

Dynafed, DPM and EGI

DPM workshop 2016

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Dynafed

- Dynafed is a system to create storage federations based on HTTP/WebDAV/S3/Azure
- It uses the same WebDAV frontend as DPM: lcgdm-dav and Apache
- It uses the same framework as DPM: DMLite
- It consists of a DMLite plugin that is loaded instead of the ones that normally build up a DPM
- Flexibility in matching site name spaces, aggressive performance, flexibility in setting up authorization
- The deployment of a fed is totally transparent for sites, they just agree in giving space for a certain VO or directory, via WebDAV (or S3 or Azure)

On the fly friendly visualization
Full **WebDAV** access
Redirection-based
Robust against failures
Fully scalable

`/dir1`
`/dir1/file1`
`/dir1/file2`
`/dir1/file3`

With 2 replicas

DESY Prototype:
14/15 LHCb sites
60 ATLAS sites

Geography-based
Client-aware
redirections

Flexible
authentication/authoriza
tion, friendly with identity
federations

Realtime detection of
sites' up-ness

Makes S3/Azure storage
Easy to use, scales it up
and applies uniform
X509/VOMS security

Site A
(*HTTP/DAV/S3/Azure*)

`.../dir1/file1`
`.../dir1/file2`

Site B
(*HTTP/DAV/S3/Azure*)

`.../dir1/file2`
`.../dir1/file3`

Use cases

- There can be many use cases for a high performance HTTP storage aggregator. Examples are: The BOINC Data Bridge, the ATLAS Canadian federation, the Belle-II storage federation
- Matches very well the case of some sites deciding to put **together** some HTTP storage space to contribute to a project. Each site keeps admin independence and needs no additional software components
- This federated storage space becomes trivially usable through WebDAV/HTTP+x509/VOMS and also FTS can be used for massive data transfers
- Beware: federated HTTP storage is ... just storage. Web applications can use it, of course ROOT (for HEP) can. A non-HEP VO may need advice to build their own apps in the right way (= that works AND scales)

The data bridge

- Data Bridge is the name given to an instance of Dynafed over Cloud storage that bridges authentication domains for storage access
- Context: volunteer computing (BOINC) and Grid environment
- Built on Apache plus the Dynafed technology with S3 buckets as backends
- Apache loads additional ‘standard’ authentication plugins, to give access to the same storage in different ways, e.g. user/pwd PLUS x509
- It’s a generic idea to harmonize Cloud storage and multiple authentication domains, including Grid/X509/VOMS
- BOINC users (user/pwd) need to receive the Job desc AND write the output
- Grid agents (FTS, X509) need to read what the BOINC user wrote

For further info

- For deeper tech information, docs are available here:
 - <http://lcgdm.web.cern.ch/dynafed-dynamic-federation-project>
- Dynafed was born in the context of EMI
- EGI representatives have expressed interest in it, we are honoured to have them at the DPM workshop