GRID storage access tools installation

This page describes the procedure to set up the tools for working directly on the srm storage. You may want to consider using the staging and download services provided by Astron if you just want to retrieve data from the archive: http://www.lofar.org/wiki/doku.php?id=public:lta_howto.

You might also be interested in the portable package of GRID storage access tools, which offers the same functionality but does not require root access.

The following documentation was developed for the installation of a GRID tools and certificates on an Ubuntu 12.04 system using a bash shell (using .bashrc as a configuration script). We have not tested the installation using csh derivatives but it is to be expected that not all scripts will work. Thanks to Martin van den Akker for providing notes of his installation procedure.

Sites that provide packages and further information on installation of grid middleware on linux based systems:

- Software repository of the European Grid Infrastructure
- Initiative for Globus in Europe
- Home of the gLite software suite (gLite UI provides a typical client installation)

NB We have tested the installation as described below only on Ubuntu 12 and CentOS 7. Please let us know if you have feedback or if you can contribute instructions on installations in different environments. You might also first need to obtain a GRID certificate.

Installation of software packages

Note: all installations require root permissions.

globus client software

The file transfer tools from the Globus package are needed, most importantly globus-url-copy:

Ubuntu

```
sudo apt-get install globus-gass-copy-progs
```

CentOS

```
sudo yum install globus-gass-copy-progs
```

voms client software

The VOMS tools for logging in and user account management:

Ubuntu

```
sudo apt-get install voms-clients
```

CentOS

```
sudo yum install voms-clients-cpp
```

Certificates for the Grid Certificate Authorities (CA)

Execute the following commands to install the certificates from the site of the European Grid Infrastructure (EGI) (root permissions are required).

Ubuntu

Note 2021-05-19: newer versions of Ubuntu require to first add the appropriate GPG key for the EGI repository:

```
wget -q -O -
https://dist.eugridpma.info/distribution/igtf/current/GPG-KEY-EUGridPMA-RPM-
3 | sudo apt-key add -
```

```
sudo add-apt-repository 'deb
http://repository.egi.eu/sw/production/cas/1/current egi-igtf core'
sudo apt-get update
sudo apt-get install ca-policy-egi-core
```

CentOS

```
wget
http://repository.egi.eu/sw/production/cas/1/current/repo-files/EGI-trustanc
hors.repo
sudo mv EGI-trustanchors.repo /etc/yum.repos.d/
sudo yum install ca-policy-egi-core
```

srmtools

The SRM tools are needed to communicate with the storage management system.

1. Download srmtools
   - srmclient-2.6.28.tar.gz (Java7, Java8)
   - srmclient-2.2.25.tar.gz (Java6)
2. Extract and install the srmtools, e.g. in `/opt/`
   This will create a subdirectory, e.g. `srmclient-2.6.28`, containing the required files.
   Note that the srm package may be installed anywhere (e.g. in your home directory).
3. Set the relevant environment path variables, e.g. in .bashrc (modify version number if applicable):

```
export SRM_PATH=<Install Directory>/srmclient-2.6.28/usr/share/srm
export PATH=<Install Directory>/srmclient-2.6.28/usr/bin:$PATH
```

NB The srm client tools depend on JAVA. There is a known issue with openjava version 7. If you have this version of JAVA installed, or otherwise get JAVA exceptions when running an srm command, please install another JAVA VM. Java-7-oracle is known to work. It is possible to have multiple JAVA VM installations and it is thus not required to replace an existing installation: if the default VM installation does not work with srm, another VM may be configured to be used by setting the following environment parameter:

```
export JAVA_HOME=/usr/lib/jvm/java-7-oracle/jre
```

The JAVA VM used by default in Ubuntu and CentOS can be selected using the following command:

```
sudo update-alternatives --config java
```

Certificate Revocation List retrieval (optional)

The fetch-crl tool retrieves Certificate Revocation Lists.

Ubuntu

```
sudo apt-get install fetch-crl
```

CentOS

```
sudo yum install fetch-crl
```

NB This is not required unless you intend to allow others to access your system by providing their grid certificate.

Additional configuration

VOMSES file for LOFAR

Add the following string for the LOFAR Virtual Organization (VO) to the vomses file (any filename is fine).

```
"lofar" "voms.grid.sara.nl" "30019"
"/O=dutchgrid/O=hosts/OU=sara.nl/CN=voms.grid.sara.nl" "lofar"
```

You can find this string also on the following website https://voms.grid.sara.nl:8443/voms/lofar/configuration/configuration.action in the text block under *VOMSES string for this VO*
The vomses file should be placed in one of the following default locations: `/etc/vomses`, `$HOME/.voms/vomses`, `$HOME/.glite/vomses`

List of certificates for voms.grid.sara.nl.lsc

Put the following strings:

```
/O=dutchgrid/O=hosts/OU=sara.nl/CN=voms.grid.sara.nl
/C=NL/O=NIKHEF/CN=NIKHEF medium-security certification auth
```

in the file (root permissions required):

```
/etc/grid-security/vomsdir/lofar/voms.grid.sara.nl.lsc
```

NB If this step is skipped or nor configured correctly `voms-proxy-init` will work but finish with warnings.

Environment (optional)

You may want to provide the following settings in `.bashrc` or another initialisation/startup script if the relevant files are not in the default locations (defaults provided below).

```
export X509_USER_CERT=$HOME/.globus/usercert.pem
export X509_USER_KEY=$HOME/.globus/userkey.pem
export X509_CERT_DIR=/etc/grid-security/certificates
export X509_VOMS_DIR=/etc/grid-security/vomsdir
export X509_USER_PROXY=$HOME/.proxy
export VOMS_USERCONF=$HOME/.glite
```

Note: For (t)csh, use *.csh init scripts and 'setenv <key> <value>' instead of 'export <key>=<value>'.

CRL cron job (optional)

You may want to create a cron job to automatically retrieve certificate revocation lists (CRLs) by invoking the fetch-crl tool at regular intervals (at least once a year).

Usage

This creates a proxy (valid for 48 hours, increase if needed) in your home directory:

```
voms-proxy-init -valid 48:00 -voms lofar:/lofar/user -out ~/.proxy
```

You can test that everything works by copying this file from surfsara to your working directory:

```
srmcp -server_mode=passive
srm://srm.grid.sara.nl/pnfs/grid.sara.nl/data/lofar/ops/fifotest/file1M
```

```
file://`pwd`/file1M
```

If your firewall allows incoming connections to non-standard ports, you can try this command without the server_mode option which will enable utilization of multiple streams to increase performance.

If you have the gridftp client software installed and in your path, it provides superior performance as compared to the native JAVA gridftp client that is provided by srmcp. In order to utilize this, download lta-url-copy.sh.gz, unzip it and use the command:

```
srmcp -use_urlcopy_script=true -urlcopy=./lta-url-copy.sh -
server_mode=passive
srm://srm.grid.sara.nl/pnfs/grid.sara.nl/data/lofar/ops/fifotest/file1M
file://`pwd`/file1M
```

Note: You may have to force the use of TLS, (export GLOBUS_GSSAPI_FORCE_TLS=1 or in /etc/grid-security/gsi.conf set FORCE_TLS=true) to make this work.

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