Network Technology

Network

A network is two or more computers connected to share data and/or resources.

Network Technology

- History of networks
- Development of Personal Computer
- File/Resource sharing needs discovered
- Network solutions & components
- Network Applications
- Security
- From LAN to WAN to The Internet
- Network Technology Guidance

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In the beginning…..

- There were counting stones, abaci, calculating engines
- Smoke signals, fleet footed messengers, carrier pigeons
- A variety of communication protocols

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In the beginning…..

- There were mainframes (definition: high-level computer designed for intensive computational tasks and used by large corporations. Mainframes are often shared by multiple users connected to the computer via terminals. Originally refers to the cabinet containing the CPU of a room-sized batch-processing machine.)

….and next, minicomputers (definition: A minicomputer, a term no longer much used, is a computer of a size intermediate between a microcomputer and a mainframe. Typically, minicomputers have been stand-alone computers (computer systems with attached terminals and other devices) sold to small and mid-size businesses for general business applications and to large enterprises for department-level operations. In recent years, the minicomputer has evolved into the "mid-range server" and is part of a network.)

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Development of the PC

- Freedom from Mainframe controls/limitations
    - Ability to run Killer Apps (spreadsheets, database)
    - Unlimited output formatting
    - Easy to use

Network Solutions The first Local Area Network

- Simple network protocols
- Efficient file sharing
- Fault tolerant
- No virus problems
- Secure
- Affectionately known as “Sneakernet”

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Network Solutions Ethernet

- Bus topology
- Probabilistic access
- Stable network adopted from printer support
- Originally 10mbps, latest revision is 100mbps
- Low cost
- Scalable

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Network Solutions Token Ring

- Ring Topology
- Deterministic access
- Fault Tolerant
- Scalable
- Big Blue standard
- Originally 4mbps, now 16mbps

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Network Solutions Network Operating Systems

- Client/Server
- Peer to Peer

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Network Components

- Topology options
- Cabling
- Network operating systems
- Network Interface Cards
- PC's, Servers & Printers
- MAUs, Concentrators, etc.
- Standards

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Network Components Topology options

- Ring or Bus???
- Either choice is actually wired to form a "Star"

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Network Components Cabling

- Use Category 5, unshielded twisted pair (comes in a variety of colors)
- Avoid Type 1 and COAX (you will have to re-cable later)
- Fiber to desktop is expen$ive

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Network Components Wire Center

- Dedicated room(s) for centralized cable distribution

- Typically houses telco equipment, routers, servers
- Install telephone (voice) in wire center(s) for support use
- Secure room from intentional or accidental access

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Network Components Network Operating Systems

- Client/Server
- Peer to Peer
- Expect NOS costs of $100 to $200 per user

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Network Components Network Interface Cards

- Geek word is NIC
- Ethernet 10 - $25-$50
- Ethernet 100 - $75-$200
- Token Ring - $125-$300
- Add $50-$75 for PCMCIA

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Network Components Servers

- Determine capacities needed & quadruple
- Protect server - electrical, physical security
- Be prepared for server crash--have plan, backup equipment & support allocated

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Network Components PCs

- Determine capacities needed & quadruple
- Pass obsolete equipment to lower usage levels
- Assign PC power on real need and not status within organization

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Network Components Network Printers

- Design network with print sharing in mind

- Educate users on the advantages of printer sharing
- Avoid large number of local printers
- Buy network direct cards for printers for older printers

Network Components Concentrators/Hubs/MAUs

- Use intelligent devices if budget allows
- Per port cost ranges from $10 for passive to $250 for intelligent device

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Network Applications

- Office Automation
- Electronic Messaging
- Intranet - Internal WEB services
- Licensing issues
- End user training

Security Issues

- Login security
- File system security
- Resource security
- Remote access issues
- Software protection/piracy
- Virus protection
- Disaster recovery
- Security training

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From LAN to WAN to The Internet

- LAN - CAN - WAN - MAN
- Bridges, Routers & Gateways
- Telecommunication options
- The Internet

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Sustaining a LAN/WAN

- Typical cost for LAN/WAN components
- Support requirements
- Contract services
- Help desk options
- Measuring support

Summary

- When involved in network projects have a ready source of reference material
- Always look to the next higher level of connectivity, isolated networks propagate later confusion
- If a technology impasse occurs use a “Friendly Technologist” to facilitate open discussion

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Summary

- Training $$$ are difficult to find, use them cautiously

- All disaster recovery plans must be tested in a real recovery scenario. This is the only way to be assured you will have any chance of recovering the network environment.

- Use commonly accepted network technology standards

Summary

- Avoid proprietary solutions, avoid solutions which tout themselves as being open but are in fact just the opposite

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References

- Source: http://faculty.washington.edu/ocarroll/infrmatc/networks/index.htm
- internet