VRE for regional Interdisciplinary communities in Southeast Europe and the Eastern Mediterranean

Staging and archiving

Tamás Kazinczy
NIIF

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Overview

- VI-SEEM Data Services
  - VI-SEEM Work Storage Space / Local Storage and Data Staging Service (VLS)
  - VI-SEEM Archival Service (VAS)
- Objectives of staging and archiving
- Infrastructure overview
- Use cases

Objectives

- Provide scientists the possibility of
  - staging data from/to HPC resources in a way they are already familiar with
  - long-term storage for their data sets
  - geo-redundant replica(s) to increase data safety
- Automate as much as possible (policies)
- Provide support for the user community, e.g.:
  - Setting up (multi-homed) access
  - Negotiations on required policies
  - Implementing policies
  - General support in connection with the use of services

Infrastructure overview [1]

- Service providers

Site	VLS	VAS
BA	+	+
CYI	+	-
GRENA	+	-
GRNET	+	+
IIAP-NAS	+	-
IICT-BAS	+	+
IUCC	+	+
IPB	+	+
NIIF	+	+
RENAM	+	-
UKIM	+	-
UVT	+	-

Infrastructure overview [2]

- VLS

Site	Access Point	Available	Remarks
BA	aa112642.archive.bibalex.org:2811	100TB	Shared with other service(s)
CYI	login2.cytera.cyi.ac.cy:2812	20TB	
GRENA	se.sg.grena.ge:2811	2TB	
GRNET	gftp.aris.grnet.gr:2811	50TB	Shared with other service(s)
IIAP-NAS	gridgtp.grid.am:2811	3TB	
IICT-BAS	gftp.avitohol.acad.bg:2811	5TB	Shared with other service(s)
IPB	paradox.ipb.ac.rs:2811	10TB	Shared with other service(s)
NIIF	login.debrecen2.hpc.niif.hu:2811	6TB	
RENAM	gridftp.renam.md:2811	1TB	
UKIM	se.hpgcc.finki.ukim.mk:2811	2TB	
UVT	gridftp.viseem.hpc.uvt.ro:2811	5TB	

Infrastructure overview [3]

- VAS

Site	Available (Disk)	Available (Tape)	Remarks
BA	100TB	-	Shared with other service(s)
GRNET	50TB	210TB	Shared with other service(s)
IICT-BAS	5TB	-	Shared with other service(s)
IPB	10TB	-	Shared with other service(s)
IUCC	5TB	-	Shared with other service(s)
NIIF	50TB	300TB	

Storage sites of VI-SEEM

Vi-SEEM

RENAMstor

NIIFI HSM

UVT HPC GPFS

NIIFI iSCSI

PARADOX

ETFBL-CC01

Avitohol

MK-04-FINKI

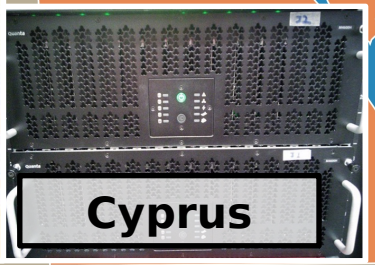
IIAP Storage

ARIS

Cyprus

BA-IA

IUCC Storage



Geographical distribution of VI-SEEM Storage sites

VAS details [1]

- iRODS in a nutshell
  - Data lifecycle management
  - Data virtualization
  - Rule oriented → policies
  - Federation
- VI-SEEM iRODS federation

Site	Zone name
BA	BA
GRNET	GRNET_ARIS
IICT-BAS	IICT_Zone
IPB	IPB
IUCC	iuccZone
NIIF	NIIF

VAS details [2]

- Access
  - GSI based access is available at all sites

    (via gridFTP server with iRODS DSI plugin)
  - Standard iRODS CLI is also available
- Possible integration with VI-SEEM AAI (N/A yet)
  - Token Translation Service
    - SLCS for use with existing GSI based access
    - Auth token for use with PAM-LDAP authentication
  - iRODS cloud browser or some other web UI

Staging use cases [1]

- Stage data from local computer to HPC facility (command line splitted for readability)

```
globus-url-copy
  /path/to/input/file
  gsiftp://my.hpc.site:<gridFTPport>/path/to/destination/dir/
```

where

`<gridFTPport>` is the port in use by gridFTP (e.g. 2811)

- Transfer computation results to local computer

```
globus-url-copy
  gsiftp://my.hpc.site:<gridFTPport>/path/to/my/result
  /path/to/destination/dir/
```

Staging use cases [2]

- Stage data from iRODS to HPC facility

  ```
  globus-url-copy
  gsiftp://my.irods.site:<DSIgridFTPport>/myZone/path/to/input/file
  gsiftp://my.hpc.site:<gridFTPport>/path/to/destination/dir/
  ```

  where

  `<gridFTP port>` is the port in use by gridFTP (e.g. 2811)

  and

  `<DSIgridFTP port>` is the port in use by iRODS DSI enabled gridFTP (e.g. 2812)

Staging use cases [3]

- Transfer computation results to iRODS

  ```
  globus-url-copy
  gsiftp://my.hpc.site:<gridFTPport>/path/to/my/result
  gsiftp://my.irods.site:<DSIgridFTPport>/myZone/path/to/destinatio
  n/dir/
  ```

- Staging/transferring data sets

  (iRODS term for data set: collection)

  `'r'` option of `globus-url-copy` shall be used

- Secure (encrypted) transfer

  `'dcpriv'` option of `globus-url-copy` shall be used

Staging example – Step 0

```
$ grid-proxy-init
Your identity: /DC=org/DC=terena/DC=tcs/C=HU/O=NIIF Intezet/CN=Kazinczy Tamas
Enter GRID pass phrase for this identity:
Creating
proxy ..........................................................................
........ Done
Your proxy is valid until: Thu Oct 12 03:41:43 2017
$ grid-proxy-info
subject  : /DC=org/DC=terena/DC=tcs/C=HU/O=NIIF Intezet/CN=Kazinczy
Tamas/CN=1496443122
issuer   : /DC=org/DC=terena/DC=tcs/C=HU/O=NIIF Intezet/CN=Kazinczy Tamas
identity : /DC=org/DC=terena/DC=tcs/C=HU/O=NIIF Intezet/CN=Kazinczy Tamas
type     : RFC 3820 compliant impersonation proxy
strength : 1024 bits
path     : /tmp/x509up_u9059
timeleft : 11:59:51
$
```

Staging example

```
$ ls randomfile2.dat
randomfile2.dat
$ globus-url-copy -list
gsiftp://niificat.niif.hu:2811/NIIF/home/testuser/stagetest/
gsiftp://niificat.niif.hu:2811/NIIF/home/testuser/stagetest/

$ globus-url-copy randomfile2.dat
gsiftp://niificat.niif.hu:2811/NIIF/home/testuser/stagetest/
$
$ globus-url-copy -list
gsiftp://niificat.niif.hu:2811/NIIF/home/testuser/stagetest/
gsiftp://niificat.niif.hu:2811/NIIF/home/testuser/stagetest/
    randomfile2.dat

$
```

Safe data replication [1]

- On-site replication example
  (splitted for readability)

```
irepl
   -S <source resource>
   -R <destination resource>
   <dataObj name>
```

- This could also be implemented as a local policy,
  e.g.
  all data objects
  under a specific collection
  is to be **replicated**
  to the archive resource

Safe data replication [2]

- Off-site replication
  - Requires coordination of sites
  - Done by implementing policies on both sides
    - Task of Site Managers
  - Replicate vs. Sync clarification
    - inside zone vs. across zones
  - Source side
    - rule to sync to destination zone
  - Destination side
    - allow ingestion from source zone

Safe data replication example

- An on-site replication example

```
$ iput myDataObj
$ ils -l myDataObj
  myuser  0 myResc;unixresc01  58 2017-10-11.15:22 & myDataObj
$
$ irepl -S myResc -R myArchive myDataObj
$
$ ils -l myDataObj
  myuser  0 myResc;unixresc01  58 2017-10-11.15:22 & myDataObj
  myuser  1 myArchive;myCompound;mycache  58 2017-10-11.15:23 &
myDataObj
  myuser  2 myArchive;myCompound;myunivmss  58 2017-10-11.15:23 &
myDataObj
$
```

End

Thank you!