System Administration

MTAT.08.021

6 ECTS

Way of assessment: Exam

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Course schedule

➔ lectures

Thursdays 12-14

Liivi 2 - 405

➔ practicals

Tuesdays 12-14 (red)
Tuesdays 14-16 (green)
Wednesdays 12-14 (blue)
Wednesdays 14-16 (black)
Thursdays 14-16 (grey)
Thursdays 16-18 (white)

Liivi 2 - 123
What is expected of the students?
What will happen in the labs?
What will we talk about in the lectures?
Terminology
Fundamentals
Prerequisites

Basic knowledge of:

- Administering a single desktop system
- Networking (TCP/IP)
- UNIX command line

Personal qualities:

- persistence
- stress tolerance
Relation to other courses

Before:

- Network Technology I / Võrgutehnoloogia I
- Operating Systems / Operatsioonisüsteemid

Same skill level:

- Computer Security / Andmeturve

After:

- Network Technology II / Võrgutehnoloogia II
- Operating Systems Structures / Operatsioonisüsteemide ehitus
Composition of the final grade

to qualify for the exam:

➔ pass all the lab (also: 30% of the grade)

final grade:

➔ 50% from tests during the semester (4-6 tests)
➔ 30% from practicals
➔ 20% from written exam

tests:

➔ take place during the lectures
➔ you will be notified in advance
Tests

the tests will take place during the lectures

you will be notified in advance

3 to 5 questions per test

~up to ½ of A4 per answer

use of materials is not allowed
Practicals

there is one system per student

you have to build a simple system offering some typical services

the platform is Fedora 12

every lab builds upon the previous labs

the result will be graded
Lab topics

- Introduction & some basic settings
- Logical Volume Management
- Name Service (DNS)
- Mail Services (SMTP, IMAP, ...)
- Relational Database Management System
Lab topics

- Web Server
- Remote File Access
- Monitoring
- Incident Management
- Virtualization
Hidden motives

What we actually want to happen:

Coherent “building” process
Systematic monitoring
Troubleshooting
Lecture topics: resources

- Storage and Backup
- Processing Power and Bandwidth
- Software
- Resource Virtualization
Lecture topics: processes

→ Planning

→ Risk Analysis and Disaster Recovery

→ Change Management

→ Configuration Management, Knowledge Management

→ Maintenance

→ Monitoring
Lecture topics: processes

- Incident and Problem Management
- Service Desk
- System Administration Standards and Best Practices
Reading Materials


➔ lecture slides
➔ links
➔ lecture notes (in estonian only)
➔ lab instructions
Reading Materials

The Practice of System and Network Administration

Thomas A. Limoncelli
Christina J. Hogan
Strata R. Chalup
Administration vs. Management

administration ~ technical level
management ~ organizational level

administreerimine vs. haldus?
haldu vs. juhtimine?
Terminology: (computer) system

system - organized, purposeful set of objects, regarded as whole; the structure of the system does not allow the components to be randomly rearranged; system as a whole can have properties/capabilities which the individual components do not have
Terminology: (computer) system

any element which has no relationship with any other element of a system, cannot be a part of that system.
Terminology: computer system

a set of hardware and software which processes data in a meaningful way
Terminology: computer system

Computer system:

- has interconnected components
- is organized, has structure
- is purposeful
- can consist of (semi-independent) sub-systems
- the goals of the system are determined by its owner
computer system
sub-systems 1
sub-systems II
sub-systems III
Terminology: user (kasutaja)

- interacts with the system
- makes some **use** of this interaction
- can change some internal state of the system
- usually cannot change the structure of the system
Terminology: system administration

(süsteemihaldus)

➔ periodical activities
➔ restructuring
➔ aims to keep the system aligned with the goals
➔ performed by the system administrator

(süsteemiadministraaator, süsteemihaldur)
Terminology: service, customer

➔ from the business' point of view we provide a service
➔ regulated with contracts
➔ internal and external services
➔ customer (*klient*) is the receiving side of the service
➔ user and customer may be the same person, but not necessarily
Selection of sysadmin's duties

- planning, implementing new technologies
- hardware installation, configuration, maintenance
- software installation, configuration, maintenance
- auditing the systems
Selection of sysadmin's duties

→ monitoring the system
→ responding to incidents, providing workarounds
→ identifying problems, providing long-term solutions
→ preventing the problems
Selection of sysadmin's duties

- consulting the users
- performing user account maintenance
- documenting
- light programming
- security administration
- data protection
Activity II

photo: http://www.flickr.com/photos/pasukaru76/
Fundamentals

Skills, knowledge

Clear overview

Direct control over the components
Skills, knowledge

General training
Practical training
Experience

Direct control over the components

Clear overview

Configuration mgmt
Monitoring
Testing

Mgmt software
User rights mgmt
Remote mgmt
Organizational rules
Basic Principles in System Administration

➔ Take care of the basics first
➔ Plan ahead
➔ Keep solutions clear and simple
➔ Automate
Basic Principles in System Administration

➔ Know your systems and tools
➔ Know your users and enterprise - communicate
➔ Document
Activity III

Bad Choice

Bad Choice