

MySQL Database Management System (DBMS) On FTP Site LAPAN Bandung



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Abstract

FTP LAPAN Bandung is a web-based FTP that houses observational data from different workshops and the LAPAN Aerospace Observer Center, which are located around Indonesia. The Data Center at LAPAN Bandung has a very high storage media capacity for observational data. As a result, software must be designed to be able to exploit and handle huge data sets. The database management process, which uses MySQL software for user management, data request, management, admin administration, and tool and data management, is used to handle huge amounts of data.

Keywords : MySQL, Database, Management.

1. Introduction

A database is a collection of information that is organised and kept in a computer so that it can be examined using a computer programme to get information from it. A database cabinet, or database, can be thought of as a database. LAPAN, like many other institutions, has a lot of observational data saved on a CD or hard disc. The arrangement of data on a CD or hard disc is sometimes regarded as haphazard or arbitrary, with merely a difference between one data and another. The aforementioned structure will only be felt if the amount of data held is already substantial. The database was created solely to make it simpler to search and get certain data in the database fast and simply. Consider what would happen if all databases or raw data were not controlled. Finding data from each piece of equipment would be extremely difficult and time-consuming.

A database, in theory, consists of two major components: data and information. So the ultimate objective is to manage the data so that it can be transformed into the appropriate information and data retrieval, deletion, and editing can be done conveniently and fast (effectively, efficiently and accurately).



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Database Management System (DBMS), often known as Database Management in Indonesian, is software that manages and executes database queries. DBMS software is used to effectively and efficiently manage databases, from the initial creation of the database to the operations that apply to it, such as entering, editing, removing queries against data, producing reports, and so on. efficient. The Relational DBMS (RDBMS), which represents data in the form of interconnected tables, is one of the most well-known types of DBMS today. A table is made up of rows (records) and columns (data) (fields). A lot of RDBMS software is developed , for example MySQL, Oracle, Sybase, dBase, MS. SQL, Microsoft Access (MS. Access) and others (Arbie 2004).

The field of information technology is quickly evolving, including advancements in various disciplines of information technology, such as database system technology, which is one of them. Although there are many other database technologies besides MySQL, the development of current database technology cannot be separated from the database technology created by MySQL, because MySQL is still a very popular database technology, used everywhere, and of course reliable, even though there are many other database technologies besides MySQL.

Various questions emerge, such as "Why should MySQL?" The following are some of MySQL's characteristics (Derek J, 2005). MySQL may run on a variety of platforms, including Windows, Linux, FreeBSD, Mac OS X Server, Solaris, Amiga, and others. The LAPAN FTP server runs FreeBSD 6.0 as its operating system. MySQL is a free and open source database. Because FTP LAPAN requires additional development in order to adjust user demands, especially LAPAN Bandung researchers in accessing data, the use of MySQL is highly appropriate to prevent paying use in utilising application software. MySQL may be used concurrently by several users without causing issues or disputes.

The number of FTP LAPAN Bandung users is estimated to be in the hundreds, given the site's importance to researchers who require observational data. To avoid the server crashing or hanging due to multiple users performing the authentication process at the same time, MySQL was chosen to handle issues with FTP LAPAN. Bandung. MySQL can manage databases with more than 50 million entries, 60 thousand tables, and 5 billion rows on a big scale. Furthermore, the maximum number of indexes that may be supported in each table is 32. Because each Balai or Loka has different types of equipment, and each piece of equipment creates different forms, MySQL is required to handle these issues. MySQL is equipped with various tools (tools) that can be used for database administration, in order to make it easier for admins to manage the database with a web-based interface and methods of managing it. This is a very important reason why MySQL was chosen because the managers or admins become very helpful due to the manager's limited programming knowledge.

The FTP LAPAN is a web-based FTP that houses observational data from the many LAPAN Aerospace Observer Centers and Workshops located around Indonesia. This system is anticipated to provide a link between the creation of a centralised data storage system and the construction of a decentralised data storage system. This article was written to serve as a review of how to maintain the device database on FTP LAPAN Bandung in terms of observation data management.

2. Basic Theory

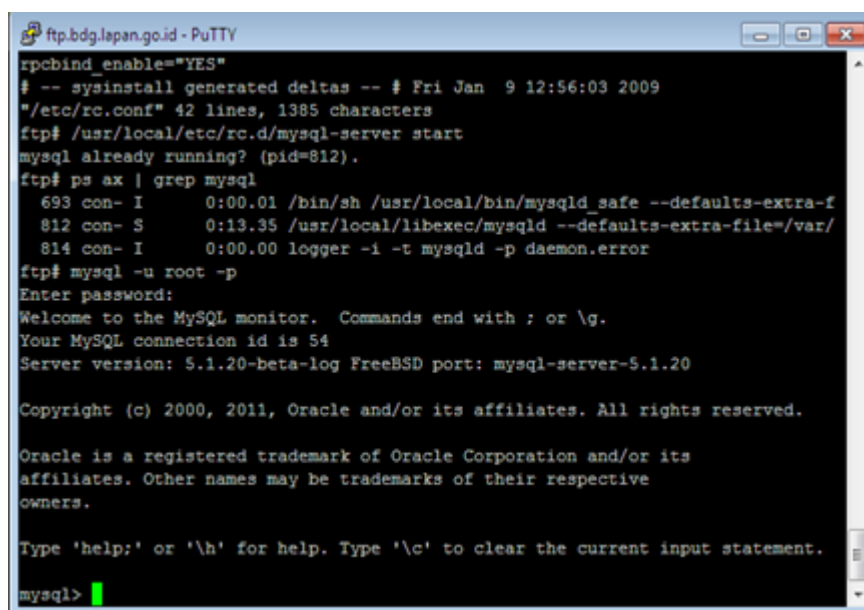
a. Introduction to MySQL

MySQL is the most widely used open source database software in the world, with more than 100 million users worldwide. MySQL has become the preferred database for many software and application developers on both online and desktop platforms due to its dependability, speed, and ease of use. Individuals and small businesses aren't the only ones that use MySQL; Yahoo!, Alcatel-Lucent, Google, Nokia, Youtube, WordPress, and Facebook are all MySQL users. Allen G. Tailor (Allen G. Tailor, 2003).

The Swedish business MySQL AB, which holds the copyright to virtually all of MySQL's source code, owns and sponsors the database. David Axmark, Allan Larsson, and Michael "Monty" Widenius are the two Swedes and one Finn that created MySQL AB. MySQL is a free Relational Database Management System (RDBMS) licenced under the GNU General Public License (GPL). Whereas anybody may use MySQL, it should not be utilised as a closed source or commercially developed derivative product. MySQL is a long-time derivation of one of the most important principles in databases, namely Structured Query Language (SQL). SQL is a database operation paradigm that allows data operations to be done simply and automatically, particularly for choosing or selecting and entering data. The optimizer's performance in processing SQL instructions entered by the user and application programmes reveals a database system's (DBMS) dependability. MySQL may be regarded as superior to other database servers when it comes to querying data. MySQL query performance is ten times quicker than PostgreSQL and five times faster than Interbase for queries executed by a single user (George Reese, 2003).

MySQL may be used in a variety of ways. MySQL is a service-oriented database programme. Service apps do not require a user interface on the desktop or taskbar to execute. MySQL may be used in Text mode, Command prompt, or PHPMyAdmin. PHPMyAdmin is an online application for managing and administering servers and databases, as well as the objects that reside within them. In Figure 2-1, you can see a representation of the MySQL operational interface.

Establishing a database, creating a table, altering the structure of a table, filling data in a table, removing data in a table, modifying (change or edit) data in a table, and searching for data in a table are some of the operations that commonly occur while using MySQL.



```
ftp.bdg.lapan.go.id - PuTTY
rpcbind_enable="YES"
# -- sysinstall generated deltas -- # Fri Jan  9 12:56:03 2009
"/etc/rc.conf" 42 lines, 1385 characters
ftp# /usr/local/etc/rc.d/mysql-server start
mysql already running? (pid=812).
ftp# ps ax | grep mysql
693 con- I    0:00.01 /bin/sh /usr/local/bin/mysqld_safe --defaults-extra-f
812 con- S    0:13.35 /usr/local/libexec/mysqld --defaults-extra-file=/var/
814 con- I    0:00.00 logger -i -t mysqld -p daemon.error
ftp# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 54
Server version: 5.1.20-beta-log FreeBSD port: mysql-server-5.1.20

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owners.

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

mysql>
```

Figure 1. MySQL command prompt

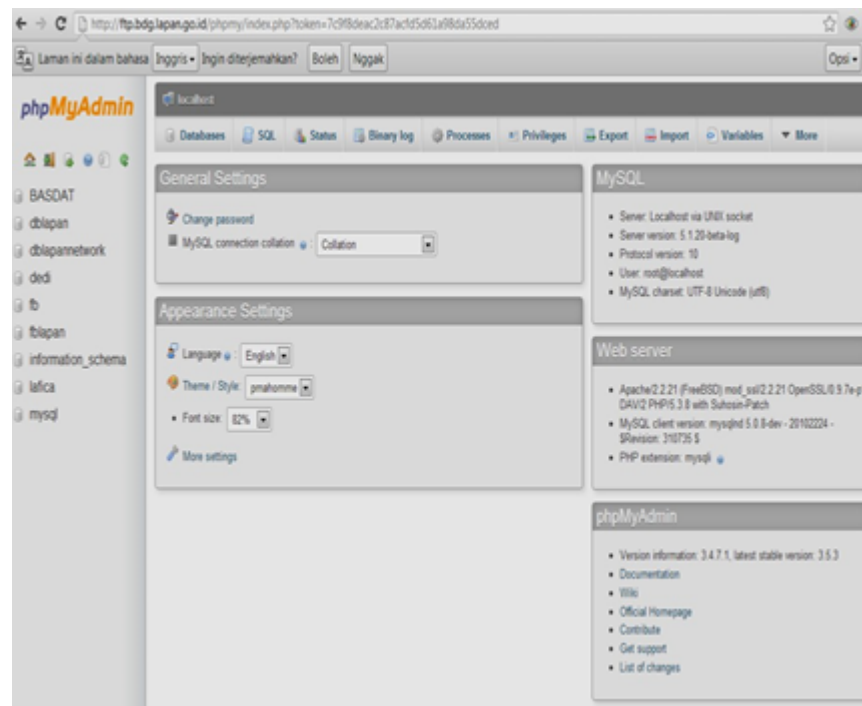


Figure 2. PHPMyAdmin operating interface

The following is an example of a command to create a database with the name "dblapan":
CREATE DATABASE dblapan;

If the above query was executed successfully and the database was successfully created, the following message will be displayed:

Query OK, 1 row affected (0.02 sec)

To view the database that has just been created or that already exists, you can use the following command:

SHOW DATABASES ;

The result of the above command will display all databases that already exist in MySQL. The following is an example of the results of the above query: Database dblapan

Next to see table whether the tool actually exists or not, you can use the following command:

SHOW TABLES;

The above command will display all tables that already exist in a database. An example of the result of the above command is as follows:

TableTools

Table Field

Table Tool data

Table Datanews

Table Request

Table Suggestion

Table SPD

Table table SPD_Tool .

Table tbladm

Table tbluser

Table tbluserlain
Table Upload_field .
Table upload_spd
Table userlevelpermissions
Table Userlevels

following is an example of creating a user table, before creating the table structure definition, for example as follows:

The command used is as follows:

```
CREATE TABLE `tbluser` (  
  `Email` varchar(200) NOT NULL default "",  
  `FirstName` varchar(100) defaults to NULL,  
  `LastName` varchar(100) defaults to NULL,  
  `Instance` varchar(200) defaults to NULL,  
  `Section` varchar(100) defaults to NULL,  
  `NoTlpHP` varchar(100) defaults to NULL,  
  `Profession` varchar(50) default NULL,  
  `Password` varchar(20) default NULL,  
  `Status` char(1) default NULL, PRIMARY KEY (`Email`)  
) TYPE=MyISAM;
```

Table 2-1. Structure of Table User

No.	Field Name	Type	Long
1	Email	Varchar	200
2	FirstName	Varchar	100
3	LastName	Varchar	100
4	Agency	Varchar	200
5	Department	Varchar	100
6	Phone Number	Varchar	100
7	Profession	Varchar	50
8	Password	Varchar	20
9	Status	Char	1

3. LAPAN FTP Site And Its Management

According to the Center for Space Science's main task, which is to conduct research and development of space science and its applications, one of its fields, observation

technology, is responsible for conducting research and development of observational instrumentation and space databases, as well as their application. As a result, an FTP Lapan Bandung was created, which serves as a repository for data collected from the Loka or the Aerospace Observer Center. When a researcher requires observational data, there are still those who use the traditional method, which is to travel to the location where the data was collected. This results in a significant amount of time wasted in conducting a study due to problems with the data collection process, as well as wasted funds for retrieval. The data may be utilised for various reasons, allowing research to proceed without stumbling blocks and with the best possible outcomes. In addition to these issues, there are other issues, such as the researcher's unilateral control over the data, which makes it difficult for other researchers to access the data. As a result, data is kept centrally on a single server and must be handled using MySQL database administration, which offers the benefits outlined above and is well suited to the demands of FTP LAPAN.

Given that the technical data is a material atmosphere and ionosphere study analysis in this instance two research topics centering in Bandung, there is no requirement for a technical data storage capacity at the current server. Equipment at the Aerospace Observer Center or Workshop in Tanjung Sari, Pameungpeuk, Pontianak, Kototabang, Watukosek, and Biak generates technical data. The technical data is then backed up to the server and sent to all data users via Lapan's FTP site, along with data from Balai and Loka's observations. FTP Lapan has two types of access: FTP (non-web based) and HTTP (web based) (web base). The goal of developing a web-based system on FTP Lapan is to make administration, data and tool management, request data management, Lapan user data management, and non-Lapan user data management easier.

FTP-based management The super admin and administrators govern Lapan, with the super admin overseeing all existing management on FTP Lapan. Lapan user administrators, Non Lapan user administrators, and Balai and Loka administrators make up the administrators (SPD administrators). This administrator option is controlled by the admin administration, which provides the ability to customise each admin's access permissions.

The Loka or Balai admin will handle tool data in data and tool management, where the admin adds and changes information about equipment and data. Fill in the information in the form of the Loka or Balai's name, the equipment's name, title, information about the equipment, appeals, quotations, and observation data.

The user administrator will read the requested data request in request data management, where the contents of the information read by the admin include the user's email requesting the data, the date of the request, the location of the requested workshop or centre, the name of the equipment, and the data you want to retrieve. When the data is accessible on the server, the admin will contact the user who made the request via email.

The super admin performs the activation process in Lapan user management; a user who has successfully registered and filled in valid registration data will be activated by the super admin, allowing the user to access the Lapan FTP site; if the registration data is invalid, the user will not be activated and will be prohibited from accessing the Lapan FTP site.

Non-Lapan users are managed using Non-Lapan user management. The super admin performs the activation process in non-lapan user management; if a user has successfully registered and filled in valid registration data, the super admin will activate the user, allowing the user to access the Lapan FTP site; if the registration data is invalid, the user will not be activated and will be prohibited from accessing the Lapan FTP site.

4. Conclusion

As the amount of data collected from equipment observed at the aerospace office or workshop grows, it must be categorised and handled using a database management system (DBMS). A database management system (DBMS) is software that is used to manage and call queries in a database where the controlled data may be transformed into the needed information and the process of retrieving, deleting, and updating data is simple and quick (Effective, Efficient and Accurate). MySQL software, which has been installed on the LAPAN Bandung FTP server to handle data management and tools, request data management, and LAPAN and Non LAPAN user administration, is one of the DBMS software utilised. At the Aerospace Observer Workshop and Center, current information regarding data and equipment will be known in data management and tools. While request data management will be able to determine what data is required and what data is most frequently sought by visitors, user management will oversee the authentication process, which is useful for safeguarding data from unauthorised parties and tracking visitor activity on FTP LAPAN Bandung.

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