



MySQL for Oracle DBA's

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About DBAces – www.dbaces.com

We Provide :

- Global Database Support & Monitoring Services
- Identity & Access Management Solution
- World Wide Training



Session Objectives

- Getting know MySQL
- Understand MySQL Architecture
- Learn the basics in order to manage MySQL
- Getting know MySQL tools both command line & GUI

MySQL Is Powering the World!

Logos for Google, eBay, flickr, Zillow.com (Beta), travelocity, facebook, YouTube, and YAHOO! are displayed. The word "Web" is centered below the logos.

Web

Logos for sage, ingonico, Check Point (SOFTWARE TECHNOLOGIES LTD.), SafeNet, Adobe, and NetQoS are displayed. The text "OEM / ISV's" is centered below the logos.

OEM / ISV's

Logos for SurfControl, Zimbra, F-SECURE, Go Daddy (SOFTWARE), and RIGHT NOW TECHNOLOGIES are displayed. The text "SaaS, Cloud" is centered below the logos.

SaaS, Cloud

Logos for Virgin mobile, Deutsche Telekom, CISCO, Comcast, ERICSSON, Alcatel-Lucent, and telenor are displayed. The text "Telecommunications" is centered below the logos.

Telecommunications

Logos for LAFARGE, TOYS R US, AP Associated Press, Rikspolisstyrelsen, LEADER PRICE, and SHINSEI BANK are displayed. The text "Enterprise 2.0" is centered below the logos.

Enterprise 2.0

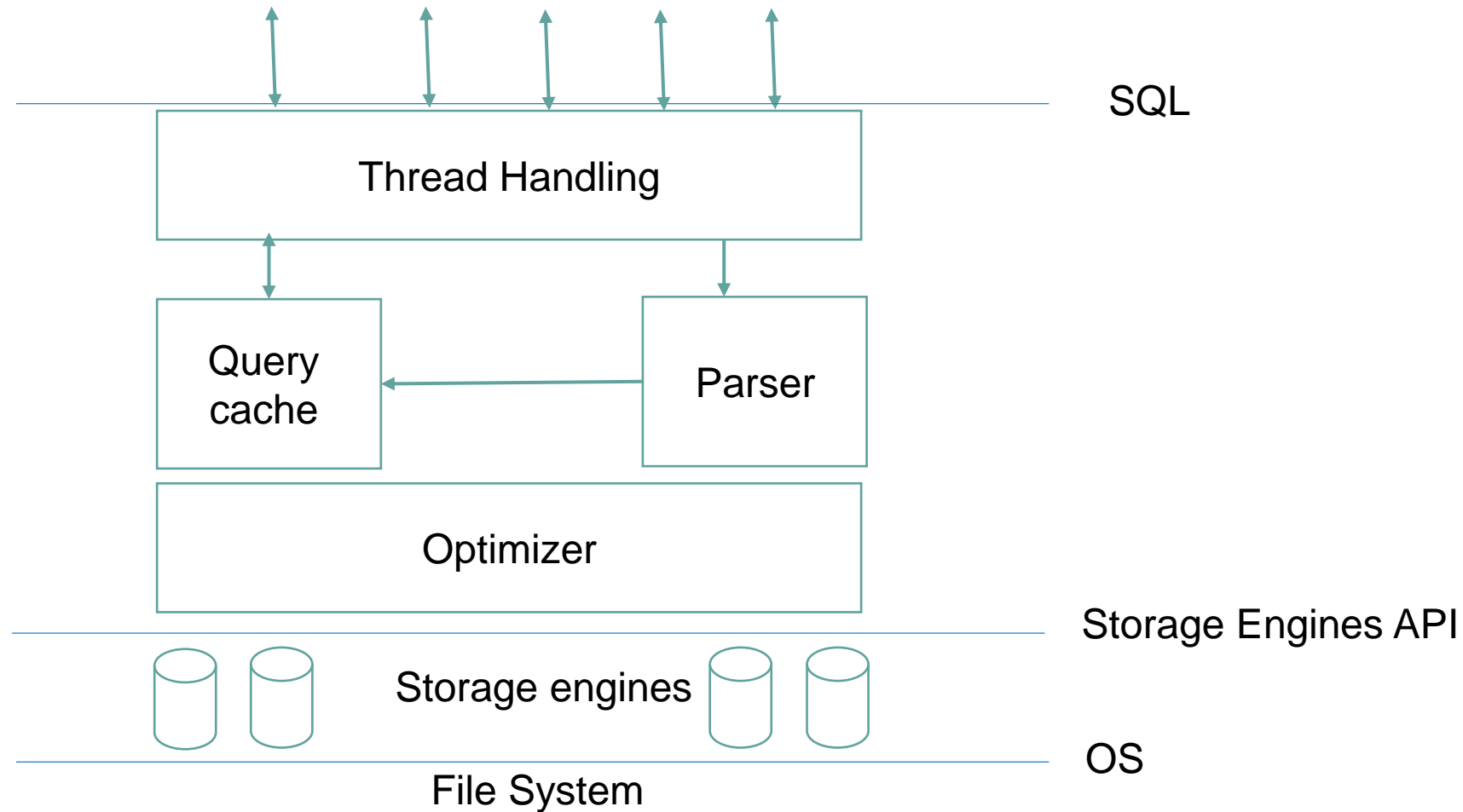
MySQL Enterprise Tools

- MySQL Enterprise Monitor
 - Web application that reduces down time, tightens security, and increases throughput
 - Includes MySQL Query Analyzer
- MySQL Enterprise Backup
 - Online hot, nonblocking backups
- MySQL Workbench
 - Visual database design tool that is used to efficiently design, manage, and document databases

The Many faces of MySQL

- Oracle MySQL 5.6
- MySQLAtFacebook 5.1 series (facebook)
- MariaDB 10 (mediawiki.org , google)
- Percona Server
- drizzle

MySQL Server Architecture



MySQL Engines

- **MyISAM** - Original Storage Engine, great for web apps
- **InnoDB** - Robust transactional storage engine
- **Memory Engine** - Stores all data in **Memory**

- To see what tables are in what engines SHOW TABLE STATUS ;
- Selecting the storage engine to use **is a tuning**
- **decision**
- `mysql> alter table tab engine=myisam ;`

MyISAM

- Fastest storage engine 3x or more
- Most compact data of all non-compressed engines
- Table locking
- Not **ACID** compliant, non-transactional
- Supports concurrent inserts
- Full-Text and Geospatial support

MyISAM

when appropriate :

- Most web applications
- Perfect for web search databases
- 80/20 read/modify or higher
- pure inserts and deletes with partitions or merge engine
- reporting DB/ Data Warehouse

InnoDB

- Transactional and fully ACID compliant
- Behavior most like traditional databases such as Oracle, DB2, SQL Server, etc.
- Data size is normally 2-3 X MyISAM
- Fast, reliable recovery from crashes with zero committed data loss
- MVCC = Non-blocking reads in most cases

Important MySQL Server Limits

Limit that important to know when you are planning to use MySQL

- MySQL is not HDFS!
- **Every** Query Is a JOIN
- All JOINS are **nested loop**
- Temp tables - No index on Temp table
- Alter Table - will recreate all table and underlying objects
- No FULL OUTER JOIN
- does not support parallel queries (except NDB, shard-query).

MySQL Windows Installation

The screenshot shows the MySQL Installer window for MySQL Server 5.6.21. The left sidebar contains the following navigation items: MySQL Installer, MySQL Server 5.6.21, Type and Networking (selected), Accounts and Roles, Windows Service, and Apply Server Configuration. The main content area is titled 'Type and Networking' and includes the following sections:

- Server Configuration Type:** A dropdown menu is set to 'Development Machine'. Below it, a note states: 'Choose the correct server configuration type for this MySQL Server installation. This setting will define how much system resources are assigned to the MySQL Server instance.'
- Connectivity:** A note says 'Use the following controls to select how you would like to connect to this server.' There are three options:
 - TCP/IP: Port Number: 3306
 - Open Firewall port for network access
 - Named Pipe: Pipe Name: MYSQL
 - Shared Memory: Memory Name: MYSQL
- Advanced Configuration:** A note says 'Select the checkbox below to get additional configuration page where you can set advanced options for this server instance.' There is one option:
 - Show Advanced Options

At the bottom right, there are 'Next >' and 'Cancel' buttons.

MySQL Windows Installation

The screenshot shows the MySQL Installer window for MySQL Server 5.6.21. The 'Accounts and Roles' step is active, showing password fields for the root account and a table for creating MySQL user accounts.

MySQL Installer
MySQL Server 5.6.21

Type and Networking
Accounts and Roles
Windows Service
Apply Server Configuration

Accounts and Roles

Root Account Password
Enter the password for the root account. Please remember to store this password in a secure place.

MySQL Root Password:

Repeat Password:

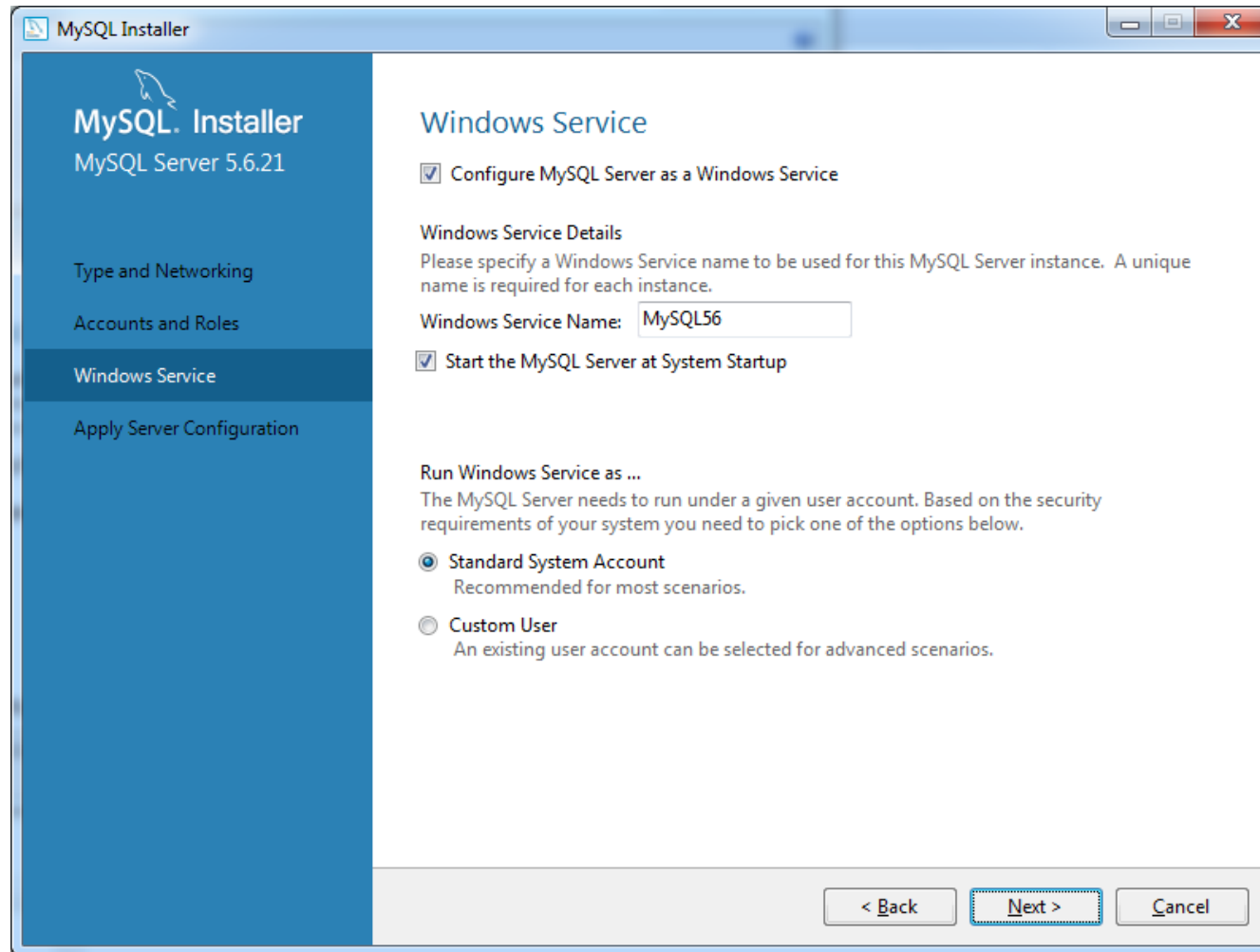
Password Strength: **Weak**

MySQL User Accounts
Create MySQL user accounts for your users and applications. Assign a role to the user that consists of a set of privileges.

MySQL Username	Host	User Role	

< Back Next > Cancel

MySQL Windows Installation



MySQL Windows Installation – Command Line

```
[mysqld]  
basedir = C:/mysql-5.0.96  
port = 3308  
enable-named-pipe  
socket = mypipe2
```

```
C:\> C:\mysql-5.0.96\bin\mysqld-nt --install mysqld2  
--defaults-file=C:\my-opts2.cnf
```


MySQL Configuration Files :

File Name	Purpose
/etc/my.cnf	Global options
/etc/mysql/my.cnf	Global options
<i>SYSCONFDIR</i> /my.cnf	Global options
\$MYSQL_HOME/my.cnf	Server-specific options
defaults-extra-file	The file specified with <u>--defaults-extra-file=</u> <i>path</i> , if any
~/.my.cnf	User-specific options

MySQL - Logs

- By default all logs except the error log are disabled
- All enabled logs are written to the DATA directory
- Use “mysqladmin” with “flush-logs” to clear logs.

Log Type	Information Written to Log
Error log	Problems encountered starting, running, or stopping <u>mysqld</u>
General query log	Established client connections and statements received from clients
Binary log	Statements that change data (also used for replication)
Relay log	Data changes received from a replication master server
Slow query log	Queries that took more than <u>long_query_time</u> seconds to execute
DDL log (metadata log)	Metadata operations performed by DDL statements

MySQL Instance

- Supports many instances under one MySQL installation
- MySQL instance doesn't have unique name instead the uniqueness of the server is the **server-id** and the **port** number.
- In order to add a new instance, just add a new server-id definition in "my.cnf" configuration file:

SERVER-ID=2

MySQL Database

- Up to 32,000 databases per instance
- Database can be compared to schema – holder of DB objects
- Database does not represents user object

```
CREATE DATABASE [IF NOT EXISTS] db_name
```

MySQL Tables - InnoDB

- By Default all tables are stored in the system tablespace
- System tablespace data is stored in “ibdata” files
- Use **innodb_file_per_table** to store table in separate datafiles
- A **TEMPORARY** table is visible only to the current session, and is dropped automatically when the session is closed.

MySQL Tables - MyISAM

Create 3 files for each table :

File	Purpose
tbl_name.frm	Table format (definition) file
tbl_name.MYD	Data file
tbl_name.MYI	Index file

MySQL Directory Structure

Directory	Contents of Directory
<code>bin</code>	Client programs and the mysqld server
<code>data</code>	Log files, databases
<code>examples</code>	Example programs and scripts
<code>include</code>	Include (header) files
<code>lib</code>	Libraries
<code>scripts</code>	Utility scripts
<code>share</code>	Miscellaneous support files, including error messages, character set files, sample configuration files, SQL for database installation

Users

User are instance level objects and not database level objects

MySQL user name is has two elements, the username and from where he allowed to connect :

```
mysql> CREATE USER 'demo'@'localhost' IDENTIFIED BY 'pass';
```

List all users in MySQL instance:

```
mysql> SELECT * FROM mysql.user;
```


User – Cont.

Connect to our instance from anywhere in the world :

```
mysql> CREATE USER 'demo1'@'%' IDENTIFIED BY 'some_pass';
```

Grant privileges to the user we just created :

```
mysql> GRANT ALL PRIVILEGES ON *.* TO 'demo'@'localhost'  
-> WITH GRANT OPTION;
```

```
mysql> GRANT ALL PRIVILEGES ON db1.* TO 'demo1'@'%'  
-> WITH GRANT OPTION;
```

Query Data Structure

```
SHOW CHARACTER SET
SHOW COLLATION
SHOW COLUMNS
SHOW DATABASES
SHOW FUNCTION STATUS
SHOW INDEX
SHOW OPEN TABLES
SHOW PROCEDURE STATUS
SHOW STATUS
SHOW TABLE STATUS
SHOW TABLES
SHOW VARIABLES
```

Backup - mysqldump

Set script variables

```
FILE=minime.sql.`date +"%Y%m%d"``
```

```
DBSERVER=127.0.0.1
```

```
DATABASE=XXX
```

```
USER=XXX PASS=XXX
```

Call mysqldump script

```
mysqldump --opt --user=${USER} --password=${PASS} ${DATABASE} > ${FILE}
```

Set script variables

```
gzip $FILE
```

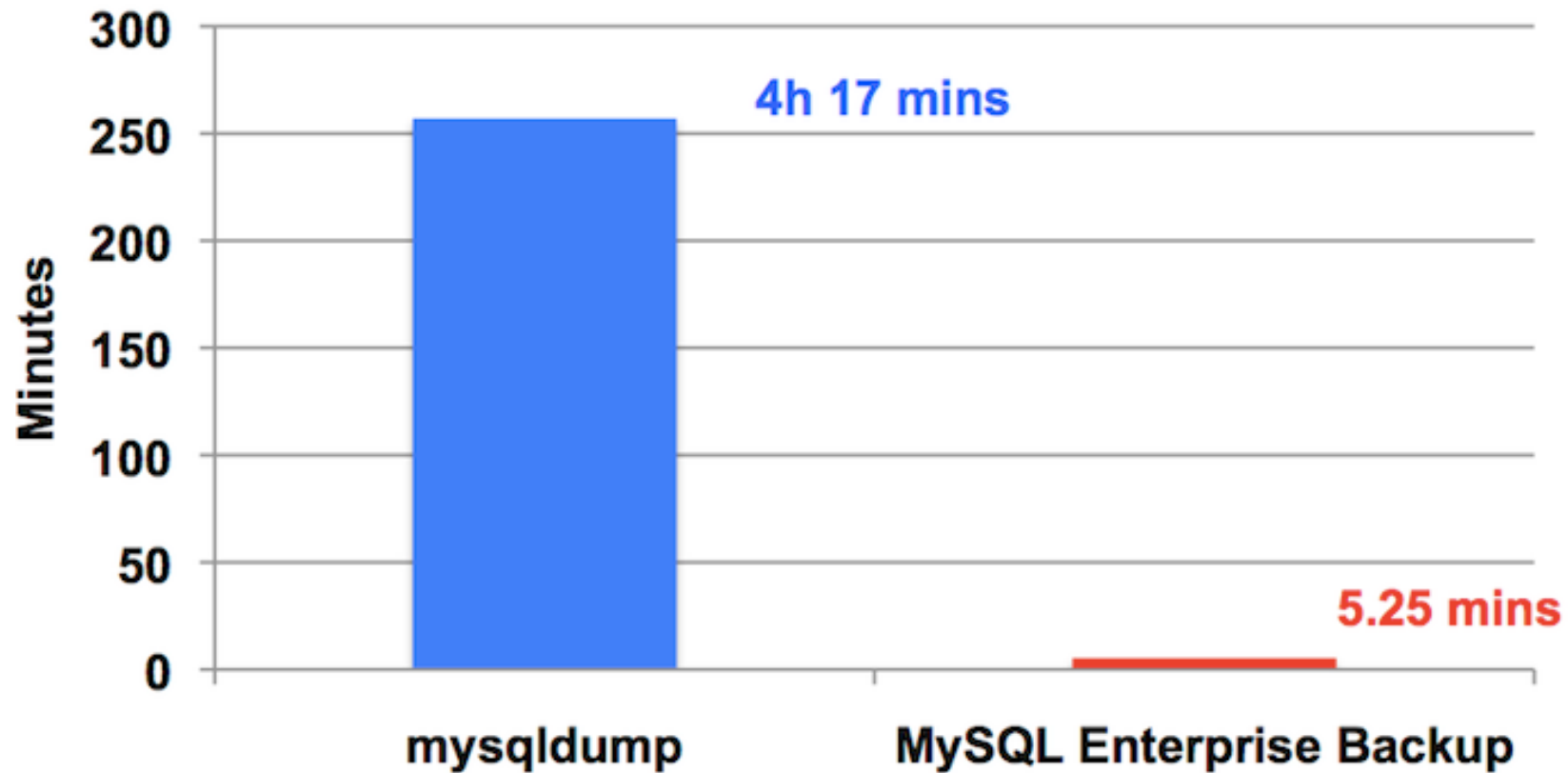
Backup - MySQL Enterprise Backup

- **“Hot” online backups**- Backups are entirely online
- **Incremental backups** - Backup data that has changed since the last backup
- **Partial Backup** - Target particular tables or tablespace
- **Full Instance Backup** - Backs up data, as well as configuration and other information to easily create a complete "replica"



Backup - MySQL Enterprise Backup

Backup: 73 GB Database



Conclusion

MySQL is easy 4 Oracle DBA'S

Thank You

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