



Enabling Grids for E-scienceE

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Storage Index

Krzysztof Nienartowicz

on behalf of the JRA1 DM Cluster:

Paolo Badino, Ricardo Brito da Rocha, Ákos Frohner, Peter Kunszt, József Kovács, Gavin McCance, Krzysztof Nienartowicz, Daniel Rodrigues

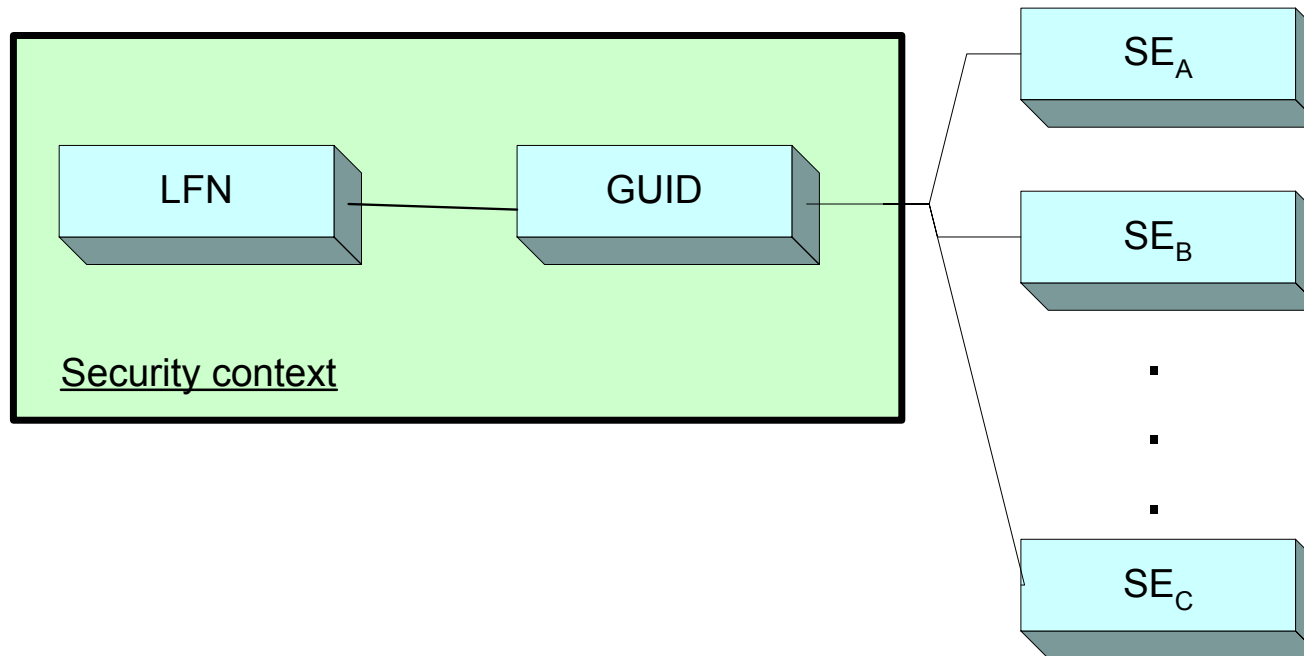
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- **Rationale and semantics**
- **StorageIndex interface**
- **CMS extension**
- **Deployment models**
- **WMS interaction and issues**



- Global view on all LFN/GUIDs in the system
- The StorageIndex stores only the mapping



- All other data is available through the proper catalog interfaces
 - Does not imply access pattern (locality) of the index data

The interface has just two methods:

```
String[] listSEbyLFN(String LFN)
String[] listSEbyGUID(String GUID)
```

- The SE name that is being returned is the string identifier of the Storage Elements where there are replicas of the file.
- The SE name has to be unique so that it can be found through the info system (See Ricardo's talk).
- Bulk methods needed.
- Administration methods required
 - **Initial population**
 - **Resync with source catalogs**
 - **Handle special situations/errors**

- DLI interface of CMS (Heinz and Flavia)

```
String[] listReplicas (String type,
                      String data)
```

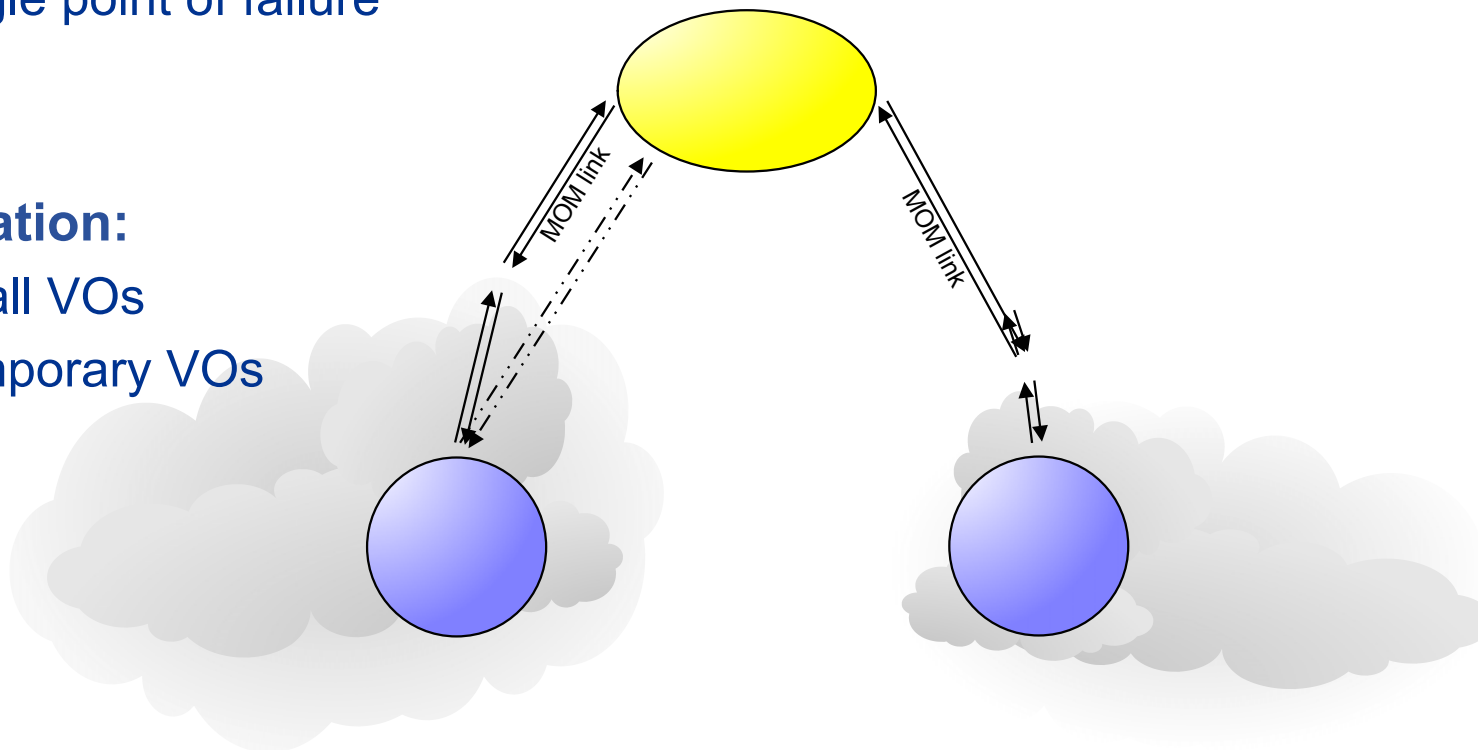
- Trivial implementation (pseudocode):

```
if (type == "GUID")
    return listSEbyGUID (data) ;
if (type == "LFN")
    return listSEbyLFN (data) ;
```

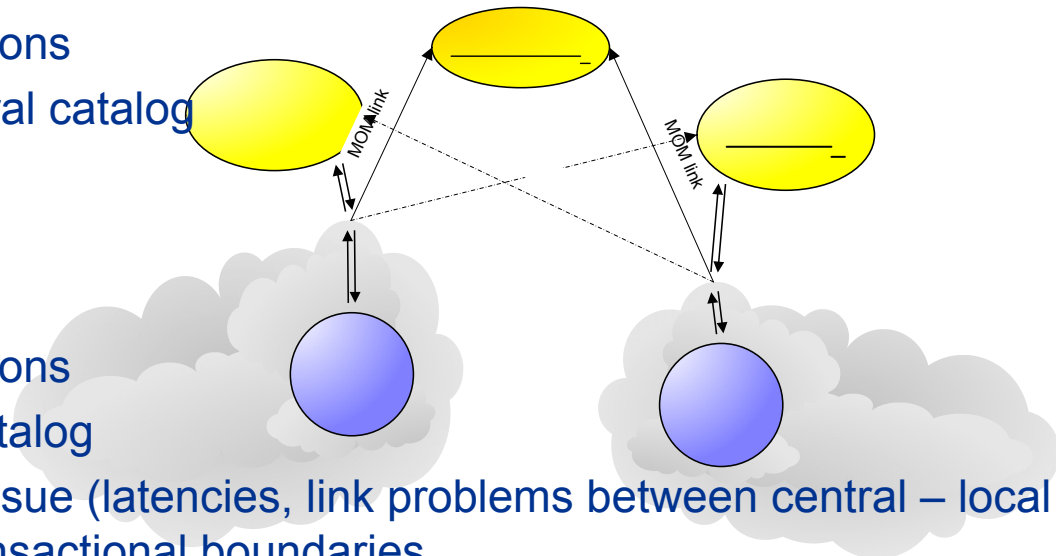
- May be implemented explicitly on StorageIndex as a separate method.

- **Central catalog.**
- **Every connection goes there.**
 - ☑ Very good consistency
 - ☒ No site autonomy – caching only
 - ☒ Single point of failure

- **Application:**
 - Small VOs
 - Temporary VOs

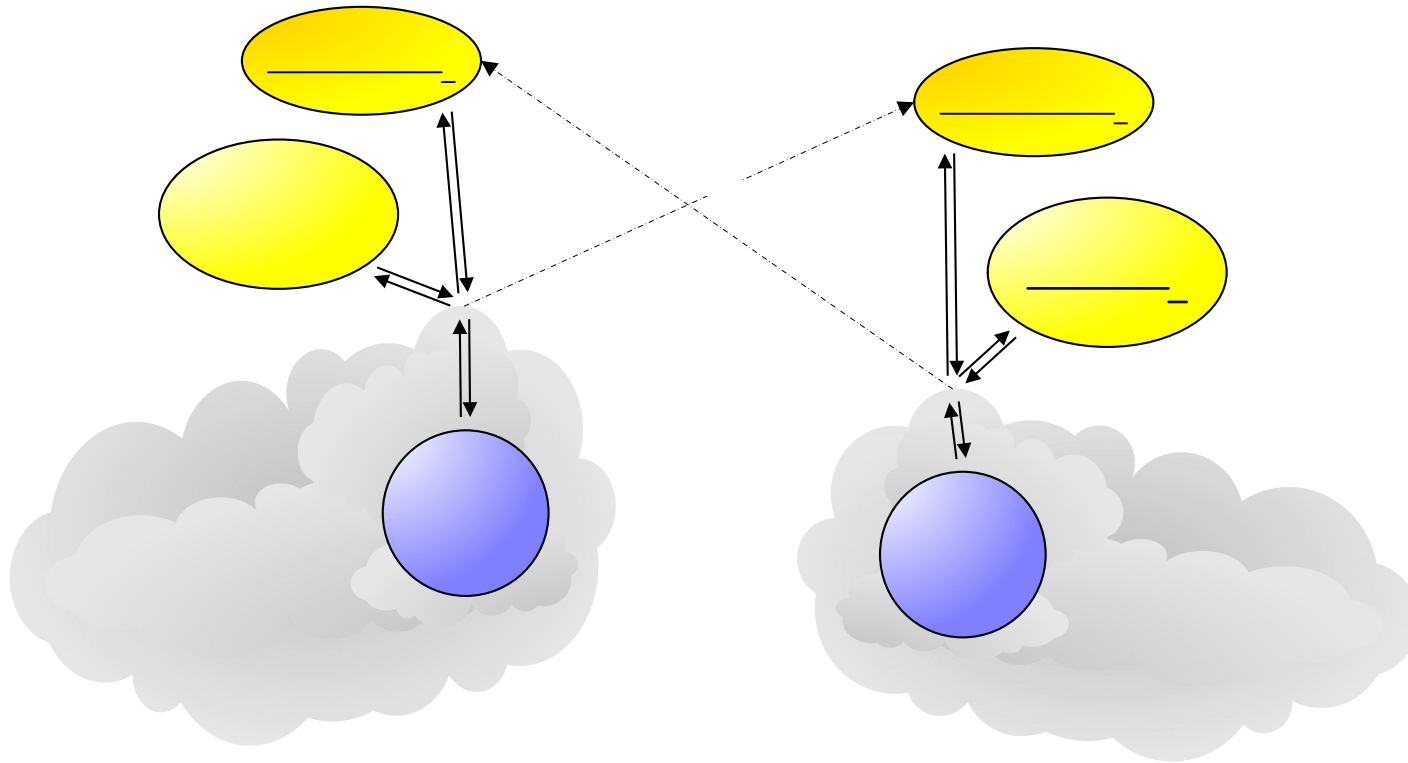


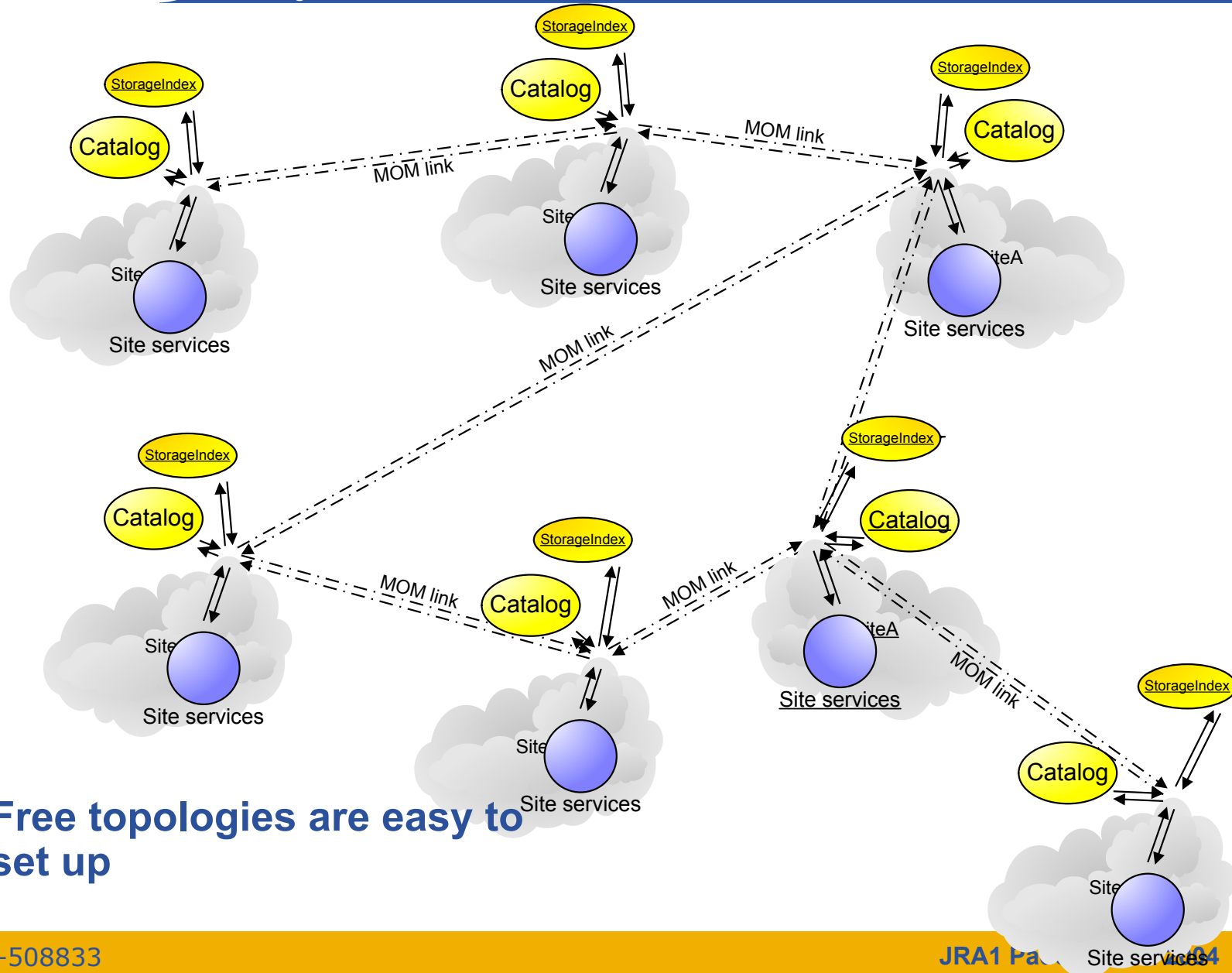
- There is a Central catalog like before.
- Every site has its own local catalog with all data necessary for site autonomy.
- Central catalog that cannot be updated directly, only through LC:
 - ☑ Reasonable consistency
 - ☑ Site autonomy for local operations
 - ☒ Limited semantics on the central catalog
 - ☒ Error handling is nontrivial.
- Central catalog that can also be updated directly:
 - ☑ Site autonomy for local operations
 - ☑ Better semantics on central catalog
 - ☒ Consistency can become an issue (latencies, link problems between central – local catalogs updates), unclear transactional boundaries
 - ☒ Error handling is nontrivial.
- Application:
 - Medium-sized VOs (to be determined)



- **No single central catalog.**
- **StorageIndex interface implemented by (more than one) service.**
- **Messaging for updates.**
 - ☑ Very good site autonomy and scaling
 - ☑ Flexible setup/topology
 - ☑ Concentrators
 - ☑ Master/slave, P2P
 - ☒ Limited semantics – having a ‘full picture’ is not guaranteed but might not be necessary.
 - ☒ Name clashes must be resolved somewhere
 - ☒ *Local or distributed or centralized LFN/GUID reconciliation*
- ☒ **Application:**
 - Very large VOs but also small VOs.

- **Distributed**





- **Free topologies are easy to set up**

- **Should input files be taken into account at all during matchmaking time?**
 - **yes** **YES**
- **Where is fine grained authorization on files checked?**
 - **At the catalogs**
- **Where are ACLs stored**
 - **At the catalogs**
- **Does the WMS move data?**
 - **Yes, but is there some implementation?**
- **Is there a “central” instance knowing about replica locations (at least sites) or is this information only local at sites?**
 - **Some “central” view is needed for the WMS!** **This is the StorageIndex**
 - **This is the file catalog – query interface defined**
- **Local space management (on WN)**
 - **Could ‘tactical’ SE help?**
- **Is metadata handled by the job?**
- **Output data merging – who does that?**

- **WMS can use SI during Matchmaking**
 - Resolve all LFN and GUIDs into SE locations
- **Questions / Issues**
 - Is this sufficient for WMS?
 - SE naming (general issue of service discovery)
 - SE – CE mapping (again service discovery, GLUE schema etc)
 - Exceptions/clashes handling
 - VO admin
 - Site admin
 - VO/Site policy