



# CLASS

## Conference 2012

Cloud Assisted Services

### Helix Nebula: Developing a European science cloud with multiple suppliers

Bernino Lind COO



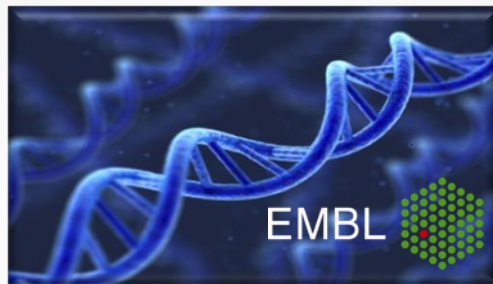
# Helix Nebula

ATLAS High Energy  
Physics Cloud Use



To support the computing  
capacity needs for the ATLAS  
experiment

Genomic Assembly  
in the Cloud



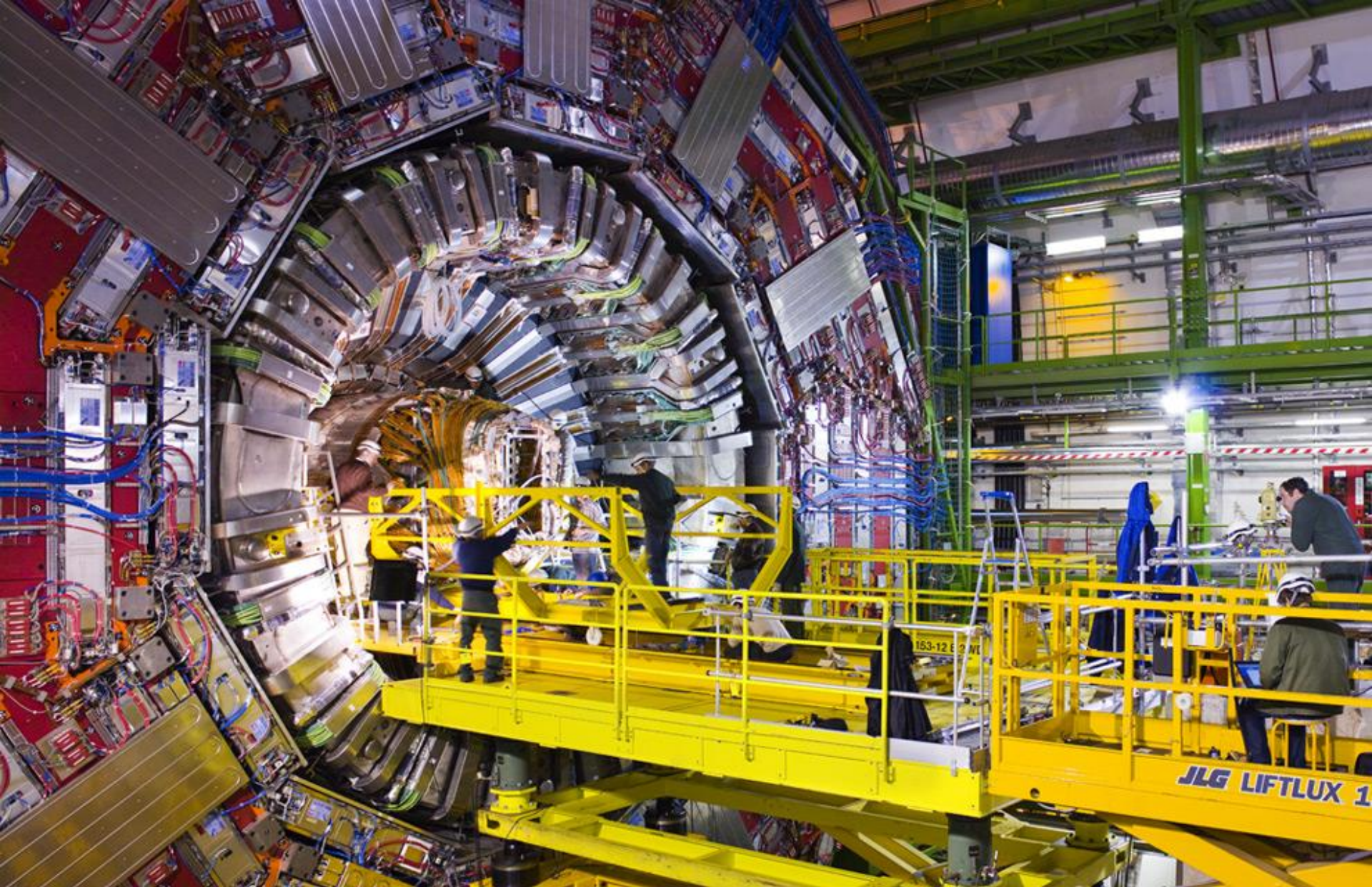
A new service to simplify  
large scale genome analysis;  
for a deeper insight into  
evolution and biodiversity

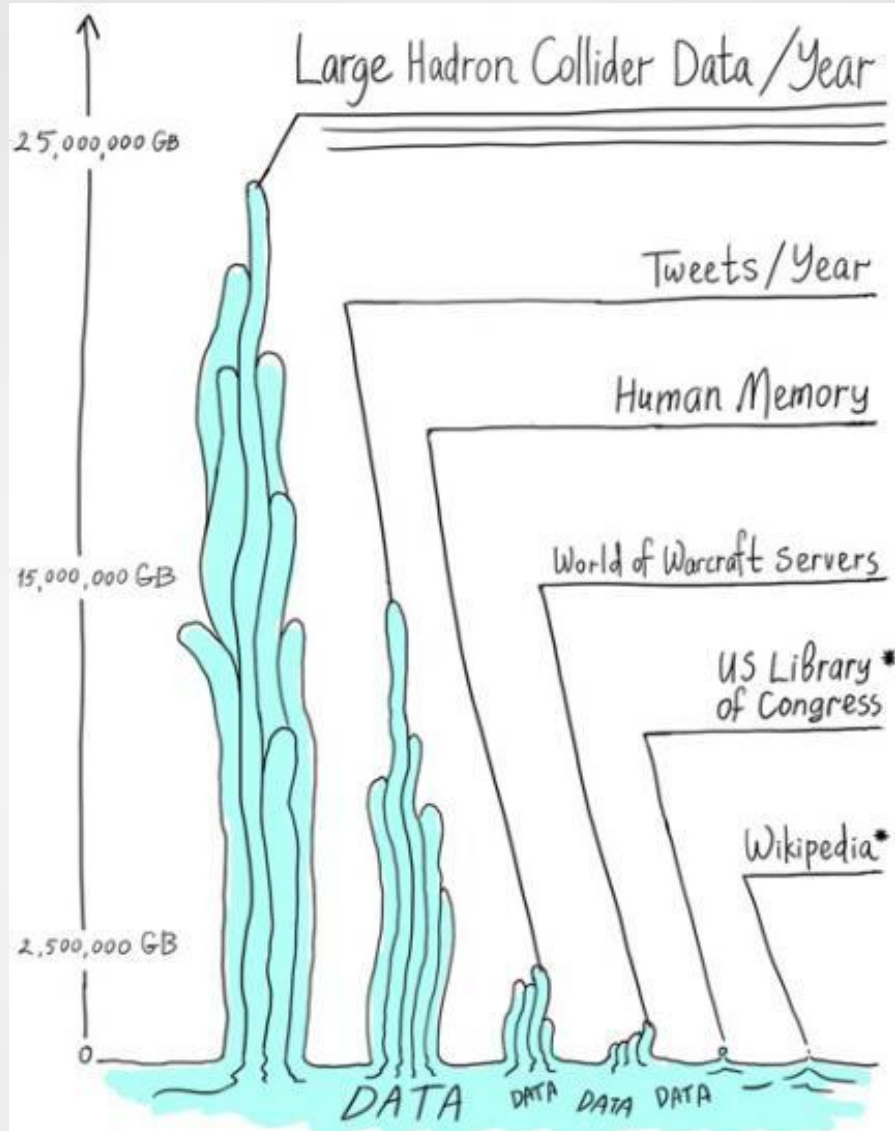
SuperSites Exploitation  
Platform



To create an Earth  
Observation platform,  
focusing on earthquake and  
volcano research

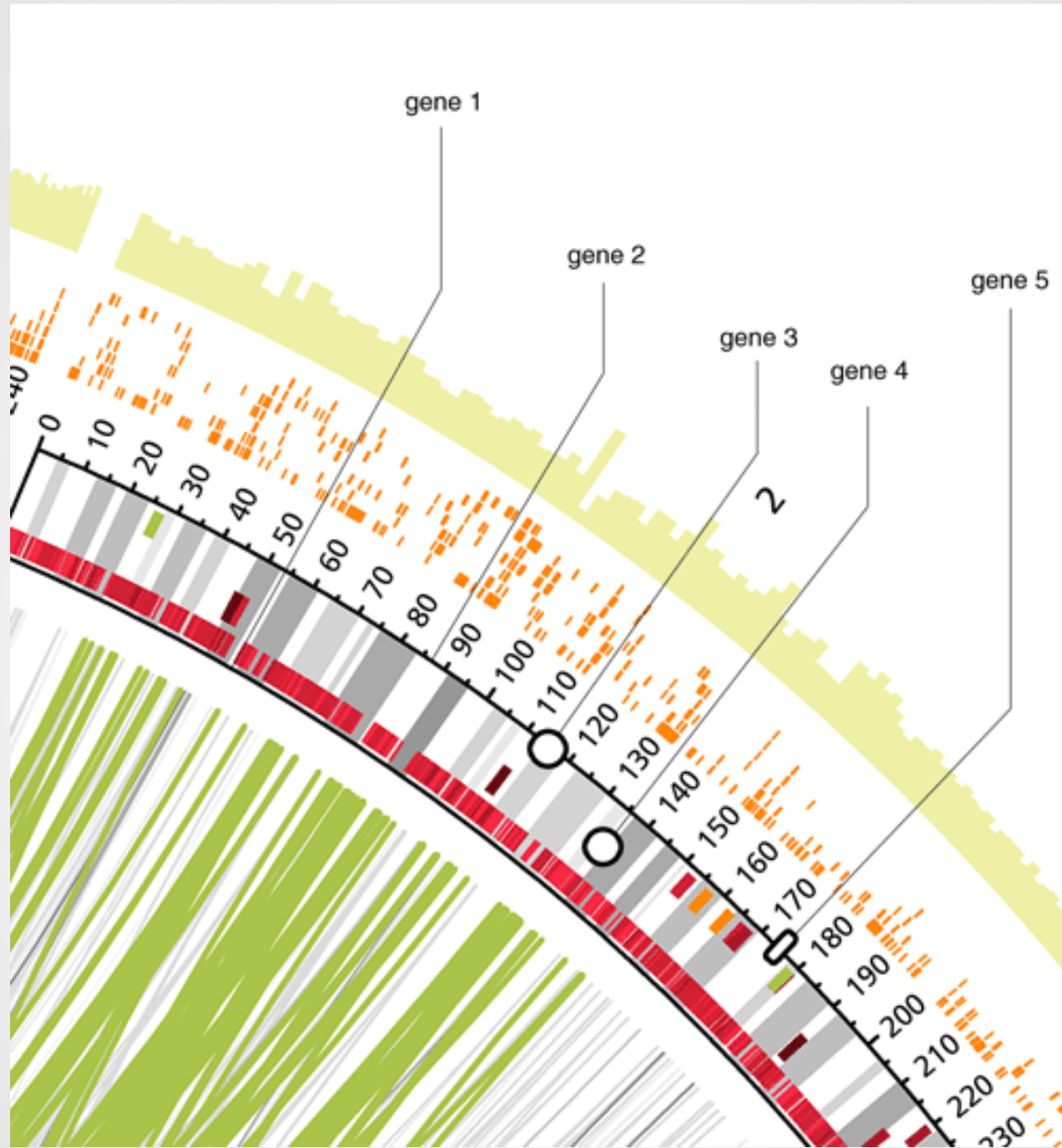
- **Scientific challenges with societal impact**
- **Sponsored by user organisations**
- ***Stretch* what is possible with the cloud today**

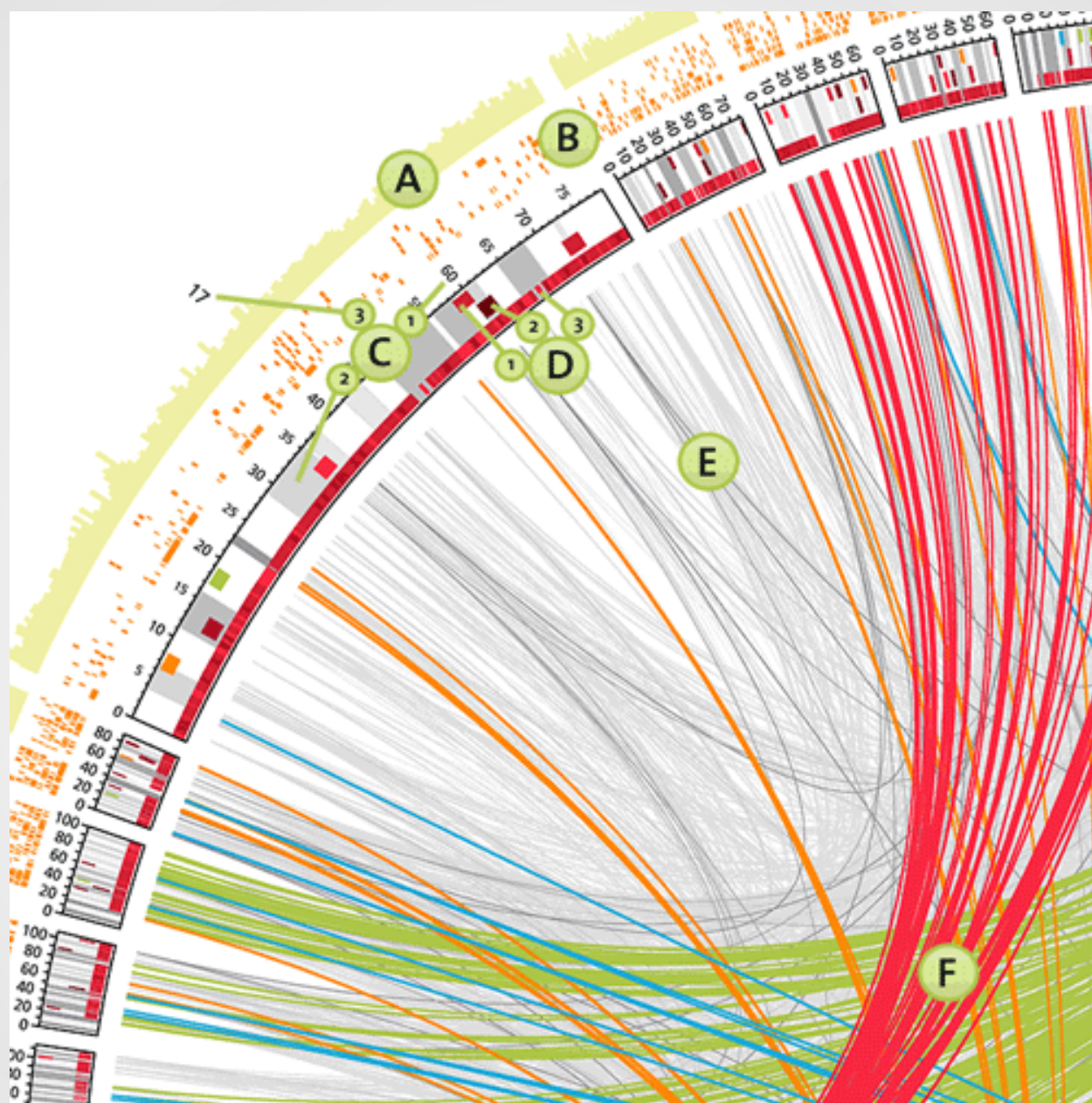


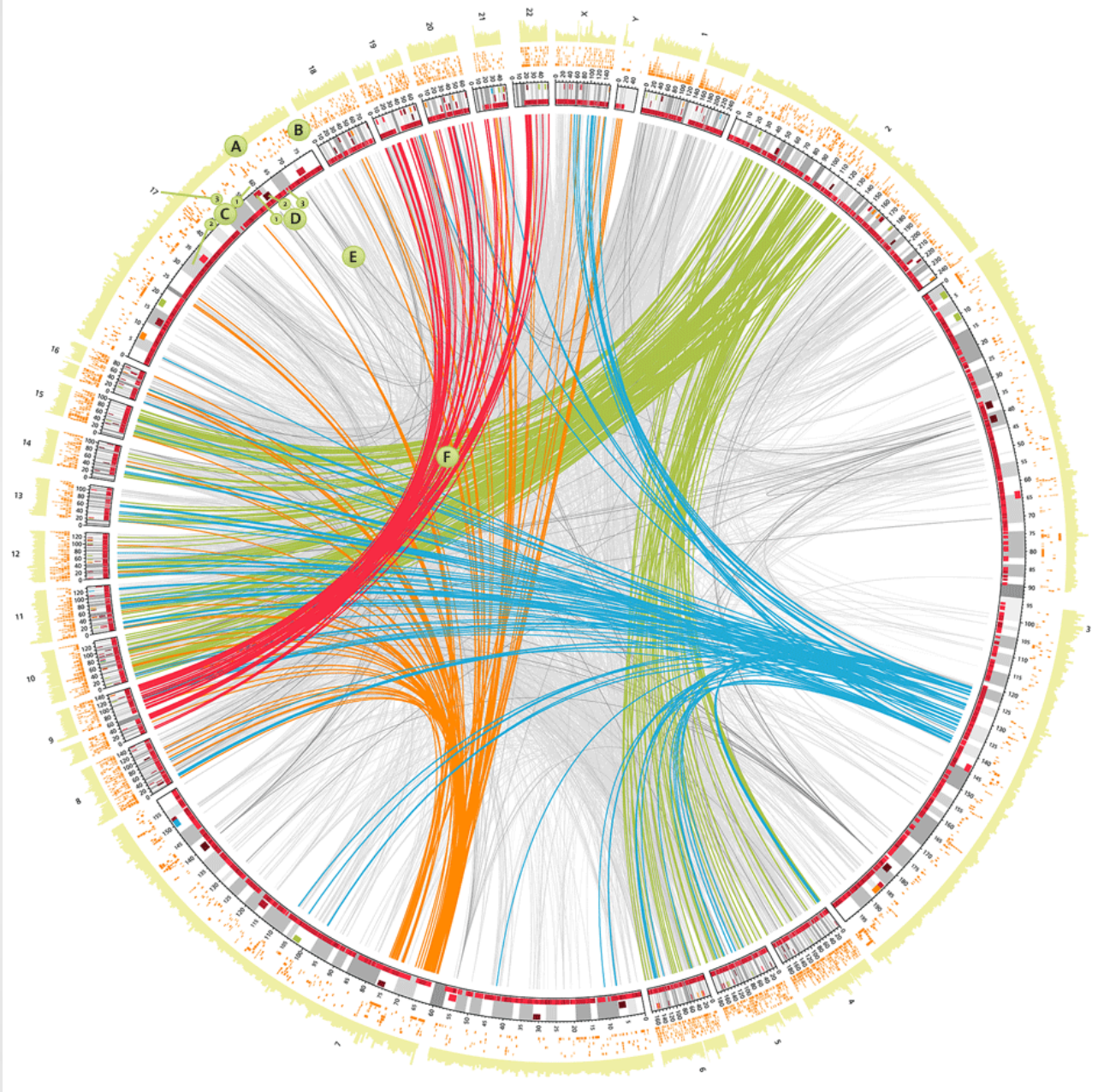


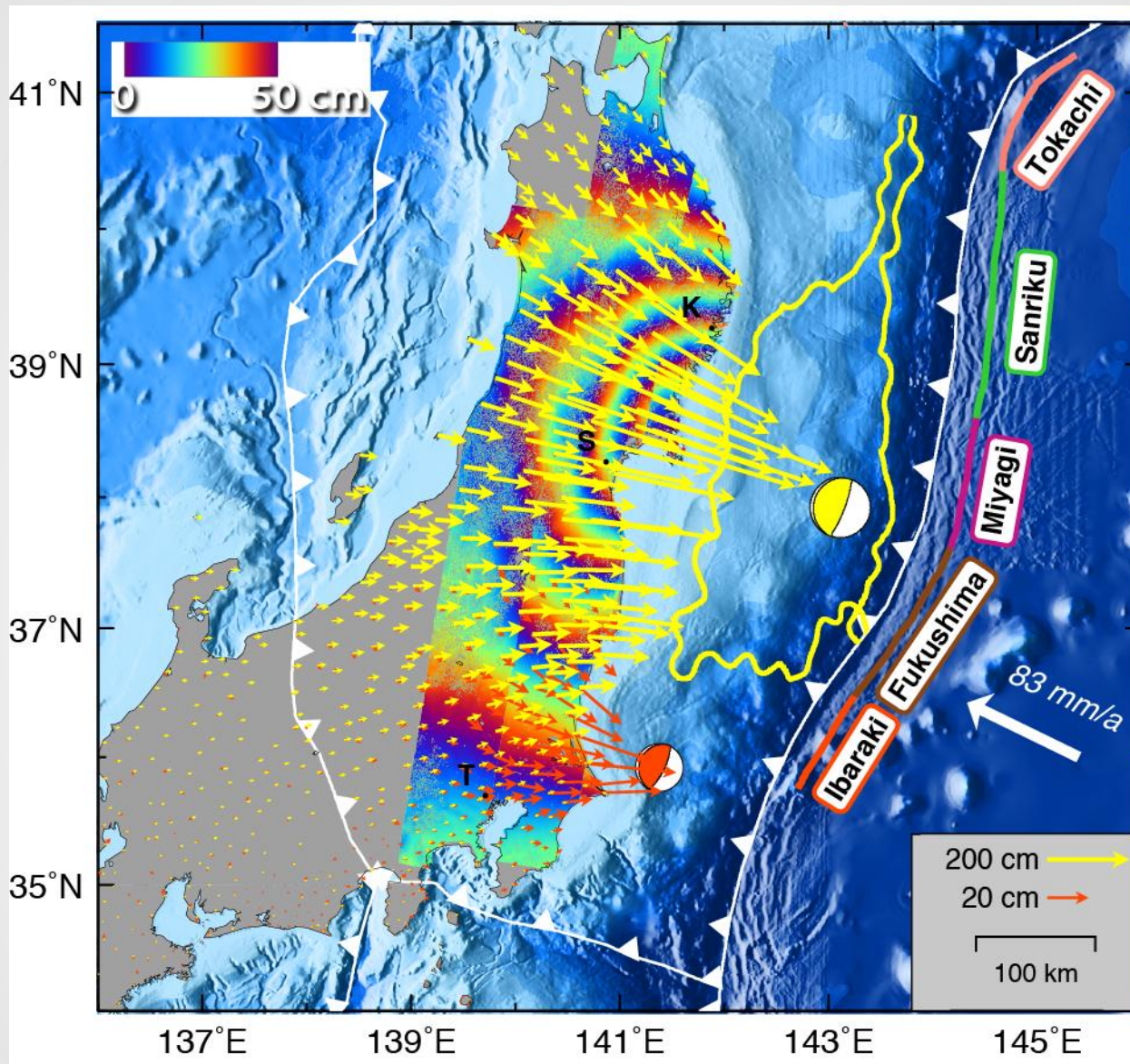
All numbers approximate.

\* Binary Data





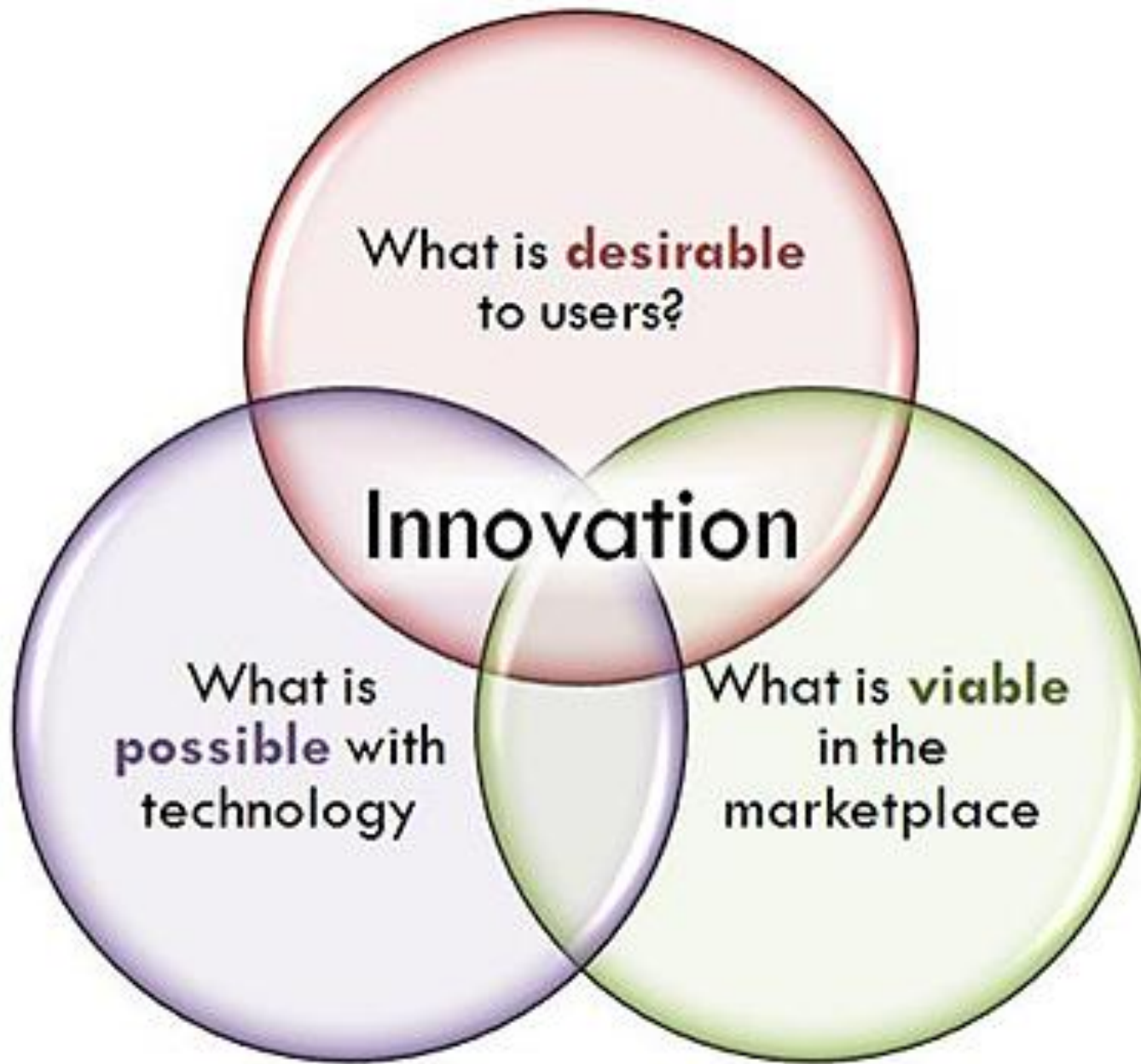








**Challenges**  
AHEAD







# A Collaboration Initiative

**European Commission  
& relevant projects**

**User organisations  
*Demand-side***

**European  
Cloud Computing  
Strategy**

**Commercial Service  
Providers  
*Supply-side***

rewards  
Advantage  
Card  
Redeem 100  
fuel points  
Details inside!

CloudSigma

Atos

Systems

Regular

4 1 9  $\frac{9}{10}$

Plus

4 3 9  $\frac{9}{10}$

V-Power

4 4 9  $\frac{9}{10}$



CloudSigma

HOLIX  
NBULA  
THE SCIENCE CLOUD

CLASS Conference 2012  
Cloud Assisted Services

# Flagship use cases Participating Suppliers in Proof of Concept stage



# The Fear





## Some concerns

- Data privacy: Moving sensitive data to the Cloud
- Scalability / Elasticity: Will the Cloud scale-up to our needs
- Vendor lock-in: Vendor dependency once data & applications are transferred to the Cloud
- Transparency: Clarity of conditions, terms and pricing

## Some solutions

- One or more normalized API layers for provisioning
- IaaS compute as a commodity market
- Tier3 / Tier4 datacenters and AES 256 bit encryption
- European Commission: focused on solving legal and technical obstacles



# One more thing...



## Instant Server Quote

Location : Zurich, Switzerland (ZR) ▾

Currency : EUR ▾

Example Servers: Custom ▾

CPU (GHz):  8.00

Core-GHz/Hour: EUR 0.0175

Memory (GB):  2.00

GB/Hour: EUR 0.0228

HDD (GB):  2688

GB/Month: EUR 0.1400

SSD (GB):  32

GB/Month: EUR 0.35

Duration: 1 year (25% discount) ▾

Data Transfer Per Month (GB):

Outgoing data: EUR 0.0455 per GB

**Total Cost: EUR 4690.3680**

**Monthly Cost: EUR 390.8640**

**Calculate**

## Computation Reference for 128-Bit Key Crack Example

<b>People</b>	7.00E+09
<b>Computers per person</b>	10.00
<b>Computers</b>	1.00E+09
<b>Combos per second per computer</b>	7.00E+19
<b>Total combos per second</b>	7.00E+19
<b>Seconds per year</b>	3.15E+07
<b>Total combos per year</b>	2.22E+12
<b>128-bit key combos (*50%)</b>	1.70E+38
<b>Years to crack</b>	7.66E+25







# Thank You

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