e-infrastructure

WS-PGRADE/gUSE

Supporting e-Science communities in Europe

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CAPACITIES

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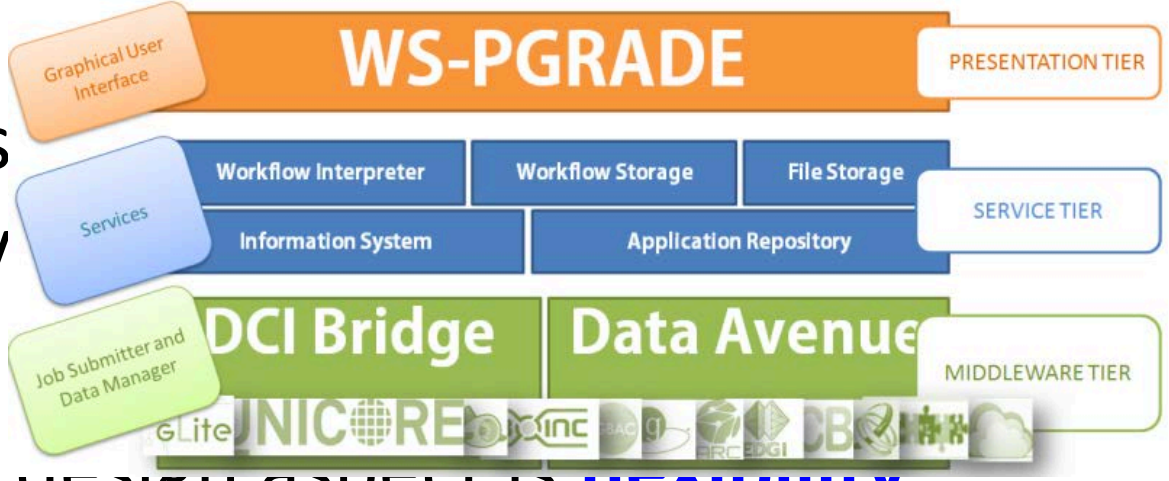
Outline

- WS-PGRADE/gUSE in a nutshell
- Flexibility of:
  - Parallelism
  - Compute infrastructure access
  - Data storage access
  - Customization possibilities
- Customized gateway examples
- Interested in the details?

WS-PGRADE/gUSE
Generic-purpose gateway framework

- Based on Liferay
- General purpose
- **Workflow-oriented** gateway framework
- Supports the development and execution of workflow-based
- Supports the fas
  specific gateway
  technology
- Most important design aspect is **flexibility**



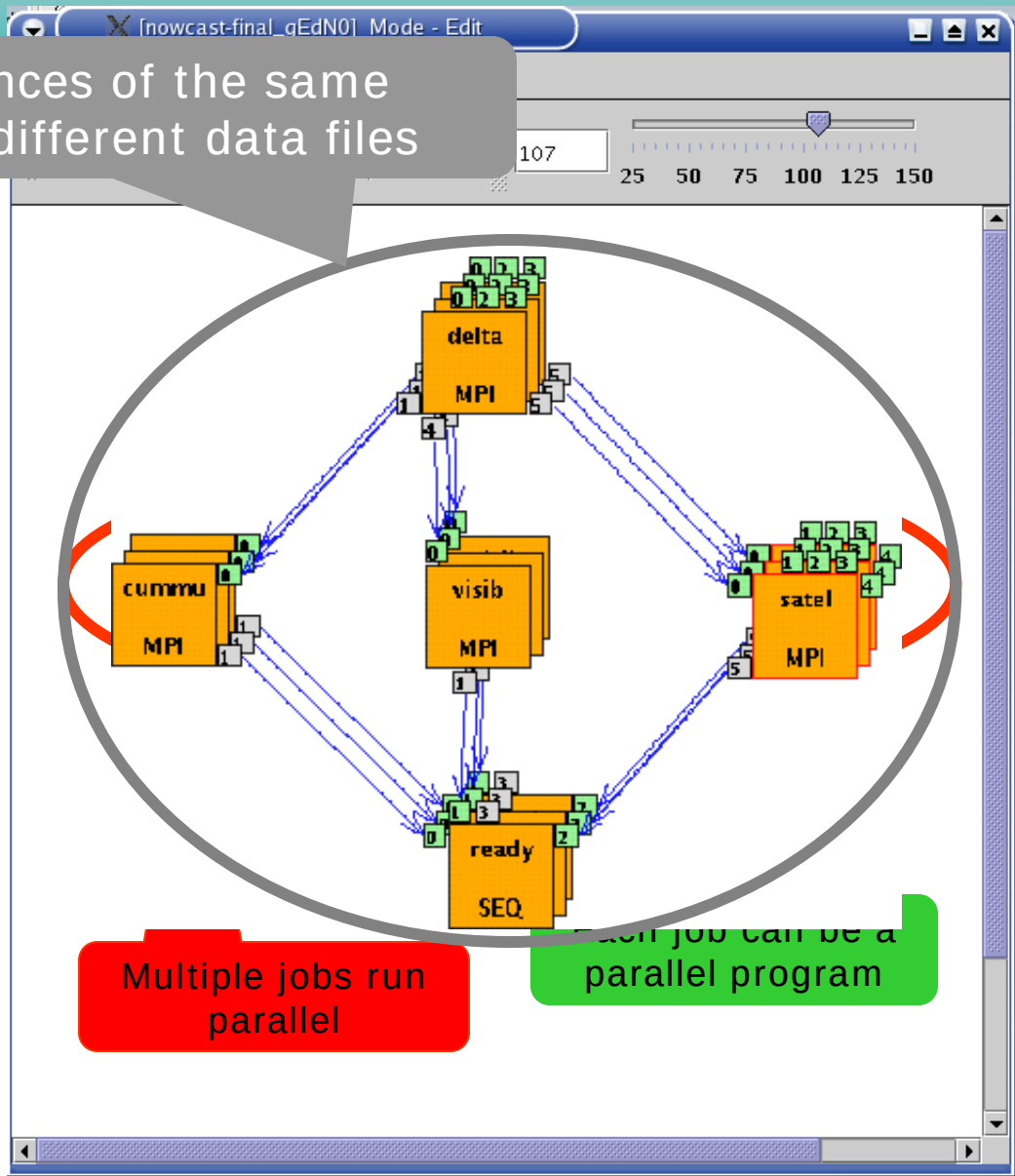
Flexibility in exploiting parallelism

Multiple instances of the same workflow with different data files

– Parallel execution inside a workflow node

– Parallel execution among workflow nodes

– Parameter study execution of the workflow



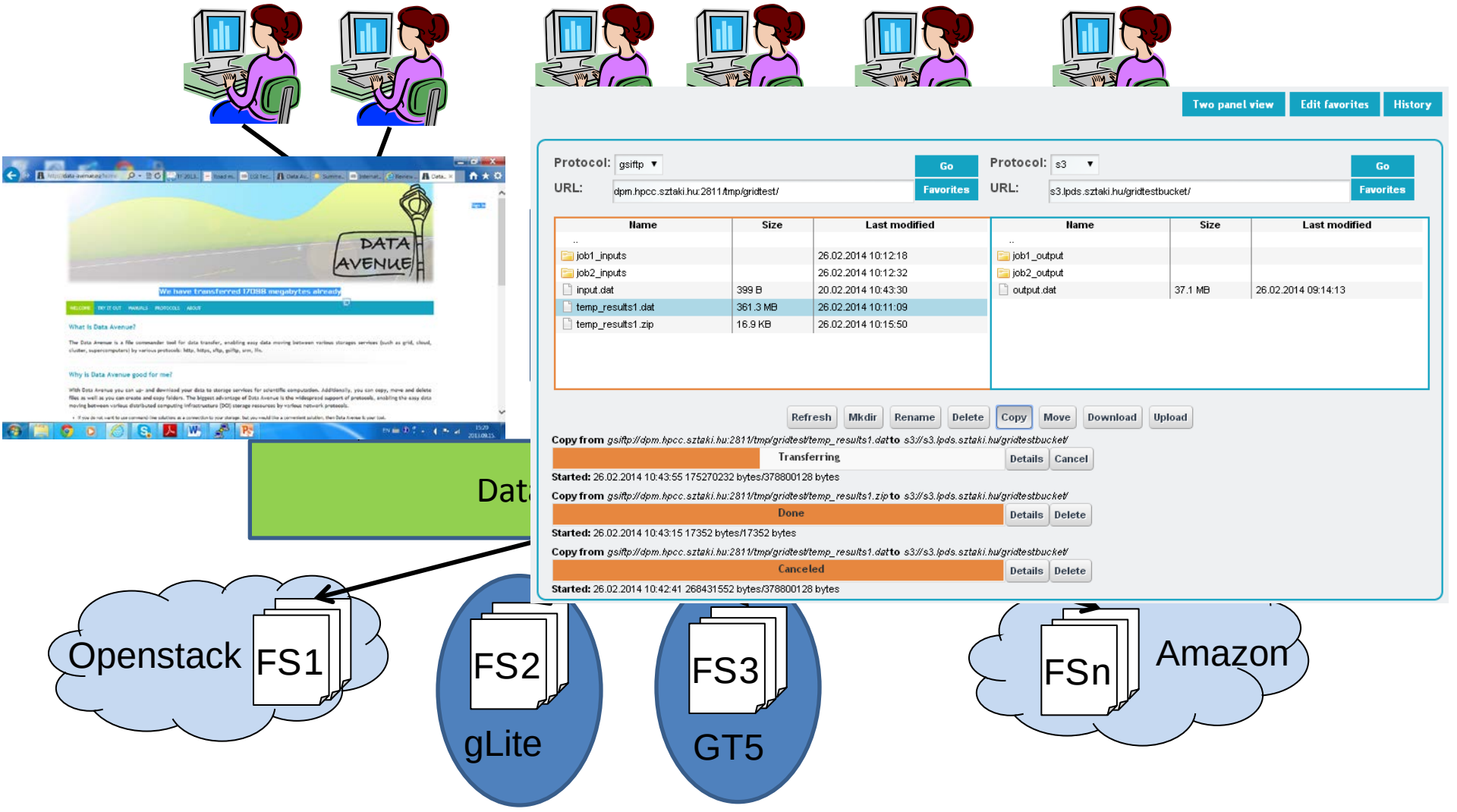
Flexibility of using compute infrastructures

- Flexible management of **Security:**
  - Individual users' certificate (X.509, SAML, pubkey, …)
  - Robot certificates
- Flexible access to **various types of DCIs**:
  - Clusters (PBS, LSF, MOAB, SGE)
  - Cluster grids (ARC, gLite, GT2, GT4, GT5, UNICORE)
  - Supercomputers (e.g. via UNICORE)
  - Desktop grids (BOINC)
  - Clouds (Direct Access, EGI FedCloud, CloudBroker Platform)
  - XSEDE

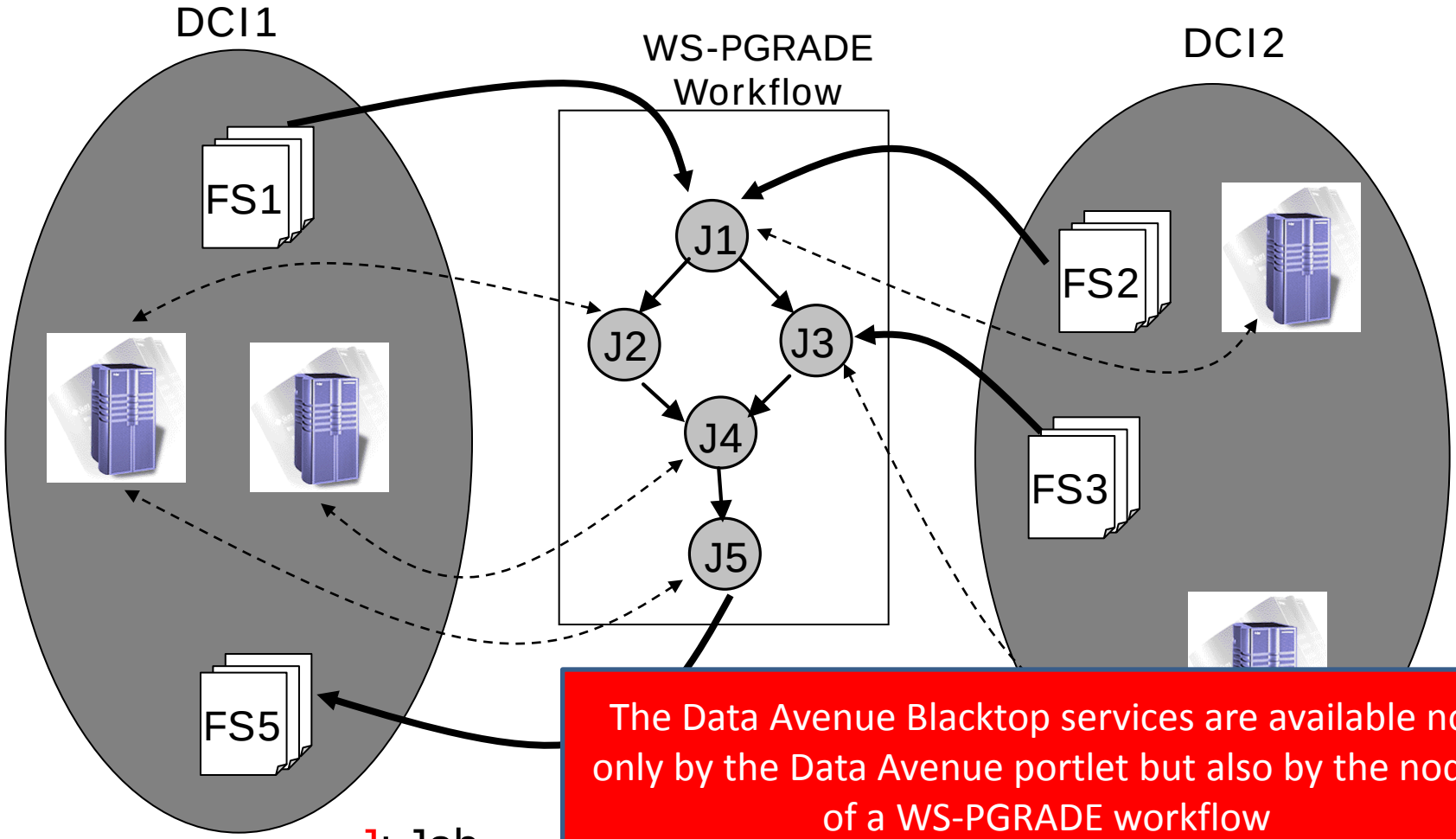
Flexibility in data storage access

- **Use Data Avenue Blacktop service**
  - To access data storages in different DCIs
  - To transfer files among the storages of different DCIs
  - To upload/download files to/from the storages of different DCIs
- **Data Avenue Liferay portlet** to access the data transfer services of Data Avenue Blacktop
- See details: https://data-avenue.eu/
- Currently supported protocols:
  - HTTP(s), SFTP, GSIFTP, SRM, iRODS, S3

Data Avenue services



Generic data transfer among WS-PGRADE workflow nodes



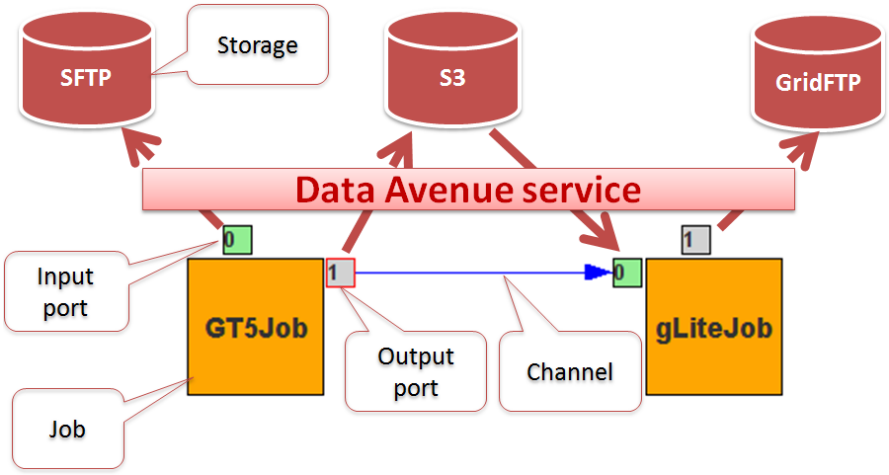
The Data Avenue Blacktop services are available not only by the Data Avenue portlet but also by the nodes of a WS-PGRADE workflow

J: Job

FS: File storage system, e.g. gsiftp, iRODS, SRM

Data Avenue in WS-PGRADE/gUSE

- Data sources and destinations of jobs can be selected
- gUSE automatically manages data transfers using Blacktop
- Actual transfer delegated up to the worker node wherever possible, *by*passing the Blacktop service if the middleware is capable of handling the protocol

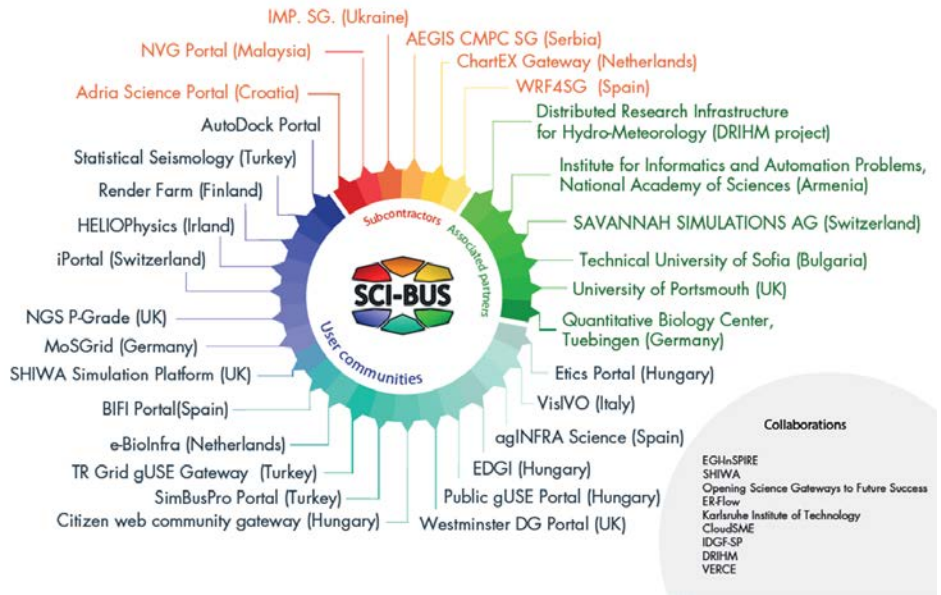


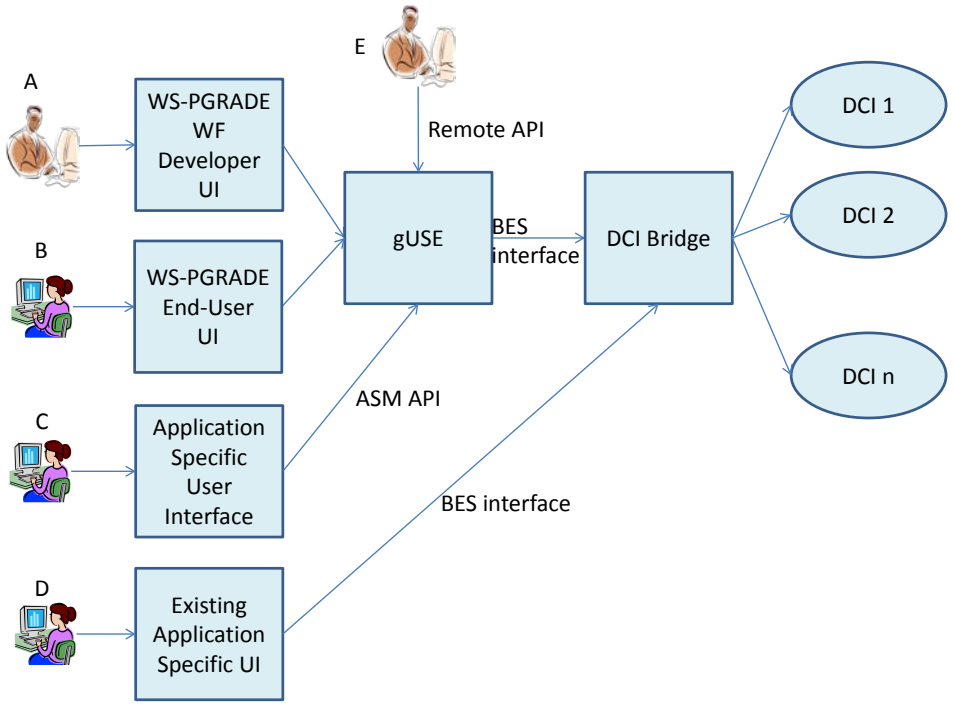
Flexibility of gateway types and user views

1. Generic purpose gateways (workflow view)
   - Core WS-PGRADE/gUSE (e.g. Greek NGI)
2. Generic purpose gateway for specific technologies (workflow view)
   - SHIWA gateway for workflow sharing and interoperation
3. Domain-specific science gateway instance
   - Autodock gateway (end-user view)
   - Swiss proteomics portal (customized GUI using ASM API)
   - VisIVO Mobile (use of Remote API)

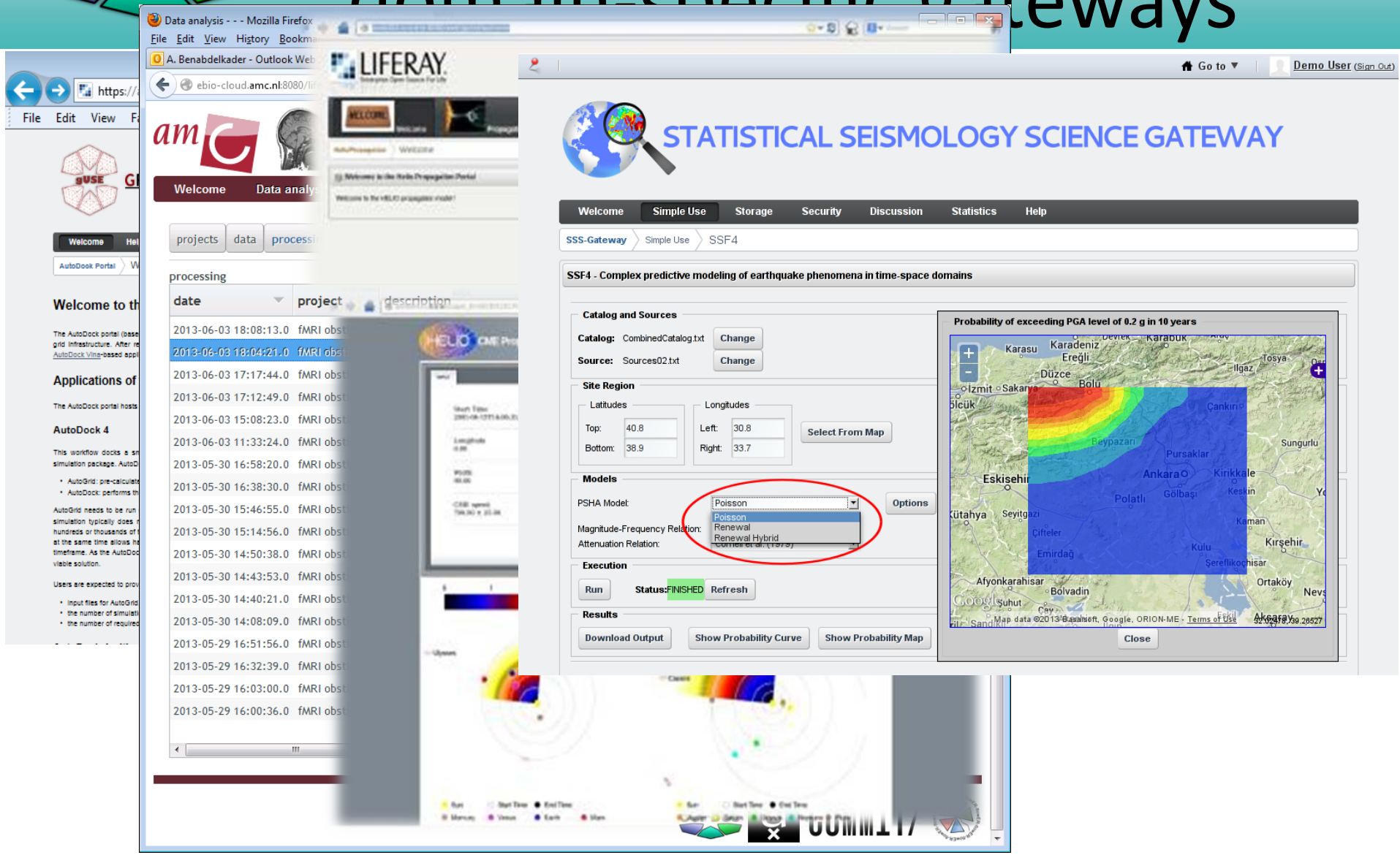
WS-PGRADE/gUSE customization possibilities

- Application Specific Module: ASM API
- Remote API
- End User View
- Job submission

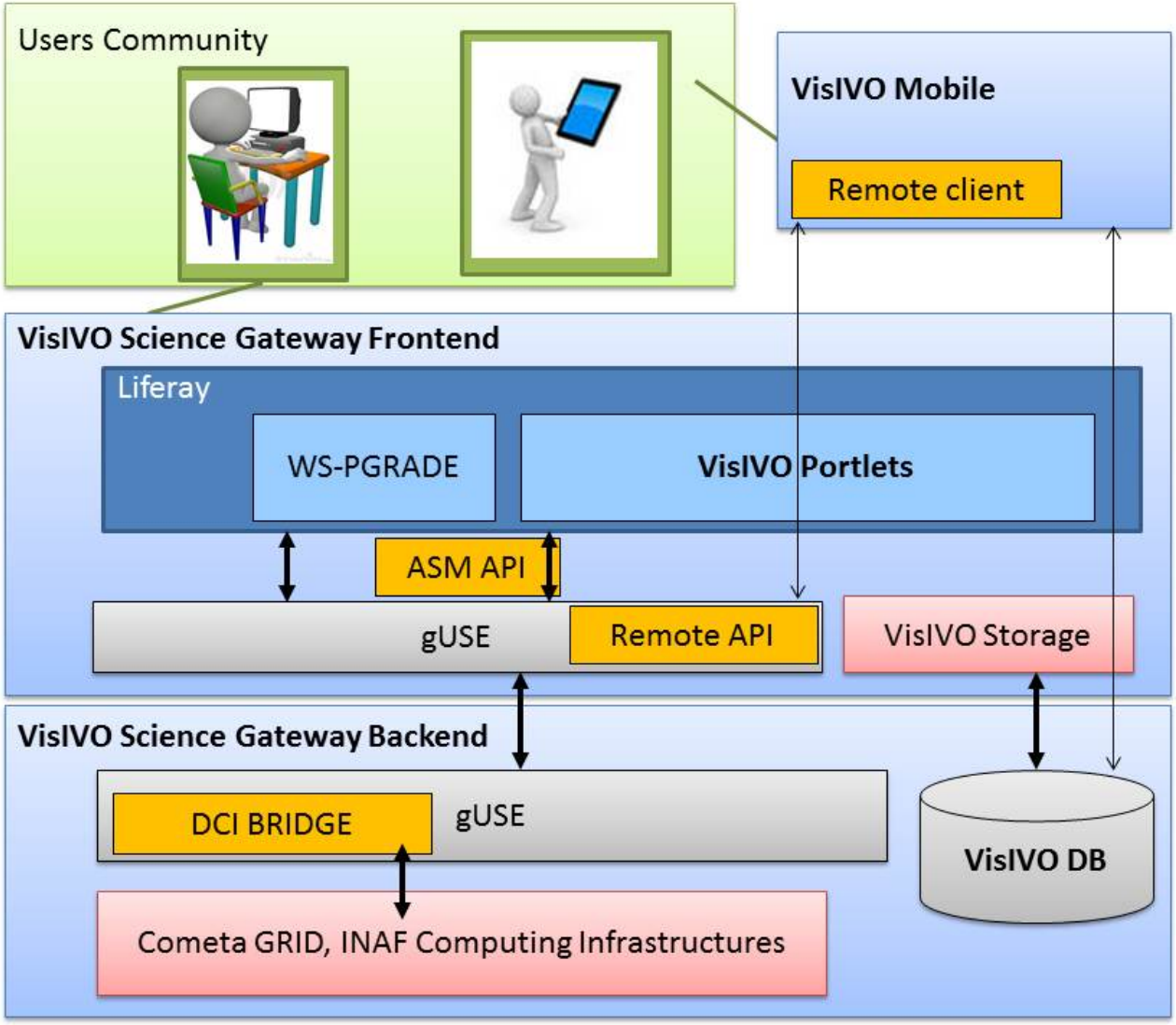




Some examples of SCI-BUS domain-specific gateways

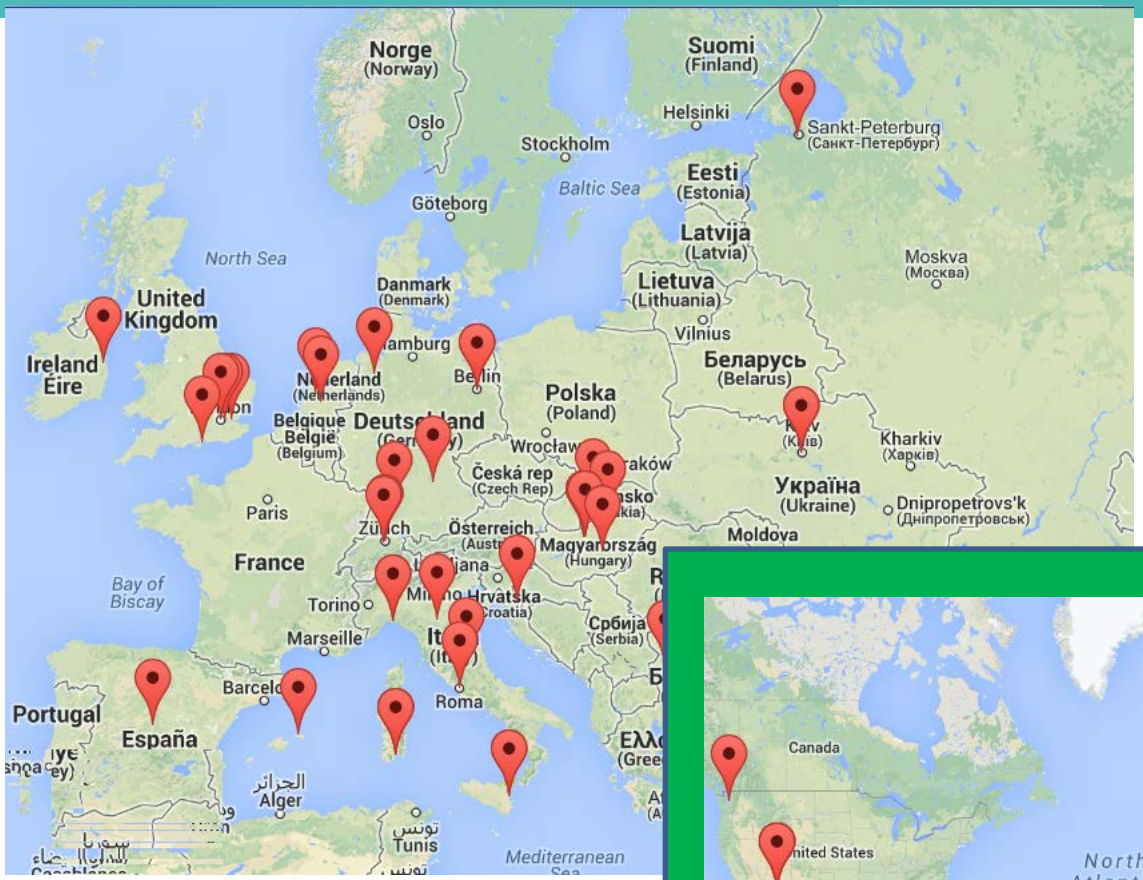


VisIVO Astrophysics Science Gateway Architecture

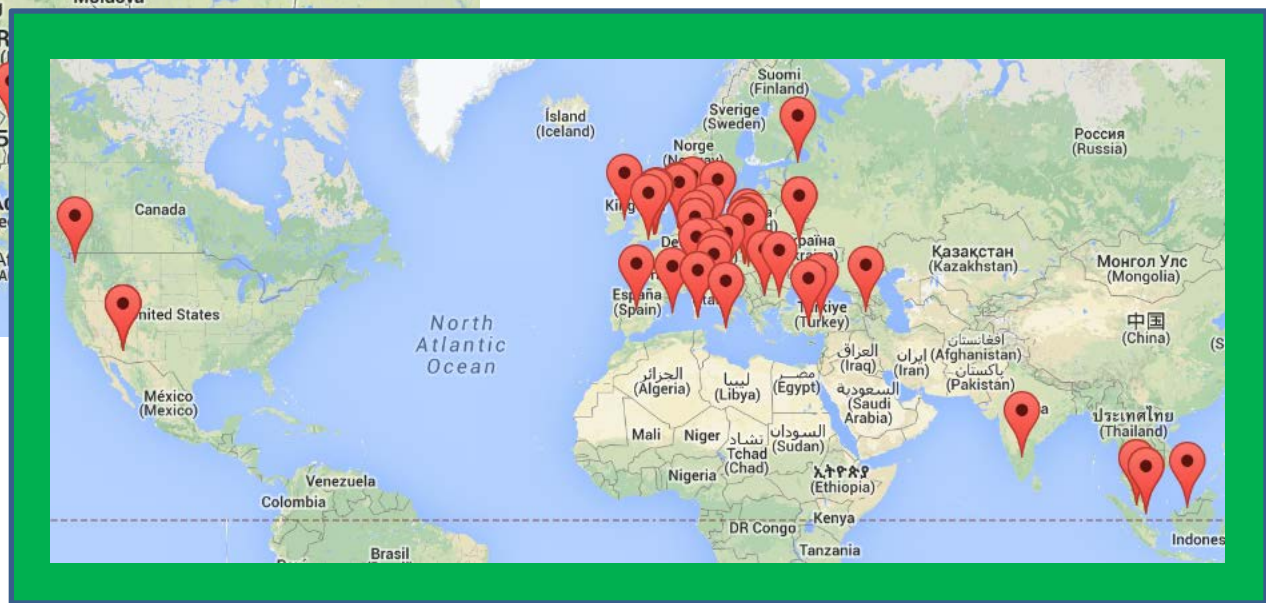


VisIVO Mobile

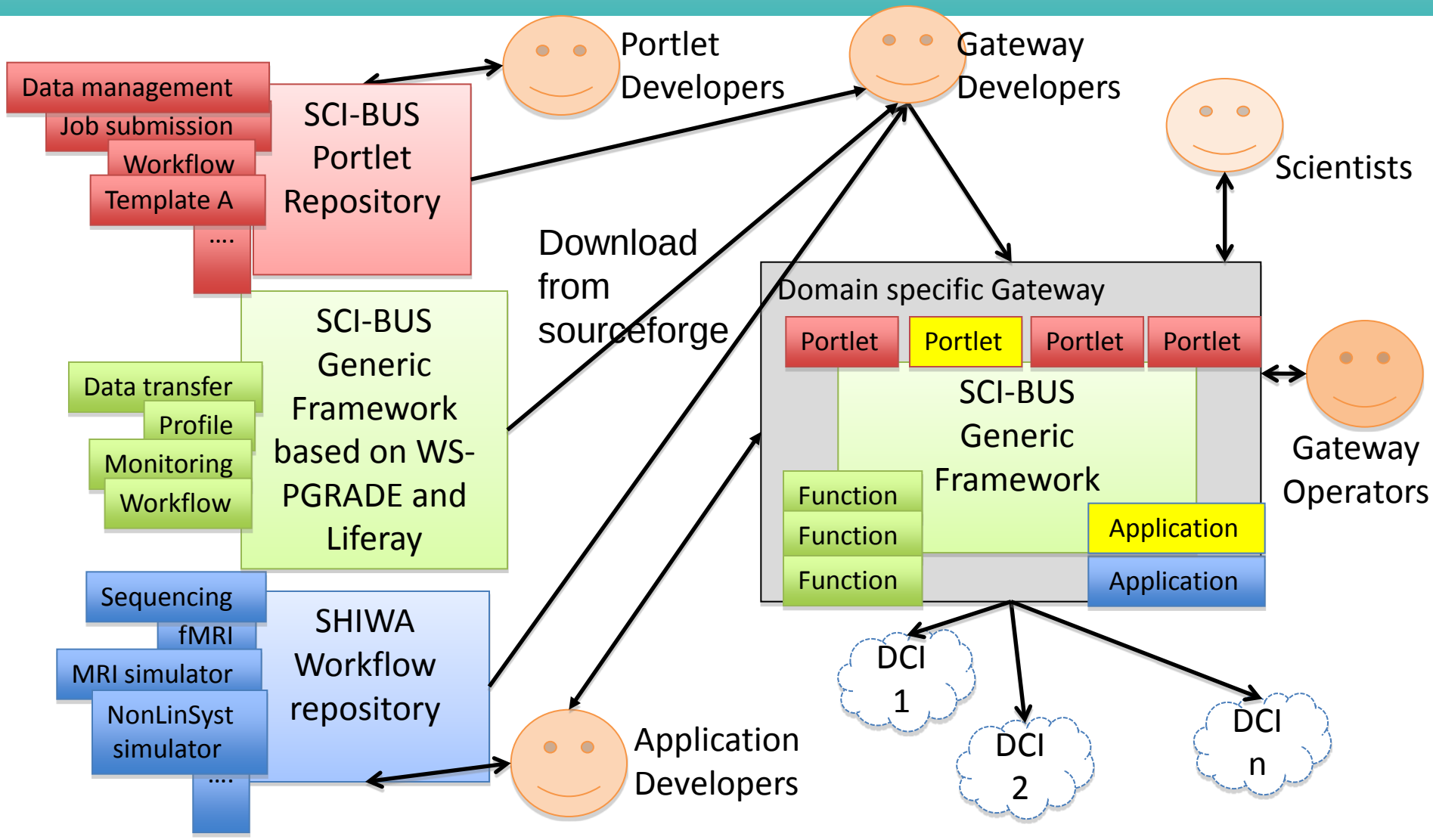
gUSE-based gateways



- Close to 130 deployments world-wide
- More than 17.000 downloads from SourceForge



Summary: SCI-BUS solution to build science gateways by communities



Additional info

- SCI-BUS: http://sci-bus.eu/
- WS-PGRADE/gUSE: http://guse.hu, http://guse.sf.net/
- Data Avenue: https://data-avenue.eu/
- More in-depth talk:
  - When: 2:30-4 p.m. Friday, Oct. 3
  - Where: Purdue University, LWSN, Room 1106

- Thank you for your attention!