

# Japanese Business Grid Project Objectives & Key Technical Issues

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Thanks to all the teams in the **BUSINESS GRID COMPUTING PROJECT**

# Contents

- ◆ Objectives
- ◆ Business Grid Middleware
- ◆ Demonstration Screen Shots
- ◆ Relevant Standardization Efforts
- ◆ Things to Do

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# Business Grid Consortium

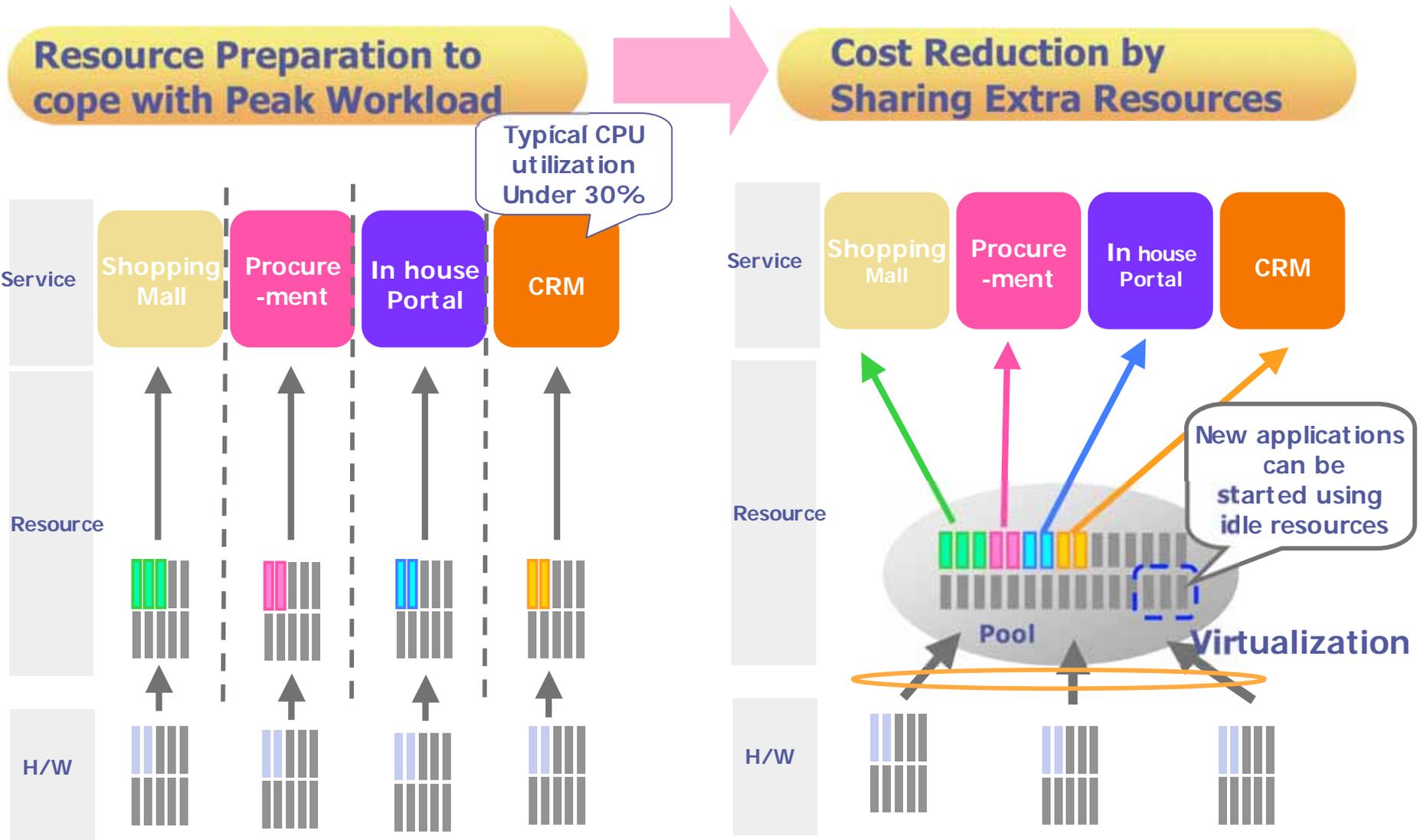
- ◆ Mission: Develop Business Grid middleware
  - Next generation business application infrastructure
  - Contribute to international standardization
- ◆ Three year project: 2003 - 2005
- ◆ Industry Members: Fujitsu, Hitachi, and NEC
- ◆ Collaboration with Grid Technology Research Center
  - Agency of Industrial Science and Technology (AIST)
- ◆ Matching funds from the METI
  - About half of the funding is from METI
- ◆ Coordinated by IPA (Information-technology Promotion Agency, Japan)
- ◆ Distribute resulting components as high-quality open-source
- ◆ Two main objectives:
  - Objective 1: Reduce IT Infrastructure Costs
  - Objective 2: Support Business Continuity

**METI: Ministry of Economy, Trade, and Industry**

# Objective 1: Reduce IT Infrastructure Costs

- ◆ Better utilization of IT resources
  - Optimal and dynamic resource allocation
  - Share available resources
- ◆ Integrated management of heterogeneous environment
- ◆ Automate System Management
  - Simplify the job of system administrators
  - Reduce human errors
- ◆ Lower overhead of trying out new business
  - Set up new services at low initial cost
  - And scale them up easily if successful
- ◆ Enable resource sharing among multiple organizations

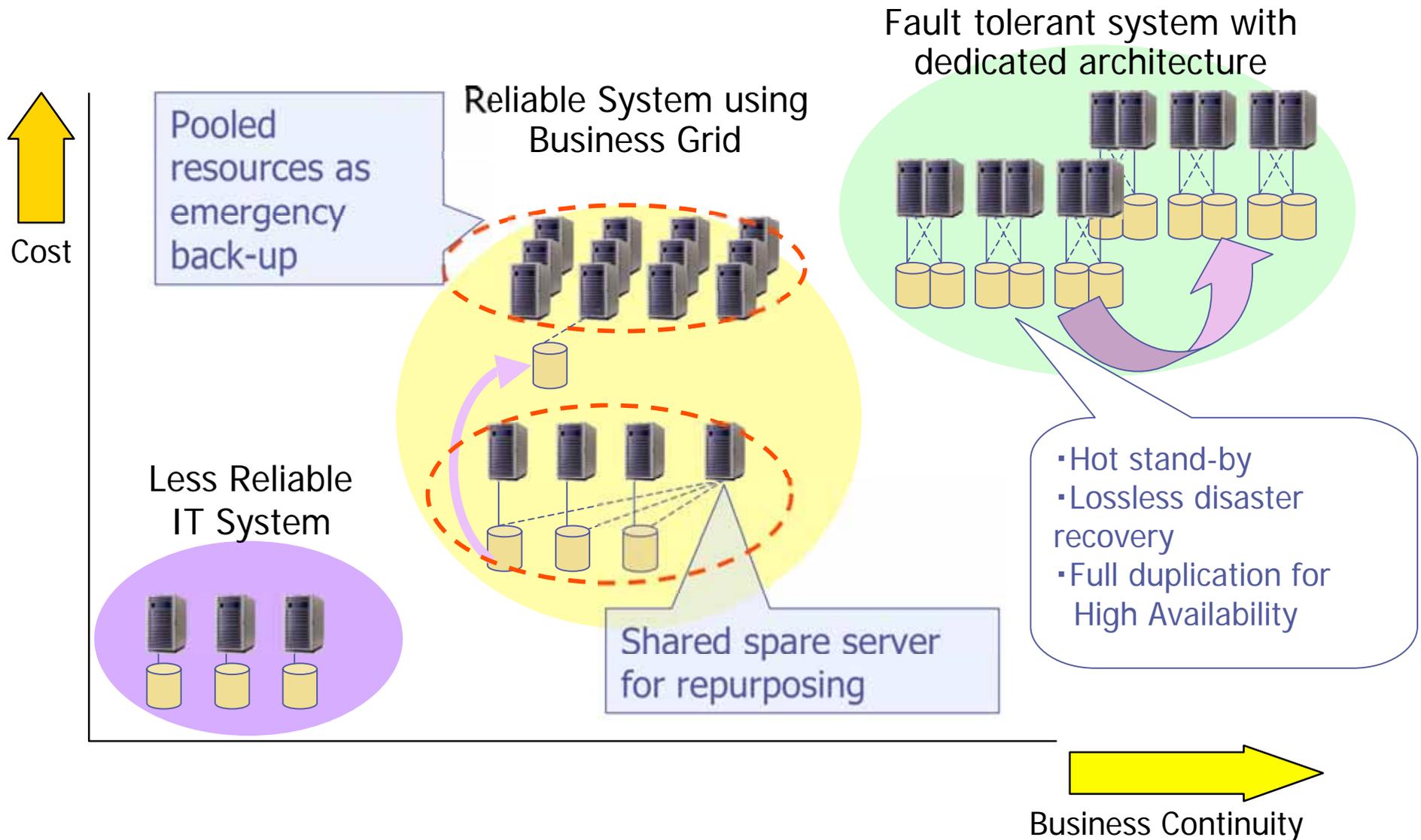
# Objective 1: Reduce IT Infrastructure Costs



# Objective 2: Support Business Continuity

- ◆ Robust IT environment
  - Respond to unexpected load spikes
  
- ◆ Reliable IT environment
  - Standards-based support for disaster recovery at reasonable cost
    - ◆ Database replication
    - ◆ Failover to remote site

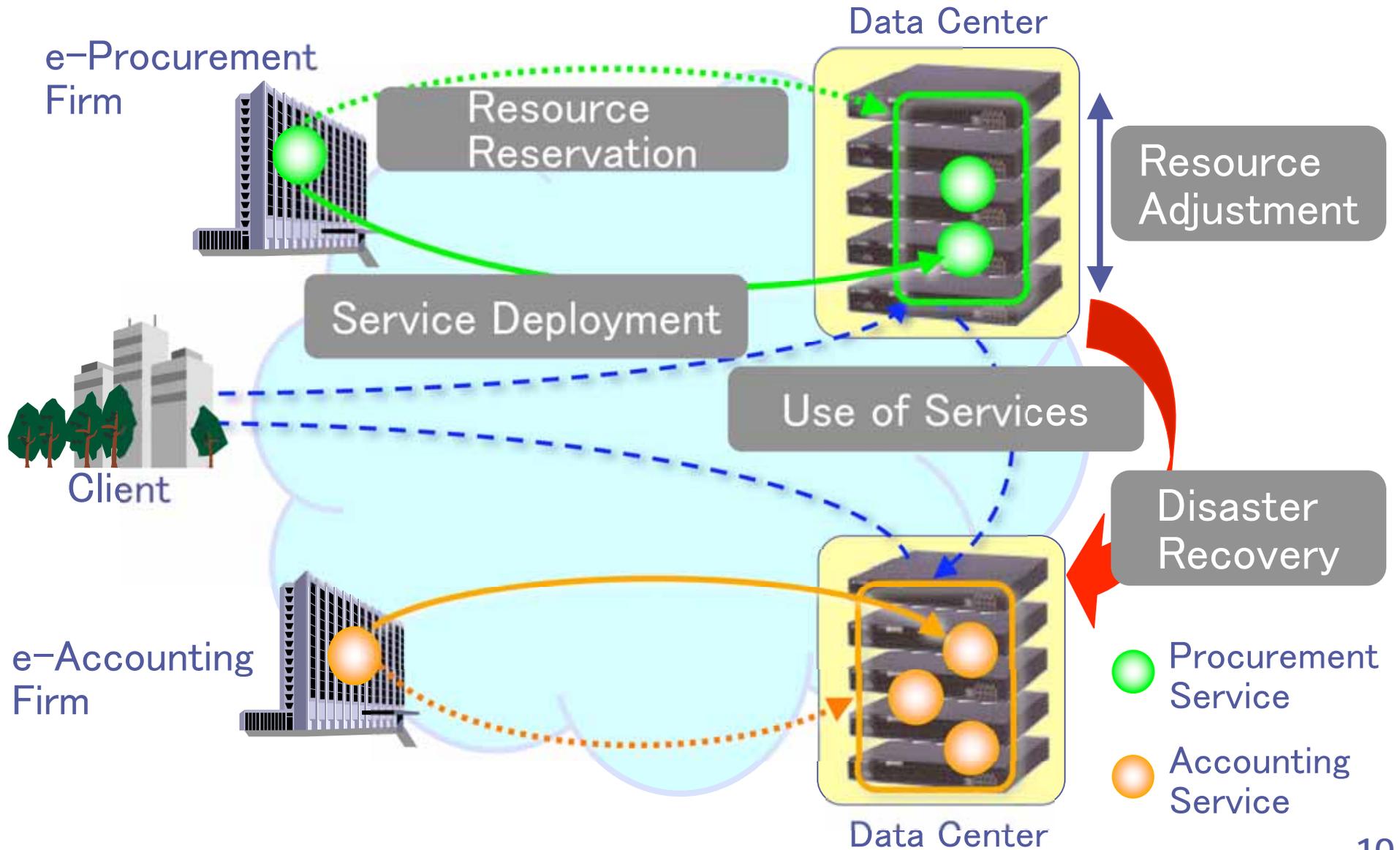
# Objective 2: Support Business Continuity



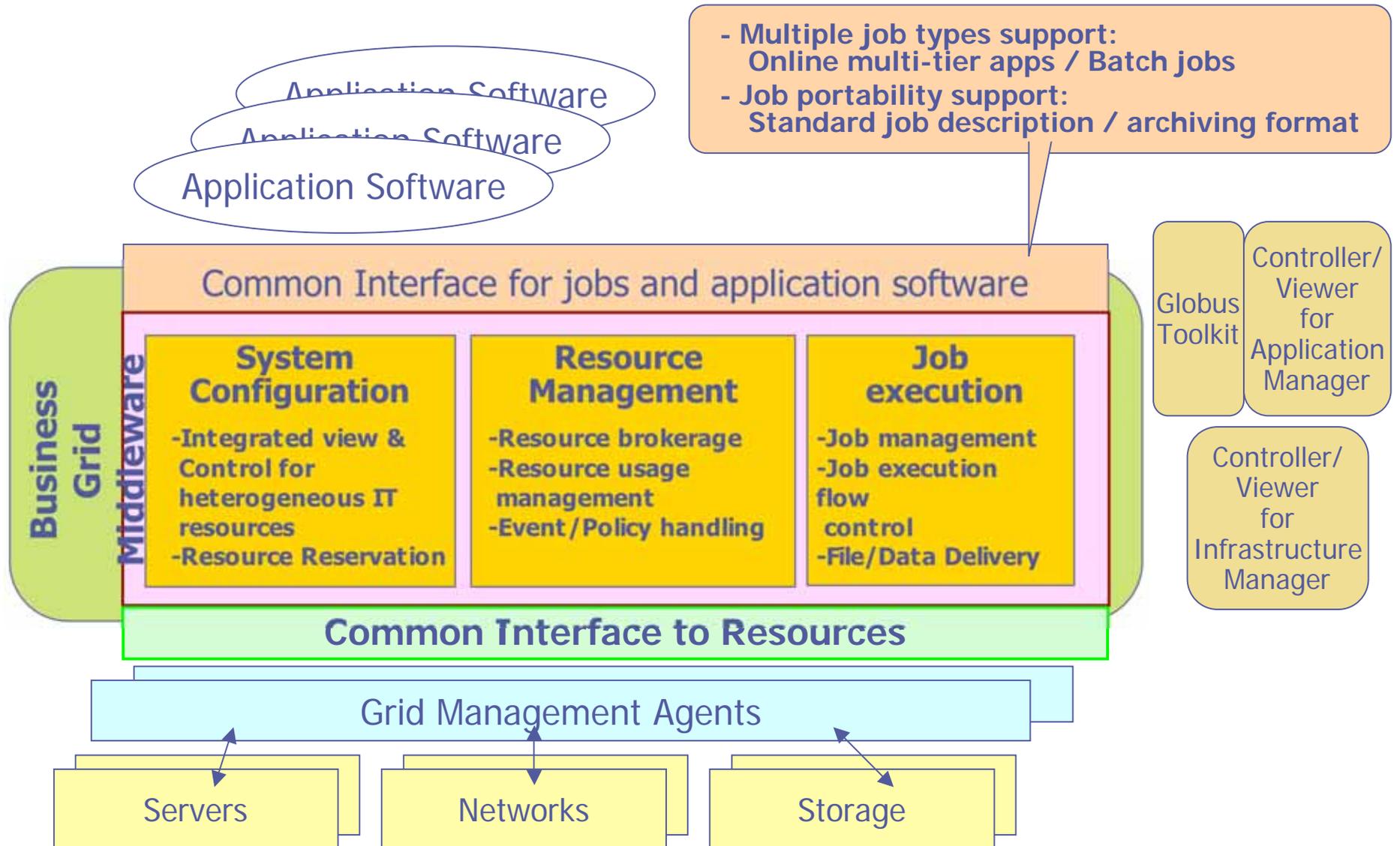
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# What Needs to be Supported by the Middleware

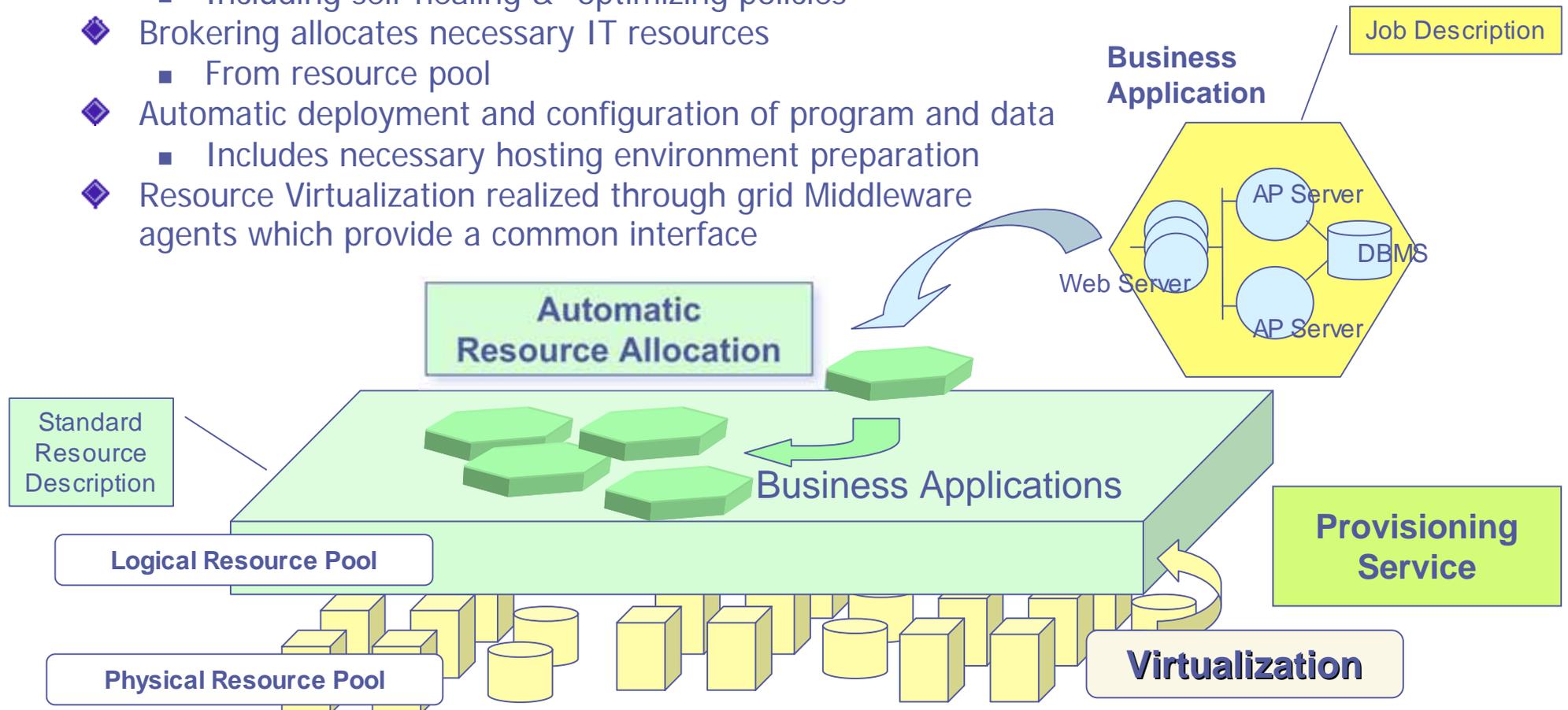


# Business Grid Key Components



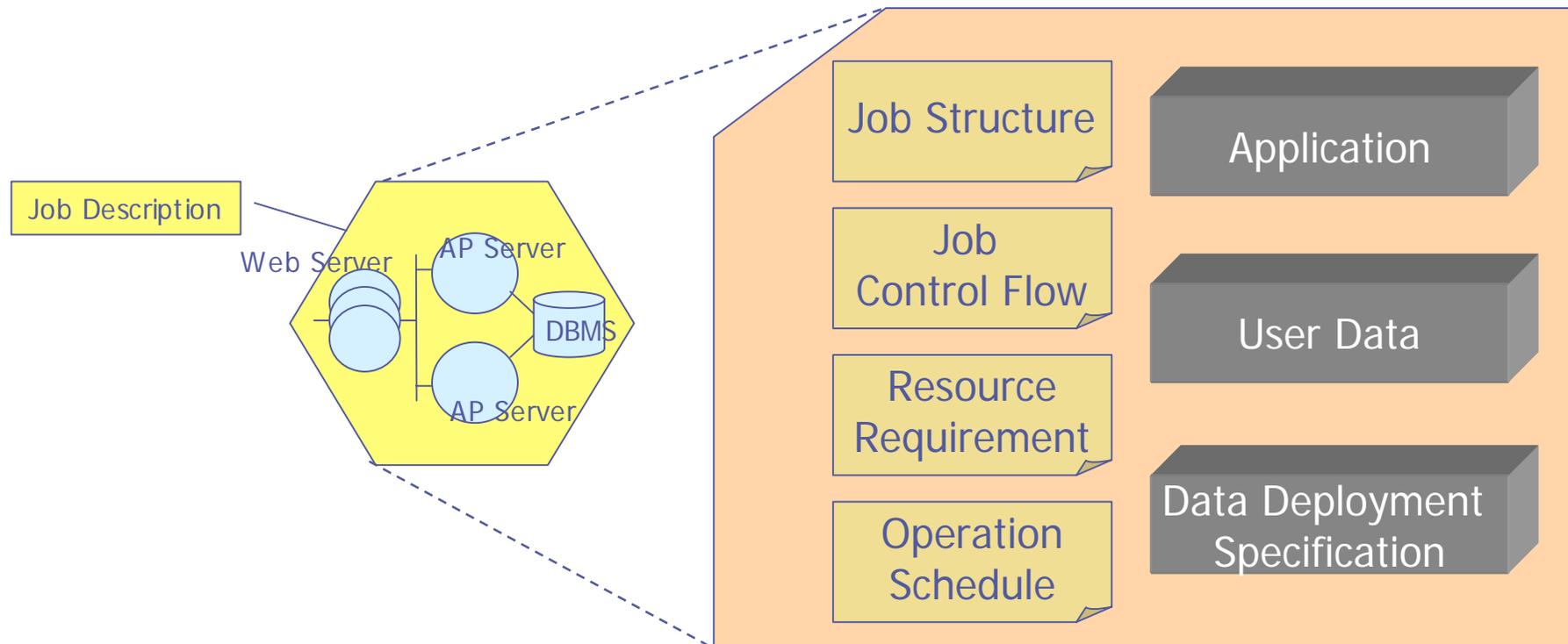
# Big Picture - how it works -

- ◆ Job Submission
  - Standard job description and application contents service (using WS-Agreement protocol)
  - Including self-healing & -optimizing policies
- ◆ Brokering allocates necessary IT resources
  - From resource pool
- ◆ Automatic deployment and configuration of program and data
  - Includes necessary hosting environment preparation
- ◆ Resource Virtualization realized through grid Middleware agents which provide a common interface



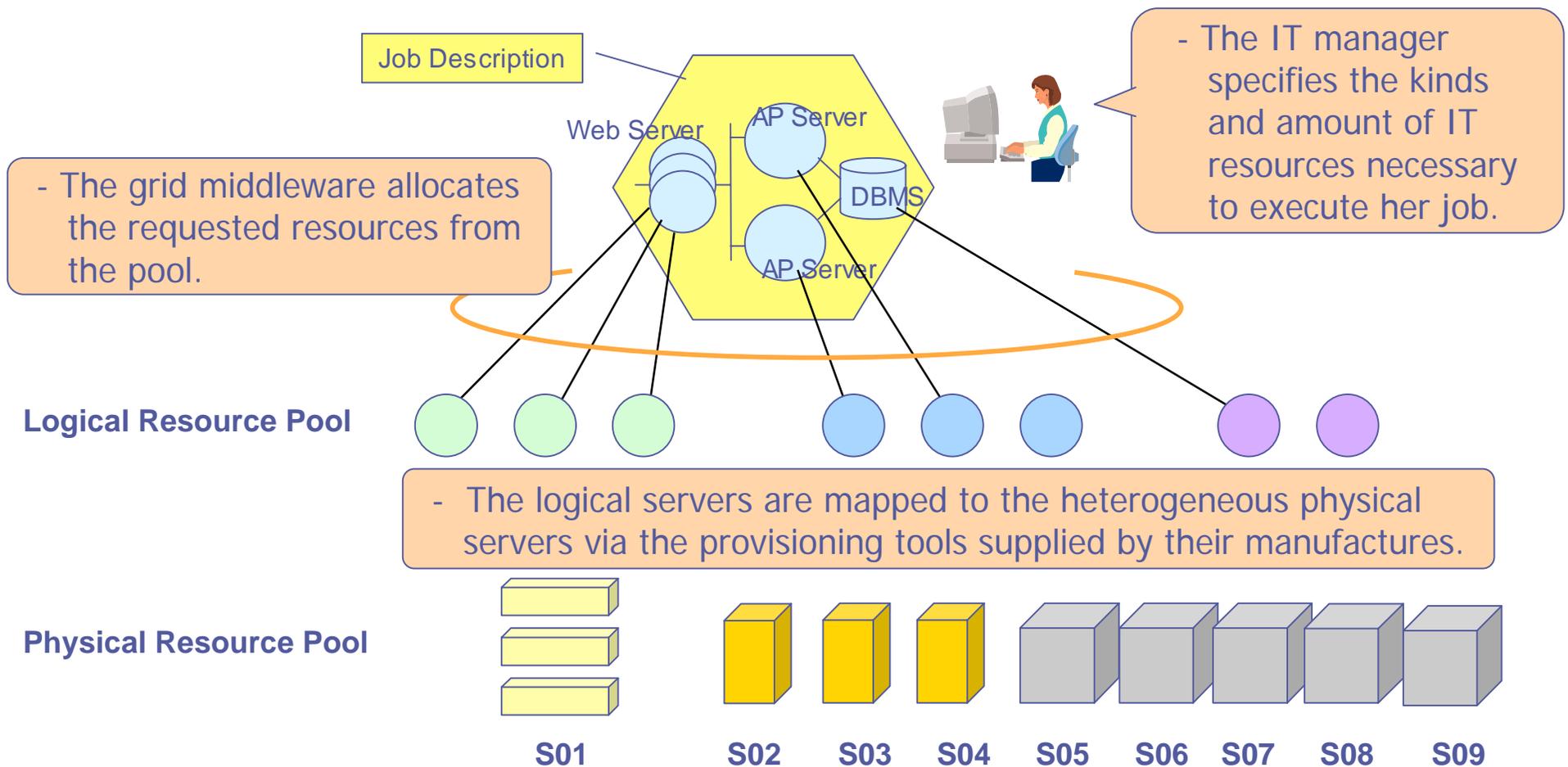
# Job Description

- ◆ The job description in BizGrid not only archives the relevant execution modules, but also maintains all necessary information in one package, in order to manage the entire lifecycle of the operation.
- ◆ The description contains the specification of job structure (e.g. 3-tier Web App). It enables mapping between the job and virtualized resources, automatic deployment of execution modules and autonomic control of the resource allocation.



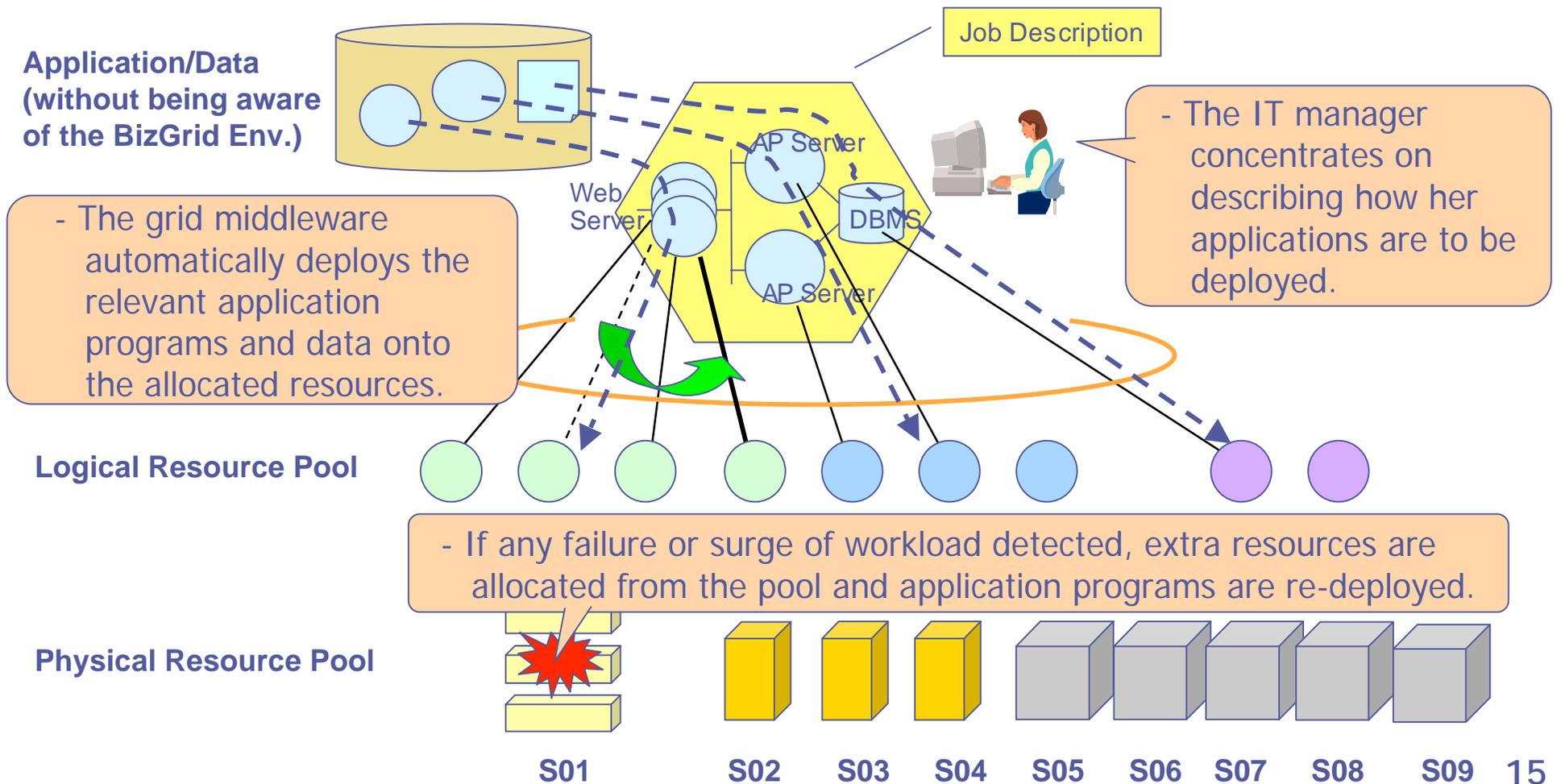
# Optimum Resource Allocation

- ◆ The grid middleware finds and allocates the optimum amount and kinds of resources from the virtualized pool, enabling increased resource utilization with minimum human intervention.

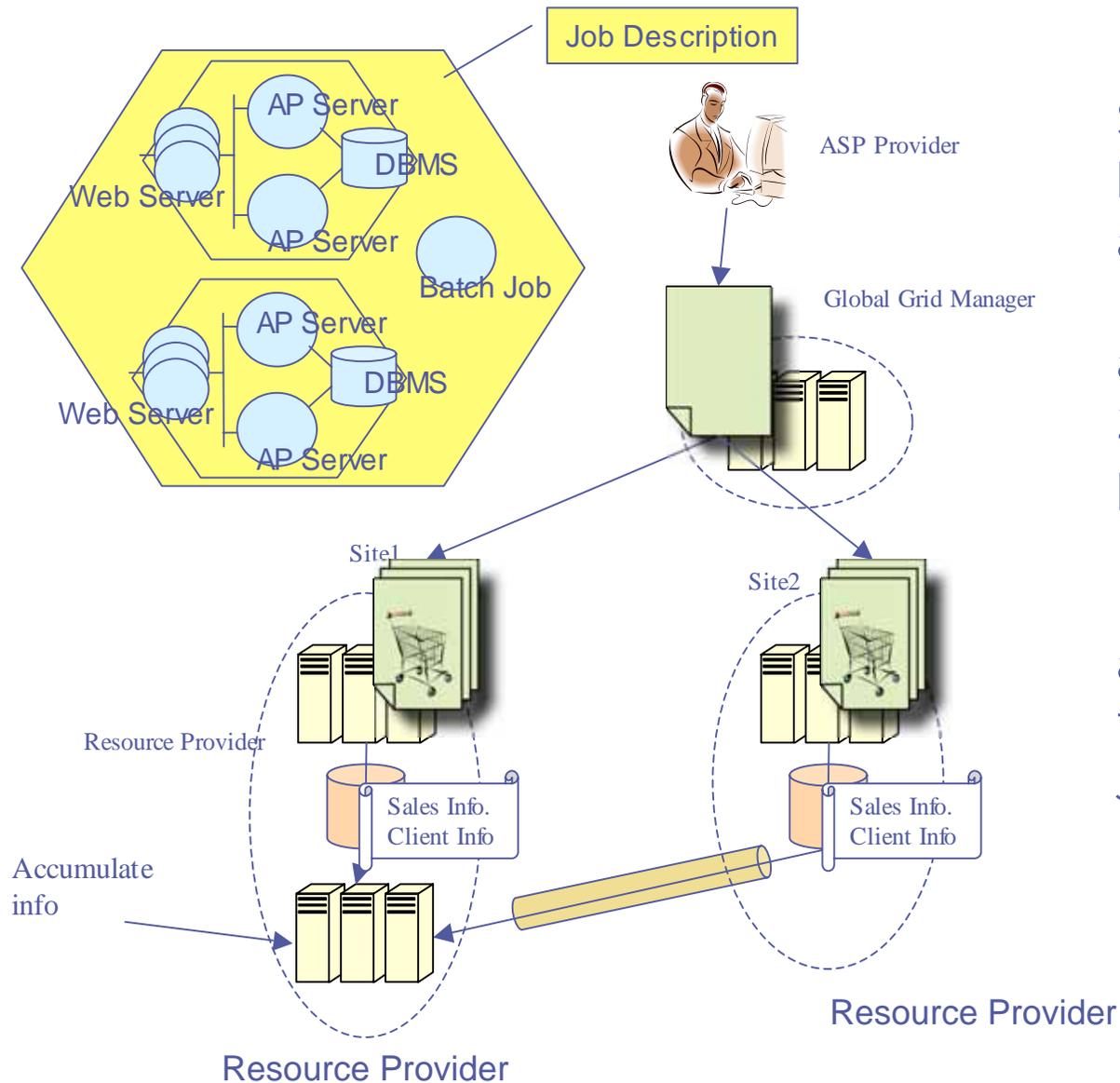


# Dynamic Deployment of Business Application

- ◆ Based upon the job description, the relevant application programs and data are automatically deployed onto the allocated resources in a consistent manner.
- ◆ The application programs need not be aware of the Business Grid Interface.



# Realization of Wide-Area Business Grid



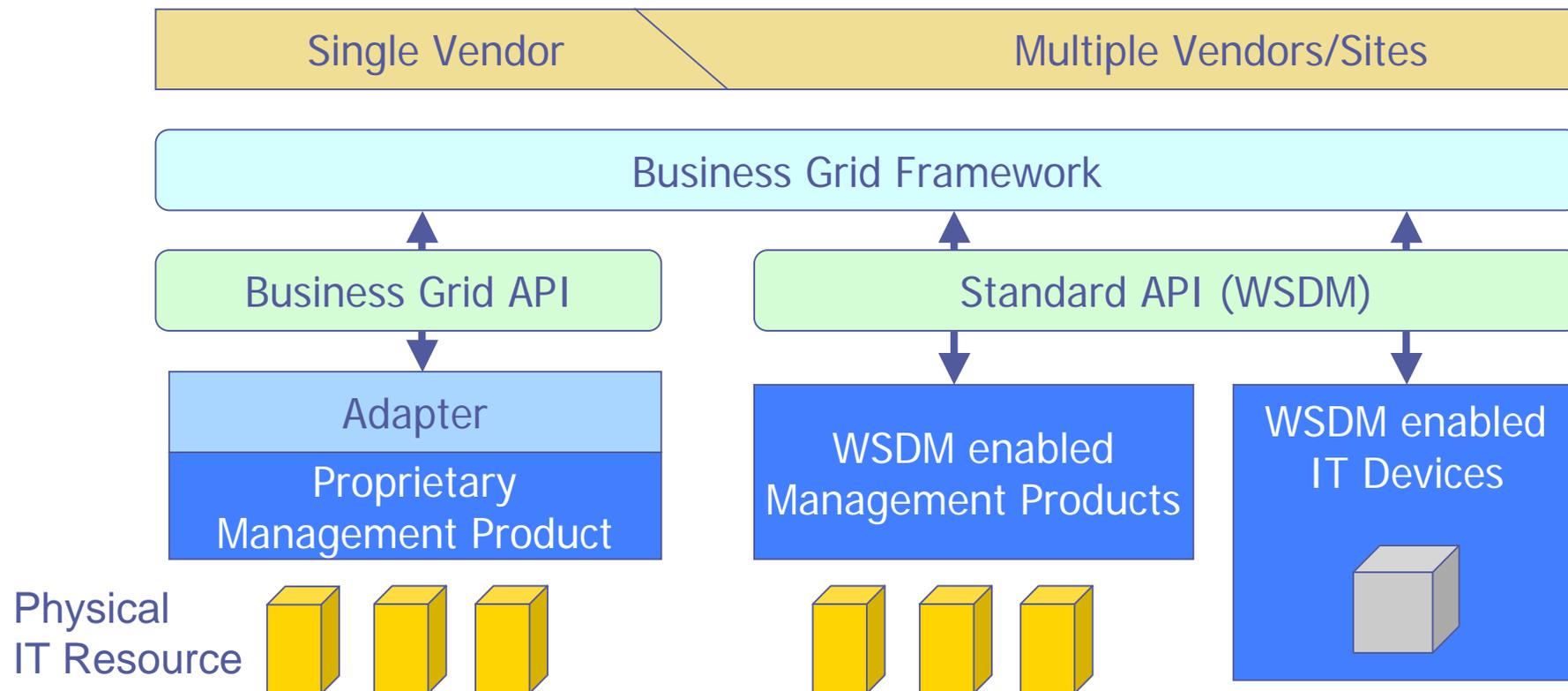
Share IT resources based on the contract / agreement among :

- 1) Distributed Centers in an Enterprise,
- 2) Among Trusted partner Data Centers

=> Make it possible for an ASP Provider (client) to dispatch a Complex Job from an entry point

# Resource Virtualization

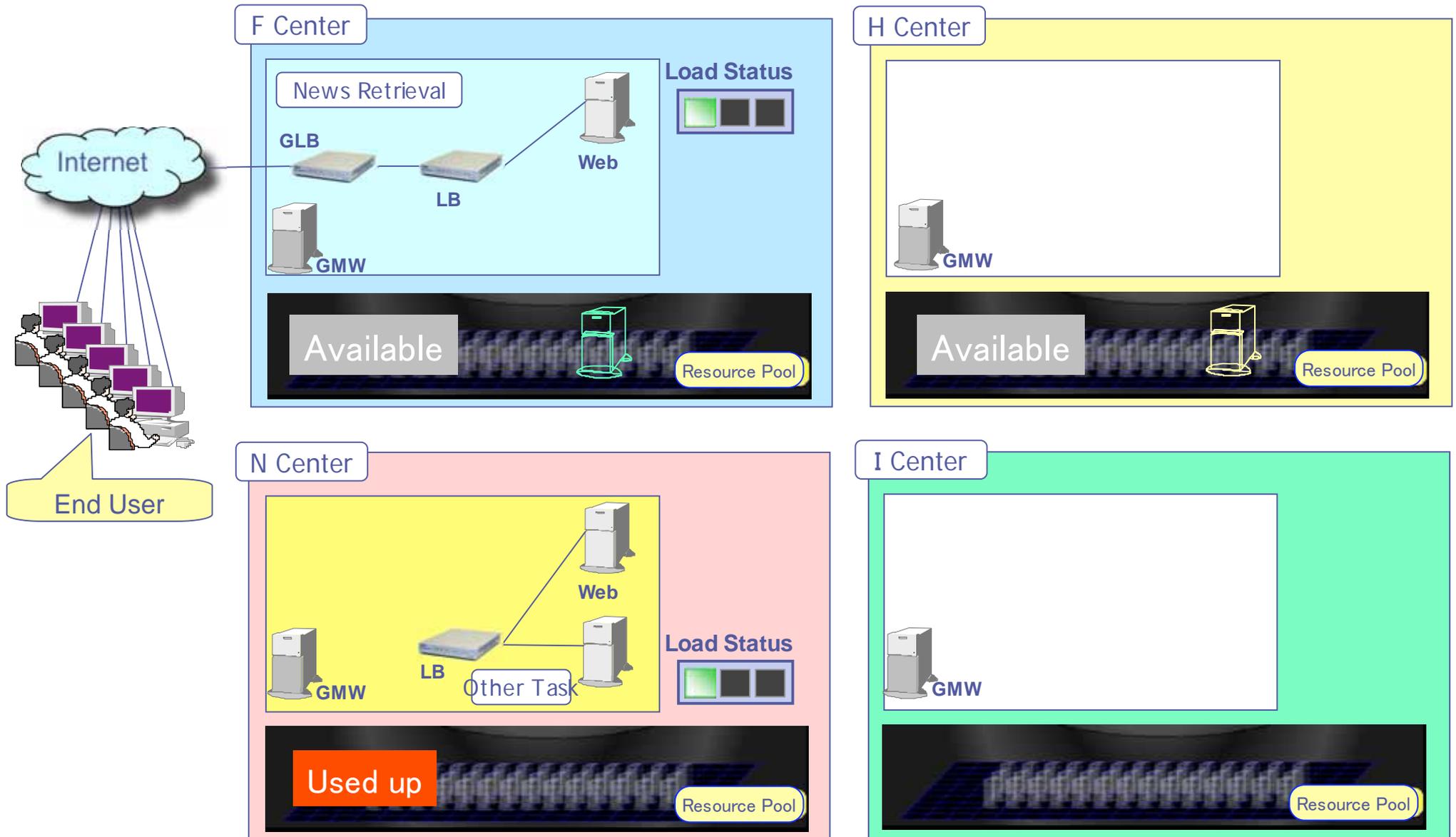
- ◆ Currently, BizGrid adopts its own API to describe and control IT devices.
- ◆ Efforts are being made to adopt the standardized API (e.g. WSDM) so that WSDM enabled management products and IT devices can also be managed by the business grid framework in a seamless way.



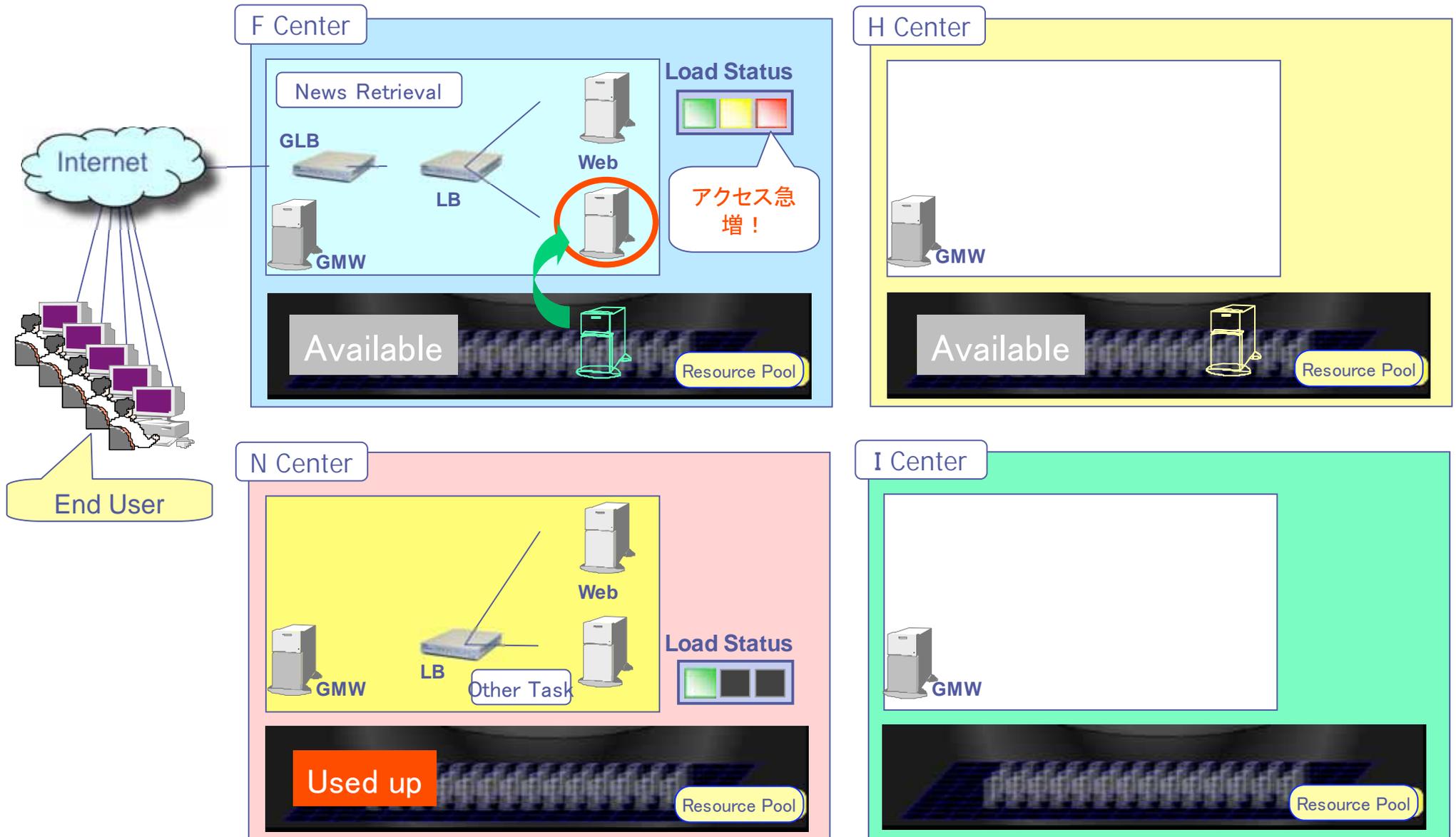
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- ◆ Early Adopters
- ◆ Relevant Standardization Efforts
- ◆ Things to Do

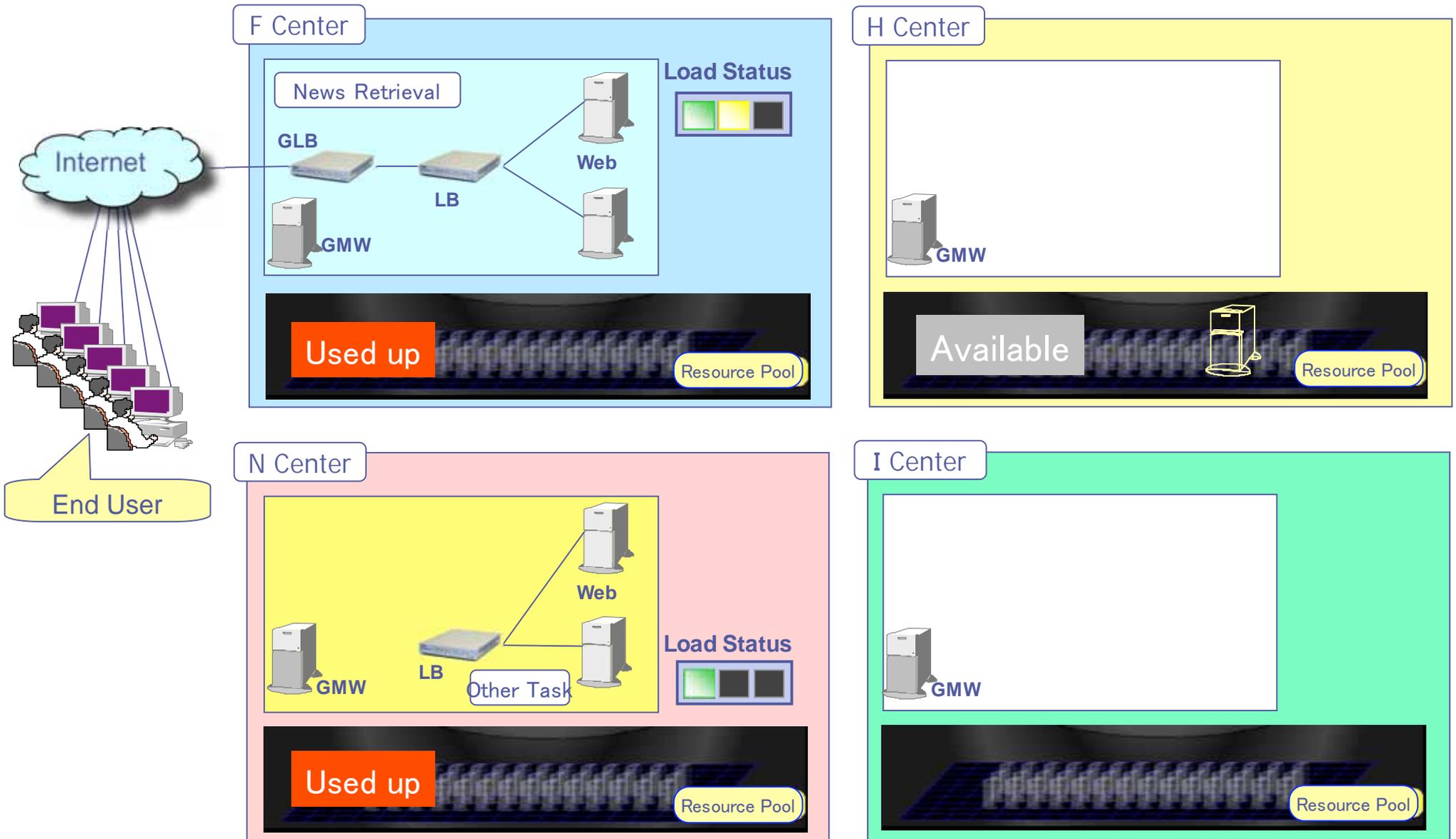
# Demonstration (Scenario 1)



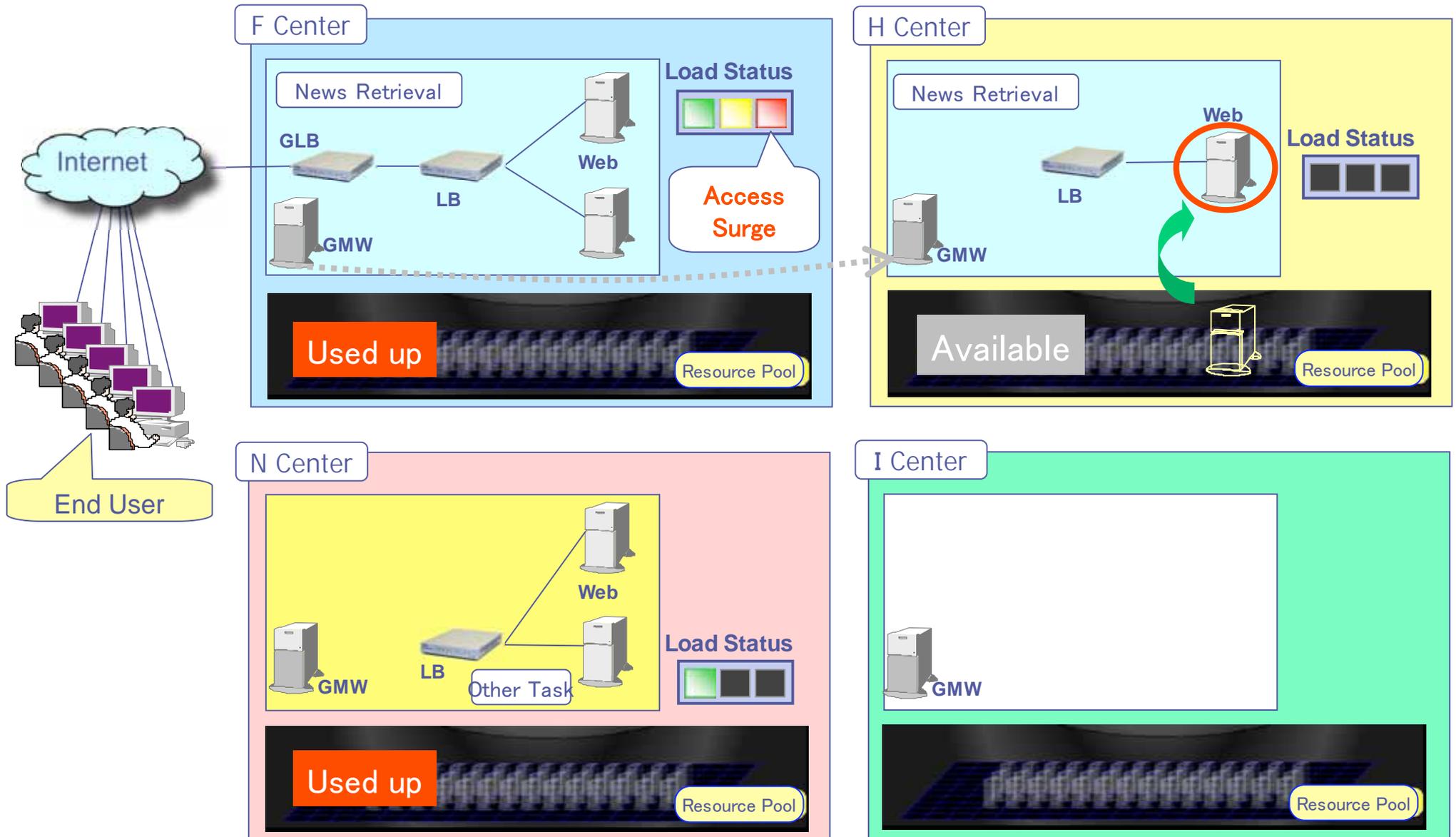
# Demonstration (Scenario 2-1)



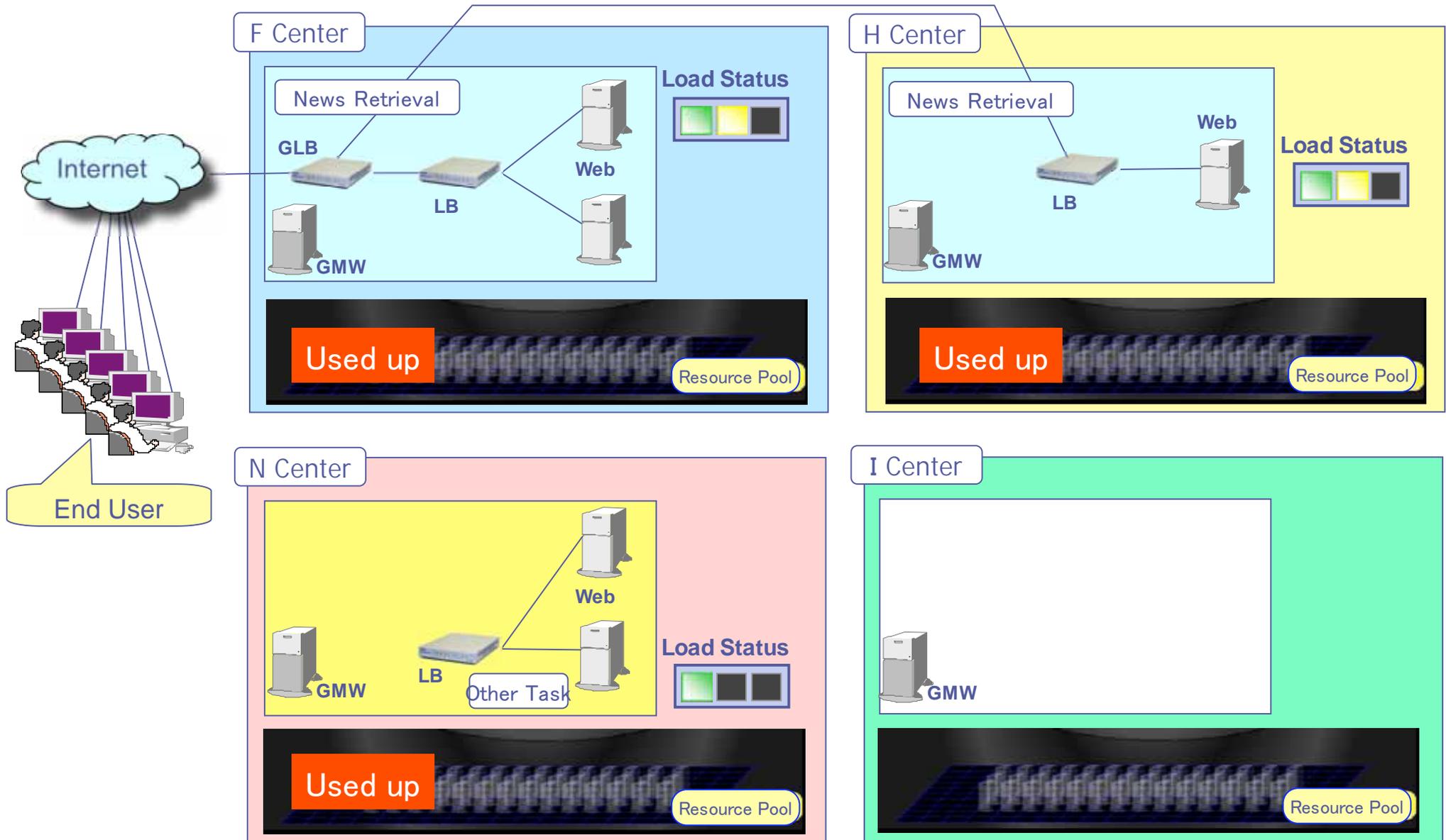
# Demonstration (Scenario 2-2)



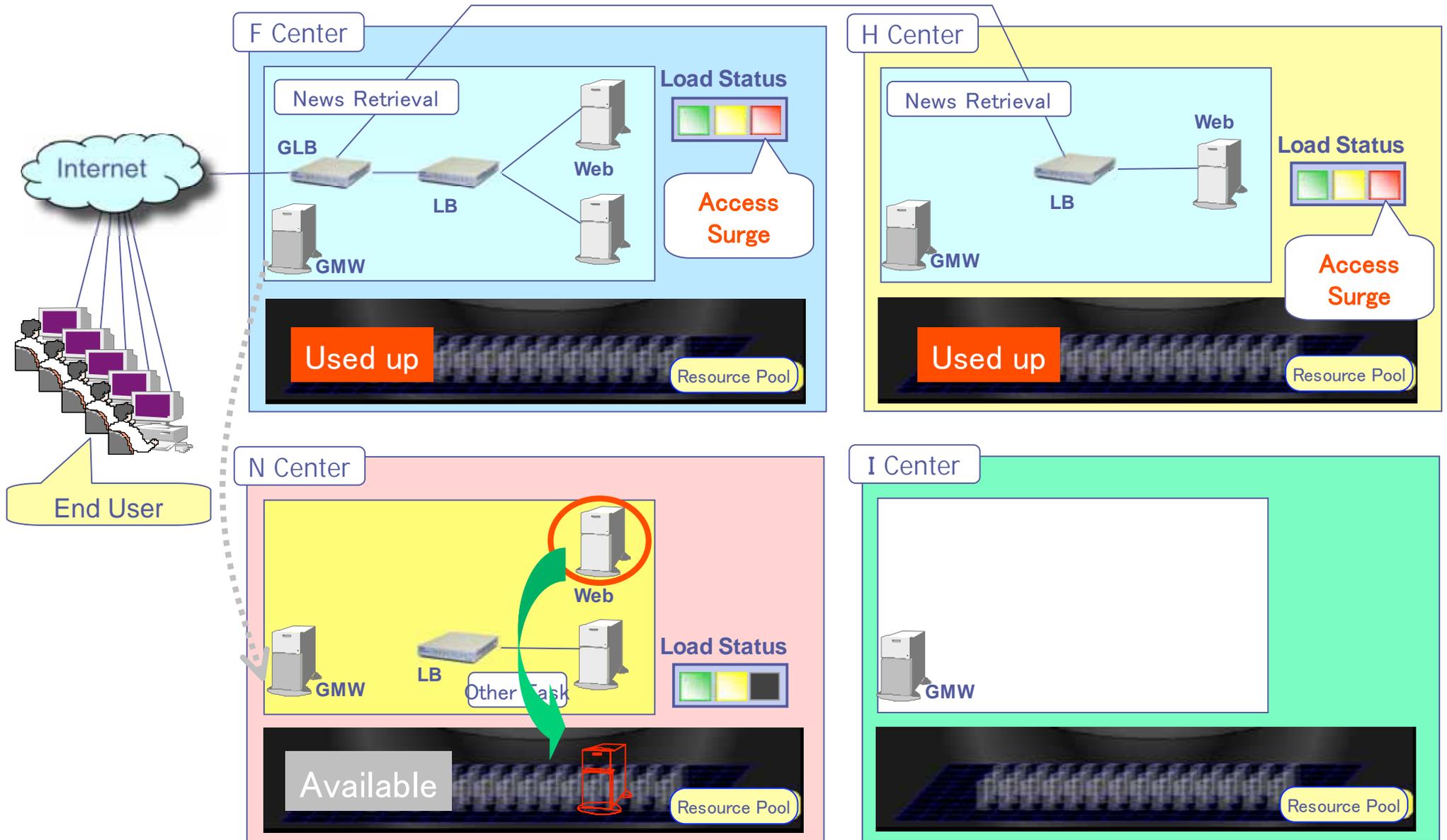
# Demonstration (Scenario 3-1)



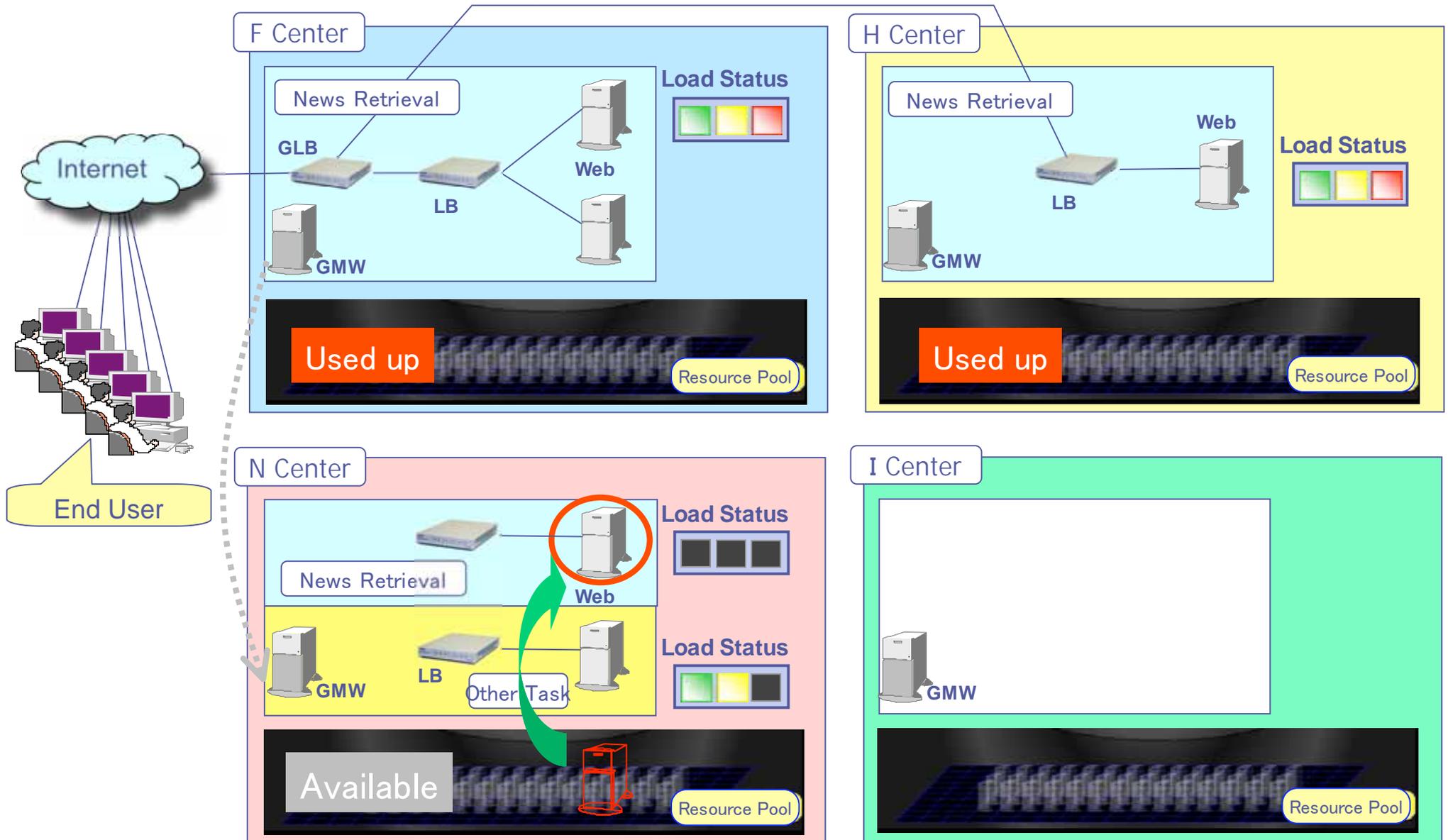
# Demonstration (Scenario 3-2)



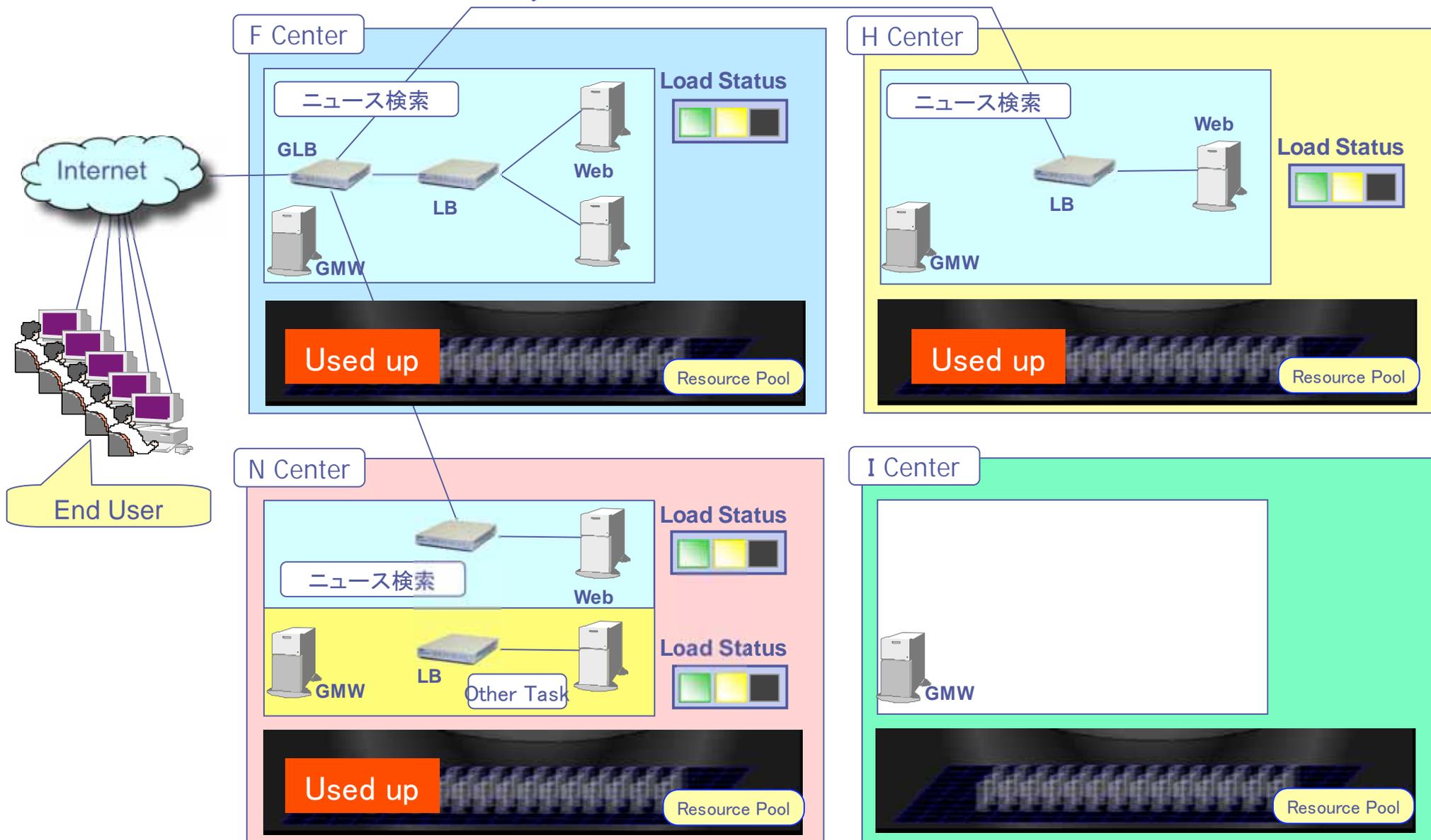
# Demonstration (Scenario 4-1)



# Demonstration (Scenario 4-2)



# Demonstration (Scenario 4-3)



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# Relevant Standardization Bodies

## ◆ GGF

- OGSA-WG (architecture, roadmap, WG factory, resource management)
- ACS-WG (application archiving format and archiver API)
- JSDL-WG, GRAAP-WG (job portability)
- CDDLM-WG (configuration, deployment, lifecycle management)

## ◆ OASIS

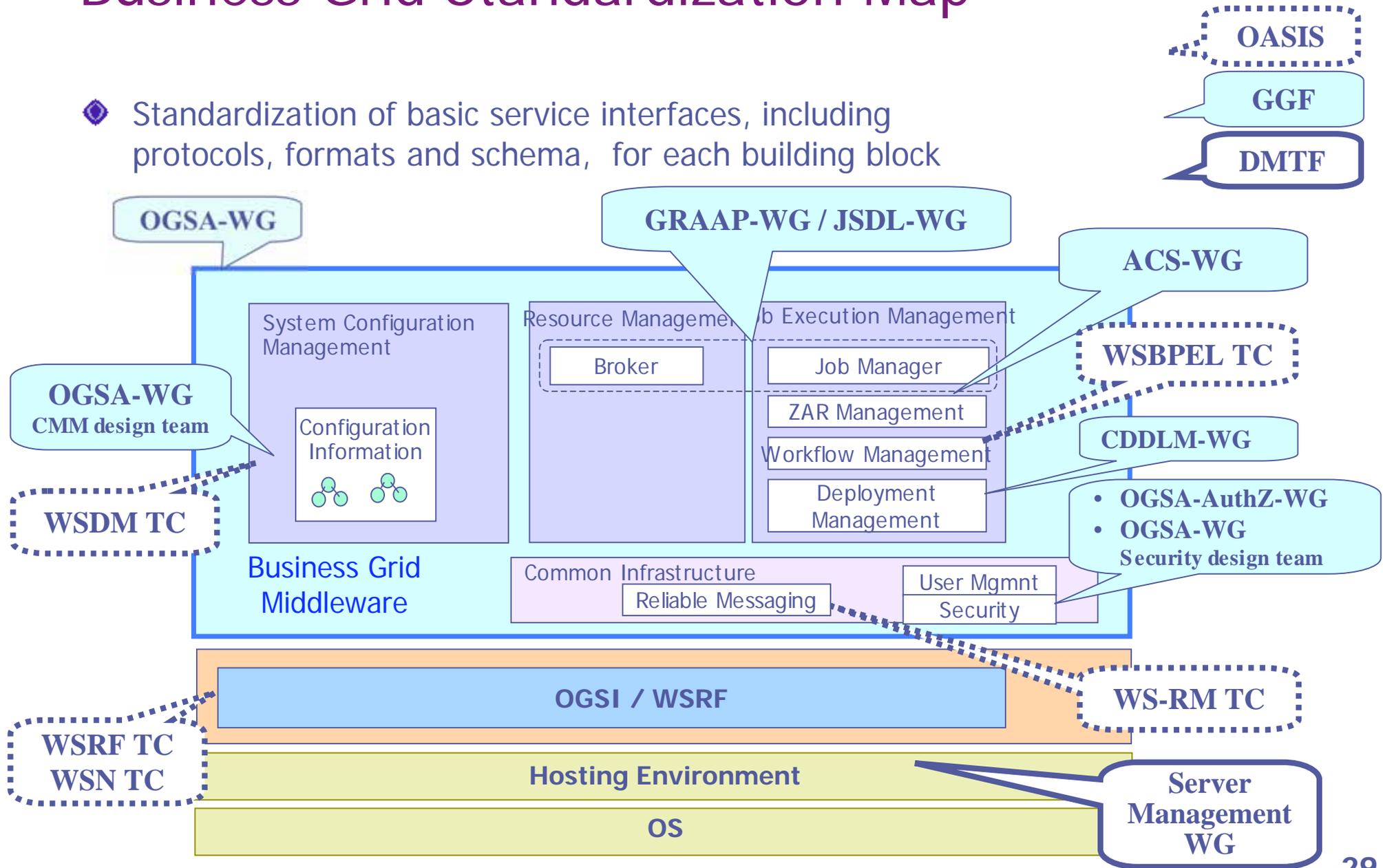
- WSDM TC
- WSRM TC
- WSBPEL TC
- WSRF TC, WSN TC

## ◆ DMTF

- Server Management WG
- Utility Computing WG

# Business Grid Standardization Map

- ◆ Standardization of basic service interfaces, including protocols, formats and schema, for each building block



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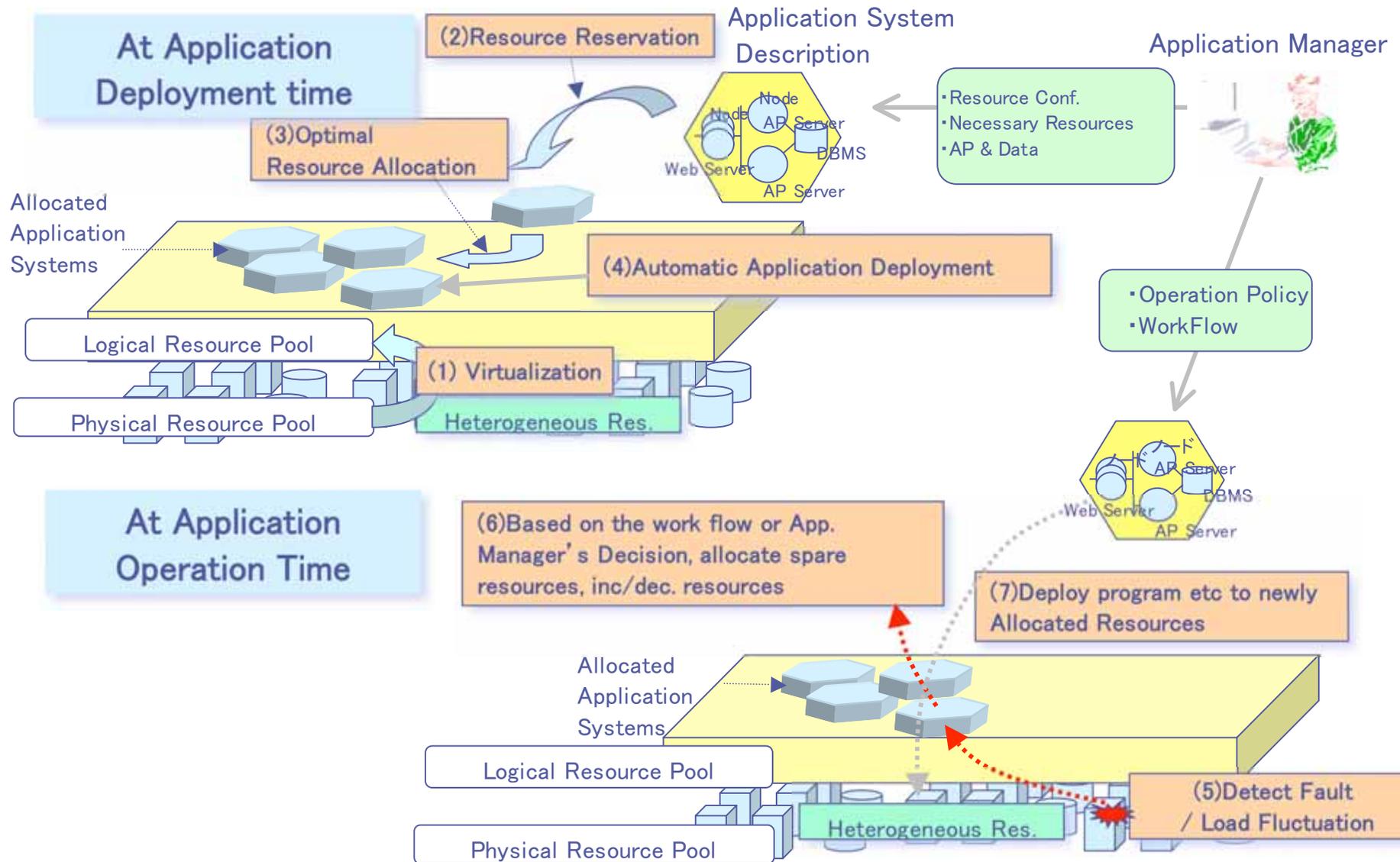
# Project Status / Things to do

- ◆ Two thirds of the project have finished.
- ◆ Initial version of the business grid middleware has been developed and basic features are tried out.
- ◆ Features developed so far include:
  - Monitoring and registering underlying IT resources (both hardware and software)
  - Submitting and controlling e-Business applications
  - Allocating IT resources required by the application
  - Deploying and configuring e-Business application
  - Primitive functions for enabling policy based self-managing functionality
  - Controlling multiple data centers i.e. Local/global two layered grid
  - Autonomic and more dynamic control of the resources
- ◆ Features to be developed this fiscal year (-03/2006) will include:
  - Adoption of emerging standards from GGF, OASIS, DMTF and other standardization bodies
  - Field test in collaboration with a number of real industry users

Thank you!

# Back-up Slides

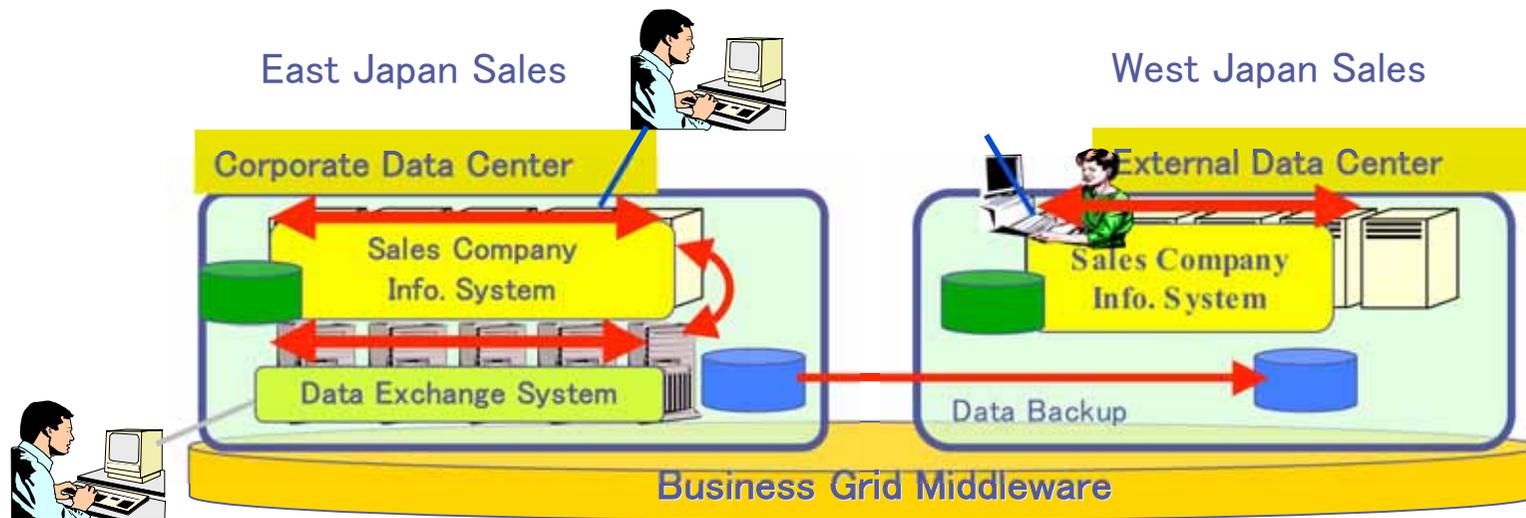
# Functions of Business Grid Middleware



# Outline and Goal of the Trial System

Keep the Investment Cost / Management Cost of the Core Information System low and at the same time improve business continuity in case of disaster by allocating the system to multiple sites

- A) Wide-Area Load Balancing
- B) Disaster Recovery
- C) Effective System Management



A) Wide-Area Load Balancing: At Normal times, use the IT resource effectively for disaster recovery as spare system for high load business apps and guarantee the quick response

# Outline and Goal of the Trial System

- B) Disaster Recovery: In case of disaster at the data center for the corporate site, let the application continue at the external data center
- C) Effective System Management: Change the configuration automatically and optimize business app management among multiple data centers.

