E-Business Technologies

Chapter 7

Client/Server Technologies for E-Business

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John Wiley & Sons, Inc.

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Key Ideas

- E-commerce applications require a variety of servers to perform a variety of functions.
- The client/server environment is divided into tiers to provide independence among presentation, application logic, and data management.
- Separating the database from a web server provides additional security.

Server Technologies
Types of Servers

- File/application
  - “An extended hard drive” for users
- Print server
  - Places files in print queue for printing
- Web server
  - Manages web traffic
- Database server
  - Holds database(s) for the organization

More Server Types

- Communication server
  - Handles remote access, communication protocols, gateway and network services
- Groupware server
  - Facilitates communication among group members
- Multimedia server
  - Run specialized files and programs for music, film, graphics
- Proxy server
  - Requests Internet services and forwards contents, may serve as cache for frequently used documents
Server and Network Operating Systems

- Network operating systems (NOS) are complex programs for managing internal and local area network resources
- May manage servers, printers, stations, remote users, security, applications, client/server functions.

Operating Systems for Web Servers

- Windows 2000/ME/XP
- UNIX
- Linux
  - Open source
  - Not a web server, just an operating system
  - Runs with Apache Web server frequently
- OS/2 (IBM)
- Netware (Novell)
- Solaris and iPlanet (Sun)
Server and Network Operating Systems

- Many selection criteria
  - (Cost, range of hardware and applications supported, performance, stability)
  - Many other operating systems exist (IBM’s OS/390)
  - Many applications can run on various platforms

Server Hardware

- Three typical processors
  - Intel Pentium
  - Alpha based
  - Sun Microsystems
- Typical computer classifications
  - Microcomputer, minicomputer, mainframe, supercomputer
- Server can be on any of these, but operating systems may not run on all machines
Server Considerations

- Dual processor servers
  - Multiple processors can improve speed, but also have coordination and communication overhead
  - (2 processors not twice as fast as 1)
- Random access memory (RAM)
- Server auxiliary storage
- RAID (Redundant arrays of independent disks)
  - Important for continuous processing and security

Other Server Peripherals

- Monitor
- Network Equipment
  - Hubs
  - Ethernet and token ring
- Backup Systems
  - Data compression
  - Zip disks and CD-ROMs
  - Optical disks and CD burners
  - Cartridge and magnetic tape backup
  - USB ports
**Server Configurations**

- **Thin server**
  - Designed for one function
- **Server farms and server collections**
  - Allows clustering
  - Fault-tolerant systems
  - Middleware, operating system clustering software, and custom applications for seamless clustering
  - Load balancing
  - Server failover
  - Data mirroring

**Sizing a Web Server**

- **User demand or volume**
  - Hits per second/average versus peak
  - Other functions: authentication, transfer protocol information, managing connections (sockets)
- **Type of content**
  - Text takes less space than images (and less time to transfer)
  - Script requests
- **Network Bandwidth**
Client Technologies

Workstations

- Generally desktop client devices
- Cost
- Performance
  - Memory is key – processing stored data much faster than getting data from peripheral devices
- Features offered
- Compatibility with existing equipment
- Reputation of vendor
Network Computer

- Lacks attached secondary storage capacity
- Reliant on network to supply OS and applications
- Updates can be facilitated for all users at once
- Security advantages – can’t copy data to diskettes
- Portable workstations
- Workstation peripherals
- Workstation operating systems

Transaction Terminals

- ATMs
- POS (point of sale) systems
  - Builds computer technology into the old “cash register”
- Kiosks
- Television set-top boxes
Client Configurations

- How much application logic by the client?
  - Thin client, server handles most logic
    - Pros: security, easier maintenance
    - Cons: less control for users, higher cost for larger servers, diminishes sharing load between clients and servers
  - Fat client, most logic handled by client
    - Inverse pros and cons with thin client.

Mobile Client Technologies

- Digital phones
- PDAs
- Smart Phones
  - WAP
  - WTLS
    - Data integrity
    - Privacy
    - Authentication
    - Denial-of-service
- AvantGo.com
- SportsFeed.com
Your Turn

- Consider the ideas of thin clients, fat clients, and thin servers.
  - Who benefits the most from each approach?
    - (Note some stakeholders may both benefit and be constrained by some approaches)
  - What should be the key considerations in making these choices?

Managerial Issues
Hosting or Being Hosted?

- Advantages for being hosted (disadvantages for hosting)
  - 24/7 support
  - High speed data lines
  - Skilled staff
  - Relatively low costs (especially upfront)
- Disadvantages for being hosted (advantages for hosting)
  - No control over server environment
  - May have size limits
  - Risk of security breach if database stored outside
  - Lack of bandwidth controls

Summary

- There are many types of servers with a wide variety of functions. Selecting the right ones can be critical for e-business success.
- Further there are many types of clients and choices for managers in this domain.
- Coordinating servers and clients can be challenging especially for small businesses.
Expanding the Domain

For examples of client/server technologies for e-business see:

- AvantGo
  - http://www.AvantGo.com
- Skiviez
  - http://www.skiviez.com
- Apache project
  - http://www.apache.org

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