Introduction to the Internet

Presented by the MC-NPL Computer Lab

Class Lesson Plans available at: www.mc-npl.org/class-resources
Objectives

- What is the Internet & how does it work?
- Who controls the Internet?
- What is the World Wide Web (aka “the Web”)?
- What do I need to access the Web?
- Terminology
The Internet is a **global network of computers**. It is millions of computers around the world, all connected, that share information with each other.

People often think of the Internet as a cloud in space. In reality, every computer in the Internet, is connected by **actual wires** -- Ethernet cables, phone lines, and fiber optic wiring on the ocean floor to connect the continents!
What is a server?

There is a LOT of information on the Internet, but all of it comes from another computer somewhere. Special computers designed for transmitting information on the Internet are called servers.

Big Internet companies often own thousands of servers so that their websites are fast. To the right is a picture of one of Google’s many server rooms, located in Georgia. A server room is a large, air-conditioned room filled with thousands of servers. When you do a Google web search, your computer just might be “talking” to one of the servers in this server room.
Who Controls the Internet?

- The Internet is a **cooperative endeavor** - no organization is “in charge” of it.
- The Internet is an inherently **participative** medium. Anybody can publish information or create new services.
- When you connect your computer to the Internet, you become **part** of the Internet.
Many people use the words “the Internet” and “the Web” interchangeably, but they do not mean the same thing.

The “Web” (short for “World Wide Web”) is just one of the services that runs on the Internet. It is a collection of interconnected webpages, documents and other resources.

The “Internet” includes the web, e-mail, instant messaging, multiplayer gaming, and streaming media (like videos and music).
What do I need to access the Internet?

#1 A computer device such as:

- Desktop Computer
- Laptop Computer
- Tablet
- Smartphone
#2 An Internet connection, obtained through:

<table>
<thead>
<tr>
<th>Internet Service Provider (ISP)</th>
<th>Wi-Fi Hotspot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home &amp; office computers</td>
<td>Public place (library, coffee shop, hotel)</td>
</tr>
<tr>
<td>Fastest speed</td>
<td>Often free, but sometimes costs money or requires password</td>
</tr>
<tr>
<td>Via: fiber, cable, DSL</td>
<td></td>
</tr>
</tbody>
</table>

**Cell Phone Carrier**

- Smart phones only
- Wireless technologies: 3G (third generation), 4G, 5G, LTE (long-term evolution)
- Cost and usage limits vary depending on cell phone **data plan**
- Accessible anywhere phone has signal
- Speed varies depending on signal strength
What do I need to access the Internet?

#3  A web browser

- A web browser is computer software that allows you to view webpages.

The “Firefox” Web Browser
Common Web Browsers

- **Chrome**
  - **Creator:** Google
  - **Cost:** Free
  - **U.S. Usage:** 47%
  - **Very good overall.**

- **Internet Explorer**
  - **Creator:** Microsoft
  - **Cost:** Free
  - **U.S. Usage:** 2%
  - **Comes with Windows.**
  - **Only available on Windows.**
Common Web Browsers

- **Creator:** Apple
- **Cost:** Free
- **U.S. Usage:** 36%
- Comes with iMacs, iPhones, and iPads.
- Only available on Apple products.

- **Creator:** Mozilla
- **Cost:** Free
- **U.S. Usage:** 4%
- Non-profit company.
- Open source (you can see the computer code, makes them more accountable to their users).
Common Web Browsers

- **Creator:** Microsoft
- **Cost:** Free
- **U.S. Usage:** 4%
- New browser, only available on Windows 10.
- Meant to replace Internet Explorer.
What’s a URL?
(Uniform Resource Locator)

A URL is the Internet address of a particular site or document available via the World Wide Web. Just like you have an address for your house, there is an address for each website.


Samples of invalid Internet addresses:
www.computers
myname@computer.com
computer/net.com
Common Top-Level Domains

This is an indication of the type of organization that is hosting the web page. It’s a category of sorts.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>.com</td>
<td>Commercial (for-profit business)</td>
<td><a href="http://www.google.com">www.google.com</a></td>
</tr>
<tr>
<td>.net</td>
<td>Originally for network providers, now used as an alternative to “.com”</td>
<td><a href="http://www.comcast.net">www.comcast.net</a></td>
</tr>
<tr>
<td>.org</td>
<td>Organization (non-profit)</td>
<td><a href="http://www.mc-npl.org">www.mc-npl.org</a></td>
</tr>
<tr>
<td>.edu</td>
<td>Educational institution</td>
<td><a href="http://www.mc3.edu">www.mc3.edu</a></td>
</tr>
<tr>
<td>.mil</td>
<td>Military</td>
<td><a href="http://www.army.mil">www.army.mil</a></td>
</tr>
</tbody>
</table>

Web sites located in other countries have a two-letter country code for their top-level domain.

Each country has its own list of second-level domains (comes before the top-level domain)
A hyperlink is a graphic or a piece of text in a webpage that, when clicked, will send the reader to another webpage or document. Hyperlinks often look like blue underlined text but can also appear as icons or other graphics. Whenever you place your mouse cursor over a hyperlink, it will change into a pointing hand.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send and receive email</td>
<td><a href="http://www.gmail.com">www.gmail.com</a></td>
</tr>
<tr>
<td>Read newspaper</td>
<td><a href="http://www.philly.com">www.philly.com</a></td>
</tr>
<tr>
<td>Get driving directions</td>
<td><a href="http://www.mapquest.com">www.mapquest.com</a> maps.google.com</td>
</tr>
<tr>
<td>Search for a job</td>
<td><a href="http://www.monster.com">www.monster.com</a></td>
</tr>
<tr>
<td>Shop or Sell</td>
<td><a href="http://www.amazon.com">www.amazon.com</a> <a href="http://www.ebay.com">www.ebay.com</a></td>
</tr>
<tr>
<td>Research</td>
<td><a href="http://www.wikipedia.com">www.wikipedia.com</a></td>
</tr>
<tr>
<td>Watch videos</td>
<td><a href="http://www.youtube.com">www.youtube.com</a></td>
</tr>
<tr>
<td>Watch TV shows</td>
<td><a href="http://www.hulu.com">www.hulu.com</a> <a href="http://www.netflix.com">www.netflix.com</a></td>
</tr>
<tr>
<td>Check Train/Bus Schedules</td>
<td><a href="http://www.septa.org">www.septa.org</a></td>
</tr>
<tr>
<td>Communicate with government</td>
<td><a href="http://www.state.pa.us">www.state.pa.us</a></td>
</tr>
<tr>
<td>Get free credit reports</td>
<td><a href="http://www.annualcreditreport.com">www.annualcreditreport.com</a></td>
</tr>
<tr>
<td>Fact-check rumors</td>
<td><a href="http://www.snopes.com">www.snopes.com</a></td>
</tr>
</tbody>
</table>
Getting to the Wrong Website
Installing a Theme in Firefox

Click Add

Click Install Theme
Installing a Theme in Firefox

New theme is installed

Theme is added to My Themes list
Pop up Blockers

pvlibrary.net/popup-demo
Secure Websites

- There are times when you need to share personal information on the Internet.
  - Online shopping
  - Job applications
  - Bank account
  - Doing your taxes
- Only enter your personal information on secure websites.
- Secure websites encrypt your information so cyber criminals can’t intercept it when it travels across the Internet.
How do I know if a website is secure?

Look for a padlock icon in the Address Bar.

If the padlock has an alert icon, it means the site is not fully secure.

Also note the “s” in “https”. Websites that use the “http” protocol (without the s) are NOT secure!
In order to use many of the services on the Internet, you need to create accounts, each of which require you to create a password. Examples of such services include:

- Email
- Facebook
- Amazon
- Bank Account

If someone guesses your password, they can access your information, so your passwords should be hard to guess.
Characteristics of a **strong** password (most important)

- ★ Is significantly different from your other passwords
- ★ Is at least 8 characters long—the longer, the better (a character is anything you can type on the keyboard)
- ★ Is NOT a word from the dictionary
- ★ Is NOT a proper noun (person, place or thing—real **OR** fictional!)
- ★ Does NOT contain personal information (user name, real name, address, mother’s maiden name).
- ★ Does NOT contain characters from adjacent keys (e.g. “zxcvb”)
Characteristics of a strong password (less important)

• Does NOT contain professions of love (“ilovedogs”) (a lot of people do this)
• Does NOT start with an uppercase letter or end with numbers (another common pattern that makes your password easier to guess).
• Does NOT contain “clever” substitutions for letters or words (“@” instead of “a”, “4” instead of “for”)

27
Characteristics of a strong password

Misconception:

Having a mix of different types of characters increases the strength of your password.

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uppercase letters</td>
<td>A B C</td>
</tr>
<tr>
<td>Lowercase letters</td>
<td>a b c</td>
</tr>
<tr>
<td>Numbers</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Special characters</td>
<td># % – (space)</td>
</tr>
</tbody>
</table>

- **This a relic from the past.** The National Institute for Standards and Technology (NIST) removed this from their security best practices in June 2017.
- Unfortunately, many websites still enforce this rule, but know that this alone does not make your password more secure!
This website erroneously considers a password to be “strong” if it has a mix of different characters:

This is NOT a “weak” password!

And this is NOT a “strong” password!
Some **good** passwords

rOses21forEver
long, easy to remember
“roses forever”

giraffeeats75dicedpears
4 random words from the dictionary formed into a memorable sentence with numbers

there are 100 speCies of roses
long, passwords don’t have to be words—they can be phrases. The spaces are part of the password.

qaH5RbM1ib
random letters and numbers
Some **bad** passwords

- elephant: Just a word from dictionary
- f8#Za: Too short
- 1qaz2wsx: Adjacent keys
- ilovemusic64: Profession of love
- Ends in numbers
- $uperm@n: Proper noun
  - “Clever” substitutions
- BillClinton: Proper noun
  - Starts with capital letter
- 4-13-1970: Birthdate (personal info)
- 143mapleln: Address (personal info)
What if I forget my password?

- Most websites provide an option for **resetting** your password via **email** if you forget it.
- Therefore, you should **never forget your email password**. Spend time to make it is both **secure** and **easy to remember**.
- Your email account is like your **ID card for the Internet**—most services will ask you for your email address in order to create accounts with them.
What if I forget my **email** password??

Most email services provide ways of resetting your email password so you can regain access to it.

- **Cell phone:** They will send you a text message with a code that allows you to reset your password.
- **Alternate email address**
- **Security questions** (“What was the name of my first pet?”)

**BUT:** In order for these things to work, you must enter this additional information **before** you lose your password!
Extra Security… 2–Factor Authentication

- Many websites with personal information such as e-mail & banking now offer an extra layer of security to verify it’s really you.
- This is called 2–Factor or Multi–Factor Authentication, or sometimes 2–Step Verification.
- It combines your password with a unique code that can be texted, sent to your primary (or alternate) e-mail, or even via an automated phone call.

YOUR CODE IS:
521093
Can I write my passwords down?

- Write them down by hand in a notebook.
  - Store it in a safe place
  - Do NOT carry it around with you in case you lose it

- Password storage programs (e.g. KeePass)
  - Encrypts your password list with a master password
  - Saved on your home computer
  - Auto-generates secure passwords for you.
  - Don’t forget the master password or else you’re out of luck!

- Secure cloud storage (Google Drive, Dropbox)
  - Store your password list on the cloud, so you can access it anywhere
  - But make sure your cloud password is secure!
Scams – Phishing

- Emails that look like they are from legitimate organizations (like your bank).
- Trick you into entering your personal information.
Security Information Regarding Your Account.

We are sorry, **For your protection and security reasons**, your Wells Fargo account has been locked.

Please click on the following link to unlock your account.

**Log-in to:** [https://www.wellsfargo.com/online-banking/updating](https://www.wellsfargo.com/online-banking/updating)

Thank you for bringing this matter to our attention.

Sincerely,
Wells Fargo Online Banking Team.

[wellsfargo.com | Fraud Information Center](https://www.wellsfargo.com)
Scams – Phishing

Story: United Nations caught scam artists, and are giving away the money they stole.

Red flag: Offering you free money

Red flag: Asking for personal information

United Nations <LindaTutu.wwine.ocn.ne.jp>

May 25 (1 day ago) ⭐️

Why is this message in Spam? It’s similar to messages that were detected by our spam filters. Learn more

This is to inform you that we have been working towards the eradication of fraudsters and scam artists in Africa with the help of the Organization of African Unity (OAU) United Nations (UN), European Union (EU) and FBI.

We have been able to track down some scam artists in various parts of African countries which includes (Nigeria, Republic of Benin, Ghana and Senegal) and they are all in Government custody now, they will appear at International Criminal Court (ICC) soon for Justice.

During the course of investigation, they were able to recovered some funds from these scam artists and IMF organization have ordered the funds recovered to be shared among the 10 Lucky people listed around the World as a compensation. This notice is been directed to you because your email address was found in one of scam artists file and computer hard disk while the investigation, maybe you have been scammed. You are therefore being compensated with sum of ($10.7 Million) US Dollars valid into an (ATM Card Number 2364 3456 0952 4204).

Since your email address is among the lucky beneficiaries who will receive a compensation funds, we have arranged your payment to be paid to you through ATM VISA CARD and deliver to your postal address with the Pin Numbers as to enable you withdrawal maximum of $5,000 on each withdrawal from any Bank ATM Machine of your choice, until all the funds are exhausted.

The ATM Card with Security Pin Numbers shall be delivered to you via courier Service, depending your choice.

In order to proceed with this transaction, you will be required to contact the agent in-charge (MR. STEVE JOHNSON) via e-mail. Kindly look below to find appropriate contact information:

CONTACT AGENT NAME: MR. STEVE JOHNSON

Phone Number: +229-6897-9405

You will be required to e-mail him with the following information:

FULL NAME:
ADDRESS:
CITY:
STATE:
ZIP CODE:
DIRECT CONTACT NUMBER:
OCCUPATION:

We advice you to stop all the communications with everyone regarding your payment as we have short listed to done you and now urge you to comply and receive your ATM Card funds.

Thanks for your understanding as you follow instructions while I wait to hear from you today.

Yours in Services
Scams – Phishing

Red flag: This email claims to be from Google, but the email address doesn’t have “google” in it.
Scams – Phony Error Messages

Red flag: Asking you to call a phone number.
Scams – Phony Websites

Product ad on next slide
nothing to lose. To order your bottle, follow the links I have provided and know that you are getting a quality product that works; no strings attached!

You can reach your weight loss goals with the Nitric Storm diet,

Ryan Hasman

Update: LIMITED TRIALS AVAILABLE: As of Thursday, August 25, 2016

RECEIVE A BOTTLE OF NITRIC STORM

Take advantage of our Exclusive Link!

CLAIM A FREE BOTTLE

This special offer ends: Thursday, August 25, 2016
Scams – Phony Websites

Seems legitimate...

Red flag:
...but look at the URL! Where is “espn.com”?

Remember the age-old saying:
If it sounds too good to be true...it probably is.
Scams – Phony Websites

Red flag:
This is NOT the Google sign-in page! Look at the address bar!
Scams – Ransomware

- Play on words—ransom + software
- Uses **modern encryption tech** to lock you out of your files unless you pay money to unlock them
- Sometimes it tries to scare you into thinking that you **broke the law** and the government locked you computer.
- Demands **$1,077** on average (2016)
- **Workplaces**, such as hospitals, are often victims. They often will pay because it’s a drop in the bucket compared to the money they would loose if their computers are down
- **Will they actually unlock your files if you pay up?** Most of the time, yes (but not always).
Scams – Ransomware
YOUR COMPUTER HAS BEEN LOCKED!

This operating system is locked due to the violation of the federal laws of the United States of America! (Article 1, Section 8, Clause 8; Article 202; Article 210 of the Criminal Code of U.S.A. provides for a deprivation of liberty for four to twelve years.) Following violations were detected:
Your IP address was used to visit websites containing pornography, child pornography, zoophilia and child abuse. Your computer also contains video files with pornographic content, elements of violence and child pornography! Spam-messages with terrorist motives were also sent from your computer.
This computer lock is aimed to stop your illegal activity.

To unlock the computer you are obliged to pay a fine of $200.

You have 72 hours to pay the fine, otherwise you will be arrested.

You must pay the fine through [redacted]
To pay the fine, you should enter the digits resulting code, which is located on the back of your [redacted] in the payment form and press OK (if you have several codes, enter them one after the other and press OK).
If an error occurs, send the codes to address fine@fbi.gov.
How to protect against ransomware:

- Avoid downloading suspicious email attachments. This is the most common way ransomware spreads.
- Backup your data regularly (copy important files to a flash drive).
- Unplug flash drives and external hard drives as soon as you are done using them.
- Have anti-virus software installed on your computer.
- Avoid clicking links in suspicious emails.
- Avoid clicking advertisements on websites.
- More info: tinyurl.com/je9yzf7
Scams

If you’ve been a victim to any of these scams, file a report with the FBI’s Internet Crime Complaint Center (IC3)

www.ic3.gov
Search Engines

- There are over **6.52 billion** web pages on the Internet.
- If you don’t know the URL (address) of the web page that has what you’re looking for, how are you supposed to find anything?
- **Search engines** to the rescue!
Search Engines

- Search engines use thousands of clustered computers to “index” (make searchable) every single webpage on the Internet.
- The programs that do this are called spiders, bots, or crawlers.
- It’s a complex process—search engines are very secretive about how they decide which websites appear at the top of the search results.
- But generally, websites that are linked to by lots of other websites appear at the top of the search results.
- **SEO (Search Engine Optimization)**: Multi-million dollar industry focused on increasing website search engine rankings.
Most Popular Search Engines

1. Google
2. Baidu 百度
3. Yahoo!
4. Bing
5. Ask

* DuckDuckGo
Search Tips

- Imagine what words would likely appear on the pages you are looking for
  - Instead of searching for “my head hurts”, search for “headache”
- If you do not get useful results, try using other words that mean the same thing.
  - For example, instead of “headache”, try “migraine”.
- Also: Try using a different search engine if you don’t get good results
- Be careful of words with multiple meanings.
  - “penguins”: Could mean the animal or the hockey team
  - “turkey”: Could mean the country, the animal, or the food.
"The Internet, referring to the specific global system of interconnected IP networks, is a proper noun and written with an initial capital letter."