TIM 50 - Business Information Systems

Lecture 16

Instructor: Terry Allen
UC Santa Cruz
11/16/2011

Outline

- Announcements
- MySQL case (cont’d)
- Databases
- Student Presentation ?

Announcements

- Reading for 11/21
  - Messerchmitt 11.2 (pp.333-335)
  - Akamai Case (reader pp.217-236)

- No class 11/23

- Homework #3 out

- Database assignment will be posted later this week

MySQL

What does MySQL make?

How Successful is MySQL?

- Visibility: Fortune magazine, more mentions on www
- Reaction from giants
- Revenue growth 2001 700K, 2002 6.2m, 2003 10m
- Good performance reviews
- Recent SAP alliance
- But Market share tiny:
  - $10 million out of $10 billion market!

Why Success?

- Good Technology
- Competing (large) DBMSs bloated with features most don’t need
- Innovative OSS model

MySQL

How does OSS work?

Two Types of License:

- GPL
  - Free
  - No Support
  - Any software that uses MySQL as a module must itself be released under GPL

- Commercial License
  - Support
  - Could be distributed with non-open source software
  - Not Free:
    - MySQL: Classic $250, Pro $495 (for ~ 50 users)
    - Compare to:
      - MSFT $3150 single proc for 50 users
      - IBM $33000 single proc for 50 users
      - Oracle $40000 single proc for 50 users
Aside: DB's in different software stacks

<table>
<thead>
<tr>
<th>General Software Stack</th>
<th>ERP Software Stack</th>
<th>Web Application Software Stack</th>
<th>Banking Software Stack</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>SAP or Oracle, Adaba, etc.</td>
<td>Proprietary Business Logic</td>
<td>Proprietary Banking App.</td>
</tr>
<tr>
<td>Middleware (DBMS)</td>
<td>Oracle or MySQL, IBM, etc.</td>
<td>MySQL or other DB</td>
<td>Oracle or other DB</td>
</tr>
<tr>
<td>Operating System</td>
<td>MS Windows or other OS</td>
<td>Linux or other OS</td>
<td>IBM z/OS or other OS</td>
</tr>
</tbody>
</table>

- Which companies are competitors?
- Which are complimentary to each other?
- Which are both?

MySQL

- Which segments of market is MySQL strong in?
  - Large Companies or Small Companies?
  - Web applications or Critical Enterprise data?

- Why would a major enterprise want to pay so much more for an Oracle or IBM DB?

MySQL: market

<table>
<thead>
<tr>
<th>Small 20%</th>
<th>Medium 30%</th>
<th>Large 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise wide data 90%</td>
<td>Microsoft</td>
<td>Oracle IBM Reliability Scalability Support Longevity</td>
</tr>
<tr>
<td>Web Sites 10%</td>
<td>MySQL Cost</td>
<td></td>
</tr>
</tbody>
</table>

How should MySQL grow in order to meet its stated goal of getting to $100 million in revenue?

MySQL: Growth Strategy

- Many of these customers already using MySQL with websites
- Less emphasis on global organization
- Leverage SAP alliance
- Up against Microsoft

MySQL: Growth Strategy

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<td>Maybe?</td>
</tr>
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Database Management
Databases & MySQL Quiz

1) In a relational table, each record is represented by
   a) a row   b) a column   c) either a row or a column

2) Who are the top three RDBMS competitors of MySQL?

3) Linux is
   a) a proprietary operating system
   b) a proprietary DBMS
   c) an open source operating system
   d) an open source DBMS

Remember: Data properties

<table>
<thead>
<tr>
<th>Field name</th>
<th>Table name</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMPLOYERS</td>
<td>EMPLOYERS</td>
</tr>
<tr>
<td>EMPL_ID</td>
<td>EMPL_NAME</td>
</tr>
<tr>
<td>EMPL_NAME</td>
<td>EMPL_POSITION</td>
</tr>
<tr>
<td>DEPT_ID</td>
<td></td>
</tr>
</tbody>
</table>

The Relational Model

<table>
<thead>
<tr>
<th>NAME</th>
<th>POSITION</th>
<th>DEPARTMENT</th>
<th>DEPT. ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alice</td>
<td>Manager</td>
<td>IT</td>
<td>San Jose</td>
</tr>
<tr>
<td>Bob</td>
<td>Programmer</td>
<td>IT</td>
<td>San Jose</td>
</tr>
<tr>
<td>Chris</td>
<td>Manager</td>
<td>Finance</td>
<td>New York</td>
</tr>
<tr>
<td>David</td>
<td>Accountant</td>
<td>Finance</td>
<td>New York</td>
</tr>
</tbody>
</table>

- Not all data are stored in the same table
- Avoid data replication/redundancy
- Enable faster/efficient computations over data

The Relational Model

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<th>DEPT_ID</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IT</td>
<td>San Jose</td>
</tr>
<tr>
<td>2</td>
<td>Finance</td>
<td>New York</td>
</tr>
</tbody>
</table>
The Relational Model

- **EMPLOYERS**
  - EMP_ID
  - EMP_NAME
  - EMP_POSITION
  - DEPT_ID
  - Alice Manager 1
  - Bob Programmer 1
  - Chris Manager 2
  - David Accountant 2

- **DEPARTMENTS**
  - DEPT_ID
  - DEPARTMENT
  - DEPT_ADDRESS
  - 1 IT San Jose
  - 2 Finance New York

Primary Keys

Secondary Key

SQL interface

- SQL (Structured Query Language)
- Forms an "interface" between an application and the DBMS
  - For manipulating, and extracting data from database
  - Standardized, not vendor specific

- Encapsulates various internal details
  - Data partitioning and replication
  - Host mapping
  - File representation
  - etc.

Database Operations

Application Logic and Tables

- **EMPLOYERS**
  - EMP_ID
  - EMP_NAME
  - EMP_POSITION
  - DEPT_ID
  - Alice Manager 1
  - Bob Programmer 1
  - Chris Manager 2
  - David Accountant 2

- **DEPARTMENTS**
  - DEPT_ID
  - DEPARTMENT
  - DEPT_ADDRESS
  - 1 IT San Jose
  - 2 Finance New York

- **EMPL_DEPT**
  - EMP_ID
  - EMP_NAME
  - EMP_POSITION
  - DEPT
  - ADDRESS
  - 100 Alice Manager IT San Jose
  - 101 Bob Programmer IT San Jose
  - 102 Chris Manager Finance New York
  - 103 David Accountant Finance New York

Application Logic (programming language)

SQL

Database

JOIN
Example - Travel Agency

Two applications might try to access & update the same resource concurrently.