Internet Connectivity, Virtualization, and Cloud Technologies

Chapter 12

This presentation covers:

- Mentoring
- Internet Connectivity Overview
- Modems Overview
- Serial Communication Overview
- Traditional Serial Devices
- VoIP
- Mobile Connectivity
- Virtualization
- Cloud Overview
- Web Browsers

Qualities of a Good Technician

"Soft skills" as they are known across many industries are essential

Mentoring

- No technician can attain his or her ultimate level without being mentored and mentoring someone else along his or her career path
- No technician can learn everything from a book or from experience
- Others helping us along the way enable us to learn faster and more efficiently
- Take a few days to look around the company when you begin your job in the IT field
- Find someone who appears to be very professional and knowledgeable—someone you want to emulate

Mentoring

- Talk to that person and explain your goals
- Ask if he or she will mentor you
- Consider mentoring others
- Knowledge is power, and by sharing information with others and helping them along the way, you cement and expand your own knowledge

Internet Connectivity Overview

Internet Connectivity Overview

- Connecting to the Internet can be done in a variety of ways:
  - Analog modem
  - ISDN
  - Cable modem
  - DSL modem
  - Satellite modem
  - Fiber
  - Wirelessly
  - Power line
  - Cellular network
- These technologies have unique installation and configuration methods but all share the capability to connect a computer to an outside network

Dial-up Overview

- A modem (modulator/demodulator) connects a computer with the outside world through a phone line
- Frequently called a dial-up network because the modem uses the traditional phone line to “dial up,” or call, another modem
- Modems can be internal or external peripheral devices

Internal Modem Ports

Serial Communication Overview

- A serial device such as a modem transmits or receives information 1 bit at a time and is traditionally connected to a serial port
- A USB-to-serial converter is used to attach an external serial device such as a modem
- An internal modem may be on an adapter
- Serial ports are also known as asynchronous ports, COM ports, or RS232 ports
- Asynchronous transmissions add extra bits to the data to track when each byte starts and ends
- Synchronous transmissions rely on an external clock to time the data reception or transmission

USB to RS232 converter

56Kb/s Modems

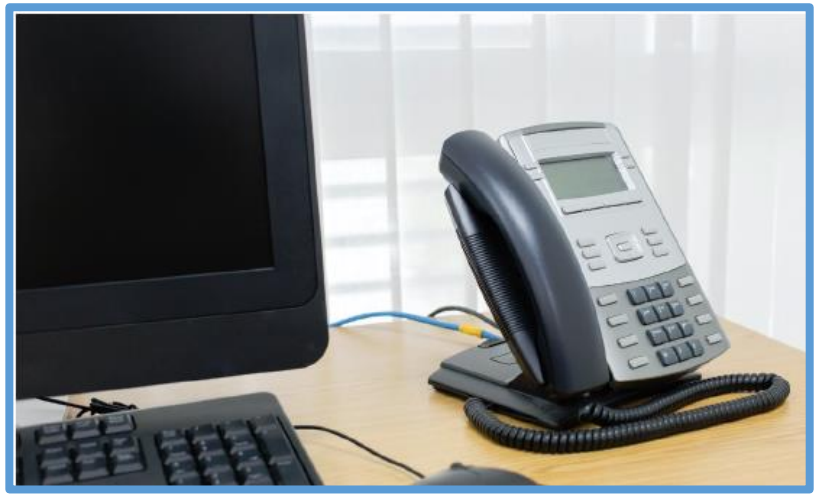
- Modems transmit and receive at different speeds
- A faster modem means less time on the phone line and less time for processor interaction
- The slowest modem determines the fastest connection speed
- Speedy modems can transmit at lower speeds
- A modem’s speed setting should be set to its maximum throughput
- Digital phone lines are quieter than their analog counterparts, have less noise on the line, and allow faster data transmissions

Digital Modems and ISDN

- A digital modem connects a computer directly to a digital phone line rather than to a traditional analog phone line
- One type of digital phone line available from the phone company is an ISDN line
- An Integrated Services Digital Network (ISDN) line has three separate channels: two B channels and a D channel
  - B channels handle data at 64Kb/s transmission speeds and can combine into a single channel for video conferencing, thus allowing speeds up to 128Kb/s
  - D channel is for network routing information and transmits at a lower 16Kb/s

VoIP and Quality of Service (QoS)

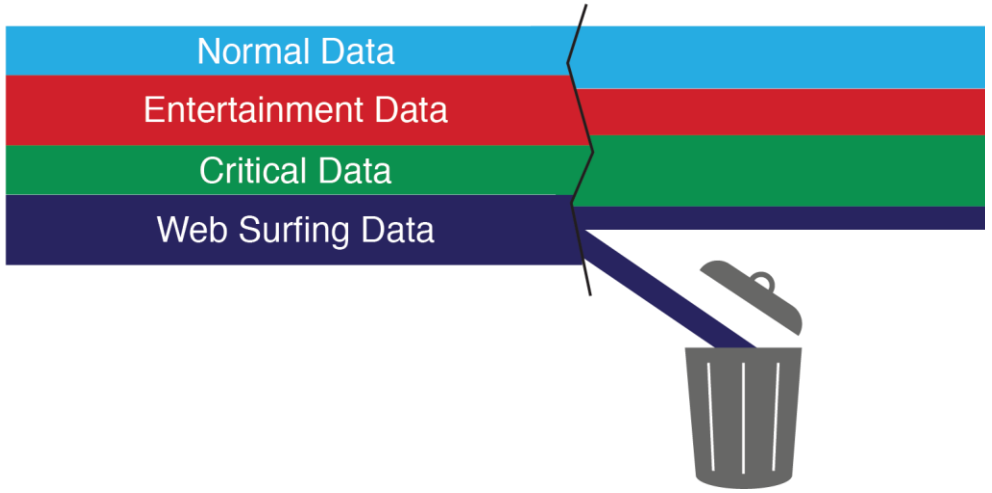
- Voice over IP (VoIP) uses a corporate data network and/or the Internet for phone traffic rather than using the traditional public switched telephone network (PSTN)
- Free and purchased VoIP software can be used so you can call someone for free using the Internet
- QoS prioritizes traffic so important traffic like business transaction traffic and VoIP traffic are sure to get through



Bandwidth Use and QoS

Bandwidth Use with No QOS

Bandwidth Use with QOS Implemented



Cable Modems

- Connects a computer to a cable TV network
- Can be internal or external devices, but commonly are external
- If a cable modem is external, two methods commonly exist for connectivity to a PC
  - (1) A NIC built into the motherboard is used or an adapter is installed; a cable attaches between the NIC and the cable modem or
  - (2) the cable modem connects to a USB port on the computer

Cable modem and USB/NIC connectivity

xDSL Modems

- The x in the term xDSL refers to the various types of digital subscriber line (DSL)
- The most common one is Asymmetrical DSL (ADSL)
- ADSL uses faster downstream speeds than upstream (fine for most home Internet users)
- DSL uses the traditional phone line to be able to send and transmit not only voice, but also Internet data

Satellite Modems

- Satellite relays communication back to receivers on Earth
- Satellite connectivity requires a satellite dish and a satellite modem at a minimum
  - It may also require an analog modem and other equipment, depending on the satellite provider

Satellite Modems

- If connected via satellite:
  - Data goes from the computer to the satellite dish mounted outside the home or business to another satellite dish
  - Up to the satellite orbiting Earth
  - Down to the Internet service provider (ISP)
  - From the ISP to the website requested
  - The web page returns via the same path it took

Mobile Connectivity

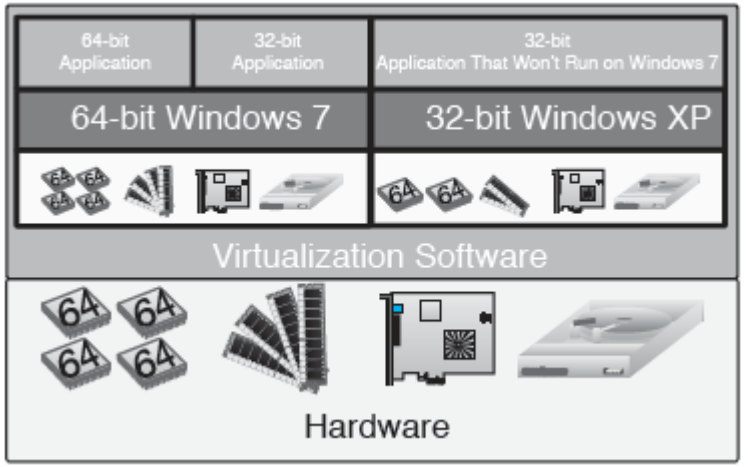
- Using a wireless connection, such as a USB port, Bluetooth wireless connectivity, or the cellular network, can provide wireless internet connectivity to others in the immediate vicinity
- The term wireless hotspot is also used to refer to an area of wireless connectivity (normally free) such as in a park, coffee shop, or museum

Mobile Connectivity

- Wireless broadband that has download speeds up to 45Mb/s referred to as wireless or cellular WAN
- Cell phone companies and internet providers offer USB modems, mobile data cards, or integrated laptop connectivity to have the ability to receive, create, and communicate Internet information within a coverage area

Virtualization

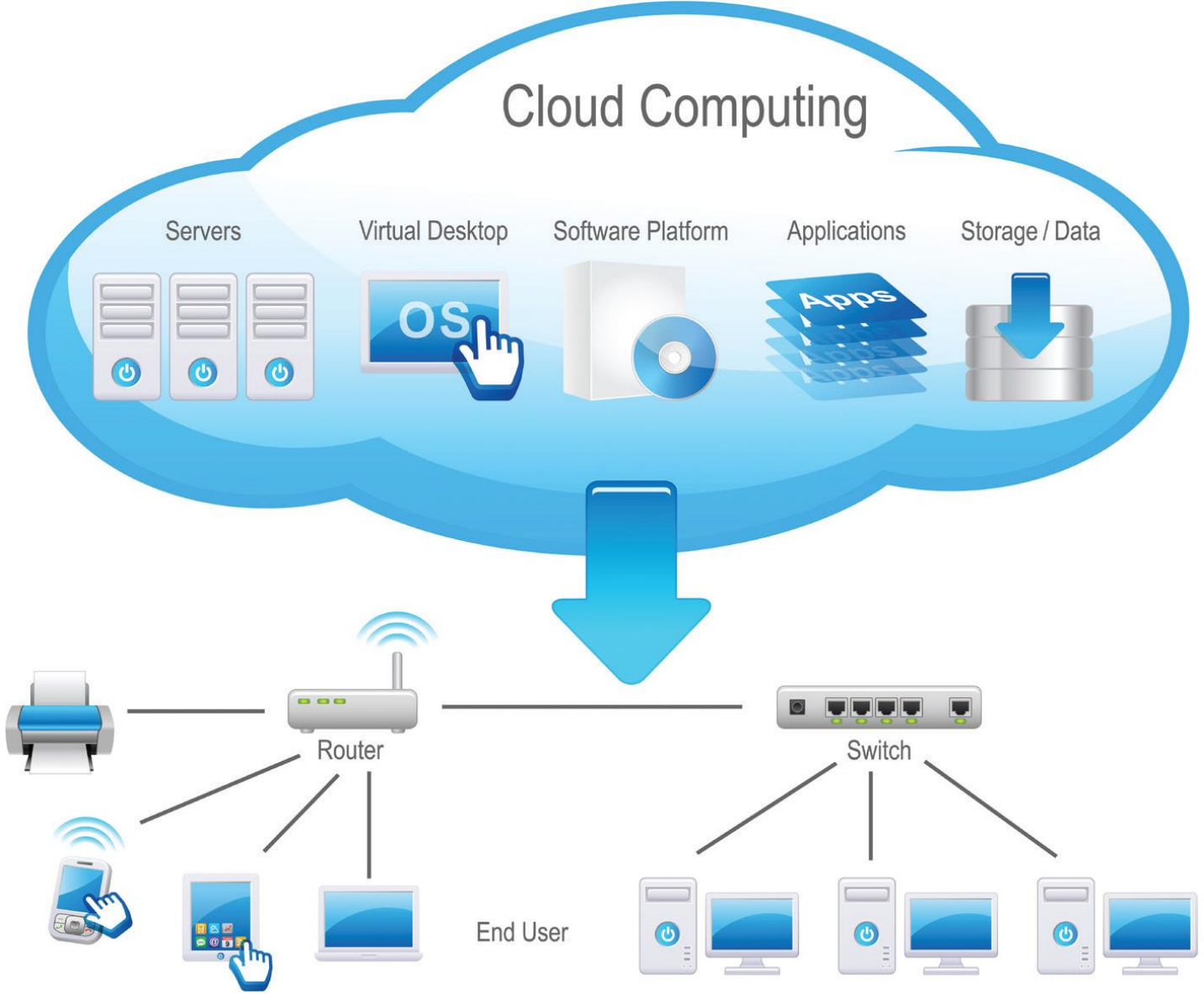
- Each virtual machine can connect to a network using one of two basic options:
  - Internal network- option allows a particular VM access to other virtual machines that connect to the same network
  - External network- allows a particular VM access to a different (external) network such as the Internet from within the VM.



Host machine	The real computer that holds multiple operating systems
Virtual machine	Also called a VM, a separate operating system from the host computer that has specifically chosen hardware components
Hypervisor	Also called virtual machine monitor or virtual machine manager, the software that can create a virtual machine and allocate resources to the virtual machine
Snapshot/ checkpoint	A copy or backup of the VM at a particular point in time, which can revert the VM to that point in time (which is a similar concept to a Windows restore point)

“In the Cloud”

Cloud Computing



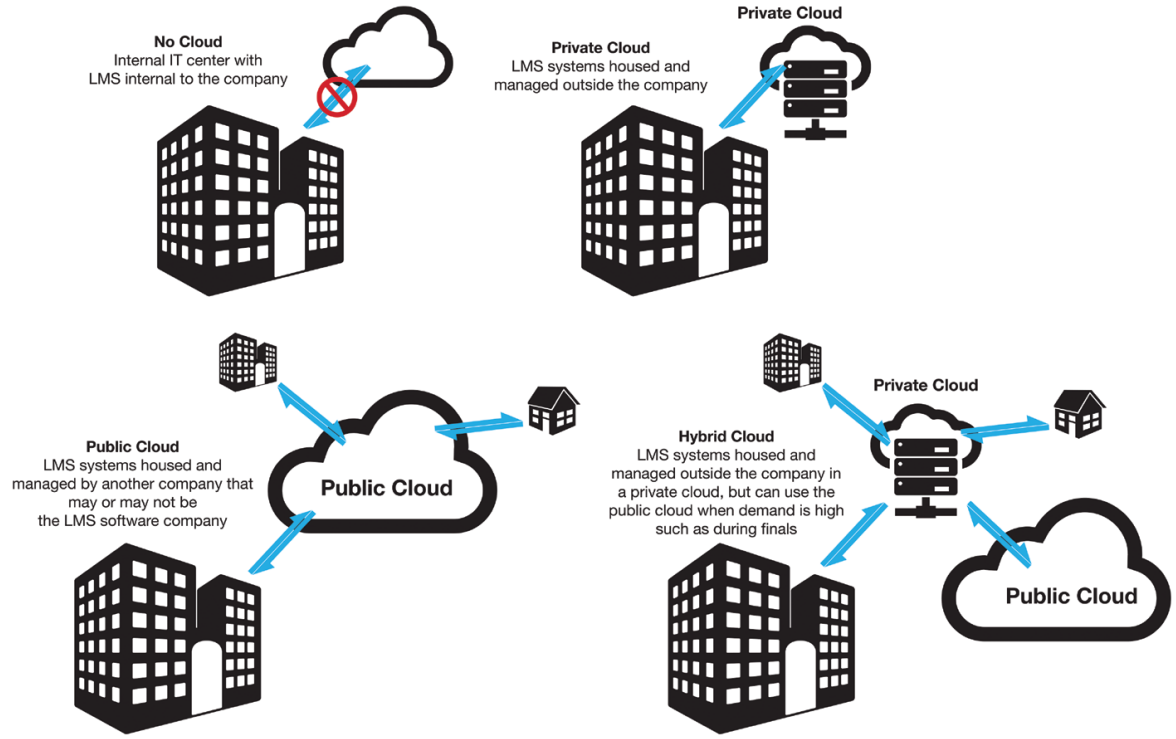
The concept of “in the cloud”

Cloud Technologies

- Most popular cloud services include
  - Off-site email applications
  - Cloud file storage services
  - Virtual application streaming/cloud-based applications
  - Cloud-based network controller
- Cloud service types
  - SaaS (Software as a Service)
  - DaaS (Desktop as a Service)
  - PaaS (Platform as a Service)
  - IaaS (Infrastructure as a Service)

Cloud Service Deployment Methods

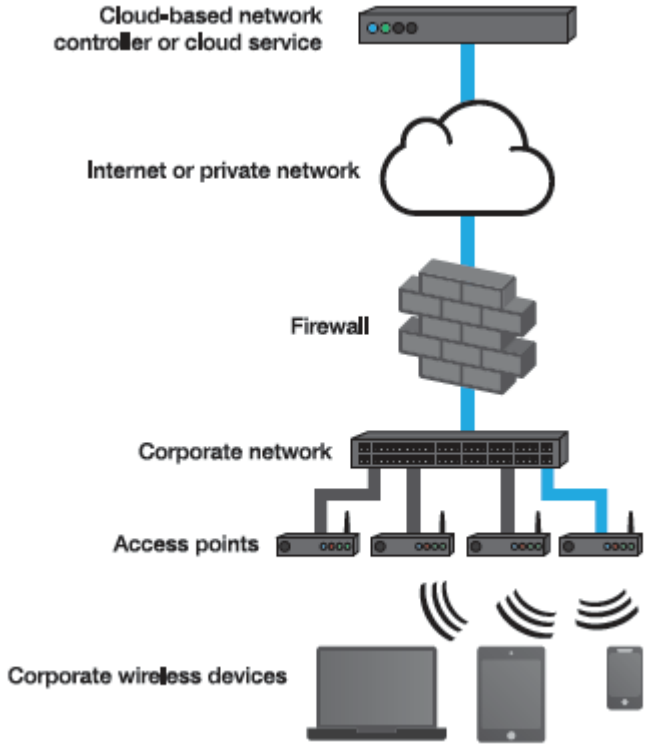
- A private cloud is part of a company's network infrastructure located outside the business in a remote location, but the company has responsibility for managing the software and/or hardware.
- A public cloud is an environment operated by a cloud provider.
- A hybrid cloud is a combination of a private cloud and a public cloud
- With a community cloud, a number of organizations have access to IT resources that are in the community cloud



Cloud deployment models

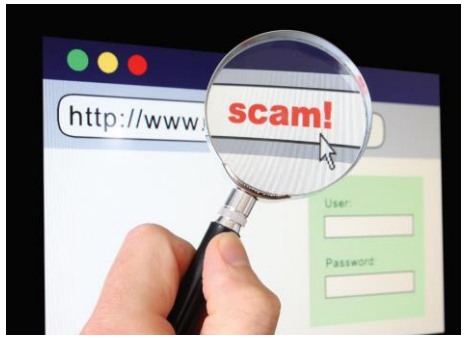
Cloud Advantages

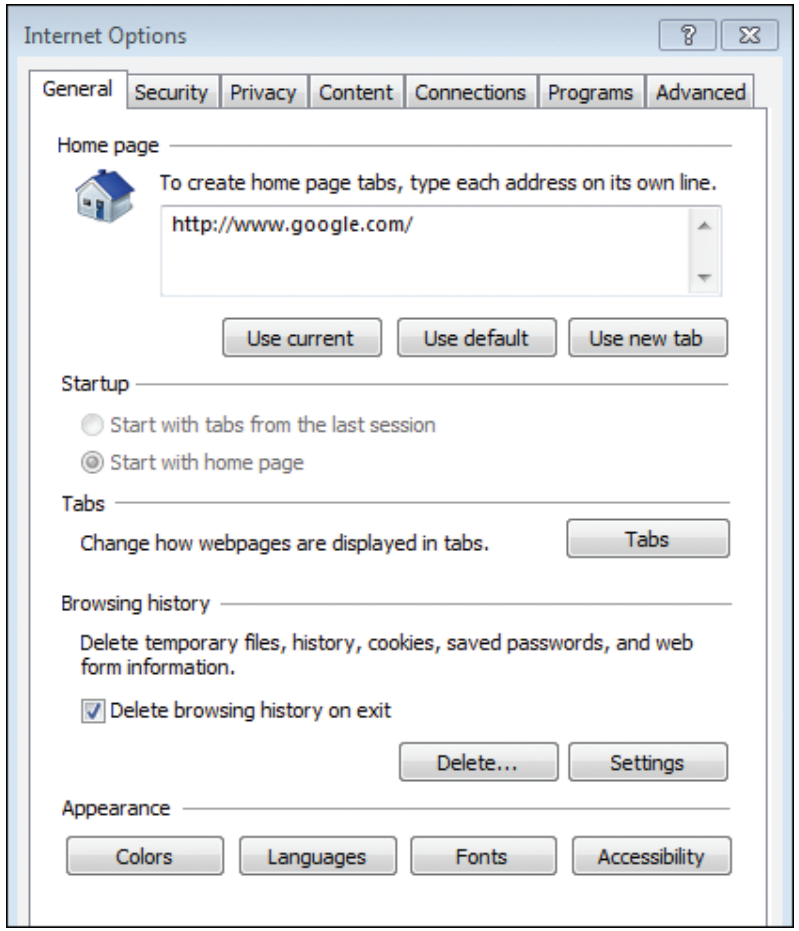
- Including but not limited to
  - Reduced costs
  - Increased flexibility
  - Increased efficiency
  - Constantly applied software patches and upgrades
  - Corporate focus
  - 24/7 access
  - Rapid elasticity
  - Resource pooling
  - Measured service
  - Metered service



Web Browsers

- A web browser is a graphical interface between a user and the Internet
- Most browsers are customizable, and many of the settings relate to security
- A browser can be hijacked - either replaces the home page with another one or directs whatever web page is being used to a different one (browser redirect)





Computer Terms

Refer to the glossary terms at the end of the textbook chapter. Review Chapter 13 and become familiar with the terms.

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to support instruction of

The Complete CompTIA A+ Guide to IT Hardware and Software 8th Ed.