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Open Source Web Services

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In the beginning...

CERN scientists needed a way to show physicists around the world:

★ their wonderful colliding particles (in full color images)

★ that their multi-million dollar particle accelerators are being used

★ convenient way of navigating from one page to another
World Wide Web

★ some guy named Tim Berners-Lee
★ developer a way of posting text and image data on the web
★ he called it the Hypertext Transfer Protocol (HTTP)
★ and its language Hypertext Markup Language (HTML)
★ sites are addressed with a Uniform Resource Location (URL)
★ http://www.w3.org/History/1989/proposal.html
Trivia 404

In the old CERN days, when someone got lost or got a wrong link/URL they were told to go to room 404 in the CERN complex.

Hence the HTTP error: **404 Page Not Found**.
World Wide Web Today

★ primary means of expression for the Net Generation
★ tool for distributing and searching for data
★ medium to transact online commerce
★ expressed best with the W3C’s goals to provide:
  – universal access - enable users to have access to as much information possible
  – semantic web - enable users to make the best of the information on the WWW
  – web of trust - to promote the WWW’s development
★ applications are made online (Web Services)
Section I

What are Open Source Web Services?
Open Source Web Services

★ to provide just-in-time, applicable and personalized content
★ to enable secure processing and transactions
★ to provide access to database and other services
★ composed of free and open source software components
Prototype Design

Scalable Application Server Setup
Section II

Open Source Tools
Breaking Down the Components

⋆ Presentation Layer
⋆ Business Logic and Transaction Layer
⋆ Data and Information Layer
Components in Terms of Software

- Frontend
- Middleware
- Backend
Frontend

★ generally refers to the means of serving content
★ usually a web server
★ in Java jargon, the servlet container

★ Apache - http://www.apache.org/
★ TomCat Servlet Container - http://jakarta.apache.org/tomcat/
★ Zope - http://www.zope.org/
★ others are Zeus, Boa, thttpd
Middleware

★ means of providing business and/or transaction logic

★ usually a application programming language

★ sometimes bundled with the frontend software and called Web Application Development environment

★ PHP - http://www.php.net/

★ Perl w/ DBI - http://www.cpan.org/

★ TomCat Java Servlets - http://jakarta.apache.org/tomcat/

★ Zope - http://www.zope.org/

★ others are Zope, Python, Apache-ASP and even C/C++
Backend

⋆ means of providing and maintaining data for the application
⋆ usually a database or a filebase information system
⋆ data sources can be plain text or XML source

⋆ PostgreSQL - http://www.postgresql.org/
⋆ MySQL - http://www.mysql.com/
⋆ Borland Interbase - http://www.interbase.com/
⋆ OpenLDAP - http://www.openldap.org/
Open Source Tools of Choice

- Frontend web server - Apache/Java Tomcat/Zope
- Middleware application tools - PHP/Java Tomcat/Zope
- Backend database server - PostgreSQL/MySQL

- good for web-based rapid application development
- ability to deploy scalable web-based solution
Other Tools

⋆ mod_ssl - optional apache module to provide SSL support

⋆ LDAP - optional utilities for providing PHP with LDAP functionality

⋆ IMAP - optional providing PHP with IMAP support

⋆ other modules such as authentication modules are also provided and more
Apache

★ a robust, commercial-grade, featureful, and freely-available source code implementation of an HTTP (Web) server

★ based on the original NCSA httpd 1.3

★ composed of patches from difference contributors around the world. Hence, the name a-patchy.

★ has been the most popular web server on the Internet since April of 1996

★ it is licensed under the Apache License
PHP

★ is an HTML-embedded scripting language
★ syntax is taken from C, Java and Perl with a couple of unique PHP-specific features thrown in
★ is to allow web developers to write dynamically generated pages quickly
★ is licensed under the PHP license
Tomcat Java Servlets

* is a world-class implementation of the Java Servlet 2.2 and JavaServer Pages 1.1 Specifications
* to provide commercial-quality server solutions based on the Java Platform that are developed in an open and cooperative fashion.
* implementation for Apache is called Jakarta
* is licensed under the Apache license and the Sun Community License
Zope

★ is a framework for building web applications
★ built with the Python programming language
★ features support by Zope:
  ● a Web based interface
  ● object database support
  ● relational integration (databases)
  ● scripting language support (Python, Perl and DHTML)
★ is licensed under the GNU GPL
PostgreSQL

★ PostgreSQL is a sophisticated Object-Relational DBMS
★ it supports almost all SQL constructs, including subselects, transactions, and user-defined types and functions
★ is licensed under a BSD license
MySQL

MySQL is also another Relational DBMS

considered one of the fastest RDBMS

not as feature filled as PostgreSQL

is licensed under the GNU GPL
Other tools

mod_ssl

* apache module for providing secure connections via SSL
* can either statically linked or loaded via DSO

LDAP

* Lightweight Directory Access Protocol
* provide a means for organizing and propagating commonly used data into a hierarchical structure

IMAP

* Internet Mail Access Protocol
* this is needed to provide IMAP support to PHP
Section III

Installation and Configuration
Installing: the not so easy way

★ download the tarballs from their respective websites and read all their INSTALL or README files

★ OR you can download the acent-superapache kit from
  http://cersa.admu.edu.ph/ftp/acent-kits/superapache/

★ read and follow the INSTALL file
Installing: the easy way

☆ rpm -Uvh postgres*-version-release.i386.rpm
☆ rpm -Uvh apache-version-release.i386.rpm
☆ rpm -Uvh modimap-version-release.i386.rpm
☆ rpm -Uvh openldap-version-release.i386.rpm
☆ rpm -Uvh openssl-version-release.i386.rpm
☆ rpm -Uvh modssl-version-release.i386.rpm
☆ rpm -Uvh php4-version-release.i386.rpm

Note: you can install the RPMs from your favorite Linux distribution
Section IV

Configuration
Things to configure

modify the httpd.conf

★ enable the modules such as php, ssl. (LoadModule jserv_module
   lib/apache/mod_jserv.so AddModule mod_jserv.c)

★ set application type settings (AddType application/x-httpd-php .php)

★ setting override access to .htaccess files (AllowOverride All)

★ add .htaccess files if necessary
Things to configure

editing the .htaccess files

AuthName "Name of Zone"
AuthUserFile /path/to/passwordfile
AuthType Basic

require valid-user
Things to configure

Configuring PostgreSQL

⋆ initdb -D /var/lib/pgsql/data
    -initialize postgresQL

⋆ /etc/rc.d/init.d/postgres start
    - to start postgresQL

⋆ createdb test
    -create a database called test

⋆ psql -u user -p pass test
    -access the database test

⋆ to add a database user and password:

    echo "GRANT ALL privileges ON test.* TO user@localhost; SET PASSWORD FOR user@localhost = PASSWORD('pass')" | psql test
Things to configure

Configure MySQL

★ /etc/rc.d/init.d/mysql start
  - to start MySQL

★ mysqladmin -h localhost -u root -p create test
  - create a database called test

★ mysql -u user -p pass test
  - access the database test

★ to add a database user and password:

  echo "GRANT ALL privileges ON test.*
  TO user@localhost"
  | mysql -u root test
  echo "SET PASSWORD FOR user@localhost
  = PASSWORD('pass')"
  | mysql -u root test
Section IV

Conclusion
Your Website Still Static?

★ reduce costs by using free/open source software

★ provide up-to-date and dynamic content

★ enable business processes to be integrated into a single online solution

★ develop applications that can be hosted online

★ why settle for mediocrity?