



DB2 Storage Engine for MySQL and Open Source Applications

Erwin Earley – Advisory Software Engineer
Open Community Solutions Center of Competency
erwin.earley@us.ibm.com

Power Systems Software

COMMON Luxembourg
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Fabian Michel
Systems Architect
Senior IT Specialist
IBM Certified

IBM Belgium s.a.
Avenue du Bourget, 42
B-1130 Bruxelles
Tel. +32 2 225 38 22
Fax +32 2 225 23 68
fabian_michel@be.ibm.com

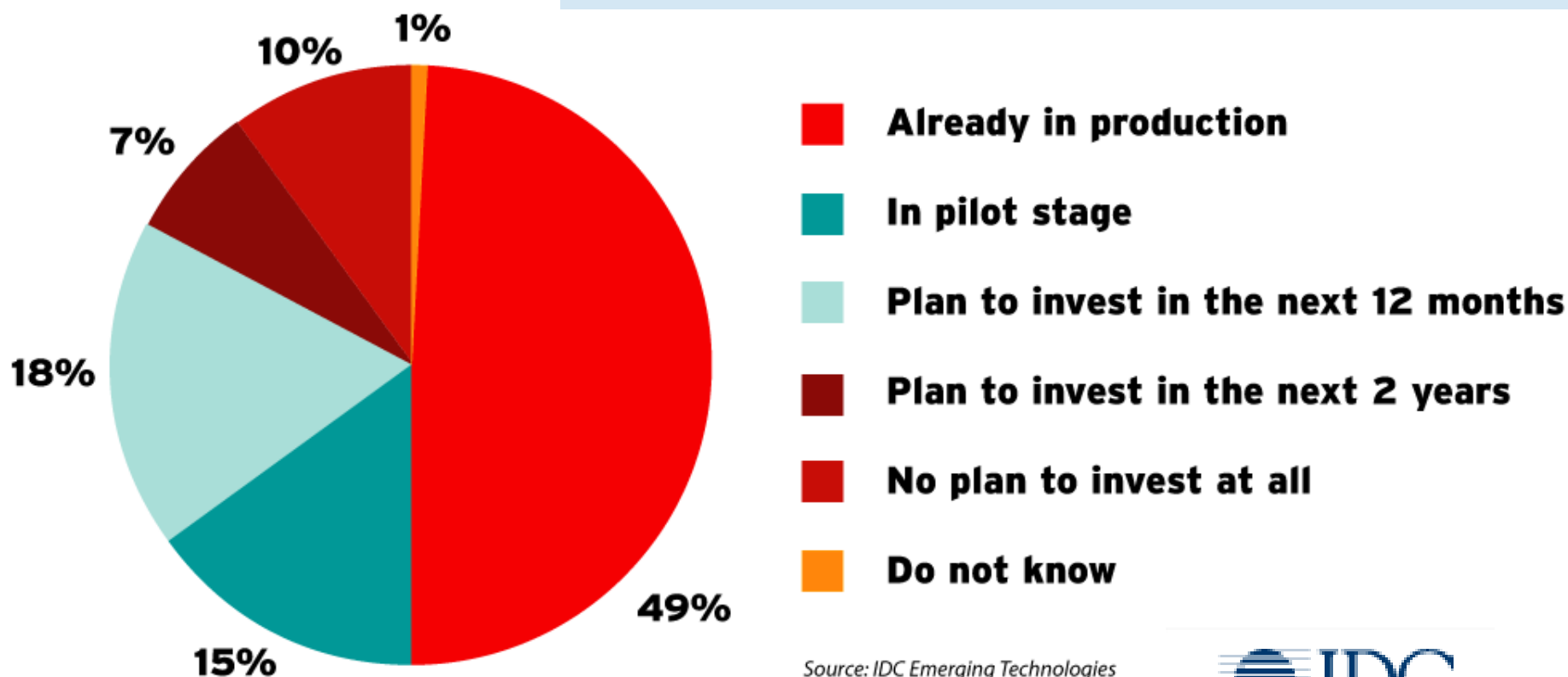


Agenda

- **Why Do We Care About Open Source?**
- **Why Open Community Applications**
- **Description of Open Community Applications**
- **What is a Web Deployment Stack**
 - What comprises the IBM i Open Community Web Deployment Stack
- **Installing the IBM i Open Community Web Deployment Stack**
 - Installation of Zend Core in IBM i
 - Installation of MySQL in IBM i
- **DB2 Storage Engine for MySQL**
- **Installation/Setup of Open Community Applications**
 - MediaWiki
 - SugarCRM
 - Joomla!
 - Zen Cart
 - PmWiki

Adoption of Open Source

82% Have Open Source in Production or Planned within 12 months



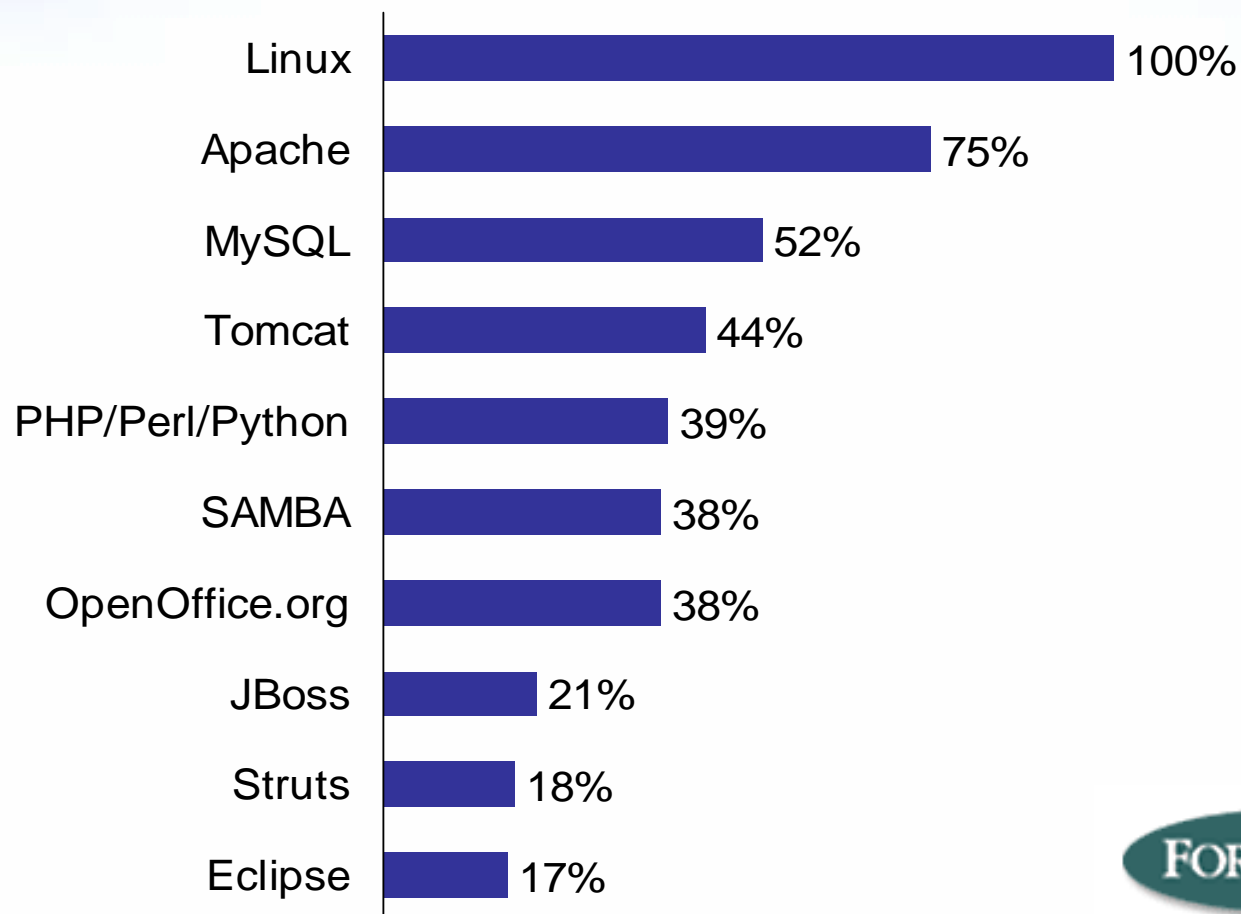
Source: IDC Emerging Technologies and Services Survey, March 2006



THE NEW POWER EQUATION

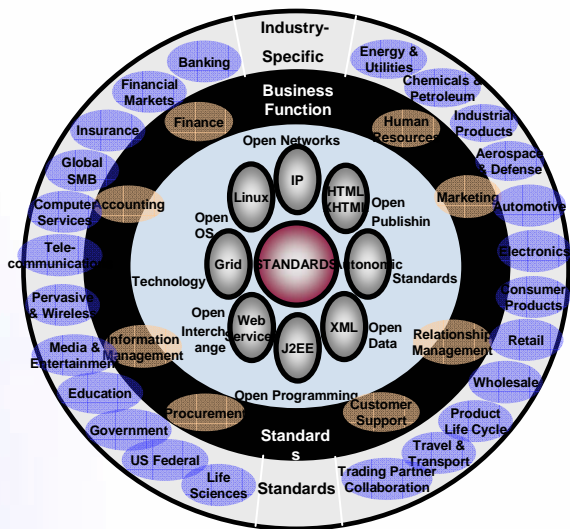
Open Community Tools Adoption Growing Rapidly

What products do you use or plan to use?



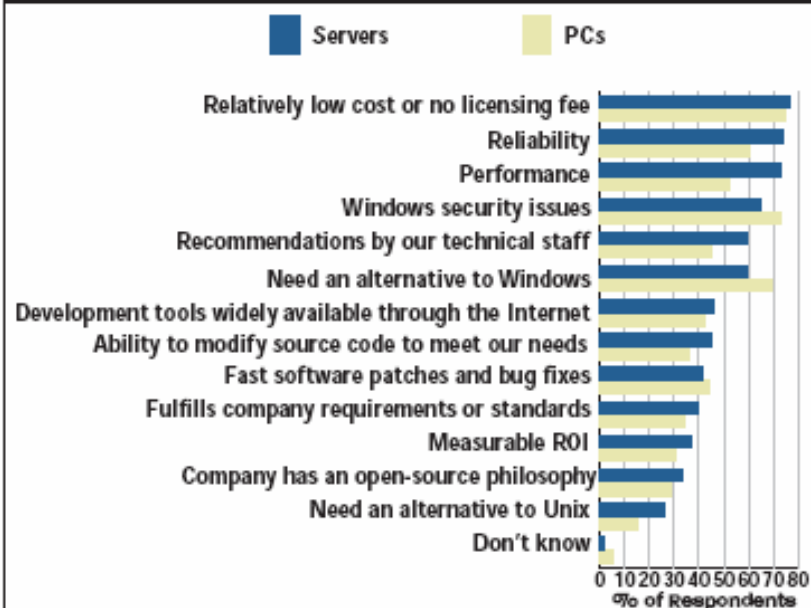
THE NEW POWER EQUATION

- **Low cost, no license fee**
- **Reliability**
- **Performance**
- **Security**
- **Technical staff recommend it**



THE NEW POWER EQUATION

What has helped accelerate your organization's decision to use Linux?



Note: Multiple responses allowed.
Base: 246 sites reporting on servers; 155 sites on PCs
Data: InformationWeek Research Linux/Open-Source Survey of
 439 business-technology professionals

Why Open Community Applications

- **Benefits of Open Community Web Applications**

- Free of Charge
- Customizable to business or user need
- Controlled global access to information
- Increases productivity
- Powerful
- Reliable
- Portable
- Easy Installation

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Evolution of web applications

- Every 7 seconds a new wiki or blog is created...
- Next wave of programmers: folks who create content are now empowered to create applications
- New platforms being established – providing simple, feature rich environments for editing and contributing content.
- Content is handled with a simple WYSIWYG editor that makes editing accessible to anyone
- Main content accompanied with discussion tabs, history tabs, version tabs, mailing list tabs



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Description of Open Community Applications

- **Wiki**
 - Collaborative website which can be directly edited by anyone with access to it
- **Content Management System**
 - System used to administer the content of a website
- **Customer Relationship Management (CRM)**
 - Method used by companies to manage their business relationships. The process includes capture, storage and analysis of clients, vendors, partners and internal process information

Description of Open Community Applications

- **Portal**
 - Site that functions as a point of access to information on the World Wide Web
- **eCommerce**
 - Web site that is used for buying and selling services and/or products electronically
- **Bulletin Board**
 - Web enabled program that allows users to advertise, share information, and meet other people.

MySQL + PHP on i5/OS Applications

- Examples on i5/OS www.zend.com/forums
 - **MySQL** (Open Source DB) on i5/OS - <http://www.zend.com/forums/index.php?t=msg&goto=3004>
 - **MediaWiki** (Open Source Wiki) on Zend Core for i5/OS - <http://www.zend.com/forums/index.php?t=msg&th=3134>
 - **SugarCRM** (Open Source Customer Relationship Management (CRM)) on Zend Core for i5/OS - <http://www.zend.com/forums/index.php?t=msg&th=3111>
 - **Joomla!** (Open Source Content Management System) on Zend Core for i5/OS - <http://www.zend.com/forums/index.php?t=msg&th=3068>
 - **Zen Cart** (Open Source Online Store) on Zend Core for i5/OS - <http://www.zend.com/forums/index.php?t=msg&th=3041>
 - **PmWiki** (Open Source Wiki) on Zend Core for i5/OS - <http://www.zend.com/forums/index.php?t=msg&goto=8085>
 - **PHP-Nuke** (Open Source Content Management System) on Zend Core for i5/OS - <http://www.zend.com/forums/index.php?t=msg&goto=3541>

Content Management



Wiki



E-Commerce



THE *NEW* POWER EQUATION

Bug Tracking

CRM

Web Development/Deployment Stacks

L A M P
 i p y H
 n a S P
 u c Q
 x h L
 e

W I M P
 i l y H
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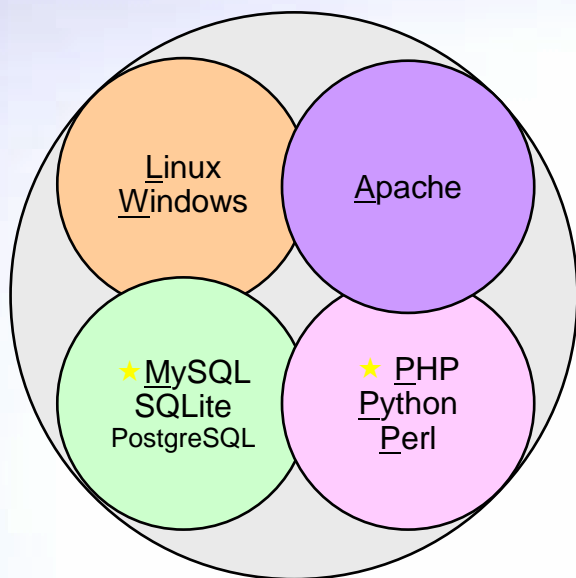
i A D P
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THE NEW POWER EQUATION

What is LAMP?



- L = Linux
- A = Apache web server
- M = MySQL
- P = PHP | Perl | Python

- **Open-source software stack with a strong focus on:**
 - Affordability – Perceived zero to low cost
 - Ease of development, ease-of-use
 - Community
 - Building solutions. Large body of single-click install & auto-configure solutions and libraries
- (<http://www.hotscripts.com/>)

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The LAMP components

Linux

- **Free UNIX-type operating system**
- **Has become firmly established as an enterprise-class alternative to proprietary UNIX and Microsoft products**
- **Commercial entities, such as IBM, have extended the free Linux kernel and created the support and services infrastructure essential to enterprise customers**

Apache

- **Traces its roots to the public domain HTTP daemon developed at the National Center for Supercomputing Applications**
- **Apache has been the most popular web server every year since 1996**

MySQL

- **World's most popular open source database**
- **Many large corporations – including Sabre Holdings, Cox Communications, The Associate Press, and NASA are using MySQL to power web-sites, business-critical enterprise applications and packaged software**

PHP

- **Widely used general-purpose scripting language**
- **Especially suited for web development**
- **Can be embedded in HTML**
- **It has become one of the most popular languages on the web**

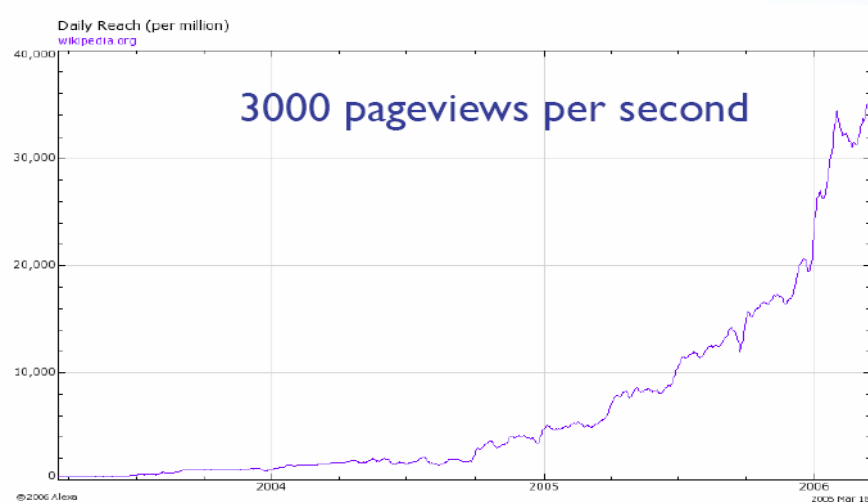
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What's driving LAMP (and open-source related development stacks)

- **Constant pressure on developers to do more, faster, and with less as firms strive to reduce costs, improve returns on IT investments, and accelerate time-to-value**
- **Growing adoption of SOA environments for enterprise integration**
 - Allows wider choice of application development & implementation technologies by allowing heterogeneous systems to interact freely at the service level
- **Faster pace of open source software improvement relative to proprietary products**
 - Facilitated by active participation of global user communities
- **Availability of polished developer tools for the LAMP environment**
 - Example: Zend's integrated development and production environments for PHP applications

What can be done with LAMP – an Example

- **Wikipedia:**
 - >8,000 HTTP requests per second
 - >25,000 SQL requests per second
 - 12 database servers
 - 15 application servers in 'external storage' role
 - 20 application servers in 'object cache' role

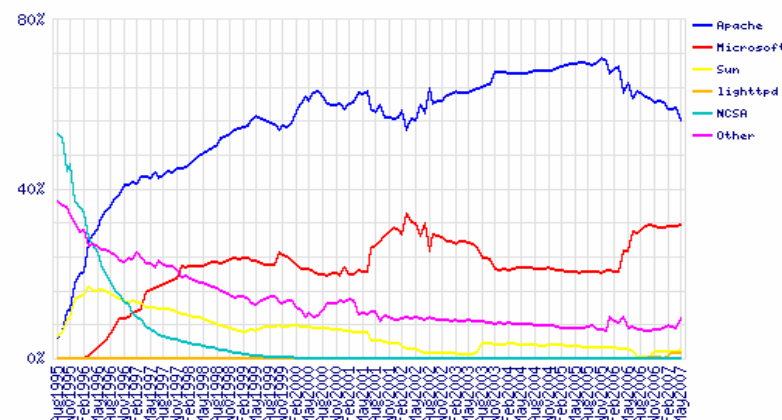


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LAMP Components: Apache

- **Flexible, Easy to configure**
- **Serves over 50% of all websites**
- **Secure, efficient, extensible server**
- **Many extensions available**

Market Share for Top Servers Across All Domains August 1995 - May 2007

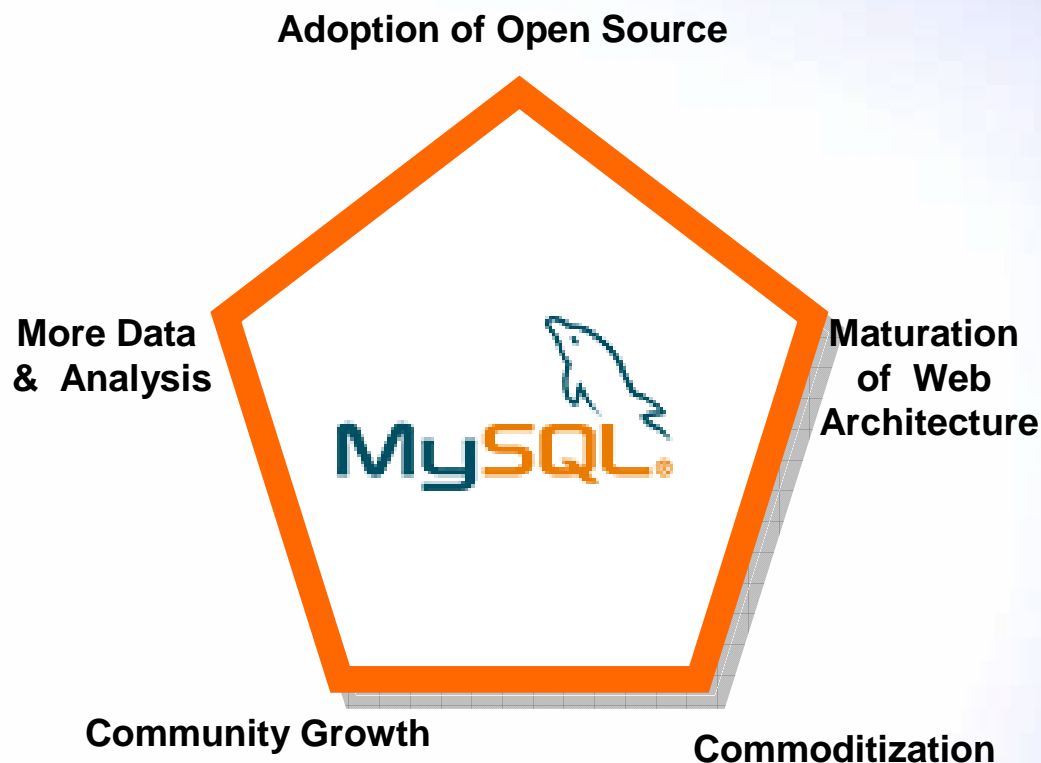


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LAMP Components: MySQL

World's Most Popular Open Source Database

- **Founded in 1995; operations in 24 countries**
- **Over 11,000,000 installations; 65,000 downloads/day**
- **Part of a rapidly growing open source LAMP stack**
- **Used by IT organizations to implement scale-out architecture**



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LAMP Components: MySQL

- **Very easy to setup and use**
- **Most popular open source database**
- **Has gained popularity in the web application world and is used in most of the leading PHP applications.**
- **Open Source, but also commercially backed**
- **Used in more the 11 million installations**
- **Cross-platform (over 20 including i5/OS, Windows, Linux, OS/X, HP-UX, AIX, Netware)**



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LAMP Components: PHP?

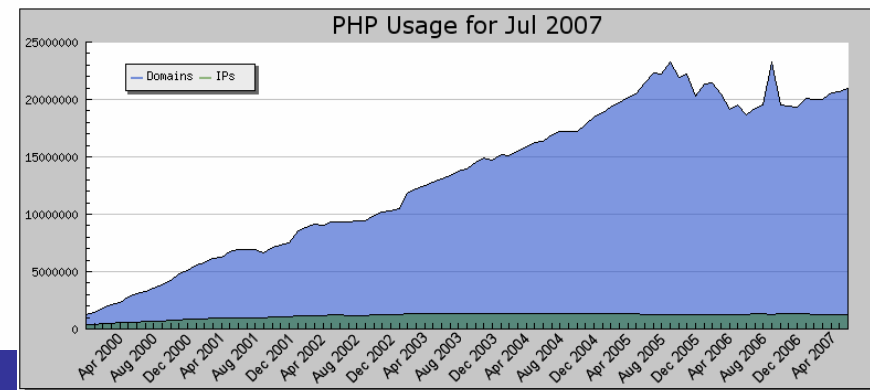


- **PHP is an easy to use, open source, platform independent scripting language**
 - Designed for web application development
 - 4.5+ Million PHP Developers
- **PHP is the leading scripting language deployed on the Internet**
 - 20+ Million Internet domains (20,917,850)
 - Out Pacing Microsoft's ASP*
- **Thousands of PHP applications are available**
 - Web applications tied to databases
 - Content management
 - Wikis and Blogs

www.hotscripts.com
www.phpjunkyard.com/
www.phpfreaks.com/
www.php-freebies.com/

Position Mar 2008	Position Mar 2007	Delta in Position	Programming Language	Ratings Mar 2008	Delta Mar 2007	Status
1	1	=	Java	20.651%	+2.61%	A
2	2	=	C	15.593%	-0.04%	A
3	5	↑↑	(Visual) Basic	10.795%	+2.65%	A
4	4	=	PHP	10.138%	+0.68%	A
5	3	↓↓	C++	9.776%	-1.33%	A
6	6	=	Perl	5.781%	-0.64%	A
7	7	=	Python	4.593%	+0.70%	A
8	9	↑	C#	4.143%	+0.78%	A
9	12	↑↑↑	Delphi	2.697%	+0.94%	A
10	10	=	Ruby	2.661%	-0.11%	A

Source: March 2008 TIOBE Programming Community Index <http://www.tiobe.com>

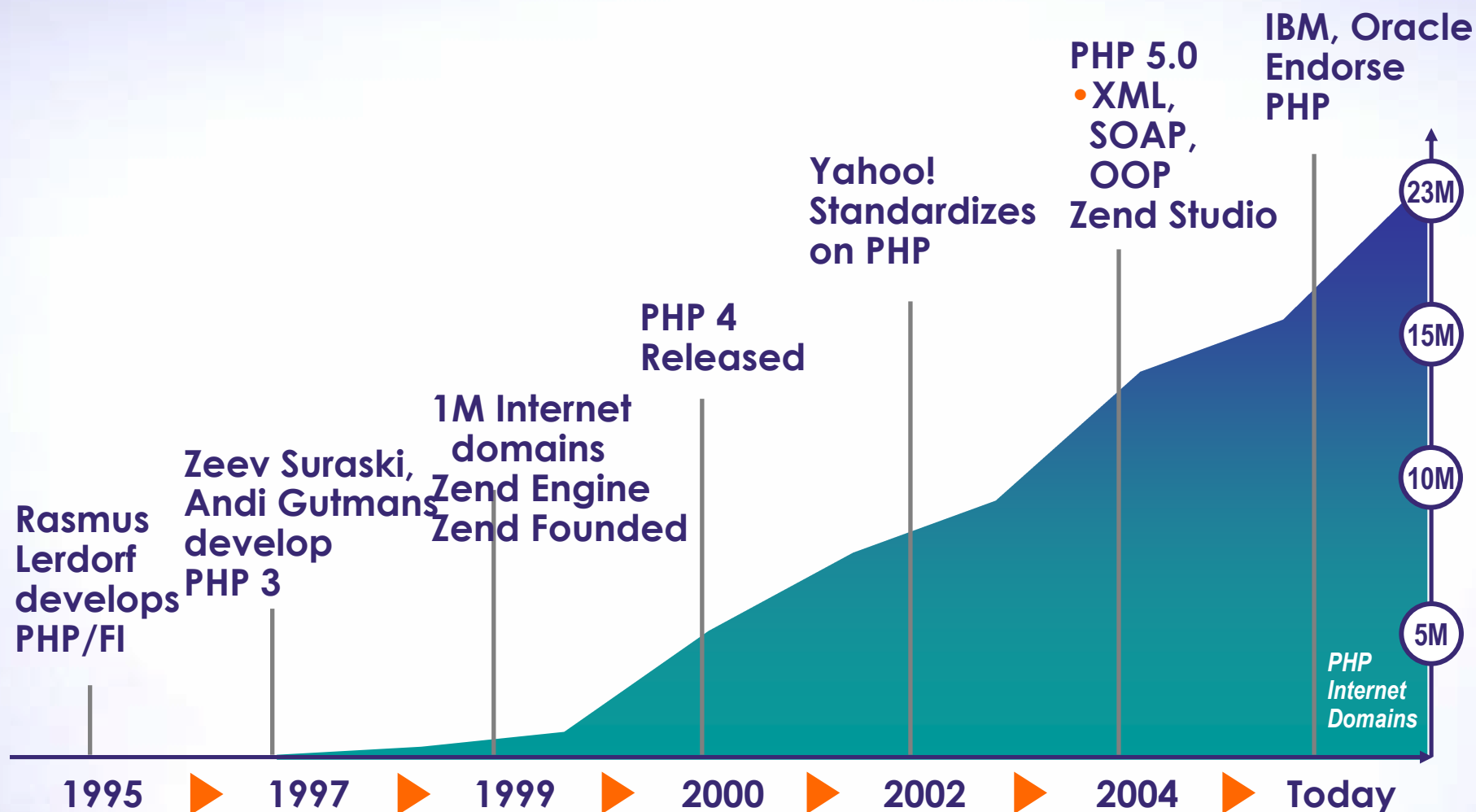


* Source: July 2007 Netcraft Survey <http://www.php.net/usage.php>

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LAMP Components: PHP

A Brief History of PHP

















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LAMP Components: PHP

Why Do Developers Use PHP?



	Why do you use PHP? (Choose as many as apply)	Number of Responses	Response Ratio
	Easy to develop with 	3093	89%
	Affordable 	2311	66%
	Web application focus 	2328	67%
	Apache integration 	2109	61%
	Multiple platform support 	1785	51%
	Performance 	1997	57%
	Preference for non-Microsoft technology 	1829	53%
	Availability of the source code (open source) 	1404	40%
	Unix/Linux investment 	1304	37%
	Multiple web server support 	853	25%
	Time to market 	606	17%
	Inherited an existing PHP system 	281	8%
	Flexibility 	2287	66%
	Other, Please Specify 	300	9%

Zend's June 2003 market snapshot of the PHP community. The survey had over 10,000 respondents.
http://www.zend.com/zend/php_survey_results.php

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LAMP Components: PHP

What Types of Applications are Developed in PHP?

What types of applications does your organization develop in PHP?		Number of Responses	Response Ratio
CRM		557	16%
Content Management		2067	59%
Security		510	15%
ERP		191	5%
Games		237	7%
Communications		851	24%
Ecommerce		1275	37%
Complete list		126	4%
Content Display/Media		1051	30%
Customer focused (external) web site		1137	33%
Intranet - Internal web front-ends for Internal organizational systems or databases		1781	51%
Extranet - External web front-ends for customers or suppliers to Internal organizational systems or databases		1014	29%
Web-based applications		2557	73%
None		78	2%

Zend's June 2003 market snapshot of the PHP community. The survey had over 10,000 respondents.
http://www.zend.com/zend/php_survey_results.php

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LAMP Components: PHP

The Growth of PHP



- **Total Servers: 23,331,627**
- **Apache Servers: 17,100,488 (73.3%)**
- **PHP Enabled Apache Servers: 6,727,170 (39%)**

PHP Supports

- **19 Databases**
- **All service-oriented-architecture protocols such as SOAP and XML-RPC**
- **Works with other languages like Java, .NET, etc.**

Web Server Survey

April 1st, 2007

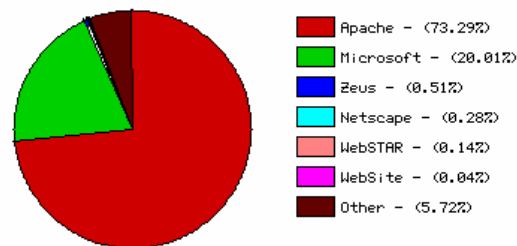
Across All Domains

Market Share Change (Total servers: 23,331,627)

Server ¹	March Count	March %
Apache	17,100,488	73.29%
Microsoft	4,668,649	20.01%
Zeus	119,073	0.51%
Netscape	66,488	0.28%
WebSTAR	32,494	0.14%
WebSite	9,553	0.04%
Other	1,334,882	5.72%

¹Servers are ordered according to their global market share.

Market Share for March 2007 - Across All Domains



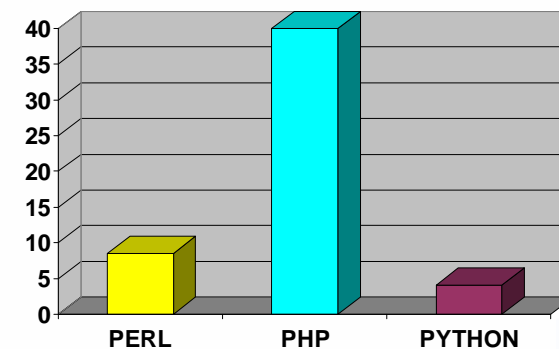
Copyright (c) 1998-2007 E-Soft Inc.

Apache Module Report

April 1st, 2007

Module	March 2007 Count	March 2007 %
PHP	6,727,170	39.34
mod_ssl	4,768,726	27.89
OpenSSL	4,768,076	27.88
FrontPage	3,037,501	17.76
mod_log_bytes	1,502,544	8.79
mod_auth_passthrough	1,488,927	8.71
mod_bwlimited	1,488,099	8.70
perl	1,454,793	8.51

Apache Modules Popularity (%)



PHP Enabled Apache Servers: Research by

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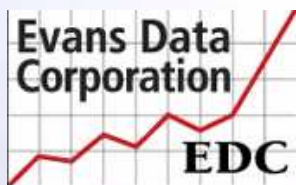


(April 2007)

LAMP Components: PHP

The Growth of PHP

Worldwide Developers	2006	%	2007	%	Growth%
Java	5,863	44%	6,806	47%	+16%
.Net	6,420	48%	8,176	57%	+27%
PHP	4,634	35%	6,426	44%	+37%
Total	13,315		14,461		



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LAMP Components: PHP

Drivers for PHP growth

- **The Migration to Web Applications**
 - When did you last install a desktop application?
 - Emerging generation of software services (**Web2.0**)
 - PHP is the leading web development platform
- **Software buyers favor Open Source Software**
 - OSS adoption driven by cost of ownership benefits, freedom from vendor lock in, and superior software quality
- **PHP is the perfect Web Integration Platform**
 - Best support for browser based rich client applications (Ajax)
 - Strong support for Web Services, XML & legacy systems
 - Powerful **SOA** capabilities enable new IT approaches (“mashable assets”) for reducing application backlogs
- **PHP is backed by a very active community**
 - ~ 1000 committers, ~ 4.5M developers (corporate/community)
 - Thousands of opensource projects and applications
 - Hundreds of thousands of commercial deployments
 - High profile PHP applications like Yahoo!, Flickr and YouTube
 - High profile ISV backing, IBM, Oracle, Microsoft, Adobe, etc.

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LAMP Components: PHP

Top 10 Internet Sites by WW traffic



1. Yahoo.com



2. YouTube.com



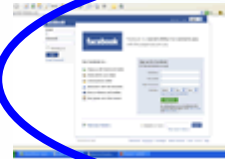
3. Windowslive.com



4. Google.com



5. Myspace.com



6. Facebook.com



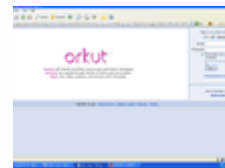
7. MSN.com



8. Hi5.com



9. Wikipedia.org



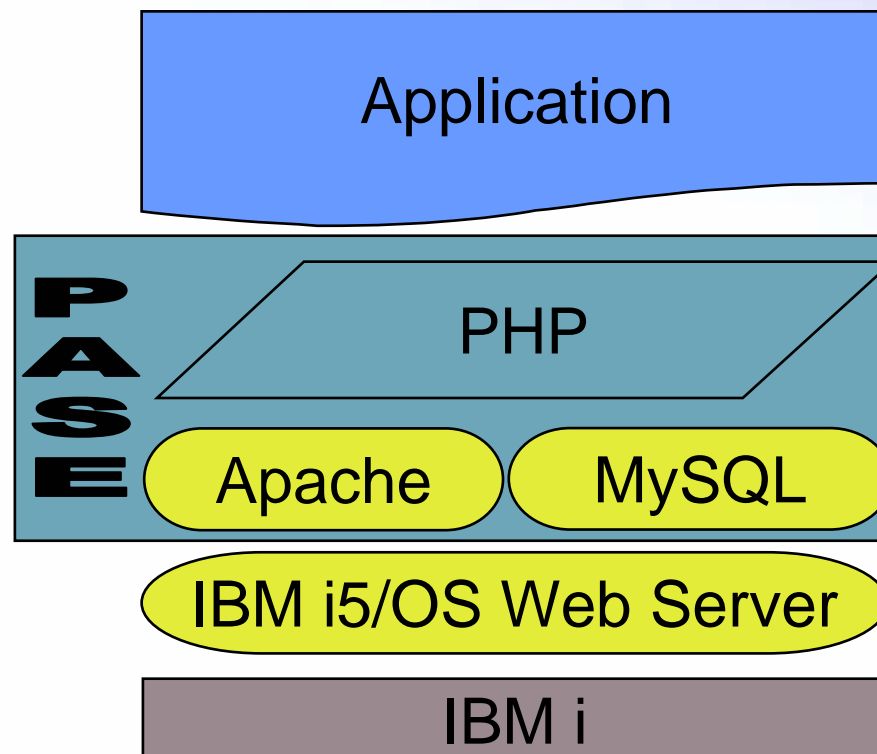
10. Orkut.org

THE NEW POWER EQUATION



What is the iAMP Stack

- The iAMP stack (IBM i, Apache, MySQL, PHP) is the IBM i native variant of the LAMP stack – it allows for deployment of web-based applications integrated with the MySQL open community database
 - iAMP is well suited for those customers/environments that wish to leverage existing open source applications based on PHP and MySQL
- The LAMP stack (and it's variants) is being used by a growing number of developers to provide a low-cost reliable platform for web-based applications.



iAMP Components: MySQL

IBM and MySQL Plans for IBM i and DB2

- **MySQL is the leading open source database with over 11 million installations**
- **MySQL is the most popular database to use with PHP applications**
- **Step 1: MySQL database supported on IBM i**
 - *Enables customers to deploy MySQL-based applications on IBM i*
- **Step 2: Plan to integrate MySQL with DB2 on i5/OS**
 - *Enables MySQL-based applications to store data in DB2 on IBM i*



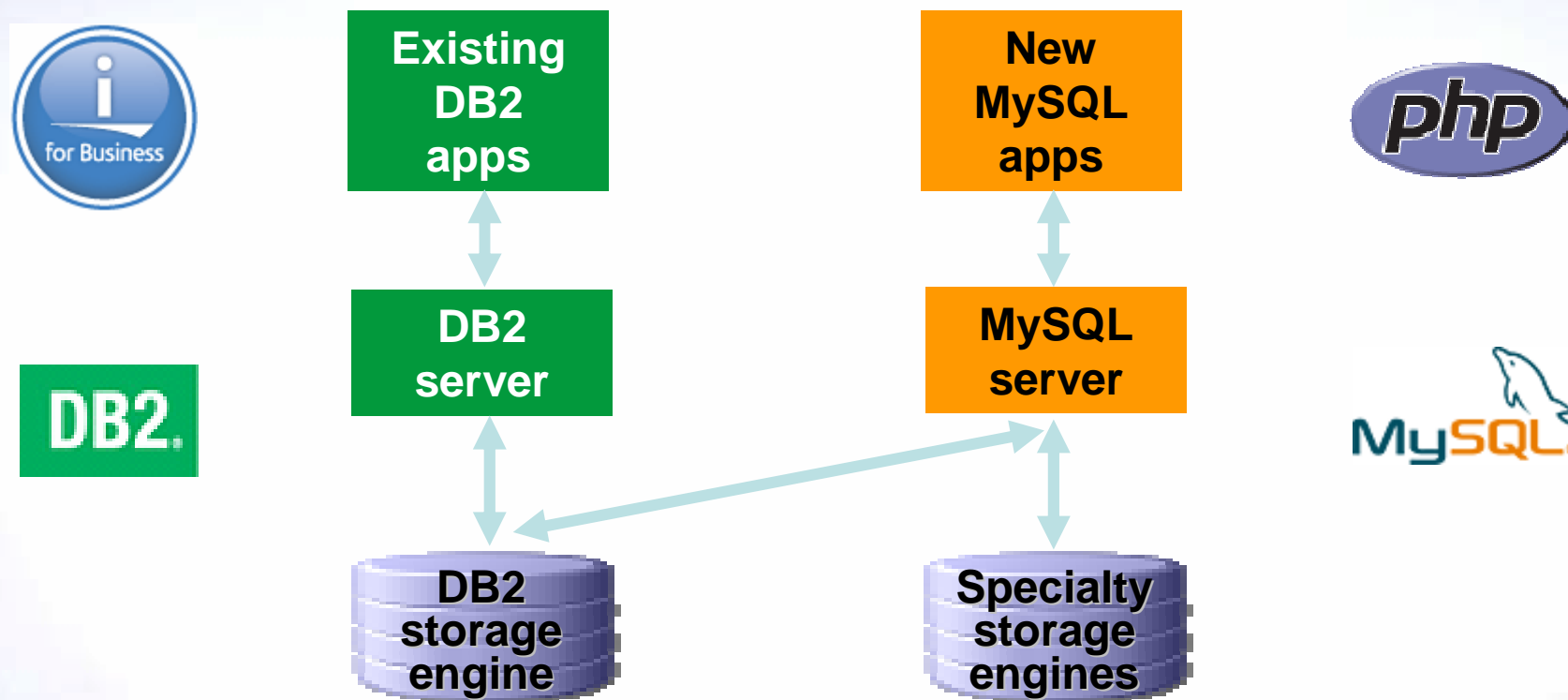
System i customers get the benefit of being able to use thousands of new open source applications while continuing to have one easy to use data store with DB2.

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iAMP Components: MySQL

IBM and MySQL plans for IBM i and DB2

- MySQL is the leading open-source database, with 10M+ installations
- MySQL is the most popular database to use with PHP applications
- Joins the expanding communities of PHP, MySQL and IBM i



"MySQL's and IBM's plan for the MySQL database management system to run on the IBM i platform brings hundreds of new applications to IBM i and should be welcome news to small and midsize businesses." - *Gartner*

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iAMP Components: MySQL for IBM i

• MySQL database available and supported on IBM i

- MySQL Community Server for IBM i
 - Free download from mysql.com
 - No Support
- MySQL Enterprise for IBM i
 - Download from mysql.com
 - Annual Subscription
 - 3 support levels
- Available directly from MySQL on 7/24
 - Can also be ordered from IBM

MySQL Enterprise Silver	MySQL Enterprise Gold	MySQL Enterprise Platinum
\$1995.00 /Server/Year	\$2995.00 /Server/Year	\$4995.00 /Server/Year
Business Hours	24x7	24x7
4 Hours*	2 Hours*	1 Hour*
Advisory Services and Consultant Support Options		

<http://www.ibm.com/systems/i/software/mysql/>

* Max Initial Response Time
MySQL US List Prices
<https://shop.mysql.com/enterprise/>

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iAMP Components: MySQL

IBM Announcements for MySQL



- **MySQL Enterprise for IBM i can be ordered from IBM**

- Same product, license, support and price as direct from MySQL
- 5639-MYS with 3 support levels
- IBM passes order to MySQL for fulfillment

- **Added Zend Core and MySQL to 550, 570, and 595 Enterprise Edition**

- Zend Core with standard support (5639-ZC1)
- MySQL Enterprise with silver support (5639-MYS)

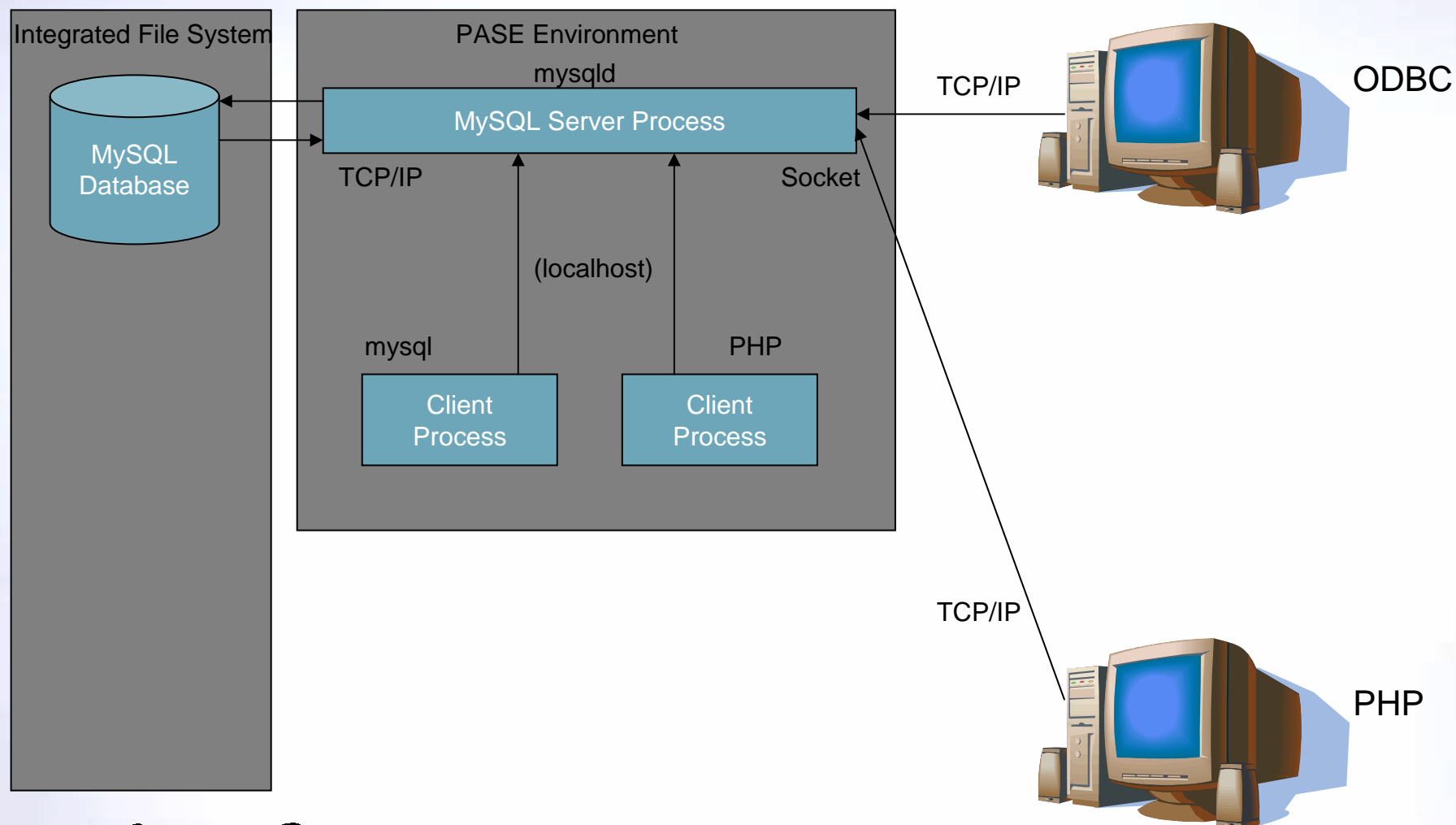
- **Added Zend and MySQL Implementation service to voucher program for Enterprise and IBM i Editions**

Announcement 7/24/07 GA: 8/17/07

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iAMP Components: MySQL

MySQL in IBM i High Level Architecture



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iAMP Components: PHP

IBM i and Zend

- **April 3, 2006: IBM and Zend announced a multi-year agreement to deliver selected Zend PHP products and solutions for IBM i®**
- **July 11, 2006: IBM announcement of order taking for Zend Core and Studio for IBM i with GA on July 28.**
- **Over 10,000 unique companies have downloaded Zend products for IBM i**



<http://www.ibm.com/systems/i/software/php>

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iAMP Components: PHP *Zend Technologies*



- The founders of Zend have been key contributors to the PHP language since 1997
- Zend delivers commercial products that enable developers and IT personnel to deliver and operate business-critical PHP applications
 - Zend has been the leading supplier of PHP products and solutions for the last six years. Its products and solutions are being used by more than 15,000 companies worldwide. The Zend Engine (the PHP kernel) is being utilized on more than 22 million websites today
 - Zend takes the open source PHP code through rigorous testing for additional quality assurance and adds over 35 popular PHP extensions to deliver their PHP runtime environment
- Zend provides enterprise level support for the PHP environment

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iAMP Components: PHP

Zend Products for i5/OS



- **Zend Core for i5/OS**

No Charge

- PHP runtime environment in i5/OS providing connections to DB2 UDB for i5/OS and RPG and COBOL applications
- With 3 years Standard support



- **Zend Studio Professional for i5/OS**

No Charge

- Integrated Development Environment on Windows, Linux, or Mac
- Includes MySQL support for i5/OS
- With 3 years Standard support



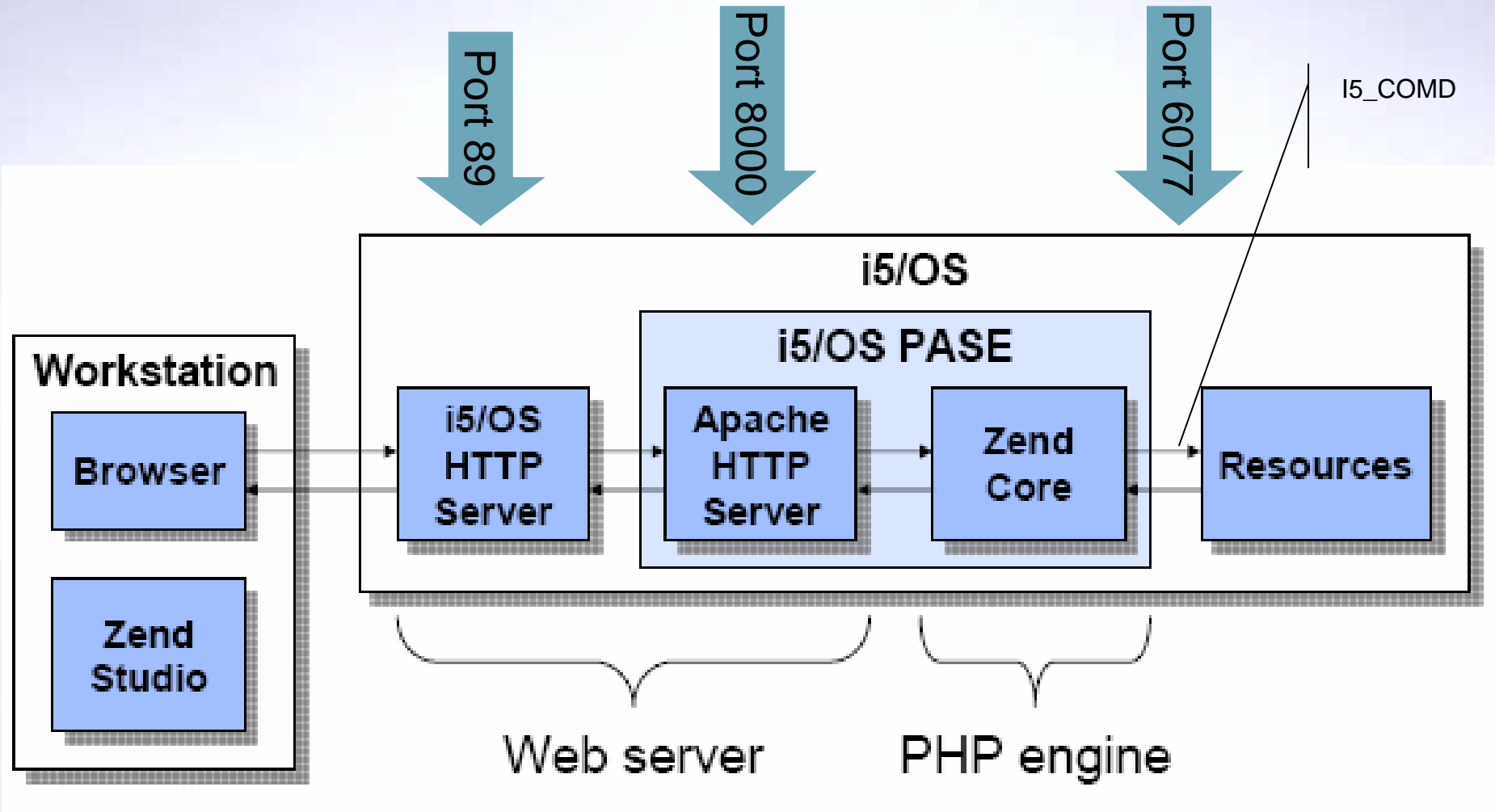
- **Zend Platform for i5/OS**

- A robust PHP production environment providing performance, scalability, and monitoring for PHP applications

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iAMP Components: PHP

How does PHP on i5/OS Work?



<http://servername:2001/HTTPAdmin>

<http://servername:89/ZendCore>

THE NEW POWER EQUATION

Installing the IBM i Open Community Web Deployment Stack



- Obtaining the components
 - **Can be ordered from IBM – orders are passed through to providers (i.e., MySQL and Zend)**
 - **Can be downloaded directly from providers**
 - **Can be downloaded as a single download from Zend (i.e., Zend Core)**
- Installation Options
 - **Separate installation procedures for MySQL and Zend Core (installatin of Zend Core will also install Apache in the PASE environment)**
 - **Single installation via Zend Core – will also install community edition of MySQL)**

iAMP Pre-Requisites

Portable Application Solutions Environment	33	5722SS1
IBM Portable Utilities for i5/OS	*base	5733SC1
OpenSSH, OpenSST for i5/OS	1	5733SC1
Crypto Access Provider 128 bit	*base	5722AC3
Qshell	30	5722SS1
System Openness Includes	13	5722SS1
Digital Certificate Manager	34	5722SS1

Installation of Zend Core

- Step 1: **Obtain Zend Core** from Zend's web-site (<http://www.zend.com>)
- Step 2: **Extract the Zend Core save-file** from the downloaded zip file
- Step 3: **Upload the save-file to i5/OS**
- Step 4: **Execute the RSTLICPGM command** against the save-file
- Step 5: **Answer the installation prompts**

Installation of MySQL

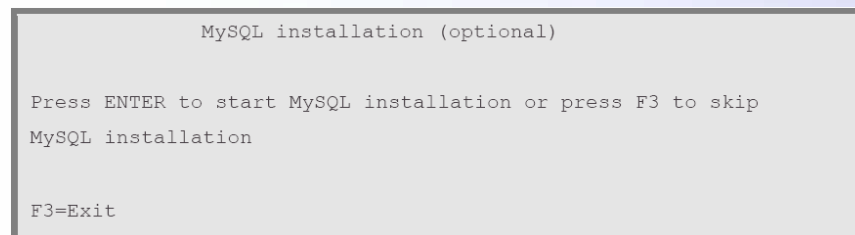
- Step 1: **Download the MySQL community server for IBM i (IBM IBM i SAVF packages) from the mysql web site (www.mysql.com)**
- Step 2: **Upload the save-file to IBM i**
- Step 3: **Use the RSTLIB command to restore the MYSQLINST library from the save-file**
- Step 4: **Execute the MySQL installation program (MYSQLINST/INSMYSQL)**
- Step 5: **Start the MySQL Server**
 - Enter the PASE environment (CALL QP2TERM)
 - Change to the MySQL binary directory
 - cd /usr/local/mysql/bin
 - Start the MySQL server
 - . /mysqld_safe -u root &

Enable Support for MySQL Extensions in **IBM** Zend Core

- Step 1: **Edit the zend core configuration file (/usr/local/zend/core/php.ini)**
 - Remove comment symbol (;) from the following lines
 - ; extension=mysql.so
 - ;extension=mysqli.so
- Step 2: **Restart Zend Core**
 - GO ZENDCORE/ZCMENU

Zend Core 2.5.x – Making it Even Easier!!

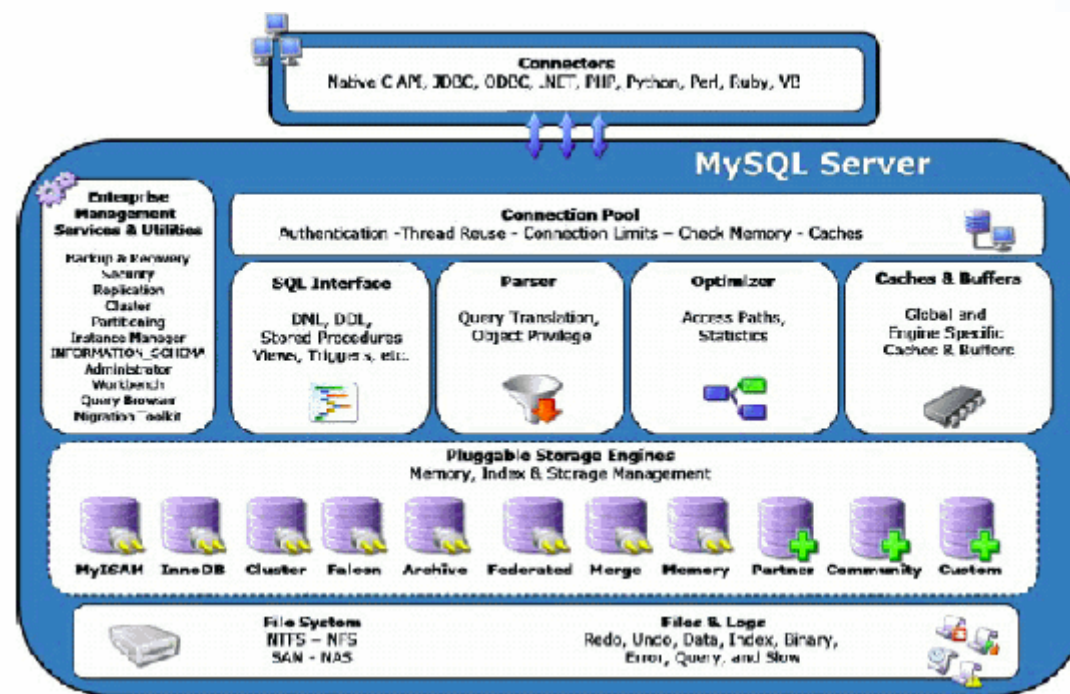
- **Version 2.5.x of Zend Core includes a bundled copy of MySQL Community Edition for IBM i**
- **Through a single installer you can get the entire iAMP stack (Apache, MySQL, and PHP) installed on your IBM i partition**
- **Support has also been added to the Zend Core Setup tool to control the MySQL processes and subsystem**
- **NOTE: Using the bundled installation will also enable the MySQL extensions in the Zend Core configuration**



Storage Engines

- A key strength of MySQL is it's pluggable storage architecture.
- This architecture allows you to select a specialized storage engine for a particular application need
- Different storage engines can be used for different tables within the same database schema

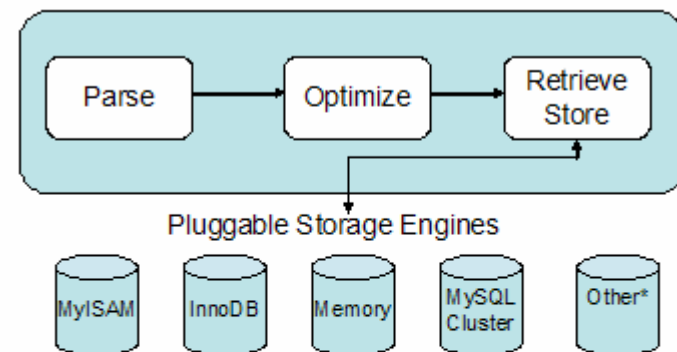
- **Key differentiations**
 - Concurrency/Locking
 - Transaction Support
 - Physical Storage
 - Index Support
 - Memory Caches
 - Performance Aids



THE NEW POWER EQUATION

Storage Engines

- **Two tier approach**
 - Upper tier includes the SQL parser and optimizer
 - Lower tier comprises a set of storage engines
- **The SQL tier is free of dependencies on which storage engine manages any given table**
- **Clients do not need to be concerned about which engines are involved in processing SQL statements.**



*Other storage engines could eventually include an i5/OS DB2 storage engine to store MySQL data in DB2 on i5/OS. NOTE: This represents a statement regarding IBM and MySQL AB's plans, directions, and intent and is subject to change or withdrawal without notice

THE NEW POWER EQUATION

Storage Engines

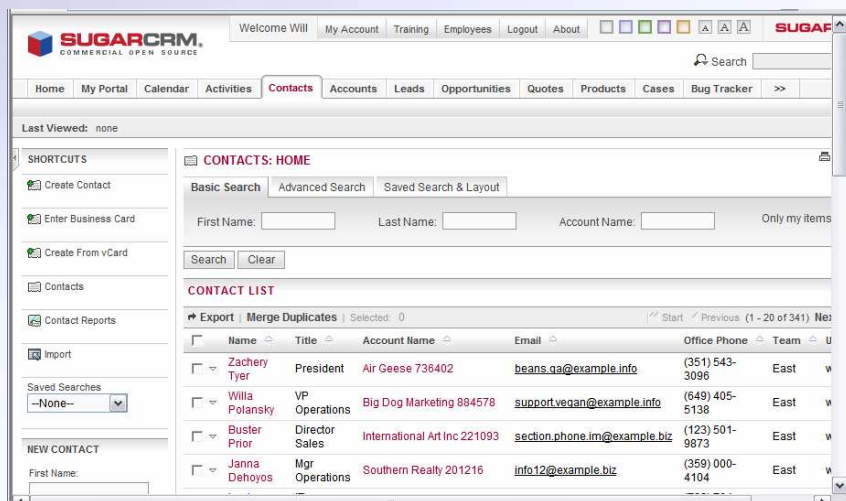
- Summary of the features of three popular MySQL Storage Engines

	MyISAM	MEMORY	InnoDB
Usage	Fastest for read heavy applications	In-memory storage	Fully ACID compliant transactions
Locking	Large-grain table locks, no non-locking reads	Large grain table locks	Multi-versioning, row-level locking
Durability	Table recovery	No disk I/O or persistence	Durability recovery
Supports Transactions	NO	NO	YES

- MyISAM for queries and Business Intelligence (BI)
- Memory is hash-based, stored in memory, useful for temporary tables
- InnoDB and Falcon for high speed transaction processing

THE NEW POWER EQUATION

Open Community Applications on IBM i Expanding Access To Your Data



ILE Applications
(RPG, Cobol, etc)

DB2
server*



IBMDB2I

P
A
S
E

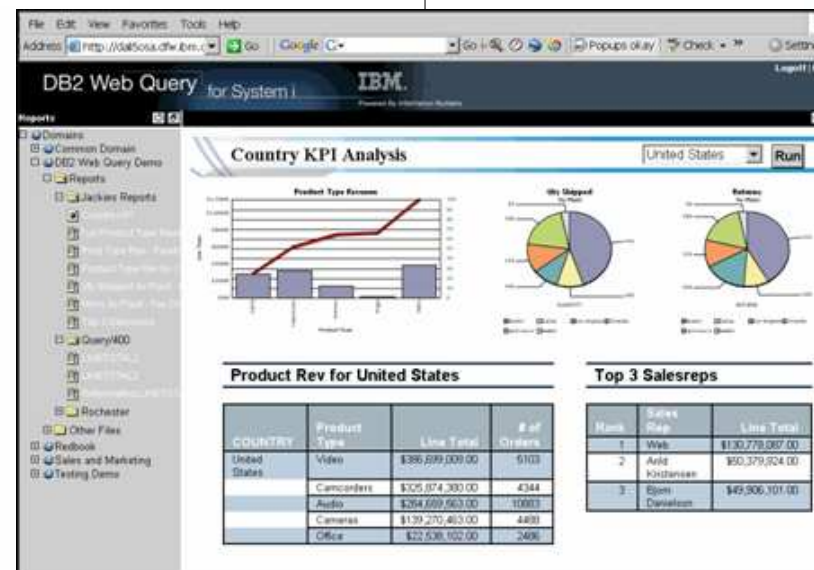
PHP

Apache

MySQL

IBM i Web Server

IBM i



THE NEW POWER EQUATION

* Leverage IBM i functions such as journaling, SAV/RST and DB2 Web Query

Session B - [24 x 80]

File Edit View Communication Actions Window Help

Command Entry RCHAPT3
Request level: 1

Previous commands and messages:
Library EEDB1 not found.
> strsql
> wrklnk '/srv/www'
Object not found. Object is /srv/www.
> wrklnk '/www'
> strsql
> wrklnk
> wrklnk '/www/zendcore/htdocs'
> STRSQL
Command prompting ended when user pressed F12.
> strsql
> strsql

Type command, press Enter.
==>

F3=Exit F4=Prompt F9=Retrieve F10=Include detailed messages
F11=Display full F12=Cancel F13=Information Assistant F24=More keys

MR b 18/007

I902 - Session successfully started

My Bluetooth Places

Screen Icons
15 Jan 07

http://rchaptf3.rchland.ibm.com:89/insert.html - Microsoft Inter...

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites SnagIt

Address http://rchaptf3.rchland.ibr Go Links

V6R1 Champions Class - DB2 for i5/OS Storage Engine Demonstration

First Name:

Last Name:

E-mail:

Done Internet

start

Address Go

100%

12:20 AM
Wednesday
1/16/2008

Session B - [24 x 80] http://rchaptf3.rchla... Windows Task Manager

DB2 Storage Engine for MySQL (IBMDB2I)

- **Requirements:**
 - MySQL version 5.1.26
- **NOTE: Installation requires both a PASE component as well as an ILE component (made available through a PTF)**
- **Starting MySQL and installing the IBMDB2I storage engine plugin:**
 - bin/mysqld_safe &
 - bin/mysql -u root
 - INSTALL PLUGIN ibmdb2i SONAME 'ha_ibmdb2i.so';

DB2 Storage Engine for MySQL (IBMDB2I)

Notes

- **MySQL identifiers are stored in DB2 with outer quotes to preserve case sensitivity.**
 - create table db1.sales (orderno int) engine = ibmdb2i;
 - The above creates the DB2 table "sales" in schema "db1".
- **The IBMDB2I storage engine will not recognize tables and indexes that are pre-created directly into DB2.**
- **MySQL will not recognize DB2 initiated attributes on the tables, such as DB2 triggers, constraints, and indexes for which MySQL has no awareness.**
- **A MySQL to drop a schema will cause DB2 to drop its corresponding schema, including both MySQL and any non-MySQL objects that were created into the schema.**

General Process for Installation Open Community Web Applications

- Step 1: **Requires prior installation of**
 - MySQL
 - Zend Core (PHP and Apache)
- Step 2: **Download the application to your PC**
- Step 3: **Use a zip utility to unzip the application tar file**
- Step 4: **Copy the tar file (resulting from previous step) into the IFS (normally into the /www/zendcore/htdocs directory)**

General Process for Installation Open Community Web Applications

- Step 5: **Enter the PASE environment**
CALL QP2TERM
- Step 6: **Navigate to the directory where the uploaded file resides**
- Step 7: **Expand the archive file:**
tar -xvf application.tar
- Step 8: **Point a web-browser to the application setup/configuration program:**
<http://systemi:89/application>

Source File Compression

- **Many of the files that you will download for the Open Community applications have two levels of compression.**
 - Typically the first final level of compression is a compression level that needs to be uncompressed prior to being uploaded to the IFS
 - One utility to perform the de-compression is 7ZIP
 - <http://www.7-zip.org/download.html>

phpMyAdmin

- Step 1: **Download phpMyAdmin**
 - http://www.phpmyadmin.net/home_page/downloads.php
- Step 2: **Uncompress the file**
- Step 3: **Upload the resulting tar file to the IFS in the root of the Apache web server (/www/zendcore/htdocs)**
- Step 4: **Untar the file in your system:**
- Step 5: **Create a symbolic link to give an easier to remember name for the application**
 - `tar -xvf phpMyAdmin-2.11.1-english.tar`
 - `ln -s phpMyAdmin-2.11.1-english phpMyAdmin`
- Step 6: **Create a directory for local configuration information:**
 - `cd /www/zendcore/htdocs/phpMyAdmin`
 - `mkdir config`
 - `chmod o+rw config`


NOTE: You could uncompress the resulting file on your PC and then upload the application directory – this would avoid steps 4 and 5

phpMyAdmin


- Step 7: **Run the setup script:**
 - <http://iseries:89/phpMyAdmin/scripts/setup.php>
- Step 8: **Add a server definition by clicking <Add> under Servers**

phpMyAdmin 2.11.1 setup

Welcome

 You want to configure phpMyAdmin using web interface. Please note that this only allows basic setup, please read [documentation](#) to see full description of all configuration directives.

Not secure connection

 You are not using secure connection, all data (including sensitive, like passwords) are transferred unencrypted! If your server is also configured to accept HTTPS request follow [this link](#) to use secure connection.

Available global actions (please note that these will delete any changes you could have done above):



Servers

Layout

Features

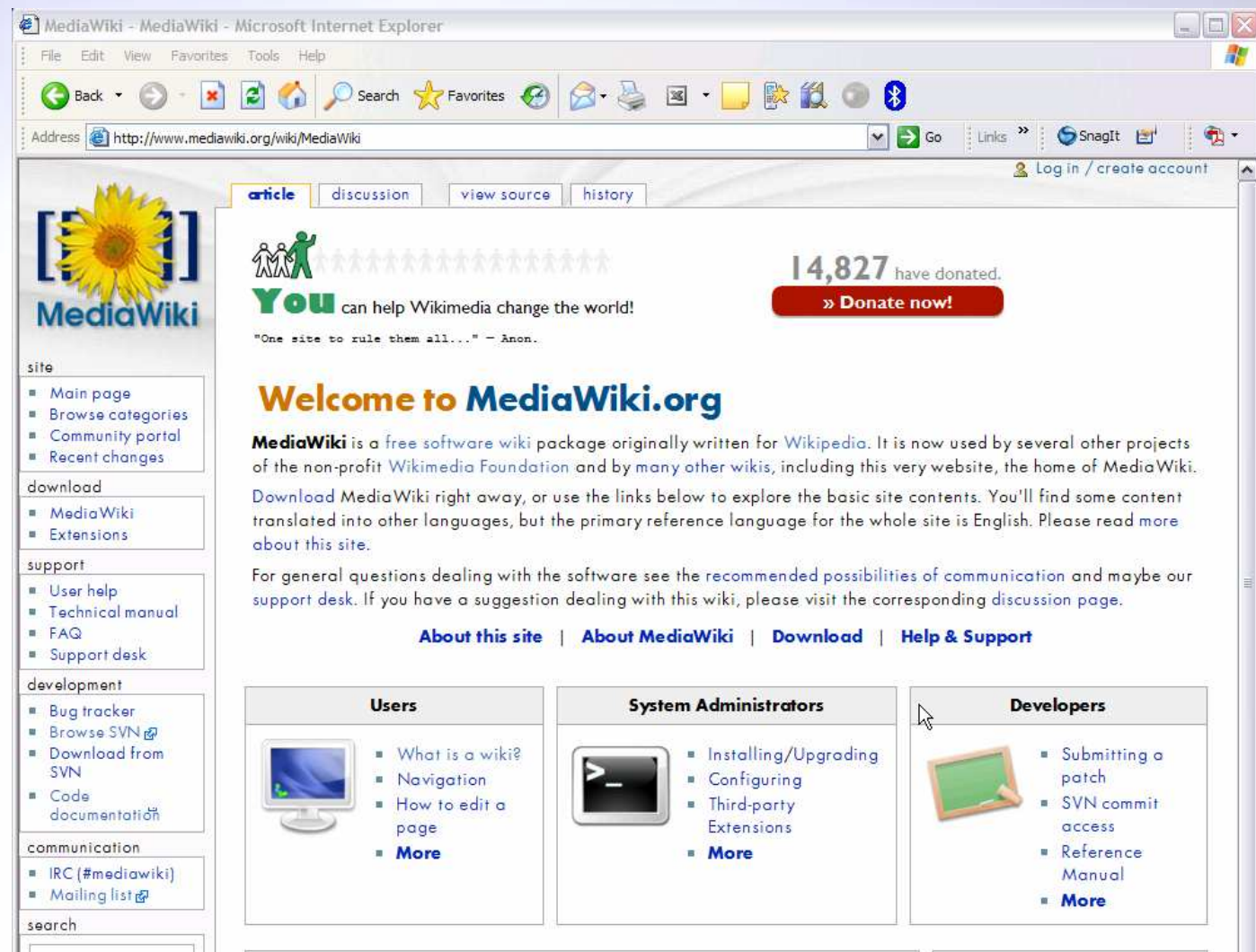
Configuration

Other actions

You are now ready to access phpMyAdmin by pointing a browser to <http://systemi:89/phpMyAdmin>

THE NEW POWER EQUATION

MediaWiki



Application Website: <http://www.mediawiki.org>

Description: <http://en.wikipedia.org/wiki/MediaWiki>

THE NEW POWER EQUATION

MediaWiki

- Step 1: **Download the latest package (mediawiki-1.11.0.tar.gz) from <http://www.mediawiki.org>**
- Step 2: **Unpack the resulting zip file on your PC**
- Step 3: **Copy the resulting tar file (mediawiki-1.11.0.tar) to the IFS (/www/zendcore/htdocs)**
- Step 4: **Start a PASE terminal session (CALL QP2TERM)**
- Step 5: **Change directory (cd /www/zendcore/htdocs)**
- Step 6: **Extract the installation/setup/source files from the tar file (tar -xvf mediawiki-1.11.0.tar)**
- Step 7: **Make the configuration directory readable by all users**
 - cd /www/zendcore/htdocs/mediawiki-1.11.0
 - chmod a+w config

NOTE: You could uncompress the resulting file on your PC and then upload the application directory – this would avoid step 5

MediaWiki

- Step 9: **Point a web-browser to the following address to start the installation/configuration:**
 - <http://iseri.es:89/mediawiki-1.9.3>
- Step 10: **Follow the on-screen prompts**

MediaWiki 1.9.3 Installation - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address C:/mysql/MediaWiki_1_9_3/Installation_USER_NAME.htm Go

Links IBM Business Transformation Homepage IBM Standard Software Installer IT Help Central Join World Community Grid Windows Marketplace

To help protect your security, Internet Explorer has restricted this file from showing active content that could access your computer. Click here for options...

Database config

Database type: ☒ MySQL

Database host:

If your database server isn't on your web server, enter the name or IP address here.

Database name:

DB username:

DB password:

DB password confirm:

Check username and password

If you only have a single user account and database available, enter those here. If you have database root access (see below) you can specify new accounts/databases to be created. This account will not be created if it pre-exists. If this is the case, ensure that it has SELECT, INSERT, UPDATE and DELETE permissions on the MediaWiki database.

Superuser account: ☐ Use superuser account

Superuser name:

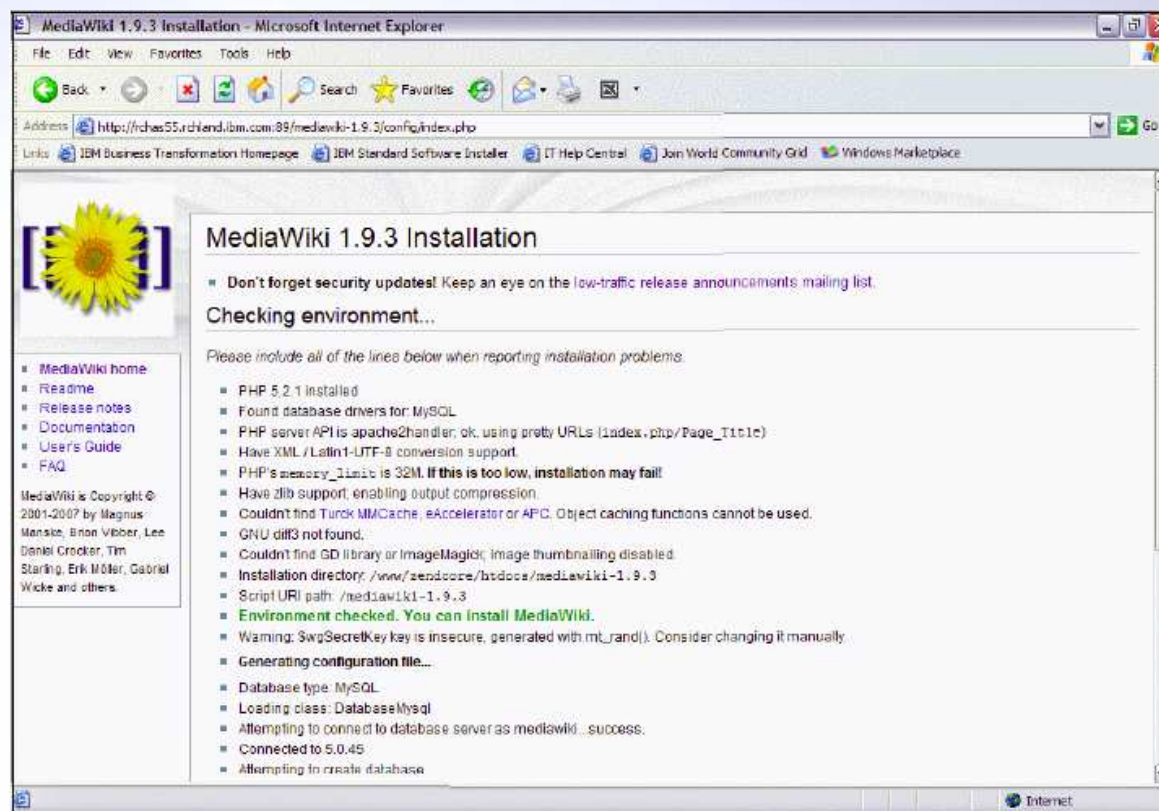
Superuser password:

If the database user specified above does not exist, or does not have access to create the database (if needed) or tables within it, please check the box and provide details of a superuser account, such as root, which does.

Done My Computer

THE NEW POWER EQUATION

MediaWiki



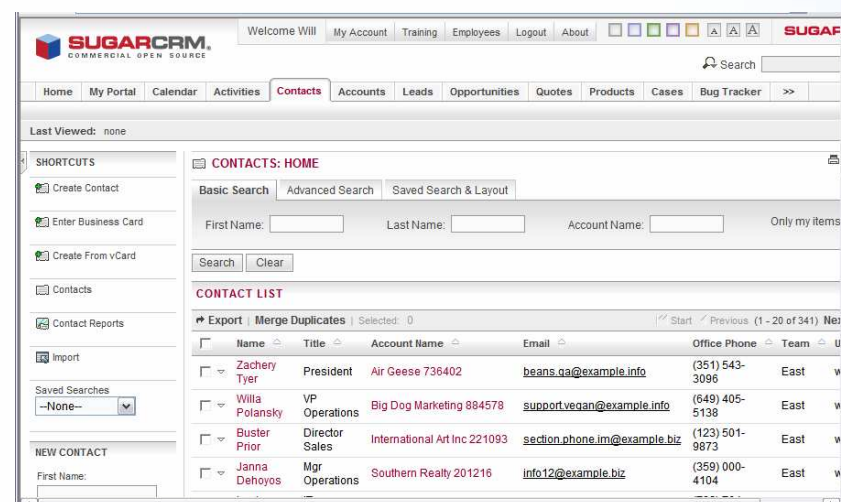
- Step 11: **In the IFS move the settings.php file to the parent directory**
 - `cd /www/zendcore/htdocs/mediawiki-1.9.3/config`
 - `mv LocalSettings.php ../`

You are ready to access the application – point a web browser to `http://iserics:89/mediawiki-1.9.3`

THE NEW POWER EQUATION

SugarCRM Announces Support for i5/OS

- SugarCRM is a leading provider of commercial open source customer relationship management (CRM) software for companies of all sizes
- Sugar Enterprise available for i5/OS
 - Runs with Zend Core and MySQL



<http://www.sugarcrm.com/crm/>

THE NEW POWER EQUATION

SugarCRM (Open Source Customer Relationship Management)



MySQL + PHP on i5/OS

My Upcoming Appointments

Close	Subject	Date	Accept?
<input type="checkbox"/>	Review needs	2006-04-04 19:37	Accepted
<input type="checkbox"/>	Discuss Review Process	2006-04-14 06:00	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	Bad time, will call back	2006-04-29 20:15	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	Initial discussion	2006-05-26 19:37	Accepted
<input type="checkbox"/>	Introduce all players	2006-05-27 19:37	Accepted
<input type="checkbox"/>	Review needs	2006-05-27 19:37	Accepted
<input type="checkbox"/>	Left a message	2006-05-29 00:30	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	Demo	2006-05-29 19:37	Accepted
<input type="checkbox"/>	Review needs	2006-05-31 19:37	Accepted
<input type="checkbox"/>	Discuss Review Process	2006-06-14 22:45	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	Review needs	2006-06-17 19:37	Accepted
<input type="checkbox"/>	Left a message	2006-06-25 00:30	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	Introduce all players	2006-06-27 19:37	Accepted
<input type="checkbox"/>	Discuss Review Process	2006-07-05 07:15	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	Get More information on the proposed deal	2006-07-05 07:15	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	Introduce all players	2006-07-05 19:36	Accepted
<input type="checkbox"/>	Left a message	2006-07-10 04:15	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	Initial discussion	2006-07-14 19:37	Accepted
<input type="checkbox"/>	Get More information on the proposed deal	2006-08-02 04:45	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

My Top Open Opportunities

Opportunity	Account Name	Amount	Close
Anytime Air Support Inc 141706 - 1000 units	Anytime Air Support Inc 141706	\$75,000.00	2006-05-30
COMPLETE HLDNG 865507 - 1000 units	COMPLETE HLDNG 865507	\$75,000.00	2006-09-09

My Pipeline

Pipeline total is \$515.00K

Stage	Count
Prospecting	50
Qualification	50
Needs Analysis	125
Value Proposition	135
Id. Decision Makers	60
Perception Analysis	70
Proposal/Price Quote	25
Negotiation/Review	
Closed Won	
Closed Lost	

Application Website: www.sugarcrm.com

Description: <http://en.wikipedia.org/wiki/SugarCRM>

How To: www.zend.com/forums/index.php?t=msg&th=3111

Running on i5/OS: <http://sei5a2.rchland.ibm.com:89/sugarcrm/>

THE NEW POWER EQUATION

Implementing Open Source Application on i5/OS



Example *SugarCRM*

- **There are several changes that need to be made to the ini file for Zend Core (`\usr\local\Zend\Core\etc\php.ini`)**

- The path that php uses to save files needs to be uncommented (remove the leading semicolon:

```
;session.save_path = "/tmp"
```

- The memory limit needs to be increased to 32 megabytes:

```
memory_limit = 8M
```

Becomes

```
memory_limit = 32M
```

- **Zend Core will need to be stopped and then restarted to activate the changes:**

```
go zendcore/zcmenu
```

- **Download the SugarCRM Open Source Code from the SugarCRM web site:**

```
www.sugarCRM.com
```

THE NEW POWER EQUATION

Implementing Open Source Applications on i5/OS

Example *SugarCRM*



- Unpack the SugarCRM zip file
- Copy the program folder (sugarcrm) to \www\zendcore\htdocs
- Launch a browser and go to <http://systemi:89:/sugarcrm/install.php>
- The first screen prompts for the language selection

Select the desired language and then click the <Start> button to begin the installation

Welcome to the SugarCRM 4.5.1d Setup Wizard

SUGAR OPEN SOURCE.

This installer creates the SugarCRM database tables and sets the configuration variables that you need to start. The entire process should take about ten minutes.

For installation documentation, please visit the [Sugar Wiki](#).

You can also find help from the Sugar Community in the [Sugar Forums](#).

Choose your language:

Start

THE NEW POWER EQUATION

Implementing Open Source Application on i5/OS

Example *SugarCRM*

Read and accept the
License agreement

Click <Next>

At this point the installation will
check the system configuration to
ensure that all dependencies are
properly met

Click <Next>

Step 1: License Acceptance

SUGAR OPEN SOURCE.

The Sugar Public License Version 1.1.3 ("SPL") consists of the Mozilla Public License Version 1.1, modified to be specific to SugarCRM, with the Additional Terms in Exhibit B. The original Mozilla Public License 1.1 can be found at: <http://www.mozilla.org/MPL/MPL-1.1.html>

SUGARCRM PUBLIC LICENSE
Version 1.1.3

1. Definitions.

1.0.1. "Commercial Use" means distribution or otherwise making the Covered Code available to a third party.

1.1. "Contributor" means each entity that creates or contributes to the creation of Modifications.

1.2. "Contributor Version" means the combination of the Original Code, prior Modifications used by a Contributor, and the Modifications made by that

☒ Accept

Printable View

Step 2: System Check Acceptance

In order for your SugarCRM installation to function properly, please ensure all of the system check items listed below are green. If any are red, please take the necessary steps to fix them.

Component	Status
PHP version	OK (ver 5.1.4)
MySQL Database	OK
XML Parsing	OK
cURL Library	Not found: scheduler will not be functional
Writable SugarCRM Configuration File (config.php)	OK
Writable Custom Directory	OK
Writable Modules Sub-Directories and Files	OK
Writable Data Sub-Directories	OK
Writable Cache Sub-Directories	OK
Writable Session Save Path (/tmp)	OK
PHP Safe Mode Turned Off	OK
PHP Allow Call Time Pass Reference Turned On	OK
PHP Memory Limit >= 32M	OK (32M)

Note: Your php configuration file (php.ini) is located at:
/usr/local/Zend/core/etc/php.ini

Help

Re-check

Back

Next

Implementing Open Source Application on i5/OS

Example *SugarCRM*



Configure the database definition for SugarCRM

Define the Site Configuration information
The URL will be `http://systemi:89/sugarcrm`

THE NEW POWER EQUATION

Step 3: Database Configuration

Please enter your database configuration information below. If you are unsure of what to fill in, we suggest that you use the default values.

* Required field

Database Configuration

* Host Name: localhost

* Database Name: sugarcrm ☒ Create database

* Database username: sugarcrm ☒ Create user

Database password: [text box]

Re-enter database password: [text box]

Drop and recreate existing Sugar tables? ☐
Caution: All Sugar data will be erased if this box is checked.

Populate database with demo data? ☒

Database account above is a privileged user? ☐

* Privileged Database User Name: root
This privileged database user must have the proper permissions to create a database, drop/create tables, and create a user. This privileged database user will only be used to perform these tasks as needed during the installation process. You may also use the same database user as above if that user has sufficient privileges.

Privileged Database User Password: [text box]

Help Back Next

Step 4: Site Configuration

Please enter your site configuration information below. If you are unsure of the fields, we suggest that you use the default values.

* Required field

Site Configuration

* URL of Sugar instance: http://se15a2:89/sugarcrm

* Sugar admin password: [password box]
Caution: This will override the admin password of any previous installation.

* Re-enter Sugar admin password: [password box]

Sugar Updates Config

Send Anonymous Usage Statistics? ☐
If checked, Sugar will send anonymous statistics about your installation to SugarCRM Inc. every time your system checks for new versions. This information will help us better understand how the application is used and guide improvements to the product.

Automatically Check For Updates? ☐
If checked, the system will periodically check to see if updated versions of the application are available.

Advanced Site Security

Use defaults? ☒

Help Back Next

Implementing Open Source Application on i5/OS

Example *SugarCRM*

Confirm the configuration settings

Step 5: Confirm Settings SUGARCRM.

Please confirm the settings below. If you would like to change any of the values, click "Back" to edit. Otherwise, click "Next" to start the installation.

Database Settings	
Host Name	localhost
Database Name	sugarcrm (will be created)
Database Username	sugarcrm (will be created)
Drop and recreate existing Sugar tables?	No
Populate database with demo data?	Yes
Privileged Database User Name	root
Site Configuration	
URL of Sugar Instance	http://sei5a2:89/sugarcrm
Enable Sugar Updates	
Sugar updates enabled?	No
Advanced Site Security	
Use a Custom Session Directory for Sugar?	No
Use a Custom Log Directory for Sugar?	No
Own Application ID Provided?	No

[Help](#) [Back](#) [Next](#)

At this point the installation of sugarCRM will proceed

```

emails_repos... done
emails_opportunities... done
emails_project_task... done
emails_projects... done
emails_prospects... done
emails_tasks... done
emails_users... done
files... done
meetings_contacts... done
meetings_users... done
opportunities_contacts... done
users_feeds... done
tracker... done
prospect_list_campaigns... done
prospect_lists_prospects... done
roles_modules... done
roles_users... done
project_relation... done
acl_roles_actions... done
acl_roles_users... done
inboundemail_autoreply... done
email_marketing_prospect_lists... done
usersignature... done
linked_documents... done

Creating default Sugar data
  Inserting default settings... done
  Creating default users... done
  Creating default scheduler jobs... done

The setup of Sugar 4.2.1b is now complete.

Total time: 1.522664 seconds.
Approximate memory used: 11155544 bytes.
Your system is now installed and configured for use.
  
```

[Help](#) [Back](#) [Next](#)

THE NEW POWER EQUATION

Joomla! (Open Source Content Management System)



MySQL + PHP on i5/OS

- **Application Website:**
<http://joomla.org/>
- **Description:**
<http://en.wikipedia.org/wiki/Joomla>
- **How To:**
www.zend.com/forums/index.php?t=msg&th=3068
- **Running on i5/OS:**
<http://sei5a2.rchland.ibm.com:89/joomla>

THE NEW POWER EQUATION

Joomla!

- Step 1: **Download the Joomla! Package (Joomla_1.0.9-Stable-Full_Package.tar.gz)** from <http://www.joomla.org>
- Step 2: **Unpack the resulting zip file on your pc**
- Step 3: **Copy the resulting tar file (Joomla_1.0.9-Stable-Full_Package.tar)** to the IFS (/www/zendcore/htdocs/joomla)
- Step 4: **Start a PASE terminal session**
 - CALL QP2TERM
- Step 5: **Navigate to the Joomla directory**
 - cd /www/zendcore/httdods/joomla

Joomla!

- Step 6: **Unpack the Joomla! tar file:**
 - `tar -xvf Joomla_1.0.9-Stable_Full_package.tar`
- Step 7: **Make the following changes to the php configuration file (/local/Zend/core/php.ini)**
 - Uncomment the session.save_path line
`;session.save_path="/tmp"`
 - Enable the display_errors setting
`display_errors=On`
 - Enable the magic_quotes_gpc setting
 - `magic_quotes_gpc = On`
- Step 8: **Restart Zend Core**
 - GO ZENDCORE/ZCMENU

NOTE: You could uncompress the resulting file on your PC and then upload the application directory – this would avoid step 6

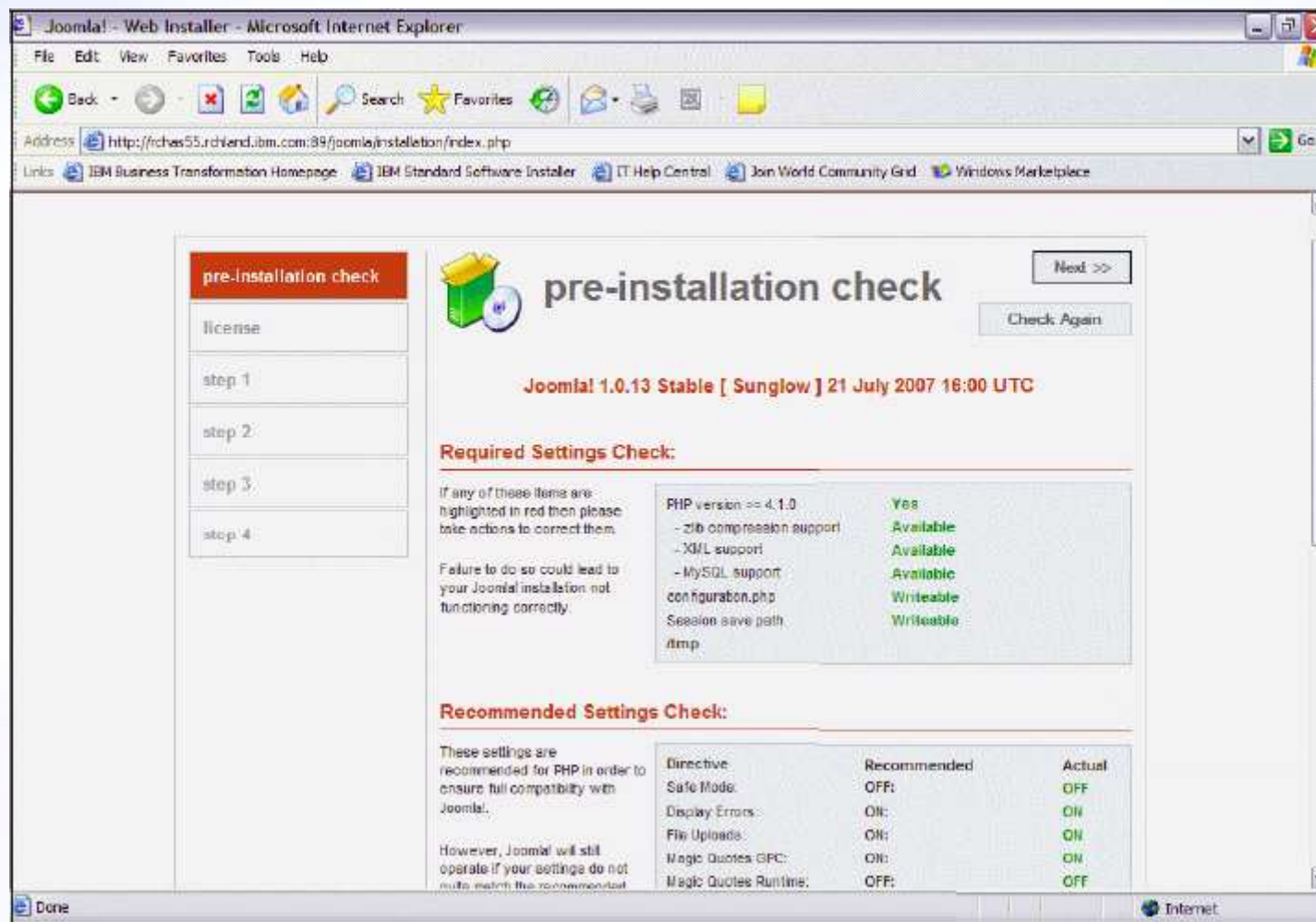
Joomla!

- Step 9: **Grant the i5/OS profile 'nobody' read, write, and execute permissions on the following directories in the /www/zenddocre/htdocs/joomla directory**

administrator/backups
administrator/components
administrator/modules
administrator/templates
cache
components
Images
images/banners
images/stories
langauges
mambots
mambots/content
mambots/editors
mambots/editors-xtb
mambots/search
mambots/system
media
modules
templates

Joomla!

- Step 10: **Point a web-browser to the following URL**
 - <http://systemi:89/joomla>
 - Pre-installation check should be all green

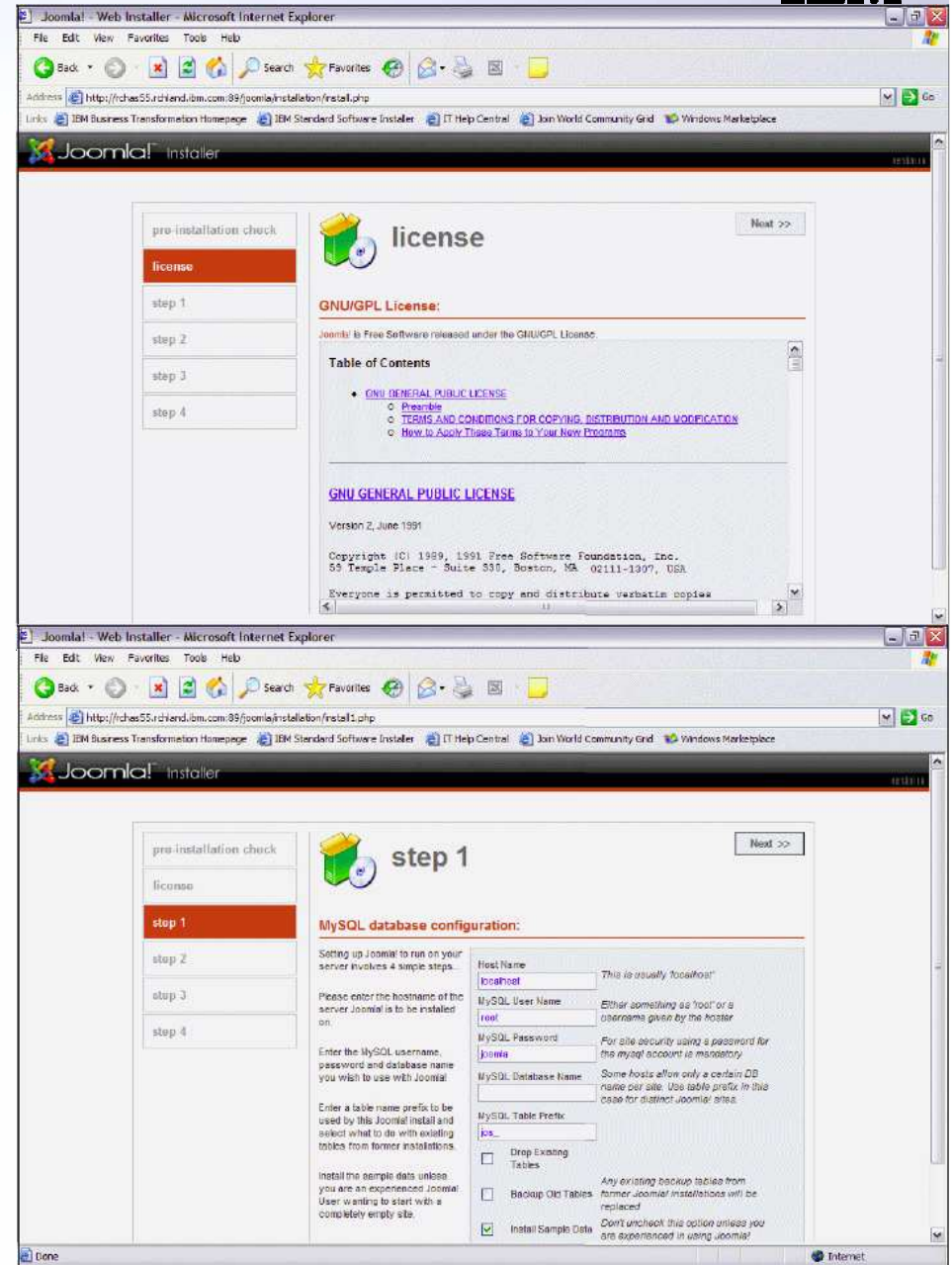


THE NEW POWER EQUATION

Joomla!

- Step 11: **Accept the license agreement**
- Step 12: **Enter the following information (for step 1 of the installation)**
 - Host Name localhost
 - MySQL User root
 - MySQL Database name joomla

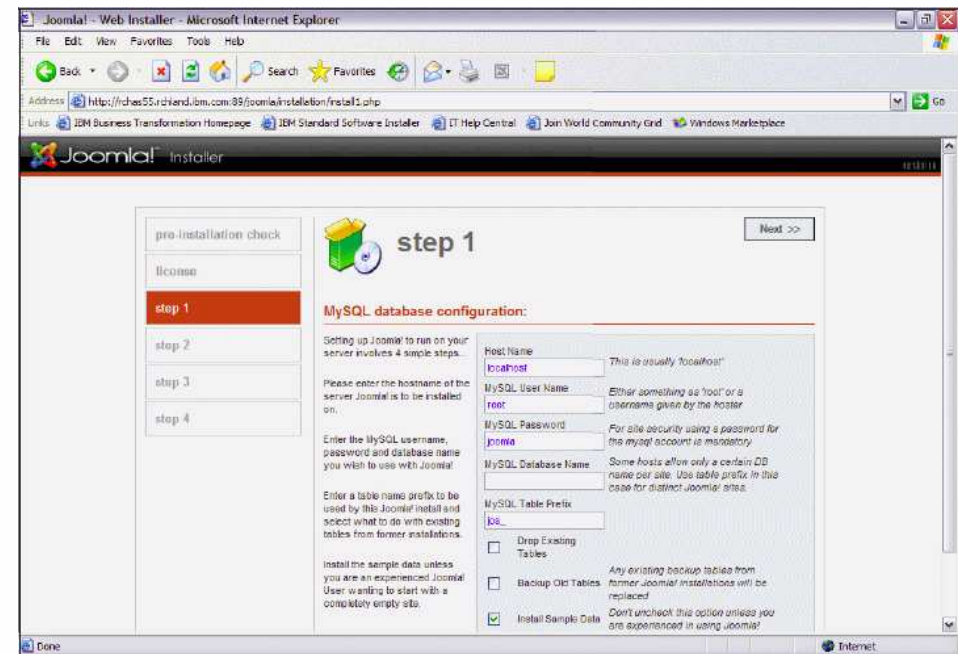
THE NEW POWER EQUATION



Joomla!

- Step 13: **Specify the site name of your choice for step 2 of the installation**

- Step 14: **Enter the following information (for step 3 of the installation)**
 - URL http://iseries:89/joomla
 - Path /www/zendcore/htdocs/joomla
 - User email <user defined>
 - Admin Password <user defined>



THE NEW POWER EQUATION

Joomla!

- Step 15: **In the Integrated File System, delete the /www/zendcore/htdocs/joomla/installation directory**



You are ready to access the application – point a web browser to <http://iseries:89/joomla/index.php>

THE NEW POWER EQUATION

Zen Cart

- Step 1: **Download the software package from <http://www.zen-cart.com>**
- Step 2: **Use a zip utility to unzip the file**
- Step 3: **Copy the unzipped contents to the `/www/zendcore/htdocs/zencart` directory**

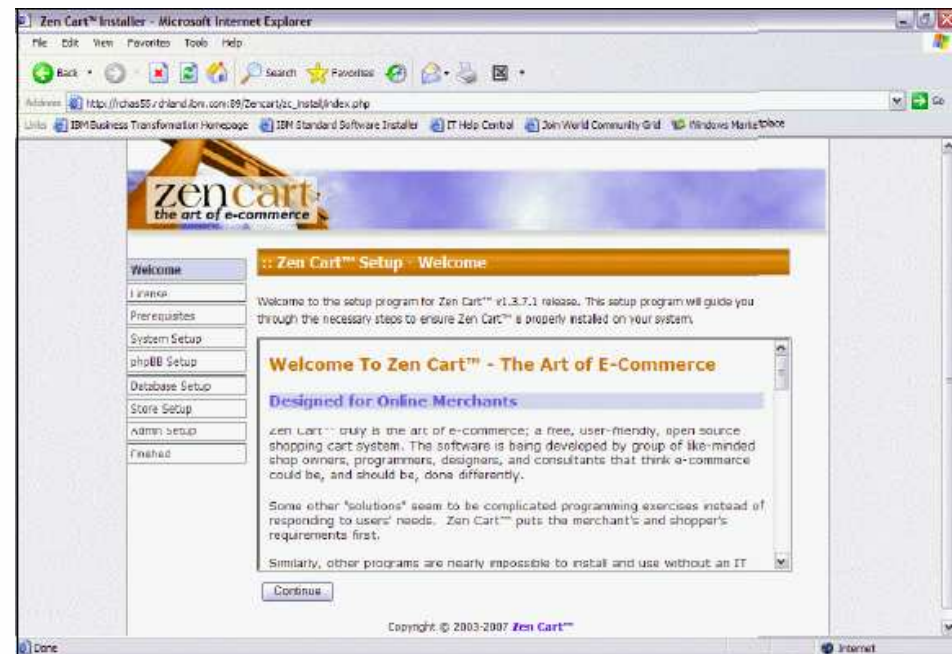
Zen Cart

- Step 4: **Open the Zend Core Administration interface:**
 - <http://systemi:89/ZendCore>
- Step 5: **In the Zend Core Administration Interface select 'Configuration→Extensions'**
 - Enable curl – cURL
 - Enable gd –GD
- Step 6: **Save the settings**
- Step 7: **Restart the Apache Web Server**
 - GO ZENDCORE/ZCMENU
 - Select Option 5, Service Management menu
 - Select Option 6, ReStart Apache server instances

Zen Cart

- Step 8: **Point a web browser to the Zen Cart installation/setup program:**
 - <http://systemi:89/zencart>

- Step 9: **On the pre-requisites screen check to ensure that all items are checked with a green mark**

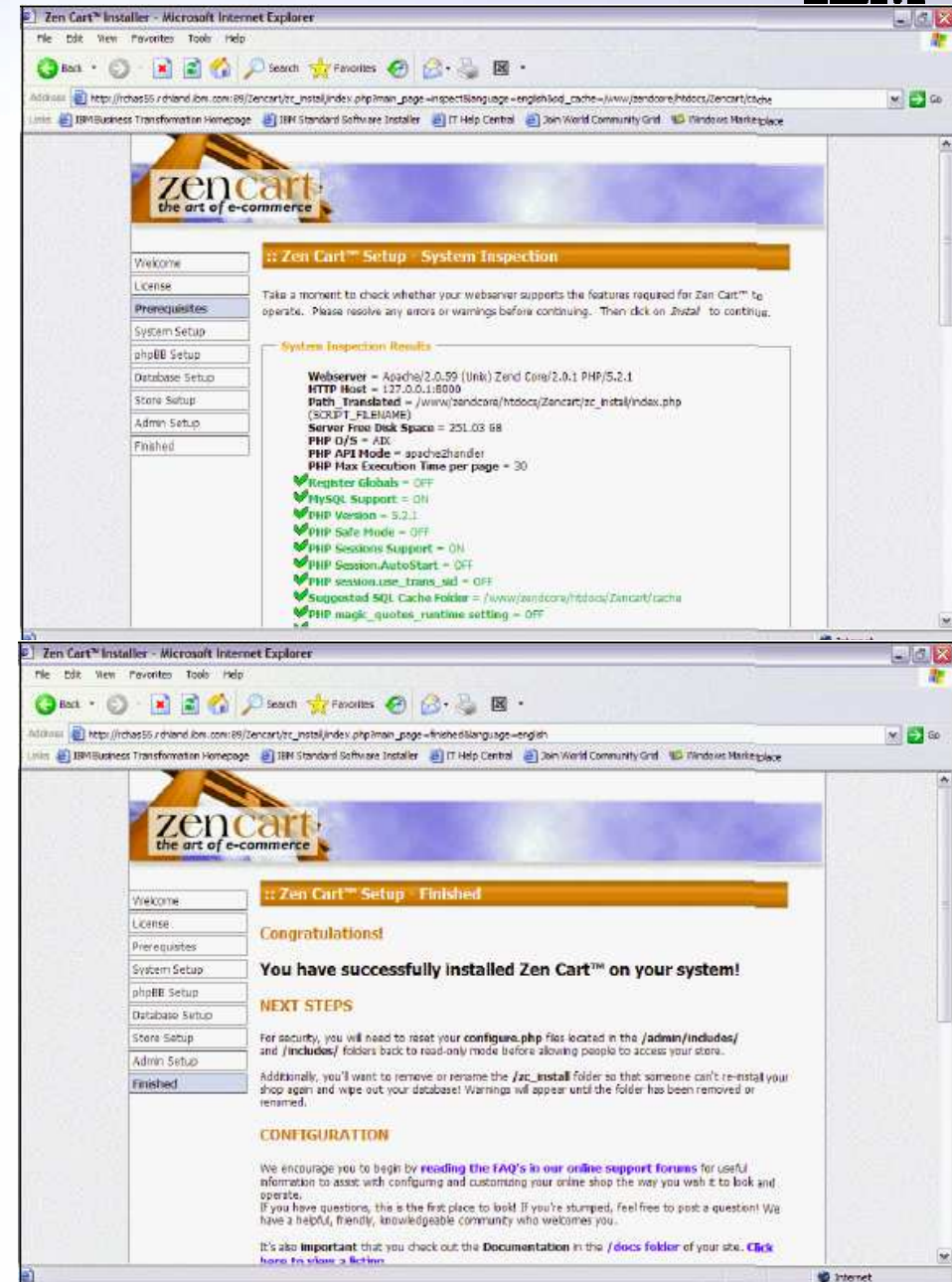


THE NEW POWER EQUATION

Zen Cart

- Step 10: **On the Zen Cart Setup – System Setup screen make sure to replace the URL with `http://systemi:89`**
- Step 11: **Follow the remaining prompts through 'database setup', 'store setup' and 'admin setup'**

THE NEW POWER EQUATION



PmWiki

- Step 1: **Download the software package to your PC**
- Step 2: **Use a zip utility to unzip the zip file**
- Step 3: **Copy the resulting tar file (pmwiki-latest.tar) to /www/zendcore/htdocs)**
- Step 4: **Start a PASE terminal session:**
 - CALL QP2TERM

Zen Cart

- Step 12: **Remove the file /www/zendcore/htdocs/zencart/zc_install**
- Step 13: **Change permissions on /www/zendcore/htdocs/zencart/includes/configure.php to read only**
 - CHGAUT OBJ(`/www/zendcore/htdocs/zencart/includes/configure.php')
USER(*BLIC) DTAUT(*R) OBJAUT(*NONE)

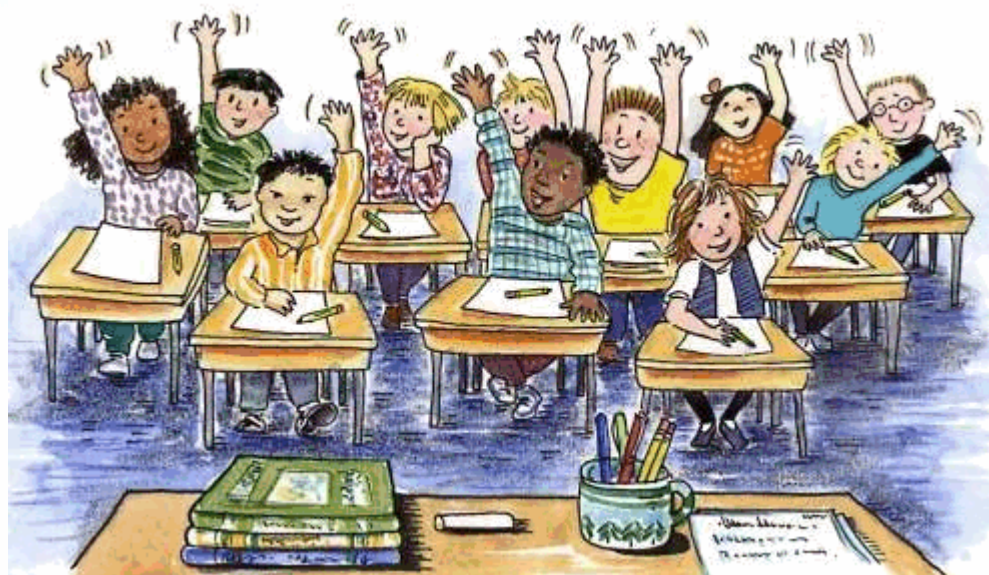
PmWiki

- Step 5: **Navigate to the root directory of the Apache server:**
 - `cd /www/zendcore/htdocs`
- Step 6: **Unpack the installation files:**
 - `tar -xvf pmwiki-latest.tar`

PmWiki

- **Step 7: In the PASE terminal session execute the following commands to create the wiki process directory and open it's permissions:**
 - `mkdir /www/zendcore/htdocs/pmwiki-2.1.27/wiki.d`
 - `chmod 777 /www/zendcore/htdocs/pmwiki-2.1.27/wiki.d`
- **Step 8: Edit the pmwiki.php file and change the ScriptUrl line as follows:**
 - Use the WRKLNK command to navigate to the path `/www/zendcore/htdocs/pmwiki-2.1.27/pmwiki.php`
 - Take option 2 to edit the pmwiki.php file
 - Find the `$ScriptUrl =` line and change the line to `'$ScriptUrl=$_SERVER['SCRIPT_NAME'];`
 - Take option <F3>to save and exit
- **Step 9: You can now execute pmwiki by pointing a browser to <http://systemi:89/pmwiki>**

Questions?



No? Well, then...

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Thank You



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