



Dialogic® PowerMedia™
Media Resource Broker (MRB)
Quick Start Guide

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Revision History

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1.0 (update)	January 2016	PowerMedia MRB Cluster : Removed a paragraph. System Requirements : Updated the operating system and software requirements. Disable SELinux : Added the section. Software Installation : Updated the section. PowerMedia MRB Configuration : Updated the sections. PowerMedia MRB Media Server Management : Updated the section. PowerMedia MRB Tests : Updated the section.
1.0	October 2015	Initial release of this document.
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1. Welcome

This Quick Start Guide leads the reader, step-by-step, through the installation and configuration of PowerMedia Media Resource Broker (also referred to herein as "PowerMedia MRB" or "MRB") to arrive at a working test setup. Many other configurations are possible; however, most of the high-availability functions provided by the MRB can be demonstrated with this one.

The full test setup will consist of two MRB nodes, which make up the MRB cluster, and two PowerMedia Extended Media Server (also referred to herein as "PowerMedia XMS" or "XMS") nodes that are managed by the MRB cluster.

The four systems can be on virtual machines. However, ensure that communication between all systems via UDP and TCP is possible before starting the verification test. Generally, a "bridged" virtual network will yield suitable results. Communication with the public Internet will also be needed. A single Ethernet device is presumed.

XMS application technologies currently supported by the MRB are NetAnn and MSML. For simplicity, NetAnn is used for the tests in this guide. SIP calls should be used in the tests. WebRTC call handling is not yet available with the MRB.

The tests will cover manual relocation of a conference, automatic conference switchover when an XMS fails, and automatic takeover when one member of the MRB pair fails.

For detailed installation and configuration information, refer to the *Dialogic® PowerMedia™ MRB Installation and Configuration Guide* at <http://www.dialogic.com/manuals/xms/xms3.0.aspx>.

2. PowerMedia MRB Overview

PowerMedia MRB Cluster

The MRB cluster is a highly-available pair of MRB nodes. The pair of MRB nodes share a common IP address, known as a Virtual IP (VIP) address. All calls to the XMS systems handled by the MRBs are directed to the VIP address. At any given time, one of the two nodes is active and services the VIP address. From the active MRB, calls are distributed to the XMS systems that the pair manages.

The keepalive messages between the nodes allow them to determine the health of one another. Thus, when the active node fails due to hardware problems or network connectivity, the standby node is able to detect this and activate the VIP address on its network interface and accept calls for the address.

PowerMedia XMS Nodes

The MRB's main purpose is to manage XMS systems by directing incoming SIP calls to an appropriate XMS to handle the call.

Since the MRB knows the port utilization of all XMS nodes, it is able to send the call to its least busy XMS configured within the node that can fulfill the call's needs.

In addition, keepalive messages between the MRB and XMS allow the MRB to determine the health of the XMS systems it manages. Thus, when an active XMS fails due to hardware problems or network connectivity, the MRB is able to detect this and direct calls to a healthy XMS. In addition, an XMS can be taken offline and its calls can be manually switched over to another XMS.

3. PowerMedia MRB Installation

System Requirements

The system requirements are as follows.

Component	Requirement
Operating Systems	Community ENTerprise Operating System (CentOS) 7.x and 6.x Red Hat Enterprise Linux (RHEL) 7.x and 6.x Note: When installing the MRB on CentOS 7.x, the CentOS net-tools package must be installed.
Software	The MRB requires Java Runtime Environment (JRE) version 1.7.0_80 (or higher). The latest update should be installed on the target machine. By default, the JRE is installed within the /opt directory (unpack tar.gz). The latest Oracle JRE 1.7 update can be found at the following location: http://www.oracle.com/technetwork/java/javase/downloads/server-jre7-downloads-1931105.html . Note: The JRE is not required if the Java Development Kit (JDK) version 1.7.0_80 (or higher) is installed.
Memory	MRB and MRB adaptor require 2 GB RAM each

Processor Requirements

The MRB processor requirements are dependent on the number of XMS it will support, and the calls per second it is required to process.

Configuration	Max Calls Per Second (CPS)	Processor
Low Density (1-7 XMS Clusters)	Up to 250 CPS	*Intel Xeon E3-1220v2 uni-processor (3.10 GHz, 4 cores) or better
High Density (8-15 XMS Clusters)	Up to 500 CPS	*Intel Xeon E5-2609v2 dual-processor (2.50 GHz, 4 cores/socket) or better
*Comparable systems can be used based on capacity requirements. For more demanding workloads, such as complex IVR systems or voicemail applications that result in a large amount of SIP traffic or demand fast response times, a more robust system may be required.		

Disable SELinux

SELinux is not currently supported and must be disabled. To disable SELinux, proceed as follows:

1. Edit the `/etc/selinux/config` file as a root user.
2. Find the line with the key **SELINUX=** and replace the value after the equals sign with **disabled**.
3. Save the file and reboot the operating system.

Software Installation

To install the MRB, proceed as follows. Refer to the image after the procedure and the *Dialogic® PowerMedia™ MRB Installation and Configuration Guide* for details.

1. Run the following command to execute the installer file:

```
java -jar dialogic-mrb-installer-<version>.jar
```

Note: Alter the command line as necessary to match the version and path of your Java executable.

The installer will commence. Depending on the graphical environment available, the installer will run on either a user interface version or a command line version.

2. Press **1** and then **Enter** to install the MRB.
3. Disable the media proxy [n] and press **Enter**. By default, it is enabled [y].
4. Enter the location of the Java install (JRE or JDK) that will be used to run the MRB and press **Enter**.
5. Enter the management interface IP address and the VIP request/response interface, or press **Enter** to use the default values, and press **1**.
6. Select the target path. Change the path, or press **Enter** to use the default path, and then press **1**.
7. Press **1** or **2** to set your Jetty web server preference, and then press **Enter**:
 - Press **1** to create a new installation of the Jetty web server. Select this option if you do not use a Jetty instance on your server already.
 - Press **2** to install the MRB Admin UI within an existing Jetty instance. Select this option if you use a Jetty instance on your server already.
8. Follow the on-screen instructions until the installation process is complete.


```
root@mbr1:~  
[root@mbr1 ~]# /opt/jdk1.7.0_80/bin/java -jar dialogic-mrb-installer-1.4.19.jar  
* Press 1 if you would like to install the Media Resource Broker  
* Press 2 if you would like to install the Media Server Adaptor  
1  
  
The Media Proxy enables the MRB to proxy media sent between MRB clients and the media server. It provides:  
* The ability to move calls between media servers faster than when the originator of the call needs to be reinvited.  
* The only way of moving calls to a new media server when the MRB client doesn't support reinviting.  
Would you like to enable the Media Proxy? [y/n][default:y]  
n  
  
Please enter the location of your Java JRE install that will be used to run the MRB [/usr/bin/java]  
/opt/jdk1.7.0_80/bin/java  
  
The MRB management interface needs to listen on a given IP Address. The list of available IP Addresses are as follows:  
116.152.124.02  
Please enter your IP Address that the MRB will listen for management traffic on. [116.152.124.02]  
]  
  
The MRB needs to send and receive VIP request/ responses via a specific interface. Available interfaces are listed below:  
eth0  
Please enter the name of the interface you would like the MRB to send and receive VIP request/ responses from the list [eth0] :  
  
press 1 to accept, 2 to reject, 3 to redisplay  
1  
Select target path [/opt/mrb]  
  
press 1 to continue, 2 to quit, 3 to redisplay  
1  
* Press 1 if you would like to create a new installation of the Jetty web server  
* Press 2 if you would like to install the MRB Admin UI within an existing Jetty instance  
1  
Please enter a path where you would like to install the jetty web server [default: /opt/mrb] :  
  
Select the packs you want to install:  
  
[<required>] MRB (The MRB base Installation files)  
[<required>] MRB Documentation (The documentation)  
[<required>] Media Server Adaptor (The Media Server Adaptor base installation files)  
  
...pack selection done.  
press 1 to continue, 2 to quit, 3 to redisplay  
1  
[ Starting to unpack ]  
[ Processing package: MRB (1/3) ]  
[ Processing package: MRB Documentation (2/3) ]  
[ Processing package: Media Server Adaptor (3/3) ]  
[ Unpacking finished ]  
  
Install of the MRB successfully complete.  
The MRB has been installed at the following location - /opt/mrb  
  
You can now view the web admin ui at the following URL:  
http://146.152.124.92:8888/mrb  
  
Login details are as follows  
Username : root  
Password : admin  
  
[ Console installation done ]
```

4. PowerMedia MRB Configuration

MRB Login

Proceed as follows to log in to the MRB console. Refer to the *Dialogic® PowerMedia™ MRB Installation and Configuration Guide* for details.

1. Launch the **MRB Login** page in a web browser using one of the following URLs:
http://{server_address}:8888/mrb or https://{server_address}:8443/mrb.

MRB Login

Welcome to the Dialogic MRB

Username	<input type="text" value="root"/>
Password	<input type="password" value="....."/>
<input type="button" value="Login"/>	

Note: If the error message "Lost connection to MRB on localhost:5100" is displayed when attempting to log in, refer to "Appendix C: Resolving the Hostname" of the *Dialogic® PowerMedia™ MRB Installation and Configuration Guide* to resolve the issue.

2. When logging in to the MRB console for the first time, enter **root** in the **Username** field and **admin** in the **Password** field. Once logged in to the MRB console, you can add different users by going to the User Administration page if desired.
3. Click **Login**. The MRB console opens and the **Dashboard** page appears.


VIP Controller and VIP Standby Setup


This section covers the setup of a pair MRB nodes: one node as the VIP Controller and one as the VIP Standby. For more information on general PowerMedia MRB configuration, refer to the *Dialogic® PowerMedia™ MRB Installation and Configuration Guide*.

To set up the MRB nodes, proceed as follows:

1. Launch the MRB console and log in. The first MRB node must be configured as a VIP Controller, so click **Unlock Config** to change to the VIP Controller.

Dashboard

Status	MRB			
	Hostname	192.168.2.74:5070		
	Status	Active		
	HA Enabled	<input checked="" type="checkbox"/>		
	Up Time	000:00:26:15		
	Start Time	Tue, 7 Jul 2015 09:25:13 BST		
	JVM Vendor	Oracle Corporation		
	JVM Version	Java HotSpot(TM) 64-Bit Server VM version 24.51-b03		
	Java Version	Java Virtual Machine Specification version 1.7		
	Operating System Version			
	Number of Processors	Number of Threads	506	
	Architecture	Peak Number of Threads	507	
	Heap Size		Non Heap Size	
	Initial	256.0 MB	Initial	22.44 MB
	Current	108.99 MB	Current	24.89 MB
	Maximum	2048.0 MB	Maximum	130.0 MB
	Committed	256.0 MB	Committed	25.0 MB






Status	Paired MRB	
	Hostname	192.168.2.117:5070
	Status	Active

Errors

No errors

2. Click **Networking Configuration** to open the **Networking Configuration** page.

Networking Configuration



VIP Manager Listening Port	<input type="text" value="5111"/>	
External Load Balancer	<input type="checkbox"/>	
Traffic VIP Address	<input type="text" value="146.152.124.51"/>	
Traffic VIP Port	<input type="text" value="5060"/>	
Traffic VIP Interface	<input type="text" value="eth0"/>	

3. To configure VIP addressing, proceed as follows:
 - Keep the **VIP Manager Listening Port** field at its default of 5111.
 - Verify that **External Load Balancer** is not selected. Since a VIP address is used by the MRB pair, it is assumed that there is no other SIP device in front of the MRB. SIP clients are calling the VIP address directly.
 - Enter an IP address in the **Traffic VIP Address** field. The IP address should be an unused IP address on the same subnet as the real addresses of the MRB pair
 - Enter a port in the **Traffic VIP Port** field. It should be an unused port. Port 5070 is a suitable, SIP-like choice.
 - Select the **Traffic VIP Interface** from the drop-down menu. The name is used as part of the alias for the Ethernet device that carries traffic. Here, eth0 is the active interface. On the system itself, the alias eth0:1 will be used for the VIP address.
 - Enter an IP address in the **Media VIP Address** fields if the media proxy is enabled.
 - Select the **Media VIP Interface** from the drop-down menu. This is the interface name for the media VIP.

When finished, save the configuration.

4. Click **Manage MRB Cluster** to open the **Manage MRB Cluster** page. The VIP Controller node will display its own information. The VIP Standby node must be manually added.

Manage MRB cluster

Status	Name	Host	Total SIP Calls	Management Mode	
	MRB-backup	192.168.2.117:5070	0	Slave	Manage
	mrbs	192.168.2.74:5070	0	Master	Manage

[Add MRB Node](#) ⓘ

5. Install the MRB software on the standby system and make sure that it is up and available. The MRB is set to **Config Locked** by default. Do not unlock its configuration.

6. Once the MRB software is installed on the standby system, click **Add MRB Node** on the **Manage MRB Cluster** page. The **MRB Node** page appears.

MRB node

MRB node new MRB-192.168.2.74:5070:Slave



Name	MRB-backup	?
SIP Hostname and port	192.168.2.117:5070	?
Listen on TLS	<input type="checkbox"/>	
TLS port	5061	?
Security Profile	▼	?
JMX Hostname and port	192.168.2.117:5100	?
Paired MRB node ID	not HA ▼	?
Management mode	Slave	
MRB/MLF	Mrb ▼	
<input type="button" value="Back"/> <input type="button" value="Save"/> <input type="button" value="Delete"/>		

7. To configure the VIP Standby node, proceed as follows:
- Enter a meaningful name in the **Name** field.
 - Set **SIP Hostname and port** to the real address/port used for SIP calls on the VIP Standby node. This is usually the IP address of the VIP Standby node. The default port is 5070.
 - Leave **Listen on TLS** not selected (default).
 - Leave **TLS Port** set to 5061 (default).
 - Set **JMX Hostname and port** to the Java Management Technology (JMX) hostname and port (typically 5100) used for the JMX server on the VIP Standby node.
 - For **Paired MRB Node ID**, select the active node (node now being configured) that will go along with the standby node.
 - Verify that **Management mode** is set to **Slave** (default).
 - Verify that **MRB/MLF** is set to **Mrb** (default).

When finished, save the configuration.

8. Click **Manage MRB Cluster** to view the status of the MRB pair. Both MRB nodes should have green status indicators. If not, click **MRB Configuration** and click **Restart** to restart the MRB console.

Manage MRB cluster

Status	Name	Host	Total SIP Calls	Management Mode	
	MRB-backup	192.168.2.117:5070	0	Slave	Manage
	mrbs	192.168.2.74:5070	0	Master	Manage

?

5. PowerMedia MRB Media Server Management

This section covers how to set up a pair of XMS nodes to be used by a PowerMedia MRB cluster.

Installing XMS

XMS must be installed on a system. Refer to the *Dialogic® PowerMedia™ XMS Installation and Configuration Guide* for information on installing the XMS:

http://www.dialogic.com/webhelp/XMS/3.0/XMS_InstallConfig.pdf

A background service runs on the XMS system and provides an interface to the MRB. The interface is known as the MRB adaptor. A PowerMedia MRB license is required for the XMS system to enable the MRB adaptor on XMS.

The MRB adaptor is installed as part of the XMS installation, and the adaptor service will be running and ready to use when the XMS system installation and configuration is complete.

By default, SIP signaling on XMS is done over UDP, while SIP keepalive messages between the MRB adaptor and MRB is done over TCP. Log in to the XMS console and navigate to the **Protocol > SIP** page to ensure that the **Transport** value is set to **UDP_TCP**. A services restart will be needed to activate this setting.

SIP	
IPv4 Address:	DEFAULT
IPv6 Address:	DISABLE
Port:	5060
Transport:	UDP_TCP
Session Timeout (seconds):	1800
Telephone Events:	0-15
Enable SIP Precondition	<input type="checkbox"/>
<input type="checkbox"/> Restrict Access to Specified Host	
Apply	

XMS system services must be restarted for the change to take effect. Click **System > Services** and then click the **Restart** button to restart the XMS system services.

Add an XMS to the MRB

XMS may now be added to the MRB. This is done on the **Manage Media Servers** page on the active MRB console.

Manage Media Servers

Status	Media Server Detail	Host	Port	Listen On Tls ?	TLS Port	Location
--------	---------------------	------	------	-----------------	----------	----------

Add Media Server

Proceed as follows to add an XMS in the MRB console:

1. On the **Manage Media Servers** page, click **Add Media Server**. The **Add Media Server** page appears.

Add Media Server

Host ⓘ


Port ⓘ

Listen on TLS ☐ TLS Port ⓘ

Location ⓘ

2. Enter the following information:
 - **Host** – the IP address used by the MRB adaptor.
 - **Port** – the SIP port used by the MRB adaptor. This must not conflict with the SIP port used by XMS (**5060** by default). Port **5070** is recommended.
 - **Location** – Pick a location from the drop-down menu. **New York** and **London** are the default choices unless others have been added.
3. Click **Add** when finished to add the XMS. If the XMS can be contacted and is ready for use, the **Manage Media Servers** page will show a green status indicator.

Manage Media Servers

Status	Media Server Detail	Host	Port	Listen On Tls ?	TLS Port	Location	
	Dialogic PowerMedia XMS	192.168.1.50	5070	false		New York	Manage

Other status indicators are as follows:

- A yellow status indicates that the XMS has been configured but has not been put in an online state on the MRB.
- A red status means the XMS has been configured and should be accessible, but it is not.
- A green status with a warning symbol means that there is a version mismatch between the MRB and the MRB adaptor on XMS.

Possible problems that would lead to an inaccessible server are as follows:

- A problem with TCP communications between the MRB and XMS. Check in both directions with a TCP-based utility such as ssh or telnet.
- XMS services on the XMS are not up and running.
- The adaptor service on the XMS system is not running or is a different version from the MRB itself.
- TCP is not enabled for SIP on XMS.

A second XMS should now be installed and configured using a different **Location** entry on the **Add Media Server** page. Once two XMS systems are installed, perform the tests that follow to verify operation.

6. PowerMedia MRB Tests

PowerMedia MRB and XMS Tests

Several tests can be performed to verify the operation of the MRB and its managed XMS systems. These also help the operator get familiar with the various screens and the system's operation. Tests that verify the operation of the MRB cluster can then be done once these more basic tests have been performed.

For the testing described in this guide, use a SIP client, such as Linphone, to direct an audio or multimedia call to the MRB's VIP address.

Call Handling and Distribution Test

A SIP call directed to the MRB's VIP address should be handled by one of the online XMS systems. In the MRB console, determine which XMS's resources are being consumed by clicking **Media Servers** and then clicking **View Port Usage**. Refer to the following guidelines for call handling distribution tests:

- For testing, a NetAnn call is easiest. A SIP URL of this format should be used:
 - sip:conf=<conf_id>@<mrbsvip_addr>:<sip_port>
 - As an example, sip:conf=1234@192.168.1.44:5070 will send a SIP call with SIP user "conf=1234" to port 5070 in IP address 192.168.1.44 and direct XMS to handle the call as a NetAnn conference with a conference ID of "1234".
- A second NetAnn call to the same conference should result in a 2-party conference on the same XMS.
- A second NetAnn call to a different conference should result in two separate, single-party conferences. If the XMS has the same number of ports licensed, the second XMS should have been selected as it was less busy than the first.

Manual Conference Switchover Test


It should be possible to manually switch over to a second XMS when the first is taken offline. Proceed as follows to test this:

1. Direct two NetAnn calls to the same conference (e.g., "conf=1234").
2. Use the **Media Servers > View Port Usage** page to determine which XMS is handling the conference.
3. Take the active server offline from the **Manage Media Servers** page by clicking the **Manage** link of the active XMS and then clicking **Take off line** on the **Media Server** page.
4. Click **Move calls to another MS**. The conference should undergo a short interruption and then be reconstructed on the second XMS. This will be most noticeable if video is used. The **MS HA Statistics** page should be displayed, with correct information in the **Time/Date** and **Failed MS** fields and the **Type** should be set to **Manual**.



Automatic Conference Failover Test

An ongoing conference should automatically switch over to the second XMS when the first is disabled. Before starting this test, make sure the **Manage Conferences** page is set to detect conference failure: select all of the check boxes and set the detection period as follows. When finished, click **Save**.

Manage Conferences

Conference Clean Up ☒ 

Conference Mix High Availability

Enable Mix HA ☒ 
RTP Failure Detection ☒
Detection Period 
SIP Re-invite on RTP Failure ☒

Once conference failure is set to be detected, simulate a failed XMS. To simulate a failed XMS, proceed as follows:

1. Direct two NetAnn calls to the same conference (e.g., "conf=1234").
2. Use the **Media Servers > Port Usage** page to determine which XMS is handling the conference
3. Disable the XMS:
 - a. Log in to the XMS using its XMS Console and simulate system failure with "service network stop" Linux shell command.
 - b. If an XMS Console is not readily available and a remote login with ssh is used, enter the shell command "service network stop;sleep 60;service network start". This will resume the network connection before the ssh session times out.

The conference should undergo a short interruption and then be reconstructed on the second XMS. This switchover will be most noticeable if video is used.

In the MRB console on the **Media Servers** page, the status indicator for the disabled XMS will turn red, and on the **Dashboard** page, the **Errors** section will indicate that there has been an XMS disconnection.

PowerMedia MRB Cluster Failover Test

Once XMS failover operation has been verified in the [Automatic Conference Failover Test](#) section, a failover test for the MRB cluster can be run. The active MRB will be the node that is first activated. It is the node on which configuration information was entered. The standby MRB will show an **Unlock Config** button at the top of its pages.

If this active node fails—as judged by not responding to keepalive messages between the two nodes, the inactive node will take over traffic arriving on the VIP address and continue as the active node.

To test automatic MRB failover, proceed as follows:

1. Direct one or two NetAnn calls to the same conference (e.g., "conf=1234").
2. Log in to the active MRB using SSH. Simulate a failure with the "*service mrb stop*" Linux shell command. The conference should remain up. Any interaction on the active MRB should be met with "*Lost connection to MRB on localhost:5100*". On the **Dashboard** page on the standby MRB, the status indicator of the paired MRB will be red.
3. Hang up the conference and retry the call. It should function as before. In the MRB console, the **Resource Summary** page on the standby MRB should accurately reflect resources in use.

Note: The nodes will still retain their active/standby mode status, irrespective of their active or inactive state.