IBM Grid and Grow

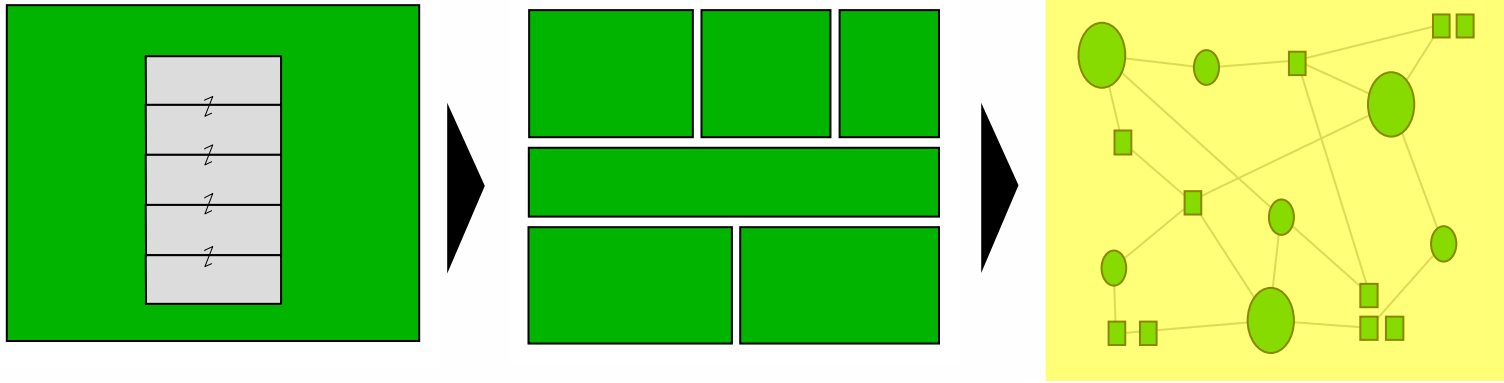
Ulazak u svijet Grida na jednostavan način!

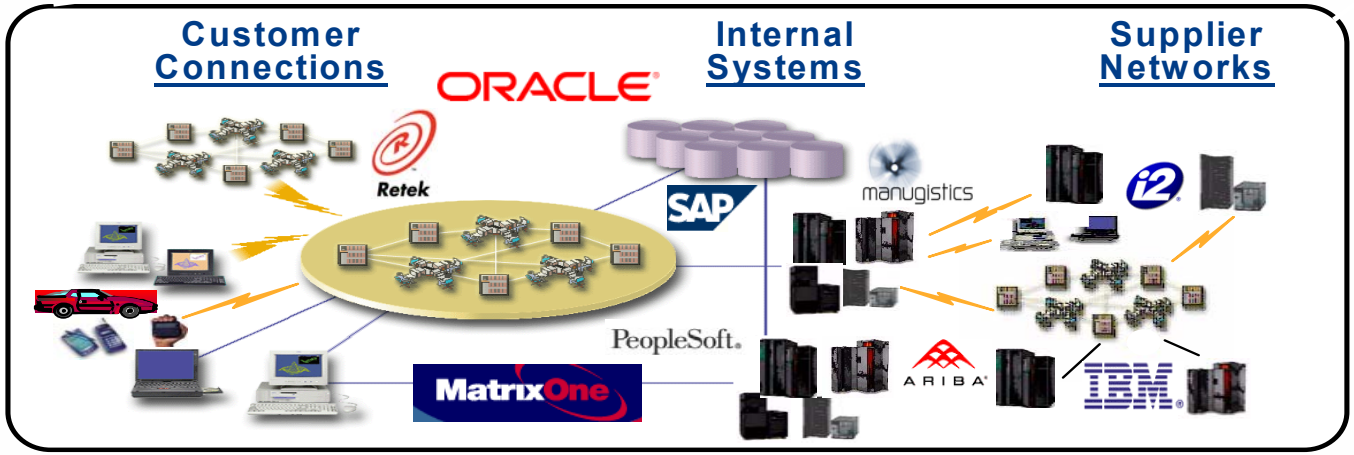
Zorislav Sić, IBM Hrvatska
hroug 2007

Technology and Business Environment

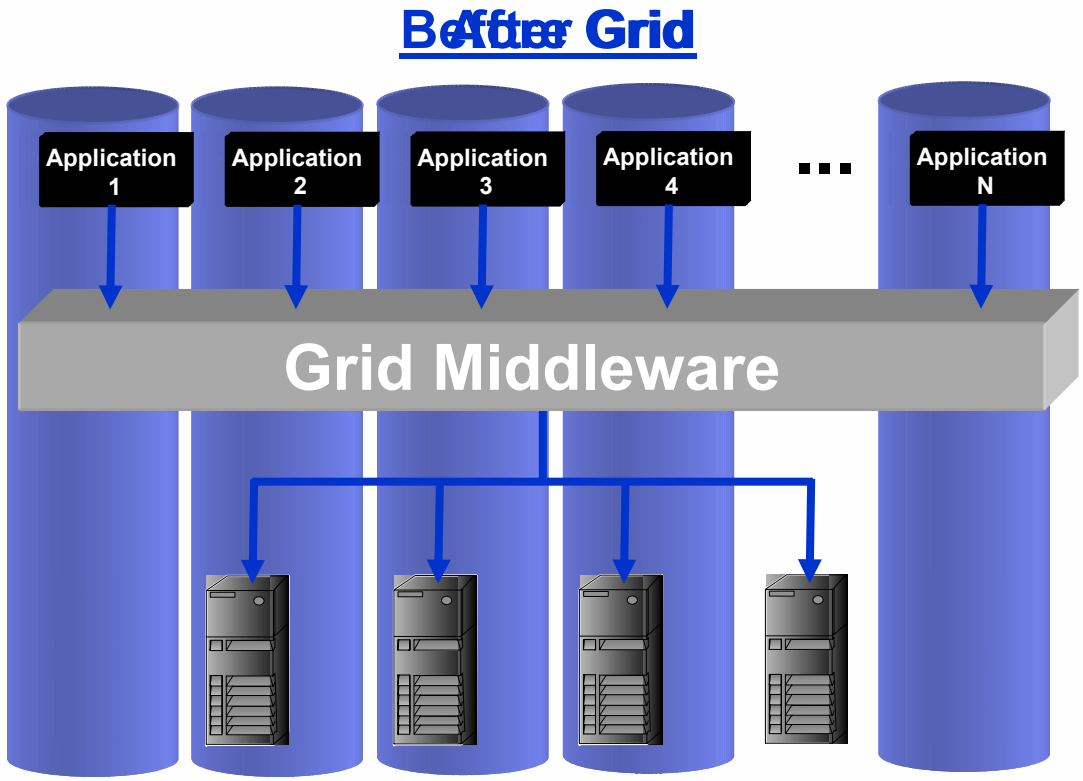
1960s **1970s** **1980s** **1990s** **2000s**

Integrated, Proprietary ***Modular*** ***Networked, Global***





Grid Computing: Enabling an On Demand Infrastructure



"Virtualized" infrastructure:

- Creates a virtual application operating, storage & collaboration environment
- Virtualizes applications across enterprise
- Dynamically responsive over a virtual pool of system resources
- Offers an adaptive, self-managed operating environment that offers high availability

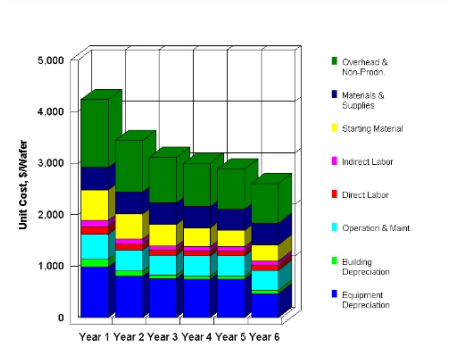
"Siloed" infrastructure:

- Has virtual application operating, storage & collaboration environment silos
- Organizes applications across enterprise
- Limited flexibility to provision resources

Grid Motivations

Accelerate

Collaborate



Optimize

Accelerate Business Processes

- Faster, more accurate decision making

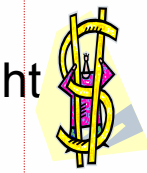
Productivity and Collaboration

- Access to distributed data, information, insight

IT Optimization

- Improve efficiency and cost structure

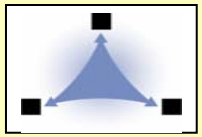
Grid Focus Areas

Research and Development	Accelerate and enhance the R&D process by enabling the sharing data and computing power seamlessly for research intensive applications	Life Sciences Education Industrial	
Engineering and Design	Share data and computing power, for computing intensive engineering and scientific applications, to accelerate product design	Industrial	
Business Analytics	Enable faster and more comprehensive business planning and analysis through the sharing of data and computing power	Financial Industrial Life Sciences	
Government Development	Create large-scale IT infrastructures to drive economic development and/or enable new government services	Gov't	
Enterprise Optimization	Optimize computing and data assets to improve utilization, efficiency and business continuity	Financial Industrial Gov't Education Life Sciences	

Grid and Virtualization

IBM is focused on solutions that help clients realize value from the full spectrum of grid computing solutions

Virtualize Like Resources



Single System (Partitioning)

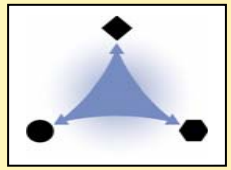
Cluster

Simple (2-4)

Sophisticated (4+)

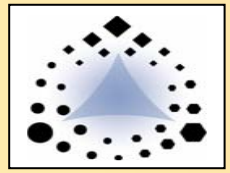
Homogenous systems, storage, and networks

Virtualize Unlike Resources



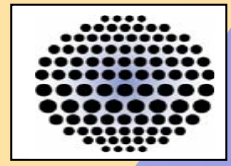
Heterogeneous systems, storage, and networks; Application-based Grids

Virtualize the Enterprise



Enterprise wide Grids, Information Insight, and Global Fabrics

Virtualize Outside the Enterprise



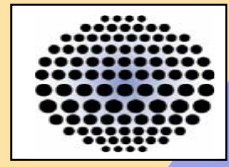
Suppliers, partners, customers and external resources

Homogenous
Single Organization
Tightly Coupled

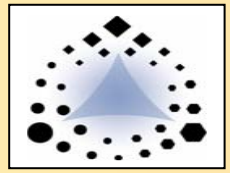
Heterogeneous
Multiple Organizations
Loosely Coupled

Realizing Increasing Levels of Business Value

Virtualize Outside the Enterprise

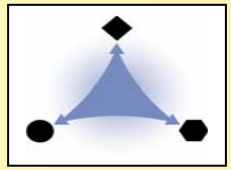


Virtualize the Enterprise



IT Simplification for Enterprise Optimization
Asset Utilization
Workload Prioritization

Virtualize Unlike Resources



Infrastructure Flexibility
Enabling
Business Resiliency

Virtualize Like Resources

Cluster

Single System (Partitioning)

Simple (2-4)

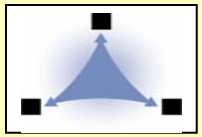
Sophisticated (4+)

Aggregating Information
Business Insight
and
Collaboration

Application Acceleration
Time to Results
and
Higher Quality

Characteristics of Grid Evolution

Virtualize Like Resources



Single System (Partitioning)

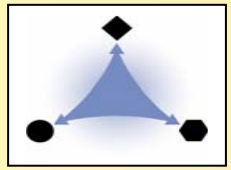
Cluster

Simple (2-4)

Sophisticated (4+)

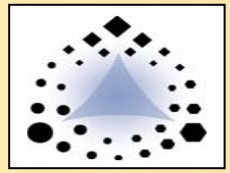
- Cluster Scheduling
- Single Application
- Homogenous
- Storage/File Virtualization

Virtualize Unlike Resources



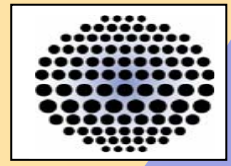
- Advanced Scheduling
- Multiple Apps/Resources
- Integrated Security
- Provisioning
- Workload Management
- Information Virtualization

Virtualize the Enterprise

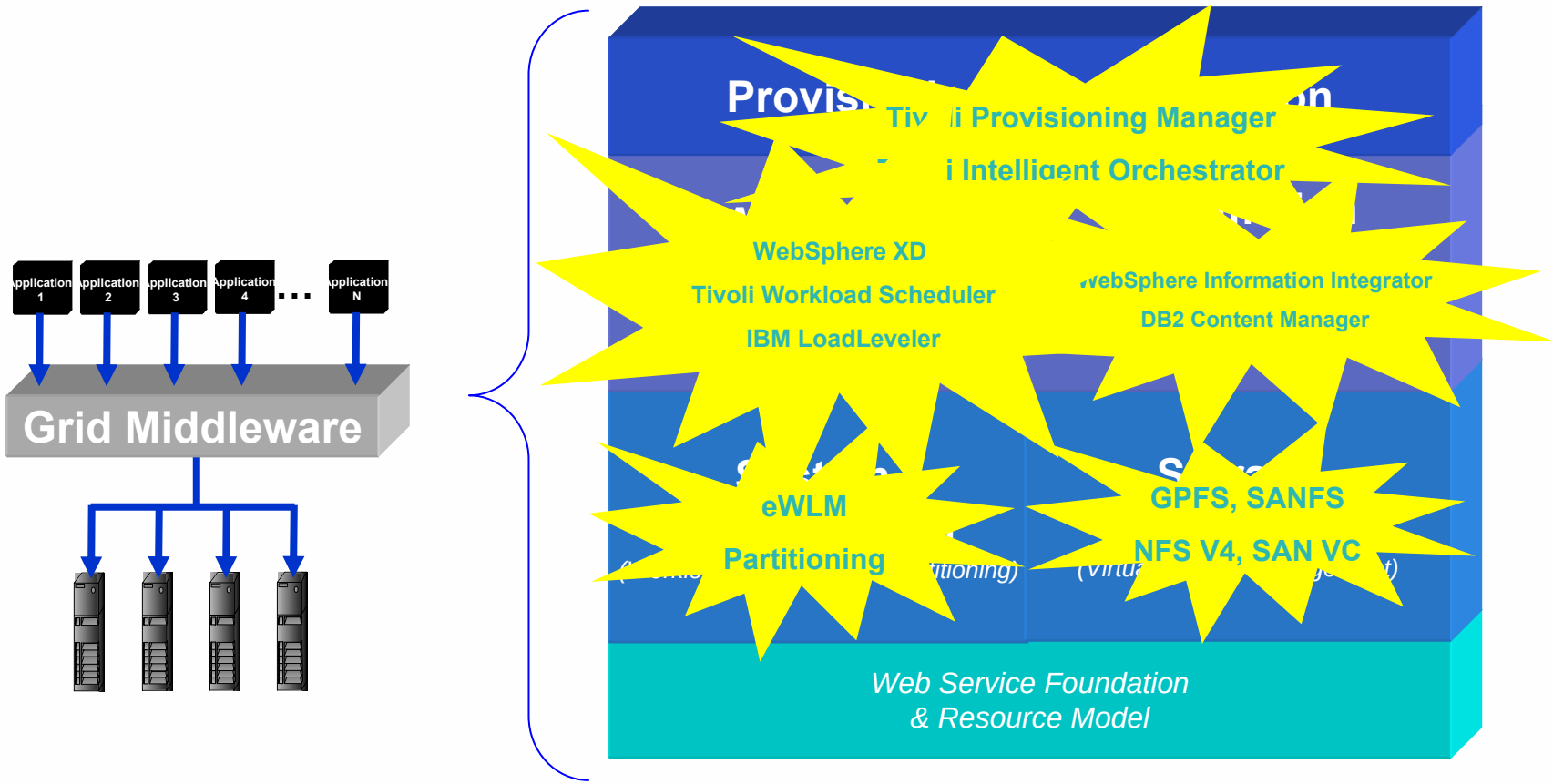


- Multiple Organizations
- Meta-scheduling
- Workload Prioritization
- SLA Attainment
- Orchestration
- Information On Demand

Virtualize Outside the Enterprise

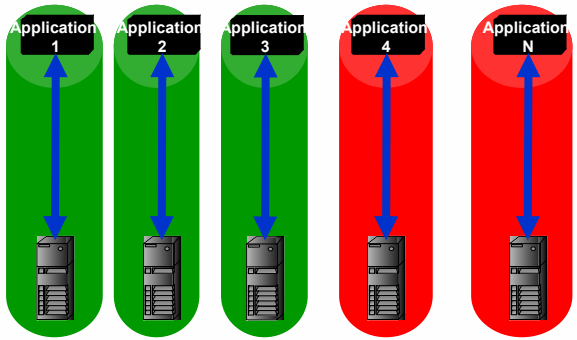


IBM Grid Components

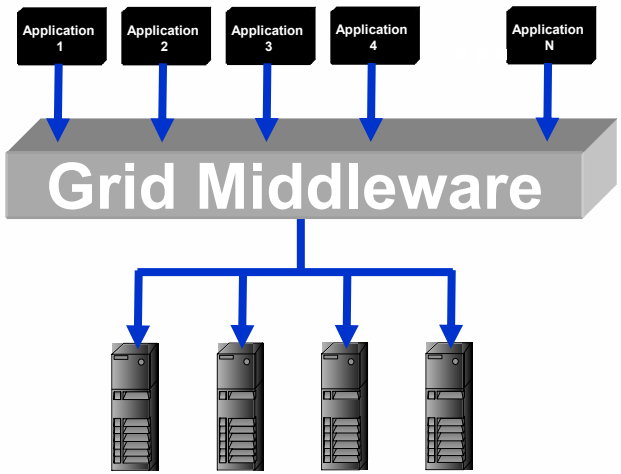


Demo of Virtualized Enterprise

Before Grid



After Grid



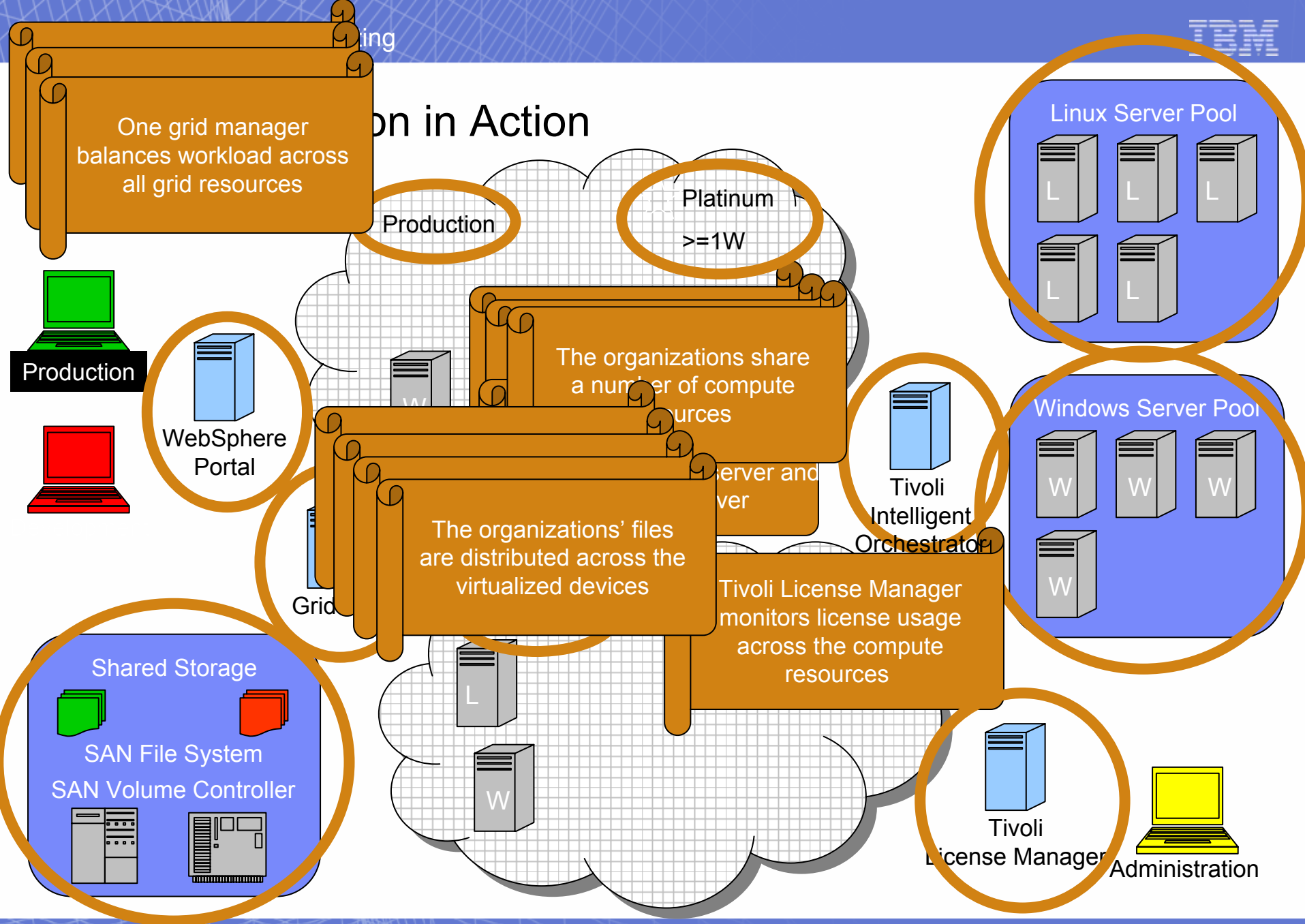
Before:

- A customer has two departments, Production and Development
- Each department has their own compute and storage resources

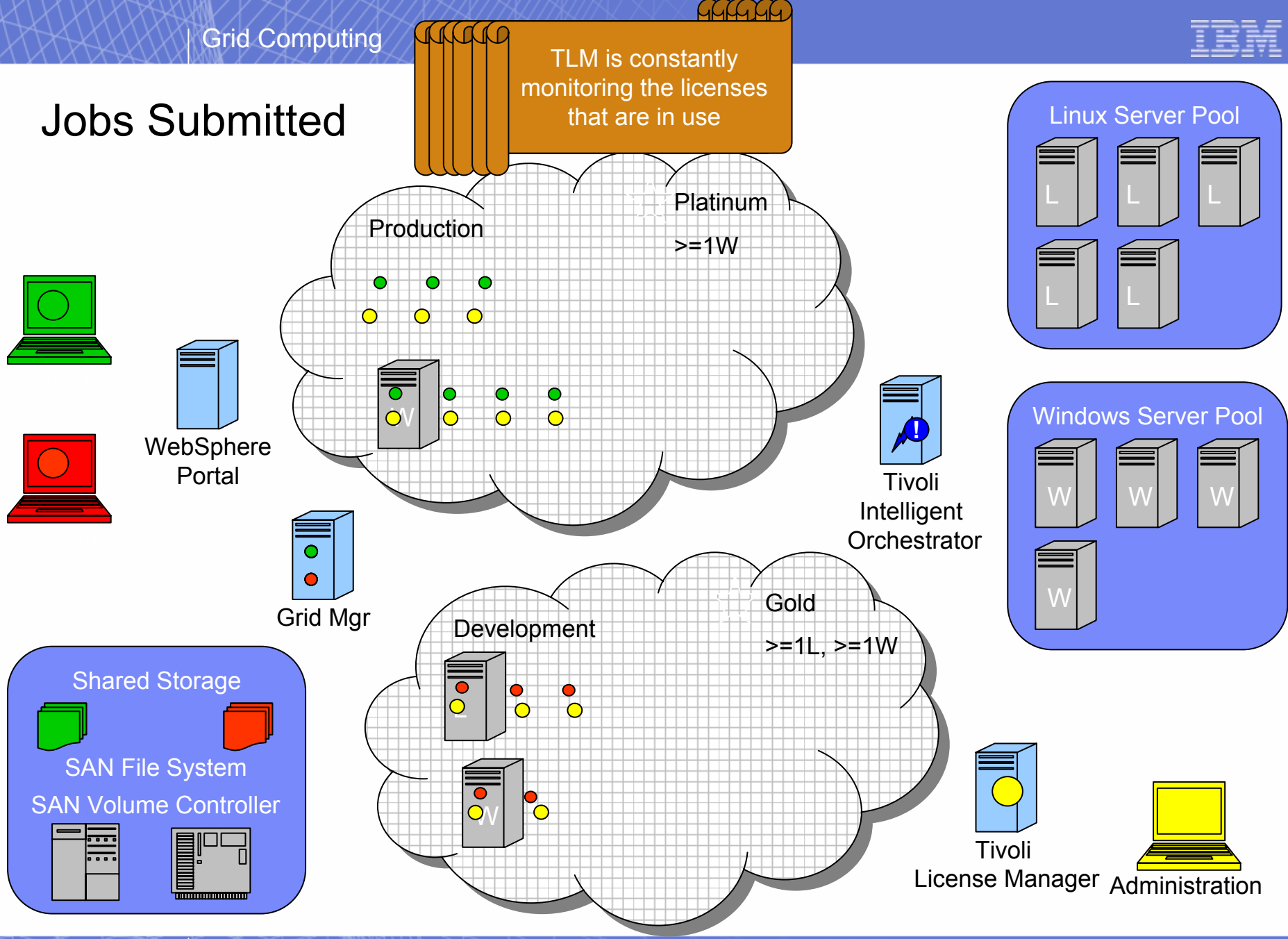
After implementing a Virtualized Infrastructure:

- Production and Development have agreed to run their applications in a shared environment
- Each organization shares many of their previously private resources into a common pool
- Priorities and policies control the allocation of resources
- Resources are automatically configured based on specific jobs

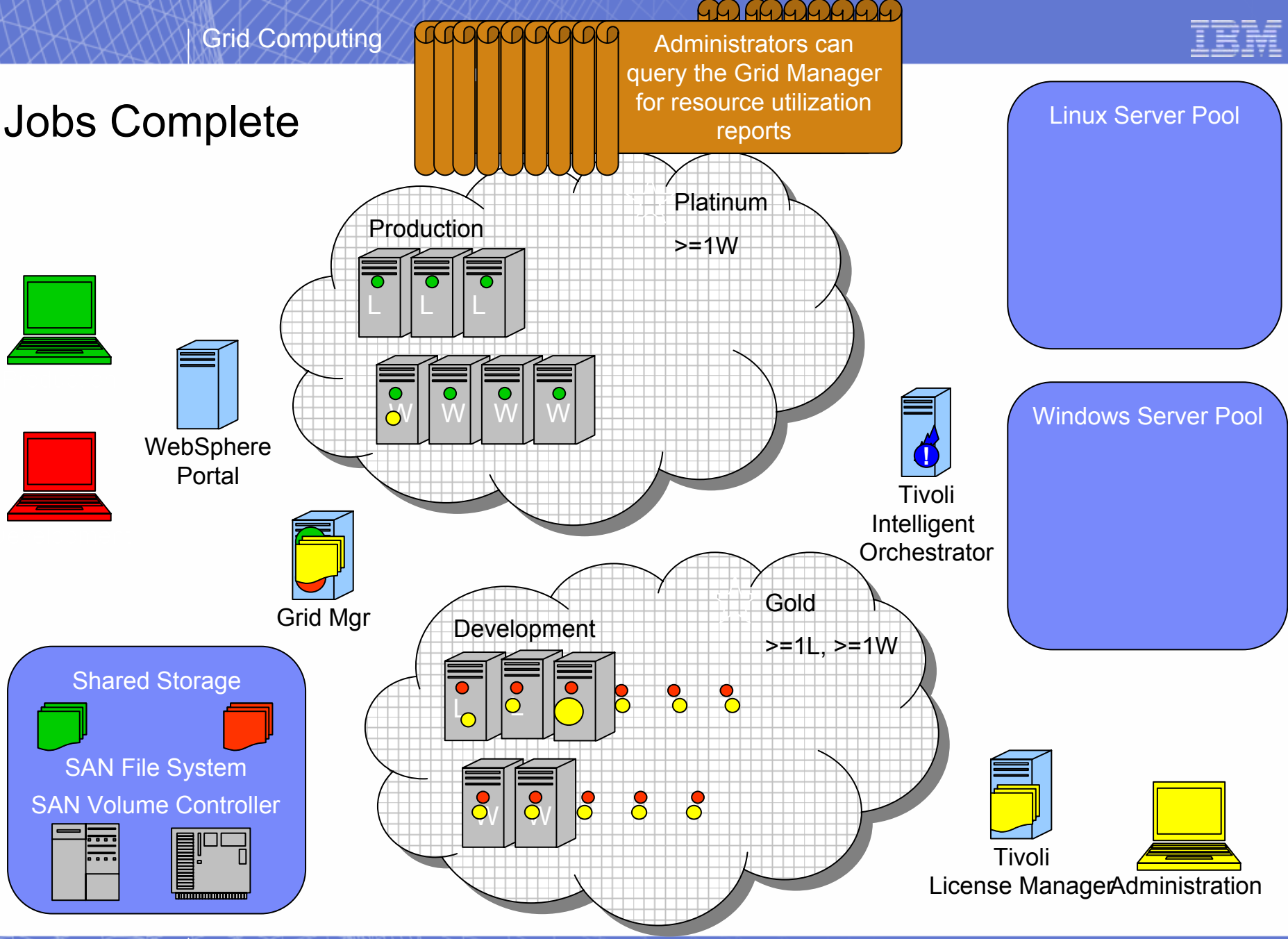
on in Action


One grid manager balances workload across all grid resources
Production
Platinum
>=1W
Linux Server Pool
L
L
L
L
L
Production
WebSphere Portal
The organizations share a number of compute resources
server and
ver
The organizations' files are distributed across the virtualized devices
Tivoli Intelligent Orchestrator
Windows Server Pool
W
W
W
W
Grid
Tivoli License Manager monitors license usage across the compute resources
L
W
Shared Storage
SAN File System
SAN Volume Controller
Tivoli
License Manager
Administration

Jobs Submitted



Jobs Complete



Mare Nostrum

University of Barcelona Supercomputing Centre

- Izgrađen 2004.
- 120 m2
- 40000 kg

Najsnažniji superkompjuter u Europi

- 94.21 LINPACK teraflops
- 9. na top500.org

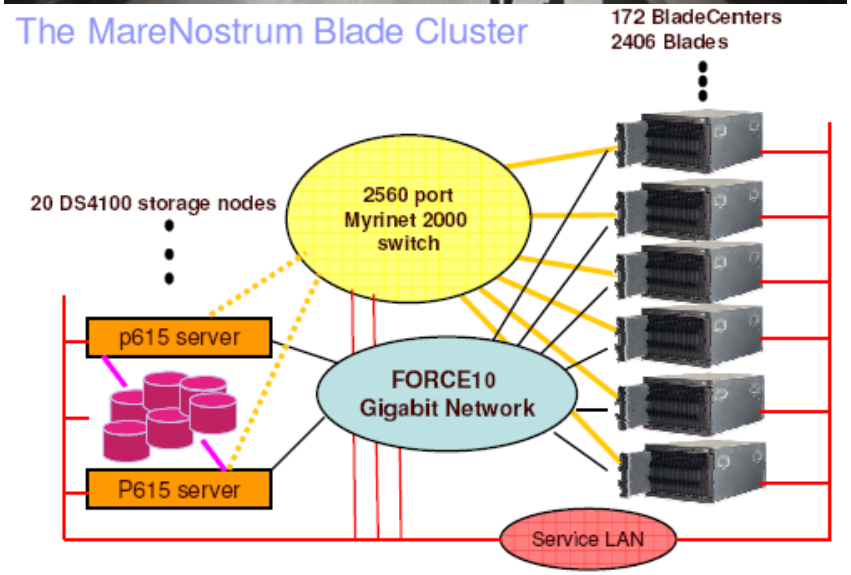
Trenutna područja djelovanja

- Astronomy, Space and Earth Sciences
- Biomedicine and Life Sciences
- Physics and Engineering
- Chemistry and Material Science

Komercijalne komponente

- 172x IBM BladeCenter
  - 2406x JS21 Blades
  - 9624x PowerPC, 2.3GHz
  - 20480GB RAM
  - SuSE Linux
- 280TB DS4100 Disk Storage
- Interkonekcije
  - Myrinet
  - Gigabit Ethernet

The MareNostrum Blade Cluster



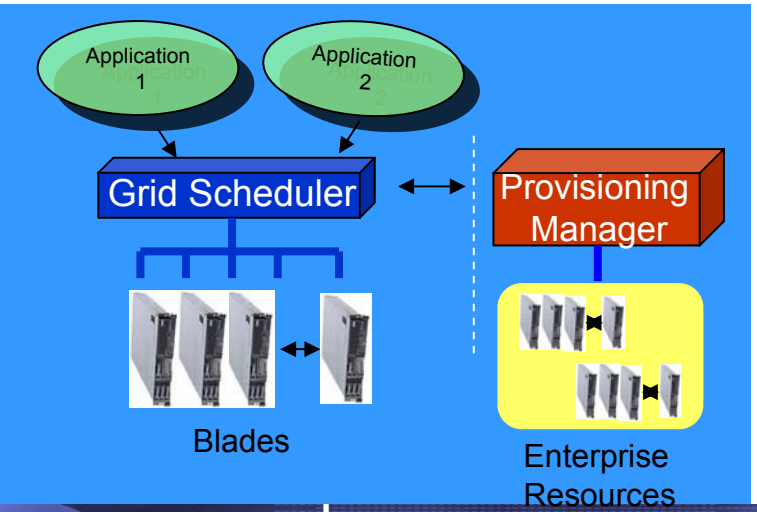
IBM Grid and Grow ponuda

Cilj

- Jednostavan i pristupačan uvod u Grid
- Otvoreno rješenje sa poslovnim pogodnostima
- Budući rast kroz podršku naprednijim Grid rješenjima

Sadržaj

- BladeCenter / Blades
- Grid Scheduler
- OS
- Servisi
- Opcija: napredne Grid komponente



Grid Scheduler	*Choice dependent on industry & workload* • *Platform LSF* • *Altair PBS Pro* • *DataSynapse GridServer* •*IBM Loadleveler*
Blade Server	*BladeCenter chassis & servers* •*7 blades (7 slots for growth)* *Intel HS20, Power JS20 or AMD LS20 each with 2 CPUs and 2 GB memory* • *Gigabit Ethernet* • *Redundant power supply* • *Management console and cables* • *IBM Director*
Operating System	*SW licenses for Linux, Windows or AIX*
Services	• *Hardware, operating system and scheduling software installation* • *Application assessment* • *Client Training*
Provisioning Manager	Tivoli Provisioning manager (TPM)
Services	TPM Installation and Implementation assistance
High Speed Interconnect	Maximize I/O and inter blade communication plus dynamic I/P addressing

Oracle i IBM

Globalni poslovni odnos na korist i zadovoljstvo zajedničkih klijenata

- Tradicija 20 godina
- Preko 170.000 zajedničkih klijenata ww
- 80% System p klijenata koristi Oracle
- Vodeće performanse u kombinaciji IBM hardver + Oracle

Snažno tehnološko partnerstvo

- Kontinuirana razmjena novih tehnologija
- Značajne obostrane investicije
- Montpellier Joint Solutions Center
  - Design, Architecture, Assessment, Sizing
  - RFP & Technical Support
  - Customer briefings
  - Proof-of-Concept
  - Benchmark Qualification & Support

Oracle i IBM referenca

Burlington Coat Factory Warehouse Corporation

- Utemeljeno 1924., 375 dućana u 44 države SAD
- Odjeća, obuća, proizvodi za djecu i dom

Izazov

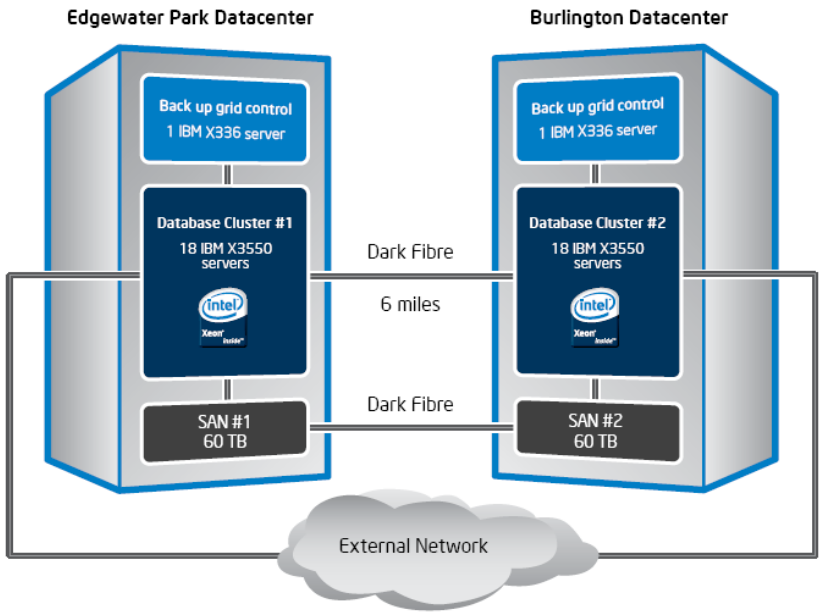
- Migracija 40 baza sa 9i na 10g

Rješenje

- Grid arhitektura (2 centra, 2x 18 čvorova System x)
- 24 baze
- Oracle RAC
- Oracle Automated Storage Management
- Montpellier Joint Solutions Center

Korist od Grid tehnologije

- Raspoloživost
- Skalabilnost
- Iskoristivost resursa, CPU >= 80%
- Performanse



Hvala!

www.ibm.com/grid

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