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Used, under license, U.S. Patent Nos. 6,473,802, 6,374,300, 8,392,563, 8,103,770, 7,831,712, 7,606,912, 7,346,695, 7,287,084 and 6,970,933
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1 Introduction

Epic develop software for mid-size and large medical groups, hospitals and integrated healthcare organizations, working with customers that include community hospitals, academic facilities, children’s organizations, safety net providers and multi-hospital systems. Epic’s applications support functions related to patient care, including:

- Registration and scheduling
- Clinical systems for doctors, nurses, emergency personnel and other care providers
- Systems for lab technologists, pharmacists and radiologists
- Billing systems for insurers

The KEMP LoadMaster is used to load balance the Epic workload. The LoadMaster offers advanced Layer 4 and Layer 7 server load balancing, SSL Acceleration and a multitude of other advanced Application Delivery Controller (ADC) features. The LoadMaster intelligently and efficiently distributes user traffic among the application servers so that users get the best experience possible.

1.1 Document Purpose

This document provides the recommended LoadMaster settings used when load balancing the Epic workload. The KEMP Support Team is available to provide solutions for scenarios not explicitly defined.

The KEMP support site can be found at: [https://support.kemptechnologies.com](https://support.kemptechnologies.com).

1.2 Intended Audience

Network administrators who are deploying Epic with a KEMP LoadMaster.
2 Epic Template

KEMP has developed a template containing our recommended settings for Epic. You can install this template on the LoadMaster and use it when creating Virtual Services. Using a template automatically populates the settings in the Virtual Services, which is quicker and easier than manually configuring each Virtual Service. If needed, you can make changes to any of the Virtual Service settings after using the template.

Download released templates from the Templates section on the KEMP documentation page: http://kemptechnologies.com/documentation/.

For more information and steps on how to import and use templates, refer to the Feature Description, Virtual Services and Templates.

For steps on how to manually add and configure each of the Virtual Services, refer to Section 4 of this document.
The above network architecture diagram depicts how the LoadMaster connects to the different backend components in Epic Systems.
4 Configure the LoadMaster

The deployed Epic Systems environment determines which of the following setups is used.

4.1 Enable Subnet Originating Requests Globally

It is best practice to enable the Subnet Originating Requests option globally.

In a one-armed setup (where the Virtual Service and Real Servers are on the same network/subnet), Subnet Originating Requests is usually not needed. However, enabling Subnet Originating Requests should not affect the routing in a one-armed setup.

In a two-armed setup where the Virtual Service is on network/subnet A, for example, and the Real Servers are on network B - Subnet Originating Requests should be enabled on LoadMasters with firmware version 7.1-16 and above.

When Subnet Originating Requests is enabled, the LoadMaster routes traffic so that the Real Server sees traffic arriving from the LoadMaster interface that is in that network/subnet.

When Subnet Originating Requests is enabled globally, it is automatically enabled on all Virtual Services. If the Subnet Originating Requests option is disabled globally, you can select whether or not to enable Subnet Originating Requests on a per-Virtual Service basis.

To enable Subnet Originating Requests globally, follow the steps below:

1. In the main menu of the LoadMaster WUI, go to System Configuration > Miscellaneous Options > Network Options.

   ![Figure 4-1: Subnet Originating Requests](image)

   2. Select the Subnet Originating Requests check box.
4.2 Create an Epic Medical Systems HTTP Virtual Service

The following are the steps involved and the recommended settings to configure the Epic Systems HTTP Virtual Service:

1. In the main menu of the LoadMaster Web User Interface (WUI), go to **Virtual Services** > **Add New**.

   ![Figure 4-2: Virtual Service parameters](image_url)

   **Please Specify the Parameters for the Virtual Service.**

   - **Virtual Address**: 10.154.11.102
   - **Port**: 80
   - **Service Name (Optional)**: Epic Medical Systems HTTP
   - **Use Template**: Select a Template
   - **Protocol**: tcp

   **Add this Virtual Service**

   Figure 4-2: Virtual Service parameters

2. Enter a valid **Virtual Address**.
3. Enter **80** as the **Port**.
4. Enter a recognizable **Service Name**, such as **Epic Medical Systems HTTP**.
5. Click **Add this Virtual Service**.
6. Configure the settings as recommended in the following table:

<table>
<thead>
<tr>
<th>Section</th>
<th>Option</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Options</td>
<td>Persistence Mode</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Active Cookie</td>
<td>1 Hour</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cookie name</td>
<td>JSESSIONID</td>
<td>Click <strong>Set Cookie</strong>.</td>
</tr>
<tr>
<td></td>
<td>Idle Connection Timeout</td>
<td>900</td>
<td>Click <strong>Set Idle Timeout</strong>.</td>
</tr>
<tr>
<td>Real Servers</td>
<td>URL</td>
<td>/</td>
<td></td>
</tr>
</tbody>
</table>

   Figure 4-3: Epic Medical Systems HTTP Virtual Service Recommended Settings

7. Add the Real Servers:
   a) Click the **Add New** button.
   b) Enter the address of the Epic Medical Systems HTTP Server.
   c) Fill out the other fields as needed.
   d) Click **Add this Real Server**. Click **OK** to the pop-up message.
   e) Repeat the steps above to add more Real Servers as needed, based on the environment.
4.3 Create an Epic Medical Systems HTTPS Virtual Service

The following are the steps involved and the recommended settings to configure the Epic Systems HTTPS Virtual Service:

1. In the main menu of the LoadMaster Web User Interface (WUI), go to Virtual Services > Add New.

![Virtual Service parameters](image)

2. Enter a valid Virtual Address.
3. Enter 443 as the Port.
4. Enter a recognizable Service Name, such as Epic Medical Systems HTTPS.
5. Click the Add this Virtual Service button.
6. Configure the settings as recommended in the following table:

<table>
<thead>
<tr>
<th>Section</th>
<th>Option</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Options</td>
<td>Persistence Mode</td>
<td>Source IP Address</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Timeout</td>
<td>1 Hour</td>
<td>Click Set Idle Timeout.</td>
</tr>
<tr>
<td></td>
<td>Idle Connection Timeout</td>
<td>900</td>
<td>Click the Add HTTP Redirector button. This automatically creates a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>redirect on port 80. This option is only visible if there is no existing</td>
</tr>
<tr>
<td></td>
<td>Advanced Properties</td>
<td>Add a Port 80 Redirector VS</td>
<td>existing port 80 redirect for this Virtual Service.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>https://%h%</td>
<td></td>
</tr>
</tbody>
</table>

7. Add the Real Servers:
   a) Click the Add New button.
   b) Enter the address of the Epic Medical Systems HTTPS Server.
   c) Click Add this Real Server. Click OK to the pop-up message.
   d) Repeat the steps above to add more Real Servers as needed, based on the environment.
4.3.1 Configure the Epic Medical Systems HTTPS-HTTP Redirect Virtual Service

Clicking the Add HTTP Redirector button automatically creates a port 80 redirect Virtual Service. This is optional, but the purpose of this Virtual Service is to redirect any clients who have connected via HTTP to the HTTPS Virtual Service.

KEMP recommends changing some settings in the Epic Medical Systems HTTPS-HTTP Redirect Virtual Service. The recommended settings are below:

<table>
<thead>
<tr>
<th>Section</th>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Options</td>
<td>Persistence Mode</td>
<td>None</td>
</tr>
<tr>
<td>Real Servers</td>
<td>Real Server Check Method</td>
<td>None</td>
</tr>
</tbody>
</table>

![Figure 4-6: Epic Medical Systems HTTPS HTTP Redirect Virtual Service Recommended Settings](image)

4.4 Create an Epic Medical Systems HTTPS Offloaded Virtual Service

The following are the steps involved and the recommended settings to configure the Epic Systems HTTPS Offloaded Virtual Service:

1. In the main menu of the LoadMaster Web User Interface (WUI), go to Virtual Services > Add New.

![Figure 4-7: Virtual Service parameters](image)

2. Enter a valid Virtual Address.
3. Enter 443 as the Port.
4. Enter a Service Name, for example Epic Medical Systems HTTPS Offloaded.
5. Click Add this Virtual Service.
6. Configure the settings as recommended in the following table:

<table>
<thead>
<tr>
<th>Section</th>
<th>Option</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Options</td>
<td>Persistence Mode</td>
<td>Active Cookie</td>
<td>SSL Acceleration must be enabled before Active Cookie can be selected as the Persistence Mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Hour</td>
<td></td>
</tr>
</tbody>
</table>
Configure the LoadMaster

<table>
<thead>
<tr>
<th>Section</th>
<th>Option</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cookie name</td>
<td></td>
<td>JSESSIONID</td>
<td>Click <strong>Set Cookie</strong>.</td>
</tr>
<tr>
<td>Idle Connection Timeout</td>
<td></td>
<td>900</td>
<td></td>
</tr>
<tr>
<td>SSL Properties</td>
<td>SSL Acceleration</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>Cipher Set</td>
<td></td>
<td>Best Practices</td>
<td></td>
</tr>
<tr>
<td>Advanced Properties</td>
<td>Add a Port 80 Redirector VS</td>
<td>https://%h%s</td>
<td>Click the <strong>Add HTTP Redirector</strong> button. This will automatically create a redirect on port 80. This option is only visible if there is no existing port 80 redirect for this Virtual Service.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Real Servers</th>
<th>URL</th>
<th>/</th>
</tr>
</thead>
</table>

7. Add the Real Servers:
   a) Click the **Add New** button.
   b) Enter the address of the Epic Medical Systems HTTPS Server.
   c) Click **Add this Real Server**. Click **OK** to the pop-up message.
   d) Repeat the steps above to add more Real Servers as needed, based on the environment.

4.4.1 Configure the Epic Medical Systems HTTPS Offloaded HTTP Redirect Virtual Service

Clicking the **Add HTTP Redirector** button automatically creates a port 80 redirect Virtual Service. This is optional, but the purpose of this Virtual Service is to redirect any clients who have connected via HTTP to the HTTPS Virtual Service.

KEMP recommends changing some settings in the Epic Medical Systems HTTPS HTTP Redirect Virtual Service. The recommended settings are below:

<table>
<thead>
<tr>
<th>Section</th>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Options</td>
<td>Persistence Mode</td>
<td>None</td>
</tr>
<tr>
<td>Real Servers</td>
<td>Real Server Check Method</td>
<td>None</td>
</tr>
</tbody>
</table>

4.5 Create an Epic Medical Systems HTTPS Re-encrypt Virtual Service

The following are the steps involved and the recommended settings to configure the Epic Systems HTTPS Re-encrypt Virtual Service:

1. In the main menu of the LoadMaster Web User Interface (WUI), go to **Virtual Services** > **Add New**.
2. Enter a valid Virtual Address.
3. Enter 443 as the Port.
4. Enter a Service Name, for example Epic Medical Systems HTTPS Re-encrypt.
5. Click Add this Virtual Service.
6. Configure the settings as recommended in the following table:

<table>
<thead>
<tr>
<th>Section</th>
<th>Option</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Options</td>
<td>Persistence Mode</td>
<td>Active Cookie</td>
<td>SSL Acceleration must be enabled before Active Cookie can be selected as the Persistence Mode.</td>
</tr>
<tr>
<td></td>
<td>Timeout</td>
<td>1 Hour</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cookie name</td>
<td>JSESSIONID</td>
<td>Click Set Cookie.</td>
</tr>
<tr>
<td></td>
<td>Idle Connection Timeout</td>
<td>900</td>
<td></td>
</tr>
<tr>
<td>SSL Properties</td>
<td>SSL Acceleration</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reencrypt</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cipher Set</td>
<td>BestPractices</td>
<td></td>
</tr>
<tr>
<td>Advanced Properties</td>
<td>Add a Port 80 Redirector VS</td>
<td>https://%h%s</td>
<td>Click the Add HTTP Redirector button. This automatically creates a redirect on port 80. This option is only visible if there is no existing port 80 redirect for this Virtual Service.</td>
</tr>
</tbody>
</table>

7. Add the Real Servers:
   a) Click the Add New button.
   b) Enter the address of the Epic Medical Systems HTTPS Server.
   c) Click Add this Real Server. Click OK to the pop-up message.
   d) Repeat the steps above to add more Real Servers as needed, based on the environment.
4.5.1 Configure the Epic Medical Systems HTTPS Re-encrypt HTTP Redirect Virtual Service

Clicking the Add HTTP Redirector button automatically creates a port 80 redirect Virtual Service. This is optional, but the purpose of this Virtual Service is to redirect any clients who have connected via HTTP to the HTTPS Virtual Service.

KEMP recommends changing some settings in the Epic Medical Systems HTTPS Re-encrypt HTTP Redirect Virtual Service. The recommended settings are below:

<table>
<thead>
<tr>
<th>Section</th>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Options</td>
<td>Persistence Mode</td>
<td>None</td>
</tr>
<tr>
<td>Real Servers</td>
<td>Real Server Check Method</td>
<td>None</td>
</tr>
</tbody>
</table>

Figure 4-12: Epic Medical Systems HTTPS Re-encrypt HTTP Redirect Virtual Service Recommended Settings
References

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

Feature Description, Virtual Services and Templates
# Document History

<table>
<thead>
<tr>
<th>Date</th>
<th>Change</th>
<th>Reason for Change</th>
<th>Version</th>
<th>Resp.</th>
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</thead>
<tbody>
<tr>
<td>Aug 2016</td>
<td>Initial draft</td>
<td>First draft of document</td>
<td>1.0</td>
<td>LB</td>
</tr>
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