

E-commerce

Web Servers Hardware and Software

Basic technical requirements of a Web site that can support E-commerce operations and match business needs.



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Outline

- E-commerce Web sites
- Web server architectures
- Software for Web servers
- Web Site and Internet Utility Programs
- Web server hardware
- Web hosting



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Learning Outcomes



Be able to:

- Discuss on web servers, E-commerce architectures and the basic technical requirements
- Discuss about Operating Systems, Software for e-commerce servers and utility programs in E-commerce
- Elaborate on Web server hardware, its architecture and performance measures
- Discuss Web site hosting alternatives

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E-Commerce Web Sites



To plan appropriately for an e-commerce server one must determine

- what they want to accomplish from a business perspective
- identify the types of content that will be delivered
- estimate how many visitors will be connecting to the Web site
- select an appropriate hardware and software platform
- select an appropriate service provider

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E-Commerce Web Sites- Server options



- The job of a server computer is to respond to requests from client computers
- Depending on the type and number of requests different options are appropriate
- The three main components of a server that have to be decided upon:
 - Hardware platform (processor, storage, networking—price, maintenance costs)
 - Operating system
 - Web server software
 - Support for standards

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E-Commerce Web Sites- Purpose of e-commerce sites



Companies create Web sites for very different reasons:

- simple proof-of concept sites
- Intranets (internal information)
- information-only sites for customers
- business-to-business portals and extranets
- on-line stores (e-shops)
- content-delivery sites

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E-Commerce Web Sites- Proof-of-concept Sites



- To explore if some type of on-line activity is appropriate for the business, to experiment
- The simplest Web site and the least costly to implement
- A development site can reside on an existing PC and can be developed with low-cost Web site building tools, such as MS FrontPage or Macromedia Dreamweaver
- Testers can access the site through their PCs on the existing LAN, possibly not accessible from the Internet

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E-Commerce Web Sites- Intranet



- Corporate intranets hold internal memos, corporate policy handbooks, expense account worksheets, budgets, newsletters, and a variety of other corporate documents
- Intranets are shielded from the Internet; they do not require additional security software to protect them against threats from outside the company

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E-Commerce Web Sites- Extranet



- Extranets are intranets that allow certain authorized parties outside the company to access certain parts of the information stored in the system
- More control than a freely available Internet site

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E-Commerce Web Sites- Transaction-Processing Sites



- Transaction-processing sites: business-to-business and business-to-consumer electronic commerce sites
- Highly available: 24 hours a day, seven days a week
- Reliability: spare servers to handle high traffic volumes
- Highly secure: must run security software to protect financial info

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E-Commerce Web Sites- Content-Delivery Sites



- Content-delivery sites deliver content:
 - news, e-books, music, software or software components
 - text, MP3 files, PDF documents, executables
 - fixed or streaming (e.g. daily news or stock exchange live data)
- Content must be delivered rapidly on the visitor's screen
- Visitors must be able to locate content quickly (this may be **very** hard)

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E-Commerce Web Sites- Open Standards



- Two ways to interoperability
- de-facto standards (MS Windows, Word Documents, Adobe PDF)
- open standards (agreed on by consensus and can be used by all)
- common property (Internet, Web) or for fee (Rosetta Net)



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E-Commerce Web Sites- Web Clients and Servers



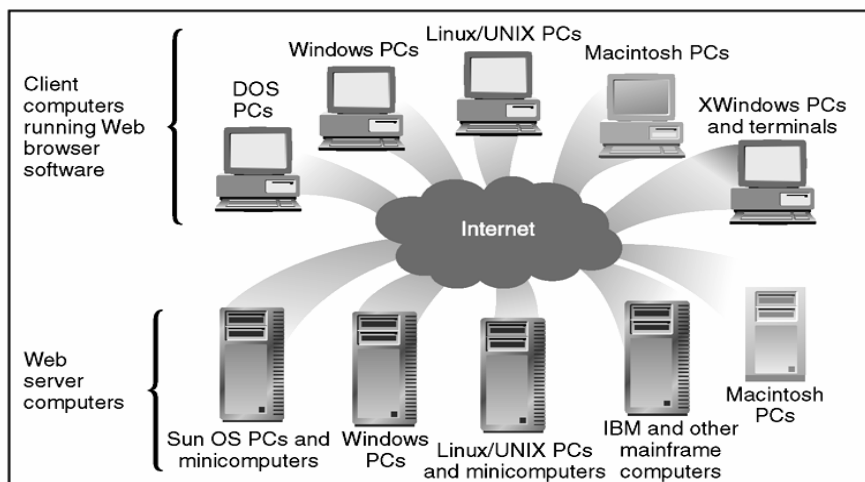
- Internet connections that are part of the Web become Web client computers on a worldwide client/server network
- Client/server architectures are used in LANs, WANs, and the Web
- Web software is platform neutral, letting computers communicate with each other easily

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E-Commerce Web Sites- An open system: the Web



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E-Commerce Web Sites- Dynamic Content



- A core requirement of e-commerce sites
- Dynamic content is information constructed on demand and in response to a Web client request
- Server-side technologies are programs running on the Web server to create the Web pages before sending them back to the client
- ASP, JSP, and PHP are server-side scripting mechanisms that build dynamic sites and Web applications

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E-Commerce Web Sites- the future



- Proliferation of different deliver channels (web, mobile, Digital TV, home appliances, in-car systems etc.)
- Transcoding: common data, different presentation
- Content is stored as XML with tags that describe the meaning of each content item
- Server recognizes type of client and “transcodes” XML documents into appropriate format by (possibly) applying a style sheet to the data
- Many frameworks: Apache Cocoon, IBM Websphere portal, Microsoft part of .NET and Oracle

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Server Architectures



- Server – any computer used to provide files to other computers connected to it through a network
 - Server software
 - Server hardware
- Patterns of server architectures (tested solutions to common problems)

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Server Architectures- Two-Tier Client/Server Architecture

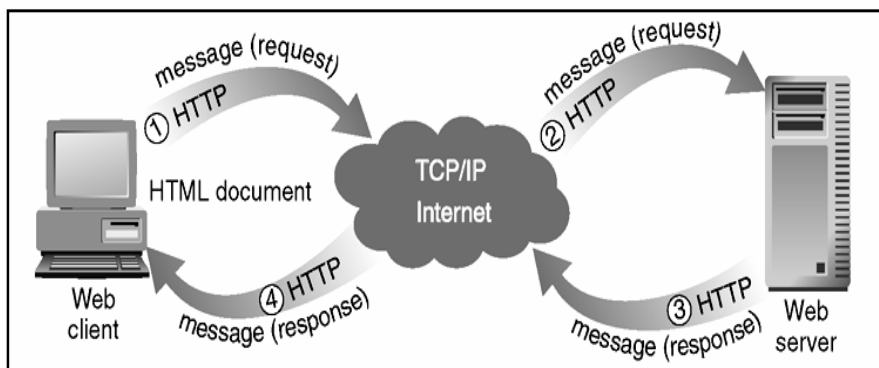


Figure 8-2 Message flows in a two-tier client/server network

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Server Architectures- Three-Tier and N-Tier Client/Server Architectures

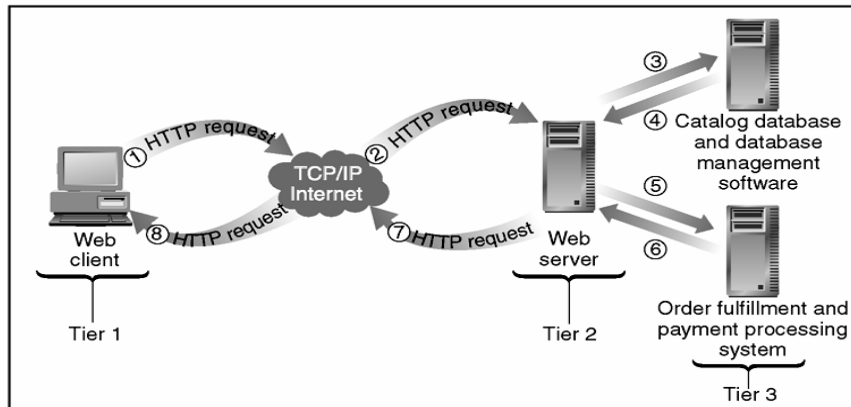


Figure 8-3 Message flows in a three-tier client/server network

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Software for Web servers- Operating Systems



- The operating system organizes and controls the hardware of any computer
- It is the first program run on a computer
- It provides "abstract" services to user applications
- Windows, Linux, Unix (Solaris, BSD, IBM etc), OS/390, VMS, Be, Mac OS, QNX, VxWorks, open source.

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Software for Web servers- Popular server programs

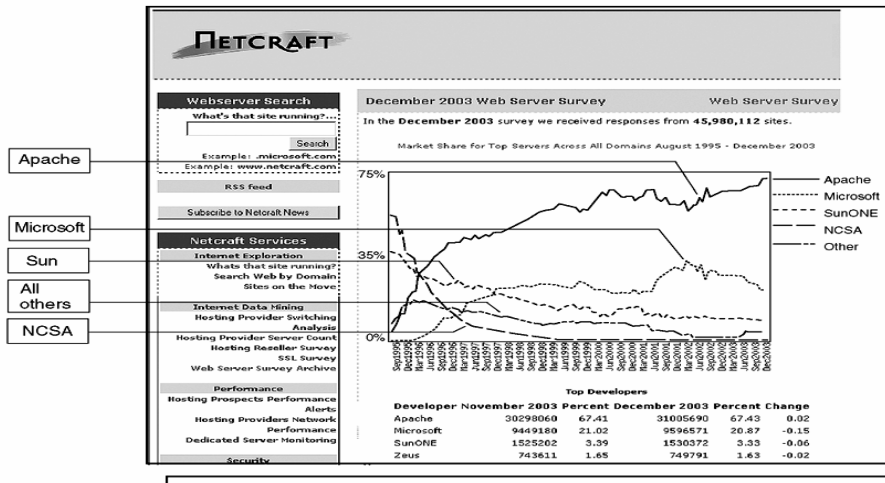


Figure S-4 Market shares for top Web server software

Software for Web servers- Apache (apache.org)



- Free and efficient
- Runs on many operating systems and the hardware that supports them
- Has a built-in search engine and HTML authoring tools and supports FTP
- Can be managed from either a server console or a Web server
- Many add-ons, e.g. XML, J2EE, ASP, PHP etc
- Web services

Software for Web servers-

Microsoft Internet Information Server-IIS



- Bundled with Microsoft Windows 2000 Server operating systems
- Includes an integrated search engine
- Permits administration from a remote server
- Combines HTML, ActiveX components, and scripts to produce dynamic pages
- Integrates with other MS products

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Software for Web servers-

Sun Java System Web Server



- Sun ONE: iPlanet or Netscape Web Server
- Runs on many operating systems, including HP-UX, Solaris, and Windows
- Its management tools allow administrators to manage users and monitor server activity interactively
- More appropriate for large enterprises

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Web Site and Internet Utility Programs- Telnet and FTP



- Used to update and maintain web sites.
- Less popular nowadays due to web based management tools
- Telnet allows users to log on to a computer that is connected to the Internet
- FTP, File Transfer Protocol, is the part of the TCP/IP rules that defines the formats used to transfer files between TCP/IP computers.
 - Can transfer files one at a time, or several at once
 - Displays remote and local computers' directories
 - Has built-in error controls to copy files accurately

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Web Site and Internet Utility Programs- Indexing and Searching



- Search engine and indexing programs are important elements of many Web servers
- Search engines, or search tools, search either a specific site or the entire Web for requested documents
- An indexing program can provide full-text indexing that generates an index for all documents stored on a server

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Web Site and Internet Utility Programs- Data Analysis1



- Web servers can capture visitor information, including data about who is visiting a Web site, how long the visitor's Web browser viewed the site, the date and time of each visit, and which pages were displayed
- Two of the most popular Web log file analysis programs are the Analog Web server log file analyzer and the WebTrends Web server log file analyzer

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Web Site and Internet Utility Programs- Data Analysis2



wide variety of detailed reports available

Table of Contents

- General Statistics
- Resources Accessed
 - ▶ Top Pages
 - Top Documents
 - Dynamic Pages & Forms
 - Top Entry Pages
 - Top Entry Files
 - Top Exit Pages
 - Single Access Pages
 - Top Directories
 - Top Paths Through Site
 - Most Accessed File Types
- Advertising
- Visitors & Demographics
- Activity Statistics
- Technical Statistics
- Referrals & Keywords
- Browsers & Platforms
- Glossary

Top Pages Help ?

This page identifies the most popular Web pages on your site, shows you how often they were viewed, and displays the average length of time the page was viewed.

Pages		Views	% of Total Views	Visits	Avg. Time Viewed
1	Oregon Marine - Products http://www.oregonmarine.com/products/	9,798	6.02%	7,362	00:02:01
2	Welcome to Oregon Marine Inc. Quality Boat Builders http://www.oregonmarine.com/	7,855	4.84%	6,735	00:01:53
3	Owner's Club http://www.oregonmarine.com/club/	8,711	5.36%	5,914	00:02:00

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Web Site and Internet Utility Programs- Link Checking



- A link checker examines each page on the site and reports on any URLs that are broken, that seem to be broken, or that are in some way incorrect
- An orphan file is a file on a Web site that is not linked to any page
- Other important site management features include script checking and HTML validation
- A dead link, when clicked, displays an error message rather than a Web page

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Web Site and Internet Utility Programs- Link Checking



Broken Links
 FOR: <http://www.testfire.net/>
 DATE: 11:59:42 AM July 06

ERROR	QUANTITY FOUND
File Not Found Errors	8
Cannot Connect	0
Host Not Found	0
Timeout	0
Other	0
Total	8

FILE NOT FOUND ERRORS

1. LINK: <http://www.testfire.net/Help/Default.asp> (Error: 404: Not Found)
 PARENT LINKS:

- <http://www.testfire.net/testfireapp/Storefront/testfire.asp> (Help)
- <http://www.testfire.net/testfireapp/Storefront/AdSearch.asp> (Help)
- http://www.testfire.net/testfireapp/Storefront/check_out.asp (Help)
- <http://www.testfire.net/testfireapp/Storefront/testfire1.asp?ProductType=Book> (Help)

wide variety of detailed reports available

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Web Site and Internet Utility Programs- Remote Server Administration1



- With remote server administration, a Web site administrator can control a Web site from any Internet-connected computer
- Although all Web sites provide administrative controls, it is convenient for an administrator to be able to fix the server from wherever he or she happens to be

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Web Site and Internet Utility Programs- Remote Server Administration2



Web site troubleshooting tools

Web site performance monitoring tools

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Don't let site errors drive visitors away. Find and fix problems with **HTML Toolbox**.

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See how your Web site looks in all major browsers with **Browser Photo**.

Optimize Slow Loading Graphics. Details | Try It
Compress images with our FREE graphic optimization tool **GIFBot**.

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Search Engine Starter will get you listed in the search engines.

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Our search engine consultants guarantee a Top 20 ranking for your Web site!

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Browser Photo keeps your site picture perfect.

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Boost your visitors confidence. Display a **Star Performer** award on your site.

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Webmaster Resource Center.
Get HTML code help from our knowledge base. Check out the **Webmaster Tips Newsletter** by **subject** or by **date**.
Learn more about search engines in our **Search Engine Optimization** articles.

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Web Server Hardware



- Web server computers
 - More memory, larger hard disk drives, and faster processors
- Blade servers
 - Placing small server computers on a single computer board, then installing boards into a rack-mounted frame
- Virtual server (virtual host)
 - Maintains more than one server on one machine

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Web Server Hardware- Performance Evaluation



- Benchmarking is a form of testing used to compare the performance of hardware and software
- Hardware and operating systems are key areas for benchmarking
- The speed of its connection can affect a Web server's performance
- Throughput and response time can be used to measure a server's Web page delivery capability

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Web Server Hardware- Architectures



- Large sites deliver millions of pages every day
- They process thousands of customer and vendor transactions each day
- The large collection of servers that these sites have are called server farms
- One approach- **centralised architecture**: a few very large and very fast (and very expensive) computers
- Alternative approach- **distributed/decentralised architecture**: a large number of relatively inexpensive servers
- Large decentralized sites must use **load-balancing** systems (divide the workload among them)

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Web Server Hardware- Load-Balancing1



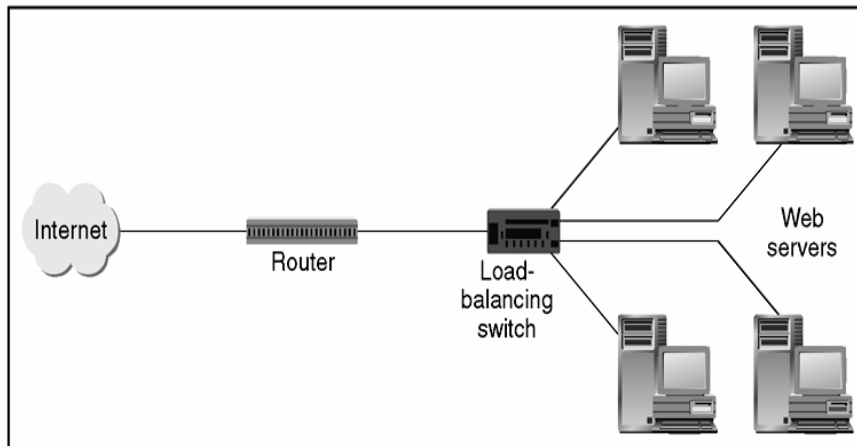
- A load-balancing switch is a piece of network hardware that monitors the workloads of the servers attached to it and assigns incoming Web traffic to the server that has the most available capacity
- In a simple load-balancing system, the traffic that enters the site from the Internet, encounters the load-balancing switch, which then directs the traffic to the Web server best able to handle the traffic

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Web Server Hardware- Load-Balancing2

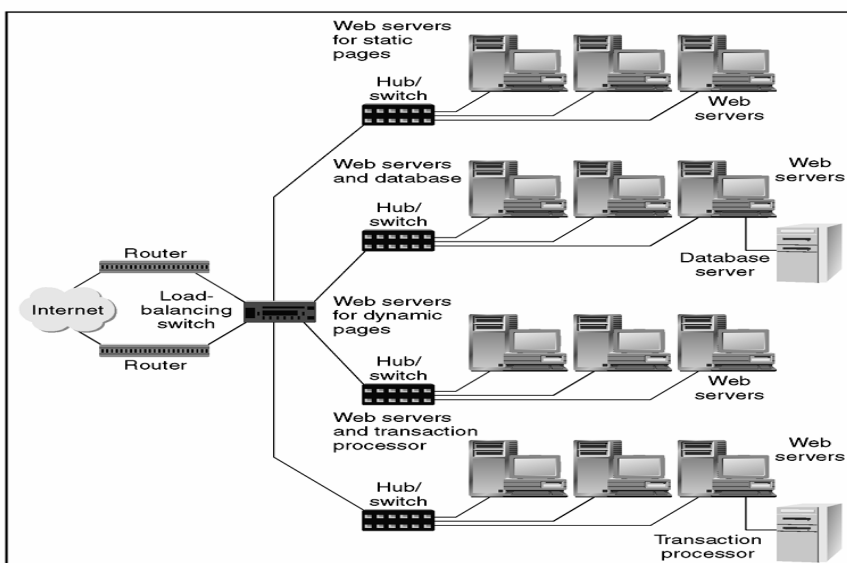


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Web Server Hardware- Complex Load-Balancing



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Web hosting



- When making Web server hosting decisions, a company should ask whether the hardware, or platform and software combination, can be upgraded when the traffic on its site increases
- Using a service provider's shared or dedicated hosting services instead of building an in-house server or using a co-location service means that the staffing burden shifts from the company to the Web host

Summary



- Server basics
- Software for e-commerce servers
- Utility and maintenance software
- Web server hardware architectures
- Web site hosting alternatives

Next week



- Auctions
- Virtual Communities
- Web Portals
- Environment of E-commerce