Federated Community Cloud Team Report

Requirement 5: Frameworks to support seamless implementation of federated community cloud environments

Alan F. Sill, Ph.D.

Vice President of Standards, Open Grid Forum
Site Director, Center for Cloud and Autonomic Computing at TTU
Senior Scientist, High Performance Computing Center
Adjunct Professor of Physics
Texas Tech University

For the FCC Team

FCC Team Priority Action Plan

1. Define federated community cloud requirements and scenarios.
2. Identify how Hybrid Cloud and Cloud Broker elements described in the cloud Reference Architecture can be leveraged and harmonized in federated Community Cloud settings.
3. Document current usage patterns and projected near-term trends in existing cloud architectures with attention to tools used for effective support of federated user communities.
4. Present analysis of applicability of solutions used in existing cloud and grid communities to federated cloud scenarios, including topics related to technology, trust infrastructure, & governance.
5. Assess inter-cloud efforts by standards development organizations and other stakeholders for applicability to Federated Community Clouds.

PAP 1A: Define federated community cloud requirements.

Federated Community Cloud definition:

A cloud in which resources are provisioned for use by a community or by multiple communities of consumers from multiple organizations using methods that address shared needs or concerns.

Many Federated Community Clouds also make use of Cloud Brokerage and/or other aggregation of services (including non-cloud services) from multiple providers to meet the needs of their participating organizations. This is further discussed in PAP 2 below.

PAP 1A: Define federated community cloud requirements (cont'd).

Broadly speaking, use cases taken from the needs of virtual organizations (VOs) can be used to describe requirements for Federated Community Clouds.

VOs are defined as *multi-organization constructs that use federation to share access to computing resources.*

Typically include one or more of the following capabilities:

privacy and security	internal organization roles
compliance adherence	common governance
trust infrastructure	policies and procedures
membership	private communication

PAP 1B: Define federated community cloud scenarios.

Team chose several among thousands of potential virtual organization communities to focus its discussions. Example scenarios included:

- Catastrophic Dynamic Event Response
- Specialized Remote Medical Care
- Community-Based Response to an Emerging Software Service Need
- Research Data Sharing
- Federated Government Communities, Acquisition History and Research Knowledge Base

PAP 2: Identify how *Hybrid Cloud* and *Cloud Broker* elements apply to Federated Community Cloud settings.

- Elements often provided by cloud service brokers include single sign-on, a shared graphic user interface (GUI) for managing multiple infrastructures, resource discovery, billing, etc.
- In the context of cloud federation, common tools to access possibly disparate services for IaaS, PaaS and SaaS services often are used to provide simpler methods for streamlining use of these services by a given community.

PAP 2: Identify how *Hybrid Cloud* and *Cloud Broker* elements apply to Federated Community Cloud settings.

- Organizations (including VOs) may accomplish federation of disparate cloud services by adopting shared software methods, such as Cloud Service Broker and/or common Infrastructure-as-a-Service, Platform-as-a-Service or Software-as-a-Service technologies.
- VOs often unify services provided by multiple providers to provide "single pane of glass" consolidation of services for their users.

PAP #2: Virtual Organizations may use Shared Platforms to Federate Clouds.

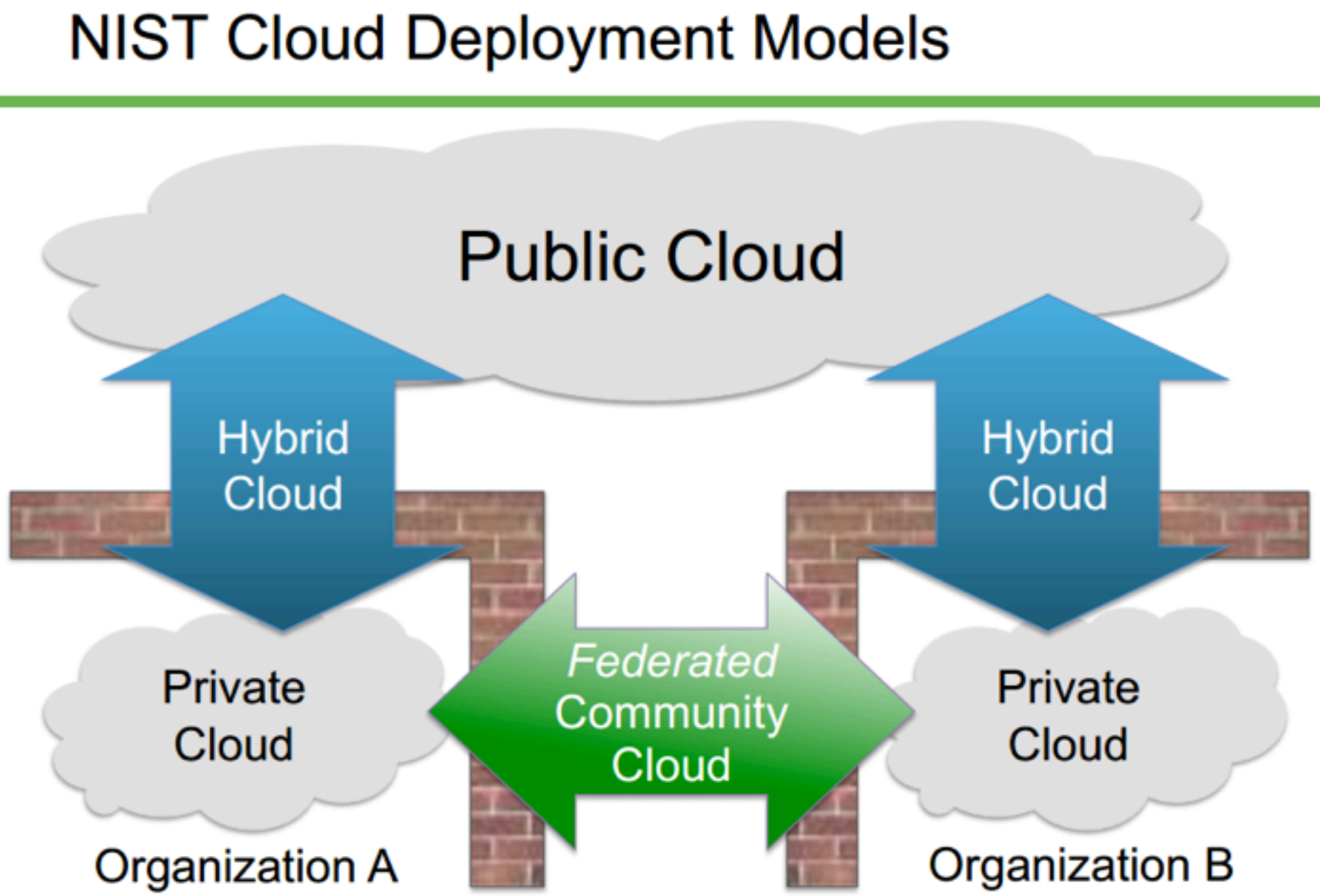
PaaS
Single Sign-on
Graphical User Interface
Workflow Services
Other Shared Services
Reporting

SaaS #1
SaaS #2
SaaS #n

Broker
Single Sign-on
Graphical User Interface
Workflow Services
Resource Discovery
Reporting

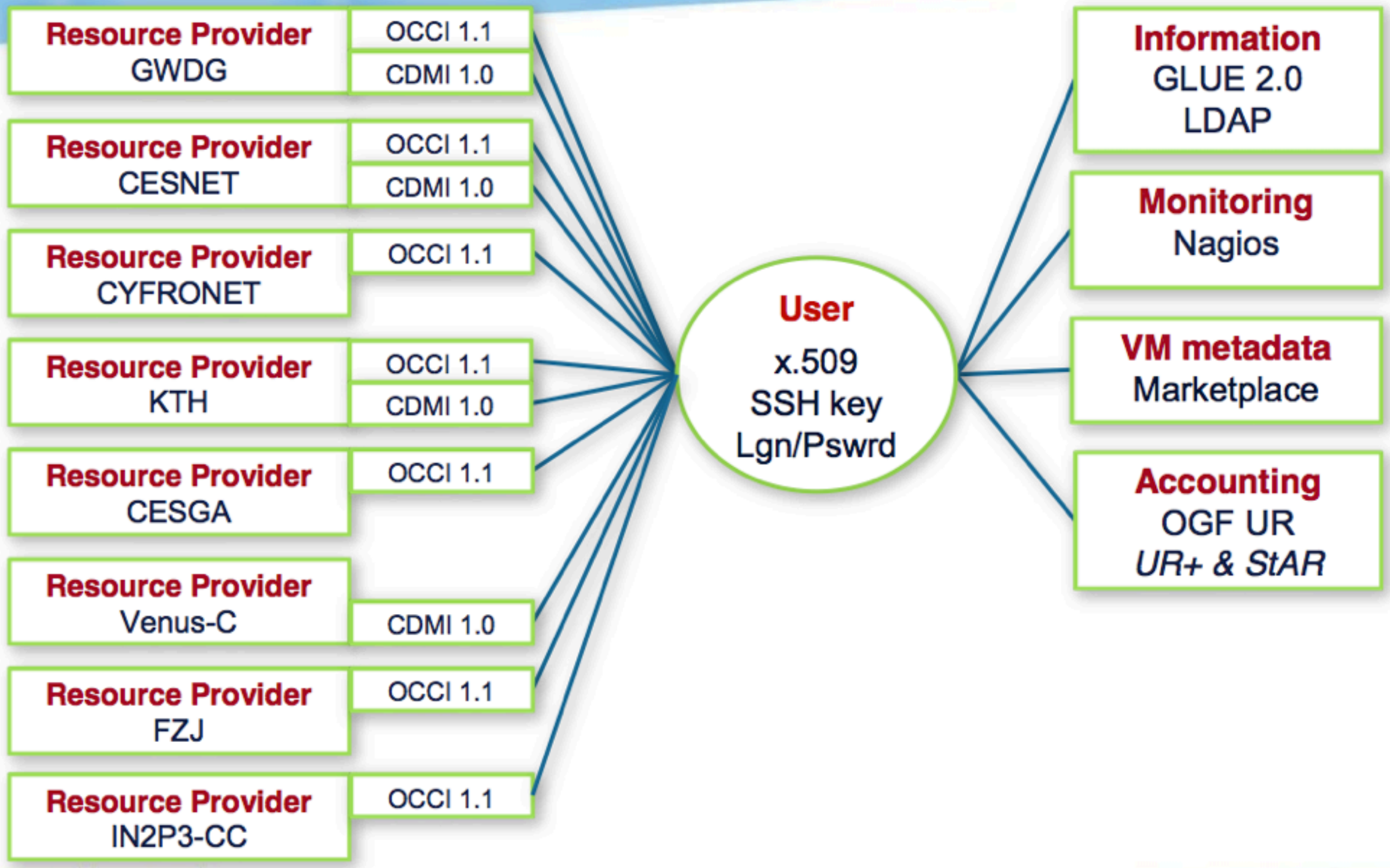
IaaS #1
IaaS #2
IaaS #n

PAP 3: Document current usage patterns and projected near-term trends in existing FCC architectures & tools.



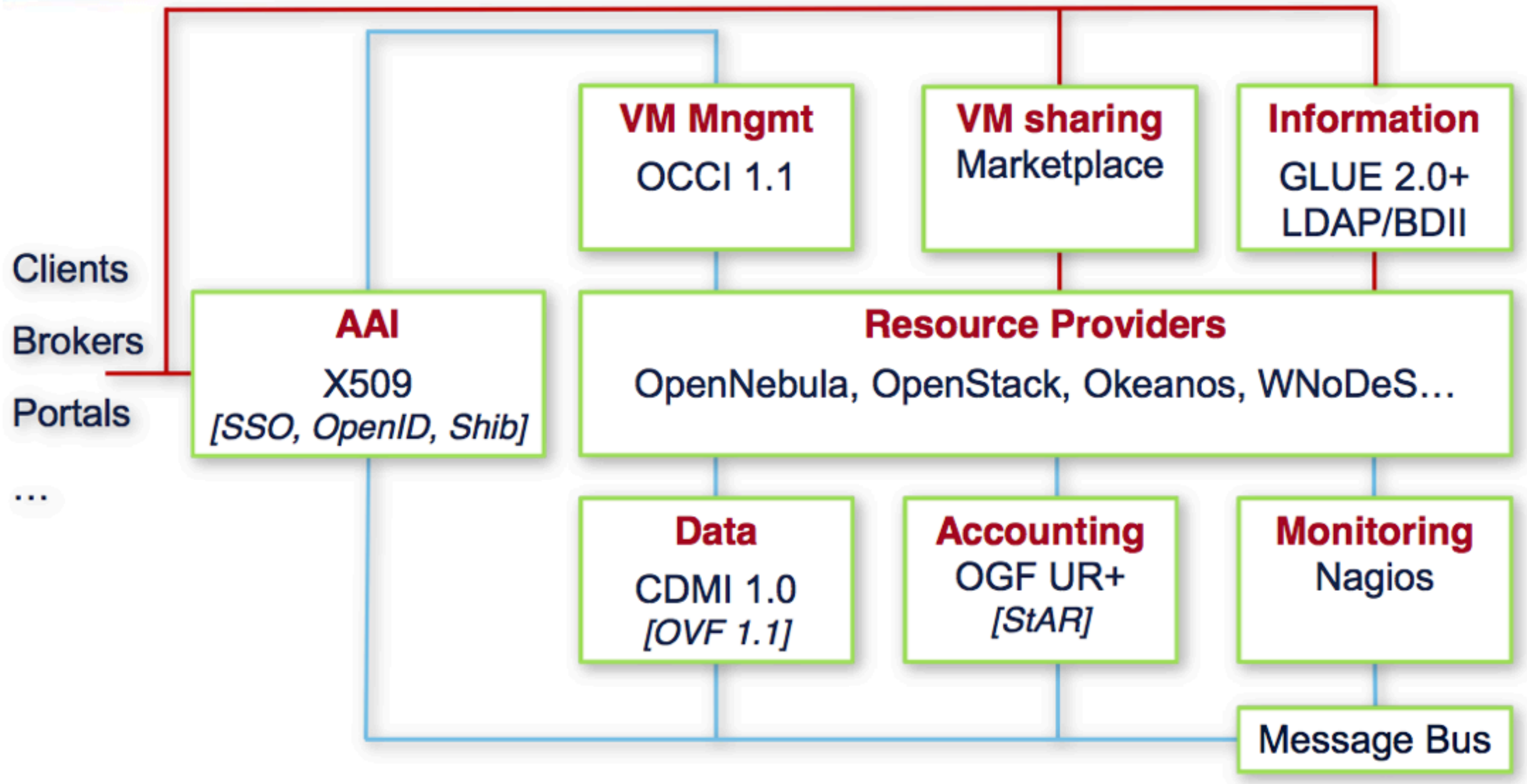
Demo Use Case

Example: EGI Federated Cloud



Credit: Matteo Turilli, Oxford University

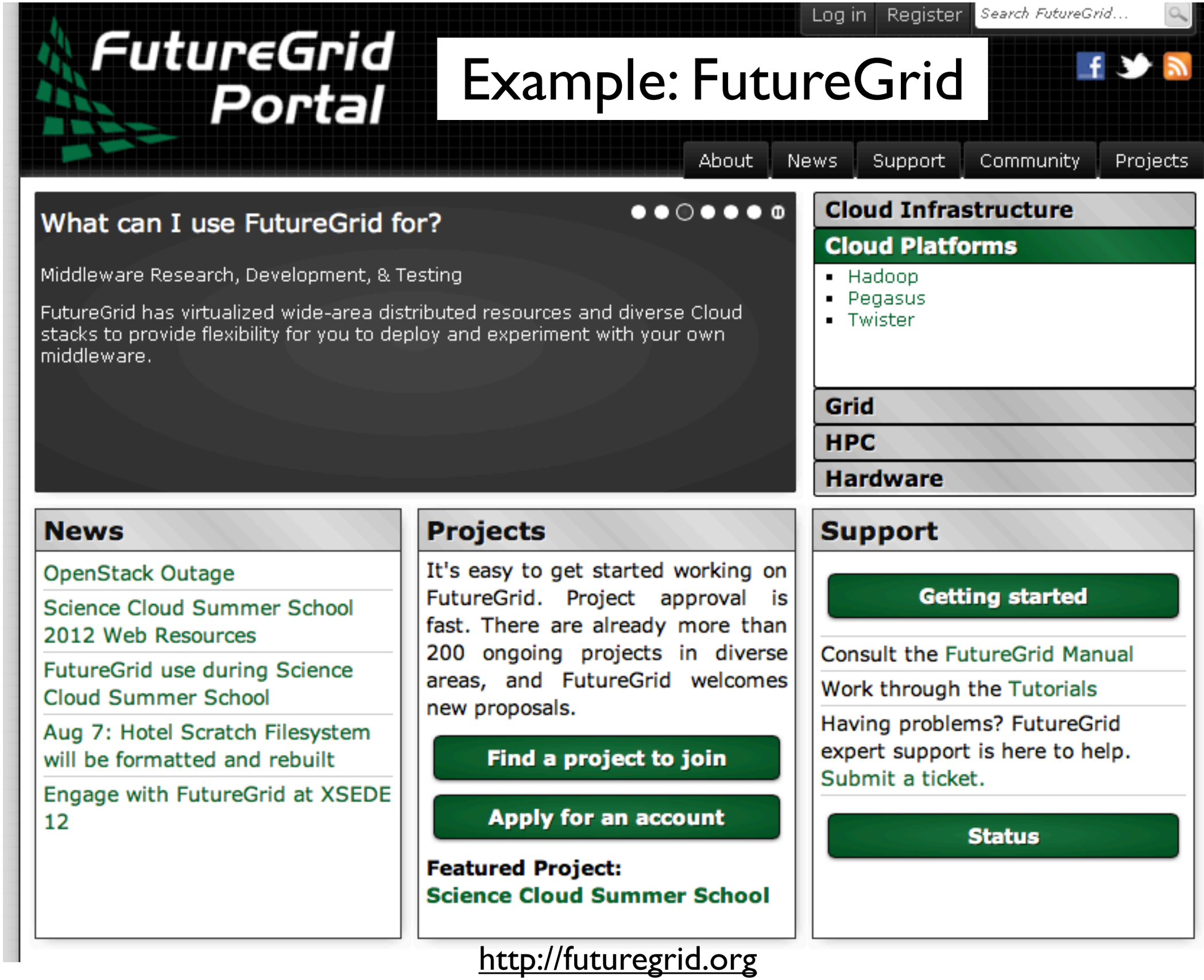
Federation Test bed



Credit: Matteo Turilli, Oxford University

https://wiki.egi.eu/wiki/Fedcloud-tf:Testbed

Example: FutureGrid



http://futuregrid.org

Example: NCHC "CloudZilla"

5 little Zillas in the Cloud

Cluster Deployment

DRBL

Diskless Remote Boot in Linux

Provides a **"diskless" and/or "systemless"** environment for client machines

P2P, P2V, V2V

Clonezilla

Open Source Cloning System

A **partitioning and disk cloning utilities** similar to Ghost® and True image®

Ezilla

Provides unattended installation and web management interface for **virtualization infrastructure**

Haduzilla

Hadoop Deployment

Provides unattended installation and web management interface for **Hadoop infrastructure**

Virtual Machine Manager (VMM)

Big Data Platform

Application Example

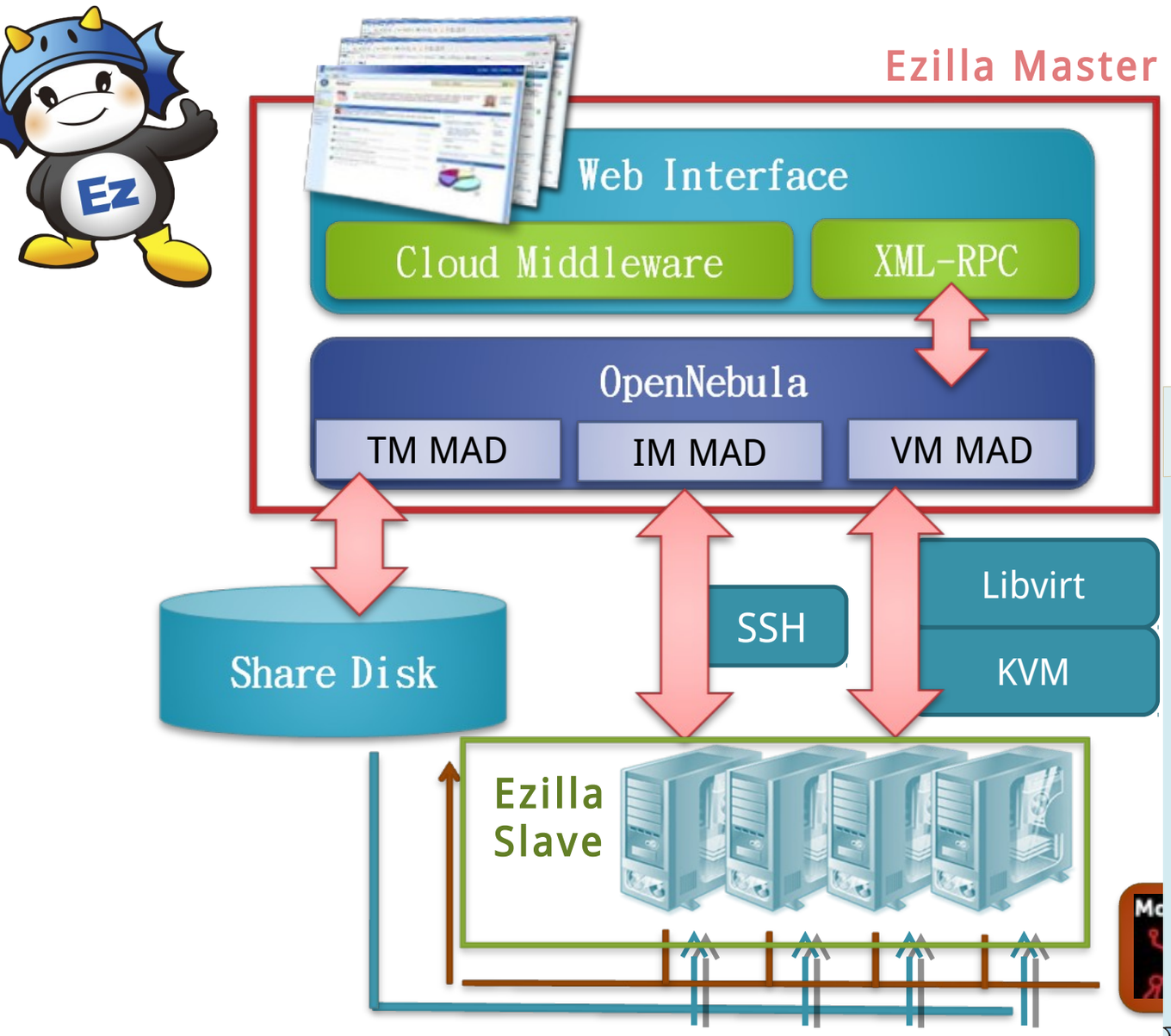
Provides cluster-based **intranet search engine** with chinese word segamentation support

CRAWLZILLA

Credit: Yao-Tsung Wang, NCHC

Example: NCHC "CloudZilla"

System Blocks of Ezilla

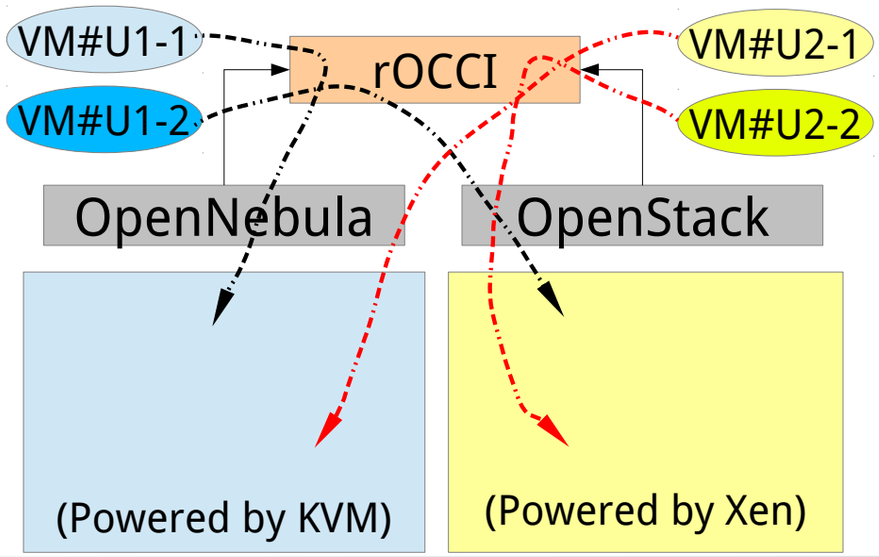


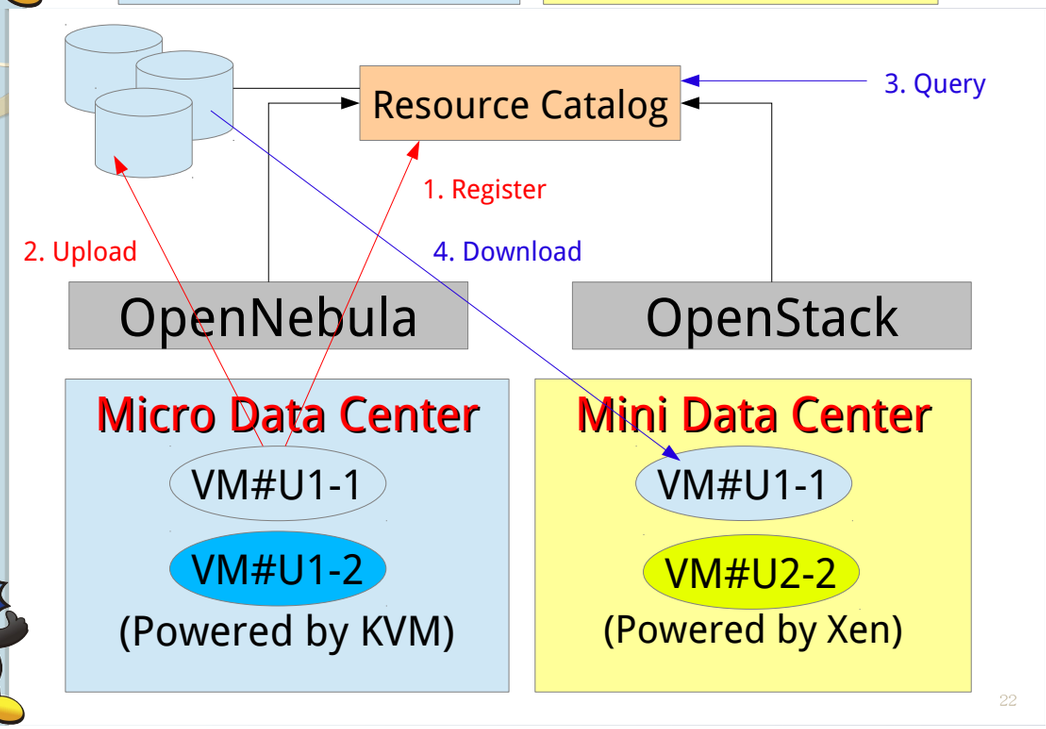
Credit: Yao-Tsung Wang, NCHC

Work in Progress

To support OCCI (Cloud Interop) :

- We're now based on OpenNebula
- But will add support to OpenStack via OCCI





PAP 3: Document current usage patterns and projected near-term trends in existing FCC architectures & tools.

The Team also observed that several activities are being undertaken by the community that indicate the uptake of standards in real-world settings:

- Cloud Plugfest series (OGF, SNIA, ETSI)
- DMTF starting interoperability plugfests on CIMI
- Emergence of open source cloud broker products and tools, such as CompatibleOne, rOCCI, jOCCI, DeltaCloud, etc.
- Several EC-funded projects supporting federated clouds, including Contrail, FI-Ware, Helix Nebula

CloudPlugFest

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Join The Community!

Subscribe to mailing lists for more information

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.

News

Call for technical expertise to prepare and conduct the Cloud interoperability event

ETSI's Centre for Testing and Interoperability (CTI) is looking to recruit technical expertise to support and conduct December 2012 Cloud Plugfest. Experts will be required to help with:the ...

Posted Aug 10, 2012 2:46 AM by Florian Feldhaus

Showing posts **1** - **1** of **1**. View more »

Next Cloud Plugfest: December 11-13, 2012

Find out why you should attend the Cloud Plugfest.

Purpose

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

For more detail, see our Mission and Goals pages.

The December 2012 event is the 7th in the series and is proudly co-organised by OGF, the SNIA Cloud Storage Initiative and ETSI. Co-hosts for the US and European locations are SNIA and ETSI, respectively. ETSI CTI is also providing testing support.

Locations:

Europe: Sophia-Antipolis, FR

http://cloudplugfest.org

PLUGTESTS™ INTEROP EVENTS

ETSI TEST REPORTING TOOL

ETSI World Class Standards

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

(Change Event) Logged in as: alan.sill@ttu.ec

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

Highlight company...
Scheduler Save
Export to PNG

Products:

CDMI client
CDMI server
OCCI client
OCCI server

Session pools:

Mandatory Sessions (51)
Forbidden Sessions (93)
Unscheduled Sessions (39)

Session Planning

		vcdm CDMI GWDG	OCCI Activeeon	OCCI Prologue	rOCCI GWDG	OpenStack OCCI GWDG	AMQP OCCI GWDG
Mon 17	14:00-15:30		Activeeon Procci-Server-EU GWDG rOCCI-Client-CLI-EU				
	16:00-17:30	TCS CATS-CDMI-Client-IN GWDG vcdm-CDMI-server-EU					
	9:00-10:30						

(Change Event) Logged in as: alan.sill@ttu.edu (eventmanager)| Logout

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

Test Session Report

Configuration :	CDMI
Session :	21
Version :	1
Session Status :	closed
Date :	Wed 19
Start Time:	15:30
End Time:	17:00
Area Name :	vcdm CDMI GWDG
Participant :	CDMI client 1:CATS-CDMI-Client-IN(TCS)
Participant :	CDMI server 1:vcdm-CDMI-server-EU(GWDG)
Last Modified :	Wed 19 18:27
Last Modified by :	florian.feldhaus@gwdg.de
Session Comment :	By Silvia from TCS Test Report Florian to review unsupported features and submit

Results

Test Case Id	Test Case Summary	Type	Result	Comment	Logs
Capability_Read_4	To read children of capability object up to a specific range	Interop	OK NO NA OT		
Capability_Read_3	To read capability object(system wide capabilities)	Interop	OK NO NA OT		
Container_Create_13	To create a container by copying an existing container	Interop	OK NO NA OT		
Container_Create_14	To move a container to new URI	Interop	OK NO NA OT		

PAP 4: Present analysis of applicability of solutions used in existing grid and cloud communities to FCC scenarios

Team analyzed existing grid and cloud communities extensively and extracted the following features:

- Federation of resources is usually enabled by federated identity management.
- Identity Provisioning approaches that provide a variety of levels in degree of security. In general, the grid community has paid more attention to creation of structures for use of strong authentication, role- and attribute-based authorization and isolation of multiple tenants than is common yet in cloud usage patterns.

PAP 4: Present analysis of applicability of solutions used in existing grid and cloud communities to FCC scenarios

Other important patterns from federated grids and clouds:

- *Delegation of Trust* is the concept of allowing another entity to act on your behalf (with permission).
- Grid and cloud communities are paying detailed attention to development of protocols, standards and usage patterns involving Federated Identity Management, including SCIM, VOMS, X.509, SAML, OpenID, WS-Federation, XACML, SPML, ADFS, etc., with many projects centered in this area.

PAP 5: Assess inter-cloud efforts by SDOs and other stakeholders for applicability to Federated Community Clouds.

Intercloud definition:

For the purposes of this work on Federated Community Cloud Computing, "Intercloud Computing Initiatives" are described as work products created by SDOs and other organized computing industry associations specializing on "interconnecting cloud computing as a cloud of clouds".

Based on the works of current Intercloud initiatives, issues pertaining to FCC infrastructures may be classified in the following categories: discovery, engagement and operating between clouds.

PAP 5: Assess inter-cloud efforts by SDOs and other stakeholders for applicability to Federated Community Clouds.

Groups identified by the FCC Team as currently working on Intercloud standards, definitions and concepts:

- Alliance for Telecommunications Industry Standardization (ATIS)
- Institute of Electrical and Electronics Engineers (IEEE) P2301 & P2302 working groups.
- Global Inter-Cloud Technology Forum (GICTF).
- The Cloud Computing Interoperability Forum (CCIF).
- Cloud Standards Customer Council (CSCC).
- Open Grid Forum (OGF).

PAP 5: Assess inter-cloud efforts by SDOs and other stakeholders for applicability to Federated Community Clouds.

- We anticipate that USG Agencies will assume one or more of the roles of Cloud Broker, Intermediary Cloud Provider and Cloud Provider as defined in the NIST Cloud Computing Reference Architecture.
- In all likelihood, various USG Agencies will aggregate some or all of their cloud efforts and will engage as Cloud Brokers and Cloud Providers supplying services to Cloud Consumers from other areas of government, the general public, private sector, health care, public services, education, research, etc.
- FedRAMP process and concepts apply.