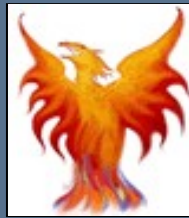


# Firebird, Fyracle & WebOS



Building & running enterprise applications with Firebird



GigaCon, March 2007



# Agenda

- **An introduction to Firebird**
- Fyracle: Oracle-mode Firebird
- A short history of web applications
- Morfik WebOS: 'Web 2.0' compiler & IDE



# A summary of Firebird



- **Firebird is an open source relational database system**
- Very popular with Windows and Delphi developers (50% of users)
- Runs on many platforms: Windows, Linux, OSX, Solaris, HP-UX, etc.
- Continuation of Interbase code base
- Large installed base, estimated at about 3 million for all versions combined
- Impressive features, exciting roadmap



# Five good reasons to pick Firebird as your DB



1

Capable: fast, reliable, scales

2

Compact

3

Easy

4

Free

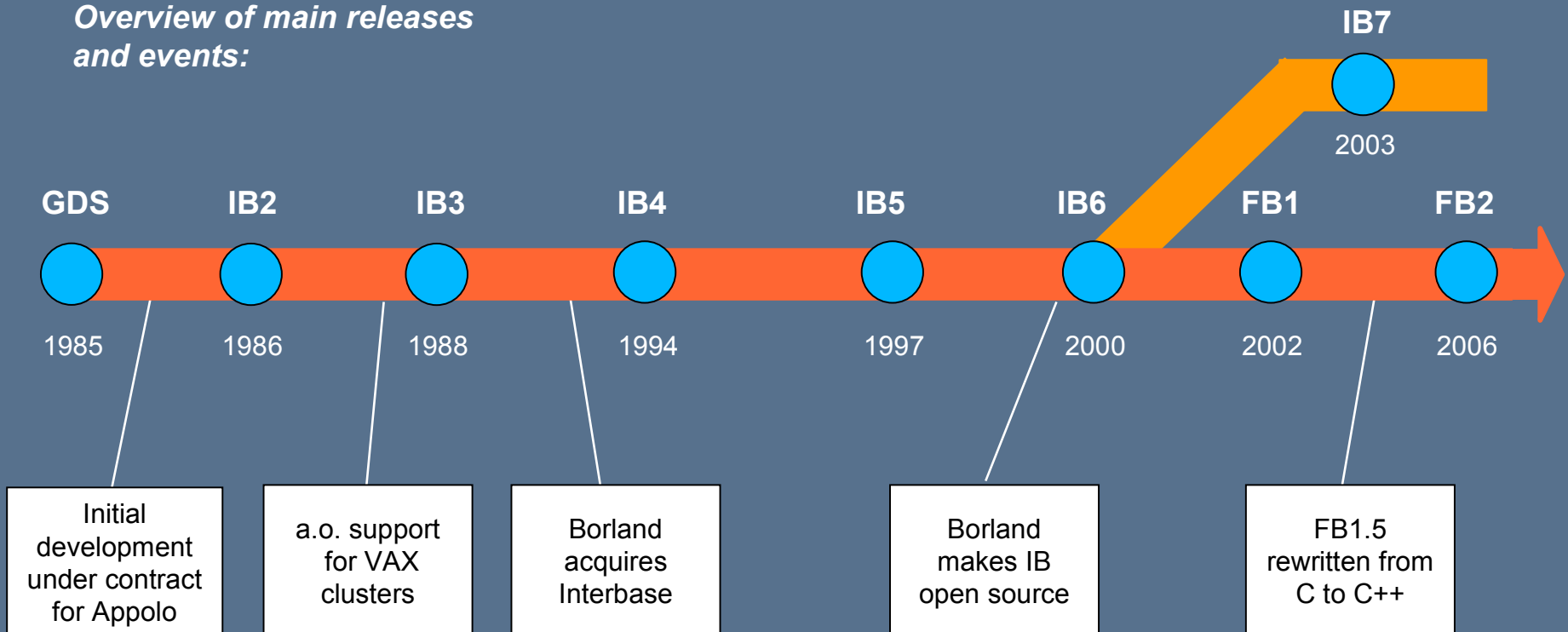
5

Community



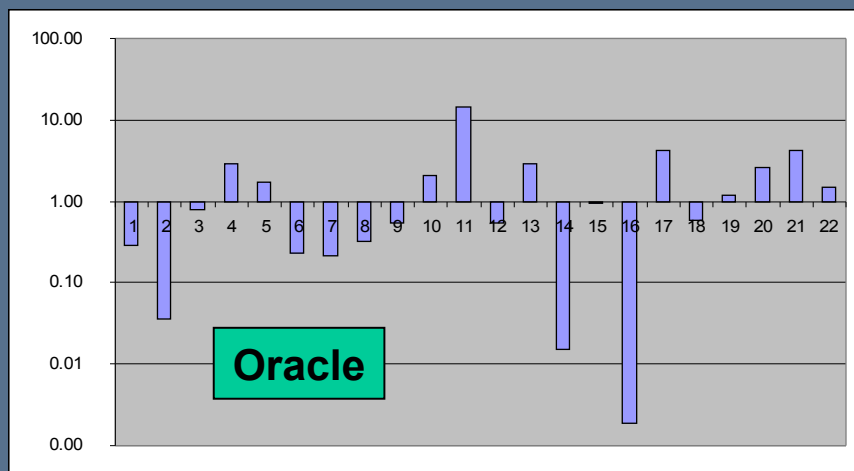
# Firebird has a 20+ year track record

## Overview of main releases and events:

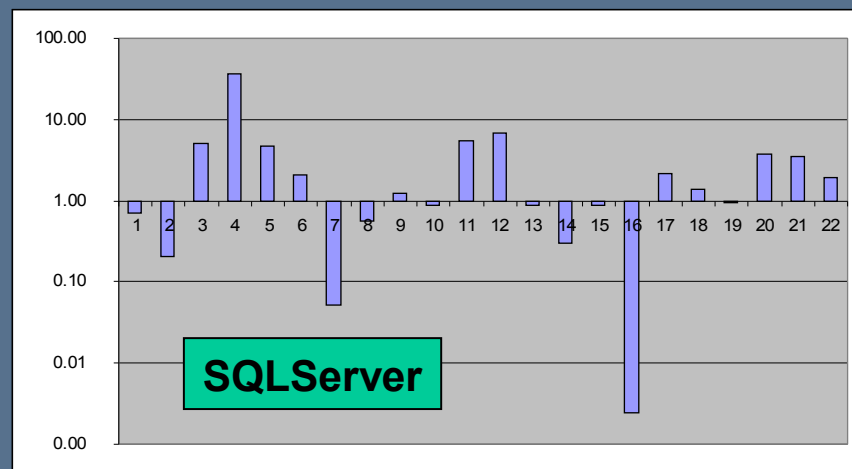
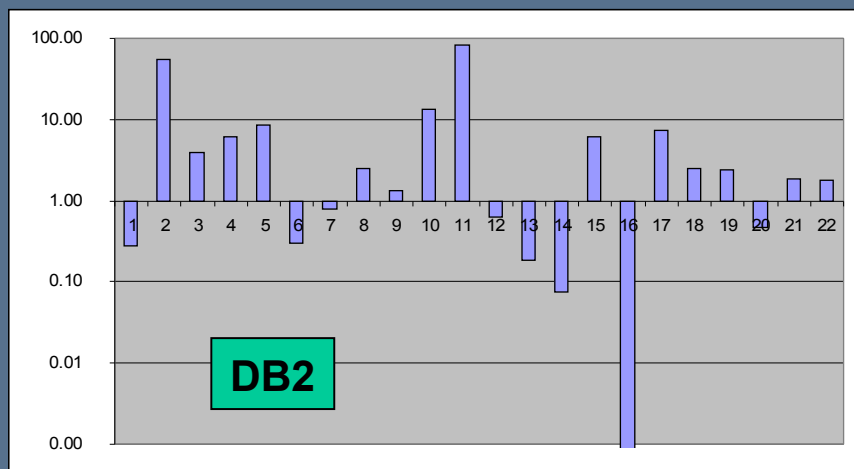




# Firebird has similar performance to leading systems

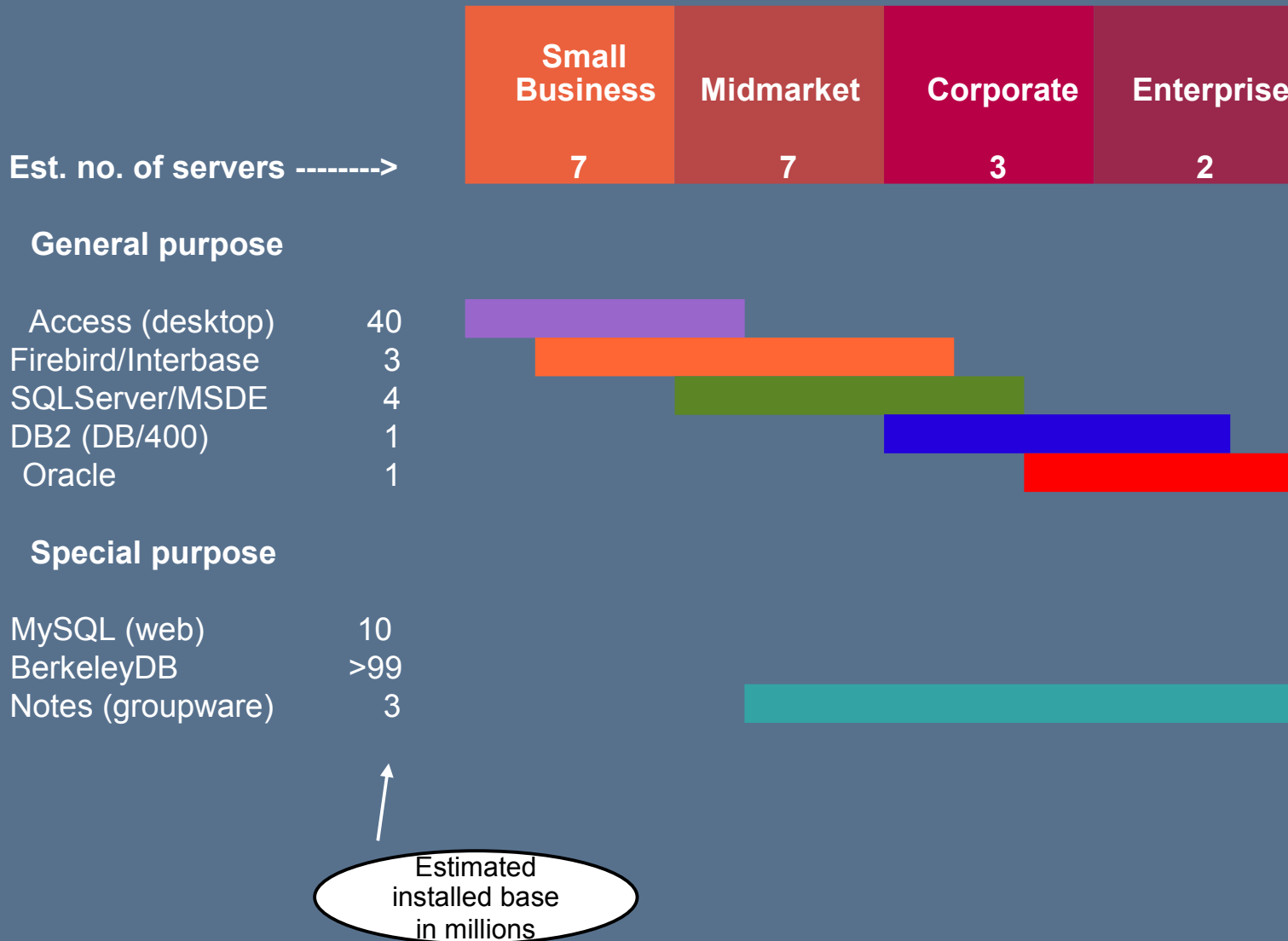


- Graphs show relative performance on the TPC-R benchmark tests
- Figures >1 mean that Firebird is faster
- Figures <1 mean that Firebird is slower





# A view of the database market





# Agenda

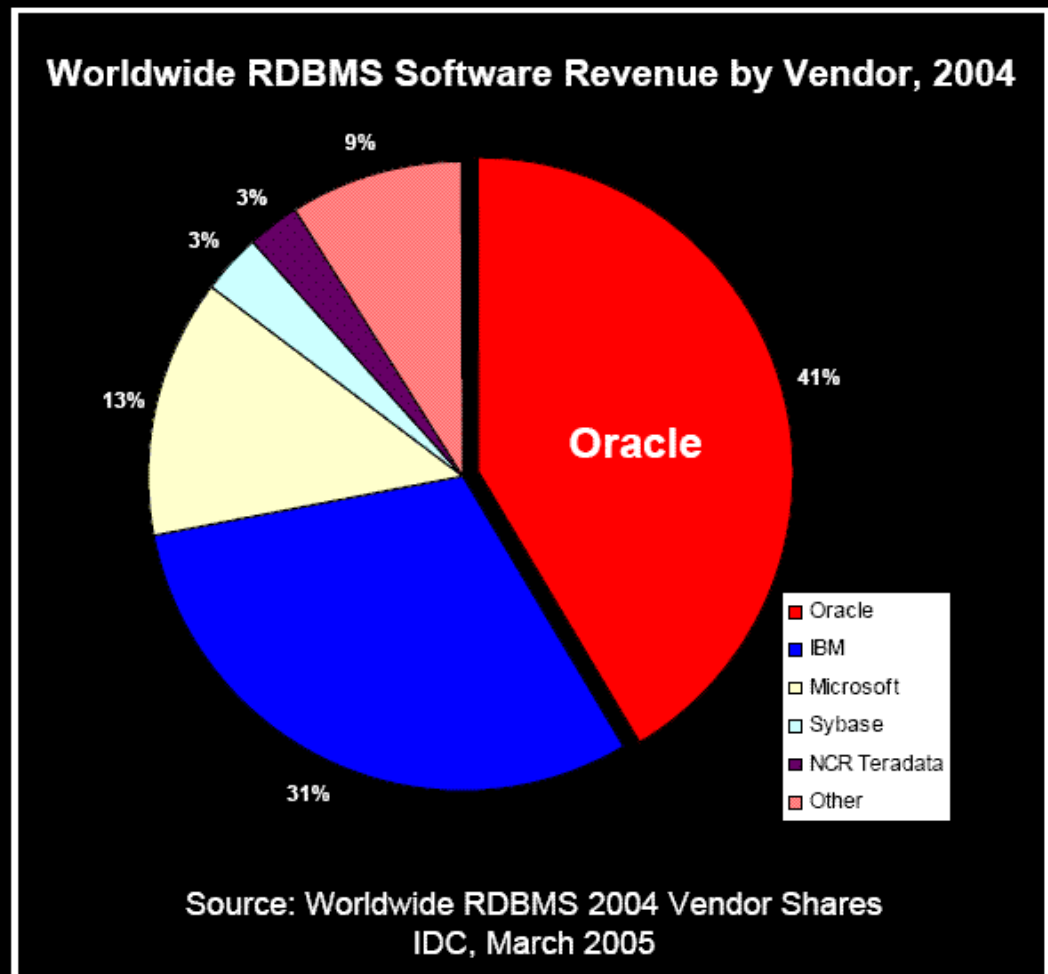
- An introduction to Firebird
- **Fyracle: Oracle-mode Firebird**
  - Why do oracle-mode?
  - Oracle-mode: the issues
  - What is inside Fyracle?
  - Where to download
- A short history of web applications
- Morfik WebOS: 'Web 2.0' compiler & IDE



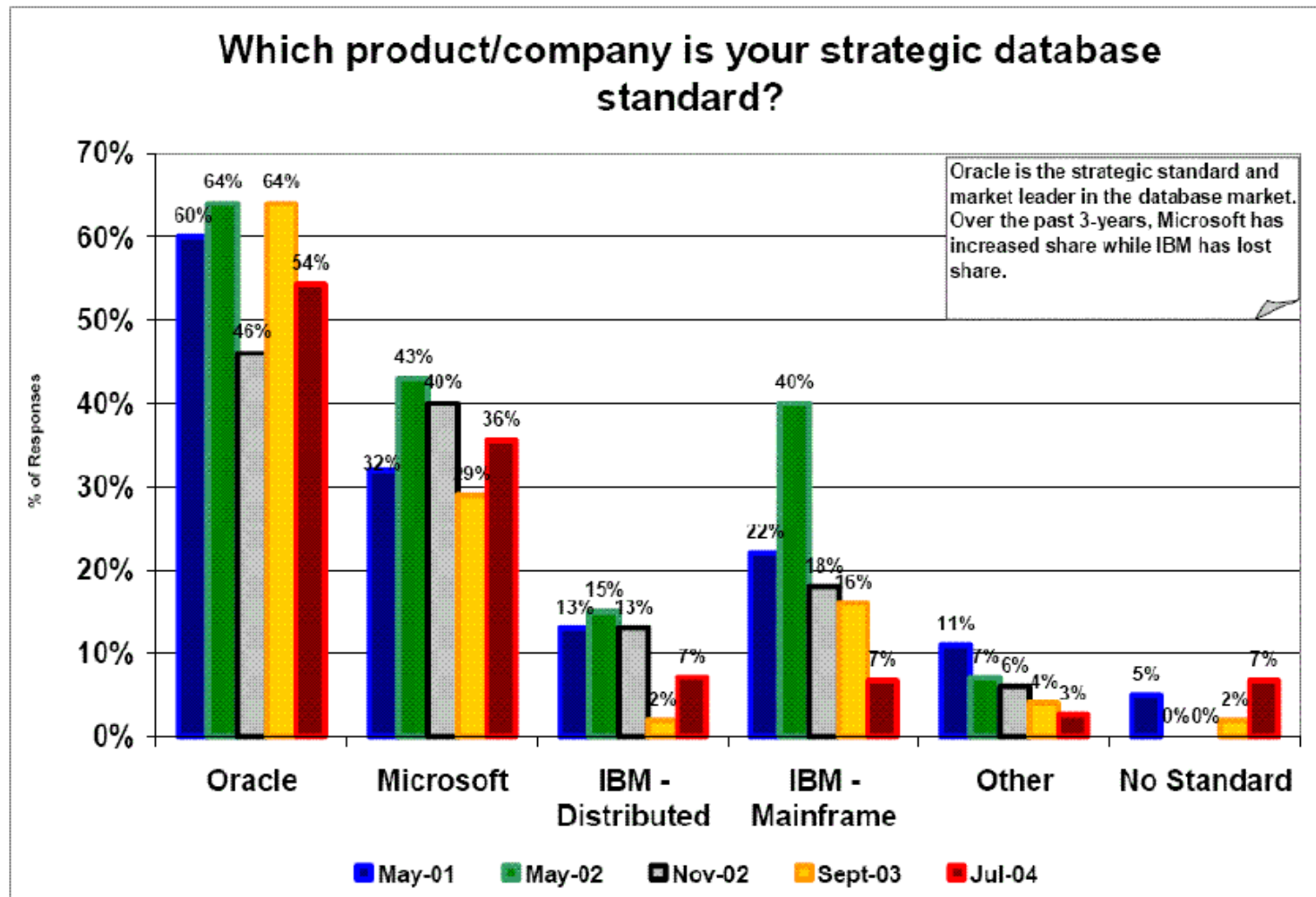
# Oracle's share of the RDBMS market continues to grow

## Market Facts<sup>1</sup>

- Oracle has a 41.3% market share
- Oracle outpaced the industry for the second year in a row
- Oracle experienced 14.5% growth as compared to 12% for the industry as a whole
- Oracle increased its lead over its largest competitor, IBM



# Oracle is the strategic database of choice



Source: Morgan Stanley CIO Survey, July 2004.

Enterprise Technology - August 11, 2004

ORACLE

[Slide 4]



# The Oracle-mode opportunity



Firebird

Oracle

- Oracle perceived as the "gold standard" of high end needs
- Through oracle-mode, FB can show how capable it really is
- Good opportunities:
  - Upgrade from 8i
  - Demo disks
  - Mid-market app's

- Oracle pushing into the mid-market
- ISV network pushed to follow move into the midmarket
- Fyoracle stronger competitor to SQLServer than SE, XE
- Good opportunities:
  - 'Uncrippled' XE
  - Easy to use, deploy

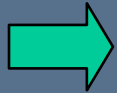


# Oracle-mode databases

- **SapDB:** 1995, special purpose to run SAP R3
- **Fyracle:** 2003, generic
- **Ingres:** 2004, “million dollar contest” – abandoned ?
- **Postgres EDB:** 2005, generic – aims for MySQL market ?



# Oracle-mode issues



- **The relational engine:** “SQL issues”
- **Stored procedures:** PL/SQL, Java, dotNet, C/C++
- **Packages:** user packages, standard packages
- **Connectivity:** OCI, ODBC, JDBC, dotNET
- **Tools:** SQL\*Loader, SQL\*Plus, ...



# “SQL issues”

- **Datatypes**

- Maximum integer size (128 bits?), localization, blob's, domains, arrays, ...

- **Views**

- access control, views-on-views, updateable views, “with check option”, ...

- **Triggers**

- before, after, instead of, access to :old & :new, constraints, body language, ...

- **DML**

- sub-queries, named cursors, hierarchical queries, built-in functions, ...

- **Transactions**

- ACID, MVCC, save points, autonomous transactions, two-phase commit, ...



# Overview of oracle-match at the basic level

*Match with Oracle's way of doing things*

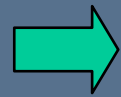
	Firebird 1.5 native	Firebird Fyrcle	Postgres EDB	SapDB Oracle mode	Ingres Oracle mode
<b>Datatypes</b>					
<b>Views</b>					
<b>Triggers</b>					
<b>DML functionality</b>					
<b>Transactions</b>					

*Overall fit:*





# Oracle-mode issues



- The relational engine: “SQL issues”
- **Connectivity:** OCI, ODBC, JDBC, dotNET, PHP
- Stored procedures: PL/SQL, Java, dotNet, C/C++
- Packages: user packages, standard packages
- Tools: SQL\*Loader, SQL\*Plus, ...










# The issues: Connectivity



Which of the following are supported?

- **OCI**  
The OCI library is the native C/C++ call interface for Oracle. Its function is similar to the function of the 'fbclient' library for Firebird. 
- **ODBC**  
Like it or not, ODBC is still the workhorse of DB connectivity. Most VB/Delphi applications that were written for Oracle connect using ODBC. 
- **Java**  
In the last five years Java has become the centerpiece of enterprise class application servers. Oracle even bundles its own J2EE app server. 
- **dotNET**  
Although still not nearly as popular as Java, dotNet is steadily gaining ground. Oracle is supporting it and more and more applications will require a dotNET driver. 
- **PHP**  
PHP is beating both dotNET and J2EE for developing web app's. Oracle is bundling a special build of PHP with its latest releases. 



# The issues: Stored Procedures



Which of the following are supported?

- **PL/SQL**  
PL/SQL is the core stored procedure language of Oracle databases. It is estimated that there are >250K PL/SQL developers in the world.
- **Java**  
Increasingly stored procedures are shifting from PL/SQL to Java, tapping into the large pool of J2EE java programmers.
- **dotNET**  
With Microsoft making a major push for the enterprise customer using dotNET integration as its lever, Oracle has pre-empted and added dotNET support.
- **C/C++**  
Despite having been around for over 25 years, C/C++ is still the most popular language on the planet and used in Oracle for fancy custom interaction with the environment.





# The issues: PL/SQL



## ■ Language design

PL/SQL is a language from the Algol-family, not the C-family, and uses lexical scoping:

- Are block level variables supported?
- Are local procedure definitions allowed?
- Can cursor definitions be parameterised?



## ■ Complex datatypes

PL/SQL has become ever more object oriented:

- Are collections supported?
- Are (ref) cursors supported?



Fyracle 0.8.12

## ■ Support for packages

PL/SQL can be organised in compilation units, called packages.

- Are packages supported?
- Are package local, global variables implemented?





# The issues: Tools



- Oracle comes with a large bundle of management tools. Most of these tools are 'automatic management' tools for the zillions of configuration settings and DBA tasks. Equivalents are unnecessary for Firebird, because it was designed to be self-managing.
  
- Two tools are of wider importance though:
  - **SQL\*Plus** is a utility like Firebird's ISQL. However, it is far more programmable, a bit like our QLI, and is often used for all sorts of scripts that automate tasks.
  - **SQL\*Loader** is a programmable bulk loader tool. There is no direct Firebird equivalent. Like Plus, Loader is used often in scripts.
  
- Oracle did not have its own GUI tool (like FB). Popular choices from third parties are **Toad** and **Tora**. Recently, Oracle has released its own (free) GUI tool, code name "**Raptor**".





# Firebird has the most complete oracle-mode

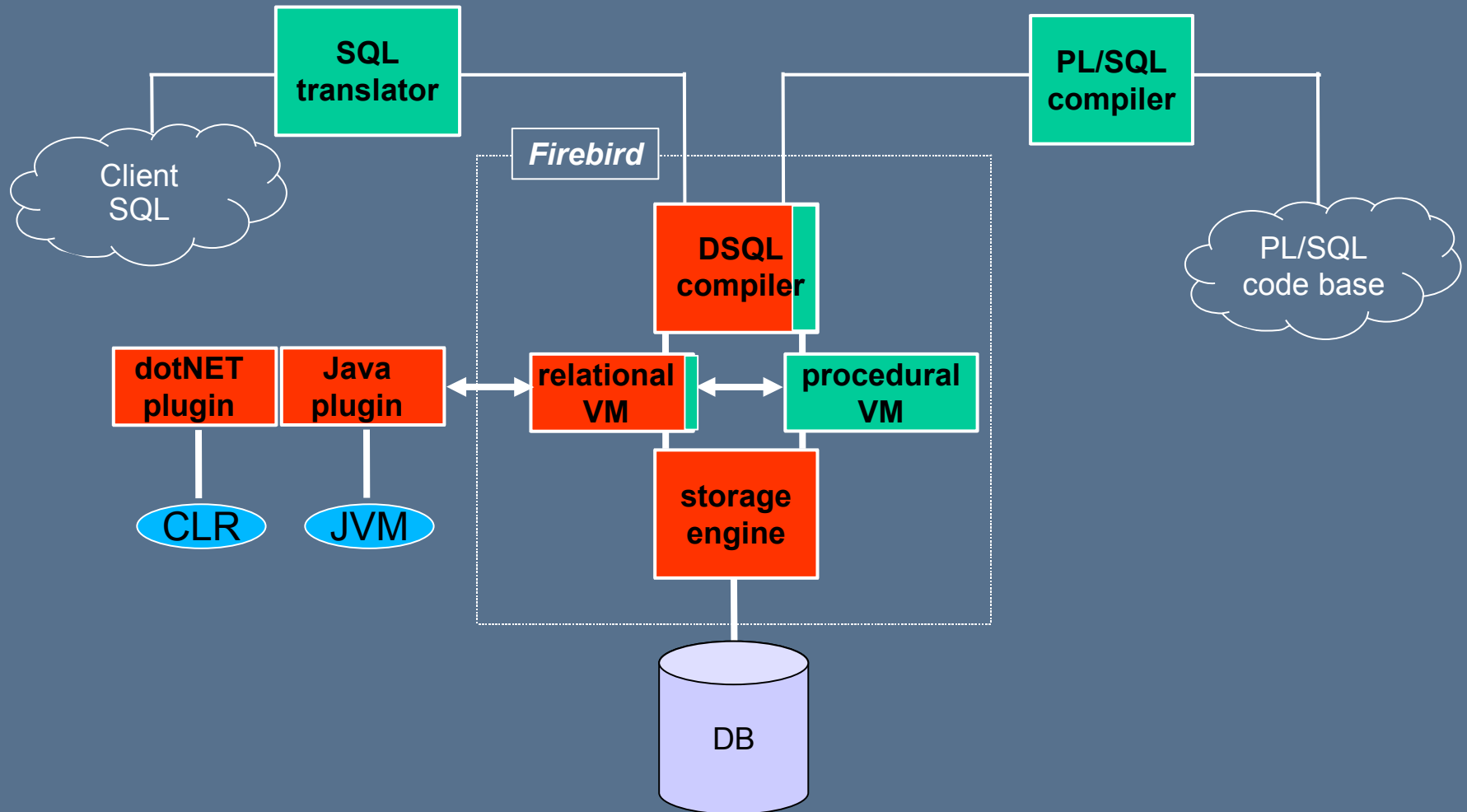
	Firebird Fyracle	Postgres EDB	SapDB Oracle mode	Ingres Oracle mode
"SQL"	●	●	◐	◑
Connectivity	●	◐	◑	◑
Stored procedures	●	◑	○	◐
Packages	◐	◑	○	○
Tools	◐	◑	?	?

*Overall fit:*



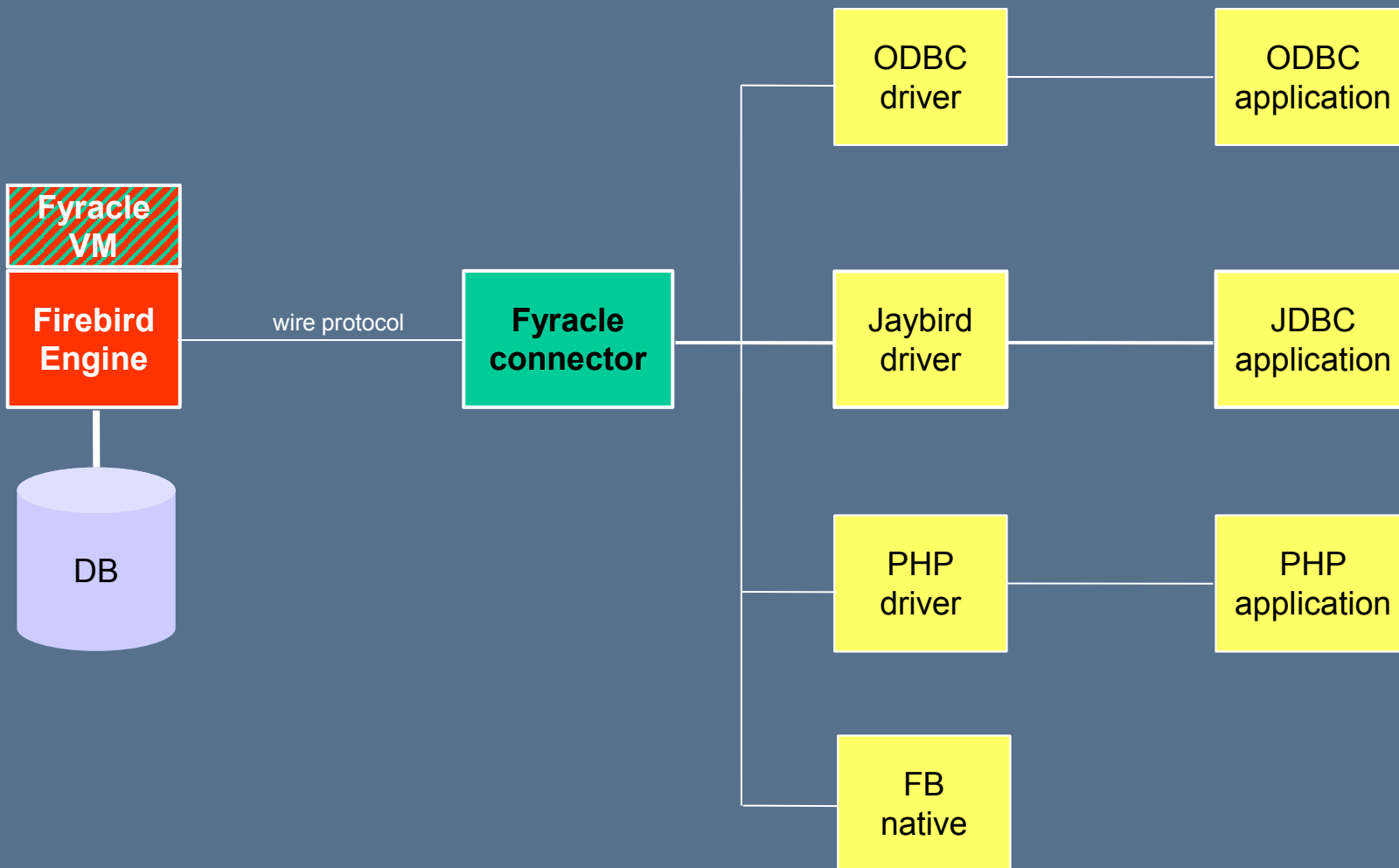


# How does Fyracle work?





# Connection options





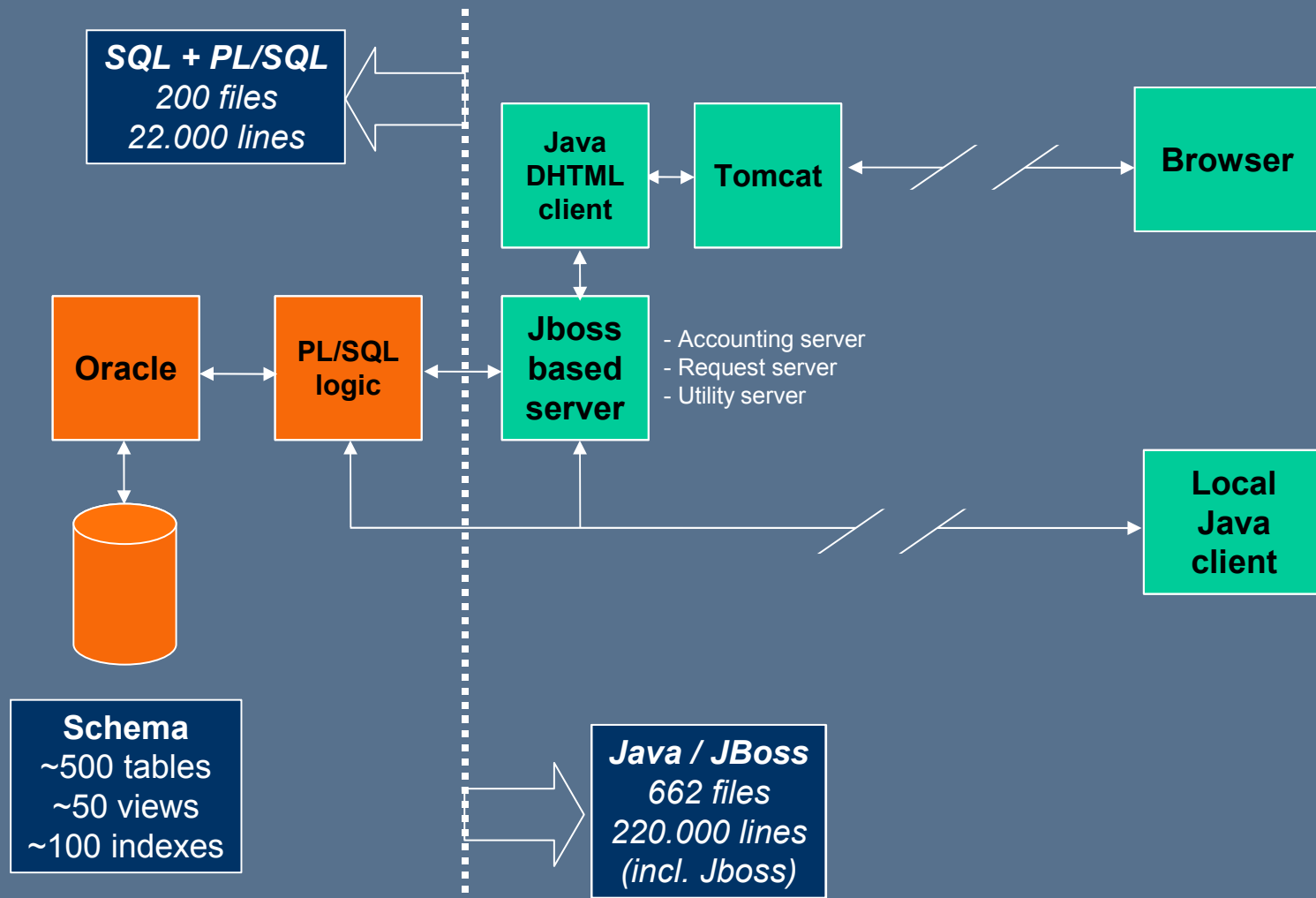
# Example non-trivial Oracle application: Adempiere

- **“Adempiere” is an open-source ERP+CRM package based on “Compiere”**
  - ERP = Enterprise Resource Planning
  - CRM = Customer Relation Management
- **Currently one of the most popular open-source packages of this kind**
  - >800.000 downloads from Sourceforge
  - Usually in the Top-10 most active list
  - > 50 active installations
  - > 10 implementation partners (VAR's)



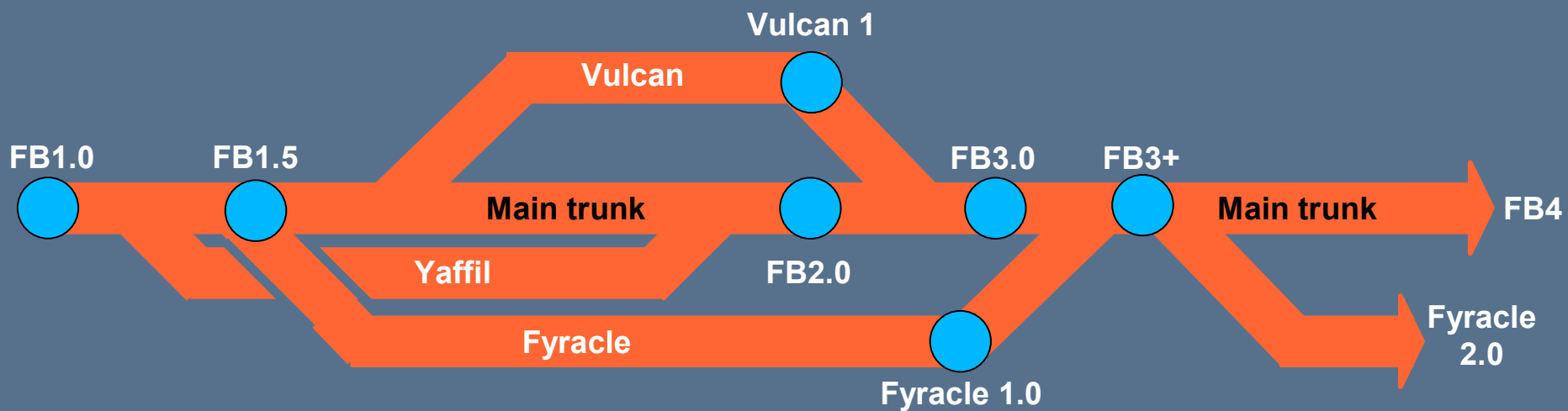


# Adempiere basic design





# Outlook: high level roadmap





# Where to download ?

- **Download at:**

<http://www.janus-software.com>

- **Cost**

deployment:	FREE
restricted compiler	FREE
full compiler	€ 50



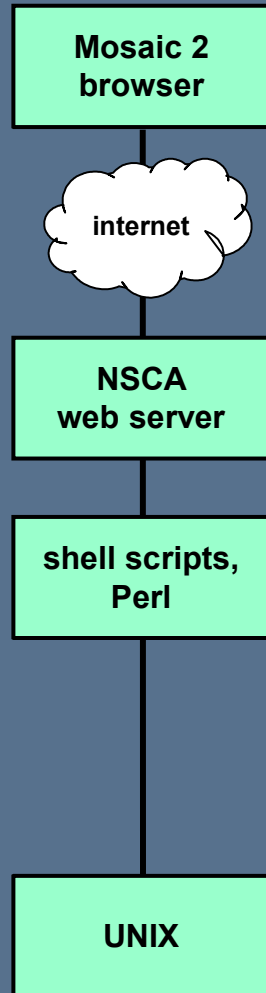


# Agenda

- An introduction to Firebird
- Fyracle: Oracle-mode Firebird
- **A short history of web applications**
- Morfik WebOS: 'Web 2.0' compiler & IDE



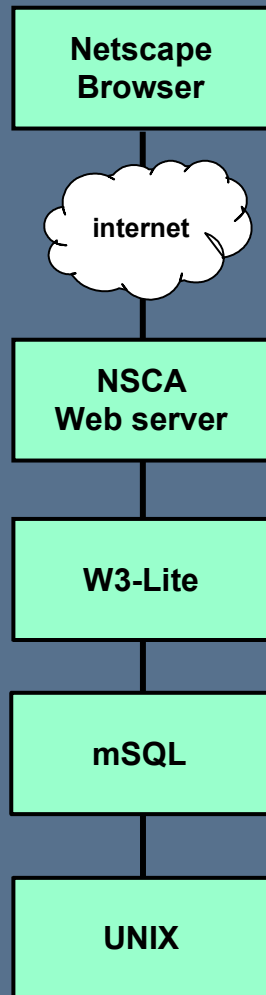
## 1992..4: The basics evolve



- The HTTP protocol is extended with the POST method
- The HTML language is extended with the <FORM ..> tag
- The web server is extended with the CGI api specification
- Typical CGI programs are Unix shell scripts or Perl scripts
- No database typically used!
- First e-Commerce application appears in the first months of 1995



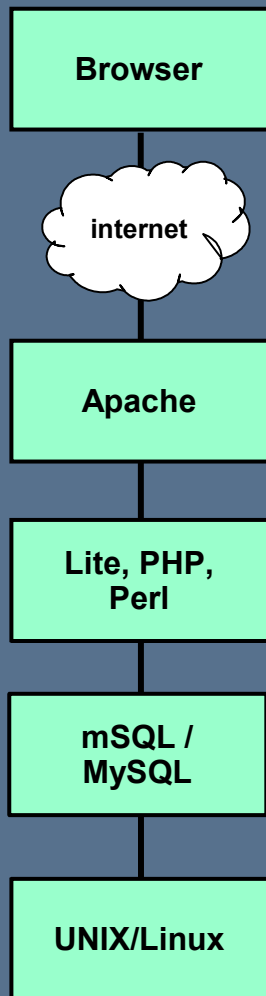
# 1995..96: David Hughes invents LAMP



- Davis has an itch to scratch: a universal client for the Athena network monitoring software
- First uses Postgres95 with a SQL-to-QUEL preprocessor; this solution is too 'heavy'
- Then he writes a simple back-end to the preprocessor, thus creating mSQL, a mini SQL server
- Invents the embedded 'Lite' language to easily generate html in response to requests
- Releases the code under a restrictive open source license in April 1996
- mSQL quickly gains traction as a lightweight database in the emerging Linux world



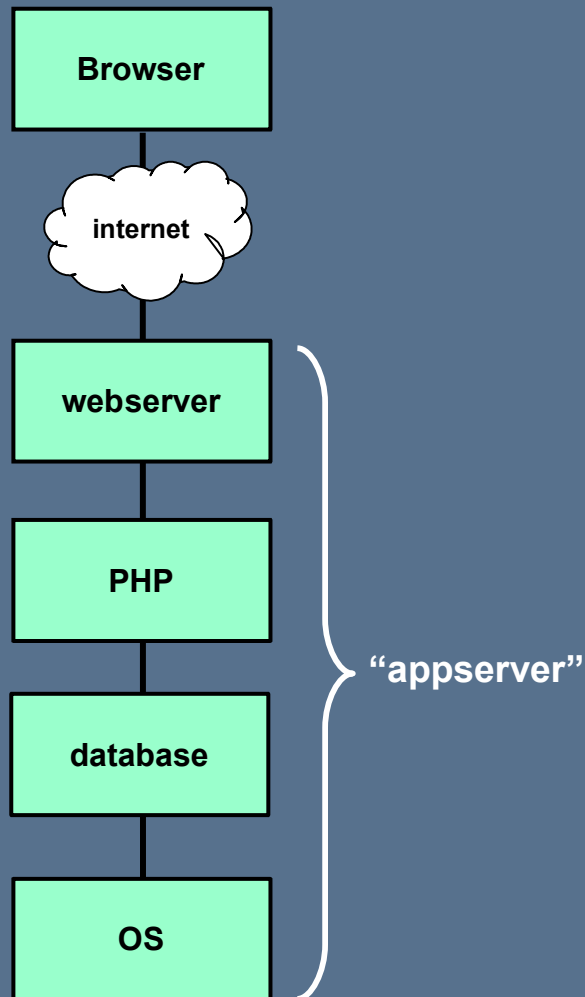
## 1997..98: MySQL, PHP/Perl and “LAMP”



- **Monty Widenius is a mSQL user but finds performance lacking (mSQL did not support indexes)**
- **MySQL is created: an API and SQL compatible clone of mSQL, with support for indexes, otherwise just as basic; license LGPL**
- **PHP starts as a set of Perl scripts in 1995; it remains a one man project for several years. PHP version 3 combines the best elements of Perl and Lite.**
- **In the summer of 1998, c't journalist Michael Kunze is the first to use the acronym “LAMP”; LAMP becomes a popular technology in Europe**
- **Linux becomes a popular platform for running web servers, mainly Apache**



## 1999..2004: LAMP becomes mainstream

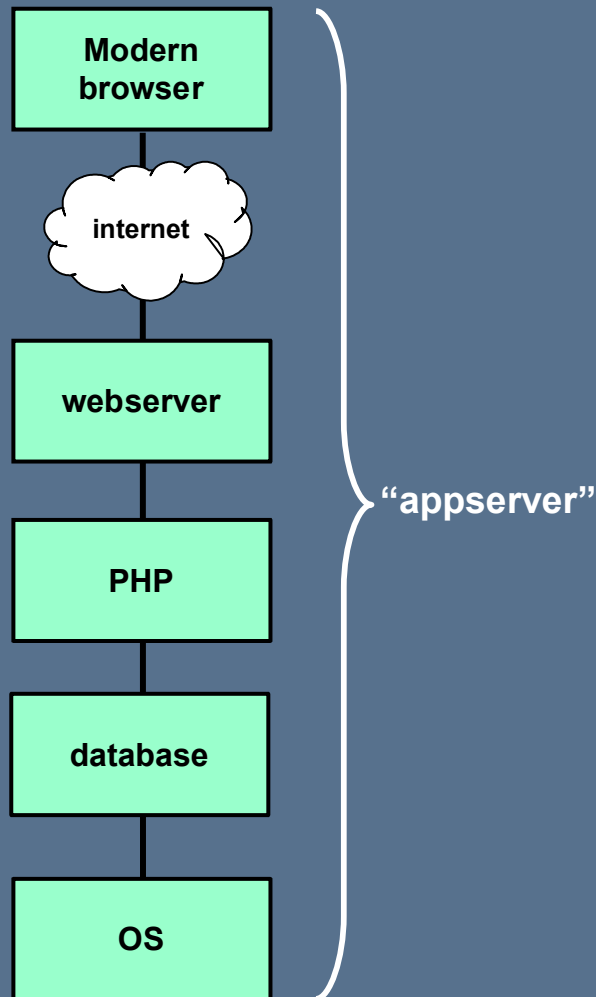


- Tech publisher O'Reilly notices the popularity of LAMP in Europe and starts to promote the concept in the US; ONLamp website started
- PHP gets rewritten twice (PHP4, PHP5) and becomes the most popular scripting choice
- LAMP programming is much easier/faster than e.g. J2EE or ASP.Net; Popularity skyrockets
- MySQL changes its license policy. The default database of PHP becomes SQLite
- Oracle and IBM start supporting PHP as part of their database offerings
- A large pool of open source PHP applications is developed





## 2005..6: client side processing, AJAX



- After many years of work, browsers are becoming more standards compliant and powerful
  - Fast JavaScript
  - Cascading Style Sheets
  - Document Object Model
  - Asynchronous HTTP requests
- Google proves that “good enough” user interfaces can be made using modern browsers (Google maps, Gmail)
- “AJAX” becomes next buzzword
- But...
  - with increasing power, some of the simplicity that made LAMP attractive is unfortunately lost

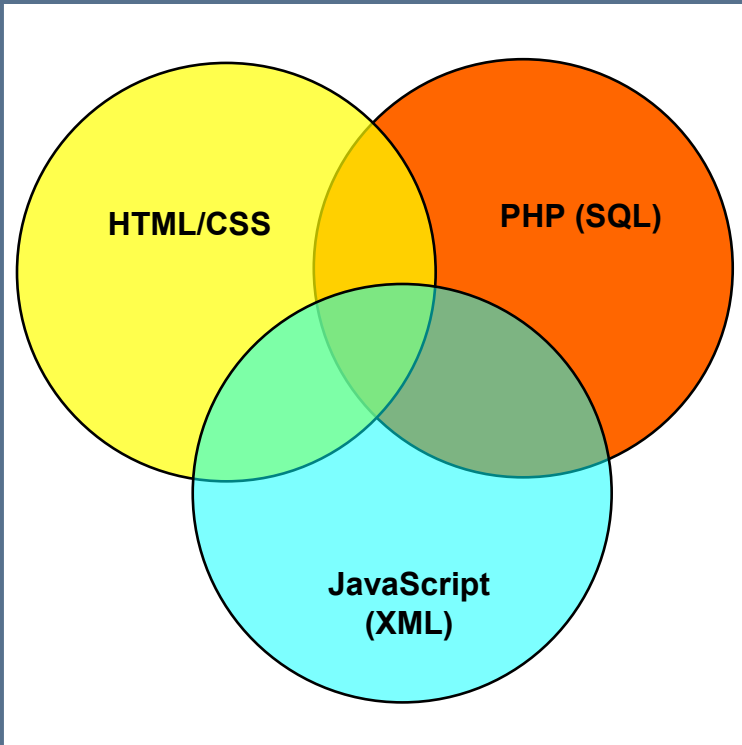


# Agenda

- An introduction to Firebird
- Fyracle: Oracle-mode Firebird
- A short history of web applications
- **Morfik WebOS: ‘Web 2.0’ compiler & IDE**
  - What problem are we trying to solve?
  - What solutions do exist?
  - Introducing “Morfik 07”
  - Where to download?



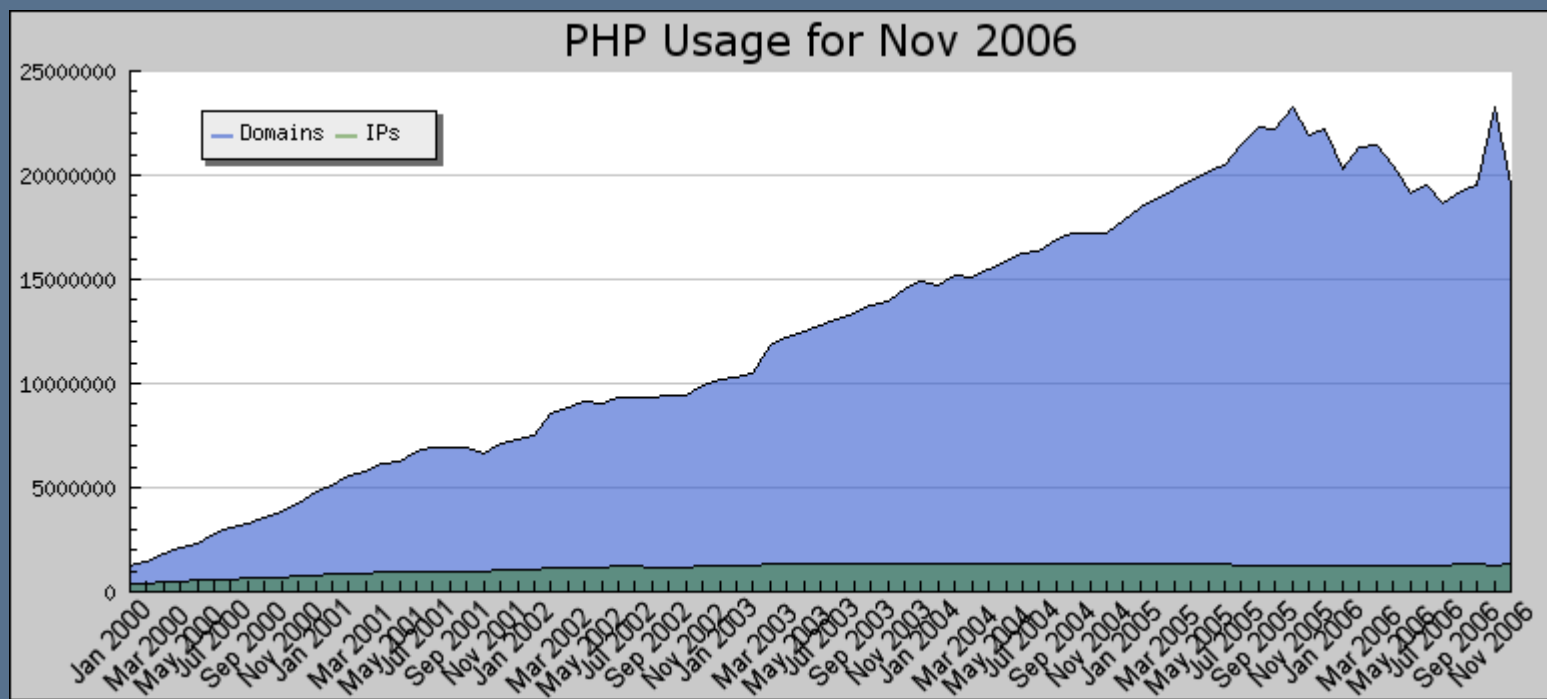
# What is the problem of LAMP/AJAX?



- The LAMP model is not as easy as it once was and combines several languages & technologies:
  - HTML/CSS
  - PHP (often containing SQL)
  - JavaScript (often handling XML data)
- Lots of scope for unmaintainable code:
  - Mixed code snippets
  - Unrelated snippets in a single file
  - One bit of functionality spread out over several files
- Requires experienced developers to get right



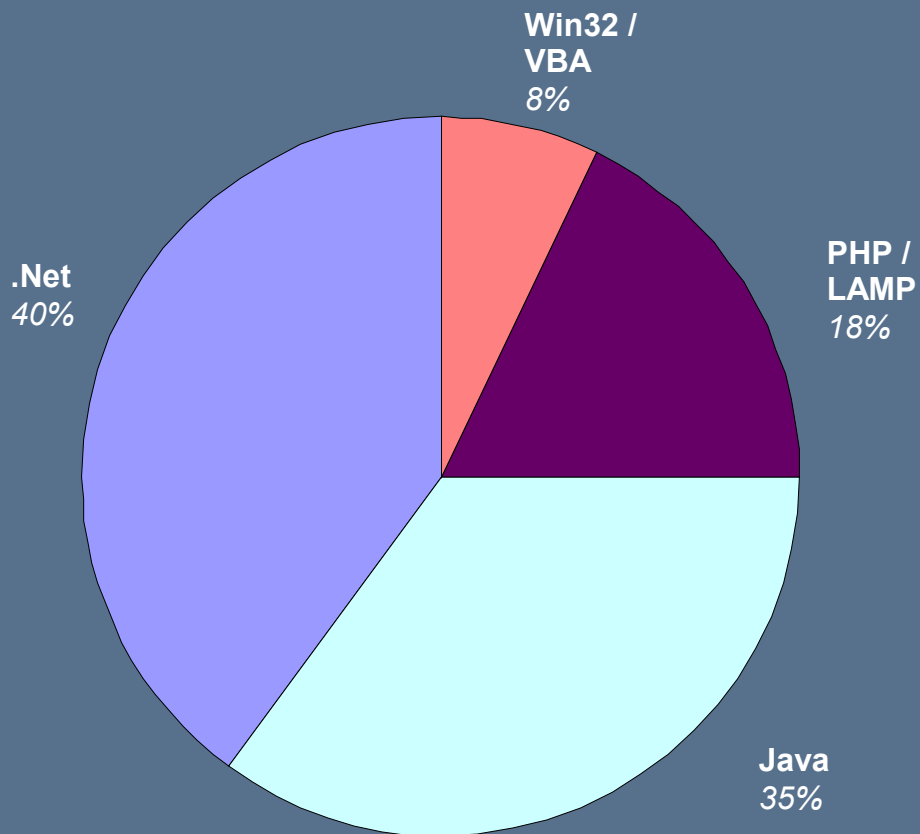
# Is this why PHP use is falling?





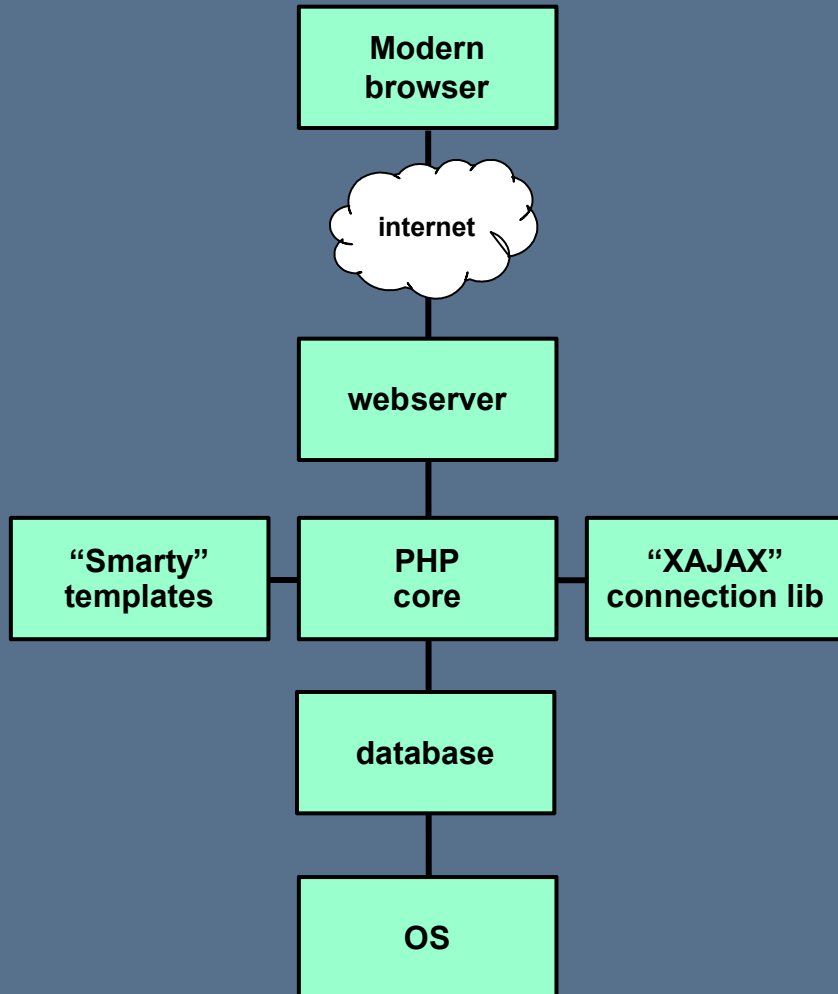
Also, PHP/LAMP is little used for intranet apps...

**Technologies used to access Salesforce.com**  
*(% of API access to the system)*





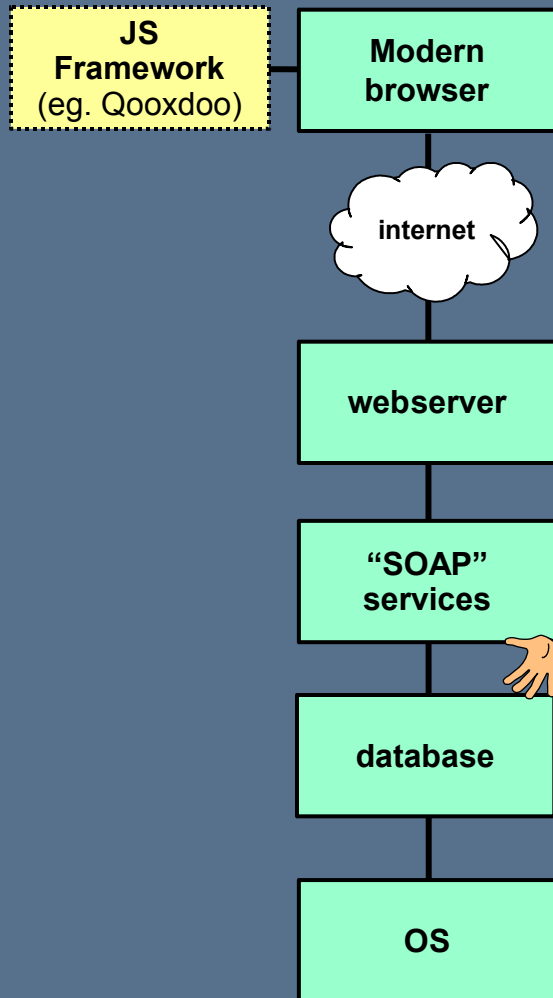
# Solution 1: get organised & experienced



- In 2005 a few libraries have become popular that separate the various elements into maintainable units
- The HTML and PHP code can be separated more by using “templating engines”. A popular choice is “Smarty”.
- The JavaScript code, especially the AJAX part, can be moved into a framework library. A popular choice is XAJAX.
- Raw PHP is used for worker pages. The object orientation of PHP5 enables better layering of this code.
- Using this route makes the code more maintainable, but...
- ...the demands on the experience of the developer are even bigger, with two more frameworks to learn



## Solution 2: use a big Javascript framework



- Very recently client Javascript libraries / frameworks have become available, such as Qooxdoo
- These libraries are similar in style to libraries like:
  - Qt
  - SWT
  - GTK
- The developer writes the entire application in Javascript, using the library for widgets and for communication with the server
- The server is programmed independently
- Whilst interesting, it has major drawbacks
  - No help in reducing detail / complexity
  - Requires learning the framework
  - Requires learning advanced Javascript



## Solution 3: use a compiler / app generator

Application  
design



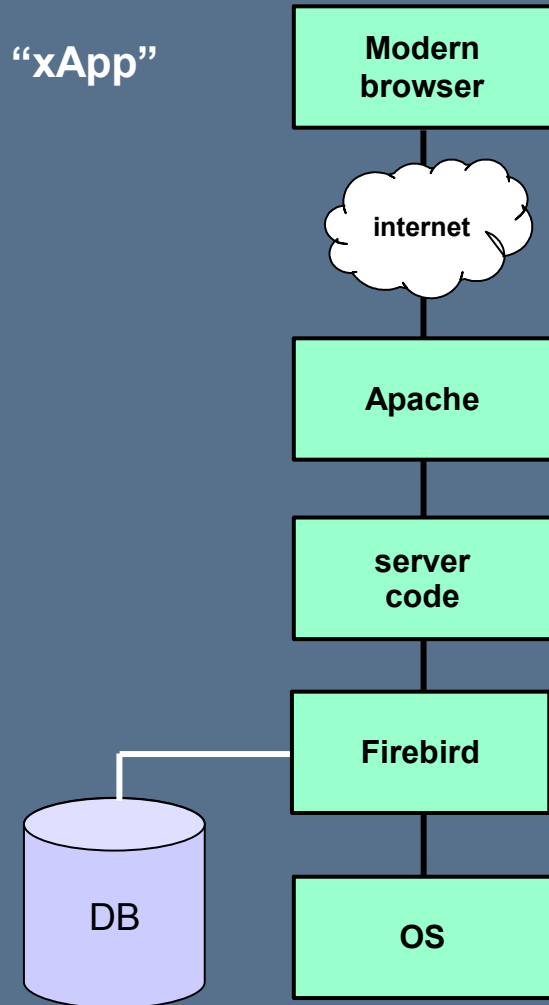
**Morfik 07  
Compiler + IDE**

input:  
forms, tables, code

output:  
javascript code +  
prebuilt server



“xApp”

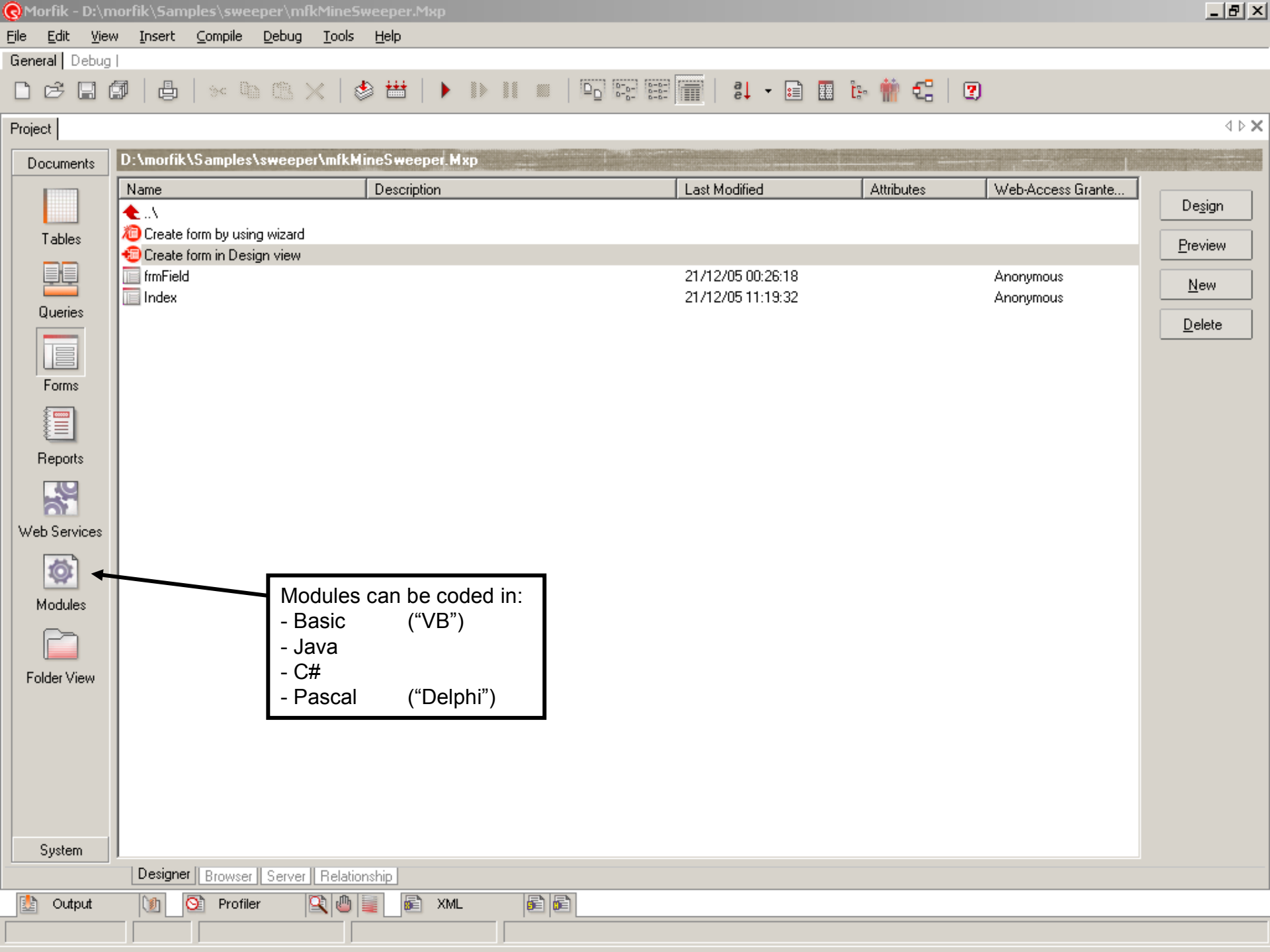




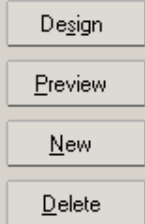


# Introducing Morfik

- Morfik pre-beta's first demonstrated at the Web 2.0 conference in San Francisco in October 2005 and was made available to 3.000 pioneers
- First release of "Morfik 07"
  - March 23rd, 2007 Today!
  - Software GigaCon in Warsaw Here!
- FREE downloads available



Name	Description	Last Modified	Attributes	Web-Access Grante...
..\				
Create form by using wizard				
Create form in Design view				
frmField		21/12/05 00:26:18	Anonymous	
Index		21/12/05 11:19:32	Anonymous	



Modules can be coded in:  
- Basic ("VB")  
- Java  
- C#  
- Pascal ("Delphi")



Properties

Multiple Components

Format | Data | Event | Other | All

BorderColor: Silver  
 BorderStyle: bbsFlat  
 BorderWidth: 1px  
 Color: 0F4F4F6  
 ControlStyle: Default  
 Cursor: crDefault  
 Enabled: True  
 Font: [font icon]  
 Height: 44px  
 HorizontalPlacement: hpNone  
 Left: 378px  
 TabOrder: 0  
 Top: [top icon]  
 Transparent: False  
 VerticalPlacement: vpNone  
 Visible: True  
 Width: 104px

Button1

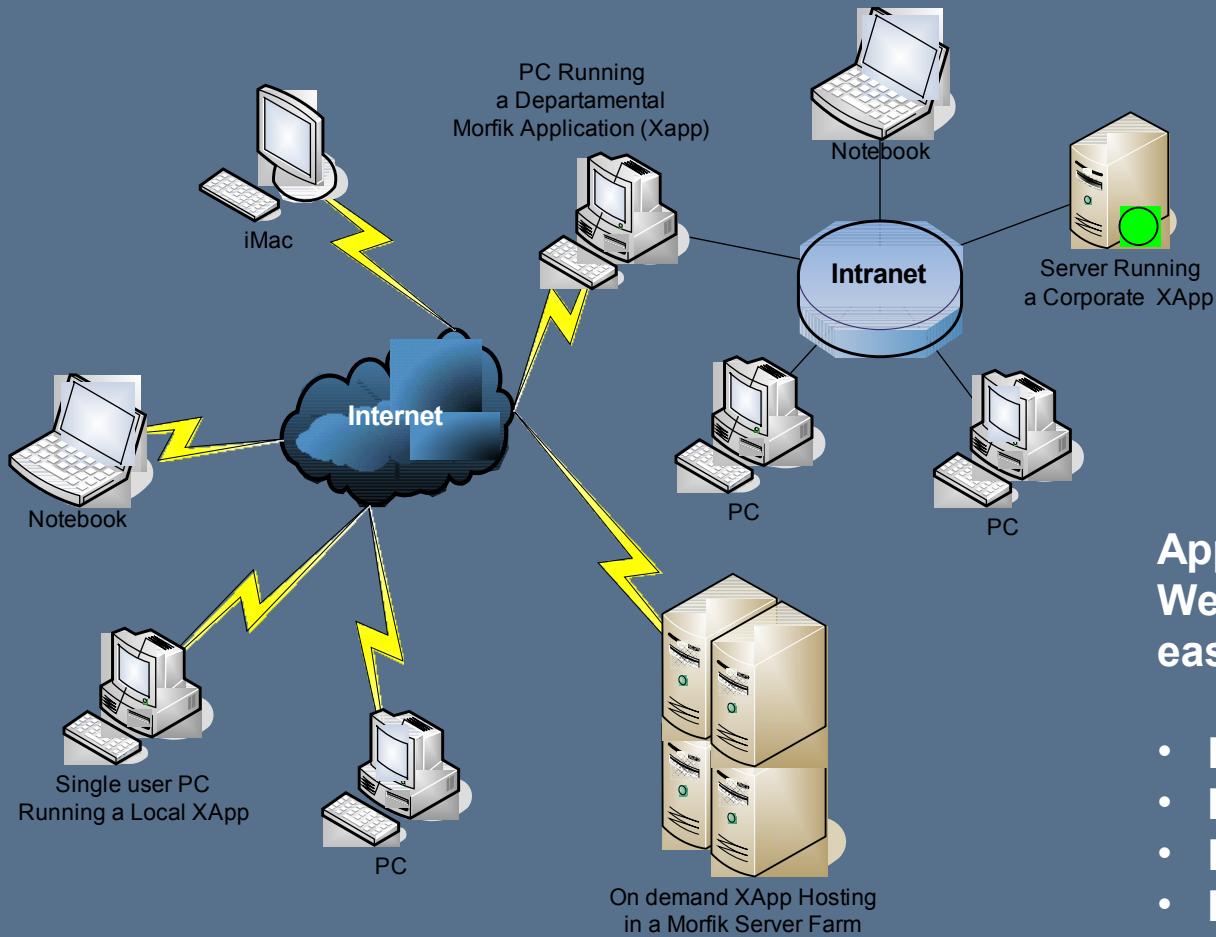
rver

Tool... x

- Mouse cursor icon
- Aa (Text tool)
- ab (Text tool)
- Circle icon
- Checkmark icon
- Calendar icon
- 20.7 (Text tool)
- Envelope icon
- Image icon
- Folder icon
- Eraser icon
- Table icon
- Up/Down arrows icon
- Refresh icon
- Empty box icon
- Eraser icon



# Deployment options



Applications developed by WebOS AppsBuilder can easily be deployed as:

- Desktop applications
- Intranet applications
- Extranet applications
- Internet applications
- On-demand applications



# Where to download ?

- **Download at:**

<http://www.morfik.com>

- **Cost**

**deployment:**

**FREE**

**non-commercial development:**

**FREE**

**start-up developer:**

**pay-as-you-earn**

**commercial development:**

**\$5.000 per developer**

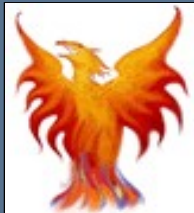




# Summary: Firebird tool chain is enterprise ready



- **Firebird:** one of the best open source databases on the planet



- **Fyracle:** Firebird + advanced Oracle compatibility



- **Morfik 07:** most advanced tool to build & deploy web applications, uses Firebird and Apache