

Cisco UCS B-Series Blade Server

Installation Guide

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1 Introduction

The Kemp LoadMaster load balancing solution is specifically optimized for the UCS B-series blades, enabling customers to deploy full-feature, high-performance load balancers. This can reduce network design complexity as well as increase performance through the direct access to the virtual networking fabric. Easily deployed on UCS Blades as a bare metal solution, Kemp's LoadMaster for UCS offers unique value. The Kemp solution is designed to handle load balancing for application-to-application connections or at the edge for external/internet based connections to web services.

Depending on the license, the LoadMaster will support 6, 16 or 32 cores. If hyper-threading is present and enabled the number of supported cores is doubled. This document describes the steps required to install the Kemp LoadMaster software on a Cisco UCS B-Series Blade Server.

> PXE and USB booting options are also supported by the LoadMaster installation ISO file.

1.1 Pre-requisites

The following pre-requisites are required:

- A Cisco UCS B-Series Blade Server.
- An ISO image with the LoadMaster software.
- For a standalone LoadMaster one IP-address on an untagged LAN is required. Three IP-addresses are required for a HA pair.
- The local disk on the Cisco UCS B-Series Blade Server should be empty as it is re-partitioned during the installation of the LoadMaster software.
- The boot order on the B-Series Blade Server should be configured as follows:
    1. Local Disk
    2. CD_ROM

The boot order can be checked and configured within the **Boot Order Details** section on the **General** tab of the **Cisco Unified Computing Systems (UCS) Manager**.

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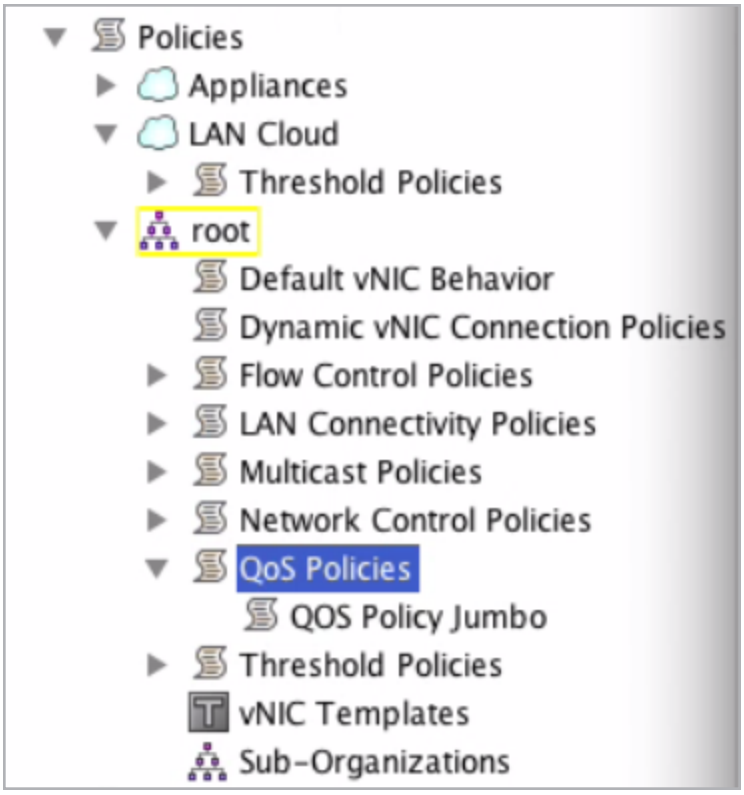
2 Create Policies

A number of policies can be created in order to optimize LoadMaster performance. The sections below give instructions on how to create these policies in the Cisco Unified Computing System Manager.

2.1 Create a QoS Policy



1. In the menu on the left, go to **Policies > root > QoS Policies**.



2. Click the plus button on the right to create a new policy.

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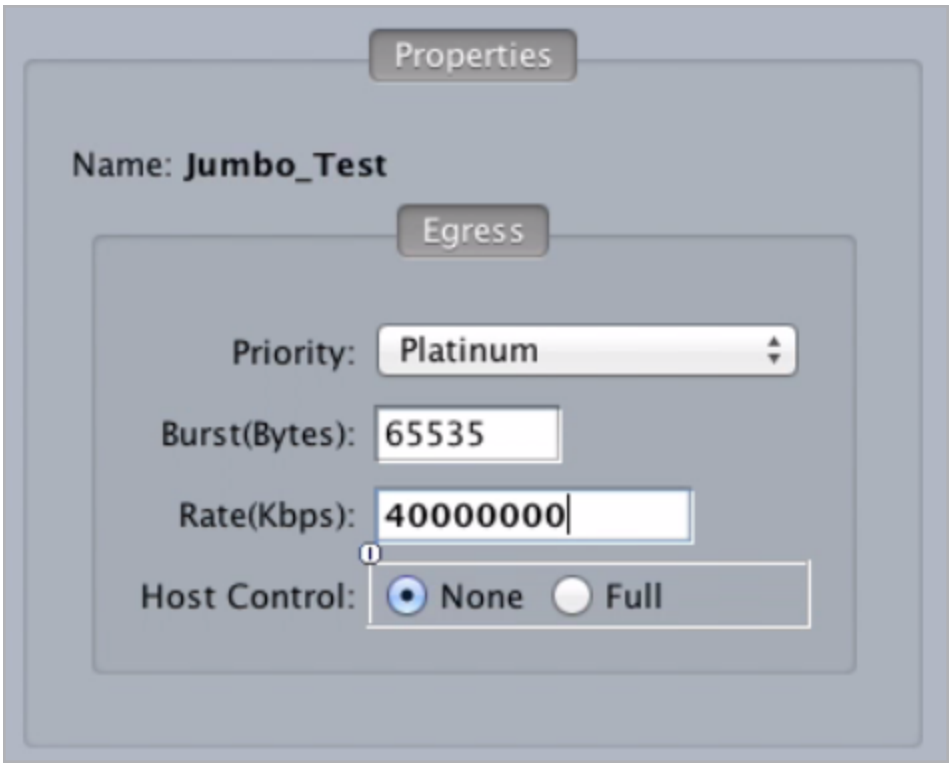

3. Enter a **Name**.
4. Select **Platinum** as the **Priority**.
5. Enter **65535** in the **Burst(Bytes)** text box.
6. Enter **40000000** in the **Rate(Kbps)** text box.
7. Ensure that **Host Control** is set to none.
8. Click **OK**.
9. Click **OK** again.

2.2 Create an Adapter Policy



1. Select the **Servers** tab at the top.
2. Expand **Policies**.

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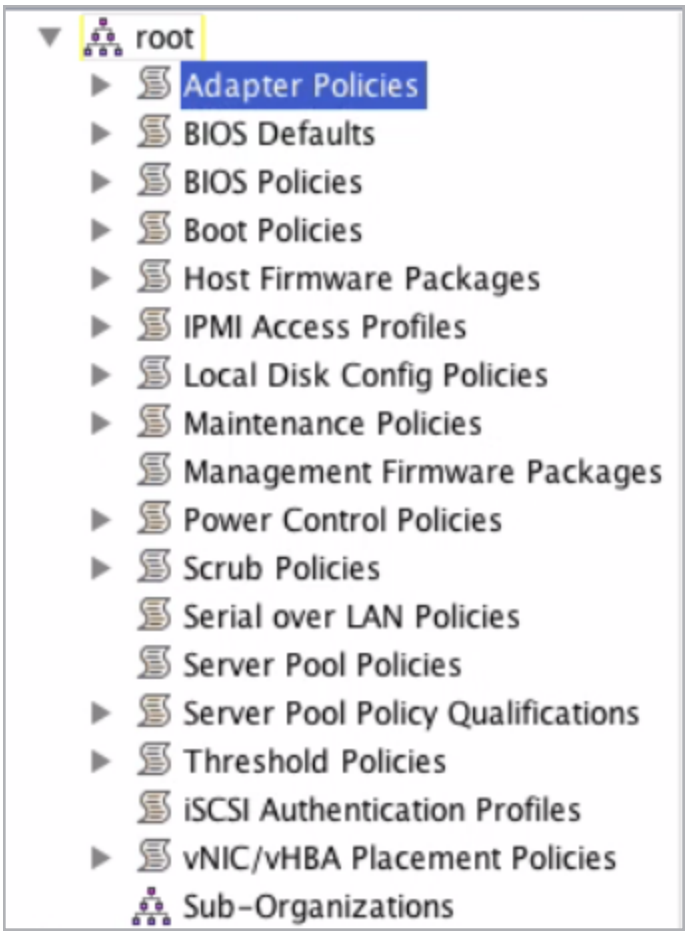

3. Expand **root**.

4. Select **Adapter Policies**.



5. Click the plus button on the right.

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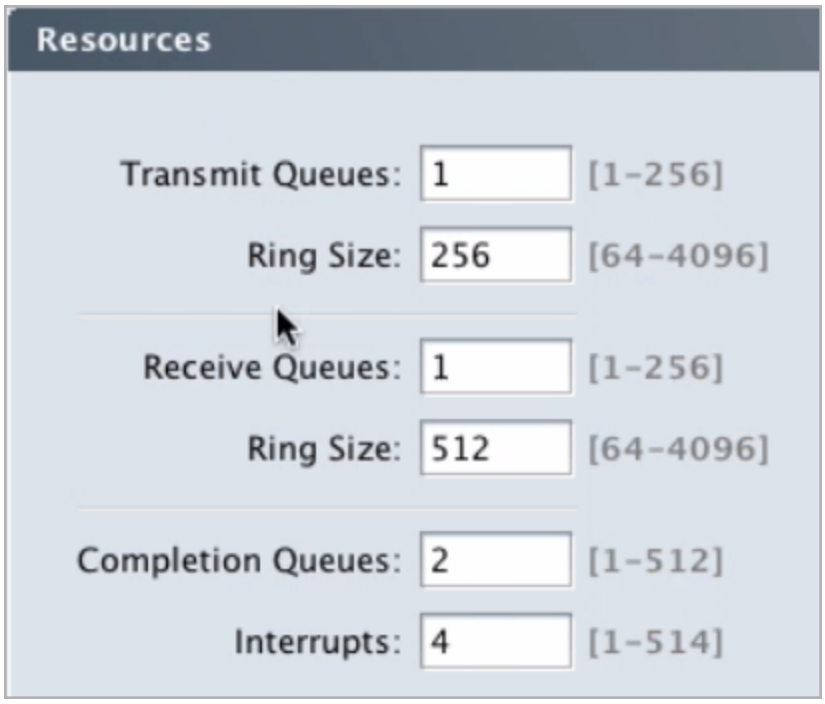

6. In the **Resources** section, set the field values as follows:

   a) Transmit Queues: 1

   b) Ring Size: 256

   c) Receive Queues: 1

   d) Ring Size: 512

   e) Completion Queues: 2

   f) Interrupts: 4

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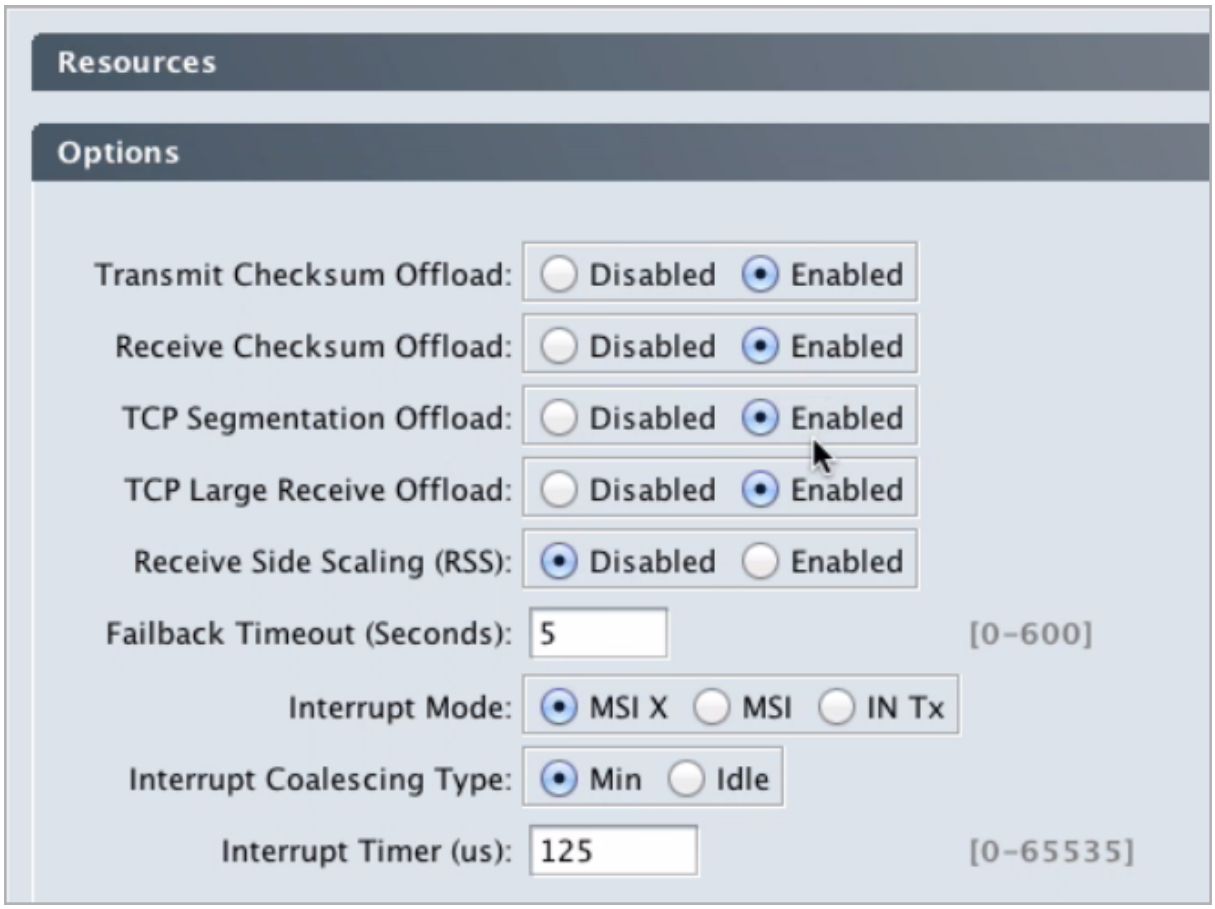

7. In the **Options** section, select **Enabled** for the following options:
    a) **Transmit Checksum Offload**
    b) **Receive Checksum Offload**
    c) **TCP Segmentation Offload**
    d) **TCP Large Receive Offload**
8. Select **Disabled** for **Receive Side Scaling (RSS)**.
9. Enter **5** in the **Failback Timeout (Seconds)** text box.
10. Select **MSI X** as the **Interrupt Mode**.
11. **Select** Min as the **Interrupt Coalescing Type**.
12. Enter **125** as the **Interrupt Timer (us)**.
13. Click **OK**.

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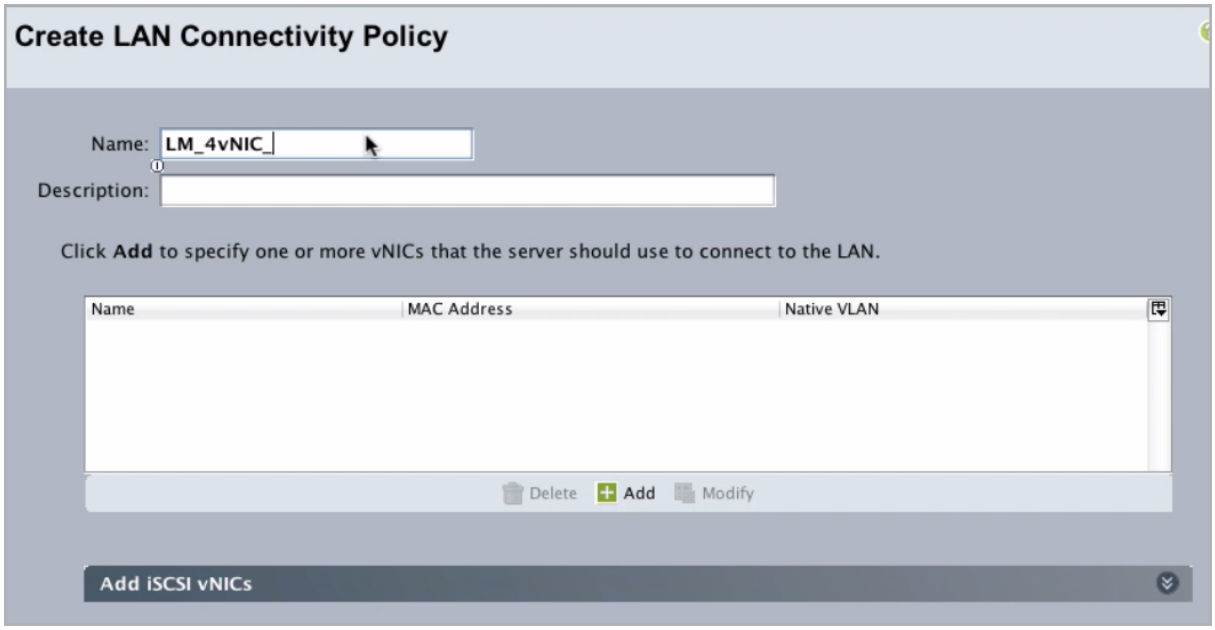
2.3 Create a LAN Connectivity Policy

If you are planning on having a setup containing 4 arms or more, creating a LAN Connectivity Policy will help to reduce complexity. Follow the steps below to create this policy:

1. Select the **LAN** tab.
2. Expand **Policies**.
3. Expand **root**.
4. Select **LAN Connectivity Policies**.



5. Click the plus button on the right to create a new policy.



6. Enter a recognizable **Name**, for example **LM_4vNIC**.
7. Enter a **Description**.
8. Click **Add** to specify a vNIC.

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9. Enter a **Name** for the vNIC, for example **eth 0**.
10. Select the relevant option in the **MAC Address Assignment** drop-down list.
11. Select the relevant clients to be on **Fabric A**.

> To maximize input and output it is best to divide the number of client VLANs and server VLANs between **Fabric A** and **Fabric B**. For example, if there are 2 clients VLANs – one should be on **Fabric A** and the other should be on **Fabric B**. Similarly, if there are 2 server VLANs – one should be on **A** and the other on **B**.

12. Select a **Native VLAN**.
13. Set the **MTU** to **9000**.

> The MTU must have the same value as it does in the **Priority** of the selected **QoS Policy**.

14. Expand the **Operational Parameters** section.
15. Select the relevant **Adapter Policy**.
16. Select the relevant **QoS Policy**.
17. Click **OK**.
18. Click **OK** again.
19. Add the remaining vNICs needed.

2.4 Create a BIOS Policy

1. To create a BIOS policy:
2. Select the **Servers** tab at the top.
3. Expand **Policies**.
4. Expand **root**.
5. Select **BIOS Policies**.

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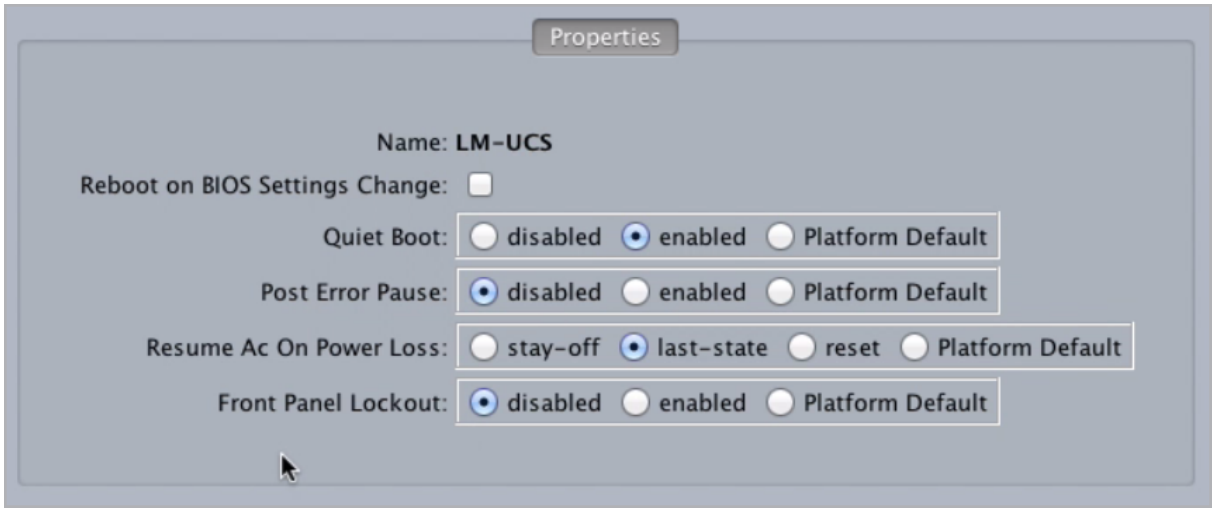
6. Click the plus button to create a new policy.



7. Enter a **Name**.

8. Set the options as follows:

   - **Reboot on BIOS Settings Change: Disabled**
   - **Quiet Boot: enabled**
   - **Post Error Pause: disabled**
   - **Resume Ac On Power Loss: last-state**
   - **Front Panel Lockout: disabled**

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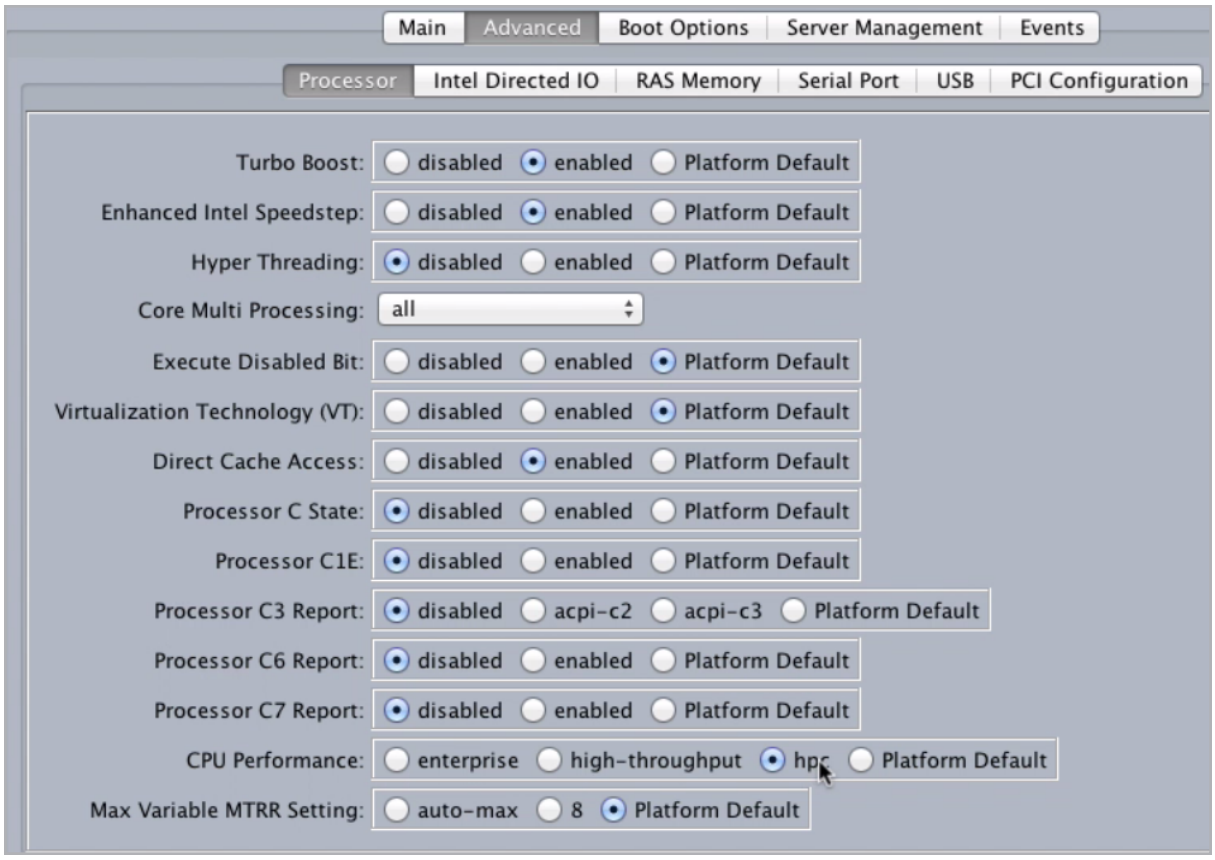

9. In the **Advanced > Processor** tab, set the options as follows:

    - **Turbo Boost: enabled**
    - **Enhanced Intel Speedstep: enabled**
    - **Hyper Threading: disabled**
    - **Core Multi Processing: all**
    - **Execute Disabled Bit: Platform Default**
    - **Virtualization Technology (VT): Platform Default**
    - **Direct Cache Access: enabled**
    - **Processor C State: disabled**
    - **Processor C1E: disabled**
    - **Processor C3 Report: disabled**
    - **Processor C6 Report: disabled**

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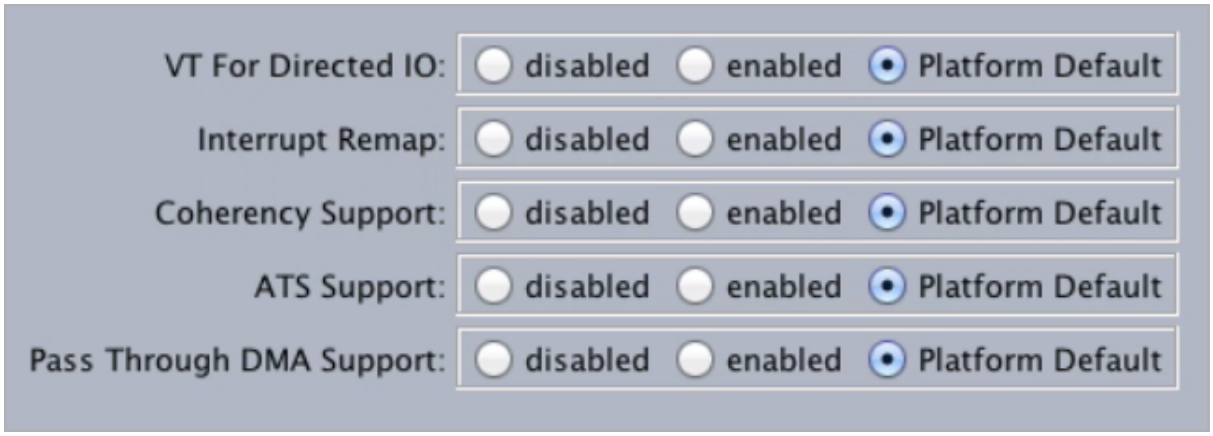
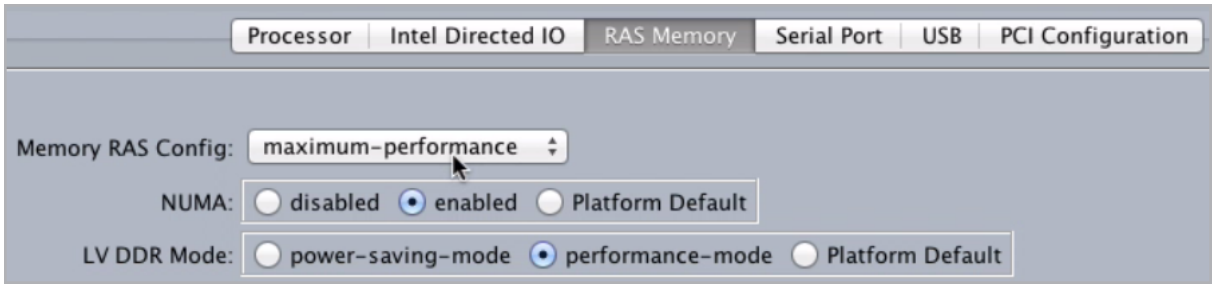
- **Processor C7 Report: disabled**
- **CPU Performance: hpc**
- **Max Variable MTRR Setting: Platform Default**



10. In the **Advanced > Intel Directed IO** tab, set all of the options to **Platform Default**.



11. In the **Advanced > RAS Memory** tab, set the options as follows:
    - **Memory RAS Config: maximum-performance**
    - **NUMA: enabled**
    - **LV DDR Mode: performance-mode**
12. Click **OK**.

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3 Installing LoadMaster on the Cisco UCS Blade

The following steps must be completed in order to install the LoadMaster software on the Cisco B-Series Blade Server. These steps must be completed on the jump host, where the LoadMaster installation ISO image is located.

3.1 Open the KVM console for the B-series server

1. Select the **Servers** tab in the navigation pane.
2. Within the expandable tree view select the relevant server.
3. Select the **General** tab in the main pane.

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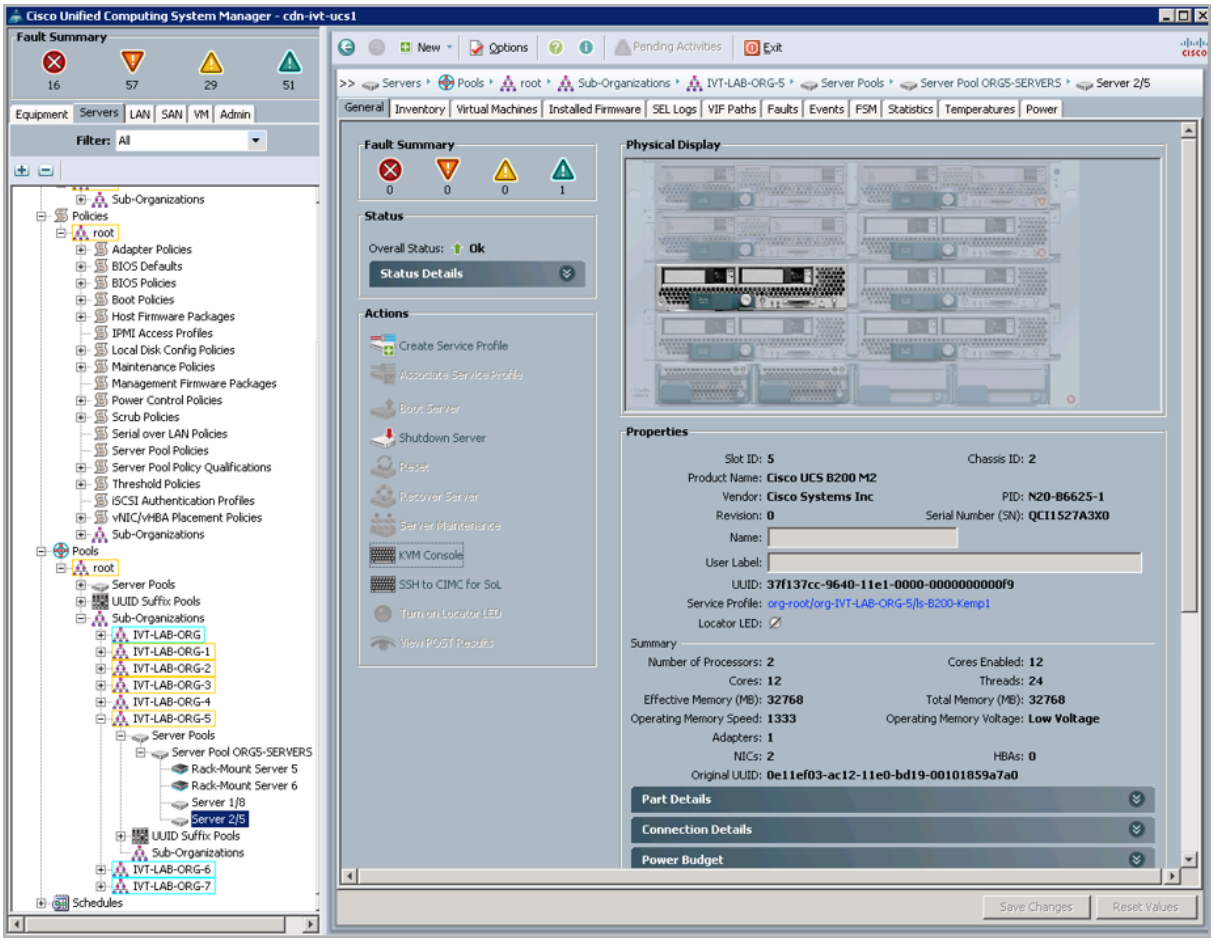

4. Click the **KVM console** option within the **Actions** section.
5. This will open a KVM console window from which the installation can be completed.

3.2 Create a virtual CD-ROM

In the KVM console window complete the following steps:

1. Select the **Virtual Media** tab.
2. Click the **Add Image** button to open a file-selector window.
3. Select the LoadMaster installation image
4. Click the **Open** button.
5. Click the **Mapped** button.

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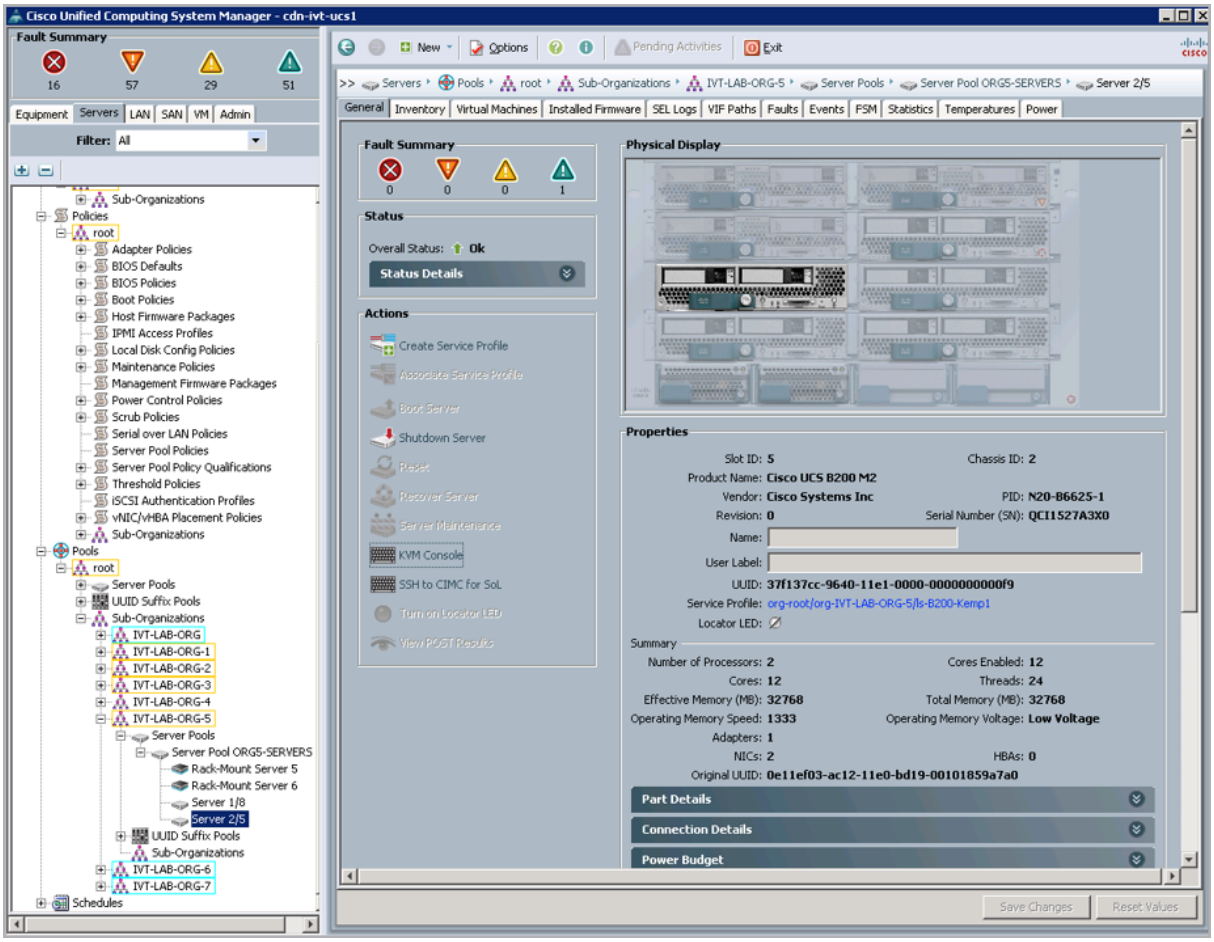

3.3 Boot the Server

The server is now ready to be booted to complete the installation procedure.

If the local disk is empty, that is contains no valid boot partition, simply click the **Boot Server** option on the KVM console. The server is booted from the previously mapped virtual CD.

If the local disk does contain a valid bootable partition you can explicitly select the virtual CD from the servers boot menu by completing the following steps:

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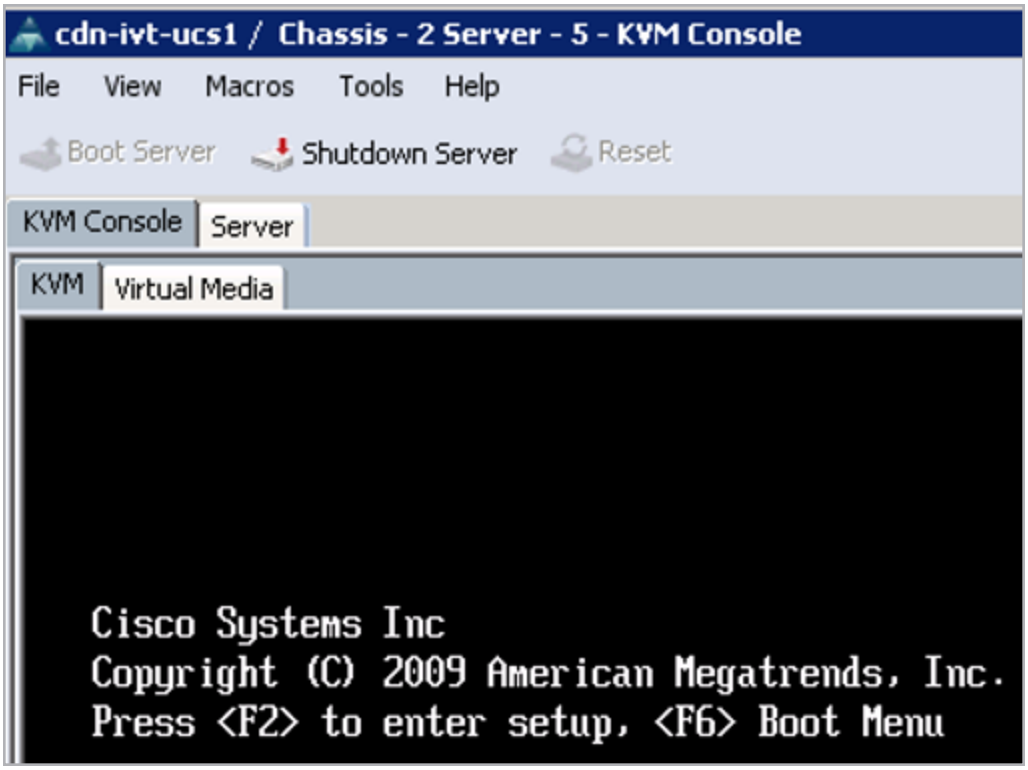
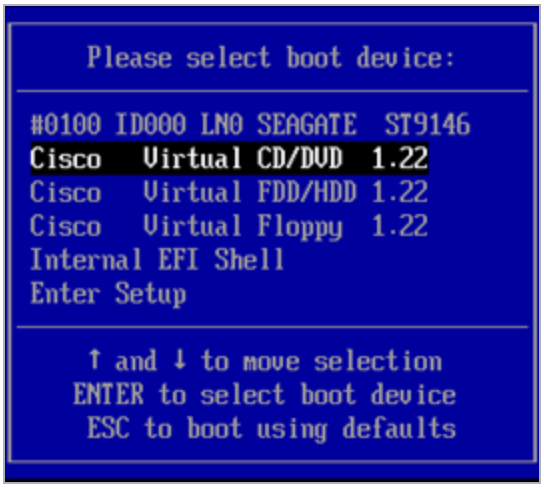


Press **F6** when the boot process reaches the point illustrated in the screenshot above.



The Boot Menu Screen, as illustrated by the screenshot above, appears.
Select the Cisco Virtual CD/DVD option and press Enter.

The server should boot from the virtual CD.

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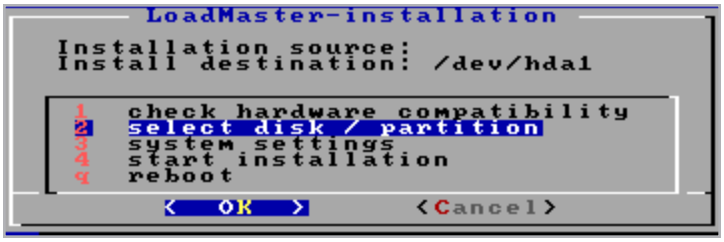
3.4 Install the LoadMaster

Once the server boots from the virtual CD, as described in the **Boot the Server** section, the LoadMaster installation process automatically begins.

> For further information on the different boot options that are available, refer to the Bare Metal Boot Options, Technical Note.

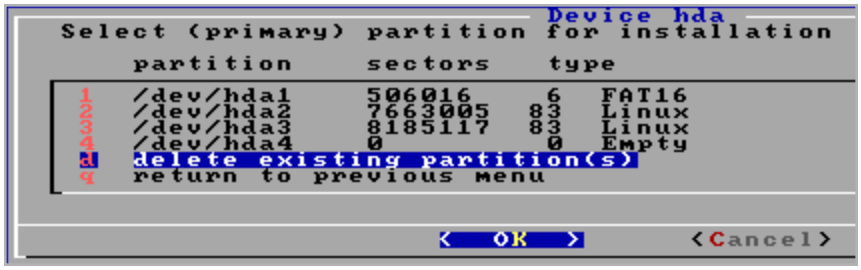
> In the vast majority of cases, the serial number should be automatically pulled from the LoadMaster. If it is not, please enter it when prompted. The location of the serial number varies by make and model, but usually there is a pull tab on the front of the device which lists the serial number.



1. Select **select disk/partition** and press OK.



2. Select the target disk for installation and press **OK**.



3. Select delete existing partition(s) and press **OK**.

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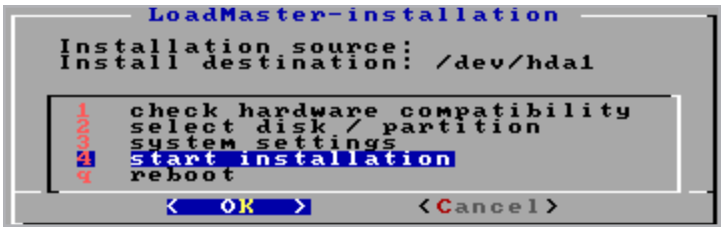
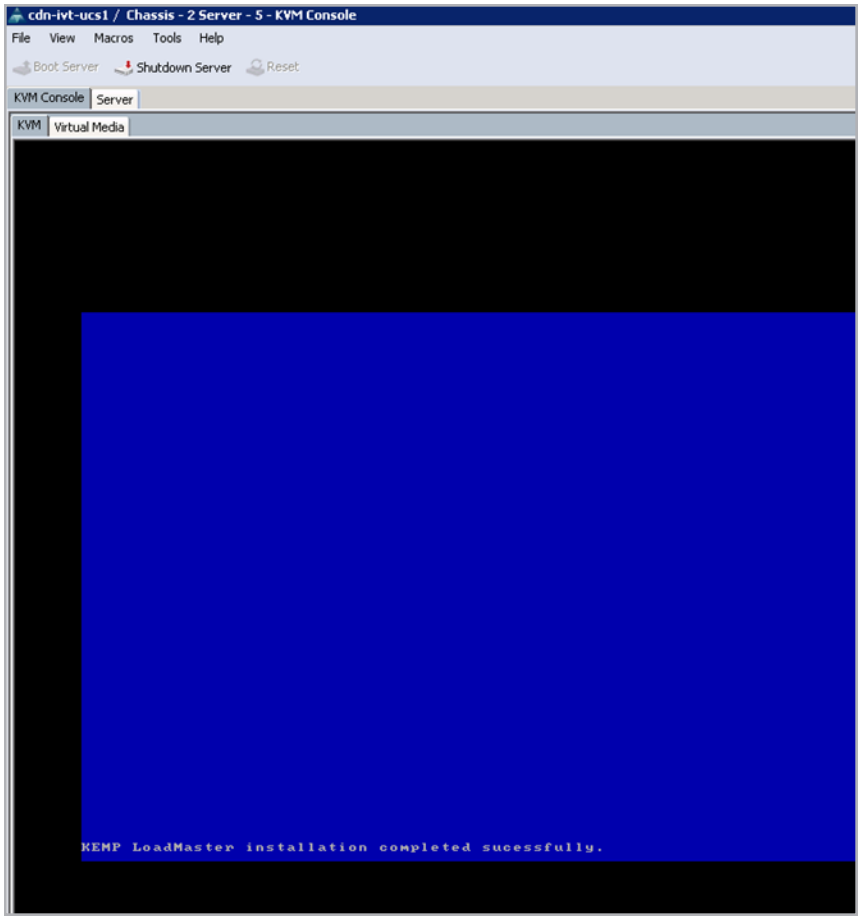


4. Select start installation and press **OK**.

When prompted, press **OK** to continue.

The installation then completes as shown in the screenshot below.



3.5 Boot the Installed LoadMaster

The server is now ready to be rebooted with the LoadMaster software installed on the local disk. Within the KVM console, select the **Ctrl-Alt-Del** option from the **Macros** drop-down menu.

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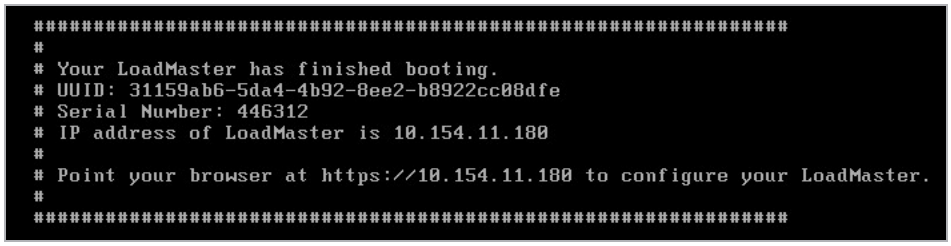
The server should now begin to boot from the local disk.



On initial deployment, DHCPv4 and DHCPv6 both run to attempt to obtain an IP address. If the LoadMaster obtains an IP address using DHCP, take note of it because this is how you will access the LoadMaster.

If the LoadMaster does not obtain an IP address using DHCP the static IP address of **192.168.1.101** is assigned and the LoadMaster must be manually configured using the console.

Please refer to the **Configuring the LoadMaster using the Console** section for further information regarding manually configuring the LoadMaster.

3.6 License and Configure the LoadMaster

The LoadMaster must now be configured to operate within the network configuration.

1. In an internet browser, enter the IP address that was previously noted.

   Ensure to enter **https://** before the IP address.

2. A warning may appear regarding website security certificates. Please click the continue/ignore option.

3. The LoadMaster End User License Agreement screen appears.

Please read the license agreement and, if you are willing to accept the conditions therein, click on the **Agree** button to proceed.

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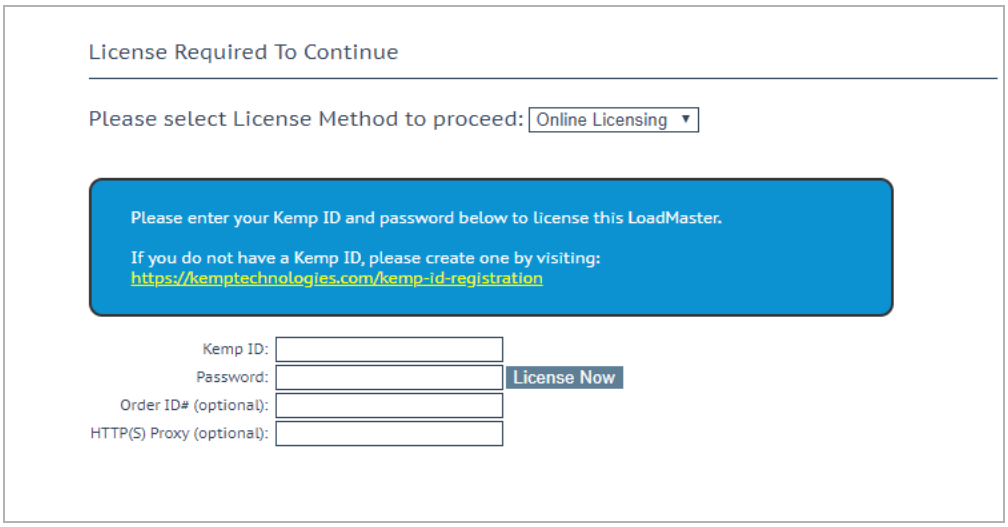
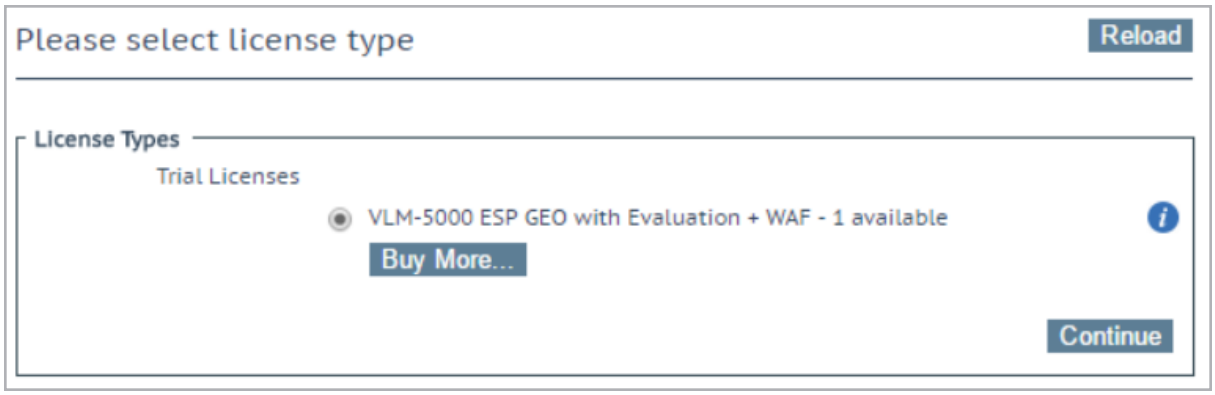


4. If using the **Online** licensing method, fill out the fields and click **License Now**.

If you are starting with a trial license, there is no need to enter an Order ID. If you are starting with a permanent license, enter the Kemp **Order ID#** if this was provided to you.

If using the **Offline Licensing** method, select **Offline Licensing**, obtain the license text, paste it into the **License** field and click **Apply License**.

For detailed instructions on how to register for a Kemp ID and license the LoadMaster, refer to the **Licensing, Feature Description** on the Kemp Documentation Page.



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5. If you entered an **Order ID**, a screen appears that provides a list of available licenses for that order ID, in addition to any licenses registered for the Kemp ID based on the LoadMaster platform type. Select the license type you want to apply to this LoadMaster.

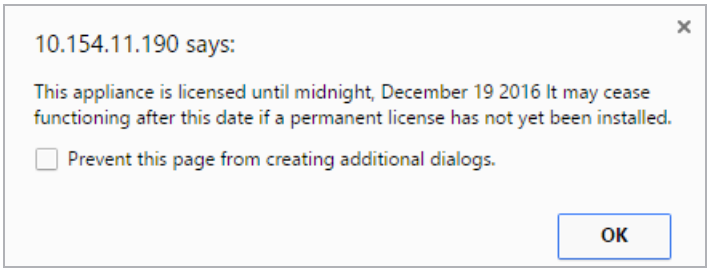
> If the license type you want is not displayed, please contact your Kemp representative.

6. Click **Continue**.

7. The login screen appears, enter the **bal** user name and the password.

8. In the screen informing you that the password has changed, press the **Continue** button.

9. If your machine has shipped with a temporary license you should get a warning informing you that a temporary license has been installed on your machine and for how long the license is valid.

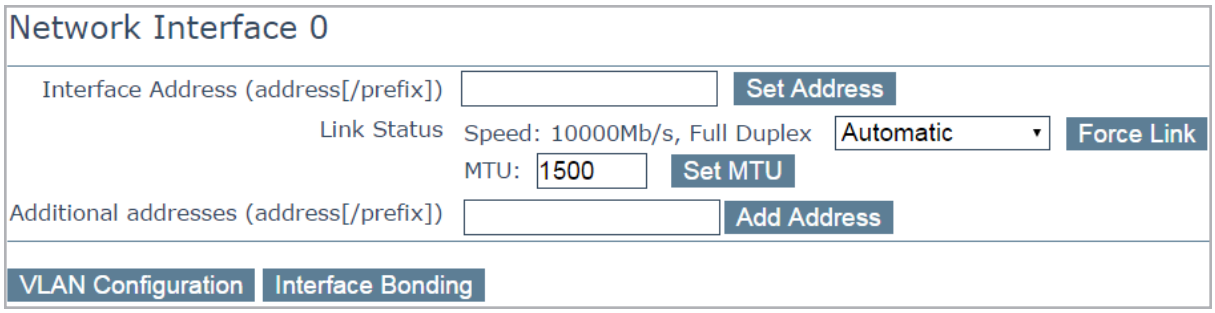


10. Click **OK** .

11. You should now connect to the **Home** screen of the LoadMaster.

12. Go to **System Configuration > Network Setup** in the main menu.

13. Click the **eth0** menu option within the **Interfaces** section.



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14. In the **Network Interface 0** screen, enter the IP address of the eth0 interface, the network facing interface of the LoadMaster, in the **Interface Address** input field.

15. Click the **Set Address** button.

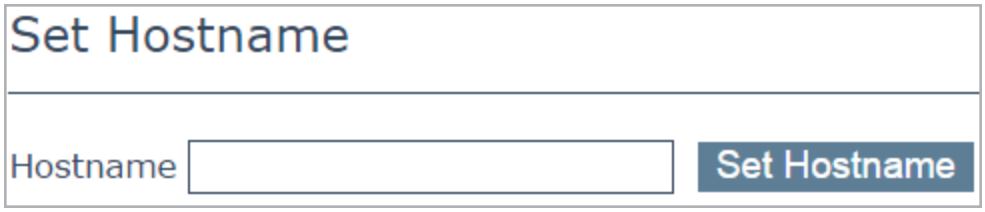
16. Click the **eth1** menu option within the **Interfaces** section.

17. In the **Network Interface 1** screen, enter the IP address of the eth1 interface, the farm-side interface of the LoadMaster, in the **Interface Address** input field.

18. Click on the **Set Address** button.

This interface is optional, depending on the network configuration.

19. Click on the **Local DNS Configuration > Hostname Con**figuration menu option.



20. In the **Hostname configuration** screen, enter the hostname into the **Current Hostname** input field.

21. Click the **Set Hostname** button.

22. Click the **Local DNS Configuration > DNS Configuration** menu option.



23. In the **DNS configuration** screen, enter the IP address(es) of the DNS Server(s) which is used to resolve names locally on the LoadMaster into the **DNS NameServer** input field.

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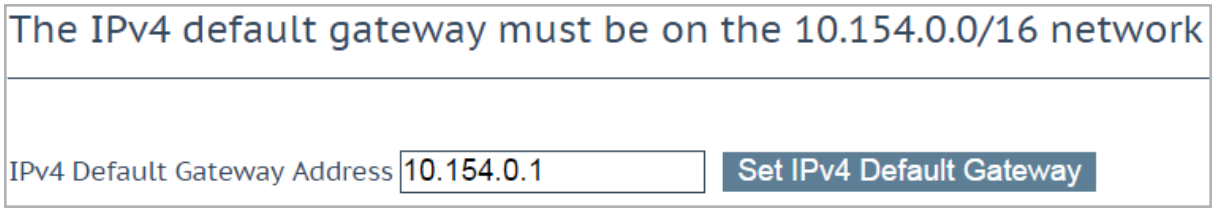
24. Click the **Add** button.

25. Enter the domain name that is to be prepended to requests to the DNS nameserver into the **DNS NameServer** input field.

26. Click the **Add** button.

27. Click the **System Configuration > Network Setup > Default Gateway** menu option.



28. In the **DNS configuration** screen, enter the IP address of the default gateway into the **IPv4 Default Gateway Address** input field.

    If you have an IPv6 Default Gateway, please enter the value in the **IPv6 Default Gateway Address** input field.

29. Click the **Set IPv4 Default Gateway** button.

The LoadMaster is now fully installed and ready to be used. For further information on how to configure and implement the Virtual LoadMaster, please refer to the LoadMaster documentation which can be downloaded from the http://kemptechnologies.com/documentation page.

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4 Configuring the LoadMaster using the Console

If the LoadMaster does not automatically obtain an IP address using DHCP, or if the user prefers to configure the LoadMaster using the console, then the following configuration steps must be completed before starting the LoadMaster.

1. Login into the LoadMaster using the console using the settings:

    - **lb100 login:** bal

    - **Password:** 1fourall

2. If required, change the LoadMaster password (for the **bal** user) when prompted to within the console.

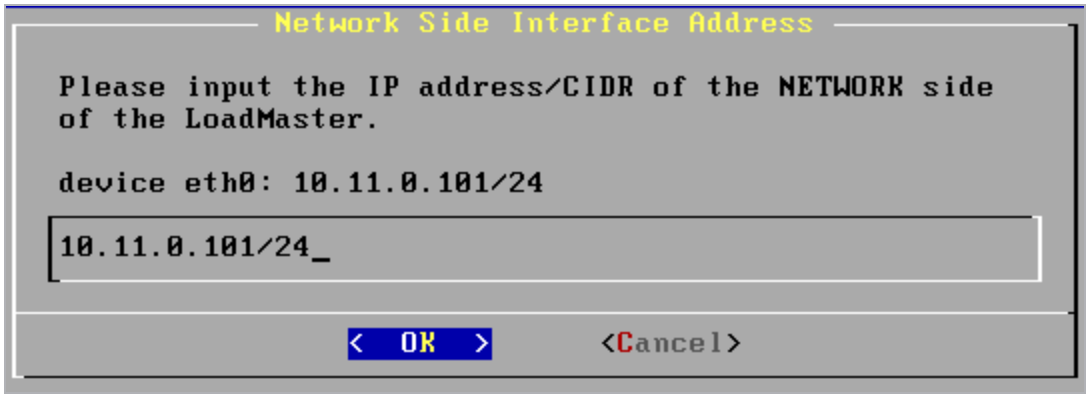
3. If required, click **OK** within the dialog box informing of the password change

4. Click **OK** within **Quick Setup Help** dialog box.

5. Enter the IP address of the eth0 interface, the network facing interface of the LoadMaster, in the input field within the **Network Side Interface Address** dialog box.

   This value must be configured from within the console.

6. Click **OK**.



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7. Enter the IP address of the eth1 interface in the input field within the **Farm Side Interface Address** dialog box. The eth1 interface is only configured if you have a two-armed configuration.

This interface can be configured at a later date using the LoadMaster WUI if preferred.

8. Click **OK**.

9. Enter the hostname (you can accept the default value of 'Kemp') into the input field of the **LoadMaster Hostname** dialog box.

10. Click **OK**.

11. Enter the IP address(es) of the DNS Server(s) which will be used to resolve names locally on the LoadMaster into the input field of the **Name Server IP Addresses** dialog box.

This interface can be configured at a later date using the LoadMaster WUI if preferred.

12. Click **OK**.

13. Enter the domain name that is to be prepended to requests to the DNS nameserver in the input field of the **Domain List** dialog box.

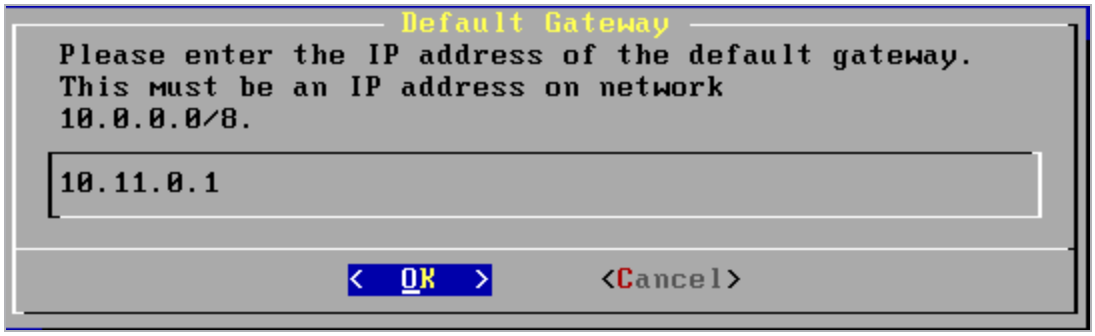
This interface can be configured at a later date using the LoadMaster WUI if preferred.

14. Click **OK**.

15. Enter the IP address of the default gateway in the input field of the **Default Gateway** dialog box.

This value must be configured from within the KVM console.

16. Click **OK**.



17. Click **Yes** within the **Reboot** screen when requested.

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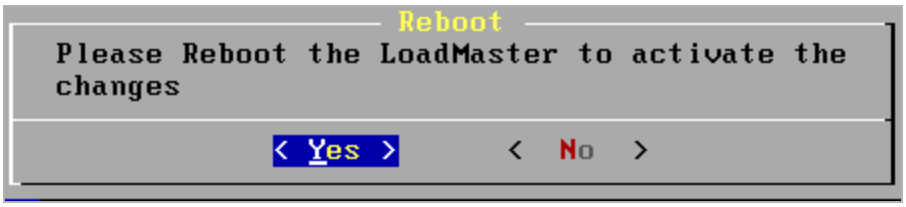

18. In your internet browser enter the IP address of the eth0 inter you entered in Step 6.

Ensure you place 'https://' before the IP address.

19. You may get a warning regarding website security certificates. Please click on the continue/ignore option.

20. The LoadMaster End User License Agreement screen appears.

Please read the license agreement and, if you are willing to accept the conditions therein, click on the **Agree** button to proceed.

21. If your machine has shipped with a temporary license you should get a warning informing you that a temporary license has been installed on your machine and for how long the license is valid.

22. Click **OK**.

23. You should now connect to the **Home** screen of the LoadMaster.

The LoadMaster is now fully installed and ready to be used. For further information on how to configure and implement the Virtual LoadMaster, please refer to the LoadMaster documentation which can be downloaded from the http://kemptechnologies.com/documentation page.

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References

Unless otherwise specified, the below documents can be found at http://kemptechnologies.com/documentation

Licensing, Feature Description

Bare Metal Boot Options, Technical Note

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