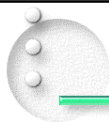


OGSA and Unicore: Status and Future

JPGRID Symposium
29 October 2002
Dr. David Snelling
<d.snelling@fle.fujitsu.com>

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Overview

Unicore Status

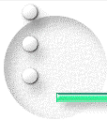
- History
- Fujitsu Server Components Implementation Status
- Pallas Client Implementation Status

OGSI Working Group Status

- Key Issues Since GGF5
- Schedule

Unicore/OGSA Roadmap

- Existing Demonstrator
- Plans to Unify Unicore and the OGSA



History



History

- Conceived in 1997
- UNICORE and UNICORE Plus BMBF Projects
- EuroGrid and GRIP EC Projects
- RealityGrid UK e-Science Project
- Varied Commercial Projects

Focus on Seamless Computing

Open Source and Online Demo Site

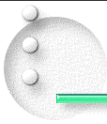
- www.unicore.org

OGSA Compliant Demonstrator

- June 7th 2002, First release.
- September 4th 2002:
 - Fast Track Demonstrator in RealtyGrid (UK e-Science).
www.sve.man.ac.uk/Research/AtoZ/RealtyGrid/AHM2002/

CheckTime™ and a
GIP description
are needed to use this screen.

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Unicore Implementation



Unicore Architecture

- Open Protocol, Abstract Job Object
- Single Reference Implementation



Fujitsu Developed Components

- Security Gateway
- Network Job Supervisor (NJS)
Authorization translation, AJO Incarnation, workflow scheduling, file management, ...
- Target System Interfaces (TSI)
Fujitsu, IBM, NEC, Hitachi, SGI, Sun, Mac, Sony (PS2), ...
- "Computer2Computer" (C2C) and "Debug" Clients

Pallas Developed Component

- Production Ready GUI Based Client

CheckTime™ and a
GIP description
are needed to use this screen.

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Important Unicore Functions

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Security

- Certificate/PKI Based Security Model
- Interoperable with Globus Certificates
- Support for stronger trust model than Globus
 - or Globus Trust Model with 1st generation proxies.

Workflow

- Local and remote tasks and file transfers
- If and loop constructs
- Flow control based on time and file-state events

GRID Management

- Hard/soft fail recovery.
- System administrator's control interface.
- Extensive logging support
- Built in certificate creation in the GUI client.

QuickTime™ and a
MP3 decoder are
required to view this movie.

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Functions Continued

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Resource Broker

- Multi-site resource check prior to submit.
- Naive estimate of time until execution.
- Ticket generation and checking (soon).
- Dynamic brokering at execution time (soon).

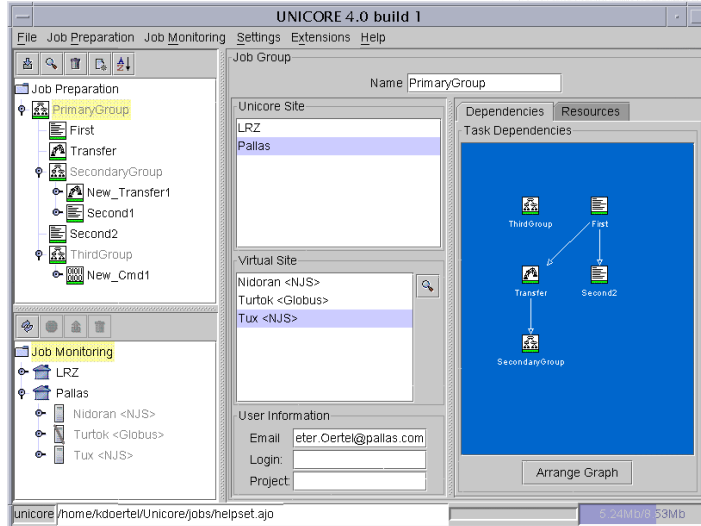
Interactive Access Extension

- Allows standard terminal style interaction.
- Unicore Single Sign-on
 - Complete multi-site authentication & authorization.
- Includes "Interactive Batch".

QuickTime™ and a
MP3 decoder are
required to view this movie.

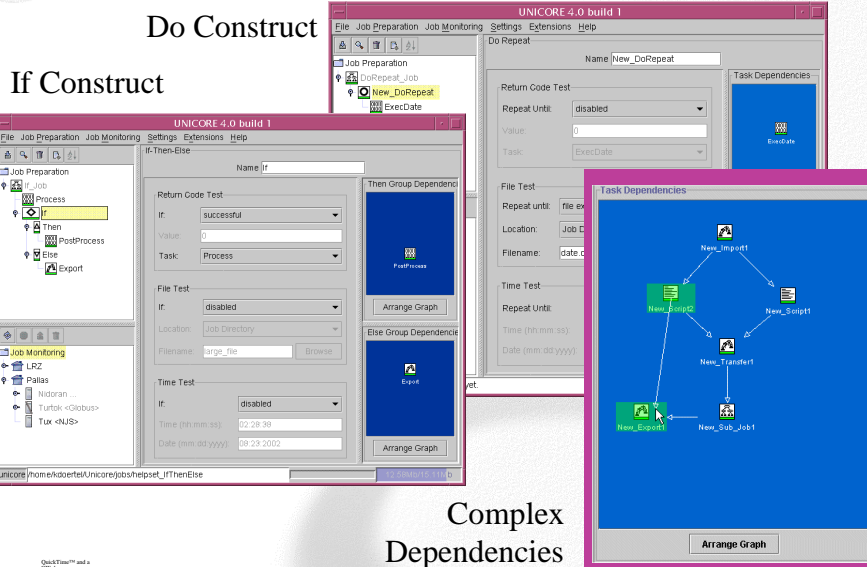
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The Unicore Client



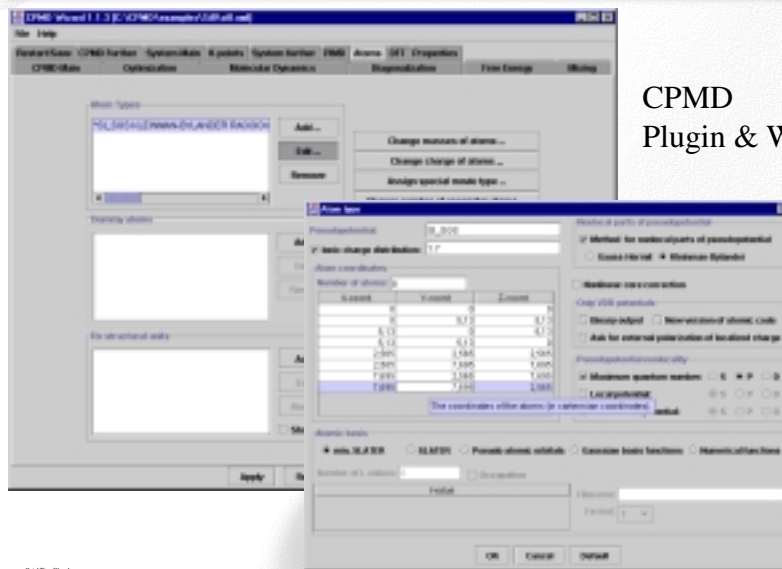
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WorkFlow



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Plugins



CPMD
Plugin & Wizard

Plugin Development

Very Seamless: Scripts

- Different for every system

Seamful: Command Task

- Path to command
- Environment variables

Seamless: Appl. Resource

- Fully abstracted
- No system/site differences
- Application metadata

Ideal: Plugin

- User's view of application
- Not a computation, but a solution

Client Development

- A few Java classes
 - GUI
 - Plugin start/stop
 - Data container
- Use Client Functions
 - Job management
 - Resource editor
- Examples available

System Development

- Install application
- Edit server data base (IDB)
 - Application location
 - Environment variables
 - Libraries and data files

Key OGSi Issues

FUJITSU

Grid Service Identity

- “Sameness” is a service property.
- Therefore, no unique Grid Service identifiers.
 - Multiple GSHs from multiple schemes
- GridServiceHandles SDE provided.

PortType Extension

- W3C WSDL WG will add it to WSDL 1.2
- Most portTypes in GSS will extend GridService
- “Set Union” of portTypes

CheckTime™ and a
GSP description
are needed to use this service.

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Key OGSi Issues Continued

FUJITSU

Many Technical Details

- Register has void return
- GSH is a URI
- Soft-state destruction and destroy operation
- All namespace references must be qnames
- Extended notion of time (w/ infinity)
- All Grid Services are immutable
- Semantics in the presence of authorization.

Key Pending Issues

- Factoring of Registration portType
- The need for Event portType & its relationship to Notification.
- Read-Write SDEs from interface
- IPR Status of WSIL vs. Lightweight temporary solution.

CheckTime™ and a
GSP description
are needed to use this service.

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Key OGSi Issues Continued

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Broad Support at Meetings

- Attendees at interim meeting:
 - Argonne, NASA, USC, Microsoft, Fujitsu, Sun, IBM, Avaki, Entropia, & EMBL.
- Regular attendees at teleconferences:
 - Argonne, NASA, USC, Fujitsu, Sun, Hitachi, IBM, & Avaki.

Politics







- All GSS authors released copyright to the GGF.
- Sun: Blanket RF statement for all GGF input.
- IBM: Single RF statement with respect to OGSi.

QuickTime™ and a GGF decompressor are needed to view this picture.

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OGSi Schedule

FUJITSU

-  **Oct_01_2002**
 - XML schemas, interim decisions, some cleaning on text.
-  **Oct_13_2002**
 - Working document for GGF6 with tracked changes
-  **Nov_12_2002**
 - All open issues resolved.
-  **Nov_14/15_2002**
 - Second interim meeting at Argonne.
-  **Dec_15_2002**
 - Ready for submission into the GGF process.
-  **GGF7**
 - Ratification

QuickTime™ and a GGF decompressor are needed to view this picture.

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OGSA Demonstrator



Unicore as a Hosting Environment

- Use Unicore to construct Grid Services
- Built on:
 - Unicore servlet from Fujitsu Labs Europe
 - GLUE Web Services from The Mind Electric

Caveat

- Actually only Web Services
Caveat on the caveat: Not a problem with WSDL 1.2
- Based on February 2002 Specification

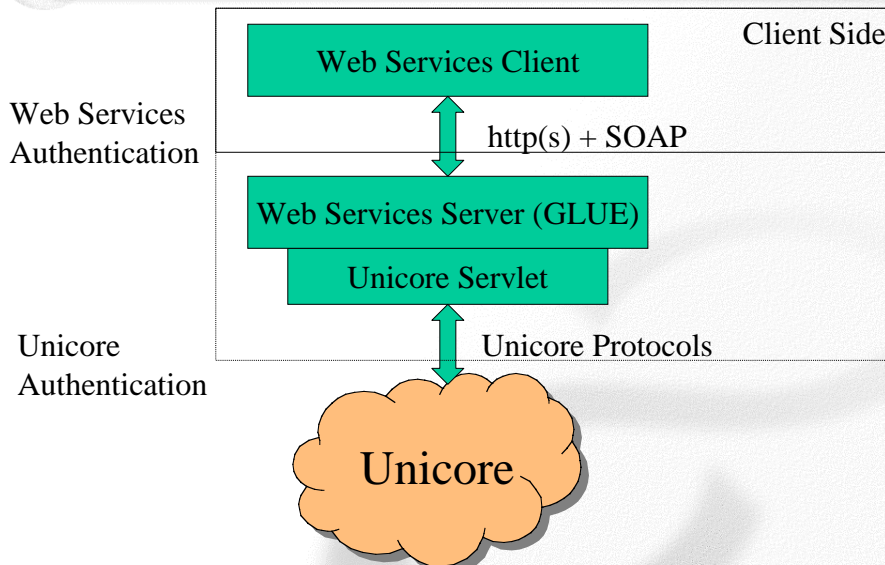
Application Steering Grid Service

- Multi-site workflow for file based steering.
- Used by a major non-Unicore project, RealityGrid:
Demonstrated the materials science; not computer (Grid) science

CheckTime™ and a
JSP description
are needed to use this service.

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Implementation Architecture



CheckTime™ and a
JSP description
are needed to use this service.

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Application Black Box

Application Resource

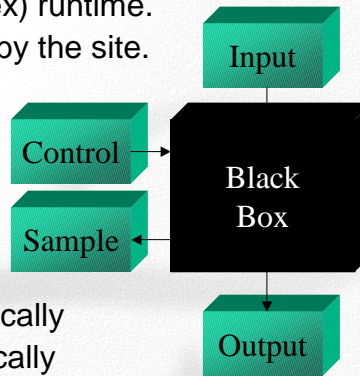
- Including (arbitrarily complex) runtime.
- Configured and advertised by the site.

Basic Application

- Input File
- Output File

Steerable Application

- Basic Application +
- Sample File created periodically
- Control File re-read periodically



CheckType™ and a GIP description are needed to use this service.

OGSA Implementation

OGSA portTypes

- GridService
 - Registry
 - HandleMap
 - Factory
 - Notification

RealityGrid portTypes

- JobGridService
 - SteeringGridService
- NotificationService

serviceTypes



CheckType™ and a GIP description are needed to use this service.

Unicore to OGSA Roadmap

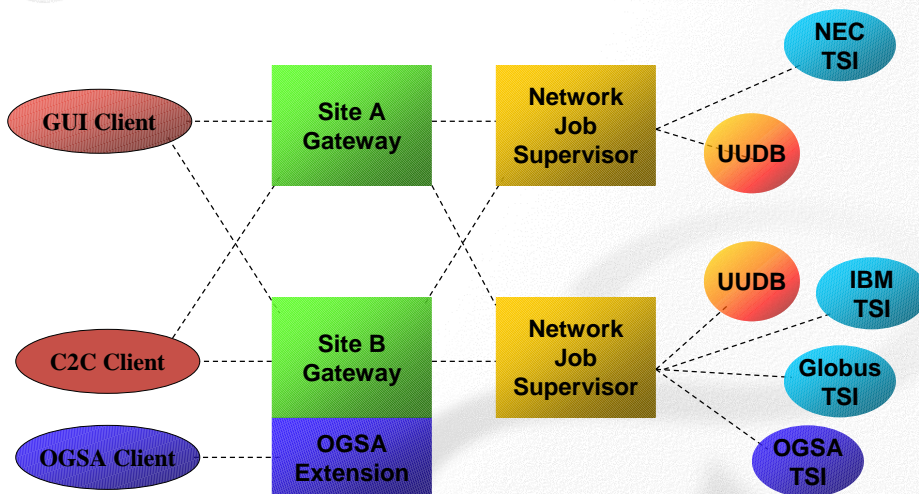


- ✦ **Update Grid Service Hosting Environment**
 - Compliance with new OGSIS Specification
 - Complete support for Service Data
 - Tool kit for creating Grid Services from basic portTypes
- ✦ **Unicore Grid Service Task**
 - Run other Grid Services from a Unicore Workflow
- ✦ **Unicore Gateway Grid Service**
 - Phase I: Submit, Monitor, Control, and Retrieve Jobs
 - Phase II: Workflow Construction portType
- ✦ **Security Architecture**
 - Several strategies to consider (probably need to do them all).

QuickTime™ and a H.264 decoder are needed to view this video.

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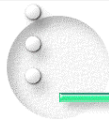
Unicore Extended Architecture



TSI = Target System Interface
 UADB = Unicore User Data Base

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The Way Forward

FUJITSU

A Complete GRID Solution Today

- Fujitsu Server
- Pallas Client
- Application Plugins (existing + new)

Bespoke GRID Applications on Demand

- Fujitsu Server and "C2C" Client

Toward the Open Grid Services Architecture

- OGSA Compliant hosting environment in 2003/1H.
- OGSA Unicore Gateway End 2003.

CheckPoint™ and a
GFI™ are registered
and used by their owners.

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