

01-MySQL 5.5.62 Installation and Configuration Guide (for Linux)

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This document describes how to install and configure the MySQL 5.5 database for use with IMC. The procedures also apply to MySQL 5.1. Perform all procedures in this document as a Linux root user, unless otherwise specified.

The installation procedures for the MySQL server for other versions might vary. For more information about installing other versions, see their respective installation and configuration guides.

 **IMPORTANT:**

Before you install IMC, you must install and start the database service.

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Before you install MySQL on Red Hat Enterprise Linux 7.3, install necessary Linux packages and remove the built-in MariaDB.

Installing the required software packages

1. Prepare the following Linux packages:

- o **glibc-2.17-157.el7.i686.rpm**
- o **libaio-0.3.109-13.el7.i686.rpm**
- o **libgcc-4.8.5-11.el7.i686.rpm**
- o **libstdc++-4.8.5-11.el7.i686.rpm**
- o **nss-softokn-freebl-3.16.2.3-14.4.el7.i686.rpm**

2. Install the packages, as shown in [Figure 1](#).

```
rpm -i --nodeps --force glibc-2.17-157.el7.i686.rpm
rpm -i --nodeps --force libaio-0.3.109-13.el7.i686.rpm
rpm -i --nodeps --force libgcc-4.8.5-11.el7.i686.rpm
rpm -i --nodeps --force libstdc++-4.8.5-11.el7.i686.rpm
rpm -i --nodeps --force nss-softokn-freebl-3.16.2.3-14.4.el7.i686.rpm
```

Figure 1 Installing the packages

```
[root@localhost ~]# cd /home/Packages
[root@localhost Packages]# ll
total 4932
-rw-r--r--. 1 root root 4394340 Sep 19 2016 glibc-2.17-157.el7.i686.rpm
-rw-r--r--. 1 root root 24956 Sep 10 2015 libaio-0.3.109-13.el7.i686.rpm
-rw-r--r--. 1 root root 106808 Sep 7 2016 libgcc-4.8.5-11.el7.i686.rpm
-rw-r--r--. 1 root root 319868 Sep 7 2016 libstdc++-4.8.5-11.el7.i686.rpm
-rw-r--r--. 1 root root 192400 Aug 6 2016 nss-softokn-freebl-3.16.2.3-14.4.el7.i686.rpm
[root@localhost Packages]# rpm -i --nodeps --force glibc-2.17-157.el7.i686.rpm
warning: glibc-2.17-157.el7.i686.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOKEY
[root@localhost Packages]# rpm -i --nodeps --force libaio-0.3.109-13.el7.i686.rpm
warning: libaio-0.3.109-13.el7.i686.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOKEY
[root@localhost Packages]# rpm -i --nodeps --force libgcc-4.8.5-11.el7.i686.rpm
warning: libgcc-4.8.5-11.el7.i686.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOKEY
[root@localhost Packages]# rpm -i --nodeps --force libstdc++-4.8.5-11.el7.i686.rpm
warning: libstdc++-4.8.5-11.el7.i686.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOKEY
[root@localhost Packages]# rpm -i --nodeps --force nss-softokn-freebl-3.16.2.3-14.4.el7.i686.rpm
warning: nss-softokn-freebl-3.16.2.3-14.4.el7.i686.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOKEY
[root@localhost Packages]#
```

Removing the built-in MariaDB

Before you install the MySQL 5.5 database, you must remove the built-in MariaDB from Red Hat Enterprise Linux 7.3, as shown in [Figure 2](#).

1. Query the installed MariaDB and related programs.

```
rpm -qa | grep mariadb
```

2. Remove the software packages.

```
rpm -e mariadb-server-5.5.52-1.el7.x86_64
rpm -e mariadb-5.5.52-1.el7.x86_64
rpm -e mariadb-libs-5.5.52-1.el7.x86_64
```

3. Remove the dependent packages if you receive a mariadb-server-5.5.52-1.el7.x86_64 and rpm -e mariadb-libs-5.5.52-1.el7.x86_64 package dependency message.

```
rpm -e --nodeps mariadb-server-5.5.52-1.el7.x86_64
rpm -e --nodeps mariadb-5.5.52-1.el7.x86_64
rpm -e --nodeps mariadb-libs-5.5.52-1.el7.x86_64
```

Figure 2 Removing the built-in MariaDB

Products and Solutions Industry Solutions Services Support Training & Certification
[root@localhost Packages]# rpm -qa | grep mariadb
mariadb-server-5.5.52-1.el7.x86_64
mariadb-libs-5.5.52-1.el7.x86_64
[root@localhost Packages]# rpm -e --nodeps mariadb-server-5.5.52-1.el7.x86_64
error: Failed dependencies:
 mariadb-server is needed by (installed) akonadi-mysql-1.9.2-4.el7.x86_64
[root@localhost Packages]# rpm -e --nodeps mariadb-5.5.52-1.el7.x86_64
[root@localhost Packages]# rpm -e --nodeps mariadb-libs-5.5.52-1.el7.x86_64
[root@localhost Packages]#

4. Query the installed MySQL database and related programs.

```
rpm -qa | grep mysql  
rpm -qa | grep MySQL
```

Figure 3 Querying the installed MySQL database

```
[root@localhost Packages]# rpm -qa | grep mysql  
akonadi-mysql-1.9.2-4.el7.x86_64  
[root@localhost Packages]# rpm -e --nodeps akonadi-mysql-1.9.2-4.el7.x86_64  
perl-DBD-MySQL-4.023-5.el7.x86_64 | grep MySQL  
[root@localhost Packages]#
```

5. Remove the software packages.

```
rpm -e --nodeps qt-mysql-4.8.5-13.el7.x86_64  
rpm -e --nodeps akonadi-mysql-1.9.2-4.el8.x86_64  
rpm -e --nodeps perl-DBD-MySQL-4.023-5.el7.x86_64
```

Figure 4 Removing the software packages

```
[root@localhost Packages]# rpm -qa | grep mysql  
qt-mysql-4.8.5-13.el7.x86_64  
akonadi-mysql-1.9.2-4.el7.x86_64  
[root@localhost Packages]# rpm -e --nodeps qt-mysql-4.8.5-13.el7.x86_64  
[root@localhost Packages]# rpm -e --nodeps akonadi-mysql-1.9.2-4.el7.x86_64  
[root@localhost Packages]#  
[root@localhost Packages]# rpm -qa | grep MySQL  
perl-DBD-MySQL-4.023-5.el7.x86_64  
[root@localhost Packages]# rpm -e --nodeps perl-DBD-MySQL-4.023-5.el7.x86_64  
[root@localhost Packages]#
```

Copying the installation programs to the Linux server

Before you install the MySQL server, copy the installation programs to the Linux server. This document uses the **MySQL-server-5.5.62-1.el7.x86_64.rpm** and **MySQL-client-5.5.62-1.el7.x86_64.rpm** installation programs shown in Figure 5. In this example, the MySQL installation programs are located in the directory **/mysql**.

Figure 5 MySQL installation programs on the Linux operating system

```
root@localhost:/home/imc/Desktop/MySQL  
File Edit View Search Terminal Help  
[root@localhost ~]# cd /home/imc/Desktop/MySQL  
[root@localhost MySQL]# ll  
total 2220  
-rw-r--r--. 1 imc imc 16139616 Aug 30 2018 MySQL-client-5.5.62-1.el7.x86_64.rpm  
-rw-r--r--. 1 imc imc 47568532 Aug 30 2018 MySQL-server-5.5.62-1.el7.x86_64.rpm  
[root@localhost MySQL]#
```

NOTE:

- Install both **MySQL-server-5.5.62-1.el7.x86_64.rpm** and **MySQL-client-5.5.62-1.el7.x86_64.rpm** on the database server.
- Install only **MySQL-client-5.5.62-1.el7.x86_64.rpm** on the IMC server that uses a database. During IMC installation, select **other server** for the database location, and the server address.

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In the following procedures, root user refers to the MySQL database root user, not the Linux root user, unless specified otherwise.

Installing the MySQL server

1. Go to the directory where the MySQL installation programs are located.
2. Launch the MySQL server installation, as shown in [Figure 6](#).

Figure 6 Installing the MySQL server

```
root@localhost:/home/imc/Desktop/MySQL
File Edit View Search Terminal Help
[root@localhost MySQL]# rpm -ivh MySQL-server-5.5.62-1.el7.x86_64.rpm
warning: MySQL-server-5.5.62-1.el7.x86_64.rpm: Header V3 DSA/SHA1 Signature, key ID 5072e1f5: NOKEY
Preparing... ################################################ [100%]
Updating / installing...
 1:MySQL-server-5.5.62-1.el7 ################################################ [100%]
190324 22:20:10 [Note] Ignoring --secure-file-priv value as server is running with --bootstrap.
190324 22:20:10 [Note] /usr/sbin/mysqld (mysqld 5.5.62) starting as process 3037
...
190324 22:20:11 [Note] Ignoring --secure-file-priv value as server is running with --bootstrap.
190324 22:20:11 [Note] /usr/sbin/mysqld (mysqld 5.5.62) starting as process 3044
...
PLEASE REMEMBER TO SET A PASSWORD FOR THE MySQL root USER !
To do so, start the server, then issue the following commands:
/usr/bin/mysqladmin -u root password 'new-password'
/usr/bin/mysqladmin -u root -h localhost.localdomain password 'new-password'

Alternatively you can run:
/usr/bin/mysql_secure_installation

which will also give you the option of removing the test
databases and anonymous user created by default. This is
strongly recommended for production servers.

See the manual for more instructions.

Please report any problems at http://bugs.mysql.com/
[root@localhost MySQL]#
```

3. Start the MySQL service after the installation is complete.

```
service mysql start
```

4. Verify that the MySQL service has started, as shown in [Figure 7](#).

```
netstat -nat | grep 3306
```

By default, the MySQL server uses port number 3306.

Figure 7 Checking the MySQL service status

```
root@localhost:/home/imc/Desktop/MySQL
File Edit View Search Terminal Help
[root@localhost MySQL]# service mysql start
Starting MySQL.. SUCCESS!
[root@localhost MySQL]# netstat -nat | grep 3306
tcp 0 0 0.0.0.0:3306 0.0.0.0.* LISTEN
[root@localhost MySQL]#
```

Installing the MySQL client

The MySQL client provides tools for MySQL management and user interaction, for example, **mysqladmin** and **mysql**.

To install the MySQL client:

1. Go to the directory where the MySQL installation programs are located.
2. Launch the MySQL client installation, as shown in [Figure 8](#).

Figure 8 Installing the MySQL client

```
root@localhost:/home/imc/Desktop/MySQL
File Edit View Search Terminal Help
[root@localhost MySQL]# rpm -ivh MySQL-client-5.5.62-1.el7.x86_64.rpm
warning: MySQL-client-5.5.62-1.el7.x86_64.rpm: Header V3 DSA/SHA1 Signature, key ID 5072e1f5: NOKEY
Preparing... ################################################ [100%]
Updating... installing...
 1:MySQL-client-5.5.62-1.el7 ################################################ [100%]
[root@localhost MySQL]#
```

3. Verify the installation.

- o If the MySQL server is installed on the local server, log in to the server by using the **mysql** command. [Figure 9](#) shows that the MySQL client is installed successfully.

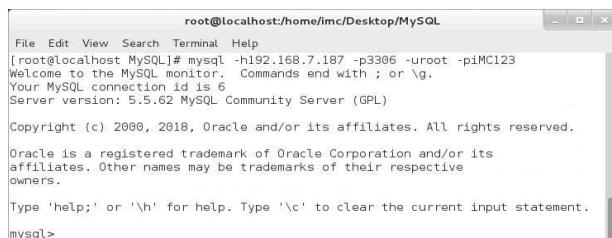
Figure 9 Entering the mysql command



A screenshot of a terminal window titled "root@localhost: /home/imc/Desktop/MySQL". The window shows the MySQL monitor with the following text:
[root@localhost MySQL]# mysql
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 1
Server version: 5.5.62 MySQL Community Server (GPL)
Copyright (c) 2000, 2018, Oracle and/or its affiliates. All rights reserved.
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
mysql>

- o If the MySQL server is installed on a remote server, verify that the client can connect to the MySQL server, as shown in [Figure 10](#). Make sure the MySQL server contains your root user account. For information about how to create a remote root user account, see "[Creating a remote root user account](#)."

Figure 10 Verifying the connection to the MySQL server



A screenshot of a terminal window titled "root@localhost:/home/imc/Desktop/MySQL". The window shows the MySQL monitor with the following text:
[root@localhost MySQL]# mysql -h192.168.7.187 -p3306 -uroot -pIMC123
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 6
Server version: 5.5.62 MySQL Community Server (GPL)
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affiliates. Other names may be trademarks of their respective
owners.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
mysql>

The output shows that **192.168.7.187** is the IP address of the MySQL server, and **root** is the root user account.

The **mysql** prompt indicates that the client has connected successfully to the MySQL server.

Customizing MySQL file directories

After the MySQL server and client are installed, the database files, configuration files, and command files are saved in different directories, as described in [Table 1](#).

Table 1 Default MySQL file directories

Directory	Connector
/usr/bin	Client programs and scripts
/usr/sbin	mysqld (MySQL service program)
/var/lib/mysql	Logs and database files
/usr/share/mysql	Configuration files, error messages, and chara
/etc/init.d/	Enables script mysql
/etc	my.cnf

To customize the directories, modify the **datadir** parameter in the **/etc/my.cnf** file.
`datadir=/root/mysql_data`

The total size of logs and database files can become large. It is restricted by the maximum size allowed by the operating system. You can change the directory to a disk drive with a large capacity. For more information about changing the directories for the MySQL database files, see "[Changing the log and database file directory](#)."

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Starting and stopping the MySQL service

MySQL is configured automatically as a system service after the MySQL server is installed.

You can start or stop the MySQL service as a common system service, as shown in [Figure 11](#).

Figure 11 Start and stop commands



```
root@localhost:/home/imc/Desktop/MySQL#
File Edit View Search Terminal Help
[root@localhost MySQL]# service mysql start
Starting MySQL.. SUCCESS!
[root@localhost MySQL]#
[root@localhost MySQL]# service mysql stop
Shutting down MySQL.. SUCCESS!
[root@localhost MySQL]#
```

You can also use the **mysqladmin** command to stop the MySQL server, as shown in [Figure 12](#).

Figure 12 mysqladmin command



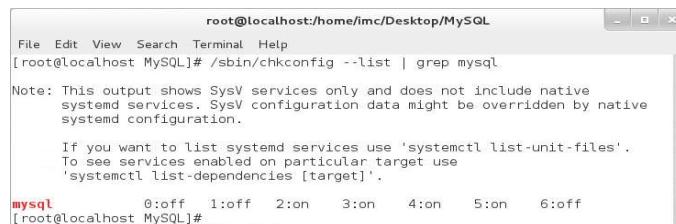
```
root@localhost:/home/imc/Desktop/MySQL#
File Edit View Search Terminal Help
[root@localhost MySQL]# /usr/bin/mysqladmin -uroot -p shutdown
Enter password:
[root@localhost MySQL]#
[root@localhost MySQL]#
```

You must enter the password for your root user account except for the initial installation. If you are installing the MySQL server for the first time, press **Enter** without entering a password.

Automatic startup

The MySQL service starts automatically when the system boots. [Figure 13](#) shows how to determine whether the MySQL service is on the automatic startup list.

Figure 13 Determining whether the MySQL service is on the automatic startup list



```
root@localhost:/home/imc/Desktop/MySQL#
File Edit View Search Terminal Help
[root@localhost MySQL]# /sbin/chkconfig --list | grep mysql
Note: This output shows SysV services only and does not include native
system services. SysV configuration data might be overridden by native
system configuration.

If you want to list systemd services use 'systemctl list-unit-files'.
To see services enabled on particular target use
'systemctl list-dependencies [target]'.
mysql    0:off  1:off  2:on   3:on   4:on   5:on   6:off
[root@localhost MySQL]#
```

The output shows that the MySQL service starts automatically in Linux run levels 2 through 5. [Table 2](#) describes the run levels.

Table 2 Linux run levels

Run level	Name	Description
0	Halt	Shuts down the system.
1	Single-user Mode	Mode for administrative tasks.
2	Multi-user Mode	Does not configure network interfaces, does not export network services.
3	Multi-user Mode with Networking	Starts the system normally.
4	Not used/User-definable	For special purposes.
5	Start the system normally with appropriate display manager (with GUI)	Starts the system normally with display manager.
6	Reboot	Reboots the system.

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Disable the MySQL service before you perform any MySQL server configuration tasks except for "[Setting security options](#)" and "[Creating a remote root user account](#)."

Setting security options

Run the **mysql_secure_installation** program to set security options, such as setting a root user password, as shown in [Figure 14](#), and removing anonymous users or the test database, as shown in [Figure 15](#).

In the following procedures, the root user refers to the MySQL database root user, not the Linux root user.

Figure 14 Setting the root user password

```
root@localhost:/home/imc/Desktop/MySQL
File Edit View Search Terminal Help
[root@localhost MySQL]# /usr/bin/mysql_secure_installation

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MySQL
      SERVERS IN PRODUCTION USE! PLEASE READ EACH STEP CAREFULLY!

In order to log into MySQL to secure it, we'll need the current
password for the root user. If you've just installed MySQL, and
you haven't set the root password yet, the password will be blank,
so you should just press enter here.

Enter current password for root (enter for none):
OK, successfully used password, moving on...

Setting the root password ensures that nobody can log into the MySQL
root user without the proper authorisation.

You already have a root password set, so you can safely answer 'n'.

Change the root password? [Y/n] Y
New password:
Re-enter new password:
Password updated successfully!
Reloading privilege tables...
... Success!
```

IMPORTANT:

For IMC to correctly identify the root user password during installation, ensure that the password does not contain spaces, tabs (lt), or any of the following characters:

' " ! () & | \ \$; @ < > / ^

Figure 15 Configuring anonymous users, remote root access, and the test database

```
root@localhost:/home/imc/Desktop/MySQL
File Edit View Search Terminal Help
By default, a MySQL installation has an anonymous user, allowing anyone
to log into MySQL without having to have a user account created for
them. This is intended only for testing, and to make the installation
go a bit smoother. You should remove them before moving into a
production environment.

Remove anonymous users? [Y/n] Y
... Success!

Normally, root should only be allowed to connect from 'localhost'. This
ensures that someone cannot guess at the root password from the network.

Disallow root login remotely? [Y/n] Y
... Success!

By default, MySQL comes with a database named 'test' that anyone can
access. This is also intended only for testing, and should be removed
before moving into a production environment.

Remove test database and access to it? [Y/n] Y
- Dropping test database...
... Success!
- Removing privileges on test database...
... Success!
```

The output shows that remote root access is disabled. For information about configuring the remote root user, see "[Creating a remote root user account](#)."

The privilege tables are reloaded, as shown in [Figure 16](#).

Figure 16 Reloading the privilege tables

The screenshot shows a terminal window titled 'root@localhost:home/imc/Desktop/MySQL'. The window contains the following text:

```
File Edit View Search Terminal Help
Reloading the privilege tables will ensure that all changes made so far
will take effect immediately.

Reload privilege tables now? [Y/n] Y
... Success!

Cleaning up...

All done! If you've completed all of the above steps, your MySQL
installation should now be secure.

Thanks for using MySQL!

[root@localhost MySQL]#
```

After the privilege tables are reloaded, the configuration is complete, and the MySQL server is secure.

Creating a remote root user account

When you install IMC to use a remote database, you must log in to the database as a remote root user.

To create a remote root user account:

1. Log in to MySQL.

```
mysql -uroot -piMC123
```

2. Create a remote root user account on the MySQL server.

```
grant all privileges on *.* to root@'%' identified by 'iMC123' with
grant option;
```

In Figure 17, the first iMC123 string is the password for the root user, and the second iMC123 string is the password for the remote root user. You can change the password for the remote root user.

Figure 17 Creating a remote root user account

The screenshot shows a terminal window titled 'root@localhost:/home/imc/Desktop/MySQL'. The window contains the following text:

```
File Edit View Search Terminal Help
[root@localhost MySQL]# mysql -uroot -piMC123
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 5.5.62 MySQL Community Server (GPL)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> grant all privileges on *.* to root@'%' identified by 'iMC123' with grant
option;
Query OK, 0 rows affected (0.00 sec)

mysql>
```

IMPORTANT:

For IMC to correctly identify the password during installation, ensure that the password contain spaces, tabs (t), or any of the following characters:

```
'""!()&|\\$;@<>/^
```

Configuring MySQL configuration files

At startup, MySQL server uses the default configuration file `/etc/my.cnf`, which determines the performance and behavior of the MySQL server. The file is not generated automatically. Select the proper settings from `/usr/share/mysql`. The `my-huge.cnf` file is required to support IMC. Copy the file, and then save it to the `my.cnf` file, as shown in Figure 18.



Configuring the maximum number of connections

1. Open the **my.cnf** file in vi editor.
`vi /etc/my.cnf`
2. Enter **i** to enter edit mode.
3. Add the **max_connections** parameter under **[mysqld]**. If this parameter already exists, modify the value as needed.
`[mysqld]
max_connections=800`
 You can set the maximum number of connections according to the installed modules. For more information about the maximum number of connections for different IMC modules, see *HP IMC Getting Started Guide*.
4. Press **Esc** to exit edit mode.
5. Save the file, and then exit the vi editor.
`:wq`
6. Start the MySQL service.

Configuring the character set

The English character set is **latin1**.

To configure the character set:

1. Open the **my.cnf** file in vi editor.
`vi /etc/my.cnf`
2. Enter **i** to enter edit mode and modify the parameters.
 - o Add the **default-character-set** parameter under **[mysql]** and set the value to **latin1**. If the parameter already exists, change the value to **latin1**.
 - o Add the **character-set-server** parameter under **[mysqld]**. If this parameter already exists, you can change the value.
`vi /etc/my.cnf
[mysqld]
character-set-server=latin1`
 The **latin1** character set is used as an example. To prevent garbled characters from appearing in IMC, choose the character set for your operating system language. If you change the character set after IMC has been deployed, you must reinstall IMC.
3. Press **Esc** to exit edit mode.
4. Save the file, and then exit the vi editor.
`:wq`

Configuring the engine type

1. Open the **my.cnf** file in vi editor.
`vi /etc/my.cnf`
2. Enter **i** to enter edit mode.
3. Add the **default-storage-engine** parameter under **[mysqld]**. If this parameter already exists, you can change the value.
`vi /etc/my.cnf
[mysqld]
default-storage-engine = INNODB`
4. Press **Esc** to exit edit mode.
5. Save the file, and then exit the vi editor.
`:wq`

1. Open the **my.cnf** file in vi editor.

```
vi /etc/my.cnf
```

2. Enter **i** to enter edit mode.

3. Add the **lower_case_table_names** parameter under **[mysqld]**. If this parameter already exists, you can change the value.

```
vi /etc/my.cnf
[mysqld]
lower_case_table_names=1
```

4. Press **Esc** to exit edit mode.

5. Save the file, and then exit the vi editor.

```
:wq
```

Disabling log-bin settings

1. Open the **my.cnf** file in vi editor.

```
vi /etc/my.cnf
```

2. Enter **i** to enter edit mode.

3. Search the **log-bin** parameter under **[mysqld]**. If this parameter already exists, comment it out.

```
vi /etc/my.cnf
[mysqld]
#log-bin=mysql-bin
```

4. Press **Esc** to exit edit mode.

5. Save the file, and then exit the vi editor.

```
:wq
```

Setting innodb buffer sizes

1. Open the **my.cnf** file in vi editor.

```
vi /etc/my.cnf
```

2. Enter **i** to enter edit mode.

3. Add the **innodb_buffer_pool_size** and **innodb_additional_mem_pool_size** parameters under **[mysqld]**. If the parameters already exist, you can change the values.

```
[mysqld]
innodb_buffer_pool_size=512M
innodb_additional_mem_pool_size=20M
```

4. Press **Esc** to exit edit mode.

5. Save the file, and then exit the vi editor.

```
:wq
```

Setting the max_allowed_packet size

1. Open the **my.cnf** file in vi editor.

```
vi /etc/my.cnf
```

2. Enter **i** to enter edit mode.

3. Add the **max_allowed_packet** parameter under **[mysqld]**. If the parameter already exists, you can change the value.

```
[mysqld]
max_allowed_packet = 200M
```

4. Press **Esc** to exit edit mode.

5. Save the file, and then exit the vi editor.

```
:wq
```

Setting the default-time-zone

1. Open the **my.cnf** file in vi editor.

```
vi /etc/my.cnf
```

2. Enter **i** to enter edit mode.

3. Add the **default-time-zone** parameter. If the parameter already exists, modify its value as needed.

```
[mysqldump]
```

```
default-time-zone = '+8:00'
```

4. Press **Esc** to exit edit mode.
5. Save the file, and then exit the vi editor.

```
:wq
```

Backing up the database

When you use the **mysqldump** program to back up the database, the backup progress might be slow and cause data backlog. No data or not much data will be available during the database backup period. To resolve the issue, modify the **my.cnf** file as follows:

1. Open the **my.cnf** file in vi editor.

```
vi /etc/my.cnf
```
2. Enter **i** to enter edit mode.
3. Add the **mysqldump** parameter.

```
[mysqldump]
```

```
Single-transaction
```
4. Press **Esc** to exit edit mode.
5. Save the file, and then exit the vi editor.

```
:wq
```

Changing the log and database file directory

1. Stop the MySQL service.

```
service mysql stop
```
2. Create a storage path for logs and database files. In this example, the path is **/data/mysql_data**.

```
mkdir -p /data/mysql_data
```
3. Copy all files from the default directory to the new directory, and then change ownership of the files.

```
cp -a -R /var/lib/mysql/* /data/mysql_data/
chown -R mysql:mysql /data/mysql_data
```
4. Add the directory in the configuration file of the MySQL database.

```
vi /etc/my.cnf
[mysqld]
datadir=/data/mysql_data
```
5. Restart the system, and then enable the MySQL service.

```
service mysql start
```

(Optional.) Configuring the transaction isolation level

When installing EIA, access the **/etc/my.cnf** file and check whether the **transaction_isolation** parameter exists under **[mysqld]**. If that parameter does not exist, add it. If that parameter exists, modify it:

1. Open the **my.cnf** file in vi editor.

```
vi /etc/my.cnf
```
2. Enter **i** to enter edit mode.
3. Add or modify the **transaction_isolation** parameter under **[mysqld]**.

```
[mysqld]
transaction_isolation=READ-COMMITTED
```
4. Press **Esc** to exit edit mode.
5. Save the file, and then exit the vi editor.

```
:wq
```

6. Restart the MySQL service.

```
service mysql start
```

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1. Uninstall the MySQL server and client, as shown in [Figure 19](#).

Figure 19 Uninstalling the MySQL server and client

```
root@localhost:/home/lnm/Desktop/MySQL$ rpm -qa | grep MySQL
MySQL-server-5.5.62-1.el7.x86_64
root@localhost:~# rpm -e --nodeps MySQL-client-5.5.62-1.el7.x86_64
root@localhost:~# rpm -e --nodeps MySQL-server-5.5.62-1.el7.x86_64
root@localhost:~# rpm -qa | grep MySQL
```

2. Check the component names, as shown in [Figure 20](#).

Figure 20 Checking MySQL components

- Manually remove the database files after uninstallation. By default, the database files are saved in `/var/lib/mysql`. Use the `rm -rf` command to remove the `mysql` directory.

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Why do garbled characters appear in the database table?

During the installation of the MySQL server and client, configure a database character set that matches the operating system language. If they do not match, garbled characters might appear in the database table.

If you use an English operating system, set the character set to **latin1**. If your operating system language is different, see the related MySQL documentation for the correct character set.

How do I update the database passwords for IMC?

If the password of the account that IMC uses to connect to a database is changed, the IMC server will fail to connect to the database. To resolve this problem, modify the database user password saved in IMC:

1. Execute the `/opt/iMC/deploy/instInfoMgr.sh -modify dbAdminPwd=yourpassword` command to modify the database password on the IMC server. For example, change the password to **iMC123456**, as shown in [Figure 21](#).

Figure 21 Changing the database password on the IMC server

```
[root@localhost ~]# /opt/iMC/deploy/instInfoMgr.sh -modify dbAdminPwd=iMC123456
The following is the properties modification information, Press 'Enter' to confirm!
dbAdminPwd : iMC123456

Change install info successfully!Please restart dma.sh and imcdmsd service.
[root@localhost ~]#
```

2. Click the **Environment** tab in the **Intelligent Deployment Monitoring Agent** window, and then click **Refresh** in the **Database Space Usage** area.

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