n   Port check
    n   ICMP check
    n   ARP check
    n   None (Means there is no health check)

5.4.1. Setup by using Web GUI

Here are the sample steps of configuring a cluster with web GUI:

(1)   Use Microsoft Internet Explorer (IE) or Netscape Navigator to connect LB-8000. For example, the IP of LB-8000 is 192.168.2.201; please enter "**http://192.168.2.201**"in the address bar and then press [**Enter**] key. Please wait a moment you will see

the Login screen. Enter the default initial Login ID and Password: "**admin**" and "**admin**" and then click on [**Login**] button.

(2) When you login, please click on [**Configuration**] on Primary Function bar.

(3) After you click on [**Configuration**], you will see the [**Virtual Host Setup**], please click on it to setup Virtual Host.
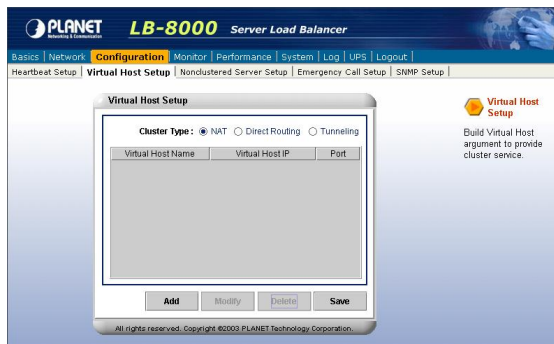
(4) In [**Virtual Host Setup**] page, please select [**Direct Routing**] and then click on [**Add**] button.

(5) Please enter the necessary information to each field. Then click on [**Real Servers**] tab to setup real servers.

(6) Please use pull-down menu to select the scheduler. The available schedules are Round Robin, Weighted Round Robin, Least Connection, and Weighted Least Connection. For more information about Scheduler, please refer to *Administration Guide for LB-8000.*

(7) Please click on [**Add**] button to add real servers.

(8) In this setup window you have two choices. You can click on [**Add Single Server**] to setup a single server or click on [**Add Multiple Servers**] to setup multiple servers.

Please enter the necessary information to each field and then click on [**OK**] button.

(9) Please click on [**Health Check**] tab to setup health check of real server.

(10) Please use pull-down menu to select the health check type. The available types are Content Check, Port Check, ICMP Check, ARP Check and None. For more information about Health Check, please refer to *Administration Guide for LB-8000*.

(11) Please specify the timeout value of health check and select the option of stateful failover.

If you select "Content Check", you also have to specify the request page and pattern for health check.

Then click on [**OK**] button to complete this task.

(12) Please click on [**Save**] button to complete the cluster setting.

(13) When you finish the cluster configuration, please click on [**Basics**] and then click on [**Service Control**] to start LB-8000 service.

(14) In this page, please click on [**Start**] button under the LB-8000.

(15) After you click on [**Start**] button, screen will prompt up a window and then click on [**OK**] to start LB-8000 service.

(16) When you click on [**OK**], then wait for other window prompts up and then click on [**OK**] again to wait a moment for starting LB-8000 service.

(17) In this page, under the LB-8000 you will see the Status shows "**Running**" and the State shows "**Active**" that mean you have accomplished the setting of Service Control.

5.4.2. Setup by using CLI

Here are the sample steps of configuring a cluster with CLI:

LB-8000 R2.6.2 Rev. A - PLANET Technology Corp. lb8000p login: admin Password: LB8000>	(1) Use TELNET or SSH client to connect LB-8000. For example, the IP address of LB-8000 is 192.168.2.201; please enter "**telnet 192.168.2.201**" in the command prompt and then press [**Enter**] key. Please wait a moment you will see the Login prompt. Enter the default initial Login ID and Password: "**admin**" and "**admin**" and then you will see the CLI prompt of LB-8000.
LB8000> cluster type direct [cluster] INFO: Update cluster configuration is completed! LB8000> cluster Cluster Type: DIRECT LB8000>	(2) Setup the cluster type as you preferred. The default cluster type is "**nat**" model. Please change it to be "**direct**".
LB8000> cluster add www 192.168.2.100 255.255.255.0 http 80 rr 0 port 1 off [cluster] INFO: Update cluster configuration is completed! LB8000> cluster Cluster Type: DIRECT Virtual Host Name: WWW Virtual Host IP: 192.168.2.100 Netmask: 255.255.255.0 Service: HTTP Port: 80 Persistency: OFF Scheduler: Round Robin Health Check Type: Port Check Check Timeout: 1 Stateful Failover: OFF	(3) Create a new cluster with the following parameters by issuing "**cluster**" command: l Virtual host name l Virtual IP l The netmask of virtual IP l Service type l Service port l The schedule of load distribution l The persistence time

Real Server List: -- ------ Real Server IP Port Weight -- ------ LB8000>	l The type of health check l The timeout value of health check l The stateful failover option If you enter the type of health check to be "**content**" check, you also should enter the request page and pattern to be checked.
LB8000> rs add www 192.168.3.101-102 80 1 [rs] INFO: Update real server configuration is completed! LB8000> rs Virtual Host : WWW IP Address : 192.168.2.100 Port : 80 Real Serve IP Port Weight ================================ 192.168.3.101 80 1 192.168.3.102 80 1 LB8000>	(4) Then you can add the real servers to this cluster by issuing "**rs**" command. When you add a real server, you should indicate the IP address, port number and its weight of this real server.
LB8000> lbsync [lbsync] INFO: Synchronization between two managers is completed.	(5) Please issue "**lbsync**" command to synchronize the settings between two LB-8000 managers.
LB8000> lb8000 start [lb8000] INFO: LB-8000 starts running. LB8000> lb8000 LB-8000 Service: Running State: Active LB8000>	(6) When the setting of cluster is completed, you can start the service of LB-8000 by issuing "**lb8000**" command.

5.5. IP Tunneling (Network Address Translation)

It is a technique to encapsulate IP datagram within IP datagrams, which allows datagrams destined for one IP address to be warped and redirected to another IP address. So far, only Linux support this IP forwarding mechanism. (See Figure 5-3)
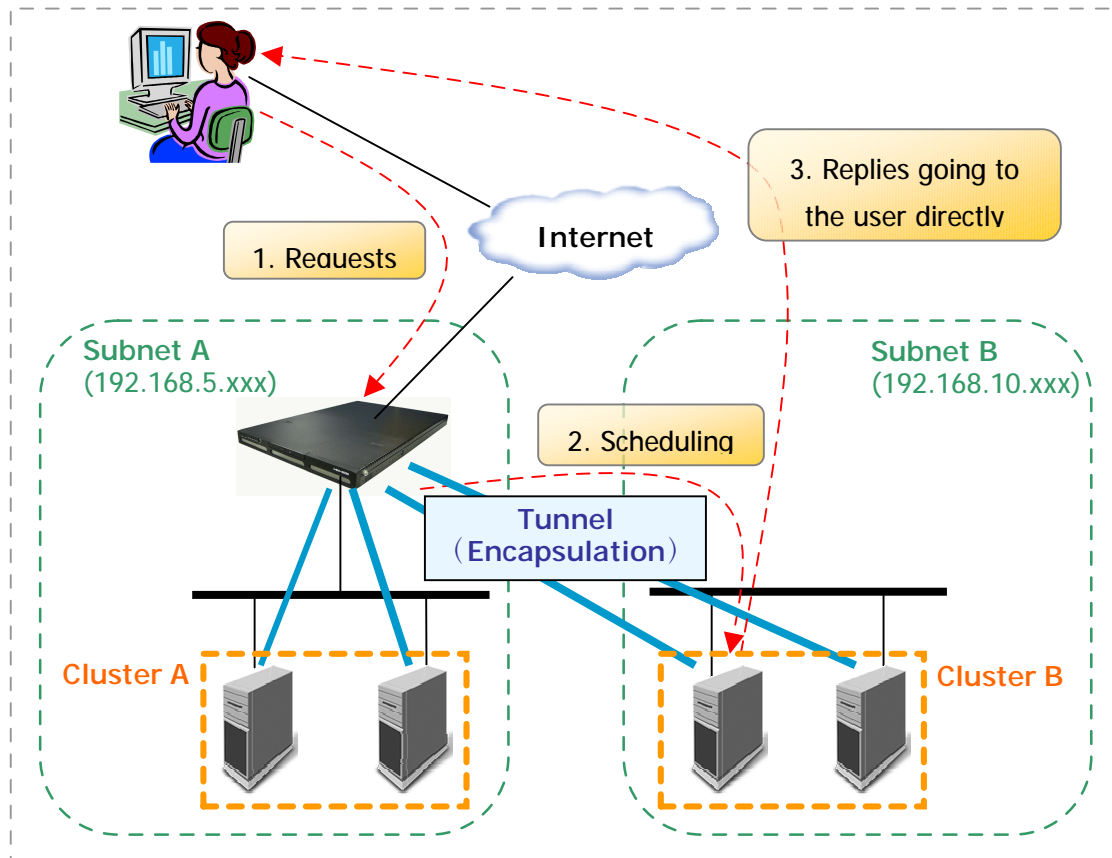
Figure 5-3   IP Tunneling

5.5.1. Configure Linux/Unix as a real server for IP Tunneling Model

Currently, you just can use Linux / UNIX as the real server on IP Tunneling model. Here is an example to create a tunnel interface on Linux.

On the console of Linux, please issue following command:

    # ifconfig tunl0 192.168.2.100 netmask 255.255.255.255 -arp up

Execute the "*ifconfig*" to make sure whether the installation is successful. If the installation is successful, the output of executing *"ifconfig -I"* should be looking like the following text:

    Link encap: IPIP Tunnel HWaddr
    inet addr: 192.168.2.100 Mask: 255.255.255.255
    UP RUNNING NOARP MTU:1480 Metric: 1
    RX PACKETS: 0 errors:0 dropped:0 overruns:0 frame:0
    TX PACKETS: 0 errors:0 dropped:0 overruns:0 carrier:0
    collisions: 0 txqueuelen: 0

5.6. Configure a Cluster in IP Tunneling Mode

After the network environment settings and the network interface settings of primary and backup managers are completed, you can perform the following steps to configure a cluster.

For configuring a cluster in IP Tunneling mode, you should setup following information:

- **l** The cluster type
- **l** The virtual host name
- **l** The virtual host IP address
- **l** The netmask value
- **l** The service type
- **l** The service port number
- **l** The persistency setting
- **l** The load distribution schedule. We support four types of schedules
  - **n** Round Robin
  - **n** Weighted Round Robin
  - **n** Least Connection
  - **n** Weighted Least Connection
- **l** Add real server list
- **l** The health check method. We support:
  - **n** Content check for HTTP/HTTPS
  - **n** Port check
  - **n** ICMP check
  - **n** ARP check
  - **n** None (Means there is no health check)

5.6.1. Setup by using Web GUI

Here are the sample steps of configuring a cluster with web GUI:

(1) Use Microsoft Internet Explorer (IE) or Netscape Navigator to connect LB-8000. For example, the IP of LB-8000 is 192.168.2.201; please enter "**http://192.168.2.201**"in the address bar and then press [**Enter**] key. Please wait a moment you will see

the Login screen. Enter the default
initial Login ID and Password: "**admin**"
and "**admin**" and then click on [**Login**]
button.

(2)   When you login, please click on
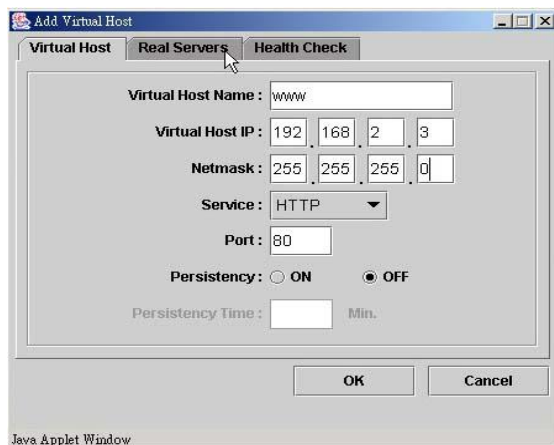[**Configuration**] on Primary function
bar.

(3)   After you click on [**Configuration**], you
will see the [**Virtual Host Setup**],
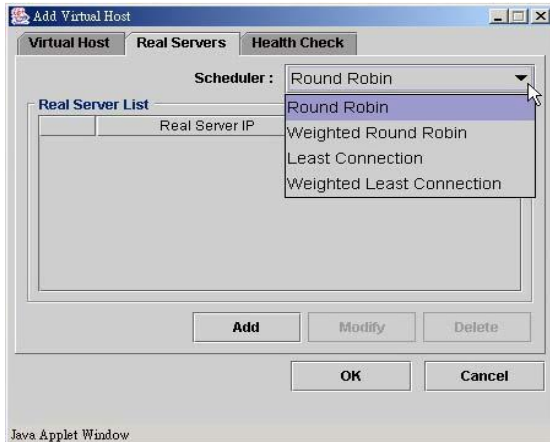please click on it to setup Virtual Host.

(4)   In [**Virtual Host Setup**] page, please
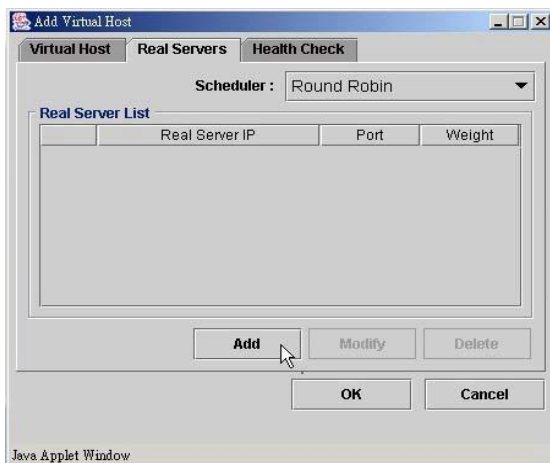select [**Tunneling**] and then click on
[**Add**] button.
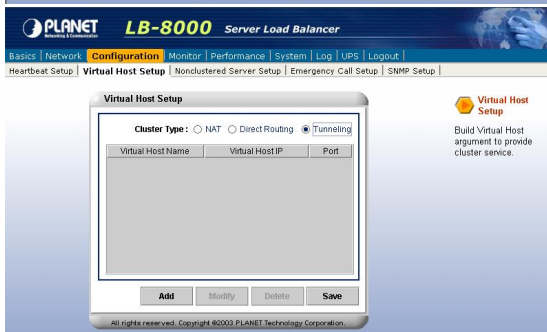
(5)   Please enter the necessary information
to each field. Then click on [**Real
Servers**] tab to setup real servers.

(6) Please use pull-down menu to select the scheduler. The available schedules are Round Robin, Weighted Round Robin, Least Connection, and Weighted Least Connection. For more information about Scheduler, please refer to *Administration Guide for LB-8000.*
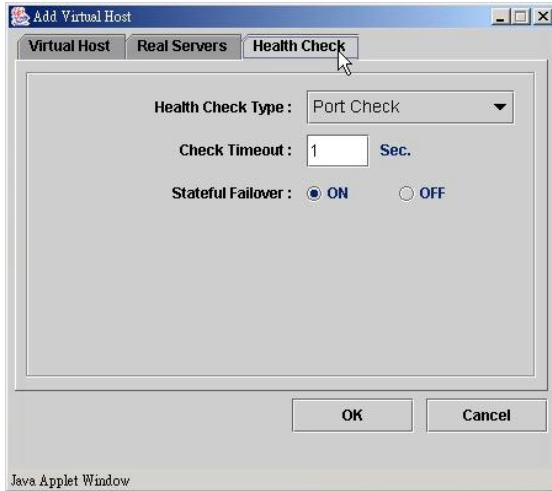

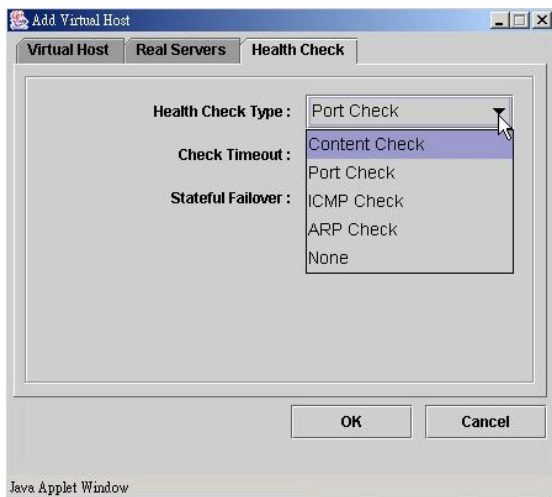(7) Please click on [**Add**] button to add real servers.

(8) In this setup window you have two choices. You can click on [**Add Single Server**] to setup a single server or click on [**Add Multiple Servers**] to setup multiple servers.

If you select to add a single server, please enter the necessary information to each field and then click on [**OK**] button.
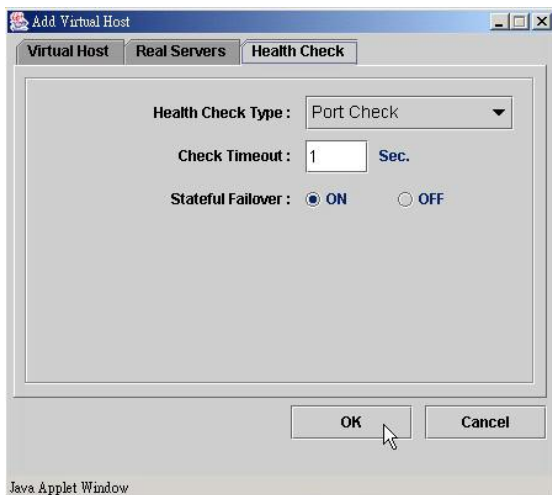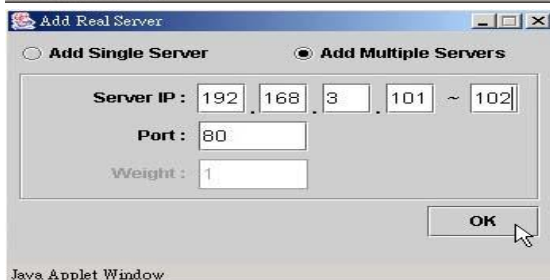
If you select to add multiple servers, please enter the necessary information to each filed and then click on [**OK**] button.

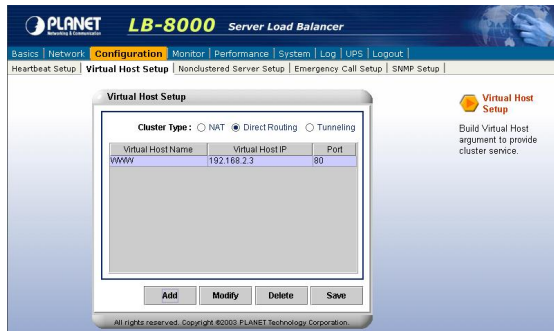(9) Please click on [**Health Check**] tab to setup health check of real server.

(10) Please use pull-down menu to select the health check type. The available types are Content Check, Port Check, ICMP Check, ARP Check and None. For more information about Health Check, please refer to *Administration Guide for LB-8000*.
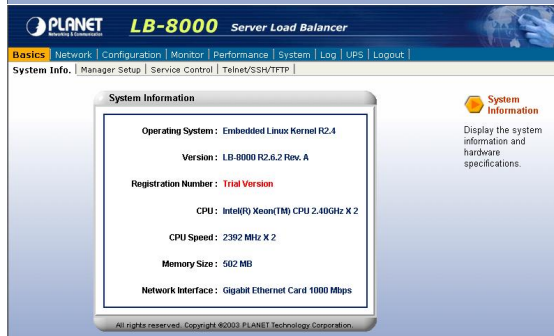

(11) Please specify the timeout value of health check and select the option of stateful failover.

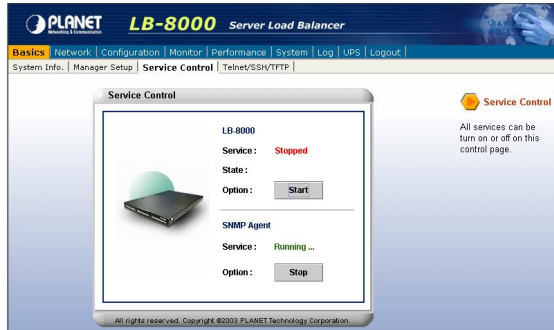If you select "Content Check", you also have to specify the request page and pattern for health check.

Then click on [**OK**] button to complete this task

(12) Please click on [**Save**] button to complete the cluster setting.

(13) When you finish the cluster configuration, please click on [**Basics**] and then click on [**Service Control**] to start LB-8000 service.
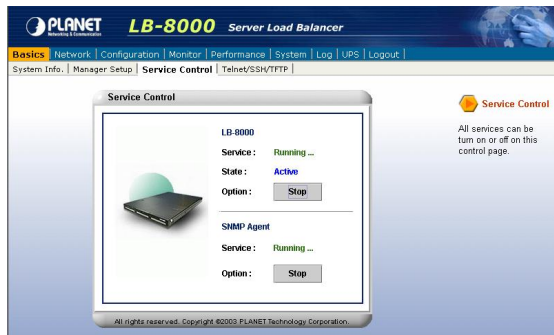

(14) In this page, please click on [**Start**] button under the LB-8000.

(15) After you click on [**Start**] button, screen will prompt up a window and then click on [**OK**] to start LB-8000 service.

(16) When you click on [**OK**], then wait for other window prompts up and then click on [**OK**] again to wait a moment for starting LB-8000 service.

(17) In this page, under the LB-8000 you will see the Status shows "**Running**" and the State shows "**Active**" that mean you have accomplished the setting of Service Control.

5.6.2. Setup by using CLI

Here are the sample steps of configuring a cluster with CLI:

LB-8000 R2.6.2 Rev. A - Planet Technology Corp. lb8000p login: admin Password: LB8000>	(1) Use TELNET or SSH client to connect LB-8000. For example, the IP address of LB-8000 is 192.168.2.201; please enter "**telnet 192.168.2.201**" in the command prompt and then press [**Enter**] key. Please wait a moment you will see the Login prompt. Enter the default initial Login ID and Password: "**admin**" and "**admin**" and then you will see the CLI prompt of LB-8000.
LB8000> cluster type tunnel [cluster] INFO: Update cluster configuration is completed! LB8000> cluster Cluster Type: TUNNEL LB8000>	(2) Setup the cluster type as you preferred. The default cluster type is "**nat**" model. Please change it to "**tunnel**".
LB8000> cluster add www 192.168.2.100 255.255.255.0 http 80 rr 0 port 1 off [cluster] INFO: Update cluster configuration is completed! LB8000> cluster Cluster Type: TUNNEL Virtual Host Name: WWW Virtual Host IP: 192.168.2.100 Netmask: 255.255.255.0 Service: HTTP Port: 80 Persistency: OFF Scheduler: Round Robin Health Check Type: Port Check Check Timeout: 1 Stateful Failover: OFF Real Server List: --- Real Server IP Port Weight --- LB8000>	(3) Create a new cluster with the following parameters by issuing "**cluster**" command: l Virtual host name l Virtual IP l The netmask of virtual IP l Service type l Service port l The schedule of load distribution l The persistence time l The type of health check l The timeout value of health check l The stateful failover option If you enter the type of health check to be "**content**" check, you also should enter the request page and pattern to be checked.
LB8000> rs add www 192.168.3.101-102 80 1 [rs] INFO: Update real server configuration is completed! LB8000> rs Virtual Host : WWW IP Address : 192.168.2.100 Port : 80	(4) Then you can add the real servers to this cluster by issuing "**rs**" command. When you add a real server, you should indicate the IP address, port number and its weight of this real

Real Serve IP Port Weight ================================ 192.168.3.101 80 1 192.168.3.102 80 1 LB8000>	server.
LB8000> lbsync [lbsync] INFO: Synchronization between two managers is completed.	(5) Please issue "**lbsync**" command to synchronize the settings between two LB-8000 managers.
LB8000> lb8000 start [lb8000] INFO: LB-8000 starts running. LB8000> lb8000 LB-8000 Service: Running State: Active LB8000>	(6) When the setting of cluster is completed, you can start the service of LB-8000 by issuing "**lb8000**" command.

6. GUI Configuration

Before you start to use GUI or CLI, we suggest that you go through the *Administration Guide for LB-8000 R2.6.2* to get the administrative information of the technology of LB-8000.

The Graphic User Interface (GUI) of LB-8000 is a java-based administration tool. It allows administrators to monitor system and also to achieve administrative tasks. (See Figure 6-2)

Following are the system tasks that can be completed via GUI (Graphical User Interface) from any Java Applet enabled web browser:

- ü   To show the status of the whole system and to enable the system service controlling (i.e. shut down or restart High Availability service) via web browser.
- ü   To show a graphical performance history of the CPU, Memory and Network Interface by different time frame.
- ü   To display the system's alert logs and connection status.
- ü   To add/modify/delete cluster and real servers.

6.1. Where to Start

After you install the LB-8000 into your network environment, then you can connect LB-8000 via browser or Telnet / SSH to use cluster management system. If you choose to use browser to do the management, please open up the IE or Netscape Navigator and connect to the login screen, for example, the default IP of LB-8000 is 192.168.2.1; please enter "**http://192.168.2.1**" and press **[Enter]** key, administrator will see the following GUI login screen: (See Figure 6-1)

Note *If your client computer does not install JRE (Java Runtime Environment) program, LB-8000 manager will pop up a window to remind you to download the JRE program when you first time login LB-8000 manager. Please download and install the JRE program. We have confirmed that current GUI works with following JRE versions: JRE 1.4.0, 1.4.0_01, 1.4.0_02, 1.4.0_03, 1.4.0_04, 1.4.1_02, 1.4.1_03.*
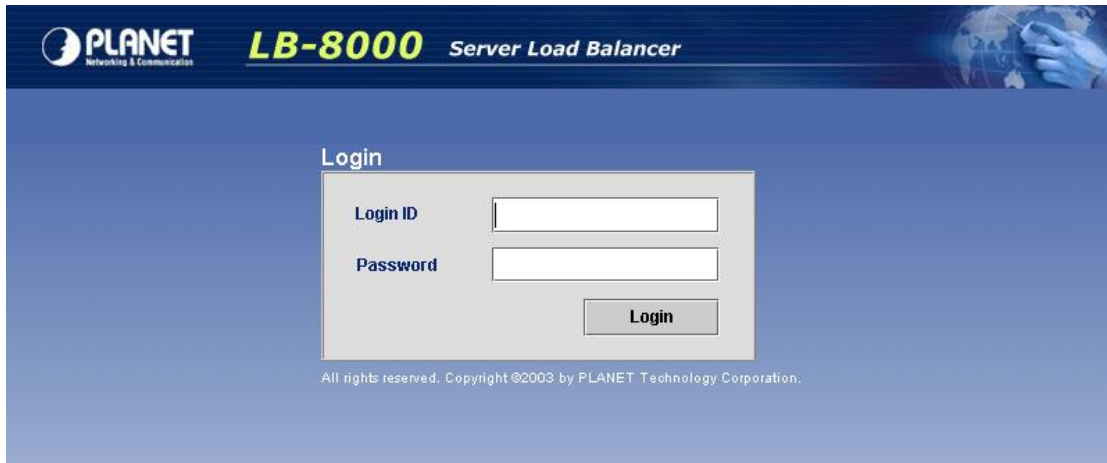
Figure 6-1 LB-8000 Login Screen

Enter the Login ID and password (the initial login ID is "admin" and the password is "admin" as well) first, and hit **[Login]** to enter the main screen of LB-8000. Once administrator logins the LB-8000 properly, further configuration process can be started.

There are nine Primary functions available and they are **Basics**, **Network**, **Configuration**, **Monitor**, **Performance**, **System, Log, UPS,** and **Logout**. On the top area of main screen is the Primary Function List. Under the Primary Function List is the Sub Function List. On the middle of the main screen is the Content Area. On the right area of main screen is Help Tips. (See Figure 6-2)

Primary Function List

Figure 6-2 Main screen
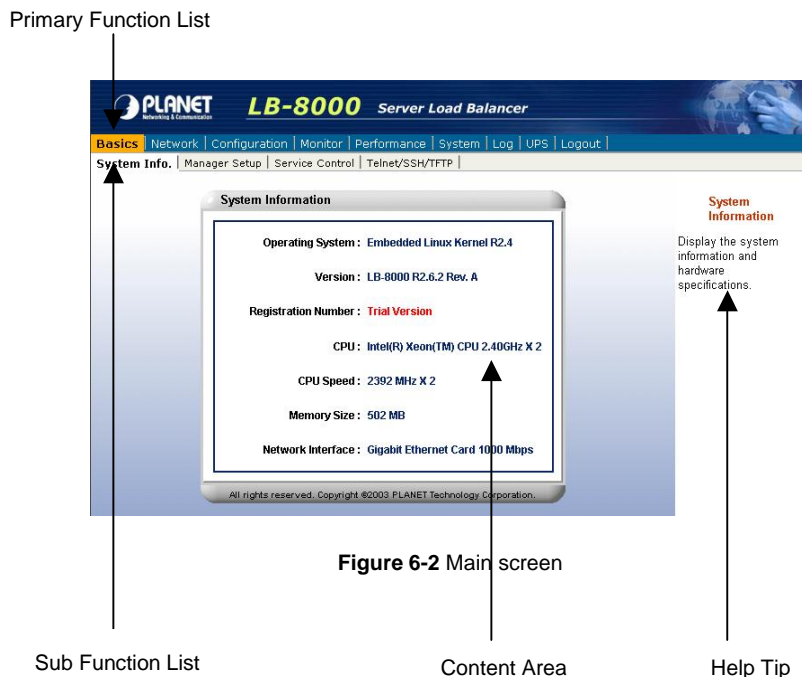
Sub Function List   Content Area   Help Tip

6.2. Basics

Click on **[Basics]** on the Primary Function List, screen will display the System information in the **Content Area** and there are also four sub functions available under **[Basics]** which are **System Info**, **Manager Setup, Service Control,** and **Telnet / SSH / TFTP**. These sub functions allow administrator to view system information, to set the role of LB-8000, to shutdown or restart the LB-8000 service and SNMP service, to enable or disable the SSH, Telnet, and TFTP service. (See Figure 6-3)
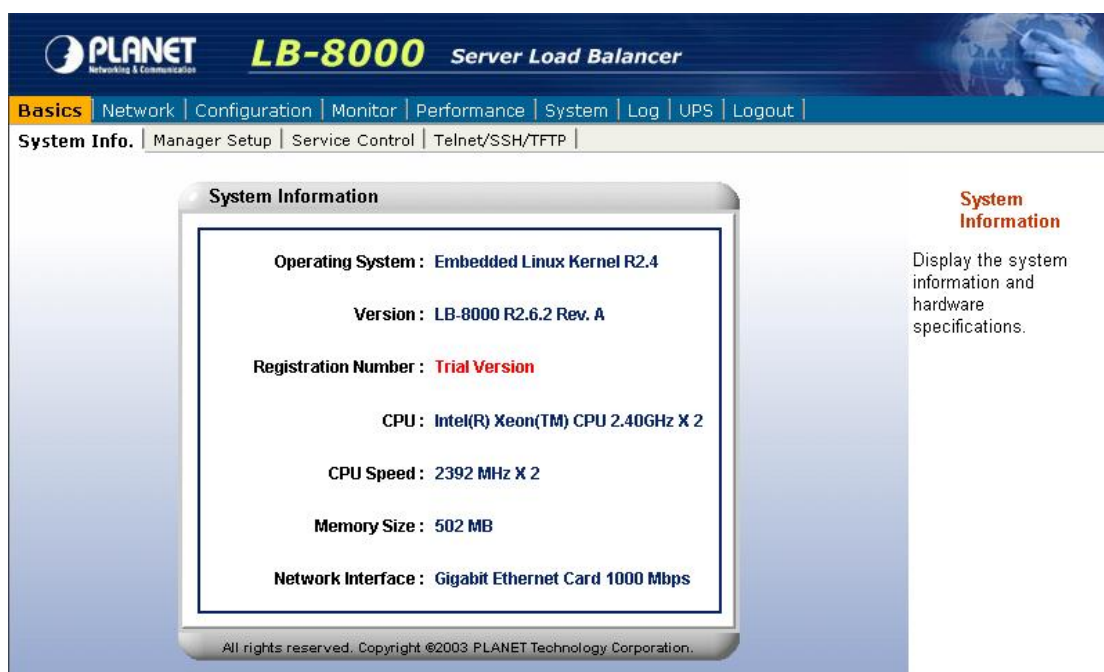
Figure 6-3   Basics screen

6.2.1. System Info

Click on **[System Info]**, and the system information and hardware specifications will be displayed on the **Content Area**: (See Figure 6-4)
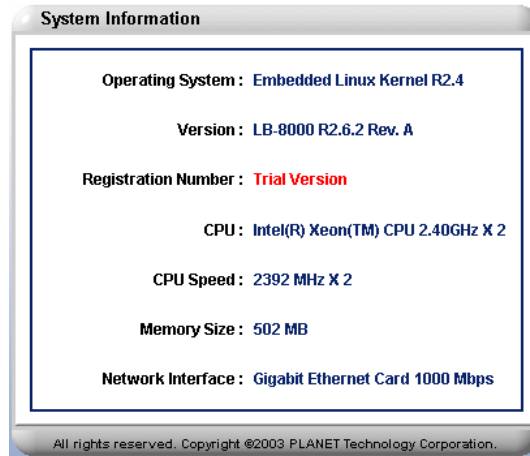
Figure 6–4 System Info Screen

<**Operating System**>: Display the version of operating system.

<**Version**>: Display the software version of LB-8000.

<**Registration Number**>: Display the legal registration number of LB-8000.

<**CPU**>: Display the brand name of CPU.

<**CPU Speed**>: Display CPU processing speed.

<**Memory Size**>: Display the size of RAM.

<**Network Interface**>: Display the type of network card interfaces.

You could view the same information by executing **"sysinfo"** command in CLI mode. For more information, please refer to page 163.

6.2.2. Manager Setup

Click on **[Manager Setup]** and administrator can set LB-8000 to be a primary manager or a backup manager. Primary Manger behaves as a main LB-8000 manger that manages and controls all services. Backup Manager is responsible for taking over and continuing to serve the tasks when primary manager stops functioning. (See Figure 6-5)

You can configure the following settings:

I   Configuring the role of LB-8000: Select the current LB-8000 as primary manager or backup manager, and setup its manager name and domain name.

I   Configuring the synchronization with other manager: You can determine the current manager synchronizes to other manager or not. If yes, you have to enter the IP address of other manager and enter the administrator's account and password of other manager for authorization.
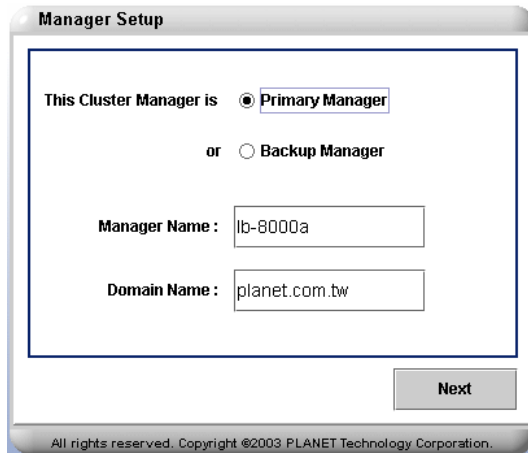
Figure 6-5   Manager Setup Screen

To Set A LB-8000 As A Primary Manager and Synchronize With Backup Manager:

1. On the **Manager Setup** screen, please check primary manager.

2. Enter a short name for your primary manager.

3. Enter the Domain Name and click on **[Next]**.

4. On next screen, please select **[Yes]** for synchronizing with backup manager (If you do not have the Backup Manager, please select **[No]** and then click on **[OK]** to complete the manager setup process). (See Figure 6-6)

5. Enter Backup Manager IP address in the field.

6. Enter administrator's name and password in the fields.

7. Click on **[OK]** to complete the manager setup process.
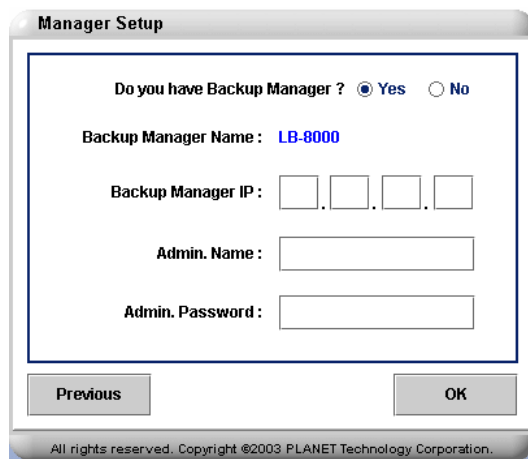
Figure 6-6   Manager Setup Screen

To Setup LB-8000 As A Backup Manager:

1. On the **Manager Setup** screen, check backup manager.

2. Enter a short name for your backup manager.

3. Enter the Domain Name and click on **[Next]**.

4. On the next screen, if synchronizing with primary manager is needed, please select **[Yes]** and then go on the next step. If synchronizing with primary manager is not needed, please select **[NO]** and then click on **[OK]** to complete the manager setup. (See Figure 6-7)

5. Enter primary manager IP address in the field.

6. Enter administrator's name and password in the fields.

7. Click on **[OK]** to complete the manager setup process.
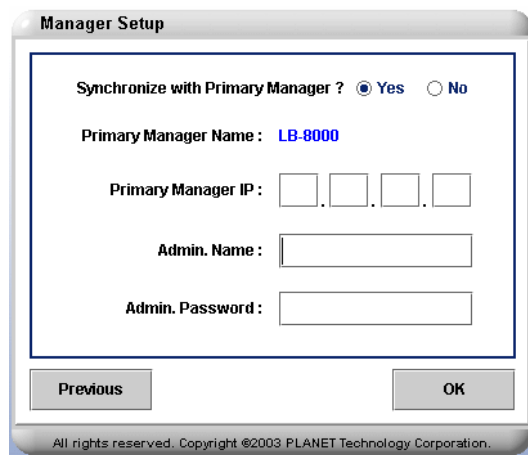
Figure 6-7   Backup Manager Setup Screen

You could configure same function by executing **"setmgr"** and **"lbsync"** command in CLI mode. For more information, please refer to page 125 and 126.

6.2.3. Service Control

Click on **[Service Control]**, and administrator can start or stop the LB-8000 service (High Availability) and SNMP service online. (See Figure 6-8)

The "service" field has two statuses:

I   Running: The service is running.

I   Stopped: The service is stopped.

When LB-8000 service is running, there are two states of LB-8000 service:

I   Active: The current manager is providing HA service.

I **Standby:** The current manager is ready to takeoff HA service when active manager is down.

To turn on / off the LB-8000 (High Availability) service, please click on **[Service Control]** and hit the **[Start]** / **[Stop]** button under **LB-8000.** (See Figure 6-8)

To turn on / off the SNMP service, please click on **[Service Control]** and hit **[Start]** / **[Stop]** button under SNMP Agent. (See Figure 6-8)

Note *You are just able to start LB-8000 (High Availability) service after you configure a cluster. And if you click [Start] / [Stop] button under LB-8000, both manager will start / stop service simultaneously.*

Figure 6-8   Service Control Screen

You could configure same function by executing **"lb8000"** and **"snmp"** command in CLI mode. For more information, please refer to page 錯誤! 尚未定義書籤。 and 146.

6.2.4. Telnet / SSH / TFTP

Telnet and SSH is a network connectivity tool. Administrator can configure LB-8000 via CLI (Command Line Interface) with TELNET or SSH client. Click on **[Telnet / SSH / TFTP]**, and administrator can enable / disable Telnet and SSH services. (See Figure 6-9)
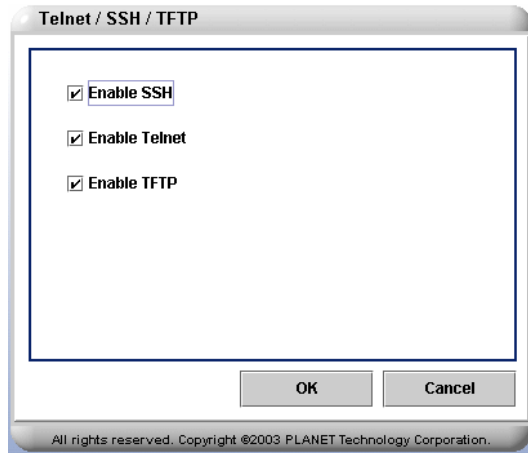
Figure 6-9   Telnet / SSH / TFTP Screen

Administrator also can enable TFTP service to allow TFTP client to upload files to LB-8000 or download files from LB-8000. For example, you can download the backup system configuration file from LB-8000 or upload the backup system configuration file to LB-8000 for restoring previous system configurations. The files have been uploaded only can be seen from CLI.

To enable / disable the **SSH** service, please click on **[Telnet / SSH / TFTP]** and then check or uncheck the box beside the **[Enable SSH]**. (See Figure 6-9)

To enable / disable the **Telnet** service, please click on **[Telnet / SSH / TFPT]** and then check or uncheck the box beside the **[Enable Telnet]**. (See Figure 6-9)

To enable /disable the **TFTP** service, please click on **[Telnet / SSH / TFTP**] and then check or uncheck the box beside the **[Enable TFTP]**. (See Figure 6-9)

You could configure TFTP service by executing **"tftp"** command in CLI mode. For more information, please refer to page 178.

6.3. Network

Click on **[Network]** on the Primary Function List, screen will display the network configuration in the **Content Area** and there are also six sub functions available under **[Network]** which are **Network Info**, **Network 1 Setup**, **Network 2 Setup**, **Router Setup**, **DNS Setup, and VPN Setup**. These sub functions allow administrator to view current network configuration, to configure essential network properties, and to configure Static Router, DNS, and VPN service. (See Figure 6-10)
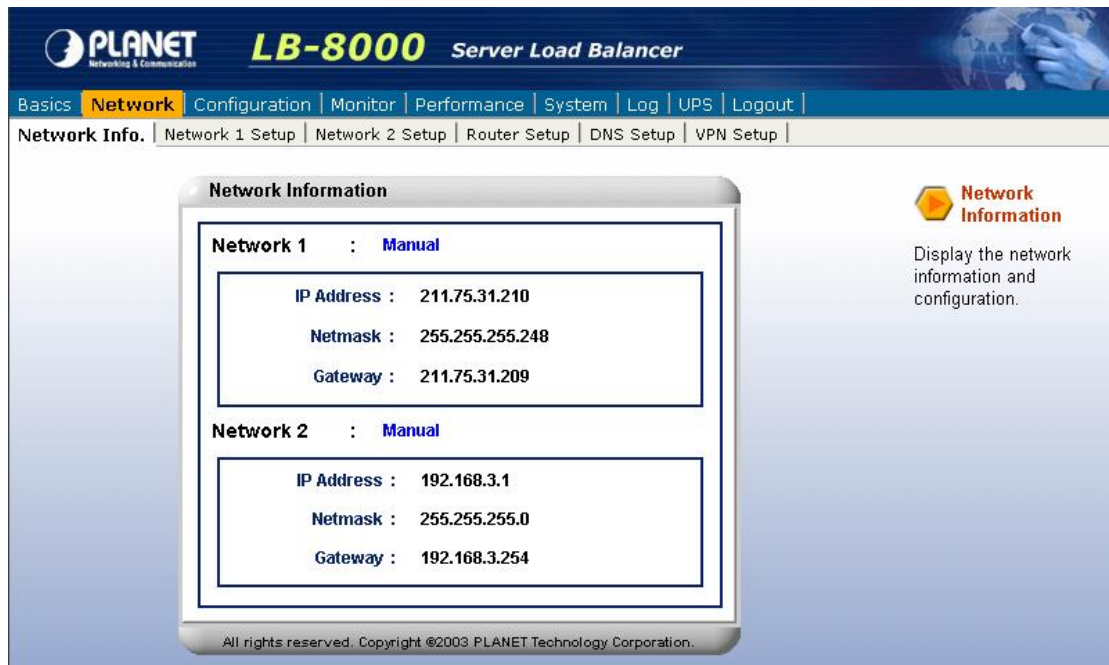
Figure 6-10 Network Screen

6.3.1. Network Info

Click on **[Network Info]**, and administrator can view current network configuration. (See Figure 6-11)
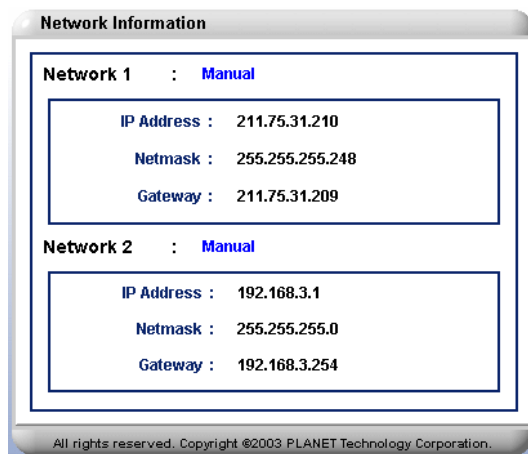
Figure 6-11 Network Info Screen

<**Network 1/2** >: Display the configuration type of current network card.

<**IP Address**>: Display the IP address.

<**Netmask**>: Display the netmask value.

<**Gateway**>: Display the gateway IP address.

You could configure same function by executing **"ifconfig"** command in CLI mode. For more

information, please refer to page 111.

6.3.2. Network 1 Setup

Click on **[Network 1 Setup]** and administrator can enter a specify IP address and related information manually. (See Figure 6-12)
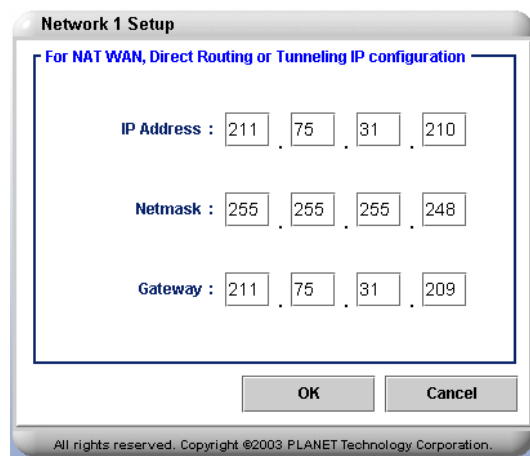
Figure 6-12 Network 1 Setup Screen

To Manually Specify An Address:

1.   Click on **[Network 1 Setup]** and enter the relevant information in following field:

     <**IP Address**>: A valid IP address.
     <**Netmask**>: The Netmask is a 32-bit notated number using four numbers from 0 through to 255, and is separated by periods. Typically, default Netmask numbers are 255 as values, such as 255.255.255.0, for class C. No default value in this field.
     <**Gateway**>: Current gateway IP address. There is no default value in this field

2.   Click on **[OK]** to save the change and finish the task.

The system will be updated with a new assigned IP address and the administrator will be asked to re-login.

Note *Clients will lose the network connection to LB-8000 when IP address is reassigned.*
       Administrator can use the new IP address to reconnect to LB-8000.

You could configure same function by executing **"ifconfig eth0"** command in CLI mode. For more information, please refer to page 111.

6.3.3. Network 2 Setup

Click on **[Network 2 Setup],** and administrator can choose "**Disable**" to turn off this network card's functions, choose "**Bond with the first network card**" to increase network bandwidth for Direct Routing and IP Tunneling, or choose "**Specify an IP address**" to enter the IP address manually for NAT model. (See Figure 6-13)
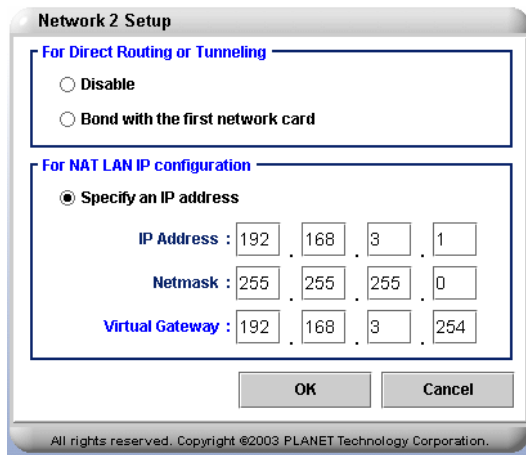
Figure 6-13 Network 2 Setup Screen

To Disable:

1. On the **Network 2 Setup** screen, please check **"Disable"**.
2. Click on **[OK]** to complete this task.

To Bond with the First Network Card:

1. On the **Network 2 Setup** screen, please check **"Bond with the first network card"**.
2. Click on **[OK]** to complete this task.

To Manually Specify An IP Address:

1. Click on **[Network 2 Setup]** and enter the relevant information in all of the following field:

   <**IP Address**>: A valid IP address.
   <**Netmask**>: The Netmask is a 32-bit notated number using four numbers from 0 through to 255, and is separated by periods. Typically, default Netmask numbers are 255 as values, such as 255.255.255.0, for class C. No default value in this field.

   Note *Network 1 and Network 2 can not be assigned in the same IP address that will cause some system errors.*

<Virtual Gateway>: The virtual gateway IP address created by LB-8000 for real servers in NAT model. In NAT model, the real servers must use this IP address as the gateway. There is no default value in this field.

2.   Click on **[OK]** to save the change and finish the task.

The system will be updated with the new configuration and the administrator will be asked to re-login.

Note *Clients will lose the network connection to LB-8000 when the configuration has been changed. Administrator can use the new IP address to reconnect to LB-8000.*

You could configure same function by executing **"ifconfig eht1"** command in CLI mode. For more information, please refer to page 111.

6.3.4. Router Setup

Click on **Router Setup**, and administrator can setup static route of LB-8000. (See Figure 6-14)

Within the static route, IP forwarding or VPN, administrator can maintain the content of real servers under NAT model. In this screen, you can configure the following settings:

I   **Configuring static route:** You can enable / disable the static route and maintain the static routing rules as you want.
I   **Configuring IP forwarding:** You can enable / disable the IP forwarding mechanism or NAT router for local area network (LAN).
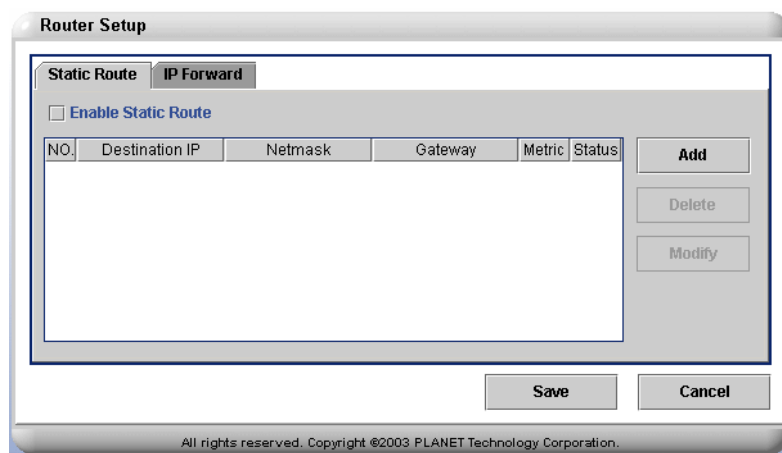
Figure 6-14 Router Setup Screen

To Add a Rule of Static Route

1. Click on **[Static Route]** tab and then check the box to enable static route.
2. Click on **[Add]** to add a new rule of static route. (See Figure 6-14)
3. Enter relevant information in all of the following field: (See Figure 6-15)

   <Status>: Select **ON** or **OFF** to enable / disable the rule of static route.

   <Destination IP>: Enter the destination IP address of this route.
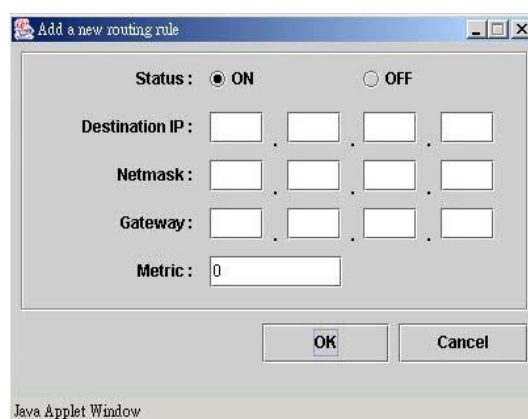
Figure 6-15 Add a Rule of Static Route Screen

   <Netmask>: Enter the netmask associated with the destination network address.

   <Gateway>: Enter the gateway IP address that tells the router where to forward packets whose destination address matches the route's IP address and subnet mask.

   <Metric>: Enter the metric number of current routing rule.

4. Click on **[Save]** to save the task.

To Delete a Rule of Static Route

To delete a rule of static route, administrator needs to select the routing rule to be deleted from the list and then click on **[Delete]** button. When the message box of reconfirmation pops up, please click on **[Yes]** to finish the task. Click on **[Save]** to complete the task.

To Modify a Rule of Static Route

Select the rule of static route to be modified, and click on **[Modify]** button, then you can make the modification on "**Modify a routing rule**" screen. Click on **[OK]** button and then click on **[Save]** to complete the task. (See Figure 6-16)
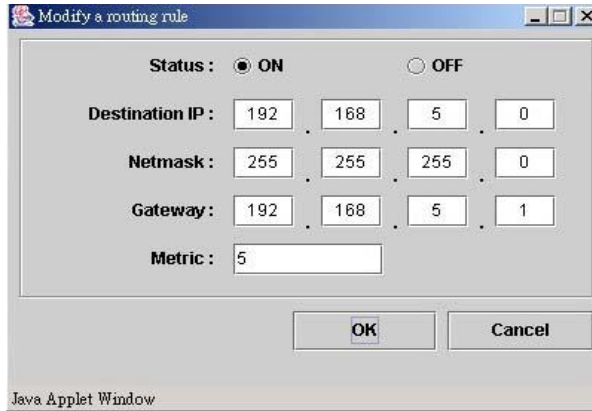
Figure 6-16 Modify a Routing Rule

You could configure same function by executing **"route"** command in CLI mode. For more information, please refer to page 138.

To Configure a Rule of IP Forward / NAT

1. Click on **[IP Forward]** tab and then check or uncheck the services. (See Figure 6-17)
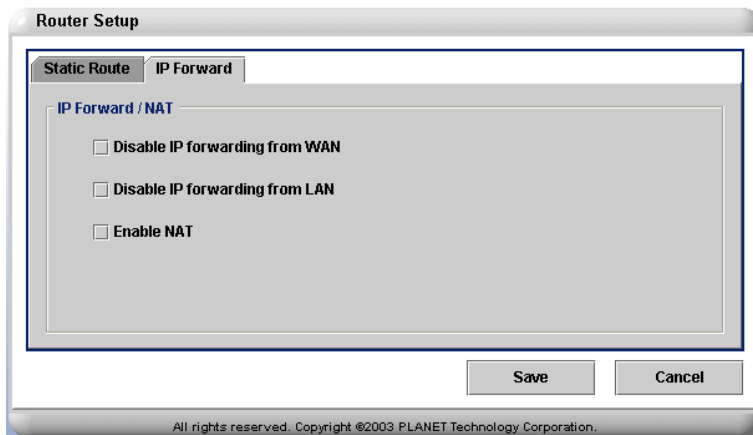
Figure 6-17 IP Forward Screen

<Disable IP forwarding from WAN>: Check to disable IP forwarding from WAN or leave box black or uncheck to enable the service.

<Disable IP forwarding form LAN>: Check to disable IP forwarding from LAN or leave the box blank or uncheck to enable the service.

<Enable NAT>: Check to enable NAT or leave the box blank or uncheck to disable the service.

2. Click on **[Save]** to save the task.

You could configure same function by executing **"ipforward"** command in CLI mode. For more information, please refer to page 141.

6.3.5. DNS Setup

Click on **DNS Setup**, and administrator can assign the address of the Domain Name Server. DNS service enables the system to send notification for system failure via email. The DNS address must be assigned before email alerts could take effects. (See Figure 6-18)

LB-8000 also provides a DNS proxy for any clients or real servers which use LB-8000 as domain name server.
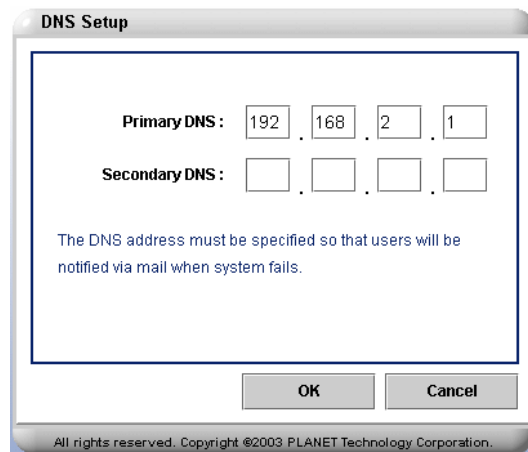
Figure 6-18 DNS Setup Screen

1. Enter relevant information in all of the following fields:

   <**Primary DNS**>: The IP address of Primary DNS Server.
   <**Secondary DNS**>: The IP address of Secondary DNS Server.

2. Click on **[OK]** to save the changes and complete the task.

You could configure same function by executing **"dns"** command in CLI mode. For more information, please refer to page 130.

6.3.6. VPN Setup

Click on VPN Setup, and administrator can enable or disable virtual private network (VPN) service on LB-8000. With VPN technology, the administrator can connect to real servers for maintenance in a security way under NAT model. (See Figure 6-19)
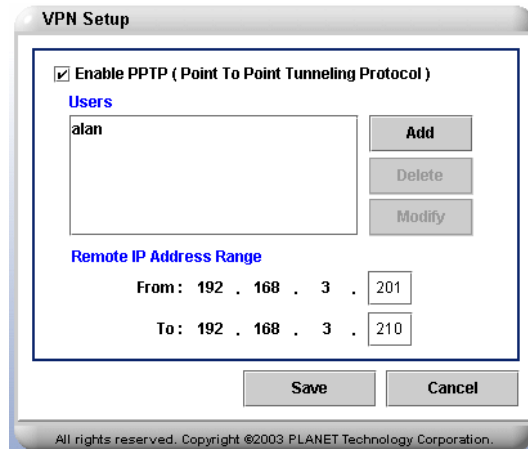
Figure 6-19 VPN Setup

To Enable PPTP (Point To Point Tunneling Protocol

1. On the VPN Setup screen, please check to enable PPTP (Point to Point Tunneling Protocol). (See Figure 6-19)

2. Click on **[Add]** to add a new user. (See Figure 6-20)

Figure 6-20   Add a New User

<User Name>: Type in the name of the user name you would like to add.

<Password>: Type in the password for this new added user.

<Retype Password>: Retype to confirm the password.

3. Enter the remote IP address range in the fields. (See Figure 6-19)

4. Click on **[Save]** to save the task.

Note *If the IP range of VPN cover the IP address of LB-8000 or real server then it would occasion system errors.*

To Delete a User

1. On the VPN Setup screen, please click on **[Delete]** to delete the user. (See Figure 6-19)
2. Click on **[Save]** to save the task.

To Modify the Password of an Existing User

1. On the VPN Setup screen, please click on **[Modify]** to change user's password. (See Figure 6-22)

   <Password>: Type in a new password for the user.
   <Retype Password>: Retype to confirm the new password.

2. Click on **[Save]** to save the task.

Figure 6-21 Modify a User

To Disable PPTP (Point To Point Tunneling Protocol)

1. On the VPN Setup screen, please leave the box blank or uncheck to disable the PPTP service (Point to Point Tunneling Protocol). (See Figure 6-19)
2. Click on **[Save]** to save the task.

You could configure same function by executing **"vpn"** command in CLI mode. For more information, please refer to page 136.

6.4. Configuration

Click on **[Configuration]** on the Primary Function List, screen will display the heartbeat setup in the **Content Area** and there are also five sub functions available under **[Configuration]**

which are **Heartbeat Setup**, **Virtual Host Setup**, **Nonclustered Server Setup**, **Emergency Call**, and **SNMP Setup**. These sub functions allow administrator to setup the heartbeat sent between Primary Manager and Backup Manager, to add or modify the virtual host, to add or modify nonclustered server, to setup an Email alert, and setup SNMP services. (See Figure 6-22)
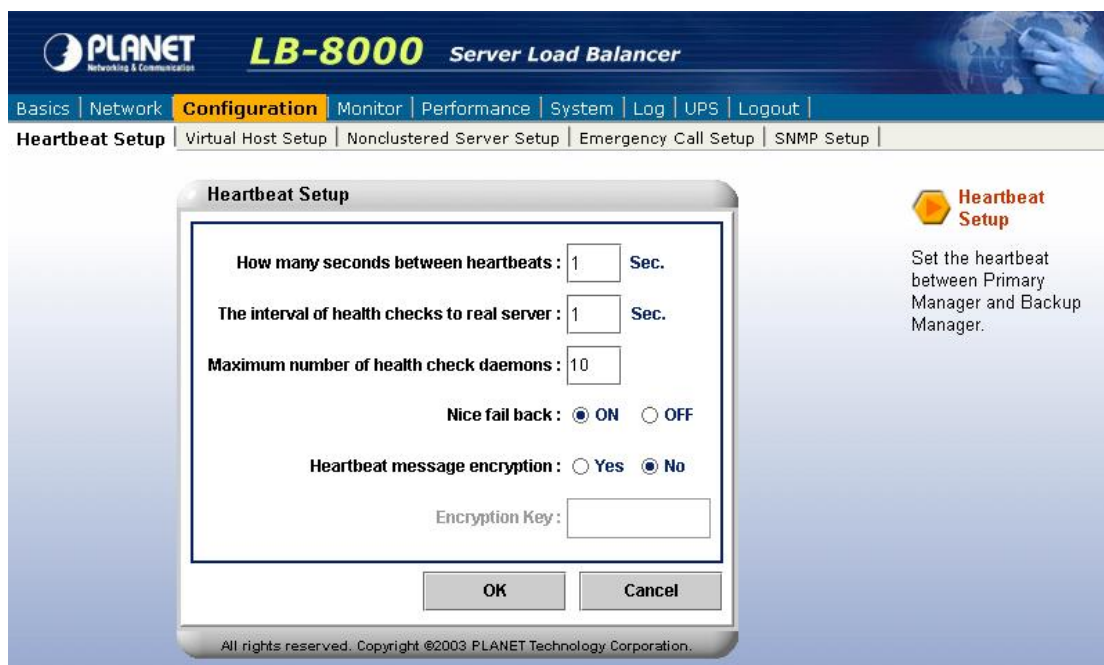
Figure 6-22 Configuration Screen

6.4.1. Heartbeat Setup

Click on **[Heartbeat Setup]** and administrator can set the heartbeat parameters between Primary Manager and Backup Manager. Administrator also can setup the parameters of health check to real servers. (See Figure 6-23)
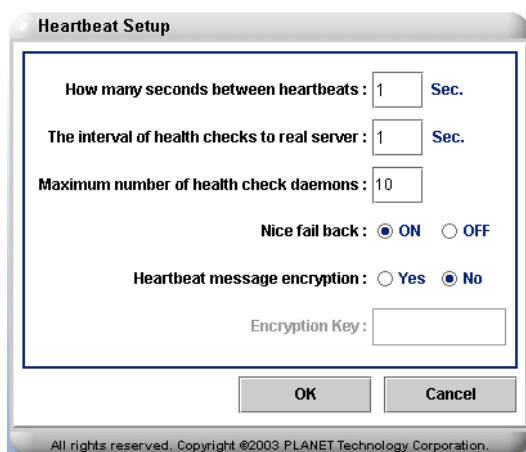
Figure 6-23 Heartbeat Setup Screen

<How many seconds between heartbeats>: The signal sending frequency of

heartbeat. (The default setting is 1 seconds, and possible value is 1 to 9 seconds)

<The interval of health checks to real server>: Administrators need to set the time of consecutive responses between LB-8000 and real servers for health checking. (The default setting is 1 seconds, and possible value is 1 to 30 seconds)

<Maximum number of health check daemons>: Administrators need to set a maximum number of health check daemons. (The default setting is 10 daemons, and possible value is 1 to 30 daemons)

<Nice fail back> – Administrators can select **ON** then the backup manager will not release the control when primary manager recovers from the failure. On the other hand, if administrators select **OFF** then when the formally crashed primary manager recovers, the primary manager will take the job back from the backup manager and become active.

<Heartbeat message encryption> – Administrator can choose to encrypt the heartbeat messages that communicate between primary and backup manager. If administrator chooses **YES**, the decrypt key is needed to read the heartbeat messages. If **NO** is chosen, no key is need. This is one way to avoid intruders.

<Encryption Key> – A key can be set for administrator to encrypt / decrypt the heartbeat messages.

Note *The frequency of heartbeat signal is higher; the time of failover is longer. In this situation, there are some application maybe timeout to disconnect if the failover time is too long.*

You could configure same function by executing **"heartbeat"** command in CLI mode. For more information, please refer to page 122.

6.4.2. Virtual Host Setup

Click on **[Virtual Host Setup],** and administrator can add a new virtual host, modify virtual host, and delete virtual host. Please note that a virtual host setting up is needed before setting up the real servers. (See Figure 6-24)

Please note that all clusters should be the same type. For example, you can not set a cluster as NAT type and another cluster as DR type.

When you add a new cluster, you should configure the following settings:

I   **The virtual host configuration:** Includes virtual host name, IP address, netmask value, service protocol, service port, and persistency option.

I   **The real server configuration**: Includes traffic forwarding scheduler, real server IP

address, service port, and its weight.

I **The health check configuration:** Includes health check level, timeout value, and stateful failover option.

Note *Please do not create the entry of real servers on the DNS which LB-8000 uses.*
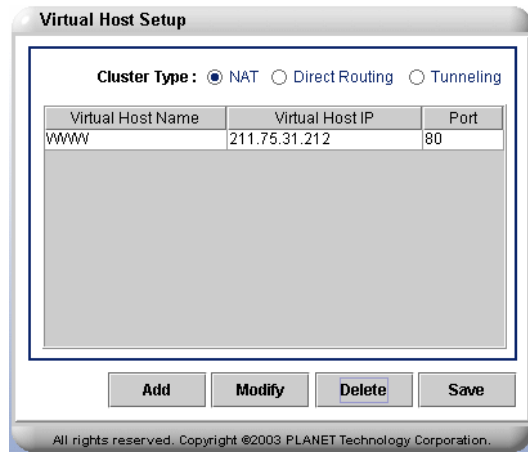
Figure 6-24 Virtual Host Setup Screen

To Add a Virtual Host

1. Beside **Cluster Type**, there are three options that are NAT, Direct Routing, and Tunneling. (See Figure 6-24)

2. Click on **[Add]** to add a new host you will see the following screen. (See Figure 6-25)
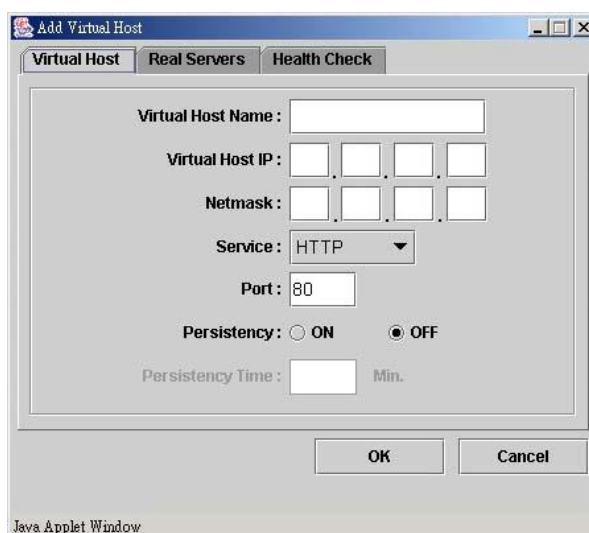
Figure 6-25 Add Virtual Host Screen

<**Virtual Host Name**>: A name for the virtual host such as "WWW" (a meaningful name)

<**Virtual Host IP**>: A designated IP address for virtual host such as 192.168.2.100.

<**Netmask**>: The netmask value of the VIP.

<**Service**>: Please use pull-down menu to select a type of Internet application that supported by LB-8000. There are ten commonly used services of Internet application such as HTTP, HTTPS, FTP, SMTP, POP3, IMAP, RTSP, MMS, E-Com and Other. For others specific Internet application use such as SNMP service, Multimedia service, please select **Other** and the port number will be used in both TCP and UDP protocol.

<Port>: A port to be set for communication.

<Persistent>: Select **ON** to set a persistency time which allow client always connects to the same real server for this period time. If **OFF** is selected, disable persistency service.

3. Click on **[OK]** and then click on **[Save]** to complete the task.

To Modify a Virtual Host

Select a virtual host and click on **[Modify]** button on the virtual host setup screen (See Figure 6-26) to do the modification work. Click on **[OK]** to finish the task and then click on **[Save]** on the virtual host setup screen to save the task. (See Figure 6-26)
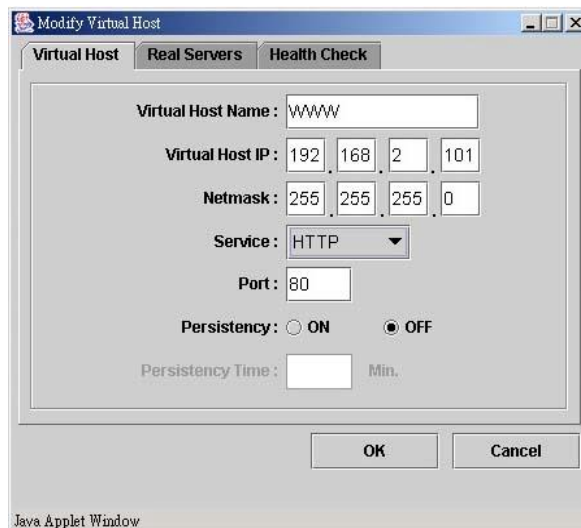
Figure 6-26 Modify Virtual Host Screen

To Delete a Virtual Host

To delete an existing virtual host, administrator needs to select the virtual host to be removed from the list and click on **[Delete]** button. When the message box of reconfirmation pops up, please click on **[Yes]** to finish the task and then click on **[Save]** to save the task.

You could configure same function by executing **"cluster"** command in CLI mode. For more information, please refer to page 114.

To Add a Real server

1. Click on **[Real servers]** tab on **Add Virtual Host** screen (See Figure 6-25)
2. Please use pull-down menu to select the scheduler, there are four scheduling algorithms available in this system such as, Round Robin, Weighted Round Robin, Lease Connection, and Weighted Lease Connection. If you select Weighted Round Robin or Weighted Lease Connection, then you can set the weight of the real servers after you click on **[Add]** button. The default weight is 1.
3. Click on **[Add]** to add a new real server (See Figure 6-27) then system will pop up other window for entering relevant information. (See Figure 6-28)
4. On this screen, administrator has two options, which are **Add Single Server** and **Add Multiple Servers**. Administrator can select one of the options and enter relevant information in these fields. After this step, please click on **[OK]** to finish the task. When all the steps are completed, a real server list will be provided. After that, click on **[Save]** on the virtual host screen to save the task.
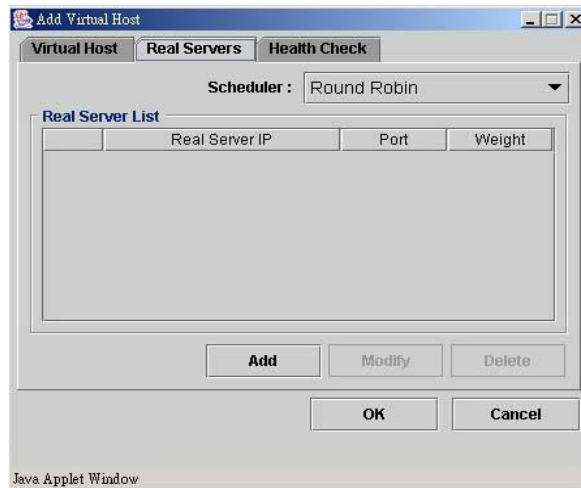
Figure 6-27 Real servers Screen
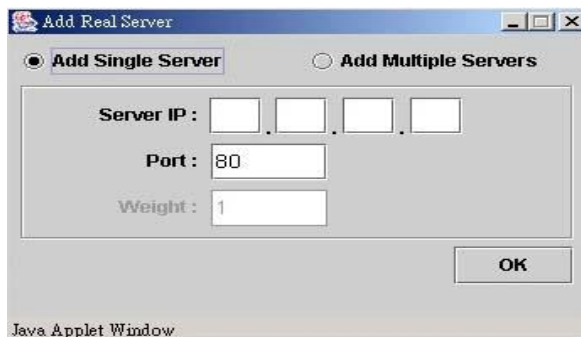
Figure 6-28 Add Real server Screen

To Modify a Real server

Administrator needs to select the real server to be modified from the list, and click on **[Modify]** button then administrator can modify the real server IP address, Port, and Weight. Click on **[OK]** to finish the task then click on **[Save]** button on Virtual Host screen to save the task. (See Figure 6-29)
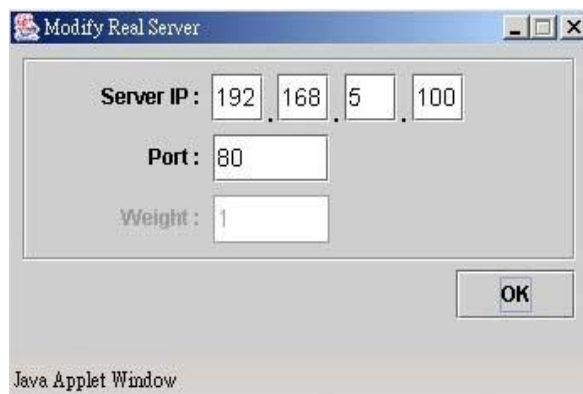
Figure 6-29 Modify Real server Screen

To Delete a Real server

To delete an existing real server, administrator needs to select the real server to be removed from the list and click on **[Delete]** button. When the message box of reconfirmation pops up, please click on **[Yes]** to finish the task. Then click on **[Save]** button on Virtual Host screen to save the task.

You could configure same function by executing **"rs"** command in CLI mode. For more information, please refer to page 118.

To Configure Health Check

1. Click on **[Health Check]** tab on **Add / Modify Virtual Host** screen (See Figure 6-25)
2. Please use pull-down menu to select the health check type, there are five types available in this system such as, Content Check, Port Check, ICMP Check, ARP Check, and None. (See Figure 6-30)
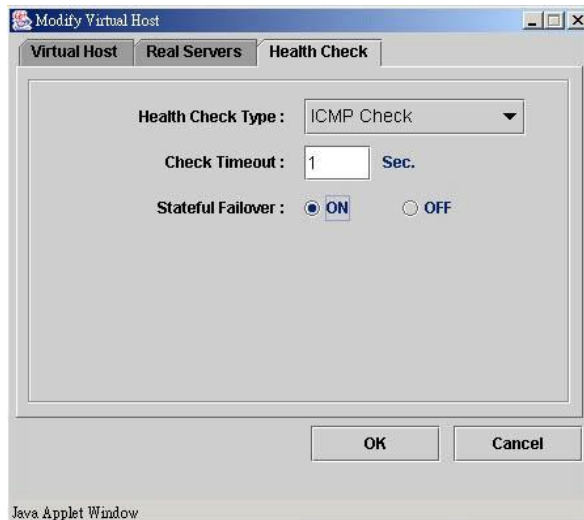
Figure 6-30 Health Check Screen

3. Enter the Check Timeout for how many seconds are needed for LB-8000 to wait the response from real servers before assuming that real servers are malfunction.

4. Select **[ON]** to enable the Stateful Failover function or select **[OFF]** to disable the Stateful Failover function. (The default setting is **ON**)

5. Click on **[OK]** button to finish the task then click on **[Save]** button on Virtual Host screen to save the task.

If you select content check, you also have to configure the request page and pattern for LB-8000 to check the health of real server.

You could configure same function by executing **"cluster"** command in CLI mode. For more information, please refer to page 114.

6.4.3. Nonclustered Server Setup

Click on **[Non-clustered Server Setup]**, and administrator can add, modify or delete a nonclustered server for monitoring by ICMP check from LB-8000. (See Figure 6-31)
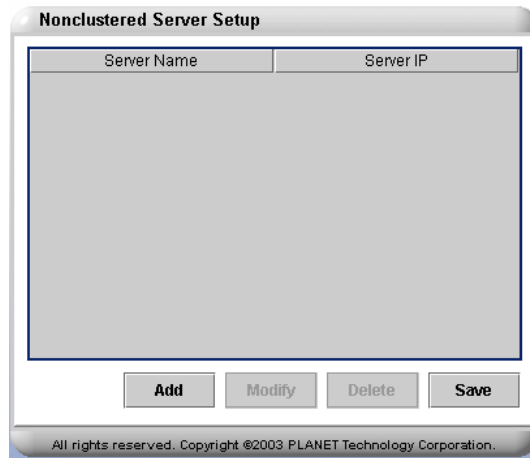
Figure 6-31 Nonclustered Server Setup Screen

Add Nonclustered Server

To add a nonclustered server, please click on **[Add]** and enter relevant information in the following fields:

> <**Server Name**>: Enter a meaningful server name.
> <**Server IP Address**>: Enter a designated IP address for this server and click on **[OK]** to finish this task. (See Figure 6-32)

After you click on **[OK]** button to finish the task, then click on **[Save]** button on **Nonclustered Server Setup** screen to save the task.
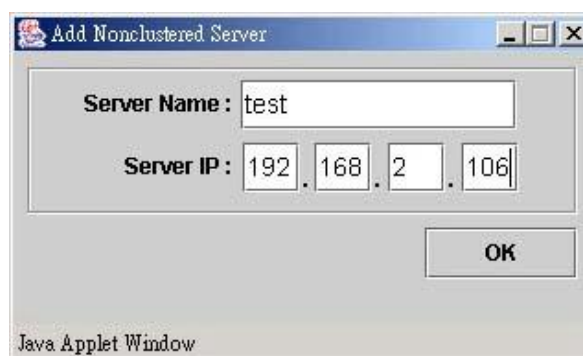
Figure 6-32 Add Non-clustered Server Setup Screen

To Modify an Existing Nonclustered Server

Administrator needs to select the nonclustered server to be modified from the list, and click on **[Modify]** first. After that, administrator can modify the Server name and Server IP. Click on **[OK]** button to finish the task then click on **[Save]** button on **Nonclustered Server Setup** screen to save the task. (See Figure 6-33)

Figure 6-33 Modify Nonclustered Server Screen

To Delete an Existing Nonclustered Server

To delete an existing nonclustered server, administrator needs to select server to be deleted from the list and click on **[Delete]**. When the message box of reconfirmation pops up, please click on **[Yes]** button to finish the task then click on **[Save]** button on **Nonclustered Server Setup** screen to save the task.

You could configure same function by executing **"noncluster"** command in CLI mode. For more information, please refer to page 131.

6.4.4. Emergency Call Setup

With LB-8000, the authorized members will be notified by email if the system shall go wrong. In LB-8000, each cluster can have its own members. If a cluster has some problems, like a real server is down, the alert mail will be sent to the members of the cluster. (See Figure 6-34)

There is one default group named @LB-8000. The members of @LB-8000 will receive the alert mails about LB-8000 manager itself. For example, if the network interface of LB-8000 is down, LB-8000 will send an alert mail to the members of @LB-8000.
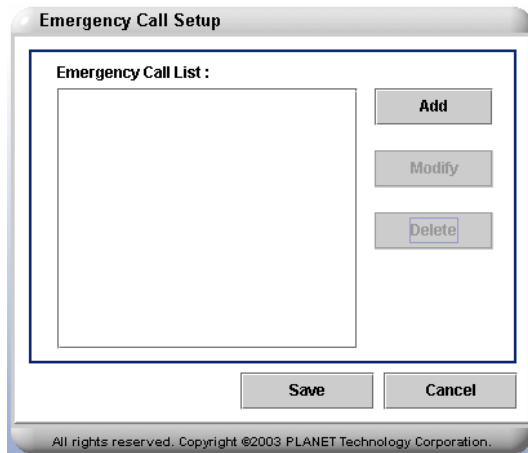
Figure 6-34 Emergency Call Setup Screen

To Add Emergency Call

1. Click on **[Add]** to add email recipients
2. Enter the recipient's effective email addresses. (See Figure 6-35)
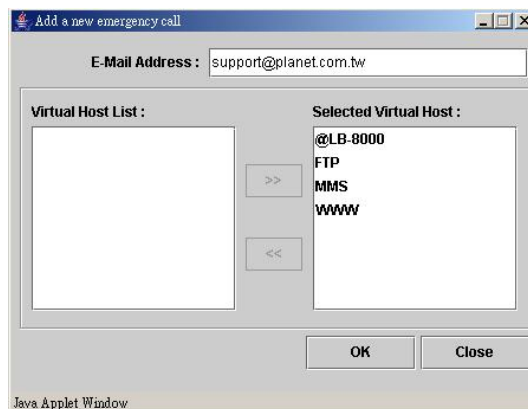
Figure 6-35   Add A New Emergency Call

3. Select the virtual host from "**Virtual Host List"** and then click on [>>] button to move the server to "**Selected Virtual Host"** field which you would like to receive the e-mail notifications while real server or LB-8000 malfunction.
4. Click on **[OK]** button and **[Save]** button in Emergency Call Setup screen to complete this task.

To Modify Emergency Call

Select the e-mail to be modified, and click on **[Modify]**. Then you can make the modification on Modify Emergency Call Screen. Click on **[OK]** button and **[Save]** button in Emergency Call Setup screen to complete this task. (See Figure 6-36)
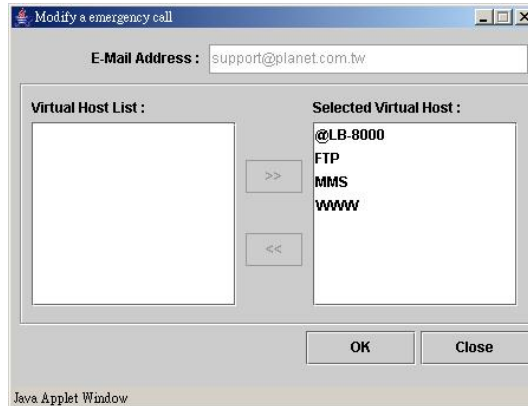
Figure 6-36 Modify Emergency Call Screen

To Delete Emergency Call

To delete an existing emergency call, administrator needs to select the emergency emails to be deleted from the list and click on **[Delete]**. When the message box of reconfirmation pops up, please click on **[Yes]** to finish the task.

You could configure same function by executing **"contact"** command in CLI mode. For more information, please refer to page 127.

6.4.5. SNMP Setup

Simple Network Management Protocol (SNMP) is used to govern and monitor network devices and their functions. You can configure the following settings:

l   **Configuring SNMP agent:** Setup the SNMP agent with a community string to allow access to LB-8000 SNMP information. And the SNMP agent can be disabled / enabled when needed.

l   **Setup manager access:** Configure the SNMP manager-IP list, from which LB-8000 SNMP agent can accept requests for SNMP information. The manager-IP list can be modified if necessary.

l   **Configuring SNMP traps:** You can enable / disable SNMP trap and specify the community for specific SNMP manager. The trap messages are equivalent to mail alert and alert log.

To configure the SNMP function, you can click **[Configure]** from main menu bar and then click **[SNMP Setup]** on sub-menu. You can see the SNMP setup configuration screen as shown on Figure 6-37.
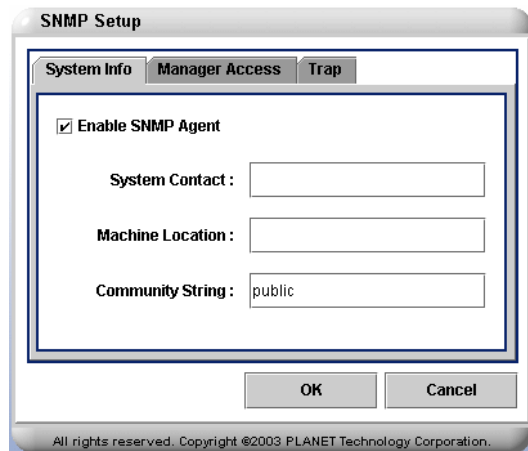
Figure 6-37 SNMP Setup Screen

To Enable SNMP Agent (See Figure 6-37)

1. In **SNMP Setup** page, please click on **System Info** tab.
2. Check on the check box to enable the **SNMP Agent**.
3. Enter relevant information in all of the following fields:

   l <**System Contact**>: Enter the E-mail address for the person to contact regarding issue with the LB-8000.

   l <**Machine Location**>: Enter a machine location, such as Room 121, that describes the physical location of the LB-8000.

   l <**Community String**>: Enter a SNMP community string, such as ID or Password that is used for basic SNMP security and for grouping machines that you manage.

4. Click on **[OK]** button to complete the task.

To Disable SNMP Agent (See Figure 6-37)

1. In **SNMP Setup** page, please click on **System Info** tab.
2. Unmark the check box to disable the **SNMP Agent**.
3. Click on **[OK]** button to complete the task.

To Setup Manager Access (See Figure 6-38)
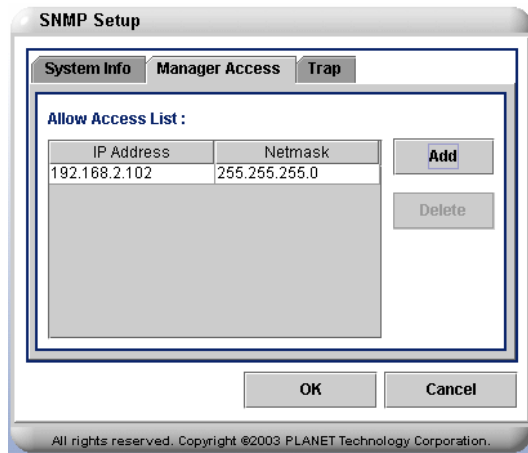
Figure 6-38 Setup Manager Access

1. On **SNMP Setup** page, please click on **Manager Access** tab.

2. Click on **[Add]** button.

3. Enter relevant information in all of the following fields: (See Figure 6-39)
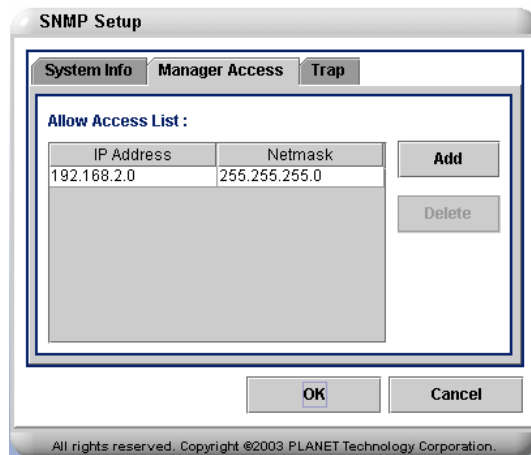
Figure 6-39 Add a New Manager

<**IP Address or Network Address**>: Enter an IP address or network Address from which the SNMP agent can accept requests.

<**Netmask** (**For Network Address**)>: Enter the netmask for the network address in this field.

4. Click on **[OK]** to complete the task.

Note *If you enter an IP address, please enter "255.255.255.255" on the Netmask field.*

To Delete A Manager Access (See Figure 6-38)

To delete an existing manager access, administrator needs to select the access to be deleted from the list and then click on **[Del]** button. When the message box of reconfirmation pops up,

please click on **[Yes]** to finish the task.

Note *The IP address of LB-8000 has been added into the list after you change the IP address of LB-8000 or you run a fully synchronization between two LB-8000 from GUI or by issue "lbsync <IP> <User Account> <Password>" command in CLI mode. But you won't see these records.*

To Enable Auth Trap (See Figure 6-40)
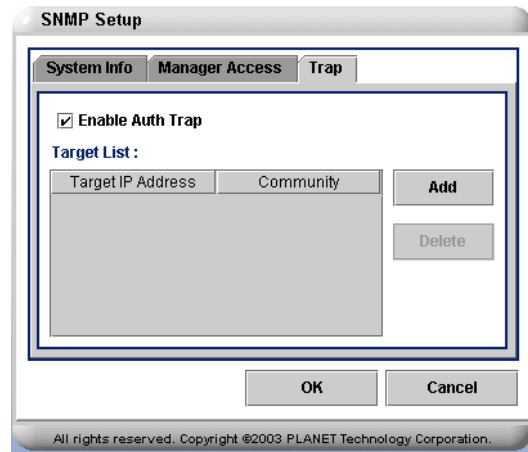
Figure 6-40 Setup Auth Trap

1. On **SNMP Setup** page, please click on **Trap** tab.
2. Check on the box to enable the Trap service.
3. Click on **[Add]** button.
4. Enter relevant information in all of the following fields: (See Figure 6-41)

Figure 6-41 Add a New Target

<**Target IP Address**>: Enter the target IP address that should be notified when a trap is sent by the LB-8000.

<**Community**>: Enter the community string which allows LB-8000 to communicate with SNMP manager for sending trap notifications to the desired manager(s).

5. Click on **[OK]** button to complete the task.

To Disable Auth Trap (See Figure 6-40)

1. On **SNMP Setup** page, please click on **Trap** tab.
2. Uncheck the box to disable the Trap service.
3. Click on **[OK]** button to complete the task.

You could configure same function by executing **"snmp"** command in CLI mode. For more information, please refer to page 146.

6.5. Monitor

Click on **[Monitor]** on the Primary Function List, screen will display the LB-8000 monitor status in the **Content Area** and there are also two sub functions available under **[Monitor]** which are **LB-8000 Monitor** and **Cluster Monitor**. These sub functions allow administrator to monitor LB-8000 machine, cluster, and real servers. (See Figure 6-42)

Figure 6-42 Monitor Screen

6.5.1. LB-8000 Monitor

Administrator can review the current system status via LB-8000 Monitor through various colors. Green represents normal and Red represents abnormal. To obtain the detail information for a specific server, please double-click on that specific server and the detail information needed will be displayed. (See Figure 6-43) If the color is gray, that means the HA service is not running or current manager is standby mode.

You also can monitor the CPU usage, memory usage and network flow from LB-8000 monitor. If the SNMP agent of real server or nonclustered server is running and can accept LB-8000 retrieve information, you also can monitor the network flow of real server or nonclustered server.
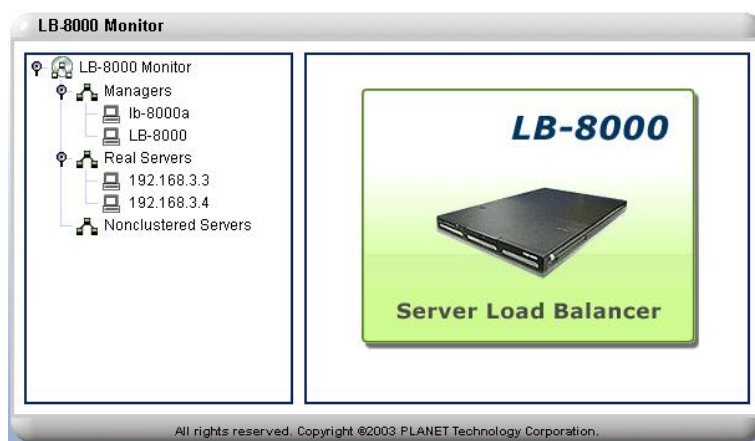
Figure 6-43 LB-8000 Monitor Screen

Click on any online manager, and more detail information of that specific manager will be displayed on the right area of the screen. The information will be displayed include: (See Figure 6-44)
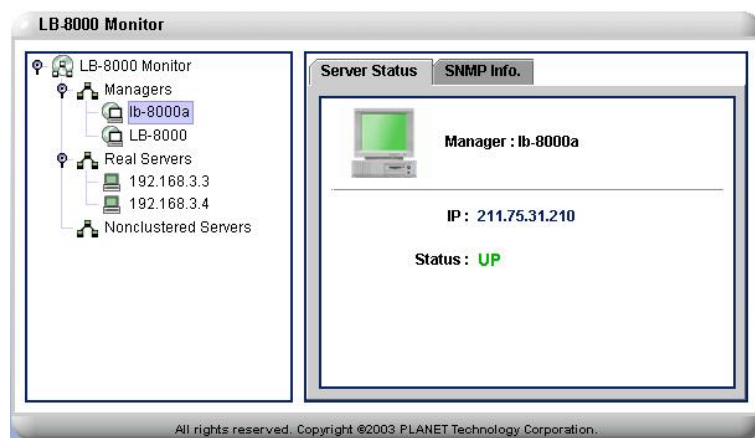
Figure 6-44 Manager Server Status Screen

<Managers>: The name of the selected manager.

<IP>: The designated IP of the selected manager

<Status>: The current activity status of the selected manager. "Green" color means the manager is up, and "Red" color means the manager is down.

<SNMP Info>: Click on **SNMP Info** tab on top and you will be able to view LB-8000 Manager real time information on the screen. You can see the CPU Usage Memory Usage, the inflow rate and outflow rate of network interface. (See Figure 6-45)
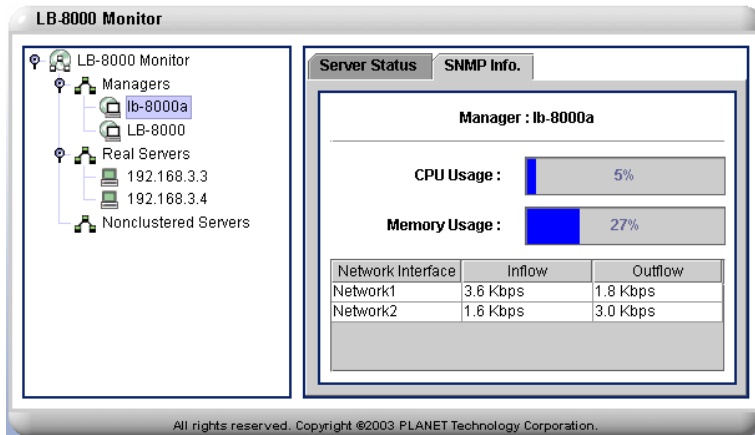
Figure 6-45 Manager Server SNMP Info Screen

Click on any online real server, and more detail information about this particular server will be displayed on the right of the screen. The information will be displayed include: (See Figure 6-46)
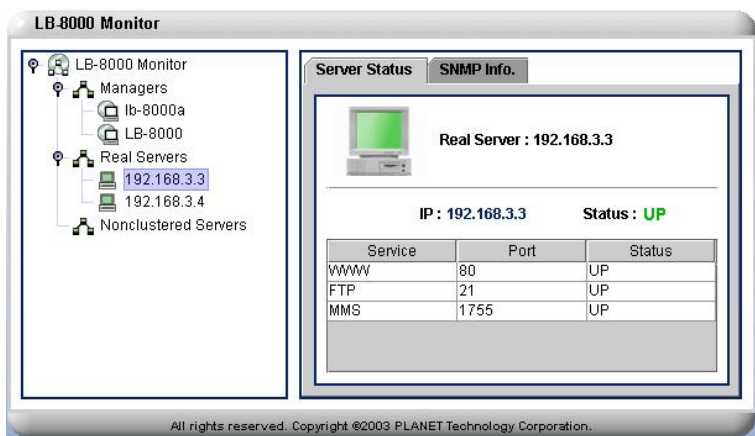
Figure 6-46 Real server Status Screen

<Real server>: The selected server.

<IP>: The designated IP of the selected server.

<Status>: The current activity status of the selected server. "Green" color means the manager is up, and "Red" color means the manager is down.

<Service>: The services provided by the selected server.

<Port>: The listening port number.

<Status>: The current activity status of the service provided by real server. There are three kinds of status: "UP" means service is up, "DOWN" means service is down and "UNKNOW" means service is unknown cause the health check method is "none".

<SNMP Info>: Click on **SNMP Info** tab on top, and you will be able to view the inflow rate and outflow rate of network interface of the real server if the SNMP agent of the real server is running. (See Figure 6-47)
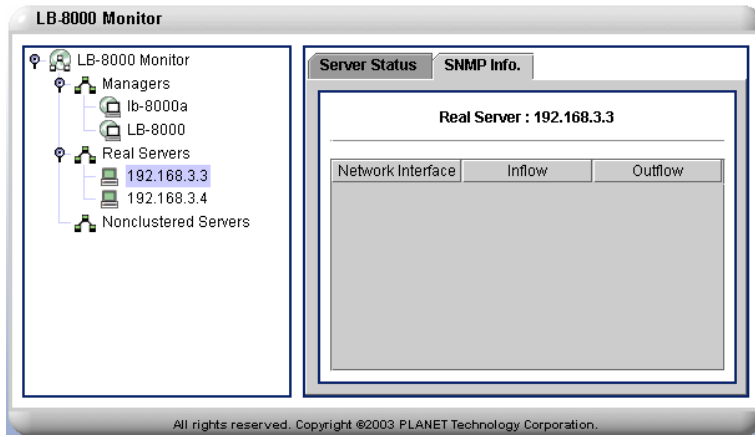
Figure 6-47 Real server SNMP Info Screen

Click on any online nonclustered server, and more detail information about this particular
server will be displayed on the right of the screen. The information will be displayed include:
(See Figure 6-48)
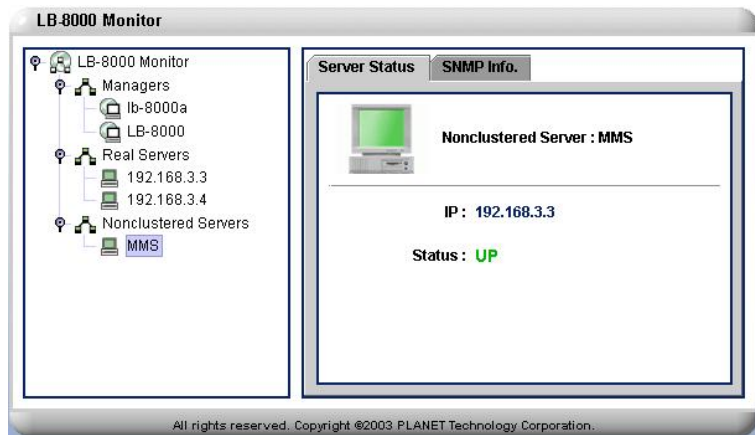
Figure 6-48 Nonclustered Server Status Screen

<Nonclustered Server>: The name of the selected server.

<IP>: The designated IP of the selected server

<Status>: The current activity status of the selected server.

<SNMP Info>: Click on **SNMP Info** tab on top, and you will be able to view the inflow
rate and outflow rate of network interface of the real server if the SNMP agent of the
real server is running. (See Figure 6-49)
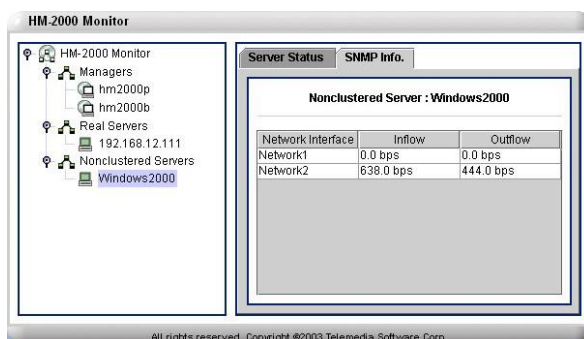
Figure 6-49 Nonclustered Server SNMP Info Screen

You could configure same function by executing **"lbonitor"** command in CLI mode. For more information, please refer to page 151.

6.5.2. Cluster Monitor

From Cluster Monitor, administrator can view the status of clusters service and real servers' service. You also can enable or disable the clusters service or real servers' service. (See Figure 6-50)

The status of cluster service has four states:

l   Stopped: The LB-8000 service is not running.

l   Enabled: The LB-8000 service is running and there is at least one real server for forwarding requests.

l   Disabling: The cluster has been disabled, but still has some connection records in connection table. The cluster will not accept any new connection request.

l   Disabled: The cluster has been disabled, and there is no connection record in connection table. The cluster will not accept any new connection request.

The status of real servers' service has five states:

l   Stopped: The LB-8000 service is not running.

l   Running: The LB-8000 service and the real server's service are running.

l   Disabling: The real server's service has been disabled, but still has some connection records in connection table. The real server will not accept any new connection request.

l   Disabled: The real server's service has been disabled, and there is no connection record in connection table. The real server will not accept any new connection request.

l   Down: The real server's service is down and will not accept any new connection request.

Figure 6-50 Cluster Monitor Screen

To View Cluster Status and Configure Services

1. Click on **[Cluster Monitor]** and then use poll-down list to select **Cluster View**. (See Figure 6-50)

2. Click on the online cluster system, and more detail information will be displayed on the right of the screen. The information will be displayed include: (See Figure 6-51)
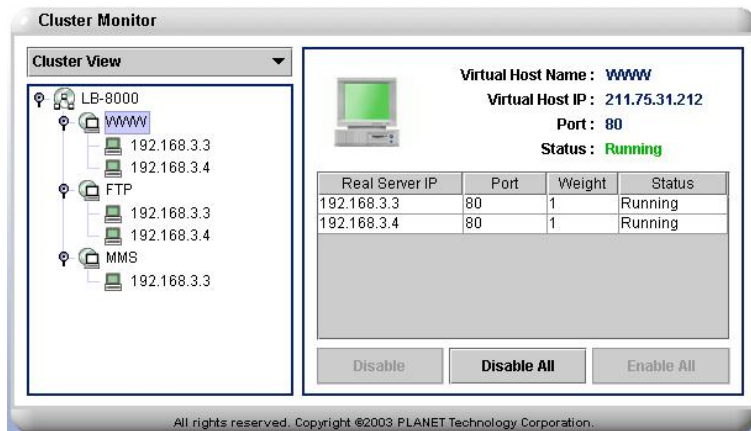
Figure 6-51 Cluster Status

<Virtual Host Name>: The host name of virtual server.

<Virtual Host IP>: A designated IP address of virtual host.

<Port>: The listening port number of virtual host.

<Status>: The current service status of the selected cluster.

<Real server IP>: The designated IP of real server.

<Port>: The listening port number of real server.

<Weight>: The current assigned service weights of real server.

<Conns>: The total connection count of real server.

<Status>: The current service status of real server.

[Disable]: To turn off the particular real server service, just select the real server and

then click on **[Disable]** button

[Disable All]: To turn off all of real server services, please click on [**Disable All**] button.

[Enable All]: To turn on all of real server services, please click on **[Enable All]** button.

To View Real server Status and Configure Services

1. Click on **[Cluster Monitor]** and then use poll-down list to select **Real Server View**. (See Figure 6-50)

2. Click on any real server, and more detail information will be displayed on the right of the screen. The information will be displayed include: (See Figure 6-52)
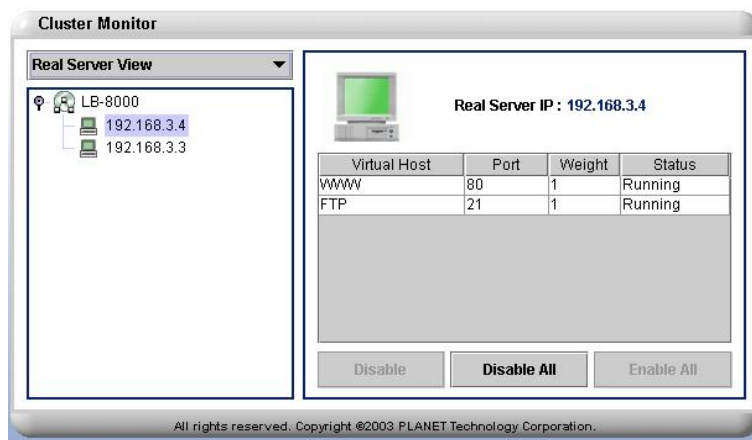
Figure 6-52 Real server Status

<**Real server IP**>: A designated IP address of real server.

<**Virtual Host**>: The host name of virtual server.

<**Port**>: The listening port number of real server.

<**Weight**>: The current assigned service weights

<Conns>: The total connection count of current service.

<**Status**>: The current service status of current service

[Disable]: To turn off the particular service of real server, just select the virtual host and then click on **[Disable]** button

[Disable All]: To turn off all services of real server, please click on **[Disable All]** button.

[Enable All]: To turn on all services of real server, please click on **[Enable All]** button.

You could configure same function by executing **"cmonitor"** command in CLI mode. For more information, please refer to page 153.

6.6. Performance

Click on **[Performance]** on the Primary Function List, screen will display the Load Distribution
status of the virtual host in the **Content Area** and there are two sub functions available under
[Performance] which are **Load Distribution** and **Server Performance**. These sub functions
allow administrator to view the load distribution status of the virtual host and server
performance. (See Figure 6-53)
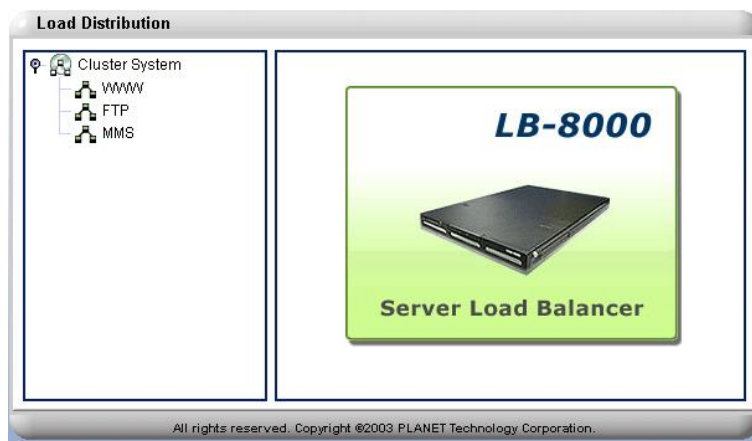
Figure 6-53 Performance Screen

6.6.1. Load Distribution

On **Load Distribution** screen, please click on the online cluster system, and more detail
information will be displayed on the right of the screen. The information will be displayed
include: (See Figure 6-54)
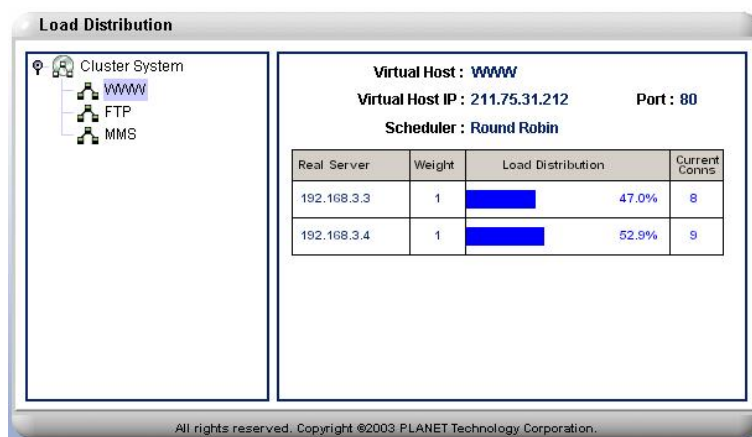
Figure 6-54 Load Distribution Screen

<Virtual Host>: The name of the virtual host.

<Virtual Host IP>: A designated IP address of the virtual host.

<Port>: The listening port number.

<Real server>: The designated IP of the real server.

<Weight>: The current assigned service weights of the real server.

<Load Distribution>: The percentage of services distribution.

<Current Conns>: The number of current total connections.

You could configure same function by executing **"load"** command in CLI mode. For more information, please refer to page 155.

6.6.2. Server Performance

Click on any online manager server and select any component to review the server performance on the right of the screen. The information to be displayed includes: (See Figure 6-55)
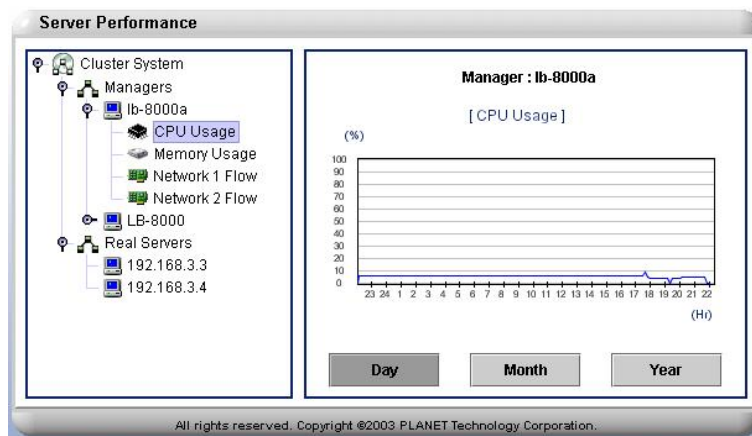
Figure 6-55 Server Performance Screen

<CPU Usage>: Click on CPU Usage, and you will see a CPU usages status graph on the right screen. If you click on **[Day], [Month], or [Year]** button, more detail information arranged according to Day, Month, or Year will be available. (See Figure 6-55)

<Memory Usage>: Click on Memory Usage, and you will see a Memory usages status graph on the right screen. If you click on **[Day], [Month], or [Year]** button, more detail information arranged according to Day, Month, or Year will be available. (See Figure 6-56)
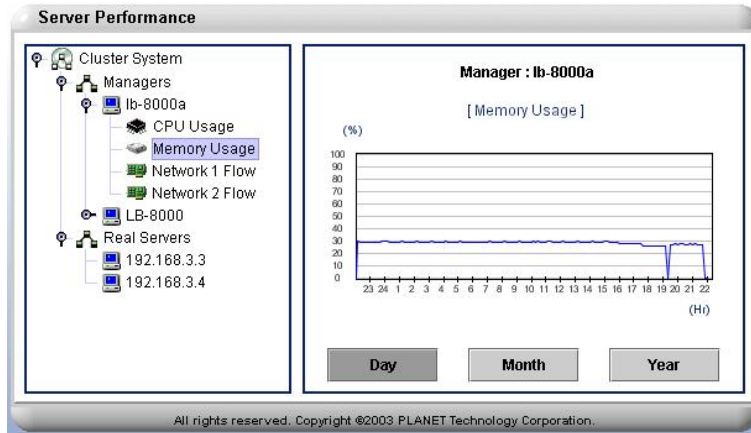
Figure 6-56 Memory Usage Screen

<Network Flow>: Click on one of Network Flow, and you will see the traffic analysis for the network card on the right screen. If you click on **[Day], [Month], or [Year]** button, more detail information arranged according to Day, Month, or Year will be available. (See Figure 6-57)

Note *Blue line represents network inflow. Pink line represents network outflow.*
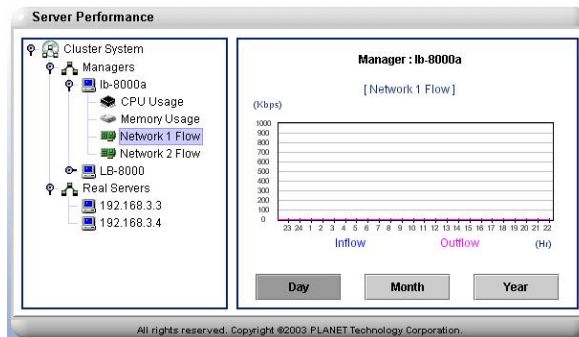
Figure 6-57 Network Flow Screen

Click on any online real server and select one of real server's IP address to see more detailed information about traffic analysis for the network card on the right of the screen. (See Figure 6-58)
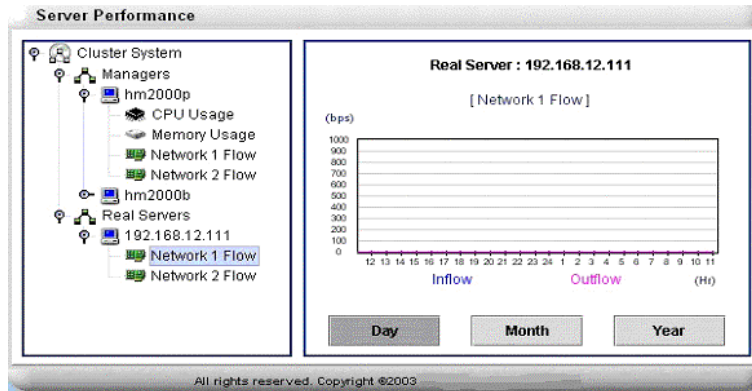
Figure 6-58 Real server Network Flow Screen

<Network Flows>: Click on one of network flow, the traffic analysis for the network card will be displayed on the right hand side of the screen. If you click on **[Day], [Month], or [Year]** button, more detail information arranged according to Day, Month, or Year will be available. (See Figure 6-58)

Note *Color Representation: Blue line represents network inflow. Pink line represents network outflow.*

6.7. System

Click on **[System]** on the Primary Function List, screen will display the LB-8000 **Date and Time** in the **Content Area** and there are seven sub functions available under **[System]** which are **Date/Time**, **Admin Password**, **UI Language**, **Reset to Default**, **Backup/Restore, Upgrade**, and **Reboot/Shutdown**. These sub functions allow administrator to change the system time, to change administrator password, to change UI language, to reset to system default, to backup or restore the system configurations, to upgrade LB-8000 system, and to reboot or shutdown LB-8000 manager. (See Figure 6-59)
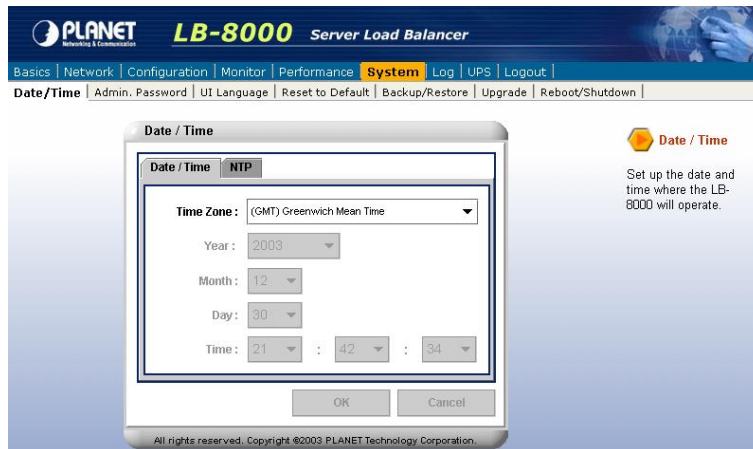
Figure 6-59 System Screen

6.7.1. Date/Time

Administrator can change the system time and update system time from NTP (Network Time Protocol) server on this screen. (See Figure 6-60) And LB-8000 also provides NTP service for any clients or real servers to synchronize their date / time with LB-8000.
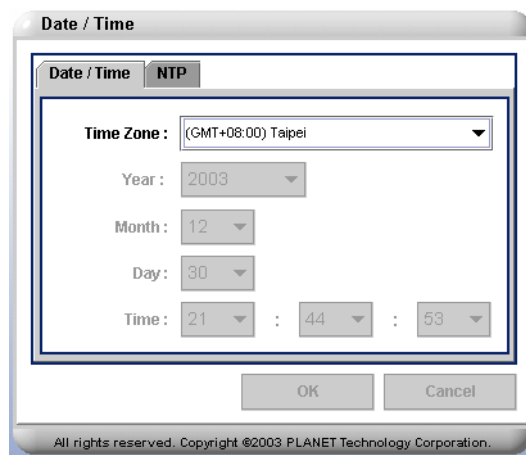
Figure 6-60 Date/Time Screen

To Change System Time

1. On **System** screen, click on **Date/Time**.
2. Click on **Date/Time** tab and then select the < **Time Zone**>, **<Year>**, **<Month>**, **<Day>**, or **<Time>** as needed and edit the information. (See Figure 6-60)
3. Click on **[OK]** to finish the task.
4. You will be asked to re-login to the system as the date/time is changed.

You could configure same function by executing **"date"** command in CLI mode. For more

information, please refer to page 143.

To Update System Time From NTP Server
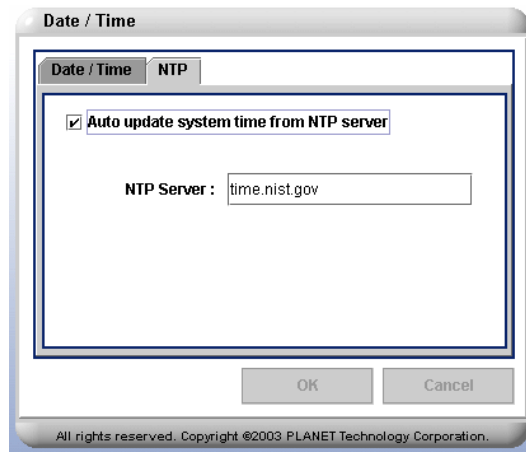
Figure 6-61 Update System Time From NTP Server

1. On **System** screen, click on **Date/Time**.
2. Click on **NTP** tab and then check the check box to enable auto update system time from NTP server. (See Figure 6-61)
3. In the NTP Server filed, enter the IP address of NTP server.
4. Click on **[OK]** to complete the task.

You could configure same function by executing **"ntp"** command in CLI mode. For more information, please refer to page 144.

6.7.2. Admin. Password

Administrator can change the password on this screen. LB-8000 comes with a default account that should be accessed by administrator only. The user name and password for this default account is admin. (See Figure 6-62)

Note *The account name "admin" can not be modified. And you also can not create new account.*
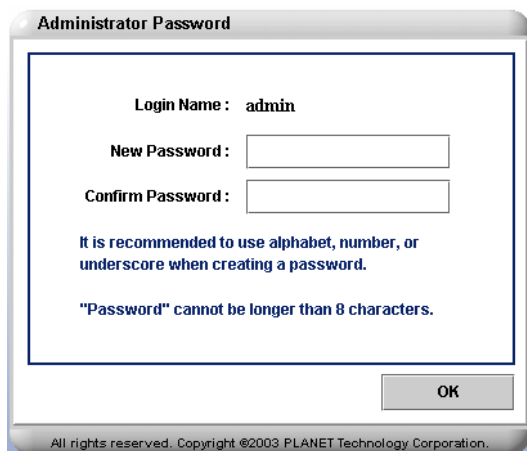
Figure 6-62 Admin Password Screen

1. On **System** screen, click on **Admin. Password**.
2. Enter the new password and re-enter the new password to confirm it.
3. Click on **[OK]** to finish the task.

You could configure same function by executing **"passwd"** command in CLI mode. For more information, please refer to page 171.

6.7.3. UI Language

There are three types of language supported by LB-8000, which are Traditional Chinese, English, and Japanese. (See Figure 6-63)

Figure 6-63 UI Language Screen

1. On the **System** screen, please click on **UI Language**.
2. Select a proper language from the pull-down menu.
3. Click on **[OK]** to complete the task.

6.7.4. Reset to Default

Administrator has the permission to reset system configuration to default value. When the system is reset to default setting, all the configurations and function settings will be erased. Please be extra careful before you click on the Reset to the default setting. (See Figure 6-64)
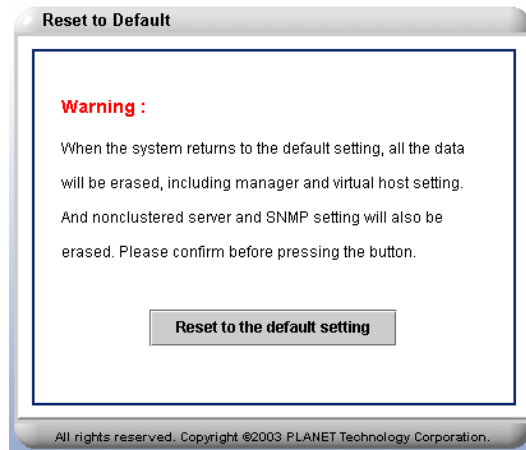
Figure 6-64 Reset to Default Screen

1. On the **System** screen, click on **Reset to Default.**
2. Click on **[Reset to the default setting]**.
3. You will be asked to click on **[Yes]** to continue the task or click on **[No]** to cancel the task.

Note *System will reboot after the system has been reset to default setting..*

You could configure same function by executing **"reset"** command in CLI mode. For more information, please refer to page 172.

6.7.5. Backup/Restore

Administrator can backup all system configurations to your client computer or restore all system configurations from your backup file. (See Figure 6-65)
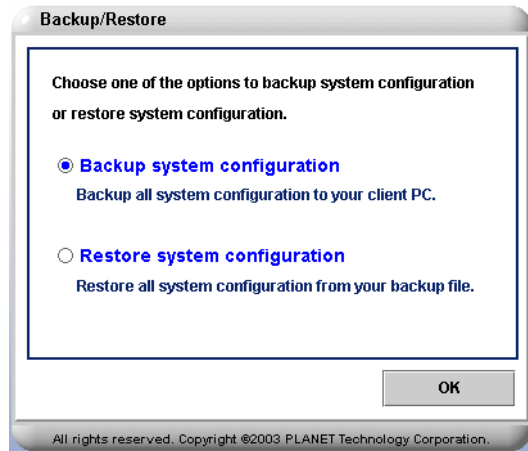
Figure 6-65 Backup/Restore

To Backup System Configuration

1. On the **System** screen, click on **Backup/Restore**.

2. Please select **Backup system configuration** and then click on **[OK]** button.

3. Click on **[OK]** to start the backup task. (See Figure 6-66)

Figure 6-66 Start the Backup Task

4. Click on **[Save]** button to save the backup file to your client computer. (See Figure 6-67)
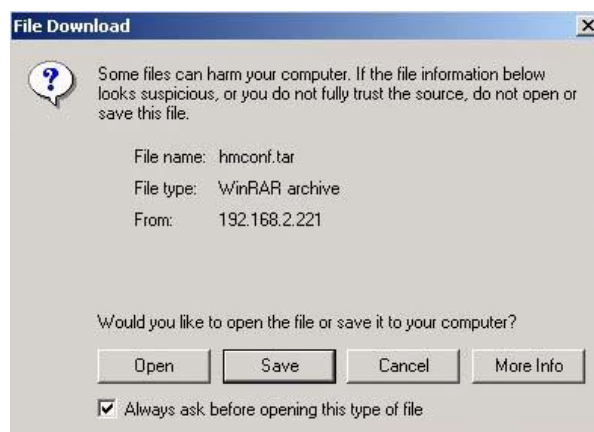
Figure 6-67 save the Backup File

5. Select the destination to save the backup file and then click on **[Save]** button. (See Figure 6-68)
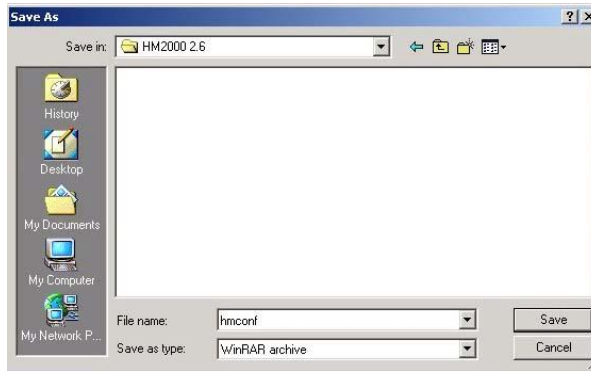
Figure 6-68 Select the Destination

6. Click on **[Close]** button the complete the backup task. (See Figure 6-69)
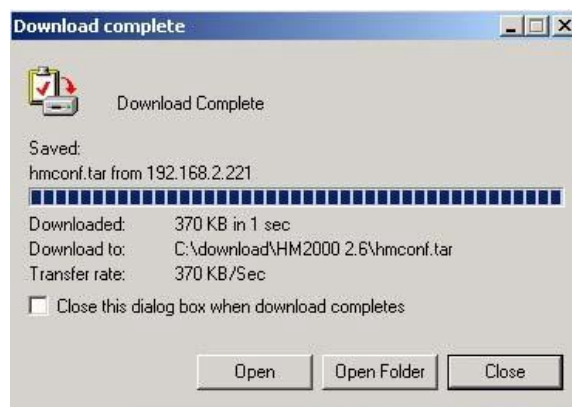
Figure 6-69 Complete the Backup Task

You could configure same function by executing **"backup"** command in CLI mode. For more information, please refer to page 176.

To Restore System Configuration

1. On the **System** screen, click on **Backup/Restore**.
2. Please select **Restore system configuration** and then click on **[OK]** button. (See Figure 6-70)
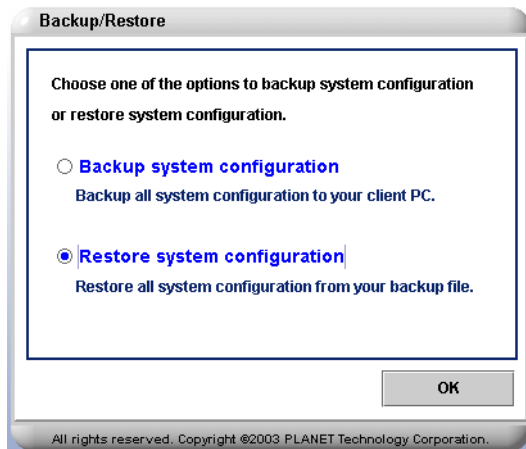
Figure 6-70 Restore System Configuration

3. Click on **[OK]** to start the restore task. (See Figure 6-71)

Figure 6-71 Start the Restore Task

4. Select the backup file from your Client PC by clicking on **[Browse]** button and then click on **[Upload Backup File]** button. (See Figure 6-72)
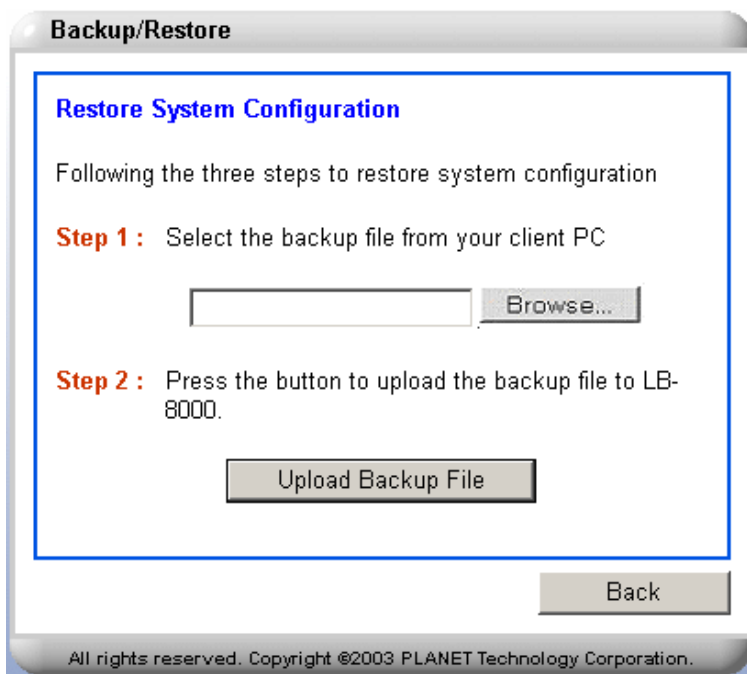
Figure 6-72 Select the Backup File

5. Click on **[Restore to the backup setting]** button to start backup task. (See Figure

6-73)
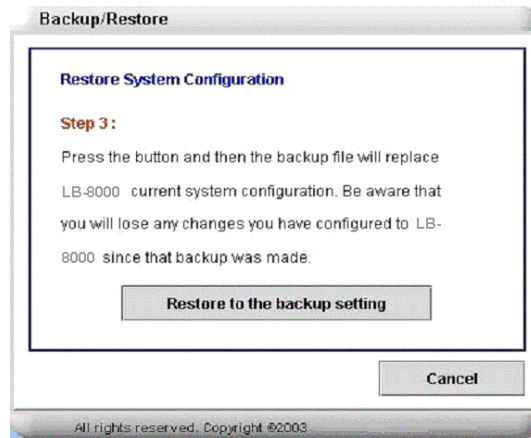
Figure 6-73 Restore to the backup setting

6. Click on **[Yes]** to continue the task. (See Figure 6-74)

Figure 6-74 Continue the Restore Task

7. Click on **[Yes]** button to continue the task. (See Figure 6-75)

Figure 6-75 Confirmation the Restore Task.

8. Click on **[OK]** to complete the restore task and then system will reboot, please
   re-login again. (See Figure 6-76)

Figure 6-76 Completed the Restore Task

You could configure same function by executing **"restore"** command in CLI mode. For more information, please refer to page 177.

6.7.6. Upgrade

Administrator can upgrade LB-8000 system to the latest version by inserting the CD with the compressed upgrade file into the CD-ROM drive and press the **[Upgrade]** button to start the upgrade process. (See Figure 6-77)
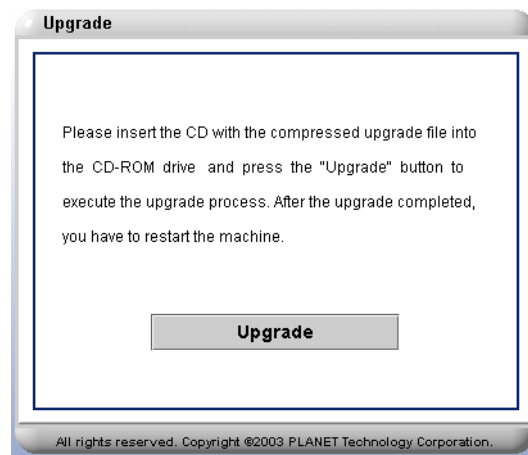
Figure 6-77 Upgrade Screen

1. On **System** screen, click on **Upgrade** and insure the Upgrade CD in the CD-ROM drive.
2. Click on **[Upgrade]** button and then click on **[Yes]** when you are ready to upgrade.
3. Click on **[OK]** to complete this task.
4. Go to **System/Reboot/Shutdown** to reboot the LB-8000.   The changes will take effect after reboot the LB-8000 system.

You could configure same function by executing **"upgrade"** command in CLI mode. For more information, please refer to page 173.

6.7.7. Reboot/Shutdown

Through web browser, administrator can remotely shutdown the LB-8000 Server service. (See Figure 6-78)
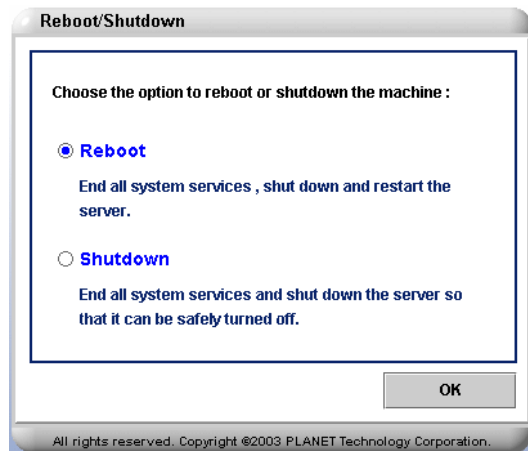
Figure 6-78 Reboot/Shutdown Screen

To Reboot The System:

1. On **System** screen, click on **Reboot/Shutdown**.
2. Check **Reboot** and click on **[OK]** to restart the system.

You could configure same function by executing **"reboot"** command in CLI mode. For more information, please refer to page 174.

To Shutdown The System:

1. On **System** screen, click on **Reboot/Shutdown**.
2. Check **Shutdown** and click on **[OK]** to shutdown the system.

You could configure same function by executing **"shutdown"** command in CLI mode. For more information, please refer to page 175.

6.8. Log

Click on **[Log]** on the Primary Function List, screen will display the system log in the **Content Area** and There are also six sub functions available, which are **System Log**, **HA Log**, **Connection Log**, **Management Log**, **Alert Log**, and **Log Export**. These sub functions allow administrator to view the system log, to view the HA log, to view connection log, to view management log, to view alert log, and to export all logs to your client. (See Figure 6-79)
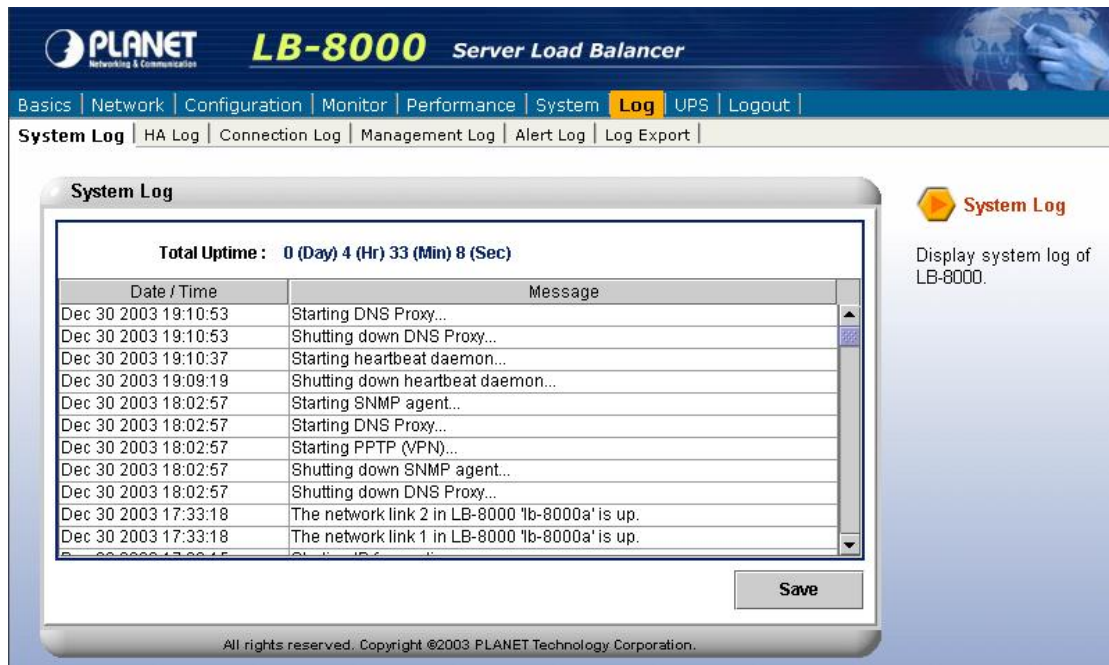
Figure 6-79 Log Screen

6.8.1. System Log

On the **System Log** screen, administrator can check the system log history and 20 messages per time.

To View The System Log

Click on **[System Log]** and the following log messages will be displayed. If you want to save the log messages, please click on **[Save]** button. (See Figure 6-80)
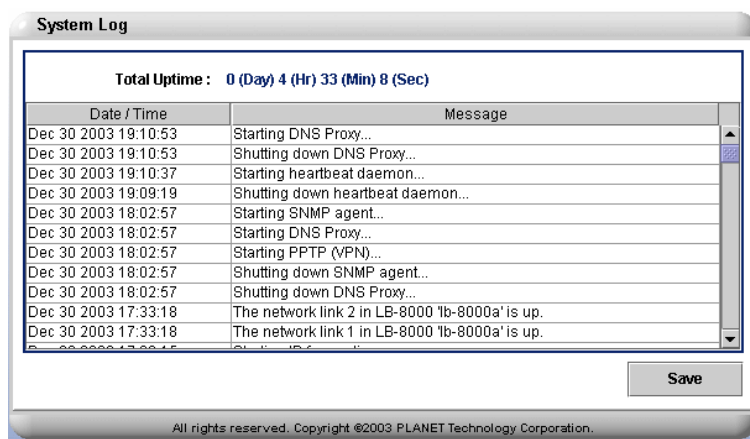
Figure 6-80 System Log Screen

You could configure same function by executing **"syslog"** command in CLI mode. For more

information, please refer to page 160.

6.8.2. HA Log

On the **HA Log** screen, administrator can check the LB-8000 log history and 20 messages per time.

To View The HA Log

Click on **[HA Log]** and the following log messages will be displayed. If you want to save the log messages, please click on **[Save]** button. (See Figure 6-81)
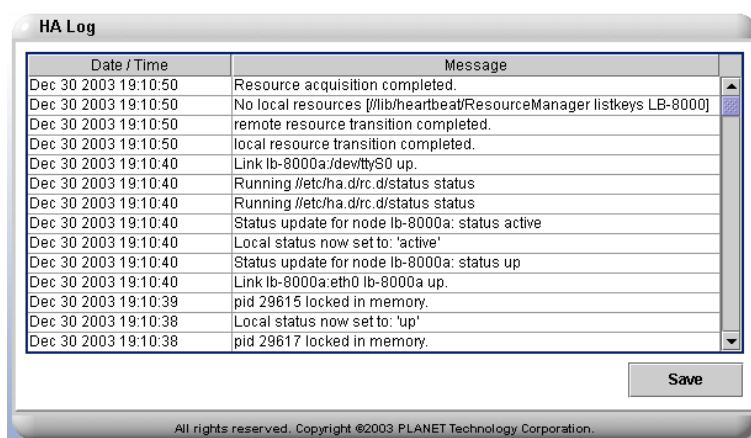
Figure 6-81 HA Log Screen

You could configure same function by executing **"halog"** command in CLI mode. For more information, please refer to page 156.

6.8.3. Connection Log

On the **Connection Log** screen, administrator can check the connection log history of LB-8000 and 20 messages per time.

To View The Connection Log

Click on **[Connection Log]** and the following log message will be displayed. If you want to save the log message, please click on **[Save]** button. (See Figure 6-82)

Figure 6-82 Connection Log Screen

You could configure same function by executing **"connlog"** command in CLI mode. For more information, please refer to page 161.

6.8.4. Management Log

On the **Management Log** screen, administrator can check the management logs history of LB-8000 and 20 messages per time.

To View The Connection Log

Click on **[Management Log]** and the following log message will be displayed. If you want to save the log message, please click on **[Save]** button. (See Figure 6-83)

Figure 6-83 Management Log Screen
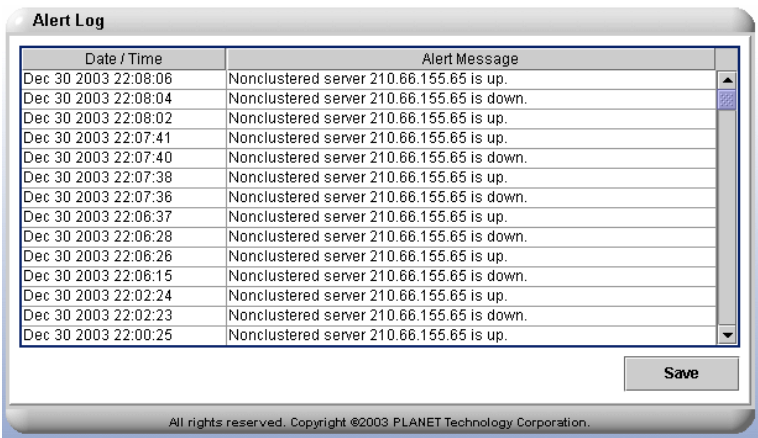
You could configure same function by executing **"mgtlog"** command in CLI mode. For more information, please refer to page 162.

6.8.5. Alert Log

On the **Alert Log** screen, administrator can check alert message log history of the server and 20 messages per time.

To View The Connection Log

Click on **[Alert Log]** and the following log message will be displayed. If you want to save the log message, please click on **[Save]** button. (See Figure 6-84)

Figure 6-84   Alert Log Screen

You could configure same function by executing **"alertlog"** command in CLI mode. For more information, please refer to page 162.

6.8.6. Log Export

On the **Log Export** screen, administrator can export all of log files such as, system logs, HA logs, management logs, connection logs, and alert logs.

To Export a Log File

Click on **[Log Export]** button then the log files will be exported as a file and save the file to your client computer. (See Figure 6-85)
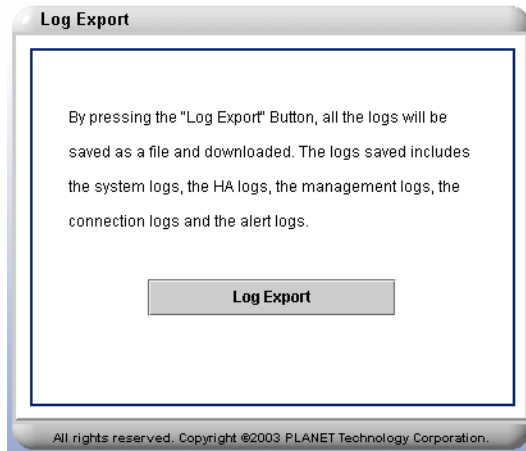
Figure 6-85 Log Export Screen

6.9. UPS

Click on **[UPS]** on the Primary Function List, screen will display the APC UPS setup screen and there is only one sub function available under **[UPS]** which is **APC UPS**. This sub function accepts APC UPS to shutdown LB-8000 by PowerChute network shutdown agent and let administrator can connect to the web GUI of APC UPS. (See Figure 6-86)
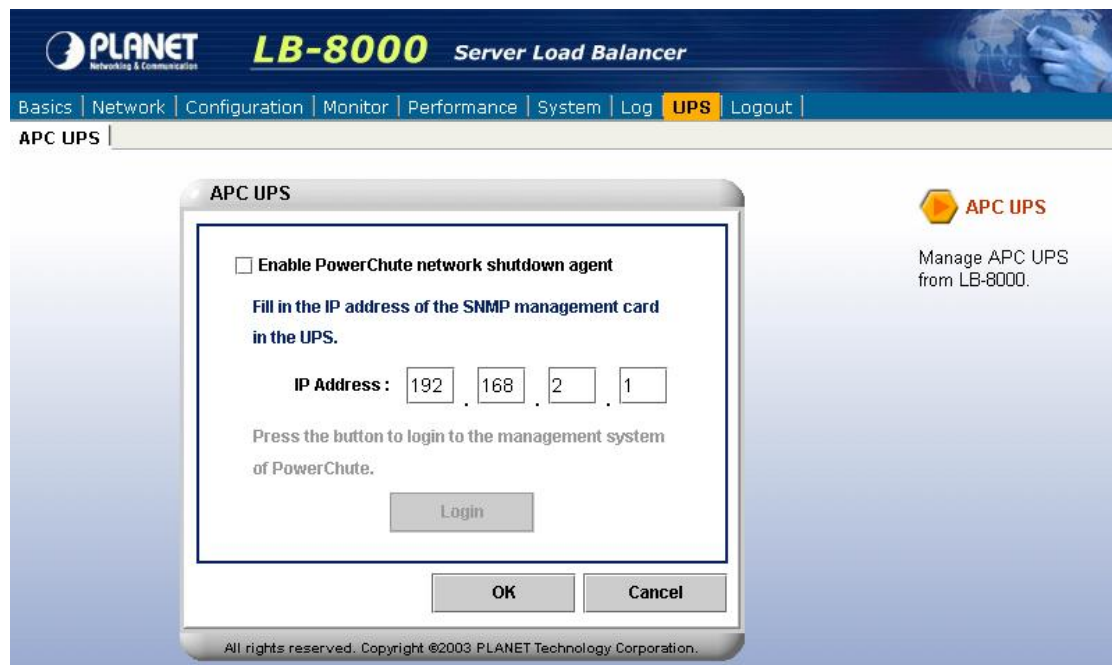
Figure 6-86 UPS Screen

6.9.1. APC UPS

Click on **[APC UPS]** and then administrator can enable / disable PowerChute network shutdown agent to shutdown LB-8000 and let administrator can connect to the web GUI of APC UPS. (See Figure 6-87)
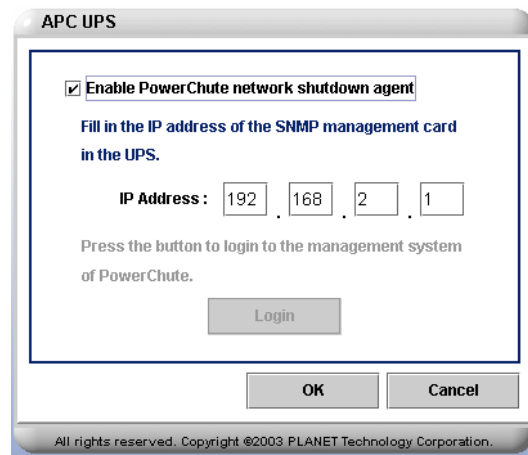
Figure 6-87 APC UPS Screen

To Enable APC UPS

1. Check to enable power chute network shutdown agent.
2. Fill in the IP address of the SNMP management card in the fields and then click on **[OK]** button.
3. Click on **[Login]** button to login to the management system of Power Chute.

To Disable APC UPS

1. Uncheck or leave the box blank to disable the APC UPS function.
2. Click on **[OK]** to complete the task.

You could configure same function by executing **"apcups"** command in CLI mode. For more information, please refer to page 150.

6.10.   Logout

To completely log off from the system, click on **[Logout]**.

You could configure same function by executing **"logout"** command in CLI mode. For more information, please refer to page 182.

7. CLI Configuration

The Command Line Interface (CLI) is the other management utility. It monitor system and achieve administrative tasks by running commands from the console, or a remote shell, like TELNET or SSH. This chapter will show the detailed information and syntax about the CLI.

7.1. The ways to run CLI command.

There are many ways for administrator to run CLI command:

l   From the console by connecting a keyboard and monitor to LB-8000 directly.

l   From a remote shell, such as the SSH client or TELNET client. The default IP address of LB-8000 is:

    l   Network 1 interface (eth0): 192.168.2.1

    l   Network 2 interface (eth1): 192.168.3.1

Before you can run the CLI command from a console, or a remote shell, you must log in first. Use the following default user name and password to log in.

Username: **admin**

Password: **admin**

After you log in, you can start to execute the CLI command.

> Note   *The one difference between GUI mode and CLI mode is that every time you execute a command or modify a system setting in CLI mode, you have to execute **"lbsync"** command to synchronize the newest configuration files between primary manager and backup manager.*

7.2. The Classification of CLI Commands

For the CLI mode, we class as four CLI commands group:

q   Commands for system configuration are **ifconfig**, **cluster**, **rs**, **heartbeat**, **setmgr**, **lbsync**, **contact**, **dns**, **noncluster**, and **ctimer** which are used to configure system configurations.

q   Commands for system service are **lb8000**, **vpn**, **route**, **ipforward**, **date**, **ntp**, **snmp**, and

apcups which are used to configure system services.

q   Commands for system monitoring are **lbonitor, cmonitor, load, connstate, netstat, halog, syslog, connlog, mgtlog, alertlog, diagnose, sysinfo, procinfo, ps, ping, snmpwalk, lsmgr,** and **connreport** which are used to monitor LB-8000 and view all logs.

q   Commands for system management are **passwd, reset, upgrade, reboot, shutdown, exec, backup, restore, tftp, del, rm, ls, dir, more, logout, quit, exit, q,** and **help** which are used to manage LB-8000 machine.

7.3. Identifying command syntax

We show complete commands in Courier text. For example, the following command shows the configuration of the specified network interface:

LB8000> ifconfig eth0

Table Intro.1 explains additional special conventions used in command line syntax:

Item in text	Description
{ }	Identifies a user-defined parameter. For example, if the command has **{your name}**, type in your name, but do not include the brackets.
|	Separates parts of a command.
[ ]	Indicates that syntax inside the brackets is optional.
…	Indicates that you can type a series of items.

Table Intro.1 *Command line syntax conventions*

7.4. Command of System Configuration

The following commands allow administrator to configure LB-8000 manager.

7.4.1. Ifconfig

Description: "ifconfig" displays the current status of network interfaces and configures the kernel-resident network interfaces.

Usage:

ifconfig

ifconfig eth0

ifconfig eth1

ifconfig eth0 **{ip} {netmask} {gateway}**

ifconfig eth1 disable

ifconfig eth1 bond

ifconfig eth1 **{ip} {netmask} {gateway}**

ifconfig -h

Options:

eth0

It is the name of the network interface 1.

eth1

It is the name of the network interface 2.

disable

This option disables the functions of network interface. It is only for network

interface 2.

bond

This option bonds second network interface with first network interface to

increase network bandwidth. (This option only for NAT model)

ip

This option assigns the IP address to the network interface.

netmask

This option assigns the IP netmask for the network interface.

gateway

This option assigns the gateway to the network interface.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the current status of active network interfaces.

```
LB8000>ifconfig
Network 1 : Manual
IP Address : 192.168.2.242
Netmask : 255.255.255.0
Gateway : 192.168.2.1
Network 2 : Manual
IP Address : 192.168.3.1
Netmask : 255.255.255.0
```

Gateway : 192.168.3.254
Syntax: ifconfig

To display the status of network interface 1 (eth0).

LB8000>ifconfig eth0
Network 1 : Manual
IP Address : 192.168.2.242
Netmask : 255.255.255.0
Gateway : 192.168.2.1
Syntax: ifconfig eth0

**To assign the IP address, netmask, and gateway to the network interface 1
(eth0).**

LB8000>ifconfig eth0 192.168.2.1 255.255.255.0 192.168.2.1
[ifconfig] INFO: Update network configuration is completed.
Syntax: ifconfig eth0 {IP} {Netmask} {Gateway}

To disable network interface 2 (eth1).

LB8000>ifconfig eth1 disable
[ifconfig] INFO: Update network configuration is completed.
Syntax: ifconfig eth1 disable

To bond network interface 2 (eth1) with network interface 1 (eth0).

LB8000>ifconfig eth1 bond
[ifconfig] INFO: Update network configuration is completed.
Syntax: ifconfig eth1 bond

To get more help for this command.

LB8000> ifconfig -h
Description: display and setup network interfaces
Usage: ifconfig
        ifconfig eth0
        ifconfig eth1
        ifconfig eth0 {ip} {netmask} {gateway}
        ifconfig eth1 disable
        ifconfig eth1 bond
        ifconfig eth1 {ip} {netmask} {gateway}
Syntax: ifconfig –h

Administrator could manage this function by using GUI mode. For more information, please
refer to page 60-62.

7.4.2. cluster

Description: "cluster" displays the current configurations of cluster and configures the cluster. Administrator can also use this command to choose cluster type such as, NAT (Network Address Translation), Direct Routing, and Tunneling.

Usage:

cluster
cluster **[vname]**
cluster type **nat**
cluster type **direct**
cluster type **tunnel**
cluster add **{vname} {vip} {netmask} {service} {port} {scheduler} **
    {persistent} {healthcheck} {timeout} {stateful} [{request} {receive}]
cluster mod **{vname} {vip} {netmask} {service} {port} {scheduler} **
    {persistent} {healthcheck} {timeout} {stateful} [{request} {receive}]
cluster del **{vname}**
cluster enable **{vname}**
cluster disable **{vname}**
cluster -h

Options:

vname

This option assigns a name to the cluster.

type

This option assigns a type of cluster. There are three types of cluster to choose: NAT, Direct Routing, and Tunnel.

nat

NAT is a method to translate the address in both outgoing and incoming datagram. NAT cluster is usually the best method for protecting the network from intrusion since LB-8000 can act as a router and firewall between WAN/LAN to send requests and response between real servers and clients.

direct

Direct is short form for direct routing; it allows the packets from clients are forwarded to the real server and then the real server processes the packets and directly sends back to the clients.

tunnel

It is a technique to encapsulate IP datagram within IP tunnelling, which enables packets addressed to an IP address to be redirected to another address, possibly on a different network.

add

This option adds a cluster.

vip

This option assigns a virtual IP address to the cluster.

netmask

This option assigns the netmask to the VIP.

service

This option assigns a service to the cluster. The services are **http, https, ftp, smtp, pop3, imap, rtsp, mms, ecom**, and **other**.

port

This option assigns a port for the service.

scheduler

This option assigns a scheduler for the cluster. The schedulers are **rr** (Round Robin), **wrr** (Weighted Round Robin), **lc** (Lease Connection), and **wlc** (Weighted Lease Connection).

persistent

To set a persistency time to allow client to always connect to the same real server for this period time. (0 represents to disable the persistent function)

check type

This option assigns a health check type for the real servers. The check types are **content** (Content Check), **port** (Port Check), **icmp** (ICMP Check), **arp** (ARP Check) and **none**.

timeout

This option assign a timeout value for how many seconds are needed for LB-8000 to wait the response from real servers before assuming that real servers are malfunction.

stateful

In order to make LB-8000 failover transparent to client applications, the primary manager needs to synchronize its state information (e.g., connection information) to the backup manager. When the backup manager takes over the service after the primary fails, the backup manager will have the state of most connections, so that almost all connections can continue to access the service through the backup manager. (**on** represents to enable stateful failover function and **off** represents to disable stateful failover function)

request receive

To set the default confirmation file such as index.html that when one web service request is sent through VIP to a real server, the system will look for this particular file to ensure that the service is granted. Also administrator can set a word, which must be sensitive, and then system will look for this particular word to ensure that the service is still alive. This option is only for **http** and **https** service.

mod

This option modifies a cluster.

del

This option deletes a cluster.

enable

This option enables the cluster service.

disable

This option disables the cluster service.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the current configurations of cluster.

```
LB8000> cluster
Cluster Type: NAT

Virtual Host Name: FTP
Virtual Host IP: 192.168.2.151
Netmask: 255.255.255.254
Service: FTP
Port: 21
Persistency: OFF
Scheduler: Round Robin
Health Check Type: Port Check
Check Timeout: 1
Stateful Failover: ON

Real Server List:
-------------------------------------------------
Real Server IP          Port          Weight
-------------------------------------------------
192.168.12.110           21             1
192.168.12.111           21             1
-------------------------------------------------
```

Syntax: cluster

To setup NAT cluster type.

```
LB8000> cluster type nat
```

[cluster] INFO: Update cluster configuration is completed!
Syntax: cluster type nat

To setup Direct Routing cluster type.

LB8000> cluster type direct
[cluster] INFO: Update cluster configuration is completed!
Syntax: cluster type direct

To setup Tunneling cluster type.

LB8000> cluster type tunnel
[cluster] INFO: Update cluster configuration is completed!
Syntax: cluster type tunnel

To setup a new virtual web host with port check method.

LB8000> cluster add WWW 192.168.2.223 255.255.255.0 http 80 rr 10 port 1 on
[cluster] INFO: Update cluster configuration is completed!
Syntax: cluster add {vname} {vip} {netmask} {service} {port} {scheduler}

{persistent} {healthcheck} {timeout} {stateful} [{request} {receive}]

To setup a virtual web host with content check method.

LB8000> cluster add WWW 192.168.2.223 255.255.255.0 http 80 rr 0 content 1 on
index.html HAWAII
[cluster] INFO: Update cluster configuration is completed!
Syntax: cluster add {vname} {vip} {netmask} {service} {port} {scheduler}

{persistent} {healthcheck} {timeout} {stateful} [{request} {receive}]

To setup a virtual ftp host with least connection schedule type.

LB8000> cluster add FTP 192.168.3.33 255.255.255.0 ftp 21 lc 10 port 1 on
[cluster] INFO: Update cluster configuration is completed!
Syntax: cluster add {vname} {vip} {netmask} {service} {port} {scheduler}

{persistent} {healthcheck} {timeout} {stateful} [{request} {receive}]

To delete an existing cluster.

LB8000> cluster del WWW
[cluster] INFO: Update cluster configuration is completed!
Syntax: cluster del {vname}

To disable an existing cluster service.

LB8000> cluster disable WWW
[cluster] INFO: Update cluster configuration is completed!

Syntax: cluster disable {vname}

To enable an existing cluster service.

LB8000> cluster enable WWW
[cluster] INFO: Update cluster configuration is completed!
Syntax: cluster enable {vname}

To get more help for this command.

LB8000> cluster -h
Description : display and setup cluster
Usage : cluster [vname]
cluster type nat
cluster type direct
cluster type tunnel
cluster add {vname} {vip} {netmask} {service} {port} {scheduler} \{persistent}
{healthcheck} {timeout} {stateful}
[{request} {receive}]
cluster mod {vname} {vip} {netmask} {service} {port} {scheduler} \{persistent}
{healthcheck} {timeout} {stateful}
[{request} {receive}]
cluster del {vname}
cluster enable {vname}
cluster disable {vname}
Syntax: cluster –h

Note *After finishing the "**cluster**" setup, you have to synchronize the setting between primary and backup manager by issuing "**lbsync**" command.*

Administrator could manage this function by using GUI mode. For more information, please refer to page 70.

7.4.3. rs

Description: "rs" displays the current status of real server and configures the real server for a cluster.

Usage:

rs
rs **[vname]**
rs add **{vname} {ip|ip range} {port} {weight}**
rs mod **{vname} {ip} {port} {weight}**
rs del all **{ip}**

rs del **{vname} {ip}**

rs enable **{vname} {ip}...{ip}**

rs disable **{vname} {ip}...{ip}**

rs –h

Options:

vname

This option lists the real server of the cluster or maintains the real servers of a cluster.

add

This option adds real servers to a cluster.

ip|ip range

This option assigns a real server or an IP range of real servers to a cluster.

port

This option assigns a port number of a real server.

weight

This option set the service weight for the Weighted Round Robin (WRR) or Weighted Least Connection (WLC) scheduling algorithms.

- *You should set the service weight to 1 if the scheduling algorithm of a cluster is Round Robin (RR) or Least Connection (LC).*

mod

This option modifies the real server.

- *Under NAT service type, you can modify port and weight but under Direct Routing and Tunnel you can modify weight only.*

del

This option deletes the real server.

all

This option deletes, enables, or disables the real server under all of different clusters. This option must be used with these three options **del**, **enable**, and **disable**.

enable

This option enables the real server service.

disable

This option disables the real server service.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the current status of real server.

```
LB8000> rs
Virtual Host : WWW          IP Address : 192.168.3.3          Port : 80
Real Serve IP            Port            Weight
=============================================
192.168.5.3             80              1
192.168.5.106           80              1
192.168.5.108           80              1
```
Syntax: rs

To display the real server of a specific cluster.

```
LB8000> rs WWW
Virtual Host : WWW          IP Address : 192.168.3.3          Port : 80
Real Serve IP            Port            Weight
=============================================
192.168.5.3             80              1
192.168.5.106           80              1
192.168.5.108           80              1
```
Syntax: rs {vname}

To add a new real server into a cluster.

```
LB8000> rs add WWW 192.168.20.100 80 1
[rs] INFO: Update real server configuration is completed!
```
Syntax: rs add {vname} {ip|ip range} {port} {weight}

To add multiple real servers into the cluster.

```
LB8000> rs add FTP 192.168.20.100-110 80 1
[rs] INFO: Update real server configuration is completed!
```
Syntax: rs add {vname} {ip|ip range} {port} {weight}

To modify the real server configurations.

Initial: Virtual Host Name: FTP

Real server IP address: 192.168.10.12

Port: 21

Weight: 1

Modified: Virtual Host Name: FTP

Real server IP address: 192.168.10.12

Port: 22

Weight: 2

```
LB8000> rs mod ftp 192.168.10.12 22 2
[rs] INFO: Update real server configuration is completed!
```
Syntax: rs mod {vname} {ip} {port} {weight}

To delete a real server of a specific cluster.

```
LB8000> rs del www 192.168.10.12
[rs] INFO: Update real server configuration is completed!
```
Syntax: rs del {vname} {ip}

To delete a specific real server under all of different clusters.

```
LB8000> rs del all 192.168.10.12
[rs] INFO: Update real server configuration is completed!
```
Syntax: rs del all {ip}

To disable a specific real server service under all of different clusters.

```
LB8000> rs disable all 192.168.5.106
[rs] INFO: Update real server configuration is completed!
```
Syntax: rs disable all {ip}

To enable a specific real server service under all of different clusters.

```
LB8000> rs enable all 192.168.5.106
[rs] INFO: Update real server configuration is completed!
```
Syntax: rs enable all {ip}

To disable multiple real servers under all of different clusters.

```
LB8000> rs disable all 192.168.5.3 192.168.5.106 192.168.10.10
[rs] INFO: Update real server configuration is completed!
```
Syntax: rs disable all {ip}...{ip}

To enable multiple real servers under all of different clusters.

```
LB8000> rs enable all 192.168.5.3 192.168.5.106 192.168.10.10
[rs] INFO: Update real server configuration is completed!
```
Syntax: rs enable all {ip}...{ip}

To disable the real server under the specific cluster.

LB8000> rs disable www 192.168.5.3
[rs] INFO: Update real server configuration is completed!
Syntax: rs disable {vname} {ip}

To enable the real server under the specific cluster.

LB8000> rs enable www 192.168.5.3
[rs] INFO: Update real server configuration is completed!
Syntax: rs enable {vname} {ip}

To disable multiple real servers under the specific cluster.

LB8000> rs disable www 192.168.5.3 192.168.5.106 192.168.5.108
[rs] INFO: Update real server configuration is completed!
Syntax: rs disable {vname} {ip}...{ip}

To enable multiple real servers under the specific cluster.

LB8000> rs enable www 192.168.5.3 192.168.5.106 192.168.5.108
[rs] INFO: Update real server configuration is completed!
Syntax: rs enable {vname} {ip}...{ip}

To get more help for this command

LB8000> rs -h
Description : display and setup real server
Usage : rs [vname]
          rs add {vname} {ip|ip range} {port} {weight}
          rs mod {vname} {ip} {port} {weight}
          rs del all {ip}
          rs del {vname} {ip}
          rs enable {vname} {ip}...{ip}
          rs disable {vname} {ip}...{ip}
Syntax: rs –h

Note *After finishing the "**rs**" setup, you have to synchronize the setting between primary and backup manager by issuing "**lbsync**" command.*

Administrator could manage this function by using GUI mode. For more information, please
refer to page 70.

7.4.4. heartbeat

Description: "heartbeat" displays the current configuration of heartbeat and setup heartbeat
parameters for sending signal between primary manager and backup manager. You also can
configure the real server health check interval and number of health check daemons.

Usage:

heartbeat

heartbeat keepalive **{1~9}**

heartbeat nicefailback **{on|off}**

heartbeat interval **{1~30}**

heartbeat maxdaemon **{1~30}**

heartbeat auth yes **{key}**

heartbeat auth no

heartbeat -h

Options:

keepalive

This option set a time interval of heartbeat. (The default value is 1 second and the range is from 1 second to 9 seconds)

nicefailback

This option allows LB-8000 to supports NICE FAIL BACK feature. Administrators can select **ON** then the backup manager will not release the control when primary manager recovers from the failure. On the other hand, if administrators select **OFF** then when the formally crashed primary manager recovers, the primary manager will take the job back from the backup manager and become active.

interval

This option set a time interval for health check to all real servers. (The default value is 1 seconds and range is from 1 seconds to 30 seconds)

maxdaemon

This option set a maximum number of health check daemons. (The default value is 10 and range is from 1 to 30 daemons)

auth yes

This option enables the authorization function for heartbeat message.

key

This option assigns an authorization key.

auth no

This option disables the authorization function for heartbeat message.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the current status of heartbeat.

LB8000> heartbeat
How many seconds between heartbeats : 1 sec.
The interval of health check to real server : 1 sec.
Maximum number of health check daemons : 10
Heartbeat message encryption : no
Syntax: heartbeat

To turn on the NICE FAIL BACK feature.

LB8000> heartbeat nicefailback on
[heartbeat] INFO: Update heartbeat configuration is completed!
Syntax: heartbeat nicefailback on

To turn off the NICE FAIL BACK feature.

LB8000> heartbeat nicefailback off
[heartbeat] INFO: Update heartbeat configuration is completed!
Syntax: heartbeat nicefailback off

To set a time interval of heartbeat.

LB8000> heartbeat keepalive 2
[heartbeat] INFO: Update heartbeat configuration is completed!
Syntax: heartbeat keepalive {1~9}

To set a time interval for health checking to all real servers.

LB8000> heartbeat interval 15
[heartbeat] INFO: Update heartbeat configuration is completed!
Syntax: heartbeat interval {1~30}

To set a maximum number of health check daemons.

LB8000> heartbeat maxdaemon 15
[heartbeat] INFO: Update heartbeat configuration is completed!
Syntax: heartbeat maxdaemon {1~30}

To assign an authorization key and set the heartbeat message to be encrypted.

LB8000> heartbeat auth yes planet
[heartbeat] INFO: Update heartbeat configuration is completed!
Syntax: heartbeat auth yes {key}

To disable health message encryption.

LB8000> heartbeat auth no
[heartbeat] INFO: Update heartbeat configuration is completed!
Syntax: heartbeat auth no

To get more help for this command.

LB8000> heartbeat -h
Description : display and setup heartbeat parameters
Usage : heartbeat
heartbeat keepalive {1~9}
heartbeat interval {1~30}
heartbeat maxdaemon {1~30}
heartbeat auth yes {key}
heartbeat auth no
Syntax: heartbeat –h

Note *Once interval time of heartbeat is more than 5 seconds, the nice fail back feature will lose its capability.*

Note *After finishing the "**heartbeat**" setup, you have to synchronize the setting between primary and backup manager by issuing "**lbsync**" command.*

Administrator could manage this function by using GUI mode. For more information, please refer to page 69.

7.4.5. setmgr

Description: Abbreviation of setup manager, "**setmgr**" set basic information about LB-8000 such as role, name of LB-8000, and domain name.

Usage:

setmgr **{role} {hostname} {domain}**
setmgr -h

Options:

    role

In this option, administrator may choose to assign a role to LB-8000 to act as either the primary manager or backup manager.

    hostname

This option assigns a hostname to LB-8000.

    domain

This option assigns a qualified domain name.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To setup a primary manager.

LB8000> setmgr primary lb8000p planet.com.tw
[setmgr] INFO: Update manager configuration is completed.
Syntax: setmgr {role} {hostname} {domain}

To setup a backup manager.

LB8000> setmgr backup lb8000b planet.com.tw
[setmgr] INFO: Update manager configuration is completed.
Syntax: setmgr {role} {hostname} {domain}

To get more help for this command

LB8000> setmgr -h
Description : setup manager basic information about role, hostname and domain
name
Usage : setmgr {role} {hostname} {domain}
Syntax: setmgr –h

Administrator could manage this function by using GUI mode. For more information, please
refer to page 55.

7.4.6. lbsync

Description: Abbreviation of LB-8000 synchronization, "**lbsync**" synchronizes primary and
backup manager load balancers system configurations and log files.

You must enter the IP address, administrator's account and password of the other LB-8000
manager when you execute "lbsync" first time. Then you can issue "lbsync" without any
parameters to synchronize between two managers.

Usage:

lbsync
lbsync **{ip} {admin. ID} {admin. passwd}**
lbsync -h

Option

ip

For this option, administrator has to enter the IP address of the other LB-8000 manager.

admin. ID

For this option, administrator has to enter the login ID of the other LB-8000 manager.

admin. passwd

For this option, administrator has to enter the login password of the other LB-8000 manager.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To synchronize primary and backup manager first time.

LB8000> lbsync 192.168.2.222 admin admin
[lbsync] INFO: Synchronization between two managers is completed.
Syntax: lbsync {ip} {admin. ID} {admin. Passwd}

To synchronize primary and backup manager.

LB8000> lbsync
[lbsync] INFO: Synchronization between two managers is completed.
Syntax: lbsync

To get more help for this command.

LB8000> lbsync -h
Description : synchronize primary and backup load balancers system parameters
Usage : lbsync
            lbsync {ip} {admin. ID} {admin. passwd}
Syntax: lbsync -h

7.4.7. contact

Description: "contact" displays the current alerted e-mail list and setup e-mail alert contacts.

Usage:

contact

contact **{vname}**

contact add **{mail address}**

contact del **{mail address}**

contact set **{mail address} {vname}**

contact unset **{mail address} {vname}**

contact -h

Options:

    vname

        This option displays the emergency call related to a specific cluster. (There is one default group named @LB-8000. The members of @LB-8000 will receive all alert mails about LB-8000 manager, but will not receive any alert email about clusters.)

    add

        This option adds an emergency call.

    del

        This option deletes an emergency call.

    mail address

        For this option, administrator has to enter an e-mail address for the emergency call.

    set

        This option setup an emergency call related to a specific cluster.

    unset

        This option unset an emergency call related to a specific cluster.

    -h

        Short form for help, it illustrates the command description and usage.

Instance:

    To display all of the current emergency call.

```
LB8000> contact
Mail list :
admin@planet.com.tw
test01@planet.com.tw
test@planet.com.tw
```
Syntax: contact

    To display the current emergency call related to a specific cluster.

```
LB8000> contact www
```

WWW :
test01@planet.com.tw
admin@planet.com.tw
Syntax: contact {vname}

To add an emergency call.

LB8000> contact add test07@planet.com.tw
[contact] INFO: Update contact list is completed!
Syntax: contact add {mail address}

To delete an emergency call.

LB8000> contact del test07@planet.com.tw
[contact] INFO: Update contact list is completed!
Syntax: contact del {mail address}

To set an emergency call to be the member of @LB-8000.

LB8000> contact set test01@planet.com.tw @LB-8000

[contact] INFO: Update contact list is completed!

Syntax: contact set {mail address} @LB-8000

To make an emergency call to leave the member of @LB-8000.

LB8000> contact unset test01@planet.com.tw @LB-8000

[contact] INFO: Update contact list is completed!

Syntax: contact unset {mail address} @LB-8000

To set an emergency call related to a specific cluster.

LB8000> contact set test01@planet.com.tw www
[contact] INFO: Update contact list is completed!
Syntax: contact set {e-mail address} {vname}

To make an emergency call to leave all of related cluster.

LB8000> contact unset test01@planet.com.tw www
[contact] INFO: Update contact list is completed!
Syntax: contact unset {e-mail address} {vname}

To get more help for this command.

LB8000> contact -h
Description : display and setup e-mail alert contacts
Usage :contact

contact [vname]
        contact add {mail address}
        contact del {mail address}
        contact set {mail address} {vname}
        contact unset {mail address} {vname}
Syntax: contact –h

Note *After finishing the "contact" setup, you have to synchronize the setting between primary and backup manager by issuing "lbsync" command.*

Administrator could manage this function by using GUI mode. For more information, please refer to page 77.

7.4.8. dns

Description: "dns" displays the current IP address of DNS server. Administrator can also assign the IP address of the Domain Name Server. DNS service is used to find the domain for LB-8000 when sends an alert mail. And LB-8000 also provides a DNS proxy server for clients or real servers. The DNS address must be assigned before e-mail alerts could take effects.

Usage:

    dns
    dns **{dns1} [dns2]**
    dns -h

Options:

> **dns1**
>
>> This option assigns the IP address to the primary DNS server.
>
> **dns2**
>
>> This option assigns the IP address to the secondary DNS server.
>
> **-h**
>
>> Short form for help, it illustrates the command description and usage.

Instance:

> **To display the current DNS server.**
>
> LB8000> dns
> Primary DNS : 192.168.2.1
> Secondary DNS :
> *Syntax: dns*

To assign an IP address to the primary DNS.

LB8000> dns 192.168.2.1
[dns] INFO: Update DNS configuration is completed.
Syntax: dns {dns1}

To assign the IP address to the primary DNS and secondary DNS.

LB8000> dns 192.168.2.1 192.168.2.2
[dns] INFO: Update DNS configuration is completed.
Syntax: dns {dns1} [dns2]

To get more help for this command.

LB8000> dns -h
Description : display and setup DNS
Usage : dns {dns1} [dns2]
Syntax: dns –h

Note *After finishing the "**dns**" setup, you have to synchronize the setting between primary and backup manager by issuing "**lbsync**" command.*

Administrator could manage this function by using GUI mode. For more information, please refer to page 66.

7.4.9. noncluster

Description: "noncluster" displays the current configurations of nonclustered servers and configures the servers which do not belong to any cluster.

Usage:

noncluster add **{server name} {ip}**
noncluster del **{server name}**
noncluster mod **{server name} {ip}**
noncluster -h

Option

add
This option adds a nonclustered server.

del
This option deletes the specified nonclustered server.

mod

> This option modifies the IP address of specified nonclustered server.

server name

> This option indicates the name of a nonclustered server.

ip

> This option indicates the IP address of a nonclustered server.

-h

> Short option for help, it illustrates the command description and usage.

Instance:

To display the current configuration of nonclustered servers.

```
LB8000> noncluster
Noncluster
Server Name        IP Address
=================================
QSTOR             192.168.3.200
test              192.168.3.222
```
Syntax: noncluster

To add a nonclustered server.

```
LB8000> noncluster add test 192.168.3.222
[noncluster] INFO: Update non-clustered server configuration is completed!
```
Syntax: noncluster add {server name} {ip}

To delete the nonclustered server.

```
LB8000> noncluster del test
[noncluster] INFO: Update non-clustered server configuration is completed!
```
Syntax: noncluster del {server name}

To modify the nonclustered server IP address.

```
LB8000> noncluster mod test 192.168.3.220
[noncluster] INFO: Update non-clustered server configuration is completed!
```
Syntax: noncluster mod {server name} {ip}

To get more help for this command.

```
LB8000> noncluster -h
Description : display and setup non-clustered servers
Usage : noncluster add {server name} {ip}
        noncluster del {server name}
        noncluster mod {server name} {ip}
```

Syntax: noncluster –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 75.

7.4.10. ctimer

Description: "ctimer" adjusts the expiration time of states of a TCP connection cycle.

Usage:

ctimer
ctimer reset
ctimer **{TCP ESTABLISH timer} {TCP FIN_WAIT timer} {TCP TIME_WAIT timer}
 {UDP ESTABLISH timer}**

Options:

reset

This option reset the expiration time of states of a TCP connection cycle to be default value. The default values are:

l   TCP ESTABLISH timeout: 900 sec
l   TCP FIN_WAIT timeout: 120 sec
l   TCP TIME_WAIT timeout: 120 sec
l   UDP ESTABLISH timeout: 300 sec

TCP ESTABLISH timer

This option set the timeout value of TCP established state.

TCP FIN_WAIT timer

This option set the timeout value of TCP FIN_WAIT state.

TCP TIME_WAIT timer

This option set the timeout value of TCP TIME_WAIT state.

UDP ESTABLISH timer

This option set the timeout value of UDP established connection.

-h

Short form for help, it illustrates the command description and usage.

Instance

To display current timeout value of TCP/IP state.

LB8000> ctimer
Timeout
TCP ESTABLISH timeout   : 900 sec
TCP FIN_WAIT timeout   : 120 sec
TCP TIME_WAIT timeout   : 120 sec
UDP ESTABLISH timeout   : 300 sec
Syntax: ctimer

To set the timeout value of TCP/IP state.

LB8000> ctimer 360 120 120 360
[ctimer] INFO: Update ctimer configuration is completed.
Syntax: ctimer {TCP ESTABLISH timer} {TCP FIN_WAIT timer} {TCP

TIME_WAIT timer} {UDP ESTABLISH timer}

To get more help for this command.

LB8000> ctimer -h
Description : setup the TCP/IP state timers
Usage : ctimer {tcp ESTABLISH timer} {tcp FIN timer} {udp ESTABLISH timer}
Syntax: ctimer –h

Note *After finishing the "**ctimer"** setup, you have to synchronize the setting between primary and backup manager by issuing "**lbsync"** command.*

7.5. Command of System Service

The following commands allow administrator to configure LB-8000 services

7.5.1. lb8000

Description: "lb8000" displays the current status of the LB-8000 service. Administrator also can turn on or turn off the LB-8000 service on both managers.

Usage:

lb8000
lb8000 start

lb8000 stop

lb8000 -h

Options:

    start

        This option turns on the LB-8000 service.

    stop

        This option turns off the LB-8000 service.

    -h

        Short form for help, it illustrates the command description and usage.

Instance:

    To show current status of LB-8000 service

```
LB8000> lb8000
LB-8000
Service: Running
State: Active
```
Syntax: lb8000

    To turn on the LB-8000 service.

```
LB8000> lb8000 start
[lb8000] INFO: LB-8000 starts running.
```
Syntax: lb8000 start

    To turn off the LB-8000 service.

```
LB8000> lb8000 stop
[lb8000] INFO: LB-8000 is stopped.
```
Syntax: lb8000 stop

    To get more help for this command.

```
LB8000> lb8000 -h
Description : display, start or stop LB-8000 service
Usage : lb8000
          lb8000 start
          lb8000 stop
```
Syntax: lb8000 –h

Administrator could manage this function by using GUI mode. For more information, please

refer to page 57.

7.5.2. vpn

Description: **"vpn"** displays the current status of virtual private network (VPN) service and configures VPN service on LB-8000. The VPN service is useful for clients which want to connect to real server for maintenance in NAT model.

Usage:

> vpn
> vpn start
> vpn stop
> vpn add **{user} {passwd}**
> vpn del **{user}**
> vpn range **{start ip} {end ip}**
> vpn -h

Options:

> **start**
>> This option turns on the VPN service on LB-8000.
>
> **stop**
>> This option turns off the VPN service on LB-8000.
>
> **add**
>> This option adds a user account to use VPN service.
>
> **user**
>> This option assigns a user name to use VPN service.
>
> **passwd**
>> This option assigns a password for the new added user.
>
> **del**
>> This option deletes the existing user account.
>
> **range**
>> This option assigns the client IP address range to use VPN service.
>
> **start ip**
>> This option assigns the beginning of IP address range. If the IP range of VPN cover the IP address of LB-8000 or real server then it would occasion system errors.
>
> **end ip**
>> This option assigns the ending of IP address range.
>
> **-h**

Short form for help, it illustrates the command description and usage.

Instance:

To display the current status of virtual private network (VPN) service on LB-8000.

LB8000> vpn
VPN Status: Enable
Users:
----
test
test01

Remote IP Address Range :
   FROM:192.168.3.201
    TO :192.168.3.210
Syntax: vpn

To turn on the virtual private network (VPN) service on LB-8000.

LB8000> vpn start
[vpn] INFO: VPN starts running!
Syntax: vpn start

To turn off the virtual private network (VPN) service on LB-8000.

LB8000> vpn stop
[vpn] INFO: VPN is stopped!
Syntax: vpn stop

To add a user account for using VPN service.

LB8000> vpn add test testpw
[vpn] INFO: Update VPN configuration is completed.
Syntax: vpn add {user} {passwd}

To delete a user account for using VPN service.

LB8000> vpn del test
[vpn] INFO: Update VPN configuration is completed.
Syntax: vpn del {user}

To assign the octet number range of IP address to use VPN service.

LB8000> vpn range 220 230
[vpn] INFO: Update VPN configuration is completed.
Syntax: vpn range {start ip} {end ip}

To get more help for this command.

LB8000> vpn -h
Description : display and setup VPN
Usage : vpn
        vpn start
        vpn stop
        vpn add {user} {passwd}
        vpn del {user}
        vpn range {start ip} {end ip}

Syntax: vpn –h

Note *After finishing the "**vpn**" setup, you have to synchronize the setting between primary and backup manager by issuing "**lbsync**" command.*

Administrator could manage this function by using GUI mode. For more information, please refer to page 66.

7.5.3. route

Description: "route" displays the current status of the static route service and configures the static routing table of LB-8000.

Usage:

route

route start

route stop

route add **{destip} {netmask} {gateway} {metric}**

route del **{destip} {netmask} {gateway} {metric}**

route enable **{destip} {netmask} {gateway} {metric}**

route disable **{destip} {netmask} {gateway} {metric}**

route –h

Options:

    start

        This option turns on the static route service on LB-8000.

    stop

        This option turns off the static route service on LB-8000.

    add

        This option adds a static route rule.

destip

This option assigns the destination IP address of this static route.

netmask

This option assigns the netmask associated with the destination network address.

gateway

This option assigns the gateway IP address that tells LB-8000 where to forward packets whose destination address matches the route's IP address and subnet mask.

metric

This option gives the metric number of current routing rule.

enable

This option enables the specified static routing rule.

disable

This option disables the specified static routing rule.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the current status of the routing table.

```
LB8000> route
Static Route
Status : Running
***Activated Routing Rules***
IP Address        Netmask           Gateway           Metric
======================================================
192.168.5.0      255.255.255.0     192.168.2.50      1

***Defined Routing Rules***
IP Address     Netmask          Gateway          Metric        ON/OFF
============================================================
192.168.5.0 255.255.255.0 192.168.2.50      1                ON
```
Syntax: route

To start the static route service.

```
LB8000> route start
[route] INFO: Static route starts running.
```
Syntax: route start

To stop the static route service.

```
LB8000> route stop
```

[route] INFO: Static route is stopped.

Syntax: route stop

To add a static route.

LB8000> route add 192.168.5.0 255.255.255.0 192.168.2.50 1
[route] INFO: Update route configuration is completed.

Syntax: route add {destip} {netmask} {gateway} {metric}

To delete the static route.

LB8000> route del 192.168.5.0 255.255.255.0 192.168.2.50 1
[route] INFO: Update route configuration is completed.

Syntax: route del {destip} {netmask} {gateway} {metric}

To enable a specific static route service.

LB8000> route enable 192.168.10.0 255.255.255.0 192.168.2.50 3
[route] INFO: Update route configuration is completed.

Syntax: route enable {destip} {netmask} {gateway}

To disable a specific static route service.

LB8000> route disable 192.168.10.0 255.255.255.0 192.168.2.50 3
[route] INFO: Update route configuration is completed.

Syntax: route disable {destip} {netmask} {gateway}

To get more help for this command.

LB8000> route -h
Description : display and setup static route
Usage : route
      route start
      route stop
      route add {destip} {netmask} {gateway} {metric}
      route del {destip} {netmask} {gateway} {metric}
      route enable {destip} {netmask} {gateway} {metric}
      route disable {destip} {netmask} {gateway} {metric}

Syntax: route –h

Note *After finishing the "**route**" setup, you have to synchronize the setting between primary and backup manager by issuing "**lbsync**" command.*

Administrator could manage this function by using GUI mode. For more information, please refer to page 63.

7.5.4. ipforward

Description: "ipforward" displays the type of IP forward and configures the rule of IP forward.

Usage:

ipforward
ipforward all
ipforward wan
ipforward lan
ipforward none
ipforward nat
ipforward -h

Options:

all

This option enables all of IP forwarding from WAN to LAN and LAN to WAN.

wan

This option enables the IP forwarding from WAN to LAN.

lan

This option enables the IP forwarding from LAN to WAN.

none

This option disables all of IP forwarding service.

nat

This option disables all of IP forwarding service, but enables NAT gateway service for LAN.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the type of IP forward.

LB8000> ipforward
IPFORWARD
Status : all
Syntax: ipforward

To enable all of IP forward from WAN and LAN.

LB8000> ipforward all
[ipforward] INFO: Update ipforward configuration is completed.
Syntax: ipforward all

To enable IP forward from WAN.

LB8000> ipforward wan
[ipforward] INFO: Update ipforward configuration is completed.
Syntax: ipforward wan

To enable IP forward from LAN.

LB8000> ipforward lan
[ipforward] INFO: Update ipforward configuration is completed.
Syntax: ipforward lan

To disable all of IP forward from WAN and LAN.

LB8000> ipforward none
[ipforward] INFO: Update ipforward configuration is completed.
Syntax: ipforward none

To disable all of IP forward from WAN and LAN, but enable NAT.

LB8000> ipforward nat
[ipforward] INFO: Update ipforward configuration is completed.
Syntax: ipforward nat

To get more help for this command.

LB8000> ipforward -h
Description : display and setup ipforward type
Usage : ipforward
        ipforward all
        ipforward wan
        ipforward lan
        ipforward none
        ipforward nat
Syntax: ipforward –h

Note *After finishing the "**ipforward**" setup, you have to synchronize the setting between primary and backup manager by issuing "**lbsync**" command.*

Administrator could manage this function by using GUI mode. For more information, please refer to page 63.

7.5.5. date

Description: "date" displays current system date, time and time zone. Administrator also can use this command to setup system date, time and time zone.

Usage:

>
    date
    date set **{mm/dd/yyyy hh:mm:ss}**
    date zone GMT+**{0~13}**
    date zone GMT-**{0~12}**
    date -h

Option:

>
    set
>
    > This option set the system time.
>
    mm/dd/yyyy
>
    > This option represents the month, day, and year.
>
    hh/mm/ss
>
    > This option represents the hour, minute, and second.
>
    zone
>
    > This option set the time zone.
>
    GMT
>
    > This option set the Greenwich Mean Time on LB-8000.
>
    -h
>
    > Short form for help, it illustrates the command description and usage.

Instance:

>
    To display the current system date, time and time zone.
>
    LB8000> date
    Tue May 20 17:07:56 GMT+8 2003
    Syntax: date
>
    To set the system time.
>
    LB8000> date set 6/1/2003 12:00:00
    [date] INFO: Update system date/time is completed!
    Syntax: date set {mm/dd/yyyy hh:mm:ss}

To set the Greenwich Mean Time on LB-8000.

LB8000> date zone GMT+8
[date] INFO: Update system time zone is completed!
Syntax: date zone {GMT+/-d}

To get more help for this command.

LB8000> date -h
Description : display and setup system date
Usage : date
        date set {mm/dd/yyyy hh:mm:ss}
        date zone GMT+{0~13}
        date zone GMT-{0~12}
Syntax: date –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 94.

7.5.6. ntp

Description: "ntp" displays the current status of NTP and setup NTP server.

Usage:

ntp

ntp auto on

ntp auto off

ntp set **{ntp server ip address or name}**

ntp –h

Options:

auto

This option enables to auto update system time from NTP server at midnight everyday.

on

This option turns on the auto update system time.

off

This option turns off the auto update system time from NTP server.

set

This option setup a NTP server with NTP server IP address or domain name.

-h

> Short form for help, it illustrates the command description and usage.

Instance:

To display the current status of NTP service.

LB8000> ntp
Auto Update: Enable
NTP Server IP: time.nist.gov
Status: System time had been synchronized with NTP server (time.nist.gov) at
8:57:42 5/26/2003.
Syntax: ntp

To turn on the auto update system time from NTP server.

LB8000> ntp auto on
[ntp] INFO: Update NTP configuration is completed!
Syntax: ntp auto on

To turn off the auto update system time from NTP server.

LB8000> ntp auto off
[ntp] INFO: Update NTP configuration is completed!
Syntax: ntp auto off

To setup NTP server with IP address or synchronize the time with NTP server

immediately.

LB8000> ntp set 192.43.244.18
[ntp] INFO: Update NTP configuration is completed!
Syntax: ntp set {ntp server ip address or name}

To setup NTP server with domain name.

LB8000> ntp set ntp.planet.com.tw
[ntp] INFO: Update NTP configuration is completed!
Syntax: ntp set {ntp server ip address or name}

To get more help for this command.

LB8000> ntp -h
Description : display and setup NTP server
Usage : ntp
       ntp auto on
       ntp auto off
       ntp set {ntp server ip address or name}
Syntax: ntp –h

Administrator could manage this function by using GUI mode. For more information, please

refer to page 94.

7.5.7. snmp

Description: "snmp" displays the current status of Simple Network Management Protocol (SNMP) service and governs and monitors network devices and their functions.

Usage:

    snmp
    snmp start
    snmp stop
    snmp add **{ip} {netmask}**
    snmp del **{ip}**
    snmp comm **{community string}**
    snmp contact **{contact mail address}**
    snmp location **{machine location}**
    snmp trap
    snmp trap start
    snmp trap stop
    snmp trap add **{ip} {community string}**
    snmp trap del **{ip}**
    snmp -h

Options:

> **start**
>> This option starts SNMP service.
>
> **stop**
>> This option stops SNMP service.
>
> **add**
>> This option adds a manager of SNMP.
>
> **ip**
>> This option assigns the IP address or network address for the new SNMP manager.
>
> **netmask**
>> This option assigns the netmask for the network address. If
>
> **del**
>> This option deletes the SNMP manager IP address.

comm

This option assigns the Community String.

contact

This option assigns the E-mail address of the recipient to which administrator would like to be sent.

location

This option assigns a location to describe the physical location of LB-8000.

trap start

This option turns on the trap service.

trap stop

This option turns off the trap service.

trap add

This option adds an IP address to be sent the trap.

trap add ip

This option assigns the target IP address that should be notified when a trap is sent by LB-8000

community string

This option assigns the community string which LB-8000 will communicate with SNMP trap manager.

trap del

This option deletes the trap IP address.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the current status of SNMP service.

```
LB8000> snmp
SNMP Agent
Status : Running
System Contact : contact@planet.com.tw
Machine Location : location
Community String : public

Managers :
IP Address        Netmask
==============================
192.168.2.0       255.255.255.0
192.168.3.0       255.255.255.0
```

Syntax: snmp

To turn on the SNMP service.

LB8000> snmp start
[snmp] INFO: SNMP agent starts running.
Syntax: snmp start

To turn off the SNMP service.

LB8000> snmp stop
[snmp] INFO: SNMP agent is stopped.
Syntax: snmp stop

To add a manager of SNMP.

LB8000> snmp add 192.168.5.0 255.255.255.0
[snmp] Info: Update SNMP configuration is completed.
Syntax: snmp add {IP} {Netmask}

To delete the manager of SNMP.

LB8000> snmp del 192.168.5.0
[snmp] Info: Update SNMP configuration is completed.
Syntax: snmp del {IP}

To enter the SNMP community string which allows accessing to real server's

or nonclustered server's statistics.

LB8000> snmp comm public
[snmp] Info: Update SNMP configuration is completed.
Syntax: snmp comm {Community String}

To enter the contact E-mail address of the recipient to which administrator

would like to be sent.

LB8000> snmp contact admin@planet.com.tw
[snmp] Info: Update SNMP configuration is completed.
Syntax: snmp contact {Contact E-Mail address}

To enter a location to describe the physical location of the LB-8000.

LB8000> snmp location headoffice
[snmp] Info: Update SNMP configuration is completed.
Syntax: snmp location {Machine Location}

To display the current status of trap service.

LB8000> snmp trap
SNMP Trap
Auth Trap : Stopped

Target List :
Target IP   Community
=============================
192.168.5.0   test

Syntax: snmp trap

To turn on the trap service.

LB8000> snmp trap start
[snmp] Info: SNMP trap starts running.

Syntax: snmp trap start

To turn off the trap service.

LB8000> snmp trap stop
[snmp] Info: SNMP trap is stopped.

Syntax: snmp trap stop

To add a new trap service.

LB8000> snmp trap add 192.168.5.0 test
[snmp] Info: Update SNMP trap configuration is completed.

Syntax: snmp trap add [IP] {Community String}

To delete the trap service.

LB8000> snmp trap del 192.168.5.0
[snmp] Info: Update SNMP trap configuration is completed.

Syntax: snmp trap del {IP}

To get more help for this command.

LB8000> snmp -h
Description : display, start or stop SNMP service and setup parameters of
managers. start or stop authentication trap and setup trap list.
Usage : snmp
          snmp start
          snmp stop
        snmp add {ip} {netmask}
        snmp del {ip}
        snmp comm {community string}
        snmp contact {contact mail address}
        snmp location {machine location}
        snmp trap
        snmp trap start
        snmp trap stop
        snmp trap add {ip} {community string}
        snmp trap del {ip}

Syntax: snmp –h

Note *After finishing the "**snmp**" setup, you have to synchronize the setting between primary and backup manager by issuing "**lbsync**" command.*

Administrator could manage this function by using GUI mode. For more information, please refer to page 79.

7.5.8. apcups

Description: "apcups" displays the current status of APC UPS supporting. Administrator also can login to the GUI of APC UPS from the GUI of LB-8000.

Usage:

> apcups
> apcups start
> apcups stop
> apcups set **{ip}**
> apcups –h

Options:

> **start**
>
> > This option turns on the Power Chute network shutdown agent.
>
> **stop**
>
> > This option turns off the Power Chute network shutdown agent.
>
> **set**
>
> > This option set the IP address for the APC UPS SNMP management card.
>
> **ip**
>
> > This option assigns the IP address to the SNMP management card in the UPS.
>
> **-h**
>
> > Short form for help, it illustrates the command description and usage.

Instance:

> **To display the current status of APC UPS.**
>
> LB8000> apcups
> APC UPS
> Status : Running
> APC UPS Management Card IP Address : 192.168.2.110

Syntax: apcups

To turn on the Power Chute network shutdown agent.

LB8000> apcups start
[apcups] INFO: ACP UPS starts running.
Syntax: apcups start

To turn off the Power Chute network shutdown agent.

LB8000> apcups stop
[apcups] INFO: ACP UPS is stopped.
Syntax: apcups stop

To setup the APC UPS SNMP card IP address.

LB8000> apcups set 192.168.2.110
[apcups] INFO: ACP UPS configuration is completed.
Syntax: apcups set {IP}

To get more help for this command.

LB8000> apcups -h
Description : display and setup APC UPS
Usage : apcups
            apcups start
            apcups stop
            apcups set {ip}
Syntax: apcups –h

Note *After finishing the "**apcups**" setup, you have to synchronize the setting between primary and backup manager by issuing "**lbsync**" command.*

Administrator could manage this function by using GUI mode. For more information, please refer to page 109.

7.6. Command of System Monitoring

The following commands allow administrator to monitor LB-8000 services.

7.6.1. hmonitor

Description: "hmonitor" displays the current server status of the LB-8000, real servers and

nonclustered servers.

The status of LB-8000 manager, real servers and nonclustered servers has three states:

I   **UP:** The manager or server is up.

I   **DOWN:** The manager or server is down.

I   **UNKNOW:** The LB-8000 service is not running or administrator issue "**hmonitor**"
      command from standby manager.

The status of real servers' service has three states:

I   **UP:** The service is up.

I   **DOWN:** The service is down.

I   **UNKNOW:** The LB-8000 service is not running or administrator issue "**hmonitor**"
      command from standby manager or the health check method of current cluster is "**none**".

Usage:

> hmonitor
>
> hmonitor –h

Options:

> **-h**
>
> > Short form for help, it illustrates the command description and usage.

Instance:

> **To display the current status of the LB-8000 system health and service.**

```
LB8000> hmonitor
***LB-8000 Monitor***

***Managers***
Manager Name      IP Address      Manager Status
============================================
adams10           192.168.2.231   UP
adams20           192.168.2.232   UP

***Real Servers***

Real Server IP Address: 192.168.2.241    Server Status: UP
Service           Port              Service Status
============================================
WWW               80                UP
FTP               21                UNKNOW
```

```
Real Server IP Address: 192.168.2.242     Server Status: UP
Service          Port             Service Status
===============================================
WWW              80               DOWN
FTP              21               UNKNOW

***Nonclustered Servers***

Press <Enter> to continue...
Server Name      IP Address       Server Status
===============================================
```

Syntax: hmonitor

To get more help for this command.


```
LB8000> hmonitor -h
Description : display LB-8000 system health status
Usage : hmonitor
```
Syntax: hmonitor –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 83.

7.6.2. cmonitor

Description: "cmonitor" displays the current status of cluster.

The status of cluster service has four states:

l   Stopped: The LB-8000 service is stopped.

l   Enabled: The LB-8000 service is running and there is at least one real server for
    forwarding requests.

l   Disabling: The cluster has been disabled, but still has some connection records in
    connection table. The cluster will not accept any new connection request.

l   Disabled: The cluster has been disabled, and there is no connection record in connection
    table. The cluster will not accept any new connection request.

The status of real servers' service has five states:

l   Stopped: The LB-8000 service is stopped.

l   Running: The LB-8000 service and the real server's service are running.

l   Disabling: The real server's service has been disabled, but still has some connection
    records in connection table. The real server will not accept any new connection request.

l   Disabled: The real server's service has been disabled, and there is no connection record

in connection table. The real server will not accept any new connection request.

l Down: The real server's service is down and will not accept any new connection request.

Here is the real server's state diagram:
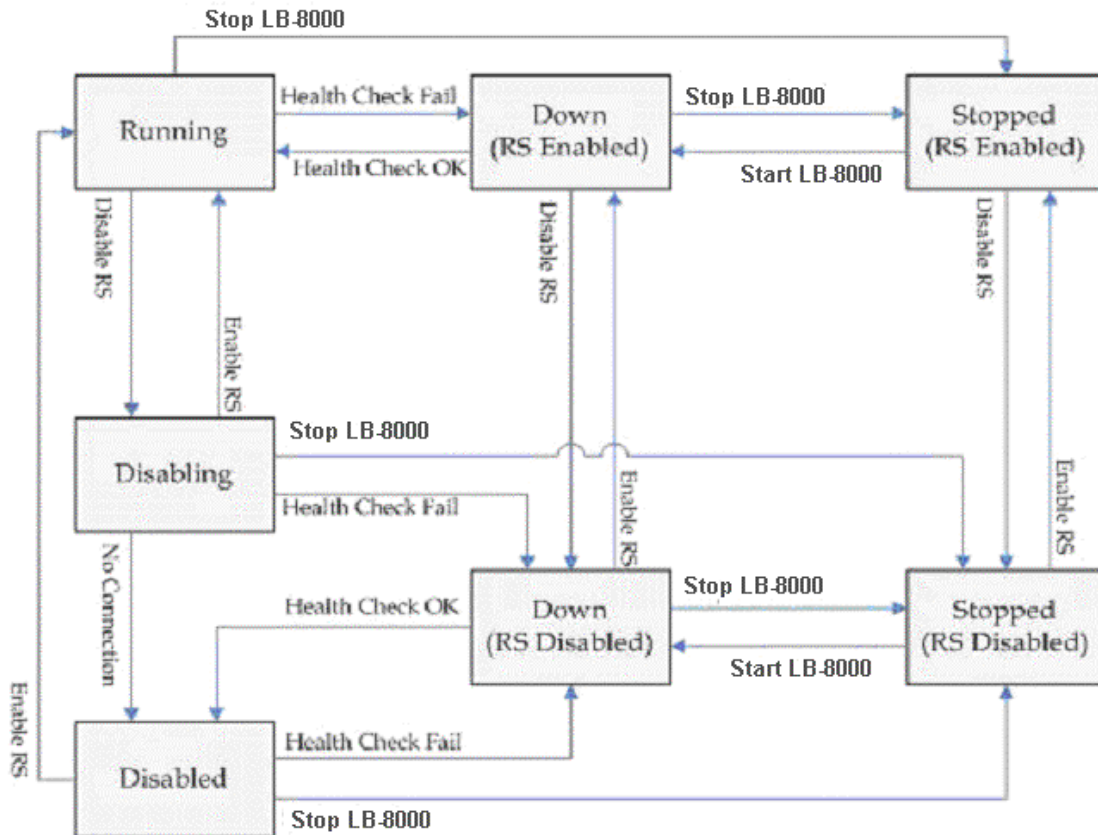
Usage:

    cmonitor

    cmonitor –h

Options:

    -h

        Short form for help, it illustrates the command description and usage.

Instance:

    To display the current status of cluster.

    LB8000> cmonitor

    Cluster Monitor

```
Vitrual Host Name: WWW            IP Address: 192.168.2.151
Port: 80                          Status: Enabled
IP Address      Port    Weight    Connections Status
========================================================
192.168.2.242   80      N/A       N/A         Down
192.168.2.241   80      1         3972        Running

Vitrual Host Name: FTP            IP Address: 192.168.2.161
Port: 21                          Status: Enabled
IP Address      Port    Weight    Connections Status
========================================================
192.168.2.242   21      1         0           Running
192.168.2.241   21      1         0           Running
```

Syntax: cmonitor

To get more help for this command.


```
LB8000> cmonitor -h
Description : display cluster status
Usage : cmonitor
```
Syntax: cmonitor –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 87.

7.6.3. load

Description: "load" displays the current online cluster system load distribution.

Usage:

load

load –h

Options:

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the current online cluster system load distribution.


```
LB8000> load
Load Distribution
```

```
Virtual Host: WWW        IP Address: 192.168.2.151        Port: 80
Scheduler: Round Robin                          Persistency: Off
Real Server      Port   Weight   ActConn   InActConn Total   Distribution
========================================================================
192.168.2.241    80     1        0         3969      3969     100.00%

Virtual Host: FTP        IP Address: 192.168.2.161        Port: 21
Scheduler: Round Robin                          Persistent Time: 10 Min.
Real Server      Port   Weight   ActConn   InActConn Total   Distribution
========================================================================
192.168.2.241    21     1        0         0         0        0.00%
192.168.2.242    21     1        0         0         0        0.00%
```
Syntax: load

To get more help for this command.

```
LB8000> load -h
Description: display load distribution
Usage: load
```
Syntax: load –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 90.

7.6.4. connstate

Description: "connstate" displays the connections statistics information. These statistics information will be reset to zero every one hour or when LB-8000 service is down (includes failover event), and save to the log file. You can view the log file by issuing "**connlog**" command.

Usage:

connstate
connstate –h

Options:

-h
Short form for help, it illustrates the command description and usage.

Instance:

To display the connections statistics information.

LB8000> connstate

Connection State

```
Virtual Host: WWW          IP Address: 192.168.2.151        Port: 80
Real Server       Port        Conns   InPkts  OutPkts  InBytes OutBytes
===================================================================
192.168.2.241     80              4   434.37K       0   29.39M         0

Virtual Host: FTP          IP Address: 192.168.2.161        Port: 21
Real Server       Port        Conns   InPkts  OutPkts  InBytes OutBytes
===================================================================
192.168.2.241     21              0        0        0        0         0
192.168.2.242     21              0        0        0        0         0
```
Syntax: connstate

To get more help for this command.

LB8000> connstate -h
Description: display connections statistics information
Usage: connstate
Syntax: connstate –h

7.6.5. netstat

Description: "netstat" displays network connections which connect to current LB-8000 and the listening ports of current LB-8000.

The output information is:

l **Proto**: The protocol (TCP, UDP, raw) used by the socket.

l **Recv-Q**: The count of bytes not copied by the user program connected to this socket.

l **Send-Q**: The count of bytes not acknowledged by the remote host.

l **Local Address**: Address and port number of the local end of the socket.

l **Foreign Address**: Address and port number of the remote end of the socket.

l **State**: The state of the socket.

    n **ESTABLISHED**: The socket has an established connection.

    n **SYN_SEND**: The socket is actively attempting to establish a connection.

    n **SYN_RECV**: A connection request has been received from the network.

    n **FIN_WAIT1**: The socket is closed, and the connection is shutting down.

    n **FIN_WAIT2**: Connection is closed, and the socket is waiting for a shutdown from the remote end.

    n **TIME_WAIT**: The socket is waiting after close to handle packets still in the network.

    n **CLOSED**: The socket is not being used.

    n **CLOSE_WAIT**: The remote end has shutdown, waiting for the socket to close.

    n **LAST_ACK**: The remote end has shutdown, and the socket is closed. Waiting for

acknowledgement.

- **n** **LISTEN**: The socket is listening for incoming connections.
- **n** **CLOSING**: Both sockets are shutdown but we still don't have all our data sent.
- **n** **UNKNOWN**: The state of socket is unknown.

Usage:

netstat

netstat all

netstat –h

Options:

all

This option is used to display all connections and listening ports.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display current network connections.

LB8000> netstat
Active Internet connections (w/o servers)

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State
tcp	0	0	192.168.2.231:10001	192.168.2.110:2709	ESTABLISHED
tcp	0	0	192.168.2.231:10001	192.168.2.110:2714	ESTABLISHED
tcp	0	2	192.168.2.231:23	192.168.2.106:3172	ESTABLISHED
udp	0	0	192.168.2.231:32798	224.0.0.81:8848	ESTABLISHED

Syntax: netstat

To display all connections and listening ports.

LB8000> netstat all
Active Internet connections (servers and established)

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State
tcp	0	0	0.0.0.0:37	0.0.0.0:*	LISTEN
tcp	0	0	0.0.0.0:111	0.0.0.0:*	LISTEN
tcp	0	0	192.168.2.231:80	0.0.0.0:*	LISTEN
tcp	0	0	192.168.12.231:80	0.0.0.0:*	LISTEN
tcp	0	0	0.0.0.0:10001	0.0.0.0:*	LISTEN
tcp	0	0	0.0.0.0:10002	0.0.0.0:*	LISTEN
tcp	0	0	192.168.12.254:53	0.0.0.0:*	LISTEN
tcp	0	0	0.0.0.0:25	0.0.0.0:*	LISTEN
tcp	0	2	192.168.2.231:23	192.168.2.106:3172	ESTABLISHED
udp	0	0	0.0.0.0:32797	0.0.0.0:*	
udp	0	0	192.168.2.231:32798	224.0.0.81:8848	ESTABLISHED
udp	0	0	0.0.0.0:32799	0.0.0.0:*	
udp	0	0	0.0.0.0:161	0.0.0.0:*	

raw	0	0 0.0.0.0:255	0.0.0.0:*	7
raw	0	0 0.0.0.0:255	0.0.0.0:*	7

Syntax: netstat all

To get more help for this command.

LB8000> netstat -h
Description: display network connections which connect to this manager and the
listening ports of this manager
Usage: netstat
       netstat all

Syntax: netstat -h

7.6.6. halog

Description: "halog" displays the heartbeat and cluster information log.

Usage:

halog

halog –h

Options:

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the heartbeat and cluster information log.

LB8000> halog
        Date | Log

May 22 2003 03:18:03 Start Heartbeat ...
May 22 2003 03:18:03 Link lb8000p:eth0: status up
May 22 2003 03:18:05 Link lb8000:eth0: status up
May 22 2003 03:18:05 Manager lb8000: status up
May 22 2003 03:18:05 Manager lb8000: status active
May 22 2003 03:18:07 ifconfig eth0:0 192.168.3.100 netmask 255.255.255.0
broadcast 192.168.3.255

Syntax: halog

To get more help for this command.

LB8000> halog -h
Description: display heartbeat and cluster information log

Usage: halog

Syntax: halog –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 105.

7.6.7. syslog

Description: "syslog" displays the system log history of LB-8000.

Usage:

syslog

syslog –h

Options:

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the system log of LB-8000.

LB8000> syslog
          Date | Log

May 22 2003 02:19:31 Shutting down heartbeat daemon...
May 22 2003 02:19:33 Shutting down web server...
May 22 2003 02:19:33 Shutting down sendmail service...
May 22 2003 02:19:33 Stopping PowerChute network daemon...
May 22 2003 02:19:33 Shutting down Cluster Management System (CMS)
daemon...

Syntax: syslog

To get more help for this command.

LB8000> syslog -h
Description: display LB-8000 system log
Usage: syslog

Syntax: syslog –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 104.

7.6.8. connlog

Description: "connlog" displays the connection log of cluster.

Usage:

     connlog **{vname}**

     connlog –h

Options:

     vname

        This option assign the virtual host name.

     -h

        Short form for help, it illustrates the command description and usage.

Instance:

     To display the connection log of the cluster.

```
LB8000> connlog www
Date
Type      IP/Name          Port    Conns    InPkts  OutPkts InBytes OutBytes
-------------------------------------------------------------------
Nov 28 2003 18:00:01
V/H      WWW               N/A      10.77K   1.34M      0   89.56M
0
R/S      192.168.2.241   80        5.38K 632.56K      0   42.43M
0
R/S      192.168.2.242   80        5.38K 703.12K      0   47.13M
0
```
Syntax: connlog {vname}

     To get more help for this command.

```
LB8000> connlog -h
Description: display cluster connection log
Usage: connlog {vname}
```
Syntax: connlog –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 105.

7.6.9. mgtlog

Description: "mgtlog" displays the management log of LB-8000.

Usage:

    mgtlog

    mgtlog –h

Options:

    -h

        Short form for help, it illustrates the command description and usage.

Instance:

    To display the management log of LB-8000.

```
LB8000> mgtlog
          Date          |           Log
-----------------------------------------------------------
May 22 2003 03:12:31 The administrator from 192.168.2.106 login successfully.
May 22 2003 03:12:49 The administrator from 192.168.2.106 logged out.
May 22 2003 03:13:27 The administrator from 192.168.2.106 login successfully.
May 22 2003 03:14:10 The configuration of manager setup is modified.
```
Syntax: mgtlog

    To get more help for this command.

```
LB8000> mgtlog -h
Description: display configuration management log
Usage: mgtlog
```
Syntax: mgtlog –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 106.

7.6.10. alertlog

Description: "alertlog" displays alert log of the server.

Usage:

    alertlog

alertlog –h

Options:

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display alert log of the server.

LB8000> alertlog
          Date | Log

May 22 2003 02:19:31 LB-8000 manager b is going to restart.
May 22 2003 02:20:40 LB-8000 manager lb8000 is starting...
May 22 2003 02:20:41 Network link 1 in LB-8000 manager lb8000 is up.
May 22 2003 02:20:41 Network link 2 in LB-8000 manager lb8000 is up.
Syntax: alertlog

To get more help for this command.

LB8000> alertlog -h
Description: display abnormal cluster and manager events log
Usage: alertlog
Syntax: alertlog –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 107.

7.6.11. diagnose

Description: "diagnose" captures the status of system to a log file and compress it as tgz format. The file name is "diagnose.tgz". You can download the log file to your client via TFTP service for analyzing problems.

The "diagnose" command captures the following information:

l   **Version**: The version of current LB-8000.
l   **Hostname:** The hostname of current LB-8000.
l   **System Date:** The date / time value when executing "diagnose" command.
l   **Proc Info:** Display LB-8000 status gathered from /proc directory.
l   **Network Info**: Display the IP configuration of LB-8000.
l   **Route Info:** Display current static routing table of LB-8000.

l   **Disk Capacity:** Display current disk capacity of RAM disk and DOM.

l   **Process State:** Display current process status.

l   **IPtable State:** Display current tables of IP packet filter rules of LB-8000.

l   **Load Balancer State:** Display current load balancing status of LB-8000.

l   **Connection Table:** Display current connection table of LB-8000.

l   **End Time:** The date / time value when finishing "diagnose" command.

Usage:

    diagnose

    diagnose –h

Options:

    -h

        Short form for help, it illustrates the command description and usage.

Instance:

    To capture the status of system log file.

    LB8000> diagnose
    [diagnose] INFO: The result is saved as "diagnose.tgz" in the upload directory !
    Syntax: diagnose

    To get more help for this command.

    LB8000> diagnose -h
    Description: capture the status of system log file to analyze problems
    Usage: diagnose
    Syntax: diagnose –h

7.6.12.   sysinfo

Description: "sysinfo" displays system information such as, CPU model, memory size, and software version, etc.

Usage:

    sysinfo

    sysinfo –h

Options:

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display all of system information.

LB8000> sysinfo
Operating System: Embedded Linux Kernel R2.4
Version: LB-8000 R2.6 Rev. B
CPU: Intel(R) Pentium(R) III CPU
CPU Speed: 1263 MHz
Memory Size: 502 MB
Netwok Interface: Fast Ethernet Card 10/100 Mbps
Syntax: sysinfo

To get more help for this command.

LB8000> sysinfo -h
Description: display system information about CPU model, memory size and S/W version
Usage: sysinfo
Syntax: sysinfo –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 54.

7.6.13. procinfo

Description: "procinfo" displays LB-8000 bootup time, memory status, and CPU usage. About the memory usage, the information includes:

l   **Total:** The total memory of LB-8000.
l   **Used:** Current used memory by LB-8000.
l   **Free:** Current free memory of LB-8000.
l   **Shared:** The shared memory allows one or more processes to communicate via memory that appears in all of their virtual address spaces.
l   **Buffers:** The buffer cache contains data buffers that are used by the block device drivers.
l   **Cached:** The page cache (disk cache) is used to speed up access to images and data on disk.

Usage:

procinfo

procinfo –h

Options:

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the LB-8000 bootup time, memory status, and CPU usage.

LB8000> procinfo
Bootup Date/Time: Wed Nov 12 06:15:14 2003
CPU Usage: 3.15%
Memory: Total   Used   Free   Shared   Buffers
Cached
Mem: 513688KB   139760KB   373928KB   0KB   984KB
99304KB
Syntax: procinfo

To get more help for this command.

LB8000> procinfo -h
Description: display system bootup time, memory status, and CPU usage
Usage: procinfo
Syntax: procinfo –h

7.6.14.   ps

Description: "ps" reports process status, includes:

l **PID:** The process ID.

l **Uid:** The user ID.

l **Gid:** The group ID.

l **State:** The status of process

    n **D:** Uninterruptible sleep (usually IO)

    n **R:** Runnable (on run queue)

    n **S:** Sleeping

    n **T:** Traced or stopped

    n **Z:** A defunct ("zombie") process

l **Command:** The process name.

Usage:

   ps

   ps –h

Options:

    -h

       Short form for help, it illustrates the command description and usage.

Instance:

    To display the LB-8000 current processes.

```
LB8000> ps
  PID   Uid        Gid State Command
    1 root      root      S init
    2 root      root      S [migration_CPU0]
    3 root      root      S [migration_CPU1]
    4 root      root      S [keventd]
    5 root      root      S [ksoftirqd_CPU0]
    6 root      root      S [ksoftirqd_CPU1]
    7 root      root      S [kswapd]
    8 root      root      S [bdflush]
    9 root      root      S [kupdated]
   57 root      root      S [ians_kth1]
   58 root      root      S [ians_kth2]
   86 root      root      S /sbin/syslogd
   88 root      root      S /sbin/klogd
  112 root      root      S /usr/local/apache/bin/httpd
  116 nobody    nobody    S /usr/local/apache/bin/httpd
  117 nobody    nobody    S /usr/local/apache/bin/httpd
  118 nobody    nobody    S /usr/local/apache/bin/httpd
  119 root      root      S /usr/sbin/xntpd -a -c /etc/ntp.conf
  121 nobody    nobody    S /usr/local/apache/bin/httpd
  122 nobody    nobody    S /usr/local/apache/bin/httpd
  125 root      root      S sendmail: accepting connections on port 25
  136 root      root      S /usr/sbin/sagent
  138 root      root      S /usr/sbin/syncserver
Press <Enter> to continue...
```
Syntax: ps

    To get more help for this command.

```
LB8000> ps -h
Description: report process status
Usage: ps
```
Syntax: ps –h

7.6.15. ping

Description: "ping" detects whether the host is alive or not by sending ICMP requests.

Usage:

> ping {ip|hostname}
> ping –h

Options:

> **ip|hostname**
>> This option assigns an IP address or hostname for detecting whether it is alive
>> or not.
>
> **-h**
>> Short form for help, it illustrates the command description and usage.

Instance:

> **To detect whether the IP or hostname is alive or not.**
>
> LB8000> ping 192.168.2.106
> 192.168.2.106 is alive.
> *Syntax: ping 192.168.2.106*
>
> **To get more help for this command.**
>
> LB8000> ping -h
> Description: detect whether the host is alive or not by sending ICMP requests
> Usage: ping {ip|hostname}
> *Syntax: ping –h*

7.6.16. snmpwalk

Description: "snmpwalk" communicates with a network entity using SNMP GETNEXT
requests. You can get the SNMP information of LB-8000 or other real servers.

Usage:

> snmpwalk {ip|hostname} {community string}
> snmpwalk {ip|hostname} {community string} {OID}
> ping –h

Options:

ip|hostname

This option assigns the IP address or hostname of SNMP Agent.

community string

This option assigns the community string.

OID (Object Identifier)

This option assigns the OID specifies which portion of the object identifier

space will be searched using GETNEXT requests.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To communicate with a network entity using SNMP GETNEXT requests.

LB8000> snmpwalk 192.168.2.232 public hm
enterprises.planet.hm.hmVersion.0 = "1.0.7"
enterprises.planet.hm.hmNumServices.0 = 0
enterprises.planet.hm.hmHashTableSize.0 = 2097152
enterprises.planet.hm.hmTcpTimeOut.0 = 900
enterprises.planet.hm.hmTcpFinTimeOut.0 = 100
enterprises.planet.hm.hmUdpTimeOut.0 = 300
enterprises.planet.hm.hmDaemonState.0 = backup(2)
enterprises.planet.hm.hmMcastInt.0 = "eth0"

Syntax: snmpwalk 192.168.2.232 public hm

To get more help for this command.

LB8000> snmpwalk -h
Description: communicates with a network entity using SNMP GETNEXT Requests
Usage: snmpwalk {ip|hostname} {community string}
        snmpwalk {ip|hostname} {community string} {OID}

Syntax: snmpwalk –h

7.6.17.   lsmgr

Description: "lsmgr" displays the role information of LB-8000 manager.

Usage:

lsmgr

lsmgr –h

Options:

-h

Short form for help, it illustrates the command and usage.

Instance:

To display the information of LB-8000 manager.

LB8000> lsmgr
Manager Role: Primary
Manager Name: lb8000p
Domain: com
Backup Manager Name: lb8000b
Backup Manager IP: 192.168.2.222
Syntax: lsmgr

To get more help for this command.

LB8000> lsmgr -h
Description: display manager information
Usage: lsmgr
Syntax: lsmgr –h

7.6.18. connreport

Description: "connreport" is for administrator to know that among total hits, how many are dispatched according to connection table and how many are according to scheduler.

Usage:

connreport

connreport on

connreport off

connreport –h

Options:

on

When "**connreport on**" command is executed, LB-8000 counts the incoming client requests.

off

When "**connreport off**" command is executed, LB-8000 stops to count the

incoming requests and reset the three counters to zero.

-h

Short form for help, it illustrates the command and usage.

Instance:

To display the connection report.

LB8000> connreport
Total hits: 100
Hits forwarded by scheduler: 50
Hits forwarded by connection table: 50
Syntax: connreport

To turn on connection report.

LB8000> connreport on
[connreport] INFO: Connection report is enabled.
Syntax: connreport on

To turn off connection report.

LB8000> connreport off
[connreport] INFO: Connection report is disabled.
Syntax: connreport off

To get more help for this command.

LB8000> connreport -h
Description: display, start or stop the connection report
Usage: connreport
        connreport on
        connreport off
Syntax: connreport –h

Note *Please note that this command will slow down the performance of LB-8000.*

7.7. Command of System Management

The following commands allow administrator to manage LB-8000 services.

7.7.1. passwd

Description: "passwd" changes the administrator's password.

Usage:

passwd

passwd –h

Options:

   -h

      Short form for help, it illustrates the command description and usage.

Instance:

To change the administrator's password.

LB8000> passwd
Old password:admin
New password:admin
Retpye new password:admin
[passwd] INFO: The password updated successfully.
Syntax: passwd

To get more help for this command.

LB8000> passwd -h
Description: change admin. password
Usage: passwd
Syntax: passwd –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 95.

7.7.2. reset

Description: "reset" reset system configuration to default value. When the system is reset to default setting, all the data and function settings include user accounts and network settings will be erased. Please be extra careful before you execute this command.

Usage:

reset

reset –h

Options:

-h

> Short form for help, it illustrates the command description and usage.

Instance:

> **To reset LB-8000 manager to be default setting.**
>
> LB8000> reset
> All your configure will be lose. Are you sure?(yes/no):yes
> *Syntax: reset*
>
> **To get more help for this command.**
>
> LB8000> reset -h
> Description: reset LB-8000 to the its default setting
> Usage: reset
> *Syntax: reset –h*

Administrator could manage this function by using GUI mode. For more information, please refer to page 97.

7.7.3. upgrade

Description: "upgrade" upgrades LB-8000 system to the latest version by inserting the upgraded CD into the CD-ROM drive.

Usage:

> upgrade
> upgrade –h

Options:

> **-h**
>
> > Short form for help, it illustrates the command description and usage.

Instance:

> **To upgrade LB-8000 system to be the latest version.**
>
> LB8000> upgrade
> [upgrade] INFO: The system has upgraded. The changes will take effect after reboot.
> *Syntax: upgrade*

To get more help for this command.

LB8000> upgrade -h
Description: upgrade system from CD ROM
Usage: upgrade
Syntax: upgrade –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 102.

7.7.4. reboot

Description: "reboot" ends all system services, shut down and restart LB-8000.

Usage:

reboot

reboot –h

Options:

-h

Short form for help, it illustrates the command description and usage.

Instance:

To end all system services, shut down and restart the server.

LB8000> reboot
System will be reboot. Are you sure?(yes/no):yes
Syntax: reboot

To get more help for this command.

LB8000> reboot -h
Description: system warm start
Usage: reboot
Syntax: reboot –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 102.

7.7.5. shutdown

Description: "shutdown" terminates all system services and shut down LB-8000 so that it can be safety turned off.

Usage:

> shutdown
> shutdown –h

Options:

> **-h**
>> Short form for help, it illustrates the command and usage.

Instance:

> **To shut down all system services and shut down the server so that it can be safety turned off.**
>
> LB8000> shutdown
> System will be shut down. Are you sure?(yes/no):yes
> *Syntax: shutdown*
>
> **To get more help for this command.**
>
> LB8000> shutdown -h
> Description: shutdown the LB-8000 system
> Usage: shutdown
> *Syntax: shutdown –h*

Administrator could manage this function by using GUI mode. For more information, please refer to page 102.

7.7.6. exec

Description: "exec" executes a batch script which uploaded by TFTP. In CLI, you can issue "**ls**" or "**dir**" command to list the files that you uploaded by TFTP. You can issue "**del**" or "**rm**" command to delete the file you want. You also can issue "**more**" command to view the script file or execution result file.

In the batch script file, you can type any valid commands of CLI. And you also can add the

comment by leading "**#**" sign.

Usage:

exec **{ script file name }**

exec –h

Options:

scrip file name

This option assigns the file that will be executed.

-h

Short form for help, it illustrates the command and usage.

Instance:

To execute a batch script file.

LB8000> exec clustersetting.txt
[exec] INFO: Execute the script file is completed! The result is saved as
"clustersetting.txt.result".
Syntax: exec {scrip file name}

You can check the execution result of this script file by "more" command.

LB8000> more clustersetting.txt.result
CMD: cluster add FTP 192.168.3.33 255.255.255.0 ftp 21 lc 10 port 1
[cluster] INFO: Update cluster configuration is completed!

To get more help for this command.

LB8000> exec -h
Description: execute a batch script which is uploaded by TFTP
Usage: exec { script file name }
Syntax: exec –h

7.7.7. backup

Description: "backup" backups the current system configurations to a tgz file. You can

download this file by TFTP client.

Usage:

backup

backup –h

Options:

    -h

        Short form for help, it illustrates the command description and usage.

Instance:

    To backup the current system configuration to your client computer.

    LB8000> backup
Backup all the system configurations. Are you sure?(yes/no):yes
[backup] INFO: Backup system configurations is completed !
The backup file is named hmconf.tar. You can download it by TFTP client.
Note: The backup file will be deleted after reboot. Please download it before
rebooting LB-8000.
Syntax: backup

    To get more help for this command.

    LB8000> backup -h
Description: backup the current configuration and ready for download
Usage: backup
Syntax: backup –h

Administrator could manage this function by using GUI mode. For more information, please
refer to page 97.

7.7.8. restore

Description: "restore" restores all system configurations from your backup file. You can
upload the backup configuration file to LB-8000 by TFTP client.

Usage:

    restore
    restore –h

Options:

    -h

        Short form for help, it illustrates the command and usage.

Instance:

To restore all system configuration from your backup file.

LB8000> restore
Restore all the system configurations. Are you sure?(yes/no):yes
[restore] INFO: Restore system configurations is completed!
Syntax: restore

To get more help for this command.

LB8000> restore -h
Description: import LB-8000 configuration file
Usage: restore
Syntax: restore –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 97.

7.7.9. tftp

Description: "tftp" displays the current status of TFTP service. Administrator also can start or stop the TFTP service. When TFTP service is on, administrator can use TFTP client to upload the file of system configuration to LB-8000 machine and then restore previous system configurations by issuing "**restore**" command.

Usage:

tftp

tftp start

tftp stop

Options:

start

This option turns on the TFTP service on LB-8000.

stop

This option turns off the TFTP service on LB-8000.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the current status of TFTP service.

LB8000> tftp
TFTP
Status: Running
Syntax: tftp

To start the TFTP service.

LB8000> tftp start
[tftp] INFO: TFTP starts running.
Syntax: tftp start

To stop the TFTP service.

LB8000> tftp stop
[tftp] INFO: TFTP is stopped.
Syntax: tftp stop

To get more help for this command.

LB8000> tftp -h
Description: display, start or stop TFTP service
Usage: tftp
      tftp start
      tftp stop
Syntax: tftp –h

Administrator could manage this function by using GUI mode. For more information, please refer to page 58.

7.7.10. del | rm

Description: "del" or **"rm"** delete a specified file.

Usage:

del | rm **{ file name }**
-h

Options:

    file name

        This option deletes a specified file.

    -h

        Short form for help, it illustrates the command description and usage.

Instance:

    To delete a specified file.

    LB8000> del diagnose.log
    Syntax: del | rm {file name}

    To get more help for this command.

    LB8000> del -h
    Description: delete file
    Usage: del {file name}
    Syntax: del | rm –h

7.7.11.   ls | dir

Description: "ls" or **"dir"** lists the directory contents.

Usage:

    ls | dir
    -h

Options:

    ls | dir

        This option lists directory contents.

    -h

        Short form for help, it illustrates the command description and usage.

Instance:

    To list directory contents.

    LB8000> dir
    diagnose.log
    Syntax: ls | dir

To get more help for this command.

LB8000> dir -h
Description: list directory contents
Usage: ls|dir
Syntax: ls | dir –h

7.7.12.   more

Description: "more" displays the contents of a text file or batch file one screen at a time.

Usage:

more **{ file name }**

-h

Options:

file name

This option displays the contents of specified text file or batch file one screen

at a time.

-h

Short form for help, it illustrates the command description and usage.

Instance:

To display the contents of text file.

LB8000> more backup
123 123 123
#Add a oncluster server
noncluster adams 192.168.2.101
#
#
contact add adams@planet.com.tw
#
#end.
Syntax: more {file name}

To get more help for this command.

LB8000> more -h
Description: display the contents of text file or batch file one screenful at a time
Usage: more {file name}
Syntax: more –h

7.7.13. logout | quit | exit | q

Description: "logout" or **"quit"** or **"exit"** or **"q"** command exits from LB-8000.

Usage:

logout | quit | exit | q
exit –h

Options:

    logout, quit, exit, and **q**

        These options exit from LB-8000 system.

    -h

        Short form for help, it illustrates the command description and usage.

Instance:

    To logout from LB-8000.

LB8000> exit
Connection closed by foreign host.
Syntax: exit

LB8000> logout
Connection closed by foreign host.
Syntax: logout

LB8000> q
Connection closed by foreign host.
Syntax: q

LB8000> quit
Connection closed by foreign host.
Syntax: quit

    To get more help for this command.

LB8000> exit -h
Description: logout from LB-8000
Usage: logout | quit | exit | q
Syntax: logout | quit | exit | q –h

7.7.14. help

Description: "help" displays all of commands and description.

Instance:

To display all of commands and description.

```
LB8000> help
alertlog   : display abnormal cluster and manager events log
apcups      : display and setup APC UPS
backup      : backup the current configuration and ready for
                download
cluster     : display and setup cluster
cmonitor    : display cluster status
connlog     : display cluster connection log
connreport: display, start or stop the connection report
connstate  : display connections statistics information
contact     : display and setup e-mail alert contacts
ctimer      : setup the TCP/IP state timers
date        : display and setup system date
del         : delete file
diagnose    : capture the status of system log file to analyze
                problems
dir         : list directory contents
dns         : display and setup DNS
exec        : execute a batch script which is uploaded by TFTP
halog       : display heartbeat and cluster information log
heartbeat : display and setup heartbeat parameters
lb8000      : display, start or stop LB-8000 service
hmonitor    : display LB-8000 system health status
lbsync      : synchronize primary and backup load balancers system
                parameters
ifconfig    : display and setup network interfaces
ipforward : display and setup ipforward type
load        : display load distribution
logout      : logout from LB-8000
ls          : list directory contents
lsmgr       : display manager information
mgtlog      : display configuration management log
more        : a filter for paging through text one screenful at a
                time
netstat     : display network connections which connect to this
                manager and the listening ports of this manager
noncluster: display and setup non-clustered servers
ntp         : display and setup NTP server
passwd      : change admin's password
ping        : detect whether the host is alive or not by sending ICMP
                requests
procinfo  : display bootup time, memory status and CPU usage
ps          : report process status
reboot      : system warm start
reset       : reset LB-8000 to the its default setting
restore     : import LB-8000 configuration file
rm          : delete file
```

```
route      : display and setup static route
rs         : display and setup real server
setmgr     : setup manager basic information about role, hostname
             and domain name
shutdown   : shutdown the LB-8000 system
snmp        : display, start or stop SNMP service and setup
             parameters of managers. start or stop authentication
             trap and setup trap list
snmpwalk   : communicates with a network entity using SNMP GETNEXT
             Requests
sysinfo    : display system information about CPU model, memory
             size and S/W version
syslog      : display LB-8000 system log
tftp        : display, start or stop TFTP service
upgrade     : upgrade system from CD ROM
vpn         : display and setup VPN
```

Syntax: help

APPENDIX A. SNMP Service of Real server

Windows 2000 managed sever

Follow the steps listed below to enable SNMP service:

1. Click on Control Panel à Select Add/Remove programs.

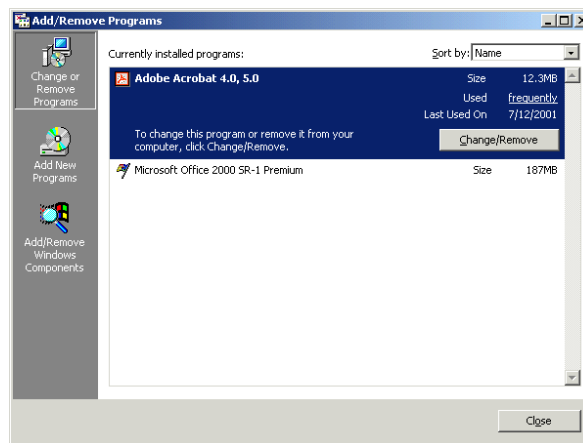2. Click on **[Add/Remove Windows Components]**. (See Figure A-1)

Figure A-1

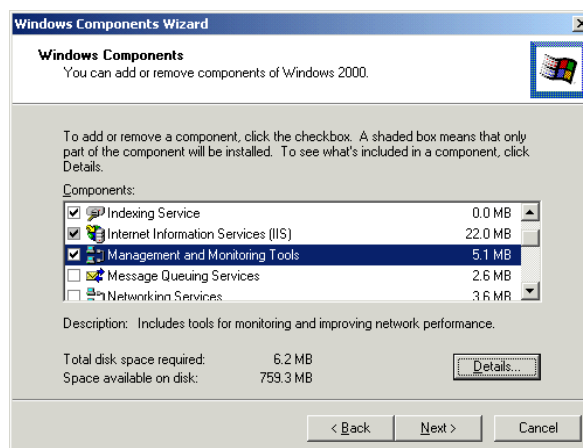3. Check **Management and Monitoring Tool** (See Figure A-2)

Figure A-2

Linux / UNIX real sever

We just illustrate the method of enable SNMP service on RedHat 7.2 since different configurations might be needed for various SNMP servers

1. Don't modify the configuration of SNMP. You just need to start the service by issue "/etc/init.d/snmpd" start.
2. Execute the following command to check whether snmp service is running.
    snmpwalk –c public –v 2c xxx.xxx.xxx.xxx (where xxx.xxx.xxx.xxx is the IP of the real server)

APPENDIX B. LB-8000 Function Table

GUI Item				CLI Command	Content	Page for GUI	Page for CLI
Main Function	**Sub Function**	**Function C**	**Function D**				
Basics	System Info			sysinfo	Version, Registration umber, CPU, CPU Speed, Memory Size, Network Interface	54	163
	Manager Setup			setmgr	Setup Primary/Backup	55	125
	Service Control			lb8000	Start the LB-8000 Server and SNMP Agent	57	錯誤! 尚未定義書籤。
	Telnet/SSH/TFTP			tftp	Enable/Disable1SSH,, Telnet and TFTP Service	58	178
Network	Network Info			ifconfig	Display The Current Network Card info	60	111
	Network 1 Setup			ifconfig eth0	Setup IP Address, Netmask and Gateway	61	111
	Network 2 Setup			ifconfig eth1	Setting of IP Address, Netmask, Gateway and connection with network 1 Interface	62	111
	Router Setup	Static Route		route	Setup Static Router	63	138
		IP Forward		ipforward	Setup IP Forward Type	63	141
	DNS Setup			dns	Setup DNS Address	66	130
	VPN Setup			vpn	Enable/Disable PPTP	66	136
Configuration	HeartBeat Setup			heartbeat	Setting of HeartBeat Interval, Health Check Interval and the maximum number of Health Check demons. Enable/Disable encryption of HeartBeat Message	69	122
	Virtual Host Setup	Add a New Virtual Host	Virtual Host	cluster	Setting of Cluster Type. Virtual Host Name, IP, Netmask, Service, Port Number and Persistency Time. Start Persistency Service.	70	114
			Real server	rs	Add Single/Multiple Server. Setup IP, Port Number and Weight	70	118
			Health Check	cluster	Setup Health Check Type and Server Timeout Value	70	114
		Modify Virtual Host	Virtual Host	cluster	Setting of Cluster Type. Virtual Host Name, IP, Netmank, Service, Port Number and Persistency Time. Start Persistency Service.	70	114
			Real server	rs	Add Single/Multiple Server. Setup IP, Port Number and Weight	70	118
			Health Check	cluster	Setup Health Check Type and Server Timeout Value	70	114
		Delete Virtual Host		cluster	Delete Virtual Host	70	114
	Nonclustered Server Setup	Add Nonclustered Server		noncluster	Setup Server Name and IP	75	131
		Modify Nonclustered Server		noncluster	Setup Server Name and IP	75	131
		Delete Nonclustered Server		noncluster	Delete Nonclustered Server	75	131

				CLI Command	Content		
	Emergency Call Setup			contact	Setup Email Recipient	77	127
	SNMP Setup	System Info		snmp	Enable/Disable SNMP Agent. Setup System Contact, Machine Location and Community String	79	146
		Manager Access		snmp	Setting of IP that ANMP Agent can accept request	79	146
		Trap		snmp	Enable/Disable Auth Trap. Setup Target IP Address	79	146

GUI Item				CLI Command	Content	Page for GUI	Page for CLI
Main Function	Sub Function	Function C	Function D				
Monitor	LB-8000 Monitor	LB-8000 Manager	Server State	hmonitor	Display Server Status	83	151
			SNMP Info		Display CPU Usage, Memory Usage and Inflow/Outflow Info of Network Interface	83	
		Real server	Server State		Display Server Status	83	151
			SNMP Info		Inflow/Outflow Info of Network Interface	83	
		Noncluster	Server State		Display Server Status	83	151
			SNMP Info		Inflow/Outflow Info of Network Interface	83	
	Cluster Monitor	Cluster Monitor	Cluster View	cmonitor	View Virtual Host IP, Port Number and Status of Virtual Host Name. View Server IP, Port Number, Weight and Status. Enable/Disable particular Real server. Enable/Disable all Real server	87	153
			Real server View				
Performance	Load Distribution			load	Display Virtual Host IP, Port Number, Current Connections and the Percentage of Services Distribution	90	155
	Server Performance	CPU Usage			Display CPU Usage Graph	91	
		Memory Usage			Display Memory Usage Graph	91	
		Network 1 Flow			Display Network 1 Flow	91	
		Network 2 Flow			Display Network 2 Flow	91	
System	Date/Time	Date/Time		date	Setup System Time	94	143
		NTP		ntp	Update System Time from NTP (Network Time Protocol) Server	94	144
	Admin Password			passwd	Change the Admin Password	95	171
	UI Language				Change UI Language to Simplify Chinese, Traditional Chinese, English, or Japanese	96	
	Reset to Default			reset	Reset to Default Setting	97	172
	Backup/Restore			backup	Backup/Restore System Configuration	97	176
				restore		97	177
	Upgrade			upgrade	Upgrade System to the Latest Version	102	173
	Reboot/Shutdown			reboot	Reboot/Shutdown LB-8000	102	174
				shutdown		102	175
Log	System Log			syslog	Display System Log (20 messages)	104	160
	HA Log			halog	Display LB-8000 Log (20 messages)	105	156

				105	161
	Connection Log	connlog	Display Connection Log (20 messages)	105	161
	Management Log	mgtlog	Display Management Log (20 messages)	106	162
	Alert Log	alertlog	Display Alert Log History of the Server (20 messages)	107	162
	Log Export		Export System Log, HA Log, Management Log, Connection Log, and Alert Log	107	
UPS	APC UPS	apcups	Enable/Disable APC UPS	109	150
Logout		logout, exit, q, quit	Log Off from LB-8000	109	179
		ctimer	Setup the TCP/IP state timers		133
		exec	Execute a batch scrip which is uploaded by TFTP		175
		lsmgr	Display manager Information		165
		lbsync	Synchronize primary and backup system parameters		126
		connreport	Display, start or stop the connection report		170
		connstate	Display the connections statistics information		156
		del / rm	Delete file		179
		diagnose	Capture the status of system log file for analyzing problems.		163
		ls / dir	List directory contents		180
		more	Display the contents of text file or batch file one screenful at a time		181
		netstat	Display network connections, routing tables, and interface statistics		157
		procinfo	Display LB-8000 bootup time, memory status, and CPU usage		165
		ps	Report process status		166
		ping	Detect whether the host is alive or not by sending ICMP requests		168
		rs	Display the current status of real server and configure the real server for a cluster		70
		snmpwalk	Communicate with a network entity using SNMP GETNEXT requests.		168

APPENDIX C. Software Specifications

Compatible Server OS

Windows, Mac OS, Linux, UNIX and all other OS supporting TCP/IP

Supporting Protocols or Applications

l   **WEB:** HTTP, HTTPS, ASP, PHP, JSP, VB (Virtual Basic Script), Active X, JAVE, VRML, CGI

l   **Email:** POP3, IMAP, SMTP

l   **FTP:** active and passive mode under NAT and direct routing

l   **Streaming:** RTSP, MMS

l   **Other TCP/IP based protocols:** Telnet, NNTP, LDAP, RADIUS, DNS...etc.

Load Balancing Modes

Round robin, weighted round robin, least connections and weighted least connections

Traffic Management Modes

NAT, direct routing and IP tunneling

Server Health Check

None, ARP, ICMP, port and content check

Fault Tolerance

l   Bi-directional stateful failover

l   Active-standby configuration

l   Nice fail back

l   Dual-path heartbeat

User Interface

l   Web GUI, based on Java Applet

l   Command line interface, through console, Telnet or SSH

Scalability

No limit on real server and cluster (VIP)

Contents Management in Real server

l   IP Forwarding
l   VPN (PPTP)

Detailed Logging

System, management, HA, Connection and alert with export and monthly report function

TFTP Support

Upload the batch file through TFTP

SNMP Support

SNMP enterprise MIB and SNMP Trap

Embedded OS
Sync of Configurations and Logs
Graceful Shutdown
ECOM Protocol
Active/Passive FTP Support
Source IP Persistence
Static Route
Email Alert
NTP (Network Time Protocol) Support
DNS Proxy
Firmware Upgrade through CD
Outbound NAT
APC UPS Support
Java Applet-based Real Time Status Monitoring

APPENDIX D. Hardware Specifications

CPU

Dual 2.4GHz Intel® Xeon® processors with 512KB L2 cache, supporting 400/533MHz front side bus speed

Memory

512 MB registered ECC DDR SDRAM, upgradeable to 4GB

Network Interface

2 x Gigabit Ethernet NIC

Drive Bay

Slim 24x CD-ROM

Thermal Heat Sink

The CPU heat sinks provide the following features:

l   Support Intel® Xeon® 2.4GHz processor (or above) with FSB 400/533MFz

l   Copper fins provide support heat conductivity

PSU

350W 1U power supply 100-240V 9A AC

Dimensions

1.67 x 16.73 x 24.5 inches (H x W x D)

42.42 x 424.94 x 622.30 mm (H x W x D)

Weight

10kg (Net)

Index

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V