Web Based tools for e-commerce

WEB SERVER

- All computers that are connected to the Internet and contain documents that their owners have made publicly available through their Internet connections are called Web servers.
- A **server** is any computer used to provide files or make programs available to other computers connected to it through a network.
- The software that the server computer uses to make these files and programs available to the other computers is sometimes called **server software**.
- Sometimes this server software is included as part of the operating system that is running on the server computer.

Common features

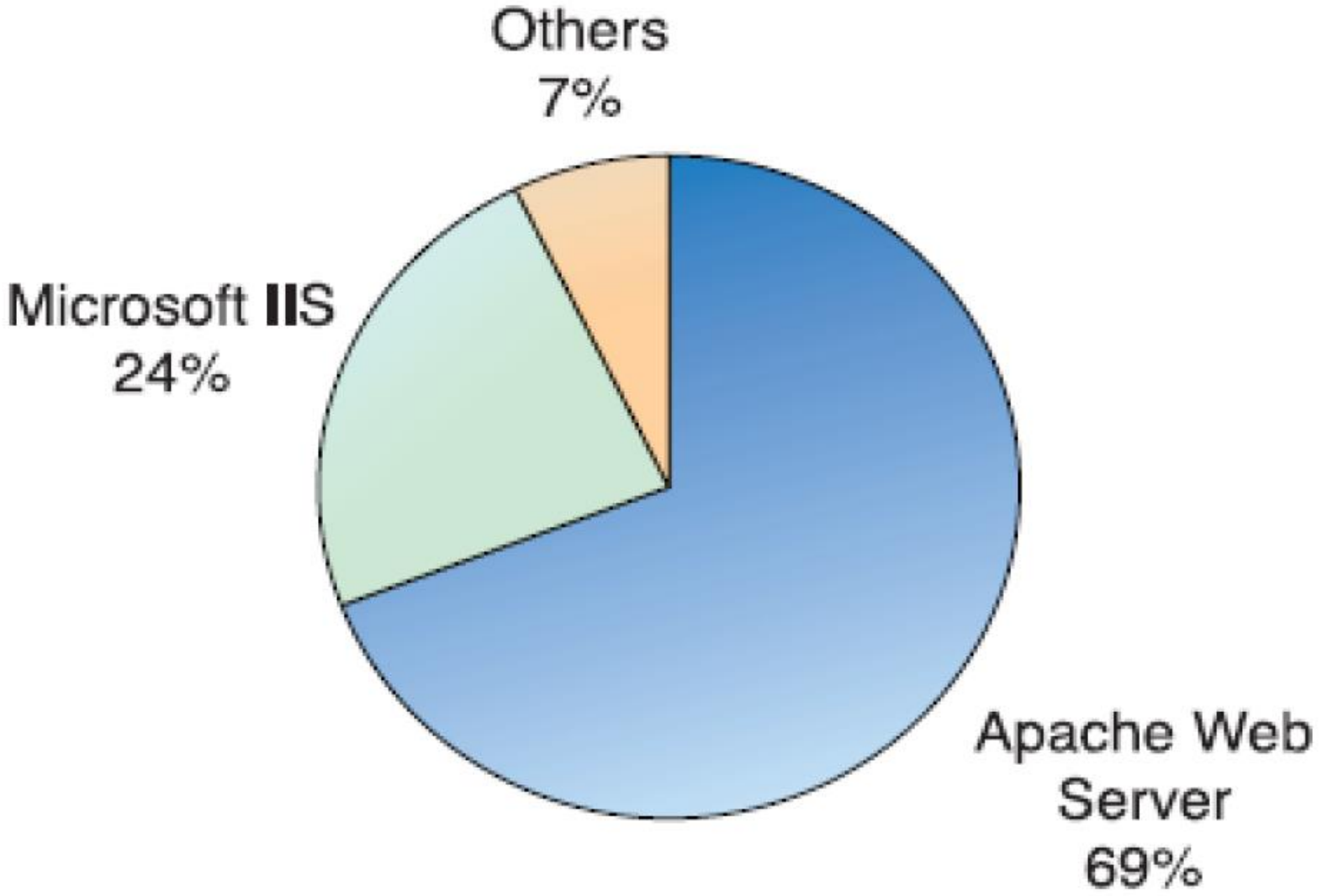
- **Virtual hosting** to serve many Web sites using one IP address.
- **Large file support** to be able to serve files whose size is greater than 2 GB on 32 bit OS.
- **Bandwidth throttling** to limit the speed of responses in order to not saturate the network and to be able to serve more clients.
- **Server-side scripting** to generate dynamic Web pages, still keeping web server and website implementations separate from each other.

Uniform Resource Locator (**URL**)

- Web servers are able to map the path component of a URL.
  - a local file system resource (for static requests);
  - an internal or external program name (for dynamic requests).
- For a *static request* the URL path specified by the client is relative to the web server's root directory.

Web Server Software

- Most commonly used Web server programs today:
  - Apache HTTP Server,
  - Microsoft Internet Information Server (IIS), and
  - Sun Java System Web Server (JSWS)
- **Netcraft**, a networking consulting company in Bath, England continually conducts surveys to tally the number of Web sites in existence and measure the relative popularity of Internet Web server software.


Others
7%
Microsoft IIS
24%
Apache Web
Server
69%

Apache HTTP Server

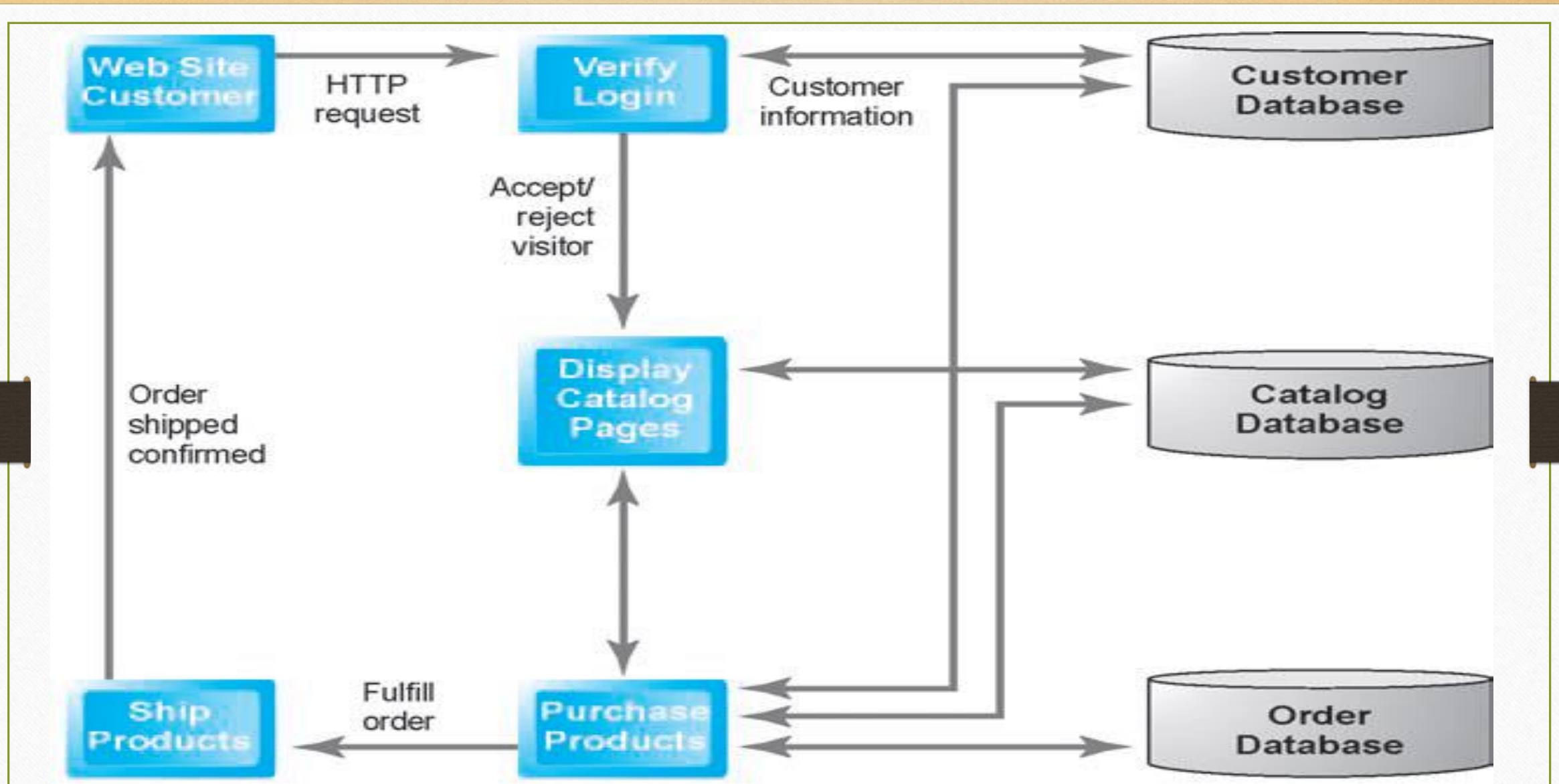
- Rob McCool developed Apache while he was working at the University of Illinois at the **NCSA** in 1994.
- The Apache Web server is currently available on the Web at no cost as open-source software.
- These can range from **server-side programming language** support to authentication schemes.
- **Virtual hosting** allows one Apache installation to serve many different actual websites. For example, one machine with one Apache installation could simultaneously serve www.example.com, www.test.com, test47.test-server.test.com, etc.
- It supports **password authentication and digital certificate authentication**.

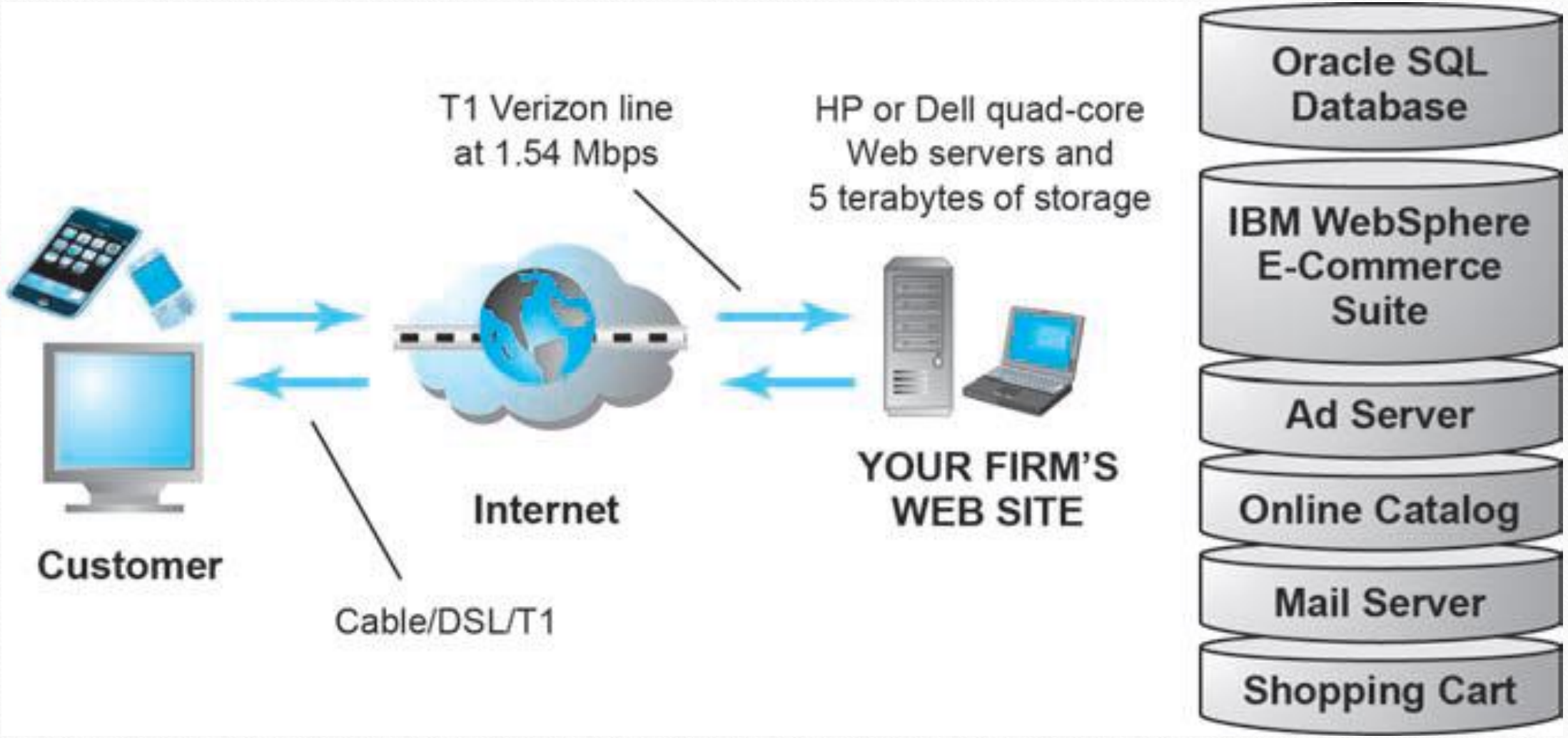
Microsoft Internet Information Server (IIS)

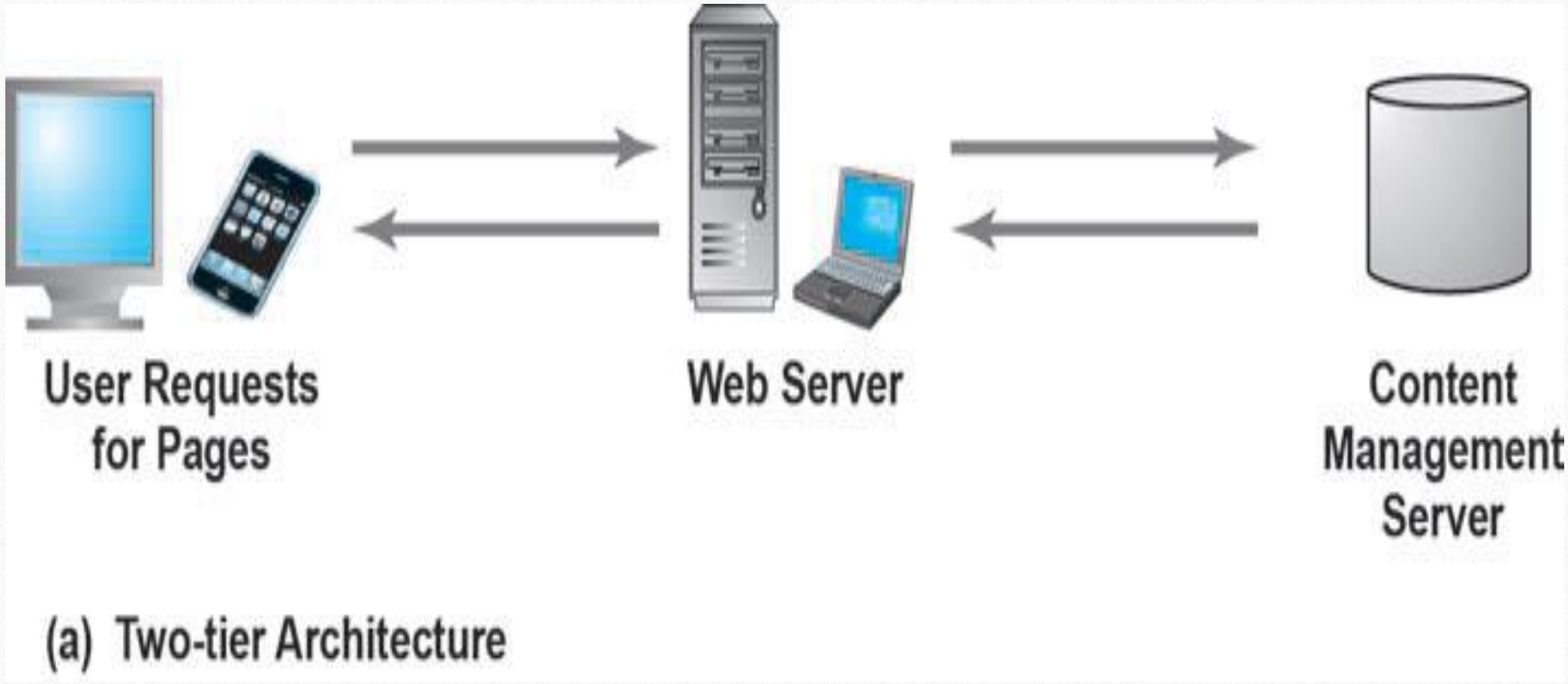
- IIS is used on many corporate intranets because many companies have adopted Microsoft products as their standard products.
- IIS supports the use of ASP, ActiveX Data Objects, and SQL database queries.
- IIS's inclusion of ASP provides an application environment in which HTML pages, ActiveX components, and scripts can be combined to produce dynamic Web pages.
- IIS also includes the Microsoft FrontPage Web site development tool and other reporting tools

Web Client/Server Communication

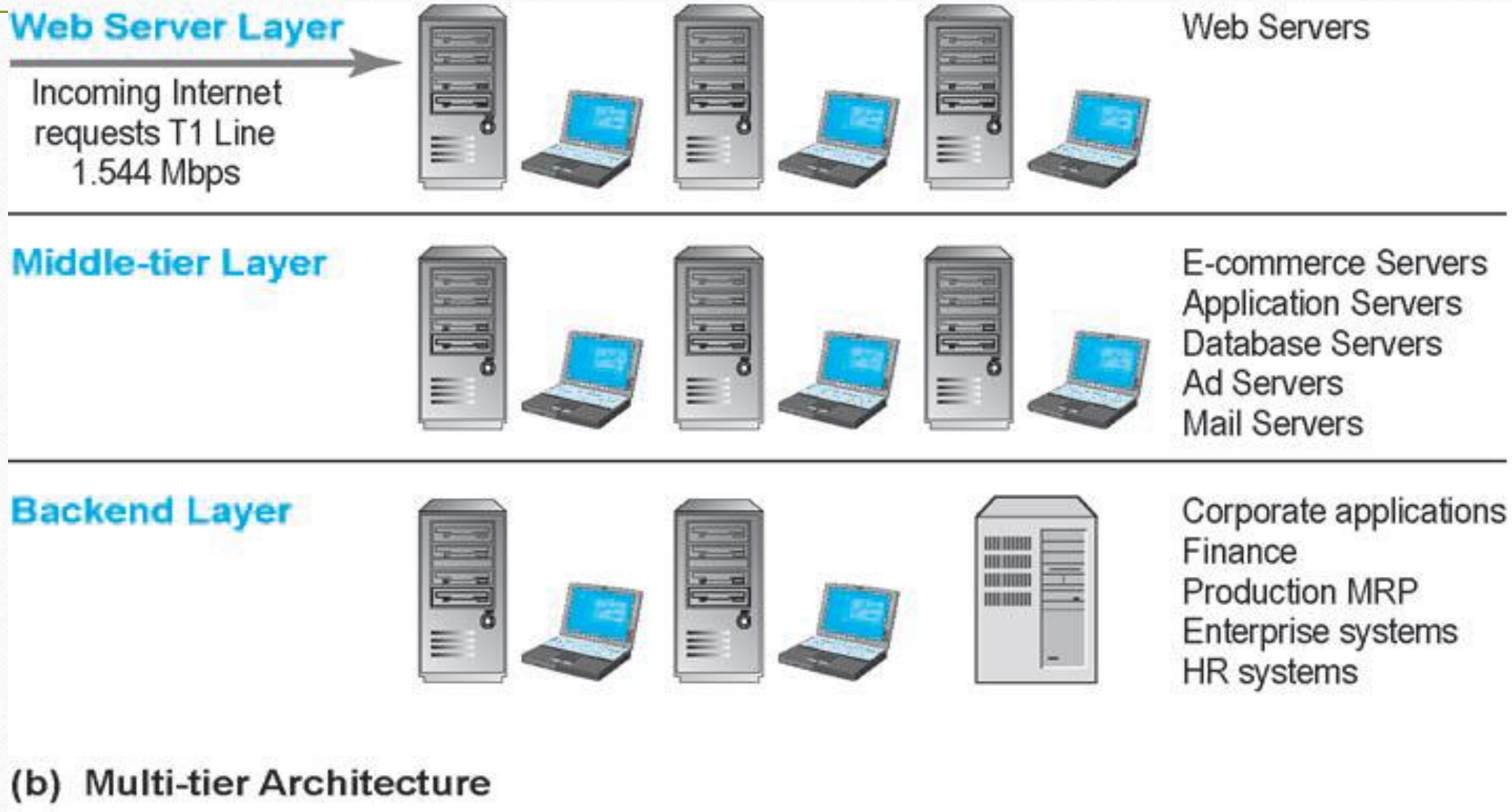
- When a person uses a Web browser to visit a Web site, the Web browser (also known as a Web client) requests files from the Web server at the company or organization that operates the Web site.
- Using the Internet as the transportation medium, the request is formatted by the browser using HTTP and sent to the server computer.
- A moment later, when the server receives the request, it retrieves the file containing the Web page or other information that the client requested, formats it using HTTP, and sends it back to the client over the Internet.


Web Site Customer
HTTP request
Verify Login
Customer information
Customer Database
Accept/ reject visitor
Display Catalog Pages
Catalog Database
Order shipped confirmed
Ship Products
Fulfill order
Purchase Products
Order Database


T1 Verizon line
at 1.54 Mbps
HP or Dell quad-core
Web servers and
5 terabytes of storage
Oracle SQL
Database
IBM WebSphere
E-Commerce
Suite
Ad Server
Online Catalog
Mail Server
Shopping Cart
Customer
Internet
YOUR FIRM'S
WEB SITE
Cable/DSL/T1



(a) Two-tier Architecture



(b) Multi-tier Architecture

Web Server Hardware

- Web sites can use two-tier, three-tier, or n-tier architectures to divide the work of serving Web pages, administering databases, and processing transactions.
- Companies use a wide variety of computer brands, types, and sizes to host electronic commerce operations.
- Most electronic commerce Web sites are operated on computers designed for site hosting, however.
- Web server computers generally have more memory, larger (and faster) hard disk drives, and faster processors
- Web server computers use more capable hardware elements and more of these elements, they are usually much more expensive than workstation PCs.

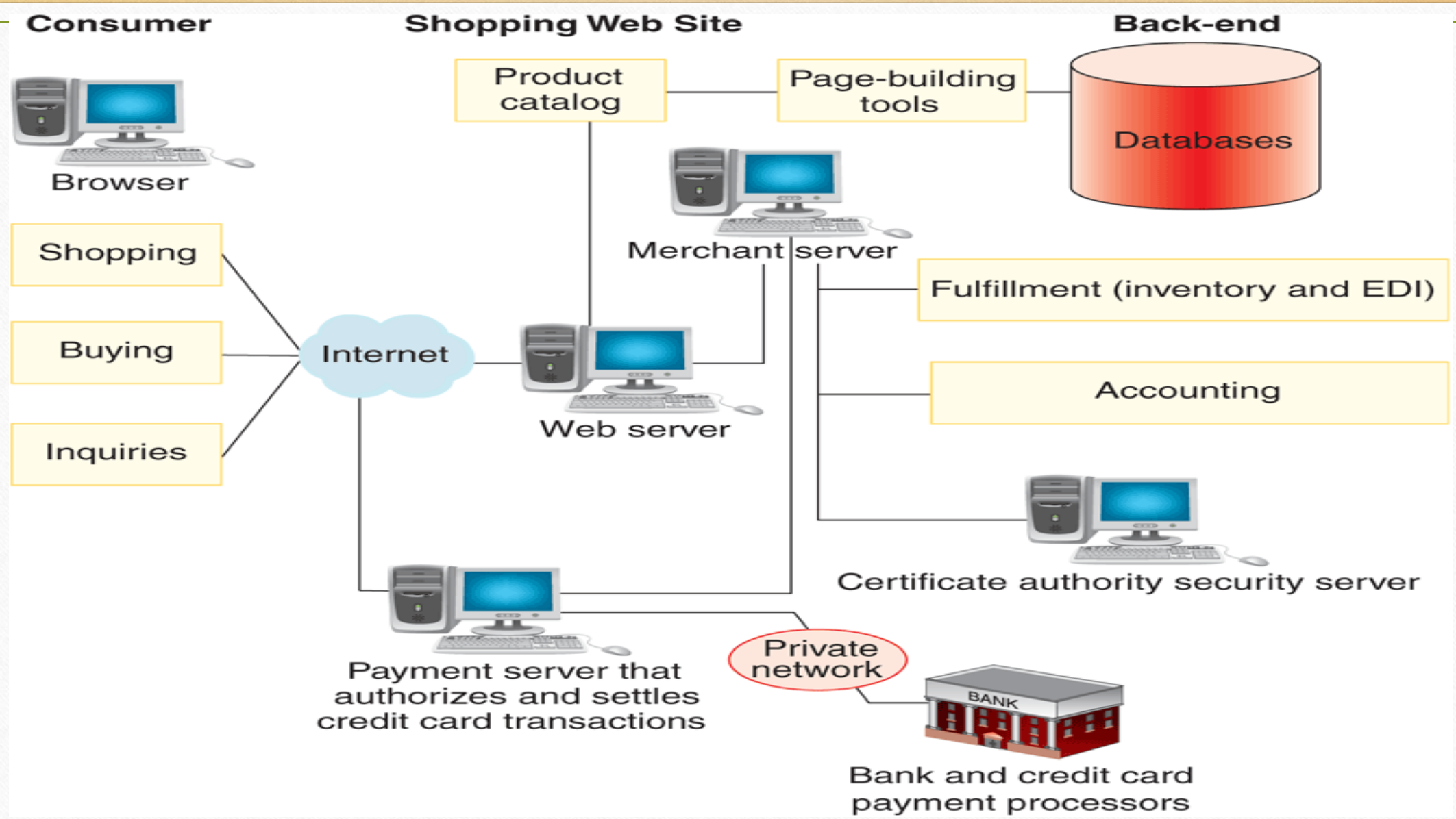
Web Server Performance Evaluation

- Benchmarking Web server hardware and software combinations can help in making informed decisions for a system.
- Benchmarking, in this context, is testing that is used to compare the performance of hardware and software.
- Elements affecting overall server performance include hardware, operating system software, server software, connection speed, user capacity, and type of Web pages being delivered.
- The number of users the server can handle is also important.

- Two factors to evaluate when measuring a server's Web page delivery capability are throughput and response time.
- Throughput is the number of HTTP requests that a particular hardware and software combination can process in a unit of time.
- Response time is the amount of time a server requires to process one request.
- These values should be well within the anticipated loads a server can experience, even during peak load times.

Web Server Hardware Architectures

- Administrators of large Web sites must plan carefully to configure their Web server computers, which can number in the hundreds or even thousands, to handle the daily Web traffic efficiently.
- These large collections of servers are called **server farms** because the servers are often lined up in large rooms, row after row, like crops in a field.
- One approach, sometimes called a **centralized architecture**, is to use a few very large and fast computers.
- A second approach is to use a large number of less powerful computers and divide the workload among them. This is sometimes called a distributed architecture or, more commonly, a **decentralized architecture**.


Consumer
Shopping Web Site
Back-end
Browser
Product catalog
Page-building tools
Databases
Merchant server
Shopping
Buying
Inquiries
Internet
Web server
Fulfillment (inventory and EDI)
Accounting
Certificate authority security server
Payment server that authorizes and settles credit card transactions
Private network
BANK
Bank and credit card payment processors