NICE

*New
Ideas for
Computing
Environments*

Grid Portals
in
Industry and Research

Workshop Enterprise Grid Solutions & Deployments

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Contents

NICE Background

- **Core business: Access to Grid Services**
  - **EnginFrame Grid Portal** & projects
  - **Expertise in Grid Intelligence**
- **Leadership in Grid deployment**
  - 3rd party products, projects, consulting
  - 8 years experience with **legacy & comm. apps**
  - Expertise in Enterprise Compute & Data Grids
- **Other relevant competencies**
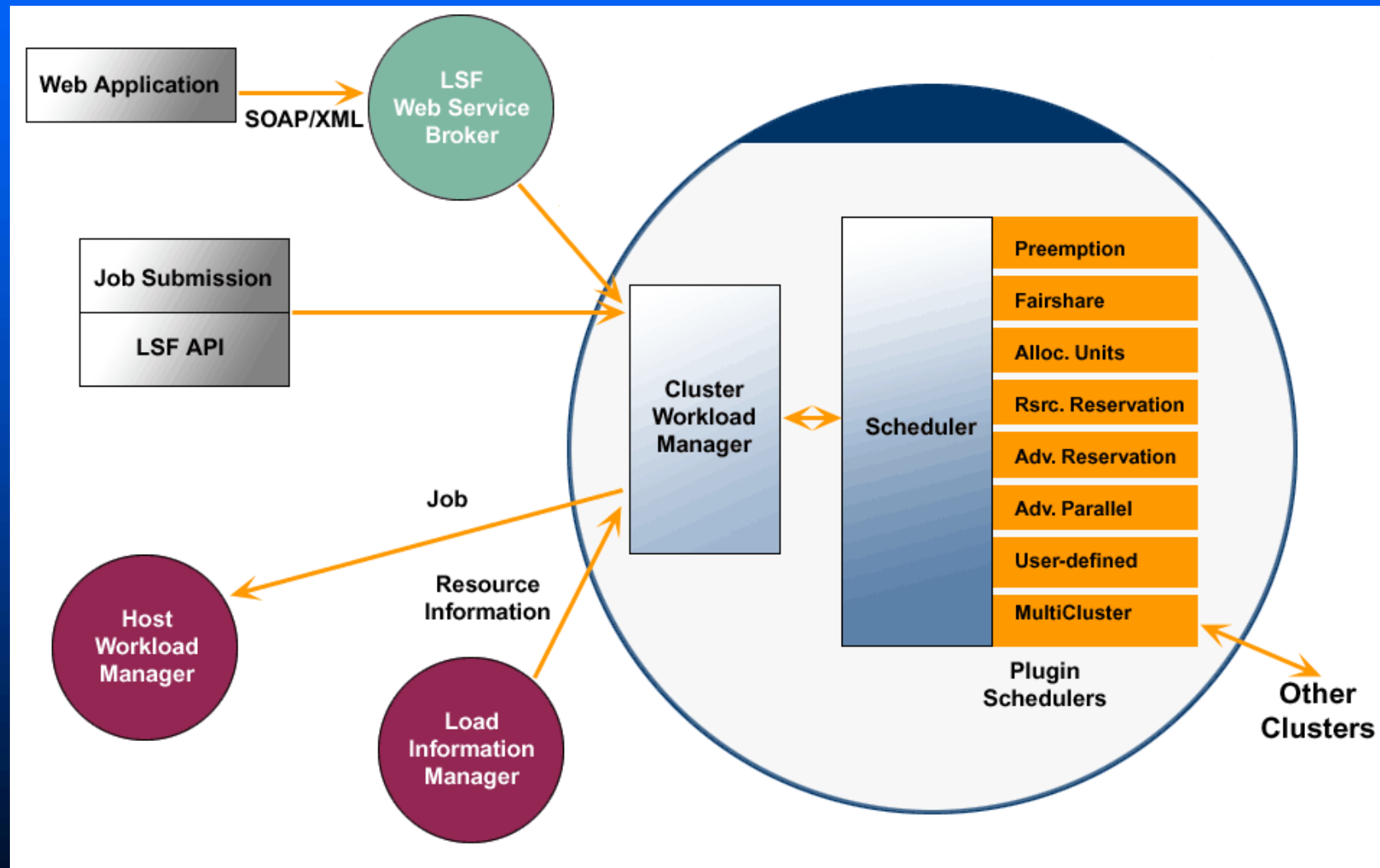 - Consulting for Grid-oriented system administration and server-based computing

NICE Customers

- **Mechanical** Ferrari, Audi, BMW, FIAT Auto, CRF, Iveco, Elasis, UTS,FG-Powertrain, Marelli, Teksid, Brembo, Lear
- **Manufact.** Procter & Gamble
- **Electronics** STMicroelectronics, Accent, Alcatel, Ericsson, Micron, Siemens, SensorDynamics
- **Aerospace** Alenia, Avio, CIRA, Galileo Avionica, IDS
- **Energy** Agip, Shell, Ansaldo, ENEL, EniChem
- **BioTech** Pharmacia, (ENEA)
- **Telecom** Telecom Italia Lab, Pirelli
- **Research** ENEA, ICTP, INFN, CASPUR, CILEA, CNR, CRS4, Astronomical Obs., SDRC
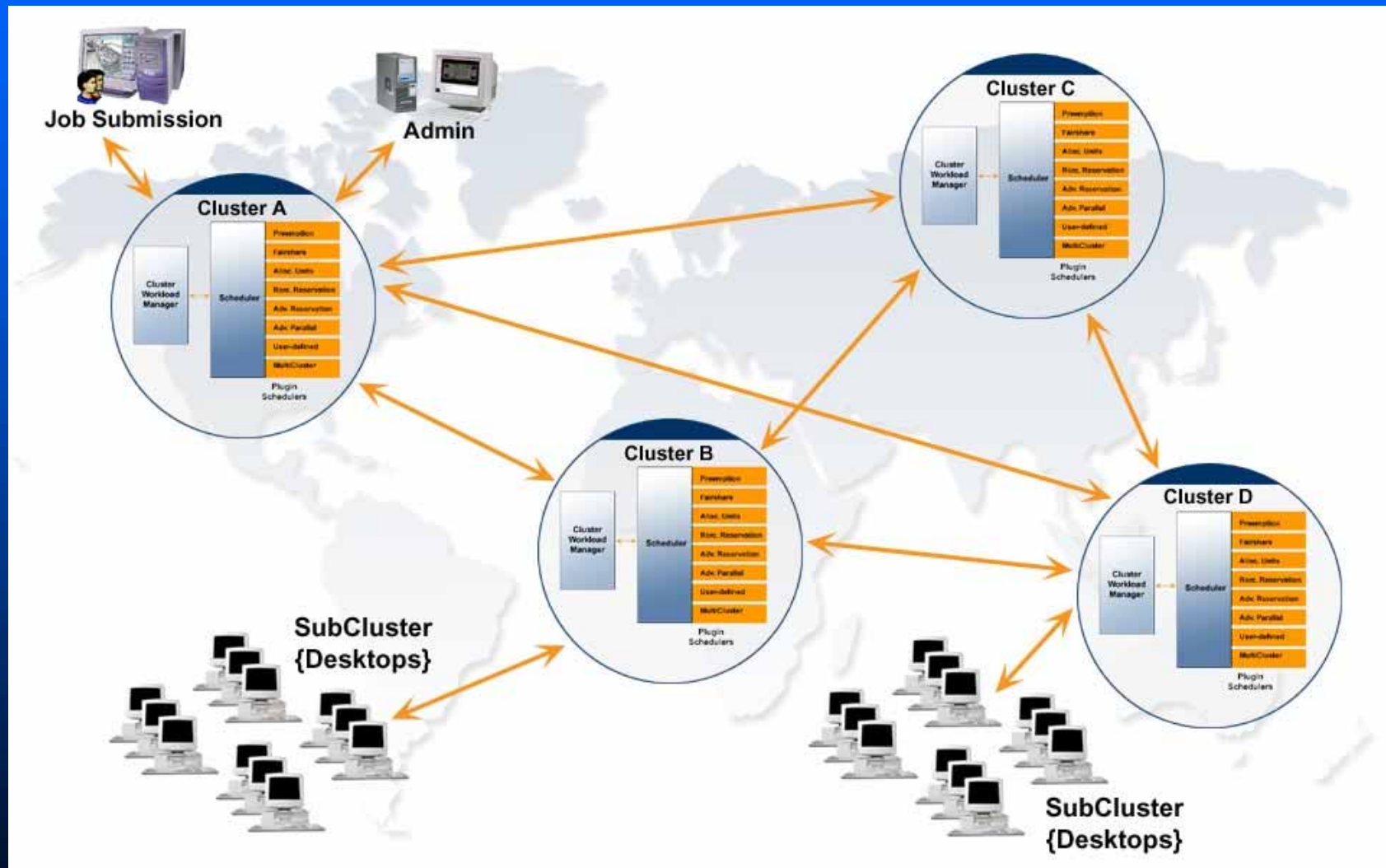- **Education** Scuola Normale Superiore di Pisa, Polit. Of Milan, Universities

Contents

- NICE in a nutshell
- Overview of Grid elements
- Drivers to Grid success
- Grid solutions in Research
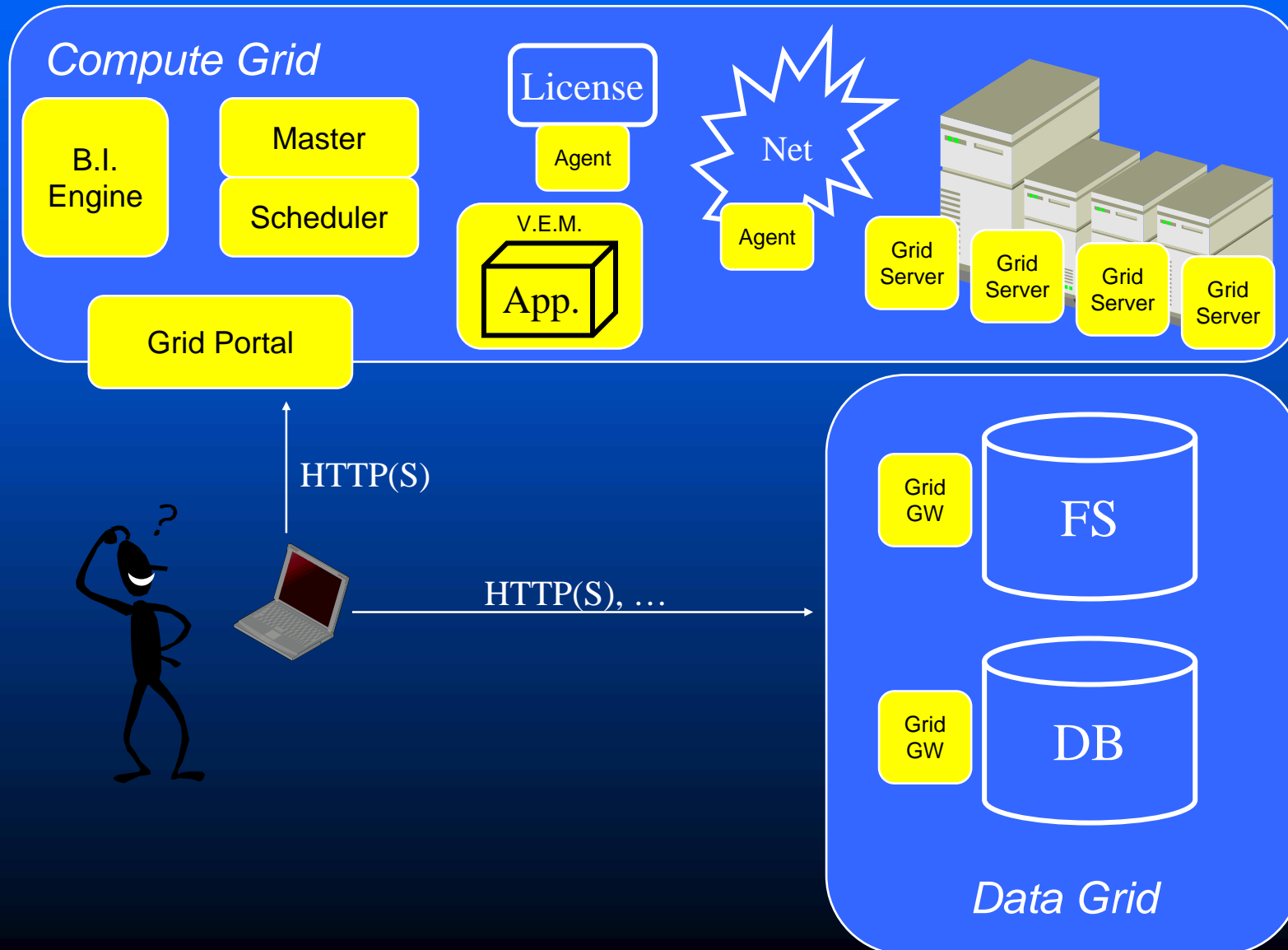- Grid solutions in Business

Departmental Grid

Enterprise Grid

Existing scenario simplified

Compute Grid

- B.I. Engine
- Master
- Scheduler
- Grid Portal
- License
  - Agent
- V.E.M. App.
- Net
  - Agent
- Grid Server
- Grid Server
- Grid Server
- Grid Server

HTTP(S)

HTTP(S), …

Data Grid

- Grid GW — FS
- Grid GW — DB

Solution Components

Grid Portal

ROI Analysis - BI

Global Resource Brokering

License Management

~~Applications~~

CPU Workload Management

~~owned)~~

Data Management

Host OS Management

Security / Authorization

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Drivers to Grid success

- **Focus on solution**
  - Applications are the key
  - Most applications can work unchanged
  - Proper balance between CPU - I/O - Network needs
- **Industry leading** components
  - Grid is new concept, but distributed computing has a long history
- **Flexible** approach to the Grid project(s)
  - **Affordable** *Bottom-up* approach to deliver immediate measurable advantages
  - **Strategic** *Top-down* approach to re-structure IT infrastructure and get the full advantage
- **Competent** Partnership

Grid Portal as Grid Drivers

- Basically, a Grid Portal aims at leveraging Grid usability by:
  - **Verticalizing** the service offering
  - Providing a **user-friendly** interface
  - **Lowering client requirements** for accessing the Grid
- The less you see the Grid, the easier you take advantage of it

Application delivery
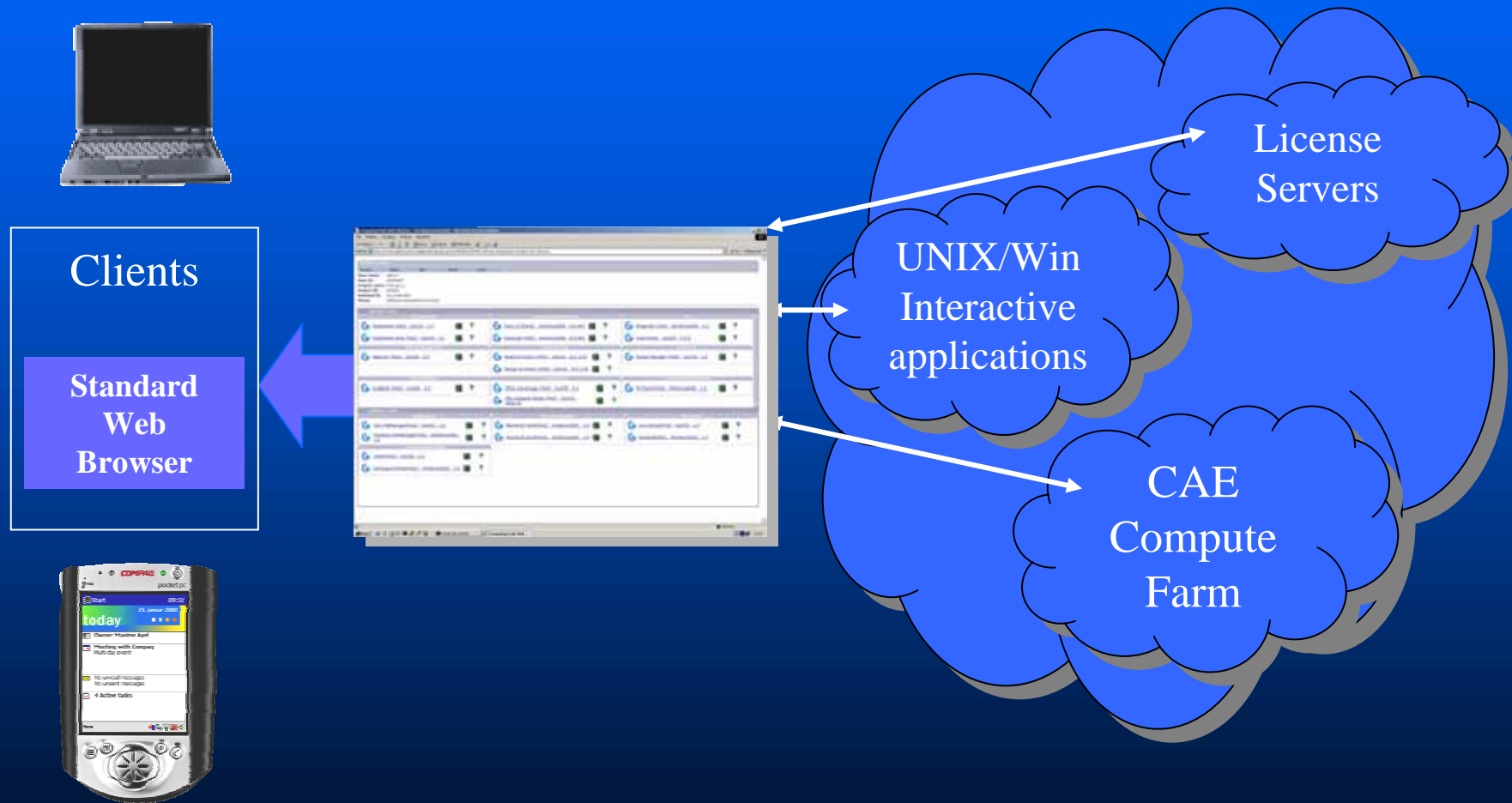
Why are Grid Portals build ?

- **Standardize** development processes

- **Simplify** and broaden the compute resource usage

- Improve users' **productivity**

  - Meta-Data, Defaults, Project-Management

- Realize compliance with **defined processes**

- **Reduce** user **errors** and misusage of the Grid

- Support **collaboration** with partners/suppliers

- Help being consistent with company's **security policies**

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Usable Grid services in R&D
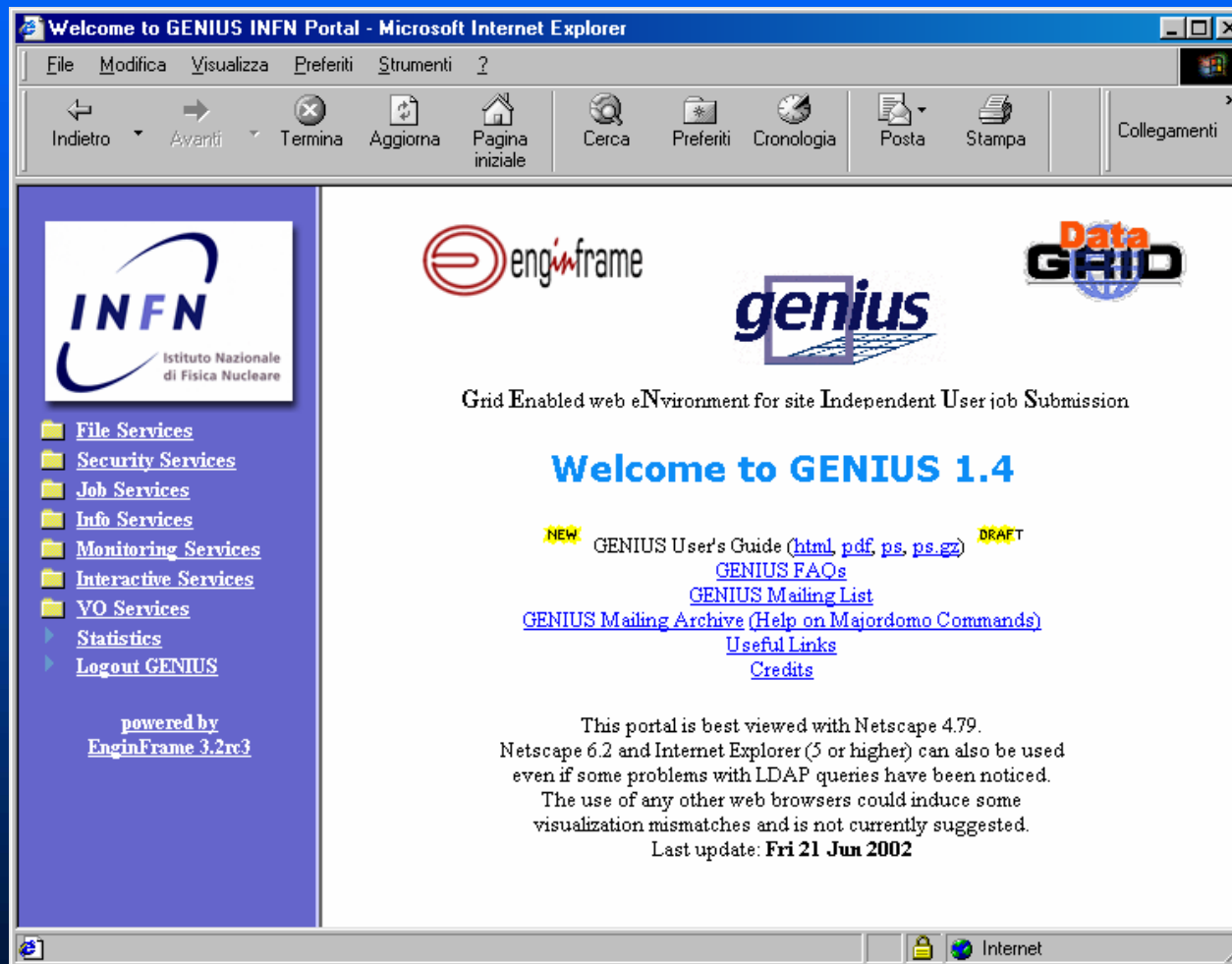
- Data Grid
- EGEE
- GENIUS-Portal Users: more than 15 HEP world-wide org. and CERN
- Other institutes

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Grid for Business

- Address **IT productivity** in core business
  - **from one** to thousands of users
  - **from one** to thousands of CPUs
  - Giga-Terabyte storage
  - Usually one site, sometimes more sites
- Heavy restrictions
  - Intellectual Property and security are **critical**
  - Legacy applications and methodology
  - Policy management & short ROI

Case study: ROI in IT

- **Scenario:**
  - Industrial companies try to fill the gap with competitors
  - CAE becomes strategic investment
  - Implementing policies and methodology (e.g. Robust dsign and multi-objective optimization

- **Problem:**
  - expensive IT resources (HW, *licenses*, storage)
  - low ROA, unpredictable ROI
  - complex for management
  - complex deployment

Grid + Grid Portal

Grid metrics

- Sites: 1
- Applications: 10+
- CPUs: 20-1000
- Users: 20-200

and BMW

Service transformation

ENTERPRISE PORTAL

Grid Portal

Grid Intelligence

COMPUTE GRID

App | App | App | App | App

LINUX

UNIX

Standard UNIX file sharing

SAN+NAS
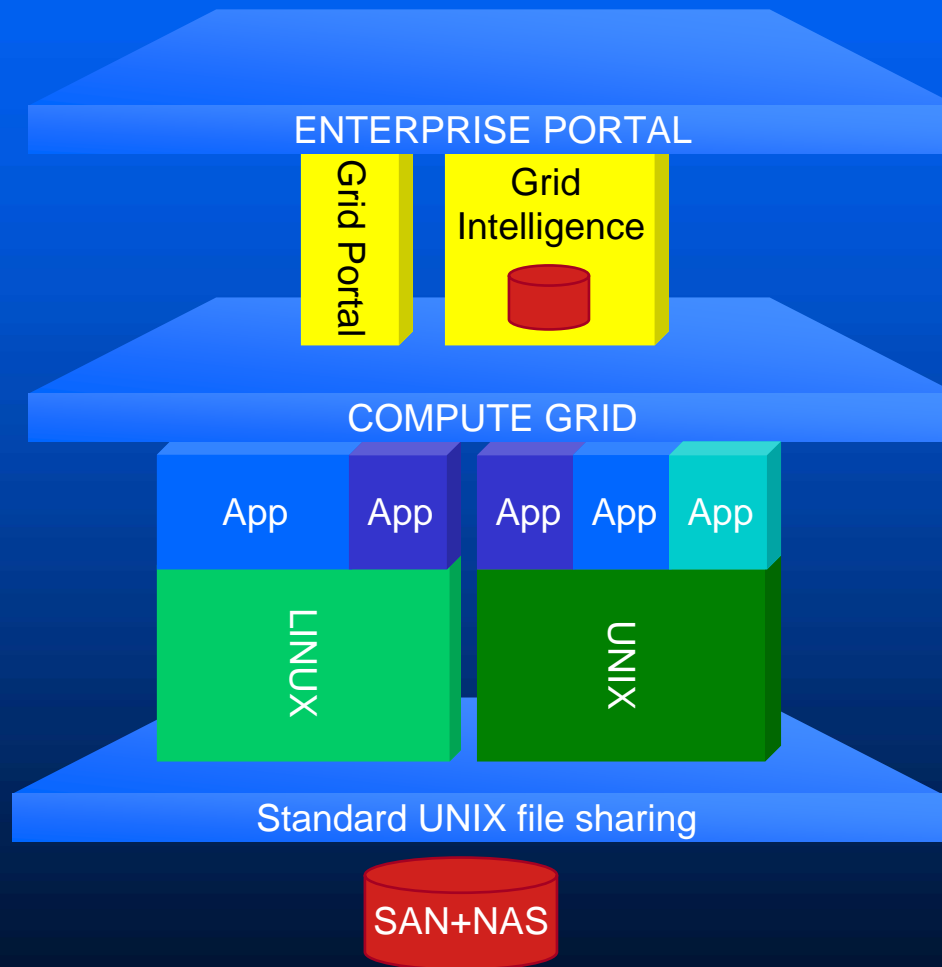
→ Oracle WebPortal, ...

→ NICE EnginFrame
→ NICE InfoMiner
→ NICE DataGate

→ Platform LSF
→ Commercial CAD/CAE applications (off-the-shelf)
→ Frequent use of MPI and SMP parallel applications
→ Typical context: CFD, Crash, DMU, FEA, PLM, etc.

Grid benefits

- Fault tolerance

- Complexity reduction for engineers

- IT assets optimization and **consolidation**

- Flexible and dynamic enforcement of **policies and priorities**

- **Controlled** incremental growth

- Smooth management of usage peaks

- Low client **TCO**

- Bottom line:
  - "Unlimited capacity" enable new product design processes
  - Better products to the market, developed faster
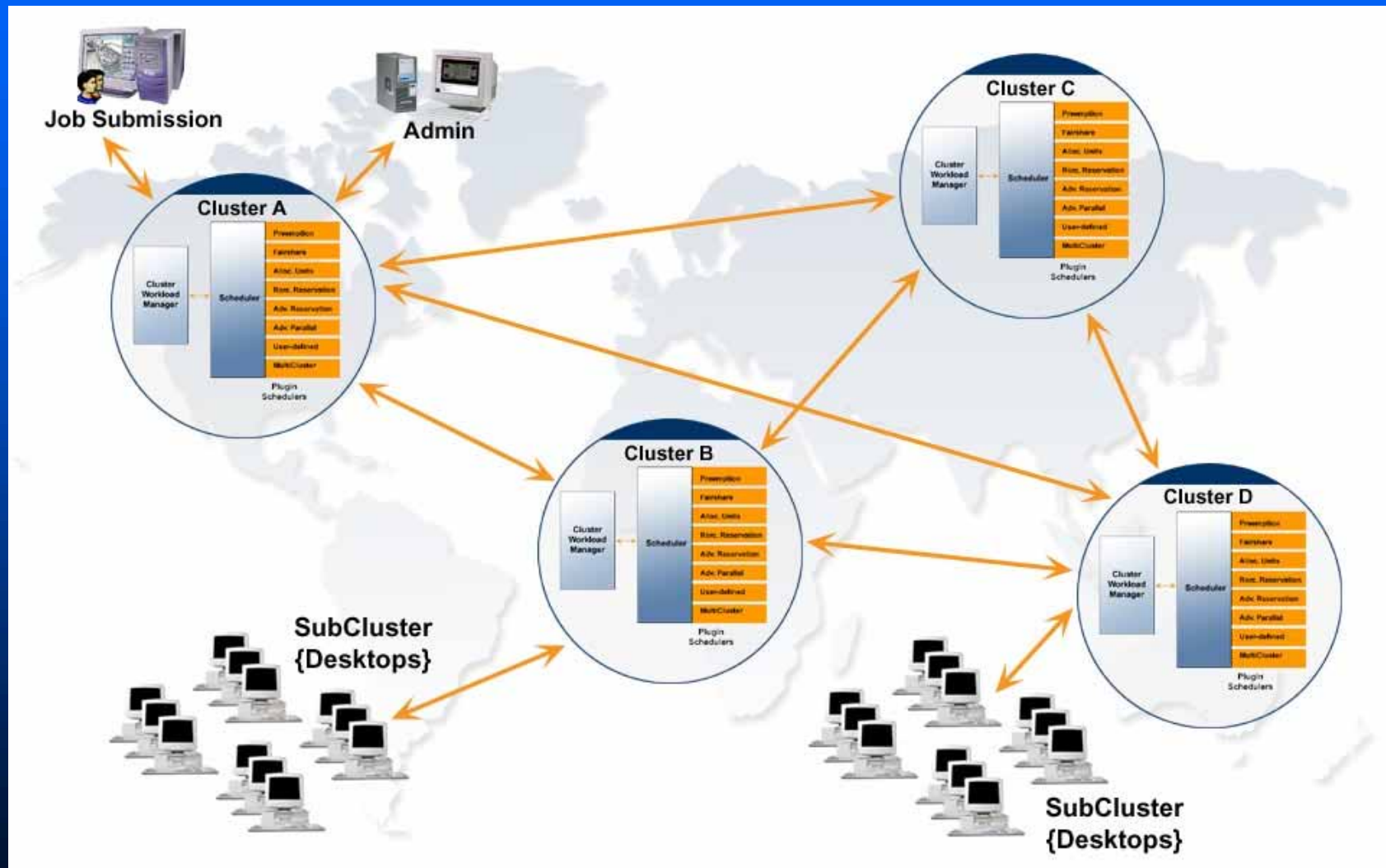
Information to support decisions

License usage
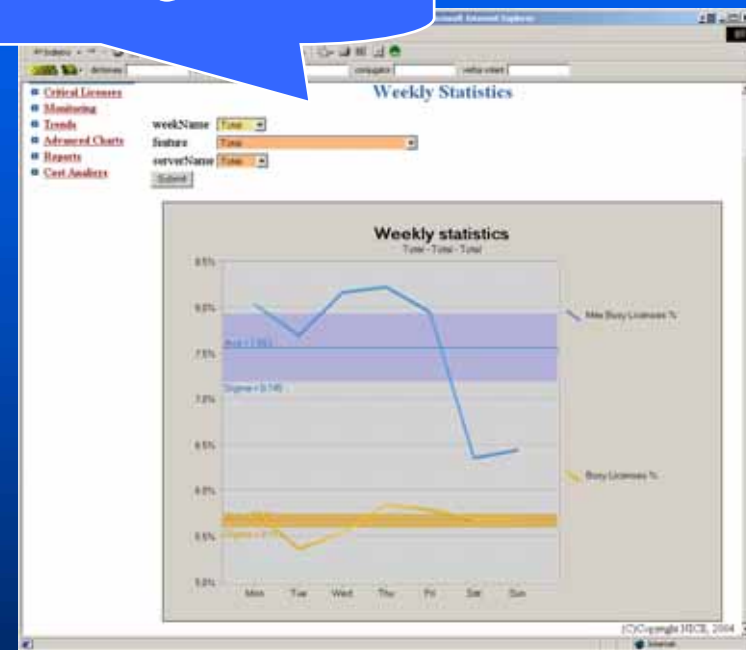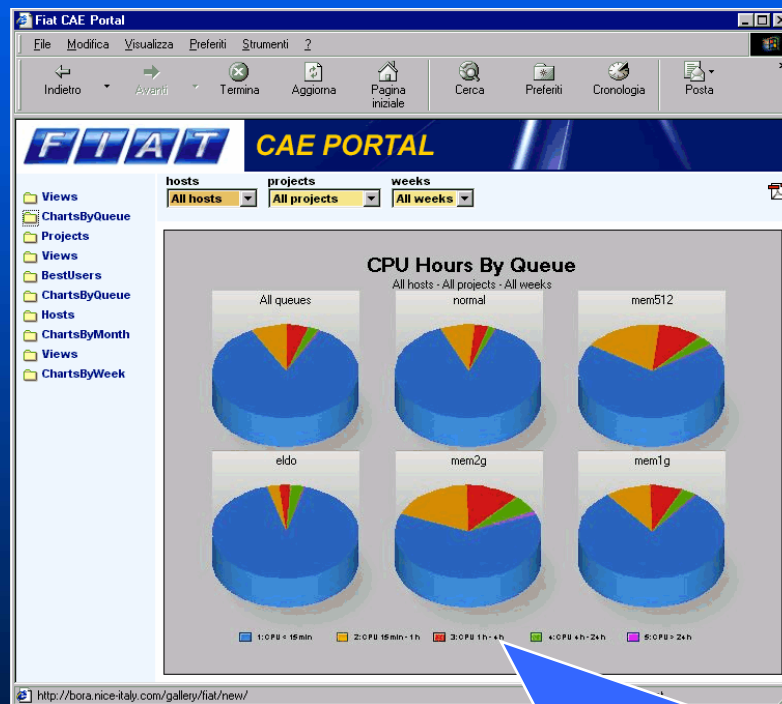
HW & Application usage

Grid Intelligence benefits

- HW/SW **efficiency insight**

- Resource usage **trends** analysis

- **Policy success** measurement

- Grid **ROI/ROA** evaluation

- Support for **charge-back** / pay-per-use approach

- Power project **profiling** for realistic **capacity planning**

Oil and Gas

Case Study: Oil and Gas

- Distributed Engineering Centers
- Distributed Compute Centers
- Computing follows the Sun
- Web Portal Standardization
- Integration into Company Portal Solutions

Oil and Gas Grid Portal

Case Study: Data Exchange

- **Collaboration problem in the supply chain**
    - Many suppliers with different supported 3D models
    - Complex operations to convert files
    - Management not comfortable with uncontrolled data exchange
    - User friendliness

DataGate

Grid metrics
- Sites: 1
- Applications: <10
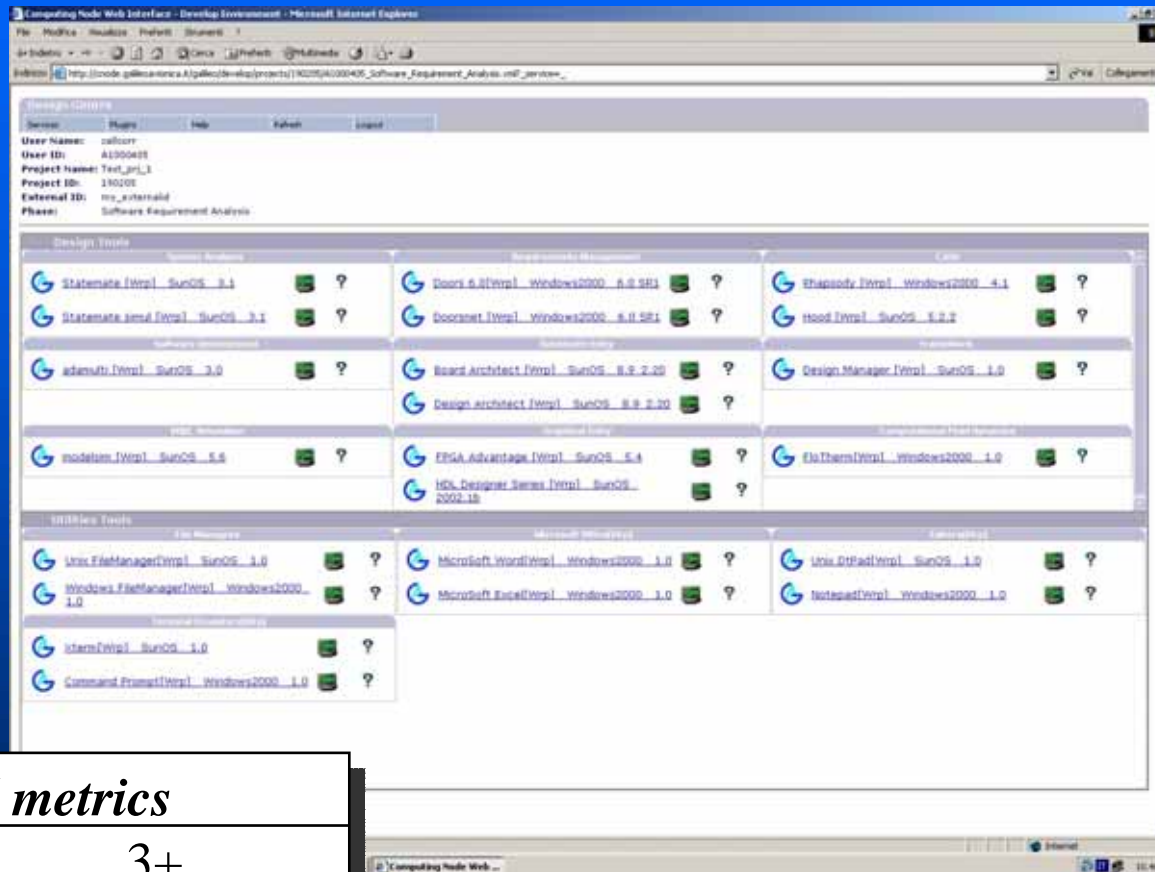- CPUs: 2!
- Users: 300+

Grid benefits

- Reduced costs in data exchange
  - *Calculated ROI on shipment savings is 4 months!*
- Complexity reduction for internal and external users
- Fault and license shortage tolerance
- Reduced network security issues
- Wide accessibility via virtually any browser

- Bottom line:
  - Full control of data coming in or out of the company

Case study: Consolidation

Company in the Defense sector

- Different companies have merged into one
- Virtualization of merged distributed IT resources
- Projects need common **coordination and collaboration**
  - No common design methodology
  - Duplicated licenses across different sites
  - Insufficient local resources
  - Limited communication

Grid Portal within Enterprise P.

Grid metrics

- Sites: 3+
- Applications: 20+
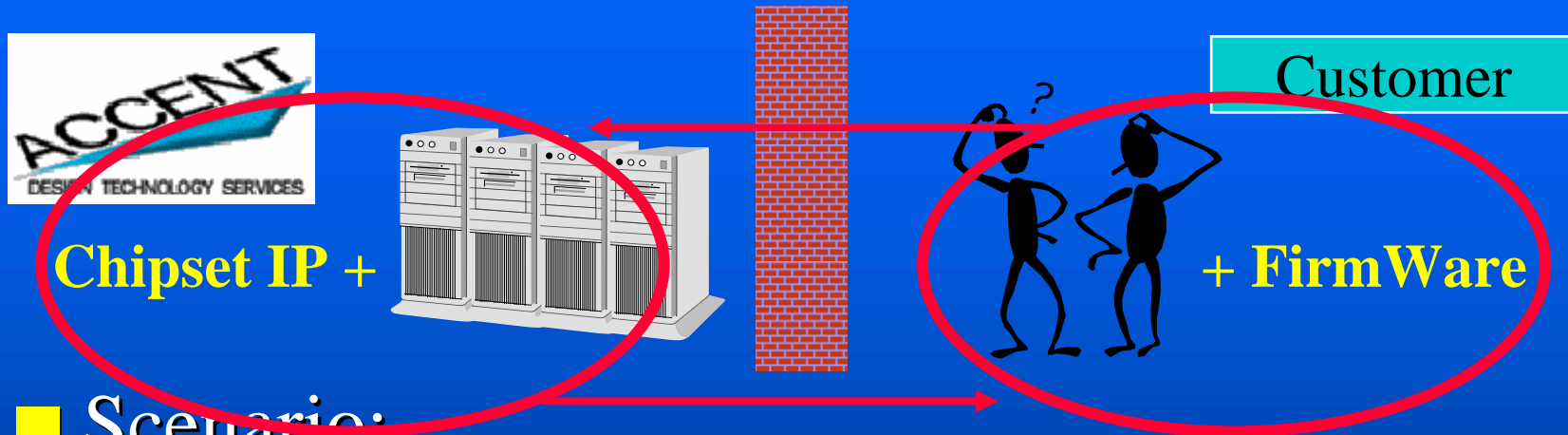- CPUs: <20
- Users: 100+

Centralized eDesign Services

Grid benefits

- Flexible software **license sharing** between sites and projects
- IT assets optimization and **consolidation**
- Flexible and dynamic enforcement of **policies and priorities**
- **Collaborative** product design across different sites
- Strong management of usage peaks
- Low client **TCO**

- Bottom line:
  - Enables product development in distributed design teams
  - Cuts inefficiencies in license management
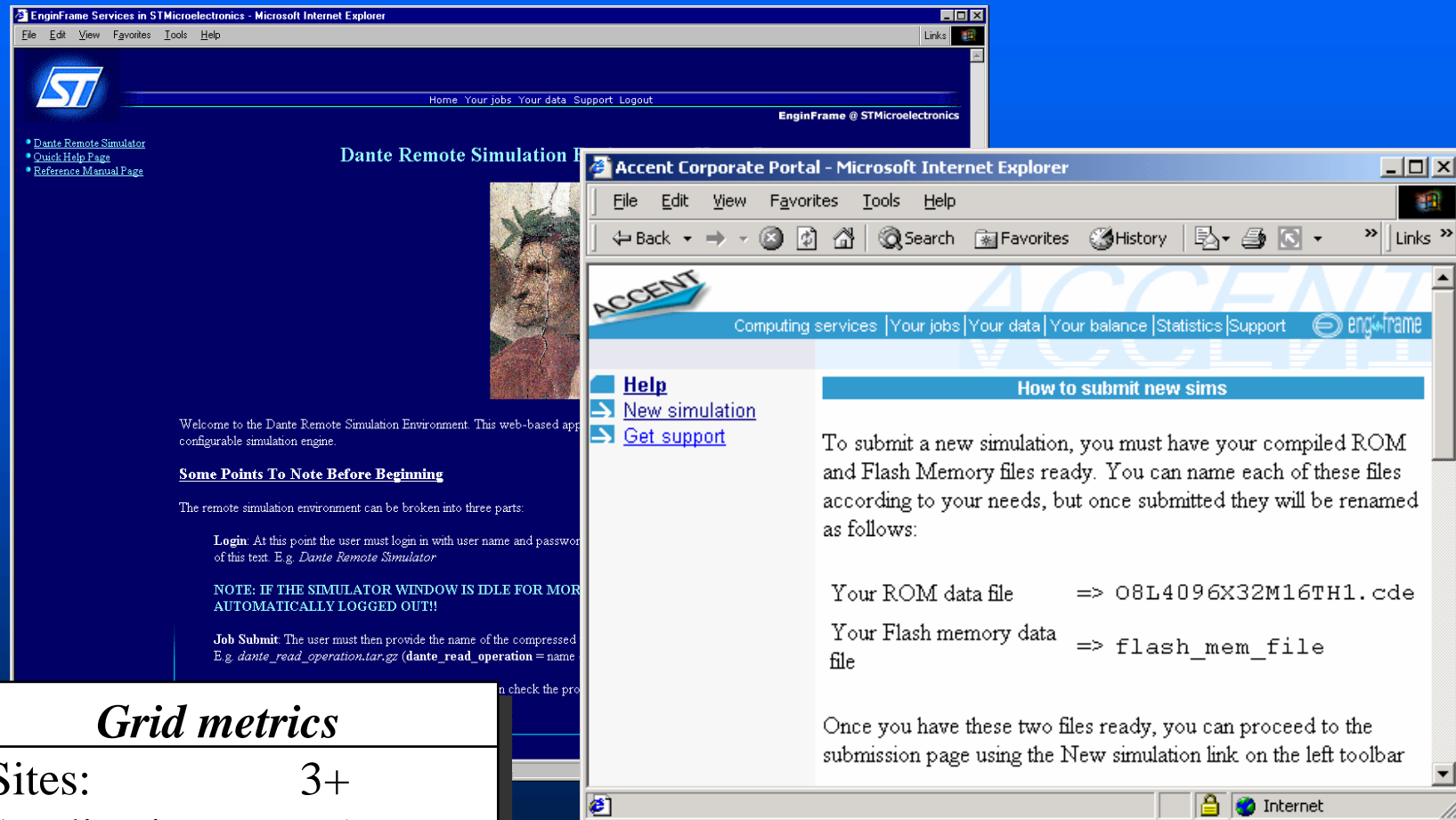
Case Study: Intellectual Property

Chipset IP +

Customer

+ FirmWare

- ■ Scenario:
  - – Accent is designing a chipset for Customer
  - – Customer needs to test the firmware & software for this chipset
- ■ Problem:
  - – Intellectual Property cannot be disclosed

Grid + Grid Portal

Grid metrics

- Sites: 3+
- Applications: <5
- CPUs: 200-600
- Users: 100+

Black-box for EDA simulation

Grid benefits

- Refined **license sharing** between projects
- Flexible and dynamic enforcement of **policies and priorities** to handle hundreds of applications
- Optimized resource pools for usage peaks
- **Collaborative** product design with customers
- Full information on **resource usage** and accounting

- Bottom line:
  - Enables design projects to match their deadline
  - Enables on-demand collaboration with customers

Risk Analysis portal
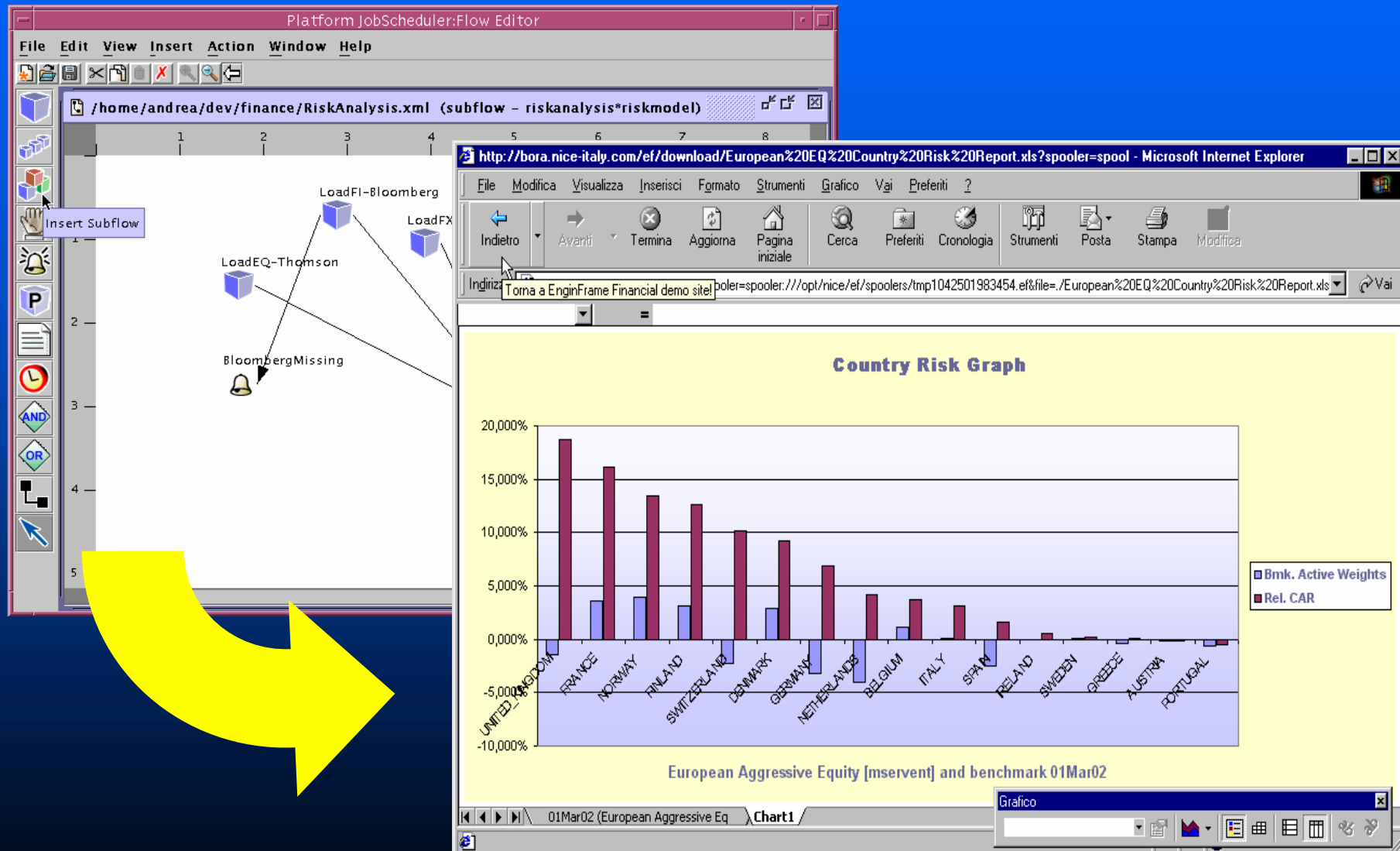
Risk Analysis portal

- **Benefits:**
  - Utilize resources and optimize risk
  - Lower Client TCO
  - Easier service accessibility
  - Enhance process monitoring and control
  - Capitalize on existing expertise

Grid + Grid Portal benefits

- **Standardization** of access to applications

- Controlled & **structured** data management

- **Process** integration and deployment

- End user **productivity improvement**

- Enables **collaboration** inside the company and with customers or partners

- Resource usage **policy** enforcement

- Easy integration in **Enterprise Portals**

Thanks for your attention!

Q&A

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