Re-VAMP Your OpenVMS System

OpenVMS Boot Camp 2006

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Agenda

- Why VAMP?
- What You Need
- Installing The Toys
- Some Performance Considerations
- Web Server Fodder
- Other Resources

Why VAMP?

- Many current web server are based on “LAMP”:
  - Linux – Growing in popularity
  - Apache – The most popular web server
  - MySQL – Open-Source, light-weight SQL RDB
  - PERL/PHP
    - Pathologically Eclectic Rubbish Lister *(ref. Programming Perl, page ix)*
      - One of the original Web Programming languages
    - Personal Home Page (Tools)
      - Increasingly popular Web Scripting language

Why VAMP?

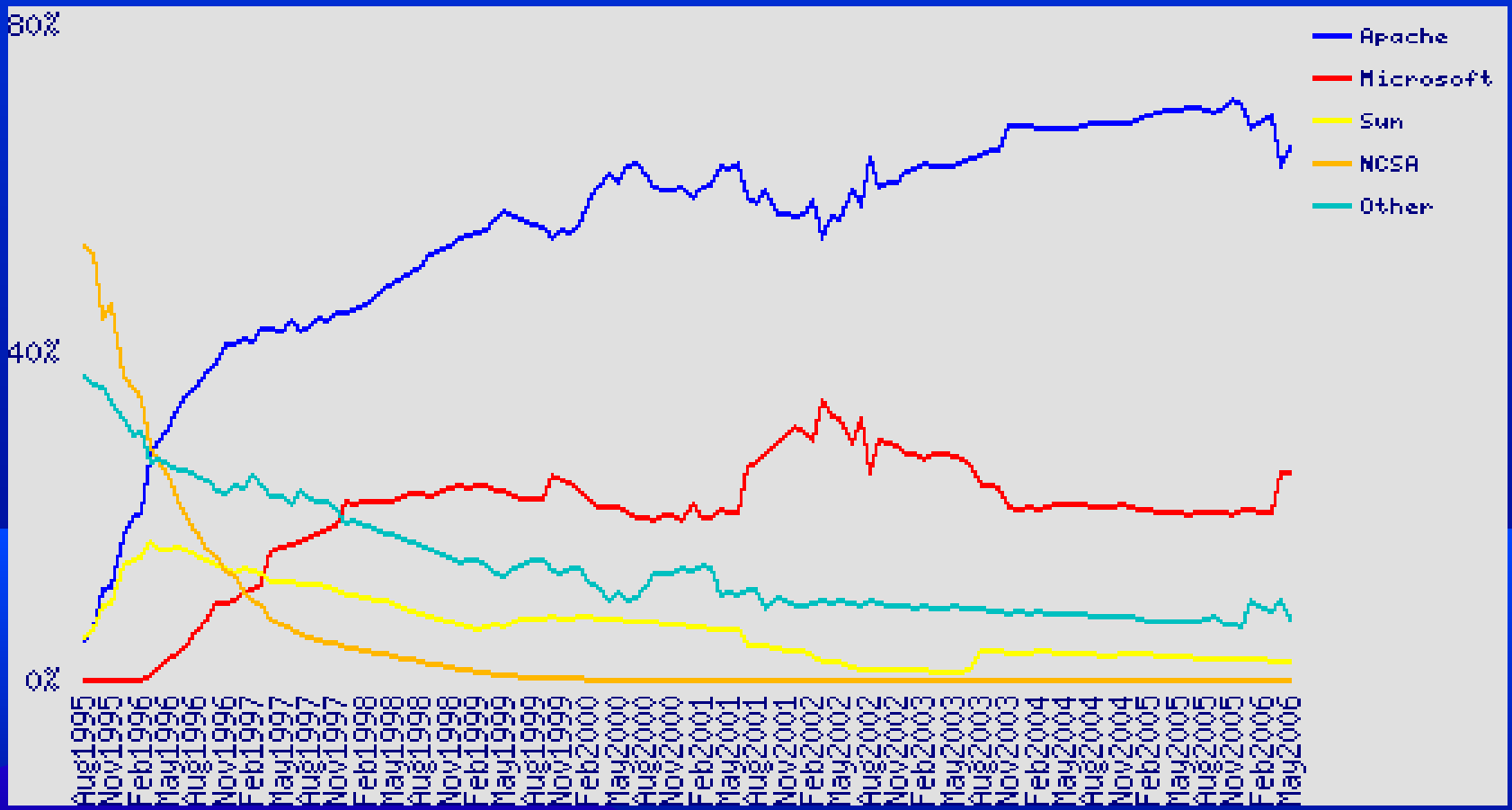
- Simply replace the Linux...
  - VMS (The “Open” is silent)
  - Apache
  - MySQL
  - PERL/PHP
    - We're going to concentrate on PHP, though, since there is some nice integration already with Apache/MySQL
- The Power of Open Source with the Power of Best-In-Class reliability, scalability, and security.

Why VAMP?

- Portability
  - Apache/MySQL/PERL/PHP are in common usage
  - Tools/Apps from other systems are portable to VAMP
- Supportability
  - Popularity means many support resources exist:
    - Books, Web Sites, User Groups, Endless Examples, ...
- Pre-Built Applications
  - Forums, CRM, and more – many work out-of-the-box

Why VAMP?

What Web Servers does the Internet use?



Why VAMP?

My SQL Growing Market Share and Support:

SANTA CRUZ, CA, January 5, 2004 -

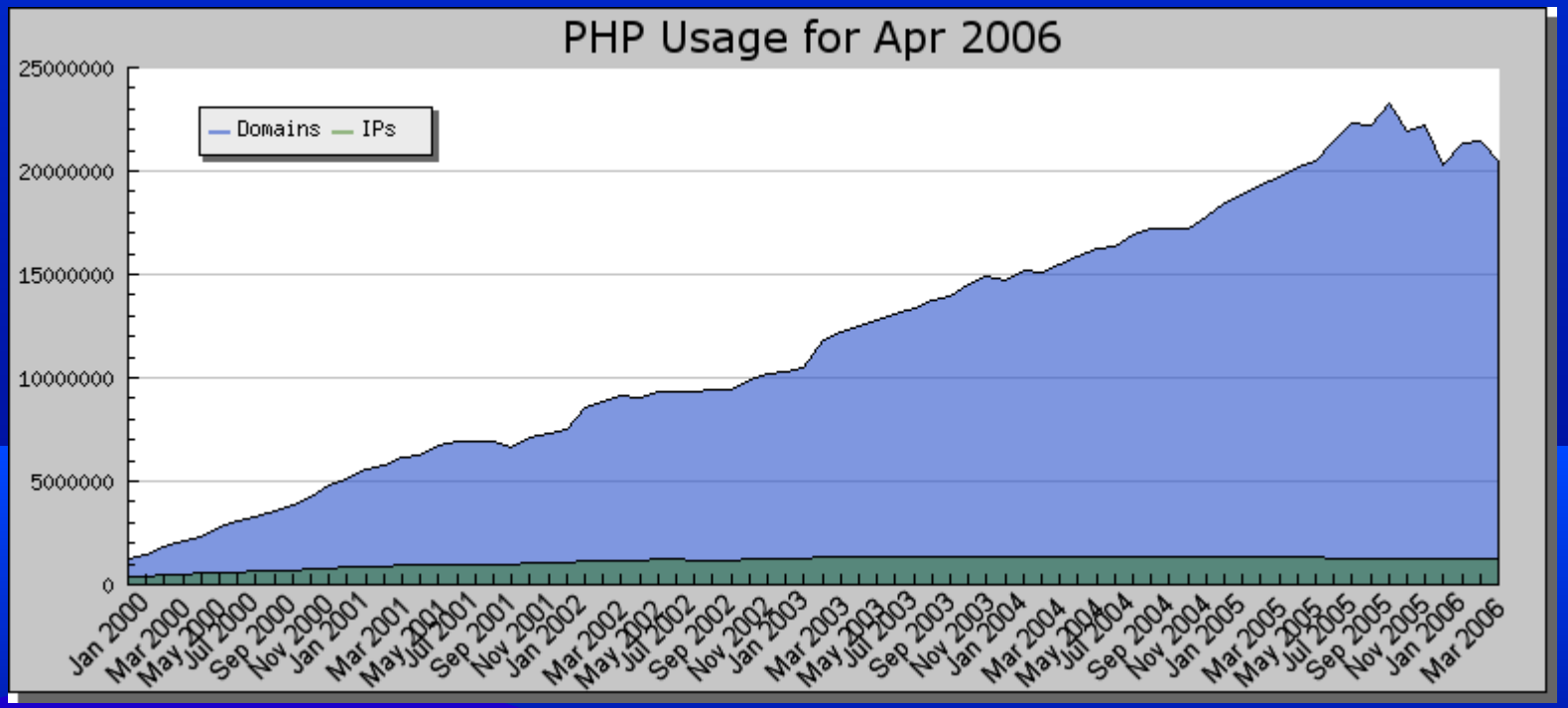
The latest Database Development Survey from Evans Data Corporation has found that Microsoft SQL Server and Access continue to dominate database development but open source databases are gaining strength. Microsoft SQL Server and Access usage has grown by six percent while MySQL usage has increased by more than 30% in the last year. (Source: *Evans Data Corporation)*

By Antone Gonsalves TechWeb.com Apr 25, 2006 04:30 PM

Hewlett-Packard Co. on Tuesday said it plans to roll out next month consulting, integration and support services for customers implementing the MySQL open source database.

Why VAMP?

PHP usage is increasing, too



What You Need

- OpenVMS
  - An Alpha or Itanium system
  - OpenVMS Version 7.3-2 or higher
  - A Disk formatted as ODS-5
  - Extra memory (Apache processes and MySQL cache)

What You Need

- Apache
  - A.K.A. Compaq Secure Web Server
  - Server Certificate
    - If you want to enable SSL transactions
    - Can be a self-signed certificate
  - Download at:
    - http://www.openvms.compaq.com/openvms/products/ips/apache/csws.html

What You Need

- Apache
  - If you need a VAX implementation, you will need to build it yourself from source code.
  - HP does not provide build-procedures, so you are on your own.

What You Need

- MySQL
  - Either get the pre-built or compile it yourself
  - Download at:
    - http://www.weaverconsulting.ca/mirror/anonymous/kits/axp/mysql-v0401-14-1.zip
    - http://www.weaverconsulting.ca/mirror/anonymous/kits/ia64/mysql-v0401-14-1.zip
    - http://www.weaverconsulting.ca/mirror/anonymous/kits/sources/mysql-4_1_14_vms.zip

What You Need

- PERL and PHP
  - Also available on the OpenVMS Web Site
  - Download at:
    - http://h71000.www7.hp.com/openvms/products/ips/apache/csws_php.html
    - http://h71000.www7.hp.com/openvms/products/ips/apache/csws_modperl.html
  - Perl can be installed independently of CSWS, for non-web based Perl programming.

Installing the Tools

- First, install Apache, PHP, and PERL
  - $ PRODUCT INSTALL CSWS
  - $ PRODUCT INSTALL CSWS_PHP
  - $ PRODUCT INSTALL PERL
  - $ PRODUCT INSTALL CSWS_PERL
  - $ PRODUCT INSTALL MYSQL
- Define Apache Logicals
  - $ @SYS$STARTUP:APACHE$LOGICALS

Installing the Tools

- Make any configuration changes:
  - $ EDIT APACHE$ROOT:[CONF]HTTPD.CONF
  - Verify “EnableMMAP” is set to “off”
    - Otherwise, files need to be in STREAM_LF format
  - Verify “Include /apache$root/conf/mod_php.conf”
  - If you are going to be hosting multiple domains, check the “NamedVirtualHost” directive, and set up the VirtualHost directives

Installing the Tools

Setting up Virtual Hosts:

```
#
# Use name-based virtual hosting.
#
NameVirtualHost 209.39.152.6 # If you have more than one IF

<VirtualHost www.openvmshobbyist.com>
        ServerAdmin     webmaster@montagar.com
        DocumentRoot    /apache$common/openvmshobbyist
        ServerName      www.openvmshobbyist.com
</VirtualHost>
```

Installing the Tools

Defining the Directory location for the Host:

```
<Directory "/apache$root/openvmshobbyist">
        AllowOverride None
        Options IncludesNoExec
        AddOutputFilter Includes html
        AddHandler type-map var
        Order allow,deny
        Allow from all
        LanguagePriority en cs de es fr it nl sv pt-br
ro
        ForceLanguagePriority Prefer Fallback
</Directory>
```

Installing the Tools

- PHP
  - Edit APACHE$ROOT:[PHP]PHP.INI
  - Uncomment out the extensions you want:
    - extension=php_mysql.exe
    - extension=php_openvms.exe
    - extension=php_sockets.exe
    - ... or just all of them!

Installing the Tools

- Start Apache:
  - $ @SYS$STARTUP:APACHE$STARTUP
- Load up the content
  - Should go in APACHE$COMMON:[HTDOCS] or appropriate locations defined by <Directory>
- Point a browser at your web site, and check to make sure it works...
  - You should see your web site, or at least the Apache test page

Installing the Tools

- MySQL
  - Once MySQL is installed, it needs to be configured
  - The primary issue is adding users
  - MySQL has a flexible system for this, but it's a little cumbersome.
  - Run the MySQL Daemon to skip security, so you can add the first user:
    - $ @my$disk:[mysql.vms]logicals
    - $ @my$disk:[mysql.vms.mysql]first_run_mysqld

Install the Tools

- MySQL
  - Define your symbols (you'll want this in SYLOGIN)
    - $ @mysql_root:[vms]symbols
  - Create your “Super User” Account
    - $ mysql mysql
      - insert into user(host, user, password)
        values('%', 'SYSTEM', password('secret'))

Install the Tools

- MySQL
  - Okay, this query is no fun, but needed...
    - update user set
      select_priv = 'Y', insert_priv = 'Y', update_priv = 'Y',
      delete_priv = 'Y', create_priv = 'Y', drop_priv = 'Y',
      reload_priv = 'Y', shutdown_priv = 'Y', process_priv = 'Y',
      file_priv = 'Y', grant_priv = 'Y', references_priv = 'Y',
      index_priv = 'Y', alter_priv = 'Y', show_db_priv = 'Y',
      super_priv = 'Y', create_tmp_table_priv = 'Y',
      lock_tables_priv = 'Y', execute_priv = 'Y', repl_slave_priv = 'Y',
      repl_client_priv = 'Y'
      where user = 'SYSTEM' ;

Install the Tools

- MySQL Access Rights
  - Controlled by three tables (two are most important)
    - user
    - db
  - USER tracks user/password, and my include valid addresses for that user/password and establishes server-wide access permissions (all databases).
  - DB establishes what host/user are allowed to access a database, plus permissions for only that database.

Install the Tools

- MySQL
  - If you add other accounts later, you will need to reload the privilege tables, or restart the MySQL daemon
    - mysqladmin -u “SYSTEM” -p reload
  - The MySQL daemon runs via command procedure
  - This can be run in a batch queue
    - Should be on a specific node, not a generic queue.
  - Depending upon how you are firewalled, you should define the –bind-address to an inside IP address.

Install the Tools

Sample RUN_MYSQLD.COM File:

```
$ set process/parse=extend
$ if f$mode() .eqs. "BATCH" then -
        $ set process/name="MySQL$Server"
$ mysqld :== $ mysql_root:[vms.mysql]mysqld
$ define /noLOG TMPDIR "/SYS$SCRATCH"
$ define /noLOG DECC$EFS_CASE_PRESERVE enable
$ define /noLOG DECC$EFS_CHARSET enable
$ define /noLOG DECC$READDIR_DROPDOTNOTYPE enable
$ define /noLOG DECC$FILENAME_UNIX_REPORT enable
$ define /noLOG DECC$FILE_SHARING enable
$ define /noLOG DECC$EFS_CASE_SPECIAL disable
$ define /noLOG DECC$FILENAME_UNIX_ONLY disable
$ define /noLOG DECC$ALLOW_REMOVE_OPEN_FILES enable
$ mysqld --innodb_flush_log_at_trx_commit=2 -
        --ansi --myisam-recover --log-bin -
        --default-table-type=innodb -
        --bind-address=raven.corp.montagar.com
$ exit
```

Install the Tools

- MySQL
  - Shutdown and then start MySQL
    - mysqladmin shutdown ! This will kill FIRST_RUN_MYSQLD
    - submit/user=mysql$server mysql_root:[vms.mysql]run_mysqld

Install the Tools

- Add procedures to system startup:
  - @SYS$STARTUP:APACHE$STARTUP
  - @MY$DISK:[MYSQL.VMS]LOGICALS
  - SUBMIT /USER=MYSQL$SERVER – MYSQL_ROOT:[VMS.MYSQL]RUN_MYSQLD - /QUEUE=MYSQL$BATCH

Some Performance Considerations

- Apache
  - Apache uses several processes, which load a variety of images and shareables.
  - This is especially true if you are running PHP – multiple PHP modules are loaded every time PHP is invoked.
  - These can be installed /OPEN/HEADER/SHARE in order to conserve physical memory and shorten load time.

Some Performance Considerations

- Apache
  - Sample procedure to install files:

```
$!
$! Install Apache images as /OPEN/HEADER/SHARED
$!
$ set noon
$ install add/open/head/share APACHE$root:[000000]APACHE$HTTPD.EXE;1
$ install add/open/head/share APACHE$root:[000000]APACHE$APU_SHR.EXE;1
$ install add/open/head/share APACHE$root:[000000]APACHE$APR_SHR.EXE;1
$ install add/open/head/share APACHE$root:[000000]APACHE$HTTPD_SHR.EXE;1
$ install add/open/head/share APACHE$root:[MODULES]MOD_LOG_CONFIG.EXE;1
$ install add/open/head/share APACHE$root:[MODULES]MOD_MIME.EXE;1
$ install add/open/head/share APACHE$root:[MODULES]MOD_NEGOTIATION.EXE;1
$ install add/open/head/share APACHE$root:[MODULES]MOD_INCLUDE.EXE;1
$ install add/open/head/share APACHE$root:[MODULES]MOD_AUTOINDEX.EXE;1
$ install add/open/head/share APACHE$root:[MODULES]MOD_DIR.EXE;1
$ install add/open/head/share ...
$ install add/open/head/share APACHE$root:[PHP.BIN]PHPSHR.EXE;1
$ install add/open/head/share APACHE$root:[PHP.EXTENSIONS]PHP_BCMATH.EXE;1
$ install add/open/head/share APACHE$root:[PHP.EXTENSIONS]PHP_BZ2.EXE;1
$ install add/open/head/share APACHE$root:[PHP.EXTENSIONS]PHP_CALENDAR.EXE;1
# install add/open/head/share ...
```

Some Performance Considerations

- MySQL
  - Databases love memory
  - On the “mysqld” command in RUN_MYSQLD.COM you may want to increase some cache values (according to taste, of course):
    - --key_buffer=128M
    - --table_cache=512

Performance Considerations

- MySQL
  - MySQL uses different “engines” for storing tables:
    - MYISAM
    - INNODB
  - MYISAM type tables can be a problem on OpenVMS
  - Set –default-type=innodb
  - Also needed for large MySQL databases, since MYISAM is restricted to 4GB tables.

Web Server Fodder

- Now that this is all running, what can you do?
  - Find PHP tools on the web:
    - phpBB2 – web-based forums
    - SourceForge is a rich archive of PHP tools/examples
  - Write your own:
    - Create database
    - Add tables
    - Create MySQL account
    - Write PHP

Web Server Fodder

- MySQL Creating a Database
  - mysqladmin create mydatabase
  - mysql mydatabase
  - create table thing(stuff1 varchar(8), stuff2 integer) ;

Web Server Fodder

- Create MySQL Account:
  - mysql mysql
  - insert into user(host,user,password) values('%','apache',password('charlotte')) ;
  - insert into db(host,db,user,select_priv,insert_priv,update_priv,delete_priv) values('%','mydatabase','apache','Y','Y','Y','Y') ;
  - Could give apache more/less privs, but these are basic
  - mysqladmin reload

Web Server Fodder

- Write PHP
  - PHP is a scripting language, used like Javascript
  - HTML code has PHP code embedded in it

```
<html>
<body>
<?php
        echo “<H1> Good Morning, Starshine!</H1>”;
?>
</body>
</html>
```

Web Server Fodder

- Items enclosed in <?php ?> are interpreted as PHP code.
- Items outside are sent directly to the browser.
- Output of PHP does not have to be HTML, as a header("Content-type: text/plain") can be included to force other types, even binary types.

Web Server Fodder

- MySQL Database Access in PHP
  - Connecting to the server:
    - $connection = mysql_connect('localhost', 'apache', 'charlotte') or die (“argh! failed to connect to MySQL server”) ;
  - Connect to the database:
    - $db = mysql_select_db('mydatabase', $connection) or die (“argh! failed to connect to database”) ;
  - Executing a SQL query:
    - $sql = “select item_name from catalog” ;
    - $result = mysql_query($sql, $connection)

Web Server fodder

- MySQL Database Access in PHP
  - Retrieve the results:
    - $row = mysql_fetch_array($result)
    - print $row['item_name'] ;

Web Server Fodder

- MySQL Database Access in PHP
  - Putting it all together:

```
<html>
<body>
<ul>
<?php
    $connection = mysql_connect('localhost', 'apache', 'charlotte') or die
    (“argh!”) ;
    $db = mysql_select_db('mydatabase', $connection)  or die (“argh!”) ;
    $sql = “select item_name from catalog” ;
    $result = mysql_query($sql, $connection) ;
    while($row = mysql_fetch_array($result)) {
            $item = $row['item_name'] ;
            echo “<li>$item\n” ;
    }
?>
</ul>
</body>
</html>
```

Is VAMP being used?

- Yes!
  - The OpenVMS Hobbyist Program uses VAMP
    - Hobbyist Membership Database
    - License Validation/Requests
    - Hobbyist Forums (phpBB2)
  - OpenVMS VAMP Message Board
    - http://vamp.issiniho.com

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Other Resources

- Since it's hard to cover all this in an hour...
  - OpenVMS with Apache, OSU, and WASD
    - Alan Winston, Digital Press
  - Apache, The Definitive Guide
    - Ben Lauriee & Peter Laurie, O'Reilly and Associates
  - Programming PHP
    - Rasmus Lerdorf & Kevin Tatroe, O'Reilly and Associates
  - MySQL & mSQL
    - Randy Jay Yarger, George Reese & Tim King, O'Reilly and Associates

Questions and Answers?