Support for MySQL in LinPAC

Applies to:			No. L6-004
Platform	OS version	SDK version	Classification
LX-8000/9000 series LP-8000/9000 series LP-22xx/51xx/52xx series	All versions	LP-51xx/8x3x/8x4x: 1.14 later LP-52xx/8x2x/9x2x: 1.5 later LP-8x8x/8x8x-atom: 0.8.3 later LX-8x3x/9x7x/9x8x: 0.8.8 later	Linux Applications

MySQL is a small open source 'Relational Database Management System' (RDBMS) that delivers a very fast, multithreaded, multi-user, and robust SQL (Structured Query Language) database server. A MySQL server can be deployed on LinPAC series devices and can be tested using the mysqldemo.c demo program. Figure 1 provides an illustration of the process used for deploying a MySQL server on a LinPAC series device.

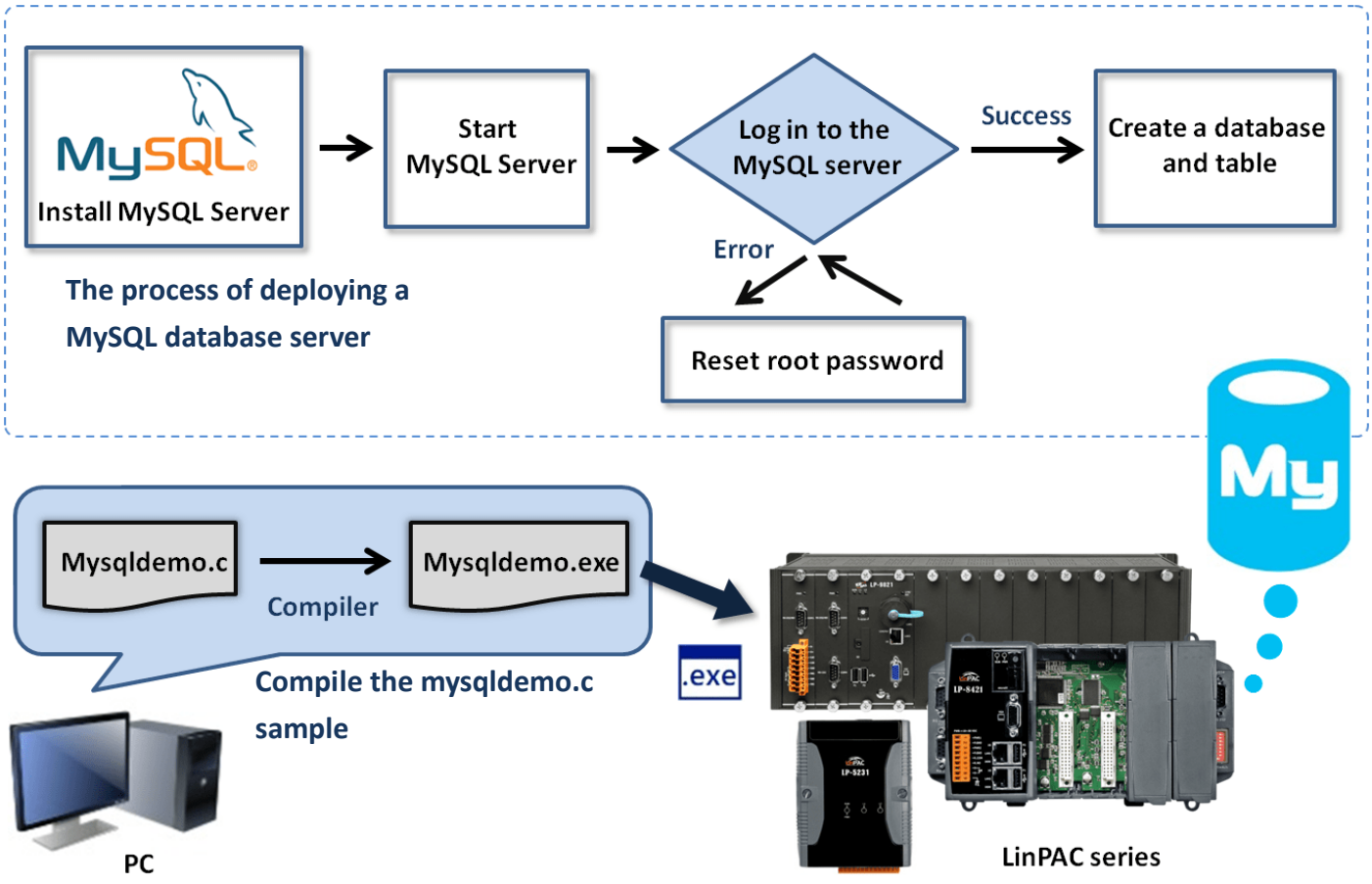


Figure 1. Deployment diagram using the MySQL demo on a LinPAC device

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Section 1: Deploying a MySQL database server

Before deploying the MySQL server, the mysql-server package will first need to be installed on the LinPAC series module. Once installed, log into the MySQL database server and create a database and tables that can be used to test the MySQL demo program. Follow the procedure described below, where the AM335X PAC is used as an example:

❒ Install the MySQL server

Step 1: Use the following command to upgrade the package lists.

Command: sudo apt-get update

Step 2: Use the following command to install the mysql-server package.

Command: sudo apt-get install mysql-server

❒ Start the MySQL service

Step 1: Use the following command to start the MySQL service, as illustrated in Figure 2.

Command: sudo start mysql

Step 2: Use the '**netstat**' command to verify that the MySQL server is active. The MySQL server should listen on port 3306 by default, as illustrated in Figure 2.

Command: netstat -tnl | grep 3306

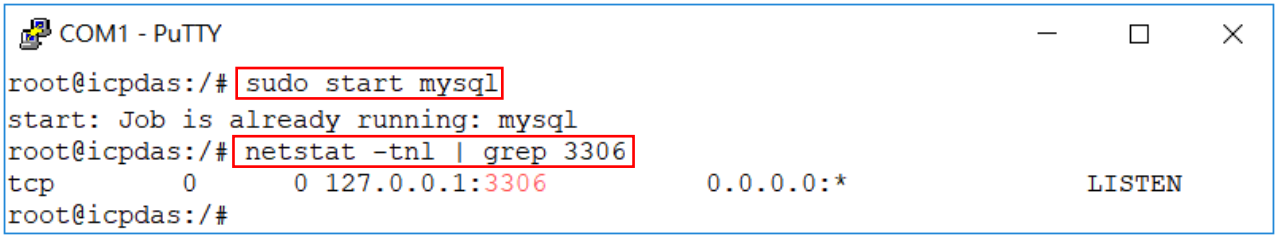


Figure 2. Confirm that the MySQL database server is active

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❒ Log into the MySQL database server

Use the following command to log into the MySQL database server. Enter the default ID '**root**' and the password '**root**' to log in, as illustrated in Figure 3.

Command: mysql -u root –p

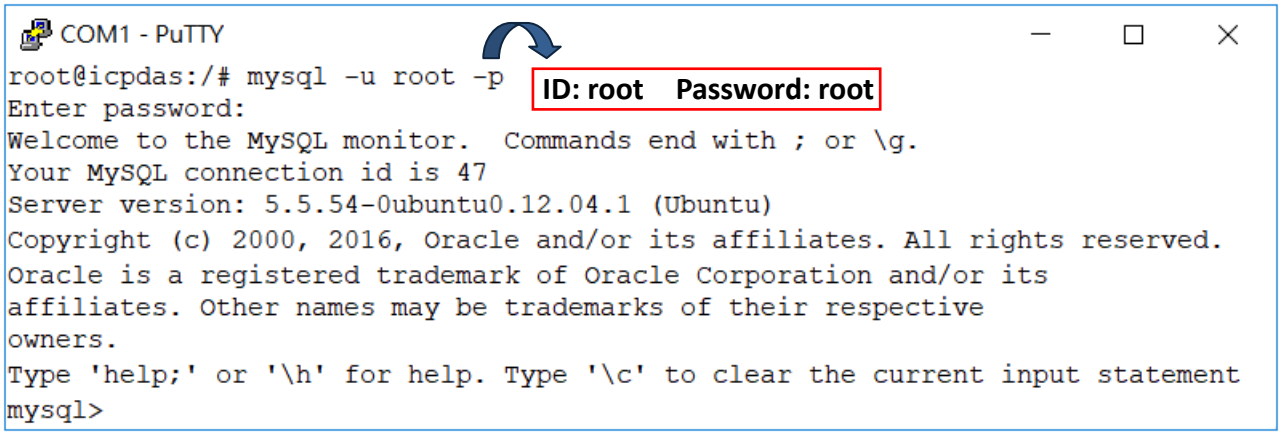


Figure 3. Logging into the MySQL database server

Note: If an error message is displayed after logging into the account, stop the MySQL service and reset the root password.

ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: No)

ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: Yes)

❒ Reset the root password

Step 1: Use the following command to stop the MySQL service, as illustrated in Figure 4.

Command: sudo stop mysql

Step 2: Use the following command to skip the grant tables to access the MySQL database server, as illustrated in Figure 4.

Command: mysqld_safe --skip-grant-tables &

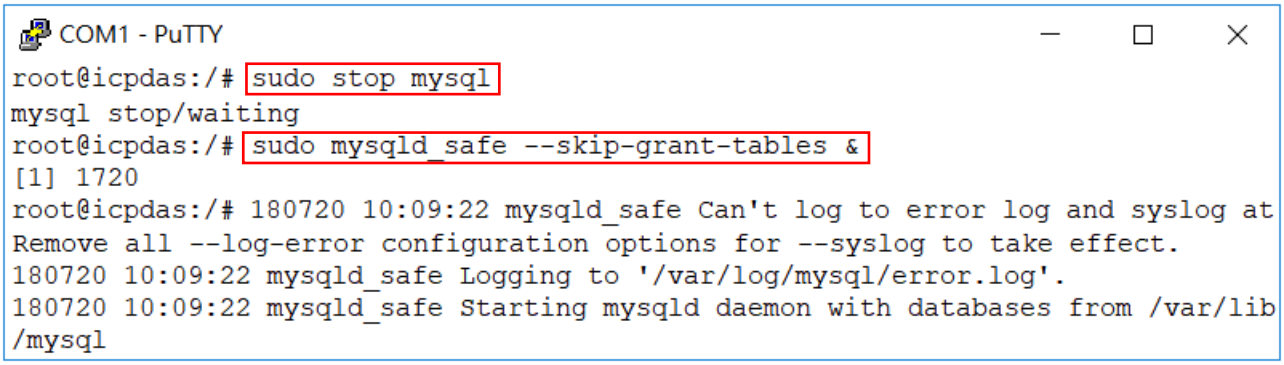


Figure 4. Resetting the MySQL root password

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Step 3: Enter the 'mysql -u root' command to log into the MySQL database server and then modify the root password, as illustrated in Figure 5.

```
mysql> use mysql;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A
Database changed
mysql> update user set password=PASSWORD("rootpw")where user="root";
Query OK, 4 rows affected (0.02 sec)
Rows matched: 4  Changed: 4  Warnings: 0
mysql> flush privileges;
Query OK, 0 rows affected (0.00 sec)
```

Figure 5. Modifying the MySQL root password.

Step 4: Restart the MySQL service and log in to the MySQL database server using the new password, as illustrated in Figure 6.

```
root@icpdas:~# sudo stop mysql
mysql stop/waiting
root@icpdas:~# sudo start mysql
mysql start/running, process 2032
root@icpdas:~# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
```

Figure 6. Restarting the MySQL service

❒ Create databases and tables

Create the necessary databases and tables in the database server so that the MySQL demo program can be tested, as illustrated in Figure 7.

```
mysql> create database icpdasDB;
Query OK, 1 row affected (0.00 sec)
mysql> use icpdasDB
Database changed
mysql> create table icpdasDB_table (Model_Name char(20),Number_of_slot int);
Query OK, 0 rows affected (0.00 sec)
mysql> insert into icpdasDB_table (Model_Name, Number_of_slot) values ('LP-5231','1');
Query OK, 1 row affected (0.01 sec)
mysql> insert into icpdasDB_table (Model_Name, Number_of_slot) values ('LP-8421','4');
Query OK, 1 row affected (0.00 sec)
```

Figure 7. Creating a database and table

More information regarding MySQL commands can be found at: https://dev.mysql.com/doc/

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Section 2: Compile the mysqldemo.c demo program

Install the **LinPAC AM335x SDK**, and follow the procedure described below to compile the demo program. Refer to the mysqldemo.c file in the C:\cygwin\LinPAC_AM335x_SDK\examples\mysql\ folder for more information.

Step 1: Double-click the 'LinPAC_AM335x Environment' icon to compile the applications.

Step 2: Use the following command to change the path, as illustrated in Figure 8.

Command: cd C:\cygwin\LinPAC_AM335x_SDK\examples\mysql\

Step 3: Use the following command to compile the mysqldemo.c program into the mysqldemo.exe executable file, as illustrated in Figure 8.

Command: arm-linux-gnueabihf-gcc -I. -I../../../opt/mysql/include -lpthread -lz -lm -lrt -ldl -o mysqldemo.exe mysqldemo.c ../../../opt/mysql/lib/libmysqlclient.a

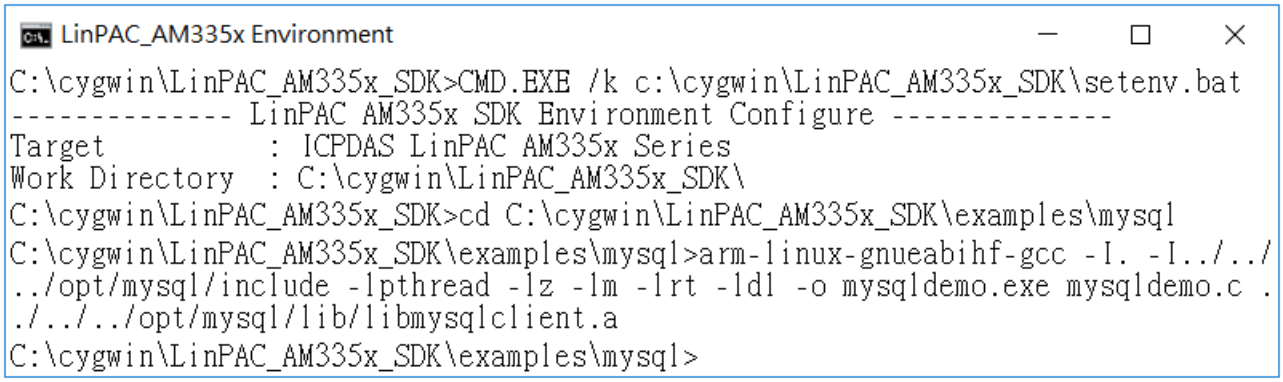


Figure 8. Compiling the mysqldemo.c file

Section 3: Execute the mysqldemo.exe file

Create the database and table on both the local and the remote hosts, as illustrated in Figure 9. Use the mysqldemo.exe demo program to read a table data from the local host or from a remote database. The process can be divided into two steps, which are described below:

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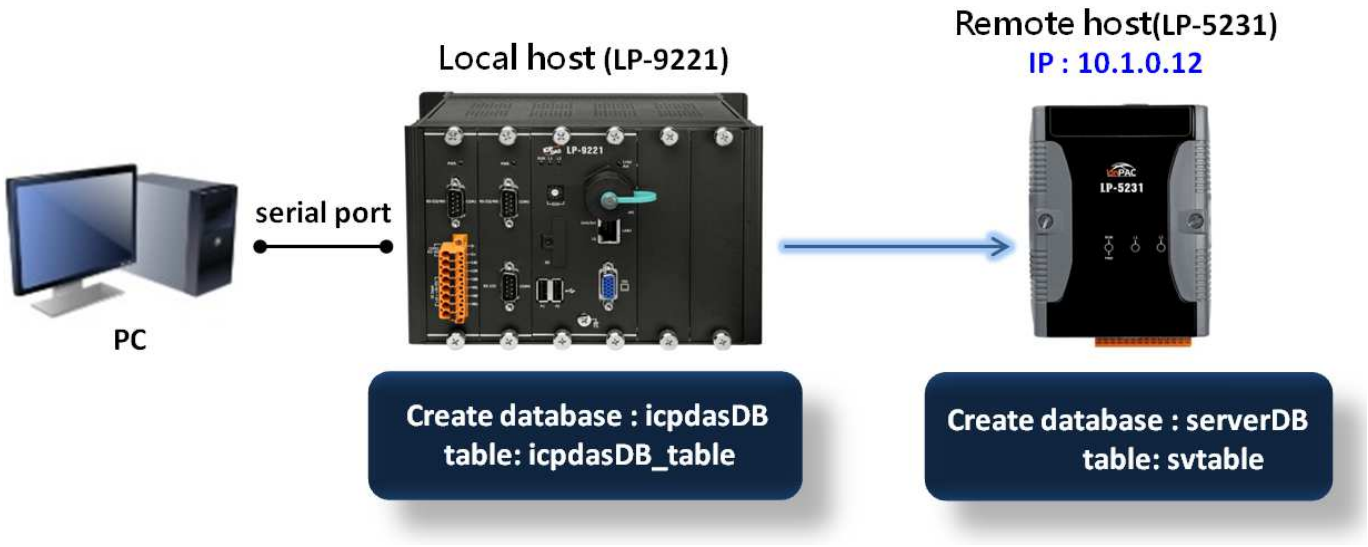


Figure 9. Creating a database and table

(1) Transfer the mysqldemo.exe file to the LinPAC module and change the permissions for the file. Refer to Chapter 4.3.3: 'Execute Demo' of the LinPAC AM335x series user manual for details, which you can download from:
https://www.icpdas.com/web/product/download/pac/linux/lp-9000/document/manual/linpac-am335x_user_manual_en.pdf

(2) Execute the 'mysqldemo.exe' file to read the MySQL database table.

❒ Use the following command to connect to the MySQL database on the local host and read the table data from the database, as illustrated in Figure 10.

Command: ./mysqldemo.exe -u <ID> -p <PW> -d <database name> -t <table name>

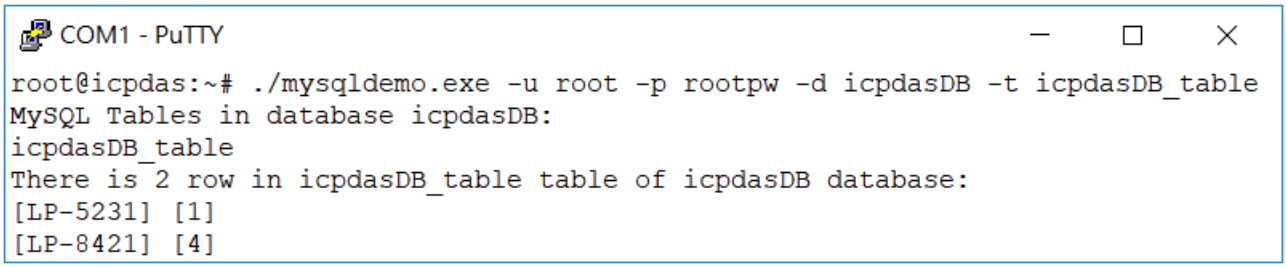


Figure 10. Displaying the table data from the database on the local host

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❒ Use the following command to connect to the remote database and read the table data from the remote database, as illustrated in Figure 11.

Command: ./mysqldemo.exe -s <IP address> -u <ID> -p <PW> -d <database name> -t <table name>

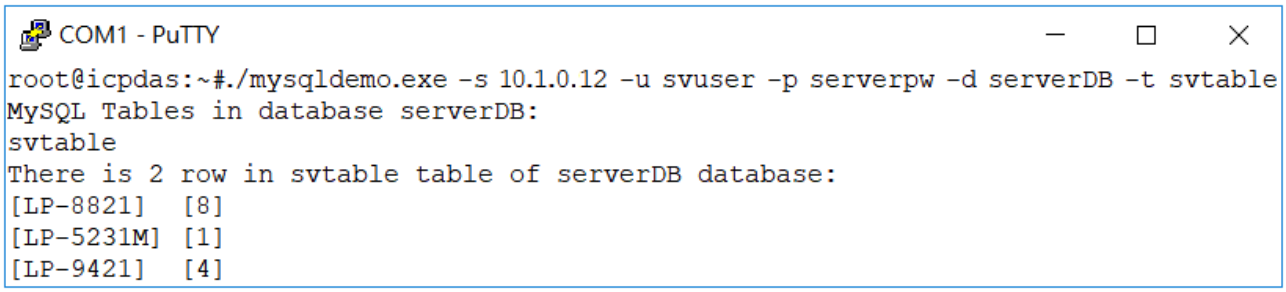


Figure 11. Displaying the table data from the remote database

Note: Before attempting to connect to a remote database server from the local host, ensure that remote access has been granted to the user account on the remote database server.

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