

Geeks Bearing Gifts: Unwrapping New Technologies

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Course Materials

□ Geeks Bearing Gifts:

Unwrapping New Technology Trends

- <http://nnlm.gov/training/geekgifts/>

□ Course Materials

- http://nnlm.gov/training/geekgifts/geeks_A.doc

- http://nnlm.gov/training/geekgifts/geeks_B.doc

- http://nnlm.gov/training/geekgifts/geeks_C.doc

□ PPT Presentation and handouts

- <http://nnlm.gov/ner/training/>
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Class Overview

Part 1

Wireless Standards, Bluetooth, and Wireless
Broadband

PDA's

Smartphones

Mp3 Players and iPods

Voice over Internet Protocol (VoIP)

RFID

Part 2

Instant Messaging, Chat, and SMS

Spyware, Adware, Malware

Blogs, RSS, and Social Networking

Podcasts and Mp3Players

Wikis

Wrapup and Evaluation



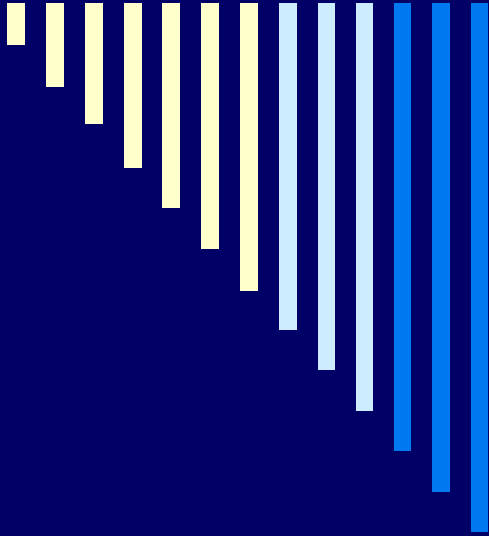
Class Objectives

- Increase awareness of new technologies
 - Give you the ability to explore and use new technologies
 - Identify library applications and integrate in own work environment
 - Become aware of resources that will help you stay informed
 - Have fun and want to learn more!
-



From the Class Description

This class is intended to provide *a fun, fast-paced, and informative* introduction to and update on today's hottest technology trends.



Introductions

Name

Library

Why Here



New Technology: Part 1

- Wireless—Wi-Fi
 - Bluetooth
 - Wireless Broadband
 - Personal Digital Assistants (PDA)
 - Smartphones
 - Mp3 Players and iPods
 - Voice over IP (VoIP)
 - Radio Frequency Identifiers (RFID)
-



Wi-Fi—Networking Without Wires

- ❑ Connect to a local area network and/or Internet when near one of the network's access points. (Wireless Access Port)
 - ❑ The geographical region covered by one or several access points is called a hotspot.
 - ❑ Access to the Internet: airports, coffee shops, hotels, schools, universities, and your neighbor
-



Wi-Fi—Networking Without Wires



Point-to-multipoint configuration: An access point communicates via an omni-directional antenna with one or more clients that are located in the coverage area around the access point.



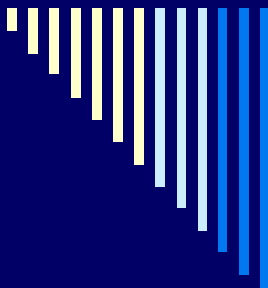
Wireless — Wi-Fi Standards

Wi-Fi Specifications			
Specification	Speed	Frequency Band	Compatible With
802.11b	11 Mb/s	2.4 GHz	b
802.11a	54 Mb/s	5 GHz	a
802.11g	54 Mb/s	2.4 GHz	b,g
802.11n	100 Mb/s	2.4 GHz	b, g, n



Wireless — Buying a Laptop or Desktop*

- **CONNECTIVITY: Wired:** 56K V.92 Internal Modem, 10/100/1000 Gigabit Ethernet network interface adaptor
- **WLAN** Dell Wireless 1390 802.11g mini-card, Dell Wireless 1490 802.11a/g dual-band mini-card, Intel® Pro/Wireless 3945 802.11a/g dual-band mini-card, Dell Wireless 350 Bluetooth



Wireless — Buying a Laptop or Desktop* (Example 2)

- **CONNECTIVITY:**

- **Wired:**

Wired: 56K V.925 Internal Modem, 10/100/1000 Gigabit Ethernet network interface adaptor

- **Wireless LAN**

Dell Wireless 1390 802.11g mini-card, Dell Wireless 1490 802.11a/g dual-band mini-card, Intel® Pro/Wireless 3945 802.11a/g dual-band mini-card,

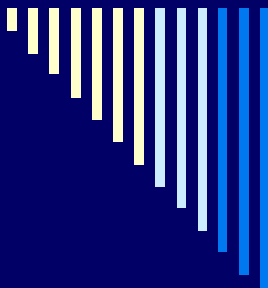
- **Wireless Broadband:**

Dell Wireless 5700 Mobile Broadband CDMA (Verizon, US Only)



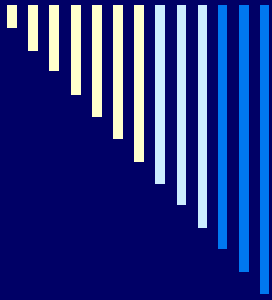
Wireless—Bluetooth

- ❑ Bluetooth is an industry specification for wireless personal area networks (PANS).
 - ❑ It is a way to connect and exchange information between devices like personal digital assistants (PDAs) mobile phones, laptops, PCs, printers, and digital cameras via a secure, low-cost, globally available short range radio frequency.
-



Wireless—Bluetooth Applications

- ❑ Wireless networking between desktops and laptops, or desktops in a confined space where little bandwidth is required.
 - ❑ Bluetooth peripherals such as printers, mice, and keyboards
 - ❑ Bluetooth headsets for mobile phones and smartphones
 - ❑ Transferring ringtones from PC to mobile phone
-





Wireless Broadband

- Broadband Defined
 - Wired Broadband
 - Wireless Broadband
 - From Wikipedia:
http://en.wikipedia.org/wiki/Broadband_Internet_access
-



Personal Digital Assistants

□ Operating Systems

■ Palm

□ Tutorials: <http://www.atomiclearning.com/palm>

■ Pocket PC (Microsoft)

□ Tutorials:

<http://www.microsoft.com/windowsmobile/help/pocketpc/default.aspx>

□ Hardware

■ <http://library.uhc.edu/pda/#general> (From Univ of CT Health Center)



Personal Digital Assistants (PDAs)

- Calendar/Date Book
 - Addresses/Telephone Numbers
 - Note Pad
 - Games
 - Wireless
 - Synchronize with Desktop Applications:
calendar, contacts, notes, mail, etc.
-



Personal Digital Assistants (PDAs): Medical Software

- ❑ Medical Calculators
 - ❑ Drug Databases (ePocrates)
 - ❑ Patient Information
 - ❑ Evidence Based Medicine
-



Personal Digital Assistants (PDAs): Medical Software

□ General Information

- Univ of CT Health Center:
<http://library.uchc.edu/pda/>
- Univ. of MA Medical School:
<http://library.umassmed.edu/pda.cfm>

□ NLM Resources

- WISER <http://wiser.nlm.nih.gov>
 - NLM Mobile:
<http://www.nlm.nih.gov/mobile/>
-



Smartphones

- Handheld device that integrates personal information management and mobile phone capabilities in the same device.
 - Adding functions to already capable PDAs
 - Adding "smart" capabilities, such as PDA functions, into a mobile phone.
 - <http://www.palm.com/us/products/smartphones/>
-

Geek Gadget Alert!



Can you
hear me
now?



Blackberry



- A handheld wireless device that provides access to:
 - Wireless email
 - Wireless web browsing
 - Wireless phone
 - Text messaging
 - Other wireless data access
- <http://www.blackberry.com/compare/index.do;jsessionid=1c307f30e2d153615c6cTR>



Blackberry Usage

- Popular w/ corp business, especially e-mail access for roaming employees
 - SMS capabilities are also popular
 - Use **push procedure**: all new e-mails, contacts and calendar entries are pushed to the BlackBerry device automatically
 - Also Known as the “**Crackberry!**”
 - **Controversy?**
 - RIM patent infringement Settled: BlackBerry pays \$612.5 million to NTP Inc.
-



Hardware Overview

- ❑ System navigation via scrolling trackwheel and buttons
 - ❑ QWERTY keyboard optimized for “thumbing”
 - ❑ Operating system is proprietary
 - ❑ Full integration into a company requires a BlackBerry Enterprise Server (BES)
-

More Smartphones

□ Palm Treo Smartphones



- Similar to blackberry: except for scroll wheel
- Palm 700w Smartphone - now with Windows Mobile operating system!

□ T-Mobile Dash

- <http://www.t-mobile.com/shop/phones/Detail.aspx?device=f164419f-eee9-4cf6-a1bd-070dbe4b5023>

Geek Gadget Alert!



Can you
hear me
now?



Digital Audio Players, Mp3 Players, and iPods

Stores, organizes and plays digital music files. It is more commonly referred to as an MP3 player. Often play many additional file formats—such as Windows Media Audio (WMA) and Advanced Audio Codec (AAC).





New Wave in Voice Communications





Voice over IP (VoIP)

- ❑ Routing of voice conversations over the Internet or any other IP-based network
 - ❑ Voice data flows over a general-purpose packet-switched network
 - ❑ The Plain Old Telephone Service (POTS) uses dedicated, circuit-switched voice transmission lines
 - ❑ Home versus Business
-



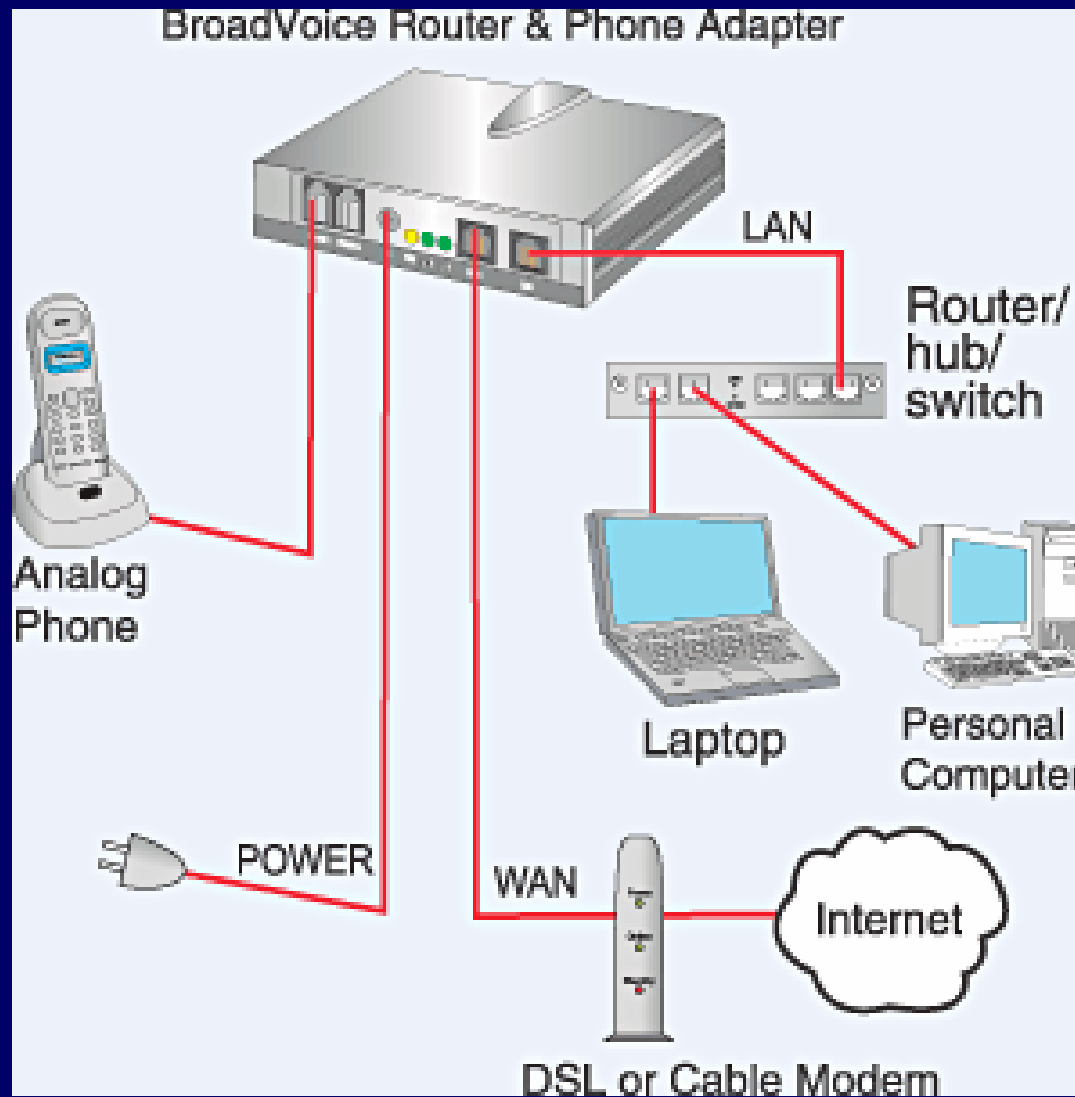
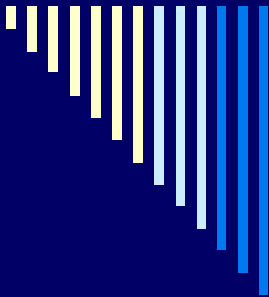
Network terminology

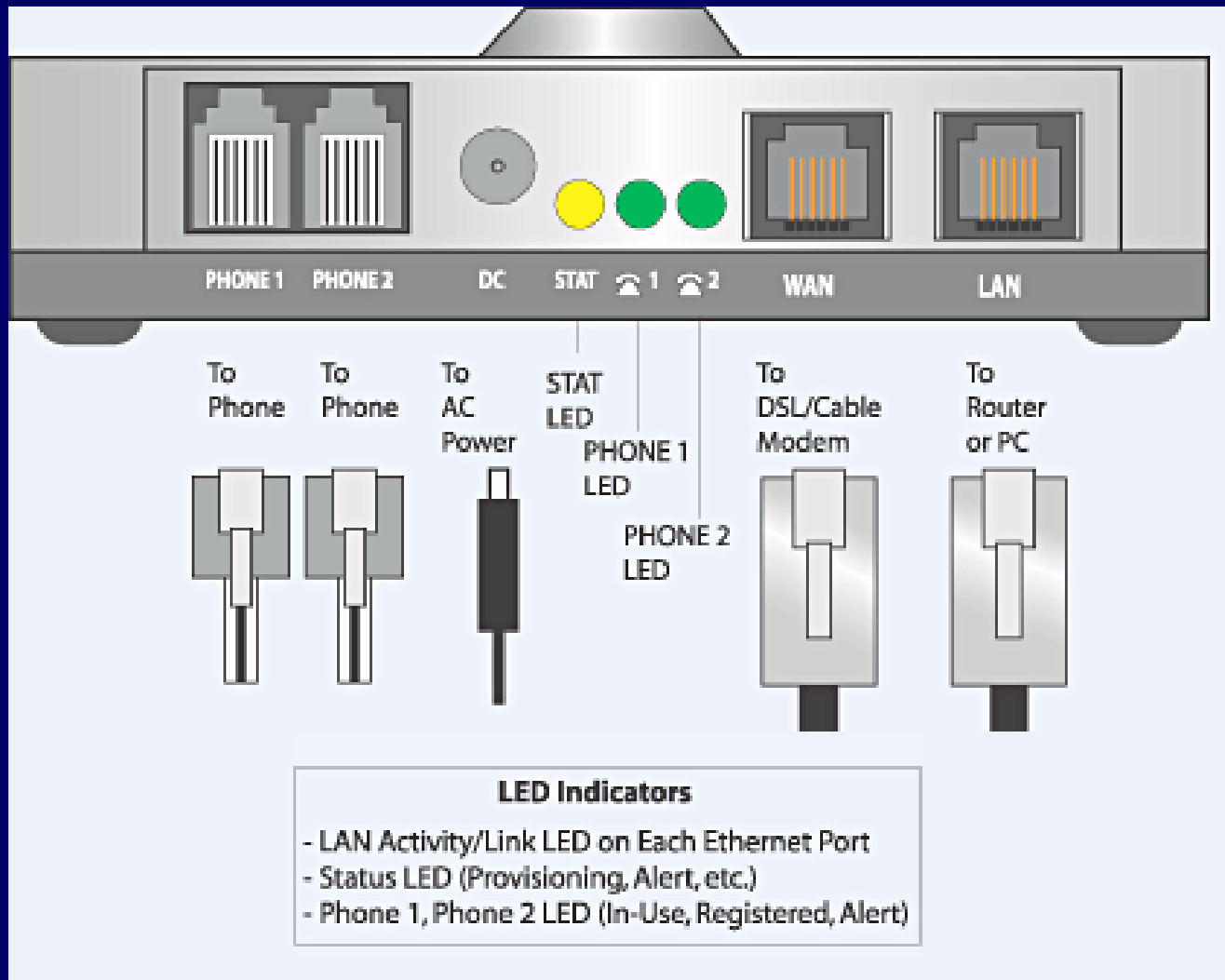
Packet switched network

- ❑ Transmitted data is broken into small, discrete groups of information and is then individually routed between nodes over conduits that may be shared by other nodes

Circuit switching network

- ❑ Establishes a direct and exclusive connection between two nodes for the duration of the exchange
-





Circuit Switching vs. Packet Switching

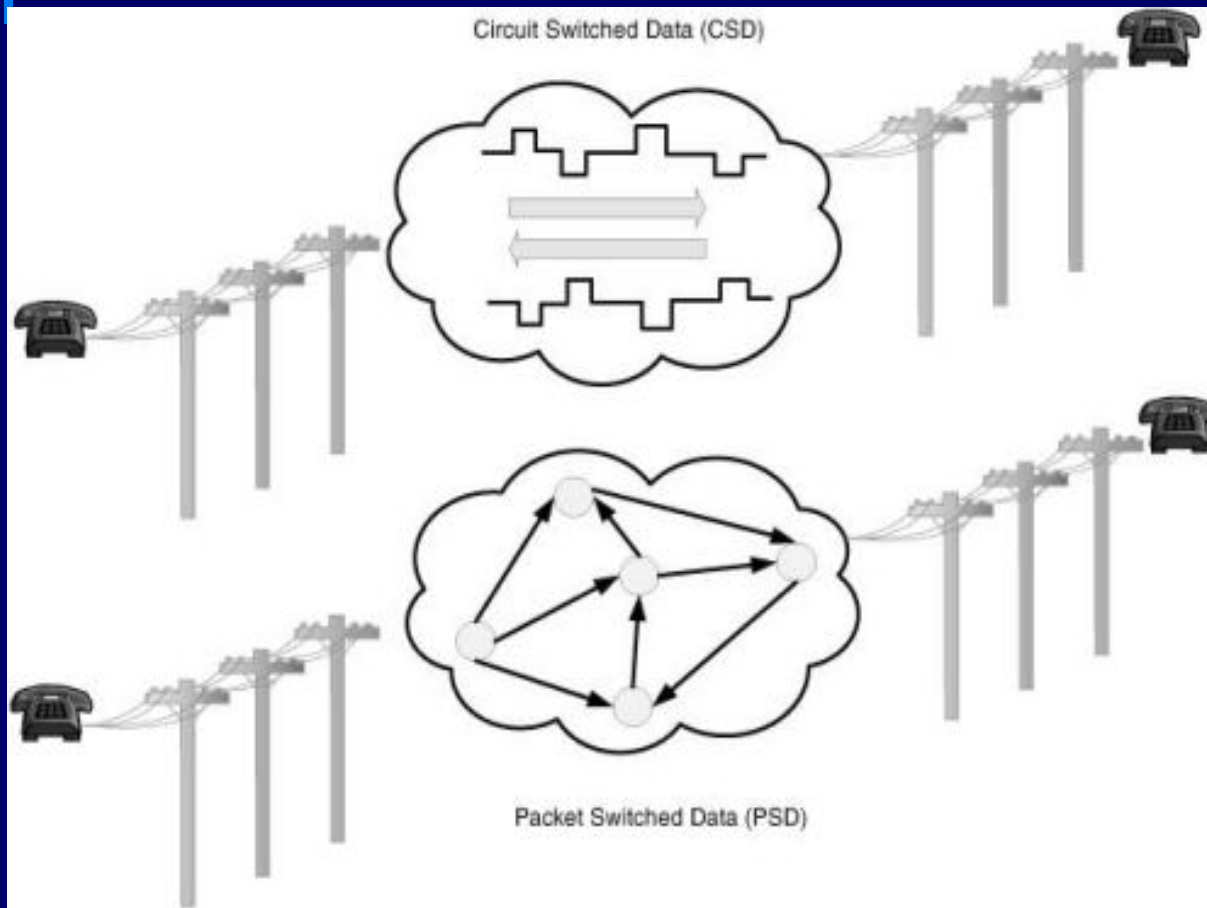


Figure 1. Circuit Switched Data Network vs. Packet Switched VOIP Network



Advantages of VoIP

Innovation

- VoIP developers respond to market pressures quicker than (ITU) – results in speedy adoption of new features

Lower cost

- Supporters claim is cheaper than POTS
- International calls can sometimes be free!

Increased Functionality

- Incoming phone calls are automatically routed to your VoIP phone, irrespective of where you are connected to the network!
-



Disadvantages of VOIP

Power dependence

- ❑ Standard telephone service works during power outages - VoIP broadband modems rely on power

Latency

- ❑ Since VoIP is packet based, sometimes packets drop resulting in audio and video dropouts and stuttering
-



Disadvantages of VoIP

911

- ❑ Problems with calling 911 - Difficult to trace callers location
- ❑ Government mandating that VoIP carriers implement Enhanced 911 - Providers Appeal

Lack of Integration into global telephone number system

- ❑ POTS and mobile phone networks share a global standard (E.164) that allocates and identifies a specific telephone line
 - ❑ No widely adopted standard for VoIP exists
-



VoIP Applications

Most popular:

□ **Skype**

<http://skype.com>



□ **Gizmo project**

<http://gizmo-project.com>



Other VoIP Applications

□ GoogleTalk, MSN Messenger, Yahoo Messenger, Comcast, Vonage

Geek Gadget Alert!



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VOIP Accessories

Plantronics USB Headsets

DSP400 - \$40.00



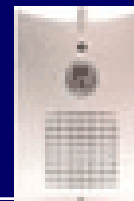
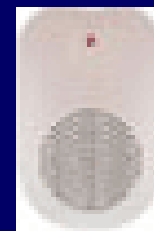
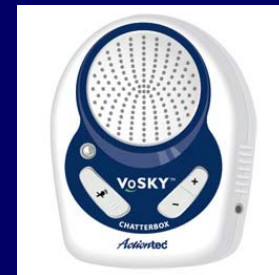
DSP-500 - \$50.00

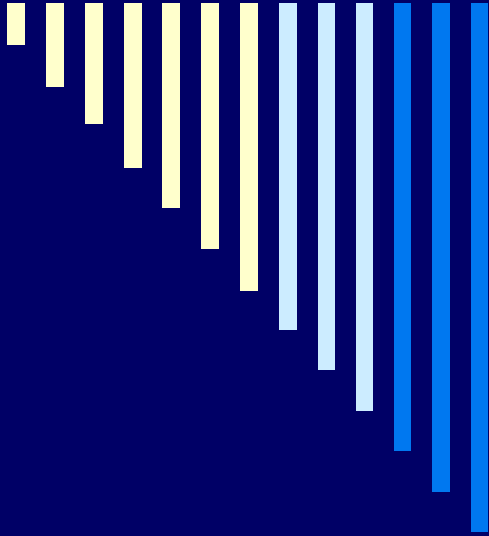


VOIP Accessories

USB Speakerphones

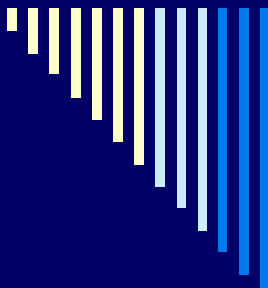
- VoSKY Chatterbox - \$29.99
- miniVox MV100 - \$39.99
- MVOX MV900 - \$159.99



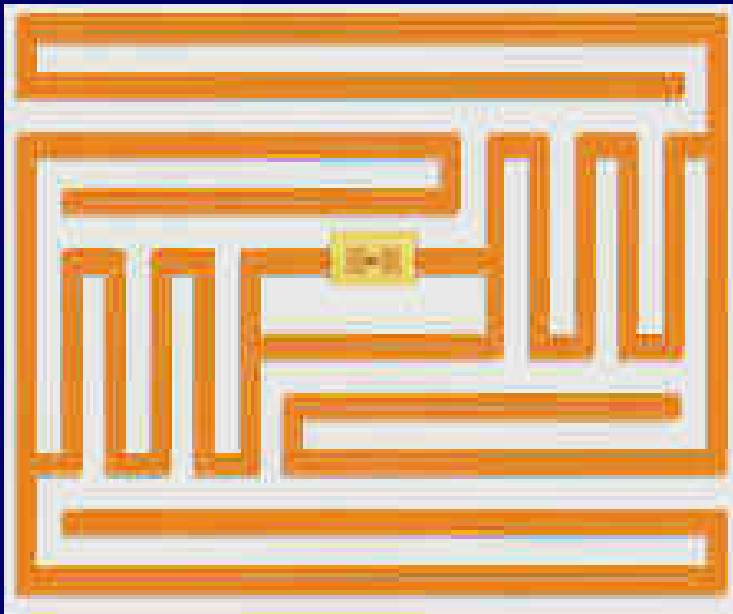


**I know what you took last
night:**

**Radio Frequency Identifiers
(RFID)**

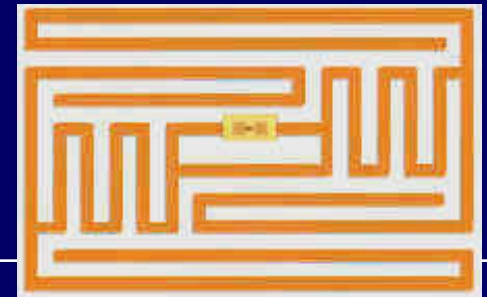


Radio Frequency Identifiers (RFID)



Radio Frequency IDentification (RFID)

- is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders
- RFID tags are small objects, containing antennas that enable them to receive and respond to radio-frequency queries from an RFID transceiver





Two Types of RFID Tags: Passive and Active

Passive:

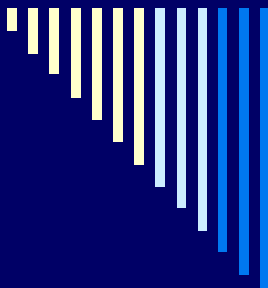
- ❑ require no internal power source
 - ❑ Smallest = 0.15 mm × 0.15 mm
 - ❑ Distance: Passive tags have practical read distances from about 10 millimeters up to around 20 feet
-



Two Types of RFID Tags: Passive and Active

Active:

- Include an internal power source which enables them to have longer range; larger memory; and ability to store additional information sent by the transceiver
 - smallest active tags = size of a coin
 - Distance: range of up to 100 feet or more, and battery life of up to 10 years
-



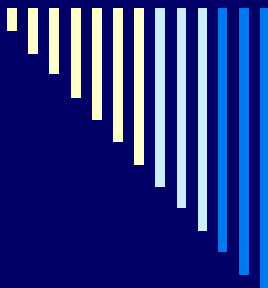
Radio Frequency Identifiers (RFID)

- Medical Applications
 - Patient Identification
 - Prescription Identification
 - Library Applications
 - Charging/Discharging
 - Theft Detection
 - High Speed Inventory of Collection
 - Automated Material Handling
-



RFID Use in Libraries

- ❑ Security gates detect whether a book has been properly checked out
 - ❑ When users return items the item record in the Integrated Library System (ILS) is automatically updated
 - ❑ Return receipts can be generated
 - ❑ Future use – replace barcode technology
-



Radio Frequency Identifiers (RFID)

□ Disadvantages (for Libraries)

■ High Cost*

- Small Public Library (40,000 items)=\$70,000
- Medium Public Library (100,000 items=\$168,000)

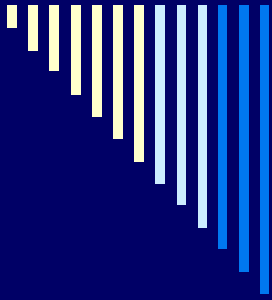
- Vulnerability to Compromise
- Removal of Exposed Tags
- Invasion of Patron Privacy?

*From: *RFID Technology for Libraries*, Prepared by Richard Boss for PLA.
(<http://www.ala.org/ala/pla/plapubs/technotes/rfidtechnology.htm>)



Potential and Actual Medical Uses

- Talking Prescriptions
 - Hospitals may use RFID systems to identify patients and/or permit hospital staff to access medical records
 - Tracking medical equipment in real-time can reduce costs and improve care
<http://www.rfidjournal.com/article/articleview/2265/>
 - Security: Newborns (and other patients?)
-





Other Uses for RFID

- ❑ Animal identification
- ❑ Airline baggage tracking, passports
- ❑ Electronic payment (debit cards)
- ❑ EZpass toll collection, driver's licenses
- ❑ Tracking prisoners
- ❑ Pallet tracking
- ❑ Building access control





The RFID System

- An RFID system consists of:
 - Tags
 - Tag Readers
 - Edge Servers
 - Middleware
 - Application Software
-



Cost

- Due to low cost the majority of RFID tags in existence are passive
 - \$ 7.5 cents for quantities of 1 million and \$ 7.2 cents for orders exceeding 10 million
 - Current demand for RFID integrated circuit chips is not close to supporting that price
-



RFID Controversies

- Privacy and security issues are numerous:
 - Illicit tracking of tags
 - Duplication or cloning of tags
 - Shortage of computation resources for standard cryptographic techniques within the tags
 - Tags can be read at a distance without knowledge of the individual
 - Customer identification data tracked without permission
-



Human Implants

- **Amal Graafstra**, a Washington State Business Owner has two RFID implants, one in each hand
 - **Amal's RFID implants page**
<http://amal.net/rfid.html>
 - **RFID Toys** – book <http://tinyurl.com/s5h3j>
 - **Good Morning America Interview:**
http://amal.net/blog/links/2006-03-08_-_GMA_low.mp4
-

For the RFID Paranoid: The RFID-Zapper

- A group of German privacy hackers have come up with a portable device that can wipe a passive RFID-Tag permanently, called the RFID-Zapper



[http://events.ccc.de/congress/2005/wiki/RFID-Zapper\(EN\)](http://events.ccc.de/congress/2005/wiki/RFID-Zapper(EN))



Questions?



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Geek Gadget Alert!



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Tablet PC



A notebook- or slate-shaped mobile computer. Its touch screen or digitizing tablet technology allows the user to operate the computer with a stylus or digital pen instead of a keyboard or mouse

Two Forms of Tablet PCs

- **Slate**
 - includes only a screen and pen.
- **Convertible (or Hybrid)**
 - include a built-in keyboard. Closely resemble laptops



Tablet PCs (cont'd)

Operating systems:

- Windows XP Tablet PC Edition
- Linux

User inputs text using:

- Built-in handwriting recognition
 - On-screen (virtual) keyboard
 - Speech recognition
 - Physical keyboard (if available)
 - Shorthand-like entry methods (AlphaTap & Shark)
-



Tablet PCs (cont'd)

Advantages:

- Lightweight (note: Hybrids are heavier)
- Doesn't require keyboard entry
- Extremely mobile

Disadvantages:

- Expensive & can get very warm
 - Handwriting-to-text conversion not perfect (Wacom jitter)
 - Screen size peaks at about 14"
-