Chapter 6: System Development

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HARDWARE REQUIREMENTS

1. PC Level Processing Units
2. Storage Devices
3. Network Protection Devices
4. Surge Protectors
5. RAID Technology
6. Server Specific Jargon

1. PC Level Processing Units

a) UNIX Workstations
b) X-Window System
c) X-Terminal
d) X-Server
e) Light Pen
f) Digital Pen
g) Notebook Computers

1. PC Level Processing Units

- Unix supports many of the most familiar personal computer applications like WordPerfect, DBASE IV, Lotus 1-2-3.
- Unix has become the workstation of choice for Client/Server environment on the basis of cost performance rather than functionality.
- The X-Window System is an open, cross-platform, Client/Server system for managing a windowed graphical user interface in a distributed network.
- XWindow is primarily used in networks of interconnected mainframes, minicomputers, and workstations. It provides the standard toolkit and protocol to build graphical user interfaces on Unix.

1. PC Level Processing Units

- An X-terminal is typically a diskless terminal especially designed to provide a low-cost user interface for applications that run in a network X-server as part of a distributed XWindow System.
- The X-terminal concept is essentially like tel-neting into a machine and then running some application there. All applications will be run on the server but the display will be exported to your computer.
- An X-server is a server of connections to X-terminal in a distributed network that uses the X-Window System. From the terminal user's point-of-view, the X-server may seem like a server of applications in multiple windows.

SOFTWARE REQUIREMENTS

1. Client OS
2. Server OS
3. Network OS

COMMUNICATION INTERFACE TECHNOLOGY

1. Network Interface Card
2. LAN Cabling
3. WAN
4. ATM
5. Ethernet
6. Token Ring
7. FDDI
8. TCP/IP
9. SNMP
10. NFS
11. SMTP

Chapter 7: Training and Testing

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INTRODUCTION

- User training for a Client/Server system is complicated by the interface of multiple front-end systems with servers.
- Teaching style is explanation of concepts, supported by hands on examples.
- Trainees can participate in learning activities at any time and location using Internet and satellite technologies.
- One consistent pattern that emerged is that the highest achievement tended to be evidenced in clusters most related to the way the course was taught, a combination of instructor-led and team-based learning.

INTRODUCTION

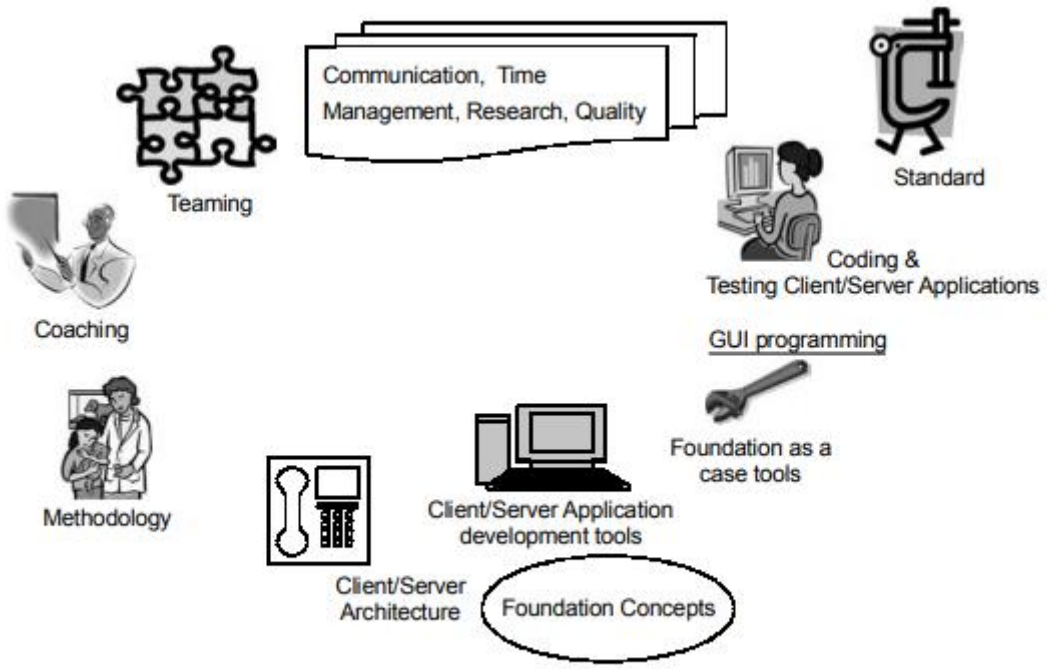

Fig. 7.1: *Concept Map for Training in Client/Server Computer Application Development*

TECHNOLOGY BEHIND TRAINING DELIVERY

1. Traditional Classroom
2. On-the-Job Training (OTJ)
3. Video Conferencing
4. Collaborative Tools
5. Virtual Groups and Event Calls
6. E-Learning
7. Web-based Training
8. Learning Management Systems (LMS)
9. Electronic Performance Support Systems (EPSS)

TO WHOM TRAINING IS REQUIRED?

- System Administrator Training
- DBA Training
- Network Administrator Training
- End-User and Technical Staff Training
- GUI Applications Training
- LAN/WAN Administration and Training Issues

System Administrator Training

- System administrator is the person in Client/Server environment, who understands the availability of resources desired by client.
- System administrator is responsible for managing server, client and as well as about all the applications running in the environment.

DBA Training

- Client/Server environment consists of centralized or distributed data, so database administrator requires additional responsibilities.
- Database Administrator (DBA) is an experienced senior member(s) of the computing staff who plan and co-ordinate the development and daily maintenance of the entire database environment.

A typical DBA's duties include:

- Installing and configuring the DBMS.
- Monitoring the performance of the database and tuning the DBMS for optimal performance.
- Ensuring data integrity is maintained and appropriate backups are made.
- Setting standards for system documentation.
- Facilitating end-users with required database facilities.
- Overseeing new database developments, database reorganization.
- Maintaining an acceptable level of technical performance for database utilities.

Network Administrator Training

- Network administrators training program specifically focuses on the design, installation, maintenance and management as well as implementation, and operating network services on LAN (Local-Area Network), WAN (Wide-Area Network), network segment, Internet, intranet of Client/Server system.

End-User and Technical Staff Training

- End user’s are the user’s of Client/Server environment those how are already having sufficient knowledge about application running on the system.
- Technological component constituting the Client/Server system must be completely known to the supporting staff.

GUI Applications Training

- Most clients in Client/Server systems deliver system functionality using a Graphical User Interface (GUI).
- GUIs have become the established alternative to traditional forms-based user interfaces.
- GUIs are the assumed user interface for virtually all systems development using modern technologies.

LAN/WAN Administration and Training Issues

- For LAN administration there are various products available such as Network General Sniffer that enables administrator to monitor the network for capacity and problems without the need for detail knowledge of the applications.
- WAN administrator must be trained in such a way that he can use and manage the remote management tools.

LAN/WAN Administration and Training Issues

- All the WAN network issues associated with remote terminal access to host system exist in the client/server to WAN access.
- Complexities arise when data is distributed to the remote LAN.
- The administrator must be trained in the software and in procedures to handle network definition, network management and remote backup and recovery.

IMPACT OF TECHNOLOGY ON TRAINING

- There are a number of factors driving the education and training markets to increase the use of technology for learning delivery:
  - Technical obstacles in adoption are falling
  - Penetration of the Internet
  - Market consolidation and one-stop shopping
  - Traditional players looking to get on the scene
  - Knowledge is the competitive weapon of

CLIENT/SERVER TESTING TECHNOLOGY

- Client/Server Software
- Client/Server Testing Techniques
  - Risk Driven Testing
  - Performance Testing
- Testing Aspects
- Measures of Completeness

TESTING CLIENT/SERVER APPLICATION

- A system can go wrong due to input/output errors, server down, records locked, lost messages and many more and then it requires to test the system response for these events.

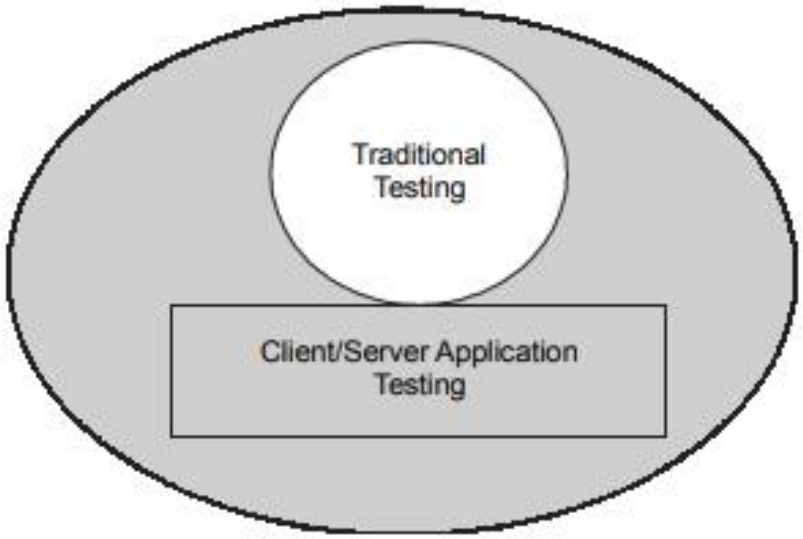

Fig. 7.3: Client/Server Testing

- Testing Client/Server Systems is entirely different; still the testing of software is there

TESTING CLIENT/SERVER APPLICATION

- Testing Client/Server applications is more challenging than testing traditional systems due to the following reasons:
  - New kinds of things can go wrong: for example: Data and messages can get lost in the network.
  - It’s harder to set up, execute, and check the test cases: for example: Testing for proper responses to timeouts.
  - Regression testing is harder to automate: for example: It’s not easy to create an automated ‘server is busy’ condition.
  - Predicting performance and scalability become critical: for example: It seems to work fine with 10 users. But what about with 1,000 users or 10,000 users?