e-Infrastructures and e-Science in the European Research Area

"Cross-border e-services – a building block for the digital ERA", 10 April 2014

ANNI HELLMAN, JARKKO SIREN
European Commission
DG CONNECT
eInfrastructure

European Commission

e-infrastructure

DEVELOPMENT AND DEPLOYMENT OF E-INFRASTRUCTURES AND SERVICES FOR RESEARCH

Jason de Caires Taylor,
underwater statue, Cancun Mexico
http://www.underwatersculpture.com/

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Vision

European Research Area

The Definition
(Lisbon Treaty and European Council Conclusions)

*… is a **unified research area** open to the world based on the internal market in which researchers, scientific knowledge and technology **circulate freely** and through which the Union and its member States strengthen their scientific and technological bases, their **competitiveness** and their capacity to collectively **address grand challenges**.*

European Research Area

has …

five priority areas:

- More effective national research systems
- Optimal transnational cooperation and competition
- An open labour market for researchers
- Gender equality and gender mainstreaming in research

- **Optimal circulation, access to and transfer of scientific knowledge including via digital ERA**
  - To guarantee access to and uptake of knowledge by all
  - Digital ERA forum

What is the H2020 approach to e-infrastructures and e-Science ?

Transversal

Cutting across disciplines and sectors

Support tomorrow's science

Open science, open access, best solutions – achieving Digital ERA

Enabling innovation

Developing and testing innovative solutions
Servicing industry and SMEs
Spinning out technologies

DRIVERS for change

- BIG DATA
- MORE COMPUTING POWER
- GLOBAL CONNECTIONS
- GLOBAL PARTICIPATION
- OPEN IS BETTER
  - WITHIN AND BETWEEN SCIENTIFIC COMMUNITIES
  - BETWEEN SCIENCE AND SOCIETY

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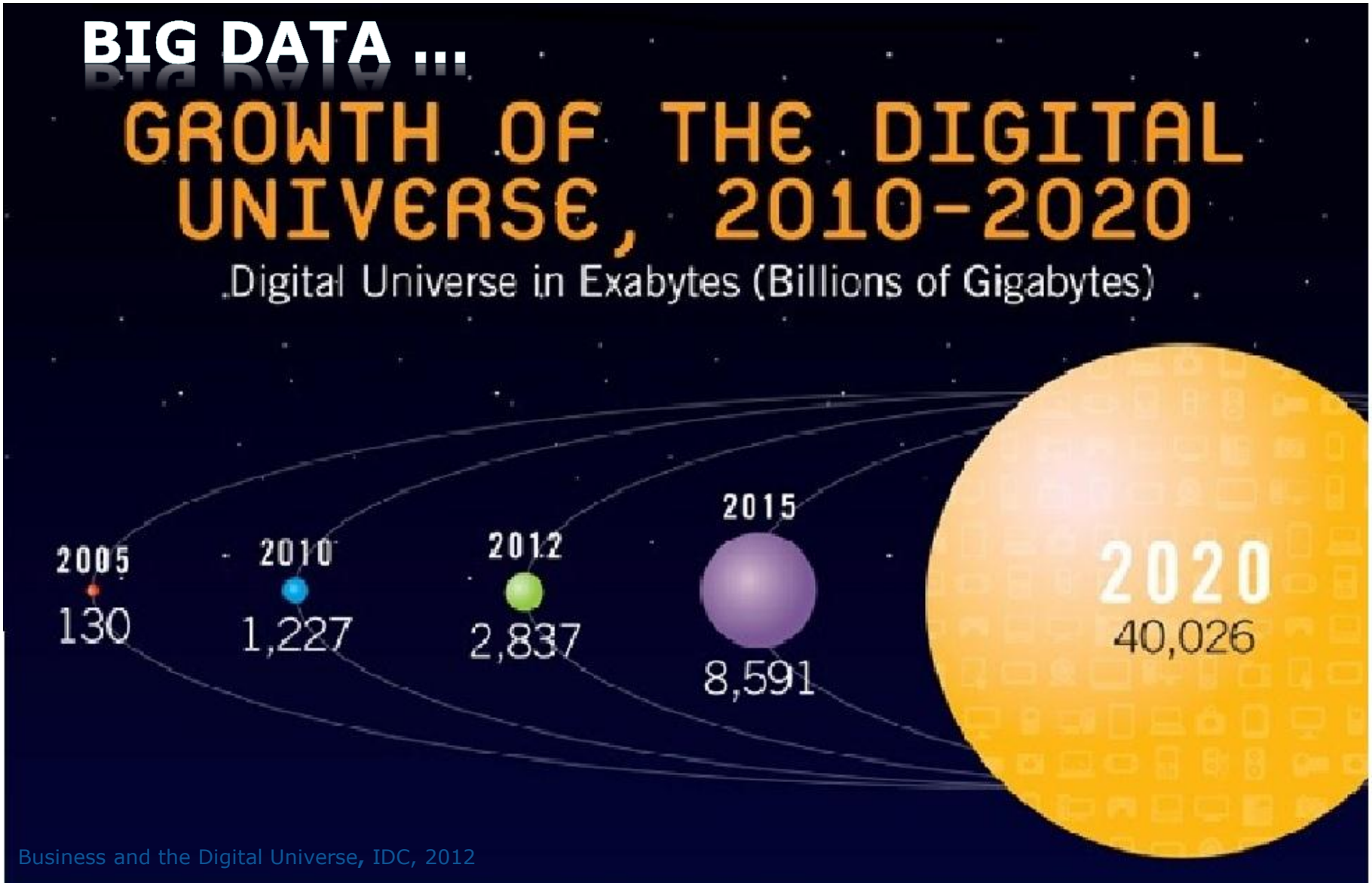
BIG DATA …



Business and the Digital Universe, IDC, 2012

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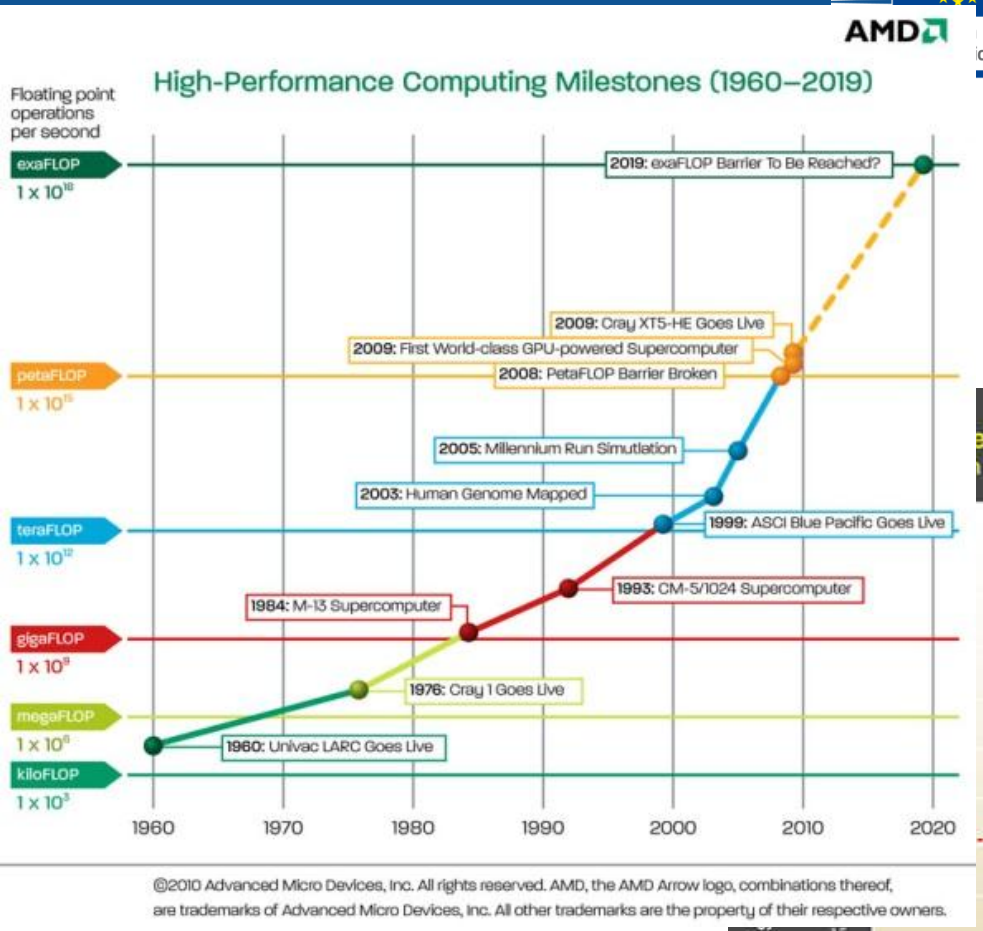
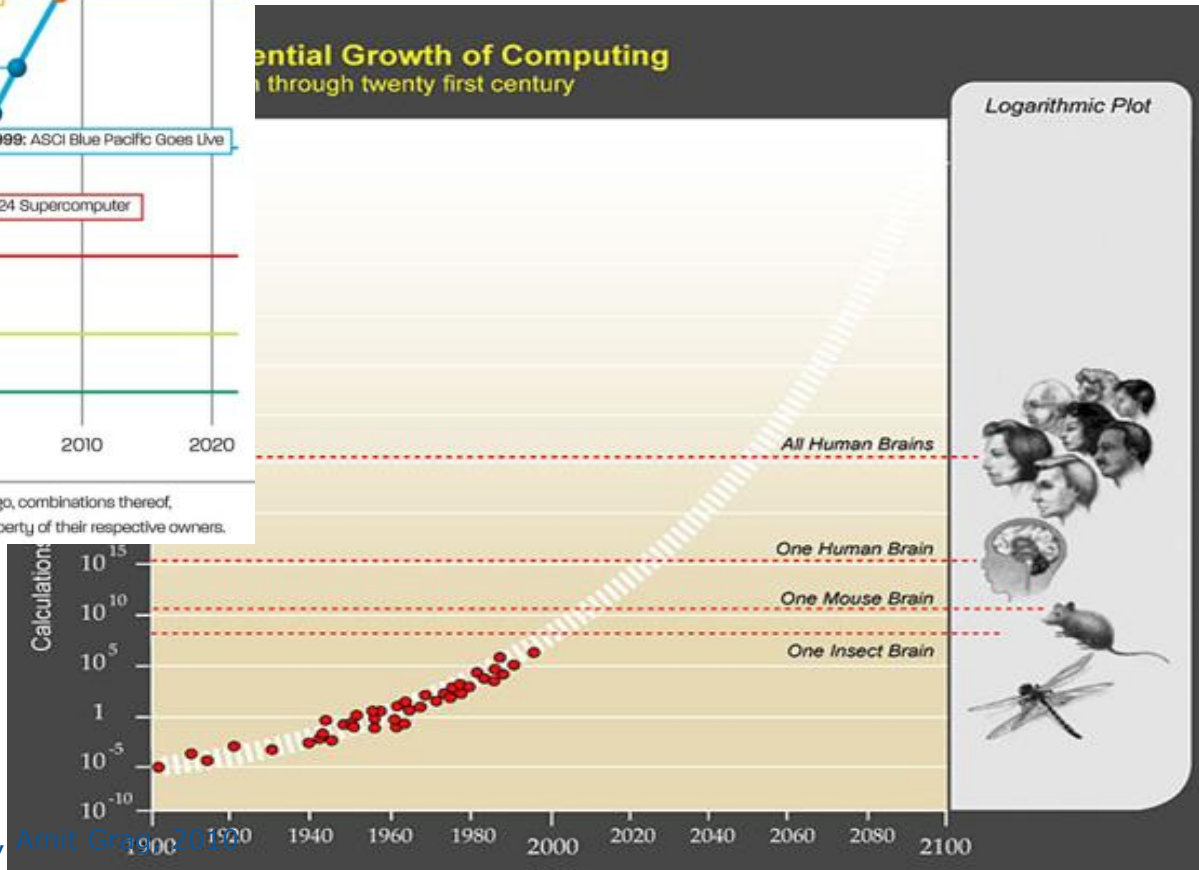
MORE COMPUTING POWER



MIT Technology Review, 2012



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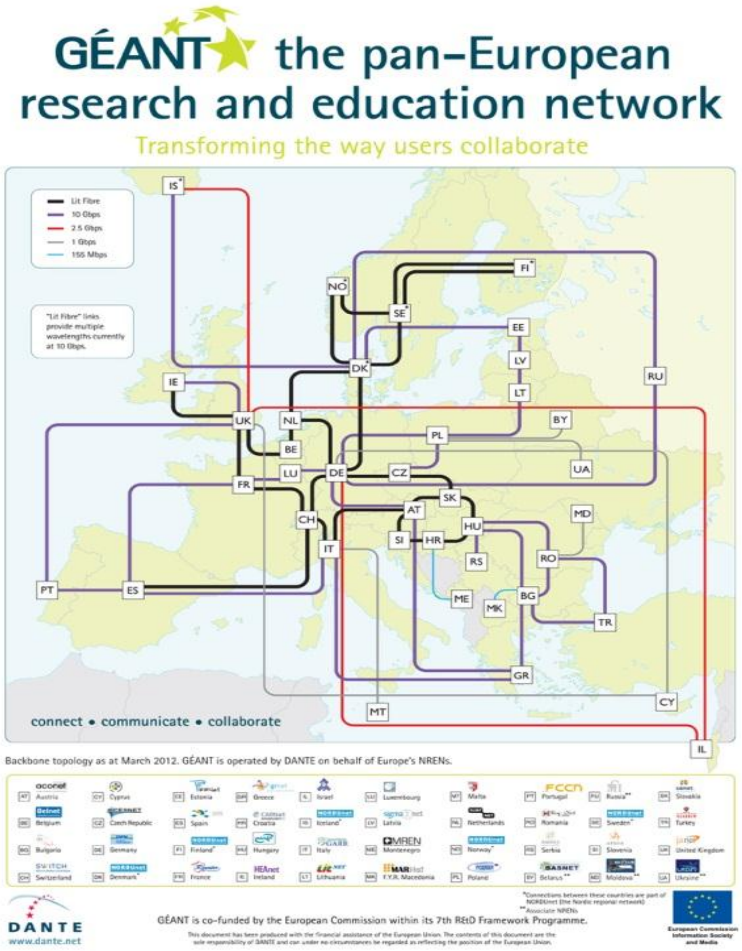

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Communication Commons

for 50M users in over 10,000 institutions across 40 countries - accessible through National Research and Education networks

50.000 km of cross-borders links including 12.000 km of dark fiber -

Vast range of innovative services operated 24x7 including

- wifi federated access – **eduroam** – growing at 100%+ y/y and adopted WW
- Federated access to content – **eduGAIN** – adopted WW (**HAKA, TAAT, Kalmar2**)

Globally connected to all peering regional clusters in the world as well as to developed countries

Open innovation through open competitive calls

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GLOBAL CONNECTIONS ...

Map of scientific collaborations from 2005 to 2009
Computed by Olivier H. Beauchesne @ Science-Metrix, Inc.
Data from Scopus, using books, trade journals and peer-reviewed journals

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Open is better…

To optimise the impact of publicly-funded scientific research

- At European level (FP7 & Horizon 2020)
- At Member State level

The way to get there: open access for everything publicly funded!

Expected benefits:

- Better and more efficient science → **Science 2.0**
- Economic growth → Innovation Union
- Broader, faster, more transparent and equal access **for the benefit of researchers, industry and citizens →** Responsible Research and Innovation
  … in the European Research Area and beyond

CHALLENGES for Europe for e-Science and e-infrastructures

- Need for long term perspective
  - Operational continuity
  - Sustainability
- Efficient and effective use of national and EU funding
- Resolving strategic, policy, legal, technical, financial and governance issues
- Innovation as a priority
  - Support SMEs
- Support to Horizon 2020

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Research Data become the infrastructure for modern science

Europe is Riding the Wave

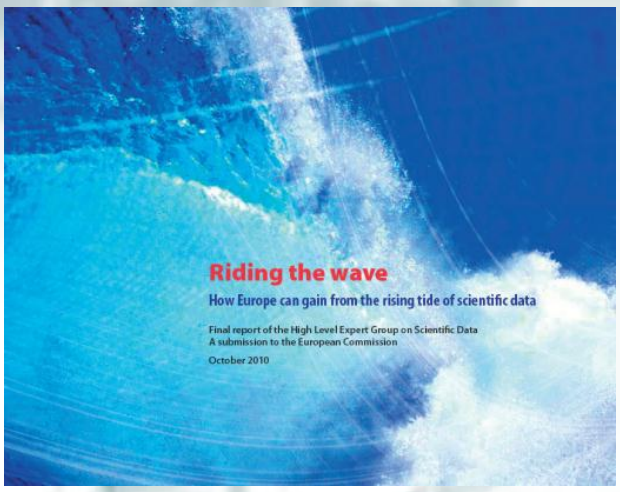
- Data e-infrastructure that supports **seamless access**, use, re-use and trust of data
- Physical and technical infrastructure become invisible and the **data becomes the infrastructure**
- Valuable asset on which science, technology, the economy and society can advance

Commission Communication on Scientific Information COM(2012)401 final (July 2012)

- Access, preservation and e-infrastructure (publications and data)

ERA Communication COM(2012)392

- **Federation of researcher electronic identities**



Riding the Wave
High Level Expert Group on Scientific Data, October 2010

http://cordis.europa.eu/fp7/ict/e-infrastructure/docs/hlg-sdi-report.pdf

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European HPC Strategy – an integrated approach in H2020

- **Basis:** Commission Communication **"High-Performance Computing: Europe's place in a Global Race"** (2012)
- **Vision:** to ensure European leadership in the supply and use of HPC systems and services by 2020 in a strategy combining:
  - (a) developing the next generation of HPC towards exascale;
  - (b) providing access to the best HPC infrastructure for both industry and academia;
  - (c) achieving excellence in computing applications - existing or new – driven by the needs of science, industry and SMEs

Linking demand and supply – in the spirit of Horizon 2020

- **Contractual Public-Private Partnership (cPPP)** covering (a) and part of (c)

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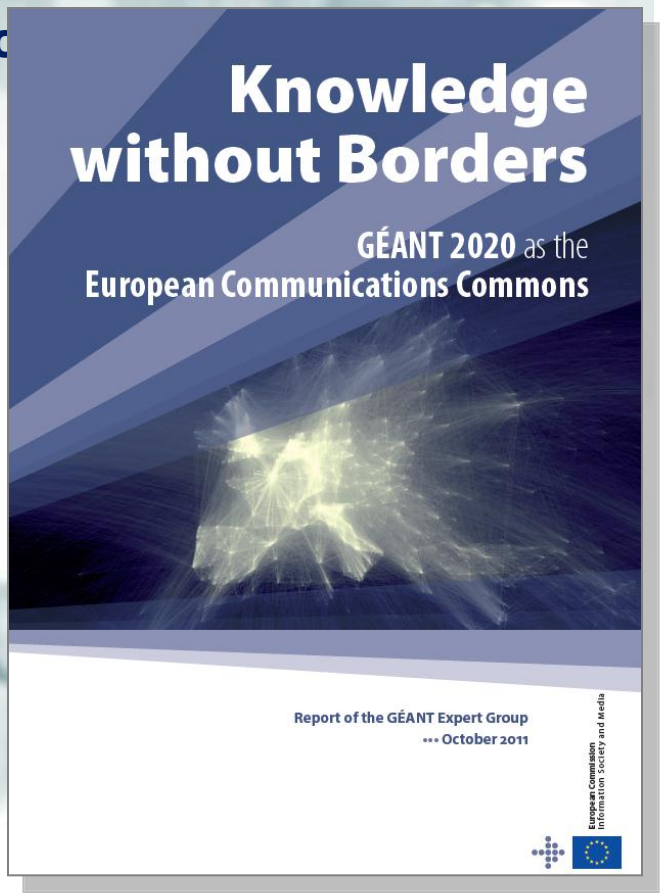
GÉANT Experts Group Report

Knowledge without Borders

World Class Connectivity and Services to Kno Communities

- Support ***Growth and Opening up***
- Help to close ***digital divides***
- Europe as global ***hub***
- Stimulate ***innovation***



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Summary of e-infrastructure priorities

- Services
- Thinking innovation
  - With both suppliers or users
- Mainstreaming skills development
- Integration between data and computing
- Business plans for financial sustainability
  - …and partnerships with the private sector
- Supporting policies
- open data and software
- Sharing basic operations services and building blocks
- Monitoring performance (KPIs)

E-SCIENCE IS...

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