

Setting up High Availability

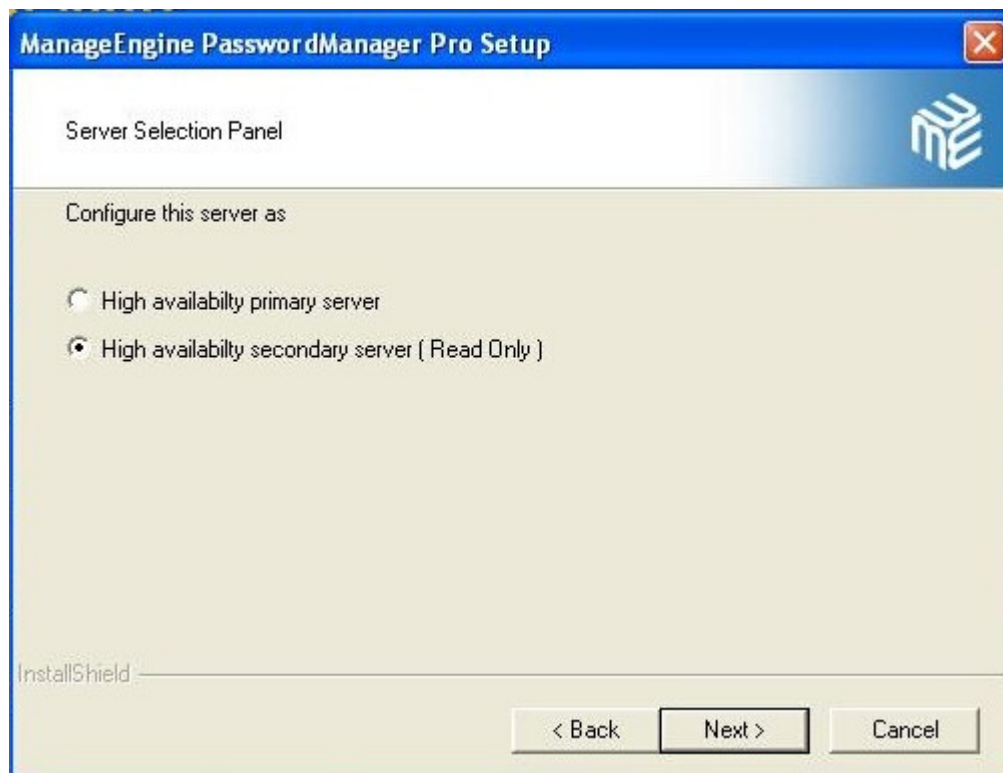
Overview

Setting up high availability in PMP consists of the following four steps:

1. Installing Primary & Secondary
2. Configurations to be done in Primary Installation
3. Configurations to be done in Secondary Installation
4. Enabling database replication

Step 1 - Primary & Secondary Server Instances

Before trying High Availability, you should have both Primary and Standby installations of PMP in place. You can use your current PMP installation as primary server. You can install another instance of PMP as secondary server in a separate workstation. To install PMP as secondary, during installation, you need to choose the option "**Configure this server as High availability secondary server (Read Only)**" (refer to the screenshot below). **After installation, the PMP Primary server should have been started and stopped at least once.**



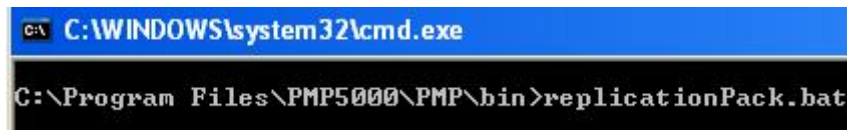
Step 2 - Changes to be made in Primary Server Installation

Prerequisite

1. **Stop PMP Primary server, if already running.**
2. Check if PMP Secondary Server is reachable from Primary Server and vice-versa (do a ping)
3. Go to the PMP Primary folder and carry out the following:
 - Navigate to **<PMP_Installation_Folder>/mysql/data** folder. **The following file & folders are important:**
 - 'passtrix' folder,
 - 'mysql' folder,
 - 'test' folder,
 - 'PasstrixTemp'
 - 'ibdata1',
 - 'ca-cert.pem',
 - 'server-cert.pem'
 - server-key.pem
 - **KEEP THESE FOLDERS and delete all other files. If you delete them, you will lose all your data.**

Steps

1. Open a command prompt and navigate to **<PMP_Installation_Folder>/bin** directory and run the script **replicationPack.bat** (Windows)/**replicationPack.sh** (Linux)



```
C:\WINDOWS\system32\cmd.exe
C:\Program Files\PMP5000\PMP\bin>replicationPack.bat
```

2. This will create a replication package named '**Replication.zip**' under **<PMP_Home>/replication** folder. This zip contains the database package for standby
3. Go to **<PMP_Installation_Folder>/mysql/bin** directory. You will find a file named **HAPrimary.conf**, **rename** that file as **HASecondary.conf**. (**Important Note:** Before proceeding further, ensure that **HAPrimary.conf** is NOT present under **PMP_Installation_Folder>/mysql/bin** folder. It should only contain HASecondary.conf)

Edit the **HASecondary.conf** as per the details below:

(1) Enter the name of the host where the secondary server is running:

master_host=<hostname of Secondary>

For example, 'test_workstation' is the machine where the secondary PMP server is running, you need to enter the information as below:

master_host=test_workstation

(2) Enter the host name, DNS Name and IP address of the secondary server:

slave_hosts=<hostname of Secondary>,<DNS Name of Secondary>,<IP of Secondary>

For example, 'test_workstation' is the machine where the secondary PMP server is running, test_workstation.test.com is the DNS name and 192.168.10.1 is its IP, you need to enter the information as below (in comma separated form without any space):

slave_hosts=test_workstation,test_workstation.test.com,192.168.10.1

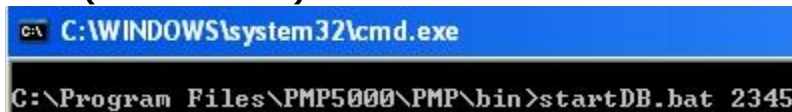
4. Open a command prompt and navigate to <PMP_Installation_Folder>/bin and run the script `startDB.bat <MySQL Port>` (Windows) /`startDB.sh <MySQL Port>` (Linux). You need to provide the MySQL port of PMP while executing the above script as shown below. By default, the MySQL port in PMP is 2345.

`startDB.bat <MySQL Port>` **(For Windows)**

`startDB.sh <MySQL Port>` **(For Linux)**

For example, with the default the MySQL port 2345, you need to execute this as:

`startDB.bat 2345` **(For Windows)**



```
C:\WINDOWS\system32\cmd.exe
C:\Program Files\PMP5000\PMP\bin>startDB.bat 2345
```

`startDB.sh 2345` **(For Linux)**

This will start the Primary Database (Default MySQL port is 2345)

Note: During this process, if you get this error, you may safely ignore it as this is harmless:

```
090601 19:53:05 [Warning] The syntax for replication startup options is deprecated and will be removed in MySQL 5.2. Please use 'CHANGE MASTER' instead.
090601 19:53:05 [Warning] option 'max_allowed_packet': unsigned value 3200000000 adjusted to 1073741824
```

5. Copy the **Replication.zip** file present under <PMP_Installation_Folder>/replication directory. This has to be put in the PMP Secondary installation machine as detailed in Step 3 below.

Step 3 - Changes to be made in PMP Secondary Installation

Prerequisite

- **Stop PMP Secondary server, if already running.**
- Check if PMP Primary Server is reachable from Secondary Server and vice-versa (do a ping)

- Go to the PMP Secondary folder and carry out the following:
 - Navigate to **<PMP_Installation_Folder>/mysql/data** folder. **The following file & folders are important:**
 - 'passtrix' folder,
 - 'mysql' folder,
 - 'test' folder,
 - 'PasstrixTemp'
 - 'ibdata1',
 - 'ca-cert.pem',
 - 'server-cert.pem'
 - server-key.pem
 - **KEEP THESE FOLDERS and delete all other files. If you delete them, you will lose all your data.**

Steps

1. Put the **Replication.zip** file copied from the **PRIMARY Installation** (as detailed in the previous step) in to the **<PMP_Installation_Folder> of Secondary** and unzip it. **Take care to extract the files under <PMP_Installation_Folder> only. It will overwrite the existing data files.**
2. Copy the **<PMP_Installation_Folder>/mysql/bin/database_params.conf** file of secondary installation and put it over **<PMP_Installation_Folder>/conf** directory of secondary installation
3. Go to **<PMP_Installation_Folder>/mysql/bin** directory. You will find a file named **HAPrimary.conf**. (**Important Note:** Before proceeding further, ensure that **HASecondary.conf** is **NOT** present under **<PMP_Installation_Folder>/mysql/bin** folder. It should only contain **HAPrimary.conf**)
4. Edit the **HAPrimary.conf** as per the details below:

(1) Enter the name of the host where the primary server is running:

master_host=<hostname of Primary>

For example, 'test_workstation' is the machine where the primary PMP server is running, you need to enter the information as below:

master_host=test_workstation

(2) Enter the host name, DNS Name and IP address of the primary server:

slave_hosts=<hostname of Primary>,<DNS Name of Primary>,<IP of Primary>

For example, 'test_workstation' is the machine where the primary PMP server is running, test_workstation.test.com is the DNS name and 192.168.10.1 is its IP, you need to enter the information as below:

slave_hosts=test_workstation,test_workstation.test.com,192.168.10.1

5. Copy the **startDB.bat** (in Windows) / **startDB.sh** (in Linux) file present under **<PMP_Installation_Folder>/mysql/bin** of secondary installation and put it over

<PMP_Installation_Folder>/bin directory of secondary installation

6. Go to <PMP_Installation_Folder>/bin of secondary installation and execute `startDB.bat <MySQL Port>` (Windows) /`startDB.sh <MySQL Port>` (Linux) to start Secondary database (Default MySQL port is 2345)

For example, with the default the MySQL port 2345, you need to execute this as:

`startDB.bat 2345` **(For Windows)**

`startDB.sh 2345` **(For Linux)**

This will start the Secondary Database (Default MySQL port is 2345)

Note: During this process, if you get this error, you may safely ignore it as this is harmless:

090601 19:53:05 [Warning] The syntax for replication startup options is deprecated and will be removed in MySQL 5.2. Please use 'CHANGE MASTER' instead.

090601 19:53:05 [Warning] option 'max_allowed_packet': unsigned value 3200000000 adjusted to 1073741824

Step 4 - Enabling Database Replication

1. Run **enableReplication.bat** (Windows) /**enableReplication.sh** (Linux) present in <PMP_Installation_Folder>/mysql/bin of **both Primary and Secondary installations**

Step 5 - Start Primary and Secondary

1. Start Primary and Secondary Servers
2. High Availability setup is now ready

Step 6 - Verify High Availability setup

After carrying out the above steps, you can verify if the High Availability setup is working properly by looking at the message in "**Admin >> General >> High Availability**" page of Primary server. If the setup is proper, you will see the following:

High Availability Status: Alive
Replication Status: Alive

If both the above messages show "Alive", it indicates that high availability is working fine. In case, if the status turns 'Failed', it indicates failure of the setup.

What does 'High Availability Status' Indicate (Alive/Failed)?

Constant replication of data between Primary and Standby server is the technology underlying high availability. The status 'Alive' indicates perfect data replication and data synchronization. If there happens any disruption like network problems between Primary and Standby (in turn between the databases), the status will get changed to 'Failed'.

This may happen when there is no communication/connection between the database of primary server and that of the standby server. When the connection gets reestablished, data synchronization will happen and both databases will be in sync with each other.

During the intervening period, those who have connected to the primary and standby will not face any disruption in service. In short, this status is only an indication of the connection/communication between databases and does not warrant any troubleshooting.

What does 'Replication Status' Indicate (Alive/Failed)?

As mentioned above, high availability leverages the MySQL replication feature. The database of Primary server acts as the Master and the one with Standby acts as the 'Slave'. When the data gets replicated properly, the status will be 'Alive'. In case, there happens any error in updating the data or query failure, the replication status become 'Failed'.

Once the status becomes failed, PMP High Availability setup also breaks down. That means, you will have to configure high availability setup all over again. If you find the status marked as 'Failed' even after re-configuring High Availability, you may have to contact PMP support with the following log files:

PMP In Windows: <PMP Installation Folder>/mysql/data/<hostname>.err file

PMP In Linux: <PMP Installation Folder>/mysql/data/tmp/.out file

Alerting Mechanism for Status Failure

Since the above two conditions assume importance in high availability setup, it is important to receive real-time alerts when the status turns Alive to Failed and vice-versa. To configure alerts, go to **Audit >> Resource Audit >> Configure User Audit >> General Operations** and select the mode of alert (email/SNMP trap/Syslog message) for the events 'High Availability Alive' and 'High Availability Failed'.

Note 1:

In case, the Primary Server crashes, when carrying out disaster recovery, please ensure the following:

- Go to the <PMP_Home>/mysql/data of **secondary server** and copy the files **ibdata1, passtrix**
- Install another instance of PMP afresh (same version as that of the PMP secondary from which you copied the above files)
- In the new installation, go to <PMP_Home>/mysql/data and overwrite the **ibdata1, passtrix** files
- Start the new PMP installation

Note 2:

- After configuring high availability, if you change the port of the Primary PMP server, the high availability setup will not work. It has to be re-configured with suitable changes.

Troubleshooting Tips

Issue

If you get error code 1201 upon executing enableReplication.bat / enableReplication.sh as shown in the screenshot below:

```
E:\PMP\mysql\bin>enableReplication.bat
HAPrimary.conf
ERROR 1201 (HY000) at line 1: Could not initialize master info structure; more error messages can be
found in the MySQL error log
ERROR 1201 (HY000) at line 1: Could not initialize master info structure; more error messages can be
found in the MySQL error log
Successfully enabled replication
E:\PMP\mysql\bin>
```

Solution

Go to the PMP Primary and Secondary installation folders and carry out the following:

- Navigate to **<PMP_Installation_Folder>/mysql/data** folder. **The following file & folders are important:**
 - 'passtrix' folder,
 - 'mysql' folder,
 - 'test' folder,
 - 'PasstrixTemp'
 - 'ibdata1',
 - 'ca-cert.pem',
 - 'server-cert.pem'
 - server-key.pem
- **KEEP THESE FOLDERS and delete all other files. If you delete them, you will lose all your data.**
- Start High Availability steps again (from Step 1)

Issue

Replication.zip is not getting created even after executing replicationPack.bat / replicationPack.sh

Solution

One of the pre-requisites for PMP High Availability setup is that after installation, the PMP Primary server should have been started and stopped at least once. If this had not been done, you will face the above issue.



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