

HPC @ University of Bern

ubelix – Uni BERN LInuX cluster

Andres Aeschlimann
University of Bern



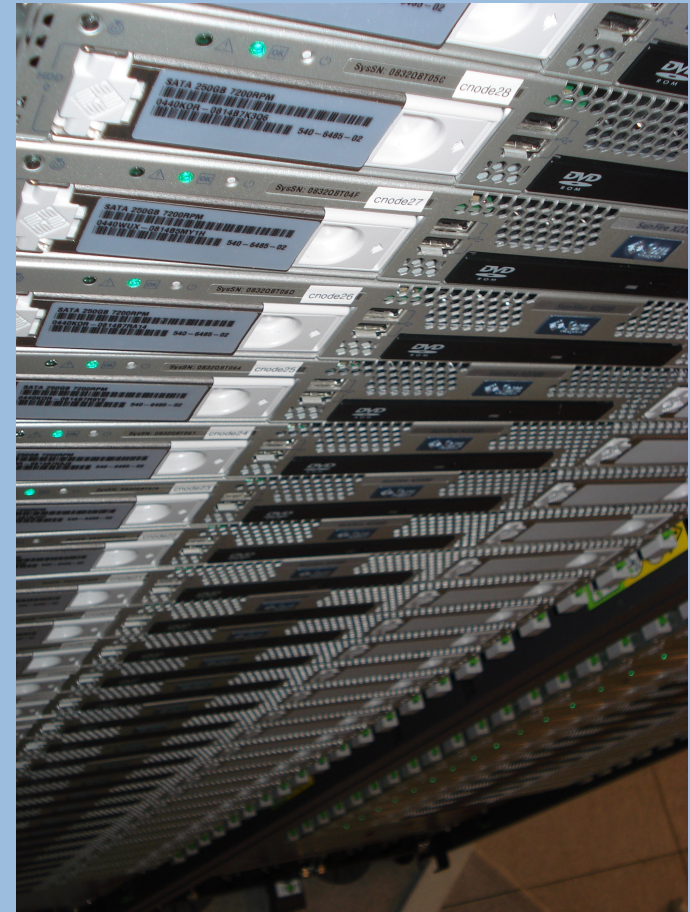
Purpose

- > “This Grid HPC infrastructure is primarily designed to support the researchers at the Campus. They should use their time doing research and not be bothered by deploying a Grid HPC infrastructure.”




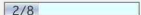



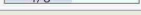
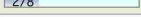




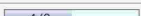

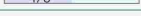

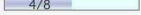


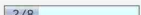
Some facts

- > first Linux Cluster was installed in 2001 (1 master and 32 single core nodes)
- > continuously expanded to ~1000 cores in >200 nodes today
- > Dual- and quadcore worker nodes
- > Mostly Opterons, increasing # of Intels (Nehalem)
- > several suppliers (mostly SUN, but currently also IBM and some Dell)
- > < 100kW

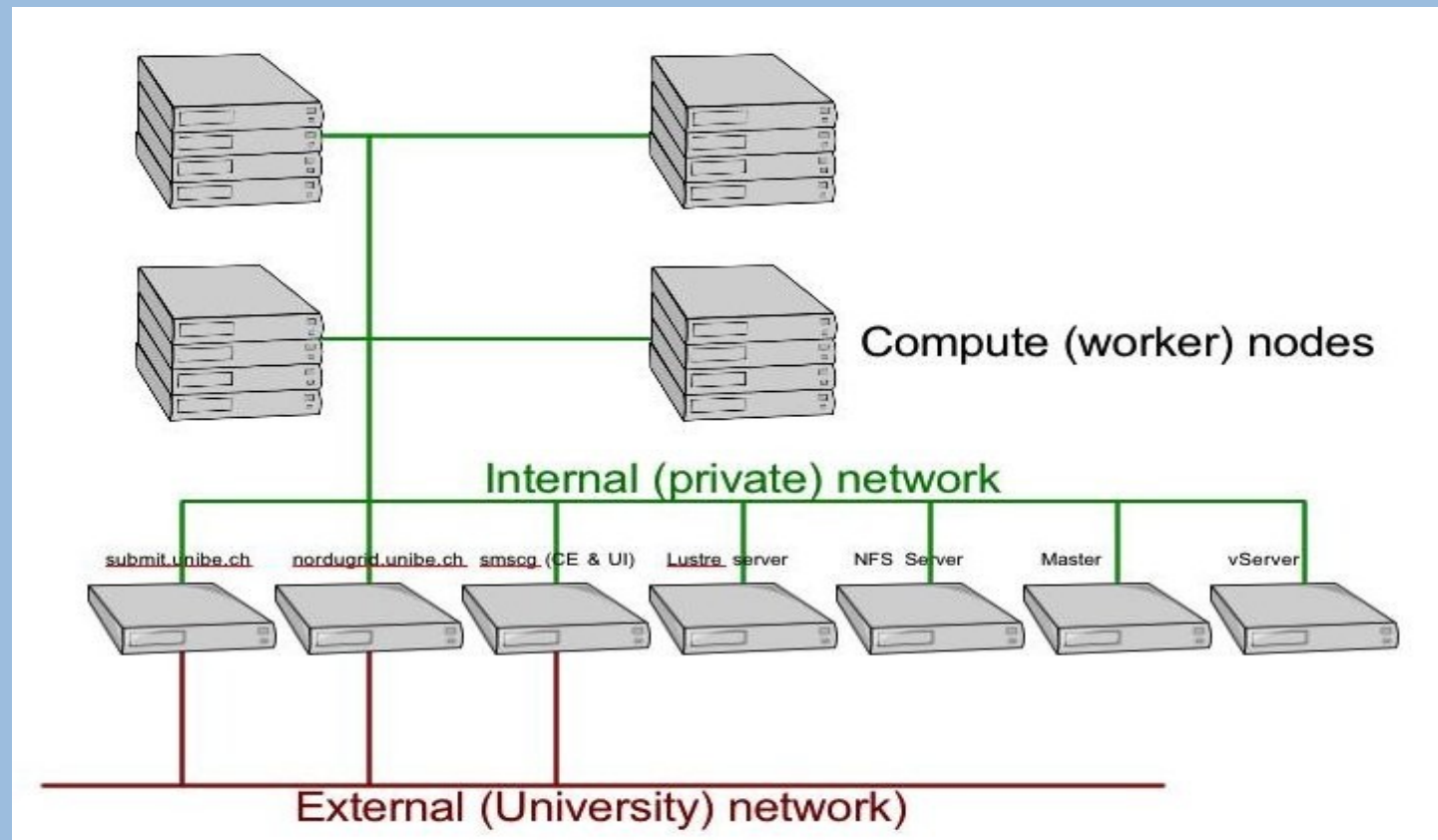


Some facts (cont.)

- > Gentoo Linux
www.gentoo.org
- > Kernel 2.6.22/2.6.27
- > 2TB memory, 50TB disk
- > Lustre filesystem: 1.8.1
- > Sun Grid Engine 6.2
- > Gb Switch
- > Currently no Infiniband Switch

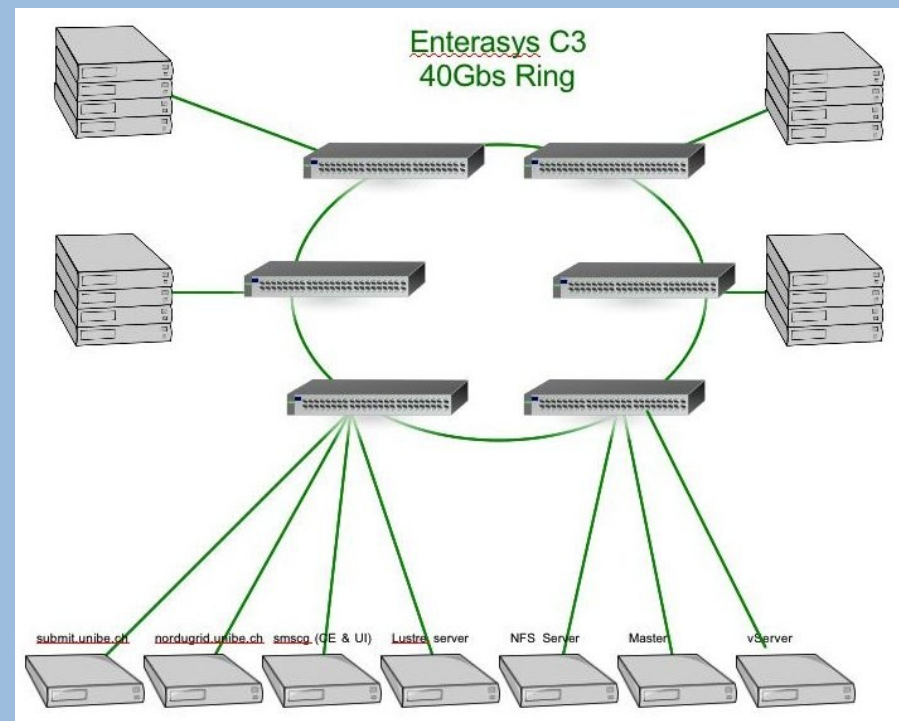
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all.q	cnode64	BIP		0.04	lx26-amd64	⊖ d
all.q	dnode01	BIP		0.31	lx26-amd64	✓
all.q	dnode02	BIP		0.31	lx26-amd64	✓
all.q	dnode03	BIP		0.27	lx26-amd64	✓

Schema



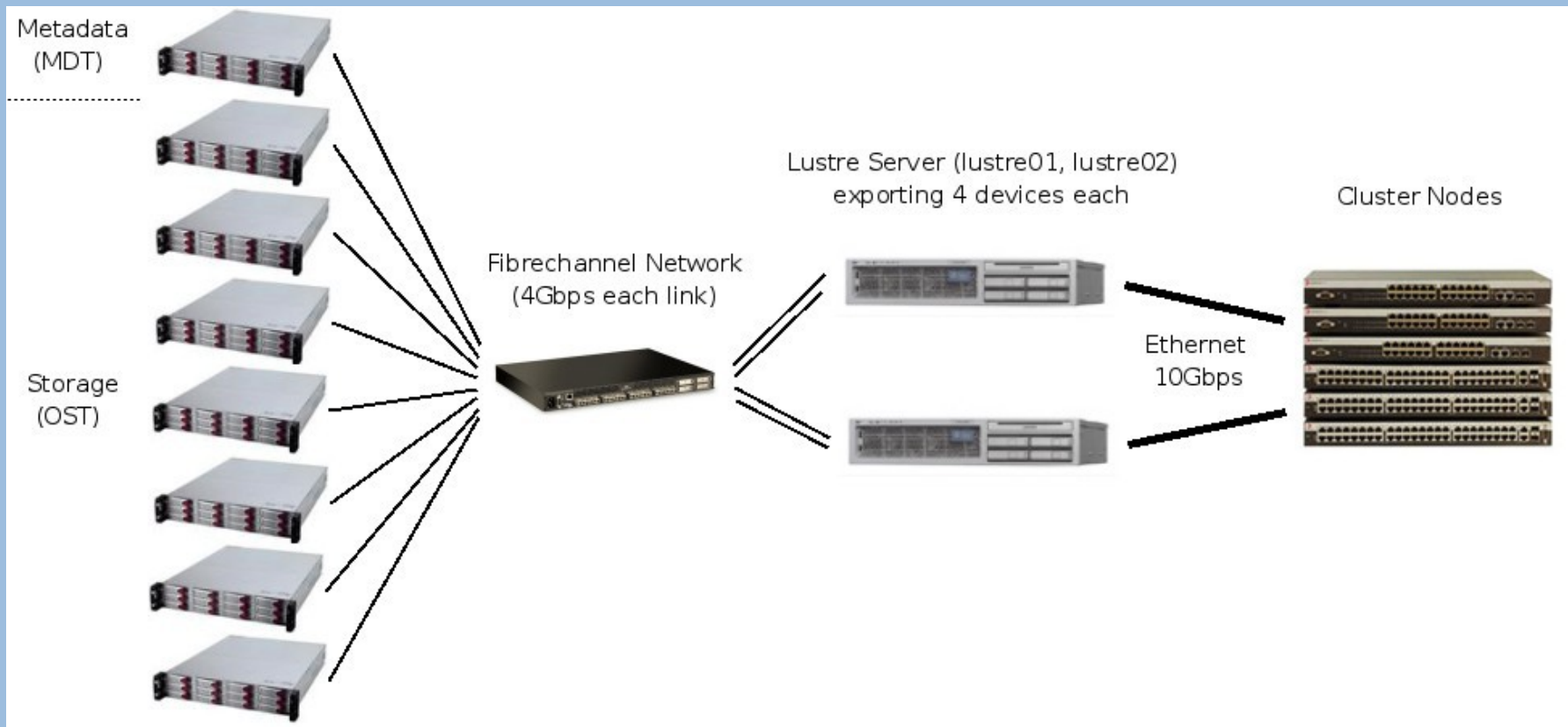
Internal (private) network

- > TCP/IP
- > Stackable Switches (~40Gbs)
- > „normal“ Gigabit Ethernet on the worker nodes
- > 10GE Ethernet for high throughput servers



Lustre@ubelix

- > Filesystem
- > `lustre01@tcp0:lustre02@tcp0:/homefs` 44T 14T 29T 33% /home/ubelix
- > ~1 GB/s sustained write performance



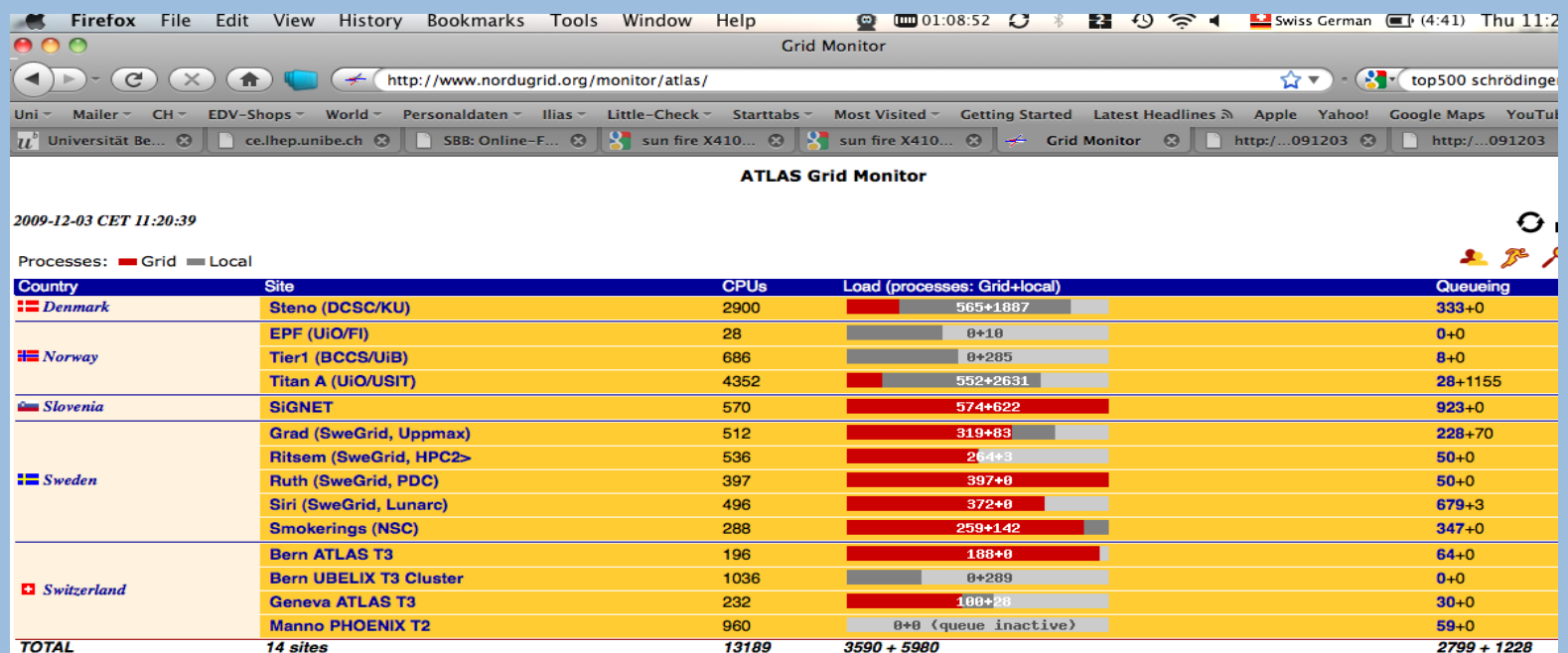
Application portfolio (local users)

- > HE Physics
- > Astronomy
- > Computational and Molecular Population Genetics Lab
- > Space Research Physics
- > Computer Vision and Artificial Intelligence
- > Chemistry and Biochemistry
- > ...

Applications from remote:



- > ATLAS: high energy physics application developed for the LHC experiment at CERN
- > RSA768: cryptographic application
- > NAMD and GROMACS: biochemistry applications
- > GAMESS: biochemistry application (work in progress)
- > ...



Other clusters @ UniBE

HPC-CH Kick Off Meeting - UZH - 2009-12-03

The **LHEP** UNIBE ATLAS T3 2009



- A ROCKS Cluster with ~200 cores (Sun Fire X2200 IU dual quad cores) and ~50 TB on CentOS. Located in same room as ID UNIBE cluster.
- Mainly serves local and remote ATLAS scientists. Backfilled with remote users and applications.
- **Speciality: Access only via ARC clients, i.e. remote and local users have the same interface.**
- Expect ~80 kCHF/year upgrades.
- May go to Lustre in 2010, now nfs.

<http://ce.lhep.unibe.ch>

Other clusters @ UniBE (cont.)

- > Theoretical Physics (~200 cores, with interconnect)
- > Climate Physics (~100 cores)
- > Space Physics (~100 cores)
- > Chemistry (~100 cores, with interconnect)
- > Computational and Molecular Population Genetics (~60 cores)
- > ...