



International Telecommunication Union

Grids for Business: A Service Provider Perspective

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ITU-T/OGF Workshop on Next Generation Networks and Grids
Geneva, 23-24 October 2006

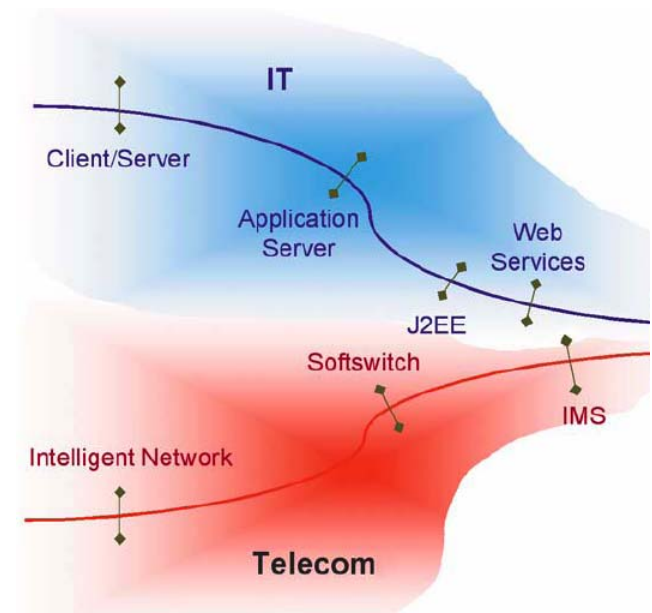
- o Changes in IT industry
- o Potential of Grid technologies
- o Current status
- o Relation to Next Generation Networks
- o Requirements on Grids for business
- o Need for standardisation
- o Technical challenges
- o Conclusion



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Changes in IT industry – Networked IT

- Connectivity and convergence are driving economies on a global basis
 - Bringing information and applications to the point of use
- Communication and collaboration is key
 - Connecting people to people, people to systems and business to business
- The real benefits derive from IT that is connected
 - “Digital Networked Economy”

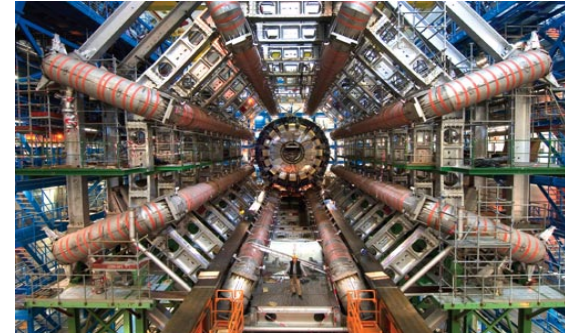


- o No simple definition of Grid
 - 'Grid computing is concerned with coordinated resource sharing and problem solving in dynamic, multi-institutional virtual organisations.' Foster, Kesselman, Tuecke "The Anatomy of the Grid"
- o Emphasis on
 - utility resources - provided as services
 - sharing and collaboration
 - multiple organisations, dynamic relationships
- o ... in other words - technology to build the Digital Networked Economy

Current status of Grid Deployments

o Academic, non-commercial Grids

- single purpose, custom built
- closed user groups
- motivated by cooperation
- depend on highly skilled people to deploy



Institute of Physics

o Commercial Grids

- sector-specific applications
- intra-enterprise
- motivated by efficiency
- generally cluster computing (not really Grids?)



- o Telco Community Group, GGF 14 (Chicago)
- o Three main areas:
 - evolution of existing networks and services to support new requirements
 - use of Grid technologies in internal operations
 - **managed Grid services as a customer offering**

- o Grid is NOT (just) about
 - providing supercomputer performance for large parallel applications
 - provision of network bandwidth or dark fibre
- o Grid is about
 - a virtualised infrastructure across all IT resources
 - enabling customers to collaborate
 - managing ICT complexity
 - extending existing VPN business



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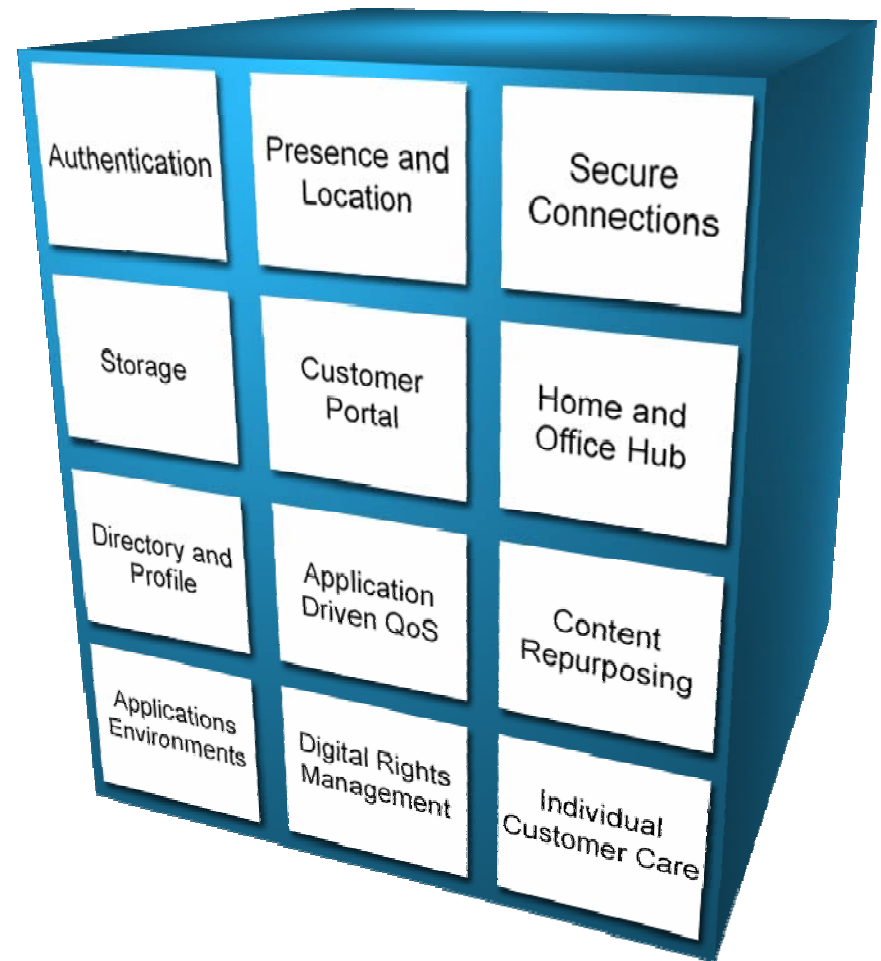
- NGN have a strong service focus
 - wide range of services, applications and mechanisms based on service building blocks
 - decoupling of service provision from network, and provision of open interfaces
 - unrestricted access by users to different service providers
 - ITU-T Study Group 13
- Service vision must include IT
 - rich infrastructure for innovative applications
 - converged networking and IT



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21CN Common Capabilities

- 21CN - BT's NGN
- Applying IT development approach
- Creating series of reusable common capabilities
- Increasing automation and accelerating time to market



- NGN needs to include IT resources to realise full potential
- Grid technologies will solve this problem
- Investment in NGN has started...
 - 100s of billions of Euros over next decade
 - opportunity to build the right infrastructure for the future
- Grid technologies need to be ready

- Next Generation Grids need to be:
 - persistent, pervasive and ubiquitous
 - transparent and reliable
 - scalable
 - open to wide user and provider communities
 - secure, with trust across multiple domains
 - easy to use, configure and manage
 - standards based
 - Next Generation Grids Expert Group, 2003
 - ftp://ftp.cordis.lu/pub/ist/docs/ngg_eg_final.pdf

- o Predictable performance and price
 - effective service level agreements (SLA)
 - clear relation to business value
- o Flexibility and control
 - ability to combine services from multiple providers
 - retention of control over business processes

- Predictable performance and cost
 - ability to quantify risk and return
 - ability to define appropriate SLAs
- General purpose infrastructure
 - support diverse customers and applications
- Efficiency and flexibility
 - common infrastructure and processes
 - consistent, automated management

- Abstraction and virtualisation
 - networks, processing, storage
- Automation
 - infrastructure management
- Service orientation
 - broad range of resources, offered as services
 - stateless (WS) and stateful (Grid)
- Security and trust

Viable solutions emerging in all these areas

- Fundamental problems are not new
 - RPC, Ansaware, DCE, TINA, CORBA, COM...
 - all had a similar vision
- Interoperability is critical
- Web Services and Grid converging
- Advantages of Web Services
 - simple things are easy to do
 - Internet and Web - oriented
 - strong tools and developer acceptance
 - naturally lead to loose coupling, flexibility

- Only limited consensus exists
- WS-I Basic Profile
 - XML (XSD): text-based representation
 - WSDL: describe a service interface
 - UDDI: publish and find a service
 - SOAP: communication across networks
 - plus basic security, addressing

WS-I

Requirements for a Service Infrastructure

- Most real systems need more...
 - e.g. service description, security, transactions, persistence, management, versioning and lifecycle, reliable messaging/notification, composition, orchestration, workflow
- Competing, incompatible standards activities
- Proprietary solutions

- o Move the focus of competition
 - eliminate unnecessary barriers to interworking
 - open standards and interfaces, good for all
 - compete at higher levels or on price/performance

- o Significant technical challenges remain
 - needed to realise full benefits of the Digital Networked Economy

- o Management
 - multiple viewpoints
 - automated/autonomic
 - consistent view of all resources
- o Composition of services
 - user-centric
 - predictable non-functional properties
 - performance, security
 - local configuration → global behaviour

- Convergence of IT and telecomms
 - advanced services and networks
- Major changes in global networks underway
 - significant investment in new technology
- Grid technologies address vital issues
 - many problems solved
 - interoperability still weak
- Need to understand priority issues, build broad consensus