OGSA Transition
ATF Migration Strategy

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The Globus Toolkit™ (GT2)

- Widely adopted Grid Middleware
- Result of 5+ years (100+ man years) work
- Provides protocols to support three services:
  - Job Submission and Monitoring (~HTTPS)
  - Monitoring and Discovery Service (~LDAP)
  - Data Transfer (~FTP)
- Infrastructure to federate distributed resources
  - Support for access control
  - Wide area security mechanisms (PKI)

Web Services

- Increasingly popular standards-based framework for accessing network applications
  - W3C standardization; Microsoft, IBM, Sun, others
- XML: Extensible Markup Language
  - Network portable structured information
- WSDL: Web Services Description Language
  - Interface Definition Language for Web services
- SOAP: Simple Object Access Protocol
  - XML-based RPC protocol; common WSDL target
- UDDI: Universal Description, Discovery, & Integration
  - Directory for Web services

Changes to Support ‘Grid Services’

- Dynamic Services
  - Created & destroyed on user demand
- Stateful Services
  - Expose internal service state
- Flexible Service Discovery Infrastructure
  - Scalable to 1000’s services across multiple locations
  - Build Virtual Organisations on demand
  - MyVO: The services I have access to

Open Grid Services Architecture (OGSA)

- Utilise standard Web services infrastructures
  - Enables resource virtualisation
- Building on capability within GT2:
  - Grid Service: semantics for service interactions
  - Management of transient instances (& state)
  - Factory, Registry, Discovery, other services
  - Reliable and secure transport
- Multiple hosting targets: J2EE, .NET, ...
- Reference implementation Globus Toolkit 3 (GT3)

‘Architect’s view of the completed building’
Grid Services Specification (v1.0),
– Produced by the GGF OGSI Working Group
– Entered 60 day comment period March 2003
– Wide engagement: Academic & Industry participation

• Specifies:
  – Web Services with Grid Behaviours (i.e. richer structure)
  – Service creation & life-time management
  – Service Data to feed into Grid Information Services
  – Hosting Environment
    • Creation, Resource allocation, monitoring
    • Control and Data transport

• GT3 as reference implementation July 2003

Define minimal set of ports & behaviours:
– Creation, destruction, notification, registration etc.

Defined other standards activity in GGF:
– Exposing an EJB as a Grid Service
– Security (authentication, authorisation, accounting)

Provides component model for web services

‘Bricks & mortar to construct a building’

OGSI:
– Defines how the service interface behaves
– Defines interaction between service & container

OGSA:
– Defines the platform (collection of services)
  • Computer centre
  • Data centre
– Services can be defined and evolve elsewhere
  • ‘Approved’ by OGSA-WG/GGF
  • ‘User Contributed’ from the community

Existing GT2 users
– GT2 is established and understood
– When to move?

Existing web service users
– Reliable commercial infrastructures
– Why & when to move?

New users
– Adopt something new (GT3) or understood (GT2 / web services)

No hurry!
– Commitment to support GT2 until end 2003 (at least)
– GT2 client-side C library to wrap GT3 interface
– Early adopters of GT3 will have to work harder

Attractions
– Standards driven architecture
– Smaller service granularity & defined framework
– Easier for projects to contribute to GT3
– ‘Proper’ software engineering process
– Access to web services and tools
– Wider range of supported platforms
• A Grid Service is a Web Service
  – Have to add the Grid Service PortTypes
  – Should be easy if:
    • Appropriate libraries & tools to support migration are developed
    • Support may be language dependent:
      – Java & C: Probably well supported
      – C++ & C#: Support currently not clear

• Issues
  – Will the same registries be used?
  – What are the minimum required Service Data Elements?
  – Which hosting platforms will work?
  – Which Web Service tools will work with Grid Services?

• Consider using GT3 but with caution…
  – New software
    • Release Summer 2003
    • Mature stable releases probably not until Q1 2004
  – By January 2004
    • Better Documentation
    • More Experience
    • Supported Services
  – OK to design and do some prototypes now?
    • OGSI stable except in the area of notification
    • OGSA intensive efforts underway

• Technical Support
  – Grid Support Centre
  – Engineering Task Force

• Training Provision from e-Science Institute
  – Primers and guides on Web Sites
  – Hands-on developer courses
  – Orientation, Planning & Management
    • For Project Leaders, Designers and Architects
  – Schedule to match GSC + ETF + Project’s activities

• Combinatorial effects of composing services
  – What will be a sensible core combination?
  – On what hosting environments and platforms?

• Need to explore, evaluate & assess a variety of:
  – Services
  – Hosting Environments
  – Platforms

• Driven by real examples:
  – Composed services within workflow
  – Code/WSDL examples
  – Test Deployment and Operation

Suggest Phased Transition
1. GT2 service + GT3 preparatory investigations
2. GT2 service + GT3 prototyping & support
3. GT2 service + GT3 service
4. GT3 service

Proposed transition from GT2 to GT3

- Level 0
- Level 1
- Level 2
- Level 3

- GT2
- GT3
- Level 0
- Level 1
- Level 2
- Level 3

- 2001
- 2002
- 2003
- 2004
- 2005
OGSI/OGSA will provide real benefits
But there are still issues to be resolved:
– OGSA definition / delivery
– Hosting environments & platforms
– Combinations of Services supported
– Material and Grids to support adopters
– Resources to support transitions
Community outreach: www.nesc.ac.uk

Comments & Questions?