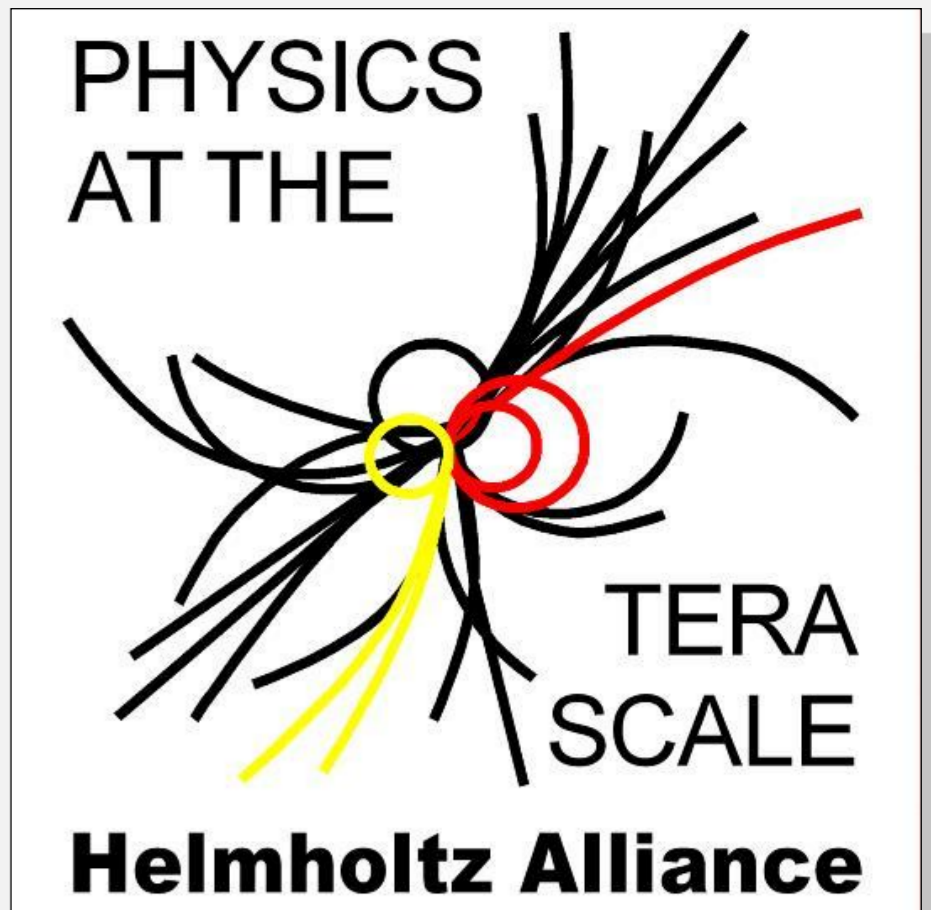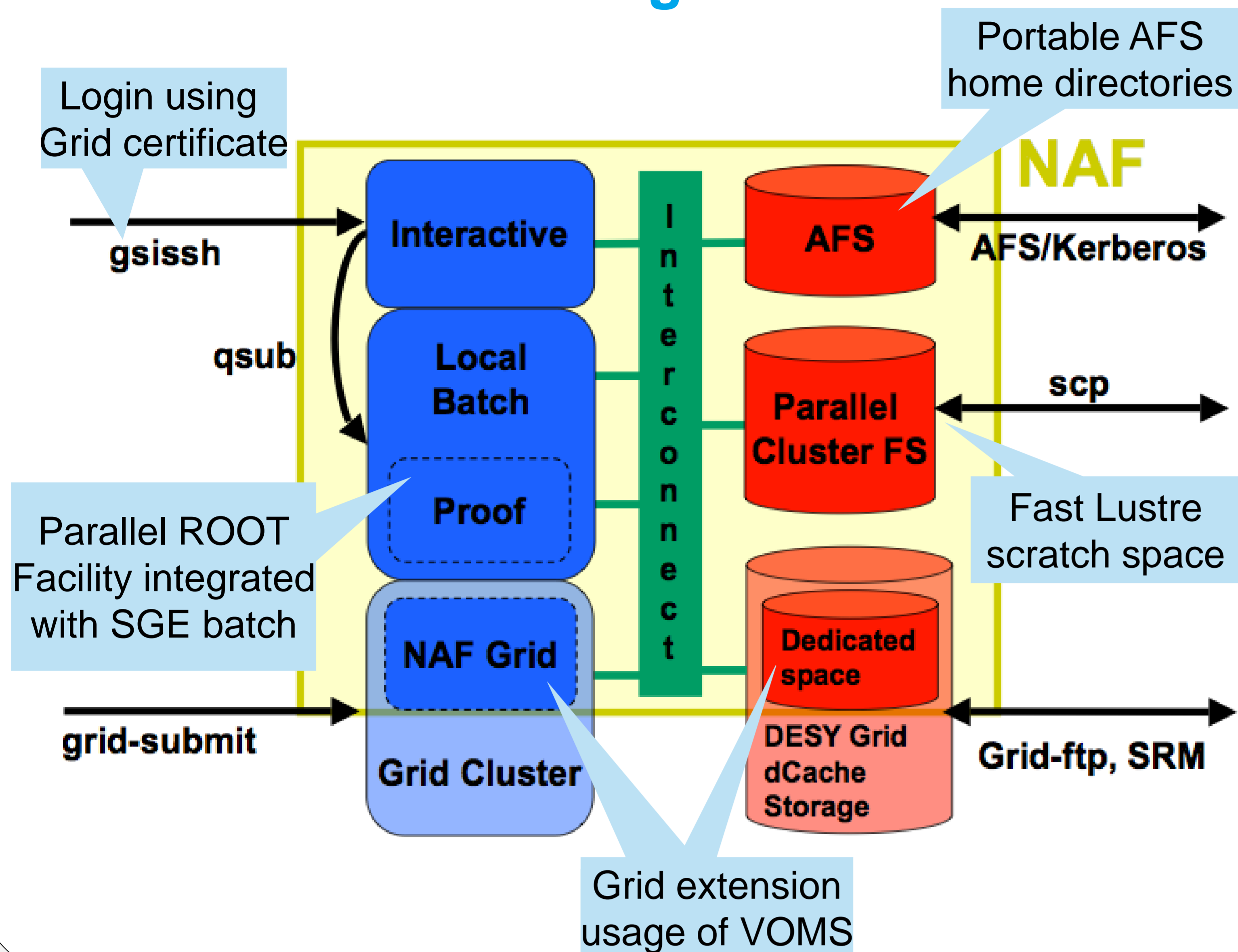# The German National Analysis Facility (NAF).

Poster Session, Mid-Term Review 30.11&1.12.2009
Andreas Haupt, Yves Kemp for DESY IT&DV, Wolfgang Ehrenfeld for the NUC

PHYSICS AT THE TERA SCALE
Helmholtz Alliance

The NAF Building Blocks

Login using Grid certificate

Portable AFS home directories

NAF

gsissh — Interactive — AFS — AFS/Kerberos

qsub — Local Batch — Parallel Cluster FS — scp

Proof

Parallel ROOT Facility integrated with SGE batch

Fast Lustre scratch space

NAF Grid — Dedicated space

grid-submit — Grid Cluster — DESY Grid dCache Storage — Grid-ftp, SRM

Grid extension usage of VOMS

NAF at DESY

▪ The NAF provides a generic multi-purpose analysis facility for Terascale Alliance members working on the ATLAS, CMS, LHCb and ILC experiments.

▪ It is built, hosted and operated by DESY. The NAF resources are distributed over the DESY sites Hamburg and Zeuthen. The access to all resources is unified and presents a "single facility" view to the user.

▪ The hardware resources extend the existing Grid infrastructure at DESY (additional 400 cores and 0.5 PB dCache storage) and provide additional interactive resources (800 cores, 100 TB Lustre storage).

▪ dCache SE central to all analysis: Can be accessed from outside (Phedex, DQ2, FTS, SRM,...), DESY Grid Cluster, and the NAF.

➜ Needed by German scientists to perform internationally competitive physics analyses.

NAF Usage
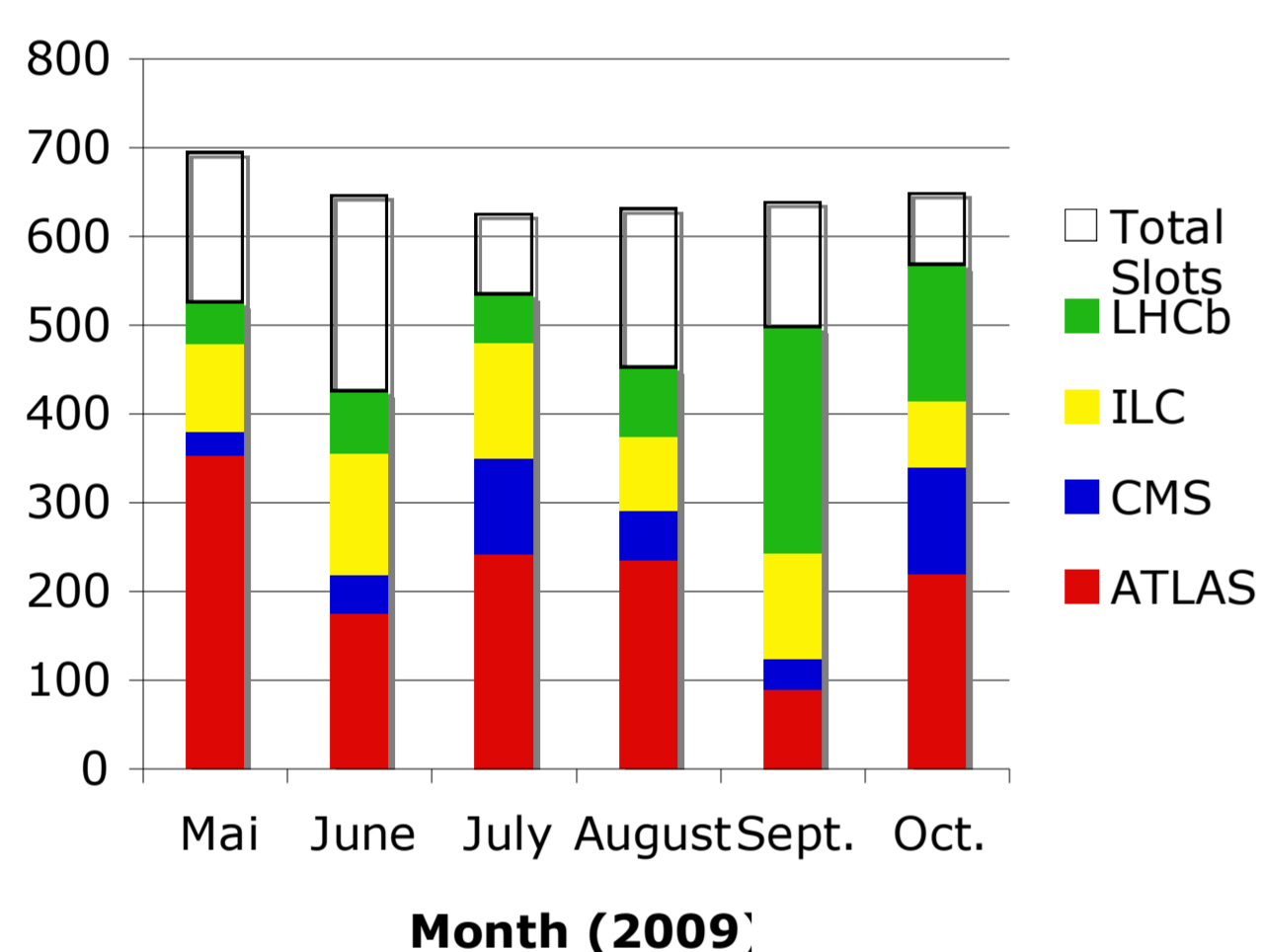
▪ System designed for fast response and interactive use
  ▪ average utilization very good (~80%)

▪ ~350 registered users
▪ from 18 institutes
▪ ~75% non-DESY
▪ Also used for training

NAF User Committee (NUC)

▪ The NUC represents the physicists, coordinates the NAF resource usage and helps to define special NAF services for the analysis workflow support. This ensures a close collaboration between the experiments, the Grid projects and DESY as the resource and service provider.

▪ Each experiment and DESY IT provide two members. The NAF technical coordinators are associated members. The chair of the NUC is an associated member of the Grid Project Board.

Experiments @ NAF

▪ The experiments use the NAF resources (Grid and local) mainly for analysis related tasks, e. g.
  ▪ data analysis preparation (development – testing – grid submission)
  ▪ MC and cosmic data analysis
  ▪ private MC production
  ▪ CPU intensive tasks as MC generator tuning or model fitting

▪ All features of the NAF are fully functional. Many user- and experiment-specific workflows have been successfully tested and are already used for daily work. The full potential of the NAF will not be exploited before large statistics samples from the LHC are ready for analysis.

▪ The experiments provide experiment specific support, which is embedded into the NAF support:
  ▪ user and resource (e. g. disk space) administration
  ▪ installation/support of experiment specific software and tools
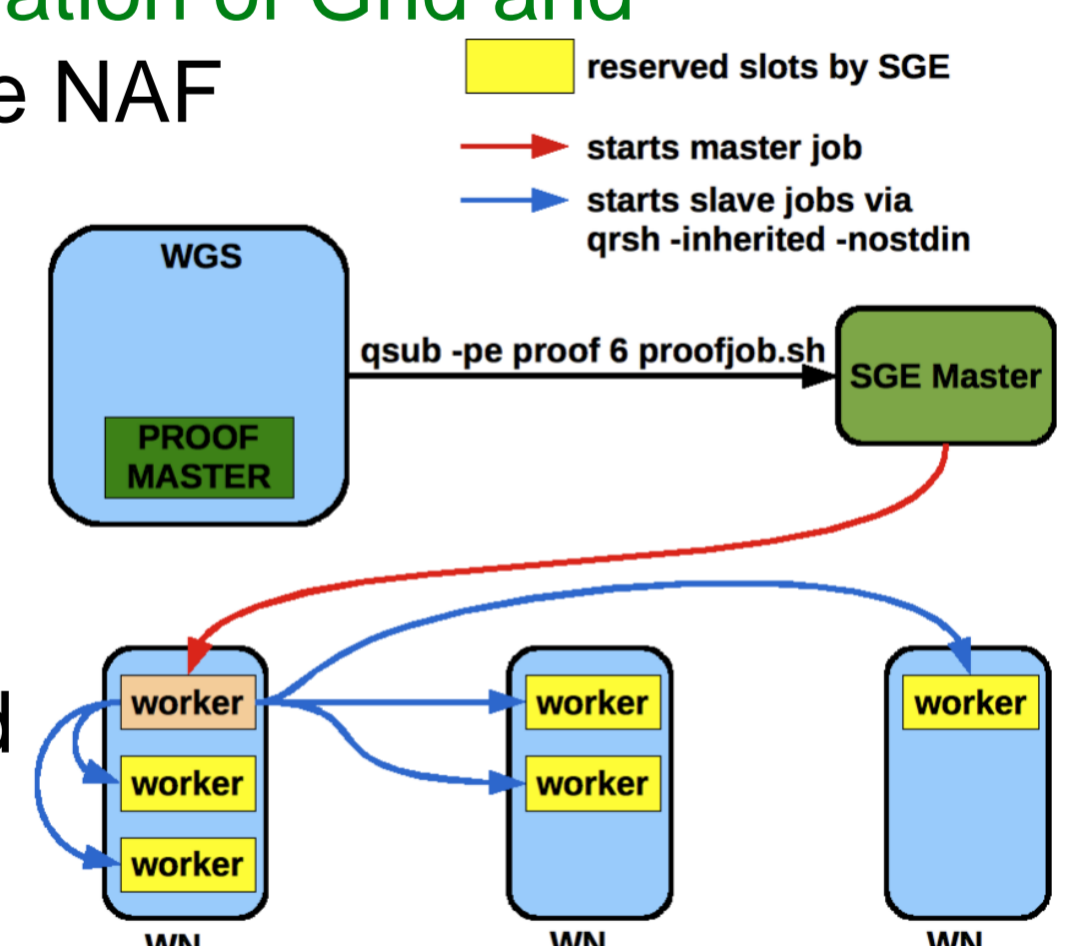
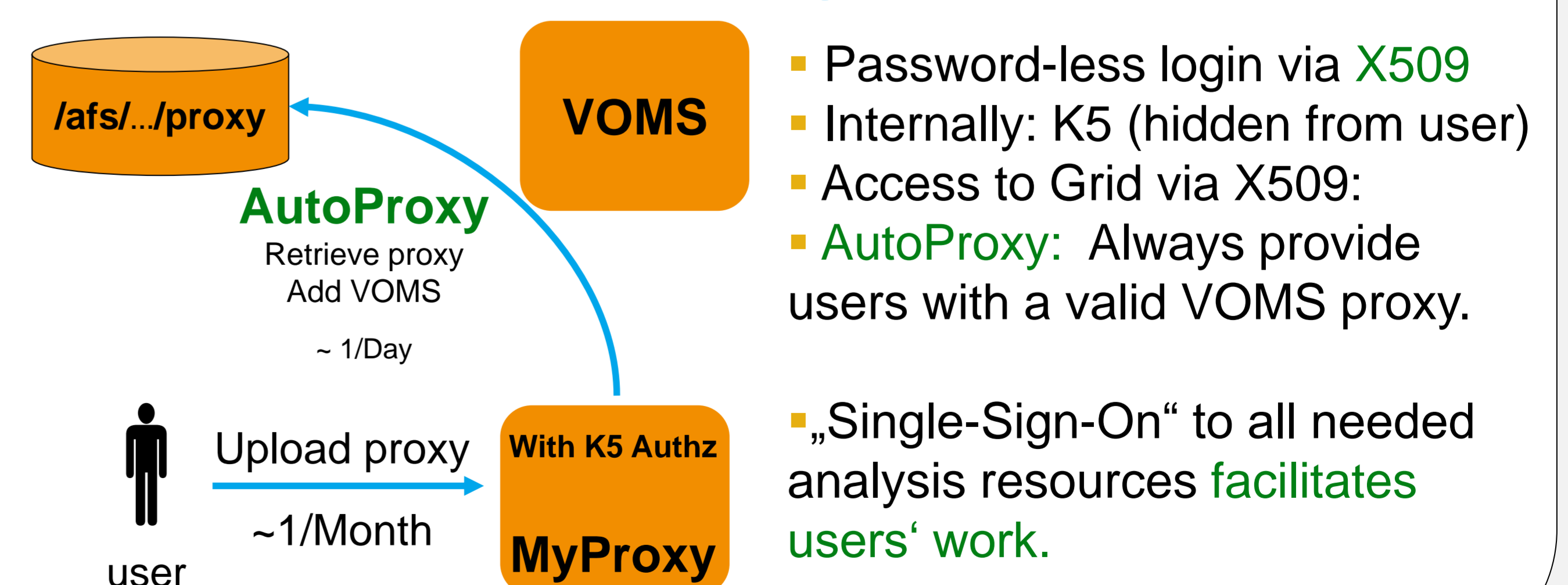➜ Provides a powerful and easy to use working environment.
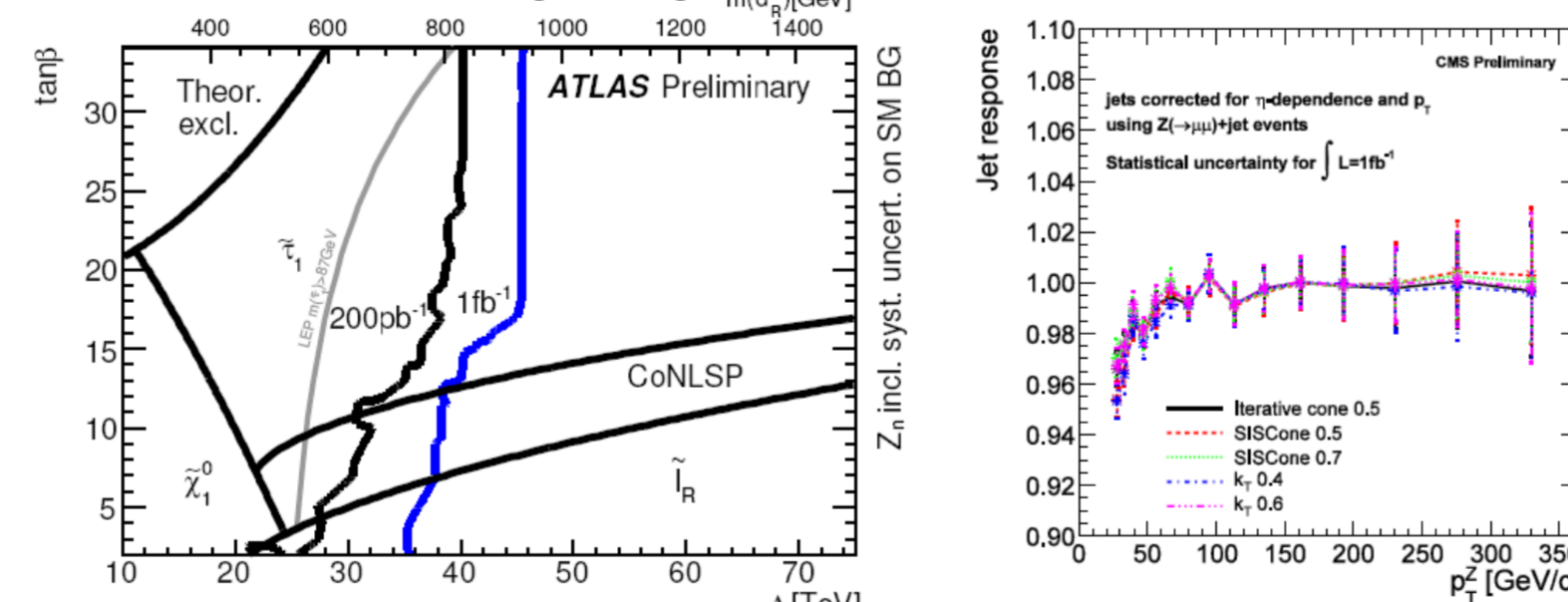
Some NAF Tools:

Development of new tools for better integration of Grid and interactive services or new concepts at the NAF

reserved slots by SGE
starts master job
starts slave jobs via qrsh -inherited -nostdin

PROOF Integration in SGE

▪ User starts own PROOF cluster
  ➜ enables accounting and security
▪ Standard SGE parallel execution method
▪ Special batch slots for PROOF jobs

WGS
PROOF MASTER
qsub -pe proof 6 proofjob.sh
SGE Master
worker — worker — worker
WN — WN — WN

X509 Proxy ⇔ AFS/K5 Integration

/afs/.../proxy — VOMS

AutoProxy
Retrieve proxy
Add VOMS
~ 1/Day

user — Upload proxy ~1/Month — With K5 Authz MyProxy

▪ Password-less login via X509
▪ Internally: K5 (hidden from user)
▪ Access to Grid via X509:
▪ AutoProxy: Always provide users with a valid VOMS proxy.

▪ „Single-Sign-On" to all needed analysis resources facilitates users' work.

Further Documentation

HELMHOLTZ ASSOCIATION

DESY

http://naf.desy.de/
http://naf.desy.de/nuc/
http://grid.desy.de/