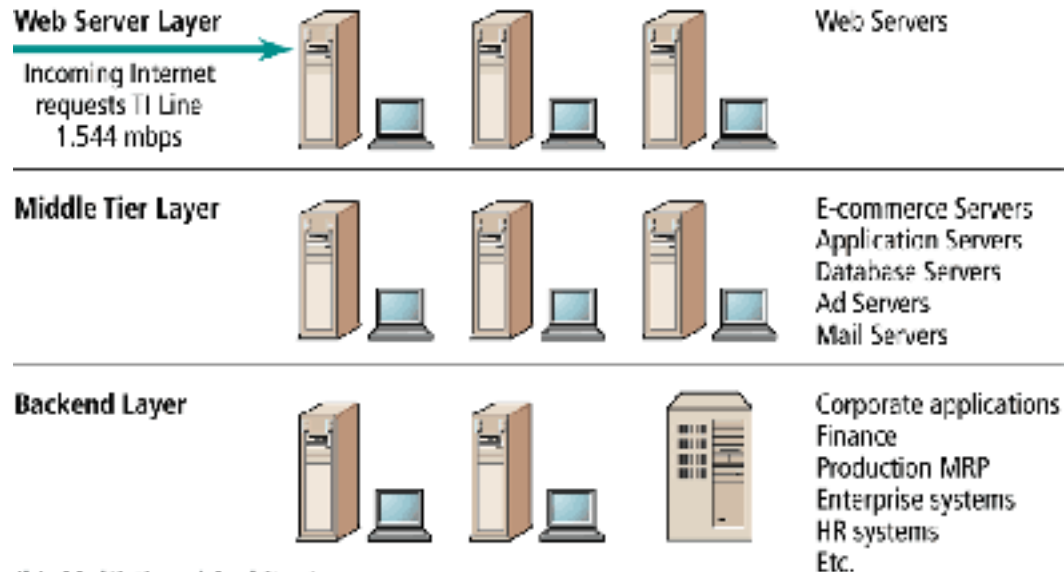


# Two-tier and Multi-tier E-commerce Architectures

Page 191, figure 4.6



(a) Two-tier Architecture



(b) Multi-tiered Architecture

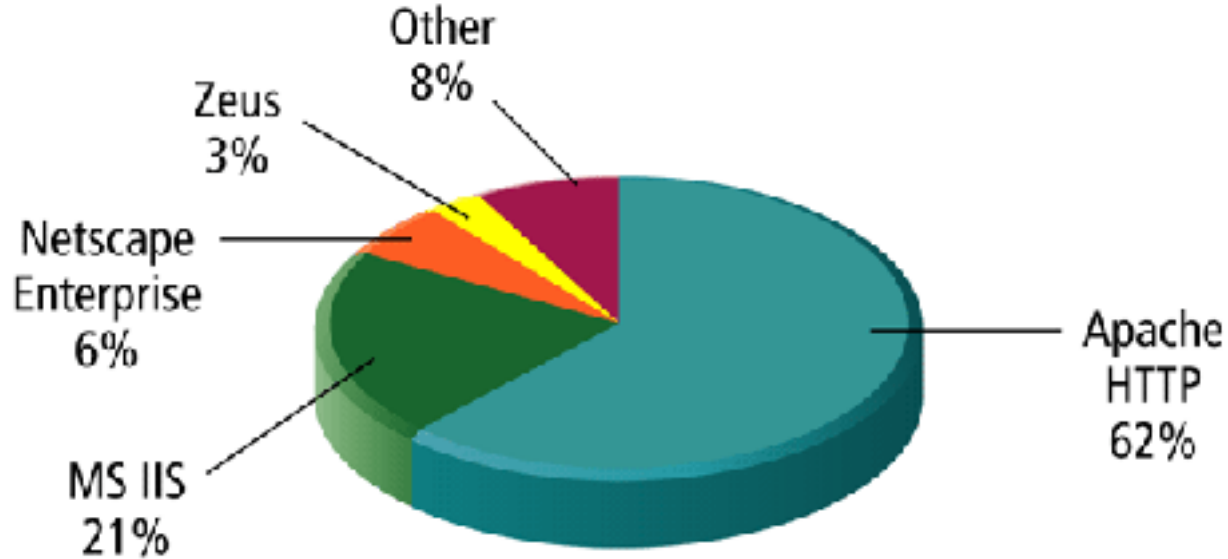
# Web Server Software

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- **Site management tools**
  - Verify that links on pages are still valid and also identify orphan files
- **Dynamic page generation tools**
  - The contents of a web page are stored as objects in a database, rather than being hard-coded in HTML

# Key Players in Web Server Software

Page 192, figure 4.7



# Basic Functionality Provided by Web Servers

Page 193, table 4.3

<b>TABLE 4.3 BASIC FUNCTIONALITY PROVIDED BY WEB SERVERS</b>	
<b>FUNCTIONALITY</b>	<b>DESCRIPTION</b>
Processing of HTTP requests	Receive and respond to client requests for HTML pages.
Security services (Secure Sockets Layer)	Verify username and password; process certificates and private/public key information required for credit card processing and other secure information.
File Transfer Protocol	Permits transfer of very large files from server to server.
Search engine	Indexing of site content; keyword search capability.
Data capture	Log file of all visits, time, duration, and referral source.
E-mail	Ability to send, receive, and store e-mail messages.
Site management tools	Calculate and display key site statistics, such as unique visitors, page requests, and origin of requests. Check links on pages.

# Web Application Servers

- **Software programs that provide the specific business functionality required of a web site**
- **Include:**
  - **Catalog display**
  - **Transaction processing**
  - **Audio/video server**
  - **Auction server**
  - **B2B server**

# Application Servers and Their Function

Page 197, table 4.4

TABLE 4.4 APPLICATION SERVERS AND THEIR FUNCTION	
APPLICATION SERVER	FUNCTIONALITY
Catalog display	Provides a database for product descriptions and prices.
Transaction processing (shopping cart)	Accepts orders and clears payments.
List server	Creates and serves mailing lists and manages e-mail marketing campaigns.
Proxy server	Monitors and controls access to main Web server; implements firewall protection.
Mail server	Manages Internet e-mail.
Audio/video server	Stores and delivers streaming media content.
Chat server	Creates an environment for online real-time text and audio interactions with customers.
News server	Provides connectivity and displays Internet news feeds.
Fax server	Provides fax reception and sending using a Web server.
Groupware server	Creates work group environments for online collaboration.
Database server	Stores customer, product, and price information.
Ad server	Maintains Web-enabled database of advertising banners that permits customized and personalized display of advertisements based on consumer behavior and characteristics.
Auction server	Transaction environment for conducting online auctions.
B2B Server	Implements buy, sell, and link marketplaces for commercial transactions.

# E-commerce Merchant Server Software Functionality

- **Software that provides the basic functionality need for online sales, including:**
  - An online catalog that list products available on a web site
  - Order taking via an online shopping cart that allows shoppers to set aside desired purchases in preparation for checkout, review what they have selected, edit their selections as necessary, and the actually make the purchase by clicking a button
  - Online credit card processing verifies the shopper's credit card and then puts through the debit to the card

# Merchant Server Software Packages (E-commerce Suites)

- Offers an integrated environment that provides most or all of the functionality and capabilities needed to develop a sophisticated, customer-centric site.
- Key factors to consider
  - Functionality
  - Support for different business models
  - Business process modeling tools
  - Visual site management tools and reporting
  - Performance and scalability
  - Connectivity to existing business systems
  - Compliance to standards
  - Global and multicultural capability
  - Local sales tax and shipping rules



# Widely Used Midrange and High-end E-commerce Suites

Page 199, table 4.5

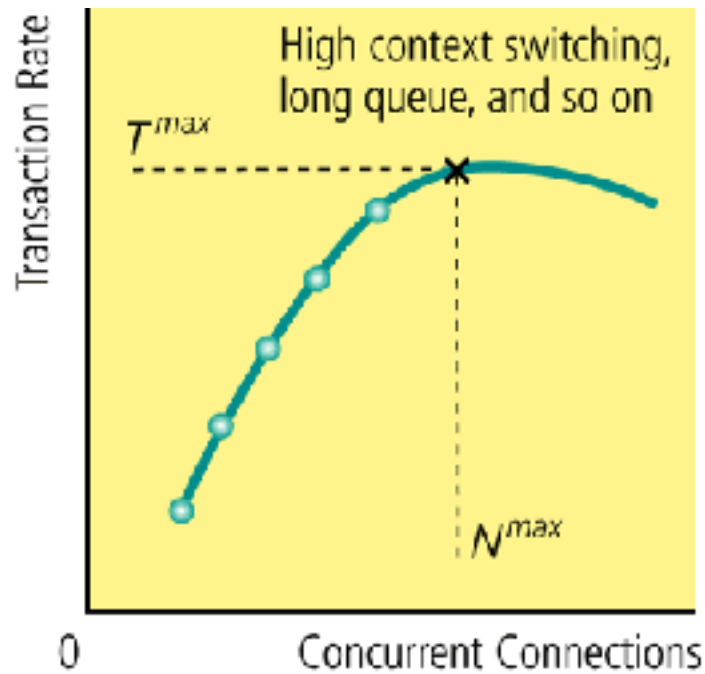
<b>TABLE 4.5</b>	<b>WIDELY USED MIDRANGE AND HIGH-END E-COMMERCE SUITES</b>	
<b>PRODUCT</b>	<b>APPROXIMATE PRICE</b>	
Microsoft Commerce Server 2000	\$8,500 per processor	
IBM WebSphere Commerce Suite	\$9,000 single workstation for Start edition; \$45,000 for Professional edition (per processor)	
InterWorld Commerce Exchange	\$65,000	
Open Market Transact	\$125,000	
Intershop Enfinity Suite	\$125,000–\$250,000	
Broadvision One-to-One Enterprise	\$250,000–\$500,000	
Blue Martini Customer Interaction System	\$1,000,000+	

# Choosing the Hardware for an E-commerce Site

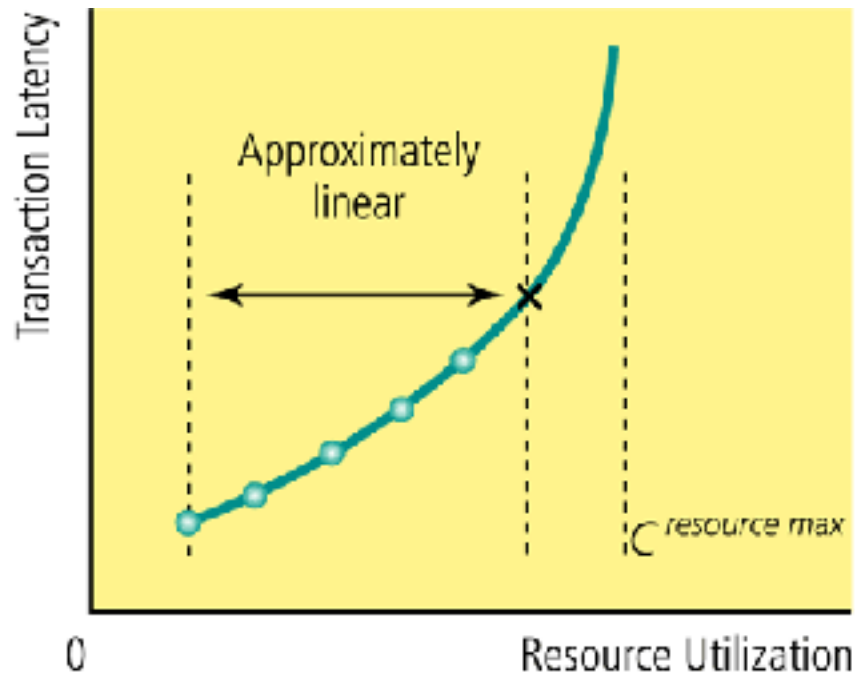
- **Hardware platform**
  - Refers to all the underlying computing equipment that the system uses to achieve its e-commerce functionality
- **Stateless**
  - Refers to the fact that the server does not have to maintain an ongoing dedicated interaction with the client
- **I/O intensive**
  - Requires input/output operations rather than heavy-duty processing power
- **CPU intensive**
  - Operations that require a great deal of processing power

# Degradation in Performance As Number of Users Increase

Page 203, figure 4.8



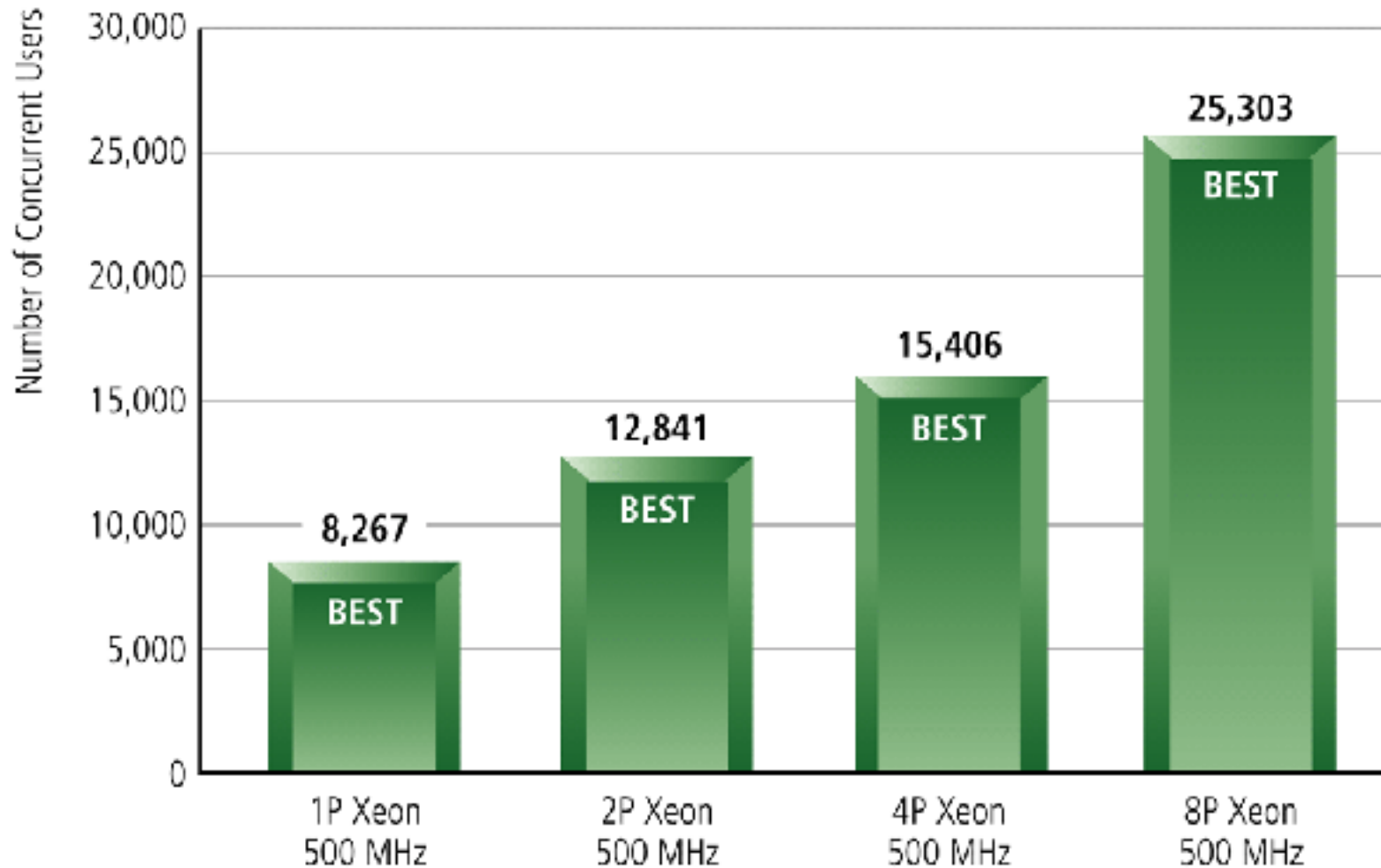
(A)



(B)

# Capacity of Static Page Web Servers

Page 204, figure 4.9



# Visitor Profile at Typical E-commerce Sites

Page 205, table 4.7

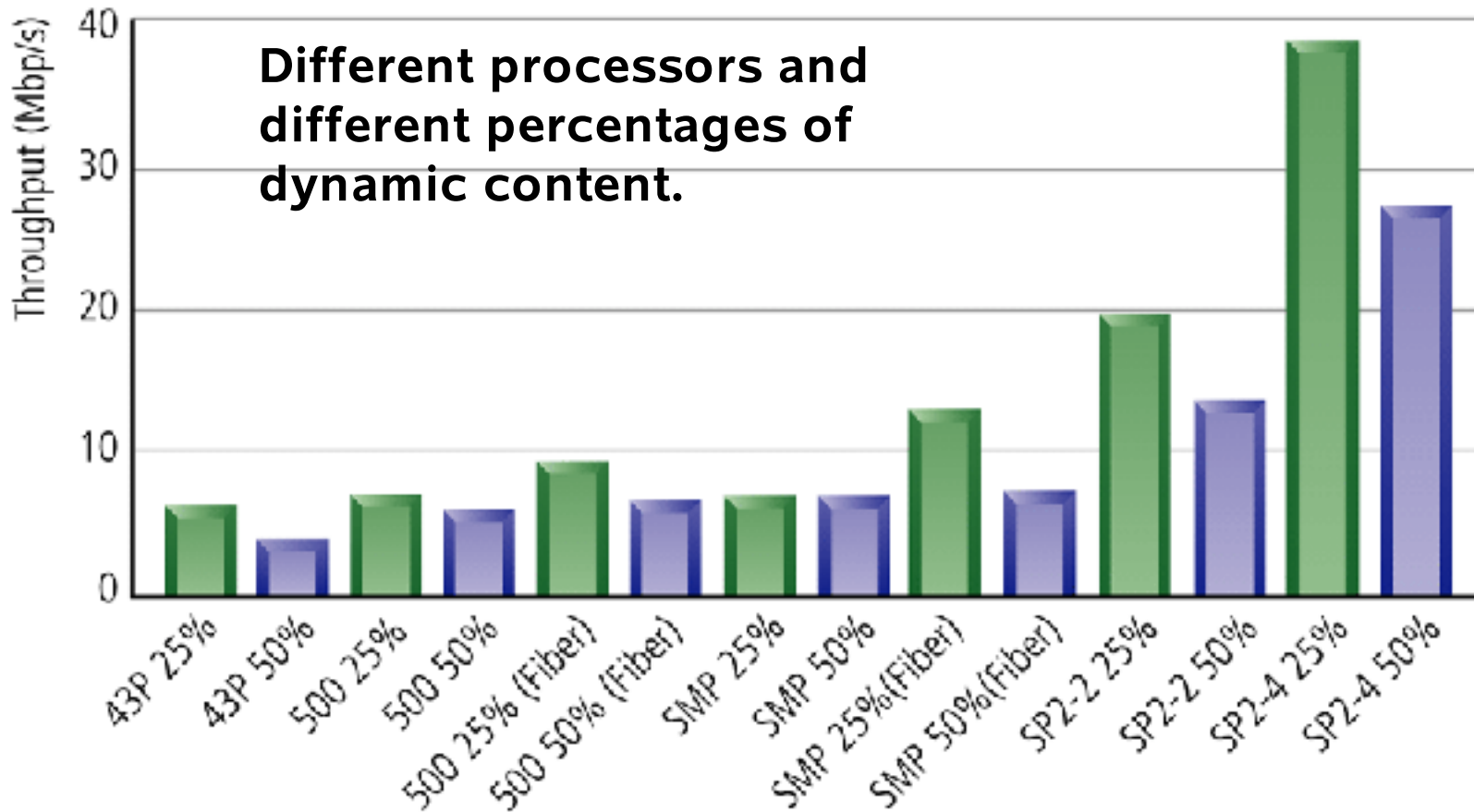
<b>TABLE 4.7 VISITOR PROFILE AT TYPICAL E-COMMERCE SITES</b>	
<b>VISITOR ACTIVITY</b>	<b>PERCENTAGE OF VISITORS</b>
Browse	80%
Search for content	9%
Add items to shopping carts	5%
Purchase goods	4%
Register at site	2%

SOURCE: Intel, 1999.

# The Impact of Dynamic Page Content on Web Servers

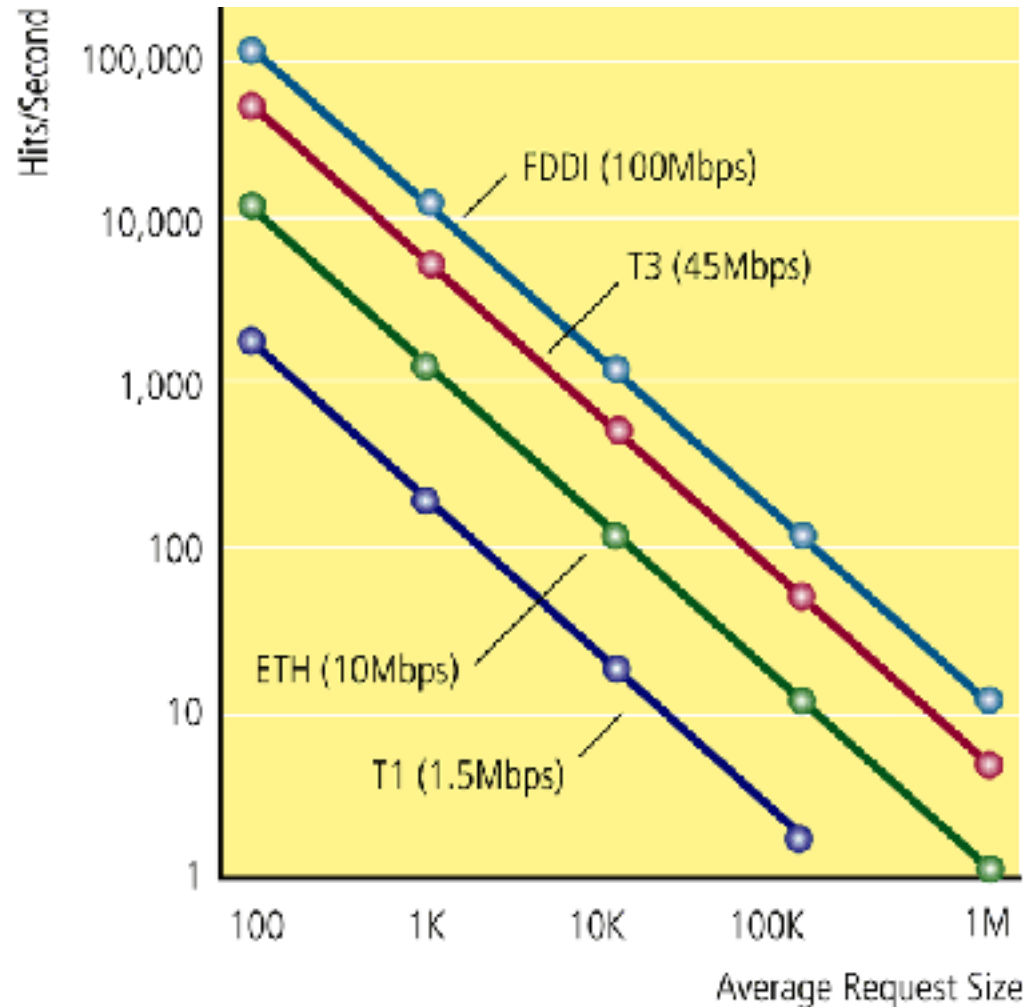
Page 206, figure 4.10

IBM RS6000 Servers



# The Relationship of Bandwidth to Hits

Page 207, figure 4.11



# Right-sizing Your Hardware Platform: The Supply Side

- **Scalability**
  - Refers to the ability of a site to increase in size as demand warrants
  - Scale hardware vertically
  - Scale hardware horizontally
  - Improve processing architecture of the site



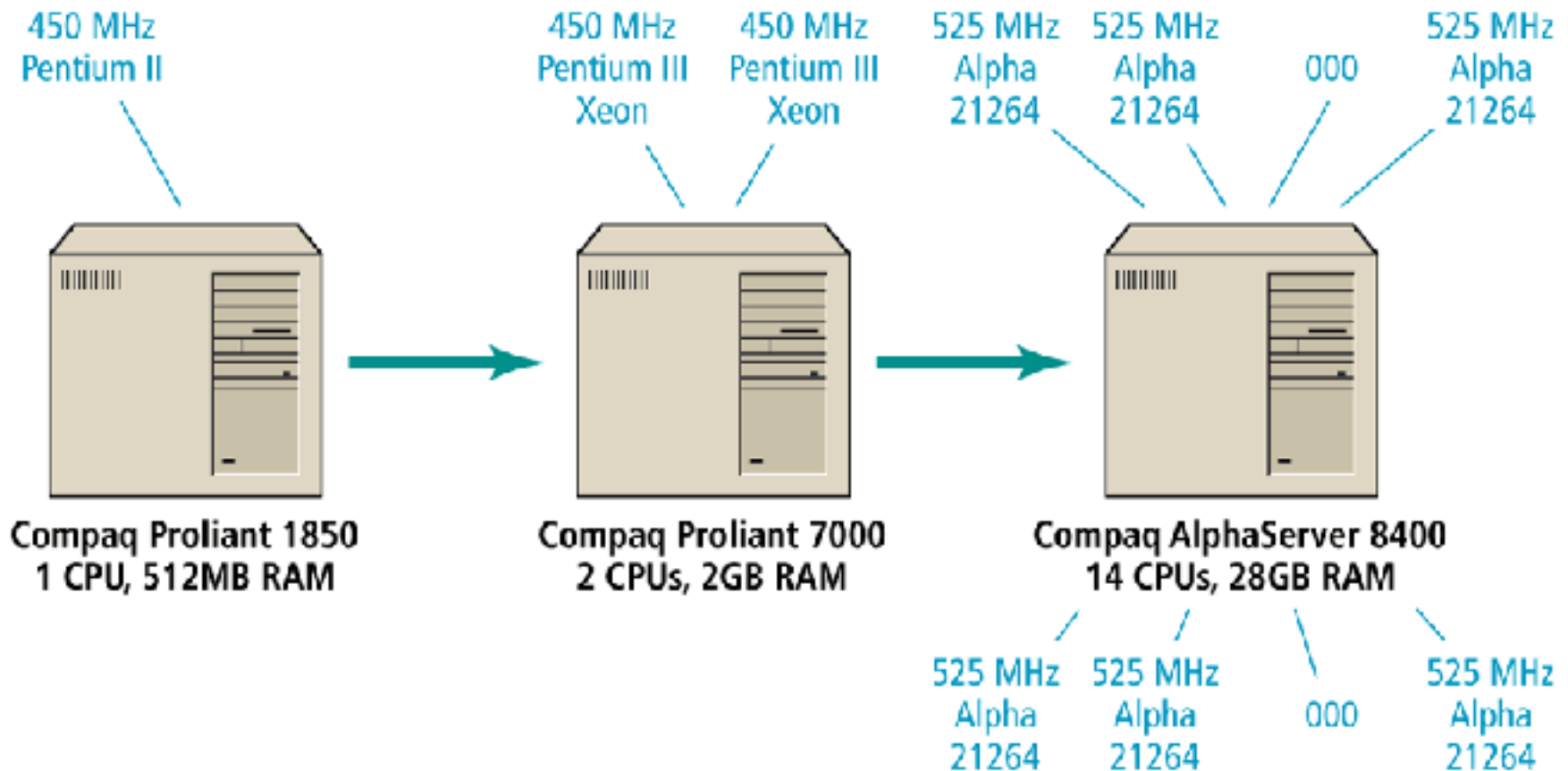
# Scaling Your Site to Meet Demand

Page 208, table 4.8

<b>TABLE 4.8</b>		<b>SCALING YOUR SITE TO MEET DEMAND</b>
<b>SCALING METHOD</b>	<b>DESCRIPTION</b>	
Vertical scaling	Increase your processing supply by improving your hardware but maintaining the physical footprint and the number of servers.	
Horizontal scaling	Increase your processing supply by adding servers and increasing your physical facility.	
Improve processing architecture	Improve your processing supply by identifying operations with similar workloads, and using dedicated tuned servers for each type of load.	

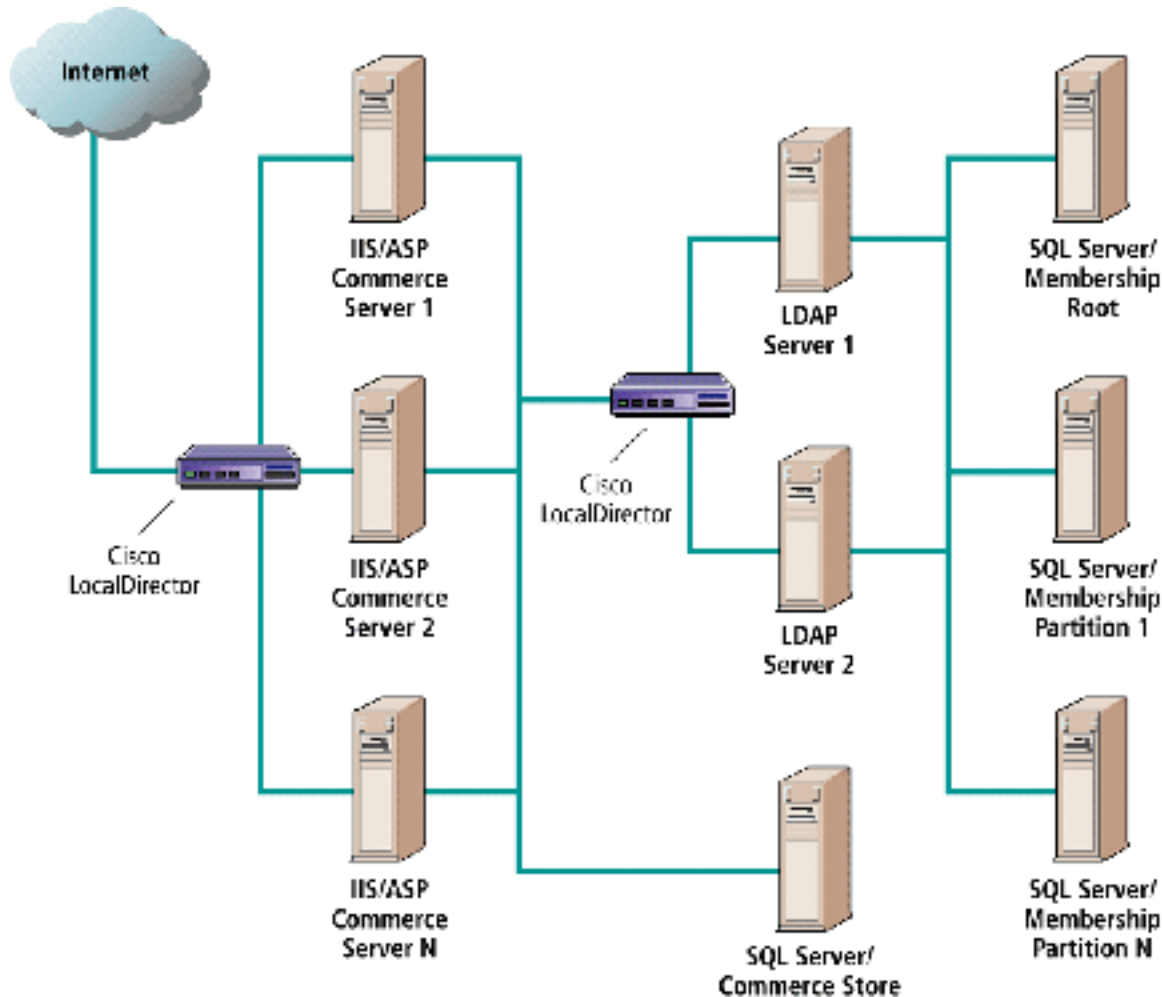
# Vertically Scaling a System

Page 208, figure 4.12



# Horizontally Scaling a System

Page 209, figure 4.13



# Improving the Processing Architecture of Your Site

Page 210, table 4.9

<b>TABLE 4.9</b>	
<b>IMPROVING THE PROCESSING ARCHITECTURE OF YOUR SITE</b>	
<b>ARCHITECTURE IMPROVEMENT</b>	<b>DESCRIPTION</b>
Separate static content from dynamic content.	Use specialized servers for each type of workload.
Cache static content.	Increase RAM to the gigabyte range and store static content in RAM.
Cache database lookup tables.	Cache tables used to look up database records.
Consolidate business logic on dedicated servers.	Put shopping cart, credit card processing, and other CPU-intensive activity on dedicated servers.
Optimize ASP code.	Examine your code to ensure it is operating efficiently.
Optimize the database schema.	Examine your database search times and take steps to reduce access times.

# Tools for Interactivity and Active Content

- **Common gateway interface**
  - A set of standards for communication between a browser and a program running on a server that allows for interaction between the user and the server
  - Active server pages
  - A proprietary software development tool that enables programmers using Microsoft's IIS package to build dynamic pages

# Tools for Interactivity and Active Content

- **Java**
  - Is a programming language that allows programmers to create interactivity and active content on the client machine -- thereby saving considerable load on the server
  - Java server pages (JSP)
  - Like CGI and ASP, a web page coding standard that allows developers to dynamically generate web pages in response to user requests
  - Javascript
  - A programming language invented by netscape that is used to control the objects on an HTML page and handle interactions with a browser

# Tools for Interactivity and Active Content

- **Active X**
  - A programming language created by microsoft to compete with java
- **Vbscript**
  - A programming language invented by microsoft to compete with javascript
- **Coldfusion**
  - An integrated server-side environment for developing interactive web applications

# Personalization Tools

- **Personalization**
  - The ability to treat customers based on their personal qualities and prior history with your site
- **Customization**
  - The ability to change the product to better fit the needs of the customer



# The Information Policy Set

- **Privacy policy**
  - A set of public statements declaring to your customers how you treat their personal information that you gather on the site
- **Accessibility rules**
  - A set of design objectives that ensure disabled users can effectively access your site
- **Financial reporting policies**
  - Statement declaring how you will account for revenues and costs at your site