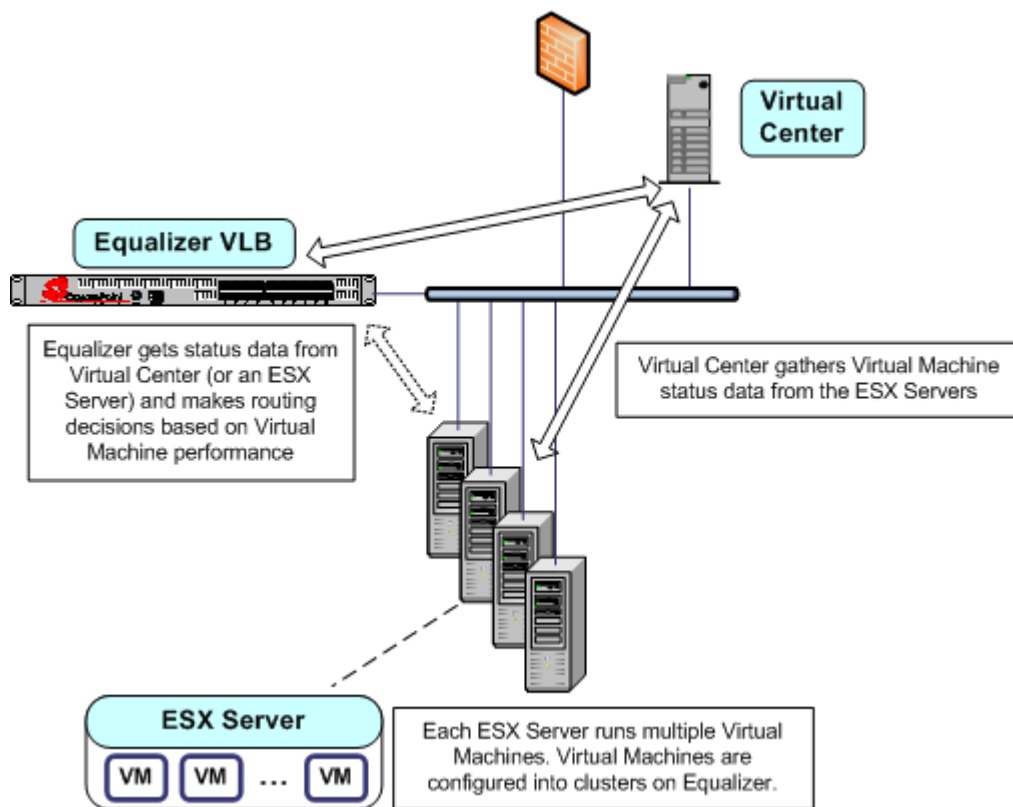


Please read these instructions completely before you install and configure Equalizer VLB. After installation, see the Help menu for Release Notes and the Installation and Administration Guide.

Equalizer VLB™ is Coyote Point’s virtualization enabled load balancing solution for VMware Infrastructure® virtual server configurations.

The initial release of Equalizer VLB uses VMware’s management API to retrieve real-time virtual server performance information from a VMware Virtual Center console that manages virtual machines running on ESX Server (or from a single ESX Server directly). The additional server availability and resource utilization information obtained from VMware allows Coyote Point’s Equalizer™ traffic management appliance to more efficiently direct the traffic flowing to VMware virtual machines. The diagram below illustrates how Equalizer VLB works:



Equalizer extracts information from the Virtual Center console via the VMware API and load balances requests across virtual machines using knowledge of what is going on inside each virtual machine. If there is only one ESX Server in your configuration, Equalizer can also be set up to communicate directly with the ESX Server (instead of Virtual Center), and load balance among the virtual machines defined on that ESX Server only.

Equalizer uses statistics such as the amount of memory in use by a virtual machine, the amount of memory in use by all virtual machines on the physical host, and CPU utilization to automatically distribute incoming cluster requests to the virtual machines added to the cluster. Response to changes in VMware configuration is dynamic. If the virtual server performance in the pool is uneven, Equalizer automatically detects the uneven latency and sends new traffic to the best available virtual machine. If a server is overloaded and reboots, Equalizer simply detects that the server is available again, and automatically resumes sending traffic to it.

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Installation and Removal

Equalizer VLB can be installed on all currently supported Equalizer appliance models.

The instructions included below are intended for Equalizers in a standalone configuration (not in a failover pair), and without the Envoy Geographic Load Balancing software. If your system is part of a failover pair or if Envoy is enabled, see the detailed upgrade instructions for Version 8, in the Software Upgrades section of the Coyote Point Support Portal (coyotepoint.com/support.htm).

Current *Release Notes* and the *Installation and Administration Guide* are available from the **Help** menu of the Administration Interface.

Upgrading to the Equalizer VLB Beta

1. Log into Equalizer in either of two ways:
 - a. Use a serial terminal and the **eqadmin** account (default password: **equalizer**). Upon successful login, the **Equalizer Configuration Menu** window is displayed.
 - b. Use a Secure Shell (SSH) connection and the **eqsupport** account, if enabled. Upon successful login, enter the following to display the **Equalizer Configuration Menu**:

```
su root
eqadmin
```

2. Select option 8, **Upgrade**, and press **Enter** (on older systems, **Upgrade** is option 10). The **Equalizer upgrade selection** screen appears.
3. Press **Enter**. The upgrade utility prompts you to enter the upgrade URL:
4. Type the upgrade URL:

```
ftp://ftp2.coyotepoint.com/pub/patches/upgrades/upgrade-8.0.0/vlb/upgrade.tgz
```

If a nameserver is not configured for your Equalizer, use the IP address “**64.13.152.125**” instead of “**ftp2.coyotepoint.com**”.

5. Select **OK** and press **Enter**. You will see FTP output as Equalizer downloads the upgrade archive.
6. During installation of the new release, some additional prompts may be displayed, depending on your configuration. These prompts are self-explanatory and the answers you supply depend on your network configuration and requirements.

- When the upgrade script is finished, it displays the message:

```
System reboot is required.
Reboot now (y/n)?
```

Type “y” and press **Enter** to reboot.

The upgrade is now complete. When Equalizer comes back up, log into the Administrative Interface. The Welcome screen should indicate the new **Equalizer Version** as well as the **Virtualization Load Balancing** version, as shown in following screen.

```

Equalizer System Information
-----
Equalizer Version 8.0.0b-vlbbeta1
system ID 0018f33f4835
serial no. CP0609R-0040
platform e350si Rev. 2.0
system name c1

external interface bge1
internal interface bge0
external address 172.16.0.190
internal address 192.168.1.180

failover mode standalone
Envoy geographic load balancing disabled
SSL acceleration Xcel I
Hardware GZIP compression disabled
Virtualization Load Balancing VLB Beta I

```

Returning to the Previously Installed Version

To return to the version of Equalizer software that was running immediately prior to upgrading to the Equalizer VLB Beta, do the following:

- Log into the Equalizer console as `root` and reboot the machine:


```
shutdown -r now
```
- Watch the messages on the console as the system boots. When the prompt to select a partition appears, choose the non-default partition and continue with the boot process.

Upgrading Over the Equalizer VLB Beta

When you upgrade over the Equalizer VLB Beta, the upgrade may stop if there are settings in the configuration file that the version to which you are upgrading does not support. This will usually happen only when installing a version that was released prior to the current version. If the upgrade stops due to a problem with the configuration file, error messages will indicate the configuration settings that are not supported by the new version. You’ll need to edit the configuration file and remove these settings before continuing.

Follow the process documented in the section “Manually Editing the Configuration File During an Upgrade”, in the detailed upgrade instructions for Version 8, in the Software Upgrades section of the Coyote Point Support Portal (coyotepoint.com/support.htm).

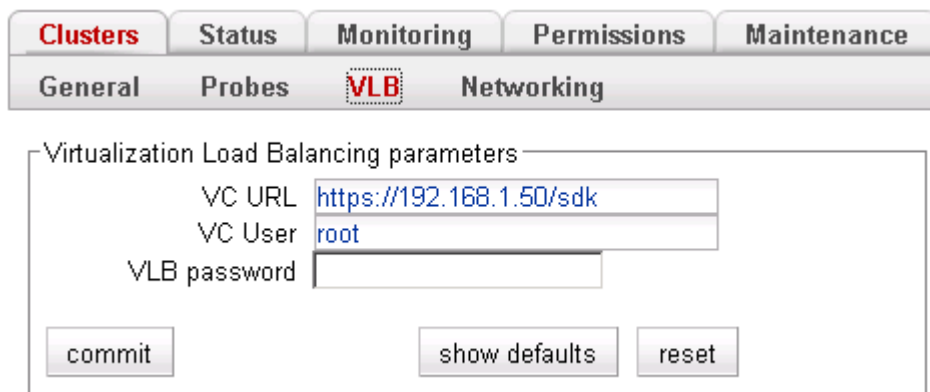
Enabling Equalizer VLB

In order to obtain VMware virtual machine information, Equalizer needs access information for the Virtual Center console managing the virtual machines. To enable communication between Equalizer and a Virtual Center console, do the following:

1. Follow the instructions in the VMware SDK & API documentation to install the VMware SDK on the system running Virtual Center (or on a single ESX Server). The SDK must be installed in order for Equalizer to be able to use VMware Infrastructure API calls and obtain virtual machine status. For instructions, see the VMware documentation at:

<http://www.vmware.com/support/pubs/>

2. Log into Equalizer using an account that has **add/del** permission on global parameters.
3. Click **Equalizer** in the left frame, and then select the **Clusters > VLB** tab:



4. Enter the following information:

VC URL	The URL configured on the system running Virtual Center (or on an ESX Server) for VMware API connections. By default, this is an https:// URL using the IP address of the Virtual Center system followed by /sdk , as in the example shown in the screen above.
VC User	The user account that you normally use to log into the VMware Virtual Center or ESX Server.
VLB password	The password for the VC User account. (Note that this text box is blank when you open the tab, even if a password has been previously saved.)

5. Click **commit** to save your settings.
6. Optionally set **agent delay**, the number of seconds between probes of VMware Virtual Center (or ESX Server) for the status of all virtual machines in all clusters (default: 10 seconds). To change the default:
 - a. Select the **Clusters > Probes** tab.
 - b. Specify a new value in the **agent delay** text box.
 - c. Click **commit** to save the new value.

Enabling VLB Agents on a Cluster

Once you have enabled VLB on Equalizer as shown in the previous section, you can configure clusters with VLB Agents. Doing so enables Equalizer to communicate with the Virtual Center and get detailed information on all the virtual machines configured in the cluster.

To enable VLB Agents on a cluster:

1. Log into Equalizer using an account that has **add/del** permission on the cluster to be modified.
2. Click the cluster name in the left frame. In the **Configuration > Required** tab, select **server agent** in the **policy** drop down box. The server agent policy gives preference to the values returned by the VLB agent, and is the recommended setting for VLB clusters.
3. Click **commit** to save the policy change.
4. Select the **Configuration > Probes** tab:

The screenshot shows the configuration interface for a cluster. The 'Configuration' tab is active, and the 'Probes' sub-tab is selected. The 'cluster parameters' section contains input fields for 'probe port' (0), 'ACV probe', 'ACV response', 'probe delay' (10.0), 'server agent port' (1510), and 'agent probe'. The 'agent type' section has radio buttons for 'server agent', 'VLB' (selected), and 'none'. A red warning message states: 'Server agent requires custom agent running on each server. Virtualization Load Balancing (VLB) agent uses Virtual Center configuration to monitor servers.' At the bottom are buttons for 'commit', 'show defaults', and 'reset'.

5. Select **VLB** in the **agent type** field.
6. Click **commit** to save your settings.

Adding Servers to a Cluster with VLB Agents Enabled

To add a server to a VLB cluster, right click on the cluster name in the left frame and select the **Add Server** command from the menu. When adding servers to a VLB cluster, note the following:

- You must specify the IP address, port, etc., for a virtual machine managed by the Virtual Center (or ESX Server) with which Equalizer is configured to communicate.

- Although it is not recommended, you can add both virtual machines and non-virtual machines (physical servers) to a VLB cluster. The non-virtual machines will be load balanced without any VLB server agent value, unless the **require agent response** option is set on the cluster (see the **cluster > Configuration > Probes** tab); if this option is enabled, then all non-virtual machines in the cluster will be marked down by Equalizer.
- Similarly, you can mix virtual and non-virtual machines as servers in a non-VLB cluster. The virtual machines will be load balanced as if they were physical servers, using no VMware data.

Disabling VLB Agents on a Cluster

To disable VLB Agents for a cluster:

1. Log into Equalizer using an account that has **add/del** permission on the cluster to be modified.
2. Click the cluster name in the left frame, then select the **Configuration > Probes** tab in the right frame.
3. Select **none** in the **agent type** field.
4. Click **commit** to save your settings.

Disabling Equalizer VLB

To disable VLB Agents for all clusters:

1. Log into Equalizer using an account that has **add/del** permission on global parameters.
2. Click **Equalizer** in the left frame, and then select the **Clusters > VLB** tab.
3. Clear the contents of either the **VC URL** or the **VC User** text boxes.
4. Click **commit** to save your settings.

Also note that if there are no clusters with the VLB agent enabled, then Equalizer will not probe Virtual Center (or ESX Server) even if the **VC URL**, **VC User**, and **VC password** are defined.

VLB Logging

Equalizer VLB writes a number of messages to the equalizer log (**Equalizer > Monitoring > Event Logs**); these messages are described below (timestamps normally displayed at the beginning of each line have been omitted):

```
Logged into VC or ESX successfully
Failed to connect to VC or ESX
Failed to log into VC or ESX
```

The messages above indicate that Equalizer attempted to log into the Virtual Center or ESX Server IP configured on the **VLB** tab. The status of the first login attempt after a reboot is recorded in the log; subsequent attempts are only logged if the login status changed since the last login. For example, the first successful login attempt is logged; subsequent successful attempts are not recorded. Likewise, the first failure is recorded; no further messages are logged during subsequent attempts until a login attempt succeeds.

```
VLB: probe: Server IP_address VLB state changed from old_value to new_value
```

A message in the above format indicates that the VLB agent return value for the virtual machine at *IP_address* has changed since the last probe of the Virtual Center (or ESX Server). Both the previous return value (*old_value*) and the latest return value (*new_value*) are logged in the message.

For example, the following series of messages was logged when a spike of CPU activity reduced availability for one virtual machine (server) in a VLB cluster:

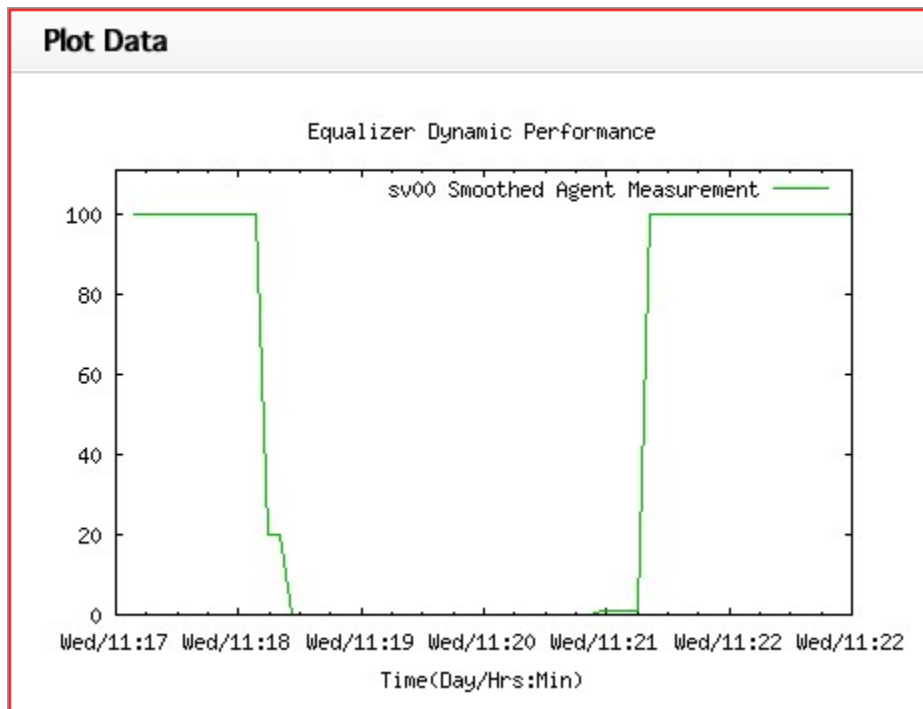
```
VLB: probe: Server 192.168.1.51 VLB state changed from 0 to 100
VLB: probe: Server 192.168.1.51 VLB state changed from 100 to 20
VLB: probe: Server 192.168.1.51 VLB state changed from 20 to 0
VLB: probe: Server 192.168.1.51 VLB state changed from 0 to 1
VLB: probe: Server 192.168.1.51 VLB state changed from 1 to 100
```

As the messages indicate, Equalizer continually adjusts to changing conditions on the server. Without VLB agents, Equalizer would not have known about the CPU utilization spike since the 'ping time' of the server IP did not change during this period.

VLB Plotting

The VLB agent return values can be plotted for any virtual machine in a VLB cluster.

1. Click on the server name in the left frame object tree. Select the **Reporting > Plots** tab in the right frame.
2. In the **display** multi-pick box, select **Server Agent**. Select other options as desired (click **Help > Context Help** for descriptions of each setting).
3. Select **plot** to display the graph. The following graph is a plot of the same data returned by the example probe log messages in the previous section.



Additional Operational Notes

1. **Failover:** All Equalizer VLB configuration settings are stored in the Equalizer configuration file, and so are transferred over to the failover peer when the configurations are synchronized.

We recommend that both failover peers run Equalizer VLB. If Equalizer VLB is used in a failover configuration with an Equalizer that is not running Equalizer VLB, then the **dont transfer** flag must be enabled on both peers. To view or set this option, select the object at the top of the left frame and then open the **Parameters** tab.

2. **Envoy:** Equalizer VLB operation is transparent to Envoy. In other words, you can use a VLB cluster in a GeoCluster configuration just like any other cluster.