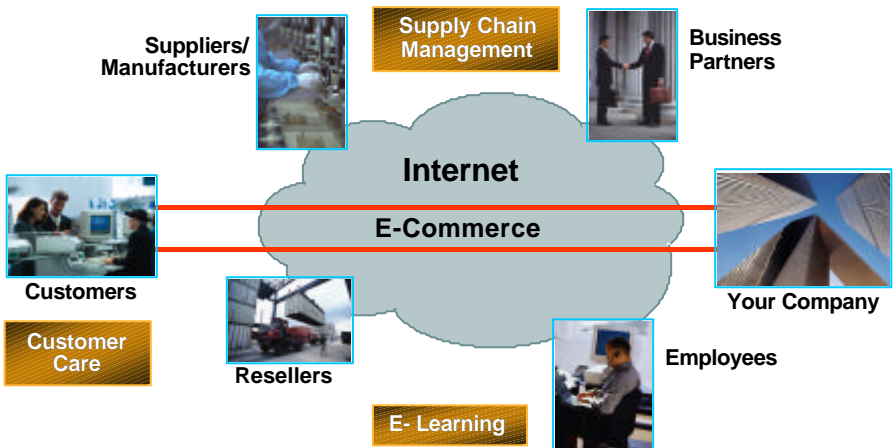




E-Business Solution



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1999 E-Commerce Data

During holidays, sites took an average of 21 seconds to load and were only accessible 90% of time.³

Worldwide e-commerce Revenue reached \$111 billion.¹

Less than 75% of holiday orders were delivered on time.²

28% of Internet shoppers failed to complete an attempted purchase.⁵

Two-thirds of first-time buyers don't make a repeat purchase.⁶

Holiday e-commerce sales reached \$5 billion.⁴

48% of online shoppers abandoned site due to slow download and 20% had to contact customer service.⁵

16% of Internet retailers failed to fulfill orders.⁷

Sources: ¹ International Data Corp., ² Bizrate.com, ³ Keynote Systems, ⁴ Forrester Research, ⁵ Boston Consulting Group, ⁶ McKinsey & Co., ⁷ e-BuyersGuide.com

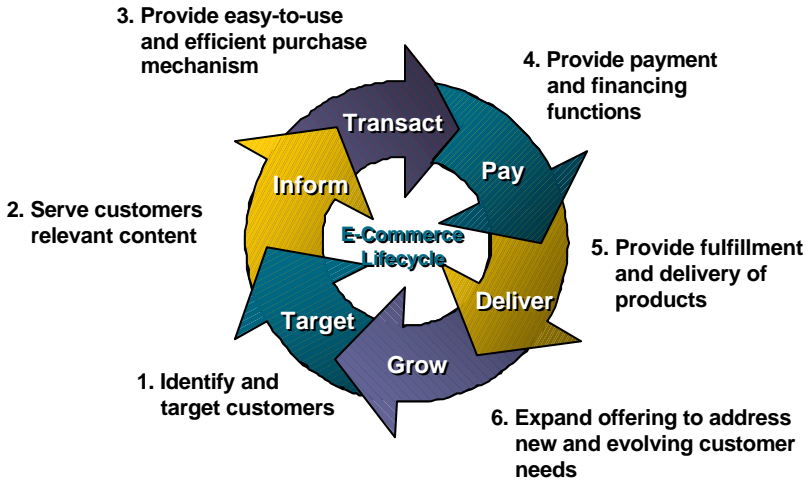
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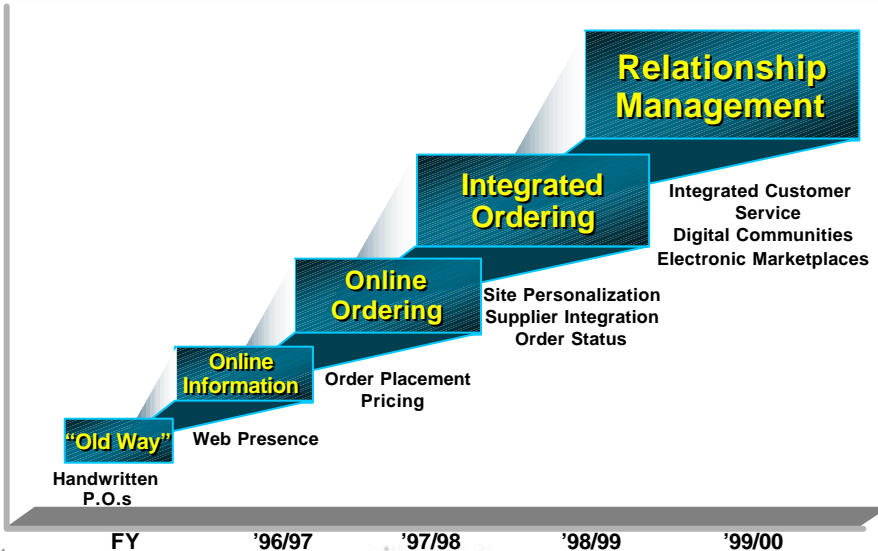
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E-Commerce: Beyond Online Order Taking



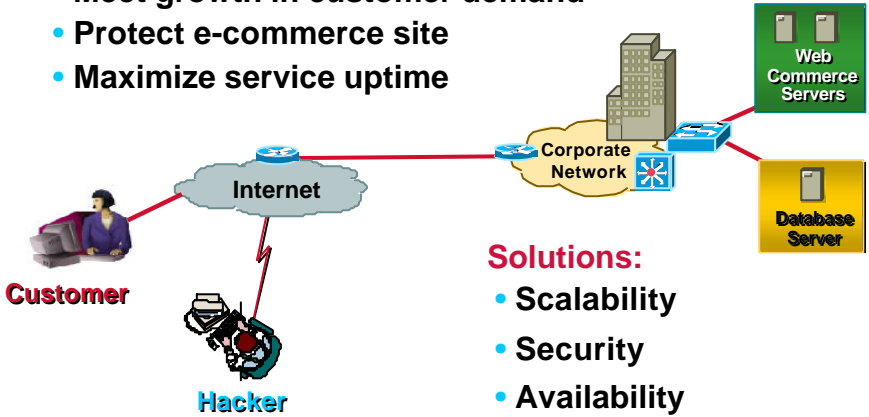
E-Commerce Evolution



E-Commerce Technical Challenges

Challenges:

- Meet growth in customer demand
- Protect e-commerce site
- Maximize service uptime

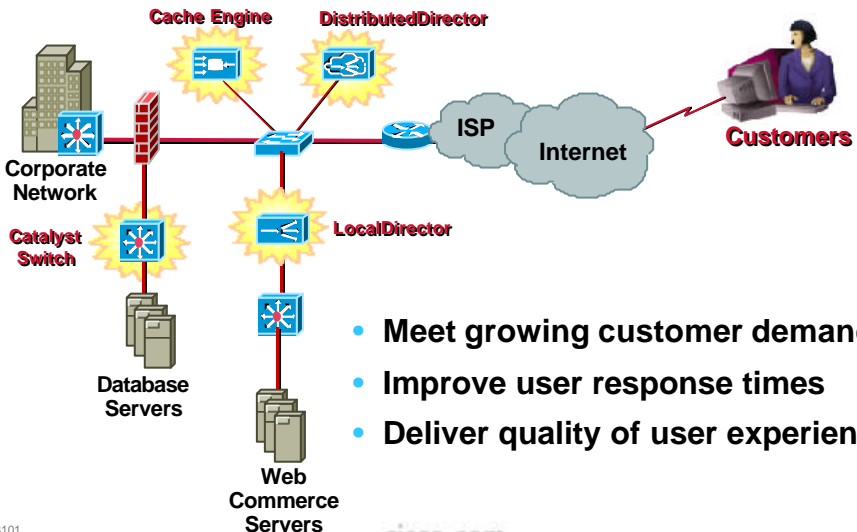


Solutions:

- Scalability
- Security
- Availability

E-Commerce Scalability

- ✓ Scalability
- ✓ Security
- ✓ Availability



- Meet growing customer demand
- Improve user response times
- Deliver quality of user experience

Growth of Commerce Sites

	Page View Growth (Monthly)	Number of Page Views (Daily)	Commerce Transaction Growth (Monthly)	Number of Commerce Transactions (Daily)	Average Transaction Value (Monthly)
Maximum	400%	87,000,000	400%	30,000	\$175,000
Average	53%	3,684,000	96%	12,700	\$13,400
Median	19%	30,000	33%	1000	\$90
Minimum	0%	10	0%	10	\$18

Source: Forrester Research, Feb 2000 Statistics for 50 online companies doing transactions

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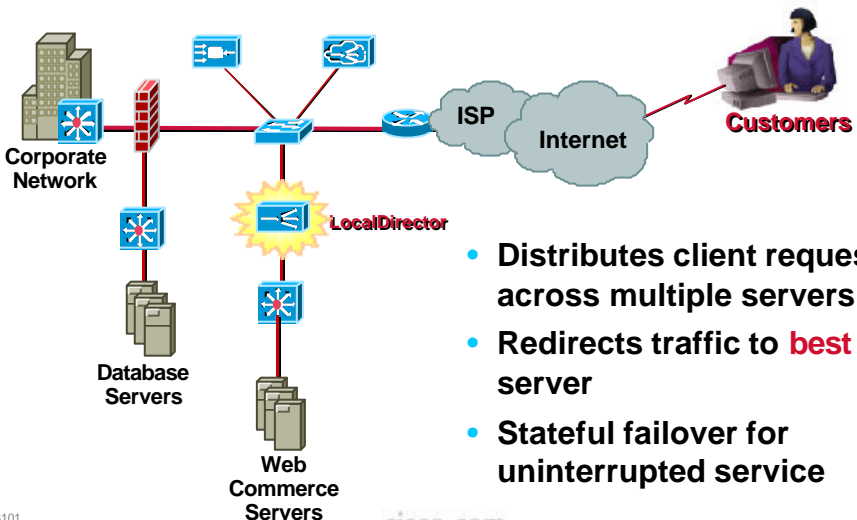
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Server Load Balancing

- ✓ Scalability
- ✓ Security
- ✓ Availability



- Distributes client requests across multiple servers
- Redirects traffic to **best** server
- Stateful failover for uninterrupted service

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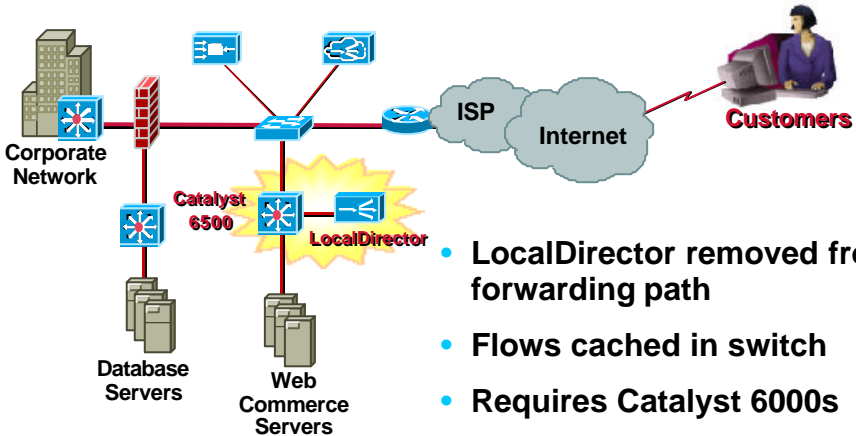
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Accelerated Server Load Balancing (ASLB)

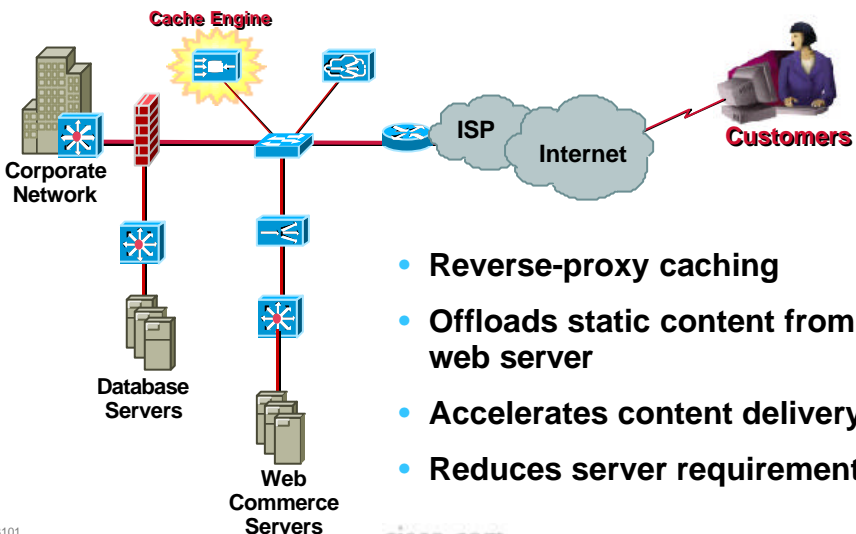
- ✓ Scalability
- ✓ Security
- ✓ Availability



- LocalDirector removed from forwarding path
- Flows cached in switch
- Requires Catalyst 6000s
- Improves packet forwarding to 15 Mpps

Web Content Caching

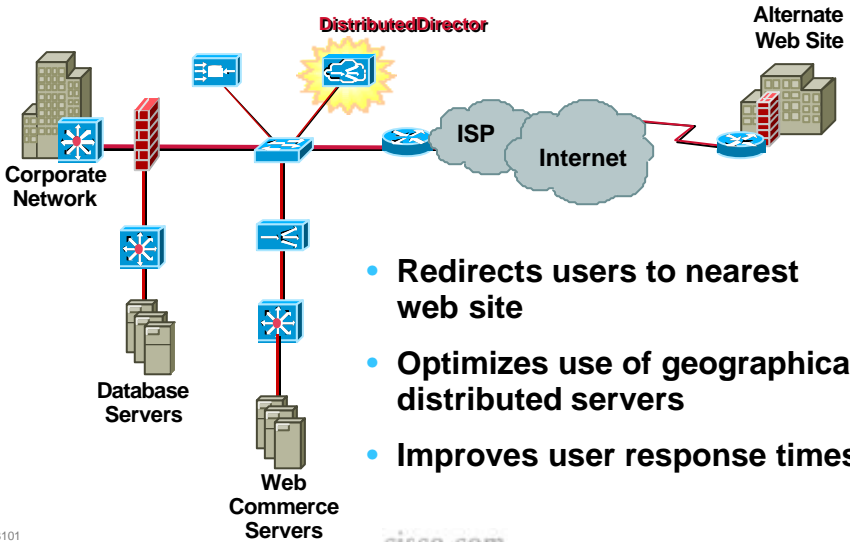
- ✓ Scalability
- ✓ Security
- ✓ Availability



- Reverse-proxy caching
- Offloads static content from web server
- Accelerates content delivery
- Reduces server requirements

Geographic Load Balancing

- ✓ Scalability
- ✓ Security
- ✓ Availability



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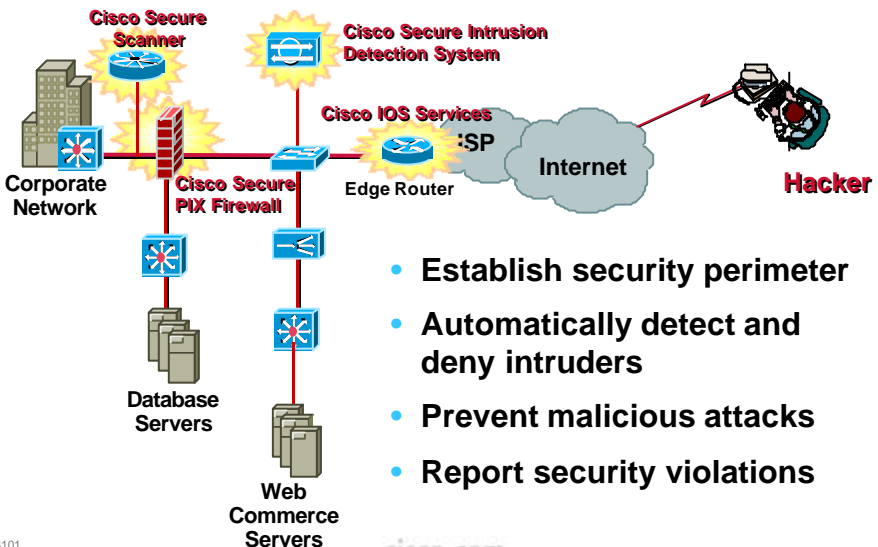
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E-Commerce Security

- ✓ Scalability
- ✓ Security
- ✓ Availability



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Is Your Site Safe?

- ✓ Scalability
- ✓ Security
- ✓ Availability

Web Site	Outage
Auction Site	2/8/00: One-hour outage Distributed denial of service attack
Retail Site	2/8/00: Site traffic blocked Distributed denial of service attack
Trading Site	2/9/00: One hour of disrupted service Distributed denial of service attack

Protecting Against DDoS Attacks:

<http://www.cisco.com/warp/public/707/newsflash.html>

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Internet Access Security

- ✓ Scalability
- ✓ Security
- ✓ Availability



Packet Filtering

- First layer of defense
- Filters according to access lists
- ACLs based on SRC/DST address, protocol, port #, etc.

Firewall Feature Set

- Stateful application firewalling
- Denial of service detection and prevention
- Secure virtual private networking (VPN)

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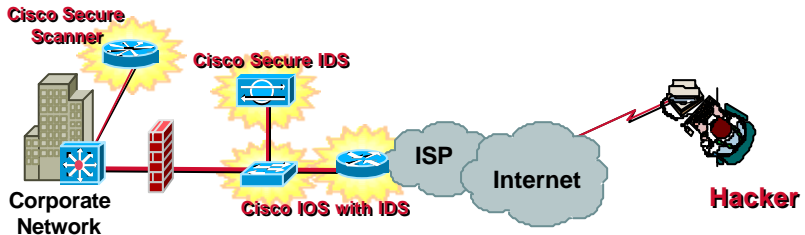
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Intrusion and Security Violation Detection

- ✓ Scalability
- ✓ Security
- ✓ Availability



Intrusion Detection System

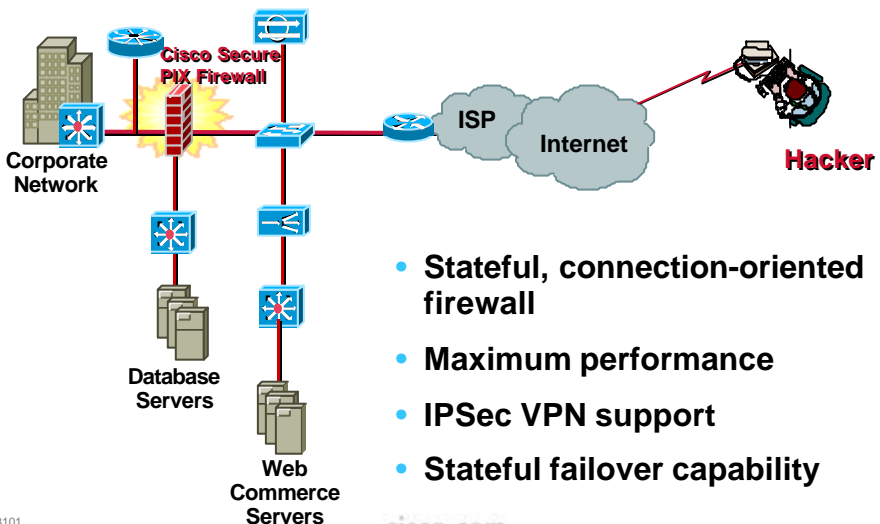
- Real time network-based intrusion detection
- Signature detection identifies content and context-based attacks
- Automated policy-based response

Cisco Secure Scanner

- Proactively identifies security weaknesses
- Defines security policies
- Comprehensive and flexible reporting

Firewall Security

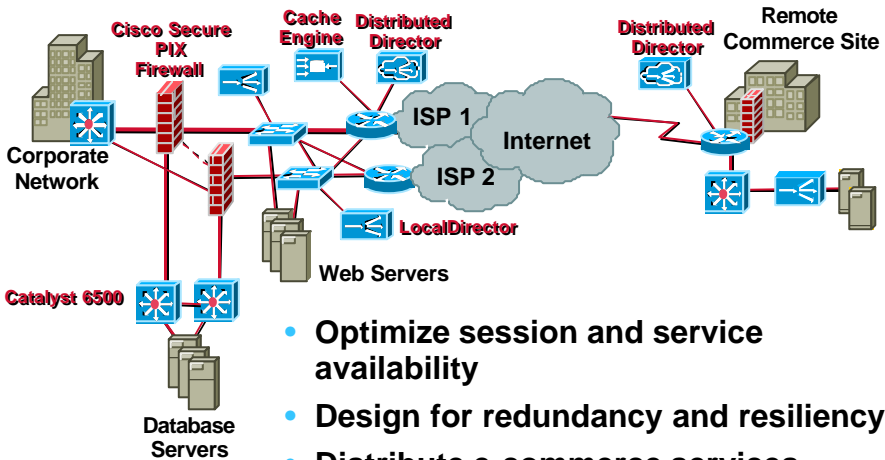
- ✓ Scalability
- ✓ Security
- ✓ Availability



- Stateful, connection-oriented firewall
- Maximum performance
- IPSec VPN support
- Stateful failover capability

E-Commerce High Availability

- ✓ Scalability
- ✓ Security
- ✓ Availability



- Optimize session and service availability
- Design for redundancy and resiliency
- Distribute e-commerce services geographically

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Measuring Availability

<u>Availability</u>	<u>Downtime Per Year (24x7x365)</u>
99.000%	3 days, 15 hours, 36 minutes
99.500%	1 day, 19 hours, 48 minutes
99.900%	8 hours, 46 minutes
99.950%	4 hours, 23 minutes
99.990%	53 minutes
99.999%	5 minutes

Unplanned and Planned Downtime

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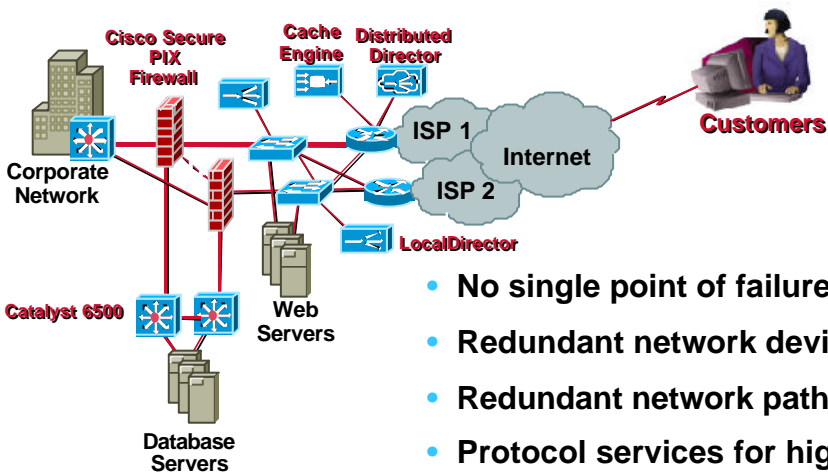
20

E-Commerce Downtime— Revenue Loss

	Daily Internet revenue as of 1/15/99	Lost revenue per hour of downtime (assumes 20% revenue loss)
www.amazon.com	\$2,700,000	\$22,500
www.dell.com	\$10,000,000	\$91,320
www.cisco.com	\$20,000,000	\$182,640
www.intel.com (partner extranet site only)	\$33,000,000	\$274,980

High Availability Design

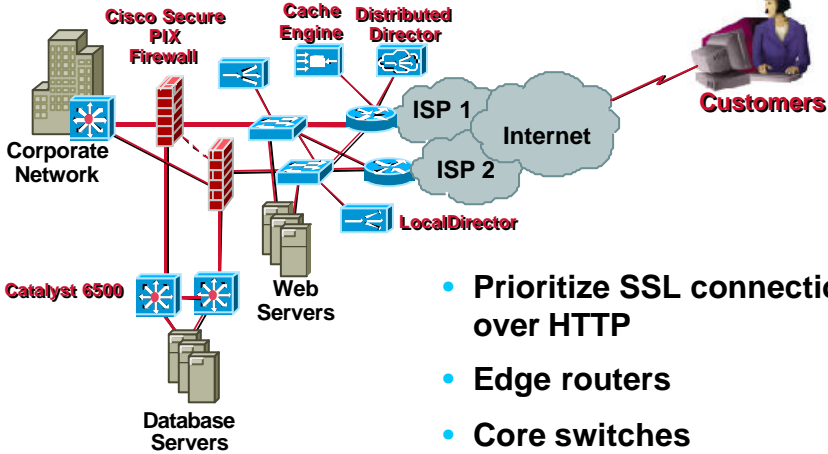
- ✓ Scalability
- ✓ Security
- ✓ Availability



- No single point of failure
- Redundant network devices
- Redundant network paths
- Protocol services for high availability (HSRP, STP, etc.)

QoS for E-Commerce

- ✓ Scalability
- ✓ Security
- ✓ Availability



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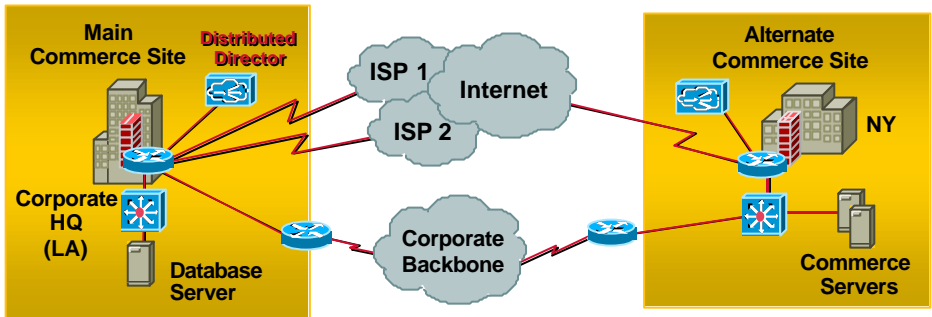
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Multiple E-Commerce Sites

- ✓ Scalability
- ✓ Security
- ✓ Availability



- Load balancing across distributed sites
- Redirect users to nearest site
- Scalability and disaster recovery combined

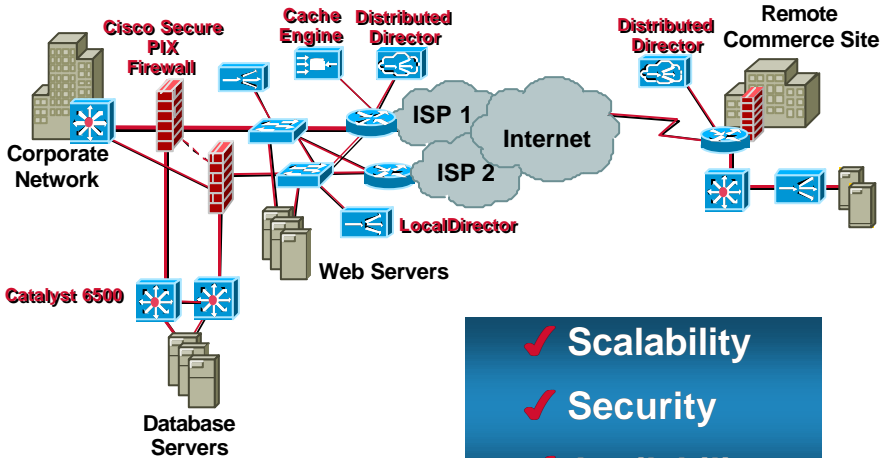
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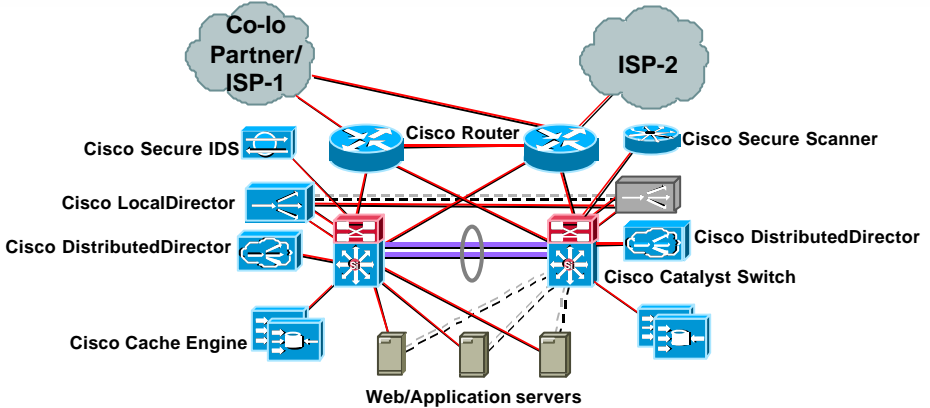
24

E-Commerce Architecture

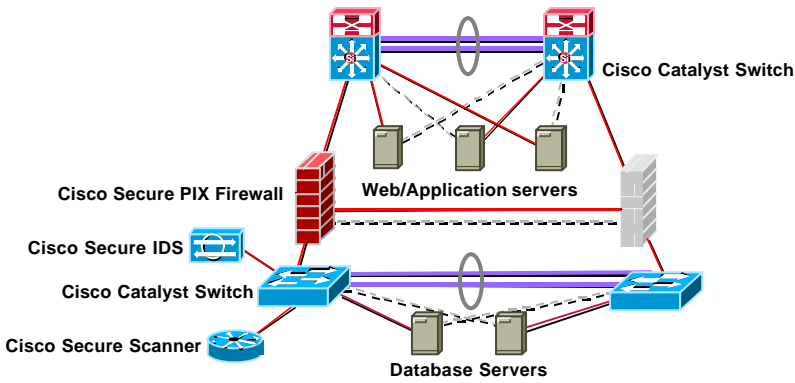


- ✓ Scalability
- ✓ Security
- ✓ Availability

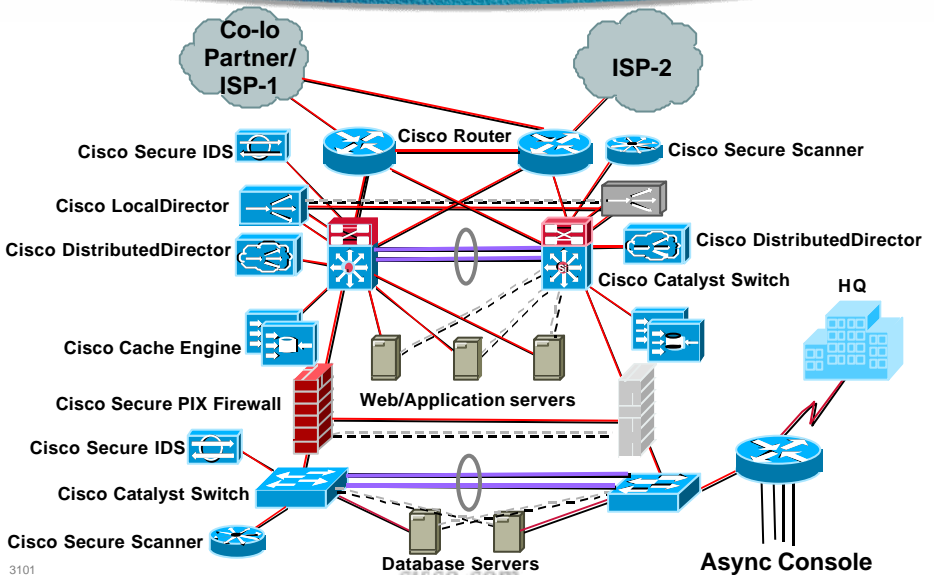
Cisco E-Commerce Framework Architecture



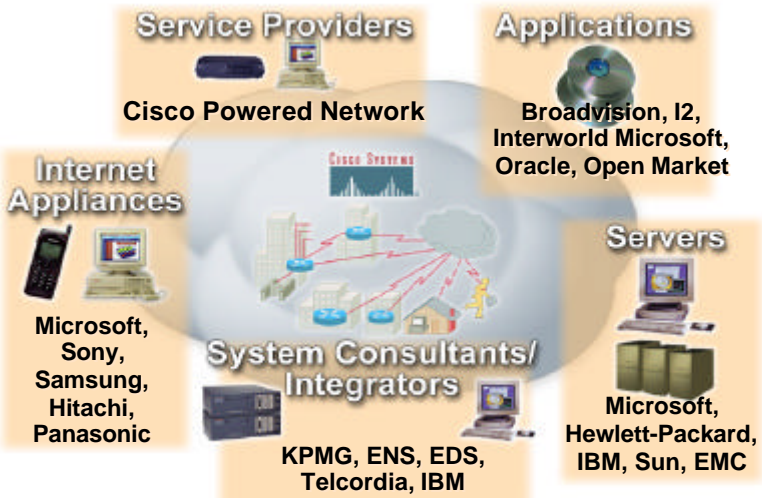
Cisco E-Commerce Framework Architecture



Cisco E-Commerce Framework Architecture



Cisco Ecosystem Partners



E-Commerce Ecosystem



ECOSTRUCTURE
THE EMC, CISCO, ORACLE INITIATIVE

EMC²
Where Information Lives

CISCO SYSTEMS
EMPOWERING THE
INTERNET GENERATION™

ORACLE
SOFTWARE POWERS THE INTERNET™

- Jointly tested and validated infrastructure blueprints
- Design recommendations
- Implementation guides
- Architecture center
- <http://www.eECOstructure.com>

Next Steps

- Develop e-business strategy
- Align business goals to e-commerce goals
- Define requirements for scalability, security, and availability
- Work with Cisco and Cisco Ecosystem Partners for complete e-commerce solution
- Visit Cisco website for Internet Quotient Test and e-commerce info:

<http://www.cisco.com/warp/public/750/indicator/quiz.html>

<http://www.cisco.com/warp/public/779/largeent/issues/ecommm/>

Forecasts for Year 2000

U.S. online retail revenues will hit \$38.8 billion.⁴

U.S. business trade over the Net will skyrocket to \$251 billion.⁴

28.4 million U.S. households will shop online.⁴

The U.S. online population will reach 137 million, less than 50% of nation's population.¹

14 million new U.S. households will go online.²

11 million U.S. households will make their first purchase online.⁴

25% of U.S. adults will visit international Web sites on a monthly basis.³

Other Networkers Sessions

- **2204 Introduction to Routing Protocols**
- **2500 Introduction to Network Security**
- **2800 Caching and Load Balancing Technologies**
- **2801 Deploying Highly Available Networks**
- **3103 Networked Supply Chain Management**
- **3104 Requirements for New World Customer Care**



E-Commerce Networking

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Thank You



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