
CCIN2P3
JSAGA
dapnia
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saclay
CNRS
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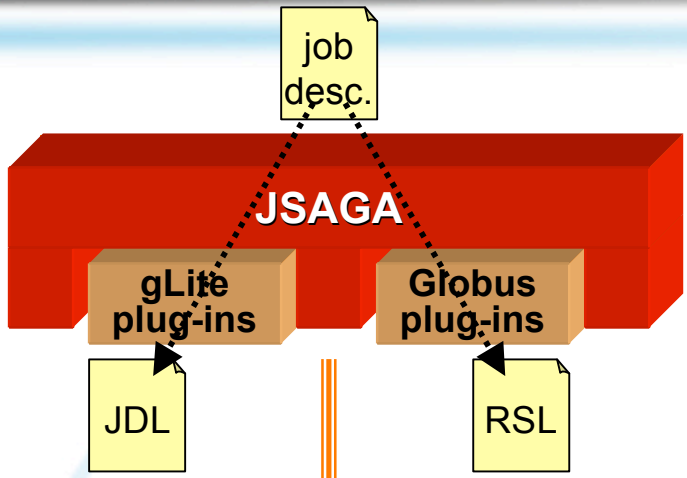
DE LA RECHERCHE
SCIENTIFIQUE

Overview

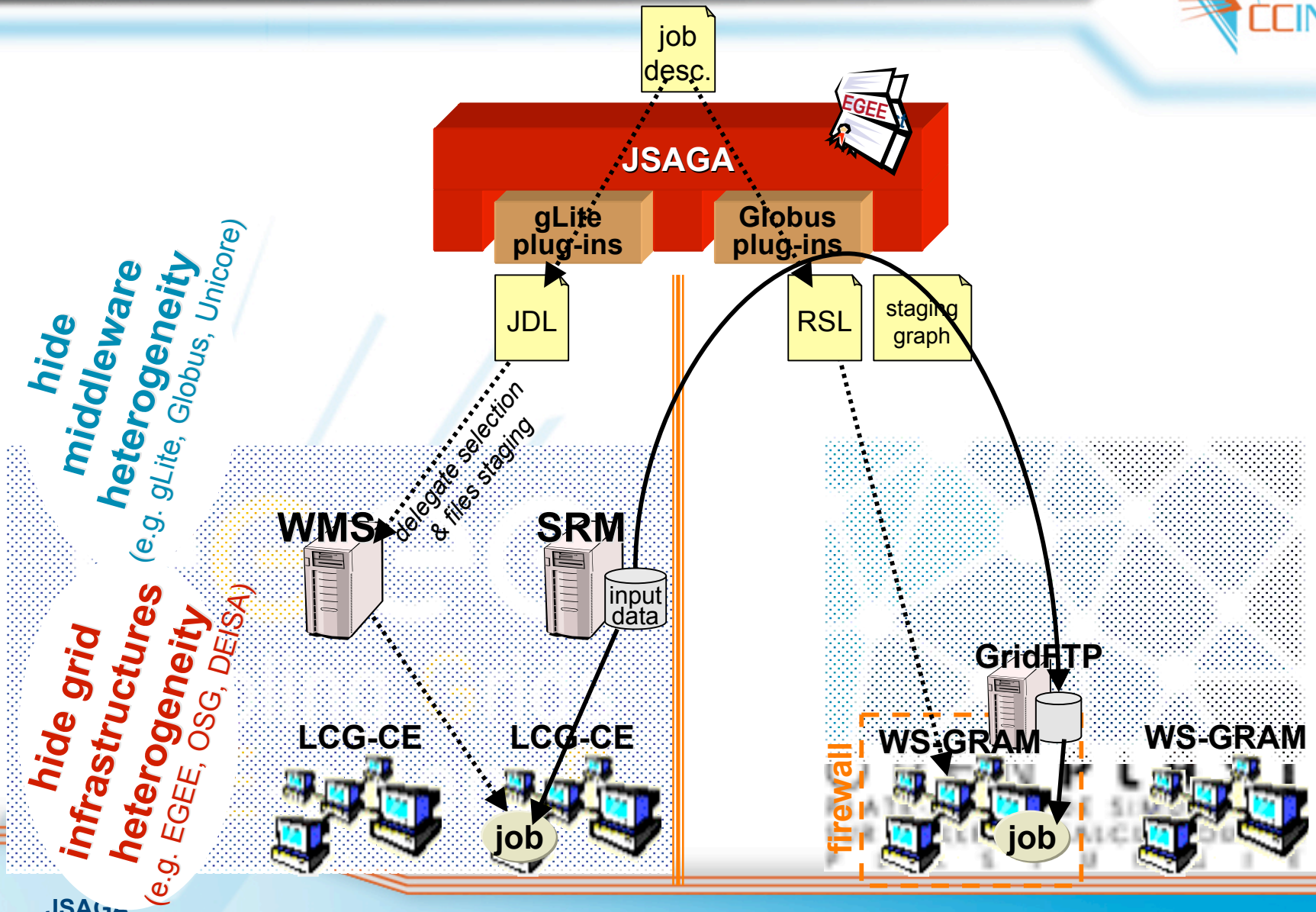


hide middleware heterogeneity (e.g. gLite, Globus, Unicore)

Enabling Grids for E-sciencE

OPENPLAST
PLATE-FORME DE SIMULATION SUR GRILLE DE CALCUL POUR LA PLASTURGIE

Overview


job desc.
EGEE
JSAGA
gLite plug-ins
Globus plug-ins
JDL
RSL
staging graph
hide middleware heterogeneity
(e.g. gLite, Globus, Unicore)
delegate selection & files staging
WMS
SRM
input data
hide grid infrastructures heterogeneity
(e.g. EGEE, OSG, DEISA)
LCG-CE
LCG-CE
job
GridFTP
WS-GRAM
WS-GRAM
job
firewall

What is JSAGA ?

JSAGA is…

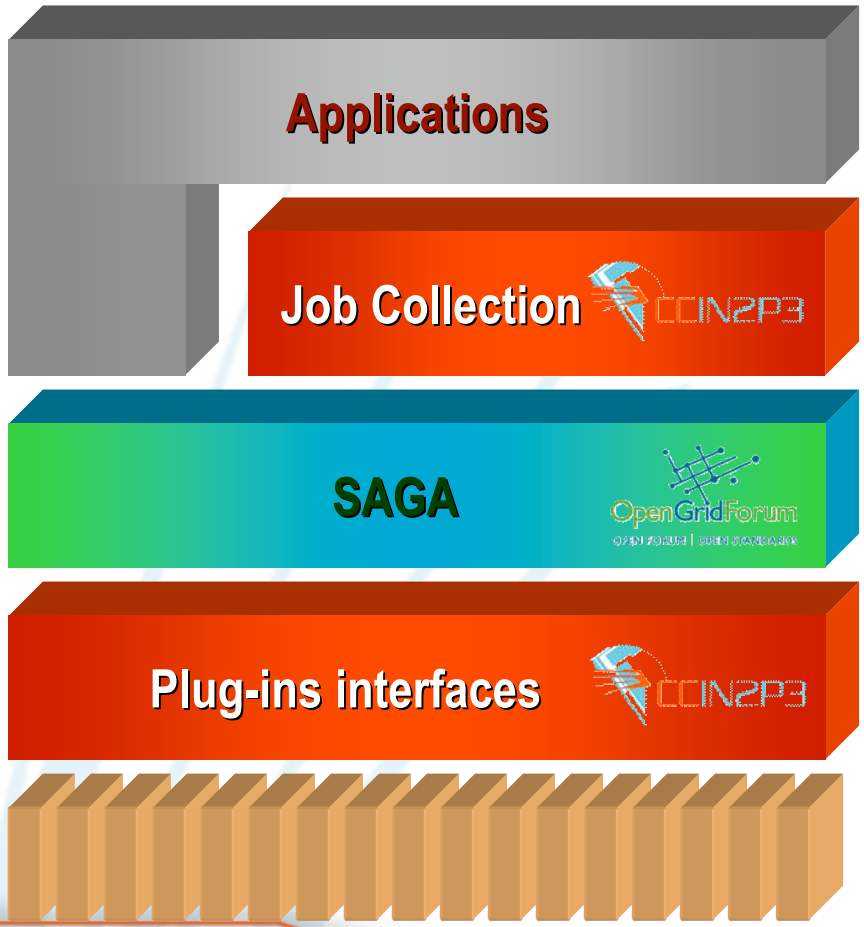
hide middleware heterogeneity *(e.g. gLite, Globus, Unicore)*

⇨ A Java implementation of the SAGA specification

hide grid infrastructures heterogeneity *(e.g. EGEE, OSG, DEISA)*

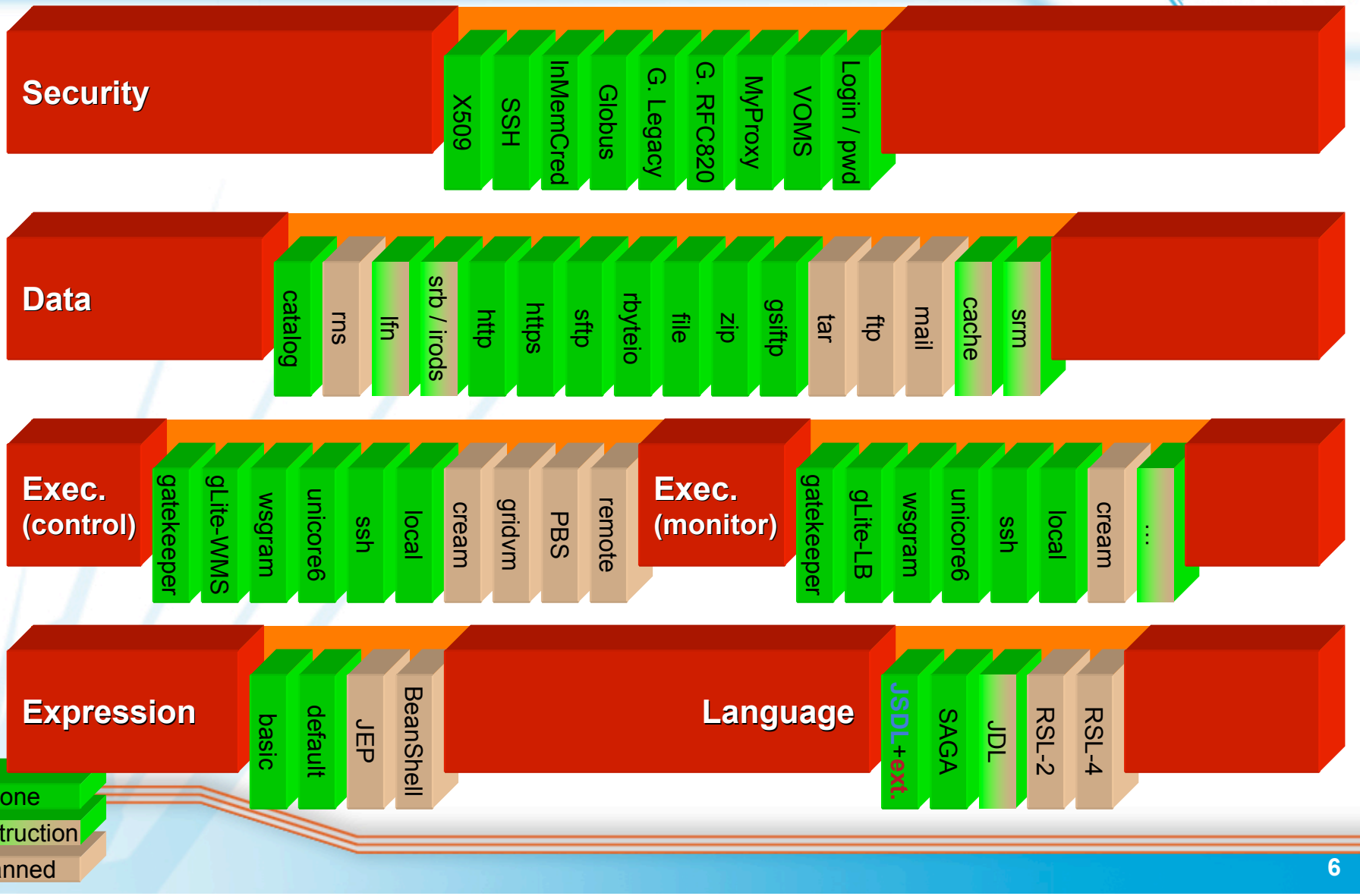
⇨ An API for submitting a collection of jobs to several grid infrastructures with a single job description

Global architecture

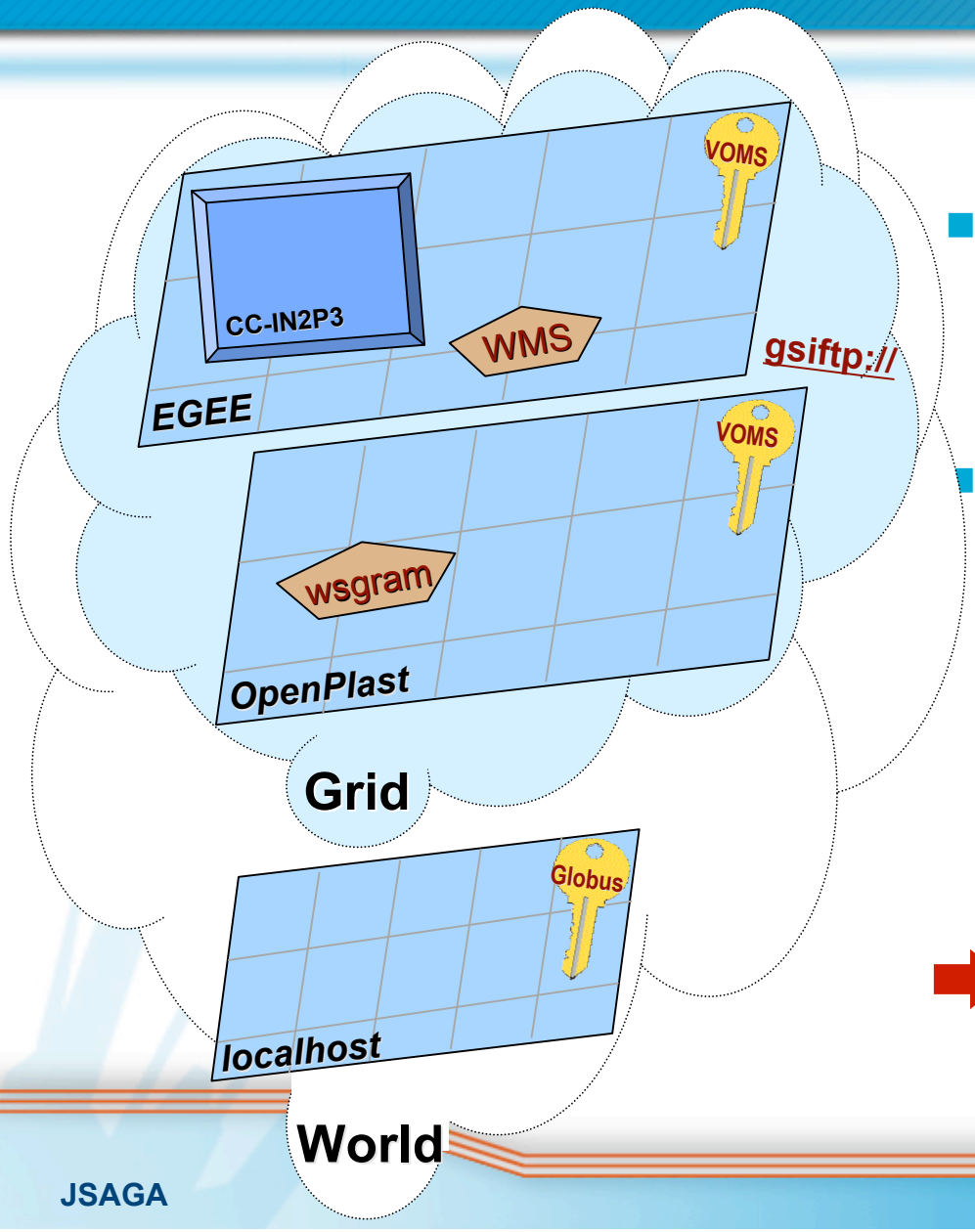


- For end-users: ready-to-use software adapted to their needs
- For application developers: hide infrastructure heterogeneity
- For application developers: hide middleware heterogeneity
- For plug-in developers: As many interfaces as ways to implement the functionalities

Provided plug-ins



Describe grid infrastructures

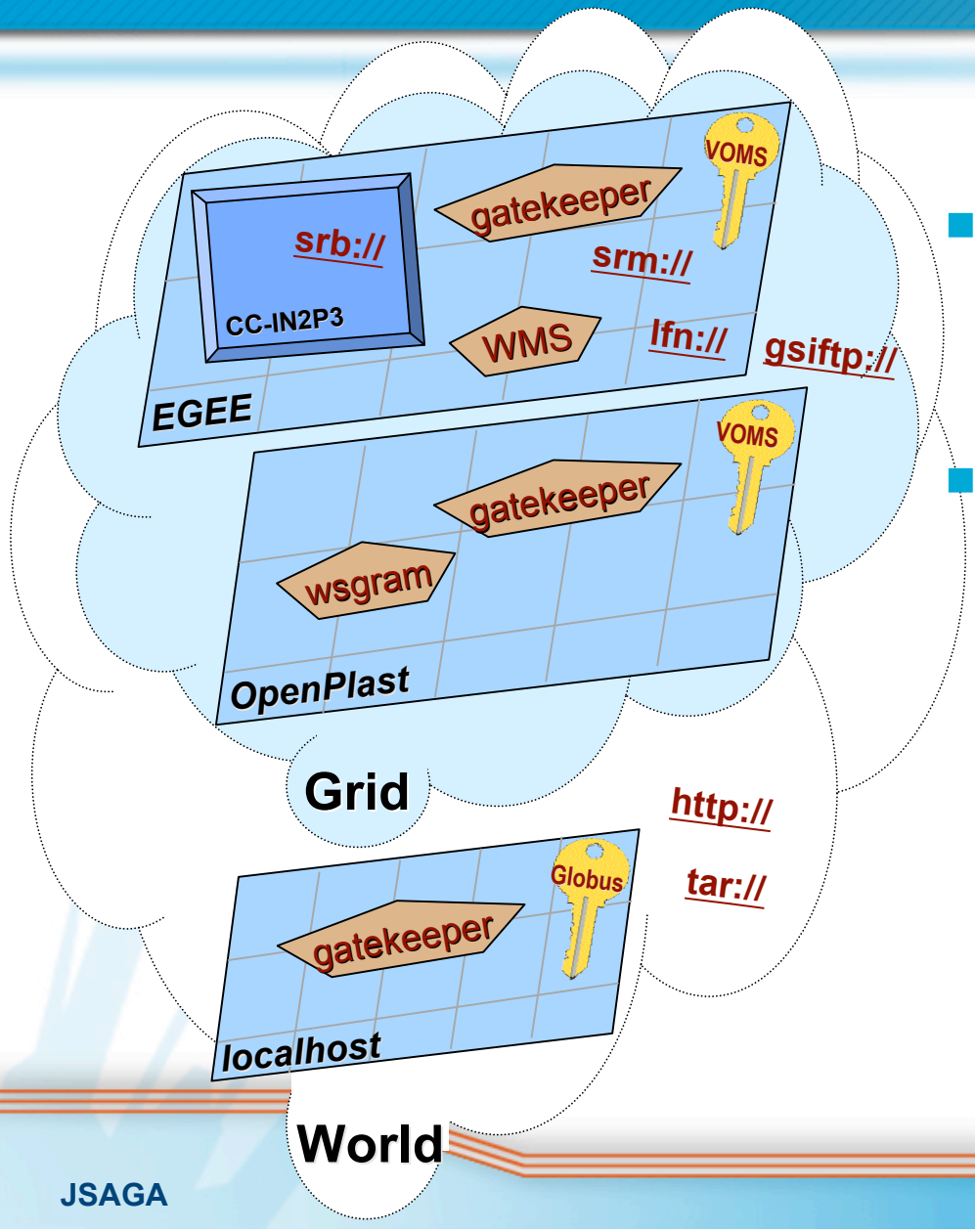


requirements

- Hide middleware heterogeneity
  - Uniform interface (SAGA)
- Hide infrastructure heterogeneity
  - Selection of the right security context
  - Selection of the right client API configuration
  - Transport of the job input/output data to/from worker nodes

➡ Describe the capabilities of the infrastructures you want to use

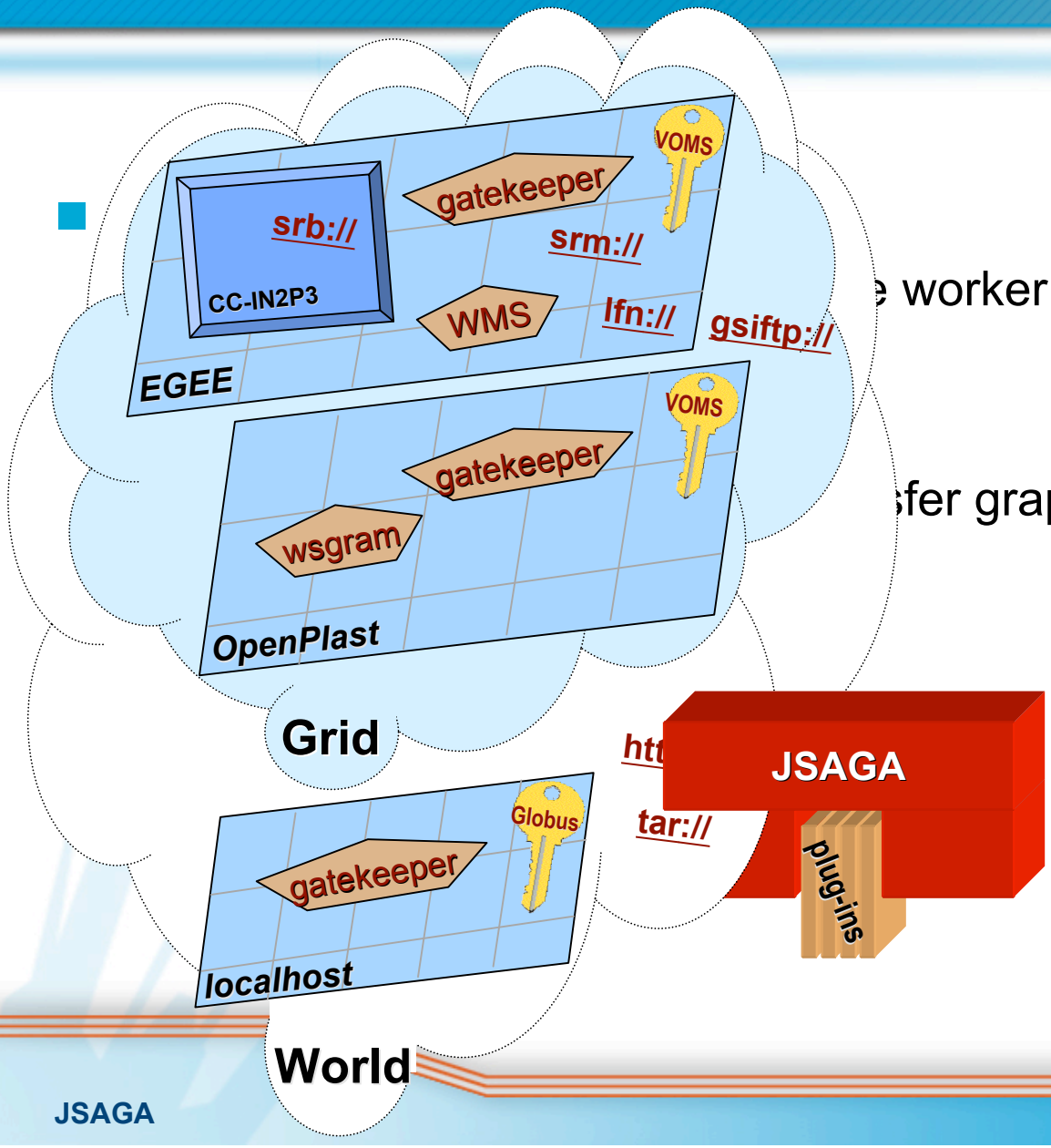
Describe grid infrastructures



examples

- Hide middleware heterogeneity
  - Job management technologies
    - e.g. CREAM, WMS, SSH, GK
- Hide infrastructure heterogeneity
  - Computing Elements (e.g. **GK**)
    - Different grid or site policies
      - e.g. network filtering, shared FS
    - Different environment variables
      - e.g. $VO_?_SW_DIR, /usr/local
    - Different configuration attributes
      - e.g. monitor service URL, shell path on cygwin, default SE URL
    - Commands available on worker
      - e.g. globus-url-copy, srmcp, Scp, wget, tar

Transfer path depends on…

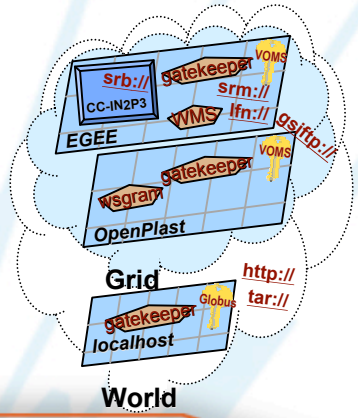


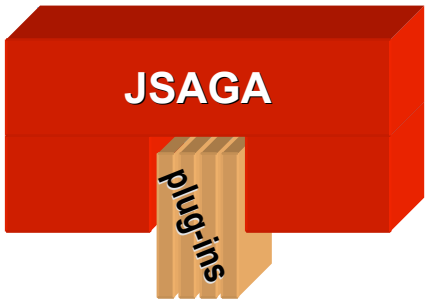
e worker through a single node

sfer graph, according to…

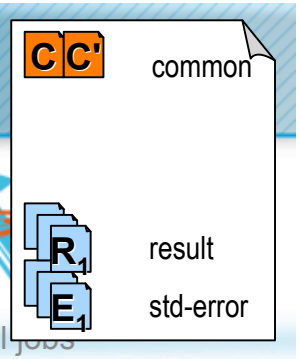
Transfer path depends on…

- grid or site
  - network filtering policy
  - commands available on workers
  - services available from workers (close Storage Element, shared FS)
  - supported context instances
- execution service
  - protocols supported for staging
- transfer protocol
  - access mode (RO, WO, RW)
  - third-party transfer
  - supported data protection level
- data to stage
  - shared by several jobs
  - installed on some worker nodes
  - file size
  - required data protection level





Transfer path depends on…



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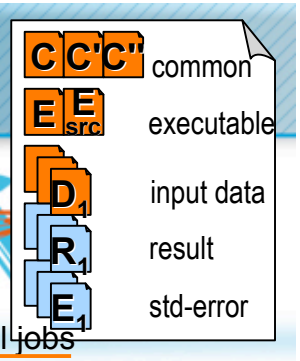

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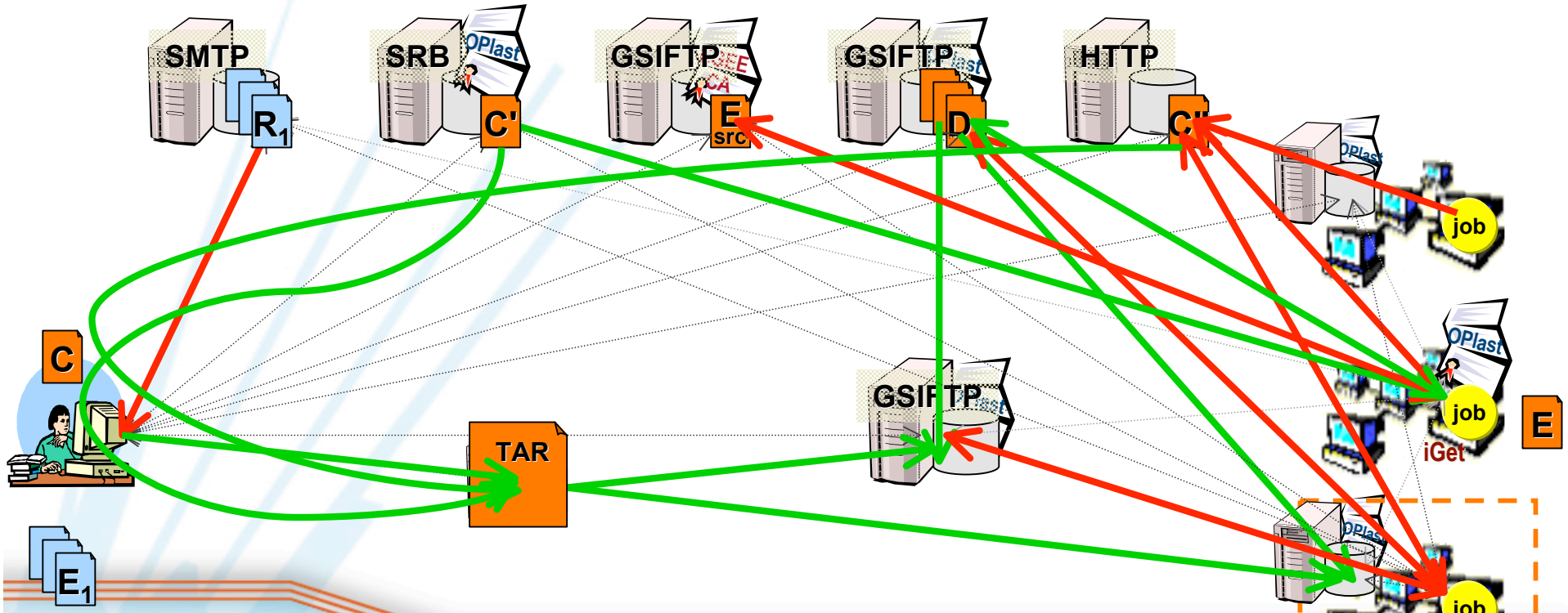
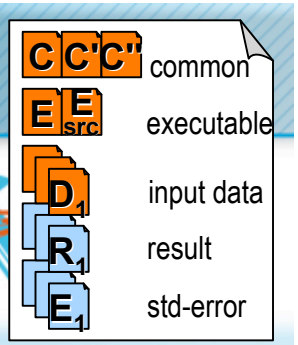
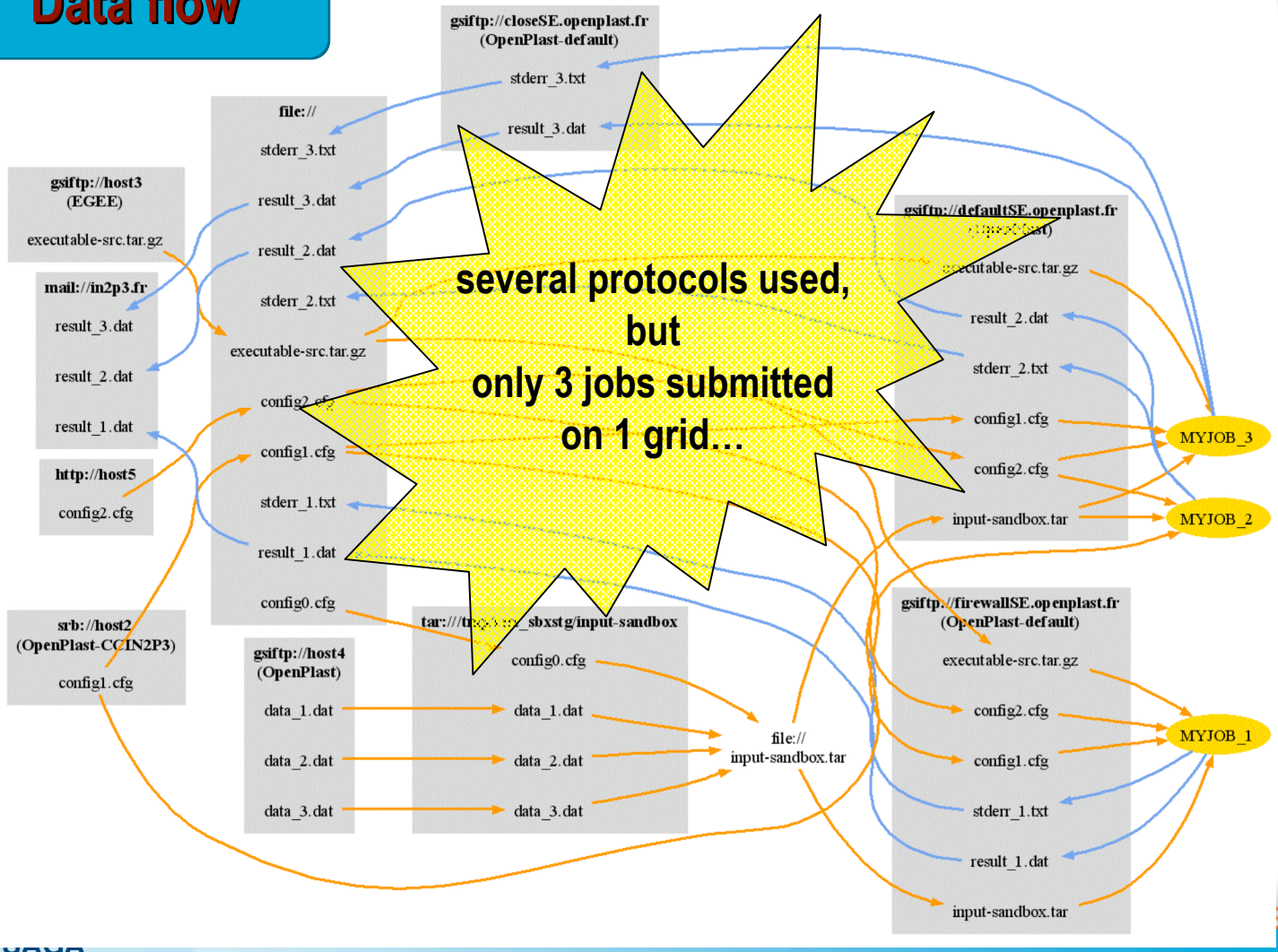
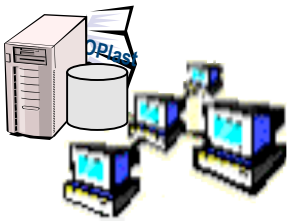


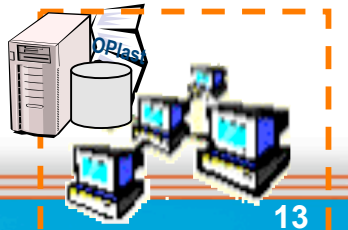
Example of generated graph



Data flow







Conclusion

- Assets of JSAGA
  - does not sacrifice scalability and efficiency for abstraction
    - thanks to design (in particular the definition of plug-in interfaces)
    - thanks to caching mechanisms
  - does not only hide heterogeneity of middleware, but also hides heterogeneity of grid infrastructures
    - thanks to the description of used grid infrastructures (configuration file)
    - thanks to the information provided by the plug-ins
    - thanks to the information provided by the user in his job description

http://grid.in2p3.fr/jsaga/

Related projects

Applications

- JSAGA is used by…
  - Elis@
    - a web portal for submitting jobs to **industrial and research** grid infrastructures
  - JJS (Java Job Submission)
    - a tool for submitting job collections to EGEE
    - optimized for **short-life** jobs (resource selection based on QoS observed while submitting jobs)
  - JUX (Java Universal eXplorer)
    - a multi-protocol file browser