
KKK4401 - Computer System Administration

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Consultation: Tue, Wed, Fri (14-16)

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Course Overview

System Administration

ITIL®

Linux

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Objective

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Lab 1: Preparation

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At the end of the course, students will be able to:

1. Understand computer system administration technique (PO1, PO3, PO5)
2. Manage a computer system (PO6, PO7)
3. Automate computer administration task (PO5, PO7)

Evaluation

Assessment	Marks	Period (Amount)
Assignment	20%	W8-W14 (2)
Quiz	20%	W4 & W9
Lab	20%	W2 - W7 (4)
Final	40%	End of semester

Teaching/Coursework Plan

Week	Topic
1	Introduction
2	Installation
3	User/group, file, process and devices management
4	TCP/IP networking
5	TCP/IP networking
6	Resources management
7	Resources management
8	Security policy
9	System security
10	Backup & Restore
11	Scripting
12	Automating administrative task
13	Advanced OS kernel
14	Advanced OS kernel

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1. Fedora Project, *Fedora Documentation*, Last accessed 10th July 2007 <<http://docs.fedoraproject.org/>>.
2. The Linux Documentation Project, Last accessed 10th July 2007 <<http://tldp.org/>>
3. Michael Stutz, *The Linux Cookbook*, 2nd Edition, No Starch Press, August 2004. 1st Edition available online at http://www.dsl.org/cookbook/cookbook_toc.html
4. Linux man pages

Questionnaire

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Answer 'Yes' or 'No' to the following statement/questions:

1. Linux is too complicated and a pain to set up
2. Windows™ OS is preinstalled on all PCs
3. Only programmers/geek use Unix/Linux
4. Software for Windows™ OS is free
5. Linux is just for servers
6. Computer administration is for system administrator

Lab 1: Preparation

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▷ Lab 1: Preparation

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Task

Preparation for Linux installation

- Download & burn Knoppix Linux LiveCD
- Choose a linux distribution
 - Download & burd a Linux CD
 - Print & read the latest Installation and User guide

Completion: First class next week

Time required: N/A

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System
▷ Administration

Definition

Sysadmin Skills

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System Administration

Definition

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- System administrator @ sysadmin is a person employed to maintain, and operate a computer system or network. System administrators may be members of an information technology department.
- Duties:
 - Install, support & maintain computer systems and networks
 - Responsible for security and documenting system
 - Plan and respond to service outages and other problems
 - Technical and administrative management
 - Supervising or training computer operators
 - Consultant for computer problems beyond the knowledge of technical support staff
 - System and network performance tuning

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Computer System

- Hardware/software troubleshooting
- Operating systems
- Applications

Organization

- User of the system
 - Usage requirement
 - Business model
-
- Most important skill: problem solving
 - Sysadmin are NOT: software/hardware engineers or developers

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System Administration

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Definition

Service Support

ICT Infrastructure
Management

Security Management

Software Asset
Management

Recommended
Reading

Linux

ITIL®

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Service Support

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Reading

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- ITIL® is a framework of management procedures that are intended to support organization in achieving quality and value IT operations.
- These procedures are supplier-independent and have been developed to provide guidance across the breadth of IT infrastructure, development, and operations.

IT Service Management sets

- Service Delivery
- Service Support

Operational guidance

- ICT Infrastructure Management
- Security Management
- The Business Perspective

- Application Management
- Software Asset Management

Service Management

- Planning to Implement Service Management

Small IT units

- ITIL Small-Scale

Service Support

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Focuses on the *User* of the ICT services to ensure that they have access to the appropriate services to support the business functions

Service desk is the single contact point for the customer to report their problem

Incident management goal is to restore services as quickly as possible with minimal disruption

Problem management must resolve root cause of incidents and prevent recurrence

Configuration management process track individual configuration items in a system

Release management is used for automated distribution of software & hardware. i.e. license controls, certified software & hardware

ICT Infrastructure Management

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Recommend best practice for requirements analysis, planning, design, deployment and ongoing operations management and technical support of an ICT Infrastructure

- ICT Design and Planning
- ICT Deployment
- ICT Operations
- ICT Technical Support

Security Management

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Security
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Software Asset
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Reading

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- Based on the code of practice for information security management also known as ISO/IEC 17799
- The primary goal of information security is to guarantee safety of the information

Software Asset Management

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Recommended
Reading

Linux

- Organisations rely increasingly on technology in order to operate profitably and software as such should be treated as a valuable asset.
- Benefits:
 - Reduce licensing costs by increasing volume licensing agreements. By centralising the procurement, organisations ensure they buy only what is needed and get the best possible price.
 - Organisation knows exactly what software and hardware is installed on the network
 - Standardise desktops, lead to reduced training, support costs and incompatibility between applications.

Recommended Reading

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1. System Administration, Last accessed 11 July 2007, <http://en.wikipedia.org/wiki/System_administrator>
2. Information Technology Infrastructure Library, Last accessed 11 July 2007, <<http://en.wikipedia.org/wiki/ITIL>>

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▷ Linux

A brief history of

Linux

A brief history of

Linux (cont.)

Overview

Why Linux?

Free Software

Notable free software

Linux

A brief history of Linux

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[Notable free software](#)

- 1983: Richard Stallman creates the GNU project with the goal of creating a free operating system.
- 1989: Richard Stallman writes the first version of the GNU General Public License.
- 1991: The Linux kernel is publicly announced on 25 August by the 21 year old Finnish student Linus Benedict Torvalds.
- 1992: The Linux kernel is relicensed under the GNU GPL. The first so called “Linux distributions” are created.

A brief history of Linux (cont.)

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A brief history of
Linux

▷ A brief history of
Linux (cont.)

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Why Linux?

Free Software

Notable free software

- 1993: Over 100 developers work on the Linux kernel. With their assistance the kernel is adapted to the GNU environment, which creates a large spectrum of application types for Linux. The oldest currently existing Linux distribution, Slackware, is released for the first time. Later in the same year, the Debian project is established. Today it is the largest community distribution.
- 1994: In March Torvalds judges all components of the kernel to be fully matured: he releases version 1.0 of Linux. This version of the kernel is, for the first time, networkable.

Resources: *History of Linux*, available at
http://en.wikipedia.org/wiki/History_of_Linux

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A brief history of

Linux

A brief history of

Linux (cont.)

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Why Linux?

Free Software

Notable free software

- Linux distribution components
 - Linux kernel
 - Free Software
 - ▷ Software developed by the GNU project
 - ▷ Other software. i.e. X Window System, Mozilla, Apache, etc

- In a typical Linux distribution, the total size of the free software > Linux kernel.

Why Linux?

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A brief history of

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A brief history of

Linux (cont.)

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Free Software

Notable free software

- Free/Libre Open Source Software (FLOSS)
- Importance to understand different part of OS
- Needed to work with embedded/robotic systems
- Linux is better!

Free Software

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Freedom 0: The freedom to run the program for any purpose.

Freedom 1: The freedom to study and modify the program.

Freedom 2: The freedom to copy the program so you can help your neighbor.

Freedom 3: The freedom to improve the program, and release your improvements to the

- Freedoms 1 and 3 require source code access, because studying and modifying software without its source code is highly impractical
- free software means that computer users have the freedom to cooperate with whom they choose, and to control the software they use

Notable free software

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- Operating systems: Linux, BSD, Darwin, and OpenSolaris.
- GCC compilers, GDB debugger and C libraries.
- Servers: BIND name server, Sendmail mail transport, Apache web server, and Samba file server.
- Relational database systems: MySQL and PostgreSQL.
- Programming languages: Perl, PHP, Python, Ruby, and Tcl.
- GUI related: X Window System, GNOME, KDE, and Xfce desktop environments.
- OpenOffice.org office suite, Mozilla and Firefox web browsers, and the GIMP graphics editor.
- Typesetting and document preparation systems \TeX and \LaTeX .