ICT Infrastructures for e-Science

The Communication by the Commission

Prague, 14 May 2009

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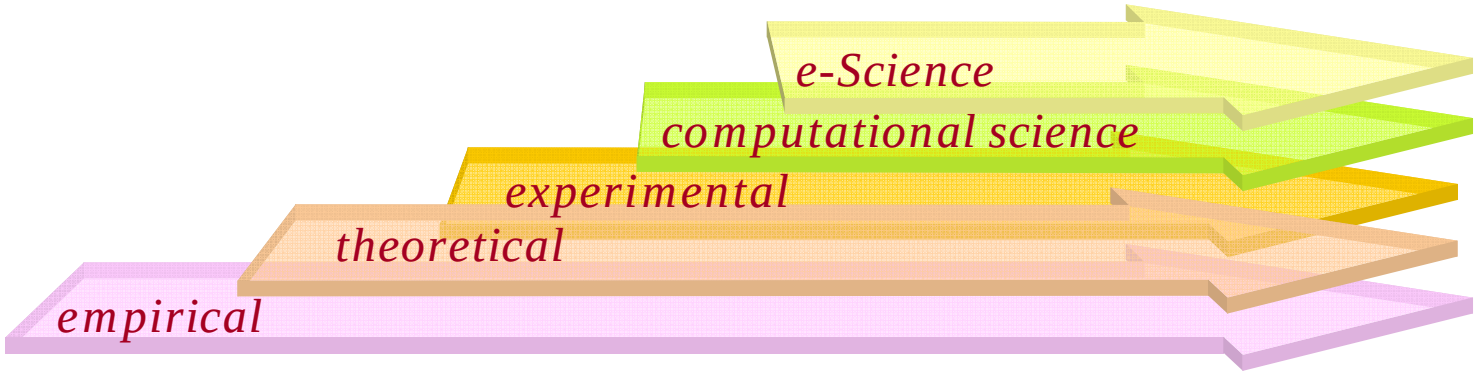
Science and ICT

- Scientific advances more important than ever
  - Global challenges with high societal impact
  - Innovation and economic development
- Adoption of ICT changes the scientific discovery process
  - Computing, simulation and data
  - Tackling the very small, the very big and the very complex
  - Cost efficiency
  - Open, cross-border and cross-discipline collaboration

The e-Science paradigm shift



towards a scientific Renaissance

e-Infrastructures for science

...ubiquitous research environments for accessing and sharing resources and tools...

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e-Infrastructures today

Innovating the scientific process:
global virtual research communities

Accessing knowledge:
scientific data

Experimenting *in silico*:
simulation and visualisation

Sharing the best computational resources:
e-Science grid, supercomputing

Linking at the speed of the light:
GÉANT

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World Leadership

- GÉANT: biggest and fastest research & education network in the globe
- EGEE: world leading grid-infrastructure

- DEISA: peering European supercomputing capability with that of other regions
- Data infrastructures: laying down the foundations
  - multi-disciplinary use, easy and open access

Future challenges

- World leadership requires ever-increasing efforts
- Scientific progress poses new requirements; e.g.
  - simulations soon at exa-scale level
  - handling mind-boggling quantities of data
  - new applications and tools
- Widespread use demands sustainable quality services
- ICT changes; HW performance increases rapidly

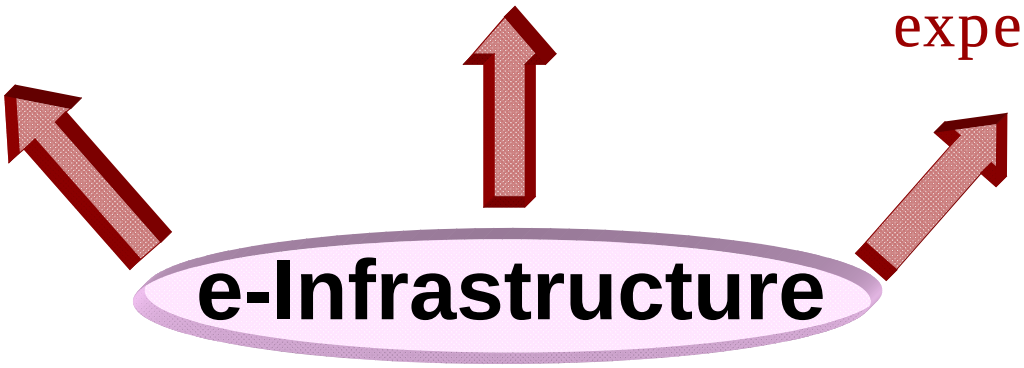
e-Infrastructures need to embrace new paradigms and include richer functionalities … to support multi-disciplinary teams to transform bits, bytes & flops into scientific discoveries & engineered products

A renewed strategy

Europe: hub of excellence in **e-Science**

Sustainable and continuous services (production quality 24/7)

Innovation: exploit know-how beyond science (public services, large scale experimentation,...)



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call for action (MS, EC)

- GÉANT: reinforce policy coordination, use/support as platform to lead to Internet of the Future
- Grids: long-term sustainability (governance model based on European Grid Initiative & National Grid Initiatives)
- Scientific data infrastructures: step up investment, share best practices, support accessibility & preservation
- Supercomputing facilities: scale up & pool investments (PRACE), set up broader strategic agenda (from components and systems to SW and services)
- Global Virtual Research Communities (GVRC): support model, promote emergence, best practices

e-Infrastructures for e-Science

postscript: the challenge landscape

- Use
  - Openness and inclusiveness
  - Service composition and personalisation
  - ⇨ Service and user orientation
- Organisation and structure
  - Efficient and fair governance, friendly to change
  - Decisions taken at most effective level (national, European, global)
  - Sustainability
- Innovation and technology
  - Reactivity to new needs and opportunities
  - Proactiveness to technological change

further information

www.cordis.europa.eu/fp7/ict/e-infrastructure/

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Connecting the finest minds

••• Linking ideas at the speed of light

Sharing the best scientific resources

••• Harnessing the unlimited power of computers, instruments and data

Building virtual global research communities

••• Innovating the scientific process

e-infrastructure

géant | grids | scientific data | supercomputing

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