Problems in the Implementation of Grid Security Services

Syed Naqvi, Michel Riguidel

{naqvi, riguidel}@enst.fr

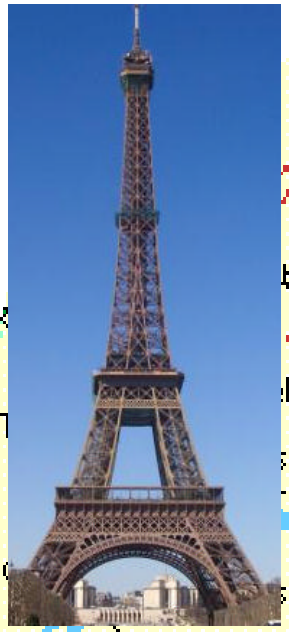
Computer Sciences and Networks Department

Télécom Paris – Graduate School of Telecommunications

46 Rue Barrault, Paris 75013 – France

Cracow Grid Workshop 2004 (CGW 04), Krakow – Poland

TELECOM PARIS
école nationale supérieure des télécommunications

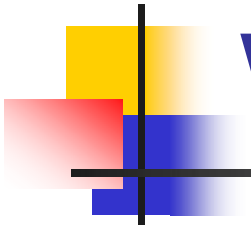


46 Rue Barrault, Paris 75013

Télécom Paris – *At a Glance* …

- French Premier School of Information Sciences and Technologies
- Established in 1878; Birthplace of 'Télécommunications' (1904)
- Four Departments:
  - Networks and Computer Sciences
  - Electronics and Communications
  - Image and Signal Processing
  - Economy, Management, Humanities and Social Sciences
- Statistics of the year 2003
  - Total Budget of 45 Million Euros
  - 142 Academics, 241 PhD students, 1270 Internees
  - 270 Revues, 550 Conferences
  - 41 Projects, 16 Softwares, 14 Patents

TELECOM PARIS
école nationale supérieure des télécommunications



What is Grid Security ?

- Login/password : Is it sufficient ?
- Cryptography : a silver bullet ?
  - Availability, Denial of Service, …
- Security for non-confidential data
  - Integrity, Availability, …
- Accountability
  - Traceability, Nonrepudiation, …
- Technology updates
  - Mobility, Security Gaps, …

Security Requirements

Confidentiality

Integrity

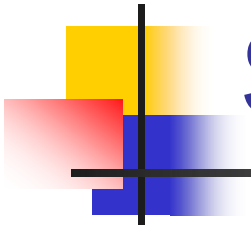
Availability

Physical Security

Access Control

Traceability

TELECOM PARIS
école nationale supérieure des télécommunications

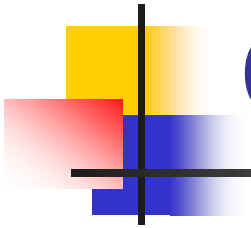


Security Practices

- Application-specific Risk Analysis
  - Bulk of data, scalability, dynamic distribution of trust, …
- Simulations of Security Services
  - OptorSim, ChicagoSim, SimGrid, EDGSim, GridNet, …
- Security Patches
  - Are they good for Grid applications ?
- Security Evaluation Mechanisms
  - Common Criteria

Where we are now ?

- GSI is still in the early stages to provide the security in-depth
- Security requirements for grid are not envisioned
- Designers have no security targets in the grid projects
- There is no benchmark to facilitate the development of security solutions

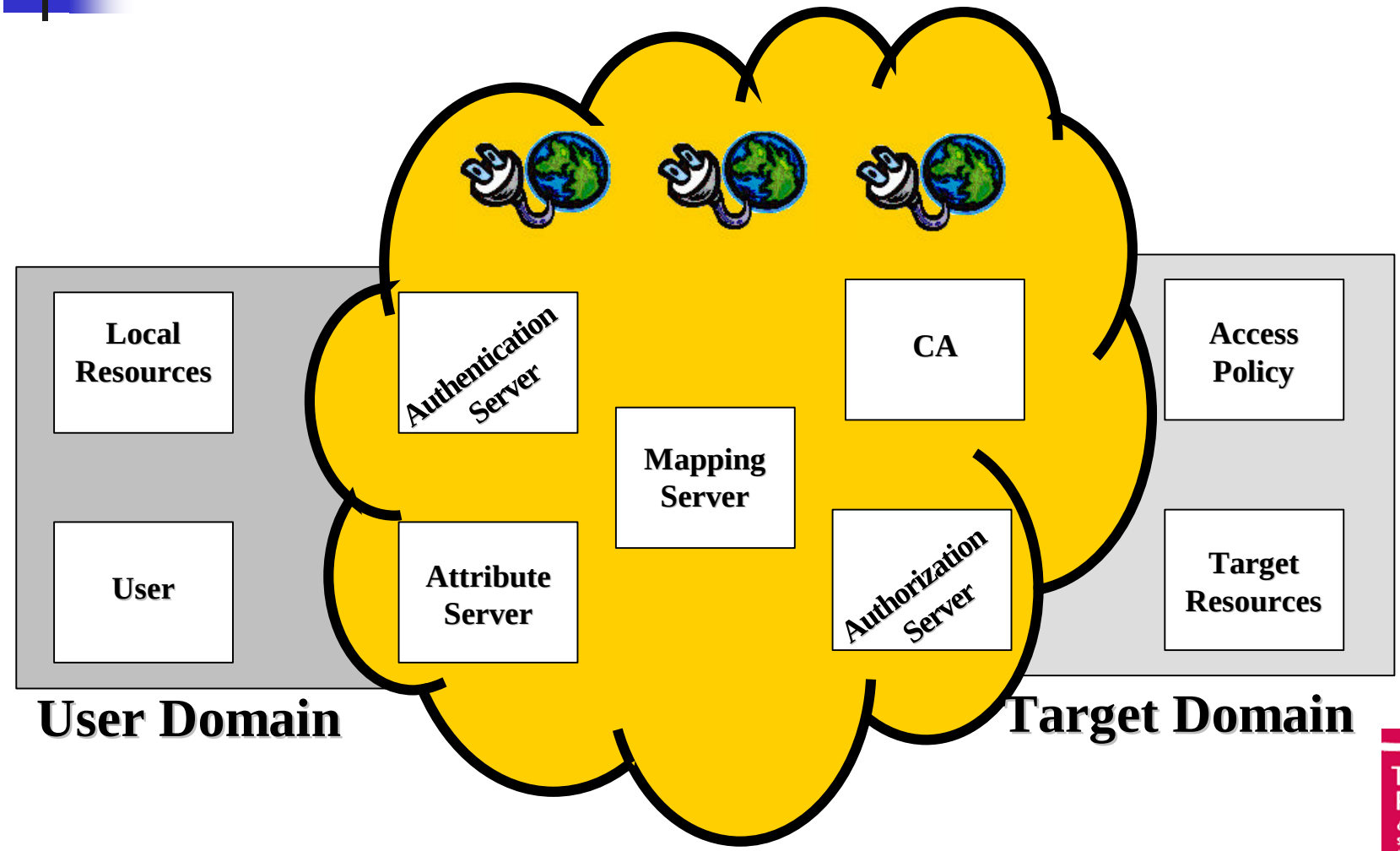


Grid Security – Our Approach

- Grid-specific Security Solution
  - Huge bunch of nodes, dynamic creation of VOs, …
- Virtual Paradigm for the Grid Security Services
  - Abstraction, Implementation Independent, …
- Pluggable Features for the Security Services
  - An extension of the vision of OGSA Security Model
- Strictly follow the standard security practices
  - Risks analysis, evaluation criteria, simulations, …

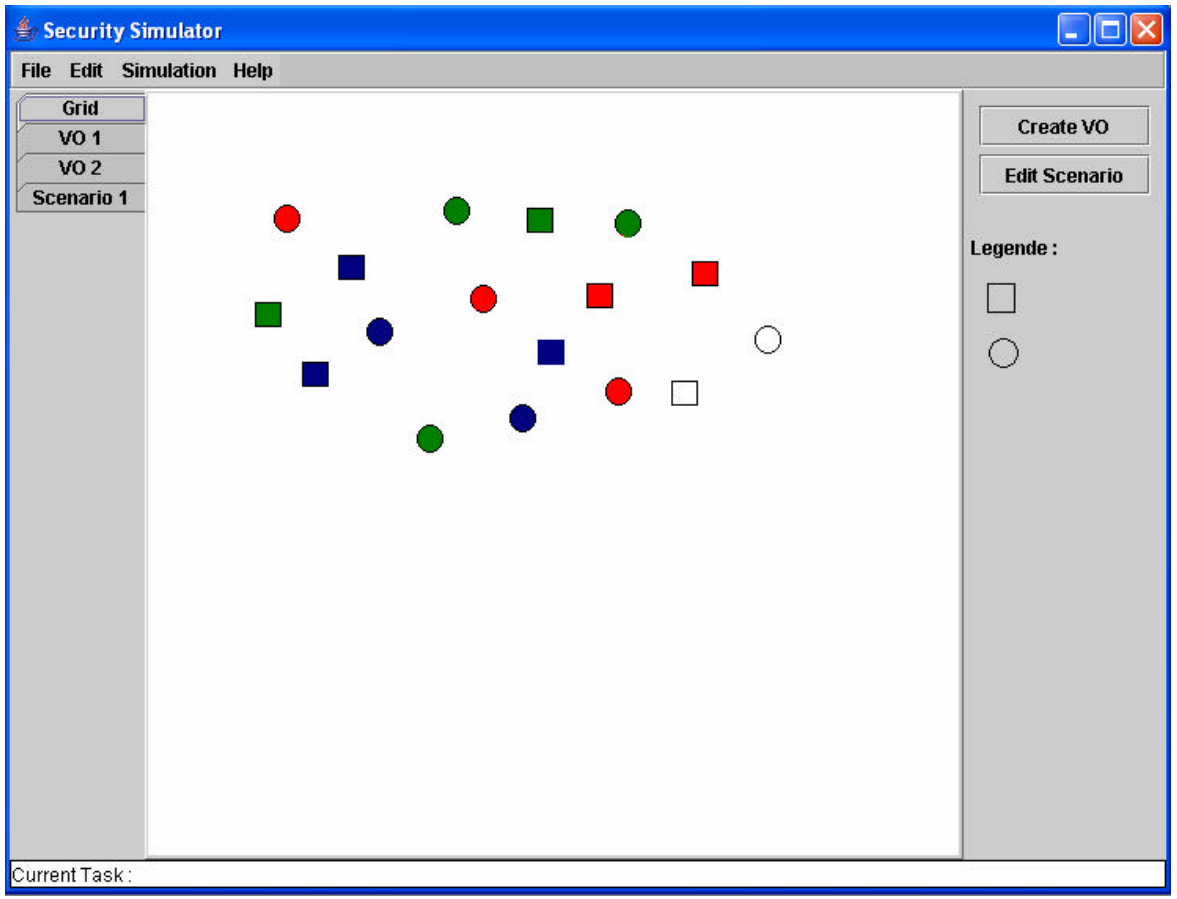
VIPSEC : VIrtualized and Pluggable SECurity Services

VIPSEC Model

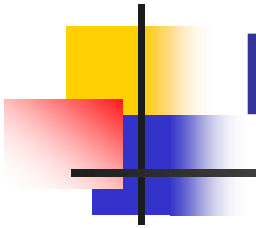


TELECOM PARIS
école nationale supérieure des télécommunications

G3S : Grid Security Services Simulator

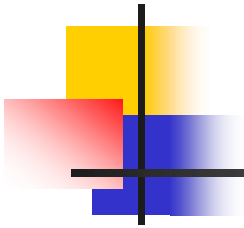


TELECOM PARIS
école nationale supérieure des télécommunications



Performance Measurement

- There is no widely accepted and deployed technique that can measure the quality of grid security services
- Even there is no clear definition for grid security performance because there is no such characterization that is able to handle
  - The diversity and heterogeneity of resources
  - The lack of universal metrics
  - The intelligent processing and presentation of performance related data
  - ...



Conclusions

- Grid security is still a barren land in the need of cultivation.
- As Grid technology becomes more widely adopted, the need for security will increase even more.
- Grid security requires **development** of grid-specific security solutions rather than just **assembling** the security solutions designed for other technologies!
- We look forward to collaborate with the members of the Grid community
  - especially with the end users, middleware developers, …