System Administration

MTAT.08.021

6 ECTS

Way of assessment: Exam

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http://courses.cs.ut.ee/2010/syshald/

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

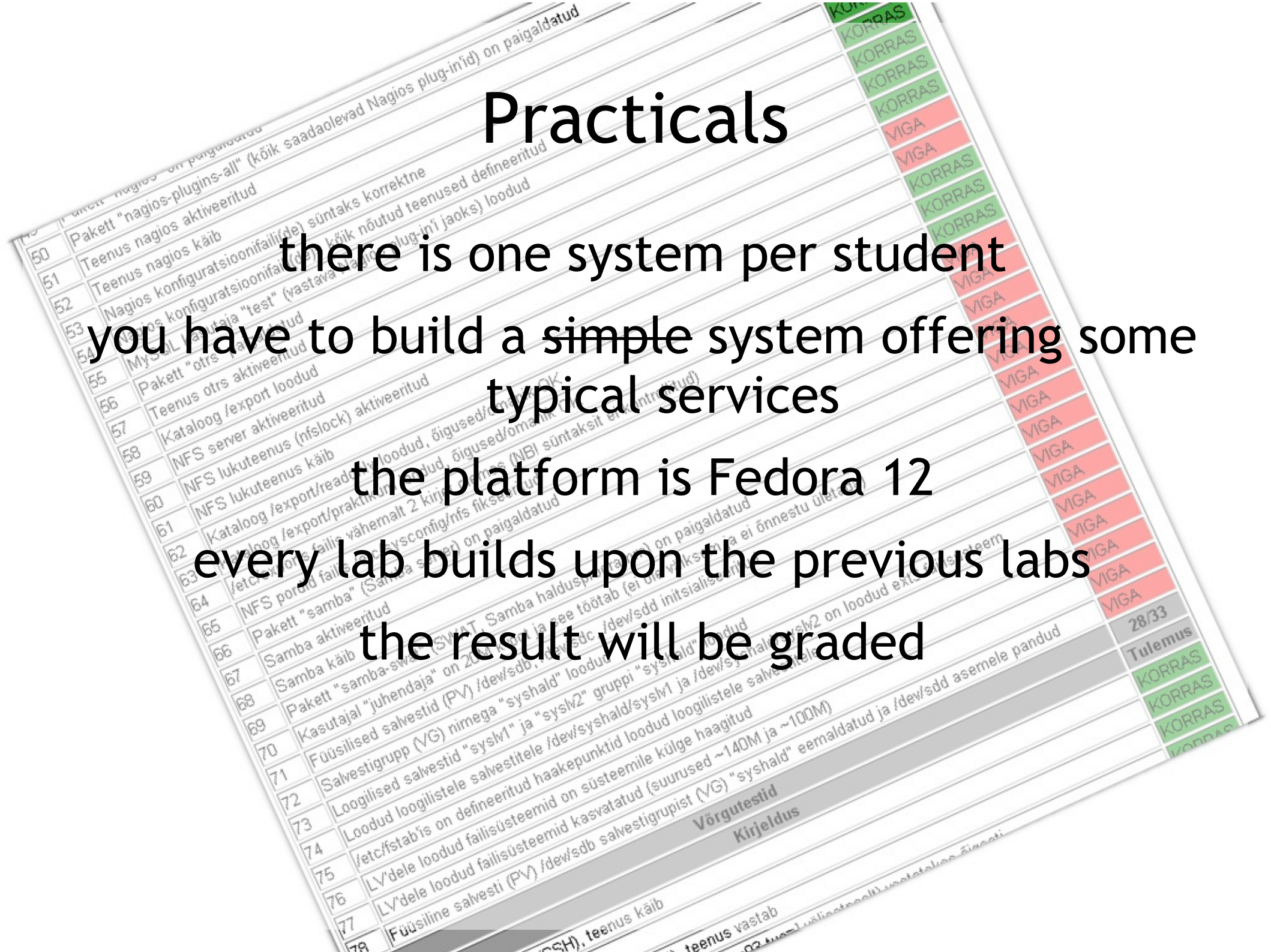
the tests will take place during the lectures

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

http://courses.cs.ut.ee/2010/syshaldus/

- lecture slides
- links
- lecture notes (in estonian only)
- lab instructions

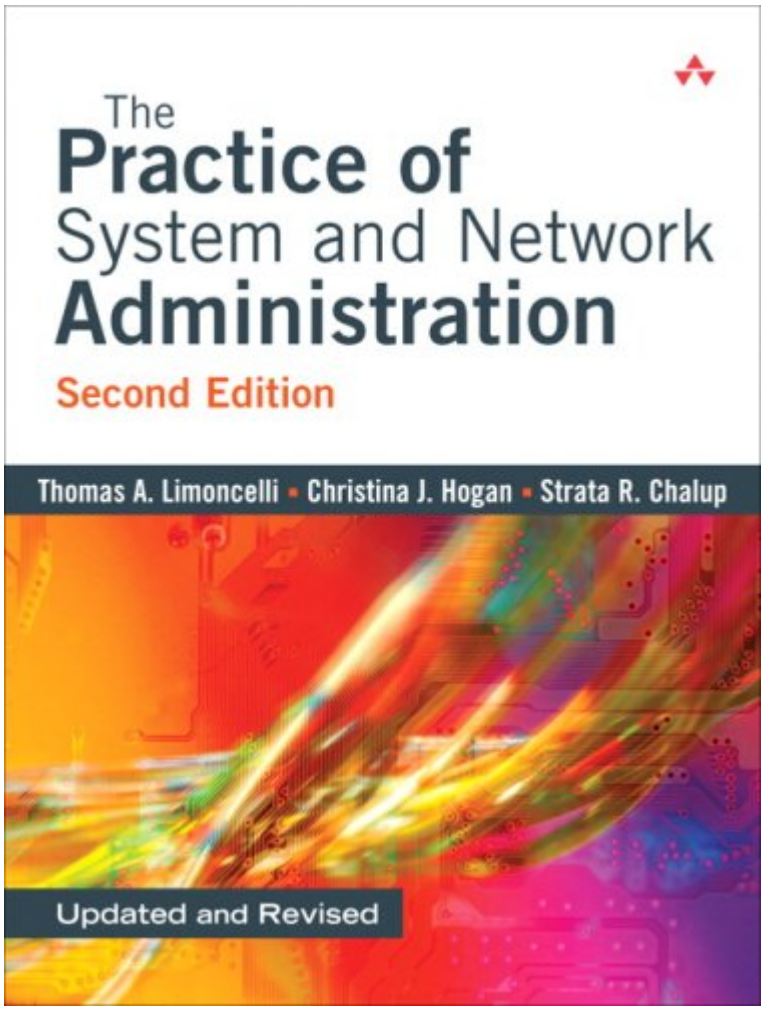
Reading Materials

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?

haldus 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.

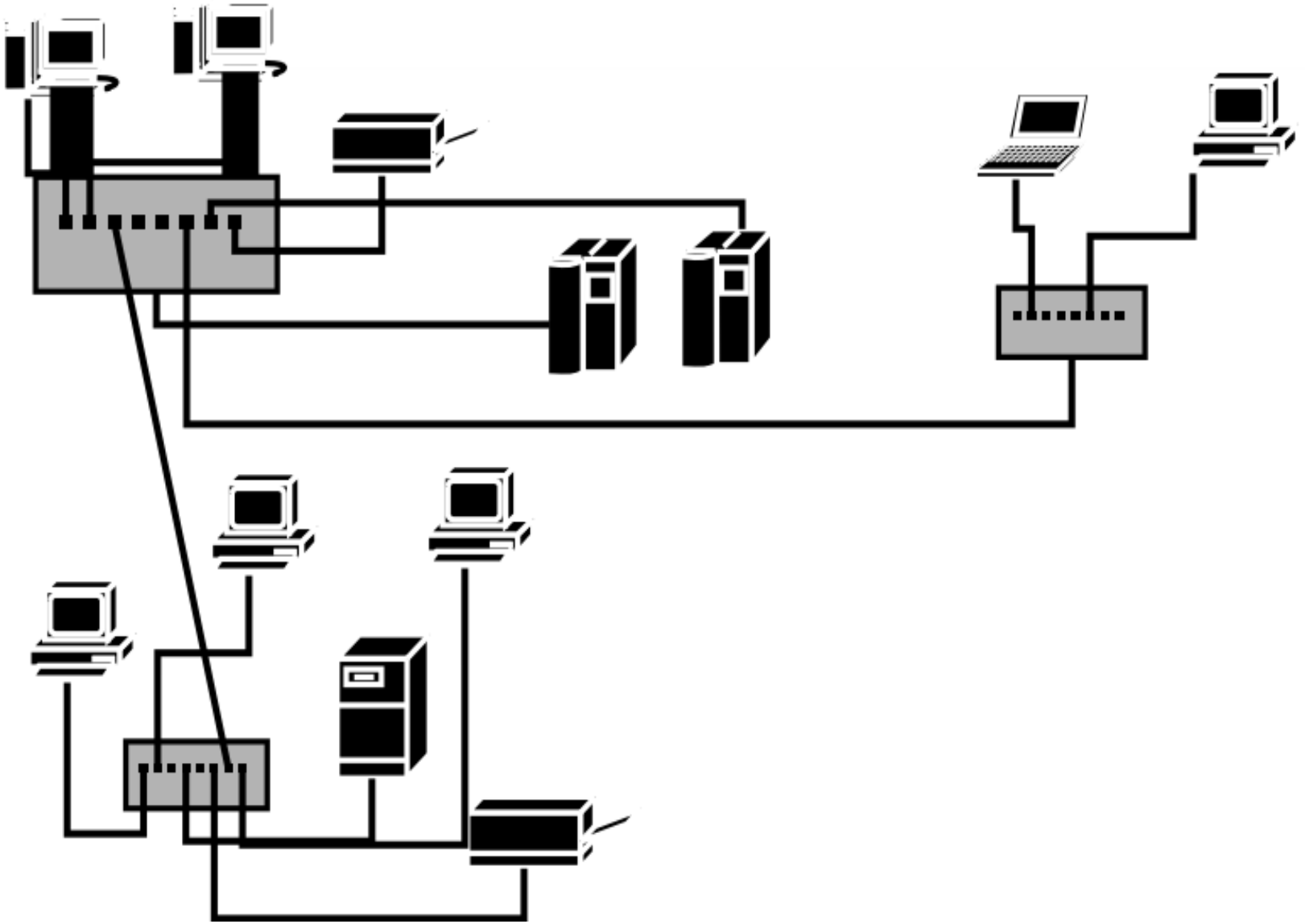
Terminology: computer system

a set of hardware and software which processes data in a meaningful way

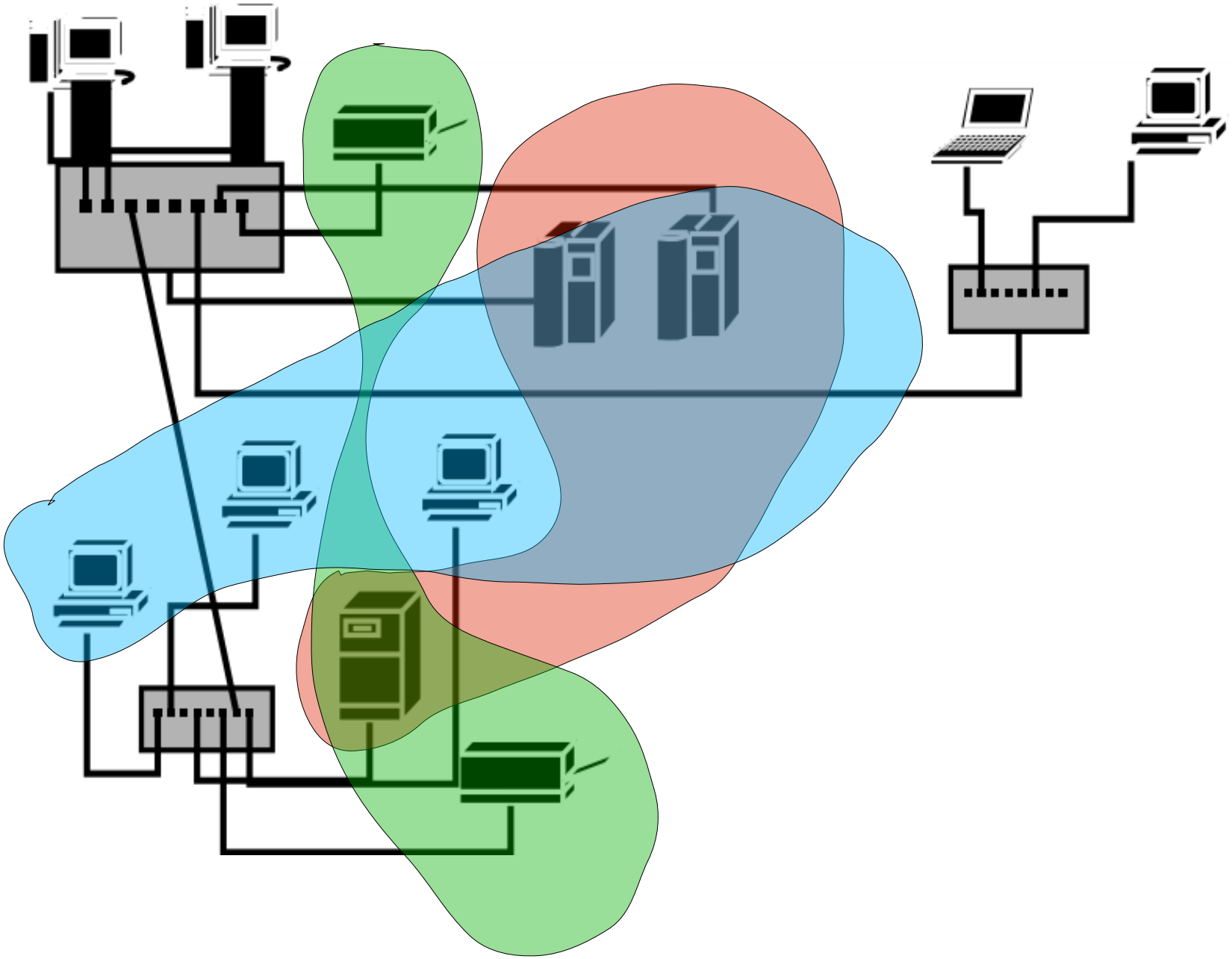
Terminology: computer system

Computer system:

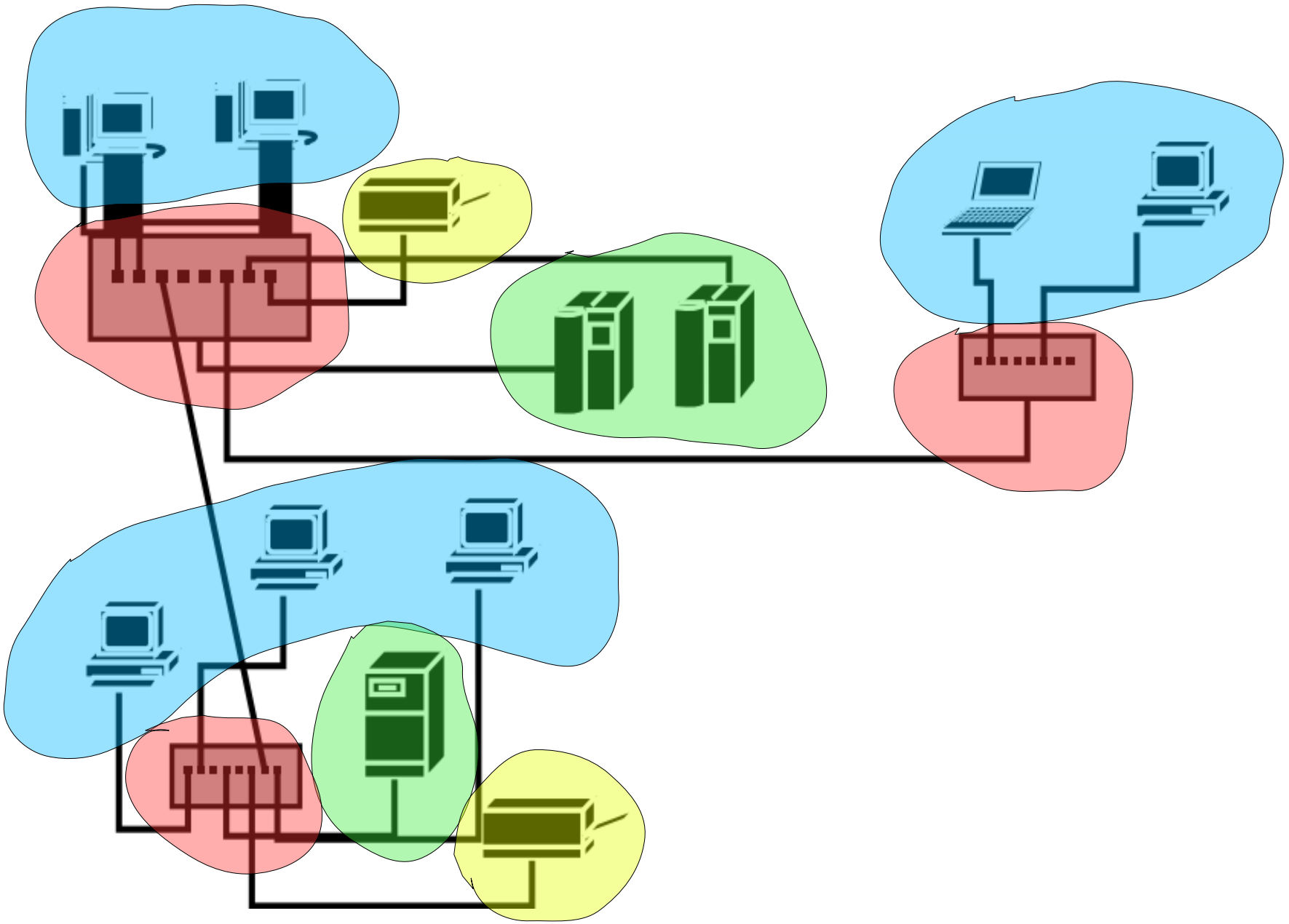
- has interconnected components
- is organized, has structure
- is purposeful
- can consist of (semi-independent) sub-systems
- the goals of the system are determined by its owner



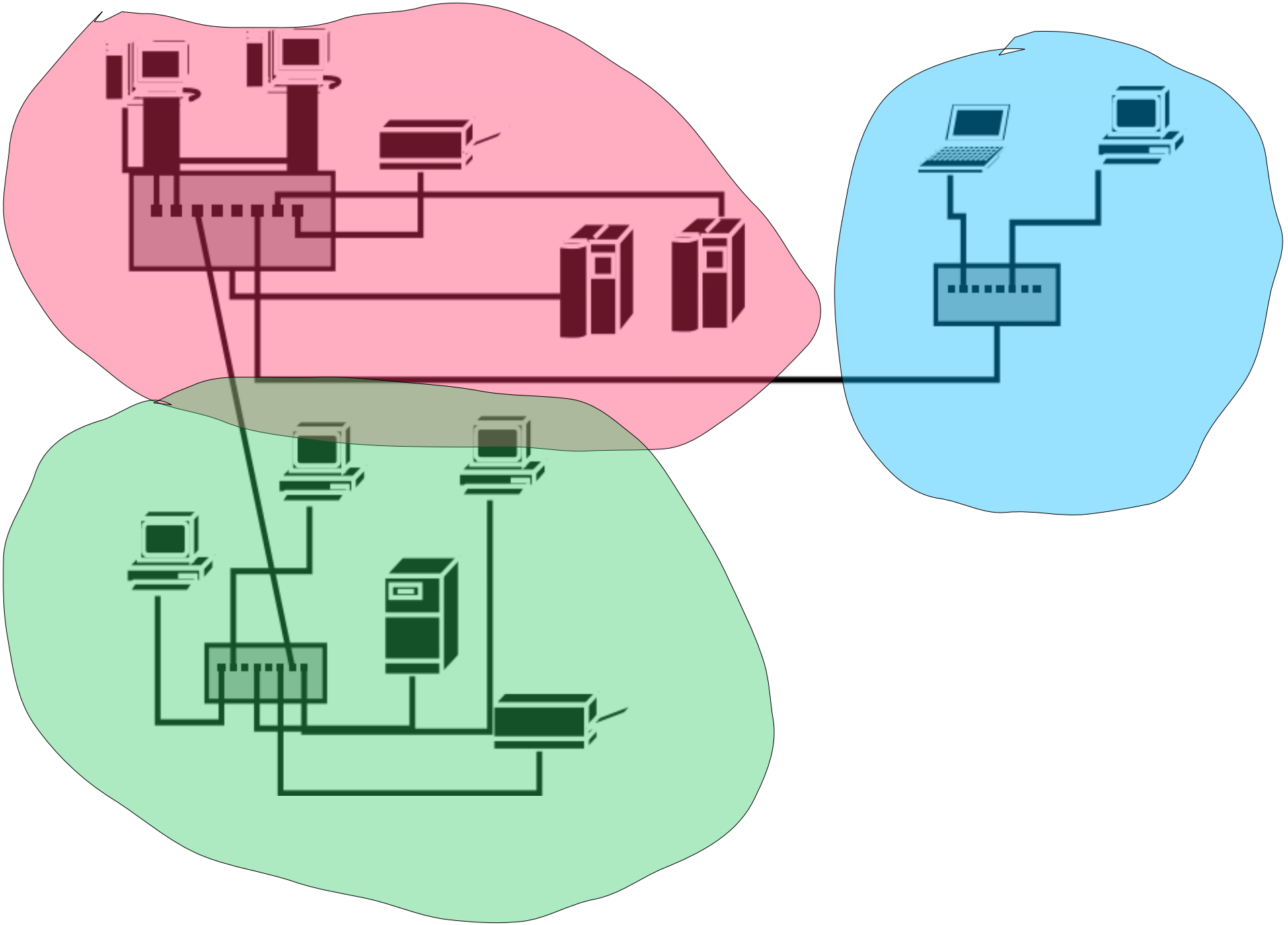
computer system



sub-systems I



sub-systems II



sub-systems III

Terminology: user (*kasutaja*)

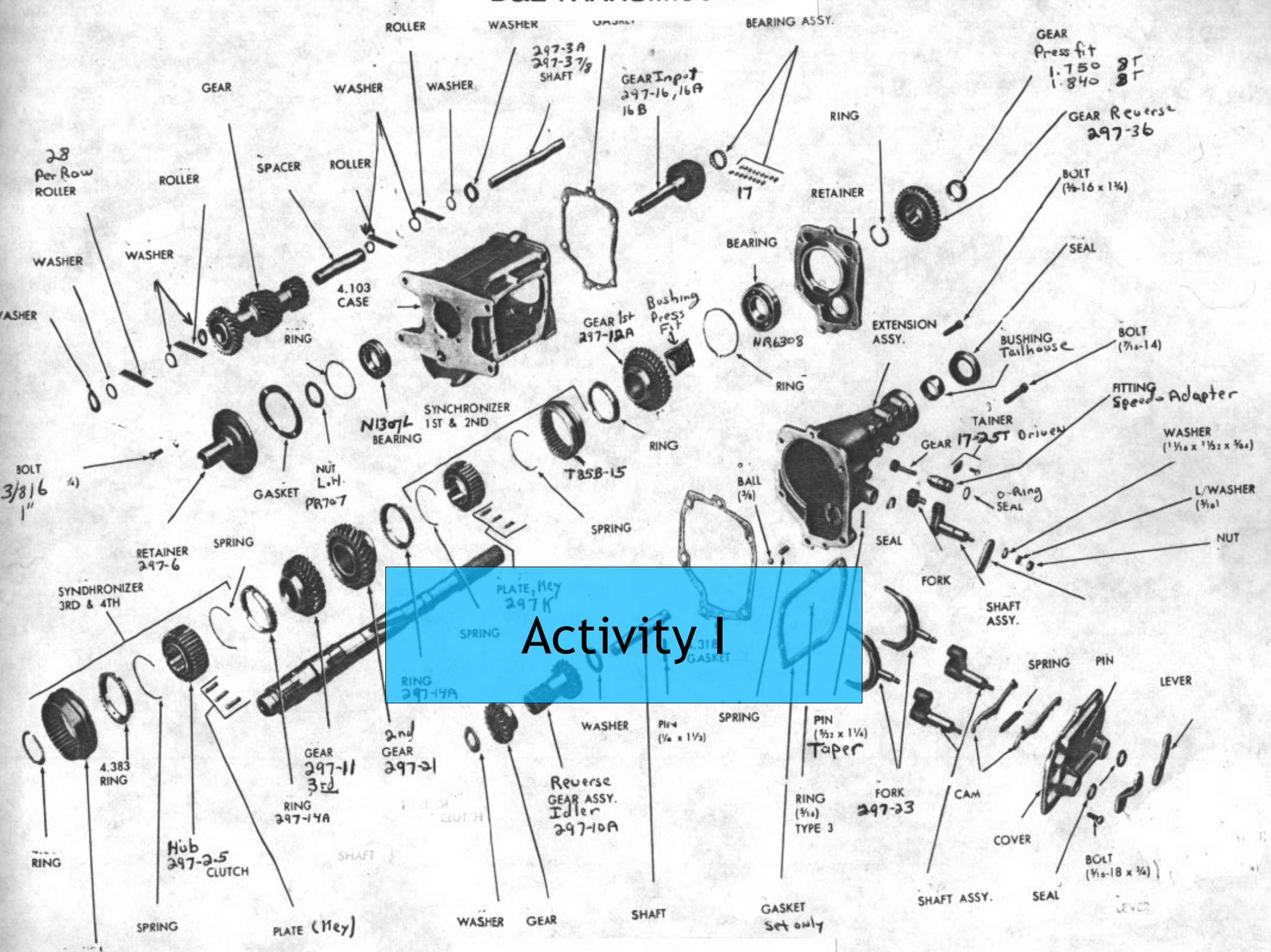
- interacts with the system
- makes some **use** of this interaction
- can change some internal state of the system
- usually cannot change the structure of the system

Terminology: system administration (*süsteemihaldus*)

- periodical activities
- restructuring
- aims to keep the system aligned with the goals
- performed by the system administrator (*süsteemiadministraator*, *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


ROLLER
WASHER
297-3A
297-3 7/8
SHAFT
GEAR Input
297-16, 16A
16B
BEARING ASSY.
17
GEAR
Press fit
1.750 8T
1.840 8T
GEAR Reverse
297-36
RING
RETAINER
BOLT
(3/8-16 x 1 3/4)
SEAL
28
Per Row
ROLLER
ROLLER
SPACER
ROLLER
GEAR
WASHER
WASHER
WASHER
WASHER
4.103
CASE
RING
BEARING
NR6308
EXTENSION
ASSY.
BUSHING
Tailhouse
BOLT
(7/16-14)
GEAR 1st
297-12A
Bushing
Press
Fit
RING
FITTING
Speedo Adapter
TAINER
GEAR 17-25T Driven
WASHER
(1 1/16 x 1 1/32 x 5/64)
L/WASHER
(5/16)
NUT
O-Ring
SEAL
BALL
(3/8)
SEAL
FORK
SHAFT
ASSY.
N1307L
BEARING
SYNCHRONIZER
1ST & 2ND
T85B-15
SPRING
BOLT
3/8 16
1"
GASKET
NUT
L.H.
PR707
RETAINER
297-6
SPRING
SYNDHRONIZER
3RD & 4TH
PLATE, Key
297K
SPRING
RING
297-14A
2nd
GEAR
297-21
GEAR
297-11
3rd
RING
297-14A
WASHER
Pin
(1/4 x 1 1/2)
SPRING
PIN
(5/32 x 1 1/4)
Taper
RING
(5/16)
TYPE 3
FORK
297-23
CAM
SPRING
PIN
LEVER
COVER
BOLT
(5/16-18 x 3/4)
SEAL
SHAFT ASSY.
4.383
RING
Hub
297-2.5
CLUTCH
RING
SPRING
PLATE (Key)
WASHER
GEAR
SHAFT
Reverse
GEAR ASSY.
Idler
297-10A
GASKET
Set only

Activity I

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

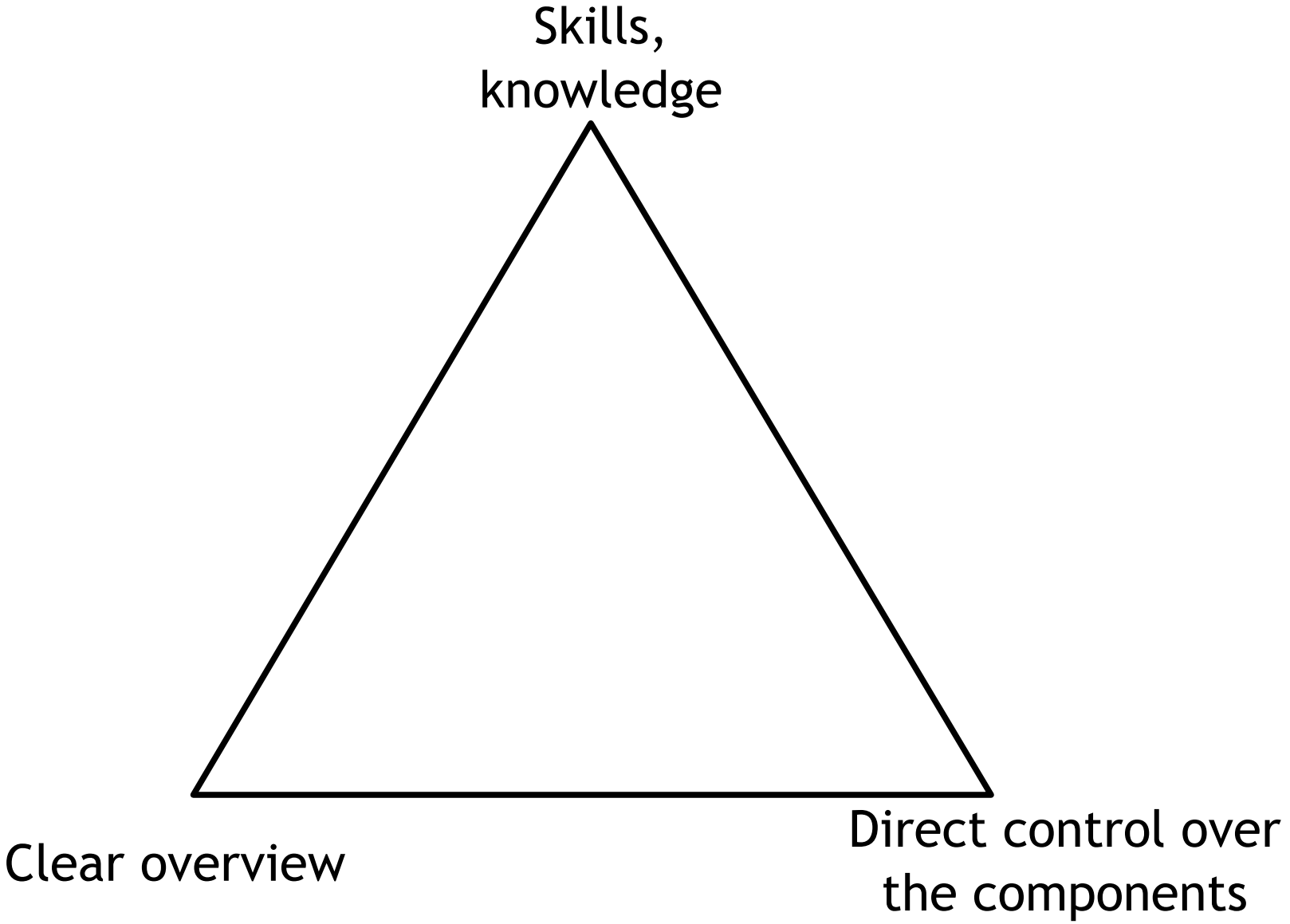
Selection of sysadmin's duties

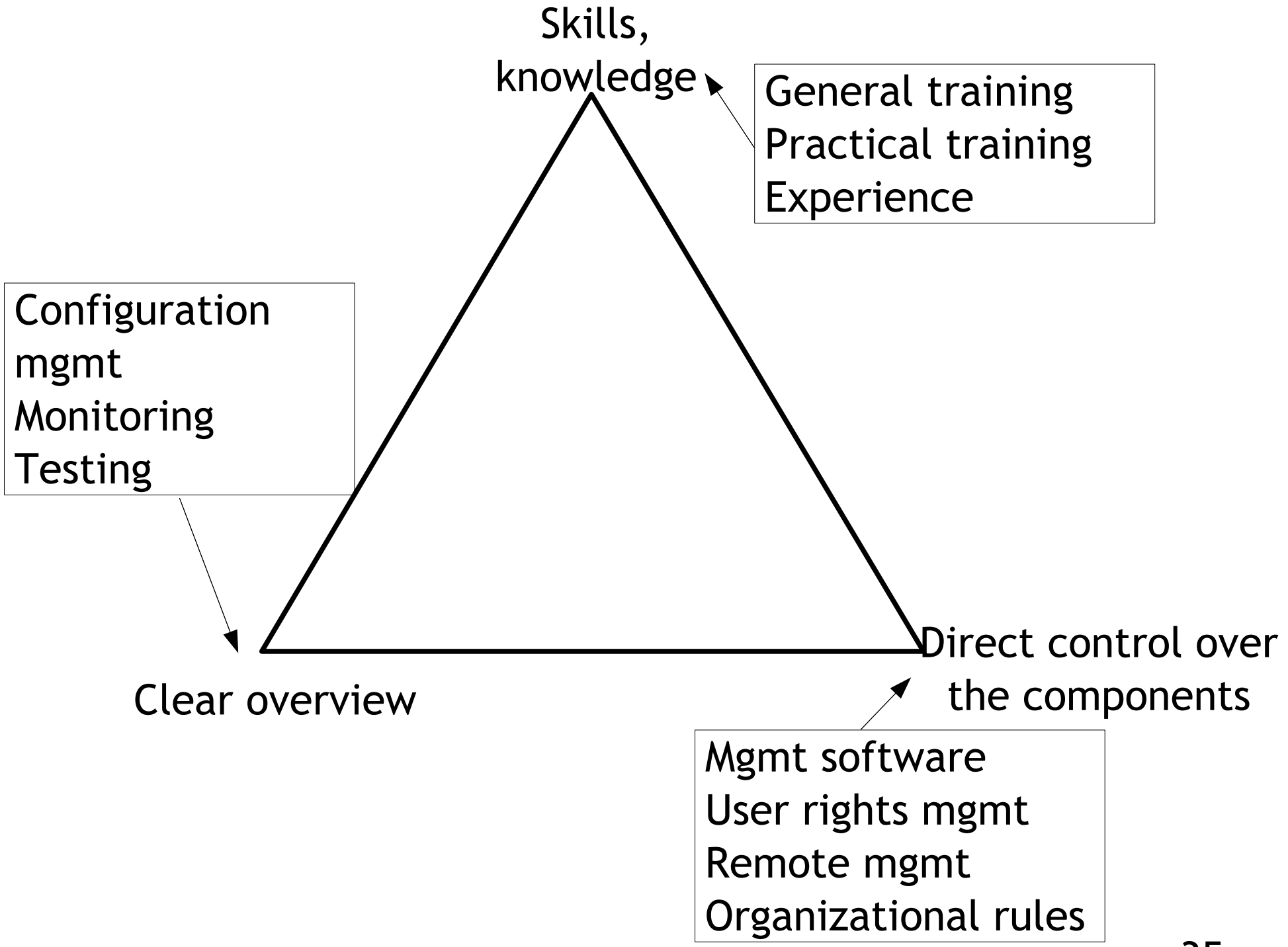
- consulting the users
- performing user account maintenance
- documenting
- light programming
- security administration
- data protection

Activity II

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

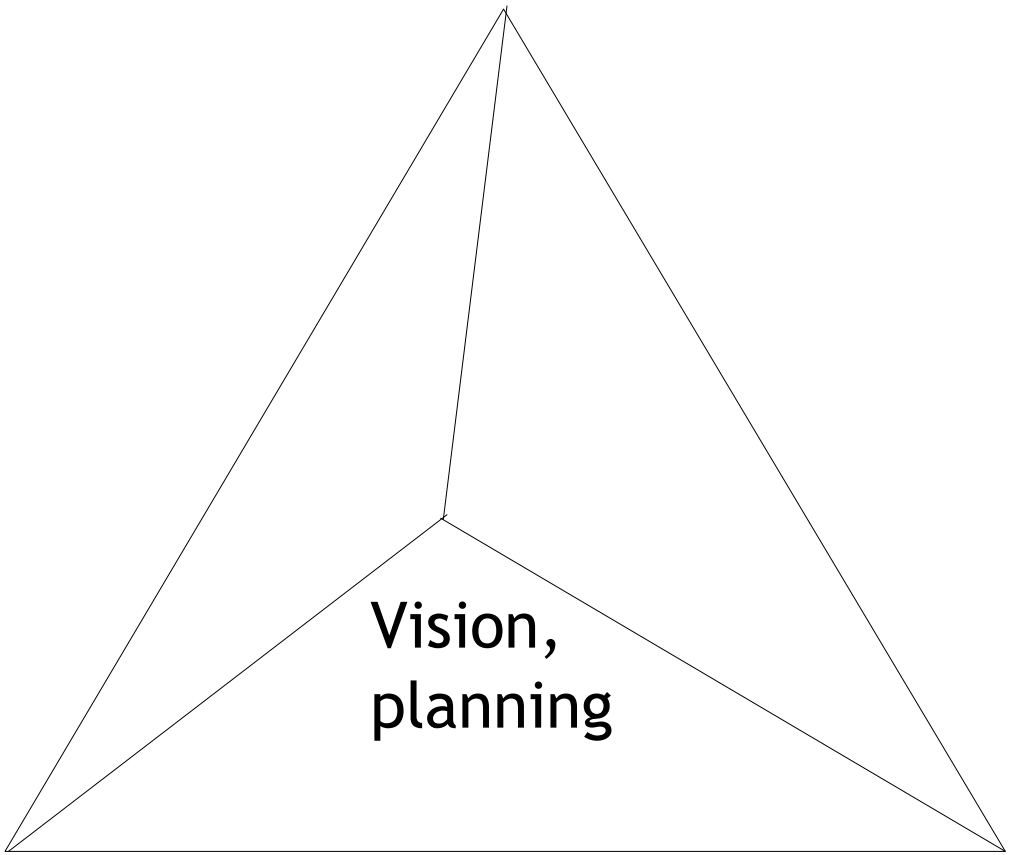
Fundamentals




Skills,
knowledge
General training
Practical training
Experience
Configuration
mgmt
Monitoring
Testing
Clear overview
Direct control over
the components
Mgmt software
User rights mgmt
Remote mgmt
Organizational rules

Fundamentals

Skills, knowledge



Clear overview

Direct control over
the components

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