# The National Analysis Facility – NAF

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PoF Helmholtz Review ET
Hamburg, 26.02.2009

HELMHOLTZ GEMEINSCHAFT

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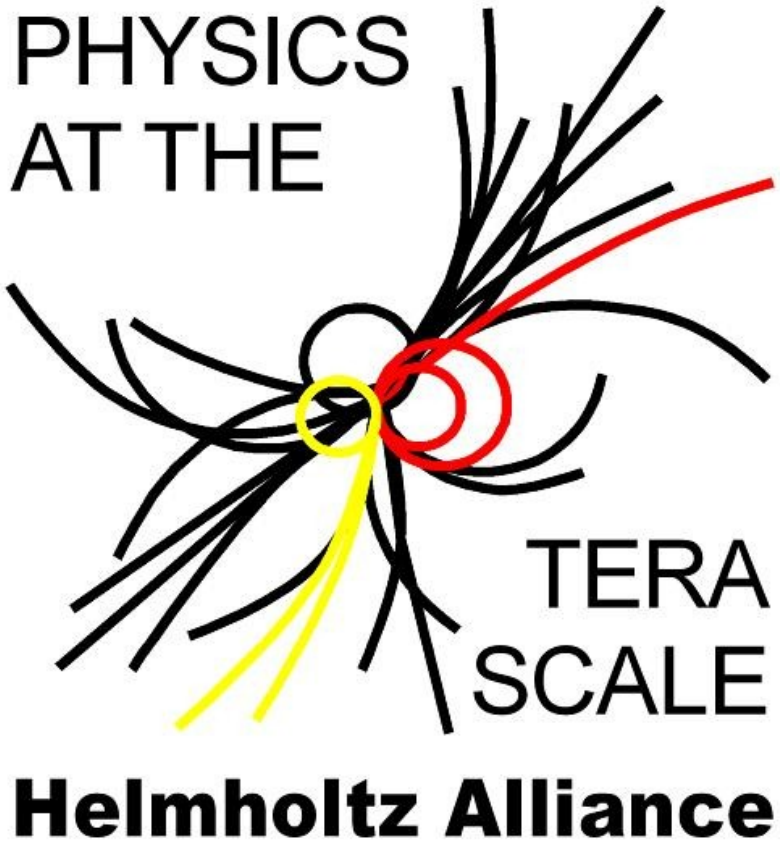
# Objective

- Build a general purpose and flexible analysis platform for the German LHC experiments (Atlas, CMS, LHCb) & ILC: the NAF
  - designed and built up according to experiments' requirements
  - locality of the analysis data is a key feature
- Provide interactive access to large scale computing resources coupled to the data
  - provide new and further possibilities in data analysis beyond grid computing
  - additional grid resources
- Keep close contact to users
  - general technical support by NAF administrators (documentation, ticket system)
  - experiments support their users via mailing lists (first steps, application support)
  - NAF User Committee (NUC) – offers a discussion platform to users and providers

# NAF – Overview




- Part of the Helmholtz alliance “Physics at the Terascale”
- Embeds an interactive and a grid part
- Legacy-free joint venture between the DESY sites Hamburg & Zeuthen
  - distributed over the DESY sites
  - operated by the DESY IT/DV groups
  - new DNS domain naf.desy.de
  - new AFS cell naf.desy.de

# NAF – Interactive & Grid Part

- Familiar environment for users, “just login and start”
  - AFS home directories
  - work groups servers (WGS) for code development and testing
  - a traditional batch system (SGE – Sun Grid Engine)
  - close access to analysis data
- Batch system:
  - prefers short running jobs
  - allows for running up to one week
  - PROOF integration (started as common effort between users & NAF developers)
- Access to a parallel high throughput filesystem (Lustre)
- Additional computing resources in the existing Grid infrastructure
  - similar usage as for the WLCG Tier2 resources
- Separate batch share using VOMS-groups



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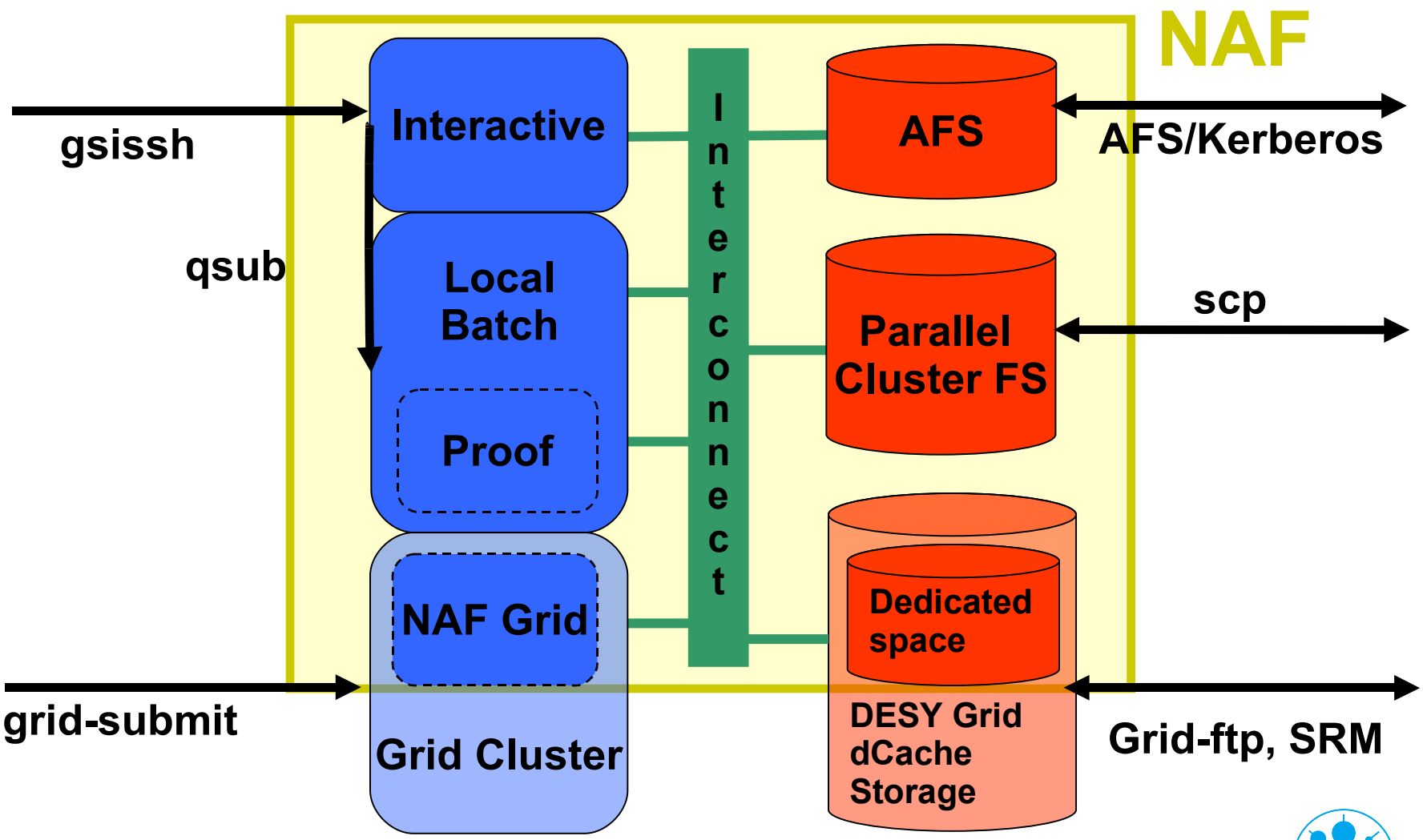
# Schematic Overview



# Currently Installed Resources

| Resource | VO | HH | ZN | Sum |
|---|---|---|---|---|
| batch cores | ALL | 400 | 368 | 768 |
| grid cores | ALL | 256 | 128 | 384 |
| dCache in TB | Atlas | 180 | 300 | 480 |
| | CMS | 160 | | 160 |
| | LHCb | | 50 | 50 |
| | ILC | 110 | | 110 |
| Lustre in TB | Atlas | 16 | | 16 |
| | CMS | 16 | | 16 |
| | LHCb | 16 | | 16 |
| | ILC | 16 | | 16 |



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# Technical Highlights – Interactive Part

- Passwordless interactive access
  - same authentication methods as in the grid world (grid proxy certificates)
  - transparent x509 – kerberos5 integration
  - local user mapping via a central registry
- PROOF integration
  - parallel environment of SGE
  - accounting available
- Distributed but homogeneous from functional point of view
  - nearby storage access in many cases faster

    network latency, better connectivity (Infiniband)



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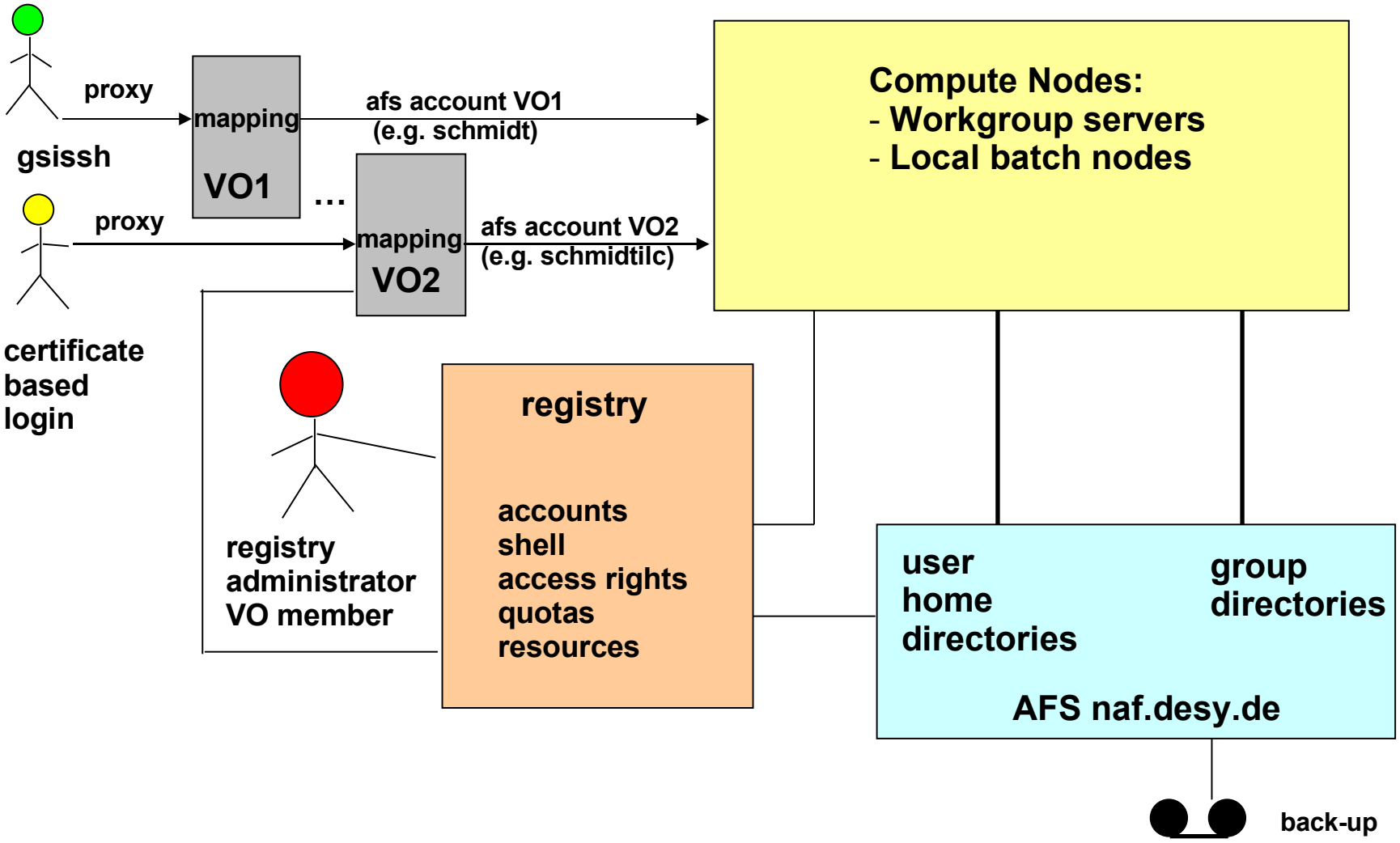
# NAF – User's Point of View

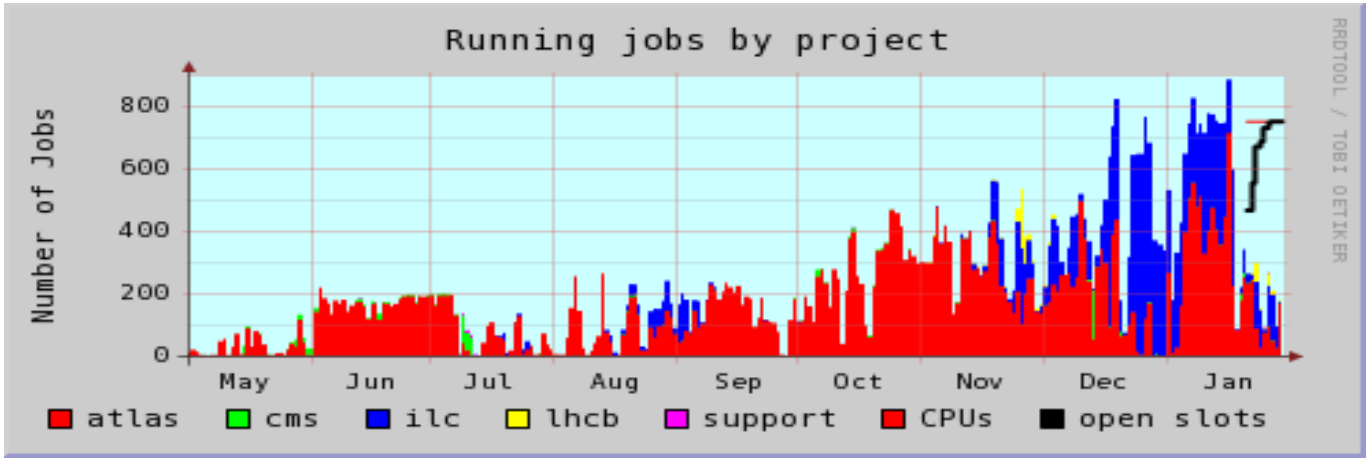


# User Registration / Administration

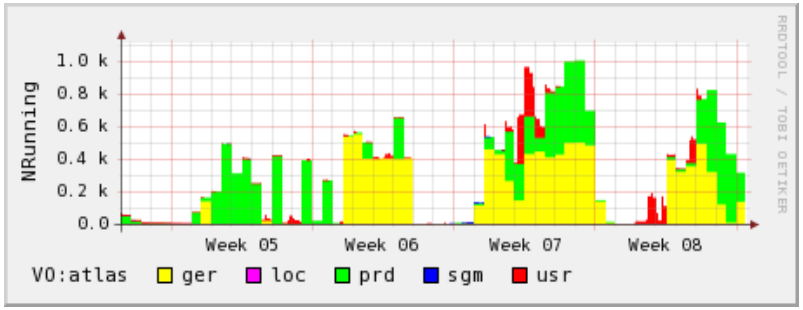
- Access to NAF part of the Grid resources via VOMS
  - register for VOMS subgroups /atlas/de, /cms/dcms, ...
  - completely integrated in existing grid infrastructure
- Access to interactive part via registration at a website
  - half-automated process
  - user registers via the certificate imported in her/his web browser
  - just needs to choose account name and experiment
  - NAF experiment administrator acknowledges request -> account will be created

# Usage of NAF Resources

usage of interactive NAF starting from May last year:




Atlas: the German VOMS subgroup is actively being used!



# Conclusion

- NAF is an accepted and established institution in the German LHC / ILC community
  - by now already ~250 registered users
  - 20-30 users logged in on a usual day
- Some technical innovations of interest also for other analysis facilities
- Generic approach allows for integration of future experiments and user communities

# Backup slides

# NAF – a schematic overview