Data Center Architecture Overview

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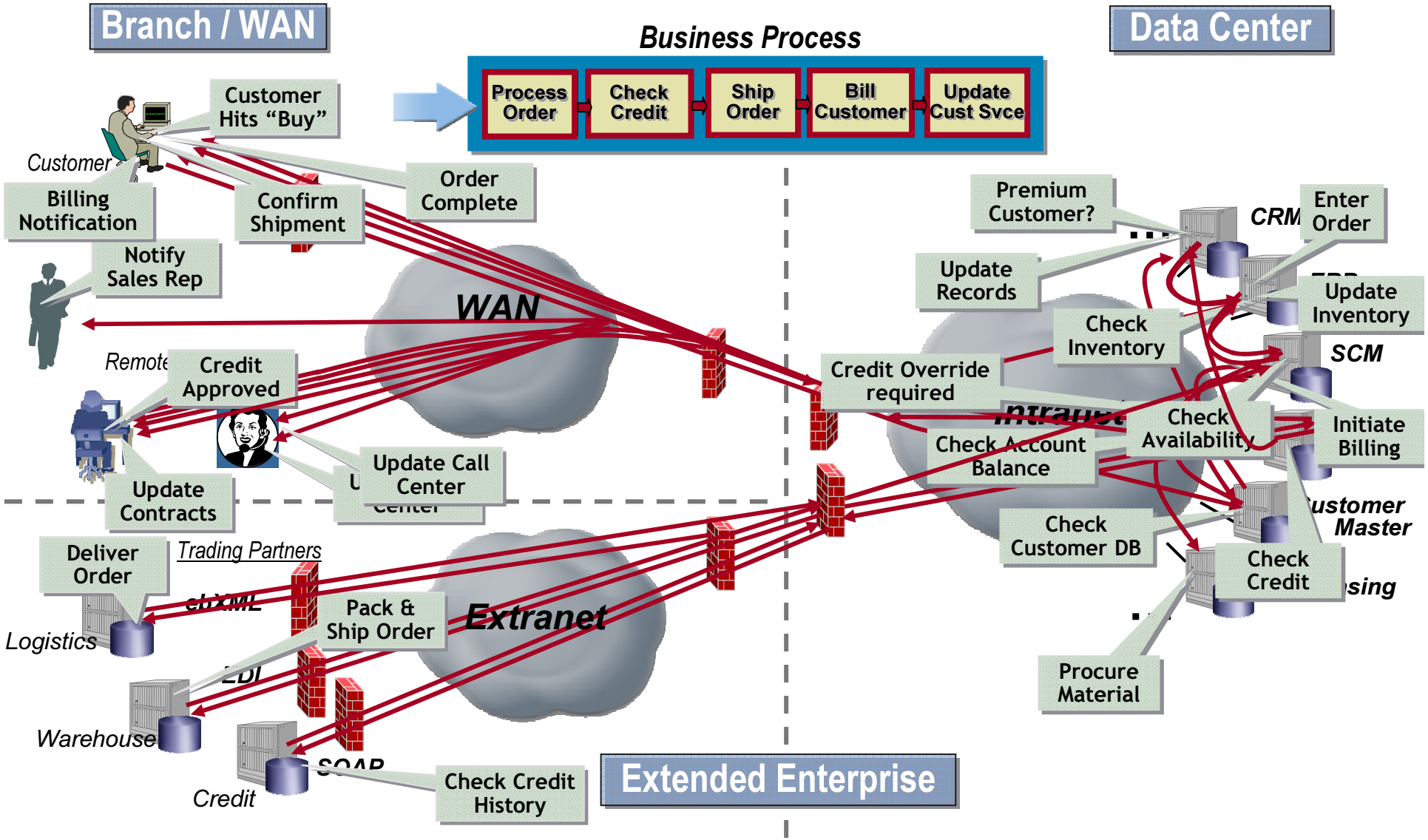
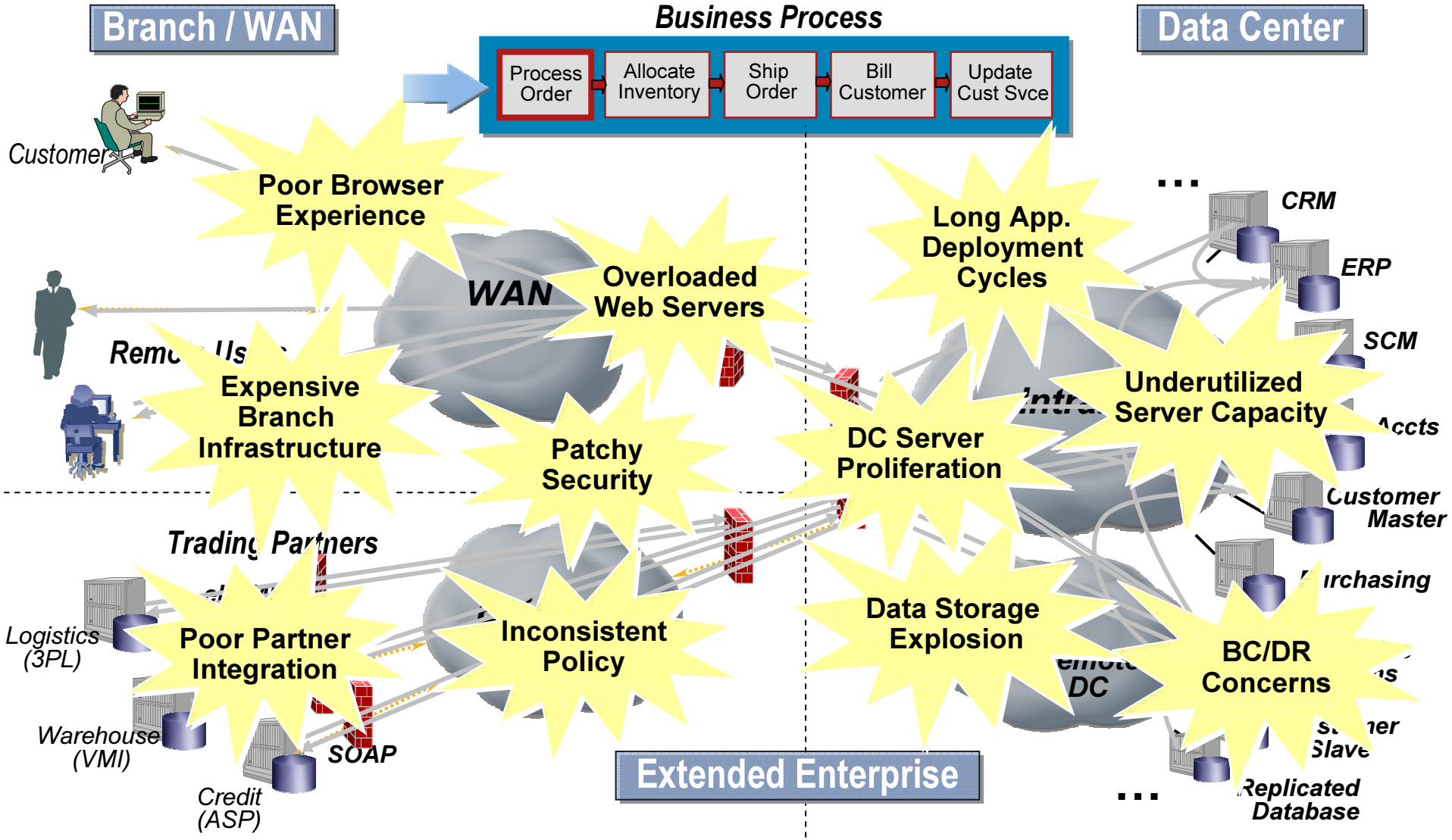
Any City….Any Data Center?

- Old & new
- Organic growth
- Different cultures
- Shared utilities
- A Human Network

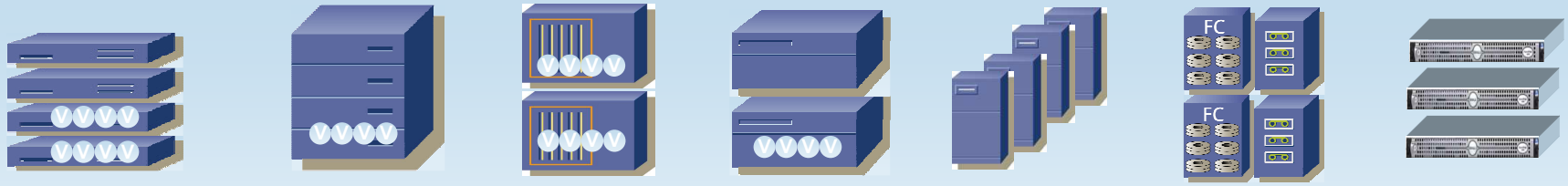
Today's Business Processes are Complex



IT Inefficiency Affects both the Customer Experience and the Business



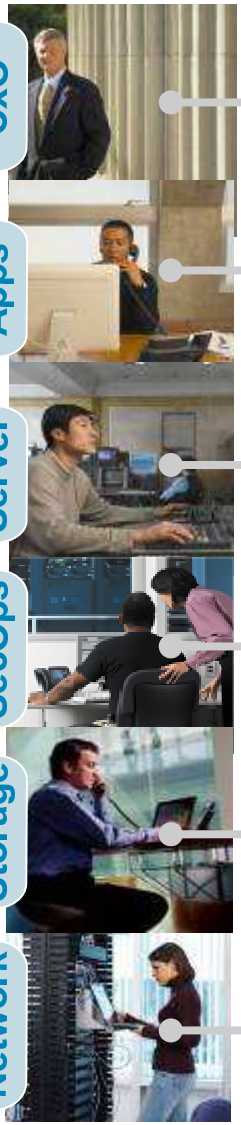
The Issue is Complexity of IT Infrastructure



Web/Application Server Farm | IBM Mainframe With OSA | Blade Servers | Departmental Servers | Email, File & Print | Storage & Backup | Point Appliances

- Siloed Applications, Departments, Information, Devices don't collaborate
- Complex, Heterogeneous Infrastructure driving Cost, Efficiency, Agility
- New developments driving additional demands on Infrastructure

Data Center Challenges Are Everywhere



"IT Runs the Business – Downtime is Not an Option"
"I Want to See More Business Value out of IT"

"Our Applications are the 'Face' of our Business"
"It's all About Keeping the Application Available"

- "As Long as My Servers Are Up I'm OK"
- "We Have Too Many Underutilized Servers"

"Our Information is our Business. We Need to Protect our Data Everywhere - in transit and at rest"

"I Can't Keep Up with The Amount of Storage that Needs to be Backed Up, Replicated and Archived "

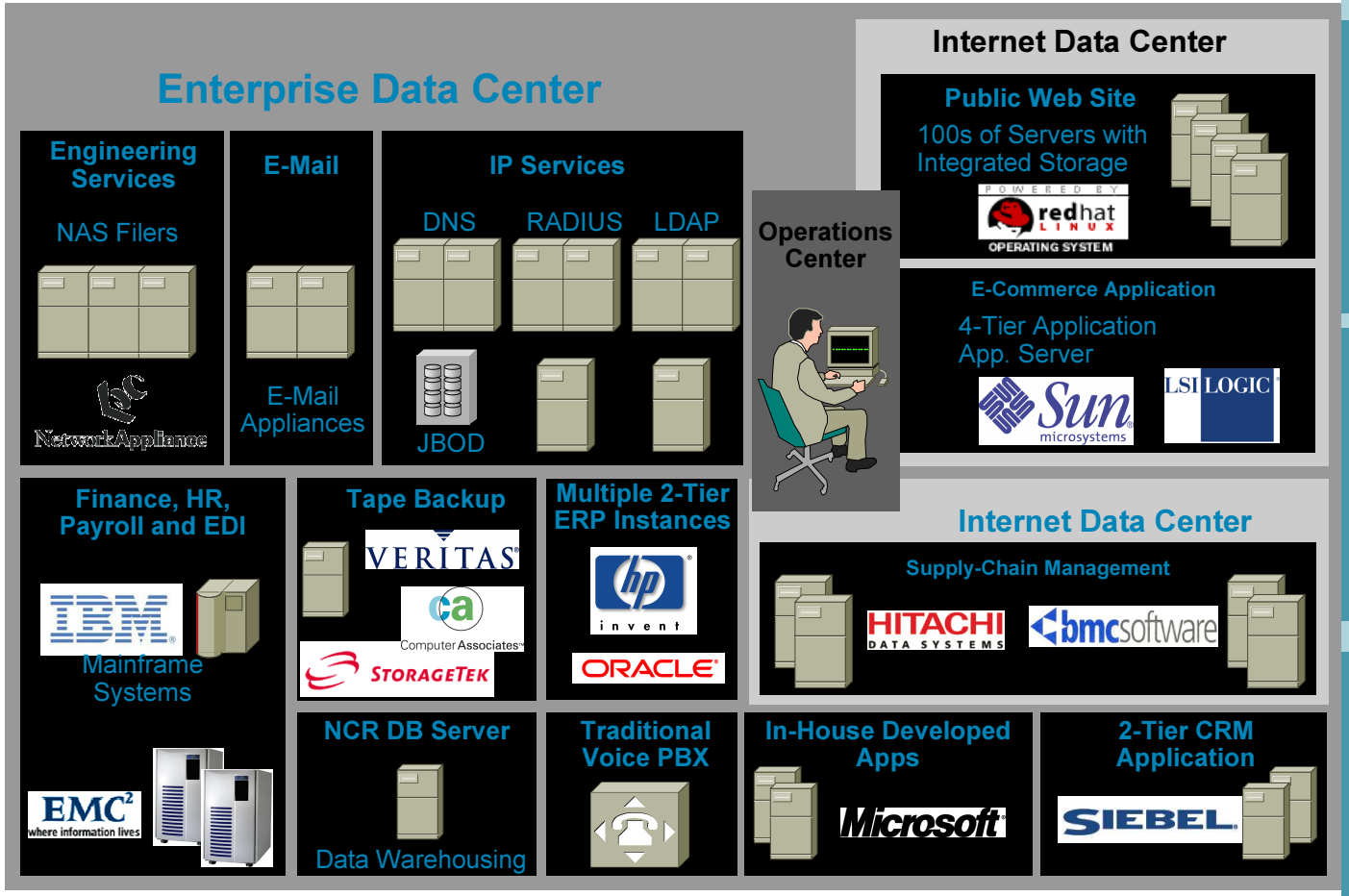
"I Need to Provide Lots of Bandwidth between Data Centers, and Make Sure Users Can Get to the Apps"

Tackling Business Challenges
Where to Invest?

70% of the IT Budget for *Maintenance*
30% Available for *Assets and Innovation**

***Source: Gartner - IT Infrastructure, And The Shift To "Real-Time" Feb, 2005**

The Typical Enterprise Data Center



Current Infrastructure

TCO

Under-utilized Resources

Operational Complexity and Inefficiency

RESILIENCE

Inconsistent Security

Inconsistent DR

AGILITY

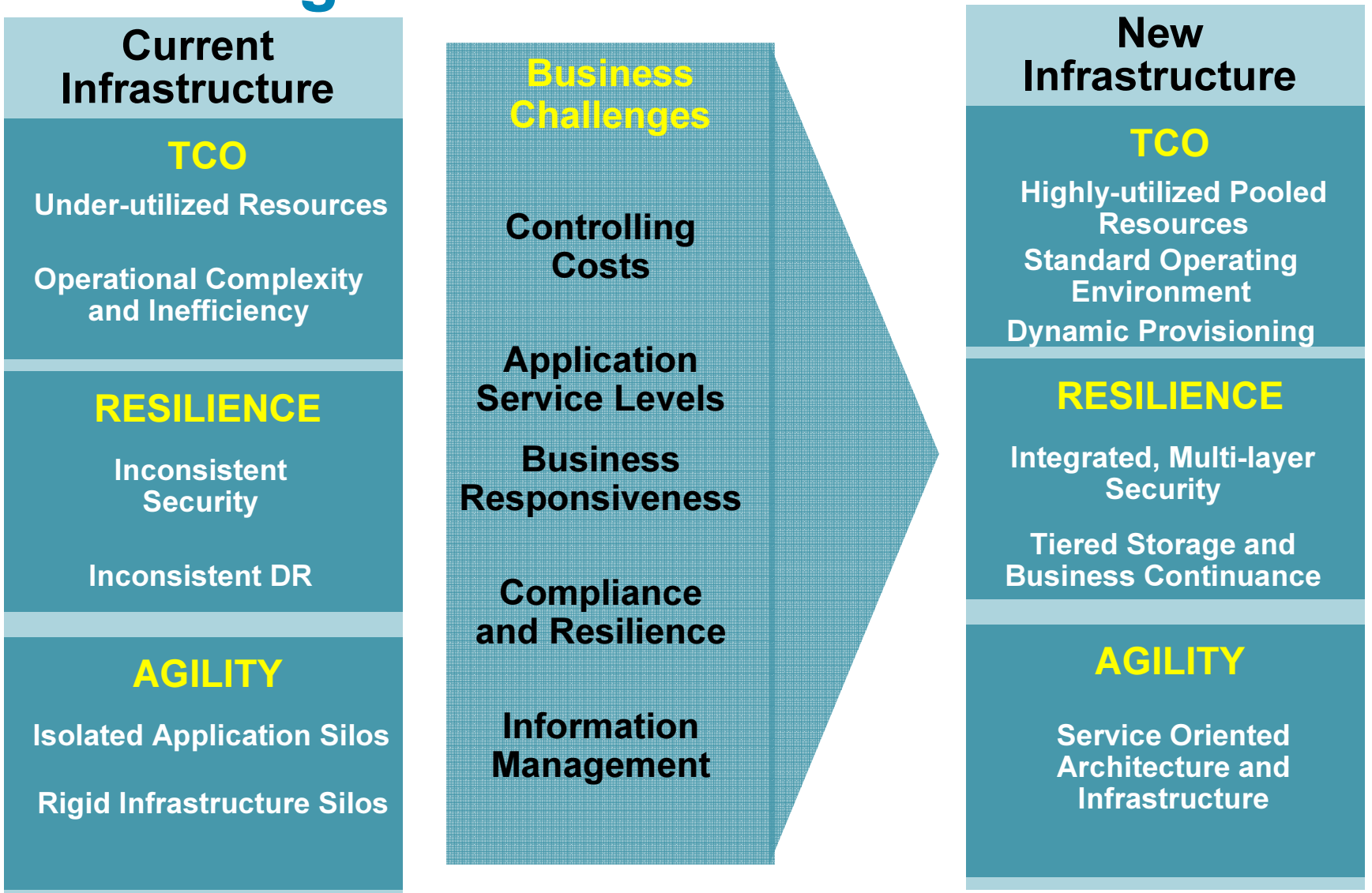
Isolated Application Silos

Rigid Infrastructure Silos

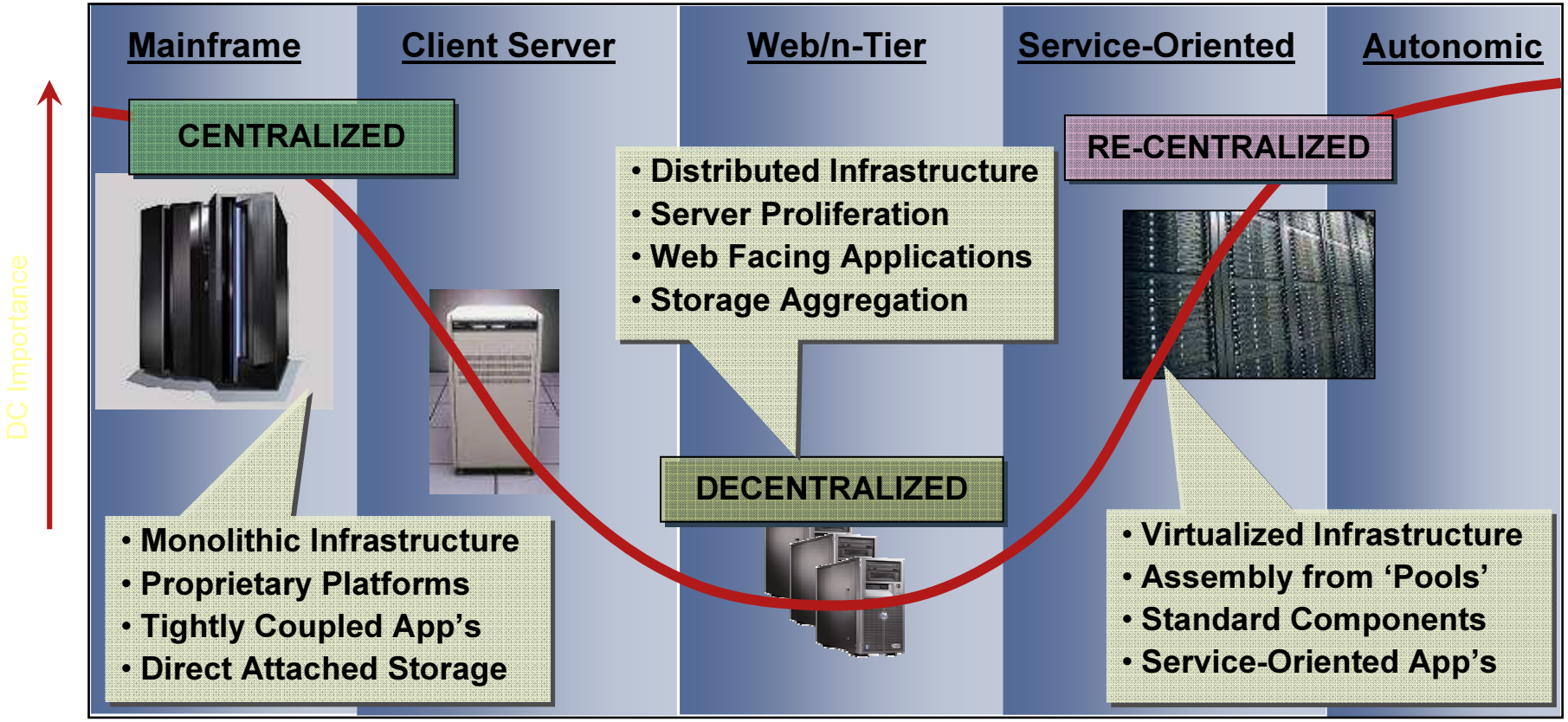
Major IT Challenges Today

IT Infrastructures (including Data Centers) Need to Evolve to Meet Today's Business Priorities

Key Data Center Infrastructure Challenges and Trends



The Data Center is Evolving (again)



Server-Centric → *New DC Infrastructure Requirements* → **Service-Centric**

Data Center Strategic Initiatives

Extend the Value of the Current Operational Model

- Lower Operating Costs
- Infrastructure Resilience
- Power and Cooling
- Application Delivery
- Holistic Security
- Compliance

Enabled by: Consolidation, Virtualization

Improve IT Effectiveness in the New Environment

- Event- and Policy-Driven Real-Time Infrastructure
- Unification of Components, Networks, Communications
- Streamlined Business Processes, IT as a Service

Enabled by: Integration, Automation

Where the Network is Going Today

Everything over IP

All Services Virtualized

Everything on Ethernet

All Devices Networked

Data Center Network Strategy and Evolution

Consolidation

Scale

Performance

Density

Availability

Operational Manageability

Investment Protection

Virtualization

- Immediate Power Savings
- Service Velocity
- Opex Alignment
- Capital Asset Utilization Improvement

Integration

- Single Unified Network Fabric
- Real-Time Provisioning Capabilities
- Data Center Class Platforms
- Integrated Services

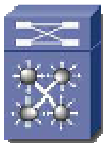
Automation

- Net-Centric Server Evolution
- Virtual Machine Integration
- Inline Data Protection
- Separation of Policy and Forwarding

How Can the Network Help?

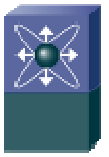
Consolidation → **Results**

Server



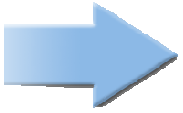
Highly Available and
Modular Switching Platforms

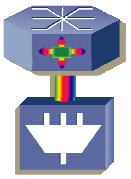
Storage



Director and Fabric-Class
FibreChannel Switches with
Intelligent Fabric Services

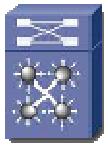
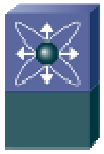
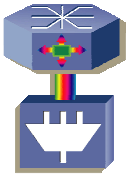
Data Center
Facilities





Optical and WAN Networking to
extend distance and link facilities

Enterprises are Already Seeing Results

Network Enabler	Results…
 Highly Available and High Density Switching Platforms	AIG Reduced the number of servers while driving utilization to >80%
 Director and Fabric-Class FibreChannel Switches with Intelligent Fabric Services	Over a petabyte of online storage added in FY2005 while reducing the storage budget by $10M TCO per GB of Storage improved by 70%
 Optical and WAN Networking to extend distance and link facilities	HP announced DC Consolidation of 85 Facilities to 6. Projected over $1B in savings. Stock Valuation rose 4% on the news.

The Network is Ready for the Journey

Consolidation → **Virtualization, Integration, Automation**

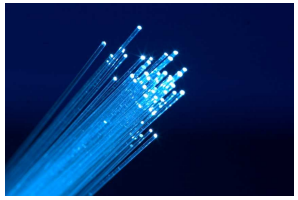
Server → Virtual Machines

Storage →

Virtual SANs
Storage Volume Virtualization
Virtualized Fabric Services

Data Center Facilities →

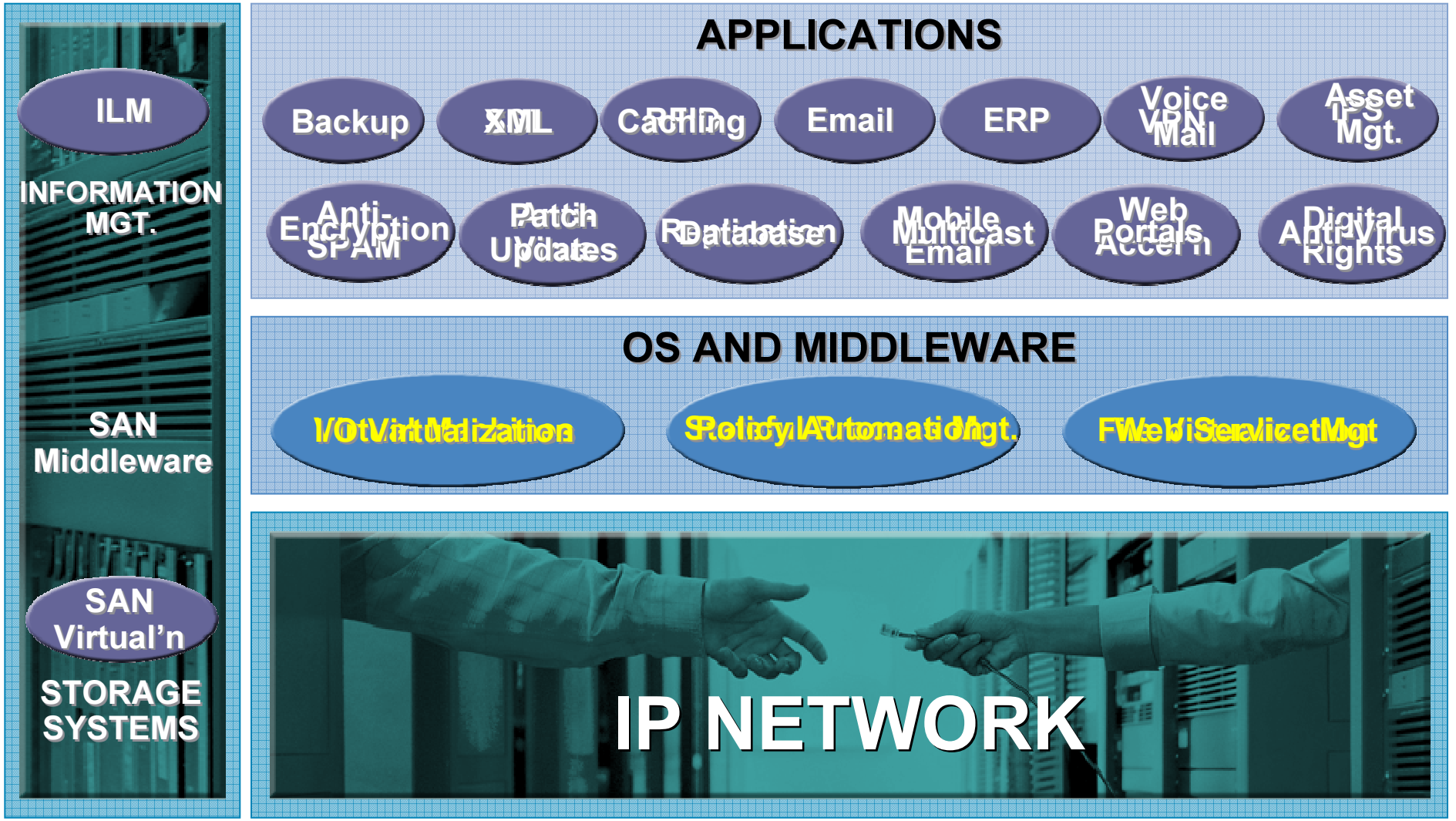
Active-Active Online Facilities
Service Transparency



Network →

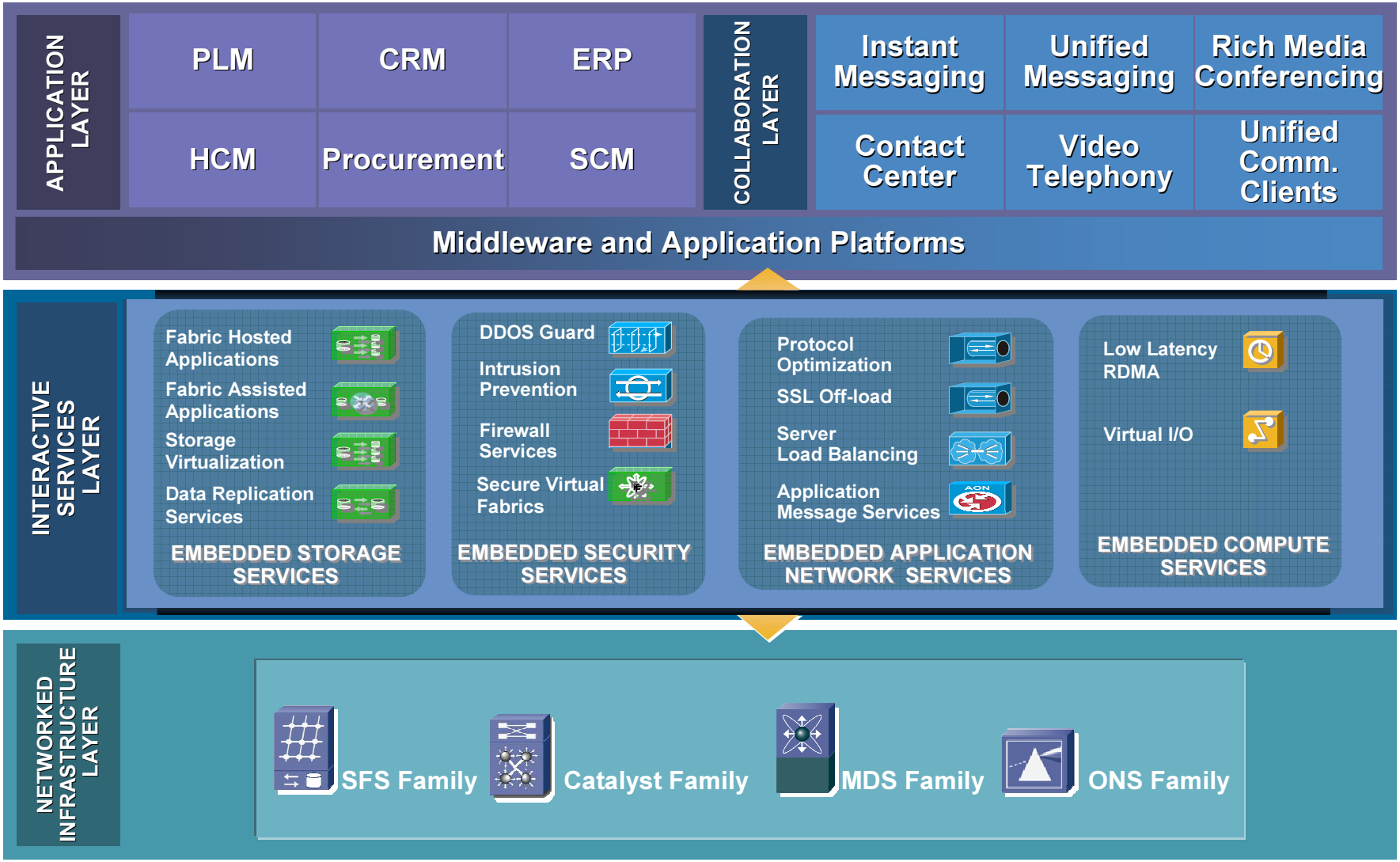
DC-Class Systems
Unified Network Fabric – Core/Edge
Dynamic Network Server/Service Provisioning

Migration into the Network is not New

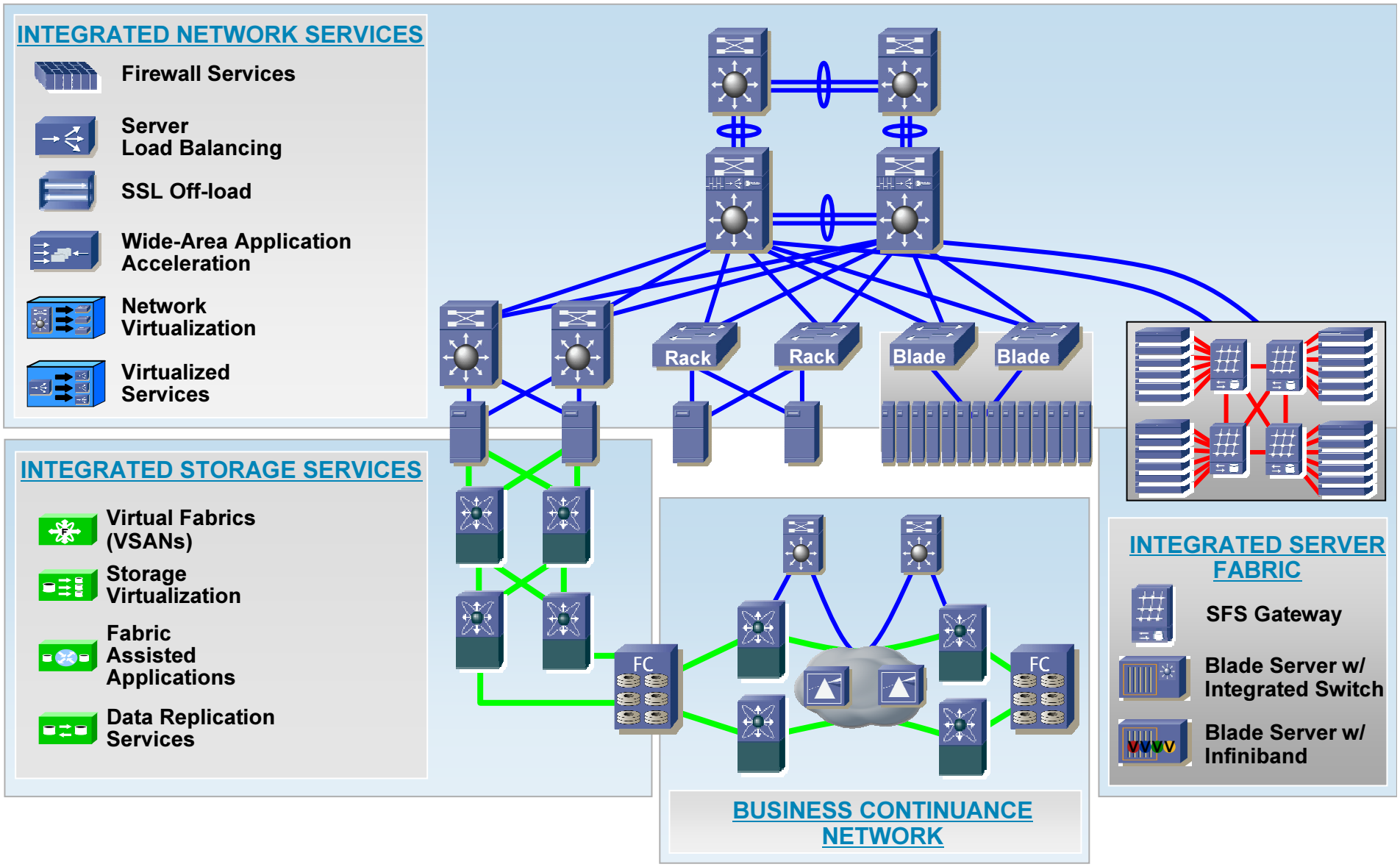


Taking a Solutions Approach

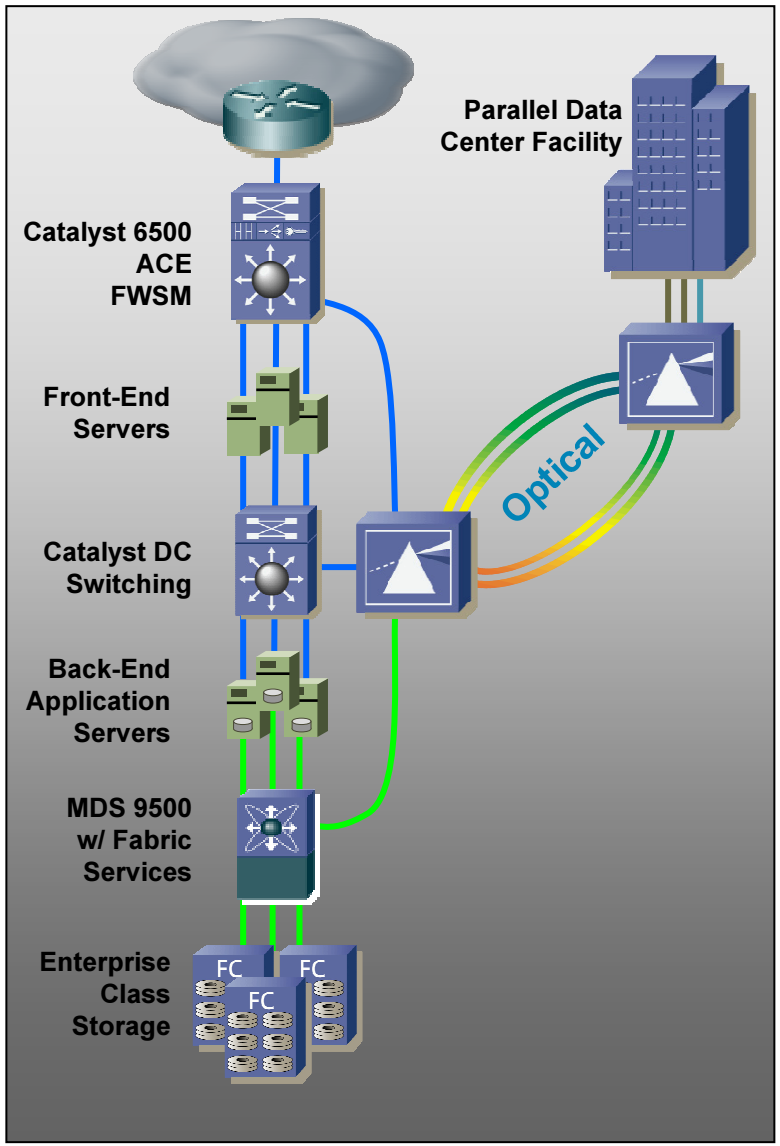
The Data Center is a Proof Point for SONA



End to End Data Center Systems/Solutions



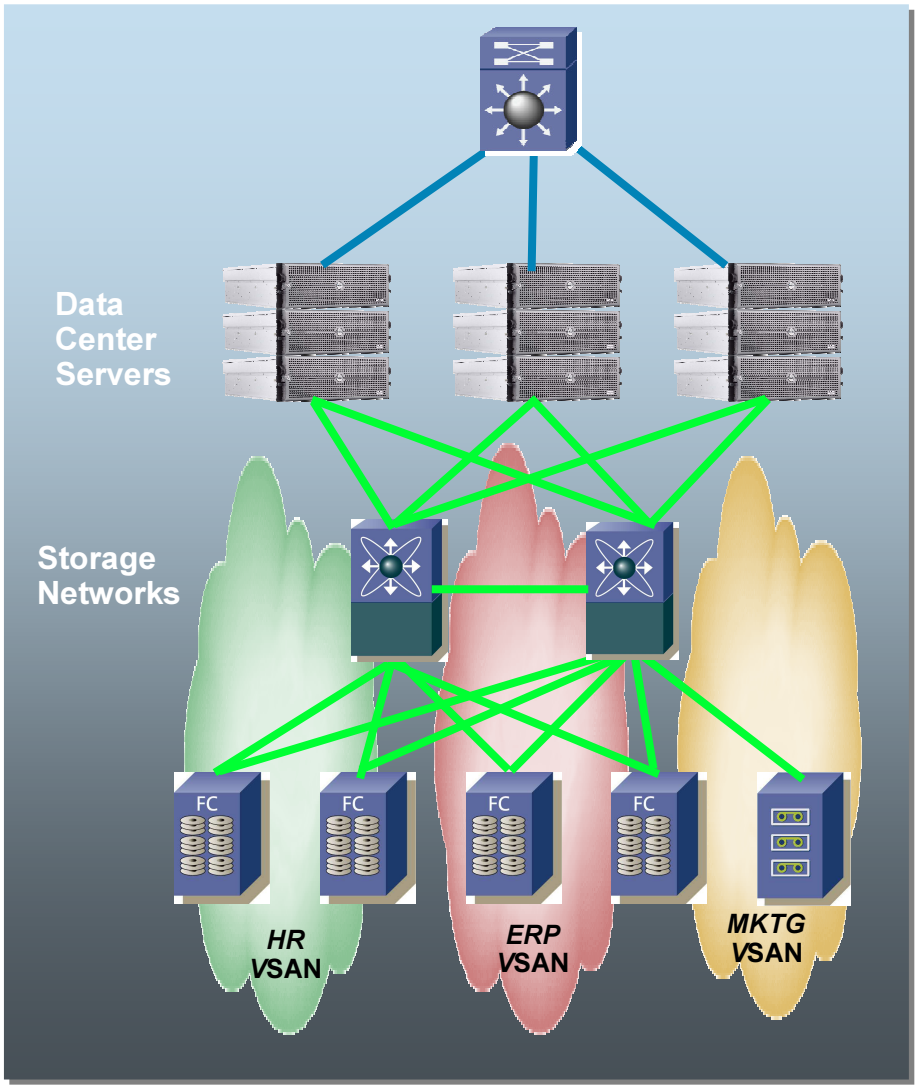
End-to-End Business Continuance Solution



Customers Are Moving to an Active-Active Architecture Wherever Practical

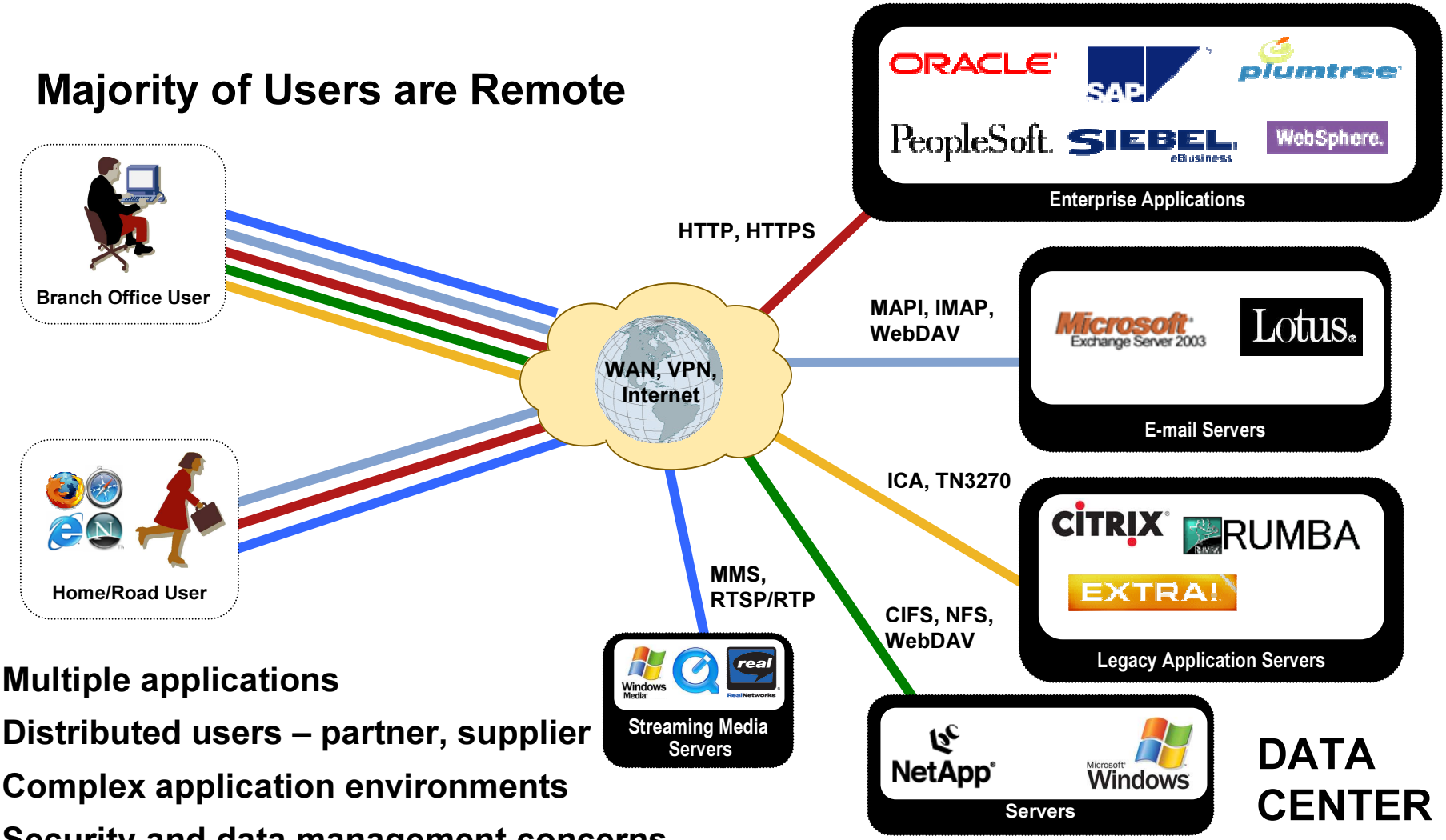
- **Any to Any Recovery**
- **Scales Across Segments and Customer Types**
- **Certified Low Risk Approach**

SAN Storage Consolidation & Virtualization



- Storage Networks allow sharing and Consolidation of Disc & Tape across multiple servers
- Utilization increased to ~50%
- Leads to SAN Proliferation and 'Islands' based on capacity
- Virtual SANs (VSANs) allow the further consolidation and virtualization of SAN islands into a large common resource pool
- Utilization increases to ~70%

Application Delivery
Cisco Application Optimization



- Multiple applications
- Distributed users – partner, supplier
- Complex application environments
- Security and data management concerns

Cisco Application Networking Services

Branch/WAN Services

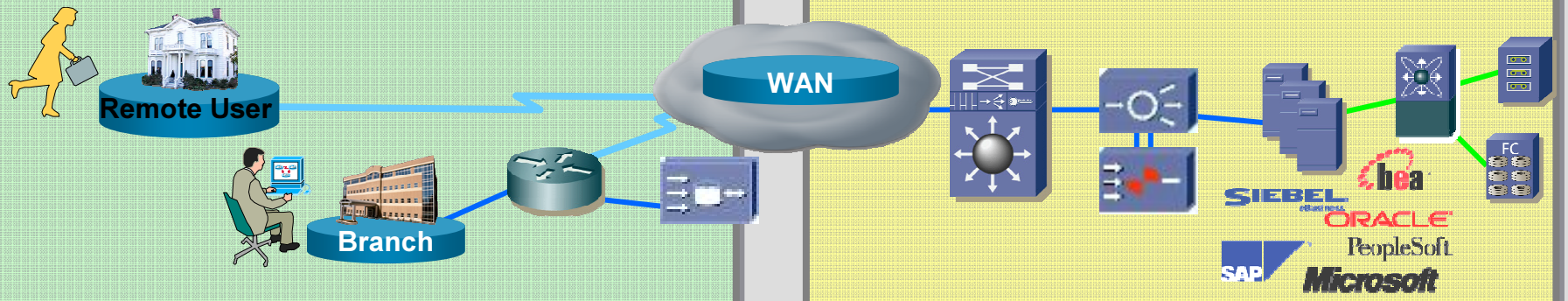
WAN Optimization

- Complete WAN optimization and application acceleration
- Enables branch server and storage consolidation
- Deployed in branch and the Data Center

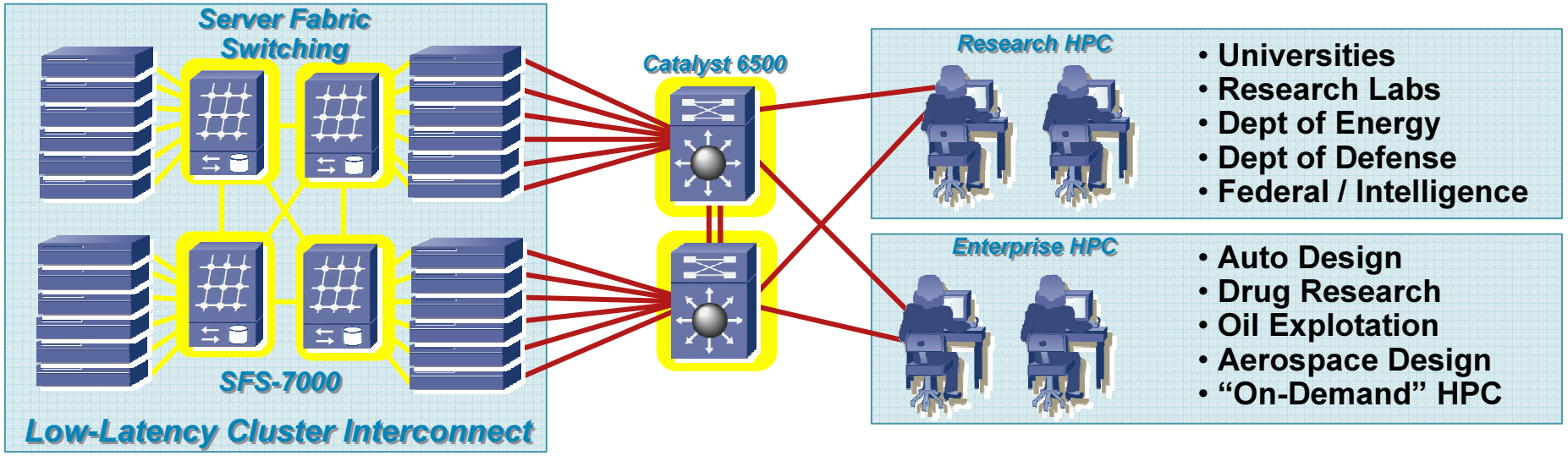
Data Center

Application Services

- Data center-based application acceleration
- Server off-load and reduced bandwidth usage
- Maximum availability and minimum time-to-service



Cost Effective High Performance Computing
Solution: Standards-based High Performance Computing



Lower Cost High Performance Computing

- High performance, low latency, low cost interconnect - Infiniband and/or Gigabit Ethernet
- Proven scalability to 4000 nodes
- Standards-based
- Servers transparently replaced for continuous operation
- Prove interoperability with major server vendors

Getting the Journey Started

Data Center Networking Action Plan

- **Decide on the end-state data center:**

  What should the data center be in five years?

- **Identify main immediate challenges and initiatives:**

  Consolidation, business continuance, virtualization, on-demand, etc.

- **Develop data center networking strategy:**

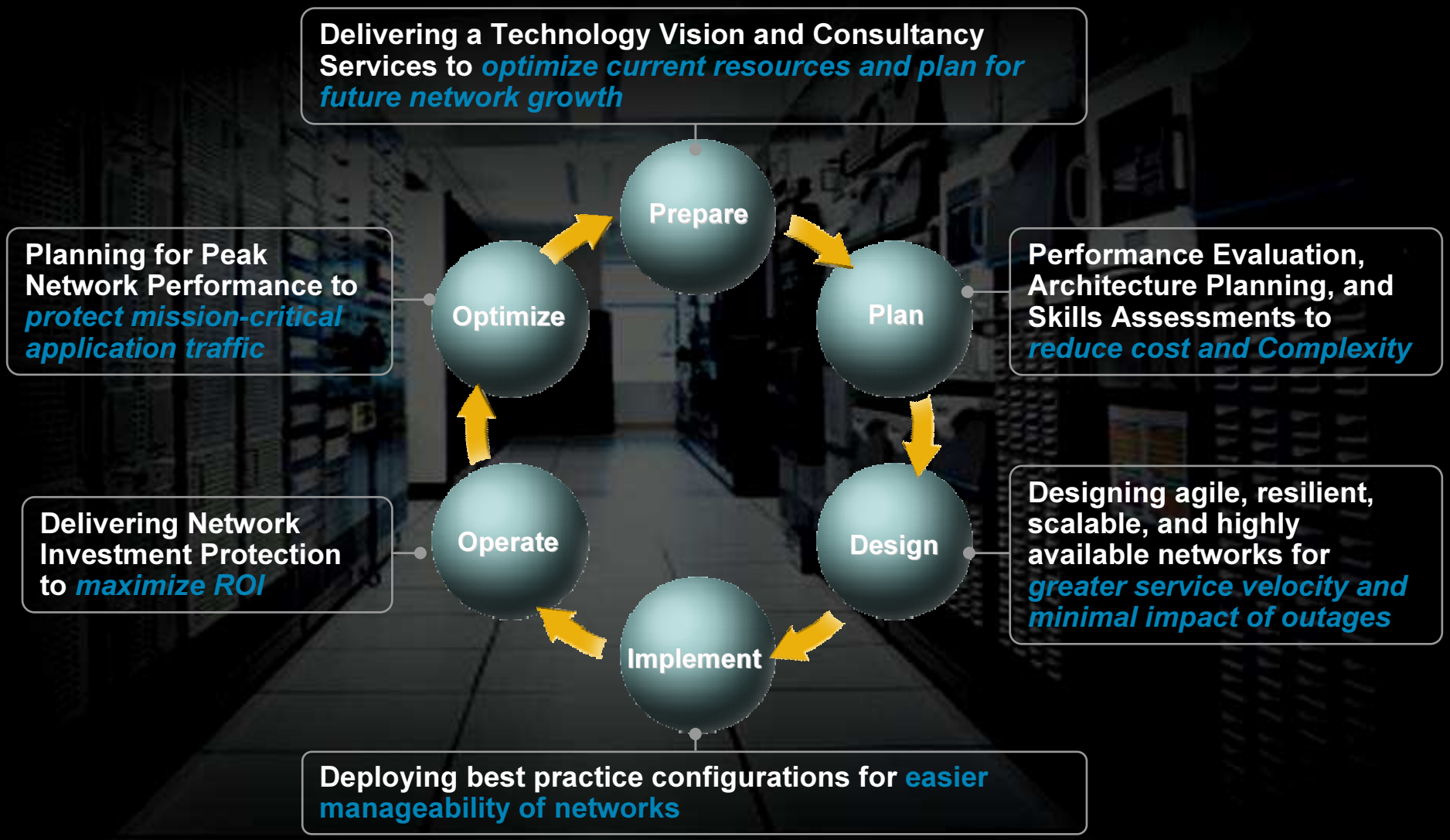
  Data center and network stakeholders engage

  Supports data center short- to long-term goals and initiatives

- **Engage with Cisco and partners:**

  Plan, design, deploy, implement, operate and optimize

Data Center Networking Lifecycle Services



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Questions?

http://www.cisco.com/go/datacenter