
# Investigating Grid Interoperability in Production Grid Environment

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# What is all about?

# Agenda


- Grid development milestones
- Difficulties, human factor
- An analogous story: appearance of TCP/IP in networking technologies
- What is needed? Three different aspects
- Fundamental interoperability issues
- Possible models
- Where to?

# Grid development milestones

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- Roots:
  - cluster computing
  - elementary technologies (SSL, LDAP)
- Globus Toolkit initiative from 1986, GT1-4
- The period of test-beds and case studies, 1999-2002
- Services and web-services
- Building grid infrastructures (Nordugrid, EGEE, national initiatives)
- Improvement of current solutions

# Current status

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- Different geographical or thematic grids have been created and being used
- Stuck to operating system limitations
- Industry expressed firm interest in grid research, however the understanding of term grid is rather unclear between industry and academia
- Network connectivity does not imply application-level connectivity
- Useful pieces of recommendations (OGSA, JSDL, SRB) already, but more work is ahead
- Related areas: user authentication, basic authorization, virtual organizations

# A familiar story: TCP/IP

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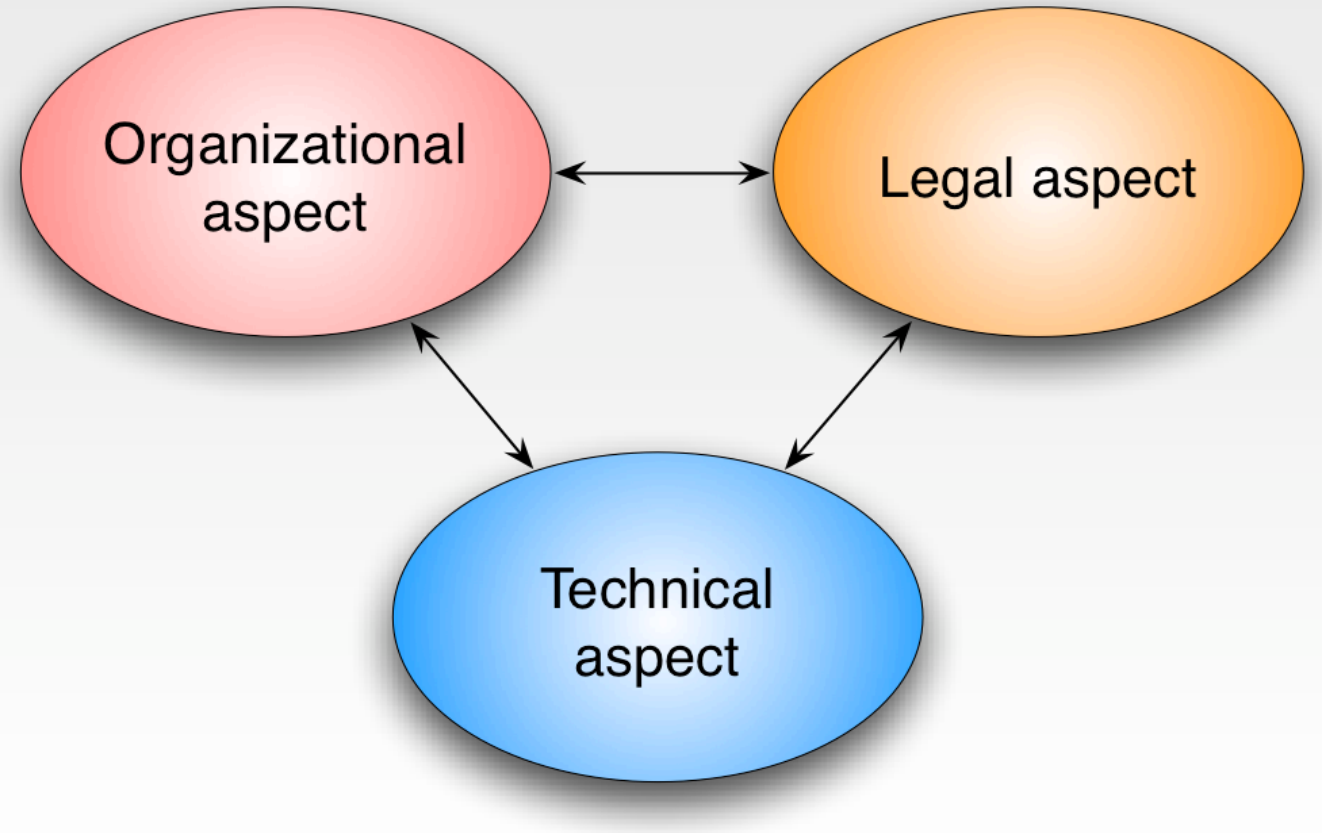
- Development of computer networks
- Competition of many industrial, academic, governmental solutions led to “protocol war”
- Dissolving resources for market share
- Consolidation: a commonly accepted protocol - TCP/IP
- Yielded huge boost in computer networking
- In grid have we reached this consolidation? Are we mature enough to cooperate?

# Interoperability questions



# Technical interoperability

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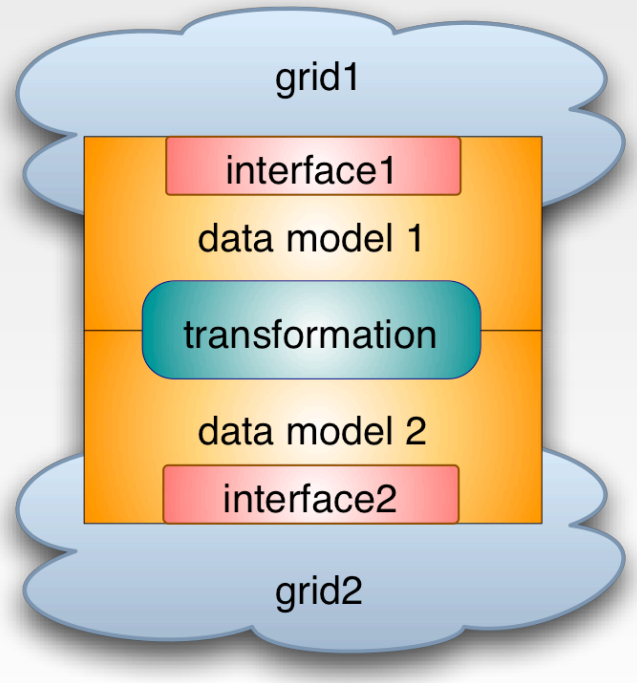
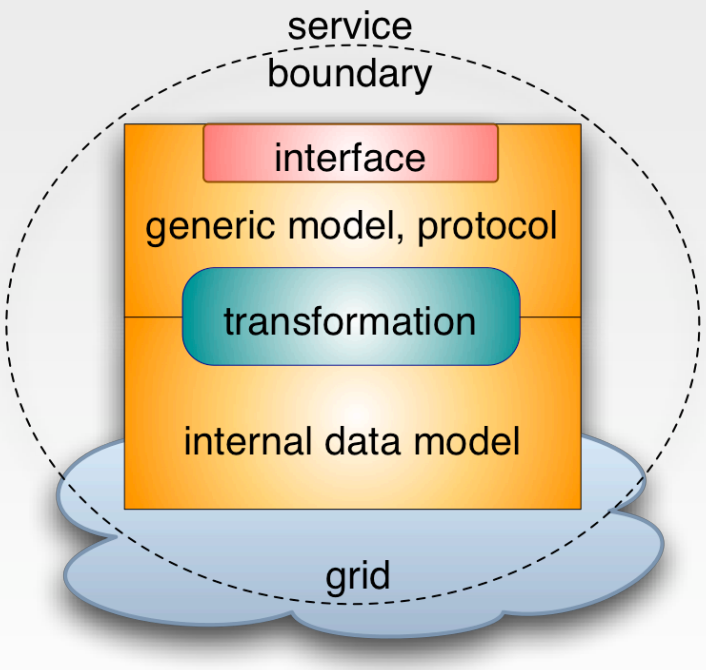
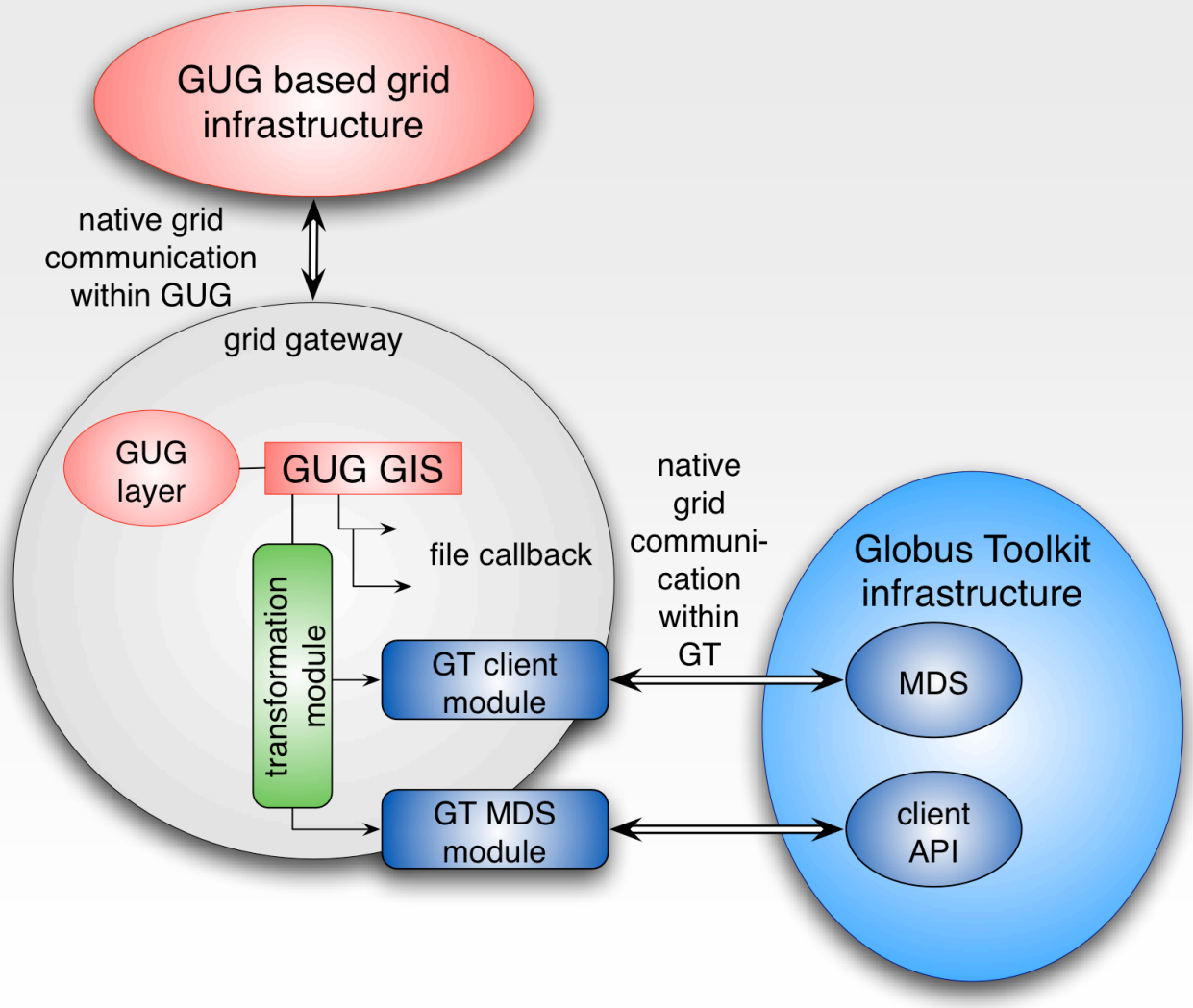
- Technical aspect:
  - Identifying and classifying services (services = any external appearance)
  - Identifying internal data representation and what appears from the data externally
  - Identifying how services communicate internally and to the external world, protocols
- Two ways to interoperate: two systems interoperation and common interface interoperation

# Technical interoperability



# Case study: GIS



# Standards

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- Standards, recommendations, quasi-standards are highly important
- So is keeping them exactly
- Good coverage: OGSA-BES, JSDL, SRM interfaces
- Standards can also be the victim of generic disagreement, as different organizations, interest groups may create their own standards

# Where to approach?

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- KnowARC has a dedicated WP for dealing with interoperability and standardization:
  - policies,
  - interoperability survey,
  - OGSA-conformance (GFD.80),
  - ARC-EGEE interoperability,
  - grid standardization initiative,
  - grid gateways and boundary services.

# Where to approach?

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- Interoperability is a common effort, no single company can give feasible solution
- It is important to recognize its importance, otherwise grid research and development might also be compromised in the long-run
- Each influential project should deal with it at least at the external communication and data model identification level
- Standardization efforts (OGF-GIN, WWW, RFC)
- Realize something usable! ☺


Thank you! Questions?