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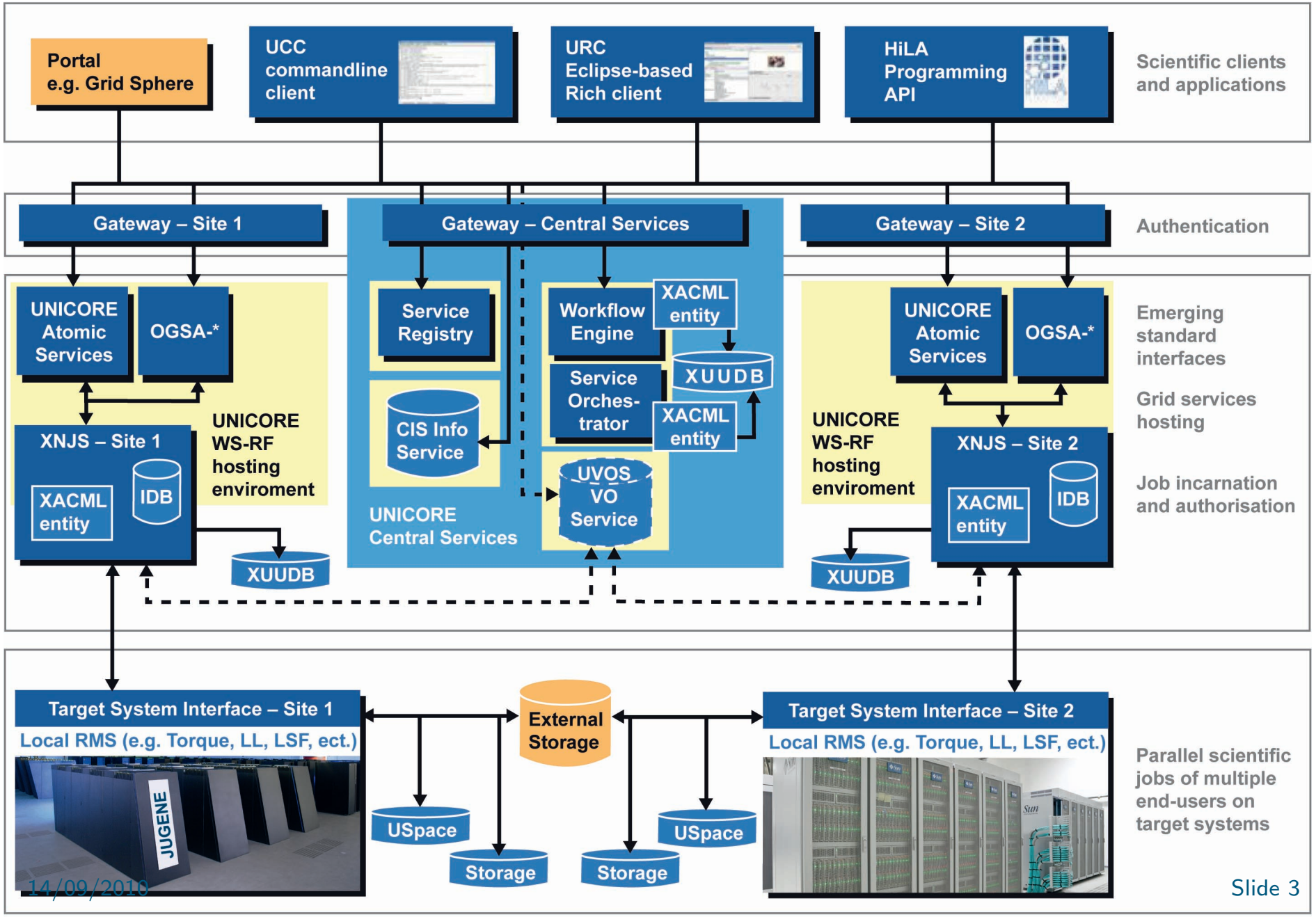
JÜLICH
FORSCHUNGSZENTRUM

"Operational Integration of UNICORE Services"

14/09/2010 | Rebecca Breu

Some Facts About UNICORE

- First version has been developed in 1997
- UNICORE has been worked on in several German and European projects since
- Integrated, complete middleware stack, including user clients
- Written in Java, thus many supported operating systems (*nix, Mac, Windows)
- Many supported Batch systems (LoadLeveler, Torque, Sun Grid Engine, . . .)
- Web services for communication (WS-RF)
- SSL (Secure Sockets Layer) for transport


Portal
e.g. Grid Sphere
UCC
commandline
client
URC
Eclipse-based
Rich client
HiLA
Programming
API
Scientific clients
and applications
Gateway – Site 1
Gateway – Central Services
Gateway – Site 2
Authentication
UNICORE
Atomic
Services
OGSA-*
UNICORE
WS-RF
hosting
enviroment
XNJS – Site 1
XACML
entity
IDB
XUUDB
Service
Registry
CIS Info
Service
UNICORE
Central Services
Workflow
Engine
XACML
entity
XUUDB
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JUGENE
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Parallel scientific
jobs of multiple
end-users on
target systems

UNICORE Clients

- Several different clients (graphical, command line, programming API).
- User installs them on their local machine.

User needs

- a grid certificate
- to apply for an account on a resource/a VO membership
- the URL of the Global Registry

Client gets a list of all available UNICORE services from the Global Registry.

Central UNICORE Services

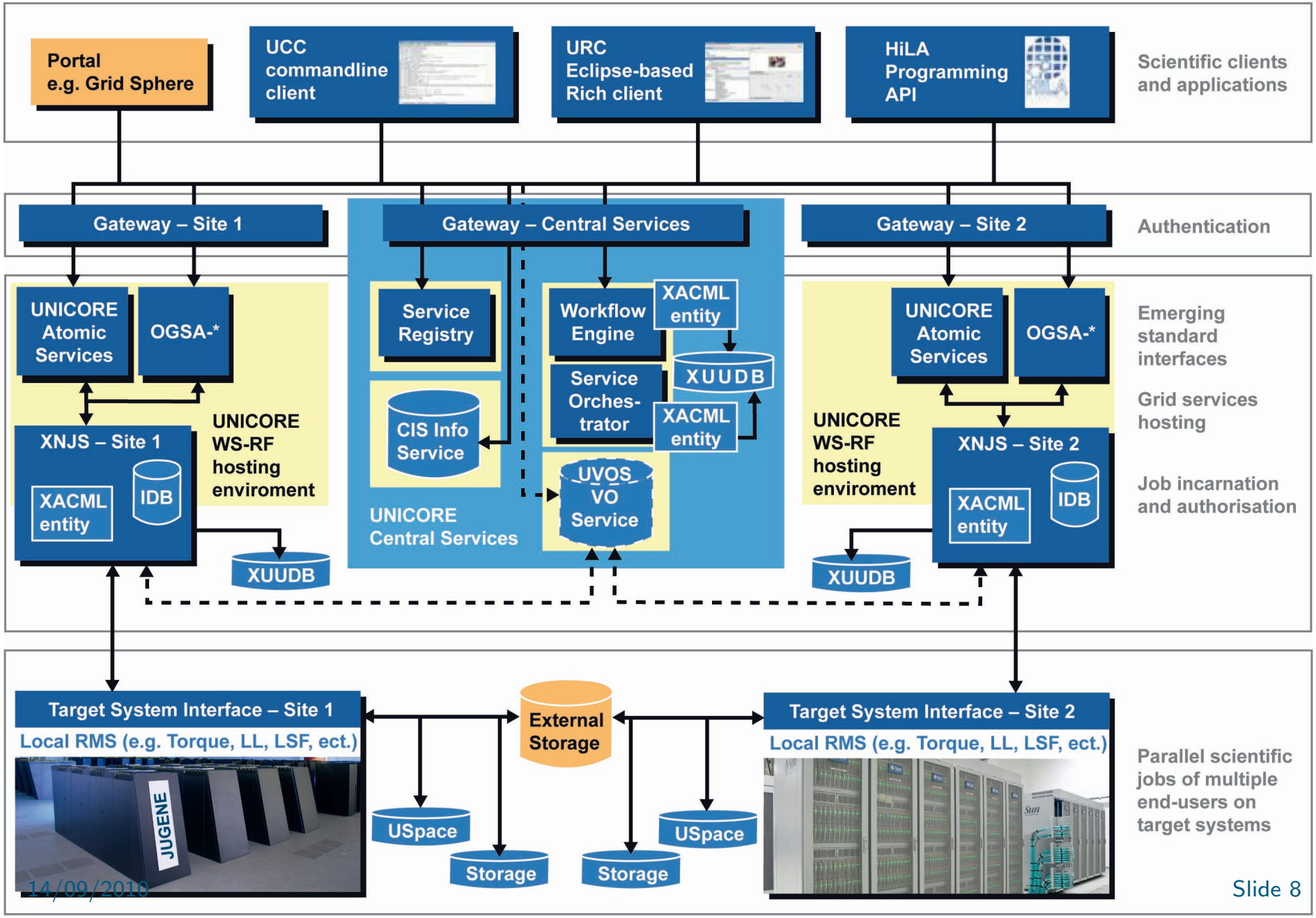
- Registry: All services register themselves; clients ask for available services
- CIS: Common Information Service; collects additional information from all registered UNICORE/X (e.g. number of running jobs, available applications etc)
- Workflow Engine: Accepts workflow jobs
- Service Orchestrator: Manages the individual subjobs of workflow jobs

Site-wide UNICORE Services

- Gateway: Authentication of incoming requests; "Door to the outside world" in a site's firewall
- XUUDB: Mapping of user certificates to machine logins and roles
  - UNICORE/X will ask XUUDB for user authorisation
  - XUUDB can hold different mappings for different UNICORE/X.

UNICORE services per compute resource

- UNICORE/X: Hosting environment for
  - UNICORE Atomic Services (UAS)
  - XNJS, who handles job submission, file transfers etc.
  - CIP, who provides information for the CIS
- TSI: Interface to the batch system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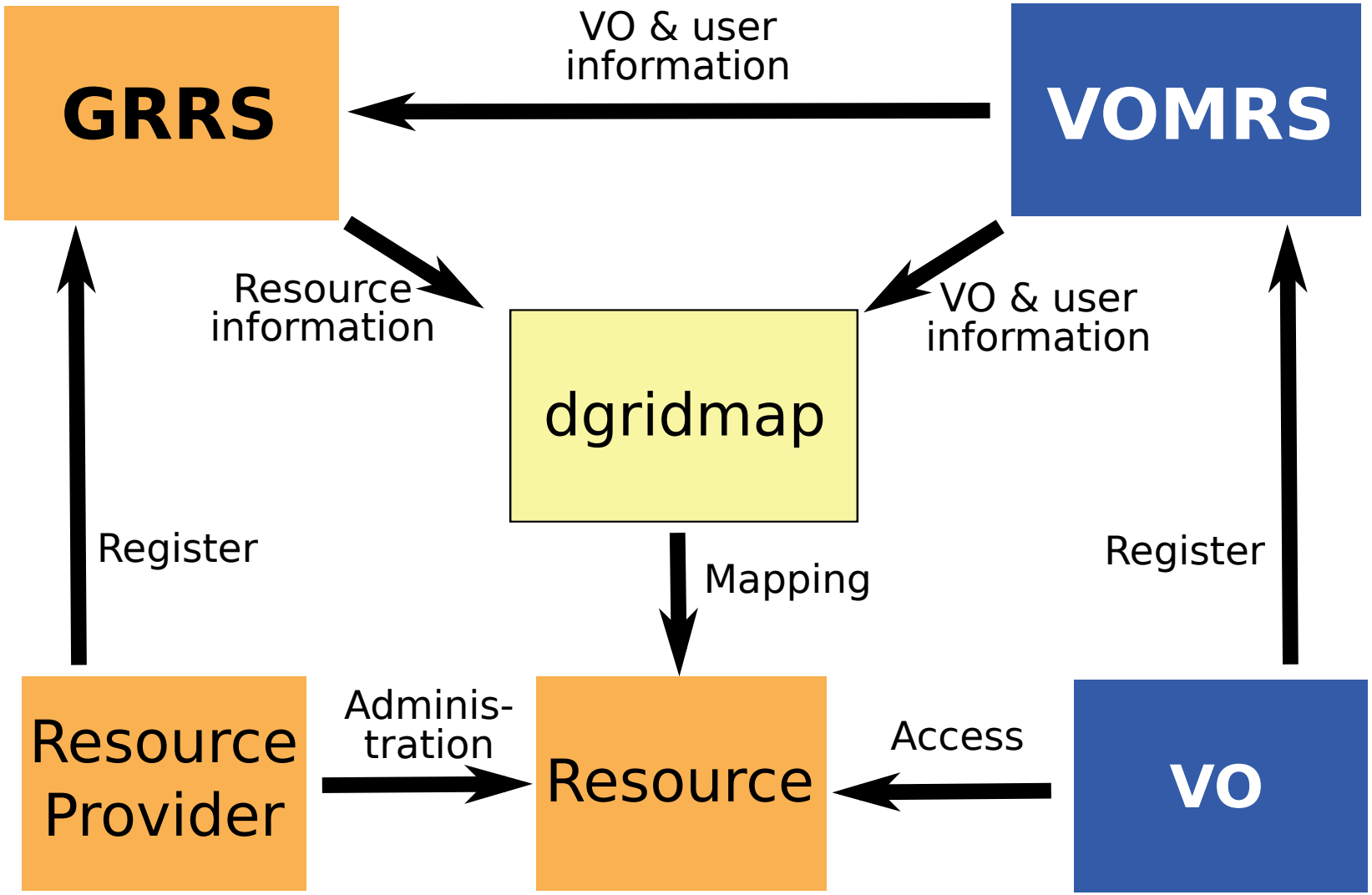
D-Grid

- Projects DGI (Deutsche Grid-Initiative, 2005-2008) created a core grid infrastructure
- Project DGI-2 (2008-2010) enhanced the infrastructure
- NGI-DE (since 2010)
- Lots of community projects
  - Users organised in VOs (over 30)
  - Communities have different demands (e.g. use different middlewares: glite, Globus, UNICORE)
  - ...

Central Services in D-Grid

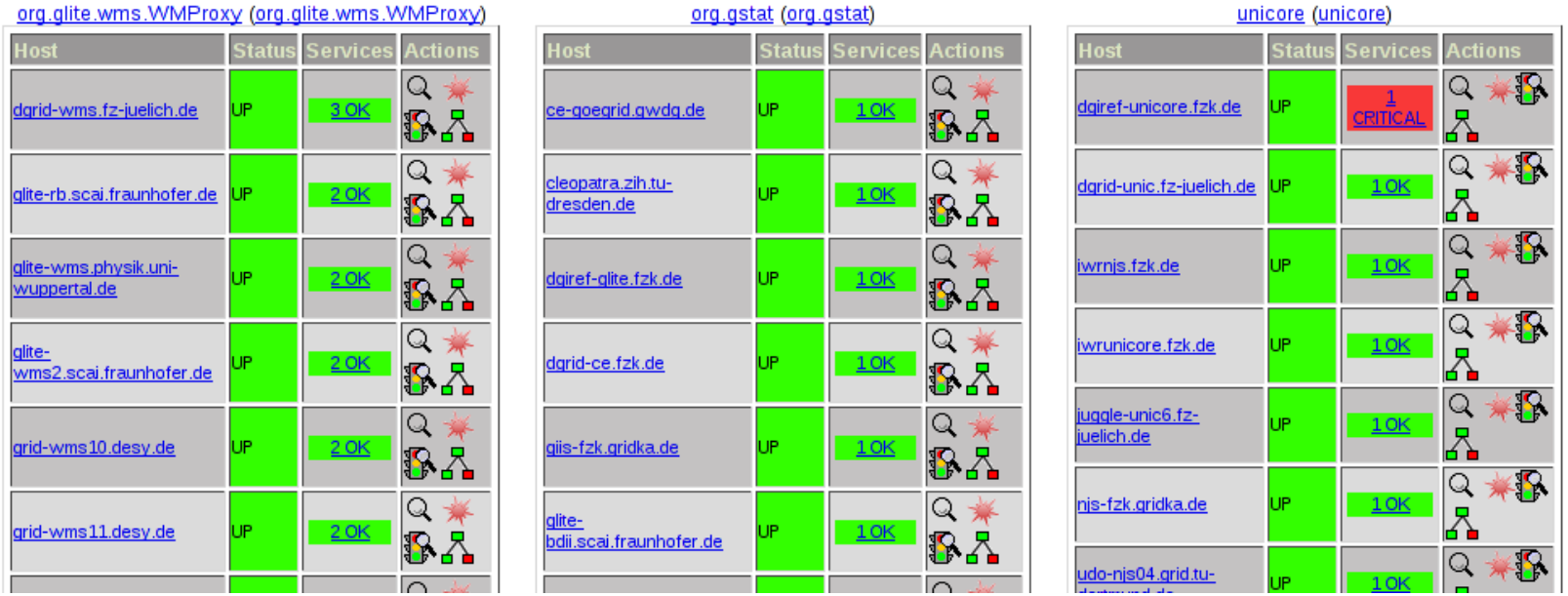
- GRRS (Grid Resource Registry Service): Resource management
- VOMRS (Virtual Organisation Membership Registration Service): User management
- dgridmap: Provides mapping information for the middlewares (UNICORE's XUUDB, Globus' gridmap etc).

D-Grid Compute Resources										
Site	Name	UNICORE5	UNICORE6	GLOBUS4.0	GLOBUS4.2	GLITE	Information Provider	Interaktiv	joined VOs	Administrator
awi	gs4gt3	N	N	gs4gt3.awi.de	N	N	No	gs4gt3.awi.de	→	Stefan Pinkernell
desy	grid	N	N	N	N	grid-ce3.desy.de	No		→	Birgit Lewendel
dlr	aerogrid	N	Y	N	N	N	→	aerogrid.dlr.de	→	Gert Ohme
fau	faui3cluster	N	N	faui3cluster.informatik.uni-erlangen.de	N	N	No	faui3cluster.informatik.uni-erlangen.de	→	Steffen Limmer
fzj	juggle	Y	Y	juggle-glob.fz-juelich.de	N	juggle-glite.fz-juelich.de	→	juggle-inter.fz-juelich.de	→	Mathilde Romberg Christina Dohmen Otto Buechner
fzj	juvis	N	Y	N	N	N	→		→	Mathilde Romberg
fzj	softcomp	N	Y	N	N	N	→		→	Christa Dohmen
fzk	dgiref	Y	Y	dgiref-globus40.fzk.de	N	dgiref-glite.fzk.de	→	dgiref-login.fzk.de	→	Dimitri Nilsen Foued Jrad
fzk	gridka	Y	N	gt4-fzk.gridka.de	N	ce-{2|3|4}-fzk.gridka.de	No	dgrid-fzk.gridka.de	→	Foued Jrad Ingrid Schaeffner
fzk	opus	Y	N	iwrgt4.fzk.de	N	dgrid-ce.fzk.de	No	iwrdgrid.fzk.de	→	Olaf Schneider Foued Jrad
fzk	sx-8	Y	N	N	N	N	No		→	Foued Jrad
gns	paportal.gns-systems.de	N	N	paportal.gns-systems.de	N	N	No	paportal.gns-systems.de	→	Jan Niemann
gsi	gsi01	N	N	lxglobus.gsi.de	N	grid13.gsi.de	No		→	Kilian Schwarz
gsi	gsi02	N	N	lxglobus.gsi.de	N	grid13.gsi.de	→	lxglobus.gsi.de	→	Kilian Schwarz
gwdg	medigrid-srv	Y	N	medigrid-srv.gwdg.de	N	ce-goegrid.gwdg.de	No		→	Dr.Ulrich Schwardmann
hlrs	bwgrid-hlrs	N	N	gridway.dgrid.hlrs.de	N	N	No	gridway.dgrid.hlrs.de	→	Jochen Buchholz Florian Niebling
hlrs	vec-sx9	Y	N	N	N	N	No		→	Jochen Buchholz
iao	stuttgart.iao.fraunhofer.de	N	N	stuttgart-globus.iao.fraunhofer.de	N	N	No		→	Oliver Strauss
ipp	svwmptgrid01	N	N	svwmptgrid01.ipp-hgw.mpg.de	N	N	→	svwmptgrid01.ipp-hgw.mpg.de	→	-
ipp	svwmptgrid01	N	N	svwmptgrid01.ipp-hgw.mpg.de	N	N	→	svwmptgrid01.ipp-hgw.mpg.de	→	-
izbi	aprilia	N	N	aprilia.izbi.uni-leipzig.de	N	N	No		→	Michael Hartung
izbi	portal1	N	N	portal1.medigrid.izbi.uni-	N	N	No		→	Michael


GRRS
VO & user information
VOMRS
Resource information
VO & user information
dgridmap
Register
Mapping
Register
Resource Provider
Adminis-tration
Resource
Access
VO

Monitoring in D-Grid

- Nagios monitors availability of all services
  - Nagios adapters for UNICORE available
- DMON project created a service that collects information from each middleware's information provider (CIS, MDS4, BDII), unifies it and stores it in a GLUE2-based database.



org.glite.wms.WMProxy (org.glite.wms.WMProxy)

Host	Status	Services	Actions
dgrid-wms.fz-juelich.de	UP	3 OK	
glite-rb.scai.fraunhofer.de	UP	2 OK	
glite-wms.physik.uni-wuppertal.de	UP	2 OK	
glite-wms2.scai.fraunhofer.de	UP	2 OK	
grid-wms10.desy.de	UP	2 OK	
grid-wms11.desy.de	UP	2 OK	

org.gstat (org.gstat)

Host	Status	Services	Actions
ce-goegrid.gwdg.de	UP	1 OK	
cleopatra.zih.tu-dresden.de	UP	1 OK	
dgiref-glite.fzk.de	UP	1 OK	
dgrid-ce.fzk.de	UP	1 OK	
giis-fzk.gridka.de	UP	1 OK	
glite-bdii.scai.fraunhofer.de	UP	1 OK	

unicore (unicore)

Host	Status	Services	Actions
dgiref-unicore.fzk.de	UP	1 CRITICAL	
dgrid-unic.fz-juelich.de	UP	1 OK	
iwrnjs.fzk.de	UP	1 OK	
iwrunicore.fzk.de	UP	1 OK	
juggle-unic6.fz-juelich.de	UP	1 OK	
njs-fzk.gridka.de	UP	1 OK	
udo-njs04.grid.tu-	UP	1 OK	

Questions/Issues regarding EGI

- Pool accounts are not desired within D-Grid (NGI-DE)
  $\longrightarrow$ Each user needs an account on each resource!
  Thus we need:
  - Central service where users can register (so that they needn't register at each site separately)
  - Service that provides mapping information for middlewares
- D-Grid is organised in Virtual Organisations (VOs). How do they fit in?
- D-Grid supports different user roles. What about those?