dCache at NDGF

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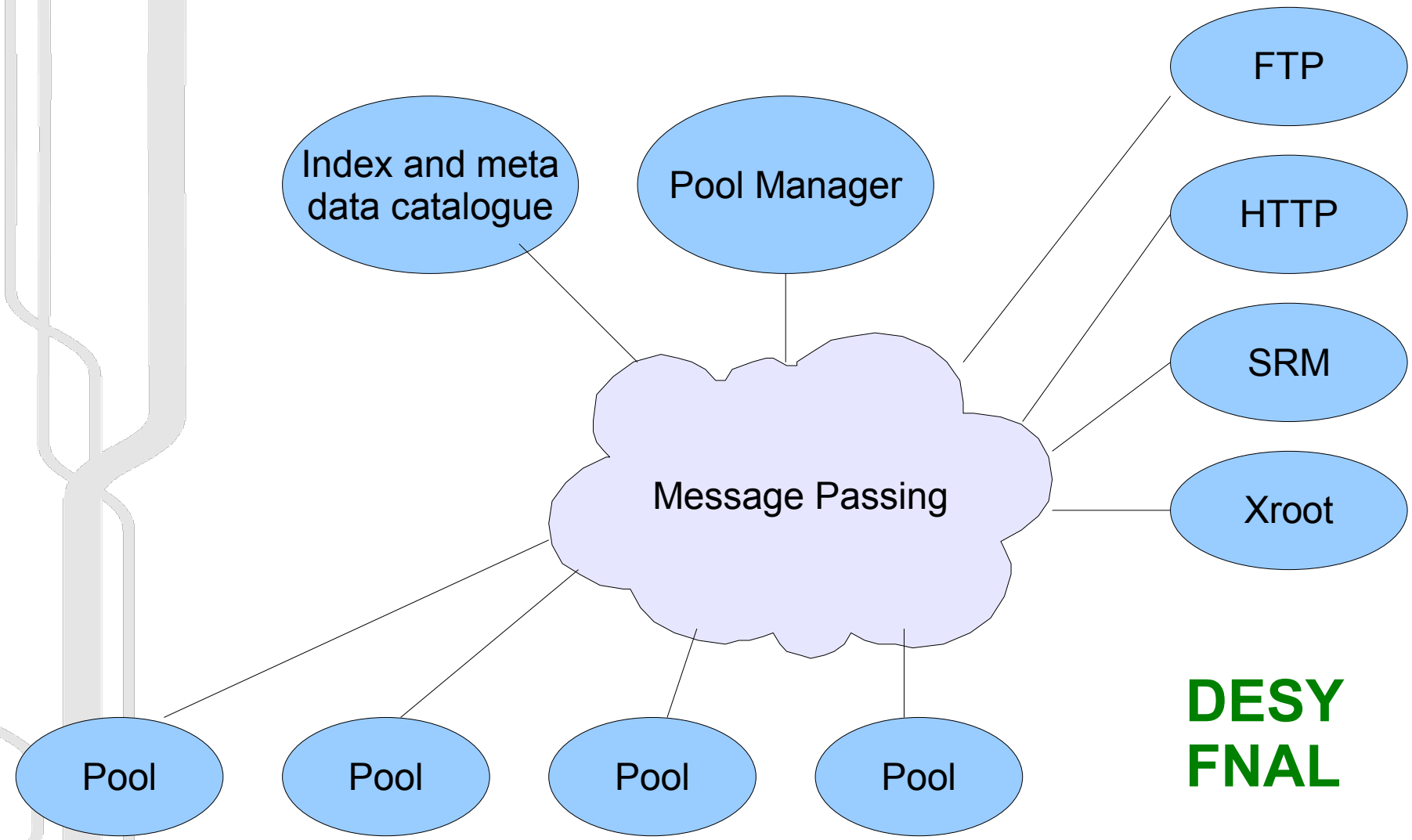
NDGF
NORDIC DATAGRID FACILITY

What is dCache



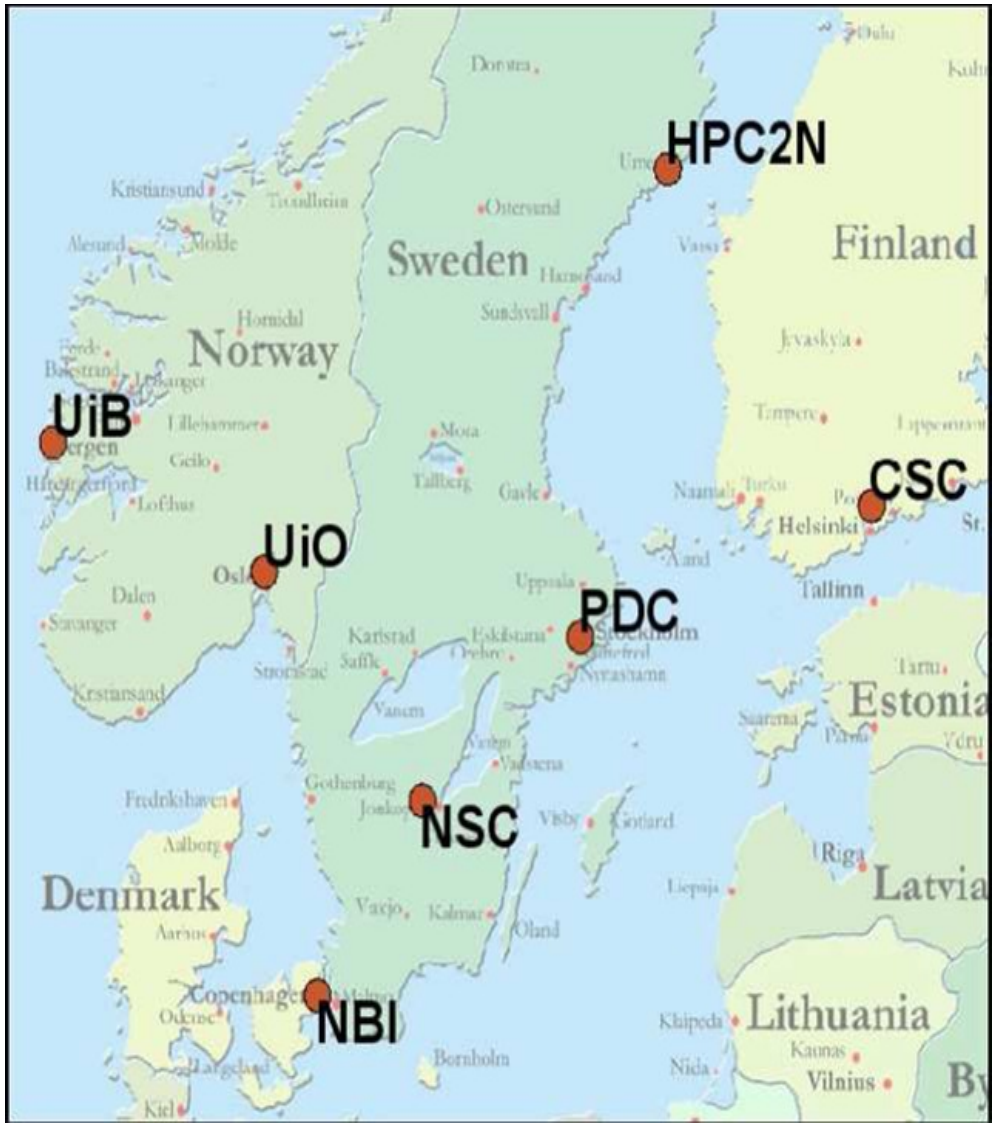
Reasons to like dCache

- Widely deployed, well supported, relatively large user base
- Supports all relevant protocols for the HPC community
- Tape support
- Excellent performance
- Hot spot detection and automatic replication
- Number of pools and number of doors can be scaled
- ...

NDGF
Nordic DataGrid Facility

dCache at NDGF

- Typical dCache deployment is limited to a single data center.
- One uniform dCache spanning all sites
- dCache pools operated by site owner



Properties of WAN

- Limited bandwidth
- High latency
- Frequent network failures
- Spanning many administrative domains

Challenges

- Security
  - Many administrative domains
  - Local and national rules
  - Internal node communication over WAN
  - Mounting NFS over WAN is out of the question
- Administration
  - Site administrators are worried about loosing control
  - Mechanisms for delegating control over local ressources

Challenges

- Maintenance
  - Platform (SL is not widely used in NorduGrid)
  - Upgradability
  - Autonomeous operation
- Reliability
  - dCache is fairly resilient against pool failures
  - Head nodes provide central point of failure
  - Network saparation in WAN
  - Disconnected operation (at least read-only)
  - Long term hope that dCache becomes less centralised

Challenges

- Performance
  - No network model
    - e.g. SRM door assummes all GridFTP doors are equal (except for current load)
  - Proxy operation of GridFTP
- Functionality
  - HSM without PNFS (dCache 1.8)
  - Heterogenous access to HSM
    - Stage-in must happen to connected pool
  - Tivoli (TSM) integration
  - User friendly view of logical name space without PNFS

Status and current tasks

- dCache deployed and operational (three sites, more to come)
- Used by ATLAS and ALICE VOs
- Development
  - GridFTP 2
    - Better data transfer protocol
    - Improved data path
    - Better checksum support
  - Multi HSM support
  - Security

Our dCache Vision

- Gradually transform dCache into a truly distributed storage solution, i.e.
  - no single point of failures
  - well defined component to component protocol
  - no synchronised upgrades
- Broaden the scope by adding new protocols, e.g.
  - WEBDAV and improved HTTP support
- Essentially, turn dCache into a data grid in itself

dCache for everything?

- Currently not the right tool if you want
  - Databases on a grid
  - Versioning of files
  - Change files
  - Distributed file system