ROSS PLATFORM MANAGER

# Redundant System Configuration Guide

**Version 5.0**

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Our mission is to:

1. Provide a Superior Customer Experience
   - offer the best product quality and support
2. Make Cool Practical Technology
   - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at *solutions@rossvideo.com*.

David Ross
CEO, Ross Video
*dross@rossvideo.com*

## Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers' best interest.
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3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

# Ross Platform Manager Redundant System · Configuration Guide

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Patent numbers 4,205,346; 5,115,314; 5,280,346; 5,561,404; 7,034,886; 7,508,455; 7,602,446; 7,834,886; 7,914,332; 8307284, 2039277; 1237518; 1127289 and other patents pending.

## Warranty and Repair Policy

Ross Video Limited (Ross) warrants its Ross Platform Manager systems to be free from defects under normal use and service time period of 15 months from the date of shipment.

If an item becomes defective within the warranty period Ross will repair or replace the defective item, as determined solely by Ross.

Warranty repairs will be conducted at Ross, with all shipping FOB Ross dock. If repairs are conducted at the customer site, reasonable out-of-pocket charges will apply. At the discretion of Ross, and on a temporary loan basis, plug in circuit boards or other replacement parts may be supplied free of charge while defective items undergo repair. Return packing, shipping, and special handling costs are the responsibility of the customer.

This warranty is void if products are subjected to misuse, neglect, accident, improper installation or application, or unauthorized modification.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profit). Implied warranties, including that of merchantability and fitness for a particular purpose, are expressly limited to the duration of this warranty.

This warranty is TRANSFERABLE to subsequent owners, subject to Ross' notification of change of ownership.

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For customers that require a longer warranty period, Ross offers an extended warranty plan to extend the standard warranty period by one year increments. For more information about an extended warranty for your Ross Platform Manager system, contact your regional sales manager.

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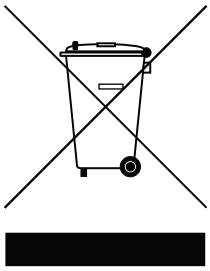
The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

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Ross Video Limited has reviewed all components and processes for compliance to:

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The “Environmentally Friendly Use Period” (EFUP) and Hazardous Substance Tables have been established for all products. We are currently updating all of our Product Manuals.

The Hazardous substances tables are available on our website at:

http://www.rossvideo.com/about-ross/company-profile/green-practices/china-rohs.html

## 电器电子产品中有害物质的使用

Ross Video Limited 按照以下的标准对所有组件和流程进行了审查：

“电器电子产品有害物质限制使用管理办法”也被称为中国RoHS。

所有产品都具有“环保使用期限”（EFUP）和有害物质表。目前，我们正在更新我们所有的产品手册。

有害物质表在我们的网站：

http://www.rossvideo.com/about-ross/company-profile/green-practices/china-rohs.html

## Company Address


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# Introduction

## A Word of Thanks

Thank you for choosing the Ross Platform Manager Redundant System as your product orchestration solution.

We are committed to providing you with the highest level of customer satisfaction possible. If, for any reason, you have questions or comments, please call Ross Video at +1-613-652-4886 or send us an e-mail at techsupport@rossvideo.com.

We hope that you visit our website www.rossvideo.com to stay up to date with ongoing software releases, join our customer forum and learn more about the complete range of Ross Video products.

Note that software maintenance and extended warranties are available for your system to protect and extend the life of your investment. Our sales team are more than happy to provide further information on the plans available. Members of our sales team promptly response to e-mails sent to: solutions@rossvideo.com.

Again, thank you for your purchase of a Ross Platform Manager Redundant System product orchestration solution from Ross Video. We are confident of your future pleasure with your choice.

Yours Sincerely,

Gabriel Duschinsky
Product Manager - Enterprise Management

gabriel.duschinsky@rossvideo.com

## About This Guide

This guide contains the following chapters that cover the installation and configuration of Ross Platform Manager software:

- Chapter 1, "**Introduction**" summarizes the guide and provides important terms, conventions, and features.
- Chapter 2, "**System Requirements**" provides the recommended minimum hardware and software requirements to ensure that the Ross Platform Manager Redundant System software functions correctly.
- Chapter 3, "**Database Software Installation**" provides instructions for installing and configuring database software on the Primary RPM Server computer and the Redundant RPM Database computer in an RPM Redundant System.
- Chapter 4, "**RPM Server Software Installation**" provides instructions for installing and configuring RPM software on the Primary RPM Server computer in an RPM Redundant System.
- Chapter 5, "**Load Balancer Configuration**" provides instructions for configuring the load balancer used for the RPM Redundant System.
- Chapter 6, "**Galera Cluster Setup**" provides the instructions for backing up MySQL data, and for installing and configuring a Galera Cluster with MariaDB.
- Chapter 7, "**Updating the Cluster**" provides instructions for updating the cluster in the RPM Redundant System.

If you have questions pertaining to the operation of the Ross Video product, please contact us at the numbers listed in the section "**Contacting Technical Support**" on page 1–3. Our technical staff is always available for consultation, training, or service.

## Documentation Conventions

This guide uses special text formats to identify parts of the user interface, text that a user must enter, or a sequence of menus and submenus that a user must follow to reach a particular command.

### Interface Elements

Bold text identifies a user interface element such as a dialog box, a menu item, or a button. For example:

In the **Media Manager Client**, click **Channel 1** the **Channels** section.

### User Entered Text

Courier text identifies text that a user must enter. For example:

In the **File Name** box, enter `Channel01.property`.

### Referenced Guides

Italic text identifies the titles of referenced guides, manuals, or documents. For example:

For more information, refer to the section "**Twitter Configuration**" on page 3–6 in the ***Ross Platform Manager User Guide***.

### Menu Sequences

Menu arrows identify a sequence of menu items that a user must follow to reach a particular command. For example: if a procedure step contains "**Server** > **Save As**," a user should click the **Server** menu and then click **Save As**.

### Important Instructions

Star icons identify important instructions or features. For example:

✶ After installing RPM software, you must obtain RPM feature licenses from Ross Video Technical Support before users can access RPM features.

## Getting Help

To access the Ross Platform Manager Online Help system, click the **Help** icon in the main toolbar. For help about the currently open panel, click he **Help** button in a panel title bar to view a help topic about the panel.

The Online Help system contains the following navigation tabs to locate and access Online Help topics:

- **Contents** — table of contents
- **Search** — full text search
- **Favorites** — preferred information storage and access

Ross Video also supplies a print-ready PDF file of the ***Ross Platform Manager User Guide*** on the Ross Platform Manager Software Installation DVD.

### Contacting Technical Support

Technical Support is staffed by a team of experienced specialists ready to assist you with any question or technical issue.

Ross Video has technical support specialists strategically located around the globe to ensure a prompt response to technical inquiries. Our primary technical support center is located in Ottawa, Ontario, Canada. In addition, we have offices in The United Kingdom (London), Australia (Sydney), and Singapore with satellite locations in New York City, The Netherlands, and China. As we expand our presence globally, we are constantly evaluating other key locations to have a local technical support specialist in order to better service our customers.

#### North America

Our North America center located in Ottawa, Ontario, Canada and is open Monday to Friday 8:30 a.m. to 6:00 p.m. EST, with 24/7/365 on-call service after hours.

Our telephone number is: +1-613-686-1557

Toll free within North America: +1 833-859-0499

#### EMEA

Our EMEA center is open Monday to Friday 8:30 a.m. to 5:00 p.m. GMT. After hours support is provided by our North America location.

Our telephone number is: +44 (0)1189502446

International toll free: +800 3540 3545

If the local support specialist is not available, your call will be transferred automatically to our North America center.

#### Australia

Our Sydney, Australia office is located in Alexandria, NSW.

Our local support telephone number is: 1300 007 677

If the local support specialist is not available, your call will be transferred automatically to our North America center.

#### Online

**E-mail**: techsupport@rossvideo.com

**Website**: open a support request using the link https://support.rossvideo.com/ to open a support request.

# System Requirements

Ross Video bases the Ross Platform Manager Redundant System on mainstream PC hardware that uses the Windows® operating system and a load balancer. To ensure that your Ross Platform Manager Redundant System functions correctly, verify that the computers in your system and the installed software meet the recommended minimum requirements described in this chapter.

This chapter discusses the following topics:

- Ross Platform Manager Redundant System
- Hardware
- Software

## Ross Platform Manager Redundant System

A Ross Platform Manager Redundant System contains two RPM Servers and a load balancer. Users access RPM by opening the **load balancer URL** in a web browser. The load balancer spreads users between the two RPM Servers in the system. The results of RPM actions on both RPM Servers are saved in the Primary database on the RPM Server 1 computer. The data contained in the Primary database is automatically replicated in the Redundant database on RPM Server 2.

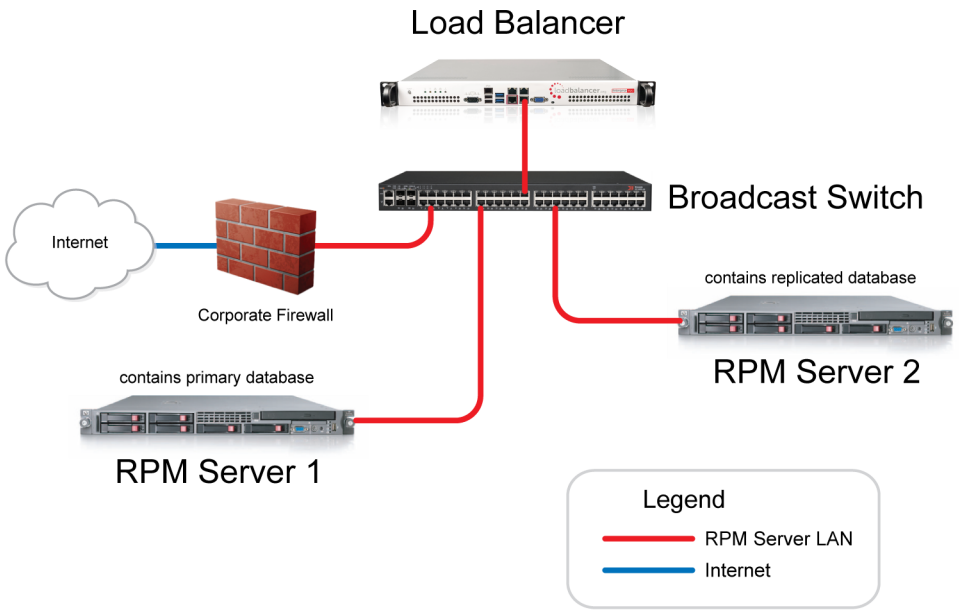



***Figure 2.1** RPM Redundant System*

If RPM falters one of the RPM Servers, the load balancer automatically directs users to the instance of RPM running on the other RPM Server. If the Primary database falters, operation can continue by manually switching the RPM to the Redundant database on the RPM Server 2 computer.

✶ Ross Video recommends repairing faulty components of an RPM Redundant System as soon as possible.

## Hardware

Ross Video recommends the following minimum hardware configurations for an RPM Redundant System:

- **VM or customer-supplied machine that meets the following minimum requirements:**
  - **CPU** — quad-core Intel® Core™ i7, 2GHz
  - **RAM** — 8GB to 16GB (16GB recommended)
  - **Hard Drive** — Minimum 64 GB free
  - **LAN** — 100 MB/s
- Loadbalancer.org Load Balancer

## Software

Ross Video recommends the following minimum software configuration for both RPM Server computers in an RPM Redundant System:

- Ubuntu 22.04.5 LTS
- MySQL Community Edition Server v8.0.x

# Database Software Installation

This chapter provides instructions for installing and configuring database software on the two Ross Platform Manager Server computers in an RPM Redundant System.

This chapter discusses the following topics:

- Before You Install Database Software
- Install Ross Platform Manager Database Software
- Configure Database Replication on Ross Platform Manager Server 2

## Before You Install Database Software

Before you install database software on the RPM Server computers in an RPM Redundant System, perform the following tasks:

- Have a qualified Ross Video technician perform any required maintenance or repairs on the computers in your RPM Redundant System.
- Exit all other programs currently running on the computers in your RPM Redundant System.
- Temporarily disable antivirus software running on the computers in your RPM Redundant System. Some heuristic-based intrusion detection systems prevent the installation of RPM database software. Re-enable antivirus software after installing RPM database software.

Contact a Ross Video sales representative for information about RPM Commissioning, Training, and Update services.

**For More Information on...**

- contacting Ross Video Technical Support, refer to the section "**Contacting Technical Support**" on page 1–3.

## Install Ross Platform Manager Database Software

Ross Platform Manager uses the MySQL Community Edition Server database to store and manage application data on the RPM Server computers in an RPM Redundant System. You must complete the following procedures before installing the RPM Server software on the RPM Server computers in your RPM Redundant System:

- "**To install MySQL Community Edition Server database software on the RPM Server 1 computer**" on page 3–2
- "**To reinitialize MySQL on the RPM Server 1 computer**" on page 3–3
- "**To configure database replication on the RPM Server 1 computer**" on page 3–4
- "**To tune MySQL Server options**" on page 3–5
- "**To install MySQL Community Edition Server database software on the RPM Server 2 computer**" on page 3–8
- "**To reinitialize MySQL on the RPM Server 2 computer**" on page 3–8
- "**To configure database replication on the RPM Server 2 computer**" on page 3–9

Only the initial installation or recovery installations of RPM Server software on a computer require the installation of the MySQL Community Edition Server database software.

### Ross Platform Manager Server 1 Computer

★ You must install and configure MySQL Community Edition Server database software on both RPM Server computers in your RPM Redundant System before you install RPM Server software.

#### Installing MySQL on the RPM Server 1 Computer

MySQL must be installed on the RPM Server 1 computer before using the commands in the procedure below.

**To install MySQL Community Edition Server database software on the RPM Server 1 computer**

1. Install and start MySQL by running the following commands:
   a. `apt install mysql-server -y`
   b. `systemctl start mysql`
   c. `systemctl enable mysql`

### Installing MySQL on the RPM Server 1 Computer

MySQL must be configured with **lower_case_table_names=1** enabled in the **mysqld.conf**. When APT is used to install MySQL, the server is automatically initialized without that required setting. MySQL forces the system to be re-initialized to make the changes.

**To reinitialize MySQL on the RPM Server 1 computer**

1. Stop MySQL by running the following command:

   ```
   systemctl stop mysql
   ```

2. Remove the error log by running the following command:

   ```
   rm -rf /var/log/mysql/error.log
   ```

3. Move SQL data files to `/tmp/` by running the following command:

   ```
   mv /var/lib/mysql/ /tmp/mysql
   ```

4. Remove the data files directory by running the following command:

   ```
   rm -rf /var/lib/mysql/
   ```

5. Recreate the data files directory by running the following commands:

   a. `mkdir /var/lib/mysql/`

   b. `chown mysql:mysql /var/lib/mysql/`

   c. `chmod 700 /var/lib/mysql/`

6. Reconfigure the MySQL config file by running the following commands:

   a. `sed -i 's/^\[mysqld\]/&\nlower_case_table_names = 1/' /etc/mysql/mysql.conf.d/mysqld.cnf`

   b. `sed -i 's/^\[mysqld\]/&\ncharacter-set-server=utf8/' /etc/mysql/mysql.conf.d/mysqld.cnf`

7. Initialize MySQL by running the following command:

   ```
   mysqld --defaults-file=/etc/mysql/mysql.conf.d/mysqld.cnf --initialize
   --user=mysql --console
   ```

8. Start MySQL by running the following command:

   ```
   systemctl start mysql
   ```

9. Get a temporary MySQL password by running the following commands:

   a. `pass=$(grep 'temporary password' /var/log/mysql/error.log | awk -F ": " '{print $NF}')`

   b. `export MYSQL_PWD=$pass`

10. Reset your MySQL password by running the following command:

    ```
    mysql -u root --connect-expired-password -e "ALTER USER 'root'@'localhost'
    IDENTIFIED BY 'password';"
    ```

    Note that using this command, your password will be set to `password`. It is recommended that you change `password` in the command to something more secure.

11. Verify that **lower_case_table_name** returns 1 by running the following command:

    ```
    mysql -u root -ppassword -e "show variables like 'lower_case_table_names';"
    ```

## Configure Database Replication on Ross Platform Manager Server 1

After you install the MySQL Community Edition Server database software on the RPM Server 1 computer, you must edit the main database configuration file and the SetReplication script file to configure database replication.

**To configure database replication on the RPM Server 1 computer**

1. Log in to the **RPM Server 1** computer as an **administrator**.
2. Locate the **mysqld.cnf** file in the following folder:

   ```
   /etc/mysql/mysql.conf.d/mysqld.cnf
   ```

3. Use a text editor to open and edit the **mysqld.cnf** file.
4. In the **mysqld.cnf** file, locate the following setting:

   ```
   server-id
   ```

5. Replace the default value with the following:

   ```
   server-id=1
   ```

6. Save the updated **mysqld.cnf** file and exit the text editor.
7. Restart MySQL by running the following command:

   ```
   sudo systemctl restart mysql
   ```

8. In the **MySQL Workbench** window, use the **File** menu to select **Exit**.

   The **MySQL Workbench** window closes.

## Tune MySQL Server Options

The **mysqld.cnf** file contains MySQL Server configuration options. The configuration options to tune are as follows:

- **key_buffer_size** — the size of the buffer used for index blocks, set to 1/16 of the memory allocated to MySQL.
- **query_cache_size** — the amount of memory allocated for caching query results, set to 0M to reduce overhead.
- **tmp_table_size** — the maximum size of internal in-memory temporary tables, set to 64M.
- **innodb_buffer_pool_size** — the amount of memory space that holds in-memory data structures, set to 1/2 of the memory allocated to MySQL.
- **table_open_cache** — the number of open tables for all threads, set to 6000 tables.
- **max_allowed_packet** — the maximum size of one packet or any generated string, set to 16 megabytes to handle large data packets.
- **max_connections** — the maximum permitted number of simultaneous client connections, set to 1/2 of the memory allocated to MySQL.
- **sort_buffer_size** — the buffer allocated to each session that performs a sort, set to 2M.
- **read_buffer_size** — the buffer allocated to each thread that sequentially scans for a MyISAM table, set to 256K.
- **join_buffer_size** — the minimum buffer used for plain index scans, range index scans, and joins that do not use indexes; set to 256K.
- **default_password_lifetime** — set to 0 to disable the automatic password expiration policy and allow passwords to never expire.
- **expire_logs_days** — the number of days between automatic removals of the binary log file.
- **log-bin** — set to mysql-bin. If a log_bin already exists and is commented, just uncomment and leave the value to the default.
- **sync-binlog** — set to 1.

**To tune MySQL Server options**

1. On the **RPM Server 1** or the **RPM Server 2** computer, locate the **mysqld.cnf** file in the following folder:

   `/etc/mysql/mysql.conf.d/mysqld.cnf`

2. Use a text editor to open and edit the **mysqld.cnf** file.

3. To set the buffer size for index blocks, complete the following steps:

   a. In the **mysqld.cnf** file, locate the following setting:

      `key_buffer_size`

   b. Use the following table to set the **key_buffer_size** value for your system with **32G** of RAM:

| System Type | Value |
|---|---|
| RPM Server & Database | 512M |
| Dedicated Database | 2048M |

      For systems with more than 32G of RAM, use 1/16 of the system RAM in MB allocated to MySQL as the **key_buffer_size** value. For systems the run both the RPM Server and MySQL database, base your calculation on 25% of the system RAM allocated to MySQL. For systems that only run the MySQL database, base your calculation on 100% of the system RAM allocated to MySQL.

   c. Replace the default setting with the following tuned value:

      `key_buffer_size = <setting_from_step_b>`

      The following example **key_buffer_size** setting would tune MySQL for a system with 32G of RAM running both the RPM Server and MySQL database:

      `key_buffer_size = 512M`

4. To set the maximum size of internal in-memory temporary tables, complete the following steps:

   a. In the **mysqld.cnf** file, locate the following setting:

      `tmp_table_size`

   b. Replace the default setting with the following tuned value:

      `tmp_table_size = 64M`

5. To set the amount of memory space to hold in-memory data structures, complete the following steps:

   a. In the **mysqld.cnf** file, locate the following setting:

      `innodb_buffer_pool_size`

   b. Use the following table to set the **innodb_buffer_pool_size** value for your system with **32G** of RAM:

| System Type | Value |
|---|---|
| RPM Server & Database | 4096M |
| Dedicated Database | 16384M |

      For systems with more than 32G of RAM, use 1/2 of the system RAM in MB allocated to MySQL as the **innodb_buffer_pool_size** value. For systems the run both the RPM Server and MySQL database, base your calculation on 25% of the system RAM allocated to MySQL. For systems that only run the MySQL database, base your calculation on 100% of the system RAM allocated to MySQL.

c. Replace the default setting with the following tuned value:

```
innodb_buffer_pool_size = <setting_from_step_b>
```

The following example **innodb_buffer_pool_size** setting would tune MySQL for a system with 32G of RAM running both the RPM Server and MySQL database:

```
innodb_buffer_pool_size = 4096M
```

6. To set the number of open tables for all threads, complete the following steps:

a. In the **mysqld.cnf** file, locate the following setting:

```
table_open_cache
```

b. Replace the default setting with the following tuned value:

```
table_open_cache = 6000
```

7. To set the maximum size of one packet or any generated string, complete the following steps:

a. In the **mysqld.cnf** file, locate the following setting:

```
max_allowed_packet
```

b. Replace the default setting with the following tuned value:

```
max_allowed_packet = 16M
```

8. To set the maximum permitted number of simultaneous client connections, complete the following steps:

a. In the **mysqld.cnf** file, locate the following setting:

```
max_connections
```

b. Use the following table to set the **max_connections** value for your system with **32G** of RAM:

| System Type | Value |
|---|---|
| RPM Server & Database | 400 |
| Dedicated Database | 1600 |

For systems with more than 32G of RAM, calculate the **max_connections** value as follows:

```
max_connections = (1/2 of the MySQL allocated RAM in MB) / 10
```

For systems the run both the RPM Server and MySQL database, base your calculation on 25% of the system RAM allocated to MySQL. For systems that only run the MySQL database, base your calculation on 100% of the system RAM allocated to MySQL.

c. Replace the default setting with the following tuned value:

```
max_connections = <setting_from_step_b>
```

The following example **max_connections** setting would tune MySQL for a system with 32G of RAM running both the RPM Server and MySQL database:

```
max_connections = 400
```

9. To set the buffer allocated to each session that performs a sort, complete the following steps:

a. In the **mysqld.cnf** file, locate the following setting:

```
sort_buffer_size
```

b. Replace the default setting with the following tuned value:

```
sort_buffer_size = 2M
```

10. To set the buffer allocated to each thread that sequentially scans for a MyISAM table, complete the following steps:
    a. In the **mysqld.cnf** file, locate the following setting:
    ```
    read_buffer_size
    ```
    b. Replace the default setting with the following tuned value:
    ```
    read_buffer_size = 256K
    ```
11. To set the minimum buffer used for plain index scans, range index scans, complete the following steps:
    a. In the **mysqld.cnf** file, locate the following setting:
    ```
    join_buffer_size
    ```
    b. Replace the default setting with the following tuned value:
    ```
    join_buffer_size = 256K
    ```
12. To set the amount of memory allocated for caching query results, complete the following steps:
    a. Scroll to the bottom of the **mysqld.cnf** file.
    b. On a new line in the **mysqld.cnf** file, add the following comment:
    ```
    # Specify the amount of memory allocated for caching query results
    ```
    c. Below the new comment, add the following setting:
    ```
    query_cache_size = 0M
    ```
13. To disable the automatic password expiration policy and allow passwords to never expire, complete the following steps:
    a. Scroll to the bottom of the **mysqld.cnf** file.
    b. On a new line in the **mysqld.cnf** file, add the following comment:
    ```
    # Specify the automatic password expiration policy (0=never)
    ```
    c. Below the new comment, add the following setting:
    ```
    default_password_lifetime=0
    ```
14. To set the automatic binary log file removal to seven days, complete the following steps:
    a. Scroll to the bottom of the **mysqld.cnf** file.
    b. On a new line in the **mysqld.cnf** file, add the following comment:
    ```
    # Specify the automatic binary log file removal policy (0=never)
    ```
    c. Below the new comment, add the following setting:
    ```
    expire_logs_days=7
    ```
15. Save the updated **mysqld.cnf** file and exit the text editor.
16. Restart MySQL by running the following command:
    ```
    sudo systemctl restart mysql
    ```

## Ross Platform Manager Server 2 Computer

✶ You must install and configure MySQL Community Edition Server database software on both of the RPM Server computers in your RPM Redundant System before you install RPM Server software.

### Installing MySQL on the RPM Server 2 Computer

MySQL must be installed on the RPM Server 2 computer before using the commands in the procedure below.

**To install MySQL Community Edition Server database software on the RPM Server 2 computer**

1. Install and start MySQL by running these commands:

```
apt install mysql-server -y
systemctl start mysql
systemctl enable mysql
```

### Installing MySQL on the RPM Server 2 Computer

MySQL must be configured with **lower_case_table_names=1** enabled in the **mysqld.conf**. When APT is used to install MySQL, the server is automatically initialized without that required setting. MySQL forces the system to be re-initialized to make the changes.

**To reinitialize MySQL on the RPM Server 2 computer**

1. Stop MySQL by running the following command:

```
systemctl stop mysql
```

2. Remove the error log by running the following command:

```
rm -rf /var/log/mysql/error.log
```

3. Move SQL data files to `/tmp/` by running the following command:

```
mv /var/lib/mysql/ /tmp/mysql
```

4. Remove the data files directory by running the following command:

```
rm -rf /var/lib/mysql/
```

5. Recreate the data files directory by running the following commands:

```
mkdir /var/lib/mysql/
chown mysql:mysql /var/lib/mysql/
chmod 700 /var/lib/mysql/
```

6. Reconfigure the MySQL config file by running the following commands:

```
sed -i 's/^\[mysqld\]/&\nlower_case_table_names = 1/'
/etc/mysql/mysql.conf.d/mysqld.cnf
sed -i 's/^\[mysqld\]/&\ncharacter-set-server=utf8/'
/etc/mysql/mysql.conf.d/mysqld.cnf
```

7. Initialize MySQL by running the following command:

```
mysqld --defaults-file=/etc/mysql/mysql.conf.d/mysqld.cnf --initialize
--user=mysql --console
```

8. Start MySQL by running the following command:

```
systemctl start mysql
```

9. Get a temporary MySQL password by running the following commands:

```
pass=$(grep 'temporary password' /var/log/mysql/error.log | awk -F ": " '{print
$NF}')
export MYSQL_PWD=$pass
```

10. Reset your MySQL password by running the following command:

```
mysql -u root --connect-expired-password -e "ALTER USER 'root'@'localhost'
IDENTIFIED BY 'password';"
```

Note that using this command, your password will be set to `password`. It is recommended that you change `password` in the command to something more secure.

11. Verify that **lower_case_table_name** returns 1 by running the following command:

```
mysql -u root -ppassword -e "show variables like 'lower_case_table_names';"
```

## Configure Database Replication on Ross Platform Manager Server 2

After you install the MySQL Community Edition Server database software on the RPM Server 2 computer, you must edit the main database configuration file and the SetReplication script file to configure database replication.

**To configure database replication on the RPM Server 2 computer**

1. Log in to the **RPM Server 2** computer as an **administrator**.
2. Locate the **mysqld.cnf** file in the following folder:

   ```
   /etc/mysql/mysql.conf.d/mysqld.cnf
   ```

3. Use a text editor to open and edit the **mysqld.cnf** file.
4. In the **mysqld.cnf** file, locate the following setting:

   ```
   server-id
   ```

5. Replace the default value with the following:

   ```
   server-id=2
   ```

6. Save the updated **mysqld.cnf** file and exit the text editor.
7. Restart MySQL by running the following command:

   ```
   sudo systemctl restart mysql
   ```

8. In the **MySQL Workbench** window, use the **File** menu to select **Exit**.

   The **MySQL Workbench** window closes.

# RPM Server Software Installation

This chapter provides instructions for installing and configuring RPM Server software on the RPM Server computers in an RPM Redundant System.

This chapter discusses the following topics:

- Create the Ross Platform Manager Database on RPM Server 1
- Before You Install Ross Platform Manager Server Software
- Install Ross Platform Manager Server Software
- Configure RPM Server 1 to Use the MySQL Database
- Configure the Ross Platform Manager Server 2
- Configure Redundancy on Both Ross Platform Manager Servers
- Start Replication on the Ross Platform Manager Server 2 Computer
- Recover from a Primary Database Failure
- Switch Back to the Primary Database

## Create the Ross Platform Manager Database on RPM Server 1

Before you install the RPM Server software on the RPM Server 1 computer you must create the MySQL RPM database on the RPM Server 1 computer.

**To create the RPM database on the RPM Server 1 computer**

1. Create schema for RPM by running the following commands:

```
UPDATE mysql.user SET host='%' WHERE user='root';
UPDATE mysql.user SET authentication_string=null WHERE user='root';
flush privileges;
ALTER USER 'root'@'%' IDENTIFIED WITH mysql_native_password BY 'password';
flush privileges;
CREATE SCHEMA platform_manager;
GRANT ALL PRIVILEGES ON platform_manager.‟ TO 'root'@'%'
GRANT ALL PRIVILEGES ON *.* TO 'root'@'%' IDENTIFIED BY 'password';
flush privileges;
quit
```

## Before You Install Ross Platform Manager Server Software

Before you install database software on the RPM Server computers in an RPM Redundant System, perform the following tasks:

- Have a qualified Ross Video technician perform any required maintenance or repairs on the computers in your RPM Redundant System.
- Exit all other programs currently running on the computers in your RPM Redundant System.
- Temporarily disable anti-virus software running on the computers in your RPM Redundant System. Some heuristic-based intrusion detection systems prevent the installation of RPM database software. Re-enable anti-virus software after installing RPM database software.

Contact a Ross Video sales representative for information about RPM Commissioning, Training, and Update services.

**For More Information on...**

- contacting Ross Video Technical Support, refer to the section “**Contacting Technical Support**” on page 1–3.

## Install Ross Platform Manager Server Software

With a MySQL Community Edition Server database software installed and configured on the RPM Server computers in your RPM Redundant System, you are ready to install the RPM Server software on the RPM Server 1 computer.

✶ After installing RPM Server software, you must obtain RPM feature licenses from Ross Video Technical Support before users can access RPM features.

**To install RPM Server software on the RPM Server 1 computer**

1. Enter the following command to install dmidecode. This is necessary for RPM to retrieve hardware serial numbers.

```
sudo apt-get install dmidecode
```

2. Create the application directory:

```
sudo mkdir /opt/platform_manager/
```

3. Copy the **PlatformManager-X.X.X-*.tar.gz** file from the commissioning package to the system. You can use FileZilla to place it into the `/opt/platform_manager/` directory.
4. Extract the file using this command:

   ```
   sudo tar -xvf PlatformManager-X. X. X-*.tar.gz
   ```

5. Set the permissions on the /opt/platform_manager directory by entering the following command:

   ```
   sudo chmod -R 755 /opt/platform_manager/
   ```

6. Run Ross Platform Manager:

   ```
   sh Install
   ```

7. View Ross Platform Manager's process status by entering the following command:

   ```
   systemctl status PlatformManager
   ```

**Note:** If systemctl command doesn't work first time, then issue the following command. Once executed, repeat the systemctl command above:

```
service PlatformManager stop
```

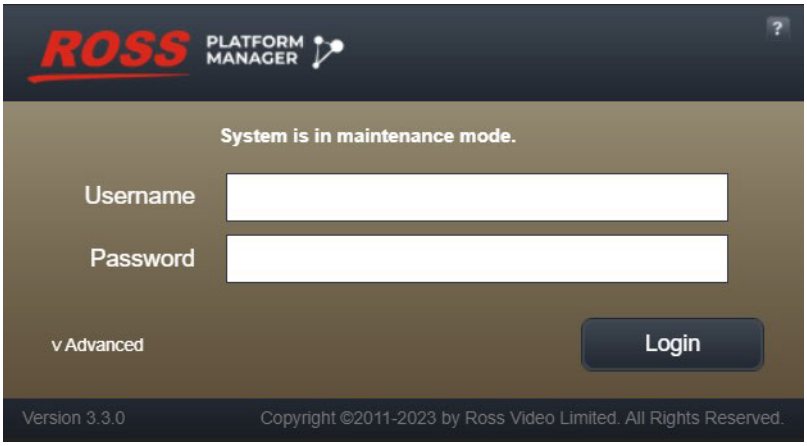
**Note: You can monitor the launch process in real time by following the steps below:**

```
cd /opt/platform_manager
tail -f workspace/.metadata/logs/application-yyyymmdd. log
```

8. Access Ross Platform Manager via web browser, and enter the IP address of one of the network interfaces:

   Example: *http://192.168.3.150*

   Ross Platform Manager's **login page** appears:




✶ If the RPM login page displays a message that says "System is in maintenance mode", follow the procedure below.

## Configure RPM Server 1 to Use the MySQL Database

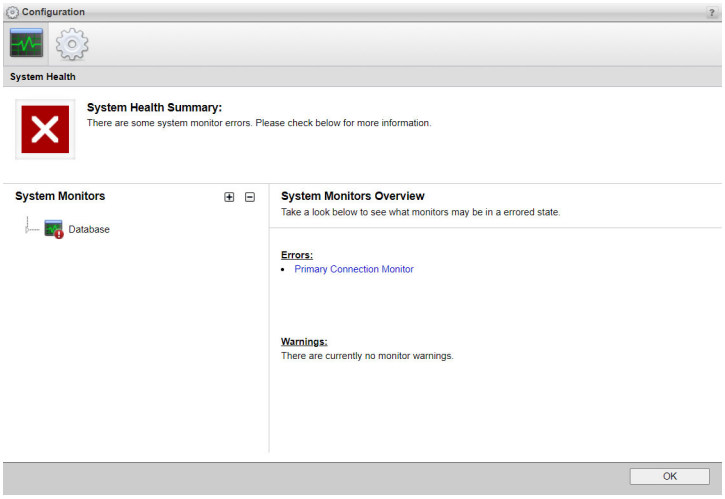
After installing RPM Server software on the RPM Server 1 computer, you must configure the RPM server to use the installed MySQL Community Edition Server database. You may also need to set the password for the root database superuser if you changed the standard password when you installed the MySQL Community Edition Server database software on the RPM Server 1 computer.

**To configure RPM Server 1 to use the MySQL database**

1. On the **RPM Server 1** computer, open the **RPM** web page.
2. At the **RPM Login** screen, enter the following user name and password in the provided boxes:
   - **Username** — `maintenance`
   - **Password** — `maintenance`
3. Click **Login**.

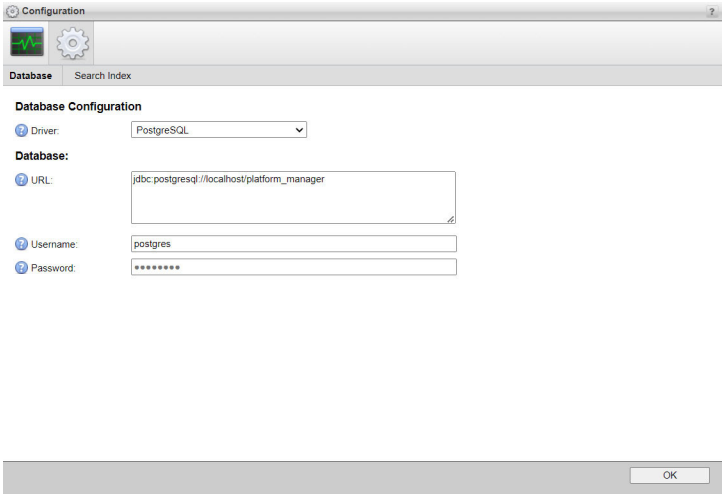
   RPM opens.
4. On the main toolbar, click the **Configuration** icon.

   The **Configuration** window opens.



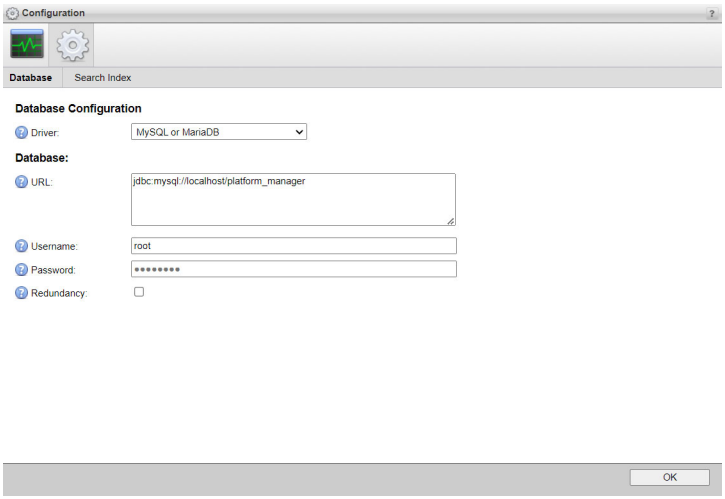

5. On the **Configuration** window toolbar, click the **System** icon.

   The **System** panel opens.



6. Use the **Driver** menu to select **MySQL**.

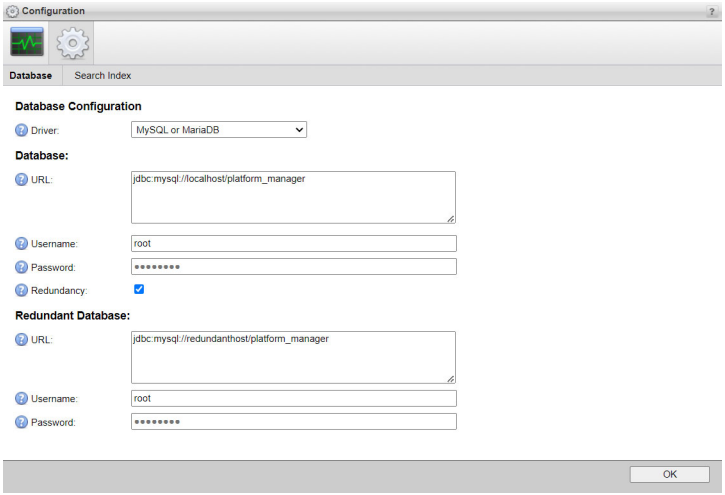
   The MySQL database settings open in the **Database** tab.




7. If you set a custom password for the **root** superuser account when you installed the MySQL Community Edition Server database software on the RPM Server 1 computer, enter your custom password in the **Password** box.

8. Select the **Redundancy** check box.

   The **Redundant Database** settings open in the **Database** tab.




9. In the **URL** box, enter the following JDBC URL to connect **RPM Server 1** with the RPM Redundant Database on **RPM Server 2**.

   ```
   jdbc:mysql://localhost/platform_manager
   ```

10. If you set a custom password for the **root** superuser account when you installed the MySQL Community Edition Server database software on the **RPM Server 2** computer, enter your custom password in the **Password** box.

11. Click **OK**.

    An **Alert** dialog box opens.

12. In the **Alert** dialog box, click **OK**.

    A second **Alert** dialog box opens.

13. Click **OK**.

The **Alert** dialog box and the **Configuration** window close.

14. On the main toolbar, click the **Logout** icon.

    An **Alert** dialog box opens.

15. Click **OK**.

    RPM logs you out.

16. Close the web browser.

17. Restart RPM by running the following command:

    ```
    systemctl restart PlatformManager
    ```

## Configure the Ross Platform Manager Server 2

After setting up RPM Server 1, you can set up RPM Server 2. RPM Server 2 involves installing and licensing RPM Server software on the RPM Server 2 computer and setting the database location.

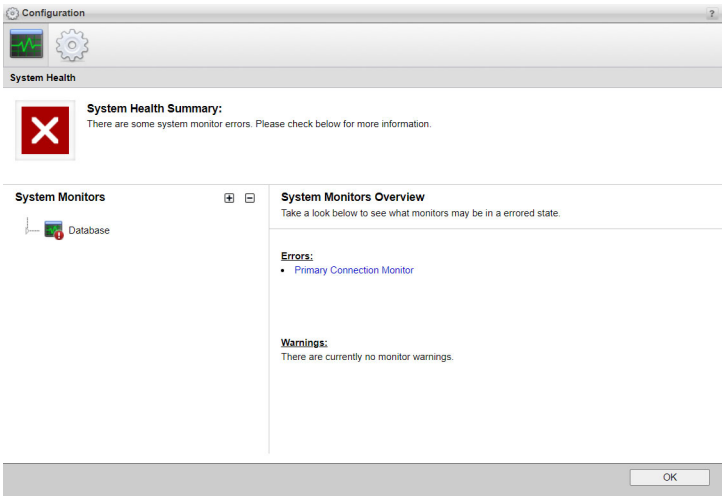
### To set up RPM Server 2

1. Log in to the **RPM Server 2** computer as an **administrator**.
2. Install and tune **RPM Server** software on **RPM Server 2**.

   For information on installing and tuning RPM Server software, refer to the section "**Install Ross Platform Manager Server Software**" on page 4–2.
3. On the **RPM Server 1** computer, open the **RPM** web page:
4. At the **RPM Login** screen, enter the following user name and password in the provided boxes:
   - **Username** — `maintenance`
   - **Password** — `maintenance`
5. Click **Login**.

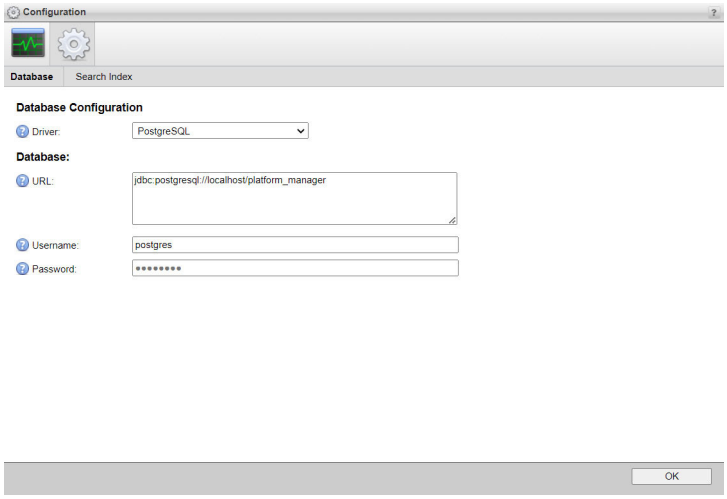
   RPM opens.
6. On the main toolbar, click the **Configuration** icon.

   The **Configuration** window opens.



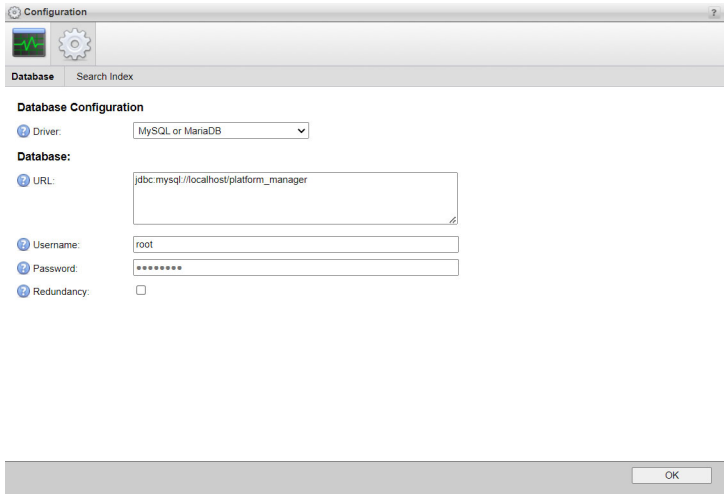

7. On the **Configuration** window toolbar, click the **System** icon.

   The **System** panel opens.




8. Use the **Driver** menu to select **MySQL**.

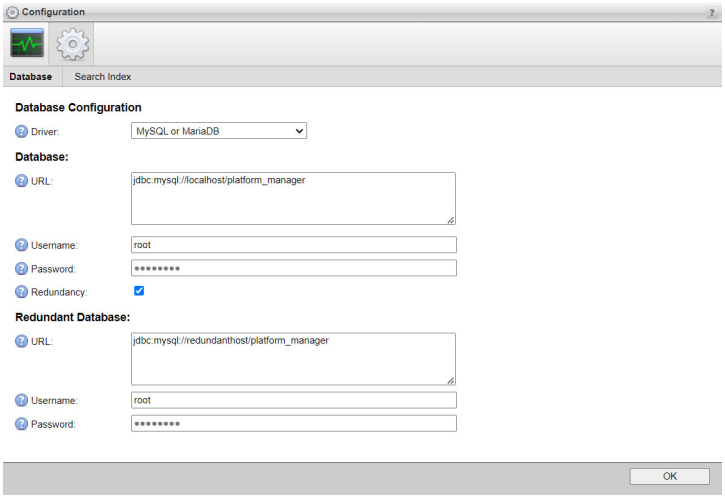
   The MySQL database settings open in the **Database** tab.




9. If you set a custom password for the **root** superuser account when you installed the MySQL Community Edition Server database software on the RPM Server 1 computer, enter your custom password in the **Password** box.

10. Select the **Redundancy** check box.

    The **Redundant Database** settings open in the **Database** tab.




11. In the **URL** box, enter the following JDBC URL to connect **RPM Server 1** with the RPM Redundant Database on **RPM Server 2**.

    ```
    jdbc:mysql://localhost/platform_manager
    ```

12. If you set a custom password for the **root** superuser account when you installed the MySQL Community Edition Server database software on the **RPM Server 2** computer, enter your custom password in the **Password** box.

13. Click **OK**.

    An **Alert** dialog box opens.

14. In the **Alert** dialog box, click **OK**.

    A second **Alert** dialog box opens.

15. Click **OK**.

    The **Alert** dialog box and the **Configuration** window close.

16. On the main toolbar, click the **Logout** icon.

    An **Alert** dialog box opens.

17. Click **OK**.

    RPM logs you out.

18. Close the web browser.

19. Restart RPM by running the following command:

    ```
    systemctl restart PlatformManager
    ```

## Configure Redundancy on Both Ross Platform Manager Servers

In order for redundancy to work properly across both RPM servers, you must complete the steps in the following procedures.

### To configure redundancy on both RPM servers

1. On **RPM Server 1**, login to the MySQL shell using the following:

    ```
    mysql -u root -p<password>
    ```

2. Execute the following command to create user replication on Primary:

    ```
    CREATE USER 'replication'@'%' IDENTIFIED WITH mysql_native_password BY
    '<password>';
    ```

3. Execute the following command to grant the replication user the permissions to access the database:

```
GRANT REPLICATION SLAVE ON *.* TO 'replication'@'%';
```

4. On **RPM Server 1**, execute the following commands to restart RPM and MySQL:

```
sudo systemctl restart mysql
systemctl restart PlatformManager
```

5. On **RPM Server 2**, execute the following commands to restart RPM and MySQL:

```
sudo systemctl restart mysql
systemctl restart PlatformManager
```

## Start Replication on the Ross Platform Manager Server 2 Computer

After you configure the main database configuration file and the SetReplication script file, you can start database replication on the RPM Server 2 computer.

**To start replication on the RPM Server 2 computer**

1. On the **RPM Server 2** computer, locate the `SetupReplication` script file in the following folder:

```
/opt/platform_manager/utilities/database/MySQL-Linux/replication
```

2. Use a text editor to open and edit the **SetupReplication** script file.
3. Use your system values to edit the following variables.

```
SET MASTER_HOST=<Primary_Host_Name>
SET MYSQL_USERNAME=root
SET MYSQL_PASSWORD=<Root_User_Password>
SET MYSQL_DATABASE=platform_manager

SET MYSQL_REPLICATION_USERNAME=replication
SET MYSQL_REPLICATION_PASSWORD=<Replication_User_Password>
```

4. Save the updated **SetupReplication** script file and exit the text editor.
5. Execute the following command to give the `SetupReplication` script file execute permissions:

```
sudo chmod +x SetupReplication.sh
```

6. Execute the `SetupReplication` script using the following command:

```
./SetupReplication.sh
```

**To view the replication status**

1. Login to the MySQL shell using the following:

```
mysql -u root -p<password>
```

2. Execute the following command:

```
SHOW SLAVE STATUS;
```

## Recover from a Primary Database Failure

In an RPM Redundant System, the instances of RPM running on the RPM Server 1 and RPM server 2 both store data in the Primary database on the RPM Server 1 (**Figure 4.1**). Database replication keeps the Redundant database on the RPM Server 2 up to date with Primary database.

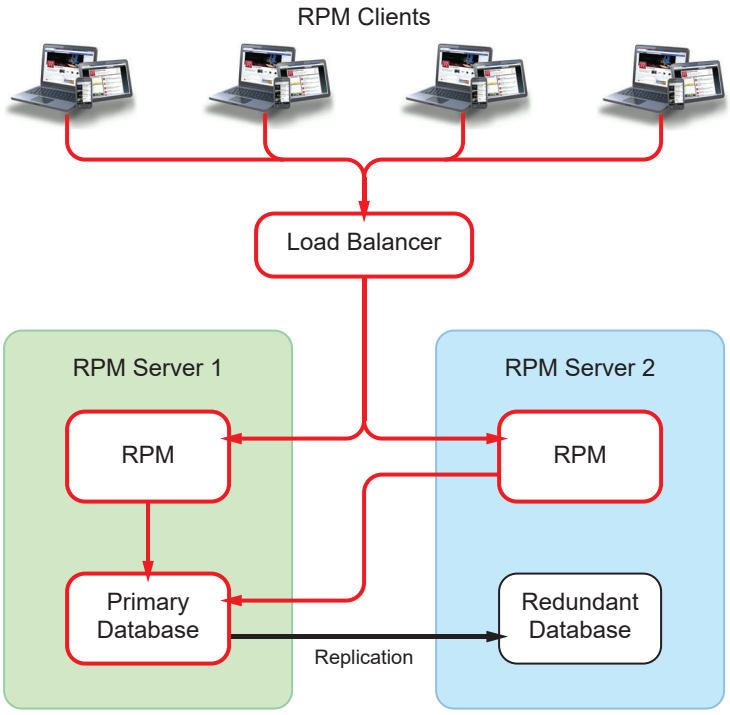



***Figure 4.1** RPM Redundant System Connections*

In the exceptionally rare circumstance that the Primary database on the RPM Server 1 computer falters, you can switch to the Redundant database on the RPM Server 2 computer to continue operation of your RPM Redundant System.

Changes made to the Redundant database are not automatically replicated to the Primary database. You should restore the Primary database with a backup of the Redundant database at the earliest available opportunity.

**To recover from a Primary database problem**

1. On the **RPM Server 2** computer, locate the `ActivateRedundantServer` script file in the following folder:

   `/opt/platform_manager/utilities/database/MySQL-Linux/redundancy`

2. Use a text editor to open and edit the **ActivateRedundantServer** script file.

3. Use your system values to edit the following variables.

   ```
   SET MASTER_HOST=<Primary_Host_Name>
   SET MYSQL_USERNAME=root
   SET MYSQL_PASSWORD=<Root_User_Password>
   SET MYSQL_DATABASE=platform_manager

   SET MYSQL_REPLICATION_USERNAME=replication
   SET MYSQL_REPLICATION_PASSWORD=<Replication_User_Password>
   ```

4. Save the updated **ActivateRedundantServer** script file and exit the text editor.

5. Execute the following command:

   ```
   sudo chmod +x ./ActivateRedundantServer
   ```

The script does the following: If RPM is still running on your RPM Server 1 computer, it stops the Platform Manager service (leave RPM offline on your RPM Server 1 computer until the Primary Database is fixed and ready to return to service).

6. Once the script has completed, access your RPM Server 2 computer in a web browser.

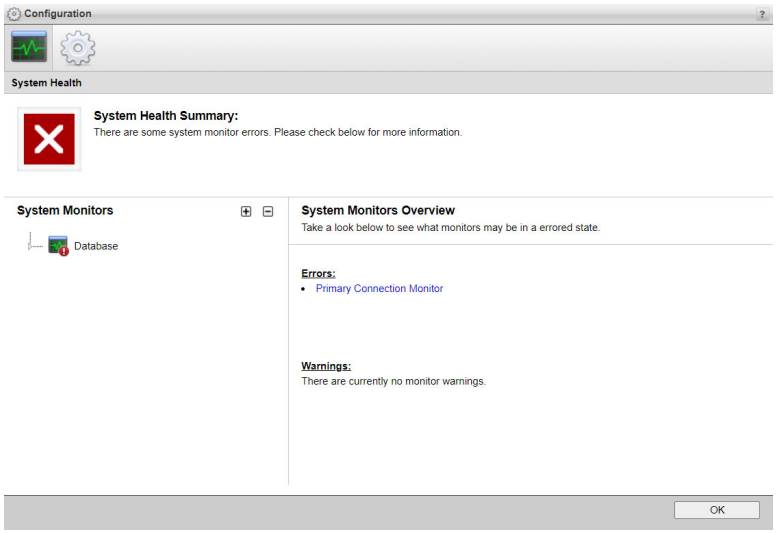
   Note that with no connection to the Primary database, RPM will be in Maintenance mode.

7. Log in to Maintenance mode using the following credentials:

   - **Username**: `maintenance`
   - **Password**: `maintenance`

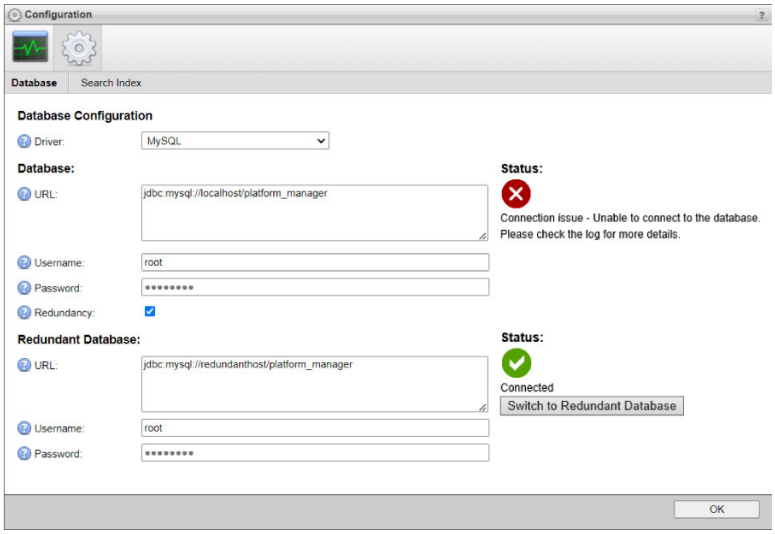
8. On the main toolbar, click the **Configuration** icon.

   The **Configuration** window opens.




9. On the **Configuration** window toolbar, click the **System** icon.

   The **System** panel opens.




10. In the **Redundant Database** section, click **Switch to Redundant Database**.

    An **Alert** opens.

11. Click **OK**.

A second **Alert** opens.

12. Click **OK**.

    The database connection switches and RPM on your **RPM Server 2** computer starts using the **Redundant** database on the **RPM Server 2** computer.

13. In the **System** panel, click **OK**.

    The **Configuration** window closes. Users can continue to work with RPM on the RPM Server 2 computer saving their content in the Redundant database.

## Switch Back to the Primary Database

After you repair the Primary database you should switch to back to the Primary database as soon as possible to continue normal operation of your RPM system.

**To switch back to the Primary database**

1. On the **RPM Server 2** computer, locate the `RecoverPrimaryDatabase` script file in the following folder:

   `/opt/platform_manager/utilities/database/MySQL-Linux/redundancy`

2. Use a text editor to open and edit the **RecoverPrimaryDatabase** script file.

3. Use your system values to edit the following variables.

   ```
   SET MASTER_HOST=<Primary_Host_Name>
   SET MYSQL_USERNAME=root
   SET MYSQL_PASSWORD=<Root_User_Password>
   SET MYSQL_DATABASE=platform_manager

   SET MYSQL_REPLICATION_USERNAME=replication
   SET MYSQL_REPLICATION_PASSWORD=<Replication_User_Password>
   ```

4. Save the updated **RecoverPrimaryDatabase** script file and exit the text editor.

5. Execute the following command:

   ```
   sudo chmod +x ./RecoverPrimaryDatabase
   ```

   The script does the following:

   - Stops RPM on both Server Computers
   - Backup the Redundant Database on the RPM Server 2 Computer
   - Export to Self-Contained File
   - Copy the Redundant database backup file to the RPM Server 1 computer
   - Restore the Primary Database on the RPM Server 1 Computer
   - Drop Schema, Import from Self-Contained File

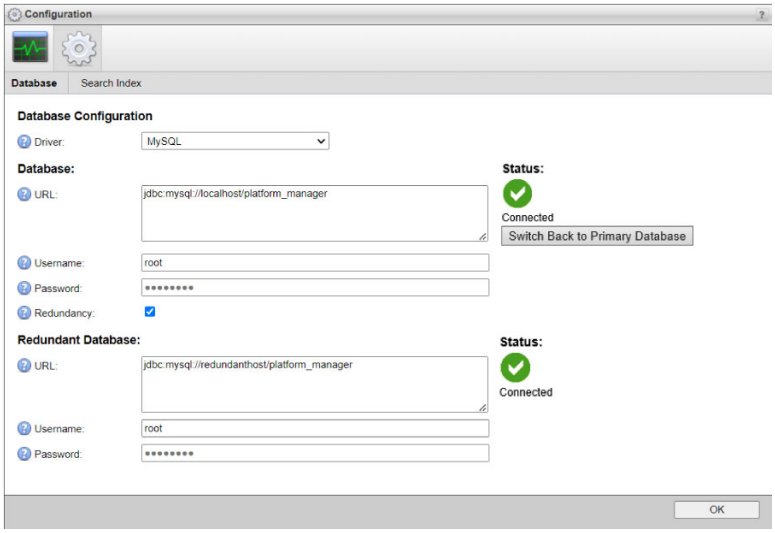
6. When the script is complete, log in to the redundant RPM server from the web browser as an **administrator**.

7. On the main toolbar, click the **Configuration** icon.

   The **Configuration** window opens.

8. On the **Configuration** window toolbar, click the **System** icon.

   The **System** panel opens.




9. In the **Database** section, click **Switch Back to Primary Database**.

   An **Alert** opens.

10. Click **OK**.

    The database connection switches and RPM on your **RPM Server 2** computer starts using the **Primary** database on the **RPM Server 1** computer.

11. In the **System** panel, click **OK**.

    The **Configuration** window closes.

12. Restore Replication on the **RPM Server 2** Computer by completing the following steps:

    a. Locate the `SetupReplication` script file in the following folder:
    `/opt/platform_manager/utilities/database/MySQL-Linux/replication`

    b. Execute the `SetupReplication` script using the following command:

    ```
    ./SetupReplication.sh
    ```

# Load Balancer Configuration

A Ross Platform Manager Redundant System contains at least two RPM Servers and a load balancer. The load balancer distributes users between the RPM Servers in the system. The results of user actions on any RPM Server are simultaneously saved to the databases.

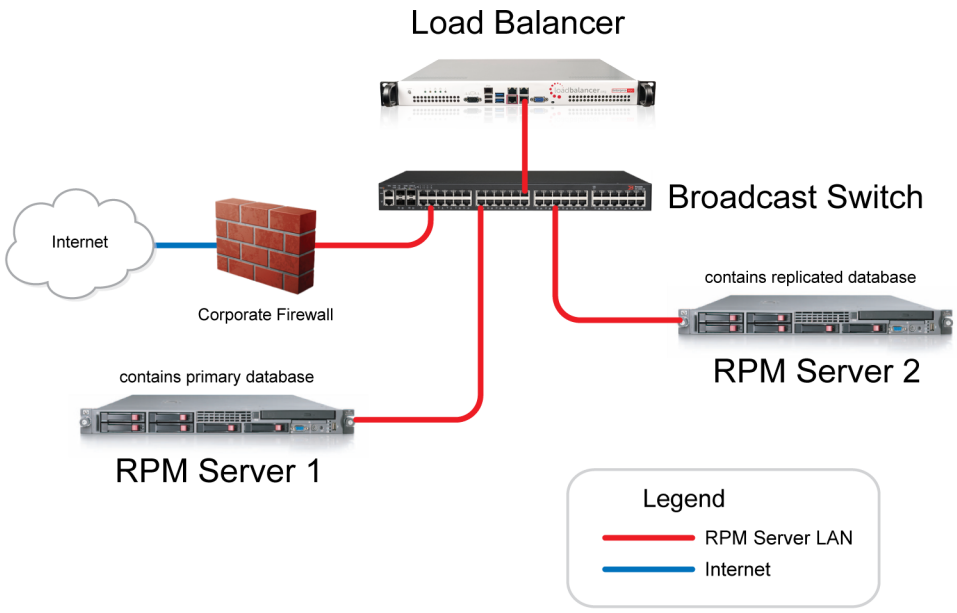



***Figure 5.1*** *RPM Redundant System*

If an RPM Server is unable to service user requests, the load balancer automatically directs users to one of the running RPM Servers in the system.

This chapter discusses the following topics:

- Load Balancer First Time Log In
- Configure Required Load Balancer Settings

# Load Balancer First Time Log In

The first time you log in to your load balancer you must configure the load balancer to work with the RPM Servers in your system.

## Configuration Methods

Use one of the following methods to connect to and configure the load balancer in your RPM Redundant System:

- **Direct Connection** — to perform initial configuration directly on the load balancer, complete the following steps:
  a. Connect a keyboard, mouse, and monitor directly to the load balancer or through a KVM switch.
  b. Complete the procedure "**To configure the load balancer through the console**" on page 5–2.
- **Network Connection** — to perform initial configuration over the network, complete the following steps:
  a. Connect a network cable from the load balancer **eth0** port (outlined in red) to a network switch or a computer.
  b. Complete the procedure "**To configure the load balancer over the network**" on page 5–3.

### Console Configuration

With a keyboard, mouse, and monitor connected to the load balancer you are ready to use the console to configure the load balancer.

**To configure the load balancer through the console**

1. Log in to the load balancer at the **lbmaster** login prompt using the following credentials:
   - **Username** — `setup`
   - **Password** — `setup`
2. Follow the prompts to enter the required details to connect to the network. The prompts automatically advance after you enter a setting value and press **ENTER**.

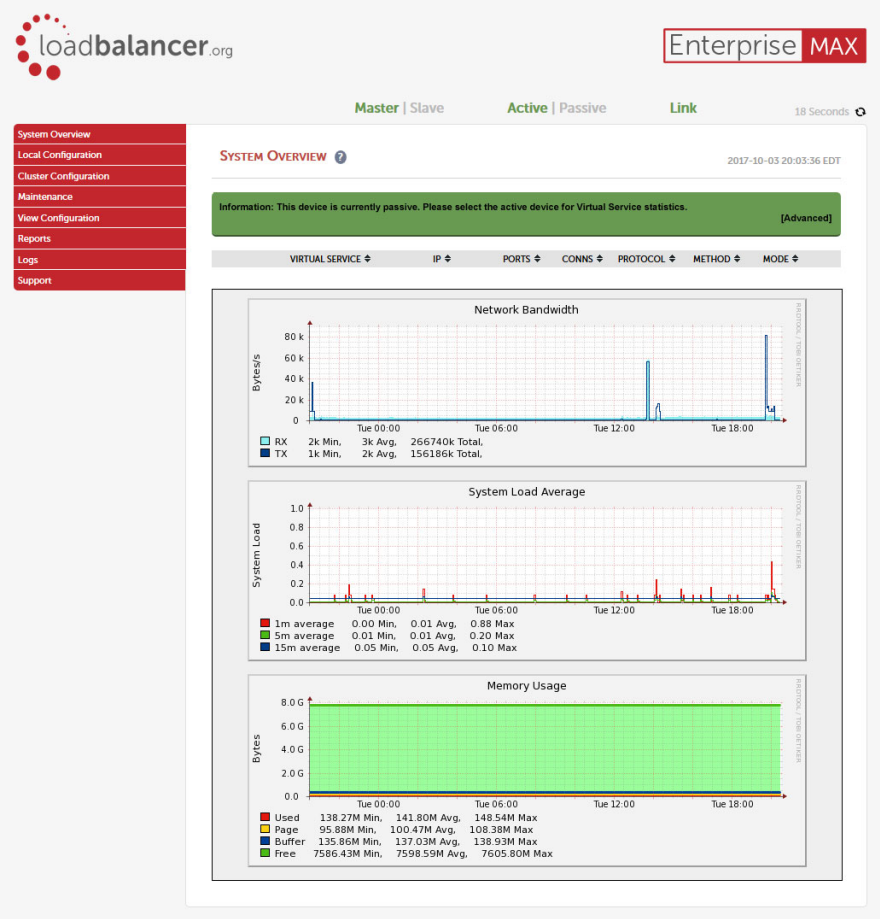
   The following is an example of a load balancer configuration"

```
Loadbalancer.org basic network set up

        This will overwrite the current configuration.
        If you do not wish to procced please enter CTRL + c.

        Static IP address (eg. 192.168.0.26)    :   192.168.1.20

        Interface netmask (eg. 24)              :   24

        VLAN tag ID (Press enter to skip) (eg. 10)      :   120

        Default gateway (eg. 192.168.0.1)       :   192.168.1.254

        DNS Servers
                Primary (eg. 192.168.0.250)     :   8.8.8.8
                Secondary (Leave blank to omit) :   _
```

3. Common netmasks are as follows:
   - `255.255.255.0 = 24`
   - `255.255.254.0 = 23`
   - `255.255.0.0 = 16`
   - `255.0.0.0 = 8`
4. Most networks do not use a VLAN tag directly on the load balancer. Press **ENTER** to skip entering a VLAN unless a network engineer provides a VLAN.
5. When prompted **Are you recovering from a node failure?** press the **N** key.

6. On a computer connected to the same network as the load balancer, use a web browser to open the one of the following URLs:
   - `http://<ip_of_loadbalancer>:9080`
   - `https://<ip_of_loadbalancer>:9443`
7. Use the following credentials to log in to the load balancer:
   - **Username** — `loadbalancer`
   - **Password** — `loadbalancer`

   The load balancer **Utility** page opens.




8. Continue with the procedure "**To configure the virtual service**" on page 5–5.

## Network Configuration

With a the load balancer connected to the network you are ready to configure the load balancer over the network.

### To configure the load balancer over the network

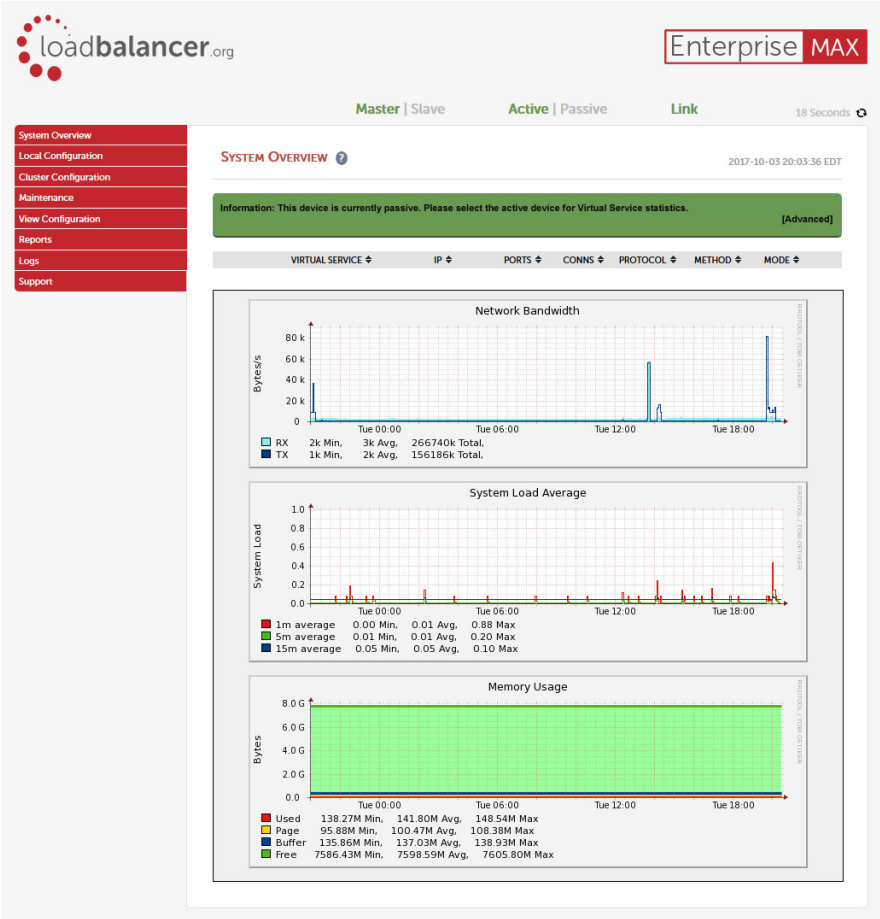
1. Configure the computer connected to the load balancer **eth0** port with an **IP** in the `192.168.2.1` range with a **netmask** of `255.255.255.0`.
2. Use a web browser to open the one of the following URLs:
   - `http://192.168.2.21:9080`
   - `https://192.168.2.21:9443`

   An **Authentication** dialog box opens.

3. Use the following credentials to log in to the load balancer:

   - **Username** — `loadbalancer`
   - **Password** — `loadbalancer`

   The load balancer **Utility** page opens.




4. Select **Local Configuration > Hostname & DNS**.

   The **Hostname & DNS** page opens.

5. In the **Hostname** box, enter a hostname for the load balancer.

   RPM users will use the set hostname to connect to an RPM Server through the load balancer.

6. In the **Domain Name Server** section, enter the IP address of your primary Domain Name Server in the **Primary** box.

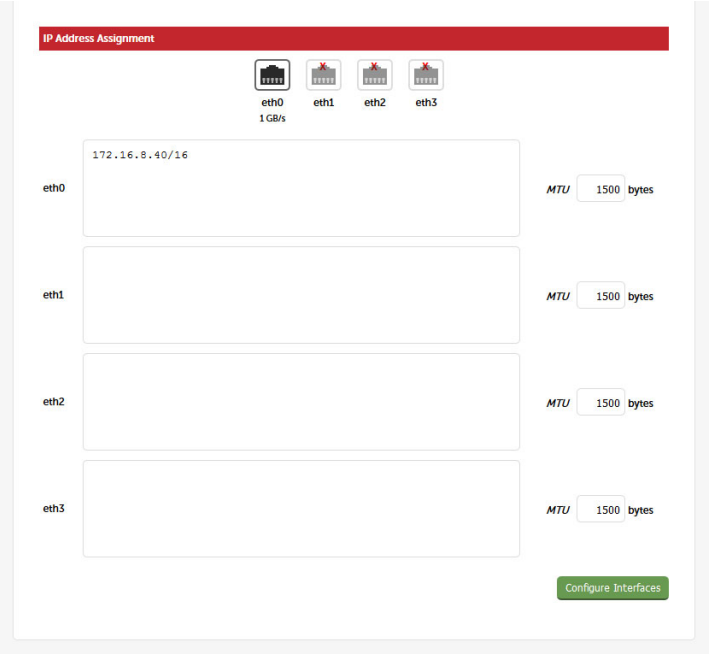
7. In the **Secondary** box, enter the IP address of your secondary Domain Name Server.

8. Click **Update**.

9. Select **Local Configuration > Network Interface Configuration**.

   The **Network Interface Configuration** page opens.

10. In the **IP Address Assignment** section, use CIDR notation (IP/MASK) to enter the load balancer IP address in the **eth0** box. Common MASK values include: 24 (255.255.255.0), 16 (255.255.0.0), and 8 (255.0.0.0).




11. Click **Configure Interfaces**.

    The **Modifying IP address assignments...** opens displaying your new IP address assignment.

12. Select **Local Configuration > Routing**.

    The **Routing** page opens.

13. In the **Default Gateway** section, enter the IP address of your default IP v4 gateway in the **IP v4** box.

14. Continue with the procedure "**To configure the virtual service**" on page 5–5.

## Initial Virtual Service Configuration

With the initial load balancer configuration complete you are ready to configure the virtual service.

### To configure the virtual service

1. Select **Local Configuration > License Key**.

   The **Install License Key** page opens.

2. Verify that the correct license key is activated on your load balancer.

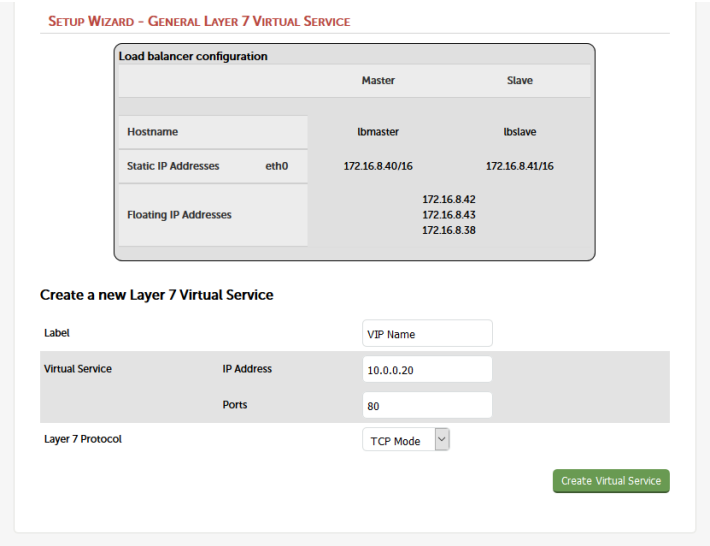
   If license key is not activated for your load balancer, use the **License Key** page to load a license key file.

3. Select **Cluster Configuration > Setup Wizard**.

   The **Setup Wizard** page opens.

4. Click **General Layer 7 Virtual Service**.

   The **Setup Wizard - General Layer 7 Virtual Service** page opens.




5. In the **Label** box, enter a name for the virtual service.

   Usually PLATFORM MANAGER is used for this label.

6. In the **IP Address** box, enter the virtual service IP address.

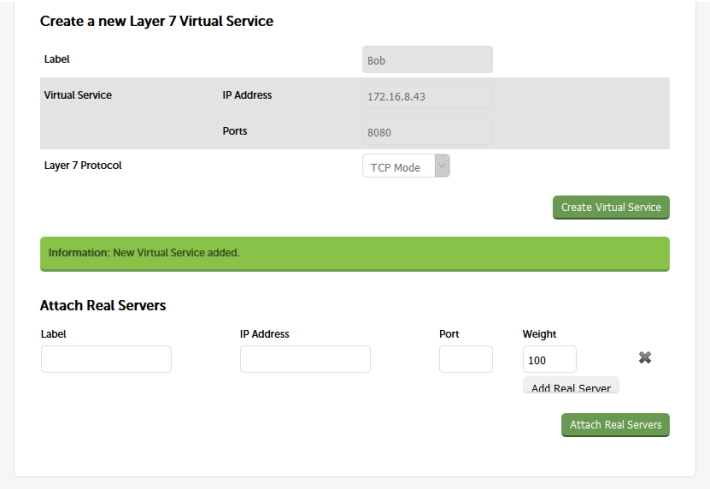
   This is the IP used by RPM users to connect to the RPM Redundant System.

7. In the **Ports** box, enter `80` as the port number on which to listen.

8. Use the **Layer 7 Protocol** list to select **HTTP Mode**.

9. Click **Create Virtual Service**.

   The **Attach Real Servers** section opens.




10. In the **Attach Real Servers** section, enter the following settings to add your **RPM Server 1** to the virtual service:

    - **Label**: `RPM Server 1`
    - **IP Address**: `<RPM Server 1 IP Address>`
    - **Port**: `80`
    - **Weight**: `100`

11. Click **Add Real Server**.

    A new **Real Server** row opens in the **Attach Real Servers** section.

12. In the new **Real Server** row, enter the following settings to add your **RPM Server 2** to the virtual service:

    - **Label**: `RPM Server 2`
    - **IP Address**: `<RPM Server 2 IP Address>`
    - **Port**: `80`
    - **Weight**: `100`

13. Repeat steps **11** and **12** for each additional real server in your RPM Redundant System.

14. Click **Add Real Servers** to add your newly created RPM Servers to the virtual service.

15. Click **Continue**.

    The **Layer 7 - Virtual Services** page lists your new virtual service.

16. In the **Commit changes** section, click **Reload HAProxy** to complete the initial configuration of the load balancer in your RPM Redundant System.

17. Continue with the section "**Configure Required Load Balancer Settings**" on page 5–7.

## Configure Required Load Balancer Settings

After you complete the initial configuration of your load balancer, you must configure Virtual Service and Advance Configuration settings before users can start accessing your RPM Redundant System through the load balancer.

### To configure required load balancer settings

1. Select **Cluster Configuration > Layer 7 – Virtual Services**.

   The **Layer 7 - Virtual Services** page displays a table of the virtual services defined on your load balancer.

2. In the table, click the **Modify** button associated with the virtual service you created for your RPM Redundant System.

   The **Layer 7 - Modify Virtual Services** page opens.

3. Use the **Persistence Mode** list to select **Source IP**.

4. Click **Edit HTTP Headers**.

   The **HTTP Header Control** dialog box opens.

5. Use the **Type** list to select **Request**.

6. Use the **Option** list to select **Set**.

7. In the **Header Name** box, enter `X-Forwarded-Port`.

8. In the **Header Value** box, enter `%[dst_port]`.

9. Click **Add**.

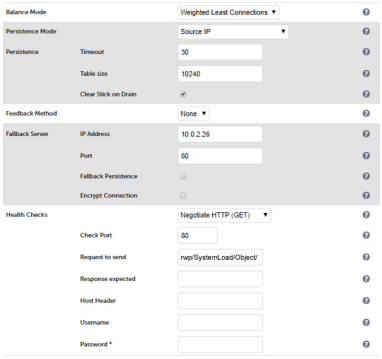
10. Click **Save**.

    The **HTTP Header Control** dialog box closes.

11. Use the **Health Checks** list to select **Negotiate HTTP (GET)**.

12. Set **Check Port** to **80**.
13. In the **Request to send** box, enter `common.rwp/SystemLoad/Object/Status.js`.
14. In the **Fallback Server** section make the following changes:
    - **IP Address** — set to the **IP of the first node**.
    - **Port** — set to **80**.
15. Under **Persistence Mode** select **Application Cookie**.
16. Set the **Application Cookie Name** to `JSESSIONID`.
17. Click **Update**.

    The **Layer 7 - Modify Virtual Services** page displays the new settings.




18. Select **Cluster Configuration > Layer 7 – Advanced Configuration**.

    The **Layer 7 – Advanced Configuration** page opens.
19. In the **Connection Timeout** box, enter `1800000`.
20. In the **Client Timeout** box, enter `1800000`.
21. In the **Real Server Timeout** box, enter `1800000`.
22. Click **Update**.

    The settings in the **Layer 7 – Advanced Configuration** page updates.
23. In the **Commit changes** section, click **Reload HAProxy** to complete the configuration of the load balancer in your RPM Redundant System.

    RPM users can now use the IP address or hostname of the load balancer virtual service to open RPM.

## Optional SSL Offloading Setting Configuration

Some customers may wish to use a HTTPS connection between their end users and RPM. HTTPS is a required configuration for the customers planning to have RPM accessible from the public internet.

## Add an SSL Certificate

The first step is to add an SSL certificate to the load balancer in your RPM Redundant System.

**To add an SSL certificate to the load balancer.**

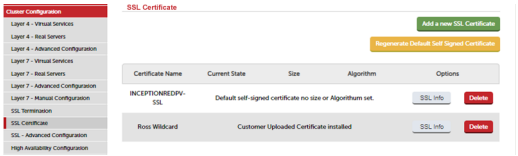
1. Use a web browser to open the one of the following URLs:
   - `http://192.168.2.21:9080`
   - `https://192.168.2.21:9443`

   An **Authentication** dialog box opens.
2. Use the following credentials to log in to the load balancer:
   - **Username** — `loadbalancer`
   - **Password** — `loadbalancer`

   The load balancer **Utility** page opens.
3. Click **Cluster Configuration**.

   The **Cluster Configuration** section opens.
4. In the **Cluster Configuration** section, click **SSL Certificate**.

   The **SSL Certificate** section opens.




5. Click **Add a new SSL Certificate**.

   The **Add a new SSL Certificate** section opens.
6. Depending on the type of SSL certificate you are adding, complete one of the following procedures:
   - **Existing SSL Certificate** — to add an existing certificate such as a wild card certificate, complete the procedure "**To add an existing SSL certificate**" on page 5–9.
   - **New SSL Certificate** — to add a completely new certificate, complete the procedure "**To add an existing SSL certificate**" on page 5–9.

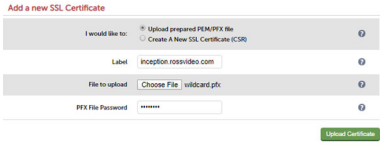
### Existing SSL Certificate

When you already have an SSL certificate you can add it to the load balancer in your RPM Redundant System

**To add an existing SSL certificate**

1. In the **Add a new SSL Certificate** section, select the **Upload prepared PEM/PFX file** option.

   The **Add a new SSL Certificate** section displays the upload settings.




2. In the **Label** box, enter a unique name for the SSL certificate.
3. Click **Choose File**.

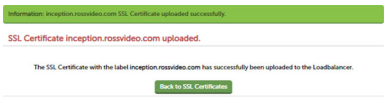
4. Use the file browser to navigate to and select and existing SSL certificate file.

   The SSL certificate file must contain any intermediate and root certificates needed as well as the private key for the server certificate it contains. The SSL certificate file can be in pem or pfx format.

5. In the **PFX File Password** box, enter the password for the selected SSL certificate file.

6. Click **Upload Certificate**.

   The **Information** screen displays after the successful upload of the selected SSL certificate uploads to the load balancer.




7. Click **Back to SSL Certificate**.

   The **Information** screen closes.

8. Continue with the procedure "**To configure SSL termination settings**" on page 5–11.

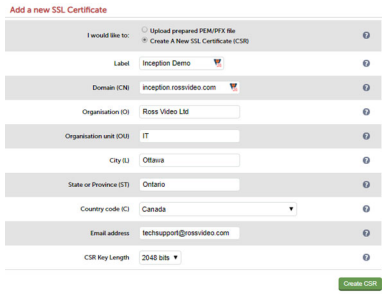
## New SSL Certificate

If you do not have an SSL certificate you must create a new SSL certificate for the load balancer.

### To create a new SSL certificate

1. In the **Add a new SSL Certificate** section, select the **Create a new SSL Certificate (CSR)** option.

   The **Add a new SSL Certificate** section displays the create settings.




2. In the **Label** box, enter a unique name for the SSL certificate.

3. In the **Domain (CN)** box, enter the URL that RPM users use to access RPM Redundant System. For example: `platformmanager.rossvideo.com`.

4. In the **Oranisation (O)** box, enter the name of the organization. For example: `Ross Video Ltd`.

5. In the **Organisational Unit (OU)** field enter the name of the department or group responsible for the SSL certificate. For example: `IT`.

6. In the **City (L)** box, the name of the city in which the SSL certificate is used.

7. In the **State or Province (ST)** box, enter the name of the state or province in which the city entered in step **6** is located.

8. Use the **Country code (C)** list to select the country in which the state or province entered in step **7** is located.

9. In the **Email address** box, enter the email address of the person or group responsible for the SSL certificate.

10. Use the **CSR Key Length** list to elect the required CSR key length for the SSL certificate.

    A key length of **2048** bits is sufficient for most signing authorities. A more secure key length of **4096** bits is also available.

11. Click **Create CSR**.

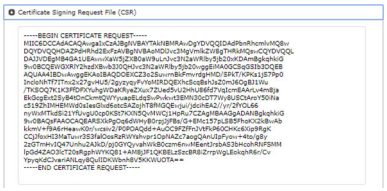
    The **Add a new SSL Certificate** section closes to return you to the **SSL Certificate** section.

12. Click the **Modify** button associated with the SSL certificate you just created.

    You entered the name of the new SSL certificate in step **2**.

13. Click the line labeled **Certificate Signing Request File (CSR)** to get your CSR.

    The CSR displays.




14. Copy the displayed **CSR** and paste it into a file with the extension `.csr`.

15. Send your **.csr** file to your signing authority.

    You require a signed certificate in **pem** format. A certificate designed for Apache or Nginx should be in the **needed** format.

16. After you receive your SSL certificate from your signing authority, enter the server certificate contents in the **Your Certificate** section.

    If you received an **intermediate certificate**, enter the server certificate contents in the **Intermediate Certificate** section.

17. Enter the **root certificate** contents in the **Root Certificate** section.

18. Click **Update**.

19. Continue with the procedure "**To configure SSL termination settings**" on page 5–11.

## SSL Termination

After uploading an existing SSL certificate to your load balancer or created a new SSL certificate for it, you are ready to configure SSL termination settings.

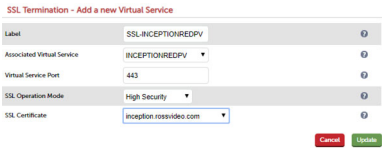
### To configure SSL termination settings

1. In the **Cluster Configuration** section, click **SSL Termination**.

   The **SSL Termination** section opens.

2. Click **Add a new Virtual Service**.

   The **SSL Termination - Add a new Virtual Service** section displays the add settings.




3. Use the **Associated Virtual Service** list to select the virtual service to add to the SSL termination.

   The following settings update after you select a virtual service:

   - **Label** — automatically set from the selected virtual service.
   - **Virtual Service Port** — should remain set to **443**.
   - **SSL Operation Mode** — should remain set to **High Security**.

4. Use the **SSL Certificate** list to select the SSL certificate added in the section "**Existing SSL Certificate**" on page 5–9 or created in the section "**New SSL Certificate**" on page 5–10.
5. Click **Update**.

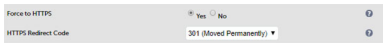
   The **Commit changes** alert opens.

6. Click **Reload STunnel**.

   The **Commit changes** alert closes.
7. Under the virtual service you are adding to the SSL termination, select the **Yes** option for the **Force to HTTPS** setting.

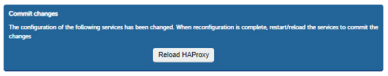
   This setting enables to X-Forwarded-Proto header needed for proper operation.
8. Verify that the **HTTPS Redirect Code** is set to **301 (Moved Permanently)**.

   **SSL Termination** settings.




9. Click **Update**.

   The **Commit changes** alert opens.




10. Click **Reload HAProxy**.

    The **Commit changes** alert closes.
11. On one of the RPM Servers, use a text editor to edit the following file:

```
C:\Program Files\Ross Video\Ross Platform Manager\Configuration\http.cnf
```

12. Change the **SSL Offload Configuration** to **true** as follows:

```
#*******************************#
# SSL Offloading Configuration #
#*******************************#
wrapper.java.additional.60=-Dorg.eclipse.equinox.http.jetty.https.offload=true
```

13. Save the **http.conf** file.
14. Restart the RPM Server.
15. Repeat steps **11** to **14** on all remaining RPM Servers in your RPM Redundant System.
16. Configure all HTML5 based RPM plugins to use HTTPS.

    RPM users should to connect using HTTPS. All connections to HTTP should automatically redirect to HTTPS.

✶ You must configure HTML5 based RPM plugins to use HTTPS in order for them to work properly.

## Redundant Load Balancer Setup

When an RPM Redundant System contains two load balancers to provide redundancy you must set one as the Master and the other as the Peer. Physical connections and initial network configuration of both load balancers are identical except that the procedures in the Configure Required Load Balancer Settings section should only be done on the Master load balancer. After configuring the pair of redundant load balancers all of the settings from the Master load balancer are automatically replicated on the Peer load balancer as changes are saved and on initial clustering.

**To set the Master load balancer**

1. Use a web browser to open the one of the following URLs:

   - `http://192.168.2.21:9080`
   - `https://192.168.2.21:9443`

   An **Authentication** dialog box opens.

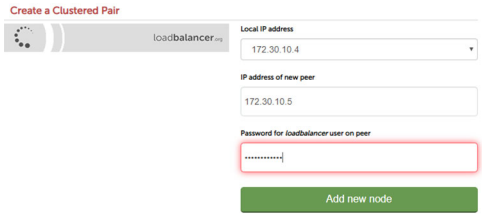
2. Use the following credentials to log in to the load balancer:

   - **Username** — `loadbalancer`
   - **Password** — `loadbalancer`

   The load balancer **Cluster Configuration** page opens.

3. In the **Cluster Configuration** section, click **High Availability Configuration**.

   The **Create a Clustered Pair** section opens.




4. Verify that the IP address displayed in the **Local IP address** box is the same as the load balancer management IP address configured in the section "**Load Balancer First Time Log In**" on page 5–2.

5. In the **IP address of new peer** box, enter the management IP address of the Peer load balancer.

6. In the **Password for *loadbalancer* user on peer** box, enter the password for the **loadbalancer** user.

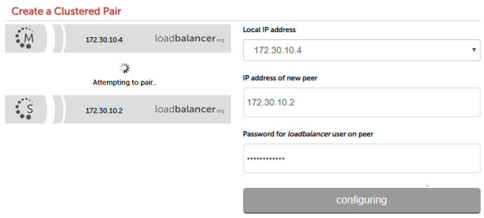
   The default password for the **loadbalancer** user is `loadbalancer`.

7. Click **Add new node**.

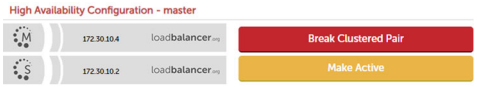
   An alert opens informing you that this process will overwrite the configuration of the selected peer.

8. Click **OK**.

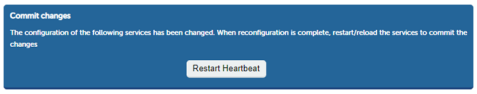
   A screen similar to the following displays while the two load balancers synchronize:



A screen similar to the following displays after the synchronization completes:




Finally the **Commit changes** alert opens.




9. Click **Restart Heartbeat**.

   The **Commit changes** alert closes. The Master load balancer automatically connects to the Peer load balancer to update the configuration of the Peer load balancer based on the configuration of the Master load balancer. From this point on ALL configuration is done on the Master load balancer. The cluster automatically synchronizes the two load balancers.

# Galera Cluster Setup

This chapter provides the steps involved for setting up a Galera Cluster with MariaDB, including preparation (such as backing up MySQL data), as well as necessary software installations and configurations.

This chapter discusses the following topics:

- Set Up for the Galera Cluster
- Installations on the Primary Node
- Configurations on the Primary Node
- Installations on the Secondary Node
- Configurations on the Secondary Node

## Set Up for the Galera Cluster

Before continuing with the configuration of the Galera Cluster, it is important that you take the necessary steps to set up properly. Perform the following procedure beginning on the primary node in your cluster before repeating steps 1 and 2 on the secondary node.

✶ Note that a minimum of 3 nodes is required for high availability and fault tolerant Galera Clustering.

**To set up for the Galera Cluster**

1. Ensure your session has `sudo` privileges.
2. Ensure that ports 3306, 4444, 4567, and 4568 are open for TCP connections between the servers.
3. If the cluster is being installed on a server with an existing Platform Manager database, backup the database on the primary node by running the following command:

   ```
   mysqldump -u root -ppassword platform_manager > platform_manager_mysql_backup.sql
   2>/dev/null
   ```

4. Repeat steps 1-2 on the other node in the cluster.

## Installations on the Primary Node

After following the steps outlined in "**To set up for the Galera Cluster**" on page 6–2, you are ready to continue on to installing Ross Platform Manager, MariaDB, and Galera on the primary node.

**To install necessary software on the primary node**

1. Install Ross Platform Manager by performing the following steps:
   a. Enter the following command to install dmidecode. This is necessary for RPM to retrieve hardware serial numbers.

      ```
      sudo apt-get install dmidecode
      ```

   b. Create the application directory:

      ```
      sudo mkdir /opt/platform_manager/
      ```

   c. Copy the **PlatformManager-X.X.X-*.tar.gz** file from the commissioning package to the system. You can use FileZilla to place it into the `/opt/platform_manager/` directory.
   d. Extract the file using this command:

      ```
      sudo tar -xvf PlatformManager-X. X. X-*.tar.gz
      ```

   e. Set the permissions on the /opt/platform_manager directory by entering the following command:

      ```
      sudo chmod -R 755 /opt/platform_manager/
      ```

   f. Run Ross Platform Manager:

      ```
      sh Install
      ```

   g. View Ross Platform Manager's process status by entering the following command:

      ```
      systemctl status PlatformManager
      ```

   **Note**: If systemctl command doesn't work first time, then issue the following command. Once executed, repeat the systemctl command above:

      ```
      service PlatformManager stop
      ```

   **Note**: You can monitor the launch process in real time by following the steps below:

      ```
      cd /opt/platform_manager
      tail -f workspace/.metadata/logs/application-yyyymmdd. log
      ```

2. Install MariaDB and Galera by performing the following steps:

a. Install the packages required to support MariaDB installation by running the following command:

```
sudo apt install software-properties-common -y
```

b. Add the MariaDB signing key to your systems trusted list by running the following command:

```
sudo apt-key adv --fetch-keys
'https://mariadb.org/mariadb_release_signing_key.asc'
```

c. Download and run the MariaDB repository setup script by running the following commands:

```
sudo add-apt-repository 'deb [arch=amd64,arm64,ppc64el]
https://mirror.mariadb.org/repo/11.4/ubuntu jammy main'
```

```
sudo apt-get update
```

d. Install MariaDB and Galera by running the following commands:

```
sudo apt install mariadb-server=1:11.4.* mariadb-client=1:11.4.* galera-4 -y
```

```
sudo systemctl stop mysql
```

## Configurations on the Primary Node

After installing Ross Platform Manager, MariaDB, and Galera on the primary node, you are ready to configure the primary node of the cluster.

**To configure the primary node**

1. Configure the MariaDB Service by performing the following steps:

   a. Navigate to the MySQL config directory by running the following command:

   ```
   cd /etc/mysql/
   ```

   b. Open the `my.cnf` file in a text editor by running the following command:

   ```
   vim my.cnf
   ```

   c. Copy and paste the following lines into this file. Make sure to change the WSREP addresses and names for the `wsrep_cluster_name`, `wsrep_cluster_address`, and `wsrep_node_name` to the appropriate values for your setup.

   ```
   [client-server]
   port = 3306
   socket = /run/mysqld/mysqld.sock

   !includedir /etc/mysql/conf.d/
   !includedir /etc/mysql/mariadb.conf.d/

   [mysqld]
   bind-address = 0.0.0.0
   binlog_format = ROW
   wsrep_on = ON
   wsrep_provider = /usr/lib/galera/libgalera_smm.so
   wsrep_cluster_name = "RPM_Galera_Cluster"
   wsrep_cluster_address = "gcomm://COMMA-SEPERATED-IPs-Joining-THE-CLUSTER"
   wsrep_node_address = "THIS-SERVER-IP"
   wsrep_node_name = "THIS-SERVER-HOSTNAME"
   wsrep_sst_method = rsync
   ```

```
innodb_flush_log_at_trx_commit = 0
innodb_doublewrite = 1
innodb_file_per_table = 1
innodb_buffer_pool_size = 512M
lower_case_table_names=1
max_connections=409
log_error = /var/log/mysql/error.log
```

2. Start the Galera Cluster by running the following command:

   ```
   sudo galera_new_cluster
   ```

3. Verify that the Galera Cluster is running by running the following command:

   ```
   mariadb -u root -ppassword -e "SHOW STATUS LIKE 'wsrep_cluster_size';"
   ```

   The output is a value of 1, verifying that there is currently one node in the cluster.

4. Configure the Platform Manager database by running the following commands:

   ```
   mariadb -u root -ppassword -e "CREATE USER 'root'@'%' IDENTIFIED BY 'password';"
   mariadb -u root -ppassword -e "ALTER USER 'root'@'localhost' IDENTIFIED BY
   'password';"
   mariadb -u root -ppassword -e "GRANT ALL PRIVILEGES ON *.* TO 'root'@'localhost'
   WITH GRANT OPTION;"
   mariadb -u root -ppassword -e "FLUSH PRIVILEGES;"
   mariadb -u root -ppassword -e "CREATE DATABASE platform_manager"
   ```

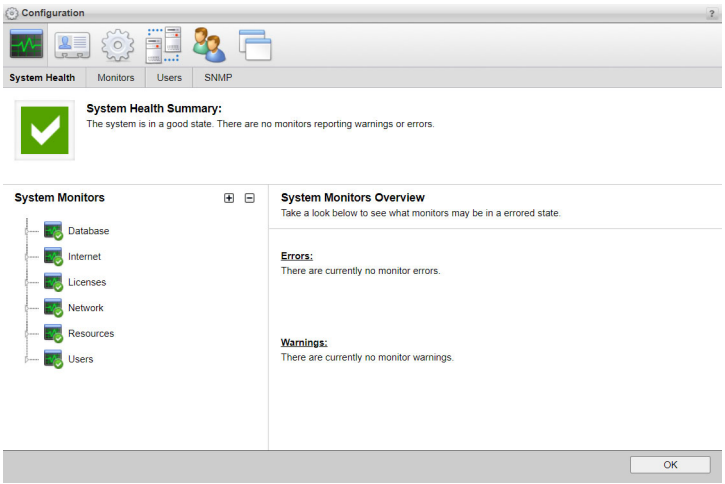
5. If the cluster was installed on a server with existing an existing Platform Manager database, restore the Platform Manager database by running the following commands:

   ```
   mariadb -u root -ppassword platform_manager < platform_manager_mysql_backup.sql
   sudo systemctl restart PlatformManager
   ```

6. Configure Ross Platform Manager by performing the following steps:

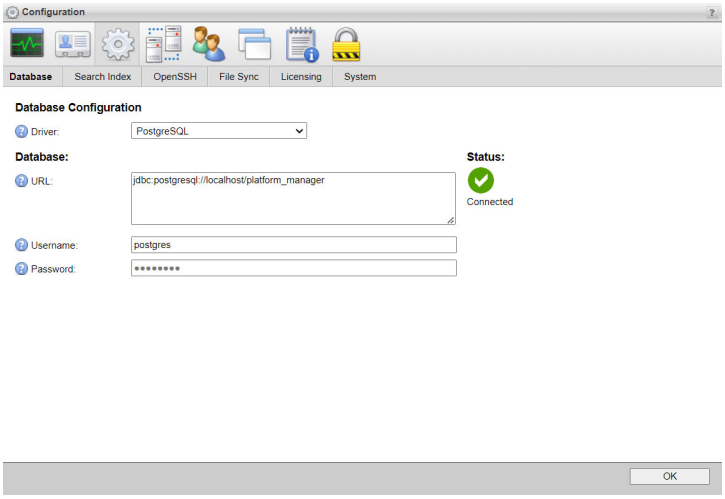
   a. Open the **Ross Platform Manager**, and from the top menu under **Tools**, select the **Configuration** icon.

      The **Configuration** window opens.

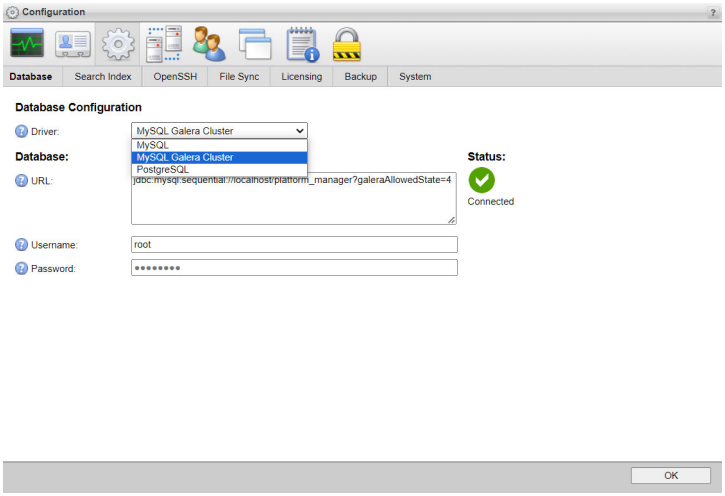



   b. Click the **Database** tab.

      The **Database** tab opens.




**c.** Use the **Driver** list to select **MySQL Galera Cluster**.




**d.** Click **OK**.

A confirmation message appears.

**e.** Click **OK** to confirm and save the changes made.

The confirmation message closes.

## Installations on the Secondary Node

After setting up the primary node, you are ready to continue on to installing Ross Platform Manager, MariaDB, and Galera on the secondary node.

**To install necessary software on the secondary node**

1. Install Ross Platform Manager by performing the following steps:

   **a.** Enter the following command to install dmidecode. This is necessary for RPM to retrieve hardware serial numbers.

   ```
   sudo apt-get install dmidecode
   ```

   **b.** Create the application directory:

   ```
   sudo mkdir /opt/platform_manager/
   ```

c. Copy the **PlatformManager-X.X.X-*.tar.gz** file from the commissioning package to the system. You can use FileZilla to place it into the `/opt/platform_manager/` directory.

d. Extract the file using this command:

```
sudo tar -xvf PlatformManager-X. X. X-*.tar.gz
```

e. Set the permissions on the /opt/platform_manager directory by entering the following command:

```
sudo chmod -R 755 /opt/platform_manager/
```

f. Run Ross Platform Manager:

```
sh Install
```

g. View Ross Platform Manager's process status by entering the following command:

```
systemctl status PlatformManager
```

**Note**: If systemctl command doesn't work first time, then issue the following command. Once executed, repeat the systemctl command above:

```
service PlatformManager stop
```

**Note**: You can monitor the launch process in real time by following the steps below:

```
cd /opt/platform_manager
tail -f workspace/.metadata/logs/application-yyyymmdd. log
```

2. Install MariaDB and Galera by performing the following steps:

a. Install the packages required to support MariaDB installation by running the following command:

```
sudo apt install software-properties-common -y
```

b. Add the MariaDB signing key to your systems trusted list by running the following command:

```
sudo apt-key adv --fetch-keys
'https://mariadb.org/mariadb_release_signing_key.asc'
```

c. Download and run the MariaDB repository setup script by running the following commands:

```
sudo add-apt-repository 'deb [arch=amd64,arm64,ppc64el]
https://mirror.mariadb.org/repo/11.4/ubuntu jammy main'
sudo apt-get update
```

d. Install MariaDB and Galera by running the following commands:

```
sudo apt install mariadb-server=1:11.4.* mariadb-client=1:11.4.* galera-4 -y
sudo systemctl stop mysql
```

## Configurations on the Secondary Node

After installing Ross Platform Manager, MariaDB, and Galera on the secondary node, you are ready to configure the secondary node of the cluster.

#### To configure the secondary node

1. Configure the MariaDB Service by performing the following steps:

a. Navigate to the MySQL config directory by running the following command:

```
cd /etc/mysql/
```

b. Open the `my.cnf` file in a text editor by running the following command:

```
vim my.cnf
```

c. Copy and paste the following lines into this file. Make sure to change the WSREP addresses and names for the `wsrep_cluster_name`, `wsrep_cluster_address`, and `wsrep_node_name` to the appropriate values for your setup.

```
[client-server]
port = 3306
socket = /run/mysqld/mysqld.sock

!includedir /etc/mysql/conf.d/
!includedir /etc/mysql/mariadb.conf.d/

[mysqld]
bind-address = 0.0.0.0
binlog_format = ROW
wsrep_on = ON
wsrep_provider = /usr/lib/galera/libgalera_smm.so
wsrep_cluster_name = "RPM_Galera_Cluster"
wsrep_cluster_address = "gcomm://COMMA-SEPERATED-IPs-Joining-THE-CLUSTER"
wsrep_node_address = "THIS-SERVER-IP"
wsrep_node_name = "THIS-SERVER-HOSTNAME"
wsrep_sst_method = rsync
innodb_flush_log_at_trx_commit = 0
innodb_doublewrite = 1
innodb_file_per_table = 1
innodb_buffer_pool_size = 512M
lower_case_table_names=1
max_connections=409
log_error = /var/log/mysql/error.log
```

2. Start MariaDB by running the following command:

```
sudo systemctl start mariadb
```

3. Restart MariaDB by running the following command:

```
systemctl restart mariadb
```

4. Verify that the Galera Cluster is running by running the following command:

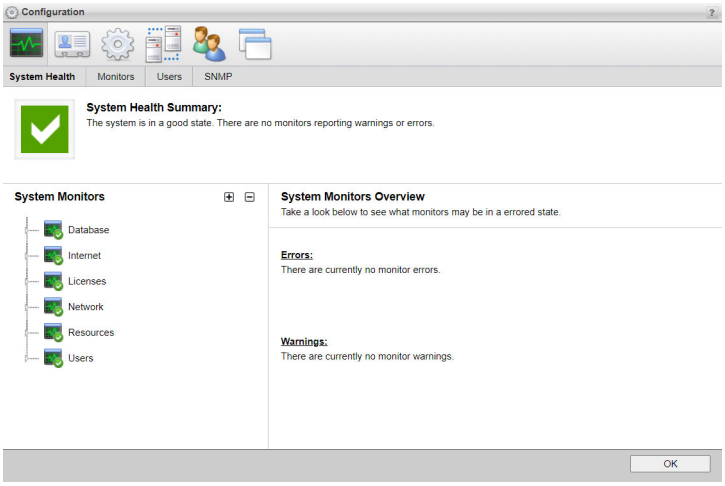
```
mariadb -u root -ppassword -e "SHOW STATUS LIKE 'wsrep_cluster_size';"
```

If the output is not a value of 2, restart MariaDB again using the command from step 3.

5. Configure Ross Platform Manager by performing the following steps:

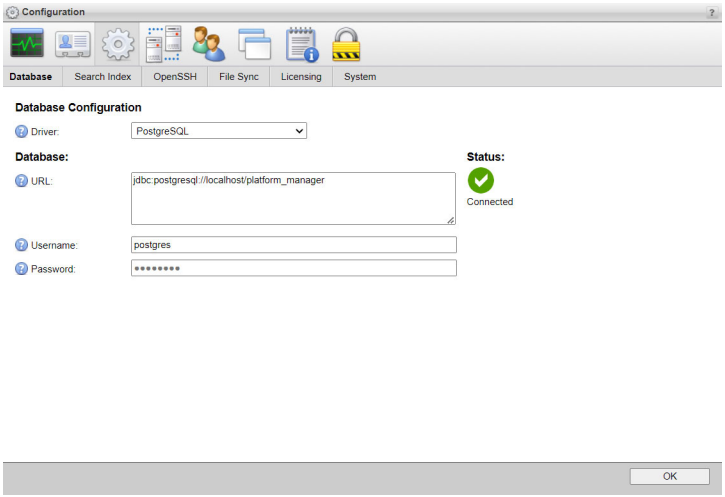
a. Open the **Ross Platform Manager**, and from the top menu under **Tools**, select the **Configuration** icon.

The **Configuration** window opens.

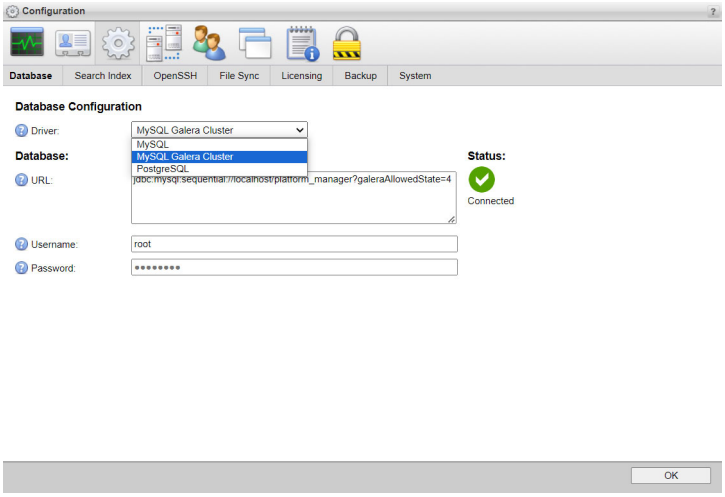



**b.** Click the **Database** tab.

The **Database** tab opens.




**c.** Use the **Driver** list to select **MySQL Galera Cluster**.




**d.** Click **OK**.

A confirmation message appears.

e. Click **OK** to confirm and save the changes made.

   The confirmation message closes.

# Updating the Cluster

This chapter provides the necessary steps involved for updating the Ross Platform Manager cluster in an RPM Redundant System. The cluster should consist of two nodes - the primary (node 1) and secondary (node 2).

This chapter discusses the following topics:

- Set Up for an Update
- Update Ross Platform Manager Cluster

## Set Up for an Update

Before you update the Ross Platform Manager cluster, it is important that you take the necessary steps to prepare for the upgrade, including stopping the nodes and backing up information.

**To set up for an update**

1. On node 1, stop the node by running the following command:

   ```
   systemctl stop PlatformManager
   ```

2. On node 1, take a backup of the existing RPM directory by running the following command:

   ```
   tar -cvf /root/PlatformManager-3.5.tar /opt/platformmanager/*
   ```

3. On node 2, stop the node by running the following command:

   ```
   systemctl stop PlatformManager
   ```

4. On node 2, take a backup of the existing RPM directory by running the following command:

   ```
   tar -cvf /root/PlatformManager-3.5.tar /opt/platformmanager/*
   ```

## Update Ross Platform Manager Cluster

In order to update this cluster, you will need to remove and reinstall RPM on both nodes, and then set up replication on the second node.

**To update the RPM cluster**

1. On node 1, remove the contents of the Plugins directory by running the following command:

   ```
   rm -r /opt/rossvideo/PlatformManager/plugins/*
   ```

2. On node 1, copy the **PlatformManager-3.*.0-*.tar.gz** file from the commissioning package to the system.

3. On node 1, use FileZilla to place the copied **PlatformManager-3.*.0-*.tar.gz** file into the **/opt/platform_manager/** directory.

4. On node 1, extract the update file by running the following command:

   ```
   sudo tar -xvf PlatformManager-3. *.-*.tar.gz
   ```

5. On node 1, set the permissions on the **/opt/platform_manager/** directory by running the following command:

   ```
   sudo chmod -R 755 /opt/platform_manager/
   ```

6. On node 1, run Ross Platform Manager by running the following command:

   ```
   sh Install
   ```

7. On node 1, open Ross Platform Manager in a web browser.

   The Ross Platform Manager web page opens with a prompt to upgrade the node.

8. In the upgrade prompt, click **Upgrade**.

9. Repeat steps 1-6 of this procedure on node 2.

   Once each step has been completed on node 2, your RPM cluster has been updated.