BeSTGRID DataFabric

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New Zealand's online storage service based on iRODS

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Talk Outline: BeSTGRID DataFabric

- BeSTGRID DataFabric – service overview
  - Software stack – user point of view
  - Sites

- Authentication and authorization – user experience
  - Shibboleth, X509 certificates, internal accounts

- Software stack – under the hood
  - webDavis – web + webDAV front-end
  - iRODS
  - Griffin – gridFTP interface into iRODS

BeSTGRID DataFabric

- BeSTGRID DataFabric – what it is for users
  - a storage system "in the cloud" (but hosted by friendly universities they know)
    - local to the country (legal restrictions, bandwidth, bandwidth costs)
  - with a web and webDAV interface for ease of use
  - with iDrop interface using native iRODS protocol for better performance
  - integrated with computational grid
    - job directories get archived onto the DataFabric
- Key features
  - auto-provisioned accounts for NZ researchers (see authNZ bellow)
  - multiple entry points (Auckland, Canterbury, more coming)
  - multiple storage resources (associated with entry points...)
    - behind the scenes data replication

BeSTGRID DataFabric - screenshot

BeSTGRID DataFabric – Sites

- University of Canterbury
  - http://df.bestgrid.org/
    - Primary server on x86_64 Linux
      - webDavis
      - Griffin
      - iRODS master + iCAT + PostgreSQL
      - but no resource
    - Slave data server on IBM p520
      - GPFS access to 37TB storage resource
- University of Auckland
  - secondary site: http://df.auckland.ac.nz/
    - Secondary webDavis, Griffin
    - iRODS slave server with 15TB

- Web interface: two authentication methods
  - Shibboleth (via Tuakiri NZ federation)
    - Nice, ties with federated SSO
    - But does not work with webDAV
      - no redirets / forms supported by clients
  - iRODS Username + password (needed for webDAV)
  - Deprecated: MyProxy username+password
    - Produces an X509 certificate for GSI
- Accounts auto-provisioned on first access
- User accounts tracked by SharedToken
  - Hash value passed as a Shibboleth attribute
  - And in DN in GSI X509 certificates
  - Stored in user info in iCAT
  - **Different access methods with same sharedToken get mapped to same account.**

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- WebDavis: runs as a Jetty web application
  - Apache with ShibbolethSP as front-end (AJP connector)
  - Accepts multiple authentication mechanisms
    - Requests on plain http use Shibboleth login
    - Requests on https use username + password
  - Talks to iRODS server through Jargon
    - iRODS server typically collocated on the same server
    - But Jargon redirects the communication directly to the target resource
  - Handles both web and webDAV requests
  - And supports files >2GB where supported by clients
    - not all browsers and webDAV clients are equal...

Login handling in webDavis

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- iRODS username+password: direct login to iRODS

- MyProxy username+password: do a login to MyProxy, use the X509 certificate returned for a GSI login to iRODS

  – New DN triggers account creation via acGetUserByDN rule

- Shibboleth login:

  – Authenticate as rods (via GSI with host certificate) to look up the user by sharedToken (iCAT query)

    • If not found, create user by iexec cmd

  – Authenticates as user (newly implemented) – use a rods session with clientUserName

    • Modification to Jargon (Classic) was needed.

    • Cannot use GSI – must do a rods password-based login (clientUserName with GSI not supported server-side)

  – Older hack: iexec cmd reset password on internal iRODS account for the user

    • Prevented us from using internal iRODS password

- Griffin

  - GridFTP interface for iRODS implemented in Java

    - Again, uses Jargon to talk to iRODS
    - Uses GSI to authenticate as the user

  - Runs as a standalone Java application

  - GridFTP endpoint registered in our computational grid infosystem (MDS replacement)

  - GridFTP endpoint also reachable via GlobusOnline

- => Seamless integration of iRODS into the NZ computational grid

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- Software packages
  - webDavis – web + webDAV front-end
    http://code.google.com/p/webdavis/
  - Griffin (GridFTP front-end for iRODS)
    http://code.google.com/p/datafabric-griffin/

- Live system – main website
  - http://df.bestgrid.org/
  - Anonymous access at https://df.bestgrid.org/BeSTGRID/home/NZDF

- User documentation
  - http://technical.bestgrid.org/index.php/Using_the_DataFabric
  - http://technical.bestgrid.org/index.php/Administering_the_DataFabric
  - http://technical.bestgrid.org/index.php/Installing_an_iRODS_slave_server