Unit Outline: KXA458 Linux Internals

Semester 2, 2007
Sandy Bay Campus, Hobart
Newnham Campus, Launceston

Prerequisites
None
Corequisites
None
Unit Weight
12.5% of one academic year
Unit Coordinator
To be confirmed

Scheduled Teaching Sessions
Lectures: 4 lectures per week in weeks 1 and 4-11.
The Unit Timetable can be accessed from the Study Resources section of the School website. (http://www.cis.utas.edu.au/cisview/studyresources.jsp).
All sessions are delivered via video conference.

Unit Website
The unit website is accessed from http://www.utas.edu.au/coursesonline/. You will need to use your university email pop account username and password to log on to the MyLO system. Once authenticated by the system your personalised MyLO Learning Online area will be displayed. It contains links to the websites that you have permission to access - including the website for this unit.
This unit is Web Dependent: content. This means that you will need to use the Web for this unit. The unit website contains unit information and resources.
If you are not able to access the unit website, please contact the University IT help desk:
Entrance Level, Morris Miller Library, Sandy Bay Campus;
Entrance Level, Launceston Campus Library, Newnham Campus.
Telephone: 6226 1818 and 1300 304 903.
The 1300 number is a local call from within Tas, with the exception of mobiles.
Email: servicedesk@utas.edu.au
Website: http://www.utas.edu.au/servicedesk/student/index.html

University Website
Information and Resources for 'Current Students' are available on the university website at:
http://www.utas.edu.au/students/

Provider
School of Computing and Information Systems - Faculty of Science, Engineering, and Technology. http://www.cis.utas.edu.au

OVERVIEW

Introduction
The unit studies the internal structures of Linux and Unix systems with an emphasis on system calls to achieve the following goals:

1. To study the design of a software system that has shown remarkable software quality attributes
2. To learn and understand the design of a concurrent, multi-user and secure system
3. To learn how application programs can interact with the underlying operating systems
4. To have a deeper understanding of the issues related to the operating systems.

Prior Learning
The unit expects the students to have knowledge and experience in C programming and basic UNIX commands. However, to make the unit accessible to students with diverse backgrounds no programming assignment would be given.

Learning Outcomes
On successful completion of this unit, you will be able to:

1. Understand and explain the functions of main components of Linux operating system
2. Have an appreciation of the reasons that have made Unix/Linux a software wonder
3. Be able to write advanced applications that interact with the operating systems in sophisticated ways

Unit Content
1. Introduction to Unix/Linux kernel
2. Kernel services
3. Linux processes -- threads, signals
4. File systems -- cache management
5. Interprocess communication
6. Devices and device drivers
7. Terminal management
8. Introduction to networking with Linux

For more information see the section titled 'Content' on the unit website.

The university has defined a set of generic graduate attributes expected in its graduates. http://www.utas.edu.au/policy/subject.html#graduates Your course is designed to enable you to develop generic skills that are valued in, and expected of, graduates. These are skills that you will need to develop over time. Hence you are encouraged to look for opportunities, as you study each unit, to reflect on and improve these skills.

LEARNING AND TEACHING

Approach to Learning
You are expected to spend about 130 hrs studying in this unit - this includes attendance at scheduled teaching sessions. (For a 13 week semester this is, on average, 10 hr/wk.) This is the amount of study time that the 'typical' student will need to reach the level of competence and understanding required to fulfil the unit objectives.

You are expected to:

- attend all scheduled lectures, unless otherwise notified by the unit coordinator
- prepare for, and actively participate in lectures
- complete the assigned learning tasks
- review what has been learnt
- complete assessment items and submit them on time
- access and be familiar with the information and resources available on the unit website
- seek help from teaching staff if you have any questions or difficulties in studying this unit

Being an honours level unit, it is expected that the students will do significant independent, self-directed study outside the classroom.

You are encouraged to read the university's Code of Conduct for Teaching and Learning. Part A describes the 'Responsibility of the University to Students' and part B describes the 'Responsibilities of Students to the University'. http://www.utas.edu.au/tl/policies/codes.html

Schedule
See the 'Schedule' section on the unit website.

The unit will be taught in self-learning mode where students would be required to explore the topic on there own. For the each scheduled 2-hour lecture slot a topic will be assigned. As an assessed item a team of 2 to 4 students would present introductory material on the topic for 1 to 1.5 hour, followed by class discussion. To make the discussion active and meaningful, all students would be required to perform active familiarisations of the topic before the presentation. Participation in the discussions would be assessed.

The lecturer may ask a the presentation to be upgraded and repeated if it is deemed to be below a pass level.

Teaching and Support Staff

Teaching Staff

Unit Coordinator:
To be confirmed
E-Mail:
Phone:
Room: 

School Help Desk

Contact the School Help Desk if you have any queries or problems with accessing, using, or printing from the computers in the School of Computing and Information Systems labs.

- **Hobart:** the Help Desk is located near the School's reception desk and is open from 10am - 4pm Monday-Friday. The phone number is 6226 2960.
- **Launceston:** the Help Desk is located near the entrance to the computing labs and is open in the morning from 10am - 12pm, and in the afternoon from 2pm - 4:30pm, Monday-Thursday. On Fridays it is open from 10am - 12pm in the morning and 2pm - 4pm in the afternoon. The phone number is 6324 3447.
- **Burnie:** the computer labs at the Cradle Coast Campus are maintained by ITS. Please contact the University Help Desk for assistance. If you have a query or problem that is specific to the School of Computing and Information Systems please phone the School of Computing and Information Systems Help Desk in Launceston.

University Services and Support

The University has staff available to assist you, such as the:
For more information and contact details see the Services and Support section on the University 'Current Students' web page. http://www.utas.edu.au/students/

### Resources

#### Unit Website

The unit website contains unit information and resources. Students are expected to print their lecture notes from the unit website. Lecture notes for each week will be available on the website at the start of the corresponding week.

In addition, electronic versions of some books are placed on this site. Students should access them as required.

#### Prescribed Text

- M K McKusick, K Bostic, M J Karels, J S Quarterman: The design and implementation of the 4.4BSD Operating System, Addison-Wesley (1996)
- M K McKusick and G V Neville-Neil: The design and implementation of the FreeBSD Operating System, Addison-Wesley (2005)

#### Readings

The University libraries have good stock of books related to the unit. Extensive online resources are also accessible over the net in this area.

#### Software

The software that you will need to access the unit website and to study this unit, including general purpose software such as word processors, is provided on the computers in the School's computing labs. If you intend to use software on other computers please check that the versions are compatible.

Programs and other executable code, where necessary, will be made available in the 'Resources' section of the unit website (details will be specified later).

#### Computing Facilities

The School has PC labs (Windows XP), Mac labs (Mac OS-X 10.5), and Networking labs at the Newnham and Sandy Bay campuses. Unix accounts can be accessed from all Macs and PCs.

If you have not used these facilities before please contact the School Help Desk to organise your account details. If you would like to access the facilities at the Newnham and Sandy Bay campuses after hours please contact the School Help Desk.

Please contact the School Help Desk if you have difficulty accessing or using these facilities.

Depending on the number of students enrolled on each campus a few dedicated machines will may be provided with Linux OS. Students with allocated machines may find it convenient to install Linux on their computers.

#### Use of Facilities

Use of computing facilities provided by the School is subject to the School's Ethics Guidelines - http://www.cis.utas.edu.au/cisview/ethics.jsp. Copies of the guidelines are also available in all School labs. The School's facilities may only be used for study-related purposes, and may not be used for personal gain. The playing of games is strictly prohibited in all labs at all times. Before being granted access to the School's facilities, you will be required to sign a declaration that you have read and understand these guidelines, and that you will abide by them. Disciplinary action may be taken against students who violate the guidelines.

#### Occupational Health and Safety

The university is committed to providing a safe and secure teaching and learning environment. For more information see http://www.admin.utas.edu.au/hr/ohs/ppl_proc/

### ASSESSMENT

| Assessment | Item 1 | Title: Research and presentation |
Items

**Type:** In-Semester - group project  
**Weighting:** 50%  
**Due:** As scheduled

Research topics and presentation schedule will be given in the class in week 1. Students will be assessed for their presentation as well as their participation in others presentations. Presentation 70%; Participation 30%.

A presentation that is classified a "fail" would be asked to be repeated. The best score for a repeat presentation would be 50% of the presentation marks.

**Item 2**

**Title:** 3-hr take home exam  
**Type:** In-Semester - test  
**Weighting:** 50%  
**Due:** To be scheduled in week 8-12, Oct 2007

Notice that the exam is scheduled before the university examination period. In a take home examination, the lecturer relies on the honesty of the honours students and trusts they will not contact another human, in any form, for solution to any exam question.

See the 'Assessment' section in unit website for more detailed information about assessment items.

In-Semester Assessment

Unless specifically stated in the specification of the assessment item provided on the unit website, it is required that:

- work submitted by a student is the work of that student alone OR
- where the assessment item is to be completed by a group of students, the work submitted by the group of students is the work of that group of students alone.

Plagiarism

Plagiarism is a form of cheating. It is taking and using someone else's thoughts, writings or inventions and representing them as your own, for example:

- using an author’s words without putting them in quotation marks and citing the source;
- using an author's ideas without proper acknowledgment and citation; or
- copying another student’s work.

**If you have any doubts about how to refer to the work of others in your assignments, please consult your lecturer or tutor** for relevant referencing guidelines, and the academic integrity resources on the web at [http://www.utas.edu.au/tl/supporting/academicintegrity/index.html](http://www.utas.edu.au/tl/supporting/academicintegrity/index.html).

The intentional copying of someone else’s work as one’s own is a serious offence punishable by penalties that may range from a fine or deduction/cancellation of marks and, in the most serious of cases, to exclusion from a unit, a course or the University. Details of penalties that can be imposed are available in the Ordinance of Student Discipline – Part 3 Academic Misconduct, see [http://www.utas.edu.au/policy/subject.html#students](http://www.utas.edu.au/policy/subject.html#students).

The University reserves the right to submit assignments to plagiarism detection software, and might then retain a copy of the assignment on its database for the purpose of future plagiarism checking.

Referencing

The university document on plagiarism contains information about referencing the work or ideas of others. (See [http://www.utas.edu.au/plagiarism/](http://www.utas.edu.au/plagiarism/).)

The preferred text referencing systems for the School is the Harvard system (also referred to as the author-date system).

Submissions

The details of the submission method (paper, electronic or other) for each assignment will be supplied in a separate assignment specification sheet. All in-semester assignment submissions (including electronic submissions) are to include an Assignment Cover Sheet which includes a statement confirming that the submission is your own work. If this undertaking is not signed, the assignment will not be marked. The Assignment Cover Sheet is available from the School Help Desk in Launceston and Hobart, and on the School's web site [http://www.cis.utas.edu.au/cisview/studyresources.jsp](http://www.cis.utas.edu.au/cisview/studyresources.jsp).

Extensions

Assessment items will not be accepted after the due date except under the conditions stated in the school policy on late assessment. [http://www.cis.utas.edu.au/cisview/late_assess.jsp](http://www.cis.utas.edu.au/cisview/late_assess.jsp)
Passing grades will be awarded based on the AVCC guidelines:

- PP at least 50% of the overall mark but less than 60%
- CR at least 60% of the overall mark but less than 70%
- DN at least 70% of the overall mark but less than 80%
- HD at least 80% of the overall mark

The maximum mark awarded to a student who fails the unit will be 44.

For more information, including other grades such as Supplementary and Terminating grades, see the School of Computing's guidelines for assessment - available at: 