

System Administration for Beginners

Final Project

Spring 2009

Assignment

Build and maintain an Internet server from scratch using Debian GNU/Linux. The system should be based around the LAMP model as covered in lecture, specifically using Apache, MySQL, and PHP.

Your system should also do something useful or implement something useful that will aid in system administration. Some examples are outlined below:

- Create a batch script which will automate the process of creating a user, directories for webspace, and copying the files for a WordPress install.
- Using a scripting language, design and implement a tool that will post the pertinent information of certain log files to the server home page.
- Design and create a webpage using HTML, PHP, and a MySQL back-end that allows interaction with a user to do something, like storing or retrieving information from a database.
- Enable SSL within apache and install an application uses SSL such as RoundCube over SendMail.
- Using a free dynamic dns hosting service such as no-ip.org or dyndns, install an updater daemon that will run on startup to check and update those host ip.

We will release more suggestions in an addendum.

You are welcome to come up with your own ideas if you wish. All proposals need to be approved by me, regardless if you decide to choose one of the examples given.

Details

- The system needs to support multiple users, thus, the environment should be suitable for untrusted users to set up their own website and have access to a MySQL database.

- The homepage of the server should contain a basic HTML page listing the project group number and members of that project group.
- All users are granted webspace and should have a default placeholder page when accessed online. Some users only need accounts to access for storage, that is, they do not require shell access.
- Specific programs, detailed later in this document, must be installed and secured as requested.

Technical Specifications

- SSH access on the server is located on port 3XX22.
HTTP access on the server is located on port 3XX80.
The host name is `decal.ocf.berkeley.edu`.
- It is recommended that you use Apache2, MySQL 5, PHP 5, along with libraries that allow MySQL and PHP to work together, and Apache's `mod_php` for PHP functionality.
- `phpMyAdmin` would be especially useful for working with MySQL databases if you are unfamiliar with the command line syntax.
- Install Webalizer for pretty graphs
- The following programs must be installed on your server: `nmap`, `links`, `mutt`, `vim`, `emacs`. Similarly, `nmap` must be secured such that only users of the group `admins` have `sudo` access to it.
- Create the user 'webdeveloper' that has no shell access, but has the ability to transfer files back and forth using `sftp` and `scp`.
- To show that you have PHP and MySQL up and running, install WordPress

Documentation

The documentation is one of the more important parts of the final project. It should be similar to a lab writeup that you may have done in other classes. A title page should be included with your project group number and the names and inst logins of your project group members.

Besides this, you are free to format the document as you wish, given some specifics. I am looking for an understanding of the process you took in order to implement what was assigned. For example, you may want to include the changes you made in configuration files and where they are located when setting up Apache. Include discussions on security or other concepts wherever relevant (i.e., explain your reasoning for doing things the way you do and relate that to concepts learned in class).

At one point during the project period, we will be changing something on your server that will interfere with your normal login process. Tell us what the error message you saw means, how it relates to security, and what you asked us in order to verify that there has been no security breach.

You should also include a conclusion reviewing your final project. This should include any problems you encountered, what you feel you could have done better the next time around, and any sort of comments about your experience with the project as a whole, as well as suggestions to improve the project.

All submission text must be in your own words. For example, do not copy and paste the explanation for a command from its `man` page or copy and paste the package description from `apt-cache` when describing a package. Similarly, do not copy and paste irrelevant output from a command when it is not necessary. It is not necessary for me to know the output of an `apt-get install` command.

Submission

All submissions should be emailed to `cardi+decal@ocf.berkeley.edu` and `jchu+decal@ocf.berkeley.edu`. The file must be in PDF, HTML or plain-text format. No Microsoft Word documents!

Timeline

4/20 Final project specifications released.

4/27 Project guidelines and suggestions released.

4/30 Idea proposals must be sent to `cardi+decal@ocf.berkeley.edu` and `jchu+decal@ocf.berkeley.edu` with your project group number and members.

5/11 Final project presentations

Grading

The final project accounts for at least 60% of your overall grade. Thus, failure to complete the project means that it will be impossible to pass the course without working on and turning in a final project.

The writeup will account for approximately 60% of the grade. The implementation of your setup will account for the rest of the final project grade. The system configuration should be trivial for me to understand. I should be able to understand what you have done and where things are in a system based on your documentation.