

Linux Terminal Server Cluster

High Availability and
Load Balancing Cluster
for
Linux Terminal Services

by
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Who am I?

Wolfgang Büch,
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Project leader: “Linux Terminal Cluster”

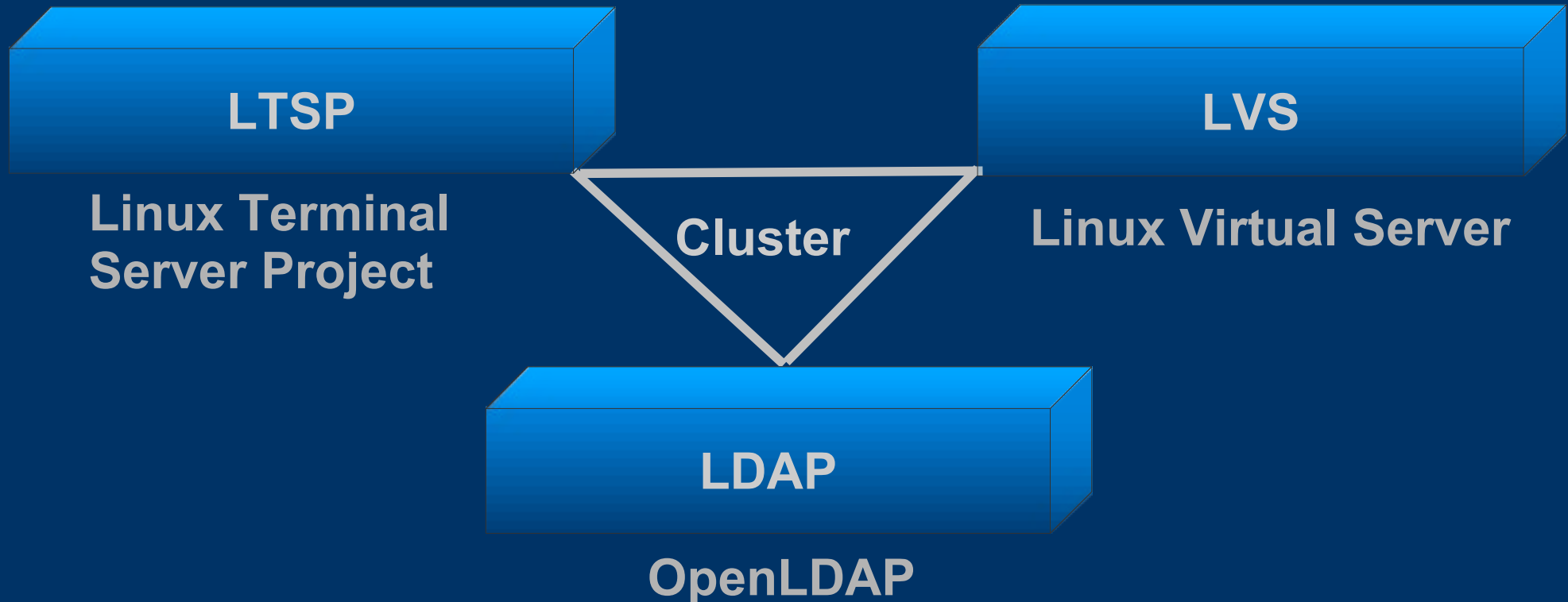
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Content

- General Concept
- Linux Terminal Services
- Clustering Linux Terminal Services
- Example: University of Hamburg
- Feedback

General Concept

Software components:



What are Thin/Diskless Clients?

- Minimal system requirements
- Server based computing
- No investment costs for clients

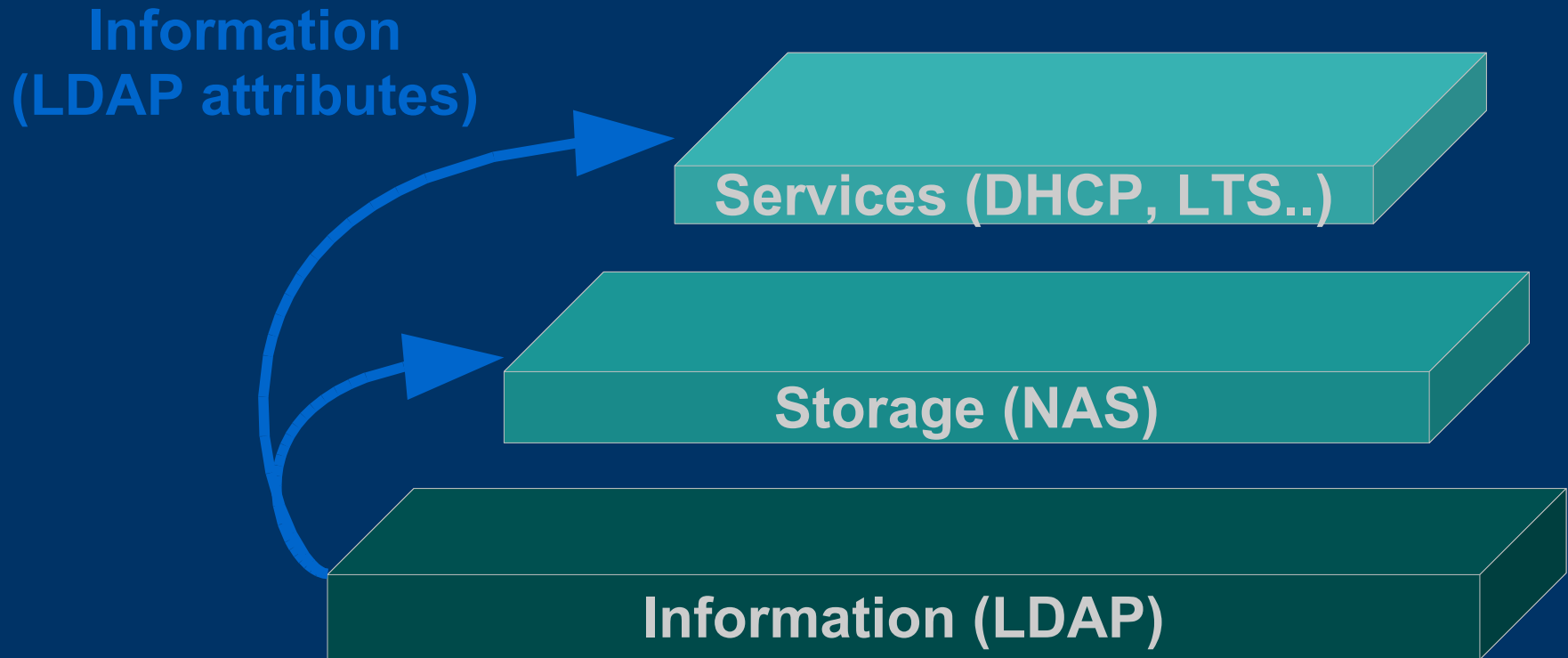
Terminal Server - Overview

- Centralized system settings
- Centralized application server
- Centralized security management

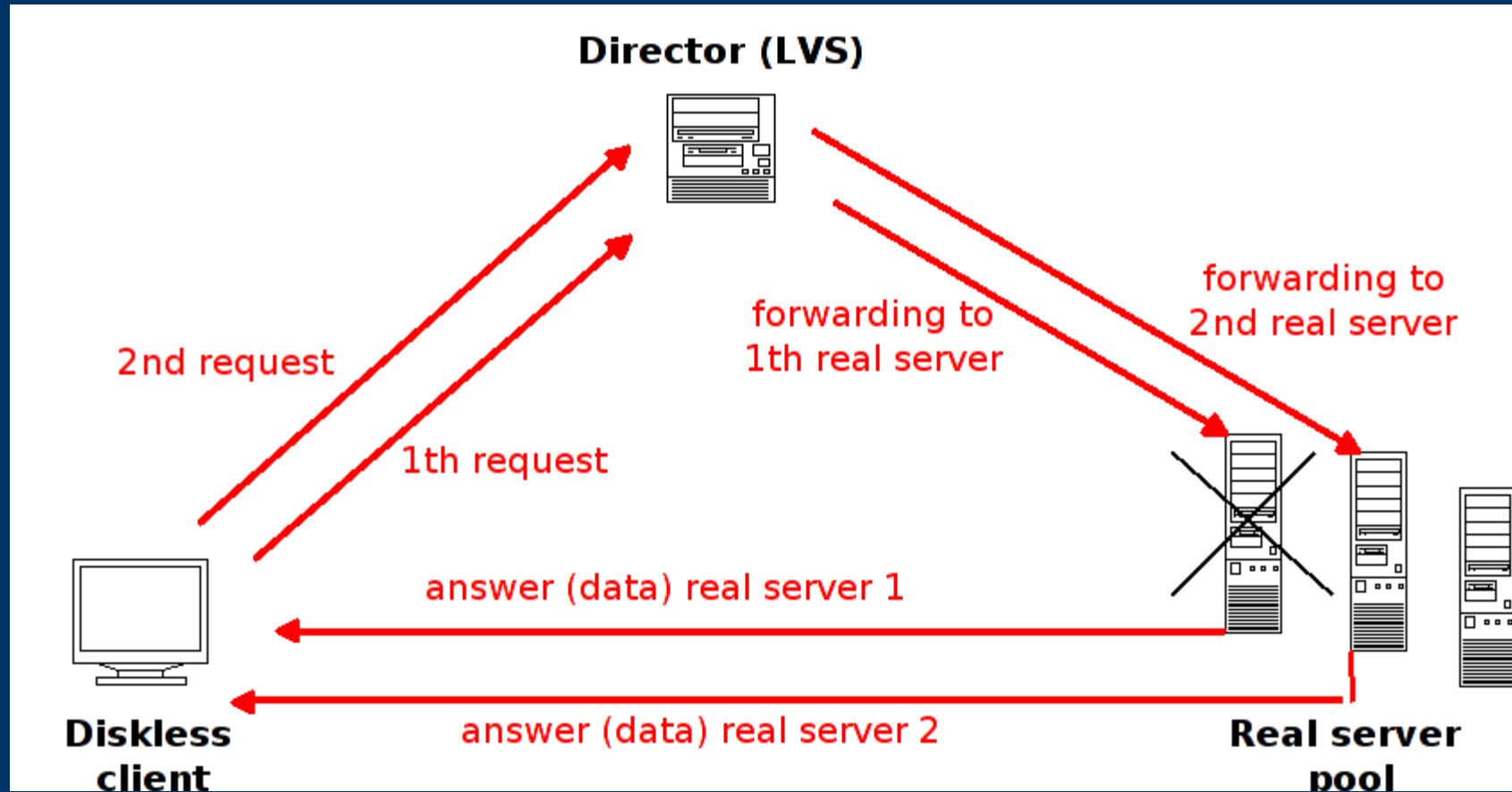
Terminal Server - relevant services

- DHCP: network configuration
- TFTP: kernel transfer
- NFS: root-filesystem
- DNS: name to ip mapping
- XDMCP: remote display
- LDAP: centralized system settings

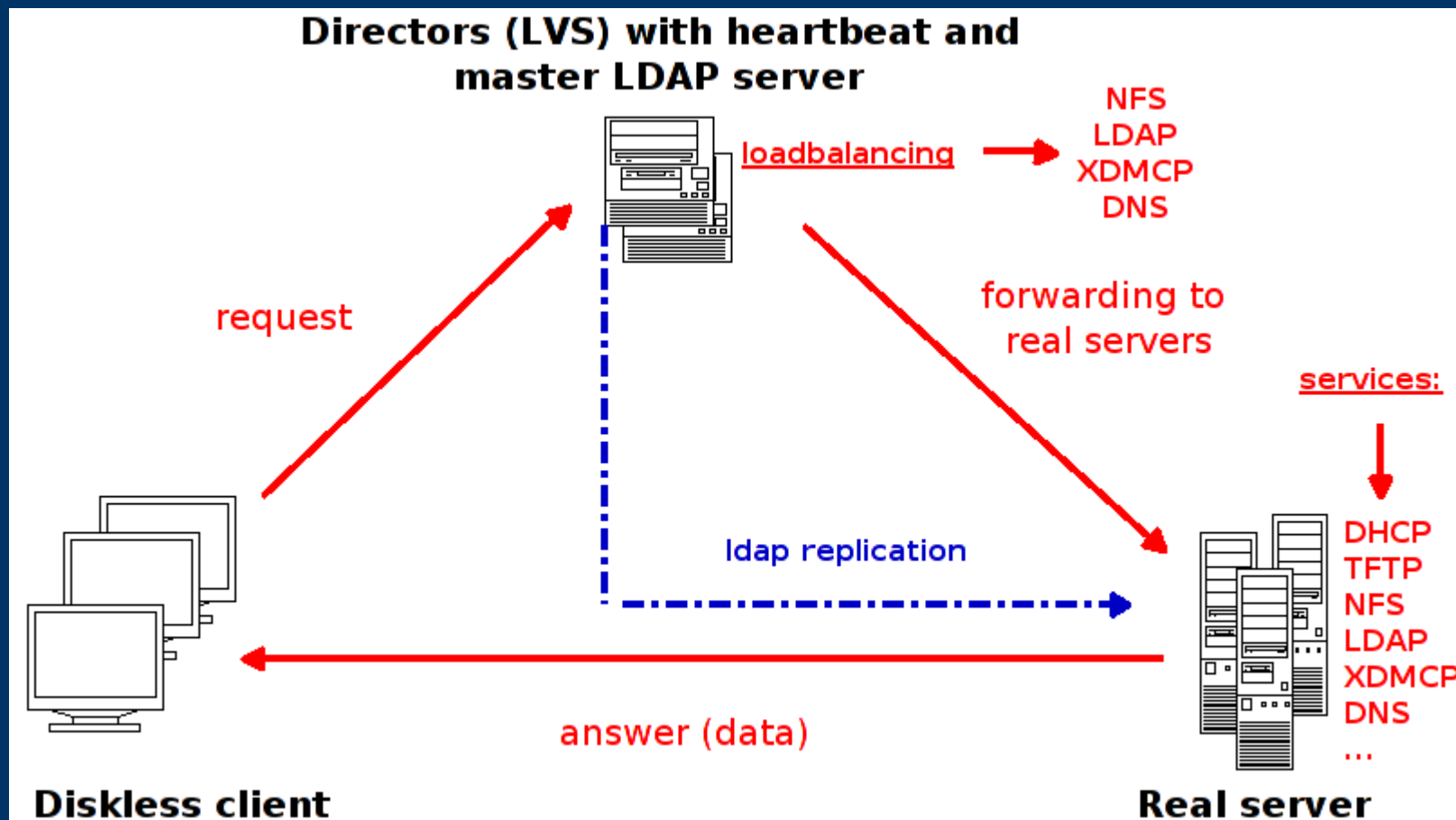
Concept of Clustering LT-Server : LDAP



Concept of Clustering LT-Server : LVS



Concept of Clustering LT-Server : Overview



Technical Implementation

- LTSP:
Root_NFS with LDAP aware startup script for the clients
- OpenLDAP:
LTSP Schema extension
- LVS:
Load Balancing and redundancy

Technical Implementation

- Ldirectord:
Monitoring service availability. Modifying the LVS kernel table entries in case of services crash.
- Heartbeat:
active stand-by for the directors

Technical Implementation

- Ldirectord.cf example for XDMCP:

```
#xdmcp
virtual=192.168.128.231:177
    real=192.168.128.209:177 gate
    real=192.168.128.210:177 gate
    real=192.168.128.211:177 gate
#    real=192.168.128.212:177 gate
    service=xdmcp
    checkport=177
    scheduler=rr
    protocol=udp
```

LTSP and LDAP

- The LDAP holds all information concerning the client configuration (e.g. monitor resolution etc.)
- The standard configuration startup script is replaced by another one querying the LDAP server instead of a config file

LTSP and LDAP

The screenshot shows the phpLDAPAdmin web interface in Mozilla Firefox. The browser title is "phpLDAPAdmin - 0.9.4b - Mozilla Firefox". The address bar shows the URL "http://localhost:8080/phpLDAPAdmin/". The page content is divided into a left sidebar and a main content area.

Left Sidebar:

- phpLDAPAdmin - 0.9.4b
 - [Request a new feature](#)
 - [Report a bug](#)
 - [Donate](#)
- VCBTUX-SAMBA-3.0
 - [Login...](#)
- Cluster-Master
 - [Login...](#)
- Director
 - [schema](#) | [search](#) | [refresh](#) | [create](#) | [info](#) | [import](#) | [logout](#)
 - Logged in as: Anonymous (read only)
 - dc=vcb, dc=de (4)
 - ou=Conf (3)
 - ou=DHCP (5)
 - ou=DNS (1)
 - ou=LTSP (6)
 - cn=Default
 - cn=hfmt_04
 - cn=jura0_11
 - cn=jura0_13
 - cn=jura4_01
 - cn=test10

Main Content Area:

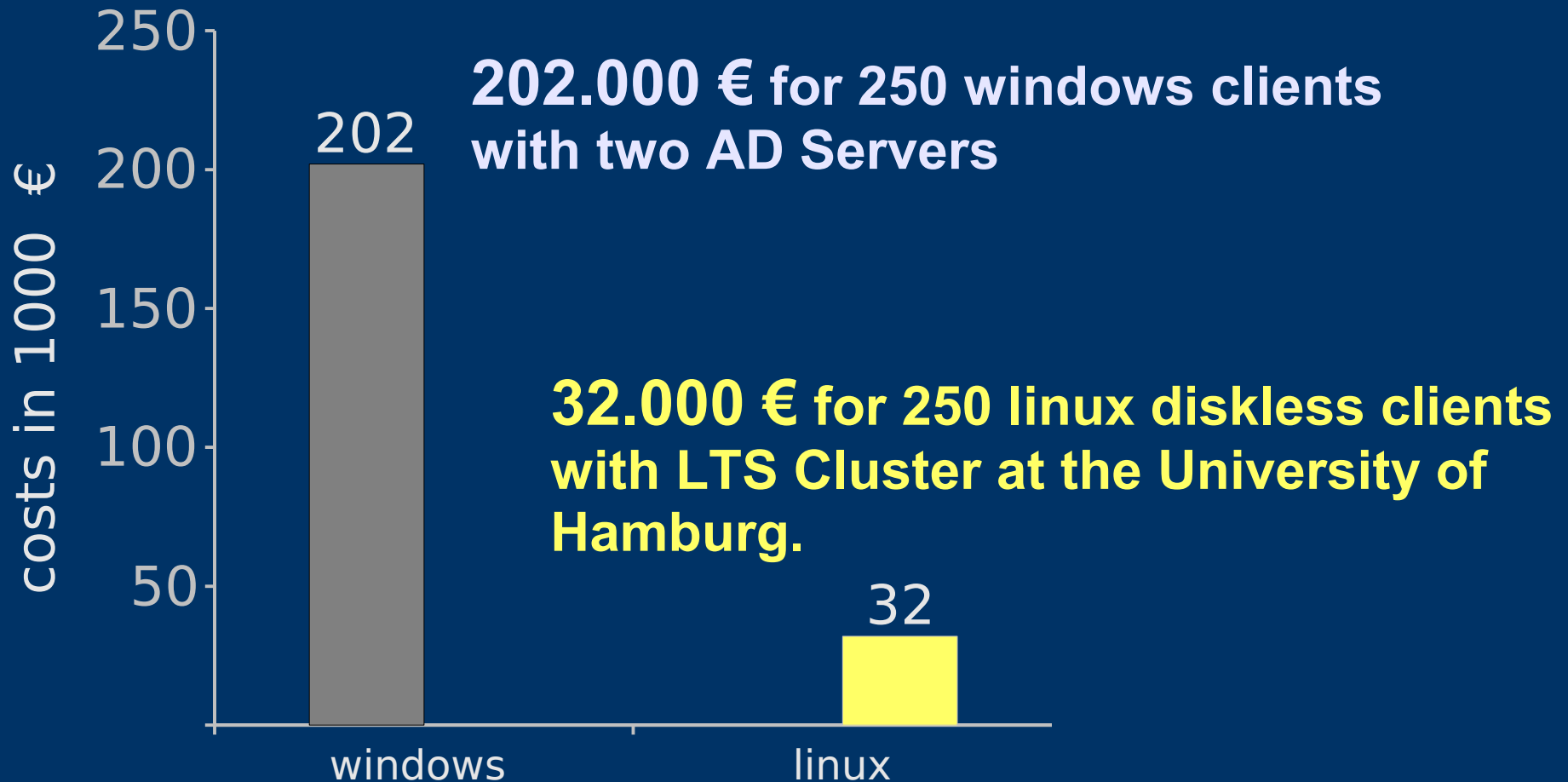
Viewing entry in read-only mode.

cn	Default
ItspLocalApps	N
ItspScreen01	startx
ItspServer	192.168.128.231
ItspUseXFS	Y
ItspXButtons	5
ItspXFSServer	192.168.128.231
ItspXMouseDevice	/dev/psaux
ItspXMouseProtocol	

LTS at the University of Hamburg

- **2003:**
LTS for 100 diskless Linux clients
- **2005:**
LTS Cluster System for 250 clients
- **2006:**
LTS Cluster System for 550 clients

Why Terminal Server Cluster ?



Conclusion

Network-centric computing with LT-Cluster:

- high availability
- lower TCO
- centralized system management
- high administration efficiency
- lower or even no hardware costs for clients
- scalability

Feedback

Thanks for your attention!

Any Questions?