Computing at MPP

Arthur Erhardt

**MPP Computing Commission
+ Fachabteilung IT**

MPP Project Review, 16.12.2014

Personnel Fachabteilung IT

	Linux	MS	Mac	SW	LAN	HW	Print	Phone
Erhardt, A.	x	x	x	x	x	x	x	x
Leupold, U.	x	x	x	x	x	x		x
Krämer, M.					x			x
Pan, Y.	(x)	x						
Salihagic, D.	x			x		x		
Krebs, K.					x			x
Kriesel, A.	x		x			x	x	x
Haunolder, T.	x	x	x			x		

Zoupanos, S.   (temp.): Implementation of SSO @ MPP

Hardware Overview

- ## Central Servers
  - 35 fileservers with ~ 100 TB
  - CEPH storage cluster, currently 280 TB
  - mail, web, DNS, accounts, backup, printer, …

- ## Experimental and engineering groups
  - ~400 PCs, 2/3 Linux, 1/3 MS
- ## Theory group
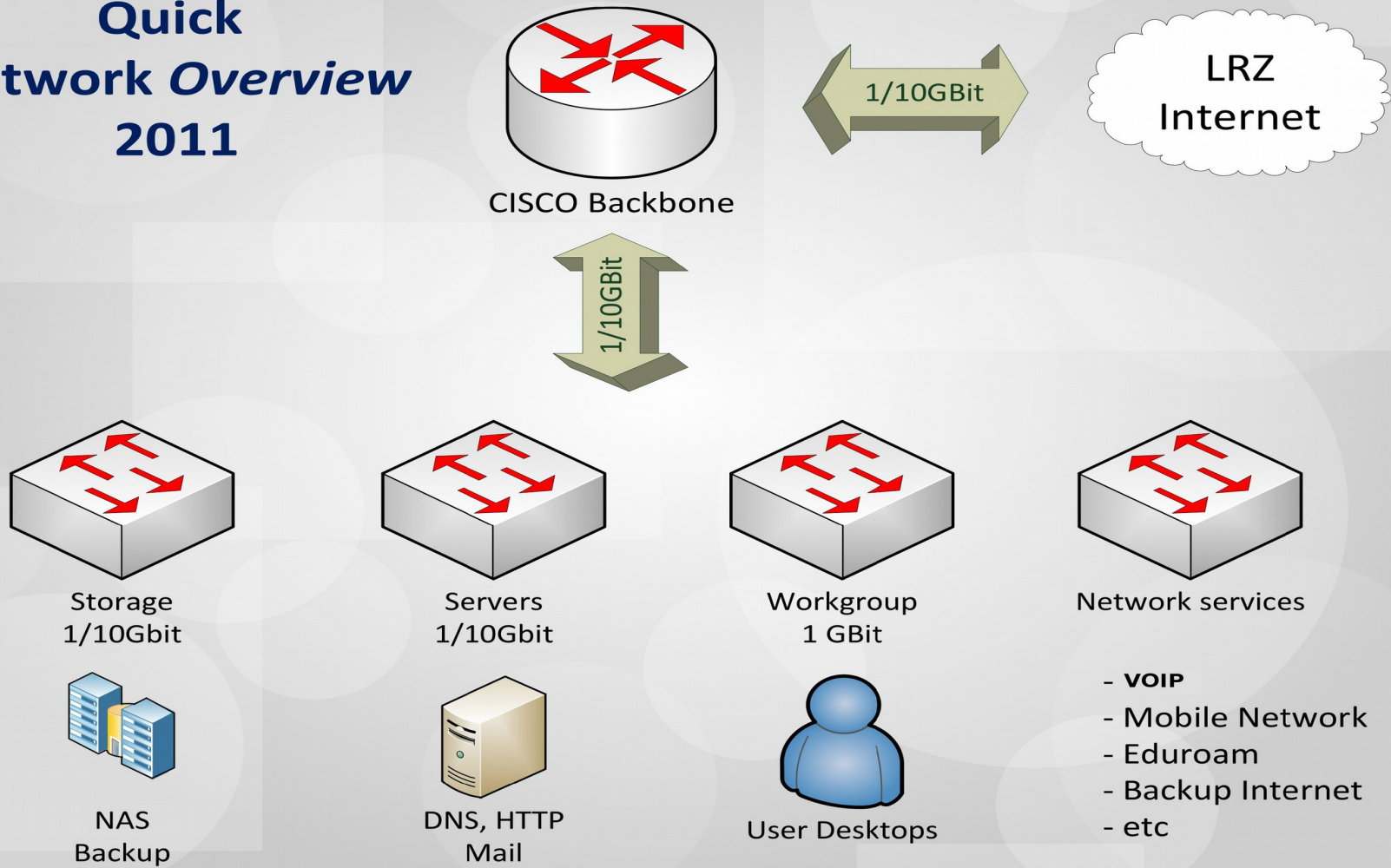 - ~ 100 PCs

Mail service

- Upgrade of Mailserver HW
    - 12+12 CPU cores, 64GB RAM, 8TB disk
    - SSD-cached mail storage (bcache)
    - More efficient mail data format (maildir)

    → about two orders of magnitude faster

    → currently no bottleneck, future replacement planned only due to hardware aging

Container Village

- Roll-out of IT infrastructure completed

    – Wired LAN: new cabling

    – WiFi: works stable after initial trouble

    – PCs, copier, printers, ...

LAN

Quick Network *Overview* 2011

CISCO Backbone

1/10GBit — LRZ Internet

1/10GBit

Storage
1/10Gbit
NAS
Backup

Servers
1/10Gbit
DNS, HTTP
Mail

Workgroup
1 GBit
User Desktops

Network services

- **VOIP**
- Mobile Network
- Eduroam
- Backup Internet
- etc

LAN (2)

- New Cisco central router

    – New Hardware for reliability reasons

    – More performance and flexibility

    – Possible emergency fallback to old router

    – Configuration and commissioning in Q1/2015

LAN (3)

- New Firewall Hardware

  - Two x86_64 servers, one active, one fallback

  - Faster network interfaces (real 10GbE, not limited to 5 GbE due to PCIe bottleneck)

  - Remote management via IPMI

LAN (4)

- EduRoam @ MPP

  - Eduroam WiFi access enabled

  - Works stable after some fine-tuning

  - Minor trouble due to misconfigured clients (Windows, MacOS X)

CEPH Storage Cluster

- CEPH storage cluster @ MPP:

  – 9 nodes, 72 disks, 280 TB raw

  – accessible via autofs from any Linux PC

  (/remote/ceph/{u/user}|{g/group/})

  – cheap, redundant storage: failure of any one or selected two nodes is covered, but **no backup**

  – after 1 year of testing: stable operation, but per-formance problems after disk replacement

  – much of the work courtesy O. Schulz (GERDA)

CEPH Storage Cluster (2)

- Future plans:
  - 3 more storage nodes
  - 3 dedicated management nodes
  - split server locations
  - 10 GbE interconnects between nodes
  - 40 GbE interconnects between racks
    $\rightarrow$ new switch and cablework needed

Software overview

- Operating Systems
  - Linux (Ubuntu 12.04/10.04 (ATLAS/BELLE/ILC)), OpenSUSE 13.1 (Theory), RHEL & clones
  - AIX, Solaris (Electronics workshop)
  - MacOSX, VMS (without IT infrastructure)
  - MS Windows (Admin., Labs, h1win, thwin)
- Applications / libraries
  - Mathematica, Maple, Portland & intel compilers, IDL, NAG, Matlab, …
  - OSS with IT group & mppcc

Software Applications

- Commercial

  – Oracle 10, Infopark Fiona cms, Tivoli backup, Gleitzeitserver, LogInventory, HP ProCurve Manager, …

  – Cisco Prime Infrastructure (WLAN mgr.)

- Open Source

  – Indico, mysql, root, CERNLIB, phpBB, twiki, Asterisk, eGroupware, kvm, ...

Phonesystem Status

- Phone system works mostly stable

- New hardware purchased and set up

- OS and asterisk upgrades in Q1/2015

- User feature requests will be implemented after upgrades

MPP computing commission

- Subcommittee of IA
    - members: Abt, Bethke, Erhardt, Hahn, Kluth, Leupold, Reimann, Simon, Stonjek
    - meetings are public
- Mandate
    - oversight of IT operations
    - medium- and longterm planning
- Please consult before buying hardware or requiring services!

Rahmenverträge

- MPG has procurement contracts for IT
  - hardware, LAN, software, services
  - order without tendering procedure
  - (mostly) competitive prices (still check F&L or street prices)
  - Fujitsu, HP, IBM, Acer, Dell, Lenovo, Apple, …
- Experience
  - good for standard orders
  - companies respond well

Summary

- MPP IT landscape continuously changing
  - rapid changes in hard- and software
  - Keeps IT staff busy

- Mass data storage at MPP growing fast
  - > 100 TB. CPU power? Management?
  - use RZG cluster & storage (10GbE to MPP)

Outlook: IT Plans for 2015

- Implement SSO solution @ MPP

- Phase out all 100MBps Ethernet in scientific environments.

- Upgrade Linux Desktops to Ubuntu 14.04.

- CEPH: Upgrade networking, add storage

- Tivoli Backup**2 to RZG: All necessary parts in place