

# On Importance of Service Level Management in Grids

*Tomasz Szepieniec,*

*Joanna Kocot, Thomas Schaaf, Owen Appleton,  
Matti Heikkurinen, Adam Belloum, Joan Serrat-Fernandez,  
Martin Metzker*



# Grid & SLM: couple?

National grid bodies  
 Grid operators  
 VO managers  
 Resource owners  
 Standards and policy bodies

# Grid



Service Management approaches

# IT Service Management

IT Service customers  
 IT Service providers  
 SLM consultants

# Overview

- ◆ Are ITSM solutions ready to support grids?
- ◆ Does grids need SLM?
- ◆ Role-based view: benefits and readiness
  - Customer, Application scenarios
  - Providers and Integrators (xGI)
- ◆ How this might work?
  - gSLM Model of SLM for Grids
  - Implementation Example

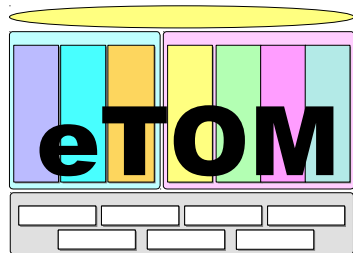
# Service Level Management in ITSM



**Standard:** provides a roadmap of things to be done



**Best practices:** describe key processes and related concepts.



**Frameworks:** successful adoption in other fields (here networking)

SLM describes the processes of:

- defining a catalogue of IT service offerings;
- specifying services and service components, including their dependencies and available service level options;
- negotiating and signing **Service Level Agreements (SLAs)** with customers, **underpinning SLAs with internal Operational Level Agreements (OLAs)** and **suitable contracts with external suppliers**,
- monitoring and reporting on the fulfilment of SLAs as well as (early) notifications of SLA violations.



# Grid & SLM: ITSM wants...

National grid bodies  
 Grid operators  
 VO managers  
 Resource owners  
 Standards and policy bodies

# Grid

Service Management approaches

# IT Service Management

IT Service customers  
 IT Service providers  
 SLM consultants

# Grid theory and Initial Motivation

◆ Grid definition by Ian Foster

*“...resources are not subject of centralized control....  
... delivering nontrivial qualities of service”*

What is the Grid: A Three Point Checklist, Grid Today, July 20, 2002.

- various qualities of service which are set-up to meet complex user demands

◆ Plaszczak and Wellner one of three advantages of grid computing:

*“on-demand provisioning”*

*Grid computing: the savvy manager’s guide, 2006*

- Replacement for purchasing and maintaining hardware
- The warranty must not be excluded

# Maturity/Disillusion

- ◆ Childish simplification:
  - “resources are almost infinite  
so you get what you want”
  - TRUE for initial usage:
    - Requested capacity  $\ll$  (possibly) offered capacity
  - FALSE for real, mature applications:
    - e.g LHC: requested for next years  $>$  currently offered worldwide
  
- ◆ Grid is mature enough to... plan  
against stereotypes, like:
  - “grid should be best-effort only”
  - “we need simply to share all our resources.... ”

# Actors view: Customers

## *Selection of result of gSLM survey on grid users String 2011*

- ◆ Grid Technology Issues:
  - 1<sup>st</sup> technical difficulties
  - 2<sup>nd</sup> **no or poor warranty of obtaining resources in reasonable (finite) time**
- ◆ The most desired improvement:
  - 1<sup>st</sup> **“improving warranty”**
- ◆ 60% users are “ready to invest in more strict and complex procedures in exchange for improvements in the Grid quality issues”.



## Actors view: Application scenarios

- ◆ LHC – tremendous effort to establish consistent resource provision in long term, signed with almost all sites in the form of MoU,
- ◆ Data Challenges in EGEE Infrastructure – specific, well-described computational project planned for defined short, terms (few months) – sites were happy to contribute;
- ◆ Urgent computing scenarios – right to consume large resources in case of emergency; require technical and organizational means (e.g. UrbanFlood Project)
- ◆ Data intensive applications - storage usage planning is especially important as storage space is shared less eagerly..

# Actors views: Providers

- Providers Goals:
  - Relations with users
    - Knowledge of what is really needed
  - Capacity planning
- ◆ Grid integrators (xGI)
  - Need to prove there are needed → show how they add 'value'
  - To maintain proper relation with customers is crucial here, however sites need to keep control of their resources/policies
  - Integration, single point of contact
- ◆ However, typical first reaction: “we won't promise anything”
  - Need a sociological change..



# Grid & SLM: Grid is positive!

National grid bodies  
 Grid operators  
 VO managers  
 Resource owners  
 Standards and policy bodies

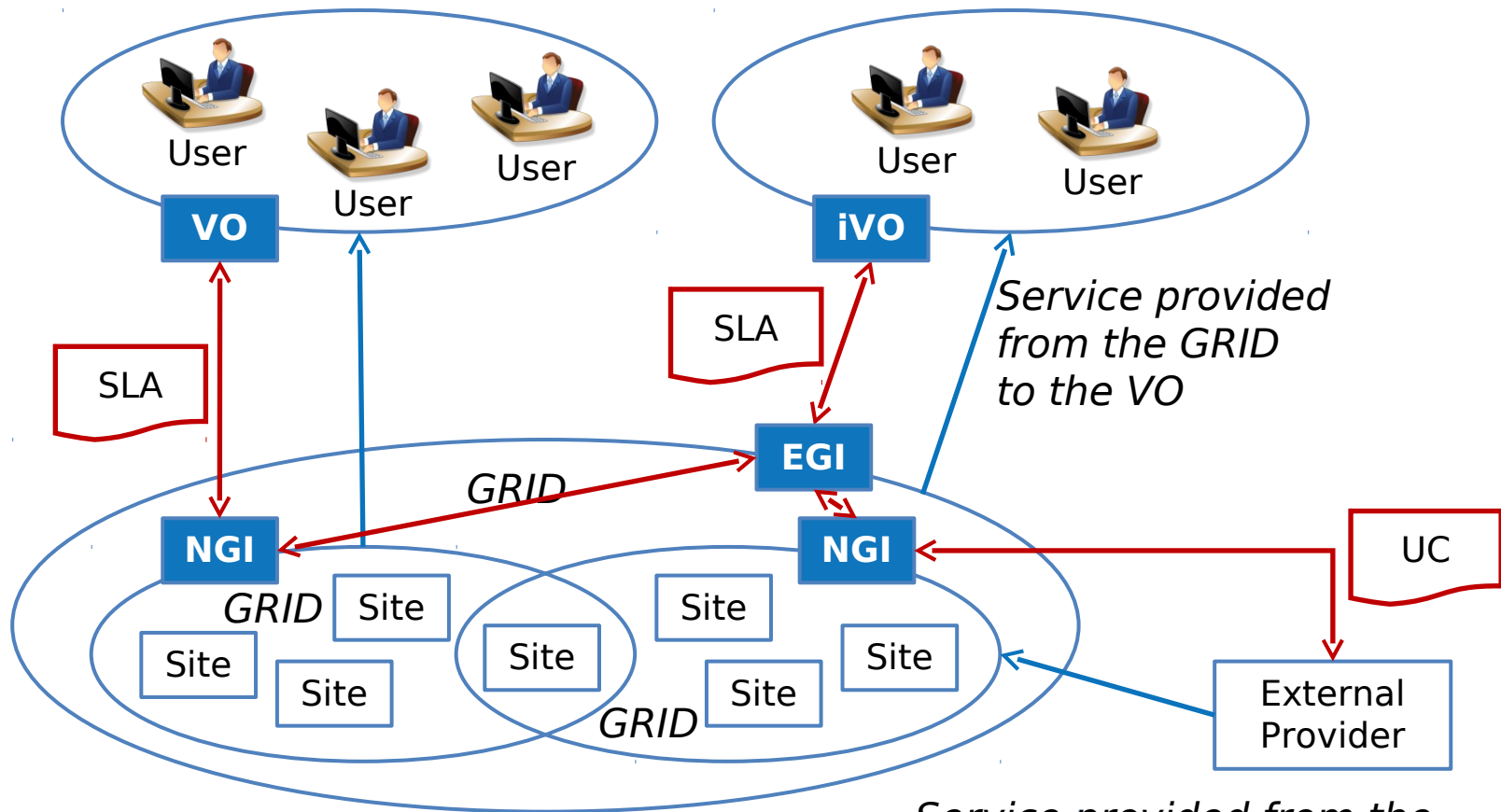
# Grid

Service Management approaches

# IT Service Management

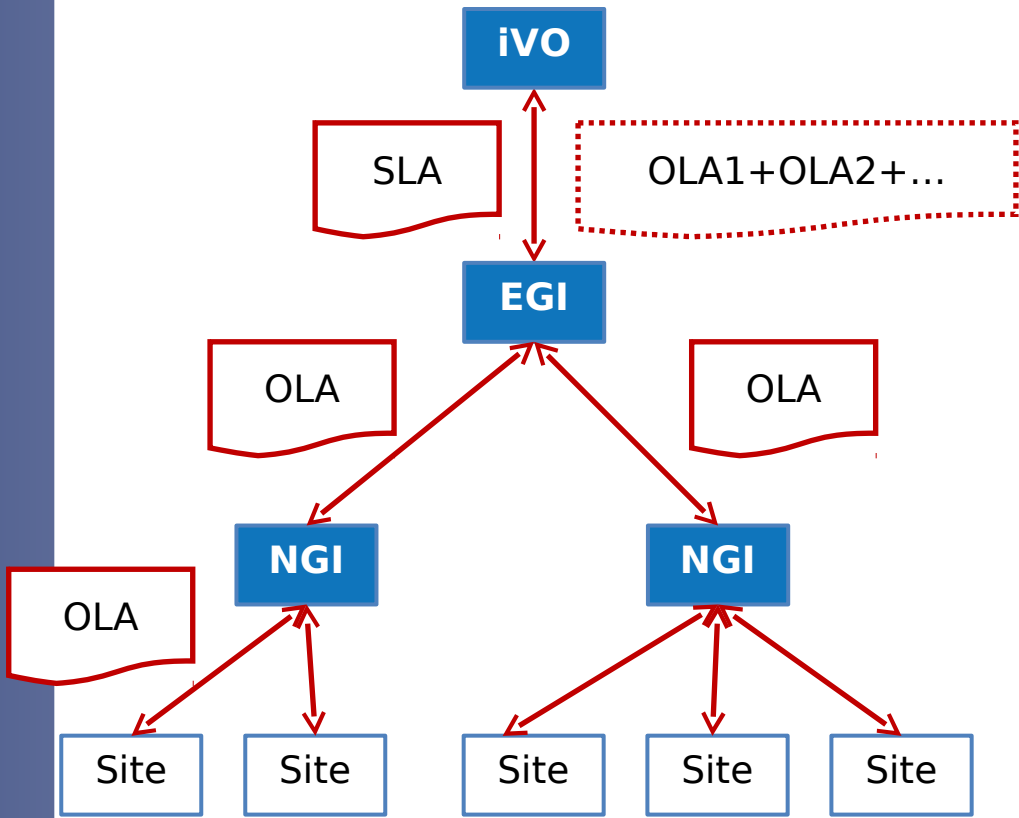
IT Service customers  
 SLM consultants  
 IT Service providers

# Relationships in Grids



*Service provided from the Provider to the Grid (e.g., software, telecom services)*

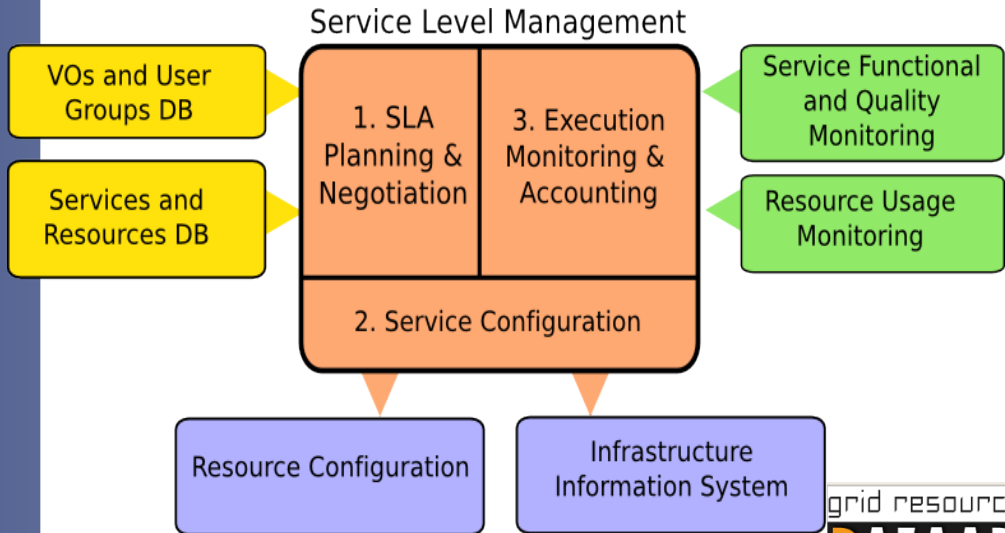
# gSLM Solution Proposal



- ◆ Hierarchical SLA/OLA framework
- ◆ VO has always a single point of contact
- ◆ NGI/EGI adds value by aggregating and (optionally) improve QoS by brokering and duplication of service instances/capacity
- ◆ Site/NGI keeps control on their resources



# Implementation example: PL-Grid



SLA-centric operations model

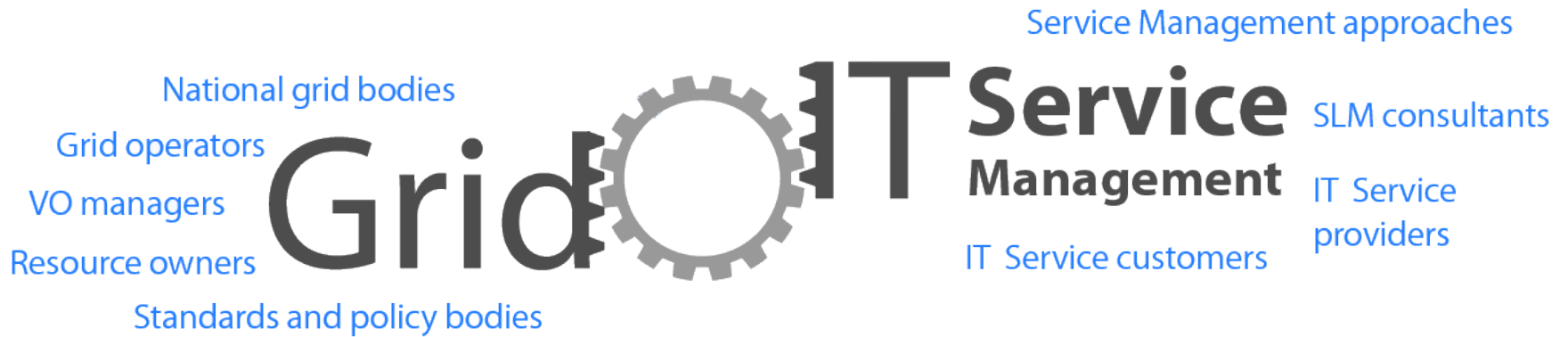
- ◆ Grid Resource Bazaar – a platform for traceable SLAs negotiations that enables efficient communication in the process; in production since June 2011
- ◆ Tools for automatic configuration of sites according SLAs in preparation

<http://bazaar.grid.cyfronet.pl>

The screenshot shows the Grid Resource Bazaar interface. On the left is a navigation tree with 'Your VOs and RCs' including 'alice' and 'argo'. The main area displays 'Actions & logs' for a 'New call' with a table of actions and a 'Log' section. Below this are two charts: 'Number of cores/CPUs' and 'Storage space (GB)'. On the right, there is a detailed view for 'Call 426: 'alice call'', showing basic information like 'Call opening period' and 'Call status', and a 'Resources' section with 'Estimated' values for 'cores/CPU[no]' and 'stor. space [GB]'. The bottom right shows the 'Edit' form for the call, including fields for 'Seed resource', 'Responsible Person', 'Number of CPUs', 'Storage [GB]', 'Comp. start date', 'Comp. end date', and 'Call open from'.



# Grid & SLM Together!



# Grid & SLM: Future work

