



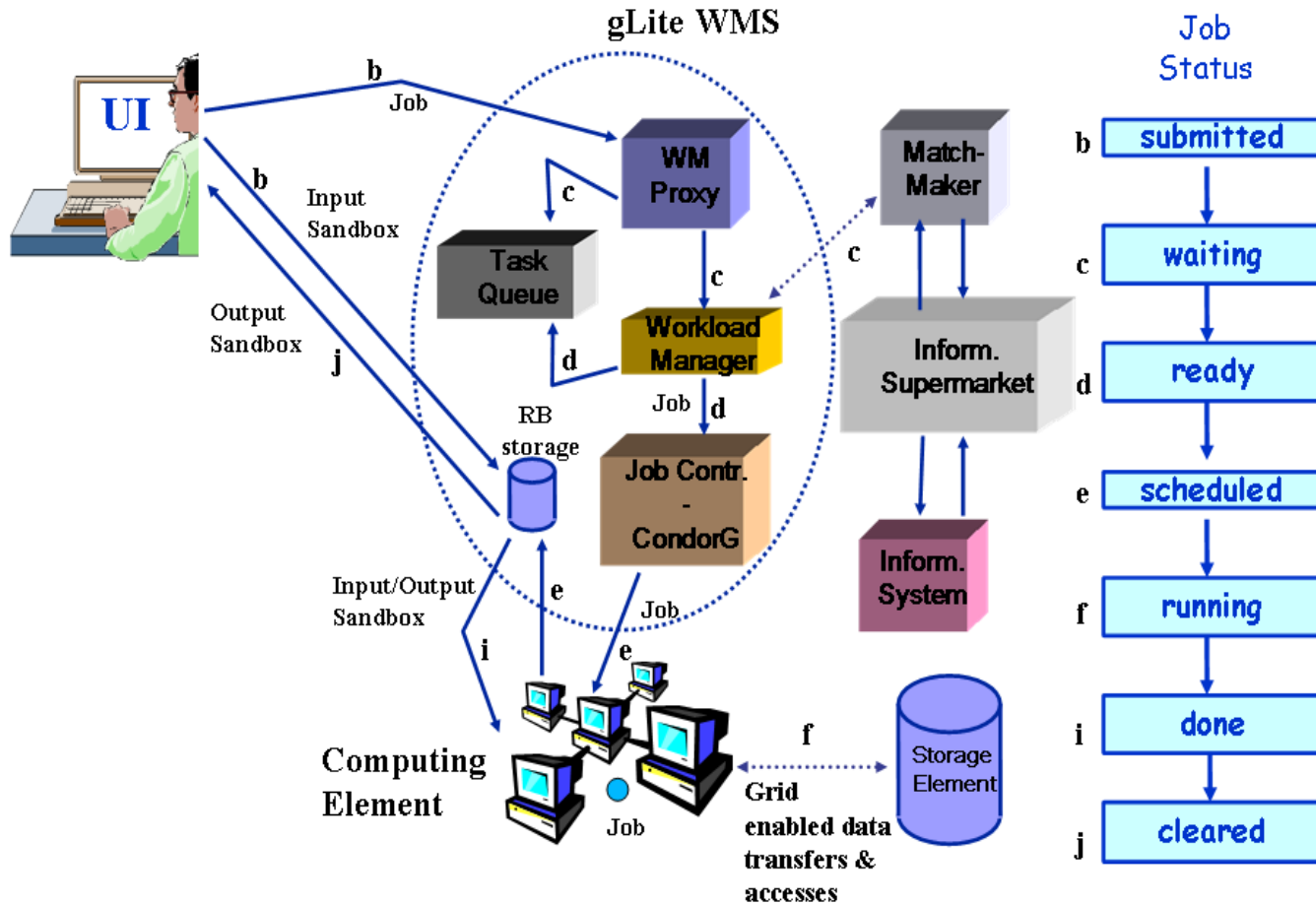
Enabling Grids for E-scienceE

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- Users and resources are typically part of more than one VO,
- but don't want many passwords

- Users and resource get a *single authentication token* (identity certificate)
 - that works across virtual organisations
 - issued by a party trusted by all (“CA”),
 - recognised by many resource providers, users, and VOs
 - satisfy traceability and persistency requirement
 - in itself does not grant any access, but provides a unique binding between an identifier and the subject

- **This is called your *(identity) certificate***
- **It is a *cryptographically protected statement* by the CA**
- that you can use to prove your identity
in combination with a *private key* and its *passphrase*

- To authenticate with your certificate directly you would have to type a passphrase every time
- Also you need a way to send you *VOMS credentials* across
- In the Grid Security Infrastructure today, this is solved by *'proxy certificates'*
 - *a temporary key pair*
 - *in a temporary certificate signed by your 'long term' private key*
 - *valid for a limited time (default: 12 hours)*
 - *and itself not protected by a passphrase*

- VOMS credential consists of a list of attributes
- short for Fully Qualified Attribute Name, is what VOMS uses to express membership and other authorization info
- Groups membership, roles and capabilities may be expressed in a format that bounds them together

`<group>/Role=[<role>][/Capability=<capability>]`

```
[glite-tutor] /home/giorgio > voms-proxy-init --voms gilda
Your identity: /C=IT/O=GILDA/OU=Personal Certificate/L=INFN/CN=Emidio
Giorgio/Email=emidio.giorgio@ct.infn.it
Enter GRID pass phrase: ****
Your proxy is valid until Mon Jan 30 23:35:51 2006
Creating temporary proxy.....Done
Contacting voms.ct.infn.it:15001 [/C=IT/O=GILDA/OU=Host/L=INFN
Catania/CN=voms.ct.infn.it/Email=emidio.giorgio@ct.infn.it] "gilda"
Creating proxy..... Done
Your proxy is valid until Mon Jan 30 23:35:51 2006
```

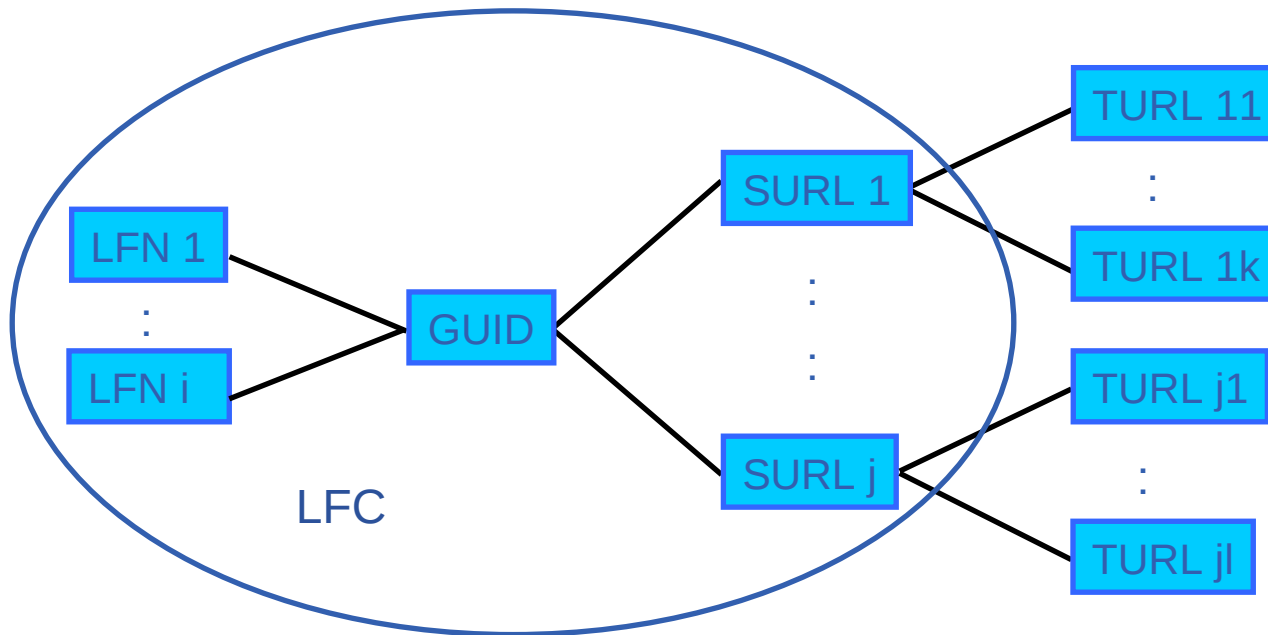
- LFC

- Keeps track of the location of copies (replicas) of files on the Grid

Name conventions

- Logical File Name (**LFN**)
 - An alias created by a user to refer to some item of data, e.g. “lfn:/grid/tutor/mydir/myfile”
 - Unix-like namespace
- Globally Unique Identifier (**GUID**)
 - A non-human-readable unique identifier for an item of data, e.g. “guid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6”
- Site URL (**SURL**)
 - The location of an actual piece of data on a storage system, e.g. “srm://pcrd24.cern.ch/flatfiles/cms/output10_1”
- Transport URL (**TURL**)
 - Locator of a replica + access protocol: understood by a SE, e.g. “rfio://lxshare0209.cern.ch//data/alice/ntuples.dat”

- How do they fit together?
 - LFC holds the mapping LFN-GUID-SURL



LFC interfaces

- Interaction with the WMS(RB)
 - The InputSandbox and OutputSandbox should only be used for small amounts of data. Large files should be on SEs
 - The RB can locate Grid files: allows for data-based match-making
 - Jdl file:
 - `InputData = "lfn:/grid/tutor/MyFile";`
 - The lfn's / guid's needed by the job as an input to the process
 - Tells RB to schedule job on CE close to SE holding the file
 - `glite-brokerinfo getInputData` returns list of files in InputData attribute
 - `OutputSE=srm.grid.sara.nl`;
 - location of a SE where the output data will be stored
 - `DataAccessProtocol="gsiftp"`;
 - The list of protocols that the application is able to "speak" for accessing files listed in the InputData

- lcg-infosites
 - Example: finding an SE:

> **lcg-infosites --vo tutor se**

Avail Space(Kb)	Used Space(Kb)	Type	SEs
1320000000	n.a	n.a	gb-se-ams.els.sara.nl
1320000000	n.a	n.a	gb-se-wur.els.sara.nl
536868064	2848	n.a	se.grid.rug.nl
104856555	1044	n.a	srm.grid.sara.nl

- Example: finding an LFC

> **lcg-infosites --vo tutor lfc**
 lfc.grid.sara.nl

- lcg-info

For more advanced searches:

For example, finding out where to put your files

```
>lcg-info --vo tutor --list-se --query='SE=srm.grid.sara.nl' --attrs=Path
```

```
- SE: srm.grid.sara.nl
```

```
- Path          /pnfs/grid.sara.nl/data/tutor
```