



Grid Computing

Overview of Grid Computing Session – S03

Using Grid Technologies To Create Business Value

Andy Gangone
8/04
xSeries Technical Conference



Key ideas to walk away with

- **Grid computing is creating IT and Business value today!**
- **Early adopters are gaining competitive advantage!**
- **Grid computing roadmap is becoming more robust and clear!**
- **Customers are using IBM Grid Offerings to start small and grow!**
- **Grid is a logical first step in the on demand journey!**

Marketplace Momentum



National Digital
Mammography Archive



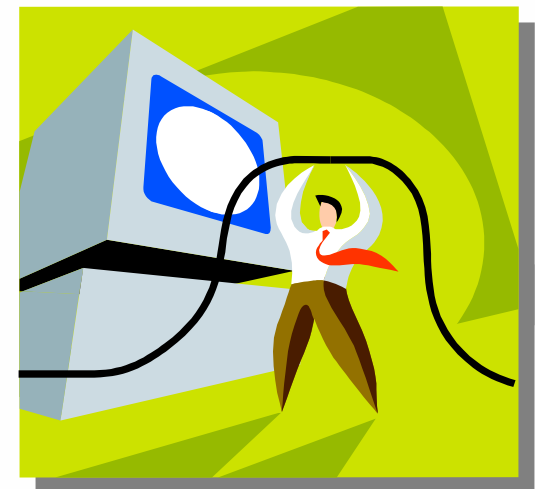
WACHOVIA

RESEARCH
ニッセイ基礎研究所

Grid Computing Motivation

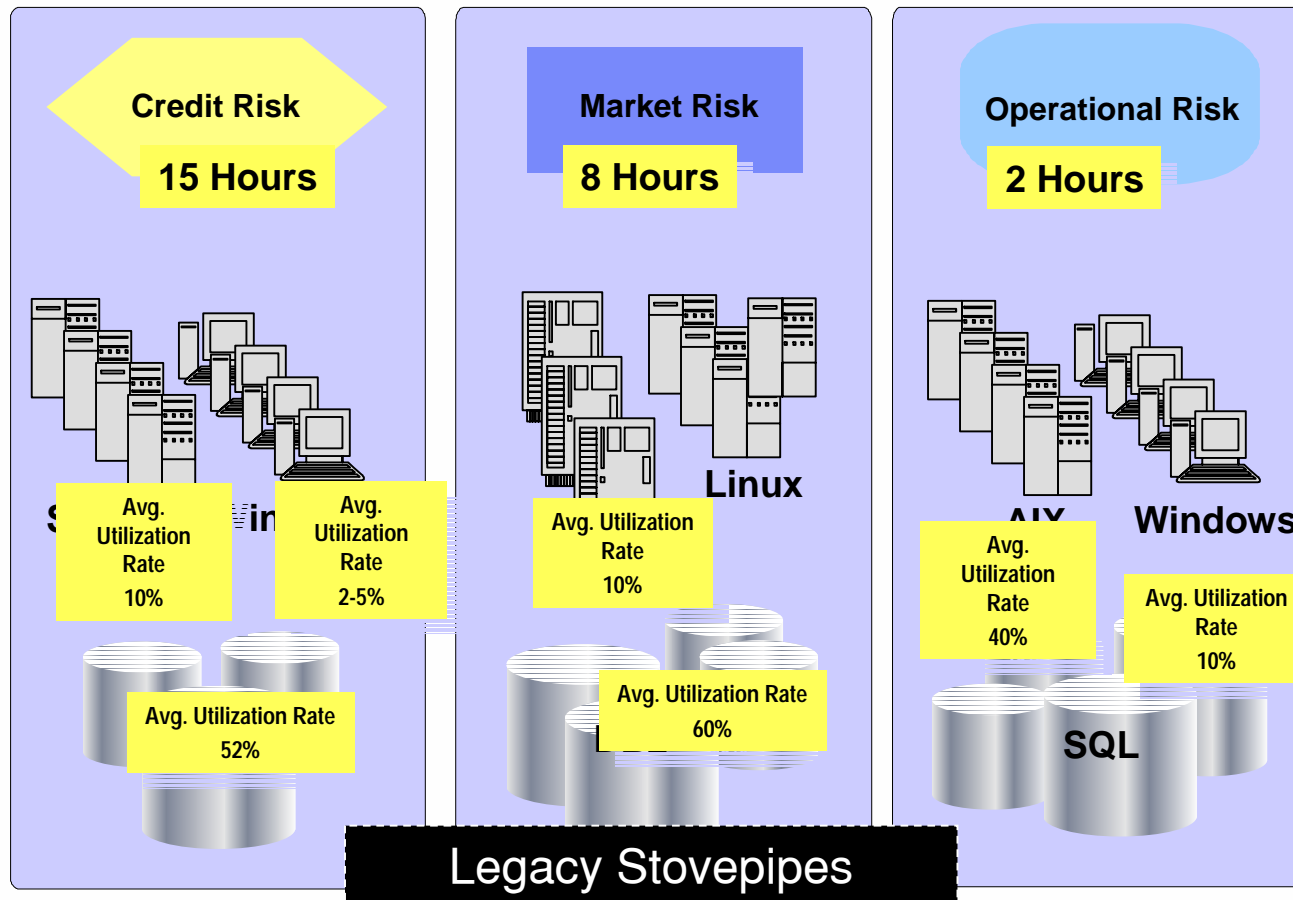
IT Pain Points

- **Improve Asset Utilization**
- **Integrate Stovepiped, Heterogeneous Resources**
- **Enable Data Access, Integration and Collaboration**
- **Strengthen Redundancy and Resiliency**
- **Quickly Respond to Variable Demands**



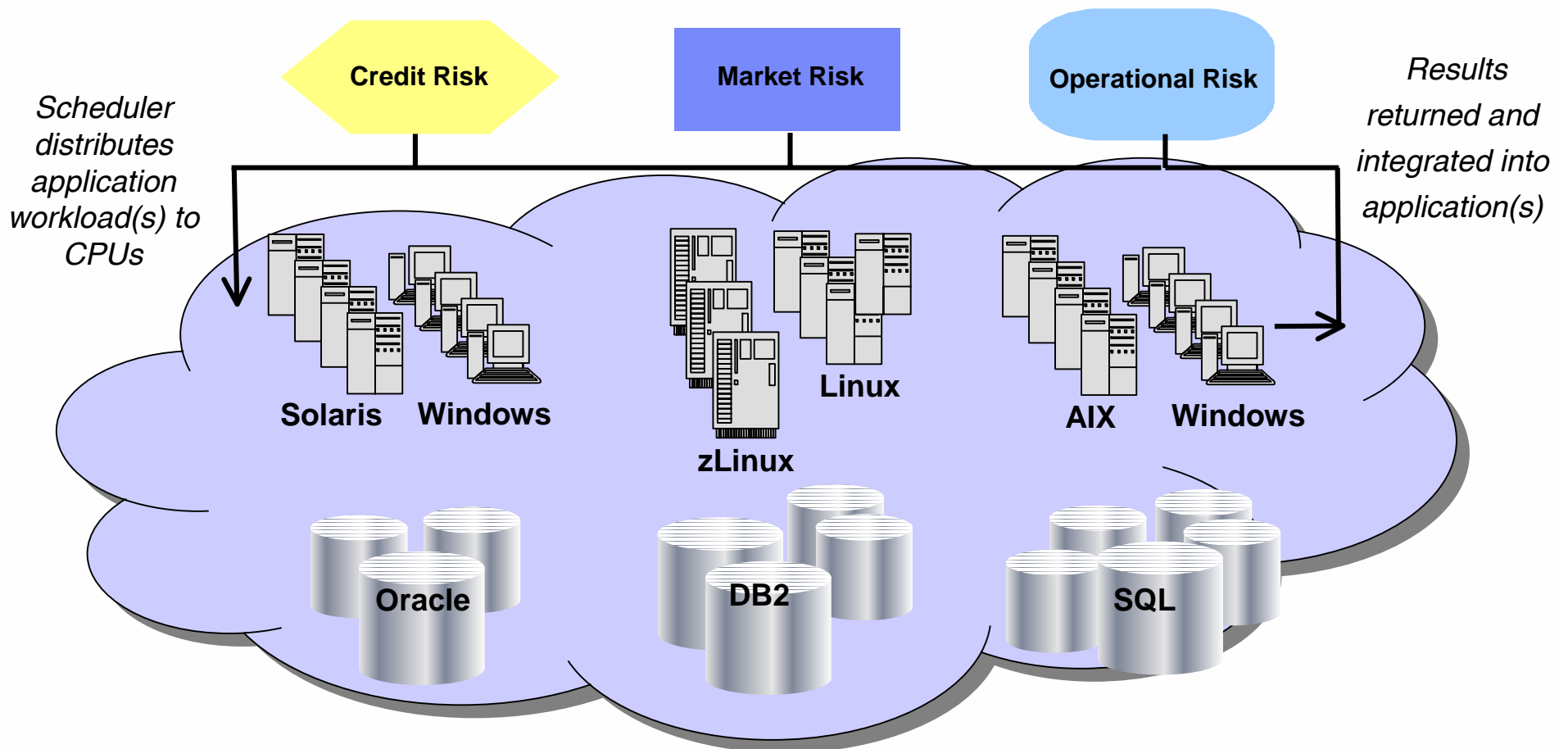
Grid Computing is about virtualizing and sharing resources

Decoupling applications from infrastructure



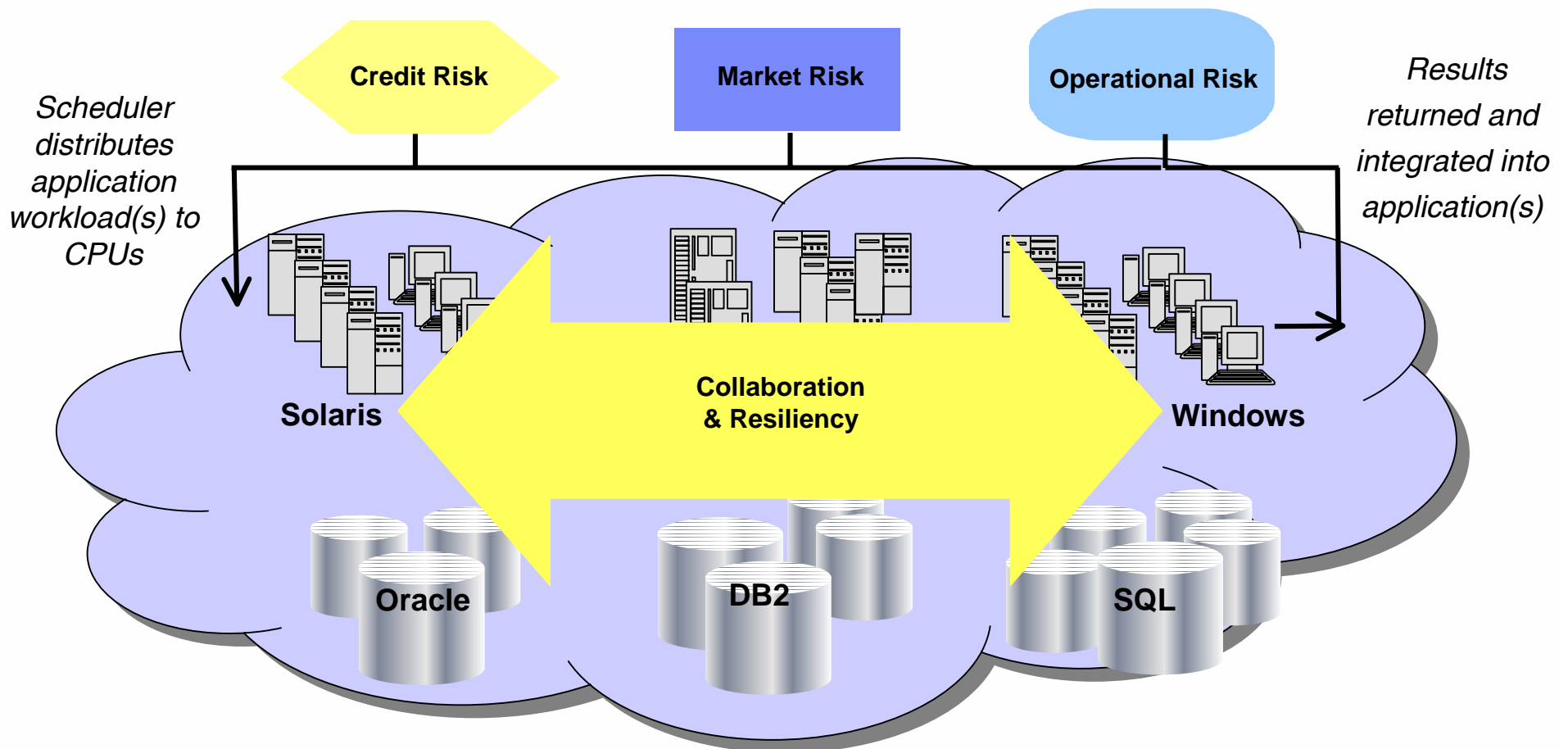
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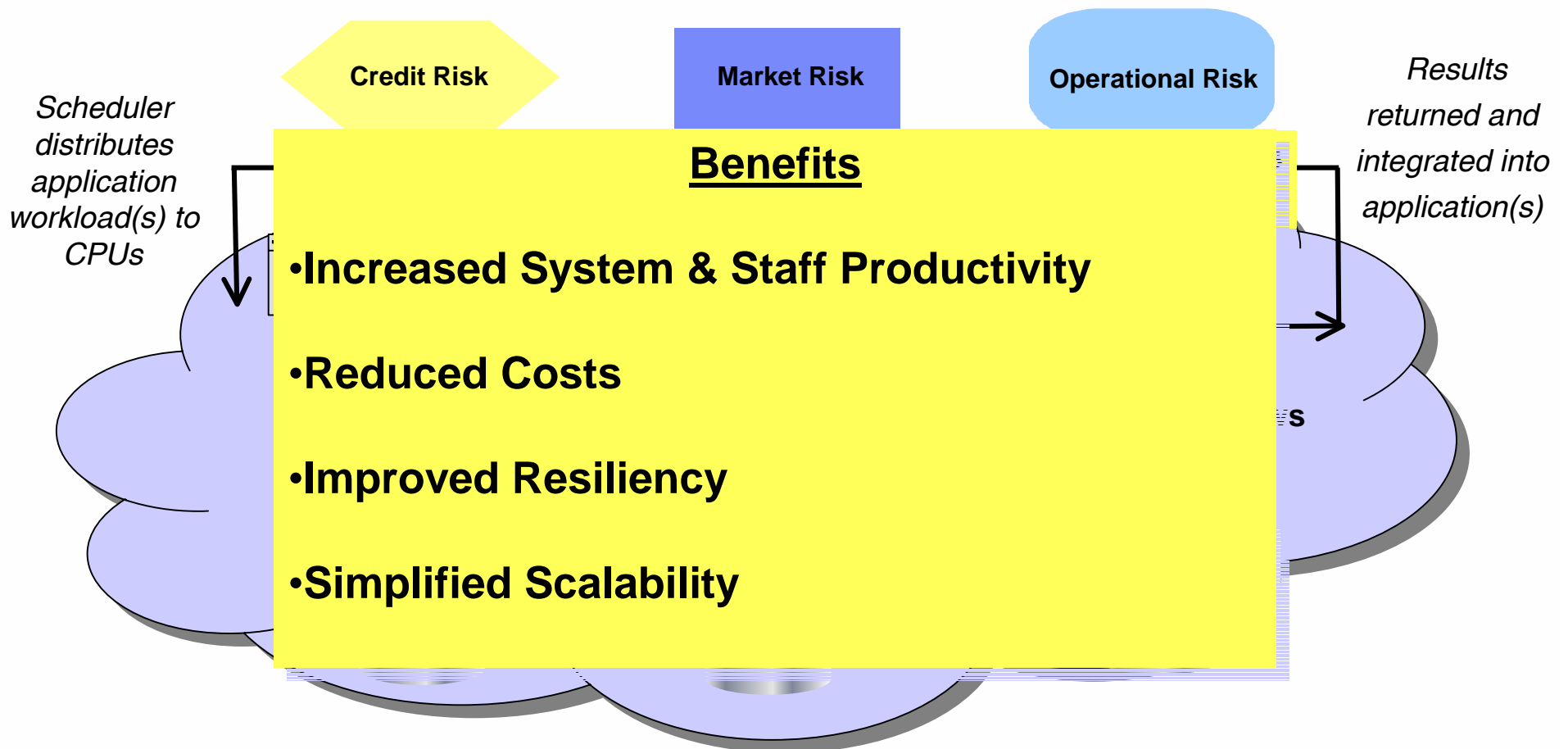
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Decoupling applications from infrastructure



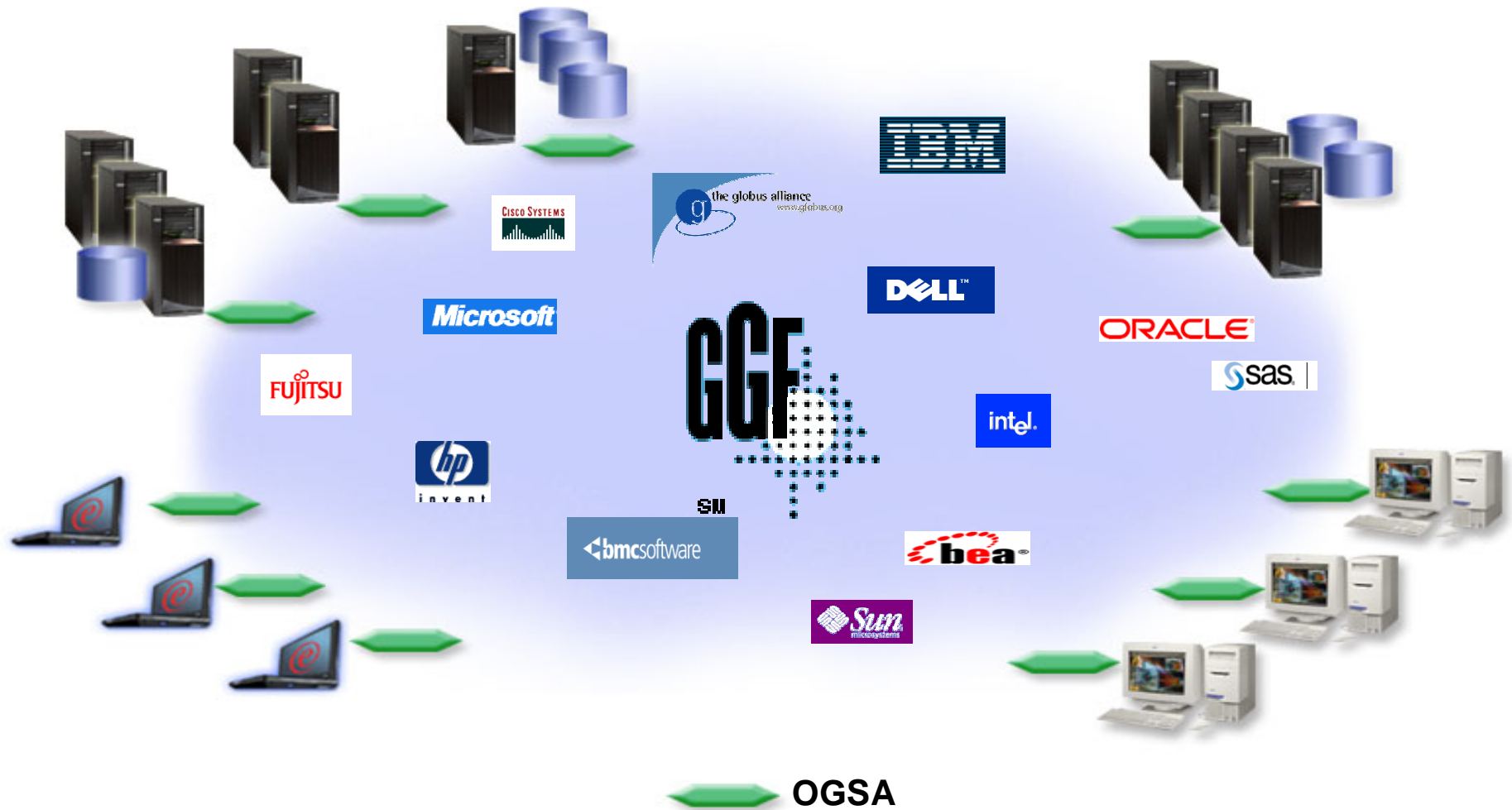
Grid Computing is about virtualizing and sharing resources

Decoupling applications from infrastructure



The Global Grid Forum: Open Grid Services Architecture (OGSA)

The TCP/IP of Grid Computing



Grid Computing Motivation

Business Pain Points






- **Improve Operating Efficiency/ROI**
- **Reduce Capital Expenses**
- **Accelerate Business Processes**
- **Enhance Employee Productivity**
- **Quickly Adapt to Changing Requirements**



What would it mean if your business could...

- Analyze the value of an investment portfolio in minutes, rather than hours?
- Significantly accelerate the drug discovery process?
- Cut the design time of products in half, while reducing the instances of defects?
- Efficiently expand and contract capacity to meet cyclical demand?
- Unite research teams around the world to take advantage of the most up-to-date learnings?

Grid Focus Areas & Value Propositions

Business Analytics Grid	Engineering & Design Grid	Research & Development Grid	Government Development Grid	Enterprise Optimization Grid
<p>Enable faster and more comprehensive business planning and analysis through the sharing of data and computing power</p> 	<p>Share data and computing power, for computing intensive engineering and scientific applications, to accelerate product design</p> 	<p>Accelerate and enhance the R&D process by enabling the sharing data and computing power seamlessly for research intensive applications</p> 	<p>Create large-scale IT infrastructures to drive economic development and/or enable new government services</p> 	<p>Optimize computing and data assets to improve utilization, efficiency and business continuity</p> 

- | | | | | |
|---|--|---|---|---|
| <ul style="list-style-type: none"> • Better Decision Making • Time to Solution • Reduced Costs | <ul style="list-style-type: none"> • Improved Product Design • Time to Solution • Reduced Costs | <ul style="list-style-type: none"> • Improved Collaboration • Time to Solution • Reduced Costs | <ul style="list-style-type: none"> • Better Decision Making • Improve Collaboration • Stimulate Economic Development | <p>Improved:</p> <ul style="list-style-type: none"> • Resiliency • Productivity <p>Reduced:</p> <ul style="list-style-type: none"> • Costs • Complexity |
|---|--|---|---|---|

Hewitt Associates LLC

Business Analytics

Challenge

- Create Grid Computing environment to:
- Contain expenses for CalcEngine valuations
- Maintain or improve availability, response time & scalability
- Insure personal-data security
- Capitalize on existing application code
- Cooperate with z/OS Sysplex CICS Calling Environment
- Enable smooth and orderly migration to change

Solution

- IBM eServer™ zSeries® server
- IBM eServer BladeCenter™ servers
- Linux Red Hat v8.0
- Business Partner: DataSynapse GridServer

Hewitt a global HR outsourcing and consulting firm

Benefits:

- Efficiently uses of the combined processing power of their heterogeneous environment
- Experienced an immediate 10% faster response time with the first application deployment
- Open architecture enables Hewitt to easily deploy additional applications
- Increased processing speed reduced cost per transaction
- Reduced operational costs improves competitiveness in their industry segment

RBC Insurance

Business Analytics

Challenge

Dramatically improve compute services to Valuation Actuaries.

Solution

- IBM [^] TM xSeries[®] servers
- IBM Global Services
- Platform Computing Inc. Software and Services



Technology Benefits:

- Reduced application processing time
- Increased ability to run multiple valuation scenarios to reduce risk

Business Benefits:

- 75% reduction of time spent on manual job scheduling
- 97% reduction in application processing time

“IBM and Platform Grid enabled our valuation application and supporting infrastructure for immediate results. With the integrated solution, we have been able to reduce a 2.5 hour job to 10 minutes, and an 18 hour job to 32 minutes. We are now looking to move to a production environment. By virtualizing applications and infrastructure, we anticipate being able to deliver higher quality services to our clients faster than ever before, which will significantly impact our competitive edge”

Keith Medley, Head of Insurance Technology, RBC Insurance

Wachovia

Challenge

- Create an infrastructure that can support significant increases in trading volume.
- Reduce the time to results of risk reports in fixed income and capital markets and

Solutions

- IBM eServer™ xSeries® Blade servers
- Linux
- DataSynapse GridServer

“ We haven’t scratched the surface yet for how we envisage using Grid Computing to meet our ongoing product development and trading activity “

--Andy Cook, Head Exotics Trader, Wachovia



Business Benefits:

- P&L Risk report turnaround improved...from as much as 15 hours to minutes on a real-time intraday basis
- Solution enables 4x more volume and 25x more modeling simulations
- Platform supports the trading of more complex financial products

Technology Benefits:

- Improved resiliency of application and jobs
- Improved utilization of supporting HW assets
- Reduces cost of ownership of infrastructure

IN2P3

Institut National de Physique Nucleaire et de Physique des Particules

Challenge

The research institute needs to enhance the scalability, reliability and resilience of the existing grid environment to meet the large-scale, high-performance computing needs of new and existing users, as well as prepare for expansion to other grid environments throughout Europe.

Solution

- IBM eServer™ pSeries® UNIX-based servers
- IBM eServer™ xSeries® Linux clusters
- Globus Tool Kit V3.0
- Storage capacity of up to thirty terabytes



Benefits:

- Improved performance increases the number of compute intensive research projects.
- Enhanced environment increases the ability of the organization to contribute in key Life Sciences research.
- State-of-the-art, production-ready Grid allows European technological community to efficiently collaborate

“We are extremely pleased about our collaboration with IBM. IBM’s technical expertise will allow us to rapidly achieve our goal to build a production ready Grid to support our key research initiatives”

-- Guy Wormser Deputy Director - IN2P3

Royal Dutch Shell

Business Analytics

Challenge

Improve accuracy and speed of summarization and scientific modeling applications

Solution

- IBM [^] TM
- Linux
- Globus Toolkit

"Grid computing is important to Shell because it offers the potential to create a truly unlimited resource, with a uniform interface to a variety of services. This is a significant opportunity for Shell to engage its independent companies in closer cooperation." J.N. Buur, Principal Research Physicist, Shell International Exploration and Production B.V.



The screenshot shows the Shell.com website interface. At the top, there is a search bar with the text 'Keyword Search:' and a 'SEARCH' button. Below the search bar, the website header includes 'Welcome to Shell.com' and a navigation menu with links like 'Home', 'About Shell', 'Shell Worldwide', etc. The main content area features a 'Latest News' section with several articles, including one about a Russian-language website and another about a hydrogen station in Iceland. The website has a blue and yellow color scheme.

Technology Benefits:

- More robust, scalable IT infrastructure that adjusts as volumes fluctuate
- Open standards permit easy integration of existing software

Business Benefits:

- Cut processing time of seismic data, while improving the quality of the output
- Focus employees on key scientific, not IT problems

University of Florida

Challenge

U.S.-based research university's Advanced Computing and Information Systems (ACIS) lab sought to respond to the needs of scientists, in multiple geographic locations, for a high-performance, secure and reliable infrastructure for grid computing research

Solution

Create a virtual, secure grid computing environment for collaboration based on:

- IBM [^] TM zSeries® server
- Linux and z/VMTM
- IBM virtualization software
- IBM TotalStorage® Enterprise Storage Server®
- IBM [^] TM xSeries® server in an 8-node cluster



Business Benefits:

- Enables scientific and design collaboration, using ACIS-developed software (In-VIGO), In Virtual Grid Organizations

Technology Benefits:

- Virtualization allows multiple researchers, each with separate and distinct applications, to use a single mainframe solution

19 Grid Offerings in 10 Industries

Research & Development	Engineering & Design	Business Analytics	Enterprise Optimization	Government Development
<ul style="list-style-type: none"> •Life Sciences: IBM Grid Offering for Information Accessibility •Higher Education: IBM Grid Offering for University Research Collaboration •Agricultural Chemical: IBM Grid Offering for Information Access •Grid Innovation Workshop/Modules 	<ul style="list-style-type: none"> ▪Aerospace: IBM Grid Offering for Engineering Design ▪Aerospace: IBM Grid Offering for Design Collaboration ▪Automotive: IBM Grid Offering for Design Collaboration ▪Automotive: IBM Grid Offering for Engineering Design ▪Electronics: IBM Grid Offering for Engineering Design ▪Electronics: IBM Grid Offering for Design Collaboration •Grid Innovation Workshop/Modules 	<ul style="list-style-type: none"> ▪Financial Services: IBM Grid Offering for Analytics Acceleration ▪Financial Services: Grid Offering for Analytics Acceleration: Risk and Compliance ▪Financial Services: Grid Offering for Analytics Acceleration: Customer Insight •Life Sciences: IBM Grid Offering for Analytics Acceleration •Petroleum: IBM Grid Offering for Geophysical Analysis: Upstream Petroleum •Agricultural Chemical: IBM Grid Offering for Analytics Acceleration •Grid Innovation Workshop/Modules 	<ul style="list-style-type: none"> ▪Financial: IBM Grid Offering for IT Optimization ▪Petroleum: IBM Grid Offering for IT Optimization •Grid Innovation Workshop/Modules 	<ul style="list-style-type: none"> ▪Government: IBM Grid Offering for Information Access •Grid Innovation Workshop/Modules

Grid Ecosystem

Business Analytics	Engineering & Design	Research & Development	Government Development	Enterprise Optimization
<ul style="list-style-type: none"> • SunGard • FairIsaac • SAS • Algorithmics • Moody's KMV • Globus • DataSynapse • Platform Computing • Gridsystems • Cornerstone Systems • Morse • Anix • Cisco 	<ul style="list-style-type: none"> • Cadence • MSC Software • Dassault • ESI • Engineous • Synopsis • Globus • Platform Computing • Avaki • GridXpert • Gridsystems • PCPC Inc • Kobelco Systems • Science + Computing • Cisco • CIS Sud-Quest 	<ul style="list-style-type: none"> • Accelrys • Dassault • Landmark Graphics • Japan Research Institute • Globus • Unicore • Avaki • Platform Computing • United Devices • GridXpert • Gridsystems • NTT-DATA • Moasys Corp. • Northgate • TBC • C.a.r.u.s Info. Tech. • Anterio Consult & Research • SCC • Cisco 	<ul style="list-style-type: none"> • Globus • Platform Computing • United Devices • Avaki • Cornerstone Systems • Esteem Systems • Italtch • CIS Sud-Quest • Cisco 	<ul style="list-style-type: none"> • Mercury Interactive • Rational • Globus • Platform Computing • United Devices • DataSynapse • GridXpert • Gridsystems • Force 10 • MSI • Beacon Information Technology • Malaysia Debt Ventures • CC Compunet • Comparex Informationsysteme GmbH • Bechtle Logistik und Service GmbH • Cisco

Application ISV
Grid ISV
Business Partner

What to Look for in a Grid Solution provider

Commitment

- Open standards
- R&D and investments in grid and related technologies
- Industry-leading partners
- Multiplatform experience and expertise
- Worldwide grid strategy, design, implementation and integration services

Focus

- Industry-specific offerings
- Product development roadmaps
- Building an ecosystem
- Implementing grids for commercial and public organizations
- Integrated solutions: Software, Services, Hardware and Partners

Getting Started

- **IBM can tailor and implement one of the Grid offerings to meet your specific needs**
- **IBM has skilled professionals and partners to help you best exploit Grid technologies**
- **Start the journey today...**
 - **Visit the Grid Website: www.ibm.com/grid**
 - **Dedicated Grid teams throughout the world**
 - **Grid Design Centers in Montpellier, Poughkeepsie, Austin, Silicon Valley and Tokyo**



Grid Computing

THANK YOU!!!
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www.ibm.com/grid

