E-Commerce Networking
Session 3101
E-Business Solution

Internet

Suppliers/Manufacturers

Supply Chain Management

Business Partners

Customers

Resellers

Your Company

Employees

E-Commerce

E-Learning

Customer Care

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 sites due to slow download and 20% had to contact customer service.³

16% of Internet retailers failed to fulfill orders.⁷

E-Commerce: Beyond Online Order Taking

1. Identify and target customers
2. Serve customers relevant content
3. Provide easy-to-use and efficient purchase mechanism
4. Provide payment and financing functions
5. Provide fulfillment and delivery of products
6. Expand offering to address new and evolving customer needs

E-Commerce Evolution

FY '96/97 '97/98 '98/99 '99/00

- Relationship Management
- Integrated Ordering
- Online Ordering
- Online Information
- "Old Way" Handwritten P.O.s
- Web Presence
- Order Placement Pricing
- Site Personalization
- Supplier Integration
- Order Status
- Integrated Customer Service
- Digital Communities
- Electronic Marketplaces
**E-Commerce Technical Challenges**

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

**Solutions:**
- Scalability
- Security
- Availability

**E-Commerce Scalability**

- Meet growing customer demand
- Improve user response times
- Deliver quality of user experience
### Growth of Commerce Sites

<table>
<thead>
<tr>
<th></th>
<th>Page View Growth (Monthly)</th>
<th>Number of Page Views (Daily)</th>
<th>Commerce Transaction Growth (Monthly)</th>
<th>Number of Commerce Transactions (Daily)</th>
<th>Average Transaction Value (Monthly)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum</strong></td>
<td>400%</td>
<td>87,000,000</td>
<td>400%</td>
<td>30,000</td>
<td>$175,000</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>53%</td>
<td>3,684,000</td>
<td>96%</td>
<td>12,700</td>
<td>$13,400</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>19%</td>
<td>30,000</td>
<td>33%</td>
<td>1000</td>
<td>$90</td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
<td>0%</td>
<td>10</td>
<td>0%</td>
<td>10</td>
<td>$18</td>
</tr>
</tbody>
</table>

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

### Server Load Balancing

- Distributes client requests across multiple servers
- Redirects traffic to **best** server
- Stateful failover for uninterrupted service
**Accelerated Server Load Balancing (ASLB)**

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

**Web Content Caching**

- Reverse-proxy caching
- Offloads static content from web server
- Accelerates content delivery
- Reduces server requirements
**Geographic Load Balancing**

- Redirects users to nearest web site
- Optimizes use of geographically distributed servers
- Improves user response times

**E-Commerce Security**

- Establish security perimeter
- Automatically detect and deny intruders
- Prevent malicious attacks
- Report security violations
Is Your Site Safe?

<table>
<thead>
<tr>
<th>Web Site</th>
<th>Outage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auction Site</td>
<td>2/8/00: One-hour outage Distributed denial of service attack</td>
</tr>
<tr>
<td>Retail Site</td>
<td>2/8/00: Site traffic blocked Distributed denial of service attack</td>
</tr>
<tr>
<td>Trading Site</td>
<td>2/9/00: One hour of disrupted service Distributed denial of service attack</td>
</tr>
</tbody>
</table>

Protecting Against DDoS Attacks:

Internet Access Security

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)
Intrusion and Security Violation Detection

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
- Stateful, connection-oriented firewall
- Maximum performance
- IPSec VPN support
- Stateful failover capability
E-Commerce
High Availability

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

Measuring Availability

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

Unplanned and Planned Downtime
E-Commerce Downtime—Revenue Loss

<table>
<thead>
<tr>
<th>Daily Internet revenue as of 1/15/99</th>
<th>Lost revenue per hour of downtime (assumes 20% revenue loss)</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.amazon.com">www.amazon.com</a> $2,700,000</td>
<td>$22,500</td>
</tr>
<tr>
<td><a href="http://www.dell.com">www.dell.com</a> $10,000,000</td>
<td>$91,320</td>
</tr>
<tr>
<td><a href="http://www.cisco.com">www.cisco.com</a> $20,000,000</td>
<td>$182,640</td>
</tr>
<tr>
<td><a href="http://www.intel.com">www.intel.com</a> (partner extranet site only) $33,000,000</td>
<td>$274,980</td>
</tr>
</tbody>
</table>

High Availability Design

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

- Prioritize SSL connections over HTTP
- Edge routers
- Core switches

Multiple E-Commerce Sites

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

- **Scalability**
- **Security**
- **Availability**

Cisco E-Commerce Framework Architecture
Cisco Ecosystem Partners

- Service Providers
  - Cisco Powered Network

- Internet Appliances
  - Microsoft, Sony, Samsung, Hitachi, Panasonic

- System Consultants/Integrators
  - KPMG, ENS, EDS, Telcordia, IBM

- Applications
  - Broadvision, I2, Interworld, Microsoft, Oracle, Open Market

- Servers
  - Microsoft, Hewlett-Packard, IBM, Sun, EMC

E-Commerce Ecosystem

- 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:

Forecasts for Year 2000

U.S. online retail revenues will hit $38.8 billion.¹

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

Sources: ¹ International Data Corp., ² Jupiter Communications, ³ Cyber Dialogue, ⁴ Forrester Research
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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