



e-Infrastructure services for R&E and beyond

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Outline

- e-Infrastructures in R&E
- Components and environment
- SOA and virtualization
- Traditional and federated services
- Beyond R&E
- Conclusions

- New environment for academic and industrial research and education in which:
 - share
 - federate
 - and exploit
the collective power of scientific facilities.

Education aspects

- Teaching the technology
 - trainings
 - regular courses
 - university students are very impulsive for new technologies
- Usage of the technology
 - technical and social advantages
 - changing/sharing ideas

Usage at different levels

- For example:
 - Virtual organizations
 - Distributed knowledge
 - Shared ideas
- Good collection of examples and nice videos at eiUS project webpage:
<http://projects.oucs.ox.ac.uk/eius/>



eiUS
e-Infrastructure Use Cases
and Service Usage Models

Selected examples

- [Access Grid Support Centre](#)
- [Archaeology Data Service \(ADS\)](#)
- [Arts and Humanities e-Science Support Centre \(AHeSSC\)](#)
- [Digital Curation Centre \(DCC\)](#)
- [EDINA](#)
- [Mimas](#)
- [National Centre for Text Mining \(NaCTeM\)](#)
- [UK Data Archive](#)

Major components

- Communication networks
- High performance computing facilities
- Distributed grid and cloud infrastructures
- Digital repositories
- Domain specific infrastructures:
 - Astronomy
 - Chemistry
 - Archeology
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Multidisciplinary environment

- Diverse aspects:
 - technical
 - social
 - economic
 - political
 - legal
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- Heterogenic
- Loose coupling

SOA concept

- Digital resources as services
- Service providers
- Third party brokers
- Friendly and common interfaces
- Interoperable components
- Frameworks putting services together to create new services

Virtualization

- Virtual communities
- Virtual resources
- Services
 - SaaS
 - HaaS
 - PaaS
 - TaaS
 -

SOA + Virtualization

- Together, SOA and Virtualization could significantly improve workflow and business processes by spreading those SOA services across multiple servers.
- Some of the traditional NREN services are already implemented on SOA basis:
 - Authentication
 - Computing
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Traditional NREN Services

- Network & Connectivity
- Security
- Authentication & “Mobility”
- Housing – Hosting – Content delivery
- Conferencing
- Computing resources
- e-Learning/ Tele teaching: e-Research
- User interaction – knowledge dissemination

Federated e-Infrastructure

- Network & Connectivity Services
- Security Services
- Authentication & Authorization Services
- Hosting Services
- Computing Services (grid and cloud)
- Digital Library Services
- Service Discovery
- Service Orchestration

Beyond the R&E

- e-Government
 - Public online services
 - e-Identification and e-Authentication
 - e-Environment
 - cross-border e-Environment services
- e-Health
 - databases for patient records
 - mobile monitors

- Hundreds of billions of Euros could be saved for European taxpayers every year as a result of administrative modernisation.
- e-Poll
- SmartGov
- Local government
 - Services serviced by ASPs

Conclusions

- The general usage of the e-Infrastructures getting more widespread in R&E sphere.
- The traditional NREN services should be reinforced and renewed.
- The virtualization and service oriented thinking will be the key element in this.

Conclusions cont.

- The e-Infrastructures play important role not only in R&E sector...
- ... but also generally speaking in all the public and private sectors.
- The SOA+Virtualization may be the basis of the future, generalized e-Infrastructures.
- Other technologies like grid/cloud computing will be generally used.