# HP BladeSystem
# Reliable Web Services
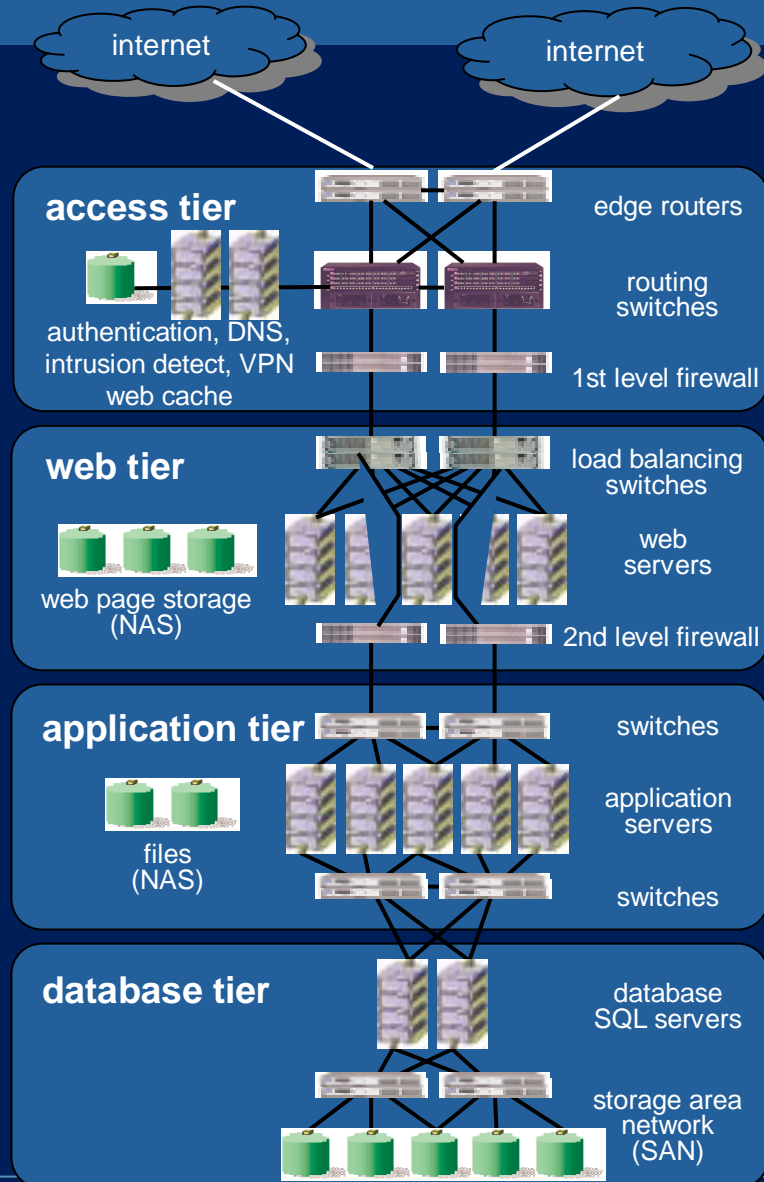
## January 2005

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HP Fellow

Hardware CTO

Industry Standard Servers

# Agenda

- Web Services Architecture
- Adaptive Enterprise Management Architecture
- Infrastructure Trends (aka Blades)
- Key Challenges

# Web Services Architecture



- Established multi-tier architecture
- Increasing complexity of web transactions
- Static content wrapped in multiple layers of dynamic business content
- Tier boundaries blurring
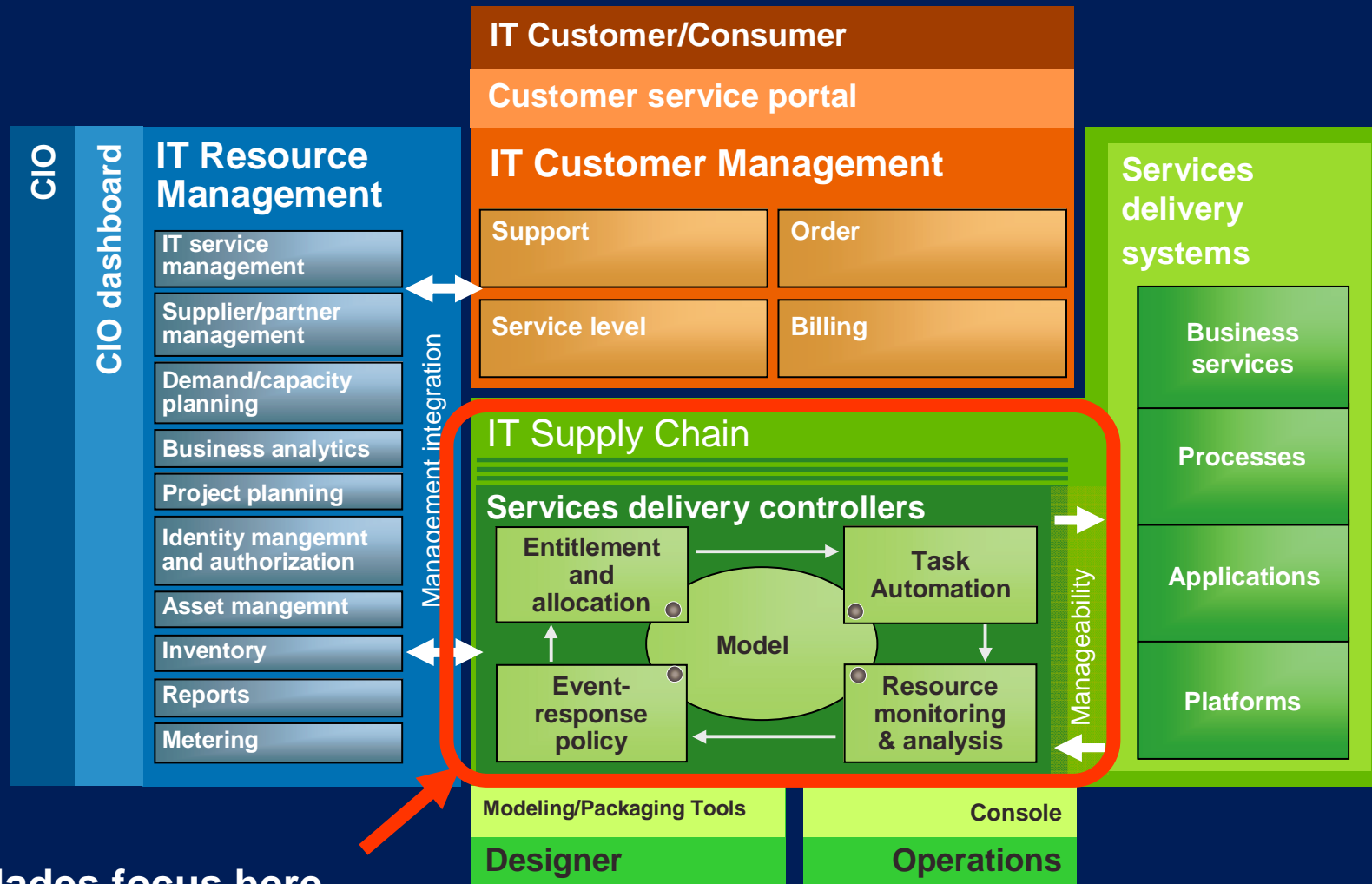- Web service reliability requires services at all tiers

# Web Services Model
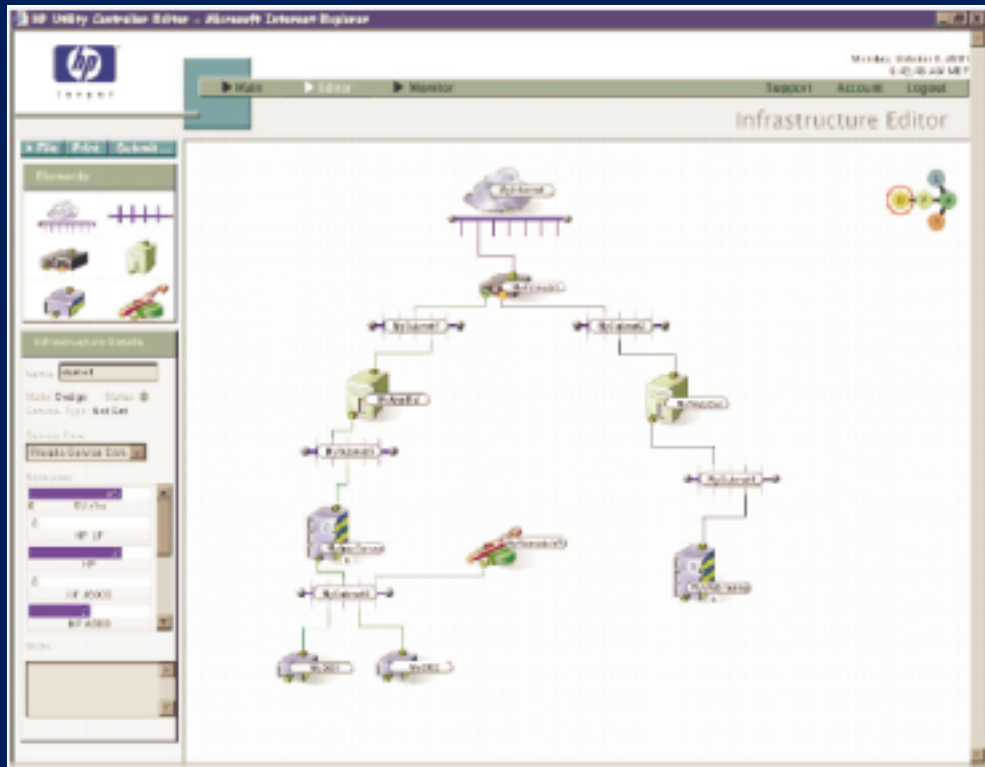


- Web service elements have been successfully modeled
- Management tools to instantiate, isolate, monitor and dynamically repair web service instances
- Scales to large datacenter
- Most effective at scale of a large datacenter

# IT service delivery business
## conceptual architecture detail

**IT Customer/Consumer**

**Customer service portal**

**IT Customer Management**

| Support | Order |
|---------|-------|
| Service level | Billing |

**CIO**

**CIO dashboard**

**IT Resource Management**

- IT service management
- Supplier/partner management
- Demand/capacity planning
- Business analytics
- Project planning
- Identity mangemnt and authorization
- Asset mangemnt
- Inventory
- Reports
- Metering

Management integration

**Services delivery systems**

- Business services
- Processes
- Applications
- Platforms

IT Supply Chain

**Services delivery controllers**

- Entitlement and allocation
- Task Automation
- Model
- Event-response policy
- Resource monitoring & analysis

Manageability

Modeling/Packaging Tools
**Designer**

Console
**Operations**

**Blades focus here**

# Blades Change Everything

- Complete web services infrastructure in a single chassis
- Even at datacenter scale, >90% of web services infrastructure is in the chassis
  - Servers
  - 1$^{st}$ tier networking
  - 1$^{st}$ tier SAN
  - Direct and network attached storage
  - Power distribution
- Fixed internal topology
- Complex problems become tractable
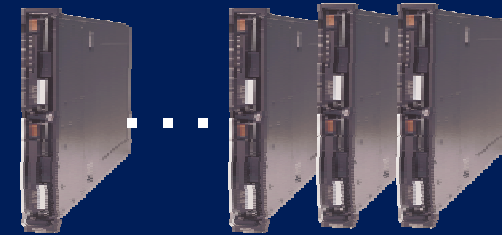
# BladeSystem p-Class fabric architecture
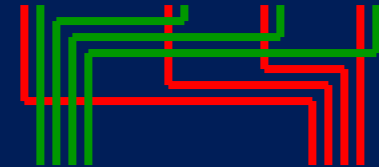


Server architecture

CPU/mem + chipset

PCI-ex

PCI-ex

I/O card

I/O card

High-speed traces

High-speed traces
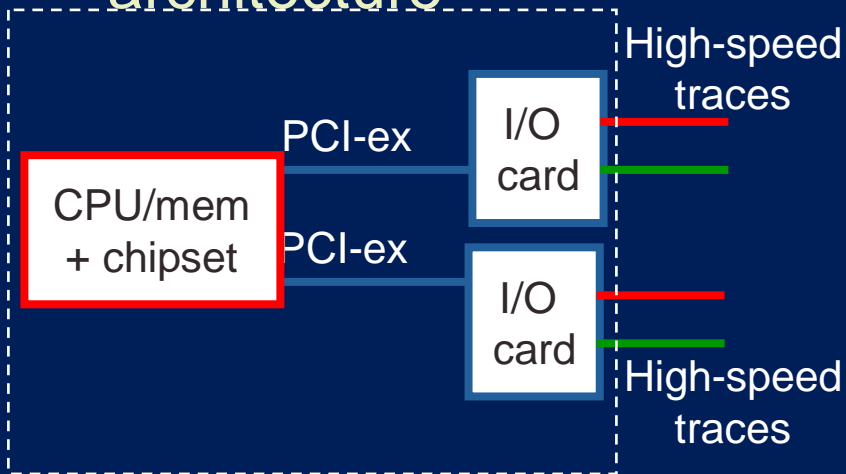
Enclosure architecture

8/16 Server blades

Back-plane

Interconnect

blades

# BladeSystem Management Architecture

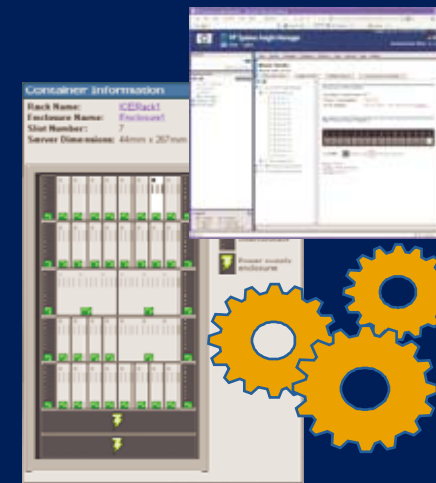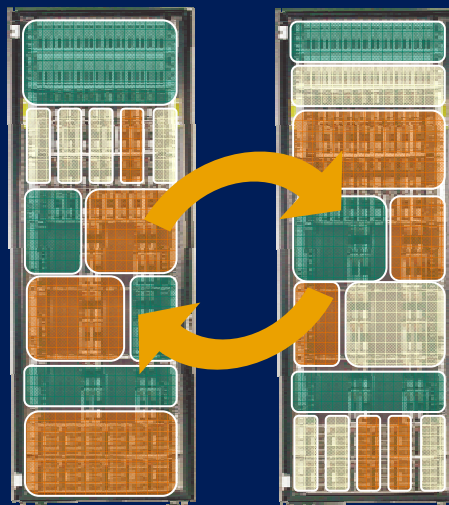Integration         Virtualization         Automation

**Acquisition costs**         **Increase Benefits**

Compute     SAN

Network     Power
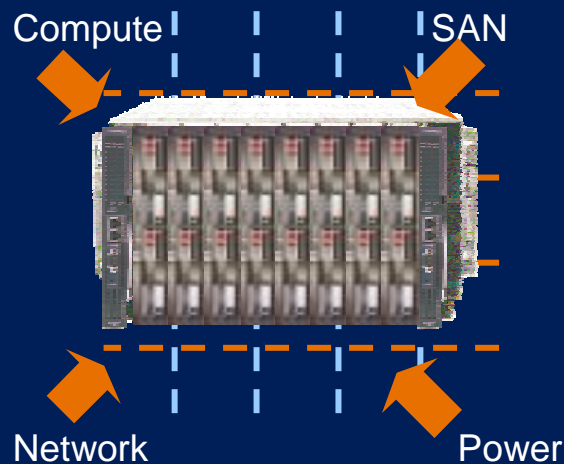
Integration simplifies
element management
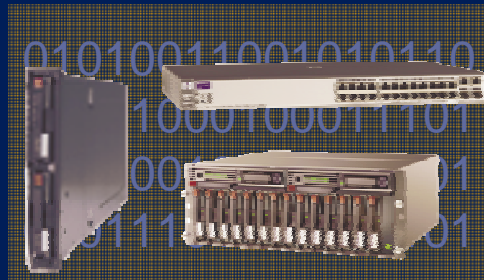Separate state data from the
elements
Inherent redundancy

Virtualization allows
configuration and
management
independent of physical
element

Integration and
Virtualization become
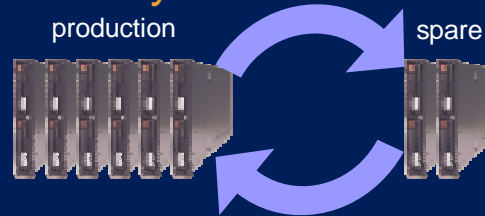bulidling blocks for
Automation
Adaptive Enterprise vision

# HP BladeSystem Automation



**End-to-end provisioning**

Provision solutions across compute, network, and storage in minutes

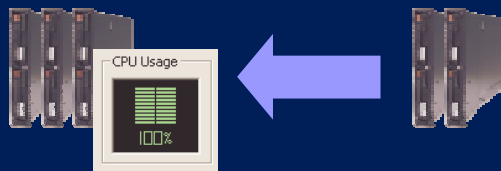**Automated node recovery**

production → spare

Deliver economical high availability via resource pooling and auto-recovery
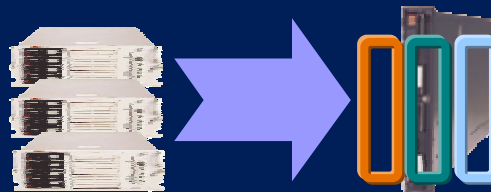
**Scheduled re-provisioning**

Improve system utilization through scheduled re-provisioning

**Dynamic scaling**

CPU Usage 100%

Dynamically scale infrastructure based on performance needs

**Rapid IT consolidation**

Consolidate legacy systems to latest performance platforms
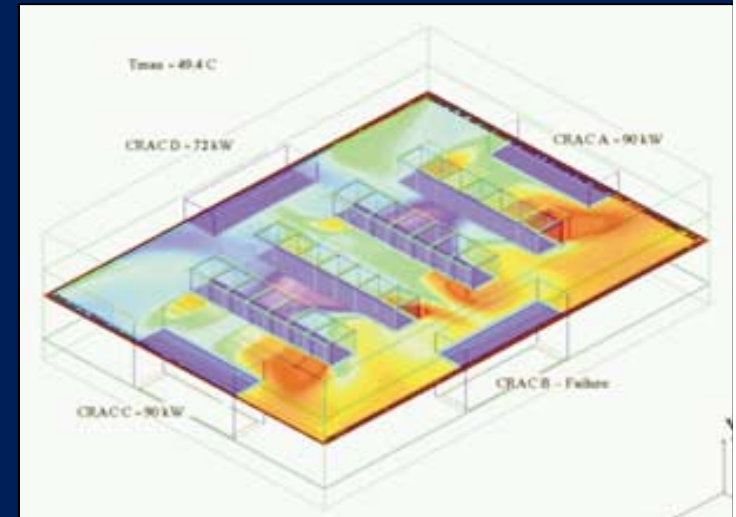
**Patch and vulnerability**

Quickly assess and respond to potential security vulnerabilities

# Key (Reliability) Challenges

- Datacenter design and layout
  - Power is fully redundant
  - What about the cooling?
- Interoperable services models
  - Standards work underway
- Storage management
  - SANs require end-end management
  - NAS model is rapidly evolving
- Security, security, security

# Thank You