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Installing the Prerequisites for WeBWorK

The WeBWorK homework checker requires a fully functional LAMP deployment. LAMP stands for Linux, Apache, MySQL, and PHP. WeBWorK also requires several LAMP extensions, such as mod_perl and SOAP libraries. The first part of this document provides a comprehensive list of the applications and libraries that are necessary for WeBWorK (as well as the software versions used in our testbed). The remainder of the document will walk you through the installation of a WeBWorK-capable LAMP deployment.

Following good engineering practices, the installation procedures described in this document require only user-level access and produce a LAMP deployment that is contained within a file system directory.

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Part 1. Required Applications

We will assume perl*, latex, dvipng, and tth are already installed on the target Linux machine. If those are not installed, you will need to install them (e.g., using YUM). To check if they are installed, you can use the 'which' command.

* These instructions assume the “File:: Which” perl library was installed by default

Get the following binaries/sources:

App/Library Name	Filename	Location
Apache	httpd-2.2.8.tar.gz	www.apache.org
MySQL	mysql-5.0.51a-linux-i686-glibc23.tar.gz	www.mysql.com
PHP	php-5.2.5.tar.gz	www.php.net
mod_perl2	mod_perl-2.0.4.tar.gz	www.cpan.org
Apache SOAP extensions	apache2-soap-0.73.tar.gz	www.cpan.org
More Apache SOAP	soap-lite-0.710.07.tar.gz	www.soap-lite.com
PERL IO SCALAR	io-stringy-2.110.tar.gz	www.cpan.org
Version	version-0.7501.tar.gz	www.cpan.org
PERLWSDL reader	pod-wsdl-0.05.tar.gz	www.cpan.org
PERL XML reader	xml-xpath-1.13.tar.gz	www.cpan.org
Perl XML writer	xml-writer-0.604.tar.gz	www.cpan.org
PERL database extensions	dbi-1.605.tar.gz	www.dbi.perl.org
Moodle Course Management Soft.	moodle-weekly-19.tgz	www.Moodle.org

Table 1: Required applications and libraries

Part 2: Installation of a WeBWork-Capable LAMP Deployment

The remainder of this document describes the installation of the applications and libraries required by WeBWork.

Section 1: Pre-Installation Setup

Our directions will assume that all of the files mentioned in Table 1 are placed in a single directory, which we will call the **HOME** directory. Our installation will create a LAMP deployment in **HOME/webwork**, which we will call **WEBWORK_HOME**.

The resulting LAMP deployment can be migrated across machines IF the **HOME** directory is the same. Choose your home directory wisely. “/home/myuser/firs-try/gibberish/goobly-gook” may not be a good choice if you can not (or do not) want to replicate that directory structure on another machine. “/home/WW” is a good choice if you can create a new user called WW on each machine in your cluster (in this case **WEBWORK_HOME**= /home/WW/webwork).

Section 2: Basic LAMP Install

Step 1. Make webwork home directory

```
cmd #1> cd HOME
cmd #2> mkdir webwork/
```

Step 2. Unpack and Install Apache

```
cmd #1> cd HOME/webwork (a.k.a. WEBWORK_HOME)
cmd #2> mkdir apache/
cmd #3> tar -xzf HOME/httpd-2.2.8.tar.gz
cmd #4> cd httpd-2.2.8/
cmd #5> ./configure --prefix=WEBWORK_HOME/apache --with-php --enable-mods-shared=all
cmd #6> make; make install
cmd #7> cd WEBWORK_HOME/
cmd #8> rm -r httpd-2.2.8/
```

Step 3. Unpack and Install MySQL

```
cmd #1> cd WEBWORK_HOME/
cmd #2> tar -xzf HOME/mysql-5.0.51a-linux-i686-glibc23.tar.gz
cmd #3> cd mysql-5.0.51a-linux-i686-glibc23
cmd #4> ./scripts/mysql_install_db
cmd #5> ./bin/safe_mysql --datadir=./data --basedir=. --socket=mysql.sock --pid-file=mysql.pid --log=./csLog & (starts MySQL in background)
cmd #6> ./bin/mysqladmin --socket=./data/mysql.sock -u root password 'new password'
(change root password)
```

```
cmd #7> ./bin/mysql --socket=./data/mysql.sock --user=root --password='new password' (log
in to MySQL shell)
cmd #8> grant all on *.* to root IDENTIFIED BY 'new password'; (within MySQL shell)
cmd #9> exit;
cmd #10> ./bin/mysqladmin --socket=./data/mysql.sock --user=root --password=new password
shutdown (shutdown MySQL)
```

Step 4. Unpack and Install PHP

```
cmd #1> cd WEBWORK_HOME/
cmd #2> mkdir php/
cmd #3> tar -xzf HOME/php-5.2.5.tar.gz
cmd #4> cd php-5.2.5/
cmd #5> ./configure --with-apxs2=WEBWORK_HOME/apache/bin/apxs --with-
mysql=WEBWORK_HOME/mysql-5.0.51a-linux-i686-glibc23
--prefix=WEBWORK_HOME/php --with-config-file-path= WEBWORK_HOME/php --
with-zlib --with-gd --with-gettext --with-gdbm --enable-soap
cmd #6> make; make install
cmd #7> cp php.ini-recommended WEBWORK_HOME/php/php.ini (Install PHP config file)
cmd #8> cd WEBWORK_HOME/
cmd #9> rm -r php-5.2.5/
```

Step 5. Configure and Test

```
cmd #1> vi WEBWORK_HOME/apache/conf/httpd.conf
cmd #2> Change "Listen" port from 80 to 8080
cmd #3> "DirectoryIndex index.html" to "DirectoryIndex index.html index.php"
cmd #4> Add "AddType text/html .php"
cmd #5> Verify (and add if nec.) "AddHandler php5-script php"
cmd #6> vi WEBWORK_HOME/php/php.ini
cmd #7> Configure "doc_root=WEBWORK_HOME/apache/htdocs"
cmd #8> vi WEBWORK_HOME/apache/htdocs/phpinfo.php
cmd #9> type <?php phpinfo();?> then save and exit
cmd #10> cd WEBWORK_HOME/apache/bin
cmd #11> apachectl start
cmd #12> Navigate your browser to http://localhost:8080/phpinfo.php
cmd #13> If you see a table with data on the PHP config, you're good-- keep going.
```

Section 3: Install Libraries Required by WeBWork

Note dependencies between libraries force a certain order of installation. I recommend that you install libraries in the order listed below. Also, user-level directories that contain Perl libraries must be added to the PERL5LIB environment variable.

Step 6. Install Base and XML libraries for PERL

```
cmd #1> cd WEBWORK_HOME/
cmd #2> mkdir perl-libraries/
cmd #3> mkdir perl-libraries/libs
```

```

cmd #4> cd perl-libraries/
cmd #5> For each package p in
        {IO-stringy-2.110
        version-0.7501,
        XML-XPath-1.13,
        XML-Writer-0.604,
        Pod-WSDL-0.05,
        DBI-1.605,
        SOAP-Lite-0.710.07.tar.gz}
cmd #6> tar -xzf HOME/p.tar.gz
cmd #7> cd p
cmd #8> perl Makefile.PL PREFIX=WEBWORK_HOME/perl-libraries/libs/p
cmd #9> make; make install
cmd #10> PERL5LIB=$PERL5LIB:WEBWORK_HOME/perl-libraries/libs/p/lib/perl5/site_perl/
cmd #11> export PERL5LIB
cmd #12> Test for correct installation: echo "require Pmod::name" | cat > test.pl ; perl test.pl
cmd #13> cd ../
cmd #14> rm -r p

```

Step 7. Install mod_perl2

```

cmd #1> cd WEBWORK_HOME/perl-libraries
cmd #2> tar -xzf HOME/mod_perl-2.0.4.tar.gz
cmd #3> cd mod_perl-2.0.4/
cmd #4> perl Makefile.PL PREFIX=WEBWORK_HOME/perl-libraries/mod_perl/libs/
        MP_AP_PREFIX=WEBWORK_HOME/apache/
cmd #5> make; make install
cmd #6> PERL5LIB=$PERL5LIB:WEBWORK_HOME/perl-libraries/libs/mod_perl/lib/perl5/site_perl
cmd #7> Test for correct installation
cmd #8> cd ../; rm -r mod_perl-2.0.4/

```

Step 8. Install Apache2::SOAP

```

cmd #1> cd WEBWORK_HOME/perl-libraries
cmd #2> tar -xzf HOME/Apache2-SOAP-0.73.tar.gz
cmd #3> cd Apache2-SOAP-0.73/
cmd #4> perl Makefile.PL PREFIX=WEBWORK_HOME/perl-libraries/apache2-soap/libs/
cmd #5> make; make install
cmd #6> PERL5LIB=$PERL5LIB:WEBWORK_HOME/perl-libraries/libs/apache2-soap
cmd #7> Test for correct installation
cmd #8> cd ../; rm -r Apache2-SOAP-0.73/
cmd #9> MOD_PERL_API_VERSION=2
cmd #10> export MOD_PERL_API_VERSION

```

Step 9. Save PERL5LIB for later use

```

cmd #1> export PERL5LIB
cmd #2> cd HOME/
cmd #3> echo "PERL5LIB=$PERL5LIB" | cat > PERL5LIB.env.sh
cmd #4> In the future, you can run this shell script and then "export PERL5LIB" to restore the

```

environment variable

Step 10. Configure Apache and PHP

```
cmd #1> vi WEBWORK_HOME/apache/conf/httpd.conf
cmd #2> add "LoadModule perl_module modules/mod_perl.so"
cmd #3> vi WEBWORK_HOME/php/php.ini
cmd #4> set soap.wsdl_cache_enabled=1
cmd #5> set soap.wsdl_cache_dir=WEBWORK_HOME/soap-cache (make this dir)
cmd #6> set soap.wsdl_cache_ttl=240
```

Section 4: Install Moodle

Step 11. Install Moodle

```
cmd #1> cd WEBWORK_HOME/
cmd #2> tar -xzf HOME/moodle-weekly-19.tgz
cmd #3> mv moodle apache/htdocs
```

Step 12. Setup Moodle

```
cmd #1> Start both apache and MySQL
cmd #2> Navigate web browser to "http://localhost:8080/moodle"
cmd #3> Select a language; verify pre-requisites; use default directory configuration
cmd #4> *IMPORTANT* Use the actual IP address of the database-- do not use "localhost" or
"127.0.0.1"
cmd #5> Create Moodle tables using the root database account
cmd #6> Create an administrator account for moodle (prob. Same as DB)
```

Keep filling in information and clicking through. Eventually, you should get to the Moodle homepage. You will be logged in as admin.

Section 5: Conclusion

You now have a fully functional LAMP deployment with the Moodle Course Management software that is necessary for WeBWork. Enjoy.