System Administration Basics

Syllabus for Summer 2017

https://iotopia-solutions.com/training/SysAdmin

Course Objectives

This course will give you an understanding of how system administration is done. It will introduce the key concerns faced by every system administrator (or sysadmin for short) and related information technology (IT) professional. After taking this course you'll be in a better position to manage a team of IT professionals or be better able to recruit them, and will be able to use the basic topic terminology correctly.

Course Content

Almost all of the technology we use and largely take for granted everyday relies on networks of machines sharing data. These networks of machines would not stay running without dedicated humans at some level monitoring them and performing routine maintenance. This course is a just-technical-enough approach to provide you with the information you need to work with IT professionals managing Linux or UNIX-like servers and understand the potential impacts of issues they raise concerning topics like capacity, obsolescence, and security.

Student Background

Before attending this course you should be a comfortable user of the Web. You don't need to know how to make anything, but filling out a Web form shouldn't be beyond your skill level.

Computer Requirements

For the purposes of this class we'd recommend you use a reasonably new laptop (running something like Mac OS X 10.6+, Microsoft Windows 7+ with Cygwin or PuTTY, Microsoft Windows 10+ with Bash Shell, or any recent version of Linux) that provides a terminal interface.

Suggested Reading

The book The Practice of System and Network Administration is what many consider to be the best guidebook on this topic, but it is far more technical and covers much more detail than this course. The book Time Management for System Administrators: Stop Working Late and Start Working Smart may help you better understand the pressures that IT professionals constantly face.

Class Schedule

This class will run for two eight-hour days. Each day will be broken up with a break in the morning, afternoon, and at lunch time. Work periods will consist of a lecture on a topic followed by exercises to reinforce it.

Day 1: The Big Picture -- How It All Fits Together

Servers and clients. SSH. Users & daemons. Sudo vs. su. Popular Web servers (Apache, Nginx) and the basics of their configuration. Popular database servers (PostgreSQL, MySQL) and the basics of their configuration. Popular e-mail servers (Sendmail, Postfix) and the basics of their configuration; SMTP, IMAP, POP. DNS; NICs. Directory services; LDAP. Specialty servers. Blasts from the past: FTP, Gopher, Usenet, Dict, Finger, and Telnet. Compilers and build tools.

Day 2: Things That Go Wrong -- Protecting Your System

Inconsistent environment. Resource usage. Adding resources. Spot checking and monitoring. Logs. Security. SSL. Permissions and ACLs. DoS attacks. DNS hijacking. Cross-site scripting (XSS). SQL injection. Content injection. Man-in-the-middle attacks. Rootkits. Countermeasures / auditing. Keeping spam off the menu; SpamAssassin, DNSBL, graylisting, Bayesian classifiers. Certificates and CAs; commercial, self-signed, OpenCA, Let’s Encrypt. Updates & patches. Dependency problems. Virtualization. VPNs. Backups. Redundancy. Load balancers. Penetration testing.