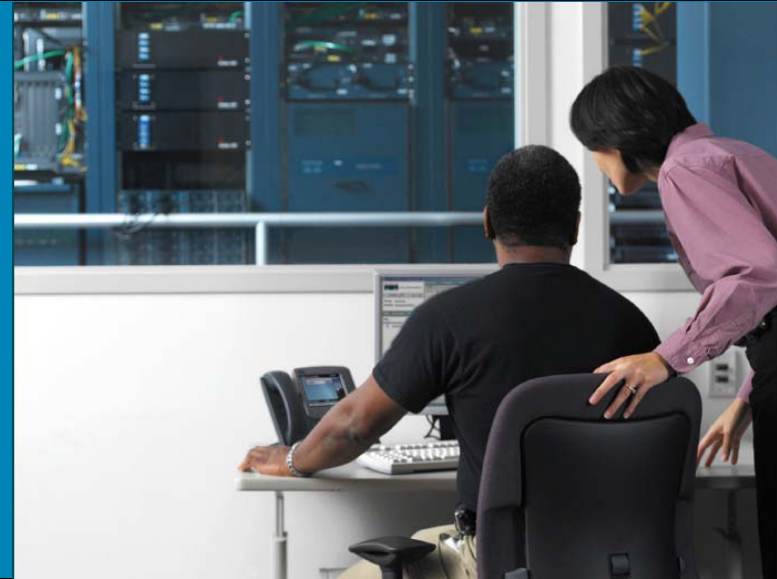




The Benefits of an Integrated Data Center Network Architecture

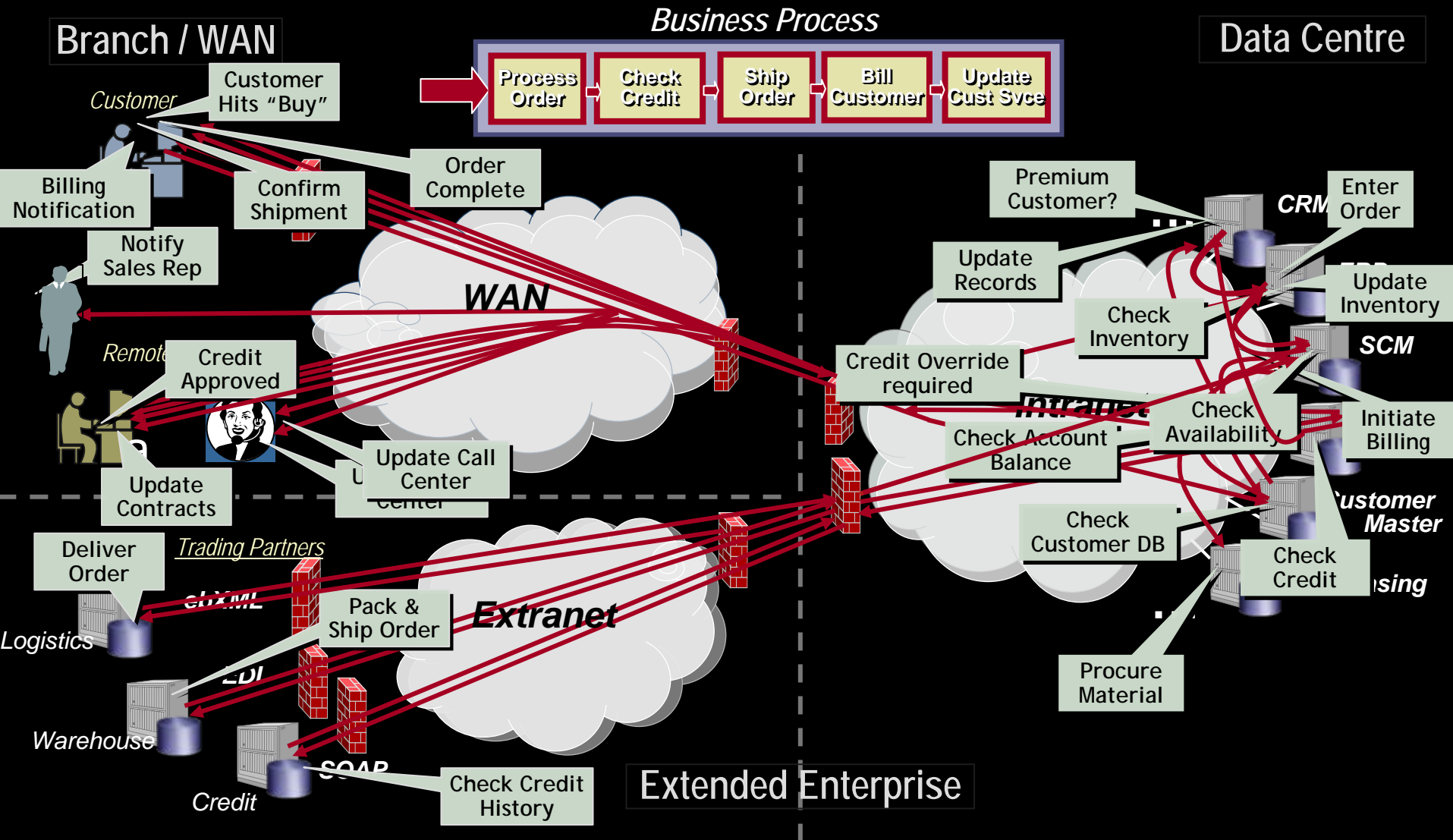


Baruch Deutsch

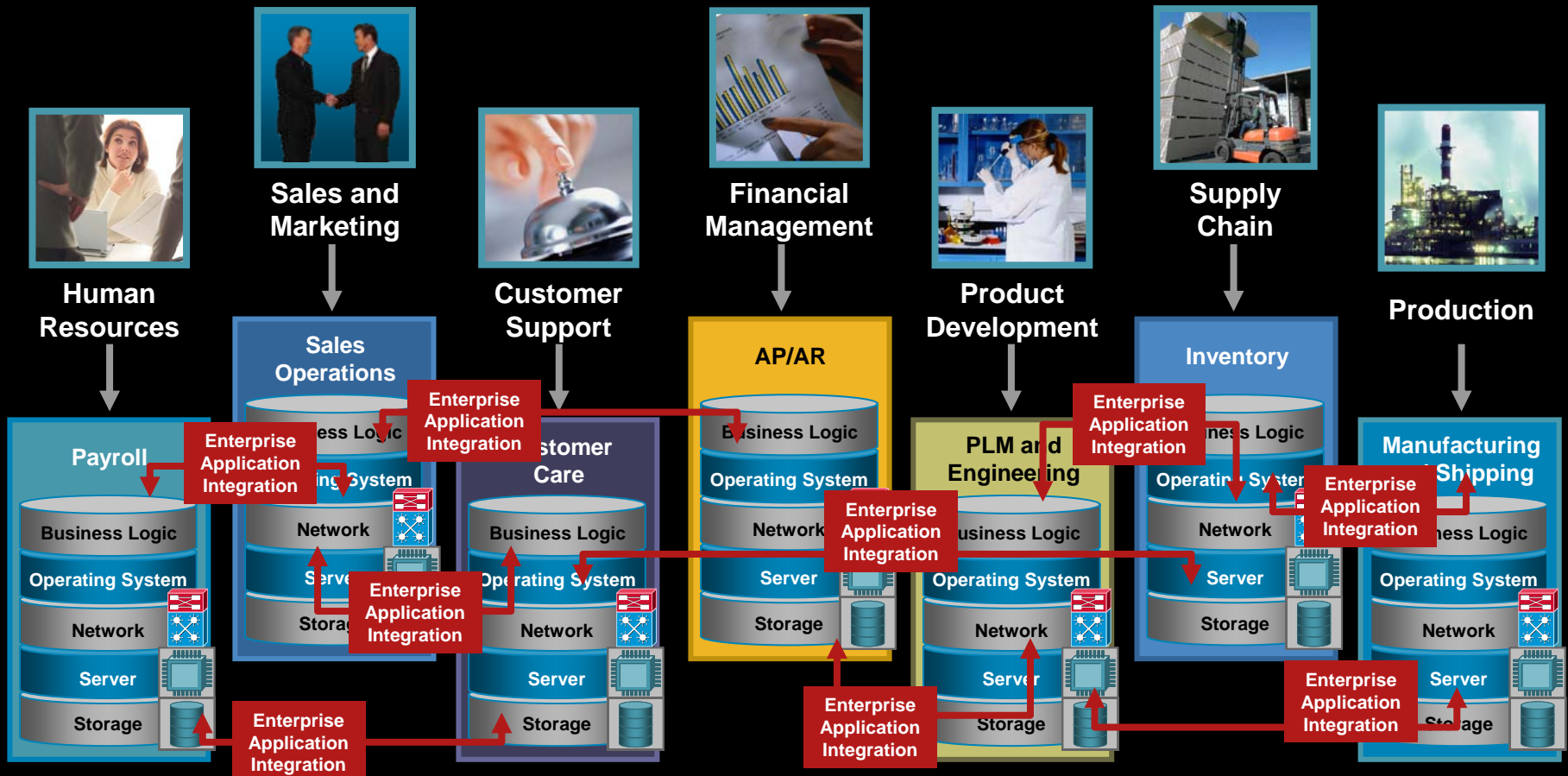
Director, Product Marketing

Cisco Systems

Today's Business Processes are Complex



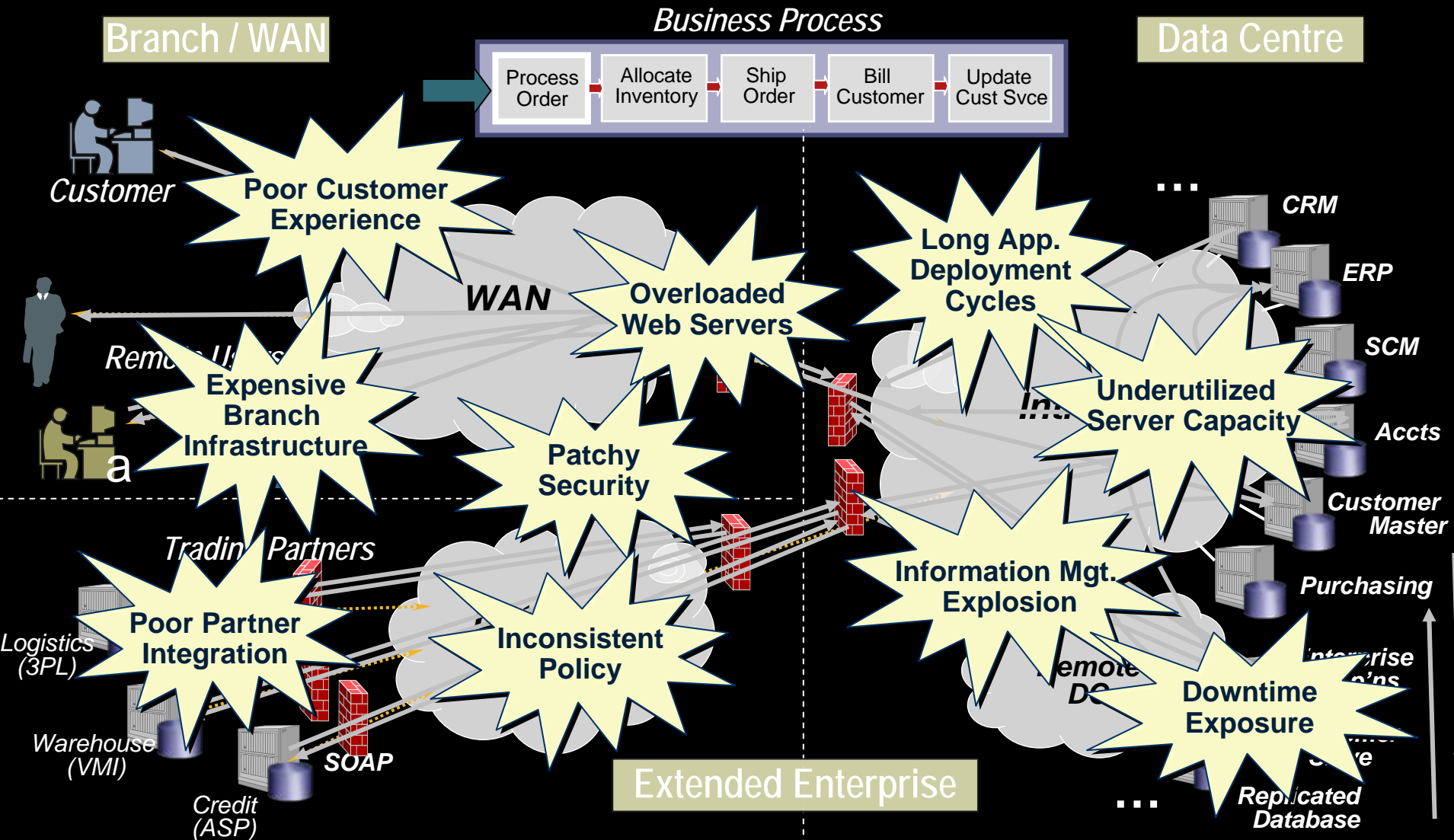
Making IT Infrastructure more Complex



Business, Application, Infrastructure and Information Silos
Applications Integrated via Multiple Complex Proprietary Interfaces
43% of IT departments are regularly unable to make requested changes*

* Source: CIO Insight, December 2005

Causing both IT and Business Challenges



Common Data Center Challenges



“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”

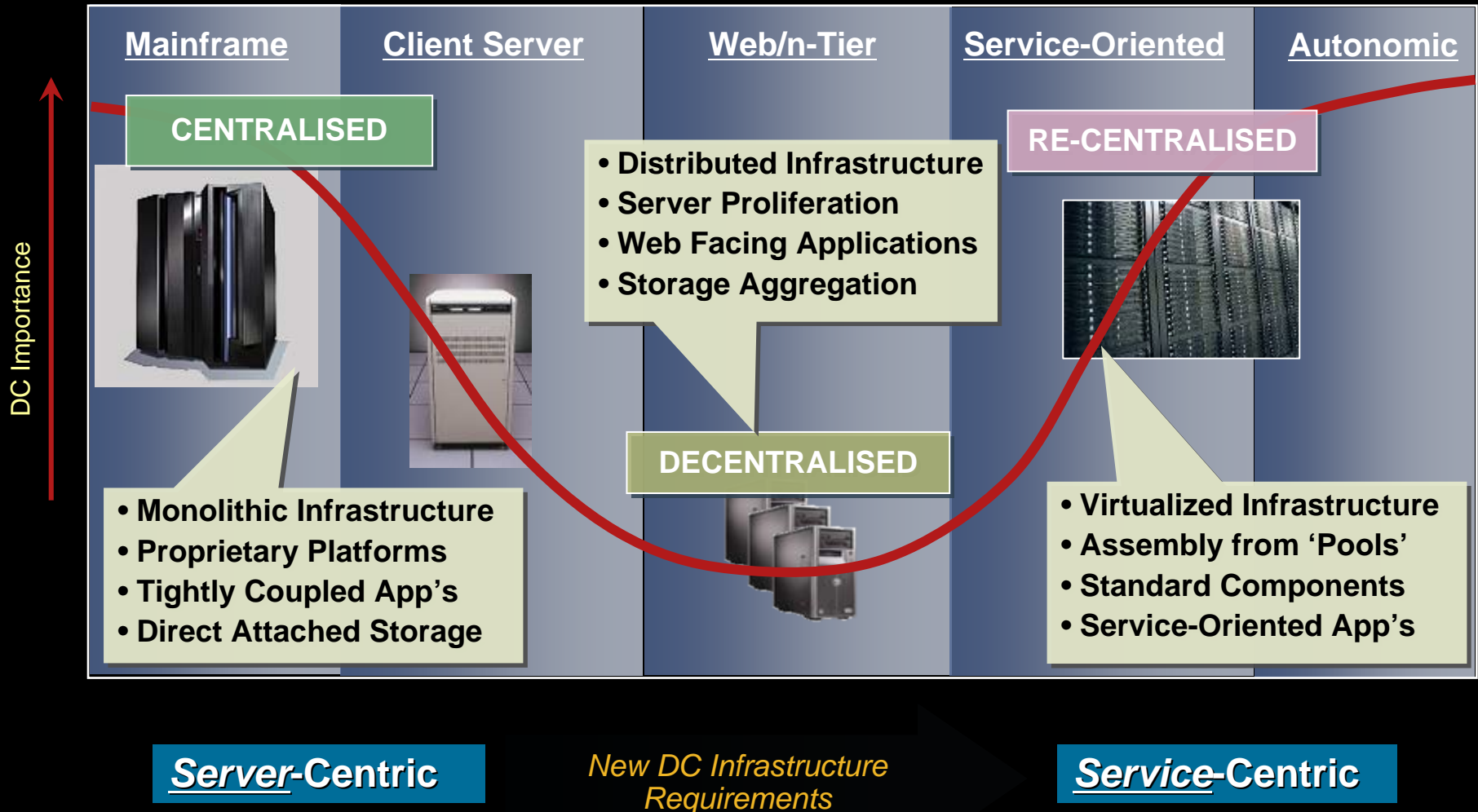
- **“As Long as My Servers Are Up I’m OK”**
- **“We Have Too Many Underutilized Servers”**

“Our Information is our Business. We Need to Protect It 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”**

The Data Center is Evolving (again)



Data Center Strategy and Evolution

Consolidation



- Scale
- Performance
- Density
- Availability
- Investment Protection

Virtualization



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

Automation



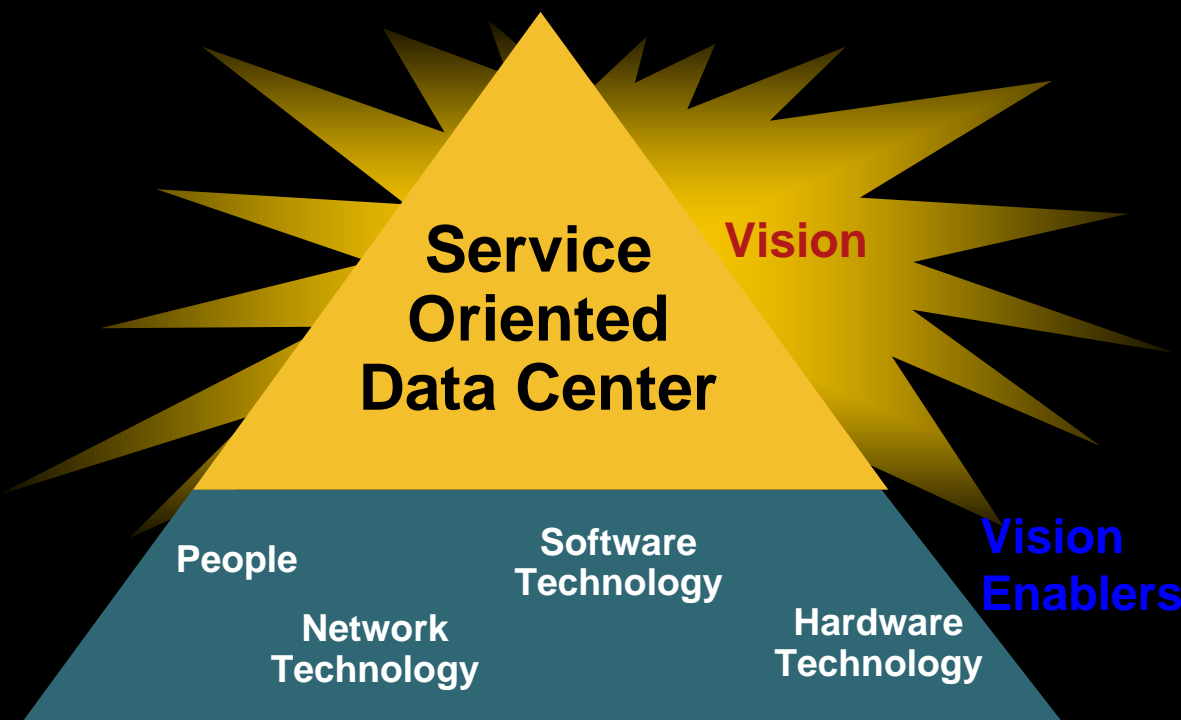
- Net-Centric Server Evolution
- Virtual Machine Network Coupling
- Simplified Provisioning

Unified Network Fabric
Integrated Provisioning

**Innovation
and
Integration**

Data Center Class Platform
Integrated Services

Cisco IT Data Center Vision ...



- Intelligent Management Fabric for easy management
- On demand utilities
- Rapid delivery of services
- Optimization of storage, servers and applications
- End to end security

Target State

A highly **automated, services based, secure, virtualized** pooled infrastructure where resources are allocated across an **Intelligent Network Fabric** founded on structured **policies** that enable tight alignment with business goals.

The Network has Inherent Qualities for Shared Infrastructure Services

The network Ubiquitous



The network promotes Standards



The network provides Scale



- Pervasive location
- Inherently distributed and federated design
- Ultimate policy enforcement point
- “Single View” centrally

- Neutral
- Drives or brokers standards adoption
- Lower TCO than proprietary choices
- Wide adoption

- Vertical scaling (high performance)
- Horizontal scaling (virtualization)
- Transparent and non-invasive to Endpoints

Key Data Center Network Operational Objectives

- **Create and Maintain a Data Center-class Network**

 - Maintain and track service levels – application/transaction-level

 - Reduce downtime and rapid recovery

- **Reduce Complexity and Cost**

 - Simplify operation of data center network

 - Automate low-level operations

- **Enable Change and Business Alignment**

 - Provisioning of network services in timely, coordinated, risk-free manner

 - Align network provisioning with compute and storage provisioning







- **Support Compliance**

 - Consistent, coordinated execution within defined compliance policies





 - Change management and audit

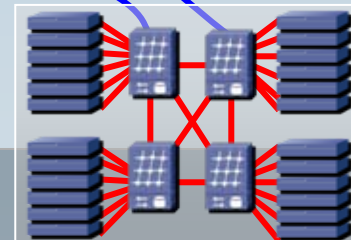
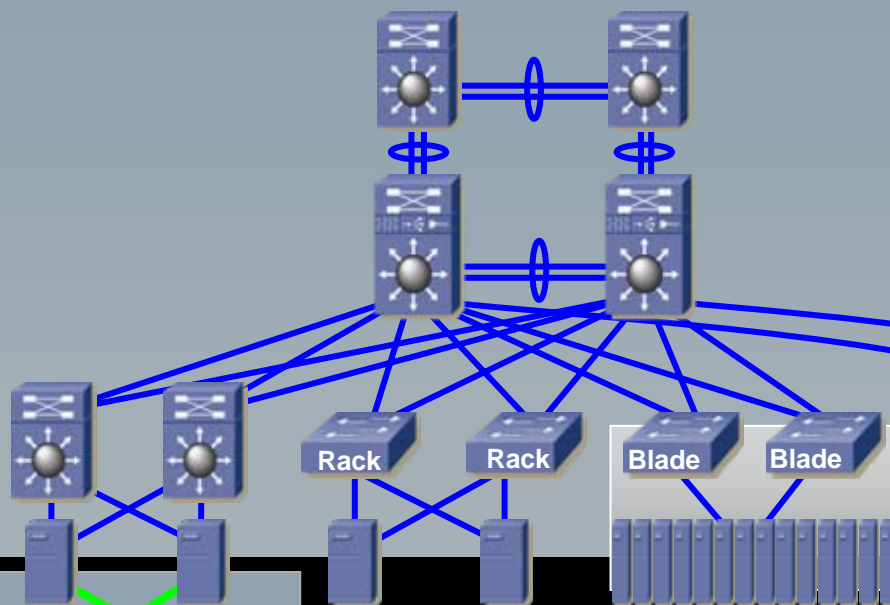
Comprehensive Data Center Network Solutions

INTEGRATED NETWORK SERVICES


-  Firewall Services
-  Server Load Balancing
-  SSL Off-load
-  Application Optimization
-  Network Virtualization
-  Virtualized Services

INTEGRATED STORAGE SERVICES

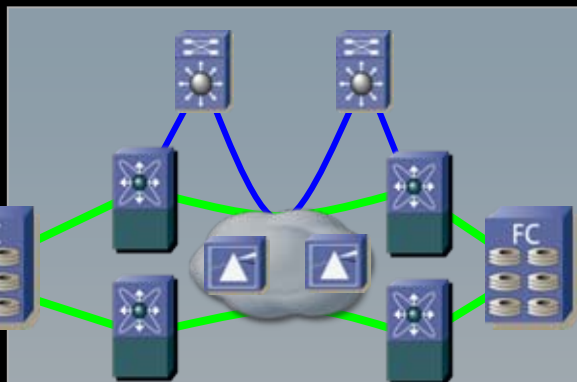
-  Virtual Fabrics (VSANs)
-  Storage Virtualisation
-  Fabric Assisted Applications
-  Data Replication Services



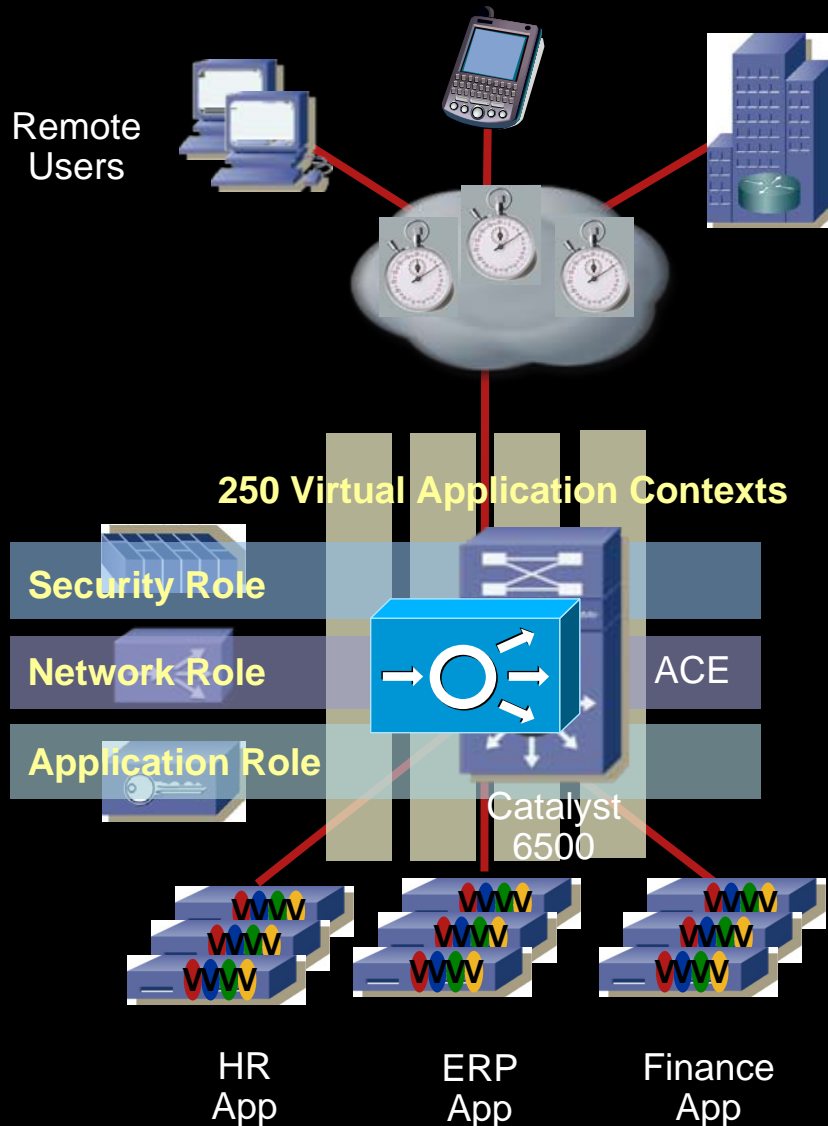
INTEGRATED SERVER FABRIC

-  SFS Gateway
-  Blade Server w/ Integrated Switch
-  Blade Server w/ Infiniband

BUSINESS CONTINUANCE NETWORK



Network Service Virtualization: An Example



Operational Control

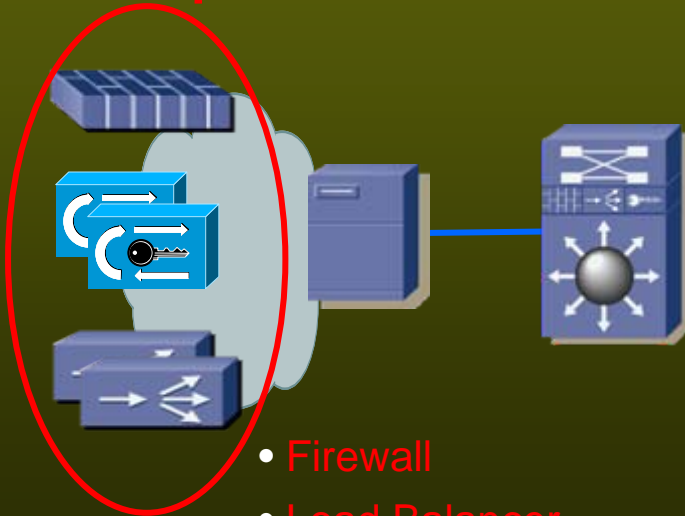
- Combined Load Balancing, SSL offload, Firewall + more
- Role Based Access Control
- Virtual Application Partitions
- Rapid Deployment, Problem Detection and Resolution

Virtualization Reduces Power Consumption Through Service Density

Design Efficiency

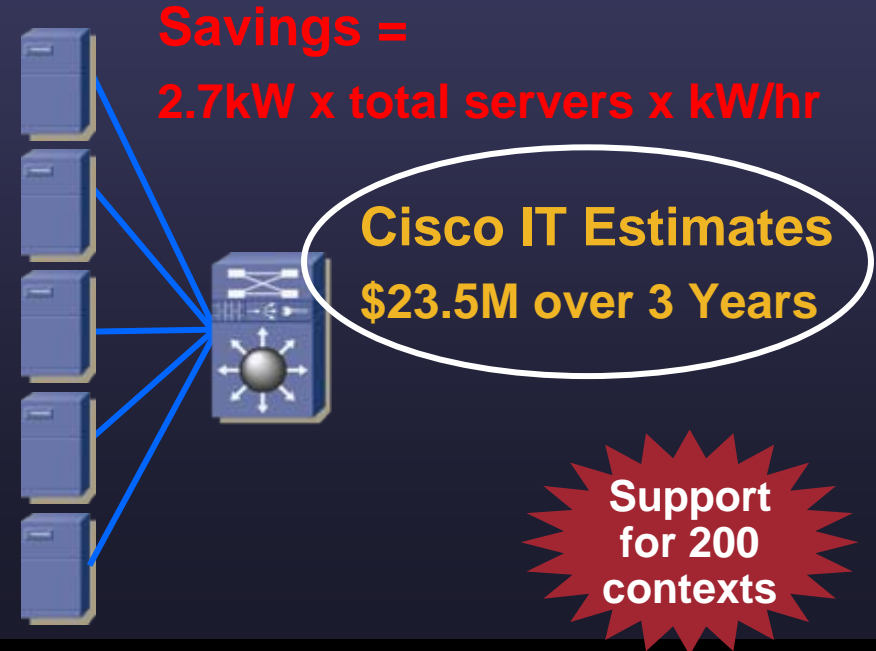
Application servers typically have multiple appliances associated with them. For Cisco IT this equaled an additional

2.7kW per server



- Firewall
- Load Balancer
- SSL Offload

Virtualized Service Modules deployed in a Catalyst 6500 eliminate multiple appliances and their associated load



Savings =

2.7kW x total servers x kW/hr

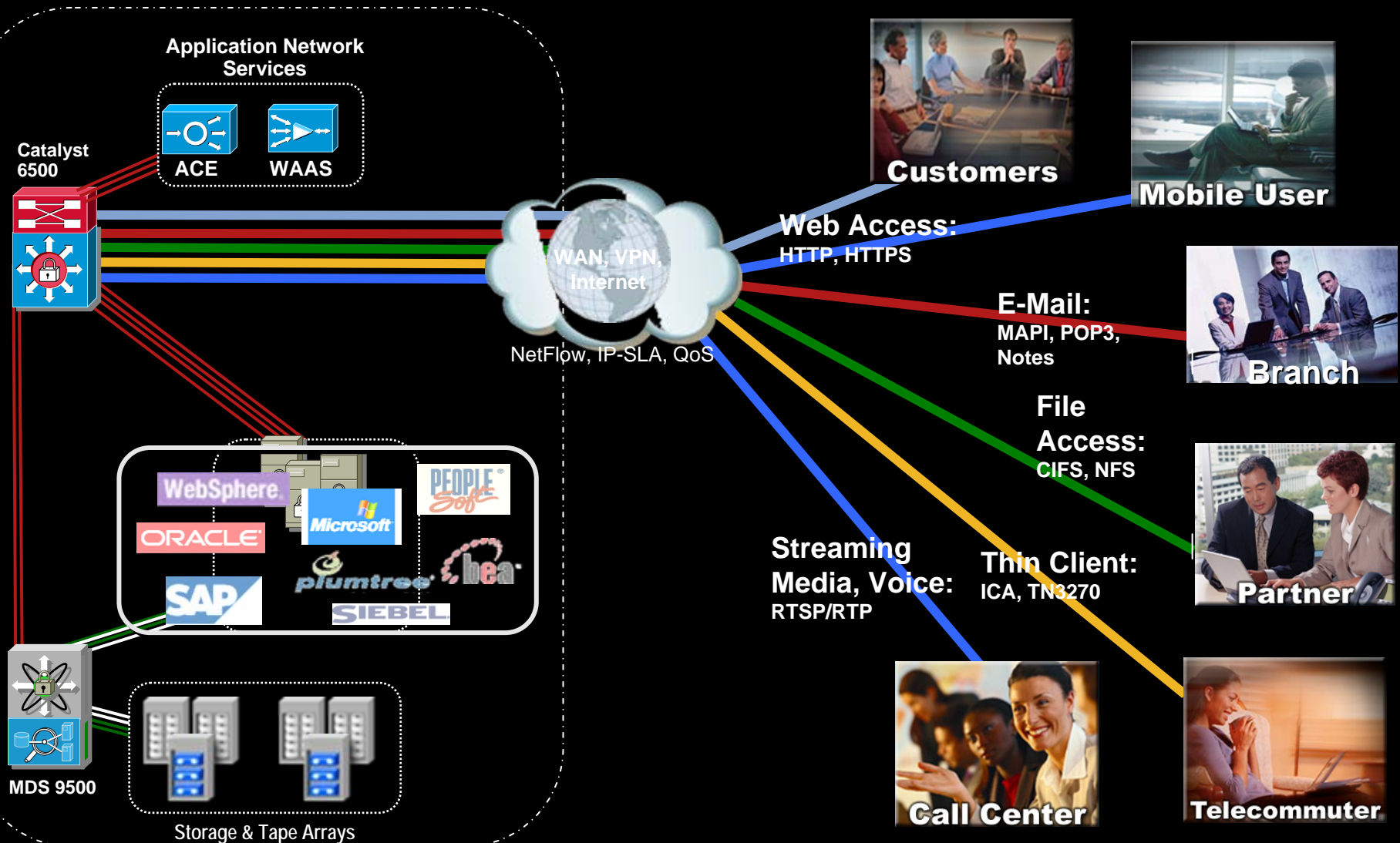
**Cisco IT Estimates
\$23.5M over 3 Years**

**Support
for 200
contexts**

Reduces complexity, increase manageability, reduces latency, and eliminates single points of failure

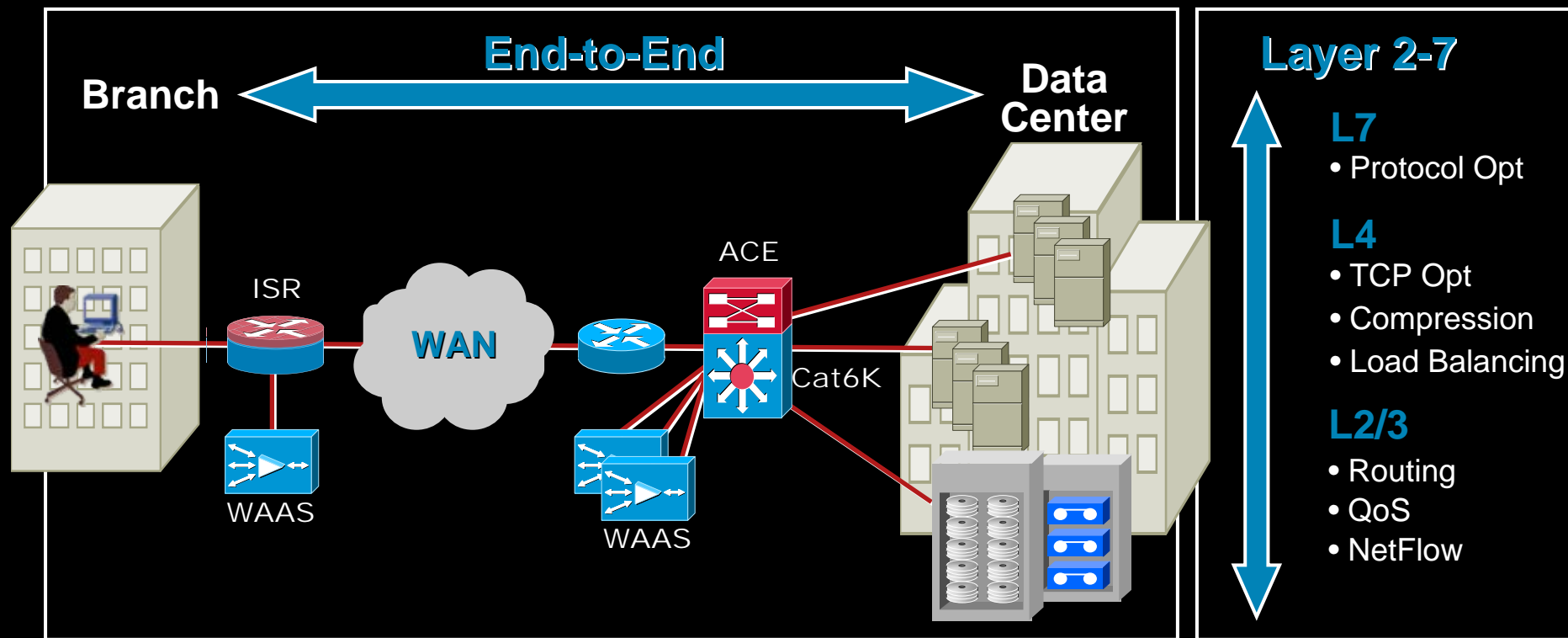
The Data Centers is Accessed by All Users

Majority of Users are Remote...



End-to-End Application Delivery

From Data Center through the WAN into the Branch



WAN Optimization (WAAS)

- Protocol Optimization
- Compression & Redundancy Elimination
- TCP Flow Optimization

Wide Area Network (IOS)

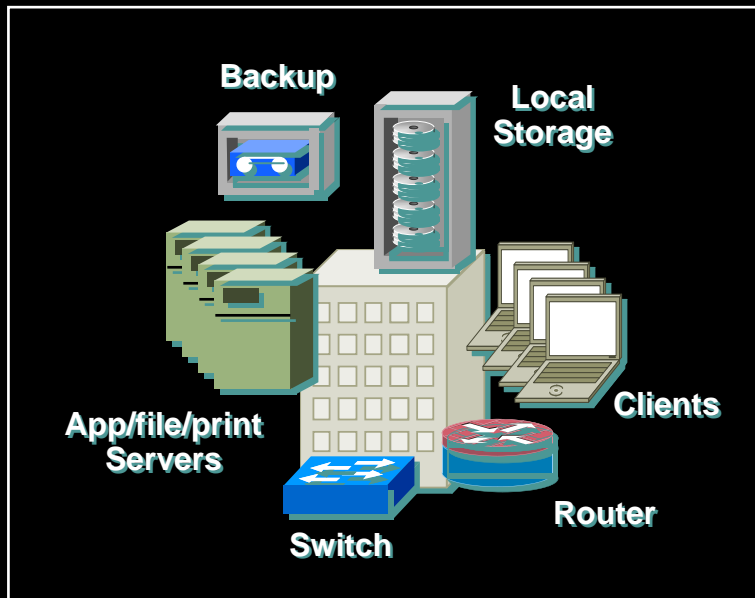
- Classification
- Shaping & Prioritization (QoS)
- Performance Monitoring

Application Switching (ACE)

- Server load-balancing
- Server Offload (SSL, TCP)
- Server and Application Monitoring

Branch Consolidation: The Next Frontier

Today's Branch Office



Companies spend 6 Billion dollars per year on branch servers, storage, backup and management

Source: IDC, Gartner, Cisco Analysis

“Most enterprises have many servers running at 15% or less utilization, but still requiring 100% administration.” Source: Gartner

The average branch has 4-6 servers

Source: Nemertes Research

■ **Infrastructure Cost & Complexity**

Poor resource utilization: Servers, Direct Attached Storage, etc

High CAPEX: File, print and email servers

High OPEX

■ **Business Responsiveness**

Poor end user experience

Bandwidth & throughput limitations

■ **Business Resilience**

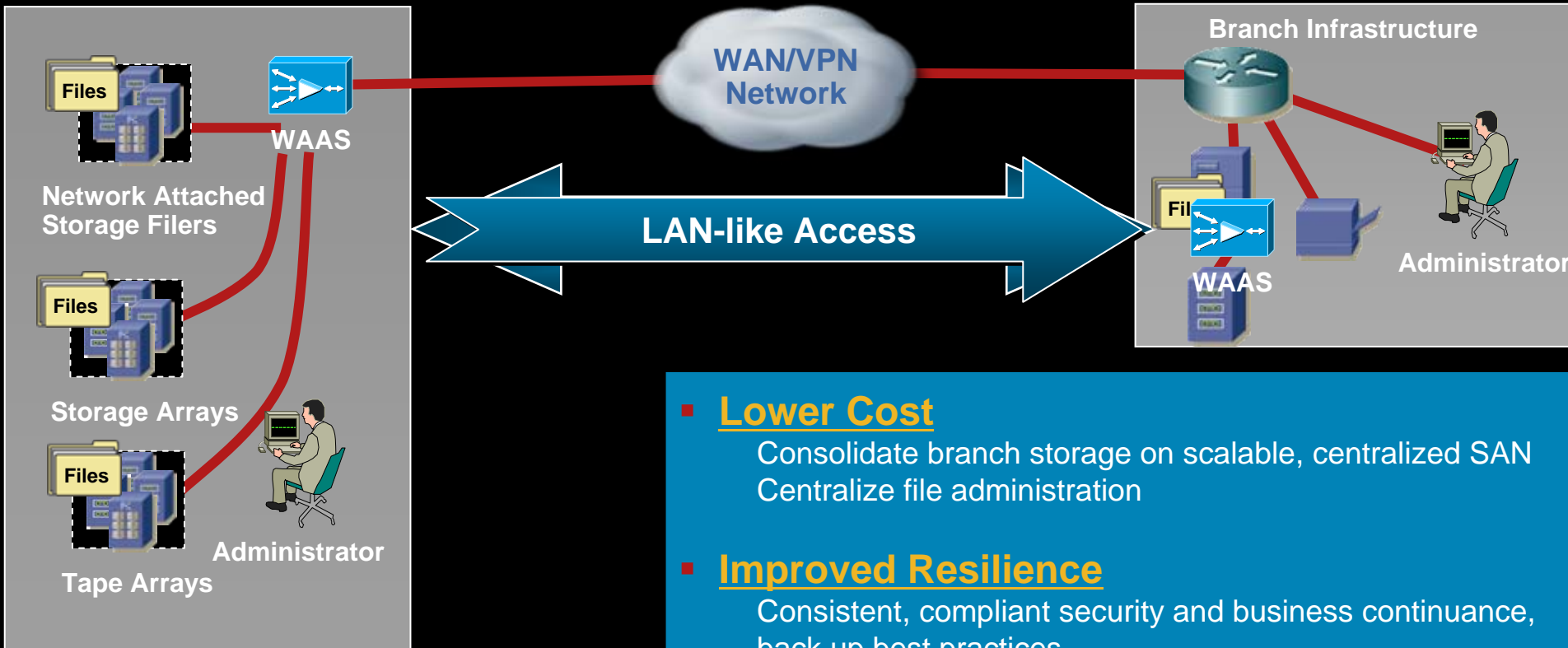
Costly Offsite Archival & Document Management

Asset (Data) protection: backups, data security & integrity

Complex Governance & Compliance

Application & OS patch management

New Approach: The Consolidated Branch Provisioning Data Center Services to the Branch



■ Lower Cost

Consolidate branch storage on scalable, centralized SAN
Centralize file administration

■ Improved Resilience

Consistent, compliant security and business continuance,
back up best practices

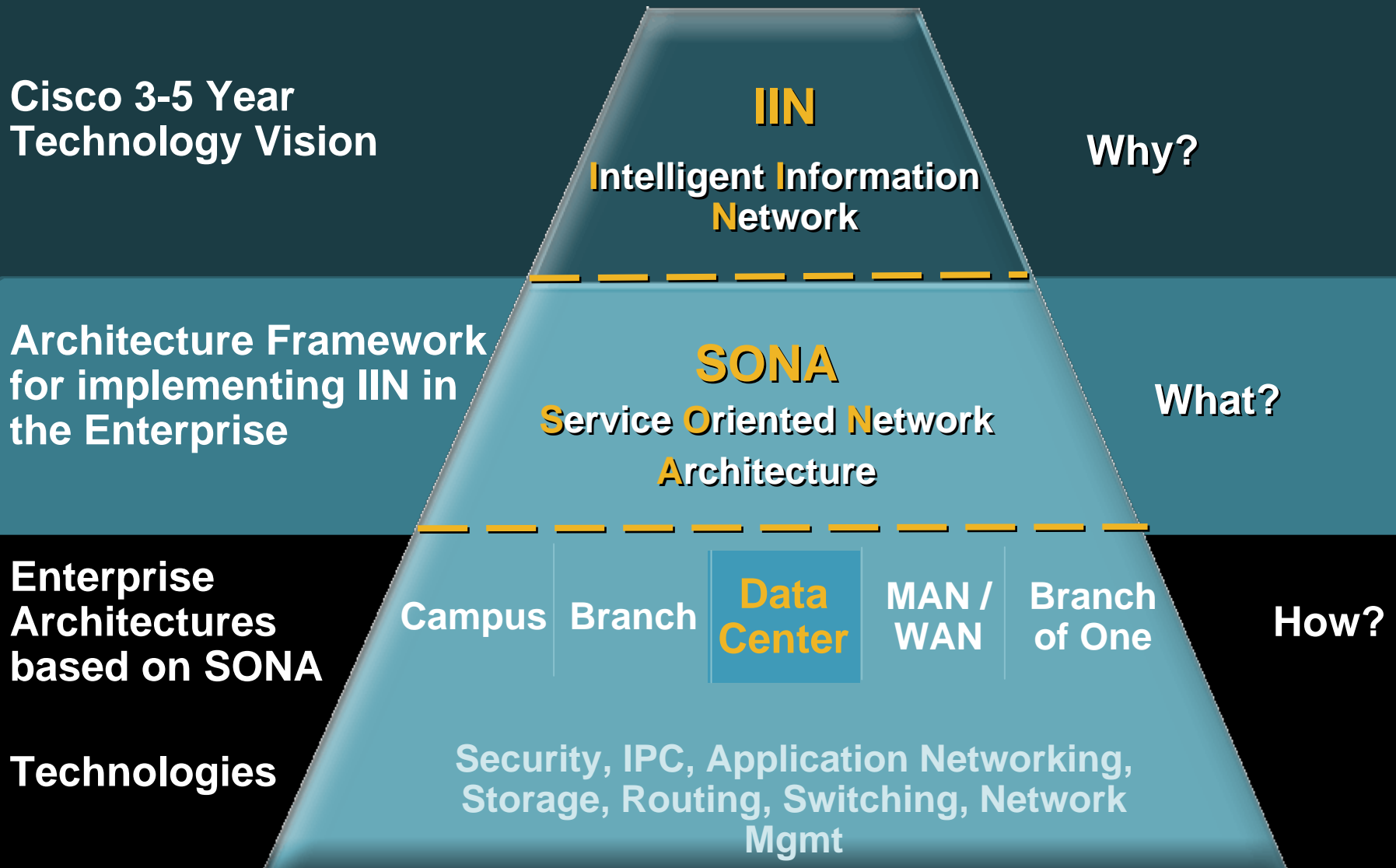
■ Improved Responsiveness & Flexibility

Dynamic provisioning of additional storage
Universal authorized access to information

Cost per Branch Office
Local server model = \$30–40 K/yr
Centralized App Delivery = \$10K/yr
SAVINGS per Branch Office = \$20-30K/yr

Source: Cisco Customers Survey

The Data Center – Core to Cisco Enterprise Strategy



To Summarize...

- Business Processes drive Data Center Evolution
- Consolidation, Virtualization and Automation are key
- The Network is a Platform for Data Center Architecture
- Service Virtualization offers Flexibility and Cost Savings
- Datacenter-hosted Applications are Accessed Everywhere
- Optimizing App Delivery enables Branch Consolidation

