Grid Standards meet Telecommunications

European Telecommunications Standards Institute

Grid Specialist Task Force

Interoperability Gap Analysis

Outline

- ETSI
- Motivation
- TC GRID
- STF 331
- Technical Report 1: Grid Stakeholders
- Technical Report 2: Interoperability Gaps

ETSI

- European Telecommunications Standards Institute
  - Standards body for *"Information and Communications Technology"* officially recognized by European Commission
  - 700 member organizations
  - 60 countries represented
  - Located in Nice, France
  - Responsible for GSM standard (2.3 billion users)
  - Prolific in creating ICT standards: 65 in 2006 with 1400 Tech Specs
- 3GPP – 3G Partnership Project
- NGN – Next Generation Network
- TISPAN - Telecommunication and Internet converged Services and Protocols for Advanced Networking

Historical ICT (Telco) View

- Large national network providers
- Strong requirement (legal/regulatory) for
  - Backwards compatibility (PSTN)
  - Very high availability (>99.99999% ≈ 3 sec/year down-time)
- Well established network and service architecture
  - Slow changing
- Well defined (standard) protocols
  - Well documented
  - Large test suites to validate implementation conformance

Modern ICT Landscape

- Deregulation
  - Multiple network operators
  - Multiple service delivery agents
- VoIP/SIP, Skype, GTalk
- Fixed/Mobile convergence
- 3G/4G mobile services
- Ubiquitous Wi-Fi, Wi-MAX, GPRS, UMTS
  - Mobile Internet
- Continuous integration of new services and features
- Standards? What standards?
  - TCP/IP
  - Focus is Internet connectivity by any means, then just TCP/IP

Issues of Interest to Grid Domain

- Impacts large user base
  - Majority of world population, across economic boundaries
- Network/Infrastructure issues
- Authentication/Authorization/Billing questions
- Large pool of hardware manufacturers
  - End user units
  - Switches
  - Servers
- Large pool of value-added service providers
- Large pool of network operators
- Everything (or at least most of it) needs to work together!

ETSI TC GRID

- Grid Technical Committee formed in 2006
- Mandate to:
  - Monitor convergence of IT and Telco domains, including grid computing initiatives
  - Report to ETSI members on standards for interoperability
  - Identify interoperability gaps
  - Liase with other standards organizations
- Members include FranceTelecom, British Telecom, Telefonica, IBM, Alcatel-Lucent, and others
- Propose actions to ETSI to improve ICT standards for Grid interoperability and report on state of the art to ETSI members

STF331

- Specialist Task Force with 4 deliverables:
  - Inventory of ICT
    - read “Grid/Telco” stake holders
  - Identify grid interoperability gaps
    - Specifically from enterprise/telco perspective
  - Grid testing framework
  - Website acting as resource for ICT (Telco/Grid) stake-holders
- Formed in October 2007
- 7 experts, each contributing 20-50 days per year
- 2 year time line, approx 400 person-days work

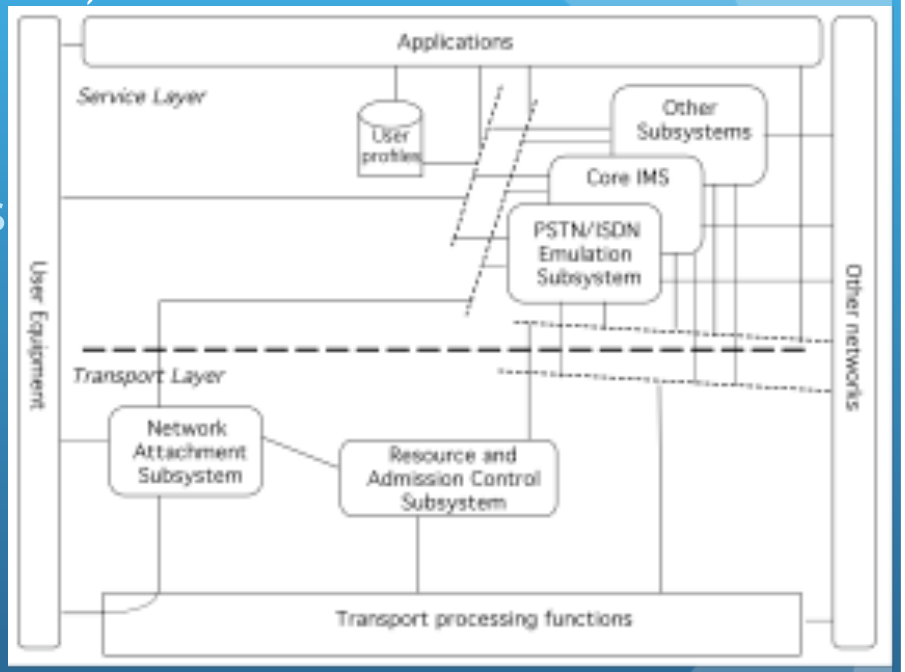
Grid Non-Functional Requirements

- Large scale
- Scalable
- Dynamic
- Inter-operable
- Extensible
- Secure
- Heterogeneous
- Non-trivial service provision
- Usable
- Manageable

- For purely pragmatic reasons, the following NFRs are optional:
  - Federated
  - Geographically distributed
  - Reliable

Summary of ICT/Grid Stakeholders

- Next Generation Network (NGN):
  - Person-to-Person services
  - Messaging services
  - Content-on-Demand services
- Grid and NGN:
  - Subsystem
  - Application
  - Interfacing network
  - Combo



ETSI and OGF

- TC GRID views OGF as primary source for grid software standards
- Memorandum of Understanding signed during OGF20
- Still, several other relevant standards bodies
  - ETSI among them
- Referencing, not repeating, work of SCRM-WG
  - Standards development organizations Collaboration on networked Resources Management
- Focus on Telco-relevant and Telco-scale grid standards
  - Software and protocols
  - Architectures
  - Data Standards
  - Networking

What do ETSI Members Want?

- Clarity on the state of Grid Standards
  - Which are relevant
  - Which are stable
  - Which can be (and have been) implemented
- Visibility of standards and interoperability gaps
  - Where will they need an "*ad hoc* bridge"?
  - Where will they need to write new standards
- Identify opportunities for Telcos to utilize and provide grid computing
  - Storage services
  - Service hosting
  - Bandwidth-on-demand
  - Generic compute-on-demand
  - Transition identities from "Internet/Grid/Web world" to "Telco world"
  - Exposing network APIs to grid layer

What could the OGF gain?

- Engagement of a major industry
- Improved exposure to and expertise on existing telco standards for
  - Network management
  - Identity management, user profiles, accounting, billing
  - High availability services
  - Standards conformance testing strategies
- Heads up for 3G/4G and NGN telco technology currently “in the pipeline”
  - Ubiquitous network availability (e.g. WiMAX)
  - Move to packet based/IP network
  - New services available to users and developers
- New requirements and use cases

Standards Bodies - Highlights (I)

- Distributed Management Task Force (DMTF)
  - Common Information Model (CIM) – well known in Telco domain
  - Web Based Enterprise Mgmt (WBEM) – "CIM API"
- ETSI
  - GRID – Security, Web Services, IT/Telco convergence
  - TISPAN – responsible for NGN and IP/packet based network
- IETF
  - Security - X.509, SASL, TLS
  - Network - IPv6

Standards Bodies - Highlights (II)

- OASIS
  - Security - XACML, SAML
  - Web Services - UDDI
  - Architecture –Service Component Architecture (SCA)
- W3C
  - XML, XSD
  - XML Security
  - SOAP

Grid Infrastructures

- Reality is much of “grid computing” takes place outside of standards
  - Monolithic systems
  - Fixed configurations
  - Limited inter-grid interoperability
- Need to learn from experience of “real implementations”
  - EGEE/WLCG
  - TeraGrid
  - OSG
  - Grid5000
  - D-Grid
  - NorduGrid
  - And other national/regional grids

Perspectives on ICT Standards

- Fixed and wireless phone network(s) **WORK**
  - Large
  - Reliable
  - Evolving
  - Commercial
- There are
  - Users
  - Data
  - Networks
  - Software
  - Hardware

- Issues around security, billing, service layering, gateways have all been addressed
- NGN provides APIs for value-added services and hooks into underlying network infrastructure

1. *Grid developers/standards could learn from these existing standards*
2. *Enterprise and/or Large-Scale Grid computing could leverage this infrastructure*

Interoperability

- Interoperability through adapters
- Interoperability through uniform deployment
- Interoperability through existing protocols/interfaces
- Interoperability through new protocols/interfaces
- How to measure interoperability?
  - Good question!
  - Look for advice from OGF, GIN …
  - ETSI PlugTest tradition
- Work in progress…

Thank you from STF 331

- Questions?
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- More information at
  - http://portal.etsi.org/GRID/
- Contact/contribute to STF:
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- Join TC GRID mailing list
  - http://list.etsi.org/grid.html