BeSTGRID DataFabric

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 – 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
• 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 redirects / 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.**
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

- 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
References

- **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/Administering_the_DataFabric
  - http://technical.bestgrid.org/index.php/Installing_an_iRODS_slave_server