

LoadMaster 4.X QuickStart Guide

1 What You Will Need

In order to get started with the LoadMaster, you will need the following items:

- A monitor with standard VGA 15-pin connection and USB keyboard

Or

- A workstation with network support and/or serial port. This will allow you to complete the Quick Setup using the Web From Start option or console access by serial cable.

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Web From the Start

- Cross-over cable and/or Ethernet cable
- An AJAX-capable browser, such as Internet Explorer 6/7, Firefox 2, or Safari 2

Console Access via Serial Cable

- A serial cable (included)
- Terminal emulator (such as HypterTerminal for Windows)

In addition, you will also need

- a LoadMaster with:
 - Power cable
 - Ethernet cable(s)

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This document assumes the reader is familiar with the basics of TCP/IP networking, web serving, and fundamental network topology.

2 Network Considerations

Before setting up the LoadMaster, take a moment to consider how the LoadMaster will fit into your network. Generally, an implementation of the LoadMaster in a given network environment will be one of two types: A one-armed configuration or a two-armed configuration.

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2.1 One-armed

In a one-armed configuration, the Virtual Servers and the Real Servers are configured on the same subnet. The LoadMaster connects to the Layer 2 network through a single interface, eth0. (Throughout this documentation the terms eth0 and “Network side” may be used interchangeably. The terms eth1 and “Farm side” may also be used interchangeably.)

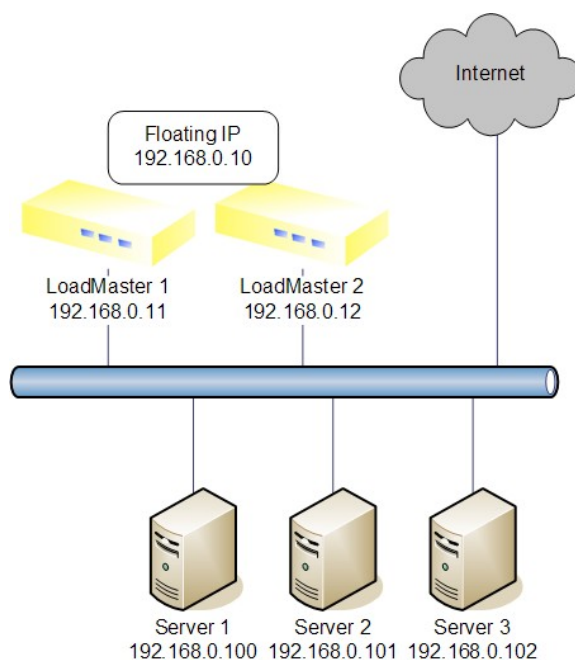


Figure 1: One-armed HA configuration

If you already have a firewall in place performing NAT, so that the addresses for the servers in the DMZ are already in a non-routeable (RFC1918) IP space (e.g., 192.168.x.x or 10.x.x.x), a one-armed LoadMaster configuration may be simpler. The LoadMaster(s) can be dropped in on the DMZ with no large-scale network changes required.

2.2 Two-armed

In a two-armed configuration, the Virtual Servers and the Real Servers are on two distinct subnets. The LoadMaster has connections to two networks, at eth0 for the virtual servers (usually the public Internet), and at eth1 one for the Real Servers.

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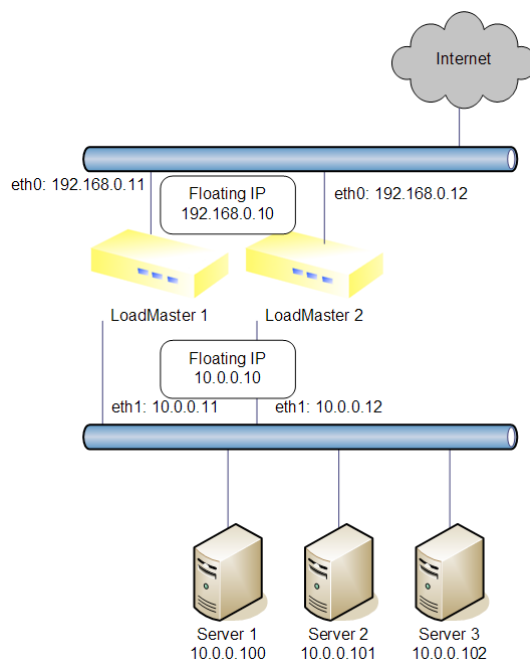


Figure 2: Two-armed HA configuration

2.3 Default Gateway

Another consideration in setting up a LoadMaster is the default gateway on the servers themselves (sometimes referred to as the default route). In a one-armed configuration, it is necessary to have the LoadMaster as the default gateway. There are some situations where the LoadMaster doesn't need to be the default gateway, but those have various limitations in terms of logging on the real servers. In a two-armed configuration, it is necessary to have the LoadMaster as the default route.

2.4 Management IP Addressing

If you're implementing a single LoadMaster (as opposed to a paired LoadMaster HA configuration) you'll need one dedicated IP address for every Ethernet interface that you utilize. If you're implementing a LoadMaster HA pair of appliances you'll need *three* dedicated IP addresses for each Ethernet interface that you utilize. For LoadMaster HA, each Ethernet on each LoadMaster appliance will have its own IP address, and there will be a shared IP address between them, for a total of three IP addresses. These addresses are reserved for management of the LoadMasters themselves. You will add additional IPs later when you create Virtual Services.

In HA configurations, you will configure the Real Server's default gateway address to point to the shared IP address on the subnet of the Real Servers.

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Table 1 and Table 2 show two sample IP addressing schemes, one for a standalone LoadMaster and one for a LoadMaster HA pair. In both cases, these are configurations for a two-armed configuration with the Network side (eth0) on a subnet of 192.168.0.0/24, and the Farm side (eth1) on a subnet of 192.168.1.0/24.

Network Segment	Interface	Subnet	IP Address
Network side	eth0	192.168.0.0/24	192.168.0.10
Farm side	eth1	192.168.1.0/24	192.168.1.10

Table 1: Standalone IP addressing

Network Segment	Interface	Subnet	IP Address
Network side	eth0	192.168.0.0/24	Shared: 192.168.0.10 HA-1: 192.168.0.11 HA-2: 192.168.0.12
Farm side	eth1	192.168.1.0/24	Shared: 192.168.1.10 HA-1: 192.168.1.11 HA-2: 192.168.1.12

Table 2: HA IP addressing

As a reminder, these addresses are used exclusively as access IPs for administration (and in some cases as default gateways for real servers). IPs for virtual services are added later through the Web User Interface (WUI).

3 Connecting to the LoadMaster

For the initial setup of the LoadMaster, configuration may be done one of two basic ways via console or web: Console access is provided through the serial port, or with a standard monitor and USB keyboard. Both result in the same console access, so use whatever method best suits your needs. Web From the Start access requires a workstation with an AJAX supported browser.

3.1 VGA Console

You can make the initial configuration with the LoadMaster through a standard monitor (with 15-pin VGA connector) and a USB keyboard. Simply plug the display and keyboard in and power the LoadMaster on. Please ensure that the USB keyboard is the only USB-attached device. (A USB mouse is unneeded and should not be attached to the LoadMaster.)

3.2 Serial Connection

To use a serial connection, you'll need a serial cable (included with the LoadMaster) and a

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terminal emulation program to connect through the serial port on a workstation. For Windows users, a commonly used terminal emulation program is HyperTerminal, and is generally included with Windows (located under Programs, Accessories, Communications).

In Linux, a popular terminal program is minicom, which is included in most current distributions.

You'll need to set your terminal emulation program with the following settings:

- Speed: 115200 (N.B., this speed is rarely a default setting in any terminal emulator.)
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

Figure 3 illustrates the proper port settings in HyperTerminal for use with a Loadmaster:

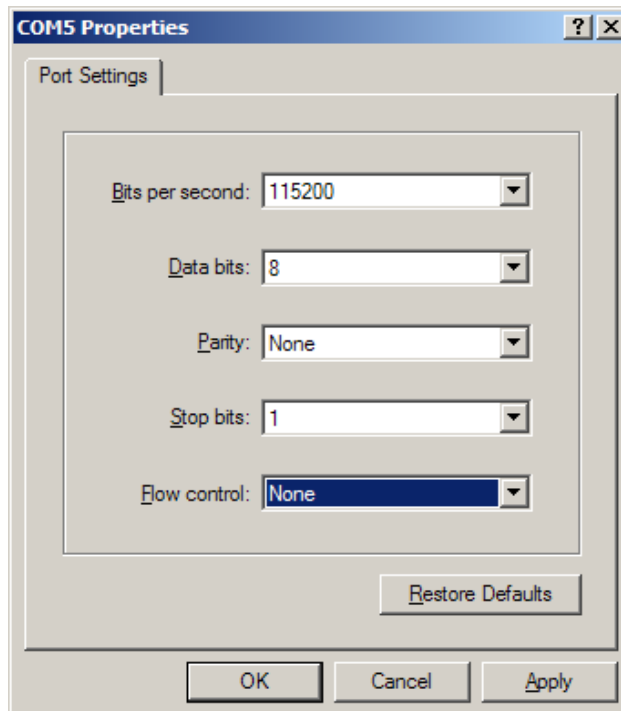


Figure 3: HyperTerminal COM Port Properties

3.3 Web From the Start

To complete the initial setup of LoadMaster you will need a web browser with AJAX support. Network access to LoadMaster can be achieved using two methods. By default factory shipped LoadMaster have been assigned the IP address **192.168.1.101** on eth0, which corresponds to the Ethernet port labeled 0. If your network supports the 192.168.1.XXX subnet then simply confirm that the 192.168.1.101 address is not reserved before attaching LoadMaster to the

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network. If your network doesn't support the 192.168.1.XXX subnet, simply run a cross over cable between Ethernet port 0 on LoadMaster and your workstation. Make sure to statically address your workstation with an IP address on the 192.168.1.XXX (eg. 192.168.1.115) subnet. Confirm you can reach LoadMaster by using the ping utility from your workstation. Continue following the Initial Setup via Web section.

4 Initial Setup via Console

HA Note: If you've purchased an HA configuration, you should first configure the system that came with the HA-1 licensing, and the HA-2 system second.

Whether you're connected through a monitor and keyboard or through the serial port, you'll be presented with a login screen:

```
LoadMaster from KEMP Technologies
(c) 2002-2007 KEMP Technologies
Version 4.0
lb100 login:
```

Log into the LoadMaster with the username "bal", and password of "1fourall".

When logging in for the first time, the LoadMaster will ask for a license (Figure 4). The LoadMaster ships with a license letter, which contains the license key as well as the license type.

Be sure to match the serial number on the license letter to the serial number of the box. A license key tied to one serial number will not work on another LoadMaster. Also, if the LoadMaster is being setup in an HA pair, configure the HA-1 unit **first**. Do not start to configure the HA-2 LoadMaster until the HA-1 LoadMaster setup is completed.

Enter the license information. Once entered properly, a brief message will be displayed showing that the license key was validated correctly.

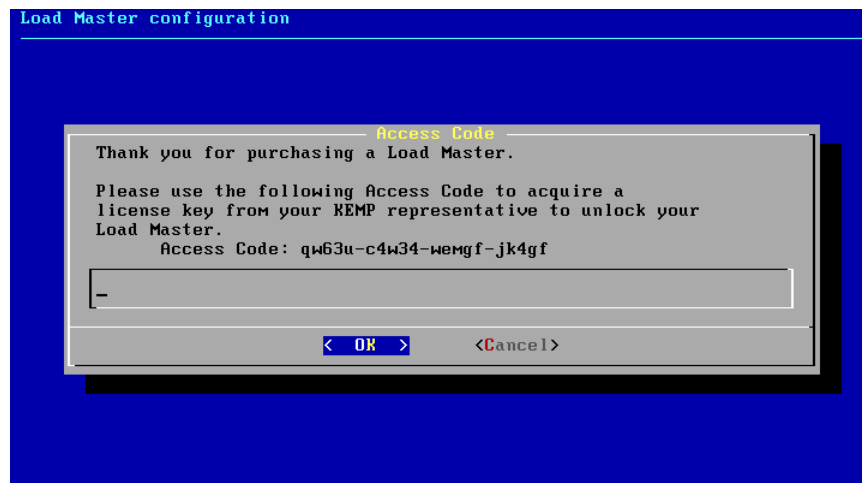


Figure 4: Enter License Key

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The LoadMaster will then launch the “Quick Setup” configuration utility. (This utility is accessible after the initial setup, should it be needed.)

The first task in the Quick Setup utility is to configure the network information for the eth0 (“Network” side) Ethernet interface. This is the leftmost interface on the LoadMaster; generally it's the one that will be accessible from the Internet (typically through a firewall).

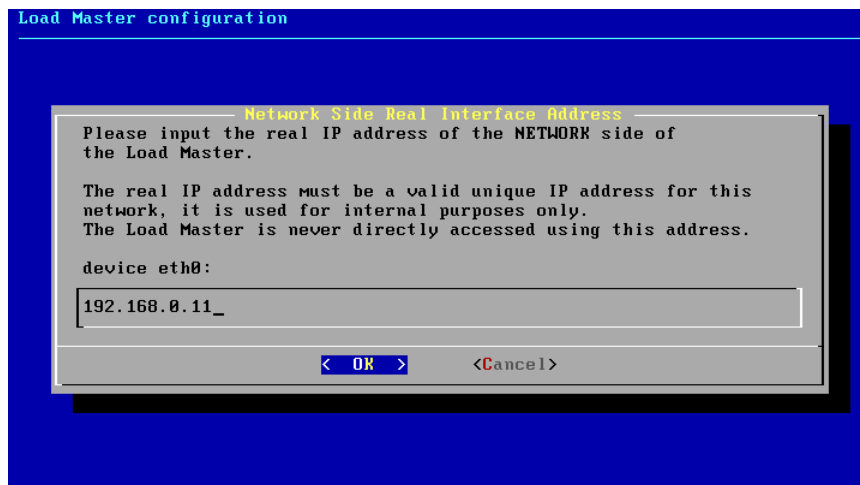


Figure 5: Enter Network Side eth0

In the example above, the IP address of 192.168.0.11 is used.

The configuration utility will then ask for the network netmask. You can enter this information in octet format (e.g, 255.255.255.0) or in slash (CIDR) format (e.g., /24).

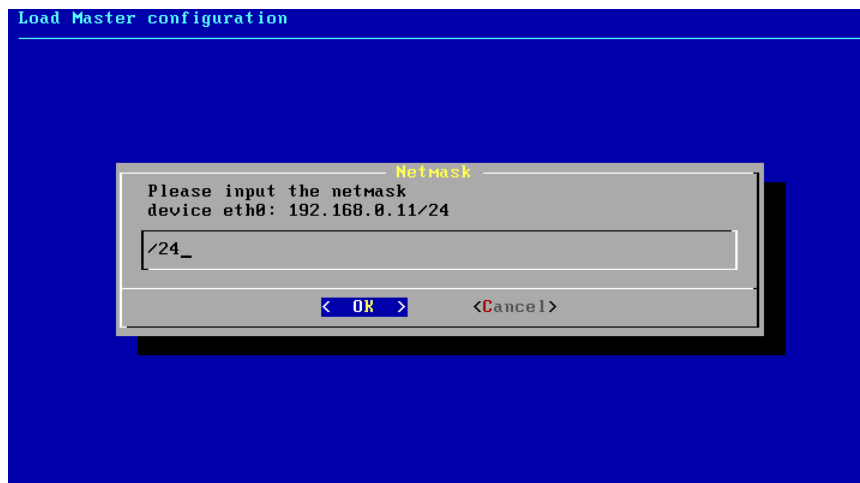


Figure 6: Netmask

Next (Figure 7), the Quick Setup asks for the a VLAN ID. Most users should leave this entry blank. It is only when the switch port that the LoadMaster is connected to is specifically configured for 802.1Q VLAN tagging that a value for this option is required, and that is not a common configuration.

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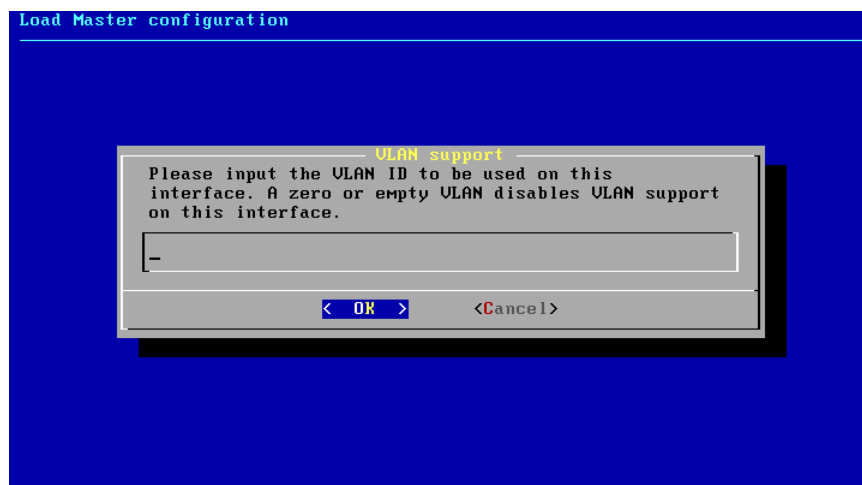


Figure 7: VLAN Information

If you've purchased a LoadMaster HA pair, you'll then be asked for the shared IP address (Figure 8).

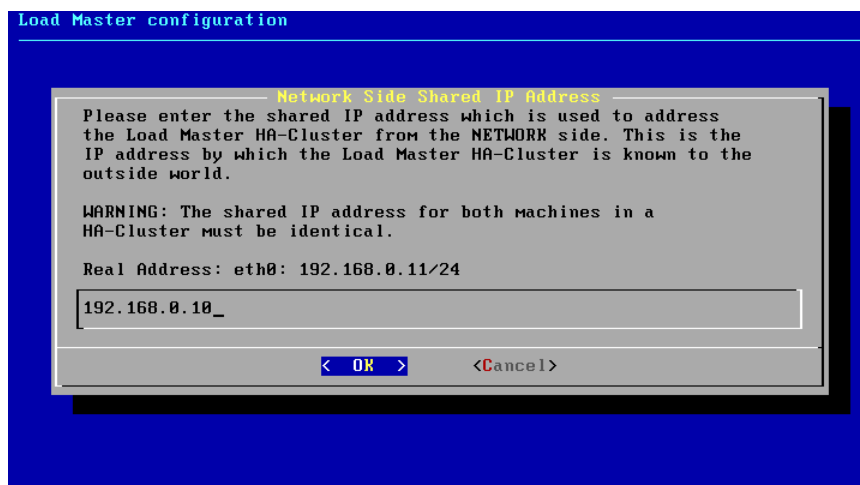


Figure 8: Shared IP Address

The shared IP address is the IP you'll use for remote administration of the LoadMaster (via https or ssh). The shared IP will resolve to the active unit in the HA pair. In a LoadMaster HA pair, changes on the WUI made on the active unit will be duplicated on the standby unit automatically.

You'll be asked for comparable information for the second, "Farm" side interface on the LoadMaster (eth1). For a one-armed configuration, leave the field blank. Quick Setup will then skip over the remaining "Farm" side configuration (Figure 9). If you are using the Farm side, input the information just as you did for the Network side. If you need to add this network later, you can do so through the WUI at a later time.

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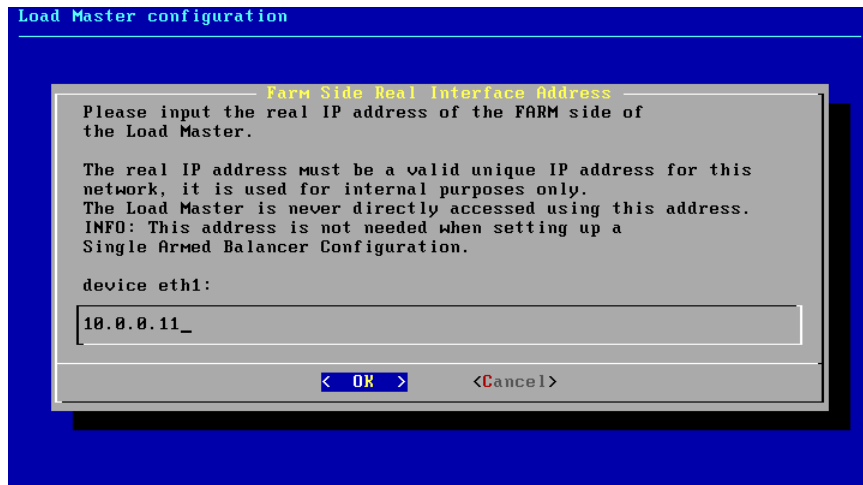


Figure 9: Farm-side (eth1) Configuration

Next (Figure 10), choose a hostname for the LoadMaster. In this example, the LoadMaster is given the name “lm1”.

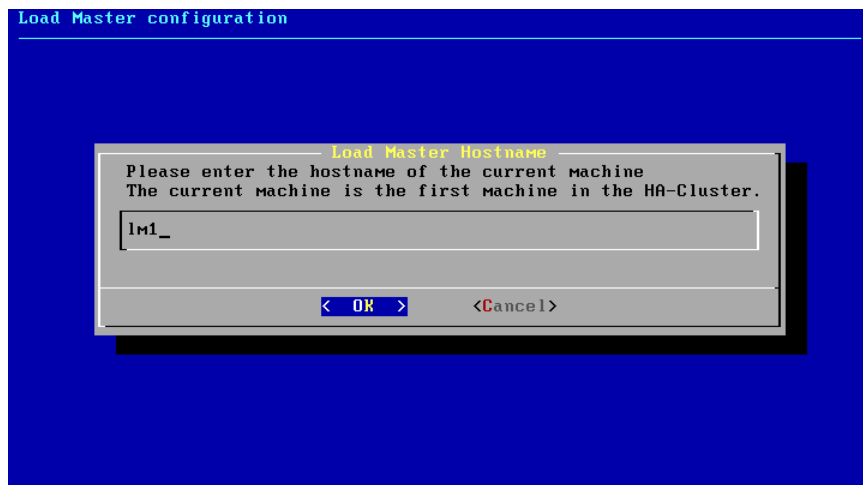


Figure 10: Hostname Configuration

For a LoadMaster HA configuration, the Quick Setup will also ask for the name of the secondary unit. In this example (Figure 11), it will be named lm2.

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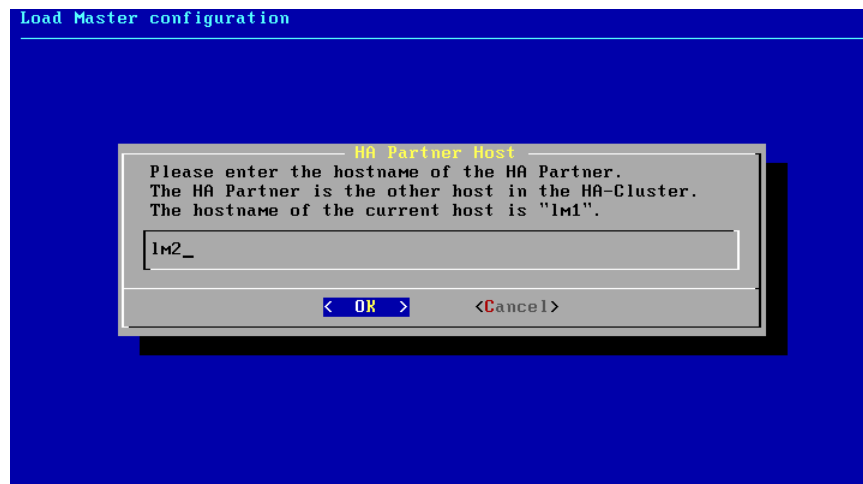


Figure 11: Partner Hostname Configuration

For the "Name Server IP Addresses" screen (Figure 12), enter at least one IP address of an accessible nameserver.

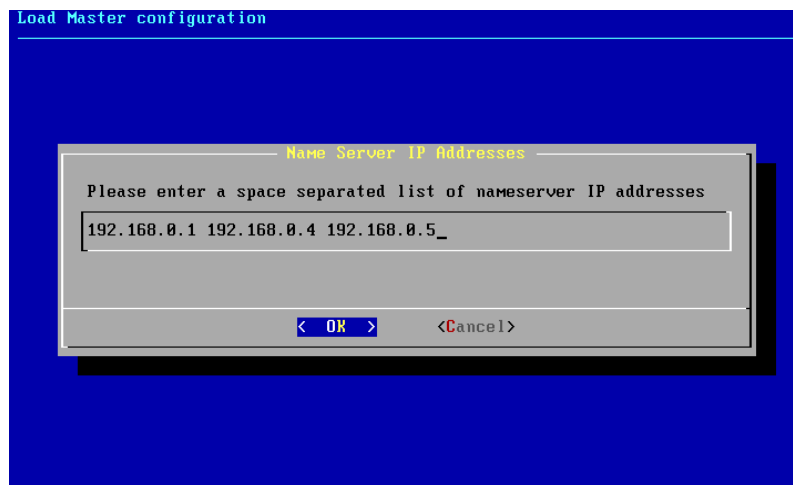


Figure 12: Name Server IP Entry

You'll next be asked for a list of search domains. You can enter search domains or you can leave this blank.

Next you'll be prompted to enter the default gateway that the LoadMaster will use to access the Internet (Figure 13). The default gateway must be an address on the same subnet as the Network-side interface, eth0, regardless of whether you are creating a one-armed or two-armed configuration.

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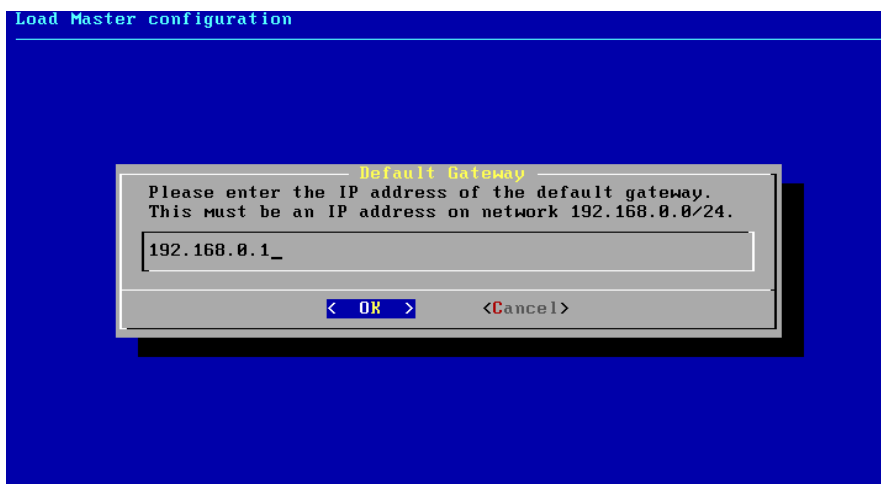


Figure 13: Default Gateway Configuration

When you've completed these steps, you'll be asked if you want to activate the changes now. Select "Yes". You'll then be presented with the main menu, shown in Figure 14.

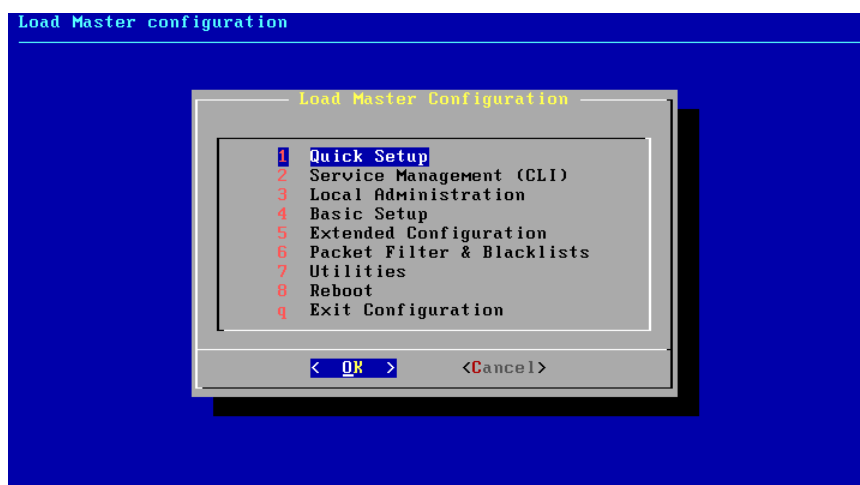


Figure 14: Main Menu

If you made a mistake or you ever need to go through the Quick Setup Menu again for any reason, select option 1: Quick Setup, and the system will take you through the steps you just completed again. Once the LoadMaster(s) is/are on the network, these options can also be accessed via the WUI (Web User Interface).

4.1 HA Configuration: HA-2 Setup

If you're only using a single LoadMaster, skip this section and move onto the "WUI Configuration" step. If you do have an HA configuration, make sure that prior to powering up the HA-2 unit that there is network connectivity on the Network side interface (eth0). Also, if you are creating a one-armed configuration, please insert an Ethernet crossover cable between the two appliances at eth1. The LoadMaster will automatically detect the presence of this cable and use it as an alternate synchronization path. No explicit configuration is required for the LoadMaster to make

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use of this direct connection

Once the HA-1 licensed system has been configured, power up the HA-2 unit and log in as you did for the HA-1 system. As with the HA-1 unit, you will be prompted for the license (a printout of the license will be included with the HA-2 system) and then the Quick Setup will be launched. First you'll be asked for the Network side IP address (Figure 15):

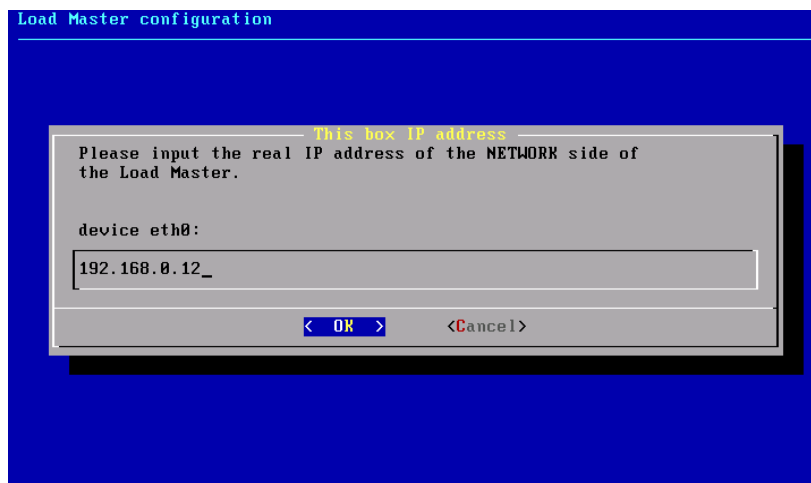


Figure 15: HA-2 Network Configuration

Enter the real IP address of the HA-2 unit. This IP address should be distinct from any address assigned to the HA-1 unit. You'll then be asked for the netmask and VLAN as you were for HA-1. You'll then be asked for the *partner* IP address, the real IP address of HA-1 on the Network (eth0) interface (Figure 16). Note: This is not the shared IP address, but the real IP of the HA-1 system.

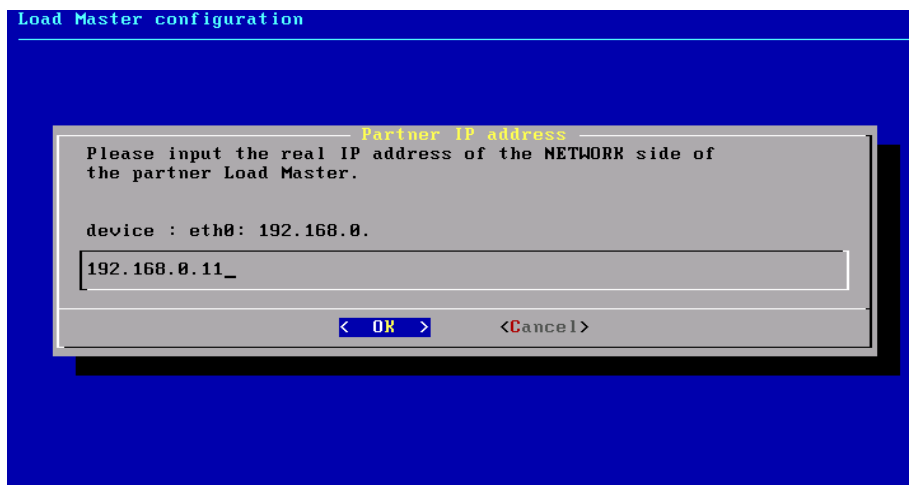


Figure 16: HA-2 Partner IP address

The HA-2 unit will now retrieve the configuration from the HA-1 unit. This process can take up to a minute, and when complete, you'll see a message indicating the transfer was successful (Figure 17).

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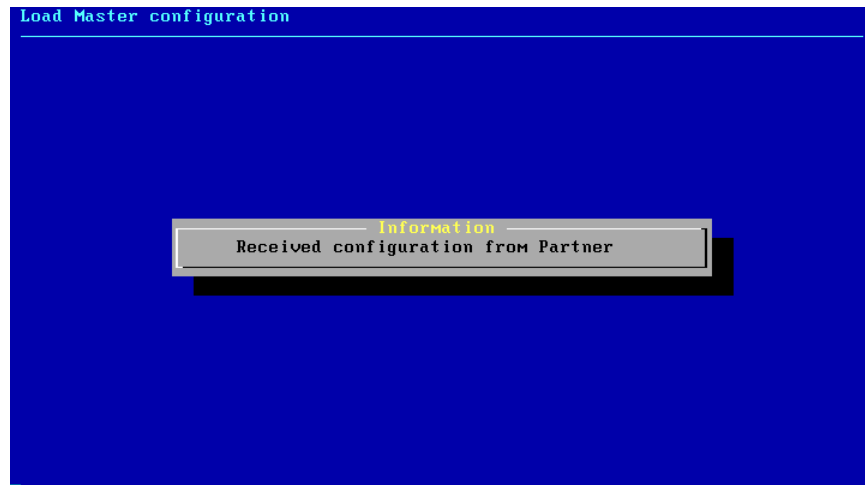


Figure 17: Configuration Retrieval

Both units are now initially configured, and you can continue the remainder of the configuration through the WUI (Web User Interface).

5 Initial Setup via Web

Enter <https://192.168.1.101> in your web browser; make sure the URL accessing LoadMaster is using **HTTPS** and not **HTTP**. The first task is to enter the license information.

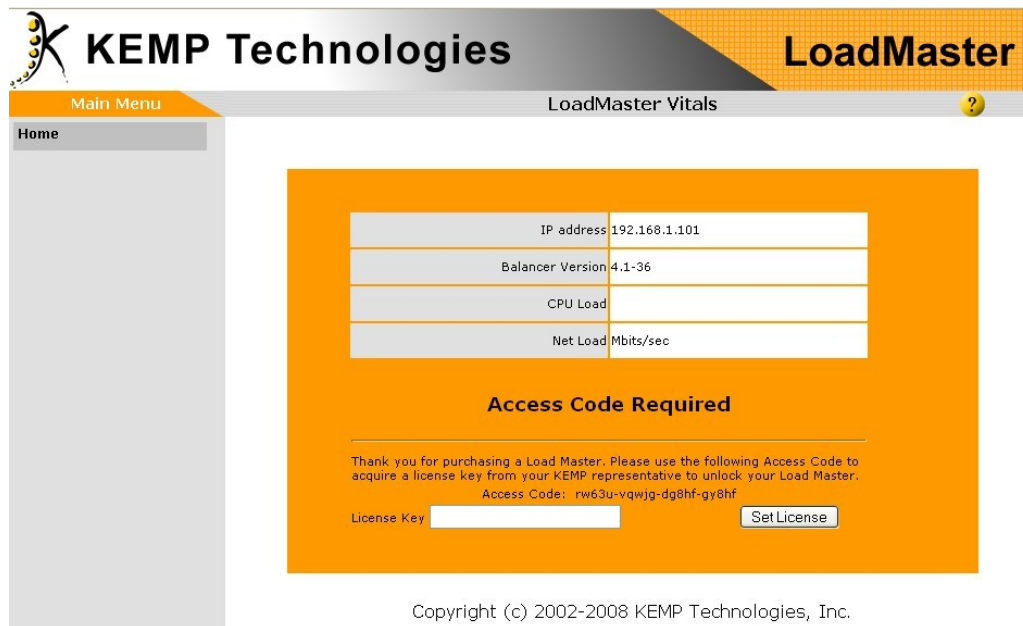


Figure 18: Access Code

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Once you set the license you will be challenged for security credentials. The default credentials are login: **“bal”** and password: **“1fourall”**.



Figure 19: WUI Authorization

Once you have supply the default credentials you will be required to change the default factory password. Please make sure that the new password is alphanumerical and between 6-8 characters.

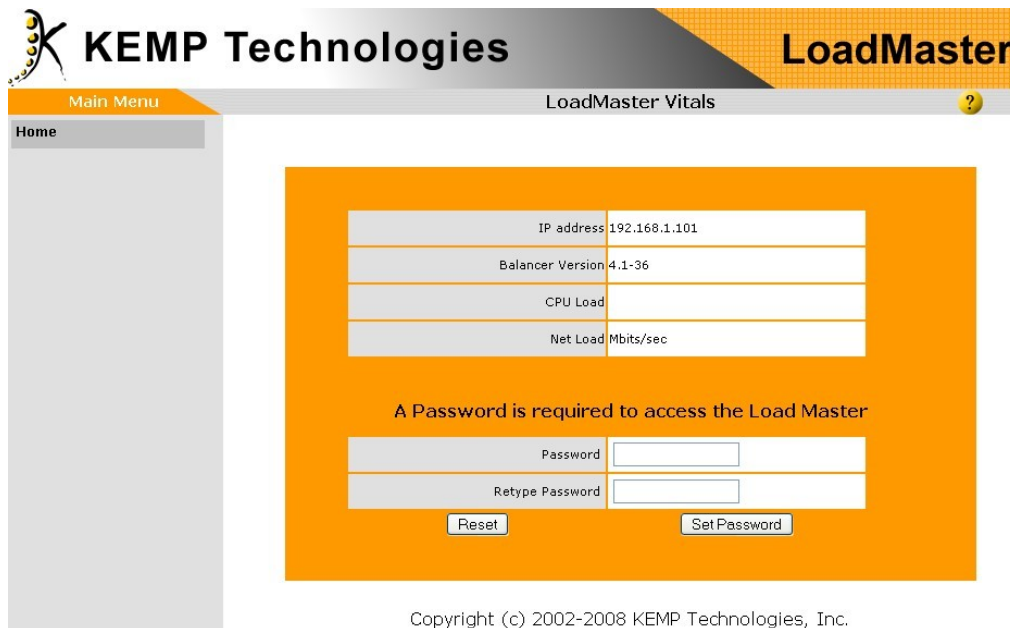


Figure 20: Password Reset

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Continue with the password reset by clicking the “Continue” link. You will now be challenged for the new security credentials.



Figure 21: WUI Authorization

LoadMaster can now be configured for your network. Navigate to System Configuration -> Interfaces and configure the port(s) as required. Once configuration is complete power down LoadMaster, attach LoadMaster to the network if not already done, and power up the appliance. For detailed configuration information please review the LoadMaster Manual.

6 Web User Interface (WUI)

From this point forward, virtually all aspects of the LoadMaster can be configured through the WUI (Web User Interface). The WUI interface utilizes HTTPS (Secure HTTP), so all passwords and information exchanged are encrypted in transit over the network.

6.1 Connecting for the First Time

To access the WUI, put the IP address of your LoadMaster (either the Network or Farm interface IP address, whichever you have access to from your subnet) into the browser as an HTTPS URL. For example, if the IP address you have configured is 192.168.0.10, then the URL would be <https://192.168.0.10>. Be sure to use “https” and not “http”; insecure http configuration is not supported on a LoadMaster.

When the URL comes up, you'll get some variation of security warning (Figure 18), depending on your browser (this warning is from Internet Explorer 7.0):

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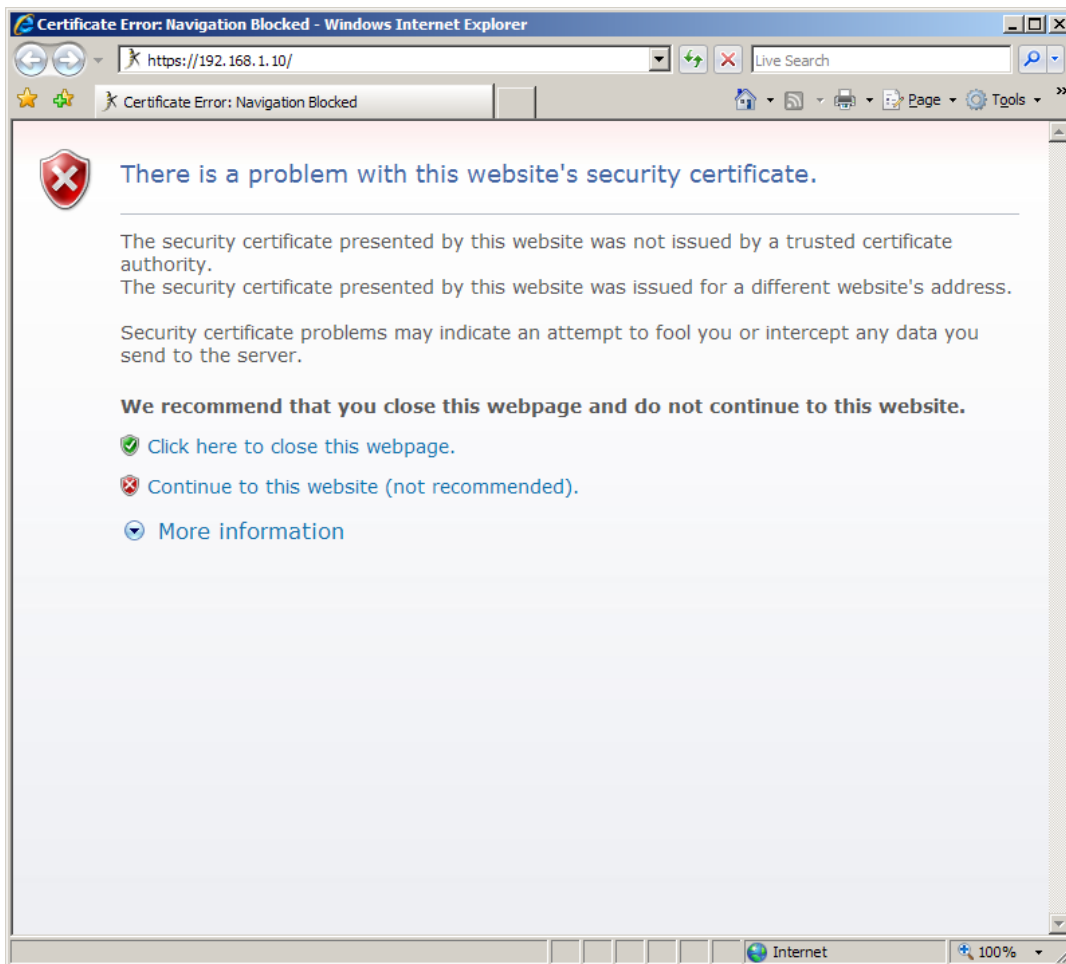


Figure 22: Security Warning

There is no cause for concern. What this alert means is that the LoadMaster is signing its own SSL certificate, instead of relying on a certificate issued by a trusted certificate authority (CA), such as Verisign or Thawte. Since this is an internal network device that you've setup, this is normally not an issue. This is only for administration of the LoadMaster itself; no one accessing the load balanced sites on the LoadMaster will see that alert. You may see this alert every time you log in, depending on your browser.

(Note: If you use the SSL offloading/acceleration functionality of the LoadMaster or load balance SSL servers behind the LoadMaster for a public website, you'll be able to install certificates from a CA for those sites onto the LoadMaster in a subsequent step.)

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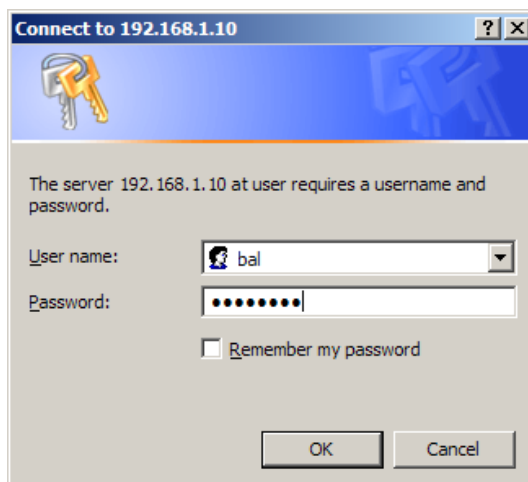


Figure 23: WUI Authentication

You'll be prompted to authenticate. The username is “bal”, and the password is the same default, “1fourall”.

The first screen you'll see (Figure 20) is a prompt to change the password from the default “1fourall”. This is a mandatory step to take; it ensures that no remote access will be possible with a widely known default password. (The username will remain “bal”.)

IP address	192.168.1.101
Balancer Version	4.0-20
CPU Load	
Net Load	Mbits/sec
A Password is required to access the Load Master	
Password	<input type="password"/>
Retype Password	<input type="password"/>
<input type="button" value="Reset"/> <input type="button" value="Set Password"/>	

Figure 24: Password change page

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6.2 Configuring a Virtual Service

Now that you're in the WUI, you can create a Virtual Service. From the main menu (shown below) select the "Virtual Services" tab from the top (Figure 16).

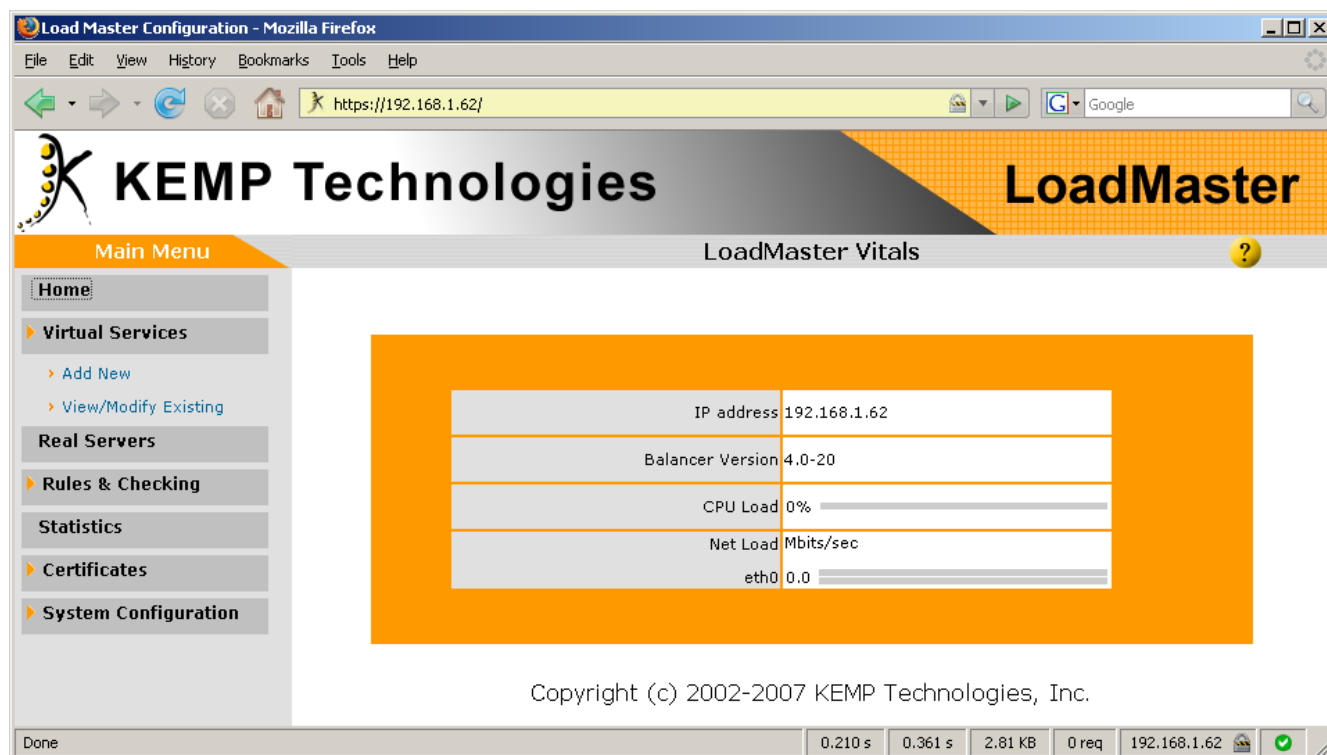


Figure 25: LoadMaster WUI Main Menu

You'll see a link for "Add New". Click there, and you'll be presented with several configuration fields (Figure 17): IP address, port, and protocol (TCP or UDP). The IP address will be how users will access your load balanced servers, and it should be on a subnet that is accessible to the Internet (or Intranet) either directly or by NAT from a firewall. If this is to be a standard web server, the port should be 80, and the protocol should be TCP.

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Please Specify the Parameters for the Virtual Service.

Virtual Address	<input type="text" value="192.168.1.200"/>
Port	<input type="text" value="80"/>
Protocol	<input type="text" value="tcp"/>

Figure 26: Adding a Virtual Service

In this example, I've used the IP address of 192.168.1.200, port 80, protocol as TCP. Now that you've configured the Virtual Service, you'll need to add some real servers for the Virtual Service to forward traffic to.

Under "Real Servers for this Virtual Service" (Figure 18), click on "Add New..." to add a real server.

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Properties for 192.168.1.200:80 - Operating at Layer 4

Basic Properties

Activate or Deactivate Service	<input checked="" type="checkbox"/>
Force L7	<input type="checkbox"/>
Real Server Check Protocol	HTTP
Service Nickname (optional)	<input type="text"/> <input type="button" value="Set Nickname"/>
Persistence Options	Mode: None
Scheduling Method	round robin

SSL Properties

SSL Acceleration	Enabled: <input type="checkbox"/>
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Advanced Properties

Healthcheck URL (optional)	<input type="text"/> <input type="button" value="Set URL"/>
Content Switching	Disabled
Not Available Server	<input type="text"/> <input type="button" value="Set Server Address"/>
Not Available Redirection Handling	Error Code: <input type="text"/>
	Redirect URL: <input type="text"/> <input type="button" value="Set Redirect URL"/>

Real Servers for this Virtual Service

Operation	IP Address	Port	Forwarding method	Weight	Status
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Figure 27: Properties for new Virtual Service

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Please Specify the Parameters for the Real Server

Real Server Address	<input type="text" value="192.168.1.1"/>
Port	<input type="text" value="80"/>
Forwarding method	<input type="text" value="nat"/>
Weight	<input type="text" value="1000"/>

Figure 28: Adding a Real Server to new Virtual Service

In the example above (Figure 19), I've added the real server IP address of **192.168.1.1**, which is on the same subnet as my Virtual Service **192.168.1.200**, meaning this is a “one-armed” configuration.

Although only one real server is required for the Virtual Service to respond, more would be required of course for scaling and redundancy. You can add more at this point, or you can go back later and add/remove real servers as required.

Click on the View/Modify Existing link at the left, and you'll see a list of all your configured virtual servers. If any of the web servers are responding, you should see a green “Up” under the status (Figure 20).

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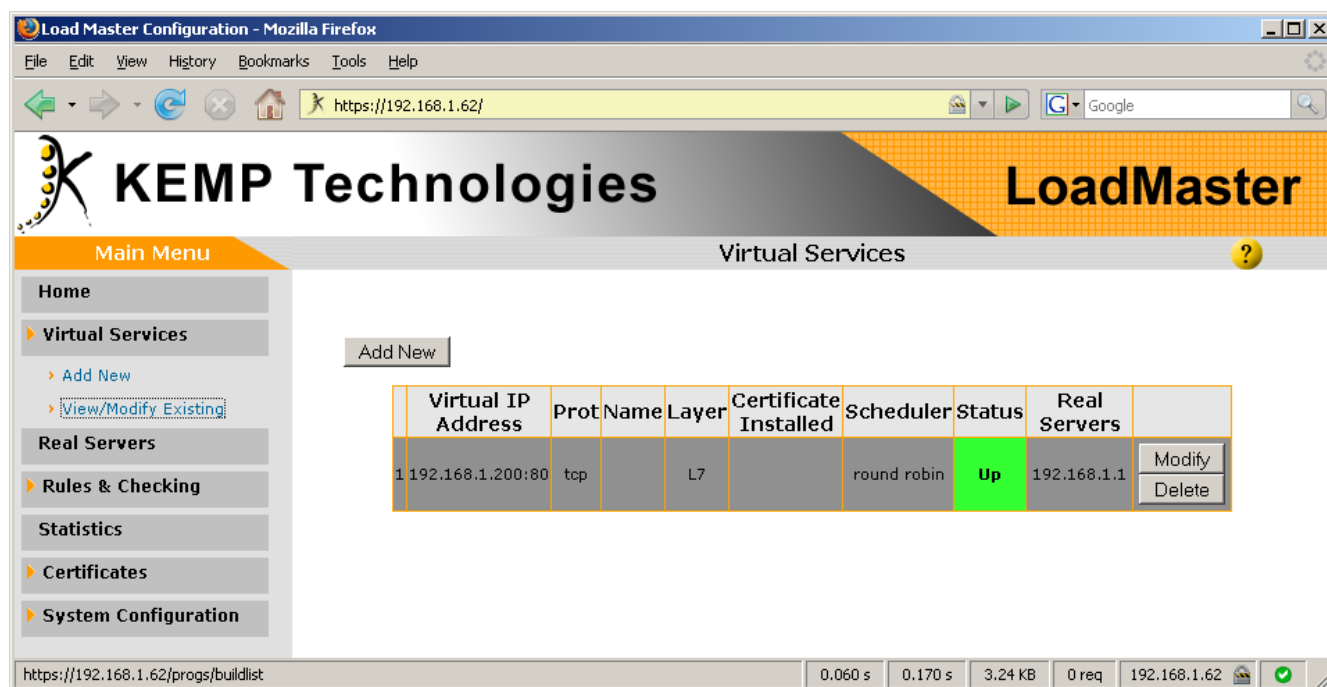


Figure 29: Virtual Services Listed

At this point, you should be able to bring the Virtual Service up in your browser. In my case, I've configured the real server as a FreeBSD system with a fresh install of Apache, and I can see the default page below (Figure 21).

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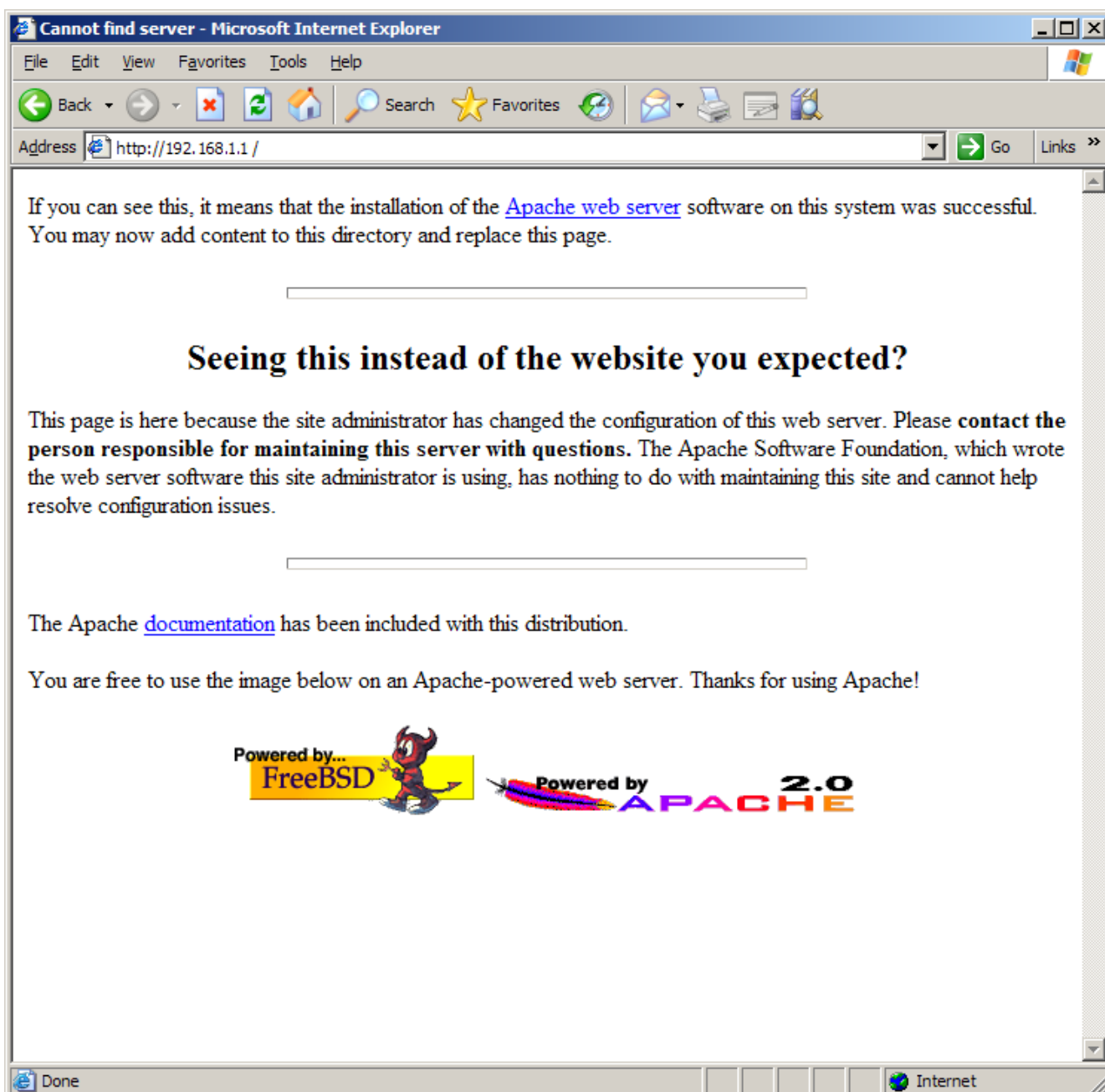


Figure 30: Successful Virtual Service

Note: If you don't get a page, and the Virtual Servers show "Up", make sure the default route is pointed towards the LoadMaster. An incorrect default route setting is the single most common reason for a page to fail to load through the LoadMaster.