



## **Avaya Solution & Interoperability Test Lab**

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# **Application Notes for INI EQUilibrium™ with Avaya Voice Portal – Issue 1.0**

### **Abstract**

These Application Notes describe the configuration steps required to integrate Interactive Northwest, Inc. (INI) EQUilibrium with Avaya Voice Portal. INI EQUilibrium is a load-balancing solution for distributing VoiceXML and CCXML page fetch requests from Avaya Voice Portal to multiple application servers. EQUilibrium maintains application server status for all application servers within its control and directs page fetches only to available application servers. EQUilibrium supports several distribution strategies, such as ordered and round-robin, for selecting the appropriate application server for the next request. EQUilibrium is a software-only solution integrated with the Voice Portal platform. Its administrative menus are integrated into the Voice Portal Management System (VPMS) administrative menus and alarm events are generated events directly into the Voice Portal alarm stream. This gives the administrator visibility and control over the application servers used by Voice Portal.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

# 1. Introduction

These Application Notes describe the configuration steps required to integrate Interactive Northwest, Inc. (INI) EQUilibrium with Avaya Voice Portal. INI EQUilibrium is a load-balancing solution for distributing VoiceXML and CCXML page fetch requests from Avaya Voice Portal to multiple application servers. EQUilibrium maintains application server status for all application servers within its control and directs page fetches only to available application servers. EQUilibrium supports several distribution strategies, such as ordered and round-robin, for selecting the appropriate application server for the next request. EQUilibrium is a software-only solution integrated with the Voice Portal platform. Its administrative menus are integrated into the Voice Portal Management System (VPMS) administrative menus and alarm events are generated directly into the Voice Portal alarm stream. This gives the administrator visibility and control over the application servers used by Voice Portal.

EQUilibrium software is installed directly on the Voice Portal platform. This component includes the EQUilibrium menus, the event/alarm monitor, and the EQUilibrium configuration database. An administrator accesses these menus via the VPMS menu structure to configure EQUilibrium. The EQUilibrium configuration is stored in specific database tables within the PostgreSQL database on the VPMS. Application servers, controlled by EQUilibrium, and clusters (discussed below) are configured through VPMS.

EQUilibrium allows application servers to be partitioned into separate clusters each with its own distribution strategy. Clusters can be used to achieve specialized types of resource balancing, such as ordered, round-robin, or random. Every Voice Portal application that uses EQUilibrium must indicate a cluster name in the URL. The EQUilibrium Dispatcher will use the cluster name parameter to select the appropriate application server for a page request.

As mentioned above, EQUilibrium also consists of the Dispatcher, a Java application installed on each Media Processing Platform (MPP). When applications are administered on the VPMS, instead of constructing their URLs to point to specific application servers, the URLs are directed to the EQUilibrium Dispatcher on the local MPP. The Dispatcher processes the request by selecting an appropriate application server, rewriting the URL to point to that application server, and forwarding the request. The MPP Dispatcher gets its configuration information from the central VPMS component. Dispatchers can generate alarms when they detect a state change in an application server. Alarms are reported using the standard mechanism on Voice Portal.

## 1.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing. Feature testing focused on verifying the following features and functionality:

- Installing EQUilibrium software on the VPMS and MPP.
- Removing EQUilibrium software from the VPMS and MPP.
- Licensing the product.
- Enabling EQUilibrium to report alarms.
- Configuring EQUilibrium with application servers and clusters.
- Generating alarms related to application server state changes.
- Configuring Voice Portal applications to use EQUilibrium.
- Using EQUilibrium in conjunction with a Voice Portal fail-over URL.
- Verifying that the Voice Portal application is dispatched to the appropriate application server according to the cluster distribution strategy and the application server's availability.
- Verifying that the EQUilibrium detects application servers in various states, such as online, offline, or in maintenance mode.
- Verifying that EQUilibrium detects the cluster state, such as online, offline, or degraded.

Serviceability testing focused on verifying the ability of EQUilibrium to dispatch applications only to available application servers, to fall back to the fail-over URL, and to recover from adverse conditions, such as VPMS and MPP server restarts.

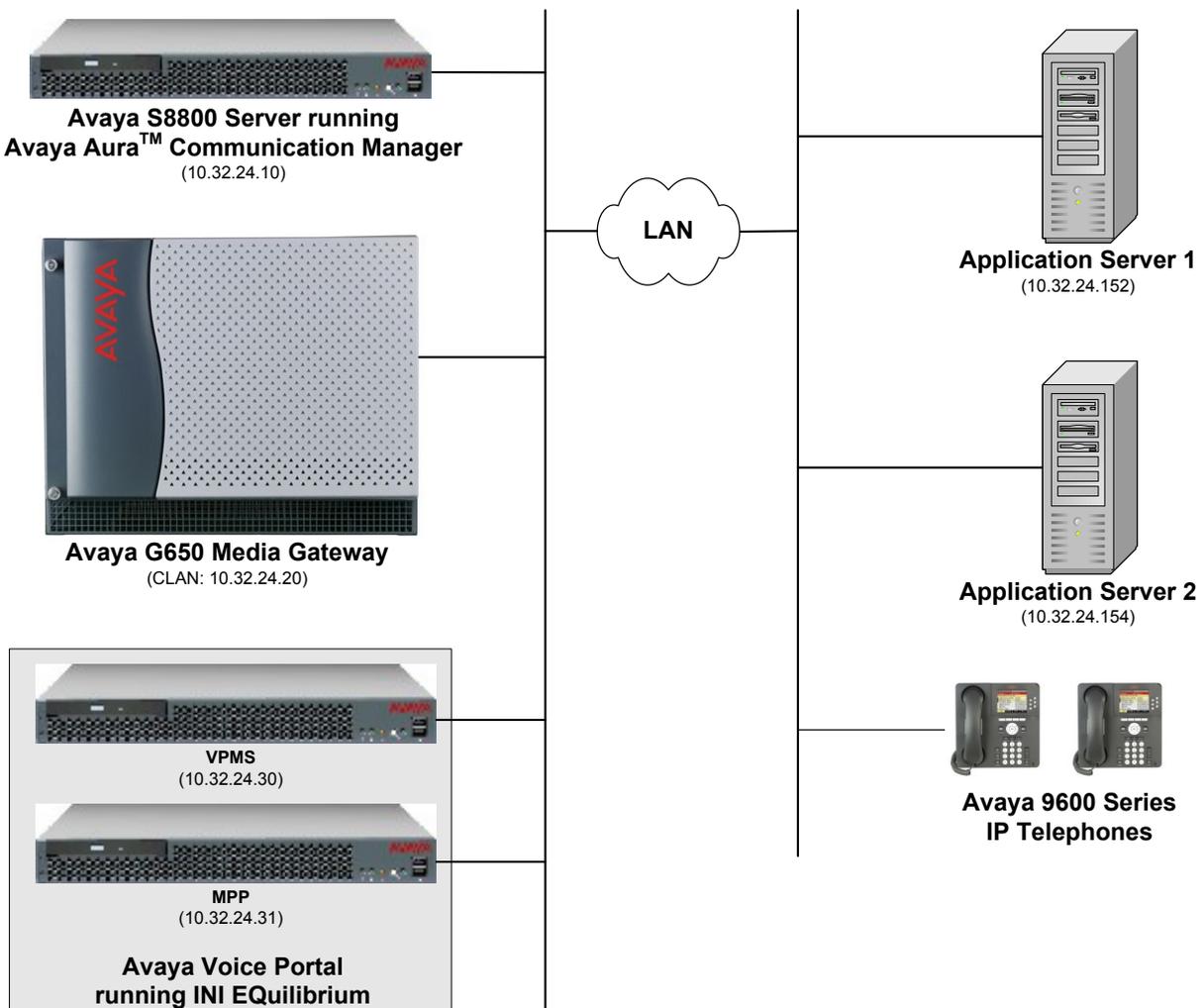
## 1.2. Support

To obtain technical support for INI EQUilibrium, contact Interactive Northwest via phone, email or through their website.

- **Web:** <http://www.interactivenw.com/support.php>
- **Email:** [support@interactivenw.com](mailto:support@interactivenw.com)
- **Phone:** (800) 808-8090

## 2. Reference Configuration

**Figure 1** illustrates the configuration used to verify the INI EQUilibrium load-balancing solution with Avaya Voice Portal, Avaya Aura™ Communication Manager, and application servers running Apache Tomcat. Application servers running Microsoft Internet Information Services (IIS) were also tested (not shown). EQUilibrium was installed directly on the Voice Portal platform (VPMS and MPP) and was configured with one cluster consisting of two application servers. EQUilibrium dispatched the Voice Portal application to the appropriate application server in the cluster using http for the page fetches. EQUilibrium was configured through the VPMS. The Avaya 9600 Series IP Telephones were used to place calls to Voice Portal. A speech server (not shown) was also used since it was required by the Voice Portal application.



**Figure 1: Configuration with INI EQUilibrium and Avaya Voice Portal**

## 2.1. Equipment and Software Validated

The following equipment and software were used for the sample configuration:

Equipment	Software
Avaya Voice Portal	5.1 (5.1.0.0.4201)
Avaya S8800 Server with a G650 Media Gateway	Avaya Aura™ Communication Manager 6.0
Avaya 9600 Series IP Telephones	3.011b (H.323)
INI EQilibrium <sup>1</sup>	1.0.1 (INI-EQ-VPMS-1.0.1-1 INI-EQ-MPP-1.0.1-1)
Application Servers	Microsoft Windows Server 2003 with Apache Tomcat 6.0 (6.0.14)
Application Servers	Microsoft Windows XP Professional with Microsoft Internet Information Services (IIS) 5.1

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<sup>1</sup> The INI EQilibrium version can be checked by running the “rpm -qa | grep EQ” command on the VPMS and MPP.

## 3. Install and Configure INI EQUilibrium

This section covers the installation and administration of INI EQUilibrium. The procedures include the following areas:

- INI EQUilibrium Software Installation on VPMS and MPP
- License EQUilibrium
- Configure EQUilibrium to Report Alarms
- Configure Application Servers
- Configure Cluster
- Configure Voice Portal Application

**Note:** It is assumed that the Voice Portal system has already been installed and configured as described in [1] and [2].

### 3.1. INI EQUilibrium Software Installation on VPMS and MPP

For this compliance test, INI EQUilibrium was installed on separate servers for the VPMS and MPP. The VPMS component should be installed on the primary VPMS and the MPP component should be installed on every MPP. In this example, only one MPP was used. Refer to [3] for more information on the EQUilibrium installation process.

Note: The Voice Portal system used in the configuration was using Avaya Enterprise Linux.

#### 3.1.1. Install the VPMS Component

The following procedure installs the VPMS component:

1. Log into the VPMS server with a *root* login.
2. Insert the INI EQUilibrium CDROM into the CDROM drive.
3. Mount the EQUilibrium installation CDROM by entering the `mount /mnt/cdrom` command, where `/mnt/cdrom` is the mount point directory.
4. Change to the mount point directory using the `cd /mnt/cdrom` command.
5. Enter the `rpm -ivh INI-EQ-VPMS-1.0.1.rpm` command to start the installation.

When the installation completes, the location of the installation log file is provided.

#### 3.1.2. Install the MPP Component

The following procedure installs the MPP component:

1. Log into the MPP server with a *root* login.
2. Insert the INI EQUilibrium CDROM into the CDROM drive.
3. Mount the EQUilibrium installation CDROM by entering the `mount /mnt/cdrom` command, where `/mnt/cdrom` is the mount point directory.
4. Change to the mount point directory using the `cd /mnt/cdrom` command.
5. Determine whether Java is installed on the server by entering the `rpm -q -a | grep jdk` command. If the package `jdk-1.6.0_18-fcs` is present is not present, load Java on

the MPP. Change to the `/mnt/cdrom/Java` directory and run the `rpm -ivh jdk*.rpm` command.

6. Add an entry in the `/etc/hosts` file for the EQVPMS alias. The following entry should be added: `10.32.24.30 EQVPMS`, where `10.32.24.30` is the VPMS IP address.
7. Change to the `/mnt/cdrom` directory and enter the `rpm -ivh INI-EQ-MPP-1.0.1.rpm` command to start the installation.

When the installation completes, the location of the installation log file is provided.

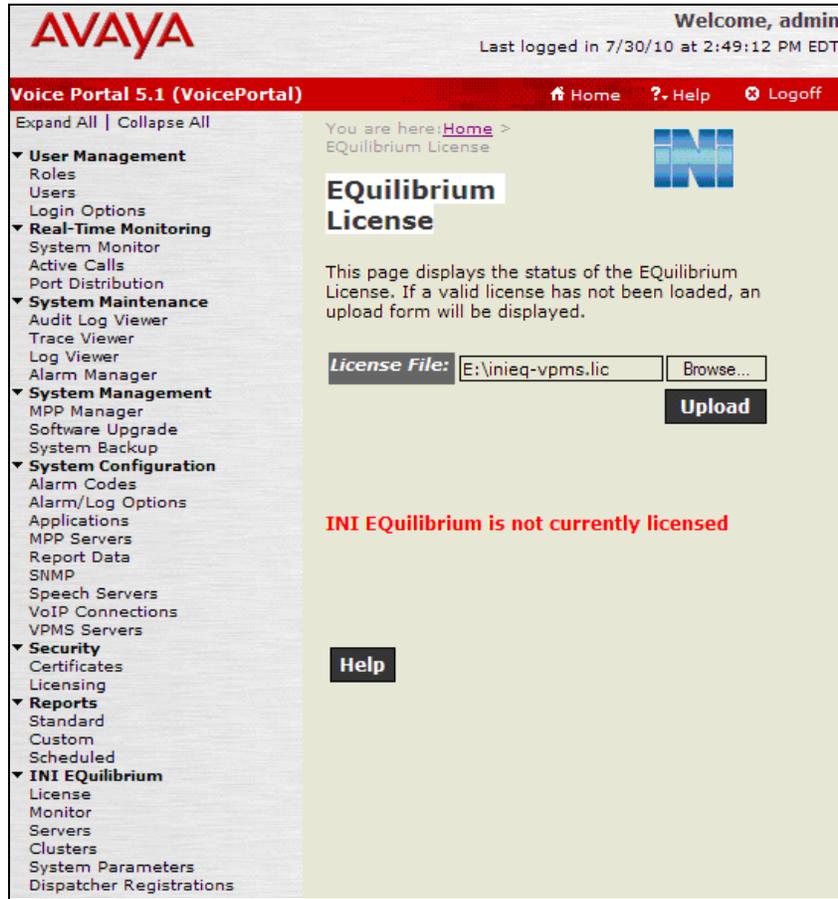
### 3.2. Configure INI Equilibrium

Equilibrium is configured via the Voice Portal Management System (VPMS) web interface. To access the web interface, enter `http://<ip-addr>/VoicePortal` as the URL in an internet browser, where `<ip-addr>` is the IP address of the VPMS. Log in using the Administrator user role. The screen shown below is displayed with the INI Equilibrium menu options in the left pane after the software is installed on the VPMS. Refer to [4] for more information on configuring Equilibrium.



### 3.2.1. License EQUilibrium

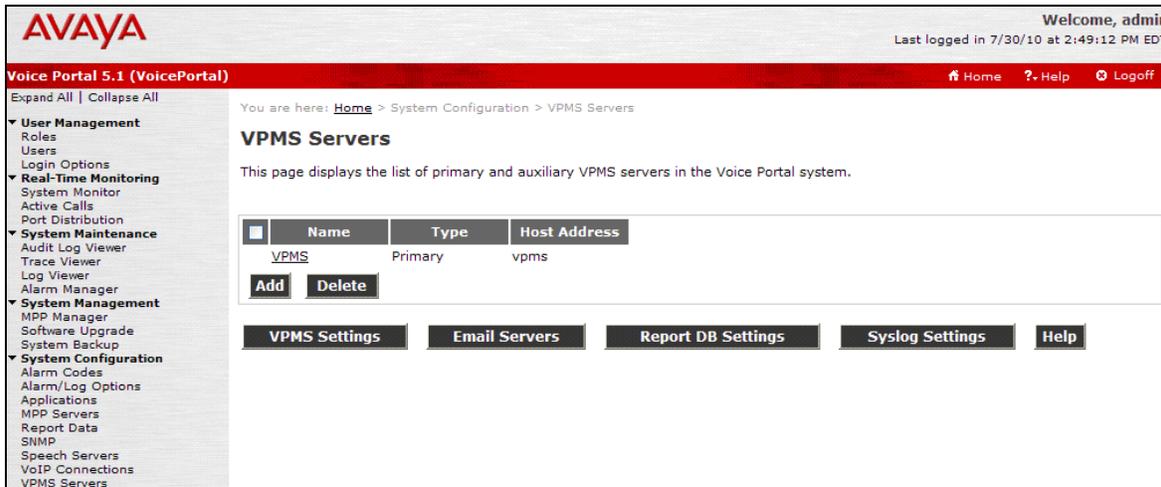
Install a valid license, provided by INI, on EQUilibrium. Click on **License** under **INI EQUilibrium** and specify the **License File**. Click **Upload**. After the license has been installed, this screen should display the “INI EQUilibrium is licensed” message.



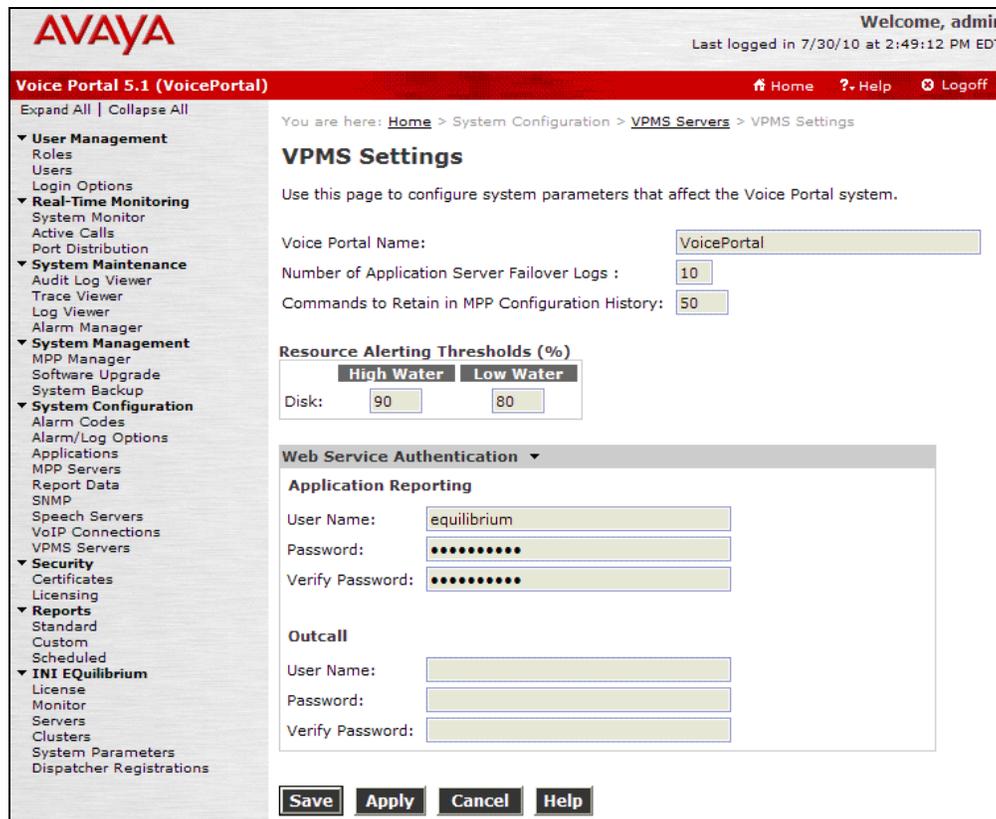
The screenshot shows the Avaya Voice Portal 5.1 (VoicePortal) interface. The top navigation bar includes the Avaya logo, a welcome message for 'admin', and the last login time '7/30/10 at 2:49:12 PM EDT'. The main navigation menu on the left lists various system management and configuration options. The main content area is titled 'EQUilibrium License' and features a message: 'This page displays the status of the EQUilibrium License. If a valid license has not been loaded, an upload form will be displayed.' Below this message is a form with a 'License File:' label, a text input field containing 'E:\inieg-vpms.lic', a 'Browse...' button, and an 'Upload' button. A red message 'INI EQUilibrium is not currently licensed' is displayed below the form. A 'Help' button is located at the bottom left of the main content area.

### 3.2.2. Configure EQUilibrium to Report Alarms

After EQUilibrium is licensed, the next step is to configure it to report alarms. Select **VPMS Servers** under **System Configuration** in the left pane to display the screen below. Click on the **VPMS Settings** button to display the **VPMS Settings** screen.



In the **VPMS Settings** screen, specify a **User Name** and **Password** under **Application Reporting** as shown below. Click **Save**.



Next, configure the VPMS application reporting user name and password in EQUilibrium. Select **System Parameters** under **INI EQUilibrium** in the left pane and specify the **Username** and **Password** as shown below. Click **Save**.

The screenshot shows the Avaya Voice Portal 5.1 (VoicePortal) interface. At the top left is the AVAYA logo. At the top right, it says "Welcome, admin" and "Last logged in 7/30/10 at 2:49:12 PM EDT". Below this is a red navigation bar with "Voice Portal 5.1 (VoicePortal)", "Home", "Help", and "Logoff" links. A left-hand navigation pane contains a tree view with categories: "User Management" (Roles, Users), "Real-Time Monitoring" (System Monitor, Active Calls, Port Distribution), "System Maintenance" (Audit Log Viewer, Trace Viewer, Log Viewer, Alarm Manager), and "System Management" (MPP Manager). The main content area is titled "EQUilibrium System Parameters" and includes the INI logo. Below the title is the instruction: "Use this page to set the username and password for the VPMS Alarm/Reporting web service." There are two input fields: "Username" with the value "equilibrium" and "Password" with masked characters. At the bottom of the form are "Save" and "Help" buttons.

### 3.2.3. Configure Application Servers

To configure the application servers, click on **Servers** under **INI EQUilibrium**. In the **EQUilibrium Servers** screen (not shown), click on the **Add** button. The **Add EQUilibrium Server** screen is displayed. Configure the following fields as follows:

- **Name** Specify a descriptive name for the application server (e.g., *AppSvr1*).
- **Protocol** This is the protocol used when EQUilibrium redirects the page fetch to the application server. In this example, *http* was used.
- **DNS Name/IP** This is the IP address of the application server (e.g., *10.32.24.152*).
- **Port** This field specifies the http port used by the application server running Apache Tomcat (e.g., *8080*).
- **Preferred State** This selection indicates the state the application server is placed into when the EQUilibrium Dispatcher initializes.
- **Health Check Path** This is the URL path to the health check application on the application server. When a forward-slash (/) is used, the root node of the application server will be polled. As long as the application server is alive, the root node should respond and the application will be considered online. However, a special health check application may be used.

After the EQUilibrium server is configured as shown below, click **Save**.

The screenshot displays the 'Add Equilibrium Server' configuration page in the AVAYA Voice Portal 5.1. The page title is 'Add Equilibrium Server' and it includes a breadcrumb trail: 'Home > EQ Servers > Add Equilibrium Server EQ Server'. The configuration fields are as follows:

Field	Value
Name	AppSvr1
Protocol	http
DNS Name/IP	10.32.24.152
Port	8080
Preferred State	In Service
Health Check Path	/

Buttons for 'Save', 'Apply', 'Cancel', and 'Help' are located at the bottom of the form.

Repeat the above procedure for the second application server. Once the application servers have been configured, they will be listed in the **EQuilibrium Servers** screen shown below.

**AVAYA** Welcome, admin  
Last logged in today at 3:32:55 PM EDT

**Voice Portal 5.1 (VoicePortal)** Home Help Logoff

Expand All | Collapse All

You are here: [Home](#) > [EQuilibrium Servers](#)

### EQuilibrium Servers

This page displays the list of EQ servers. When a cluster receives a call, it will send the call to an available application server based upon the defined dispatch method for the cluster.

Server Name	Base URI	Health Check Webapp
<a href="#">AppSvr1</a>	http://10.32.24.152:8080 /	<a href="#">Delete</a>
<a href="#">AppSvr2</a>	http://10.32.24.154:8080 /	<a href="#">Delete</a>

**Add** **Help**

### 3.2.4. Configure Cluster

To create a cluster that groups application servers, click on **Clusters** under **INI EQuilibrium**. In the **EQuilibrium Clusters** screen (not shown), click on the **Add** button. The **EQuilibrium Cluster Information** screen is displayed. Provide a descriptive name for the cluster and select a **Dispatch Method**, such as *Ordered*, *Round-Robin*, or *Random*, as shown below. Refer to [4] for a description of the dispatch methods. Accept the default values for the other fields or fine-tune according to customer requirements. Click **Next**.

**AVAYA** Welcome, admin  
Last logged in today at 3:32:55 PM EDT

**Voice Portal 5.1 (VoicePortal)** Home Help Logoff

Expand All | Collapse All

You are here: [Home](#) > [EQ Clusters](#) > [EQuilibrium Cluster Information](#)

### EQuilibrium Cluster Information

Use this page to add a new EQ cluster.

**Name** : ApacheCluster

**Dispatch Method** : Ordered

**Health Check Frequency (ms)** : 5000

**Health Check Timeout (ms)** : 5000

**Offline Check Loops** : 60

**Next** **Finish** **Cancel**  
**Help**

In the **Equilibrium Cluster Server Assignments** screen shown below, select the application servers to be added to this cluster. Click **Finish**.

In this example, the *Ordered* dispatch method was used (see previous screen). This means that page fetch requests are distributed to application servers based upon the listed order. If the first server is available, the call will be routed to that server.

The screenshot displays the Avaya Voice Portal 5.1 (VoicePortal) interface. At the top, the AVAYA logo is on the left, and the user is logged in as 'admin' with the text 'Welcome, admin' and 'Last logged in today at 3:32:55 PM EDT'. The main header shows 'Voice Portal 5.1 (VoicePortal)' with navigation links for Home, Help, and Logoff. A left-hand navigation menu is expanded to show 'INI Equilibrium' options, including License, Monitor, Servers, Clusters, System Parameters, and Dispatcher Registrations. The main content area is titled 'Equilibrium Cluster Server Assignments' and includes a breadcrumb trail: 'You are here: Home > EQ Cluster > Equilibrium Cluster Server Assignments'. Below the title, there is a sub-header 'INI' and a description: 'Use this page to assign EQ servers to the EQ cluster.' The interface is divided into two main sections: 'Available Servers' (an empty box) and 'Assigned Servers' (a box containing 'AppSvr1' and 'AppSvr2'). Between these sections are four directional buttons: a left arrow, a right arrow, a double left arrow, and a double right arrow. At the bottom of the interface are four buttons: 'Previous', 'Finish', 'Cancel', and 'Help'. There are also small up and down arrow icons at the bottom right of the 'Assigned Servers' box.

### 3.2.5. Configure Voice Portal Application

Once EQuilibrium has been installed and configured, the application servers added, and the cluster defined, EQuilibrium is ready to provide application dispatch. This section covers the configuration of a Voice Portal application that uses EQuilibrium. This is accomplished by administering the application's URL to point to EQuilibrium on the local MPP. In the example below, the URL is specified as:

`http://localhost:9090/avptestapp/dtmf/intro.vxml?EQID=ApacheCluster`

This example points out two things. First, the URL for this application points to "localhost:9090", meaning that EQuilibrium listens to port 9090 on the local MPP ("localhost"). Secondly, the URL requires the EQID parameter that specifies the name of the cluster. In this example, the name of the cluster is "ApacheCluster". If desired, a second fail-over URL may be configured in the application that will be used if the application servers in the specified cluster are not available.

The screenshot displays the Avaya Voice Portal 5.1 administration interface. The top navigation bar includes the Avaya logo, a user greeting "Welcome, admin", and the time "Last logged in today at 3:32:55 PM ED". The main header shows "Voice Portal 5.1 (VoicePortal)" and navigation links for Home, Help, and Logoff. A left sidebar contains a tree view of system components, with "INI EQuilibrium" selected. The main content area is titled "Add Application" and contains the following configuration fields:

- Name:** Intro.vxml
- Enable:** Yes (selected) / No
- Type:** VoiceXML
- URL:** Single (selected) / Fail Over / Load Balance. The VoiceXML URL is `http://localhost:9090/avptestapp/dtmf/intro.vxml?EQID=ApacheCluster` with a Verify button.
- Mutual Certificate Authentication:** Yes / No (selected)
- Basic Authentication:** Yes / No (selected)
- Speech Servers:** ASR: Nuance, TTS: Nuance. Languages: English(USA) en-US. Voices: English(USA) en-US Samantha F.
- Application Launch:** Inbound (selected) / Inbound Default / Outbound. Number (selected) / Number Range / URI. Called Number: 23801 with Add and Remove buttons.
- Parameters:** Speech Parameters, Reporting Parameters, and Advanced Parameters sections, each with a right-pointing arrow.

At the bottom of the form are Save, Cancel, and Help buttons.

## 4. General Test Approach and Test Results

The interoperability compliance test included feature and serviceability testing. Feature testing entailed placing calls manually to Voice Portal and verifying that EQUilibrium dispatched the application to the appropriate application server according to the cluster dispatch method, including *Ordered* and *Round-Robin*. Testing was performed with application servers running Apache Tomcat and Microsoft IIS. When testing with Microsoft IIS, HTTP Keep-Alive messages were disabled to prevent the application server from going offline periodically in EQUilibrium. In addition, various states of the application servers were tested to verify that EQUilibrium would indicate the correct state in the **Monitor** screen, that calls would not be dispatched to offline application servers, and that the appropriate alarms were generated in the VPMS. Finally, the fail-over URL feature in Voice Portal was used together with EQUilibrium to verify that it would be used if the application servers in the cluster were not available.

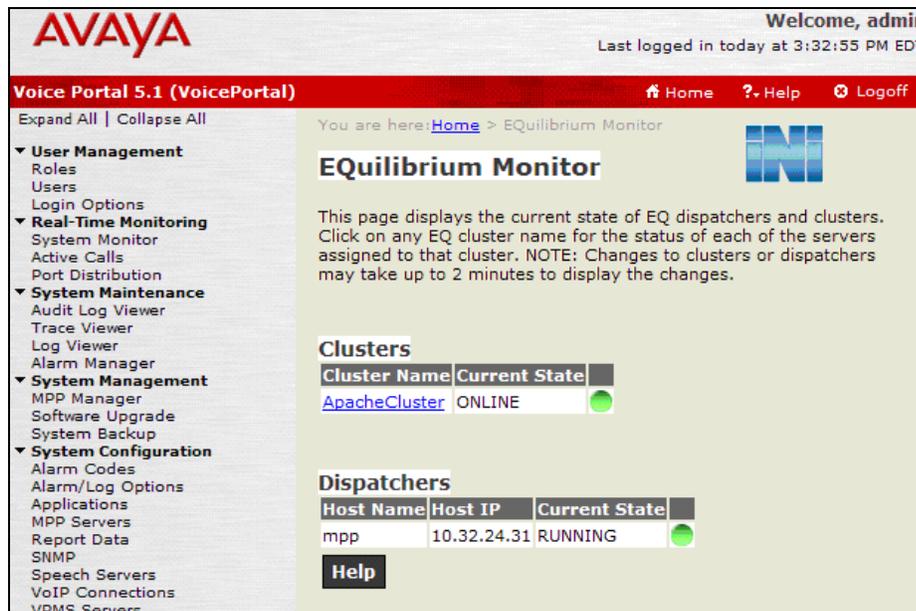
Serviceability testing focused on verifying the ability of EQUilibrium to dispatch applications only to available application servers, to fall back to the fail-over URL, and to recover from adverse conditions, such as VPMS and MPP server restarts.

All test cases passed.

## 5. Verification Steps

This section provides the verification steps that may be performed to verify that EQUilibrium is able to dispatch applications to the application servers under its control.

1. Verify that the EQUilibrium cluster is *online* and that the EQUilibrium Dispatcher is *running* on the MPP as shown in the **EQUilibrium Monitor** below. This screen is accessible by clicking on **Monitor** under **INI EQUilibrium**.



AVAYA

Welcome, admin  
Last logged in today at 3:32:55 PM EDT

Voice Portal 5.1 (VoicePortal) Home ? Help Logoff

Expand All | Collapse All

You are here: [Home](#) > EQUilibrium Monitor

### EQUilibrium Monitor

This page displays the current state of EQ dispatchers and clusters. Click on any EQ cluster name for the status of each of the servers assigned to that cluster. NOTE: Changes to clusters or dispatchers may take up to 2 minutes to display the changes.

#### Clusters

Cluster Name	Current State
<a href="#">ApacheCluster</a>	ONLINE

#### Dispatchers

Host Name	Host IP	Current State
mpp	10.32.24.31	RUNNING

Help

- From the **EQuilibrium Monitor**, click on the cluster name (e.g., ApacheCluster) to check the status of the individual application servers in the cluster. The state of each application server should be *online* as shown below. The application servers can be placed in maintenance mode from this screen.

**AVAYA** Welcome, admin  
Last logged in today at 3:32:55 PM EDT

**Voice Portal 5.1 (VoicePortal)** Home Help Logoff

Expand All | Collapse All

You are here: [Home](#) > [EQ Monitor](#) > EQuilibrium Monitor - Servers

### EQuilibrium Monitor - Servers

This page displays the current state of EQ servers assigned to the selected cluster. To place a server into maintenance mode, click the Maintenance link to the right of the selected server. To return a server into service from maintenance mode, click the InService link to the right of the selected server. NOTE: Changes to servers or server state may take up to 2 minutes to display the changes.

**Cluster: ApacheCluster**

Server Name	Last Health Check	Current State	
AppSvr1	2010-08-30 15:55:59	ONLINE	<a href="#">Maintenance</a>
AppSvr2	2010-08-30 15:55:59	ONLINE	<a href="#">Maintenance</a>

[Help](#)

- If any application server controlled by EQuilibrium is not available, an alarm will be raised. The Voice Portal Alarm Report may be checked for alarms and will be displayed as shown below.

**AVAYA** Welcome, admin  
Last logged in today at 3:32:55 PM EDT

**Voice Portal 5.1 (VoicePortal)** Home Help Logoff

Expand All | Collapse All

You are here: [Home](#) > [Real-Time Monitoring](#) > [System Monitor](#) > [VPMS Alarm Monitor](#) > Alarm Report

### Alarm Report

This page displays the alarms that have been generated in one or more Voice Portal system components. An alarm indicates that there is a problem with your Voice Portal system.

Page 1 of 1 Total Records: 2

<input type="checkbox"/>	Timestamp	Alarm Status	Server Name	Category	Alarm Severity	Alarm Code	Event Code	Alarm Message
<input type="checkbox"/>	8/30/10 4:02:01 PM	UNACK	VPMS	VP Application Logger	Critical	QAPP_00003	<a href="#">PAPP_00003</a>	QAPP_00003: Application generated a Critical alarm.
<input type="checkbox"/>	8/30/10 4:02:01 PM	UNACK	VPMS	VP Application Logger	Major	QAPP_00002	<a href="#">PAPP_00002</a>	QAPP_00002: Application generated a Major alarm.

Page 1 of 1

**Change Alarm Status**

Selected alarms on this page  All alarms on this report

New Status:  [Submit](#)

[Help](#)

- Clicking on the **Event Code** of an active alarm (see previous screen) will display more information about the alarm, such as which application server or cluster changed state. The following screen displays the log report for an event.

The screenshot shows the Avaya Voice Portal 5.1 (VoicePortal) interface. The user is logged in as 'admin' and is viewing a 'Log Report for Event PAPP\_00003'. The breadcrumb trail is: Home > Real-Time Monitoring > System Monitor > VPMS Alarm Monitor > Alarm Report > Log Report for Event PAPP\_00003. The report shows one event on 8/30/10 at 4:02:01 PM. The event details are as follows:

Timestamp	Server Name	Category	Event Severity	Event Code	Event Message
8/30/10 4:02:01 PM	VPMS	VP Application Logger	Fatal	PAPP_00003	Application EQUilibrium reported an error from AppSvr1, Session ID: none at Aug 30, 2010 4:01:54 PM EDT with message: Server AppSvr1 has entered a state of OFFLINE, Server check failed after 5003 because of an IO e... Method=VPReport4SoapBindingImpl::logApplicationEventAlarm

- Assuming that all application servers and clusters are online, place a call to Voice Portal that invokes an application that uses EQUilibrium. Verify that EQUilibrium dispatches the application to an available application server in the specified cluster. To verify that the appropriate application server was used according to the cluster dispatch method, the standard **Session Details** report can be viewed.

## 6. Conclusion

These Application Notes describe the configuration steps required to integrate INI EQUilibrium with Avaya Voice Portal for performing load-balancing across the available application servers. All feature and serviceability test cases were completed successfully.

## 7. Additional References

This section references the Avaya documentation relevant to these Application Notes. The following Avaya product documentation is available at <http://support.avaya.com>.

- [1] *Implementing Voice Portal on separate servers*, June 2010.
- [2] *Administering Voice Portal*, June 2010.

The following EQUilibrium documentation is available from INI.

- [3] *INI EQUilibrium Installation Guide*, Revision 0.5, July 2010.
- [4] *INI EQUilibrium Administrator's Guide*, Revision 0.5, July 2010.

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