



PSSC – IBM Customer Center Montpellier

Grid Computing Perspectives for IBM

Atelier “Internet et Grilles de Calcul en Afrique”

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Agenda

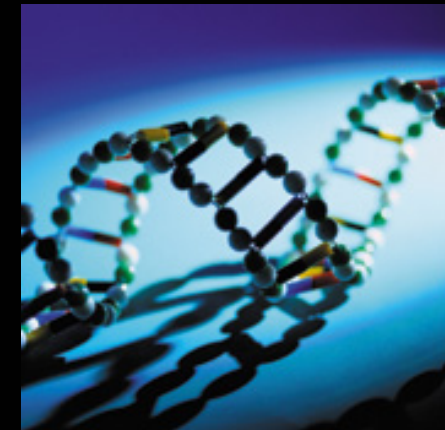
- **Grid Computing Initiatives within IBM**
 - World Community Grid
 - Decryphon
 - Cloud Computing and Blue Cloud
 - Latin American Grid
- What about the industry?
 - **Convergence between Grid, Virtualization, and SOA**

World Community Grid



- **IBM has established a Global Public Grid for Philanthropic Research**
- **IBM is working with the Mayo Clinic, United Nations, EPA, World Health Organization and United Devices on this worldwide effort**
- **An advisory Board with members from leading foundations, universities and public organizations is providing oversight to the research projects**
- **Projects in the following disciplines are being implemented:**
 - Medical Research – Genomics, proteomics, epidemiology, and biological system research such as AIDS and HIV studies
 - Environmental Research – Ecology, climatology, pollution, and preservation
 - Basic Research – Human health and welfare related studies

<http://www.worldcommunitygrid.org/>



> Over 80 million results returned

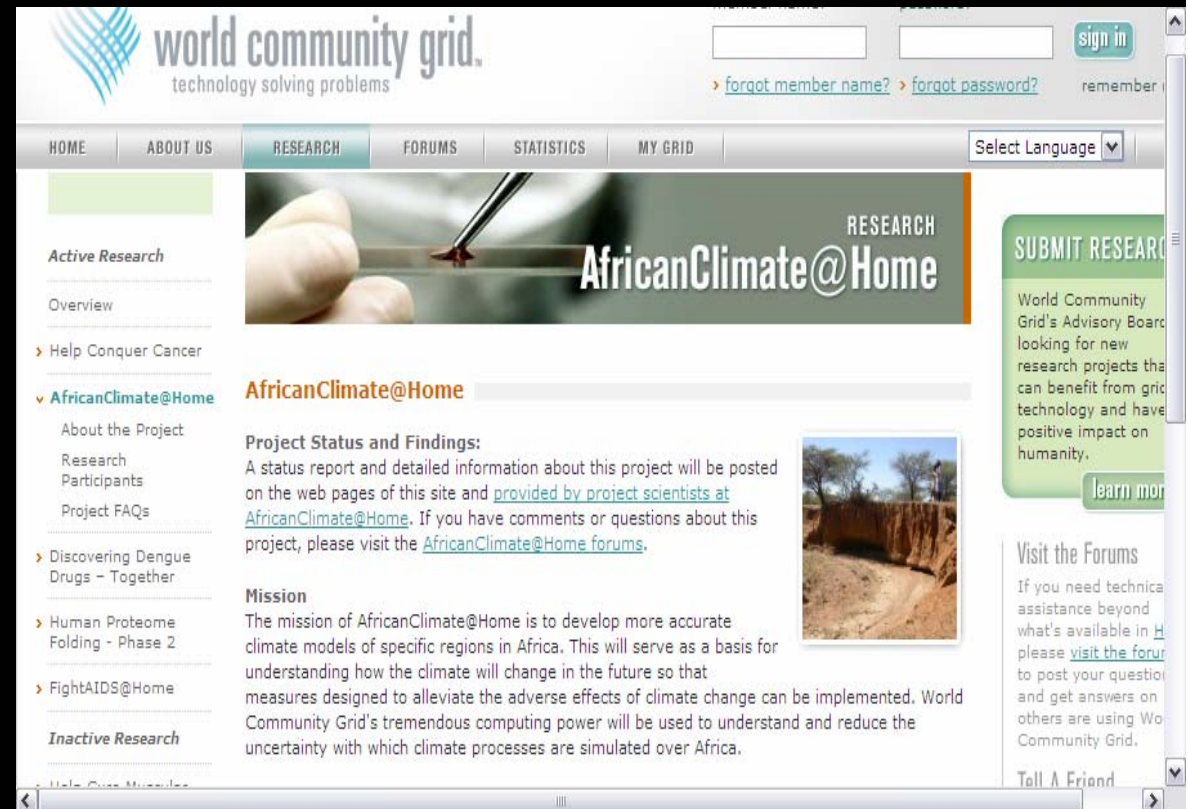
> Over 73,000 years of CPU processing time

> Approximately 500k devices on the Grid

AfricaClimate@Home



- AfricaClimate@Home, an ambitious effort based in South Africa
- Attempt to accurately predict the impact of climate change on various regions in Africa
- Use the power of 750,000 devices to render the climate models



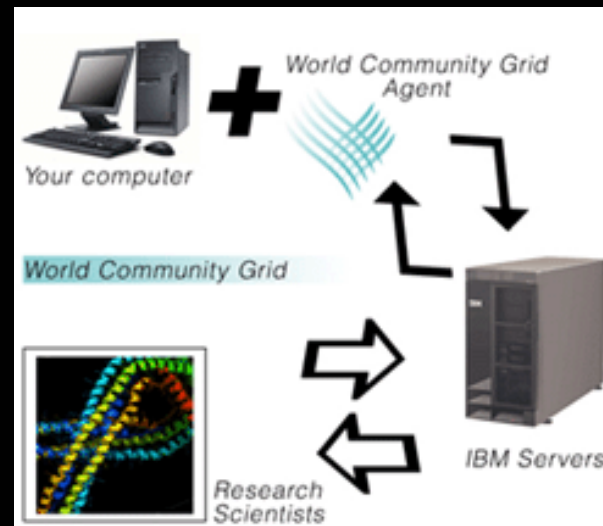
The screenshot shows the AfricaClimate@Home website on the World Community Grid platform. The page features a navigation menu with options like HOME, ABOUT US, RESEARCH, FORUMS, STATISTICS, and MY GRID. A prominent banner for 'AfricanClimate@Home' is displayed, along with a sidebar listing active research projects such as 'Help Conquer Cancer' and 'Discovering Dengue Drugs - Together'. The main content area includes a 'Project Status and Findings' section and a 'Mission' statement. A 'SUBMIT RESEARCH' button is visible on the right side of the page.

Join the WCG Community Now !

Employees join
World Community Grid at
www.worldcommunitygrid.org.

- Employees download a small piece of software (“agent”).
- The agent asks World Community Grid for work.
- World Community Grid sends work to the agent.
- The agent runs when the PC has unused cycles.
- When the agent finishes the computation, it sends the work back to World Community Grid and receives new work.
- Company teams and individual employees can see the impact of their contribution and earn points.

- Provide employees with an easy, safe, free opportunity to make a difference on critical humanitarian issues.
- Augment employees’ community work at no additional cost.
- Strengthen corporate citizenship reputation by publicizing your company’s overall employee contribution.
 - Company team will be created, and employee contributions will earn the team points, as well as individual employee points.



- Company listed on “Our Partners” Web page and in all materials and public descriptions.
- Join forces with other companies, associations, and public and private organizations, working toward a common goal.

Décryphon

Research & Development

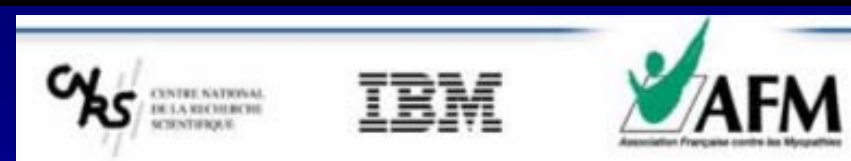
Challenge:

The Décryphon program, set up to rapidly accelerate progress in researching genetic diseases and their cures, required an ambitious IT infrastructure to support its mission.

Solution:

IBM, AFM, CNRS and several major French universities joined the Décryphon program to provide a collaborative compute grid including:

- Building of a nation-wide “University Centers” grid leveraging existing HPC infrastructure involving IBM pSeries, and jointly a second “end user” grid to link in the compute resource of the general public
- Implementing specific grid services that are mission-critical for this type of project (such as confidentiality, single-sign-on security and multi-job workload balancing)



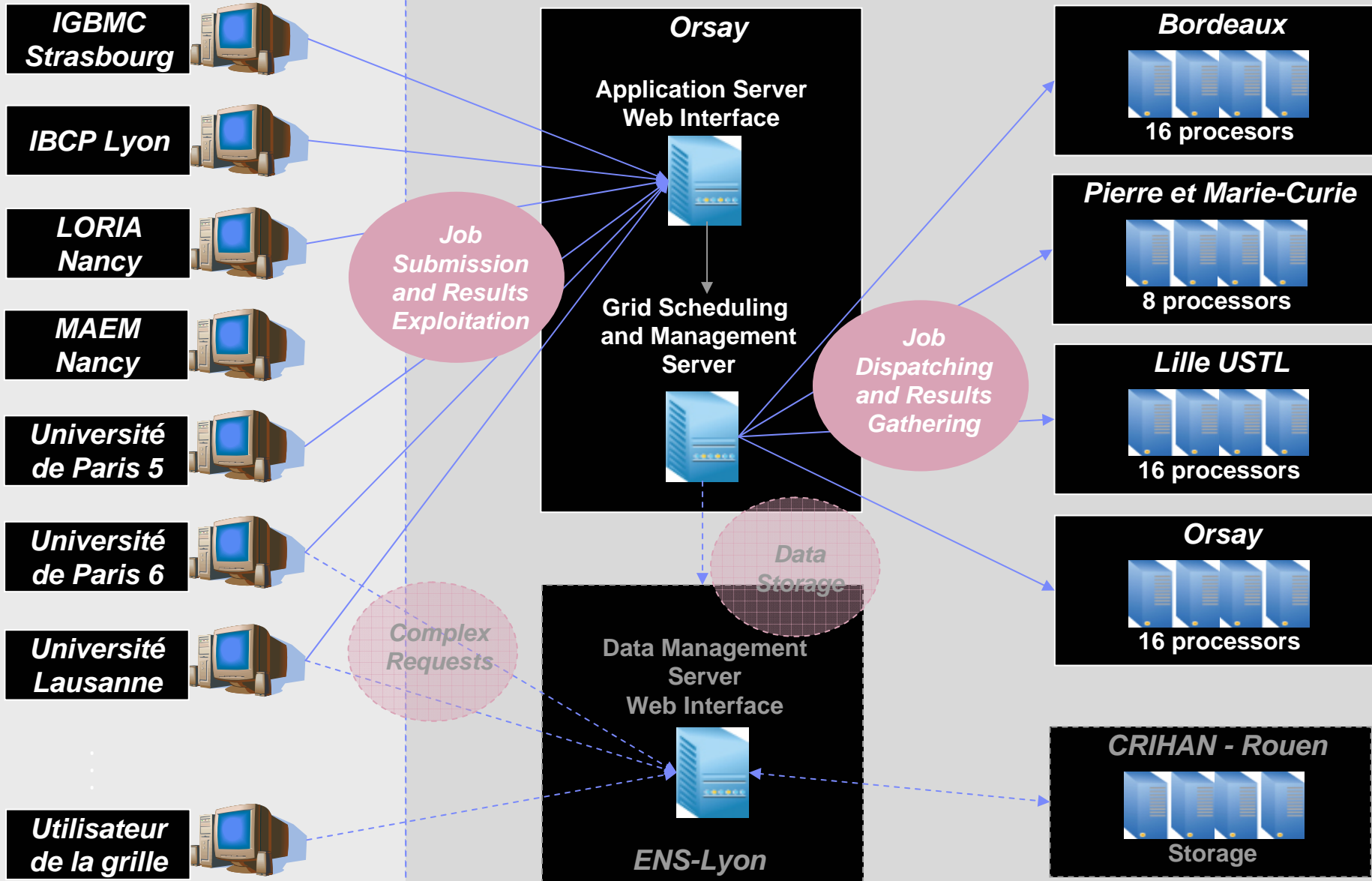
Benefits:

- Huge calculation resources now available for research on genetic diseases and protein modeling
- Ability to leverage both the unutilised compute power of the universities’ IT infrastructure and also individually-owned PCs connected to the grid
- Improved and faster results on genetic disease research meaning that 2 years worth of calculations can now be completed in just 1 year

“Working with IBM on the implementation of the grid solution for the Décryphon program will help us optimise the use of the university compute centers and share the compute resources of thousand of end users to get faster results on genetic diseases as part of this ambitious research program” said Stéphane Roques, Secrétaire Général , AFM

Universities Laboratories

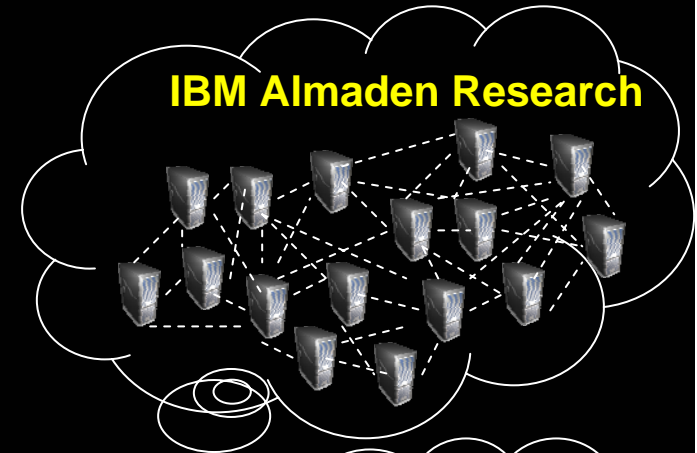
University Computing Centers



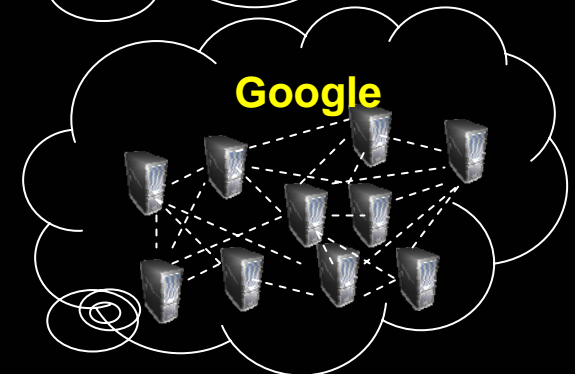
Joint IBM Google Announcement

- Train future workforce with next generation computing skills
- University initiative to promote open standards and emerging parallel computing model
- Jointly provide compute platform of the future including hardware, software, and services to support new parallel computing curricula
- Three active “clouds”

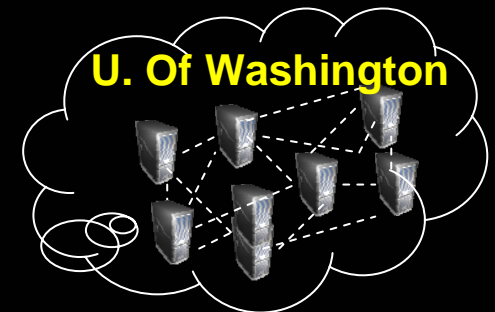
IBM Almaden Research



Google



U. Of Washington

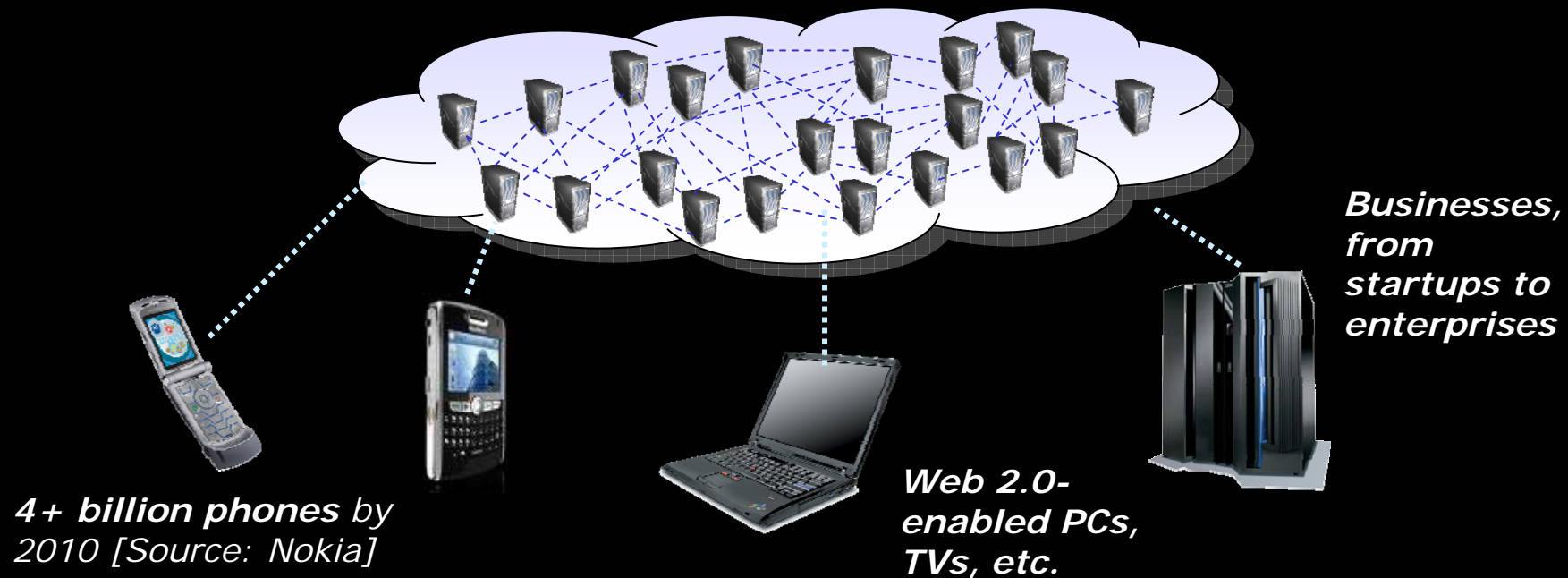


Universities participating in initial pilot

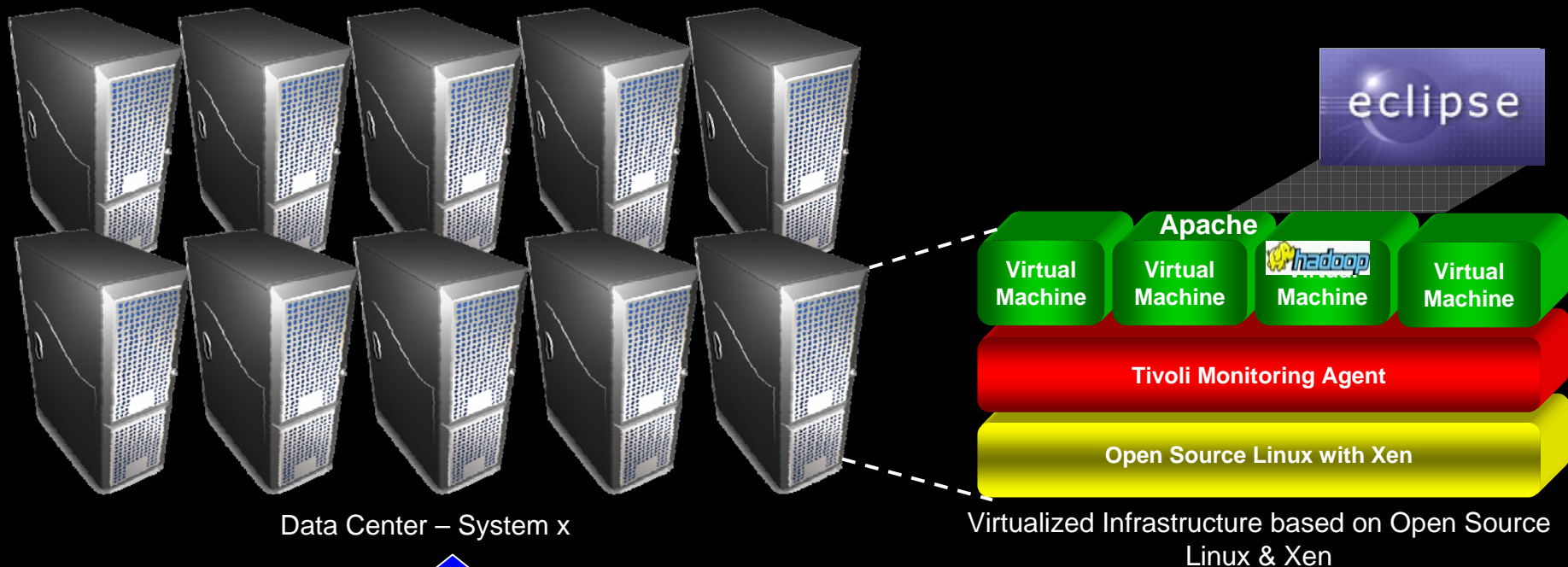


What is Cloud Computing?

An emerging computing paradigm where data and services reside in massively scalable data centers and can be ubiquitously accessed from any connected devices over the internet



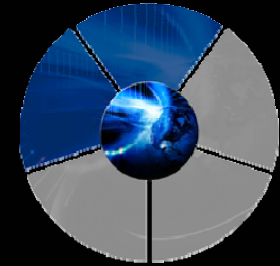
Cloud Computing High-Level Architecture



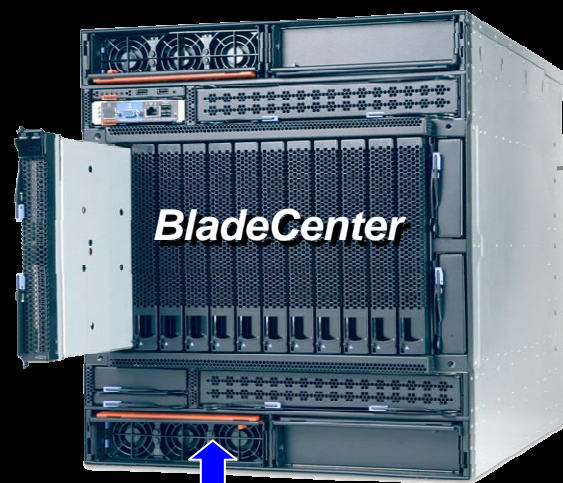
Cloud computing infrastructure to support the academic initiative can be delivered either as hosted or onsite solution

Blue Cloud Initial Offering – Spring 2008

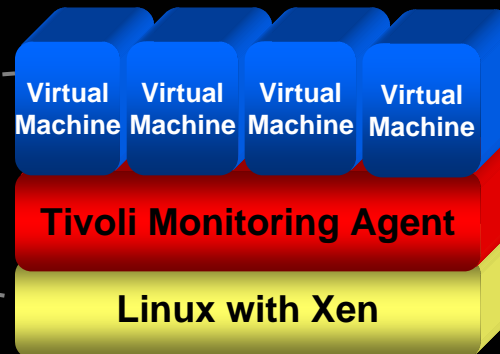
Delivers a massively scalable and flexible compute platform for hosting both existing and emerging data-intensive workloads



Family of ready-to-use cloud computing offerings



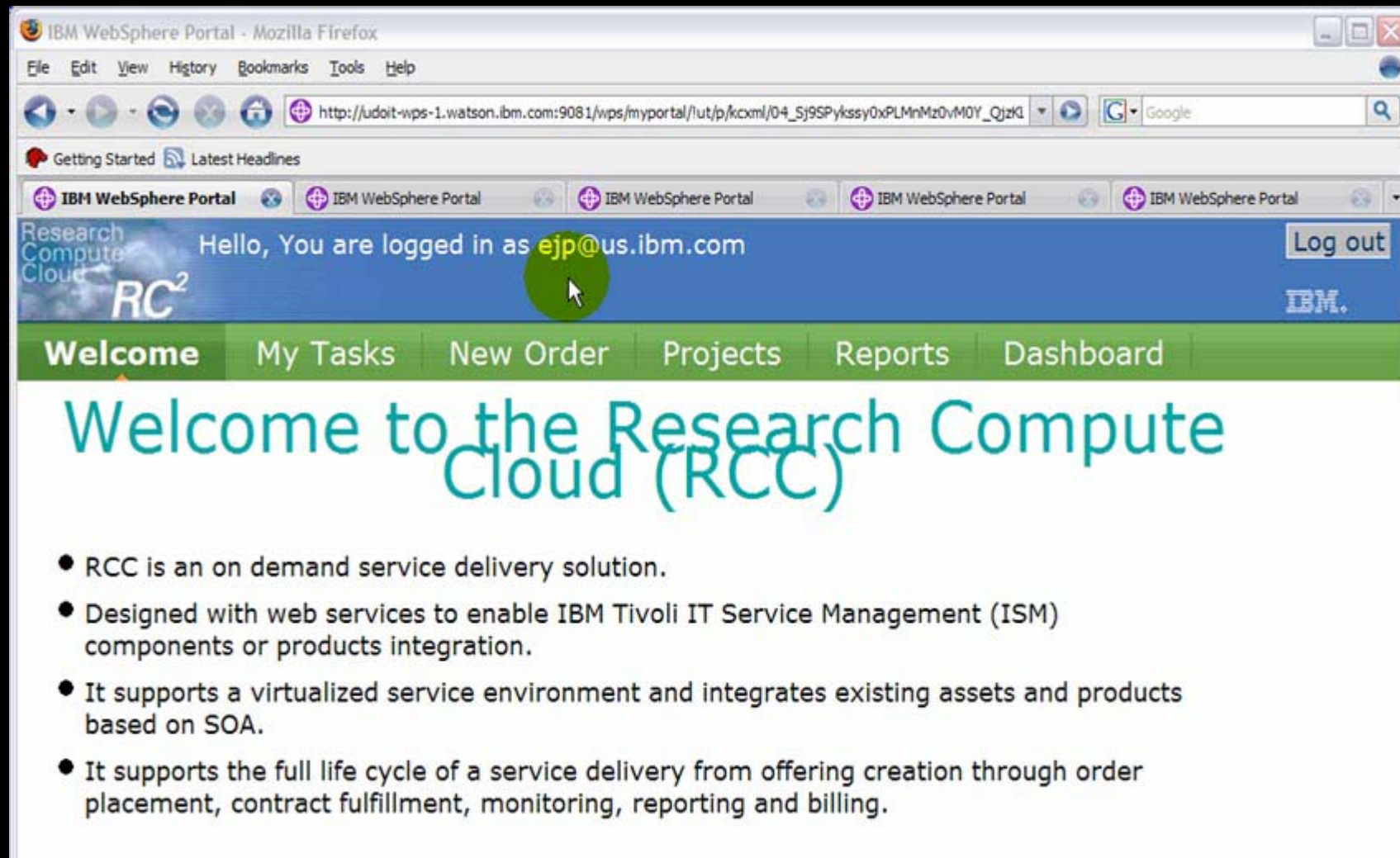
Virtualized Infrastructure
Based on Linux & Xen



Monitoring and Provisioning
Management Stack

*Business
Benefits*

- Cost efficient model for creating and acquiring information services
- Reduces IT management complexity
- Increases business responsiveness with real-time capacity reallocation as demand for compute power grows
- Powers both existing and emerging data-intensive workloads



IBM WebSphere Portal - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://udoit-wps-1.watson.ibm.com:9081/wps/myportal/!ut/p/kcxml/04_Sj9SPykssy0xPLMnMz0vM0Y_QjzKl

Getting Started Latest Headlines

IBM WebSphere Portal

Research Compute Cloud **RC²**

Hello, You are logged in as **ejp@us.ibm.com** [Log out](#)

IBM.

Welcome My Tasks New Order Projects Reports Dashboard

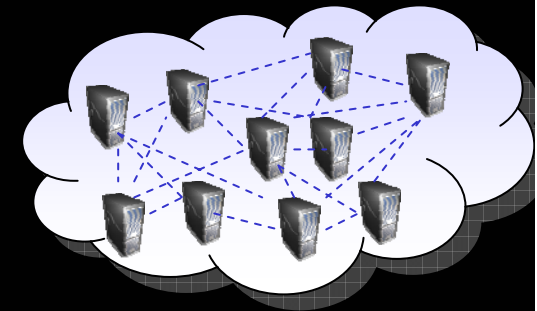
Welcome to the Research Compute Cloud (RCC)

- RCC is an on demand service delivery solution.
- Designed with web services to enable IBM Tivoli IT Service Management (ISM) components or products integration.
- It supports a virtualized service environment and integrates existing assets and products based on SOA.
- It supports the full life cycle of a service delivery from offering creation through order placement, contract fulfillment, monitoring, reporting and billing.

[Click above to Start Video Demo](#)

Example of How the Cloud Drives Innovation

Leverage Cloud's powerful combination of Web 2.0 collaboration platform and dynamic, secure computing environment to drive business transformations



Innovation Factory

Virtualized Cloud Incubation Environment

Expand sources of innovation with a network of partners, customers, researchers, and academia

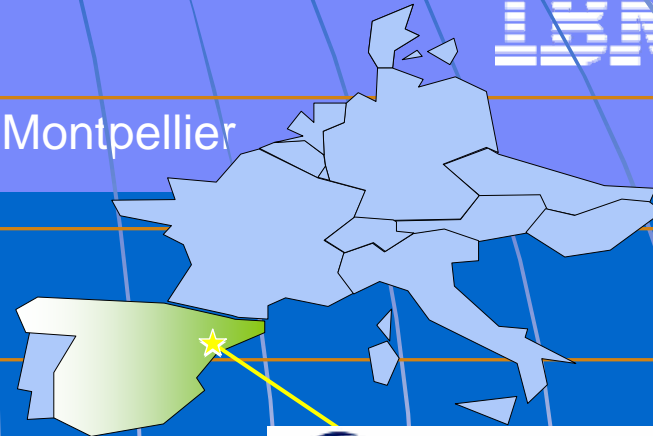
Speed time to market for new offerings by exploiting collaboration technology to co-create and gather rapid feedback on new offerings

Lower barriers to IT by leveraging Cloud to provide incubation environment for new prototypes

LA Grid™



PSSC – IBM Custom Montpellier



Education

Research

**LA
Grid**

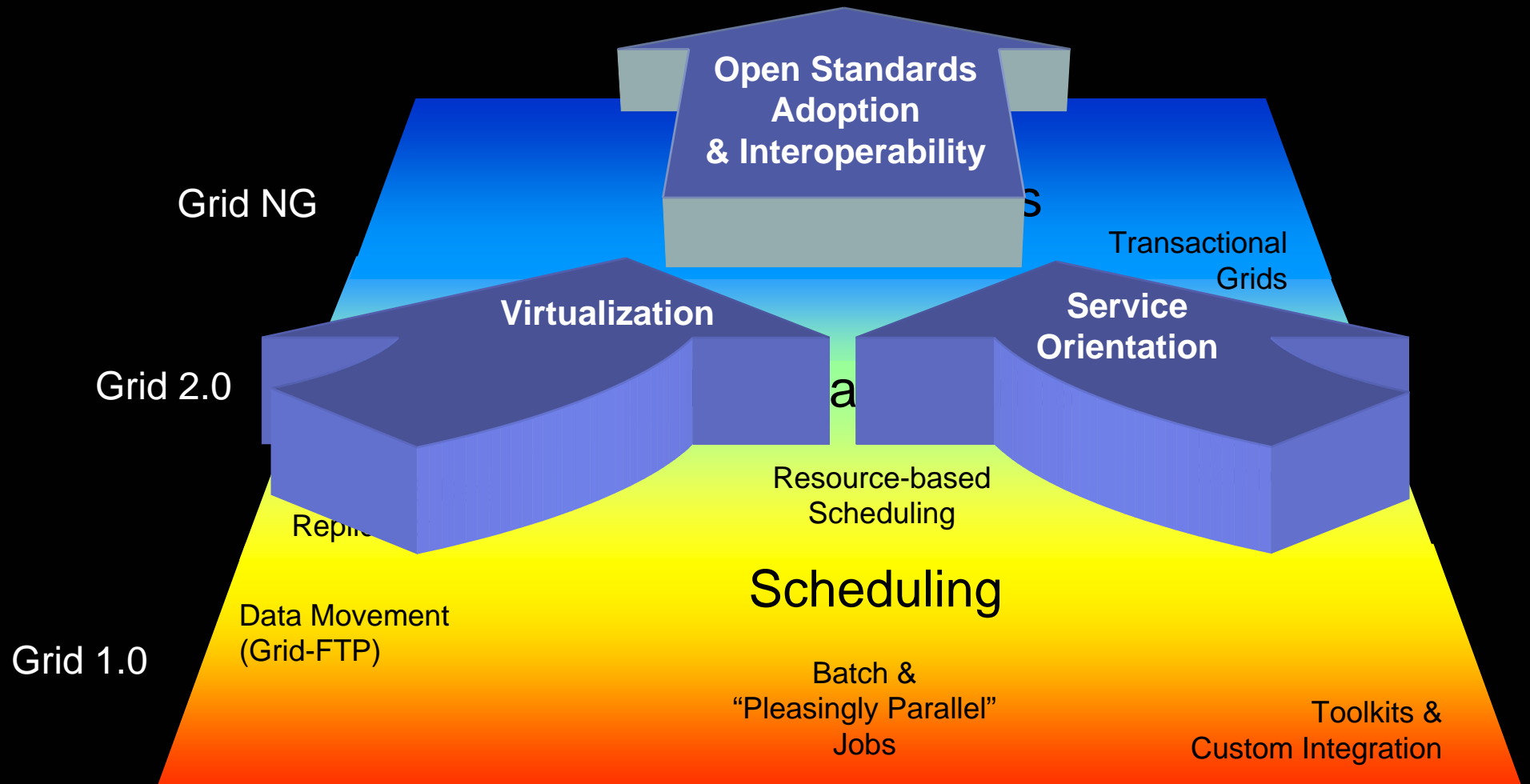
Collaboration

**Talent
Development**

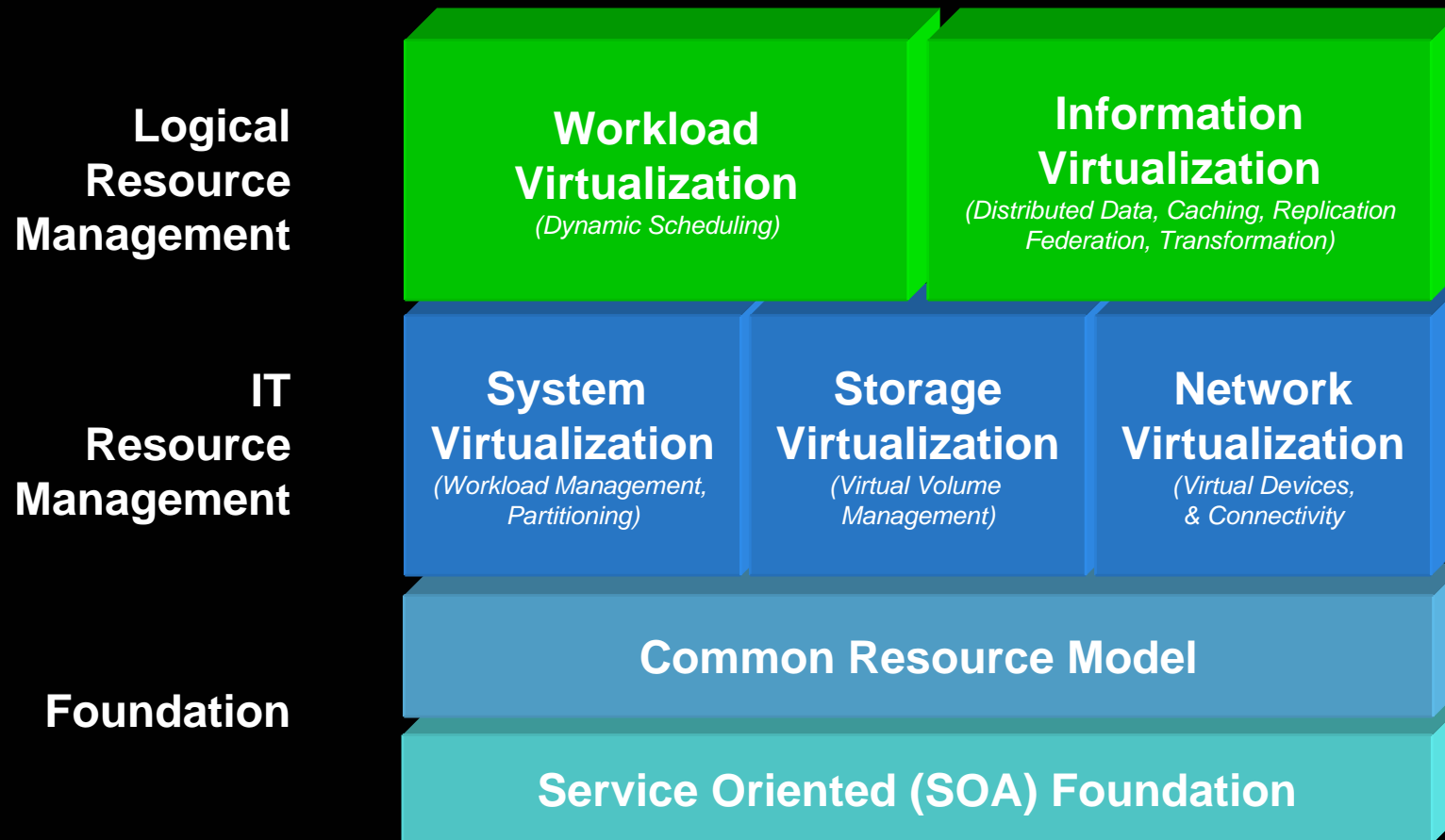
Agenda

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Grids are Evolving



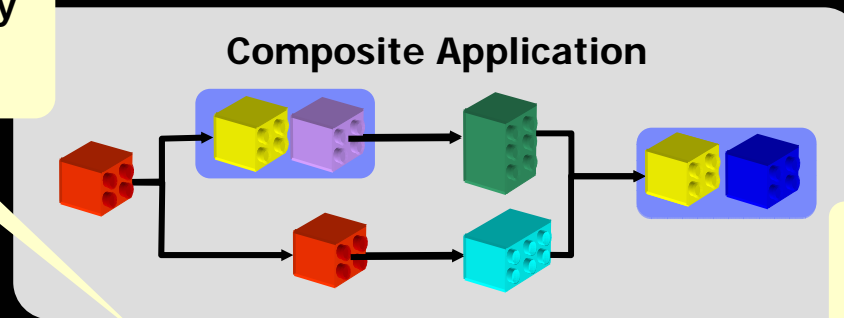
Grid & Virtualization



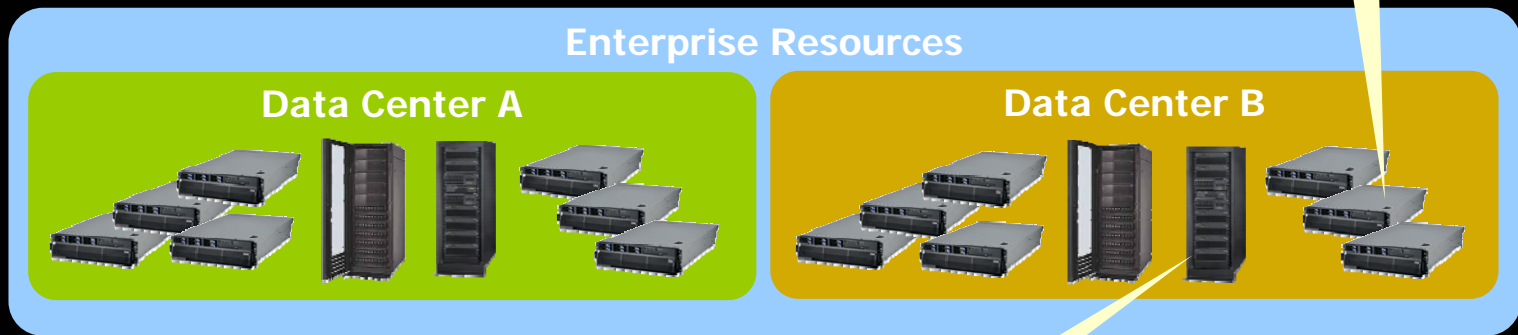
SOA Supports Grid

How Grid Exploits Service Oriented Architecture

Application components (services) can be easily distributed in as grid workload



or moved if resources fail or are overloaded

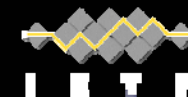


Workload can be easily moved to new resources

Open SOA Supports Grid



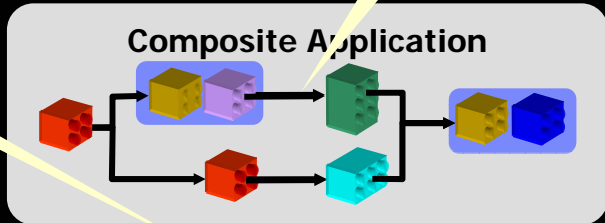
Job description, choreography, workflow, parallel programming



Foundational web service protocols

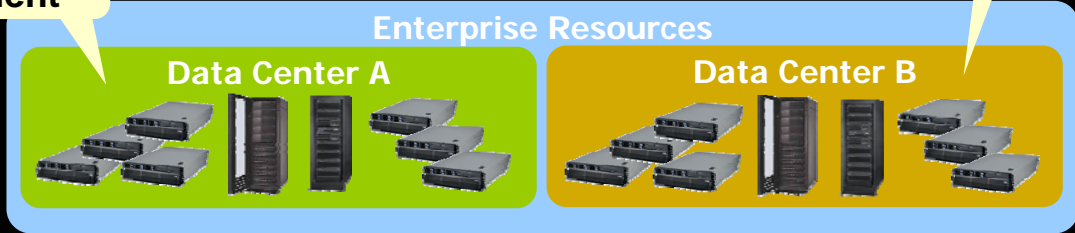


Scheduling, workload brokering



Provisioning, application deployment, resource management

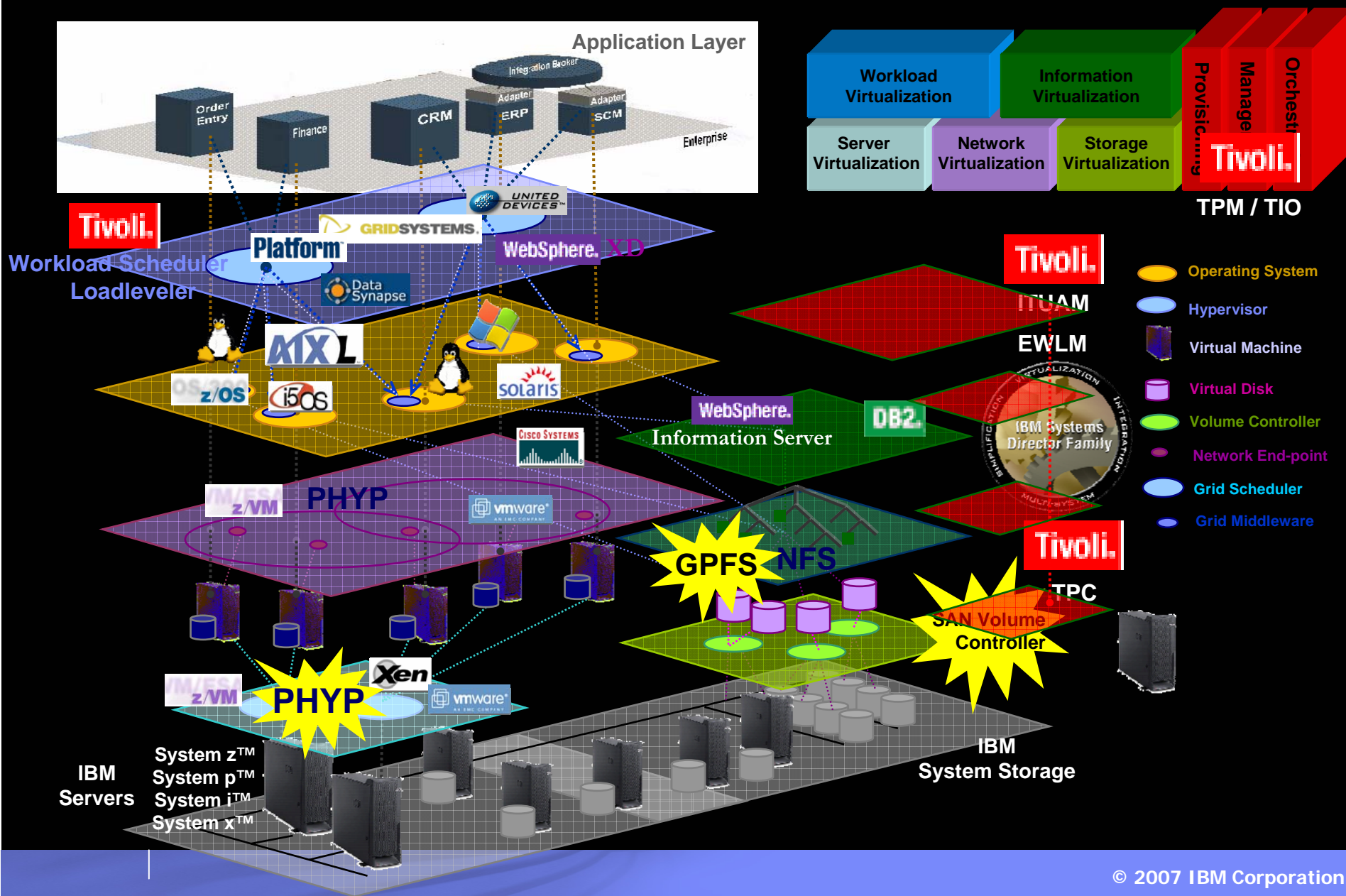
Resource definition, endpoint model



- Support the diversity of hardware, operating systems, and software that are common in building grids.
- Promote interoperability and allow customers to integrate grid system using middleware from many sources.



Virtualization Technologies



Thank you