Italian Grid Infrastructure Portal (for CTA)

portal.italiangrid.it

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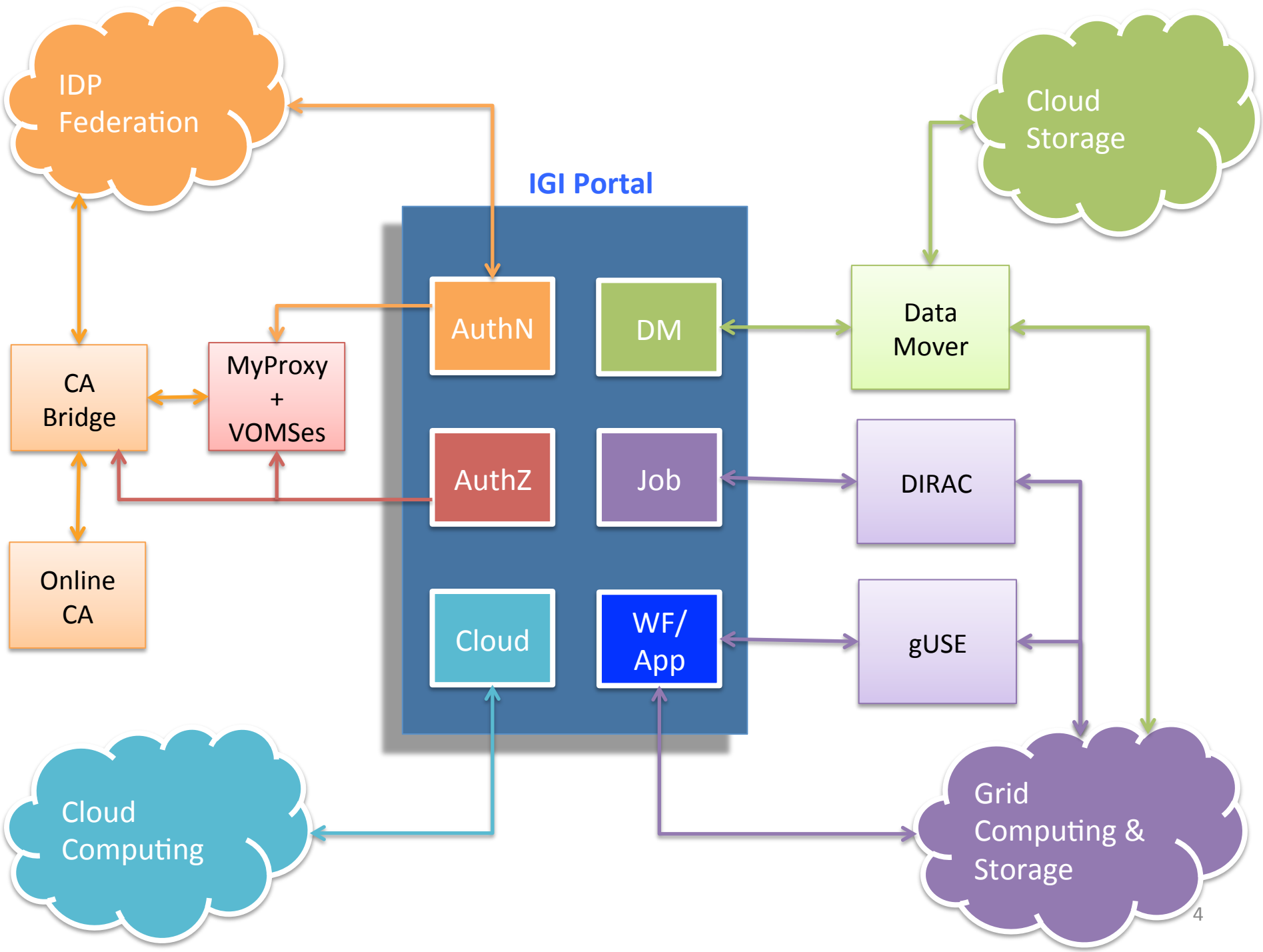
Introduction

- Main goals
  - Hiding the Grid Complexity
  - Facilitating the credential management
  - Being a unique access point for several services

- Main Features
  - Federated authentication
  - Online-CA integration (Certificate on demand)
  - Simple job, workflow, application submission (different middleware supported)
  - Virtual machine instantiation (Wnodes, OpenNebula, OpenStack)
  - Grid and Cloud data management
  - Modular structure

Introduction

- Liferay based
  - Based on Portlet JSR286 standard for easier reuse and integration of components
- Mostly integration of existing services
  - Focus on reuse vs. new development for sustainability: DIRAC, gUSE/ WS-Pgrade, WNoDeS, StoRM, EJBCA etc.
- General Purpose →Multi VOs/Communities portal
  - Interfaces ad hoc for specific communities or applications
- Some development needed to link components together
- User driven Functionalities development


IDP
Federation
Cloud
Storage
IGI Portal
AuthN
DM
Data
Mover
CA
Bridge
MyProxy
+
VOMSes
AuthZ
Job
DIRAC
Online
CA
Cloud
WF/
App
gUSE
Cloud
Computing
Grid
Computing &
Storage

AuthN/AuthZ

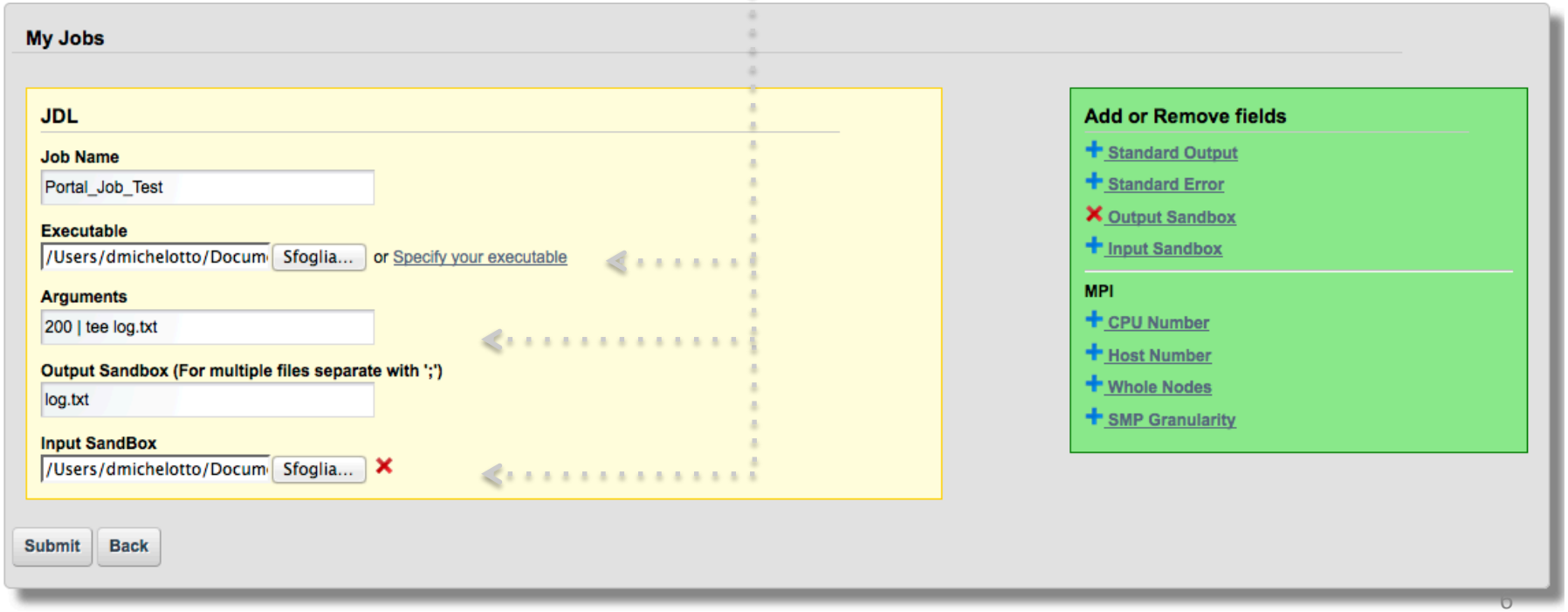
- Authentication based on identity federation (IDEM – eduGAIN extendible with other federations or single IDP)
  - No new username and password to remember
  - Sensible information not in the portal
  - IDP standard attributes used also for other services
  - Each IDP provides its authentication method (username and password, certificate etc)

- To use the portal features an X.509 certificate and a VO membership are needed
- The portal provides an IDP catch-all for the users with certificate but not members of IDEM – eduGAIN
  - The data retrieved from the certificate are used to register the user in the IDP

- Interfacing to an online-CA to provide certificate on-demand in a transparent way for the members of IDEM – eduGAIN (work in progress)
  - The data retrieved from the IDP are used for the certificate generation

Computing - Simple Job

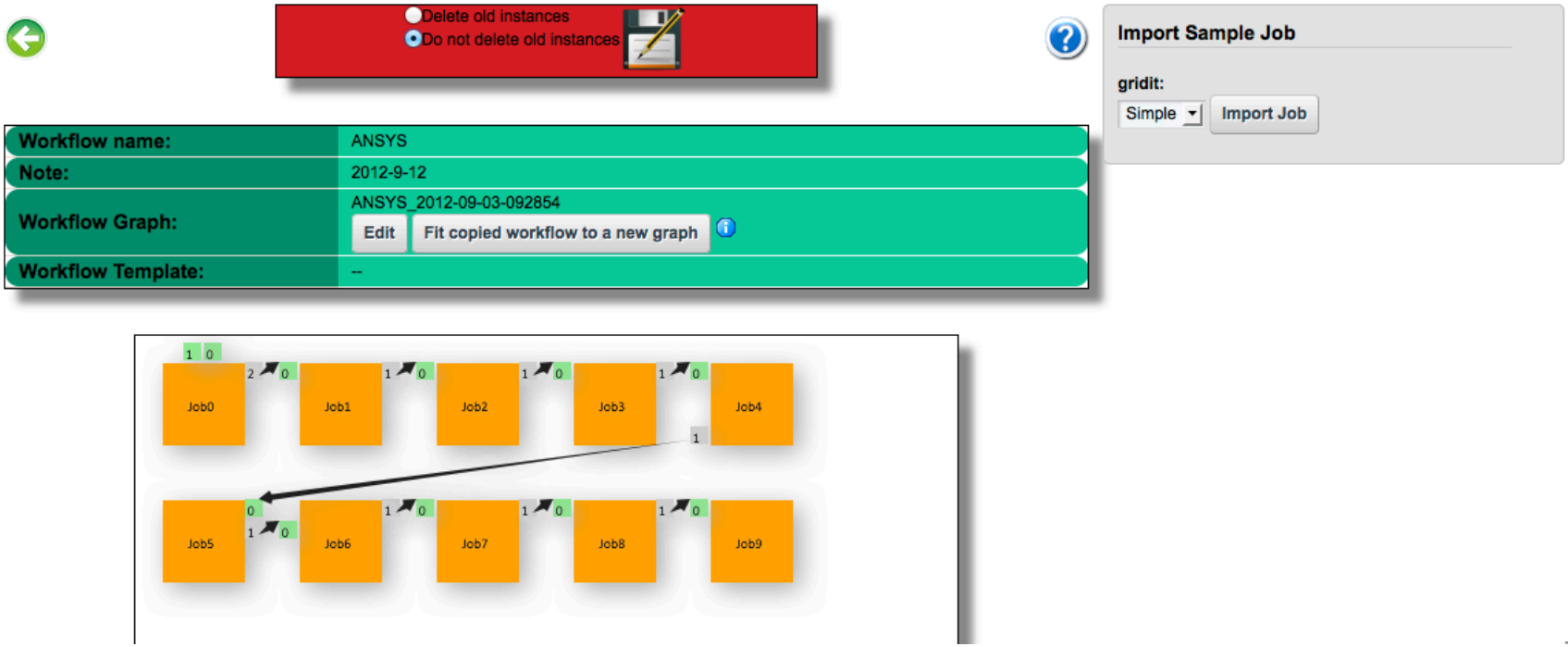
- Dirac based --> Pilot job
- Simple JDL building (normal job, MPI, parametric)
- Upload of: input data, executable and parameters (thanks to the use of personal certificate)
- Output and log retrieve
- Job status monitoring



Demonstration video: https://portal.italiangrid.it/en/web/guest/demo-egitf12

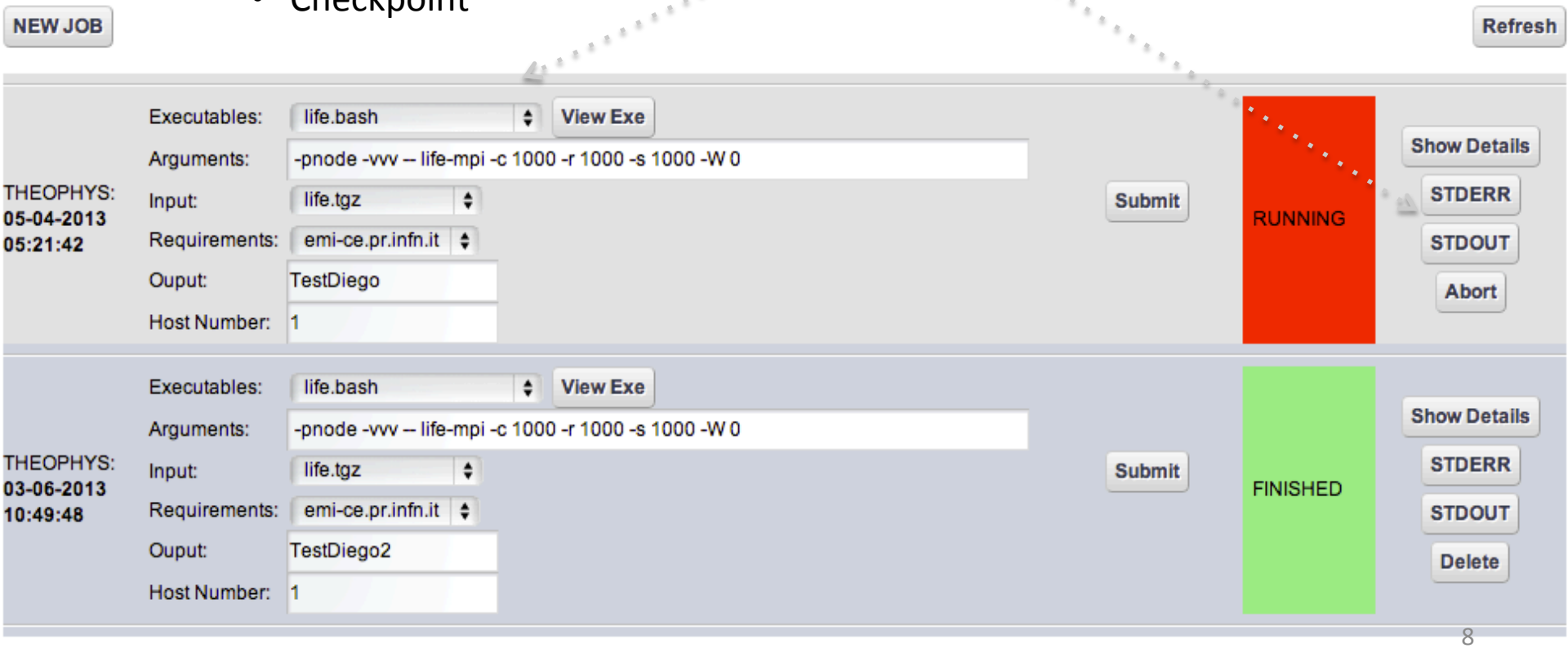
Computing - Workflow

- gUSE/WS-Pgrade based
- Graphical editor to build the workflow structure
- Multi middleware
- Simple JDL building



Computing: Specific Applications

- gUSE/WS-Pgrade based – Application Specific Module API (ASM)
- Ad hoc interfaces
- Runtime output and log retrieve
- Licenses manager
- Data management integration
- Checkpoint

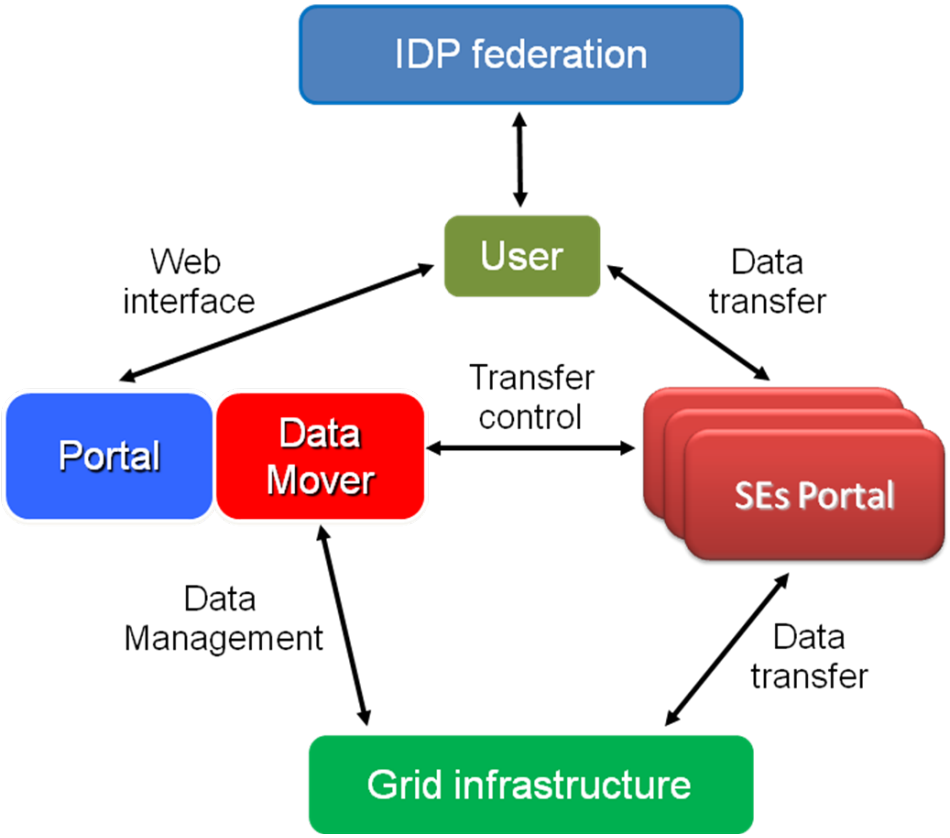


Demonstration video: https://portal.italiangrid.it/en/web/guest/demo-egitf12

Institute	Application	Description	State
INFN-Legnaro	• Ansys • Fluka	• Simulation Software	• OK • Developing
INGV	• NEMO	• Oceanographic modeling	• OK
INFN-Parma/Pisa	• Executables	• Theoretical Physics	• OK
CNR ISAC	• Globo	• Weather Forecasting and Climate study	• To Do
CNR ISOF	• Namd • Gaussian • Amber	• Dynamic Molecular Simulation • Electronic Structure Modeling • Dynamic Molecular Simulation	• OK • Developing • To Do
Compchem VO	• Namd • Gaussian • Dl_poly • abc	• Dynamic Molecular Simulation • Electronic Structure Modeling • Dynamic Molecular Simulation • Analytical chemistry	• OK • Developing • To Do • To Do
Bio Computing Group - Bologna University	• Blast	• DNA sequences alignment	• Developing
DRIHM.eu Project	• WRF	• Weather Forecasting	• To Do
Virgo Experiment	• Executables	• Detection of gravitational wave	• Developing

Data Management

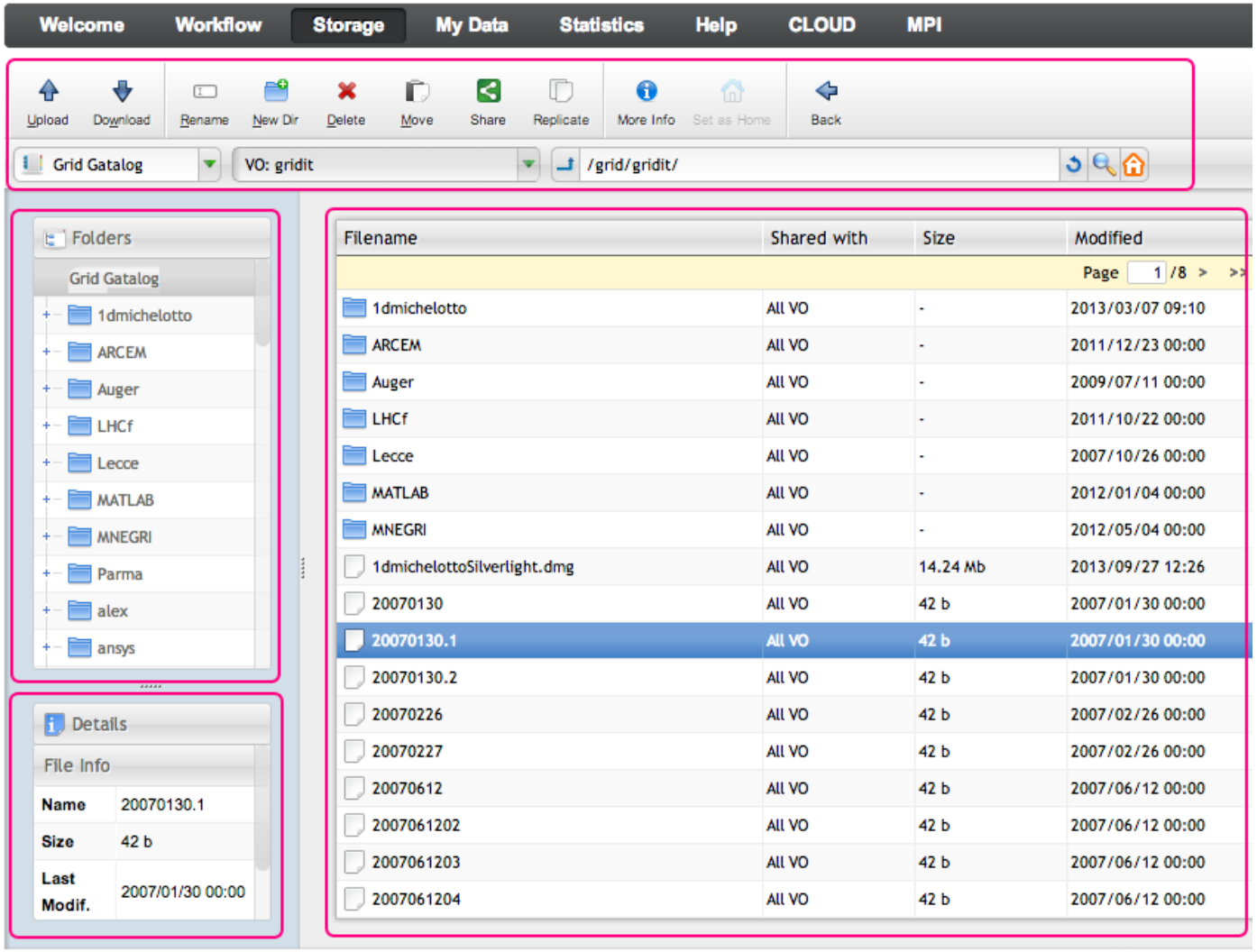
- To avoid the portal being a bottleneck for the data moving, files transfer is external to the portal trough a dedicated storage space
- The **Portal SEs** acts as a cache memory until the file has been transferred to/ from Grid (StoRM based)
- The **Data Mover** monitors and manages every transfer steps and communicates directly with the Grid Infrastructure for some operations: replicas, deletion, etc.



Data Management

- LFC catalog browsing
- File replica
- Renaming
- File sharing
- File Deleting
- Folder making
- Details retrieving

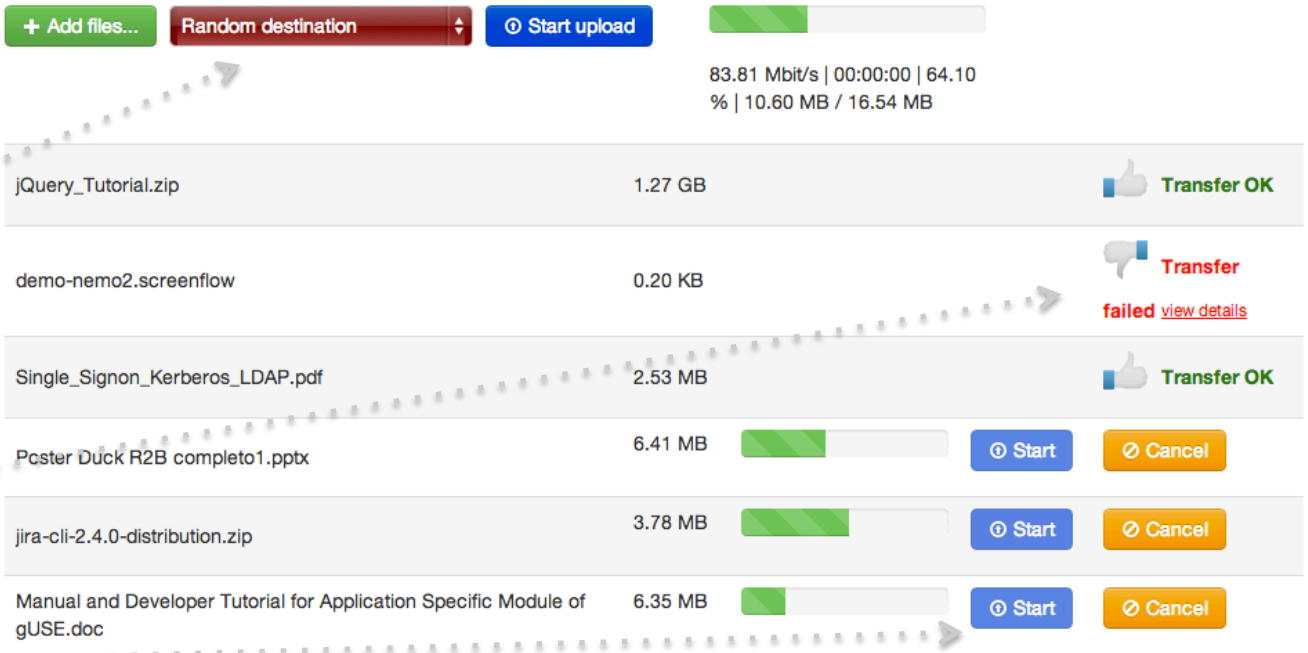
- It acts at Logical and Physical level.



Demonstration video: https://portal.italiangrid.it/web/guest/data-management

Data Management - Upload

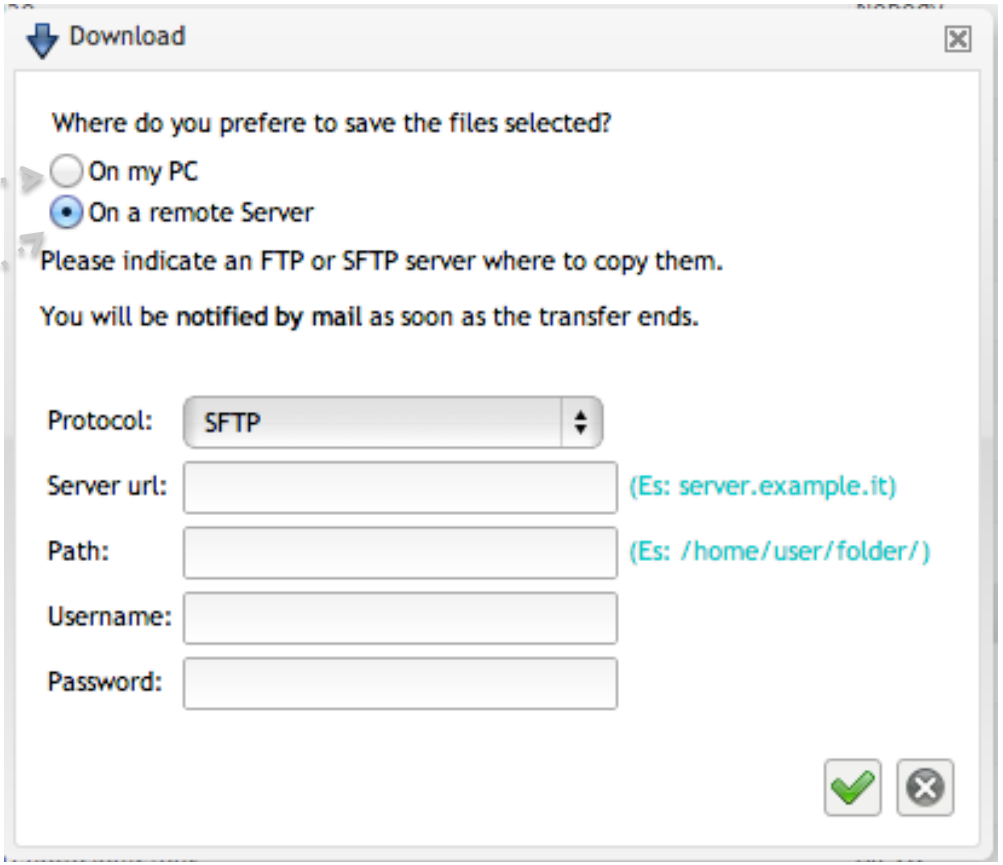
- SE Upload and Catalog registration
- SE destination choosing
- Automatic retry in case of failure
- Final state information and error
- Resumable upload



*Demo*nstration *video*: https://portal.italiangrid.it/web/guest/data-management

Data Management - Download

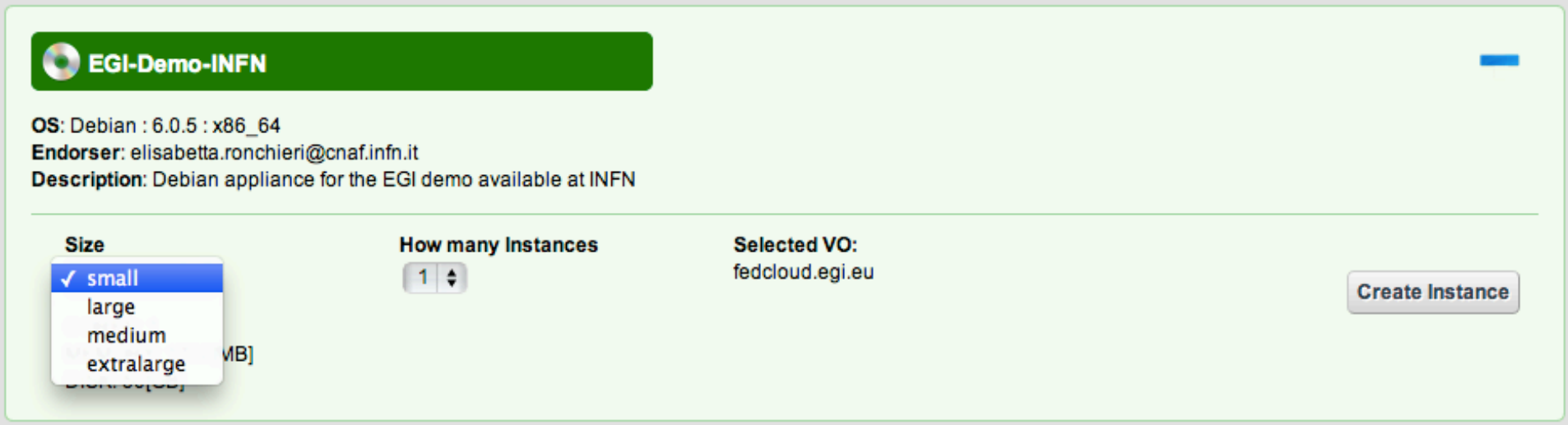
- Download from Grid to user's PC
- Download from Grid to remote server (FTP,SFTP webDAV)
- Mail notification when the transfer is completed.



- *Demonstration video:* https://portal.italiangrid.it/web/guest/data-management

Cloud

- The portal uses a Cloud CLI to allow the users to interact with several platforms Cloud (OpenStack, OpenNebula and WNoDeS) in a transparent way using, to instantiate virtual machines choosing the image from a central repository (EGI Market Place for FedCloud task force)
  - Users can set the virtual machine size: RAM, hard disk, core numbers
  - Uploading or auto-generation of SSH key pair
  - Login via web console or via SSH client from user's PC
  - OCCI standard
- The mechanism can be easily extended for other use cases using repositories and images ad hoc



Demonstration video: https://portal.italiangrid.it/web/guest/cloud

Compliance status key

– [**READY**] – the Science Gateway is able to fulfill this requirement but some application developments could be needed for complete fulfillment

– [**FUTURE**] – the requirement is not fulfilled now, work on fulfilling it was not started

– [**EXTERNAL DEPENDENCY**] – fulfillment of the requirement depends completely on external (to the Gateway) factors – e.g. existence of a certain application or policy

– [**CLARIFICATION NEEDED**] – the requirement needs further clarification

– [**DIFFERENT IMPLEMENTATION**] – From an architectural point of view the functionality is present but implemented in a different way

Capability requirements

- [**READY**] UR-SG-0010: Capabilities
- [**READY**] UR-SG-0020: Data access
- [**EXTERNAL DEPENDENCY**] UR-SG-0030: Applications access
- [**EXTERNAL DEPENDENCY**] UR-SG-0040: Data Management Monitoring Applications
- [**READY**] UR-SG-0045: Privileged Applications access
- [**READY**] UR-SG-0050: Documentation access
- [**READY**] UR-SG-0055: Science Gateway documentation – „About" page and FAQ available
- [**EXTERNAL DEPENDENCY**] UR-SG-0060: User support
- [**EXTERNAL DEPENDENCY**] UR-SG-0065: Help-desk
- [**EXTERNAL DEPENDENCY**] UR-SG-0070: Community feedback – functionality available in Liferay, presently no content available
- [**READY**] UR-SG-0080: Resource discovery service – the applications run only on the resources to which the user has access rights (decided on VO membership basis)
- [**READY**] UR-SG-0090: Job execution service – done for jobs executed on Grid infrastructure
- [**READY**] UR-SG-0095: Data for local computing
- [**READY**] UR-SG-0100: Input/output transfer between applications
- [**READY**] UR-SG-0110: Application workflow management – execution of predefined workflows is possible
- [**READY**] UR-SG-0150: Simultaneous users performance

Constraint requirements

- [**READY**] UR-SG-0200: Internet Service Providers support – hosted in CNAF with very good Internet connection
- [**FUTURE**] UR-SG-0300: User devices support – mobile support is future work
- [**READY**] UR-SG-0400: Web browser support
- [**READY**] UR-SG-0410: User device Operating system dependency
- [**READY**] UR-SG-0500: Web portal
- [**READY**] UR-SG-0510: Science Gateway language
- [**READY**] UR-SG-0600: Maintainability over many years – the Gateway's architecture is modular
- [**READY**] UR-SG-0610: Existing framework use – uses Liferay, DIRAC, WS-Pgrade etc., components reuse is possible
- [**CLARIFICATION NEEDED**] UR-SG-0620: Existing standards compliance – what kind of standards should be considered?
- [**CLARIFICATION NEEDED**] UR-SG-0630: EGI VO Portal policy?
- [**READY**] UR-SG-0700: Availability>98%
- [**EXTERNAL DEPENDENCY**] UR-SG-0800: Portability over 30-40 years – the Gateway is built from standard technologies which are expected to be maintained in foreseeable future, applications?
- [**CLARIFICATION NEEDED**] UR-SG-0910: Supported simultaneous user profiles – roles and privileges supported
- [**EXTERNAL DEPENDENCY**] UR-SG-0915: Restricted network access
- [**READY**] UR-SG-0916: Specific access rights per application – see UR-SG-0910
- [**EXTERNAL DEPENDENCY**] UR-SG-0920: CTA data collection access rights
- [**EXTERNAL DEPENDENCY**] UR-SG-0930: CTA access policy
- [**READY**] UR-SG-0940: Public access

Single Sign On specific requirements

- [**DIFFERENT IMPLEMNTATION**] UR-SSO-0010: Local Account – Username and password are not local but external to the portal
- [**READY**] UR-SSO-0020: X509 certificate or institute login/password support
- [**DIFFERENT IMPLEMNTATION**] UR-SSO-0030: – CTA Federation OR IDP
- [**READY**] UR-SSO-0040: Grid certificate support - Personal certificate used
- [**READY**] UR-SSO-0050: User attributes – IDP attributes
- [**READY**] UR-SG-0060: User support
- [**EXTERNAL DEPENDENCY**] UR-SSO-0100: Performance - IDP dependent
- [**READY**] UR-SSO-0900: Password encrypted on network– Shibboleth protocol
- [**READY**] UR-SSO-0910: Identity check for each connection
- [**READY**] UR-SSO-0920: Connection time-out
- [**CLARIFICATION NEEDED**] UR-SSO-0930: Ability to keep user session opened even if browser is closed – Browser settings dependent
- [**CLARIFICATION NEEDED**] UR-SSO-0940: Session recovery
- [**READY**] UR-SSO-1000: Existing standards compliance

Comments to the VT

- Some of the requirements need further clarification

- External authentication
  - CTA Identity federation
  - A new user should be saved in a CTA IDP (username and password)

- Summary table for Single Sign On requirements (pag. 14)→ many errors

Contacts

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