



#### **Tutorial MySQL com Java**

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### Alguns clientes MySQL













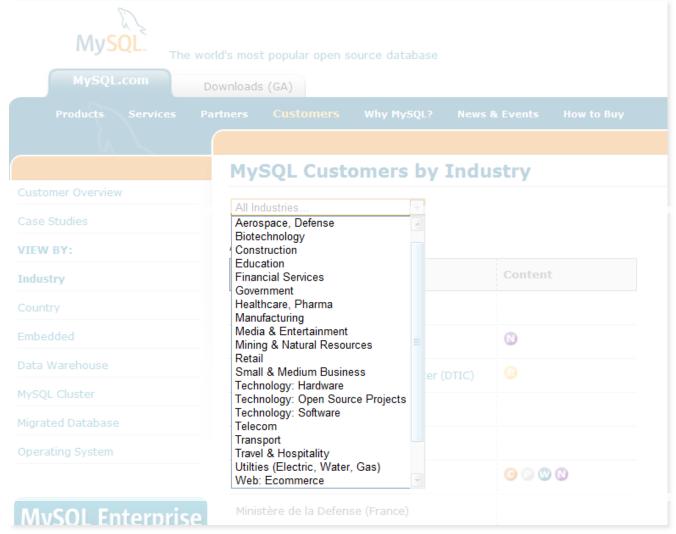








#### Várias Indústrias



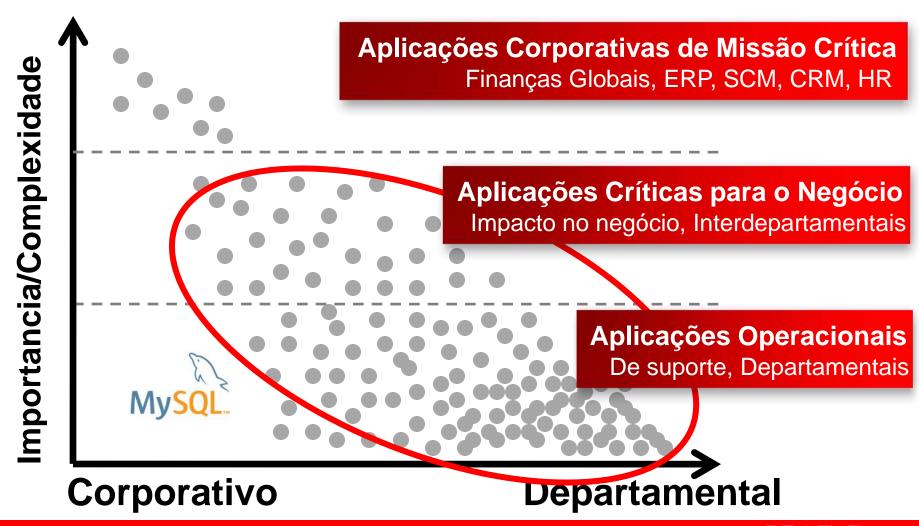
mysql.com/customers

# Quando usar MySQL?

### Resumo: onde o MySQL se encaixa

- Novas aplicações e aplicações customizadas Ad-hoc
  - principalmente arquitetura Web (ex. Linux+Apache+MySQL+Java)
  - arquiteturas inovadoras, NoSQL (versão 5.6 e Cluster 7.2)
- Aplicações híbridas
  - expansão de sistemas legados
  - MySQL como front-end e Oracle DB como back-end
- Online e SaaS
  - E-commerce/OLTP e pagamentos digitais
  - Gerenciamento de Conteúdo (CMS)
  - Redes Sociais, mensagens e colaboração
  - Games Sociais e MMO
  - Gerenciamento de Sessão e Autenticação do usuário
- Datamarts e Relatórios Departamentais
- SMS, e-marketing, Infra Telecom, Infra TI
- Embarcadas

### MySQL em Aplicações Enterprise



# Quando custa o MySQL?

#### Portfolio Open Source (GPL)

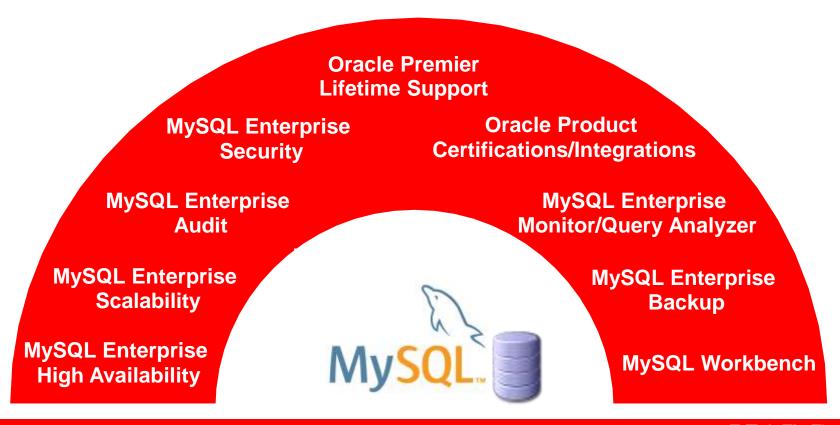


- MySQL Database (Community Server) 5.5.27 GA e 5.6.6 DMR
- MySQL Cluster (NDB Community) 7.2.7 GA
- MySQL Workbench Community Edition 5.2.40 GA
  - MySQL Utilities (em Python)
- MySQL Connectors
  - ODBC, Java, .Net, C, C++, PHP, OpenOffice
- MySQL Proxy 0.8.2 Alpha
- Documentação: livre para uso, não coberto pela GPL
- Forums

dev.mysql.com/downloads

#### MySQL Enterprise Edition.

Indicado para empresas ou pessoas físicas que pretendem aumentar **produtividade**, **diminuir riscos** e explorar mais a fundo e **aumentar as capacidades** do MySQL.



# Arquitetura do MySQL

#### MySQL Database

Performance, Confiabilidade, Facilidade de Uso

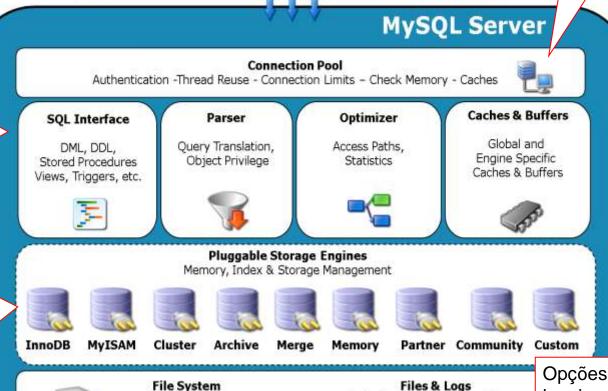
Suporte às mais conhecidas plataformas/linguagens de desenvolvimento Connectors
Native C API, JDBC, ODBC, .NET, PHP, Python, Perl, Ruby, VB

Gerenciamento eficiente e multithread de sessões

Parsing completo DML+DDL, otimizador, baseado em custo, caching de queries

e resultados

Várias opções de Storage Engine para necessidades específicas das aplicações





NTFS - NFS SAN - NAS

Redo, Undo, Data, Index, Binary, Error, Query, and Slow Opções flexíveis de logging e armazenamento físico

### InnoDB no MySQL

- Storage Engine mais utilizado
  - aplicações Web 2.0
  - aplicações de varejo
  - aplicações de entretenimento & mídia
- ACID, transacional
- Crash recovery
- Integridade referencial
- Suporta altos níveis de usuários concorrentes
- No MySQL versão 5.5
  - padrão
  - otimizado para hardware multi-core, multi-thread e SOs

# Como instalar o MySQL?

### **MySQL** Installer for Windows

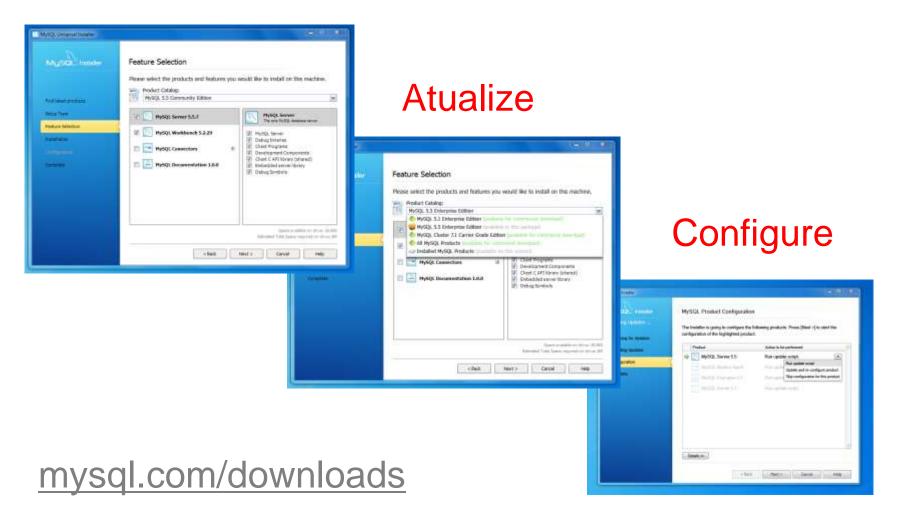


- Interface gráfica nativa do Windows
- Todos produtos MySQL para desenvolvimento em UM único pacote
  - MySQL Database
  - MySQL Connectors
  - MySQL Workbench e exemplos de modelos
  - Exemplos de bancos de dados
  - Documentação
- Alta integração de produtos, download sob demanda, funcionalidades de atualização



#### **MySQL** Installer for Windows

#### Selecione





The world's most popular open source database

MySQL.com

Downloads (GA)







#### **Current Downloads (Generally Available)**

#### MySQL Community Server

MySQL Enterprise Edition

MySQL Cluster

MySQL Cluster CGE

MySQL Workbench (GUI Tool)

MySQL Connectors

#### Contact Sales

USA/Canada - Toll Free:

+1-866-221-0634

USA - From abroad:

+1-208-338-8100

USA/Canada - Subscription Renewals: +1-866-221-0634

Latin America: +1 512 535

7751

Brazil: +55 11 5189-1097 South Africa: +27 113194408

HK+ +44 207 553 8447

#### MySQL Downloads (Generally Available)



#### MySQL Community Server

(Current Generally Available Release: 5.5.28)

MySQL Community Server is a freely downloadable version of the world's most popular open source database that is supported by an active community of open source developers and enthusiasts.

DOWNLOAD

#### MySQL Enterprise Edition

MySQL Enterprise Edition is a commercial edition of MySQL that combines:

- MySQL Database
- MySQL Enterprise Backup

- New Releases (GA)
- MySQL Community Server 5.1 (5.1.66 GA)
- Connector/Python 1.0 (1.0.7 GA)
- MySQL Community Server 5.5 (5.5.28 GA)
- MySQL Installer 5.5 (5.5.28 GA)
- MvSOL Workbench 5.2 (5.2.44 GA)

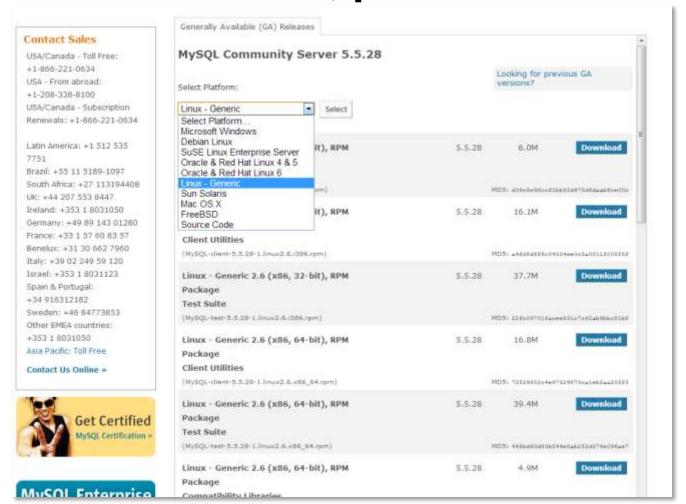
MySQL open source software is provided under the GPL License.

OEMs, ISVs and VARs can purchase

commercial

licenses.

No Linux ou Mac, prefira os binários

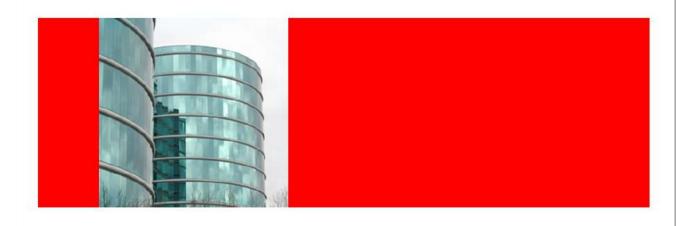




mysql.com/downloads/mysql

### **Tutorial MySQL em 10 minutos**







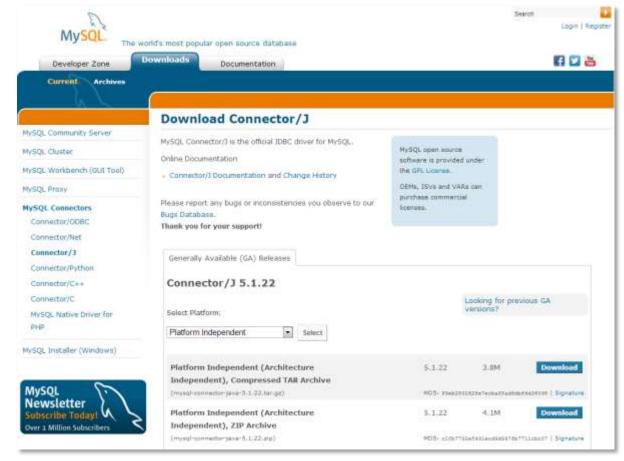


MySQL em 10 minutos - II

Alexandre M de Almeida Consultor Sr MySQL

slideshare.net/MySQLBR/mysql-em-10min-alexandre-almeida-hti-tecnologia

# No Linux ou Mac, instale também o Connector/J

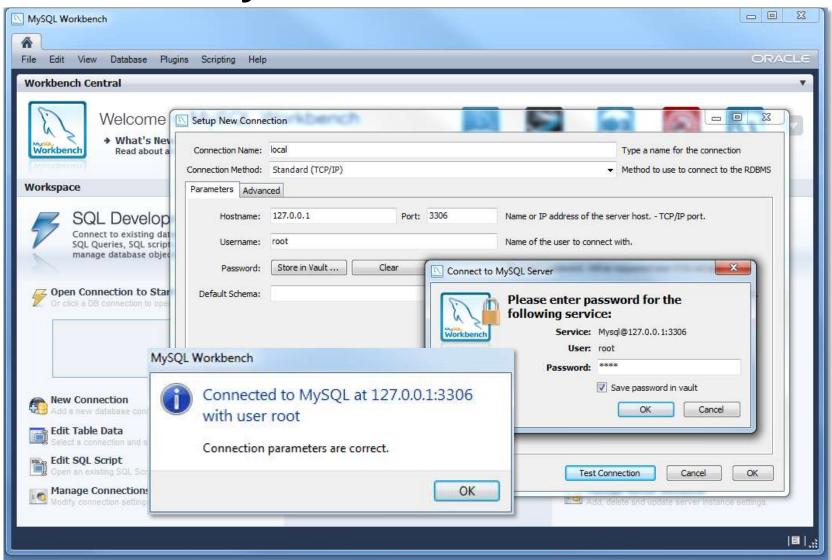




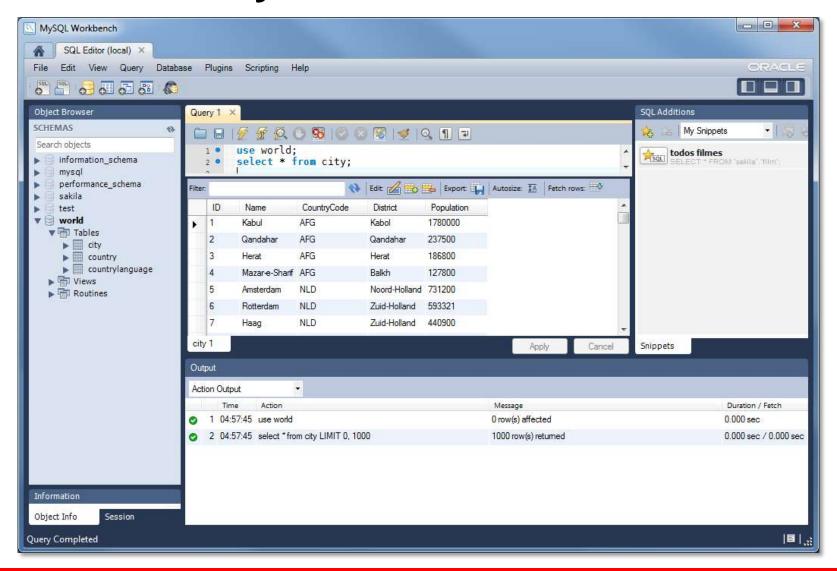


mysql.com/downloads/connector/j

### Teste via MySQL Workbench 1/2



### Teste via MySQL Workbench 2/2

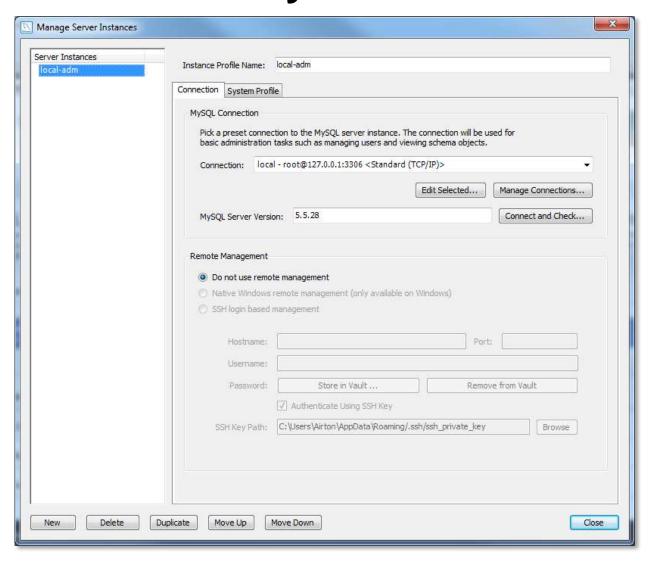


#### **Teste via MySQL Client**

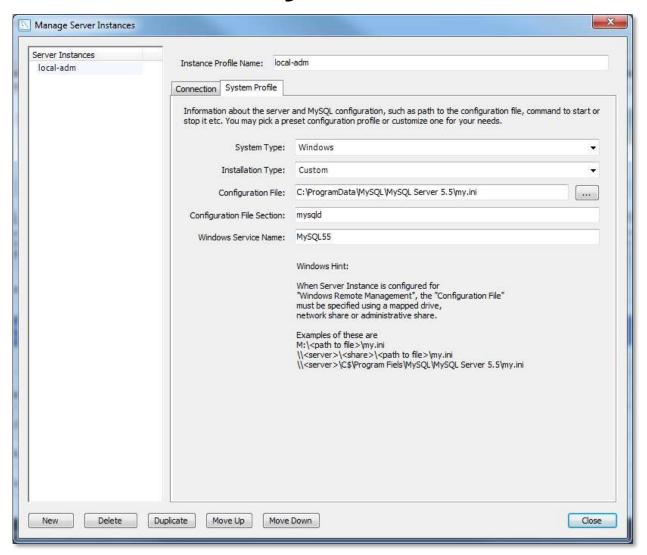
(opcional)

```
C:\Program Files\MySQL\MySQL Server 5.5\bin>mysql -uroot -p
Enter password: ****
Welcome to the MySQL monitor. Commands end with; or \q.
Your MySQL connection id is 8
Server version: 5.5.28 MySQL Community Server (GPL)
Copyright (c) 2000, 2012, 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>
```

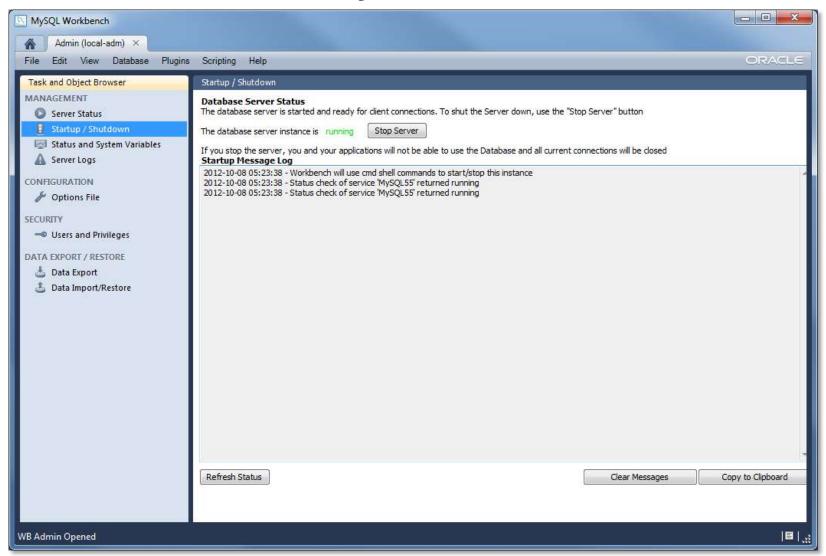
### Administre via MySQL Workbench 1/3



#### Administre via MySQL Workbench 2/3

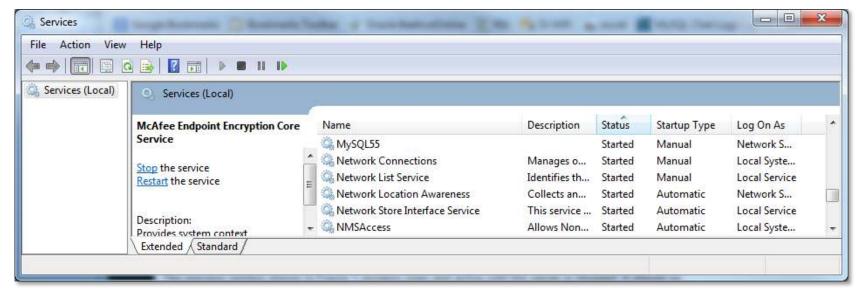


### Administre via MySQL Workbench 3/3

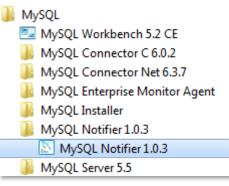


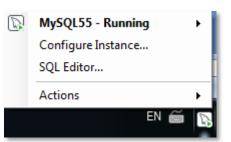
#### Parar ou Iniciar o servidor MySQL

(opcional)



#### Ou via MySQL Notifier

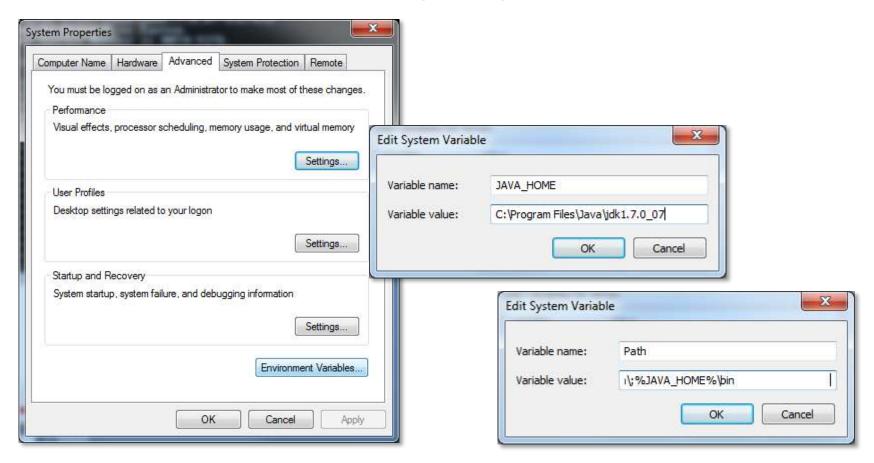




#### Tudo certo com seu ambiente Java? 1/2

#### Instalar e configurar JDK e path

oracle.com/technetwork/java/javase/downloads



#### Tudo certo com seu ambiente Java? 2/2

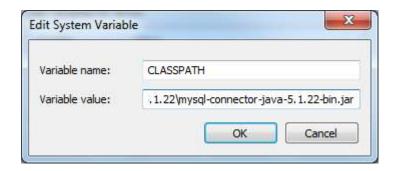
#### JDK e path configurados

```
C:\Program Files\MySQL\MySQL Server 5.5\bin>java -version
```

# Hello world MySQL!

#### Adicione o driver MySQL ao CLASSPATH

#### caminho completo do .jar



#### Confira:

```
C:\>set CLASSPATH
```

```
CLASSPATH=.;C:\Program Files (x86)\Java\jre6\lib\ext\QTJava.zip;C:\Program Files \MySQL\mysql-connector-java-5.1.22\mysql-connector-java-5.1.22-bin.jar
```

#### HelloMysql.java 1/2

```
import java.sql.*;
public class HelloMysql {
  public static void main(String args[]) {
    System.out.println("Tentando conectar ao MySQL...");
    try {
        Class.forName("com.mysql.jdbc.Driver");
        String url = "jdbc:mysql://localhost:3306/mysql";
        String usuario = "root";
        String senha = "root";
        Connection con = DriverManager.getConnection(url, usuario, senha);
        System.out.println("URL: " + url);
        System.out.println("Connection: " + con);
```

Continua...

#### HelloMysql.java 2/2

```
Statement stmt = con.createStatement();  //objeto Statement
  ResultSet rs; //objeto ResultSet
  rs = stmt.executeQuery("SELECT * FROM world.country");
  System.out.println("Ola mundo!");
  while(rs.next()){
   String nomePais = rs.getString("Name");
   System.out.print(nomePais + ", ");
  }//end while
  con.close();
  } catch( Exception e ) {
  e.printStackTrace();
  }//end catch
}//end main
}//end class HelloMysql
```



#### java HelloMysql

C:\tutorial>javac HelloMysql.java

#### C:\tutorial>java HelloMysql

Tentando conectar ao MySQL...

URL: jdbc:mysql://localhost:3306/mysql

Connection: com.mysql.jdbc.JDBC4Connection@ed07f45

Ola mundo!

Aruba, Afghanistan, Angola, Anguilla, Albania, Andorra, Netherlands Antilles, Un ited Arab Emirates, Argentina, Armenia, American Samoa, Antarctica, French South ern territories, Antigua and Barbuda, Australia, Austria, Azerbaijan, Burundi, B elgium, Benin, Burkina Faso, Bangladesh, Bulgaria, Bahrain, Bahamas, Bosnia and Herzegovina, Belarus, Belize, Bermuda, Bolivia, Brazil, Barbados, Brunei, Bhutan, Bouvet Island, Botswana, Central African Republic, Canada, Cocos (Keeling) Isl ands, Switzerland, Chile, China, C H te d TEIvoire, Cameroon, Congo, The Democratic Republic of the, Congo, Cook Islands, Colombia, Comoros, Cape Verde, Costa Rica, Cuba, Christmas Island, Cayman Islands, Cyprus, Czech Republic, Germany, Djib

ietnam, Vanuatu, Wallis and Futuna, Samoa, Yemen, Yugoslavia, South Africa, Zambia, Zimbabwe,



### Revisão: Conceitos importantes

- Como conectar o Java ao MySQL
- Entender o CLASSPATH

### Revisão: conectando o Java ao MySQL

- O driver JDBC é chamado MySQL Connector/J
  - Desenvolvido pela Oracle sob licença GPL
- Driver Type IV (todo java, nativo)
- Disponível para baixar em:
  - Software
    - dev.mysql.com/downloads/connector/j
    - Maven, Ivy
    - Many Linux and BSD distributions
  - Documentation
    - dev.mysql.com/doc/refman/5.5/en/connector-j.html

#### Revisão: Entendendo o CLASPATH

- O classpath é o local onde o Java procura por código compilado (biblioteca)
- Há locais padrão para o classpath
  - WEB-INF/lib, WEB-INF/classes in webapps
  - \$JRE\_HOME/lib/ext
- Quando estiver desenvolvendo ou implantando evite estes locais
  - \$JRE\_HOME/lib/ext
  - Application-server-wide
    - e.g. \$CATALINA\_HOME/lib
- Se possível deixe este trabalho para sua IDE

# Crie um usuário no MySQL.

### Criando usuário

```
public User createUser(Connection c, String
login, String firstName, String lastName, String
credentials) {
           PreparedStatement p = null;
           try {
                 p = c.prepareStatement("INSERT
INTO user (login, first_name, last_name,
passwd_hash) VALUES (?, ?, ?, ?)");
                 p.setString(1, login);
                 p.setString(2, firstName);
                 ResultSet rs =
p.getGeneratedKeys();
                 rs.next();
                 long id = rs.getLong(1);
                 PersistentUser user = new
PersistentUser():
                 user.setId(id);
                 return user;
```

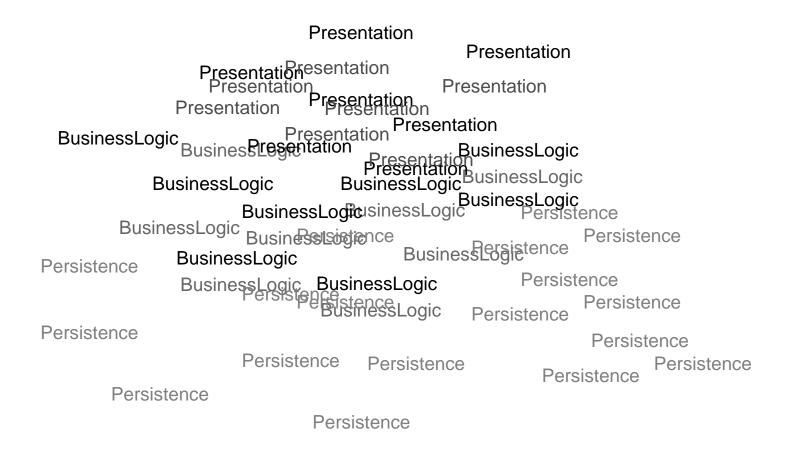
Estes tipos de acesso é conhecido como Raw JDBC...

# Arquitetando para o sucesso com MySQL!

Applications start small

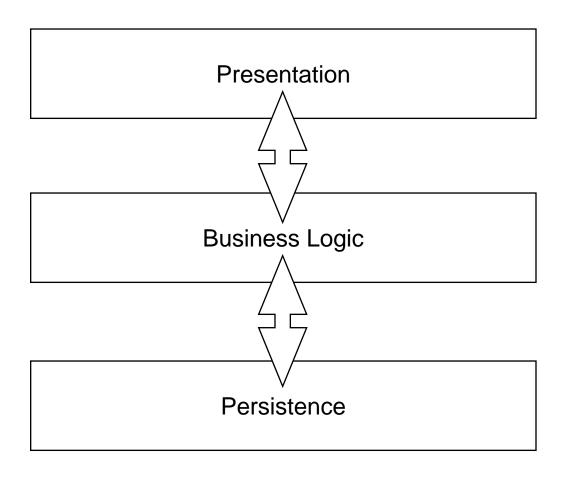
If they're successful, they don't stay that way

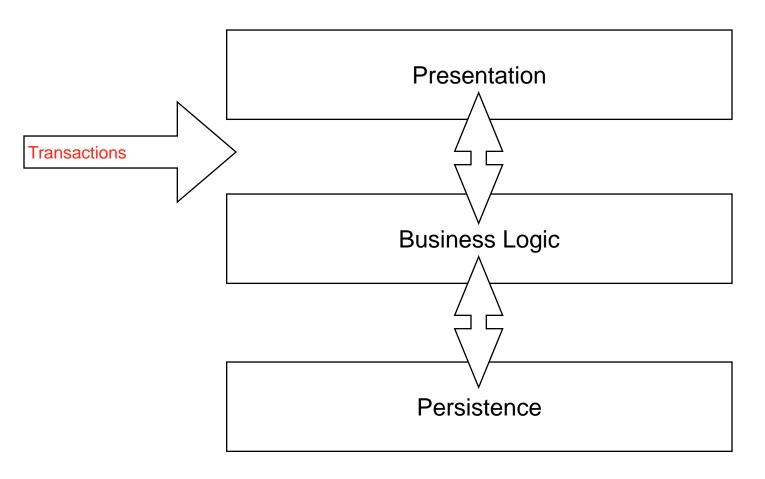
### **Um Anti-Pattern**

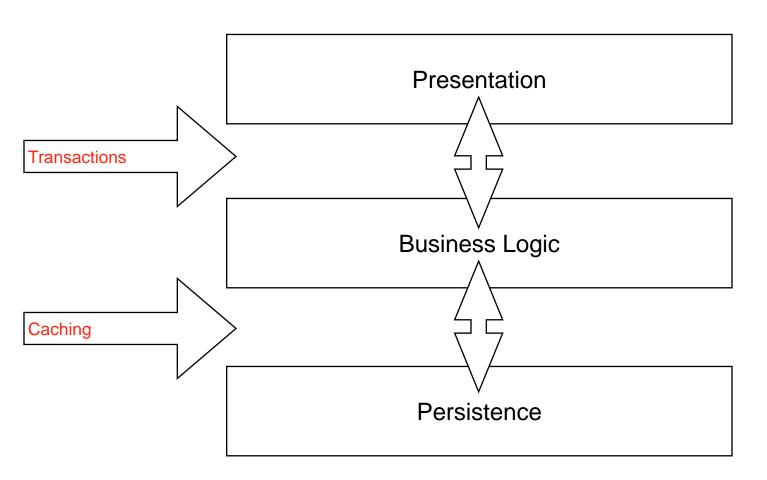


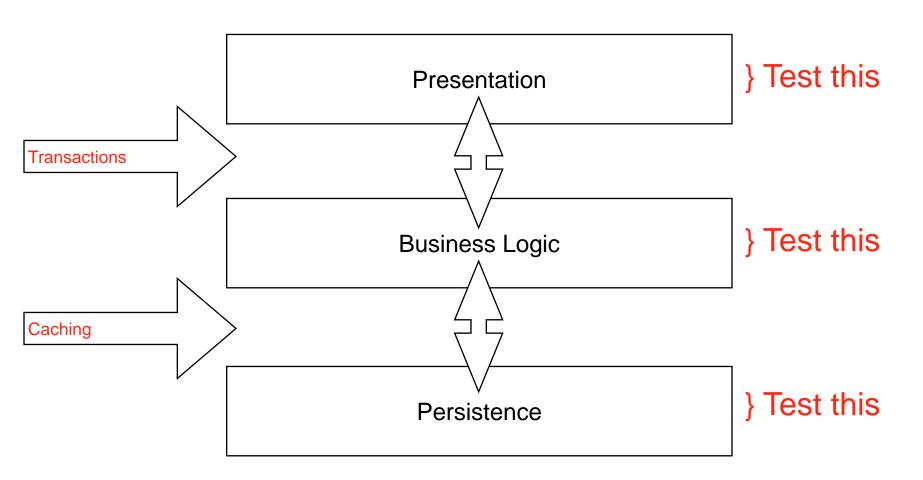
### **Um Anti-Pattern**

Quero usar uma lógica daqui... Presentation Presentation Plesentation Plesentation Presentation ...aplicar aqui... Presentation Presentation Presentation Busines resentation BusinessLogic BusinessLogic BusinessLogic\_BusinessLogic BusinessLogic BusinessLogic BusinessLogic Persistence ...no contexto BusinessLogic Businessistience Persistence desta BusinessLegistence BusinessLogic Persistence BusinessLogic BusinessLogic BusinessLogic trasação. Persistence Persistence









### Use ferramentas adequadas

- Using Maven to manage the depedencies/build
- Using SpringFramework
  - Dependency Injection
  - Templates/Boilerplate/Integration
- Uma boa IDE: NetBeans, Eclipse

# **Arquitetura em Camadas**

### **Exemplo Criar Usuário**

```
@Override
     public User createUser(String login, String firstName, String lastName, String credentials) {
           jdbcTemplate.update("INSERT INTO user (login, first_name, last_name, passwd_hash)
VALUES (?, ?, ?, ?)", login, firstName, lastName, credentials);
           long id = jdbcTemplate.queryForLong("SELECT LAST_INSERT_ID()");
           PersistentUser user = new PersistentUser();
          user.setId(id);
           user.setLogin(login);
           user.setFirstName(firstName);
           user.setLastName(lastName);
           user.setCredentials(credentials);
           return user;
```

### Como era no Raw JDBC

```
public User createUser(Connection c, String
login, String firstName, String lastName, String
credentials) {
           PreparedStatement p = null;
           try {
                 p = c.prepareStatement("INSERT
INTO user (login, first_name, last_name,
passwd_hash) VALUES (?, ?, ?, ?)");
                 p.setString(1, login);
                 p.setString(2, firstName);
                 ResultSet rs =
p.getGeneratedKeys();
                 rs.next();
                 long id = rs.getLong(1);
                 PersistentUser user = new
PersistentUser():
                 user.setId(id);
                 return user;
```

Estes tipos de acesso é conhecido como Raw JDBC...

# Resolvendo erros comuns com MySQL!

### Class not found

- java.lang.ClassNotFoundException: com.mysql.jdbc.Driver
  - The driver is not in your CLASSPATH
  - Standalone applications with framework-managed CLASSPATH help with this, i.e WEB-INF/lib, or mvn or antmanaged CLASSPATH

### **No Suitable Driver**

- SQLException: No suitable driver
  - Check your URL, compare to the documentation at

http://dev.mysql.com/doc/refman/5.1/en/connector-j.html

Your URL should look something like

jdbc:mysql://host:port/database[...]

# **Out of Memory**

- java.lang.OutOfMemoryError when reading results
  - Your result set is too large, Connector/J buffers results by default
  - Most use cases don't require large result sets
  - Those that do, process in chunks via SELECT ... LIMIT, or Statement.setFetchSize(Integer.MIN\_VALUE)
- Heap dump shows many statement, result set instances
  - Not closing resources on every code path
  - Frameworks help prevent this
  - Plumb try {} catch {} finally {} throughout your code (yuck!)

# **Communications Exceptions**

- "The last packet sent successfully to the server was 0 milliseconds ago. The driver has not received any packets from the server."
  - Your server was started with --skip-networking or --bindaddress=127.0.0.1 and your client is remote to the server
- "The last packet successfully received from the server was 25899 milliseconds ago. The last packet sent successfully to the server was 25899 milliseconds ago, which is longer than the server configured value of 'wait\_timeout'"
  - Connections are sitting idle too long in your pool
  - Configure your pool to evict idle connections before wait\_timeout would expire
  - Don't let connections idle much more than the amount of time it takes to create a new one under worst-case

# Devo migrar para MySQL?

# **MySQL Migration Tool**



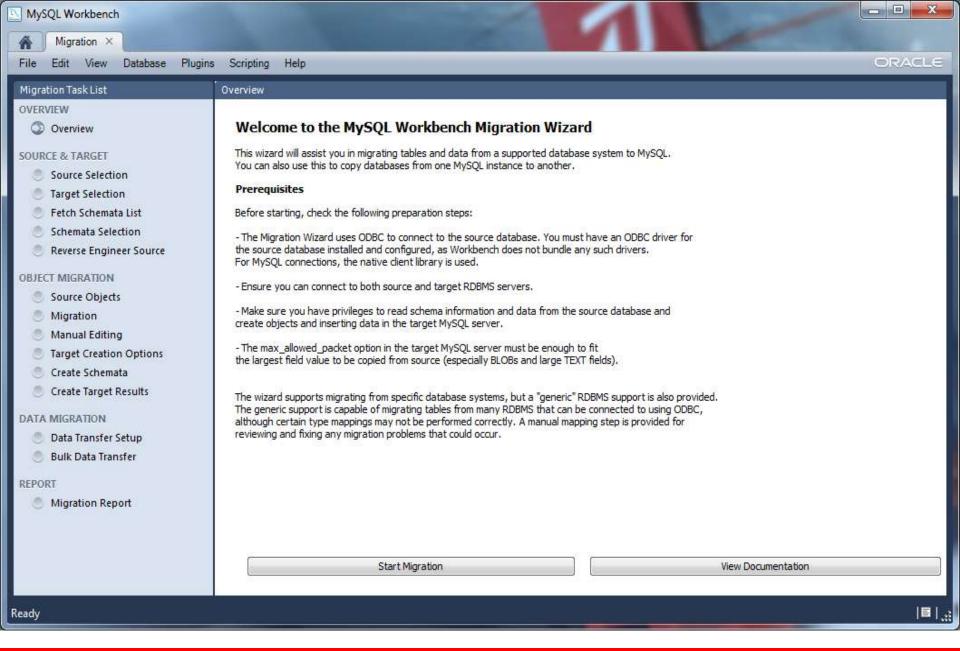
- Wizard para migração de tabelas e dados:
  - MS-SQL Server 2000, 2005, 2008 e 2012.
  - SGBDs em geral via ODBC
  - Mapeamento personalizado (opcional)
  - Integrado ao Workbench open source e gratuito

### Download:

mysql.com/downloads

## Documentação:

dev.mysql.com/doc/workbench/en/wb-migration.html



# Próximos passos com MySQL

### Referências

- Use MySQL with Java http://dev.mysql.com/usingmysql/java/
- Read Connector/J User Manual
   \_http://dev.mysql.com/doc/refman/5.5/en/connector-j.html
- Download MySQL 5.5
   http://www.mysql.com/downloads/mysql/
- Download Free MySQL White Papers
   http://dev.mysql.com/why-mysql/white-papers/
- \_View MySQL Training Courses http://mysql.com/training

# MySQL Treinamento e Certificação

### **Treinamentos**

#### **MySQL DBA**

MySQL Boot Camp Accelerated

MySQL Performance Tuning Boot Camp Accelerated

MySQL for Begginers

MySQL for Database Administrators

MySQL Performance Tuning

MySQL High Availability

MySQL Cluster

#### MySQLDeveloper

MySQL Boot Camp Accelerated

MySQL Performance Tuning Boot Camp Accelerated

MySQL for Begginers

MySQL and PHP Developing Dynamic Web Applicationg

MySQL for Developers

MySQL Advanced Stored Procedures

# Certificações

Oracle Certified Associate, MySQL 5.0/5.1/5.5

Oracle Certified Professional, MySQL 5.0 Developer

Oracle Certified Professional, MySQL 5.0 Database Administrator

Oracle Certified Expert, MySQL 5.1
Cluster Database Administrator

ion ovodlo com

Necessário

[ ] Opcional

education.oracle.com



# **Obrigado!**







