

Home & Small Office Computing Solutions

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Topics

- ! Goals of Networking
- ! Physical Network
- ! Internet Connections
- ! Making it all work
- ! Managing the network

Goals of Networking

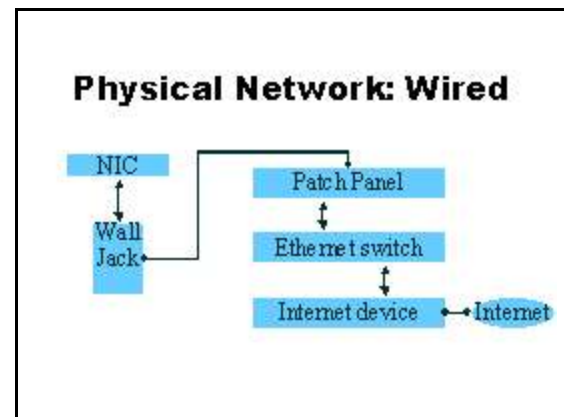
- ! Simplify office tasks
 - " Eliminate the "sneaker network" (share information more effectively)
- ! Maximize equipment utilization
 - " Reduce equipment purchases by sharing peripheral devices
- ! Share Internet connection
 - " Move away from only one computer online at a time with a modem connection of <56 Kbps

Physical Network

- ! Wired
- ! Wireless
- ! How to decide

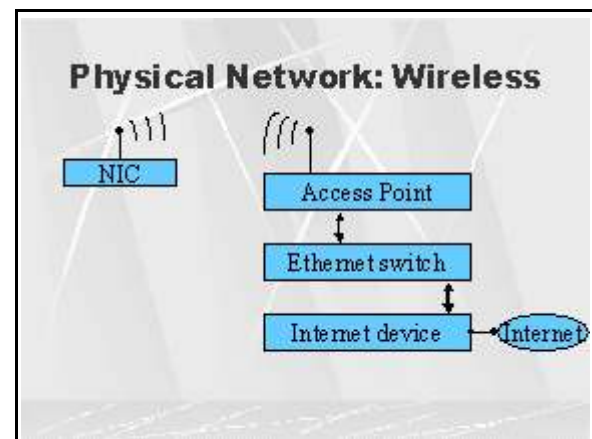
Physical Network: Wired

- ! 10/100 Mb Ethernet NIC (network card)
- ! Cat 5 cable: NIC to wall jack
- ! Cat 5 wire: wall jack to patch panel
- ! Cat 5 patch cable: patch panel to switch
- ! Cat 5 cable: switch to Internet source device



Physical Network: Wireless

- ! Wireless (PCI) NIC w/ antenna
- ! Centrally located Wireless Access Point (AP)
- ! Cat 5 cable: AP to switch
- ! Cat 5 cable: switch to Internet source device
- ! Take security precautions:
 - WEP, MAC address specific



Physical Network: How to decide

- ! Decision is location specific
- ! Is there access (ceiling/floor/walls)
- ! Distance between computers
- ! Compare cost of installation
- ! Wireless requires more security

Internet Connections

- ! LAN Modem
 - " Built-in Ethernet hub and phone line sharing
 - " Share one phone line for several computers (typically 4 or less)
 - " Pros/Cons:
 - Phone line < 56 Kbps
 - Ethernet hub vs. switch
- ! Satellite
 - " Uploads and downloads
 - " DirecWay-commercially available
 - " Tachyon-Under evaluation
 - " Pros/Cons:
 - Location independent
 - Requires clear line-of-site
 - Affected by weather
 - "Shared" environment
- ! DSL (ADSL)
 - " Telco provided
 - " Multiple speeds
 - " Pros/Cons:
 - Uses existing phone wiring
 - Higher speeds (>256 Kbps)
 - Not weather dependent
 - Distance <18000 ft
 - Not on a FAX line
- ! Point-to-Point Wireless
 - " Similar to satellite - external antenna
 - " Many vendors
 - " Pros/Cons:
 - Location independent
 - Higher speeds
 - Requires clear line-of-site
 - Congested
 - "Shared" environment
- ! Cable Modems
 - " Provided by Cable TV service
 - " Uses existing cable TV Coax
 - " Pros/Cons:
 - Higher speed
 - Not weather dependent
 - Can be congested
 - "Shared" environment
- ! Dedicated Data Circuits
 - " Frame Relay
 - 56 Kbps
 - T1 (~700 Kbps)
 - " T1 (1.544 Mbps)
 - " T3 and higher
 - " Pros/Cons
 - No congestion
 - Higher speeds
 - Work well for Web servers
 - Much more expensive in some locales

Making it all work: Network Protocols

- ! TCP/IP
 - " Separate/unique IP address
 - No duplicate IP addresses allowed
 - If not, TCP/IP protocol disabled
 - " Routable addresses - Internet use
 - DHCP/Static
 - " Non-routable addresses - Intranet use
 - NAT/Static
 - " DNS/WINS - settings from "ISP"
- ! NetBEUI
 - " Non-routable protocol using NetBIOS names
 - " Browsing Network Neighborhood

Managing the Network

- ! Workgroup
 - " Loosely controlled – share everything
 - " Do not share entire hard drives due to security concerns
 - Virus problems
 - Compromise system files
- ! Domain
 - " Domain Controller
 - Maintains a list of all users
 - Provides for authentication of users
 - Controls access to files/peripherals
 - Requires more knowledge
 - " File/Print servers
 - Specific computer to share files/printers
 - HP Jetdirect print server
 - Other file storage devices (SNAP file server)
- ! Concerns
 - " Networks require more:
 - planning
 - oversight
 - knowledge
 - " How to prevent unauthorized access
 - " Mixed operating systems – Windows 9x/NT/2000/Me/XP