MYSQL OVERVIEW

History, Architecture and more

MYSQL

- MySQL (pronounced "My-es-que-el") is an open source Relational DataBase Management System (RDBMS).

- Michael "Monty" Widenius was the original author of the MySQL database system. It all started back in 1994 when his employer needed a new database system and none of the existing options were acceptable. For a while, MySQL was an internal product.

- In 1996, MySQL 3.11.1 was released publicly in binary forms for Linux and Solaris. Over time, MySQL moved towards a dual-license model, with an open source GNU version and a commercial licensing scheme as well.

MYSQL VERSIONS

- **3.23** - First major, popular release. c. 2001

- **4.0** - Updates and new features, including Unions. c. 2003

- **4.1** - R-tree, B-trees, subqueries, prepared statements. c. 2004

- **5.0** - Cursors, stored procedures, triggers and more. c. 2005

- **5.1** - Event scheduler, partitioning, plugins and more. c. 2008

- **5.5** - New InnoDB, enhanced tuning, better replication. c. 2010

MYSQL ARCHITECTURE

- MySQL follows a traditional client/server model. The server is in charge of managing all of the data while the clients use/update the data.

- MySQL multi-processing is implemented with threads, providing some benefits and drawbacks; notably better inter-thread communication, but at the cost of more difficult implementation.

- There are many parts to the MySQL system, so a handy picture yanked from the documentation will work well:

Connectors
Native C API, JDBC, ODBC, .NET, PHP, Python, Perl, Ruby, VB

MySQL Server

Enterprise Management Services & Utilities

Backup & Recovery
Security
Replication
Cluster
Partitioning
Instance Manager
INFORMATION_SCHEMA
Administrator
Workbench
Query Browser
Migration Toolkit

Connection Pool
Authentication -Thread Reuse - Connection Limits – Check Memory - Caches

SQL Interface

DML, DDL,
Stored Procedures
Views, Triggers, etc.

Parser

Query Translation,
Object Privilege

Optimizer

Access Paths,
Statistics

Caches & Buffers

Global and
Engine Specific
Caches & Buffers

Pluggable Storage Engines
Memory, Index & Storage Management

MyISAM InnoDB Cluster Falcon Archive Federated Merge Memory Partner Community Custom

File System
NTFS – NFS
SAN - NAS

Files & Logs
Redo, Undo, Data, Index, Binary,
Error, Query, and Slow

Tuesday, March 15, 2011

OBTAINING MYSQL

- The MySQL source code is available for download from `www.mysql.com`

- Additionally, most distributions of Linux maintain one or more packages for the MySQL system.

- MySQL is even available to the Microsoft world! If running on Windows, MySQL 5.5 should be strongly considered due to massive overhaul of performance on Windows systems in that version.

COMPILING

- Compiling from source is an attractive option because:

  - Users can tweak advanced settings and features

  - Users can wring extra performance from the server

- Compiling from source cons:

  - Compiling. :)

  - Understanding all of the options and implications to achieve an effective database server for the user's application.

COMPILING

- Compiling is a multi-step, often complicated process.

- Fortunately, MySQL is a very well maintained project, and the process of building it has been finely tuned.

- The short form:

  - `./configure; make; make install`

- Note that as of MySQL 5.5, the build processes utilizes `cmake`.

- In the lab, you will get to try this out

PRE-COMPILED

- Pre-compiled software is an attractive option because:

  - Generally available in package form, therefore bringing all of the benefits of packaged software (dependencies, tracking, upgrades, management)

  - Do not need up front knowledge on MySQL compile time options and settings

- The only real drawbacks to pre-compiled software are:

  - Often not compiled to target user's specific hardware

  - No control over compile time configuration options and features

PACKAGES

- Installing a package is very simple on most distributions of linux:

  - `yum install mysql`

  - `apt-get install mysql`

- Windows users just download the installer and run it.

LAB

1) Experienced Linux users: download the latest source code for MySQL from `www.mysql.com`. Extract and compile the software, but do not install it. Windows users, watch a nearby Linux user while they do this.

2) Everyone: install the mysql packages. This includes at least packages `mysql` and `mysql-server`.

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