

ALADDIN-G5K

A Large-scale Distributed and Deployable Infrastructure

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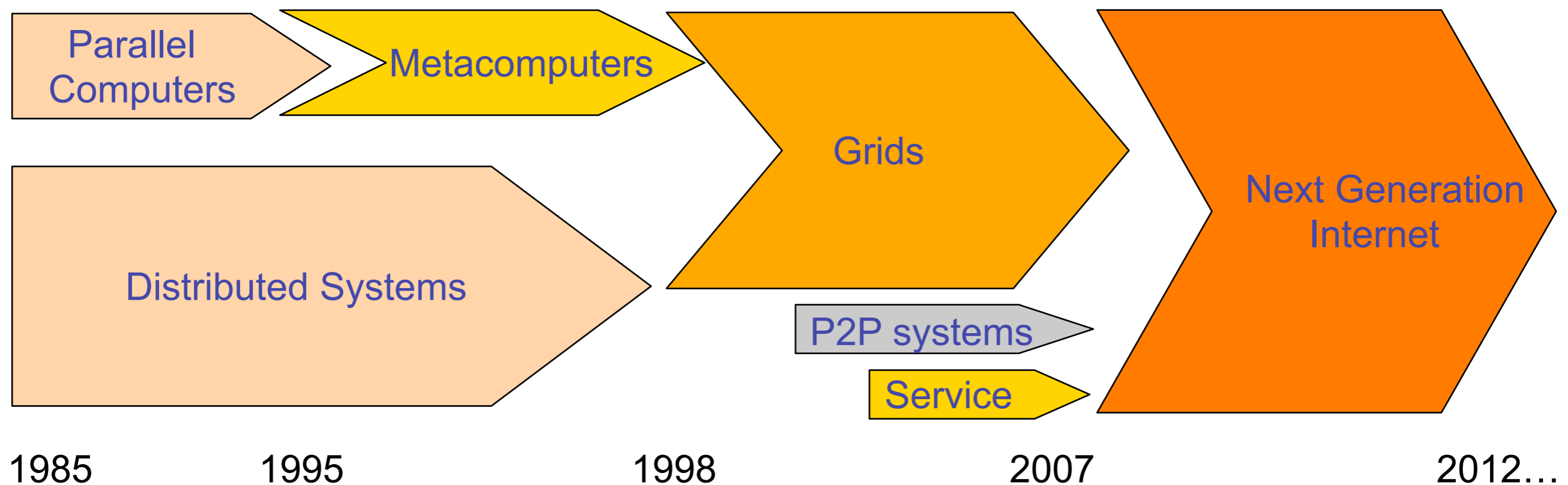


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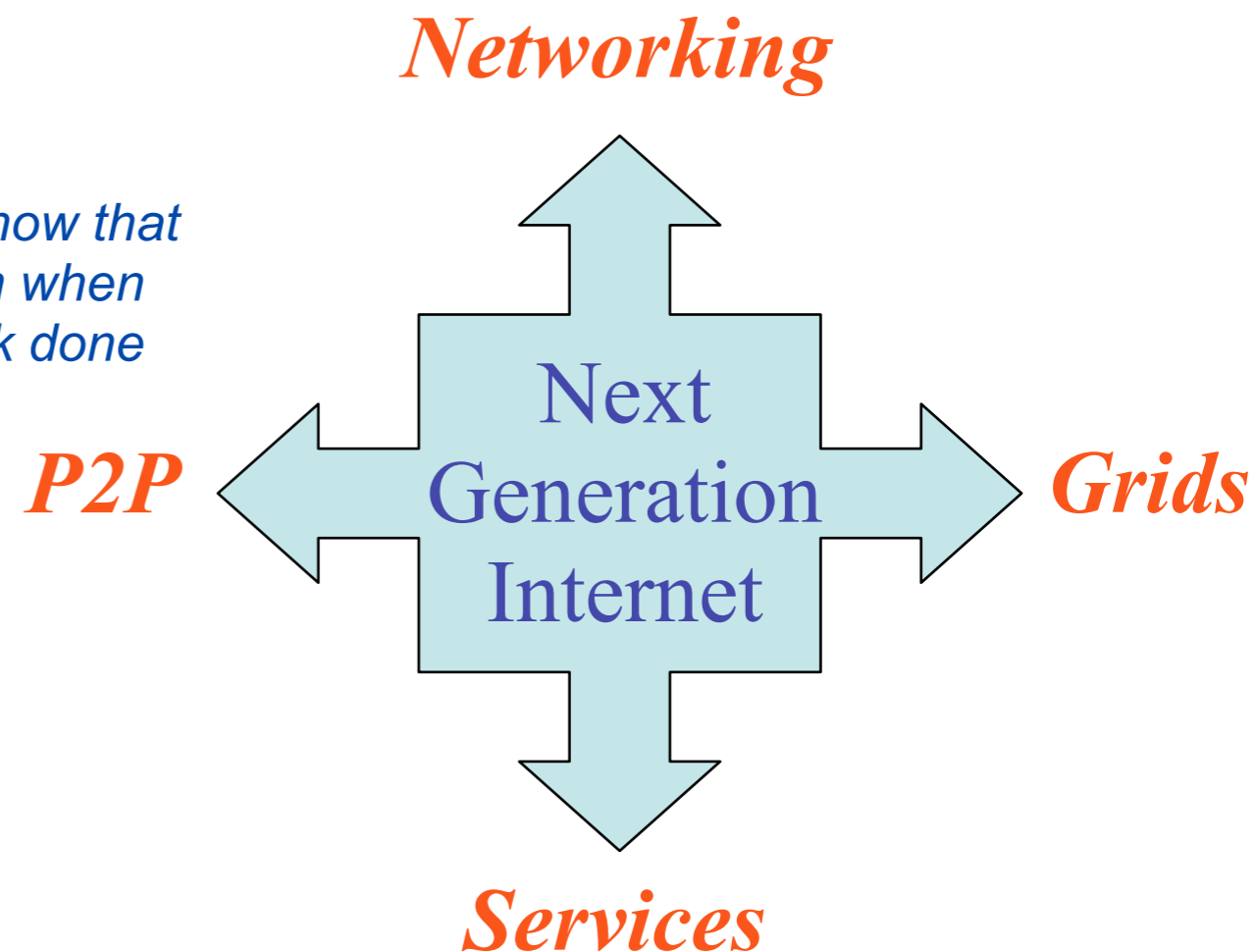
Where we come from... ... and where we are going

- Grids came from the needs to get access to more computing resources
- Grid Infrastructures: the first implementation of large scale distributed systems

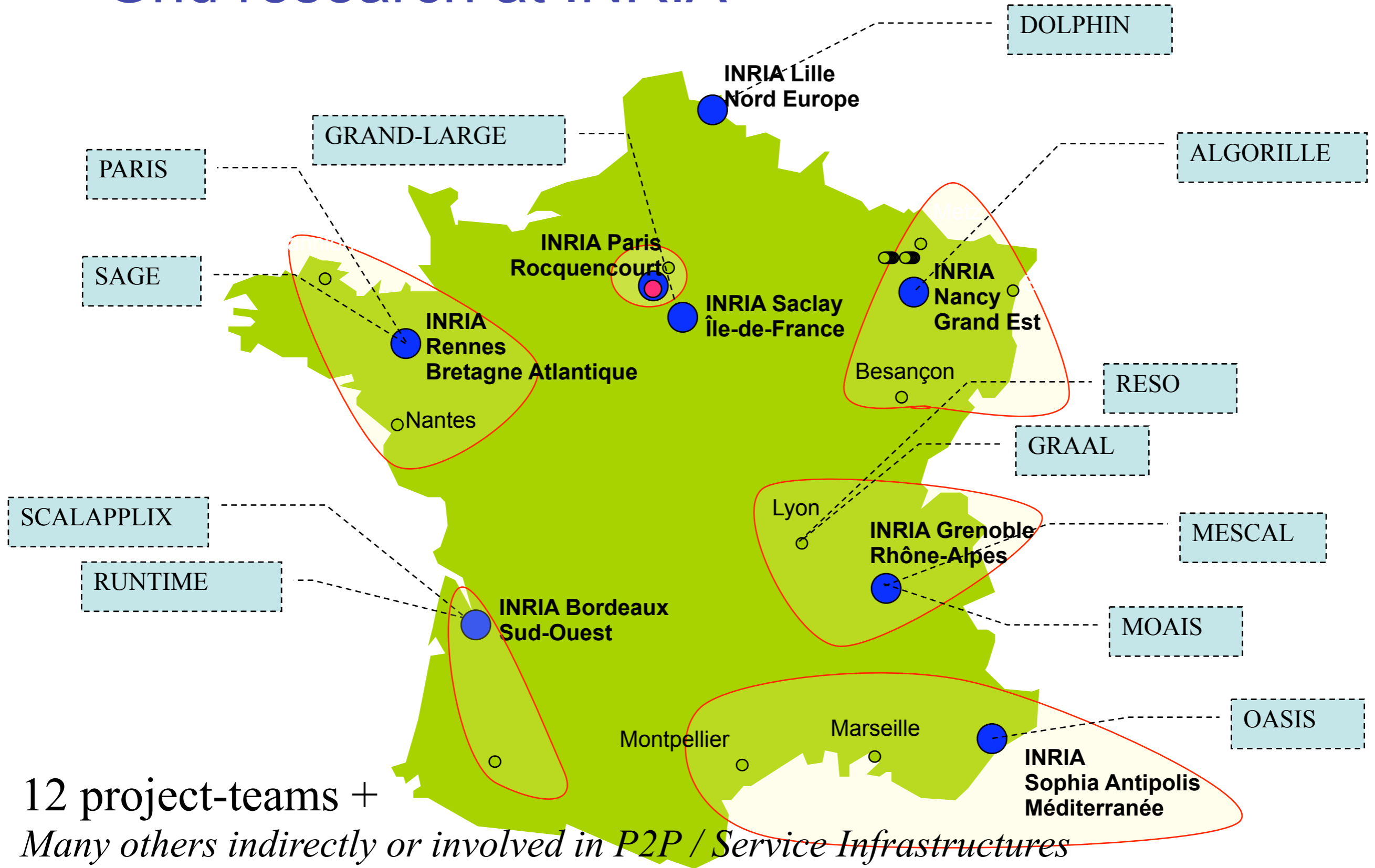


Next Generation Internet

- Not anymore a network of computing systems
 - The Internet as a computing infrastructure per se
- A “new” frontier of Computer Science
 - Computing as a service
 - Unreliable computing infrastructures
 - Failures are common events...
 - **To paraphrase Leslie Lamport, "You know that you are dealing with a distributed system when you are prevented from getting your work done because a node you never heard of has crashed."**
 - Insecurity, Dynamicity, Complexity
- Scientific challenges
 - Which operating systems ?
 - How to program such an infrastructure ?
 - How to design applications ?
 - How to model behaviours ?
 - ...



Grid research at INRIA



INRIA involvement in Grid National and EU initiatives

INRIA is a key player in France in Grid research

- Direction of the ACI GRID (M. Cosnard, T. Priol)
 - INRIA project-teams involved in 14 ACI GRID projects (among 30)
 - Scientific and Technical Coordination of the ACI GRID Grid'5000

INRIA was involved in the Next Generation Grid panel of experts to help the commission drafting the FP6 workprogramme in Grid Technologies

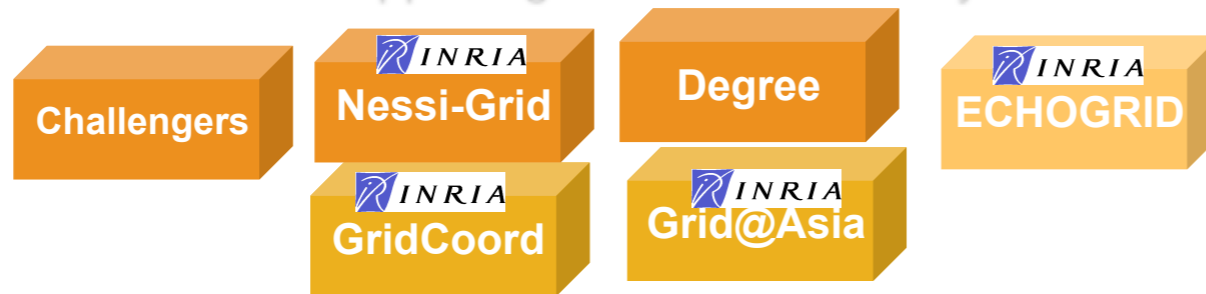
INRIA is involved in 10 EU funded Grid projects (6 in calls 5 & 6)

- Scientific coordination of the CoreGRID NoE
- Scientific and technical coordination of the XtremOS IP
- Scientific and technical coordination of the GridComp STREP

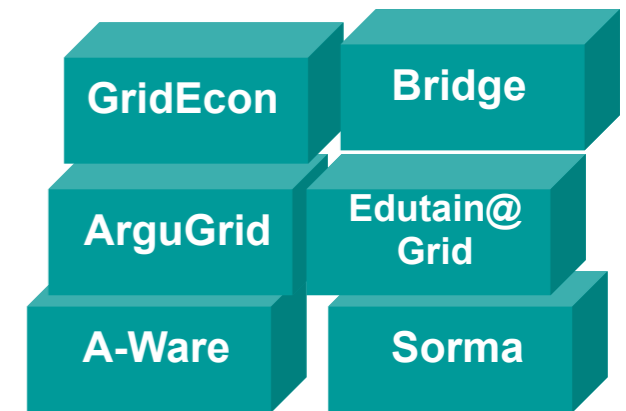
FP6 Grid Technologies Projects – Calls 2, 3, 5

EU Funding: 130 M€

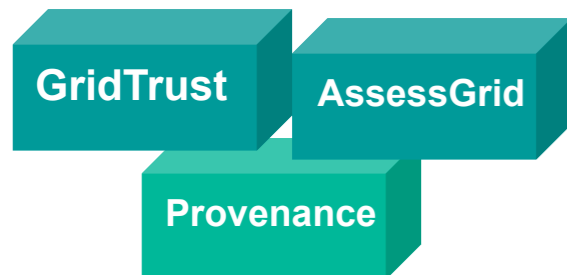
supporting the Grid community



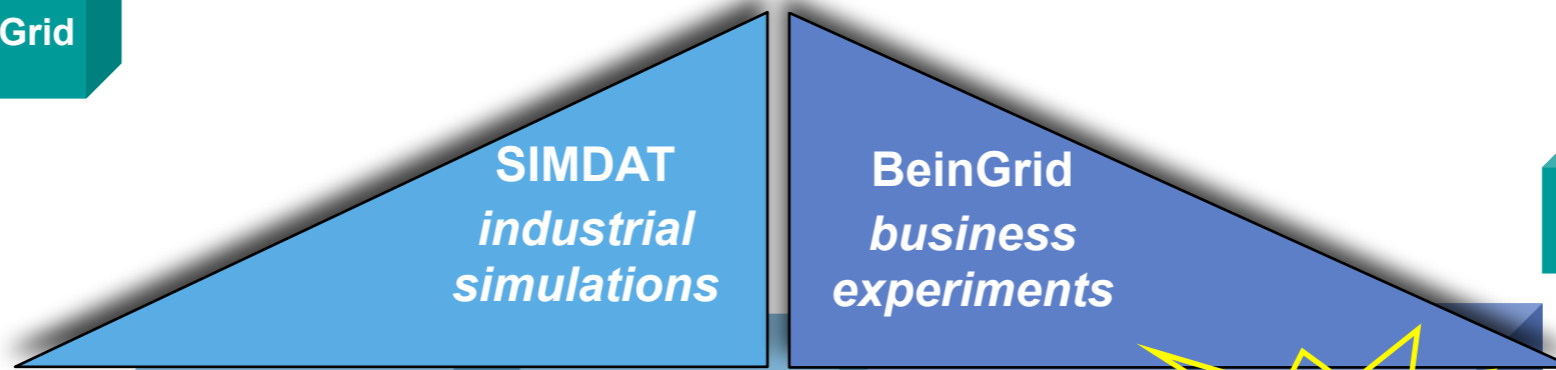
Grid services, business models



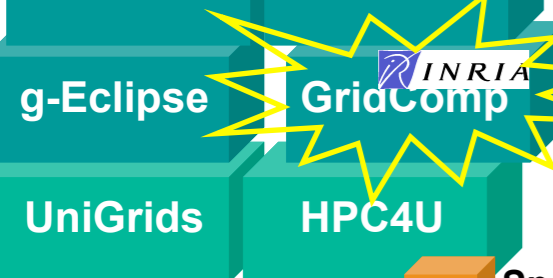
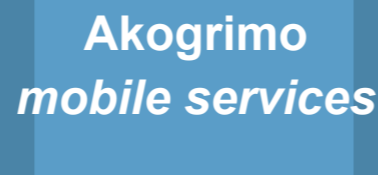
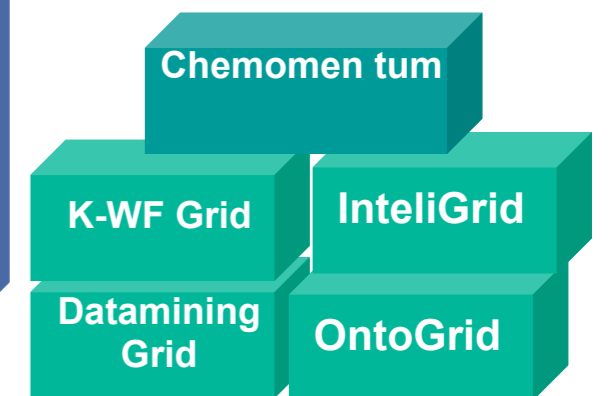
trust, security



platforms, user environments



data, knowledge, semantics



Specific support action
 Integrated project
 Network of excellence
 Specific targeted research project



Why ALADDIN-G5K ?

- INRIA has an imperative need to get access to a large scale distributed system
 - To carry out experiments in various research fields: P2P systems, Service infrastructures, Networking, Grid systems, ...
 - Commitment to provide a testbed within European projects (CoreGRID, XtremOS, S-CUBE, ...)
- The ACI GRID, that gives the funding for Grid'5000, ended last July
 - About 400 users, publications and experiments
 - A very positive evaluation done by a scientific committee with Jean-Claude ANDRÉ (CERFACS) and Domenico LAFORENZA (CNR-ISTI, Italie)
 - This committee has expressed a clear recommendation to continue this initiative
- L'INRIA provided funding support to acquire hardware and to hire engineers in the context of the GRID'5000 national initiative
 - To continue to provide funding, a new structure has to be set up internally (Technological Development Action)



ALADDIN-G5K Objective

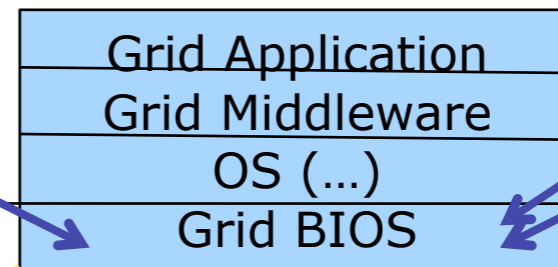
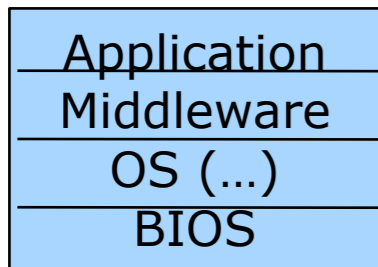
Deploy an experimental large scale computing infrastructure

Experiments of any kind of distributed systems

Distributed System Testbed

- Experimental conditions
- Configuration of the entire software stack – from the application to the operating system

Single Computer testbed



GridPreams

KADEPLOY



ALADDIN Grid'5000

ALADDIN-G5K within the INRIA ecosystem

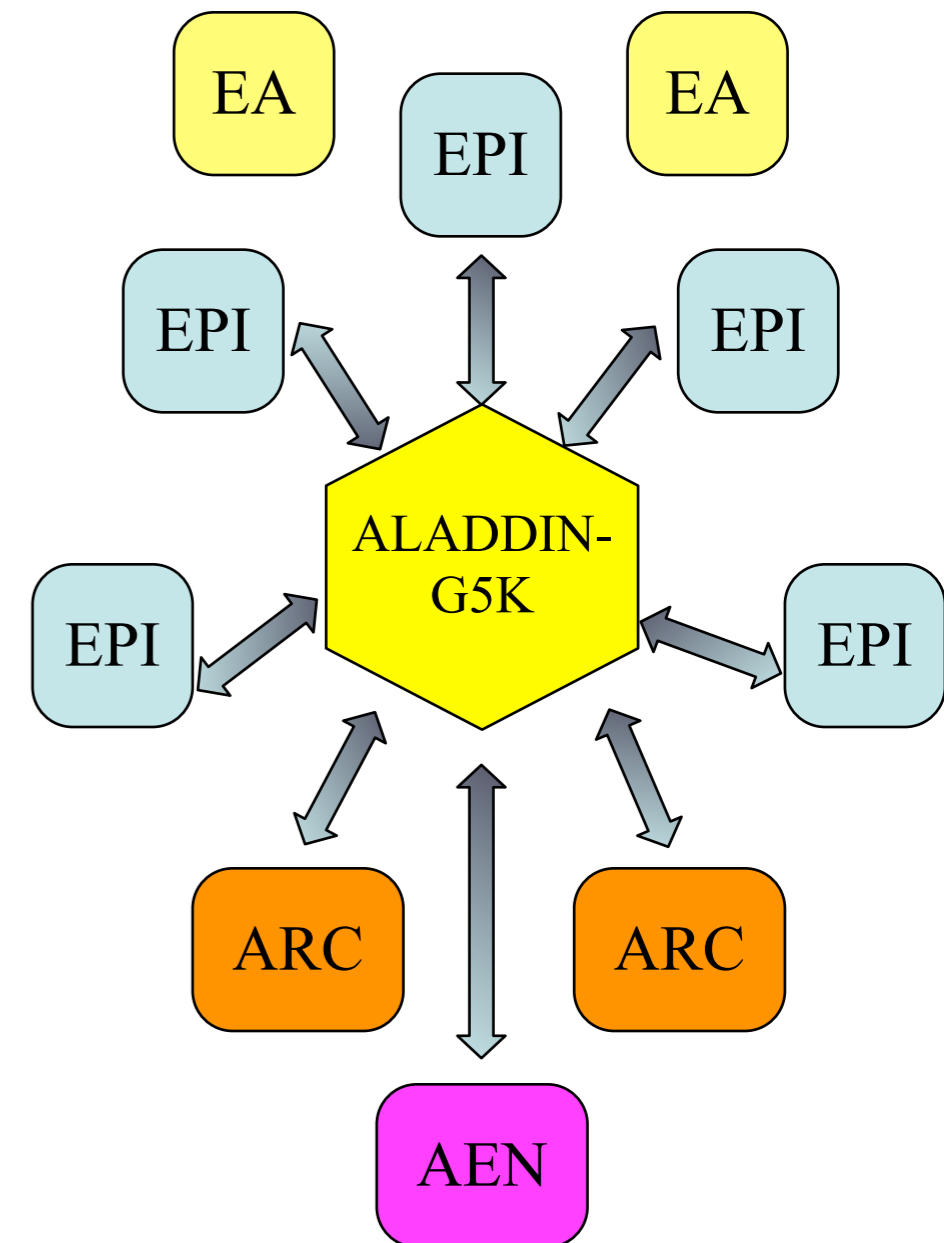
ALADDIN-G5K will be an ADT
 (“Action de Développement Technologique”)

- From an experimental prototype towards a sustainable experimental infrastructure
- Close cooperation between researchers and engineers

ALADDIN-G5K will provide a service to:

- Project-teams (EPI)
- Cooperative Research Actions (ARC)
- Associated teams (EA)
- Large-scale Initiative Actions (AEN)

It is expected to have several ALADDIN-XXX as ARC, EA and one AEN

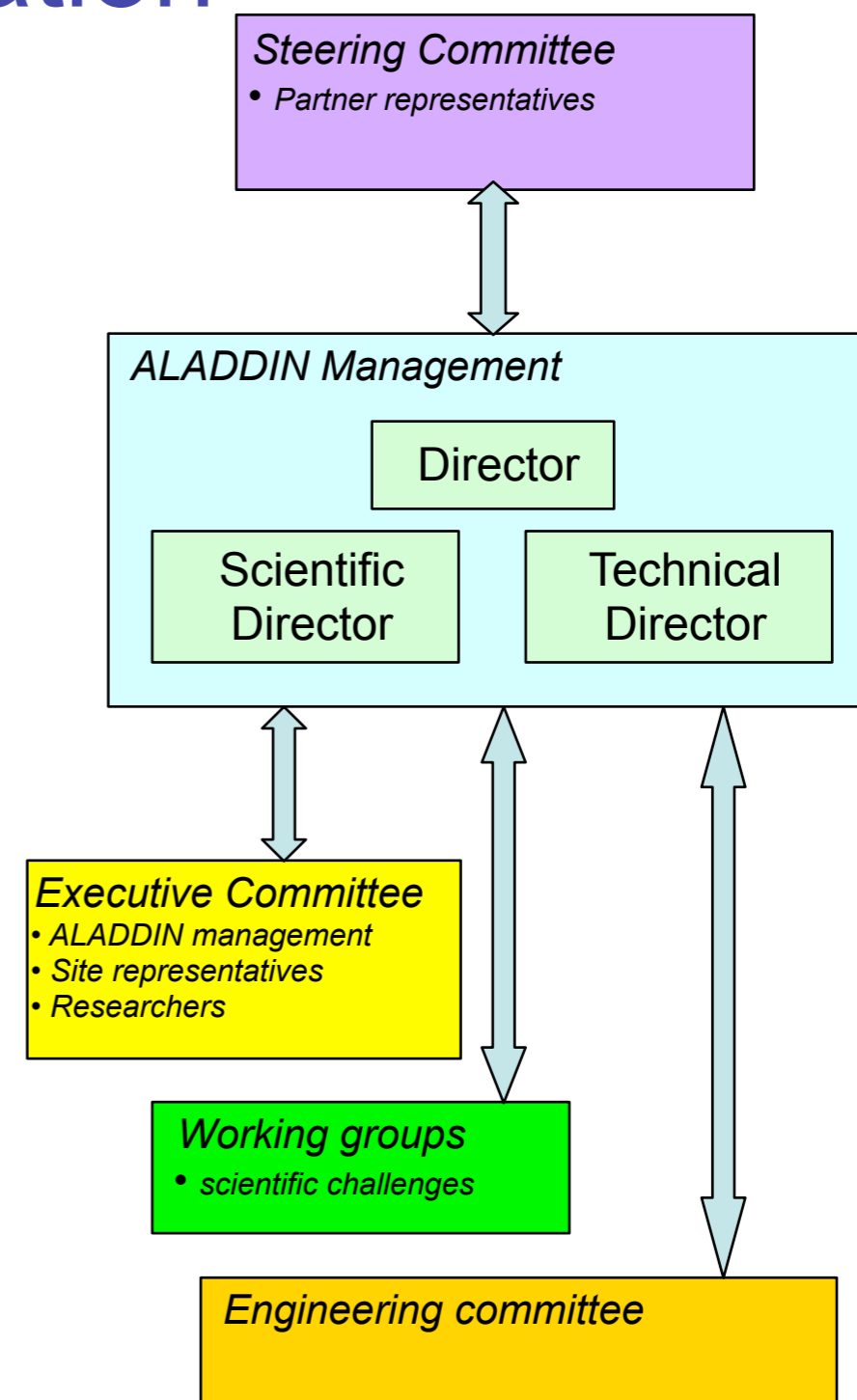




Structure and organization

- Management
 - Director: T. Priol
 - Scientific Director: F. Cappello
 - Technical Director: D. Margery

- Duration
 - 4 years starting from 2008



Collaboration with other institutions

- INRIA has already strong collaborations with CNRS and Universities
 - Many joint project-teams with CNRS and with several Universities
 - CNRS and several Universities were involved in G5K from the ACI GRID
- INRIA and CNRS have already agreed to collaborate to make Grid'5000 a sustainable infrastructure
 - Set up a common structure (GIS)
- Universities are more than welcome to participate to this GIS

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