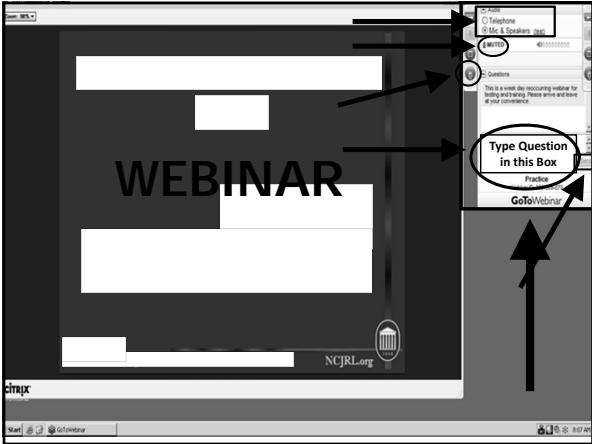


Web Browsing 101

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1. Power off cell phones.
2. If accessing webinar through telephone, turn down volume of computer speakers (or mute them.)
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5. If you want to ask a question, click the "hand" icon, and then type your question.
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Web Browsing 101

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Web Browsing Topics

Physical
Technology

Exchange of
Information

Web
Browsers

Web
Applications

Evolution of
Technology

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Questions welcome


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Physical Technology

- What devices are involved in Internet communications?
- What are the various ways a computer can connect to the Internet?
- Why is one connection better than another?

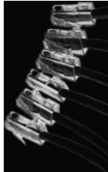
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Physical Technology **Personal Computers**



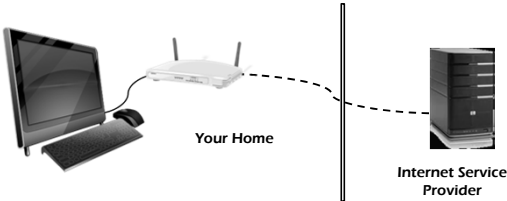
Home computers connect to the Internet in a variety of ways:

- Modems
 - Dial-up, Cable, DSL
- Routers
 - Wireless or Wired



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Physical Technology **Modem Connection**



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Physical Technology

Routers

Your Home

Internet Service Provider

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Physical Technology

Routers

- Home routers may take two forms:
 - Wired – each computer connects to the router with a cable
 - Speeds of 100 Mbps
 - Wireless – computers connect through a signal that is broadcasted by the router
 - Home wireless networks allow sharing of a connection as far as 750 feet
 - Unauthorized access is much easier
 - Speeds up to 600 Mbps

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Physical Technology

Cell Phones

User's Cell Phone

Nearest Cell Towers

Cell Providers' Server

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Physical Technology

Office Networks

- Many businesses utilize the same connection types as home users, but often subscribe to a higher connection speed
- Larger businesses use a T1 or T3 connection
 - Requires direct fiber optic connection
 - May cost more than \$10,000 per month
- Even faster networks are available
 - Cost can exceed \$5 million per month

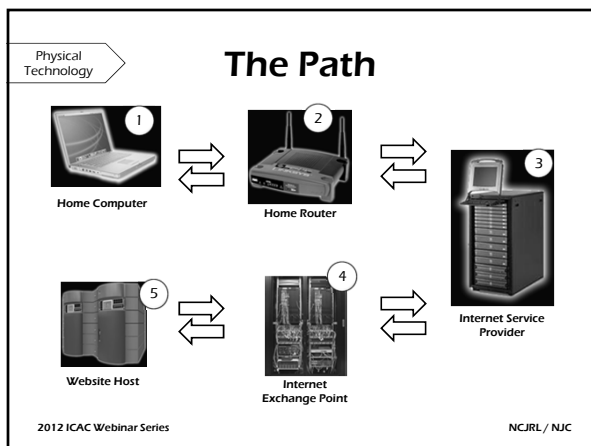
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Physical Technology

Internet Connections

- At one time, dial-up was the predominant way to connect to the Internet. Today, dial-up has been replaced so the user is constantly connected and receives higher speeds
 - Dial-up – 56 Kbps
 - DSL – 245 Kbps to 20 Mbps
 - T-3 – 44 Mbps
 - 3G – 200 Kbps; 4G – 6.4 Mbps

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Physical Technology

QUIZ

Which is a device that **MAY** be involved in a computer's connection to the Internet?

- A. Modem
- B. Router
- C. User's computer
- D. ISP's server
- E. All of the above

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Physical Technology

QUIZ

Which Internet connection has the **FASTEST** speed?

- A. DSL
- B. Dial-up
- C. T3
- D. 3G

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Exchange of Information

- What is the Internet?
- How do computers communicate with each other?
- How is information sent across the Internet?
- Is it possible to track actions back to a specific person?

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Exchange of Information

What is the Internet?

- A network of computers?
- A network of networks?
 - It is a network of millions of networks
- World Wide Web
 - Plus lots more. WWW is the most obvious part of the Internet, but it isn't all of it
- Each computer on the Internet uses TCP/IP to communicate

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Exchange of Information

What is TCP/IP?

- A set of rules governing the communication of computers online
- TCP (Transmission Control Protocol)
 - Converts data into packets and reassembles them into files for the user to read
- IP (Internet Protocol)
 - Handles addressing so that information is sent to the correct computer

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Exchange of Information

IP Addressing

- Each device on the Internet has a unique IP address, such as this one:
 - 317.23.90.134
- Computers, servers, and even printers have an IP address
- Addresses are usually temporary
 - Temporary addresses are called "dynamic"
 - In some cases, "static" addresses are assigned to a specific computer and do not change

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Exchange of Information

IP Addressing

- Some businesses and organizations have a range of IP addresses assigned to them
 - Government agency ranges can easily be found on the Internet
 - Disney, for example, uses 224.0.19.0 - 224.0.19.63
- ISPs also have a range of IP addresses to assign to their users

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Exchange of Information


IP Addressing

- If a network utilizes a router, there are two IP addresses involved
 - **Internal:** each computer has an internal IP address that distinguishes the computers on the network
 - **External:** the unique IP address assigned to the router by the ISP
 - Data is received at the external IP address by the router, and then the router sends the information to the correct internally-addressed computer

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Exchange of Information


IP Addressing




Computer 1
Internal: 172.168.1.1
External: 190.56.292.002

Router
Internal: 172.168.1.4
External: 190.56.292.002





Computer 3
Internal: 172.168.1.3
External: 190.56.292.002



Computer 2
Internal: 172.168.1.2
External: 190.56.292.002

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Coffee Shop
Internal: 172.168.1.102
External: 235.71.90.123

The Office
Internal: 172.168.1.195
External: 190.56.292.002

Home
External: 453.23.234.901

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Exchange of Information

IP Tracking

- Since every computer has a unique address, actions on the Internet can [somewhat] easily be traced back to the user.
 - A range of IP addresses is assigned to ISPs. If given a certain IP address, the ISP can be easily determined.
 - The ISP can track the IP address to the account holder at a designated time.

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Exchange of Information

IP Tracking

- One important thing to remember – ISPs are not required to keep such data
 - Some ISPs may delete such information after only 3 days
 - Congress has considered such a requirement, but has yet to pass one

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Coffee Shop
Internal: 172.98.1.102
External: 235.71.90.123

The Office
Internal: 172.16.1.195
External: 190.56.292.002

Home
External: 453.23.234.901

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Exchange of Information

MAC vs. IP

- While an IP address is assigned by a network, each computer also has a unique MAC address which is assigned by the computer's manufacturer
 - IP = software
 - MAC = hardware
- Example:
 - 70-F3-95-38-1F-06

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Exchange of Information

TCP – Packet Switching

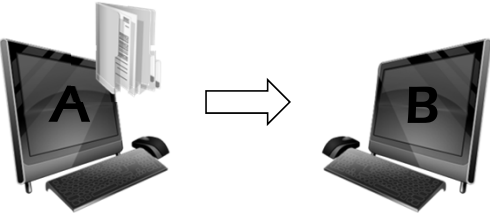
A → **B**

Sending File from Computer A to Computer B

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Exchange of Information

TCP – Packet Switching

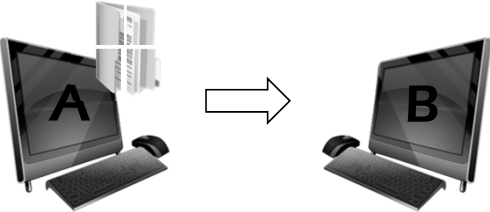


File is broken into smaller pieces called "packets"

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Exchange of Information

TCP – Packet Switching




The packets are labeled with addressing information

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Exchange of Information

TCP – Packet Switching




The packets are not sent through the same path. There are billions of paths they may take.

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Exchange of Information

TCP – Packet Switching



When the packets arrive, they must be put back together.

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Exchange of Information

QUIZ

Which is **NOT** a step in packet switching?

- A. Attaching addressing information
- B. Sending packets
- C. Putting the packets back together
- D. Encrypting the information so it cannot be received by the wrong person

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Exchange of Information

QUIZ

What can an IP address **NOT** identify?

- A. The person sending a file
- B. The computer sending a file
- C. The business or organization where the computer is located
- D. The ISP

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Web Browsers

- What is a “browser”?
- How does a browser work?
- What are the functions of modern browsers?
- What information do browsers keep on computers as you access the Internet?

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Web Browsers

What is a browser?

- A browser is a computer application that retrieves and displays content from the web
- This content may include web pages, videos, pictures, and more
- Popular browsers include Firefox, Internet Explorer, Chrome, and Safari



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Web Browsers

Website Coding

- Originally, all websites were programmed in HTML.

```

<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html
charset=UTF-8" />
<title>National Center for Justice and The Rule of Law </title>
<link href="css/2ndpg_index.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!-- style3 (font-size: 14px; color: #990000); -->
</style>
</head>
<body>
<div id="wrapper">
<div id="content">
<table cellpadding="0" cellspacing="0" width="800">
<tr>
<td colspan="2" class="mast" id="mars">
<div id="lyceum">

</div>
<div id="title">

```




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Web Browsers

Website Coding

- Today, websites typically involve a little HTML, coupled with various other programming languages, such as:
 - Javascript
 - ASP
 - PHP
 - XML
 - SQL



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Web Browsers

Domains & URLs

- Domain names are used to help a browser locate a website. For example:

http	://	www	.	ncjrl	.	org
Protocol		Subdomain		Domain		
				Host		Top-Level

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Web Browsers

Domains & URLs

- URLs may be more specific:
 - http://www.ncjrl.org/Administration/about_admin.html
- Other protocols also exist:
 - ftp://hp.com/
 - FTP: File Transfer Protocol
- Other top-levels domains (TLDs) exist as well:
 - .com, .net, .mil, .edu, and many more

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Web Browsers

Domains & URLs

- Domain names often serve as an alias for an IP address. For some websites, the IP address is interchangeable with the domain name.
 - For example, you can visit Google by entering either:
 - <http://www.google.com>
 - <http://74.125.159.99/>

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Web Browsers

Browser Functions

Address Bar Search Box

Tab

Status Bar

Web Browsers

Browser Functions

- Displays web pages
- Blocks popup advertisements
- Keeps Favorites / Bookmarks
- Allows saving of pages, images, and other files
- Prints webpages and images
- Stores usernames and passwords for your convenience

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Web Browsers

Browser Functions

- Web browsers also collect a variety of information about a user's online actions and save this information on the computer
 - History
 - Cache / Temporary Internet Files
 - Cookies

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Web Browsers

Browser Functions


- History
 - Records each page visited within the browser
 - Tags each visit with a time and date

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Web Browsers

Browser Functions

Internet History



The screenshot shows the Internet History window with a table of visited sites:

Name	Location
firefox	http://en-us.start3.mozilla.com/firefox?cli...
Mozilla Firefox Start Page	http://www.google.com/firefox/client=fi...
Google	http://www.google.com/
google.com	http://google.com/
srch.php	http://www.facebook.com/srch.php?nm...
Facebook	http://www.facebook.com/search.php?g...
find-friends	http://www.facebook.com/find-friends?l...
Find Your Friends on Facebook Fac...	http://www.facebook.com/find-friends?l...
facebook.com	http://facebook.com/
Welcome to Facebook	http://www.facebook.com/
Citi® Credit Cards - Logged Out	https://www.accountonline.com/cards/sv...
Citi® Credit Cards - Account Activity	https://www.accountonline.com/cards/sv...
Citi® Credit Cards - Account Home	https://www.accountonline.com/cards/sv...
Citi® Credit Cards - Account Activity	https://www.accountonline.com/cards/sv...
DeclineOffer.do	https://www.accountonline.com/cards/sv...

21 items
Select an item to view and edit its properties

Web Browsers

Browser Functions

- Cache (Temporary Internet Files)
 - Stores data so that future requests for the same website can be served faster
 - Cache is most obvious when you click the “back” button. The webpage appears almost immediately because the content is retrieved from your computer, not the server
 - Cache may remain on a computer for weeks at a time – or longer

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Web Browsers

Browser Functions

- Cache (continued)
 - Usually consists only of images and text
 - May allow viewing of an entire website even if the computer is not connected to the Internet

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Web Browsers

Browser Functions

Temporary Internet Files Folder

client_ad.php?p...	http://insider.msg.yahoo.com/client_ad...	PHP Script	3KB	11/26/2010 8:53 PM
b?P=BYkh80PDu...	http://us.bc.yahoo.com/b?P=BYkh80PDu...	GIF File	1KB	11/26/2010 8:53 PM
b?P=SEdbf0PDu...	http://us.bc.yahoo.com/b?P=SEdbf0PDu...	GIF File	1KB	11/28/2010 1:17 AM
client_ad.php?p...	http://insider.msg.yahoo.com/client_ad...	PHP Script	3KB	11/28/2010 1:18 AM
b?P=Ml3LkPDu...	http://us.bc.yahoo.com/b?P=Ml3LkPDu...	GIF File	1KB	11/28/2010 1:18 AM
rg02y_234x60_0710	http://ads.yimg.com/a/a/md/sprk/rg02y...	JPG File	7KB	11/28/2010 1:51 AM
b?P=a89IUePDu...	http://us.bc.yahoo.com/b?P=a89IUePDu...	GIF File	1KB	11/28/2010 1:51 AM
client_ad.php?p...	http://insider.msg.yahoo.com/client_ad...	PHP Script	3KB	11/28/2010 1:52 AM
b?P=BAFseUPDu...	http://us.bc.yahoo.com/b?P=BAFseUPD...	GIF File	1KB	11/28/2010 1:52 AM
client_ad.php?p...	http://insider.msg.yahoo.com/client_ad...	PHP Script	3KB	11/28/2010 12:02 PM
?ord=12909867...	http://ad.doubleclick.net/adi/N5047.Yah...	Chrome HTML Do...	9KB	11/28/2010 12:24 PM
PLAC_WhiteBlac...	http://s0.2mdn.net/1676624/PLAC_White...	Flash Movie	10KB	11/28/2010 12:24 PM
client_ad.php?p...	http://insider.msg.yahoo.com/client_ad...	PHP Script	6KB	11/28/2010 12:25 PM
?ord=12909872...	http://ad.doubleclick.net/adi/N5047.Yah...	Chrome HTML Do...	9KB	11/28/2010 12:25 PM
client_ad.php?p...	http://insider.msg.yahoo.com/client_ad...	PHP Script	3KB	11/28/2010 12:26 PM
b?P=STNb_UPD...	http://us.bc.yahoo.com/b?P=STNb_UPD...	GIF File	1KB	11/28/2010 9:16 PM
client_ad.php?p...	http://insider.msg.yahoo.com/client_ad...	PHP Script	3KB	11/28/2010 9:17 PM
b?P=JdnBUPDu...	http://us.bc.yahoo.com/b?P=JdnBUPDu...	GIF File	1KB	11/28/2010 9:17 PM
rg12y_234x60_1010	http://ads.yimg.com/a/a/mn/dspr/rg12y...	Flash Movie	15KB	11/28/2010 11:45 PM

Web Browsers

Browser Functions

- Cookies
 - Text stored by the browser
 - May store a user's site viewing preferences or contents of their shopping cart
 - Some will contain personal information such as a login name or email address
 - Cookies rarely, if ever, contain information like passwords or credit card numbers

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Web Browsers

Browser Functions

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Web Browsers

Browser Functions

- Extensions
 - Millions of extensions are available to give your browser extra functionality
 - For example, since browsers do not have functions that allow you to easily download videos you watch online, someone created an extension that allows you to do that

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Web Browsers

QUIZ

Which is **NOT** a function of a browser?

- A. Displaying webpages
- B. Saving cache
- C. Assigning IP addresses
- D. Blocking popups

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Web Browsers

QUIZ

Which **MAY** contain information showing a user's actions while on the Internet?

- A. Cache
- B. Cookies
- C. History
- D. All of the above
- E. None of the above

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Web Applications

- What is a web app?
- How do web apps function?

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Web Apps

What Is a Web App?

- A program similar to those on your computer, but different because it does not need to be installed
- Accessed entirely online
 - No need to update
 - Less chance of getting viruses and spyware from installing them
 - Works on any computer with a browser – Macs, PCs, cell phones

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Web Apps


Sample Apps

Google Docs – word processing, spreadsheets, presentations, and more

Google docs

Create and share your work online with Google Docs


- **Upload your files from your desktop:** It's easy to get started and it's free!
- **Access anywhere:** Edit and view your docs from any computer or smart phone.
- **Share your work:** Real-time collaboration means work gets done more quickly.



Web Apps

Sample Apps

JayCut – online video editing

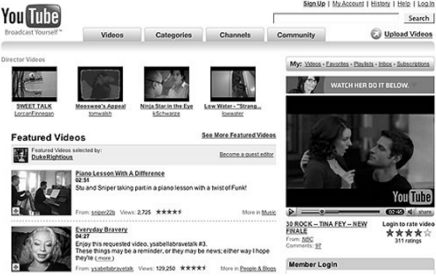


Business: License our technology under your brand
JayCut provides everything you need to get your own white labeled video editor up and running today.

Web Apps

Sample Apps

YouTube– online video sharing website



Web Apps

How does the app work?

- Web apps were not possible during the HTML era of web browsing, but new languages have changed this
- Java, DHTML, Flash, Silverlight, Ajax, Ruby on Rails, and others have enabled the creation of web apps

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Web Apps

QUIZ

Which is **NOT** an advantage of a web app?

- They are available whether or not your computer is connected to the Internet
- Safety – lesser chance of getting viruses
- No need to update the app
- Doesn't take up memory on your computer

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Evolution of Technology

- Where are we now?
- What's next?

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Evolution of Technology **How have we changed?**

- Over the past 10 years,
 - Average Internet speed has become 25 times faster
 - Average home computer memory has increased over 100 fold
 - Internet access has become available nearly anywhere with the proliferation of smartphones
- It's not going to slow down

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Evolution of Technology **Right Now**

- Peer-to-Peer Networking
- Google technologies
- Virtual Worlds
- Social Networks
- Chat rooms, instant messaging, message boards
- Blogs and wikis

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Evolution of Technology

Right Now

- Data and tracks are becoming increasingly easier to hide

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Evolution of Technology

Right Now

- .xxx Top Level Domain
 - Went into effect in April 2011
 - Use of the TLD is voluntary for websites hosting sexually explicit material
 - Some fear a legislative mandate will follow
 - Cost of a .xxx domain name
 - Cost is \$99
- Plans to create many more TLDs

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Evolution of Technology

The Near Future

- IP Addressing changes
 - Current technology, IPv4, provides about 4.3 billion addresses
 - Asia has already exhausted their allocations
 - Remaining addresses will soon be depleted
 - New technology, IPv6, will provide about 50,000,000,000,000,000,000,000,000 per person living today
 - An example of the new address is
 - 2001:0db8:85a3:0000:0000:8a2e:0370:7334

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Evolution of Technology

The Near Future

- The "Cloud"
 - Files are gradually moving off computers and being stored on servers around the world
 - People are using web applications to perform tasks they once had to do on their home computer
 - Many state governments have made the move as well

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Evolution of Technology

QUIZ

Which is **LEAST** likely to occur in the future?

- Technology becomes faster and better
- Increasing movement to the "cloud"
- People stop trying to hide their online tracks
- Change to IPv6

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Presented by
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Questions?

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Thank you for joining us.

Next webinar in this series:
"Hiding Tracks on the Net"
February 8, 2012

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