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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)

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Convergence on Service Oriented Architectures

```

    graph TD
      SR[Service Requestor]
      SRV[Service Registry]
      SP[Service Provider]
      SRV -- "Find a service" --> SR
      SP -- "Publish Service Description" --> SRV
      SR <--> |"Bind to the Service"| SP
  
```

- Globus: Grid Index Information Service (LDAP)
- Jini: Look-up Server
- CORBA
- Web Services

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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

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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

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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'

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Open Grid Services Infrastructure (OGSI)

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- 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

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Grid Service Specification

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- 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'

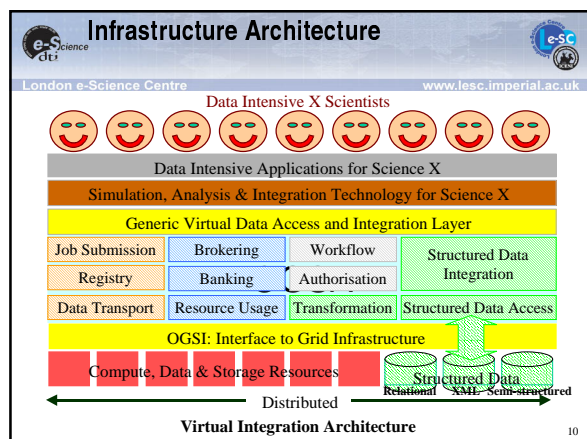
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Relationship between OGSI & OGSA

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- 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

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Migration To GT3

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- 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)

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Users Moving from GT2

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- 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

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Users Moving from Web Services

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- A Grid Service is a Web Service
 - Have to add the Grid Service PortTypes
 - Should be easy iff
 - 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?

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New Projects

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- 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

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Support from UK e-Science Programme

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- 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

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Engineering Challenges from GT3

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- 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

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Suggest Phased Transition

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

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UK e-Science Grid

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Proposed transition from GT2 to GT3

Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
2001	2002		2003		2004		2005								

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Summary & Conclusions



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- OGS/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?

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