

Open Grid Forum: Overview of OGF Standards Relevant to Cloud Computing

Alan Sill
Vice President of Standards

ITU-T JCA-Cloud Meeting
Feb. 26, 2013

About the Open Grid Forum:



Open Grid Forum (OGF) is a leading global standards development organization operating in the areas of cloud, grid and related forms of advanced distributed computing.

The OGF community pursues these topics through an **open process** for development, creation and promotion of relevant specifications and use cases.

OGF actively engages partners and participants throughout the international arena through an **open forum with open processes** to champion architectural blueprints related to cloud and grid computing.

The resulting specifications and standards enable **pervasive adoption of advanced distributed computing techniques** for business and research worldwide.

History and Background



- OGF began in 2001 as an organization to promote the advancement of distributed computing worldwide.
- Grid Forum --> Global Grid Forum --> GGF + Enterprise Grid Alliance --> formation of OGF in 2005.
- Mandate is to take on **all forms of distributed computing** and to work to promote cooperation, information exchange, best practices use and standardization.
- OGF best known for a series of important computing, security and network standards that form the basis for major science and business-based distributed computing (BES, GridFTP, DRMAA, JSDL, RNS, GLUE, UR, etc.).
- Have also been working on cloud and Big Data standards (OCCI, WS-Agreement, DFDL, etc.) for several years.
- Cooperative work agreements with other SDOs in place.

- OGF has extensive set of applicable standards related to federated community grid and cloud computing:
 - Federated Identity Management (FedSec-CG)
 - Managing the Trust Eco-System (CA operations, AuthN/AuthZ)
 - Virtual Organizations (VOMS)
 - Job Submission and Workflow Management (JSDL, BES)
 - Network Management (NSI, NML, NMC, NM)
 - Secure, fast multi--party data transfer (GridFTP, SRM)
 - Data Format Description (DFDL)
 - Service Agreements (WS-Agreement, WS-Agreement Negotiation)
 - Cloud Computing interfaces (OCCI)
 - Distributed resource management (DRMAA, SAGA, etc.)
 - Firewall Traversal (FiTP)
 - Others under development
- Working to gather this information to form an organized description of OGF work - an OGF “**Cloud Portfolio**”.

GFD Publication History To Date

2000

2004

2008

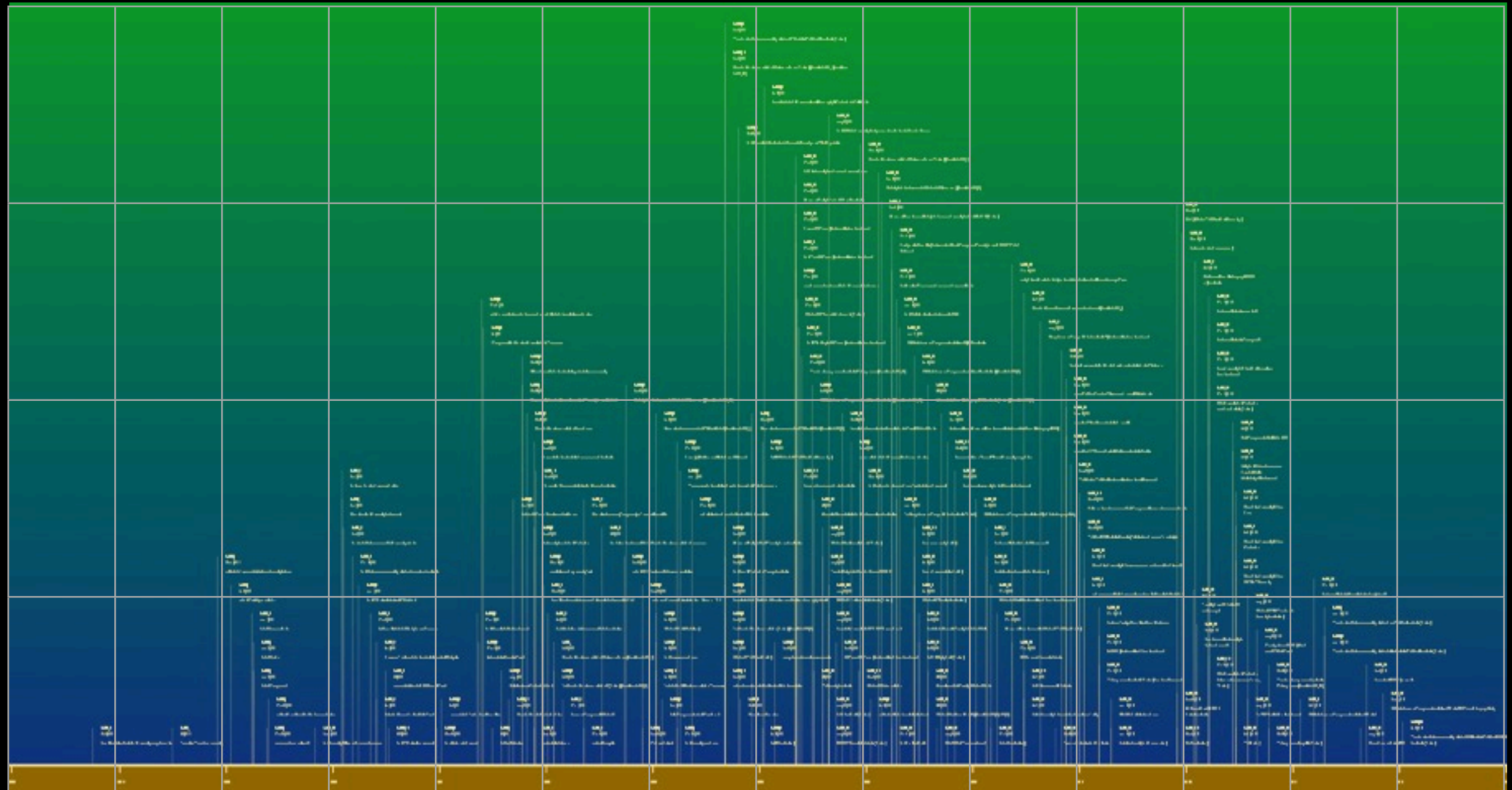
2012

24

18

12

6



2000 - Early 2013 ...

Starting Point for OGF Documents:



<http://ogf.org/documents>



OPEN FORUM | OPEN STANDARDS

About OGF Documents
OGF DOCUMENT SERIES
All Active Documents
Recommendation
Informational
Community Practice
Experimental
Historical Documents
PUBLIC COMMENTS
Archived Comments
DRAFT DOCUMENTS
EGA DOCUMENTS

OGF Document Series
Click on the Document Number (GFD.n) to view the document or view [all the documents in Editor pipeline.](#)
Showing documents 1-10 of 181. | [First](#) | [Prior](#) | [Next](#) | [Last](#) | [All](#)

Document	Title	Document Type	Author(s)	Publication Date	Area/Group
GFD.200	Web Services Data Access and Integration - The RDF(S) Realization (WS-DAIRDFS) RDF(S) Querying Specification, Version 1.0	P-REC	I. Kojima, S. M. Pahlevi, S. Lynden	2013-01-10	Data DAIS-WG
GFD.198	Distributed Resource Management Application API Version 2 (DRMAA) - C Language Binding	P-REC	P. Tröger, R. Brobst, D. Gruber, M. Mamonski, A. Merzky	2012-11-04	Applications DRMAA-WG
GFD.197	Example set of DFDL 1.0 properties	INFO	S. Hanson	2012-09-06	Data DFDL-WG
GFD.196	Firewall Traversal Protocol (FITP)	P-REC	R. Niederberger	2012-08-19	Infrastructure FVGA-WG
GFD.195	SAGA API Extension: Information System Navigator API	P-REC	S. Fisher, A. Wilson	2012-03-12	Applications SAGA-WG
GFD.194	Distributed Resource Management Application API Version 2 (DRMAA) [Obsoletes GFD.22, GFD.130 and GFD.133]	P-REC	P. Tröger, R. Brost, D. Gruber, M. Mamonski, D. Templeton	2012-11-04	Applications DRMAA-WG
GFD.193	WS-Agreement Negotiation Version 1.0	P-REC	O. Waeldrich, D. Battré, F. Brazier, K. Clark, M. Oey, A. Papaspyrou, P. Wieder, W. Ziegler	2011-10-10	Compute GRAAP-WG

GFD Publication History: Full Recommendations To Date

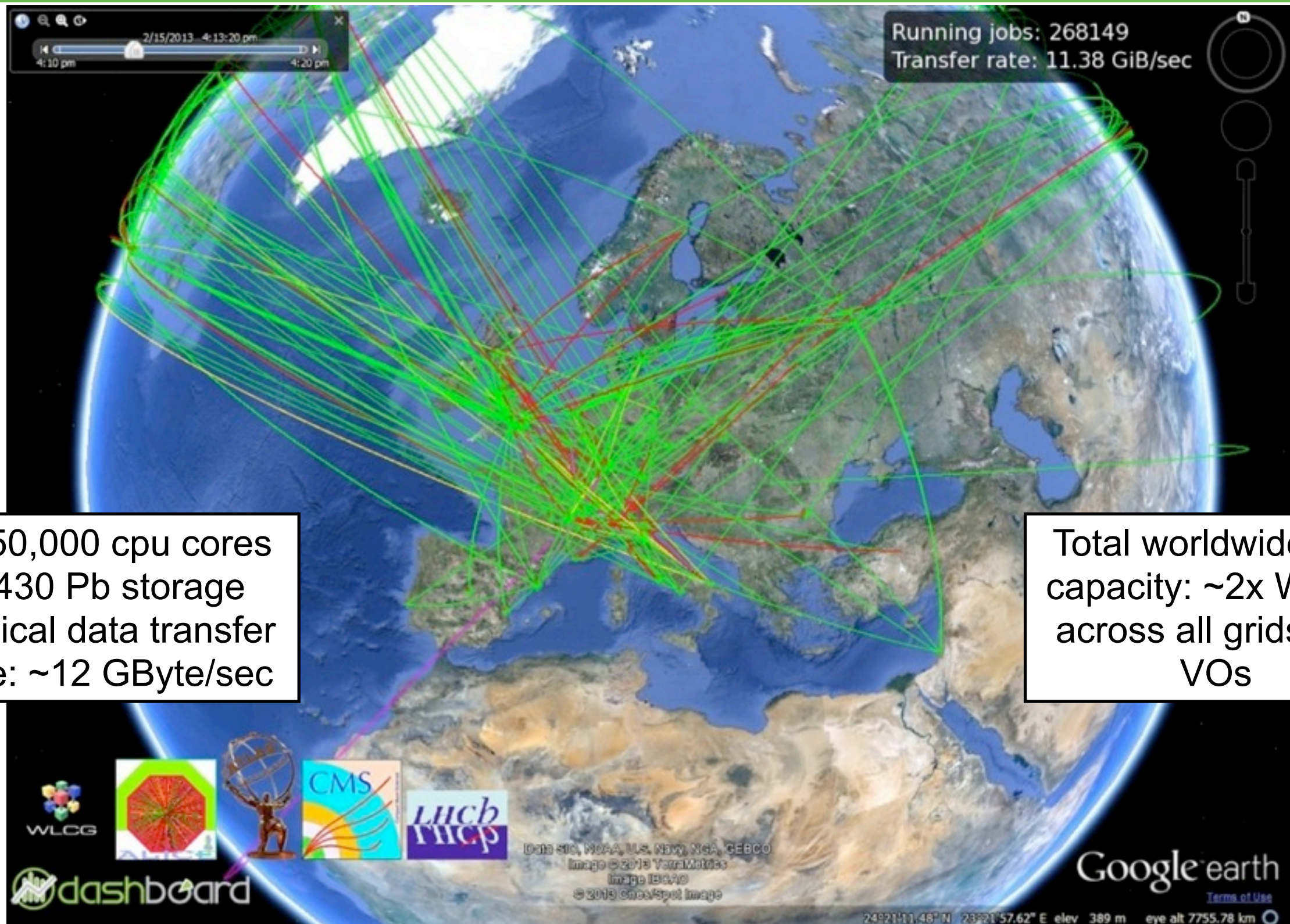
▼ REC			
GFD.52	2005	A GridRPC Model and API for End-User Applications	REC
GFD.87	2007	ByteIO Specification 1.0	REC
GFD.88	2007	ByteIO OGSA® WSRF Basic Profile Rendering 1.0	REC
GFD.107	2007	Web Services Agreement Specification (WS-Agreement) [Obsoleted by GFD.192]	REC
GFD.22	2007	Distributed Resource Management Application API Specification 1.0 [Obsoleted by GFD.133]	REC
GFD.108	2007	OGSA® Basic Execution Service Version 1.0	REC
GFD.111	2007	JSDL HPC Profile Application Extension, Version 1.0	REC
GFD.114	2007	HPC Basic Profile, Version 1.0	REC
GFD.90	2008	A Simple API for Grid Applications (SAGA)	REC
GFD.129	2008	The Storage Resource Manager Interface Specification Version 2.2	REC
GFD.133	2008	Distributed Resource Management Application API Specification 1.0 [Obsoletes GFD.22]	REC
GFD.136	2008	Job Submission Description Language (JSDL) Specification, Version 1.0 [Obsoletes GFD.56]	REC
GFD.192	2011	Web Services Agreement Specification (WS-Agreement) [Obsoletes GFD.107]	REC
GFD.74	2012	Web Services Data Access and Integration - The Core (WS-DAI) Specification, Version 1.0	REC
GFD.76	2012	Web Services Data Access and Integration - The Relational <u>Realisation</u> (WS-DAIR) Specification, Version 1.0	REC

Full REC status represents OGF's highest level of output standard: Requires documentation of multiple implementations in the field and a separate review after at least 6 months of practical experience.

GFD Publication History: Proposed Recommendations

▼ P-REC			
GFD.20	2003	GridFTP: Protocol Extensions to FTP for the Grid	P-REC
GFD.23	2004	A Hierarchy of Network Performance Characteristics for Grid Applications and Services	P-REC
GFD.72	2006	OGSA® WSRF Basic Profile 1.0	P-REC
GFD.75	2006	Web Services Data Access and Integration - The XML Realization (WS-DAIX) Specification, Version 1.0	P-REC
GFD.98	2007	Usage Record - Format Recommendation	P-REC
GFD.101	2007	Resource Namespace Service Specification	P-REC
GFD.109	2007	WS-Naming Specification	P-REC
GFD.110	2007	Information Dissemination in the Grid Environment - Base Specifications	P-REC
GFD.115	2007	JSDL SPMD Application Extension, Version 1.0	P-REC
GFD.130	2008	Distributed Resource Management Application API 1.0 - IDL Specification	P-REC
GFD.131	2008	Secure Addressing Profile 1.0	P-REC
GFD.132	2008	Secure Communications Profile 1.0	P-REC
GFD.134	2008	OGSA-DMI Functional Specification 1.0	P-REC
GFD.135	2008	HPC File Staging Profile, Version 1.0	P-REC
GFD.138	2008	OGSA® Basic Security Profile 2.0 [Obsoletes GFD.86, GFD.99]	P-REC
GFD.144	2009	SAGA API Extension: Service Discovery API	P-REC
GFD.147	2009	GLUE Specification v. 2.0	P-REC
GFD.149	2009	JSDL Parameter Sweep Job Extension	P-REC
GFD.151	2009	HPCBP Advanced Filter Extension	P-REC
GFD.157	2009	Use of WS-TRUST and SAML to access a Credential Validation Service	P-REC
GFD.158	2009	Use of SAML to retrieve Authorization Credentials	P-REC
GFD.159	2009	Use of XACML Request Context to Obtain an Authorisation Decision	P-REC
GFD.172	2010	RNS 1.1 OGSA WSRF Basic Profile Rendering 1.0	P-REC
GFD.171	2010	RNS Specification 1.1	P-REC
GFD.174	2011	Data Format Description Language (DFDL) v1.0 Specification	P-REC
GFD.178	2011	SAGA API Extension: Message API	P-REC
GFD.177	2011	SAGA API Extension: Advert API	P-REC
GFD.186	2011	Data Management API within the GridRPC	P-REC
GFD.188	2011	WS-Iterator 1.0	P-REC
GFD.185	2011	Open Cloud Computing Interface - RESTful HTTP Rendering	P-REC
GFD.184	2011	Open Cloud Computing Interface - Infrastructure	P-REC
GFD.183	2011	Open Cloud Computing Interface - Core	P-REC
GFD.187	2011	OGSA-DMI Plain Web Service Rendering Specification 1.0	P-REC
GFD.193	2011	WS-Agreement Negotiation Version 1.0	P-REC
GFD.194	2012	Distributed Resource Management Application API Version 2 (DRMAA) [Obsoletes GFD.22, GFD.130 and GFD.133]	P-REC
GFD.195	2012	SAGA API Extension: Information System Navigator API	P-REC
GFD.196	2012	Firewall Traversal Protocol (FITP)	P-REC
GFD.198	2012	Distributed Resource Management Application API Version 2 (DRMAA) - C Language Binding	P-REC
GFD.200	2013	Web Services Data Access and Integration - The RDF(S) Realization (WS-DAIRDFS) RDF(S) Querying Specification, Version	P-REC

Example: Worldwide LHC Computing Grid



XSEDE: The Next Generation of US Supercomputing Infrastructure

The Role of Standards for Risk Reduction and
Inter-operation in XSEDE

Andrew Grimshaw

OGF standards
power the largest
supercomputing
infrastructures in
the world!

XSEDE

Extreme Science and Engineering
Discovery Environment

UNICORE in XSEDE: Towards a large-scale scientific Environment based on Open Standards

inSiDE

inSiDE • Vol. 9 No.2 • Autumn 2011

Innovatives Supercomputing in Deutschland

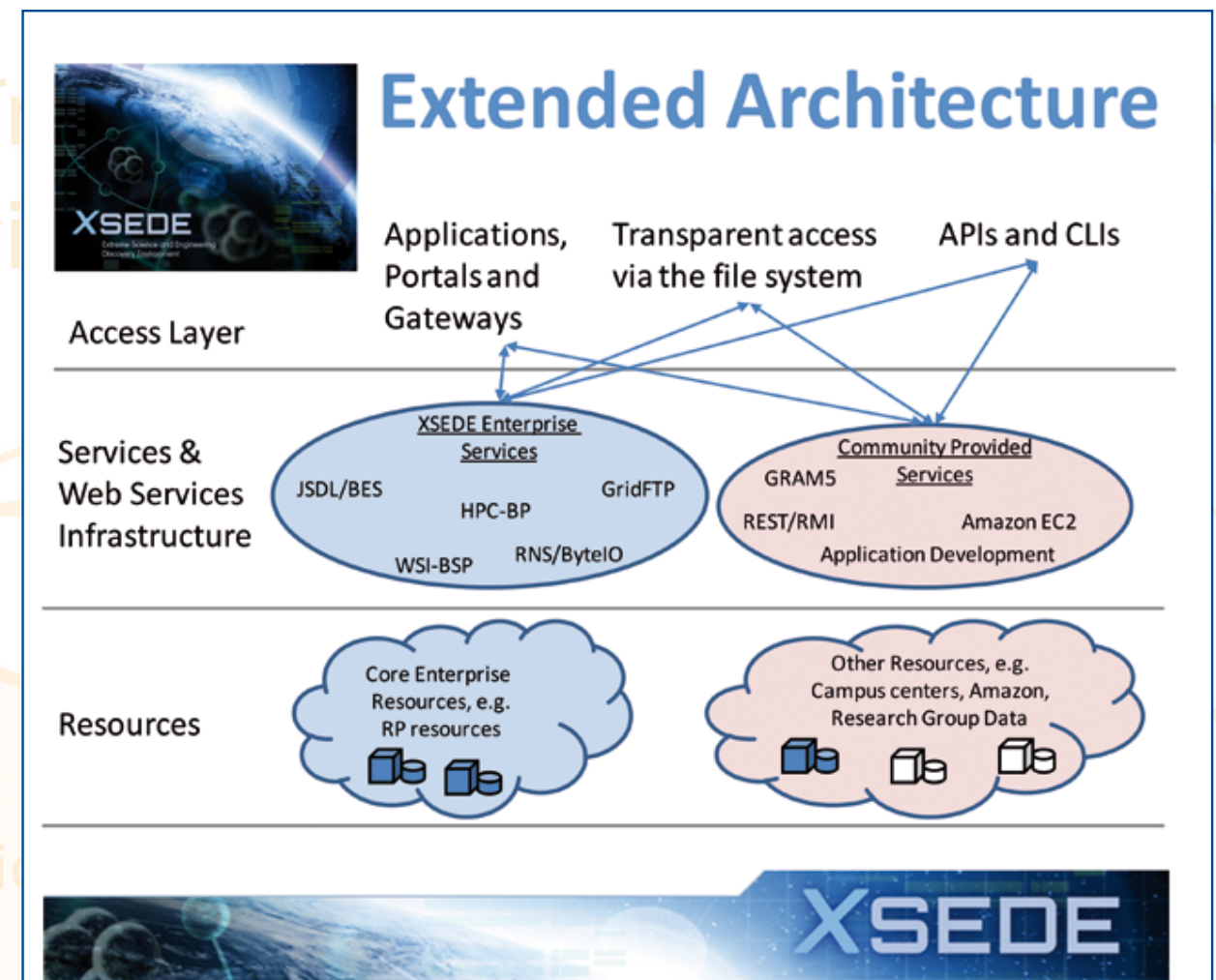


Figure 1: The current XSEDE architecture aims at providing XSEDE Enterprise Services at every major XSEDE site and optionally available Community Provided Services. The architecture will evolve over time according to end-users' needs.

• Morris Riedel
• Bastian Demuth

lightweight Genesis II services, UNICORE meets all the security requirements of modern High Performance Computing centres and provides extensive support for their highly specialized hardware as well as their varying batch systems.

Infrastructure Vision

The XSEDE architecture envisions deploying UNICORE as part of the XSEDE Enterprise Services at major US high performance centres whereas Genesis II will be used for integrating smaller computer systems such as desktop PCs in order to provide interoperability with campus Grids across the country. The

resulting infrastructure is expected to cover both high performance and high throughput computing, thus enabling innovative research and discovery requiring both types of parallel computations. Moreover, collaboration between American and European scientists will be easier than ever: UNICORE will also be deployed on the European Grid Infrastructure (EGI) and is already installed on many of the systems forming the infrastructure of the European supercomputing project PRACE.

Jülich
Supercomputing
Centre

XSEDE Services Layer:

LSN-MAGIC Meeting
February 22, 2012

Simple services combined in many ways

- Resource Namespace Service 1.1
- OGSA Basic Execution Service
- OGSA WSRF BP – metadata and notification
- OGSA-BytelIO
- GridFTP
- JSDL, BES, BES HPC Profile
- WS Trust Secure Token Services
- WSI BSP for transport of credentials
- ... *(more than we have room to cover here)*

Examples – (not
a complete list)

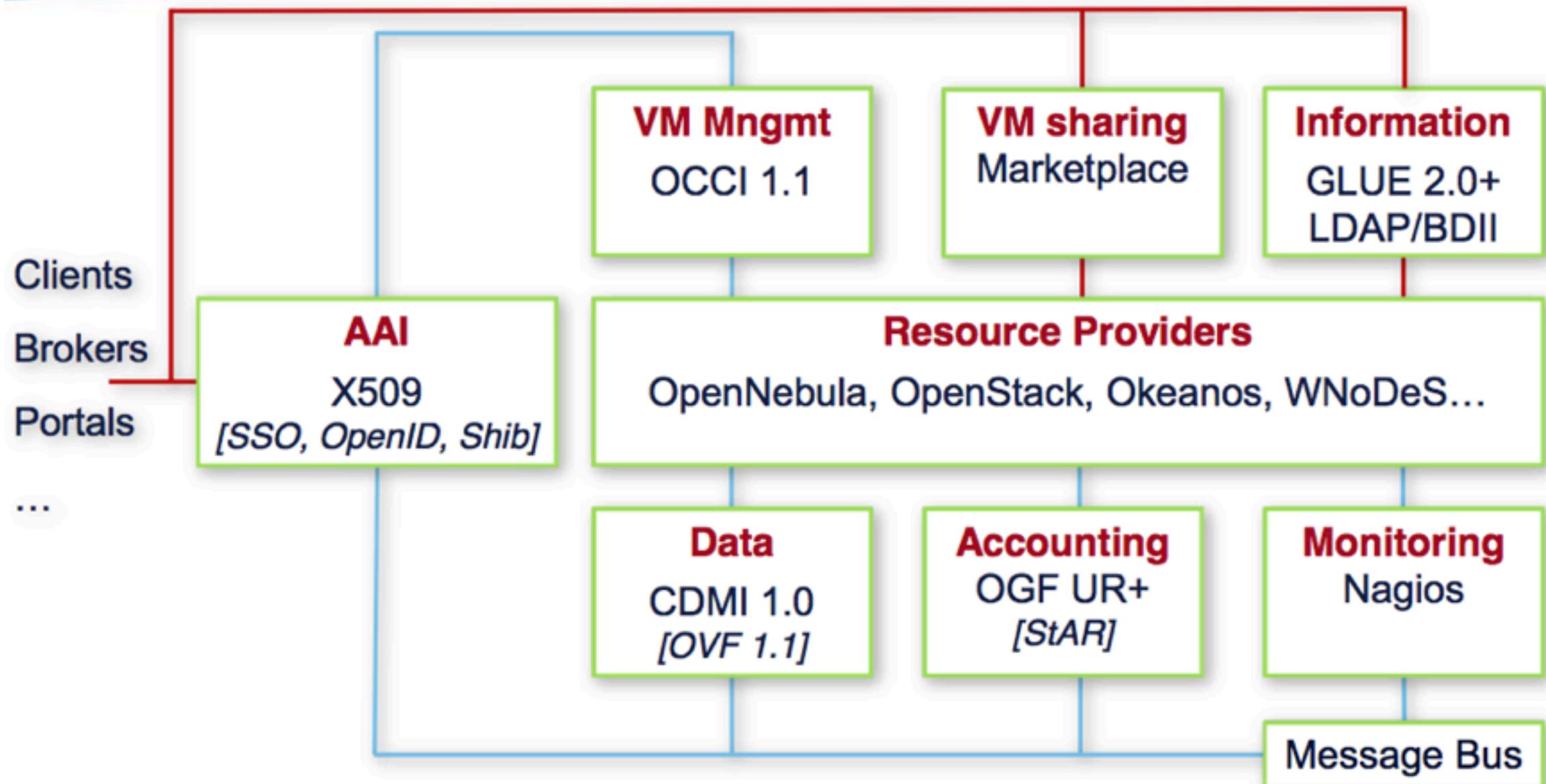
XSEDE represents a the state of the art in the use of modern standards in international supercomputing cyberinfrastructure.

OGF Standards In Practical Use For Cloud Federation:

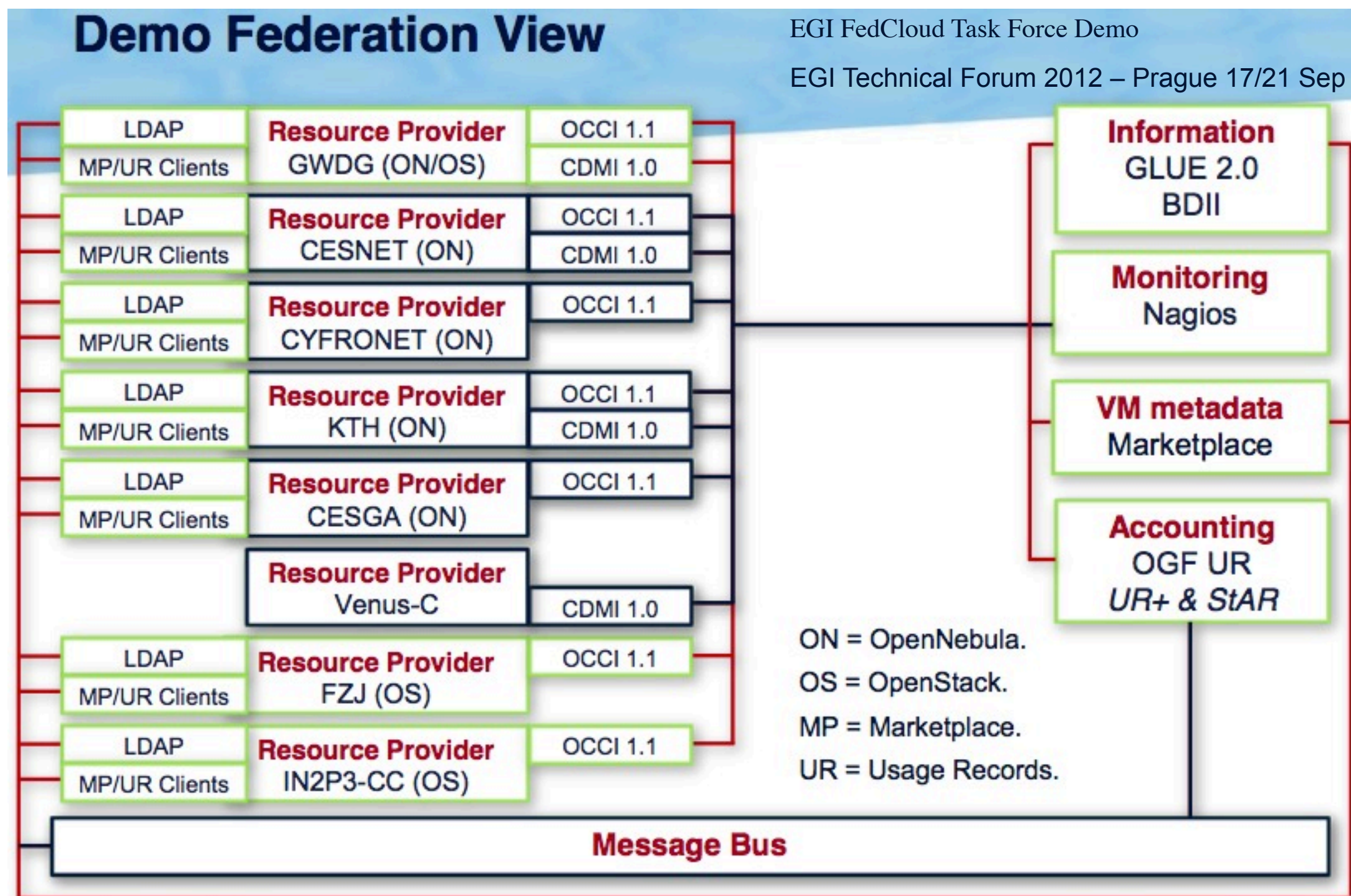
Federation Test bed

EGI FedCloud Task Force Demo

EGI Technical Forum 2012 – Prague 17/21 Sep



Example of OGF Standards Use:



OGF Standards In Use In Industry:



- DRMAA: Distributed Resource Management Application API
Grid Engine, Open Grid Scheduler: (open source); TORQUE and related products: *Adaptive Computing*; PBS Works: *Altair Engineering*; Gridway: *DSA Research*; Condor: U. of Wisconsin / *Red Hat*;
- OGSA® Basic Execution Service Version 1.0 and BES HPC Profile:
BES++ for LSF/SGE/PBS: *Platform Computing*; Windows HPC Server 2008: *Microsoft Corporation*; PBS Works - (client only): *Altair Engineering*;
- JSDL: Job Submission Description Language (family of specifications):
BES++ for LSF/SGE/PBS and Platform LSF: *Platform Computing*; Windows HPC Server 2008: *Microsoft Corporation*; PBS Works - (client only): *Altair Engineering*;
- WS-Agreement (family of specifications):
ElasticLM License-as-a-Service: *ElasticLM*; BEinGrid SLA Negotiator, LM-Architecture and Framework: (Multiple partners); BREIN SLA Management Framework: (Multiple partners); WSAG4J, Web Services Agreement for Java (framework implementation): *Fraunhofer SCAI*.

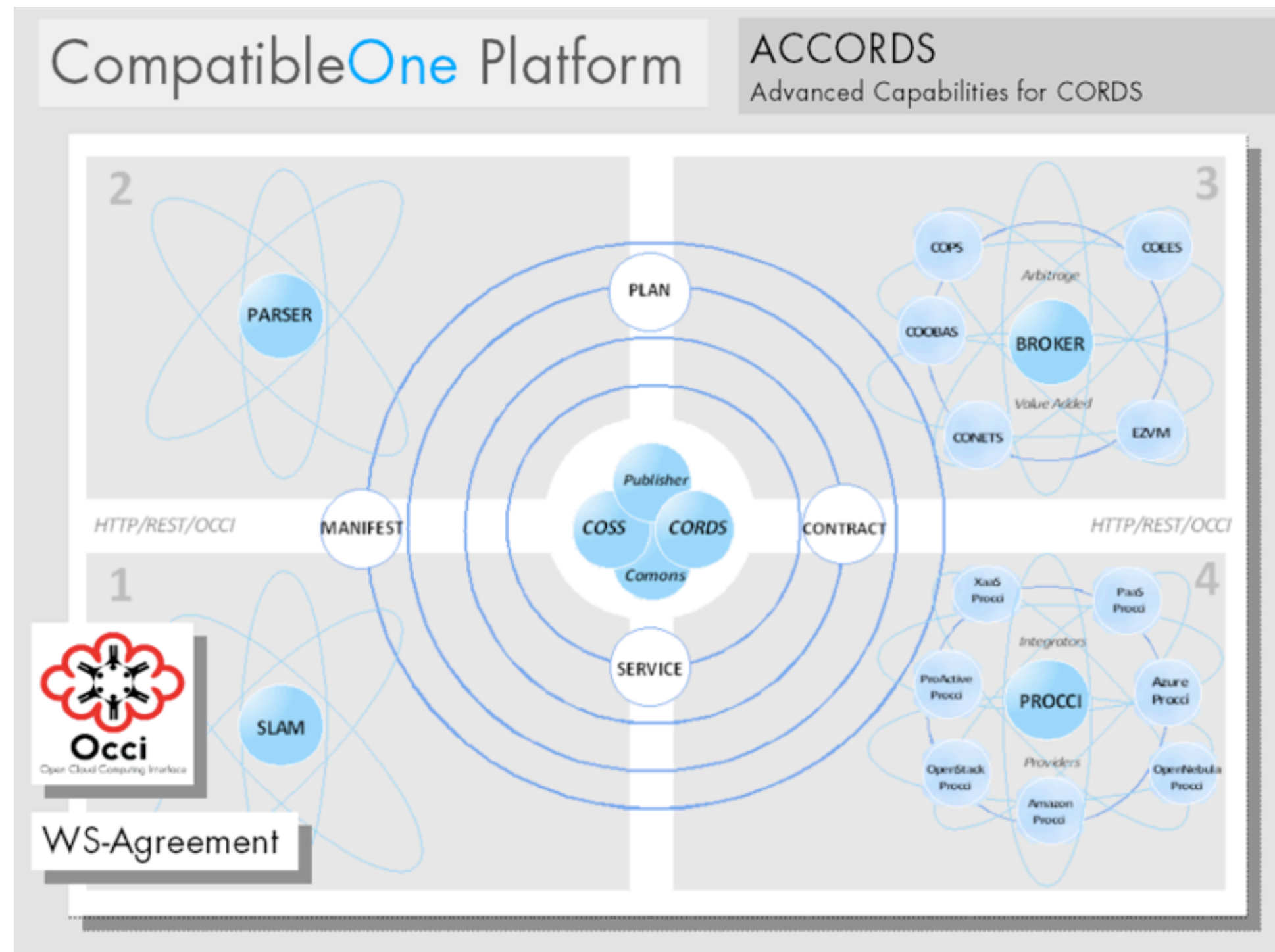
Uptake of OGF Cloud Standards In Industry:

Example:

CompatibleOne

Open Source
Cloud Broker
project started
by industry
consortium
based in France

Product line
heavily based
on published
OGF standards
(OCCI, WS-
Agreement, etc.)



OGF Cooperative Agreements In Place as of Feb. 2013



OCCL and DMTF:

- OGF published the the OCCL Core, Infrastructure and HTTP Rendering specifications as GFD.183, 184 and 185 respectively, and is working on a JSON rendering. We created a joint work register with DMTF and continue to follow their progress towards implementation of the CIMI specification.

OGF and ISO:

- OGF has been accepted as a Category A liaison with ISO JTC1 SC38 on Cloud Computing.

OCCL and SNIA (CDMI):

- OGF has cooperative agreement w/SNIA and has held 7 jointly hosted Cloud Standards Plug-Fests so far; series continues.

OGF Cooperative Agreements In Place as of Feb. 2013



OGF and ETSI:

- Cooperative MoU in place; contributing to ETSI CSC effort.

OGF and TM Forum:

- Memorandum of Understanding in place; ongoing cross-SDO document on End-to-End Management of Cloud Service Agreements, including SLAs, in progress.

OGF and CSA:

- Cooperative agreement between OGF and CSA in place.


OGF and IEEE:

- OGF co-sponsored IEEE Cloudcom 2011 (Athens) and Cloudcom 2012 (Taipei), pursuing other engagements.

OGF and SIENA, NIST, GICTF, etc.:

- We contribute actively to ongoing roadmapping efforts.

Cloud Plugfest Developer Series:



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 - Plugfest Agenda has been updated
- ▼ **Next Event - March 2013**
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*Co-sponsored by
OGF, SNIA and ETSI*



About Cloud Plugfests

The Cloud Interoperability Plugfest project (or "Cloud Plugfests" for short) is a co-operative community series designed to promote interoperability efforts on cloud-based software, frameworks, and standards among vendors, products, projects and implementations.

The March 2013 event is the eighth in the ongoing series, and is proudly co-organised by the Open Grid Forum (OGF), the Storage Networking Industry Association (SNIA) Cloud Storage Initiative and the European Telecommunications Standards Institute (ETSI). Continuing our long-standing pattern of providing multiple convenient opportunities for participation, simultaneous hosted locations for in-person on-site attendance will exist in Europe, the USA and Japan for this event, and remote participation by registrants from other organizations and locations will also be supported, subject to the conditions of the participation agreement.

Register for the event!

Purpose

- **Interoperability Testing**
- **Software Development**
- **Community-Based Bug-Finding**
- **Standards Adoption**

For more detail, see our Mission and Goals pages.

News

Next Cloud Plugfest - March 2013 The next Cloud Plugfest will be held in **March 2013**. Specific dates and locations are in the process of being finalized by the plugfest planning team and will ...

Posted Jan 29, 2013, 2:32 AM by Florian Feldhaus

Showing posts 1 - 1 of 5. [View more »](#)

Developer-oriented
in-person standards
and software testing

7 events held so far!

ETSI Tools Used in Cloud Plugfests:



2012 Cloud Plugfest #3, Sophia - FR / Sta Clara - US, 2012-09-17 to 2012-09-19

(Change Event)

Logged in as: alan.sill@ttu.edu (eventmanager)

+ Event Management
Users Management
Event Information
Session Planning
Products
Companies
Test Session Reports
Result Summaries
Change Password
About

Result Summaries

Results for all configurations

The following companies are included in these results: GWDG

Number of tests per test session: 82

Number of Sessions: 10

Of the 10 reported sessions 10 were agreed (100.0%)

All results in the following includes non-agreed sessions

Overall Results

Interoperability		Not Executed		Totals	
OK	NO	NA	OT	Run	Results
117 (81.3%)	27 (18.8%)	172 (48.3%)	40 (11.2%)	144 (40.4%)	356

Total: 144

Results Statistics per Test Session

	Interoperability		Not Executed		Totals
	OK	NO	NA	OT	Runs
Minimum	1	0	5	0	4
Maximum	24	8	44	34	24
Mean	11.7	2.7	17.2	4.0	14.4
Deviation	7.68	2.53	10.34	10.05	5.90

Results per Group

Group	Interoperability		Not Executed		Totals	
	OK	NO	NA	OT	Run	Results
Capability	2 (66.7%)	1 (33.3%)	1 (25.0%)	0 (0.0%)	3 (75.0%)	4
Container	0 (0.0%)	4 (100.0%)	16 (50.0%)	12 (37.5%)	4 (12.5%)	32
Create	33 (100.0%)	0 (0.0%)	38 (52.8%)	1 (1.4%)	33 (45.8%)	72
DataObject	2 (25.0%)	6 (75.0%)	9 (50.0%)	1 (5.6%)	8 (44.4%)	18
Delete	17 (100.0%)	0 (0.0%)	23 (57.5%)	0 (0.0%)	17 (42.5%)	40
Discovery Interface	19 (67.9%)	9 (32.1%)	4 (12.5%)	0 (0.0%)	28 (87.5%)	32
Domain Object	0 (0.0%)	0 (0.0%)	40 (50.0%)	40 (50.0%)	0 (0.0%)	80

Conclusions

- OGF occupies an important role in standards development for advanced distributed computing, including cloud, grid, networking and large-scale data processing, transfer and data handling standards.
- OGF actively engages partners and participants throughout the international arena through an open forum with open processes.
- OGF standards support a wide variety of flexible architectures for advanced scientific and business uses.
- OGF's extensive experience has enabled distributed computing built on these architectures to become a more flexible, efficient and utility-like global computing infrastructure.