

Introduction to the National Analysis Facility

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- > NAF 2 and its components
 - Workgroupserver
 - Batch
 - Grid cluster
 - AFS
 - Sonas
 - dCache
- > ATLAS Software
- > Support
- > Documentation
- > Hands On!



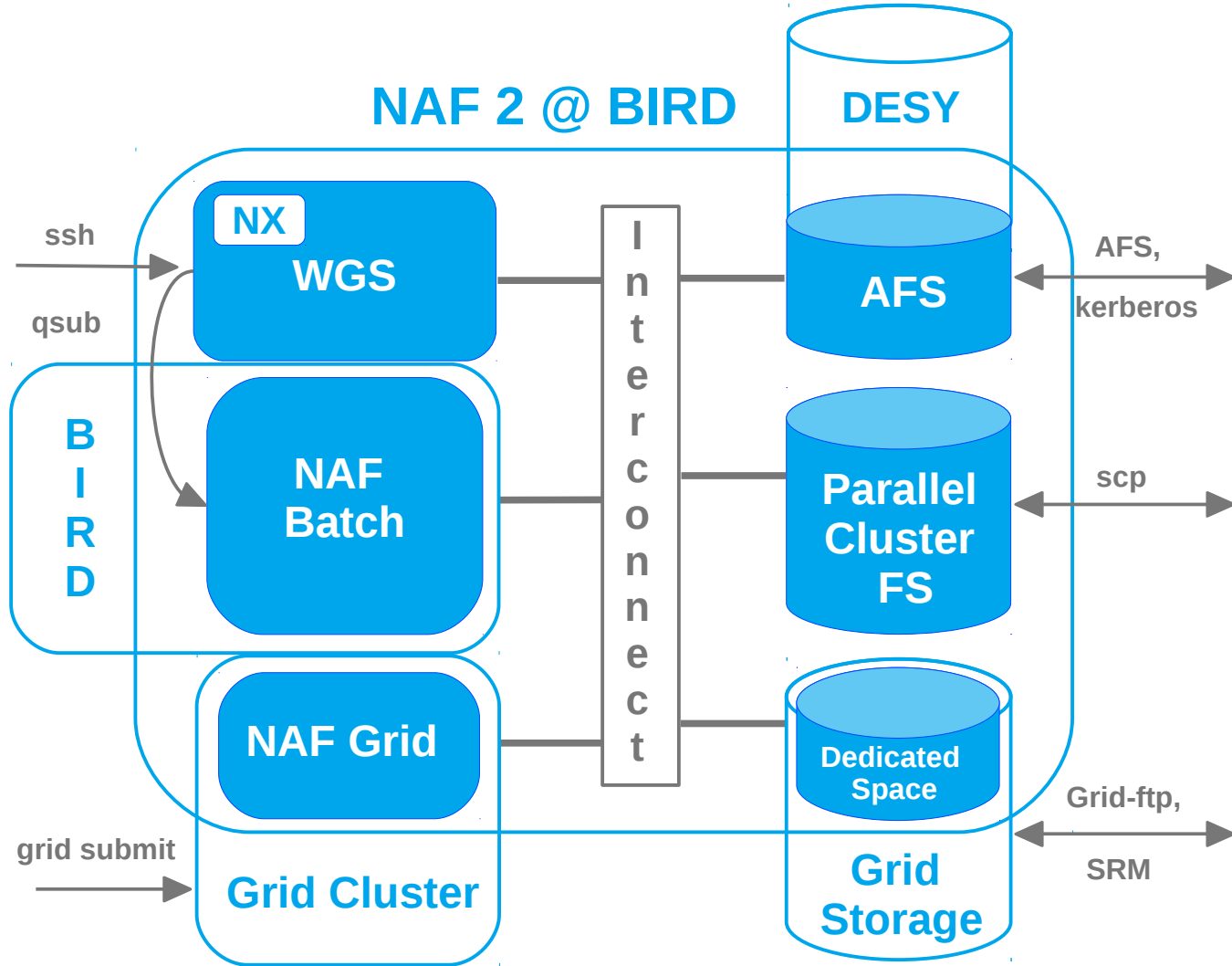
The National Analysis Facility (NAF)

- > Part of the Helmholtz Alliance “Physics at the Terascale”
 - collaboration of ~20 institutes
- > Located at DESY Hamburg
- > Users are currently ATLAS, CMS, ILC, Belle, and HeraFitter
- > Note: currently in the transition from “NAF 1” to “NAF 2”
 - you will work on “NAF 2”
- > Computing size of 1 average Tier 2 (~3000 job slots)
- > Coupled to existing Tier 2 storage
 - access to data already stored at site!

<http://naf.desy.de>
<http://terascale.de>



Implementation

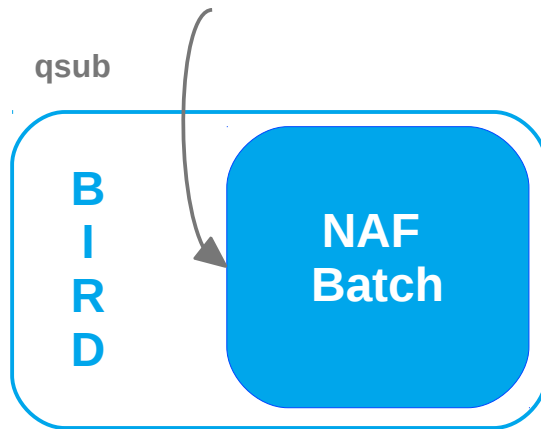


BIRD: Batch Infrastructure Resource at DESY



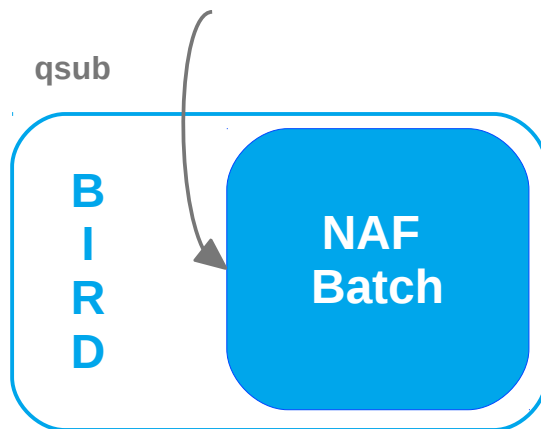


- > Each VO has their own WGS
- > For code development and testing
- > Login via ssh:
ssh -l username nafhh-atlas0N.desy.de
with N = 1, 3...6
- > Do **not** use N=2 (SL6 test machine)
- > NX-like graphical login
→ for latency troubled connection
(not covered in this tutorial)



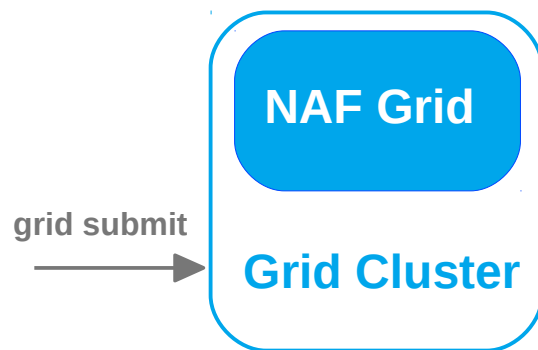
- > Shared resources within the Batch Infrastructure Resource at DESY (BIRD) (ATLAS O(30)%)
- > Currently mixture of SL5 (~1500 cores) and SL6 (~500 cores)
- > Cores from NAF 1 will be added (~4000)
- > Scheduler based on Sun Grid Engine (SGE)
- > Technical data:
 - 8/12 cores per host
 - 100 GB disk space per host
 - 2-4 GB memory per core

<http://bird.desy.de/>



- > Jobs can be submitted via qsub (or Ganga,...)
- > Example to request resources:
 - wall clock time: `-l h_cpu=24:00:00`
 - virtual memory: `-l h_vmem=2G`
- > Specify your resource need carefully
 - SGE is very strict in resource accounting → will kill your job if memory/cpu/... usage too large!
 - If you ask for too many resources, SGE might not find a host → your jobs will never run!
- > You can grab yourself a worker node:
`qrsh -now n (-l distro=sld6)`
(Not covered in this tutorial)

<http://bird.desy.de/>



- > Grid cluster is independent of NAF (belongs to Tier 2)
- > Extra resources with NAF funding
- > Dedicated, high-priority queue for ATLAS-D users
- > Create proxy with appropriate role:
`voms-proxy-init --voms atlas:/atlas/de`
- > Grid jobs can be submitted with both Ganga and Panda

- > Your home directory will be in the standard DESY AFS cell

`/afs/desy.de/user/n/nowaf`

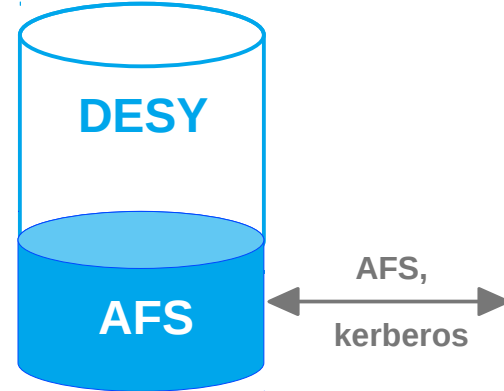
- Comes with backup (expensive!)
- Quota: 4 GB, can be increased
→ mail to uco@desy.de

- > Scratch space also available

`/afs/desy.de/user/n/nowaf/xxl`

- No backup!
- Quota: 10 GB, can be increased
→ mail to naf-atlas-support@desy.de

- > Is mounted on both WGS and NAF worker nodes (but not in the Grid)



- > For access to other AFS cells, do

`klog -cell cell name`

- > Sharing files with other NAF/DESY/AFS users

`/afs/desy.de/user/n/nowaf/public`

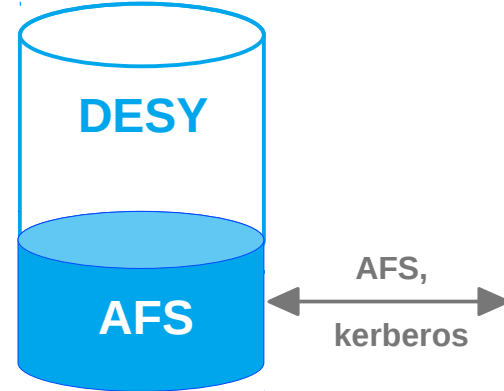
- > Sharing files with the outside world, create

`/afs/desy/de/user/n/nowaf/www`

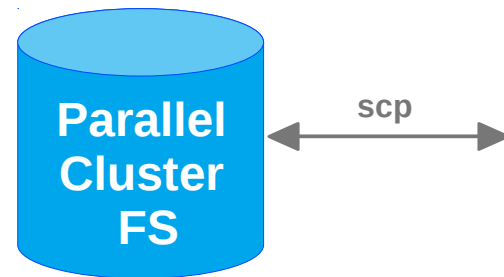
will appear at

`www.desy.de/~nowaf`

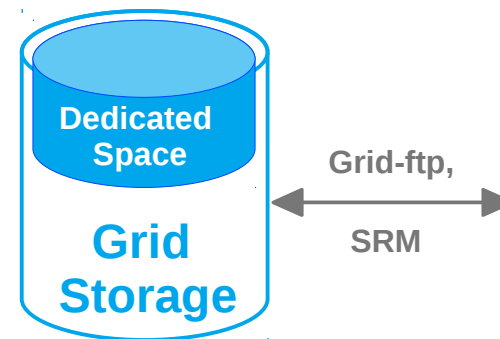
(will be shown later in this tutorial)



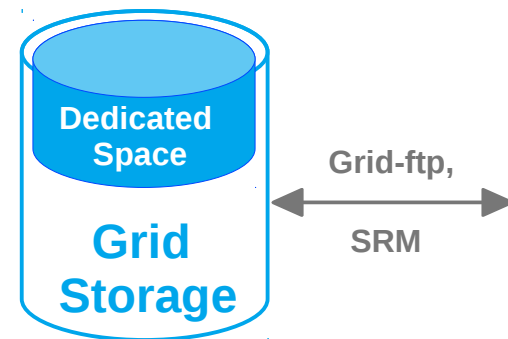
- > Fast, shared File System
- > Scratch space (no backup!)
- > Is mounted under
`/nfs/dust/atlas/user` (workshop directory: `/nfs/dust/atlas/group/atlasd/`)
- > No automatic generation of user directory
 - request one: send mail to `naf-helpdesk@desy.de`
- > Quota: 1TB, can be increased
 - send mail to `naf-atlas-support@desy.de`
- > Is mounted on WGS and NAF worker nodes (but not in the Grid)



- > dCache is the used system at DESY for Tier2 storage
- > Currently 2.7 PB of space installed for ATLAS
- > Divided by spacetokens; the most important are
 - ATLASDATADISK: centrally managed main storage; official datasets (AOD, D3PDs, etc.) goes here
 - ATLASSCRATCHDISK: files you produce usually go here; will be deleted after 30 days!
 - ATLASLOCALGROUPDISK: locally managed; requested or inofficial (your) datasets go here



- > This is the place where your input data should be!
- > Different protocols for file access:
 - dcap (not very secure, but works with athena)
 - gsidcap (needs valid grid proxy with VOMS extension)
 - xrootd (not standard currently)
 - webdav (not standard currently)
- > Tools to use are dq2 (recommended), srm, lcg tools, dctools
- > Also root, athena, ... can run on files on dCache directly



- > The ATLAS software is provided via CERN Virtual Machine File System (CVMFS)
- > CVMFS is a caching, http based read-only file system
- > Software in CVMFS is provided by ATLAS centrally
- > Is mounted on WGS, the grid worker nodes and some of the NAF worker nodes (request via “-l cvmfs”)
- > Setup the software by doing

```
export ATLAS_LOCAL_ROOT_BASE=/cvmfs/atlas.cern.ch/repo/ATLASLocalRootBase
```

```
export DQ2_LOCAL_SITE_ID=DESY-HH_SCRATCHDISK ← Do not forget this!
```

```
source /cvmfs/atlas.cern.ch/repo/ATLASLocalRootBase/user/atlasLocalSetup.sh
```

- > You will get a print out of available tools



- > Individual Tools will be set up by doing `localSetupToolName`, e.g. `localSetupDQ2Client`, `localSetupGLite`, ...
- > `asetup` does the ATLAS environment setup

```
mkdir ~/testarea/17.7.0.2
cd ~/testarea/17.7.0.2
asetup 17.7.0.2,here
```
- > `showVersions` lists all available versions of installed software
- > `diagnostics` provides some scripts to check the setup in case of problems
- > `helpMe` provides a list of web pages and mailing lists for different topics



- > Non-experiment specific NAF problems: naf-helpdesk@desy.de
(Note: make clear you work on NAF 2)
- > ATLAS related NAF problems: naf-atlas-support@desy.de
- > ATLAS only problems: HN [gridkaCloudUserSupport](#)
- > General suggestions/requests should go to the NAF User Committee (NUC)
<http://naf.desy.de/nuc>
ATLAS representative: David South, ?
- > Talk to other NAF users!



Documentation

> Documentation is important!

> NAF (2) related:

- <http://naf.desy.de> (General NAF documentation, mainly NAF 1)
- <http://naf.desy.de/atlas> (ATLAS NAF documentation, mainly NAF 1)
- http://it.desy.de/services/computing_infrastructure/national_analysis_facility___naf (Tiny NAF page by DESY IT)
- <https://wiki-zeuthen.desy.de/ATLAS/WorkBook/NAF2> (under construction)
- <http://bird.desy.de/> (Batch farm related information for NAF 2)

Please, contribute!



> In the rest of this hour, please try

- To log into the NAF 2
- To set up ATLAS software
- To do some simple examples at

<https://twiki.cern.ch/twiki/bin/viewauth/AtlasComputing/SoftwareTutorialGermanyNAFIntroduction>

