Using Grids in Industry

The example of EADS

French/UK workshop on GRID Computing

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Outline

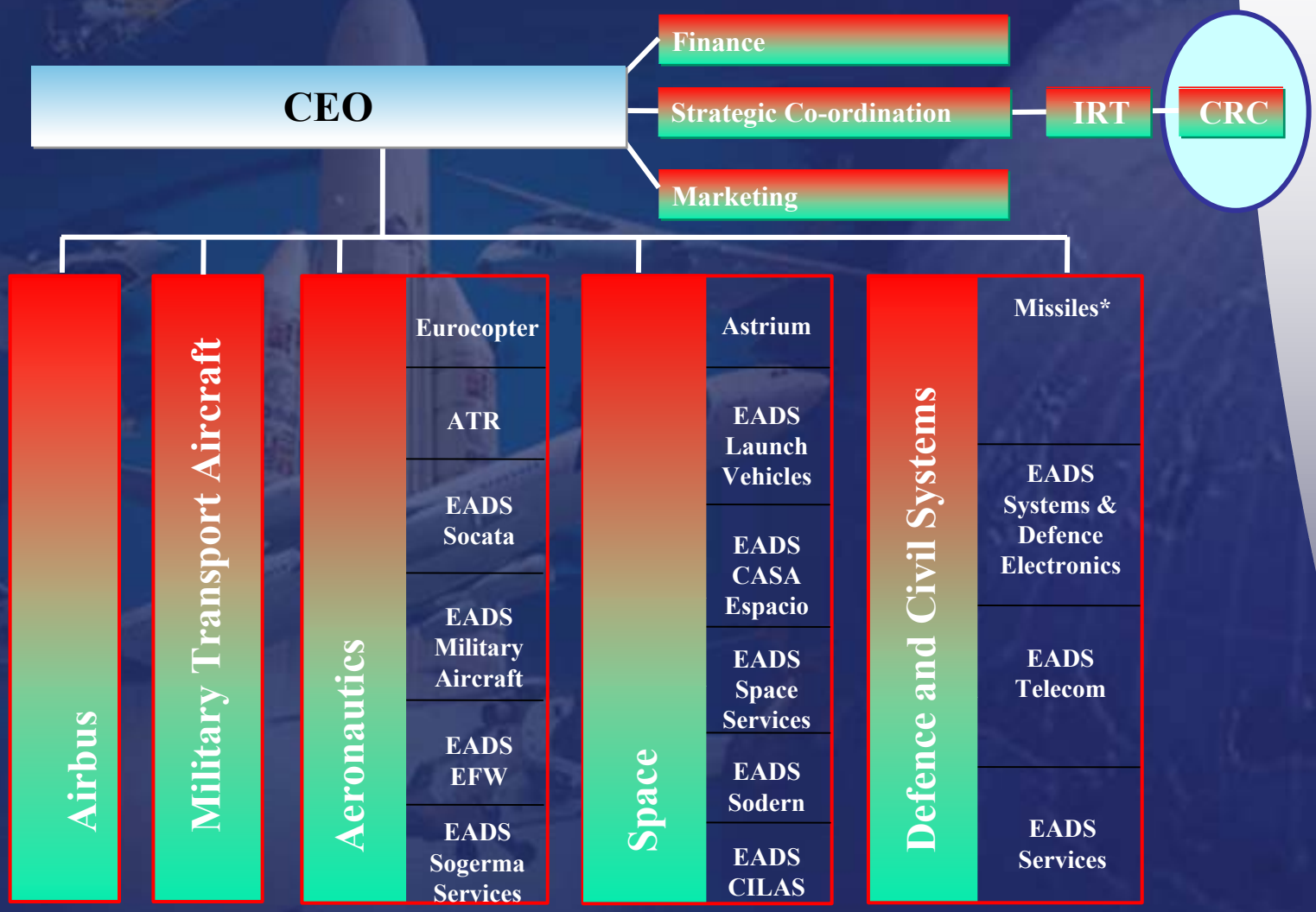
Company presentation

Why Grids are of interest for us

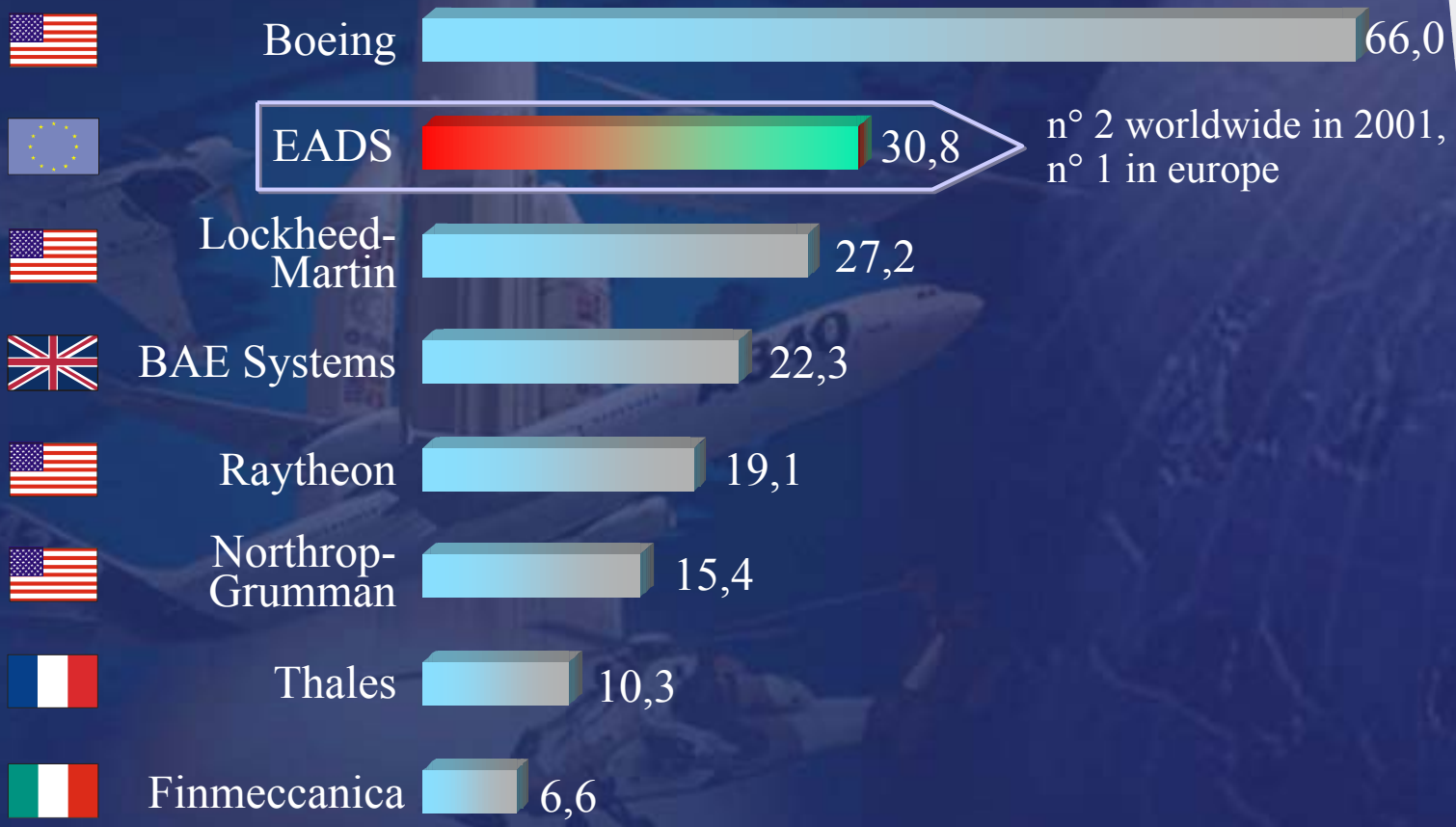
Some ongoing projects

Conclusions

European Aeronautic Defense & Space company



EADS: A worldwide competition



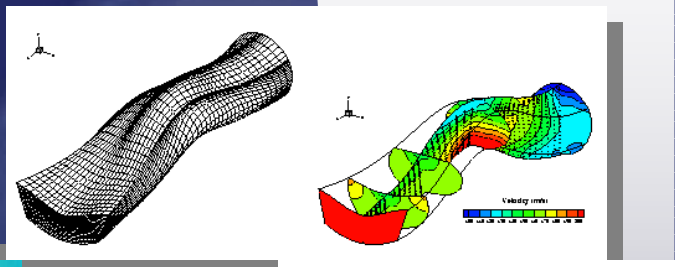
EADS: Research sites (testbed for Grid computing)

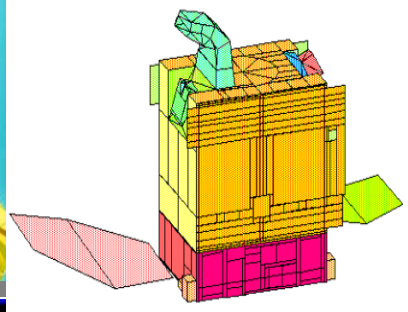
Corporate Issues

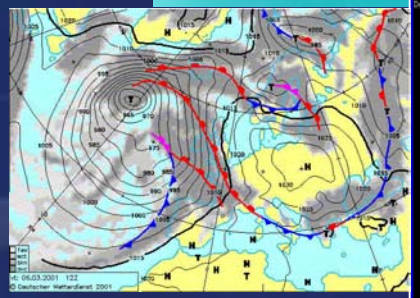
- Technical Computing environment **more and more complex**
- Must cut budget in R&D and Innovation
- Access computing resources anywhere, anytime
- Must optimize resources, data sharing and application sharing

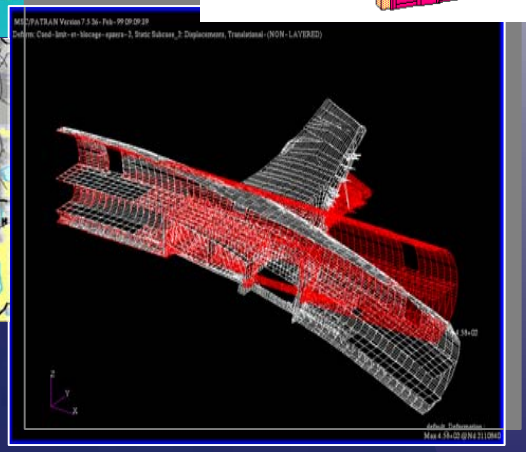
Which grid are we dealing with ?

- Compute Grid:
  - seamless access to CPU cycles,
  - saved about 100k Euros the first year using Globus during off-peak hours using our existing assets (CAD desktops).
- Data Grid:
  - ex CAD databases
  - more benefit expected



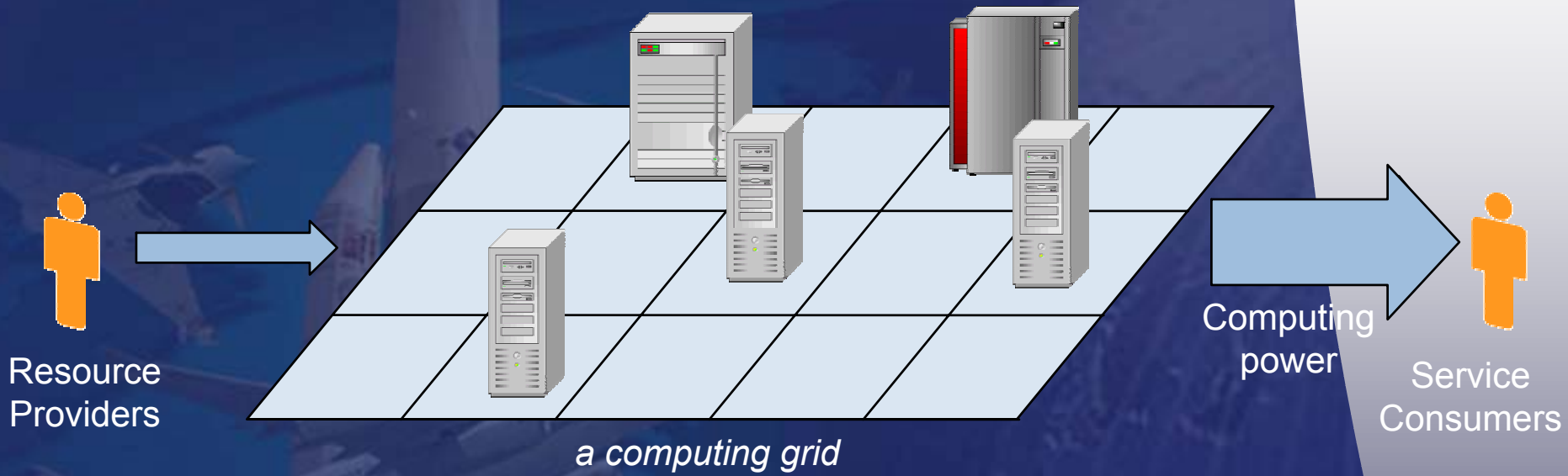






Improved Collaboration

Grid Computing



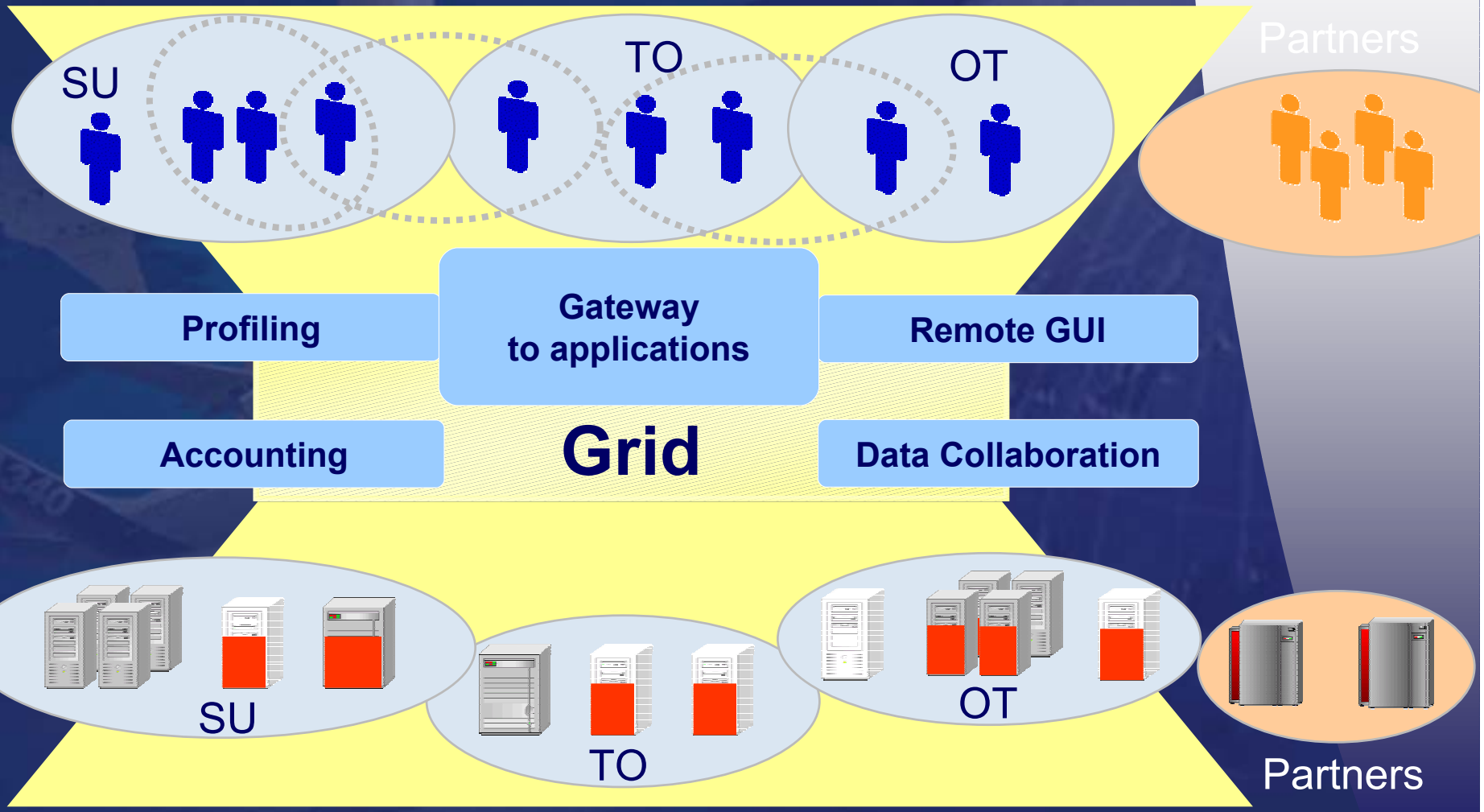
a computing grid

- Dynamic, distributed, heterogeneous
- Unprecedented power
- Virtual organizations

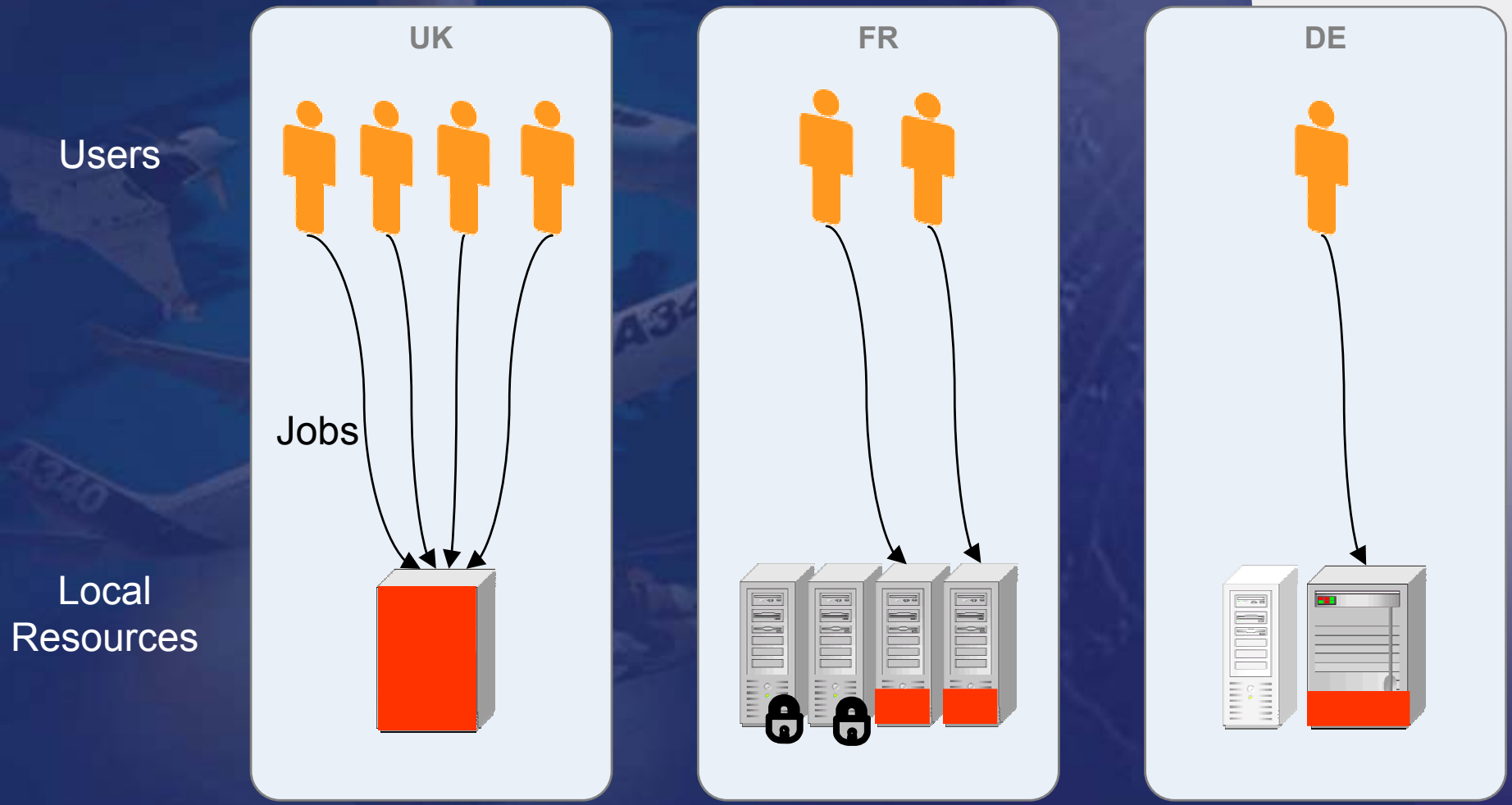
The response of On Demand Computing

- **Federate** computing resources across the extended enterprise
- **Gain peak performance** when needed by using (momentarily) idle resources
- Make better use of **IT investment**
- Shorten development cycles and **time to market**

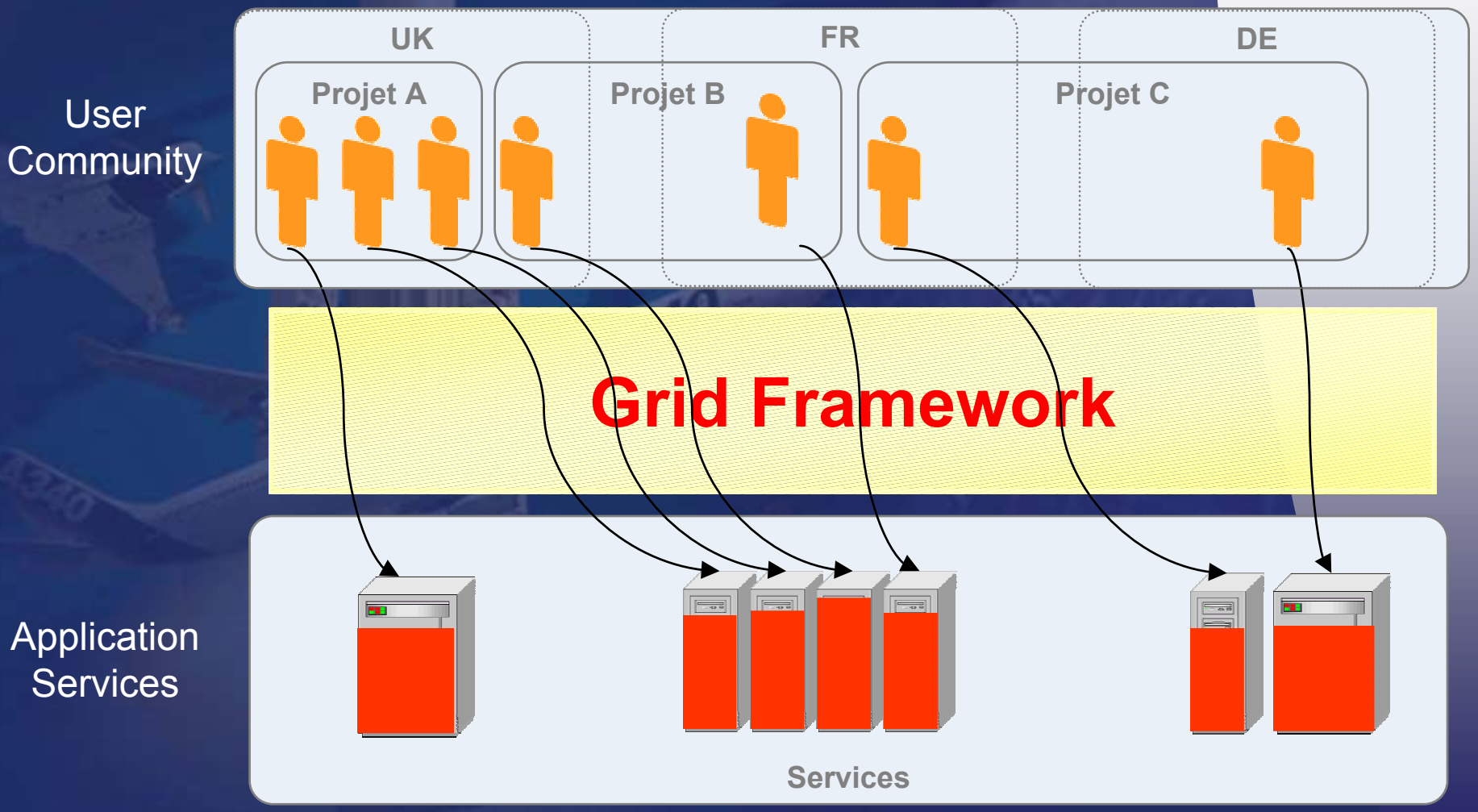
Model, Optimize, Analyze



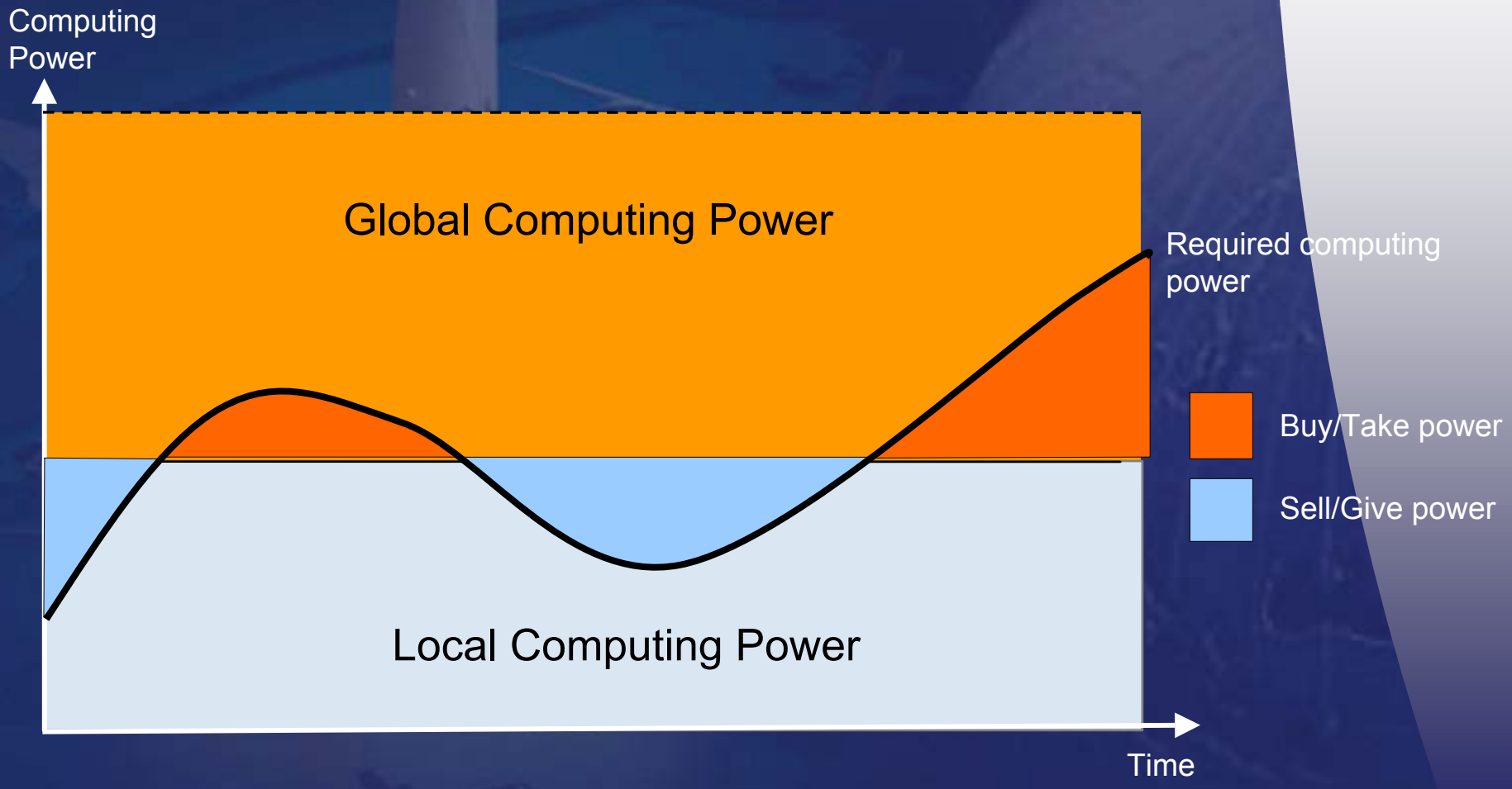
Non optimized resource usage



Optimized resource usage



Flexible computing power



What are the benefits for EADS ?

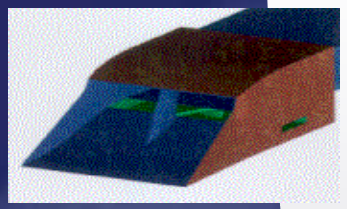
Lowering the total cost of IT ownership

- Monitors and controls use of computing resources for your enterprise virtual infrastructure. Identifies under-utilized, over-utilized and mis-utilized resources. Recommends more efficient architecture configurations based on real needs

Improve Users productivity

- Provides users with simple, web-based, secured access to computing resources ‘on demand. Gives projects Managers more Projects Flexibility : On-Demand real-time allocation of Computing and resources to projects without IT usual constraints

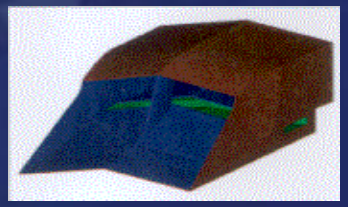
SC & Grid added value ....



- Scientific Computing (and Grids) are used to decrease physical mock-up (especially for certification) ; a factor from 2 to 3 seems possible.

- SC is used to decrease conception margin which have a direct cost (material, mass, …); 30% is a realist target.

- SC unleash the power of your engineers enabling them to study an unlimited number of in-silico configurations – which is impossible through physical testing.



EUROGRID Project

- ***Based on UNiform Interface to COmputing Resources***
- ***Funded by EC (11/2000-12/2003)***

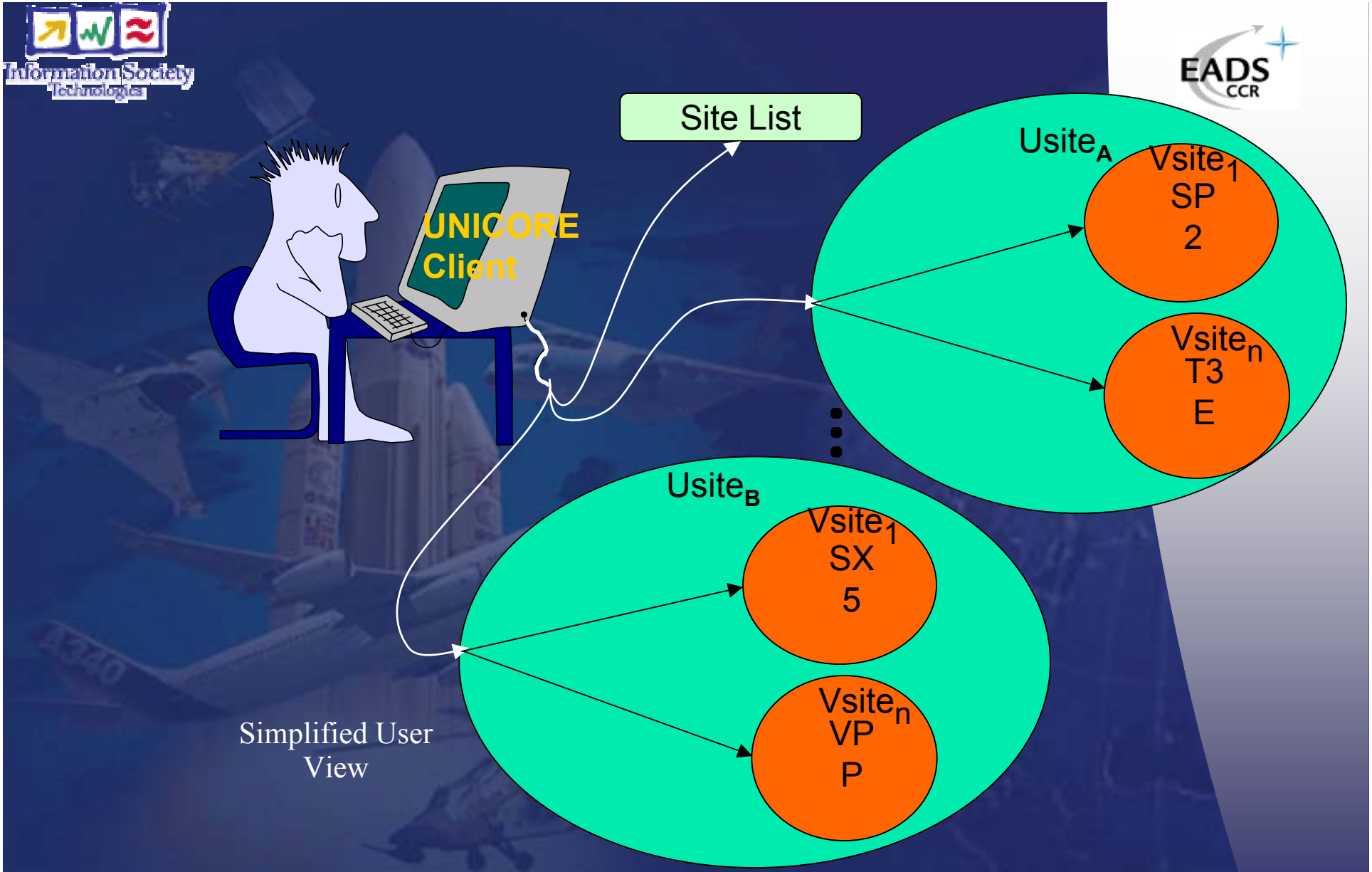
- Integrate resources of leading European HPC centres into a European HPC GRID

- Develop new software components for GRID computing

- Demonstrate the Application Service Provider (ASP) model for HPC access ('HPC portal') for different applications

- Contribute to the international GRID development

- www.eurogrid.org
- DWD, ETH, FZJ, IDRIS, ICM, PALLAS, Parallab, UoM, T-Systems & Fujitsu labs

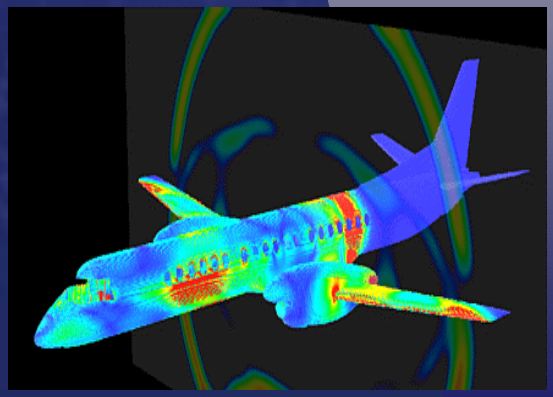


Complex simulations …

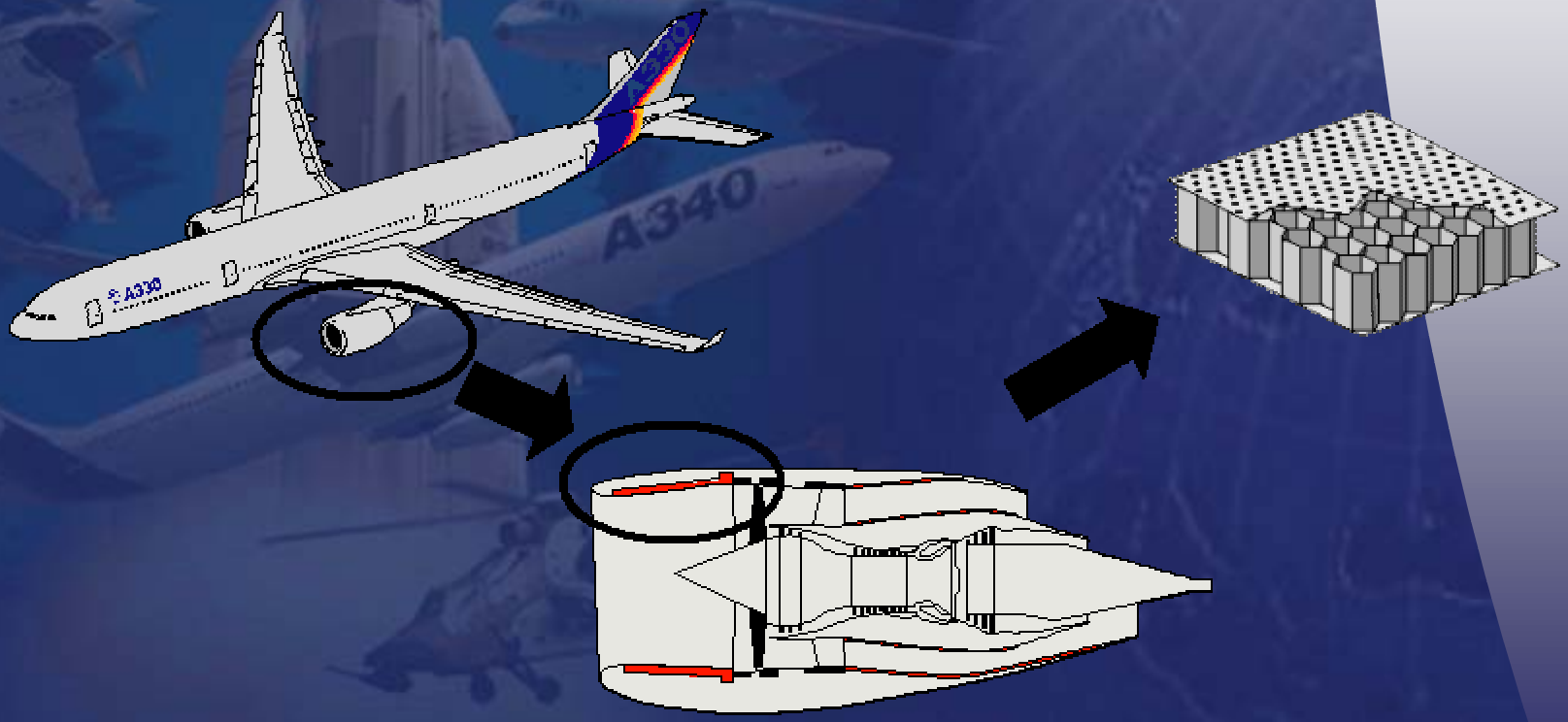
- Application specific interface can be provided. They are called plugins.

- There exist a number of plugins for commercial software such as Fluent, Nastran, Star-CD,

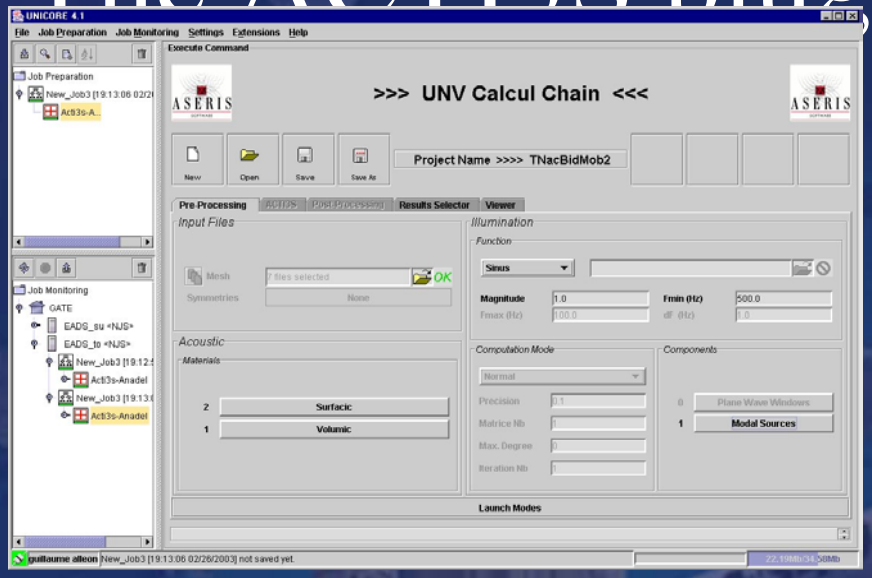
- At EADS, this approach has been chosen for interfacing some of our applications mainly in the wave propagation area.

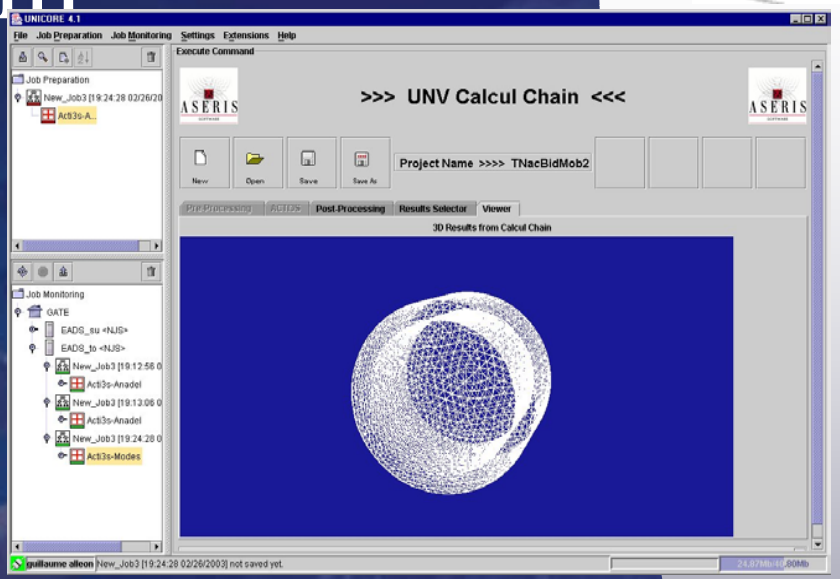


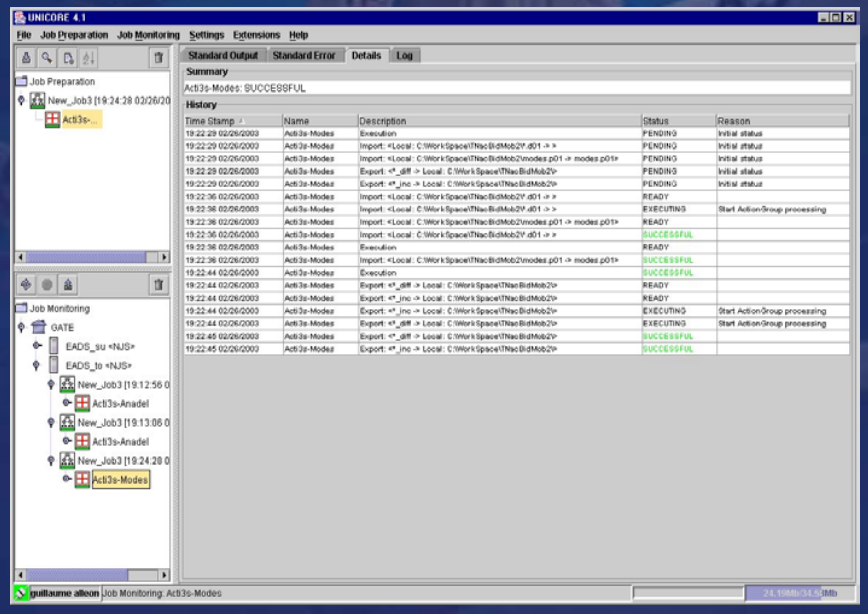
- In Acoustic : noise prediction of a nacelle.

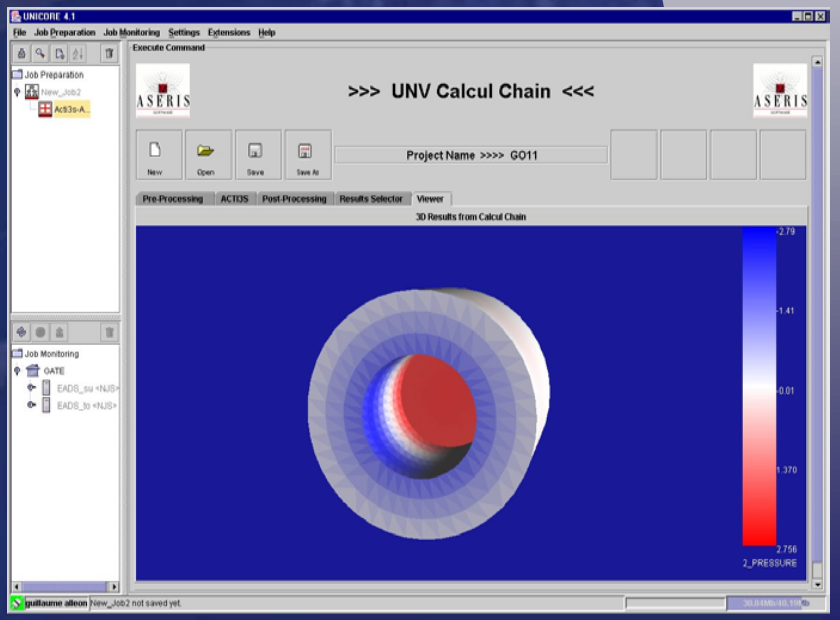


The ACTI3S plugin

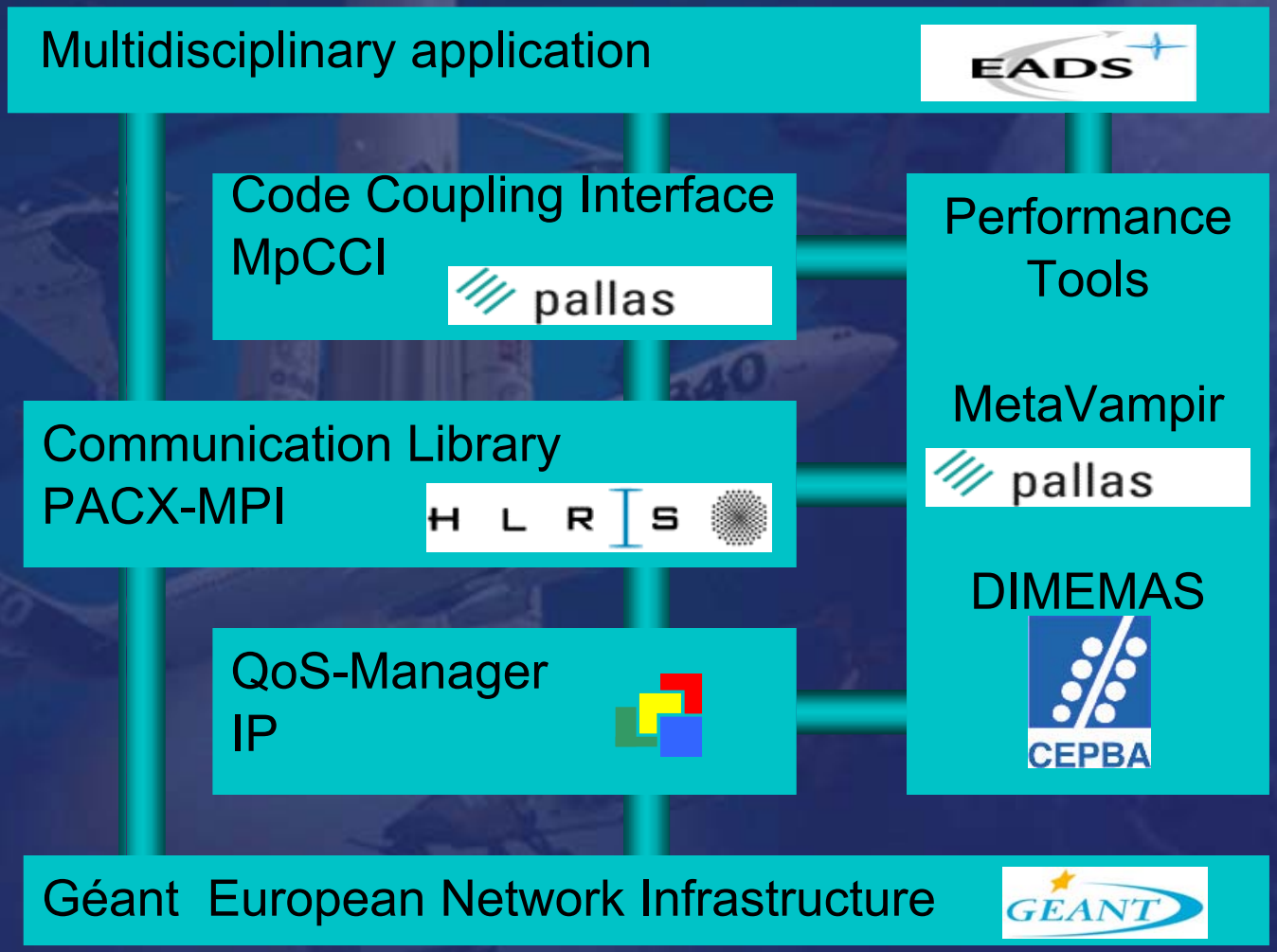






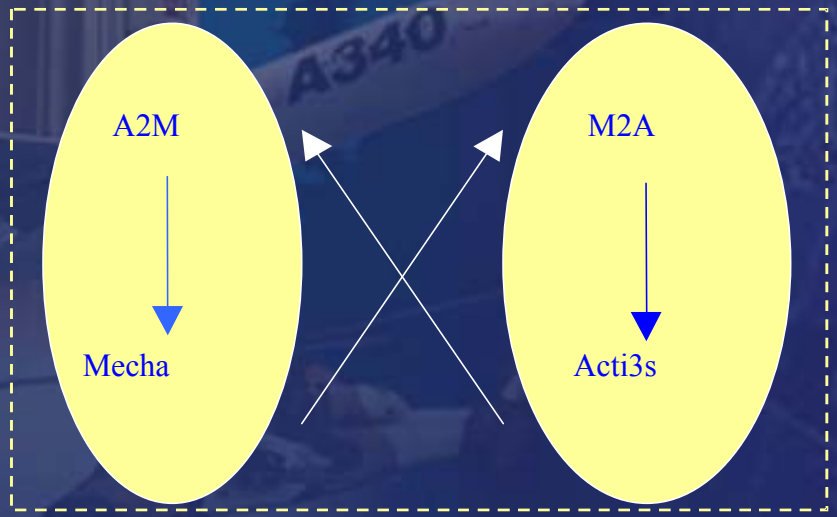


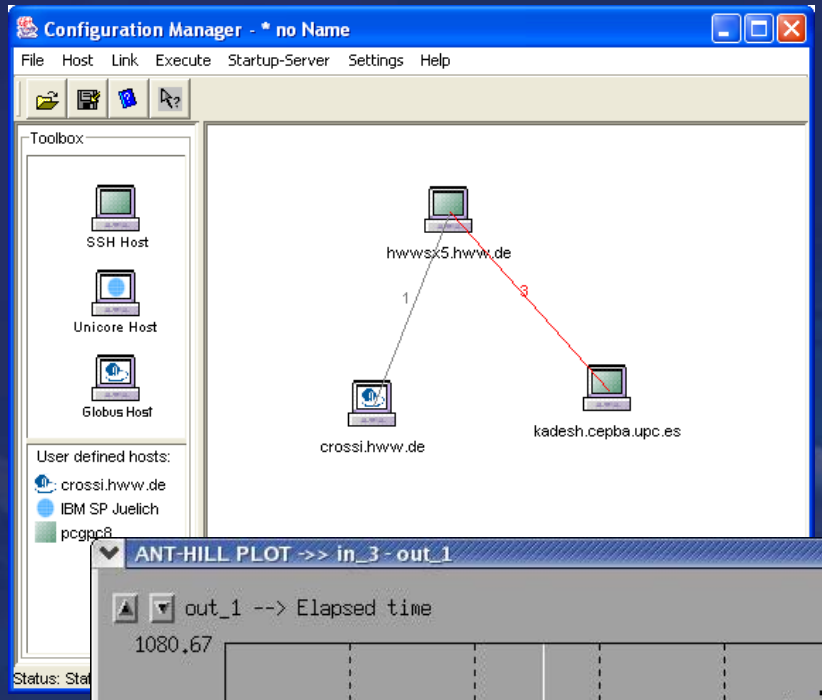
The DAMIEN Project

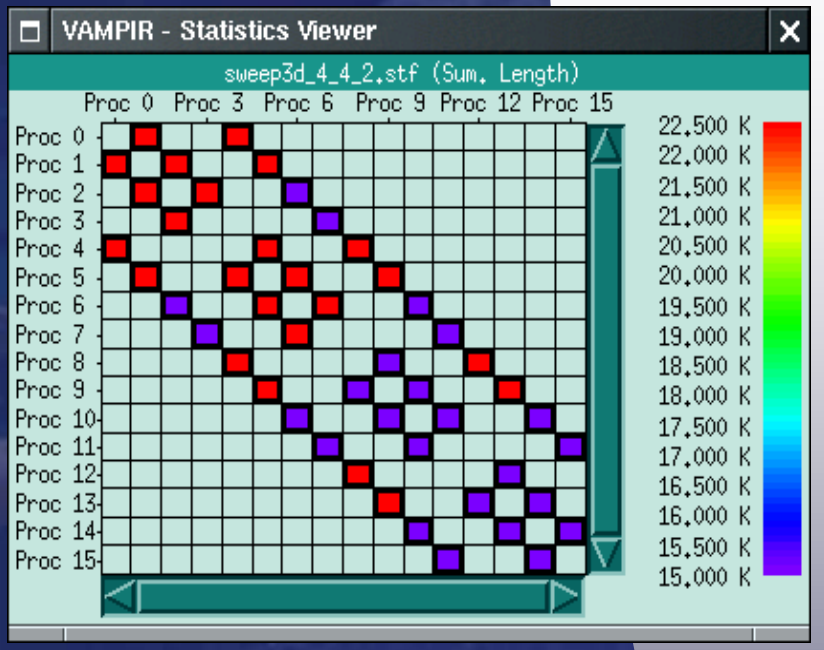


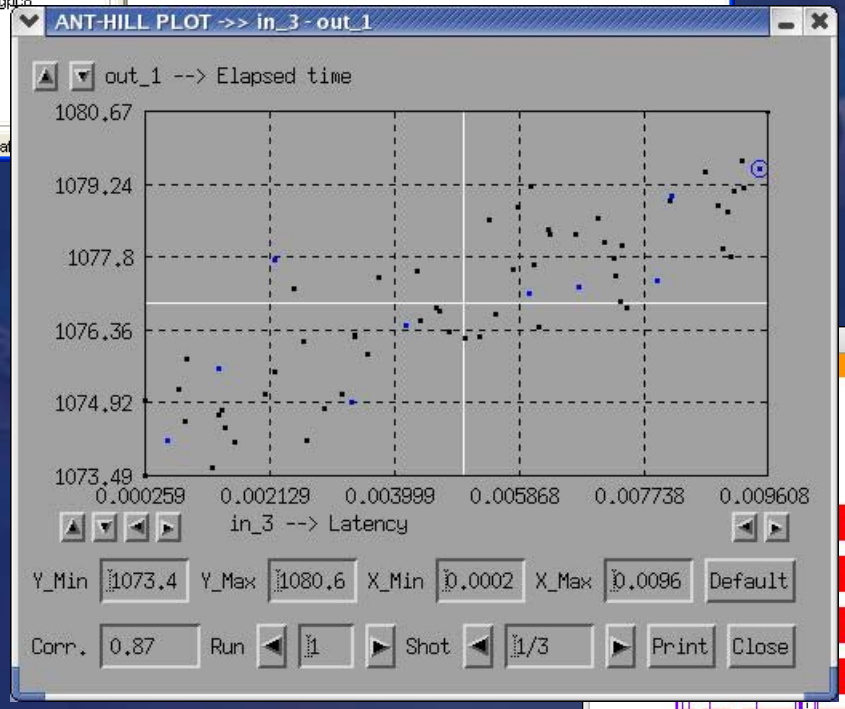
The coupled application

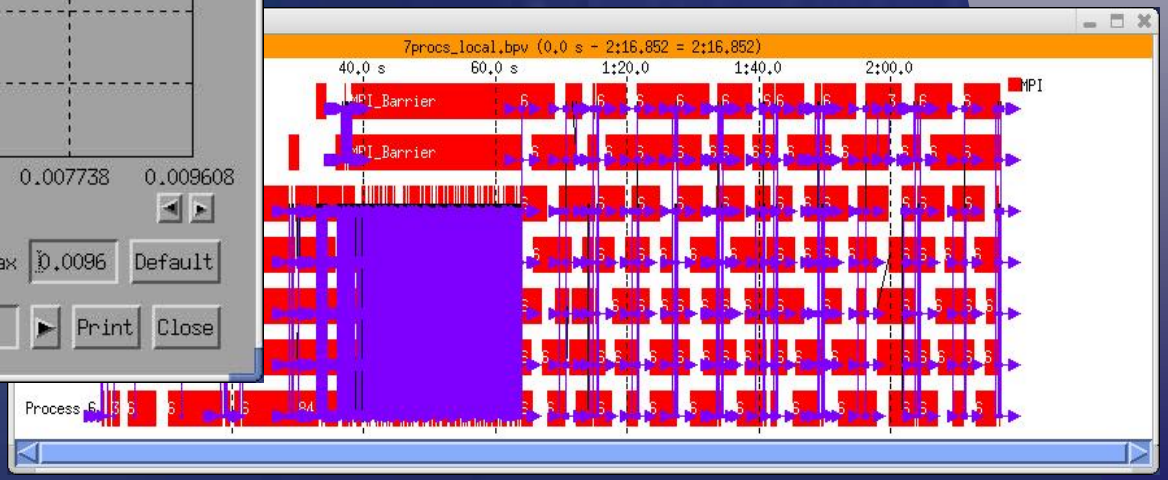
A vibro-acoustic application targeted for Airbus cockpit simulations

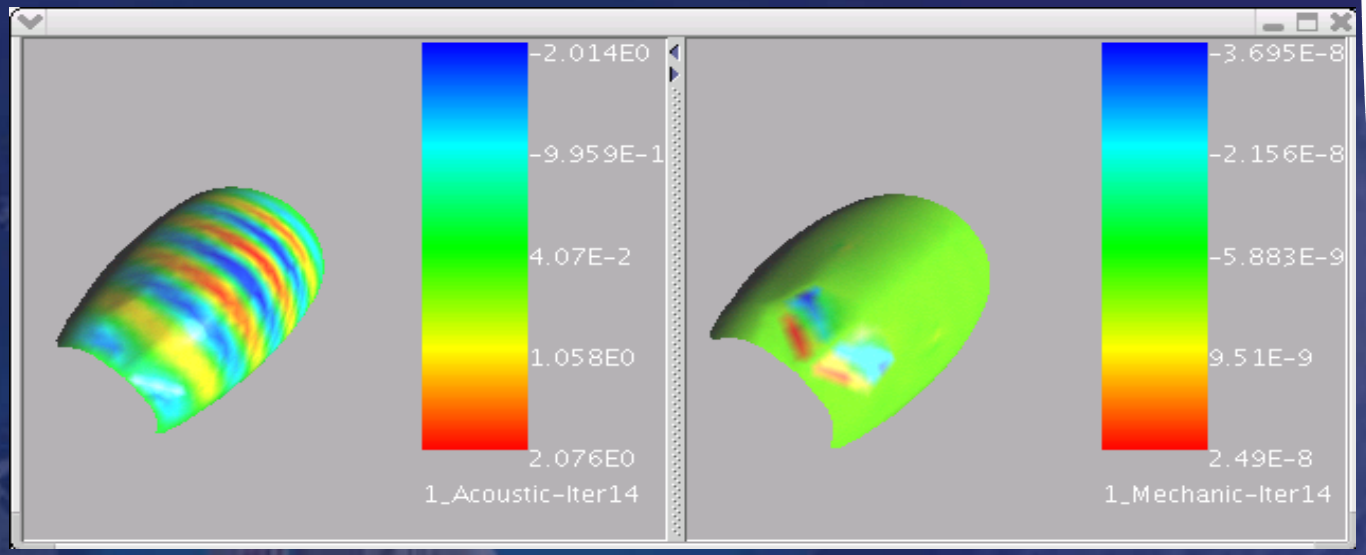


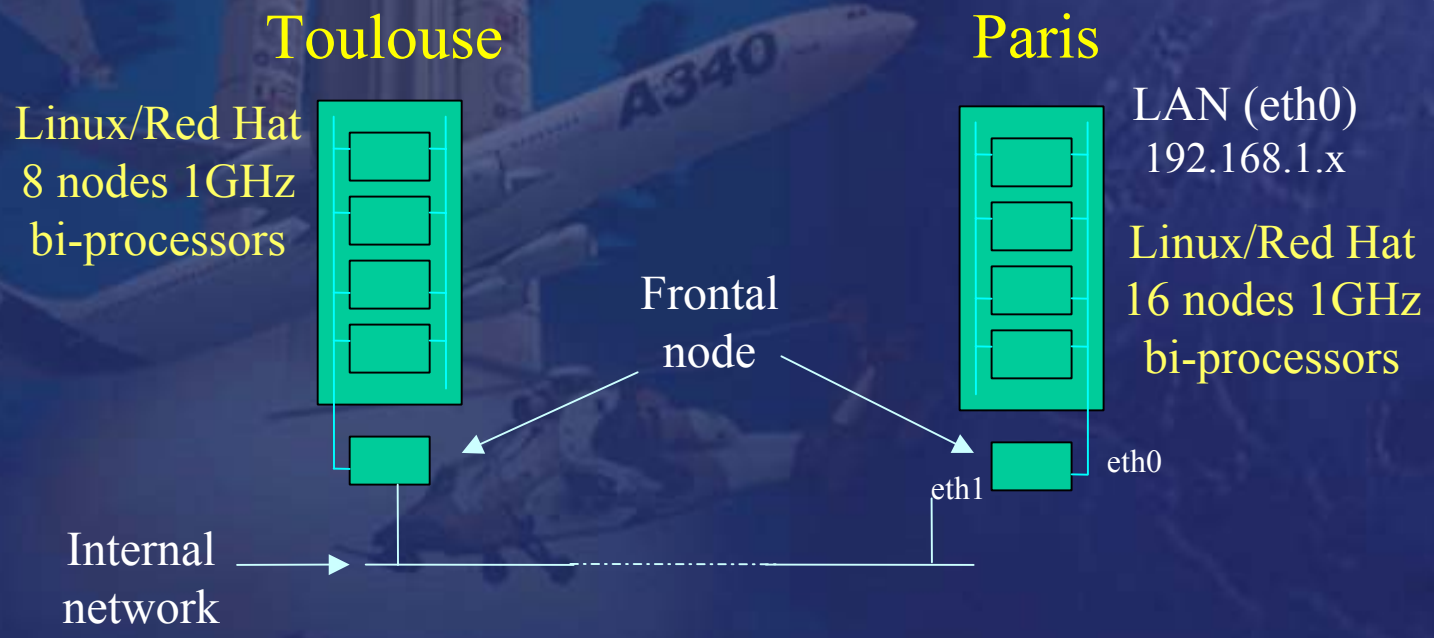




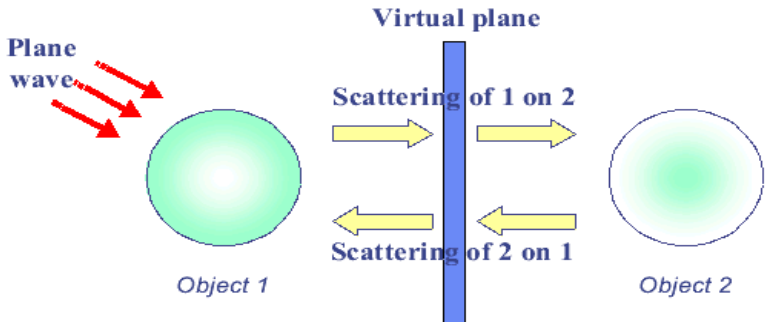


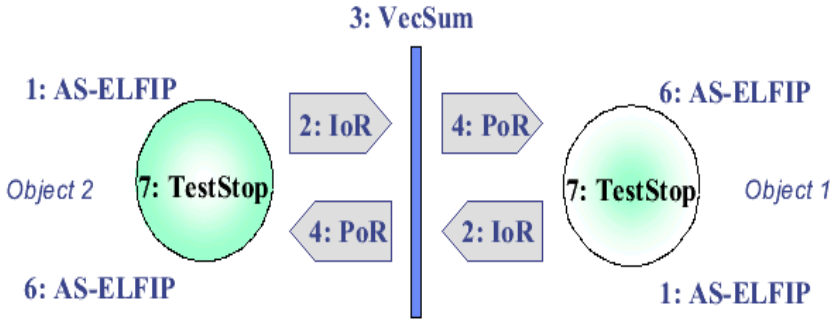


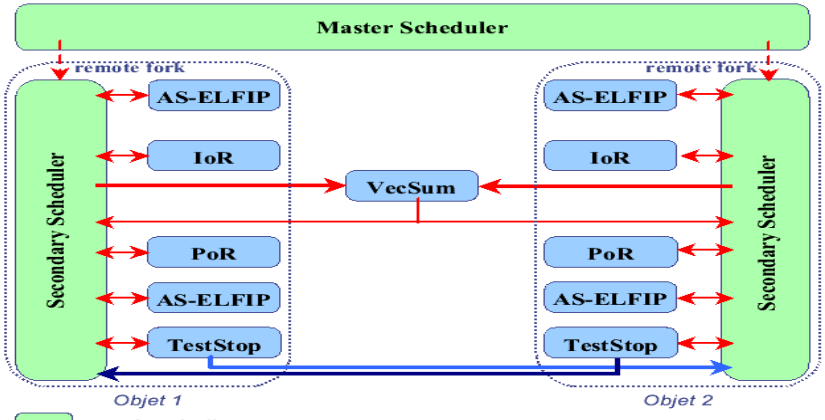




Grid RMI an ACI grid funded project







EADS CRC involvement in GRID initiatives

FP5 projects

- EUROGRID
- DAMIEN

ACI Grid projects

- GRID RMI
- CGP2P (use XtremWeb for ray tracing application)
- GRID TLSE (evaluate Sparse solvers)

RNTL project

- CASPER (Build ASP for scientific applications)

RNTL 2003 & FP6 proposals

- eGuilde, Visage
- SIMDAT, HEAVEN, EUGICA, CCGrid

Room for collaboration

On an application basis

- Wave propagation phenomena (EMC, Acoustics, ...)

- Multi-disciplinary, coupling

Areas of interest (with no particular priority)

- Convergence of Desktop Computing & Clusters (Integration /Heterogeneity)

- Virtual organisations (trust, security, contract Mgt, ...)

- Data Sharing & Knowledge Management

Summary

- For EADS, Grid computing is about resource sharing in multi-domain environments.
- Thanks to several projects, it is being used in CRC and should spread to business units,
- Our goals are:
  - Improvement in the design, manufacturability and/or maintenance,
  - Ease collaboration between discipline,
  - Gain insight,
  - Lower cost & shorten process cycle time,
  - Take advantage of distributed hardware, data & expertise.
- Grids requires investment, investment requires stability i.e. need for standards.