

# Data Networking Fundamentals

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- This presentation is made possible in part due to the generous support of Nortel Networks.



## Agenda

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- Protocols
- Building a Data Network
- Final Considerations

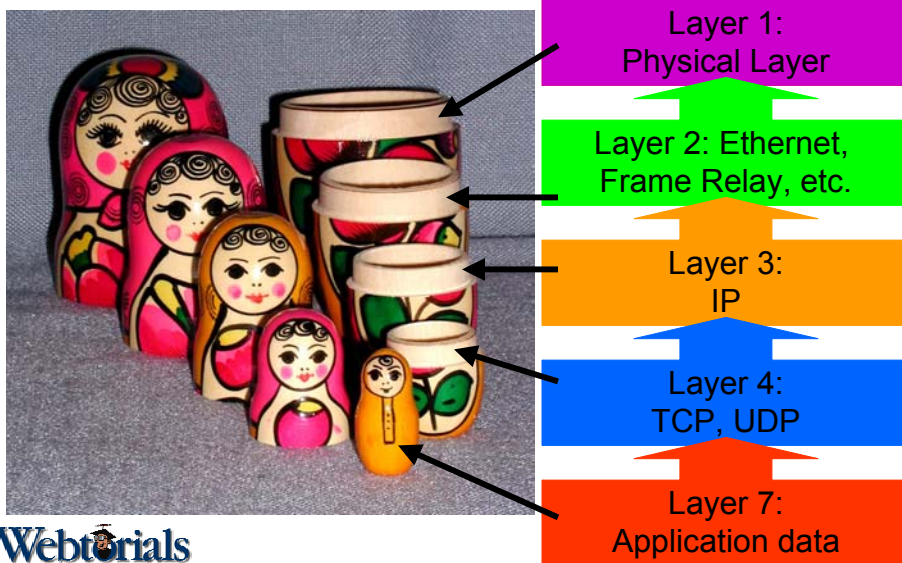
# What is a protocol?

- As diplomatic protocols determine the rules of conduct for diplomats to conduct affairs of state, data communications protocols determine the rules for data format and transmissions.
- Data protocols work in "layers" so that tasks are defined and distributed
- Historically defined by the Open Systems Interconnect (OSI) Model



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# Redefining the OSI Model



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## Typical Data Protocols

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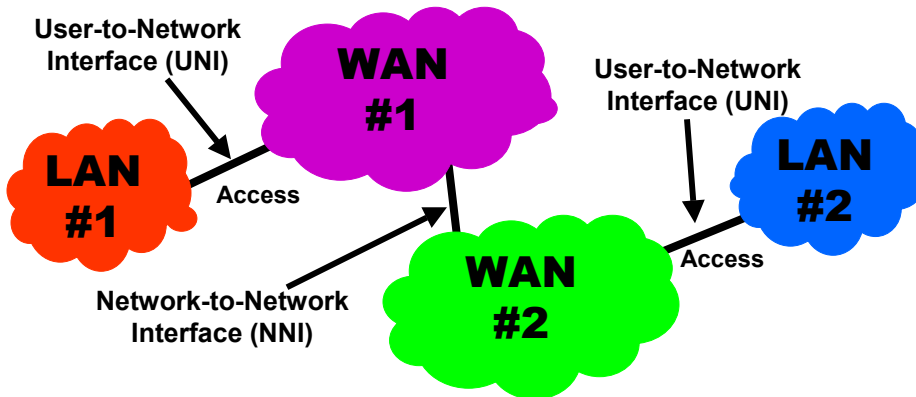
- Ethernet
  - Primarily used in the LAN
  - Originally shared, now switched
- Wireless LAN
  - Similar to Ethernet
  - Shared media; Slower than wired options
- IP, TCP, and TCP/IP
  - Popular and confusing
  - Spans WAN and LAN
- Frame Relay
  - Primarily in the WAN; Popular connection option

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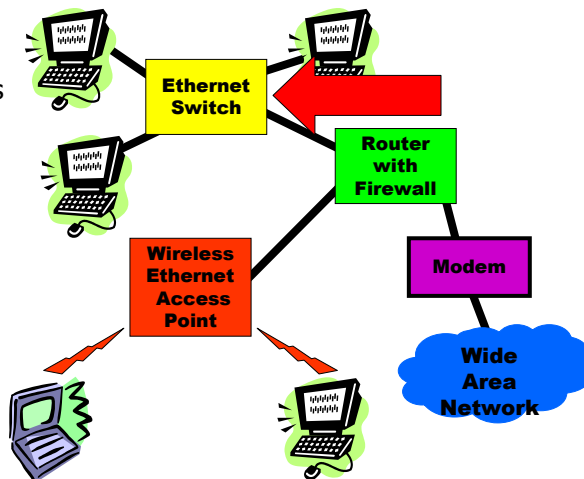
# Components and Interfaces



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# Data Networking Equipment

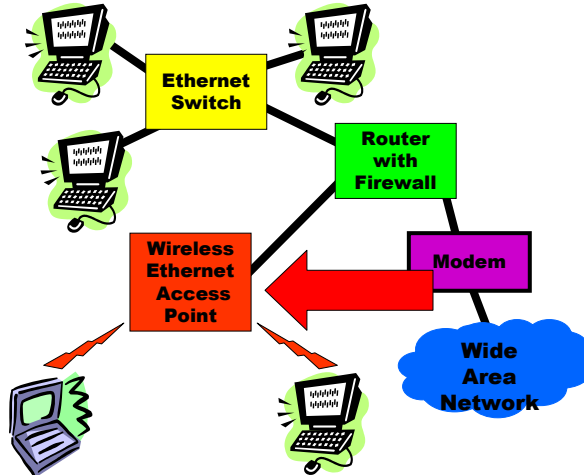
- Ethernet Hubs
  - Shared cable media connections to Ethernet attached devices.
- Ethernet Switches
  - Dedicated connection between Ethernet connectors



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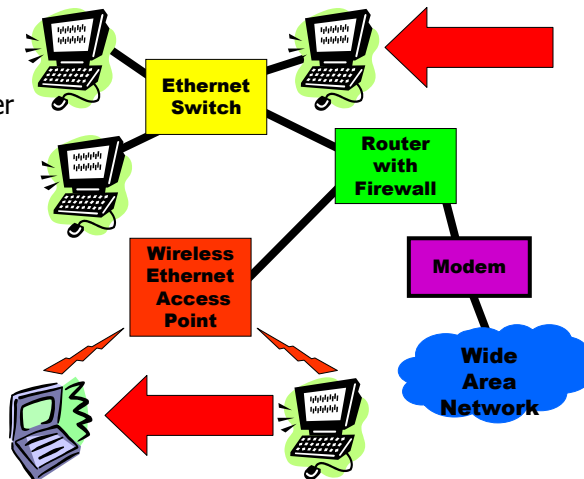
# Data Networking Equipment

- Wireless Ethernet Access Points
  - Include an Ethernet 802.11 transceiver to send and receive wireless Ethernet traffic in the local area.



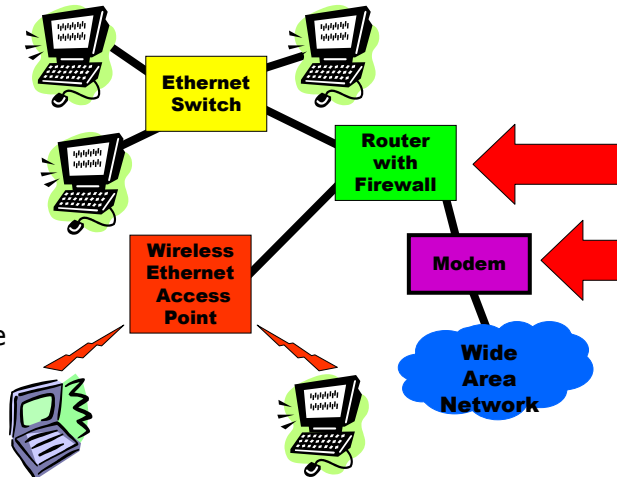
# Data Networking Equipment

- Network Interface Cards (NICs)
  - Used in a computer to send and receive traffic to the network
  - Can also be implemented as a chip on the PC's motherboard
  - Wired or wireless



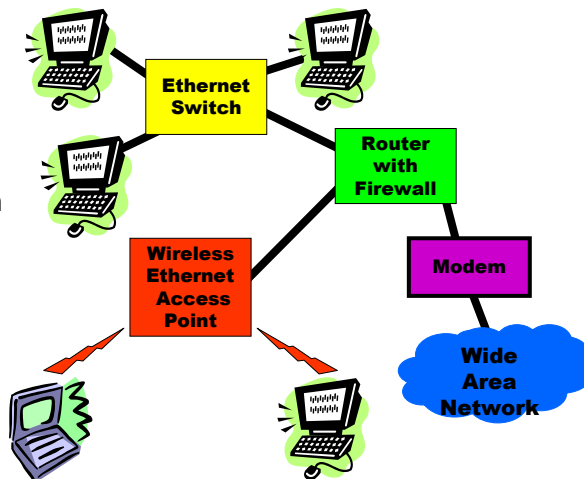
# Data Networking Equipment

- Routers
  - Filter and forward the IP packets to other IP-devices, including other routers
- Modems
  - Convert digital transmissions to analog so the information can be carried on an analog phone or cable network.



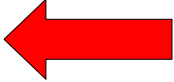
# Data Networking Equipment

- Firewalls
  - Hardware or software that prevents unauthorized access to a private network
  - A "must-have" when connected to the Internet.
- VPN Appliances
  - Used to provide added security and performance for IP-based WANs, including the Internet.



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## Assessing Your Network

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- How critical is data network uptime to my minute-by-minute business needs?
- What would happen if an outsider gets access to my information stored in the LAN?
- What skills do I have to buy or build a data network?
- When should I consider using my data network for voice traffic?
- How much employee time can I save with an efficient data infrastructure?
- How can I use my network to improve customer service?
- What's the bottom line return on investment?



# Network Management Issues

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- How much of my data network is “self-managed” or “self-healing”?
- Who can I turn to if I have an immediate need or problem with the network?
- Am I willing to learn personally or dedicate employee time to manage this network?
- What’s the bottom line return on investment for ongoing management?



# Thank you!

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- Summary
  - Protocols
  - Building a Data Network
  - Final Considerations
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