

## Component 4: Introduction to Information and Computer Science

### Unit 2: Internet and the World Wide Web

#### Lecture 2

This material was developed by Oregon Health & Science University, funded by the Department of Health and Human Services, Office of the National Coordinator for Health Information Technology under Award Number 1U24DC000015.

---

---

---

---

---

---

---

---

### Unit Objectives

- Definition of the Internet and World Wide Web.
- Connecting to the Internet.
- Searching the Internet, filtering results and evaluating credibility of results.
- Internet security and privacy concerns.
- Ethical considerations of the Internet.
- Online healthcare applications and associated security and privacy issues (including HIPAA).

Component 4/Unit 2-2

Health IT Workforce Curriculum  
Version 2.0/Spring 2011

2

---

---

---

---

---

---

---

---

### Service Providers and You

- Internet Access Providers connect users to the Internet.
  - ✓ Commonly known as ISPs.
  - ✓ Access to the Internet revolves around the use of ISPs.
  - ✓ ISPs are organized as local, regional, and national providers.
  - ✓ Local providers connect to a regional provider.
    - ✓ Might only work in a limited number of cities.

Component 4/Unit 2-2

Health IT Workforce Curriculum  
Version 2.0/Spring 2011

3

---

---

---

---

---

---

---

---

### Service Providers and You (cont'd)

- Regional providers connect to national providers.
  - ✓ Usually operate in parts of a number of states or provinces.
- National providers provide high-speed data transfer amongst themselves to provide a robust, redundant system.
  - ✓ Provides connectivity to every other network on the Internet without needing to pay for it.

---

---

---

---

---

---

---

---

### Internet Access for a Fee

- Since ISPs must maintain equipment and pay salaries, they provide access for a fee.
- Fees based on type of service available and desired speed.
  - ✓ Dialup is available everywhere in the U.S. But is it very slow! Cost is approx. \$10/month.
  - ✓ DSL is much faster than dialup but is not available in many locations. Cost is approx. \$50/month.
  - ✓ Cable is usually much faster than DSL but is only available where cable companies have installed coaxial cable in streets. Cost is approx. \$60/month.

---

---

---

---

---

---

---

---

### Provider Equipment

- ISPs usually provide the equipment required to connect to their service for purchase or for a monthly lease fee (known as provider equipment).
  - ✓ Dialup connections require a modem on the premises. A computer connects to the modem and the modem connects to the ISPs wall connection, which provides Internet access.
  - ✓ DSL connections require a DSL modem and connect similar to dialup.
  - ✓ Cable connections require a cable modem router and connect similar to dialup.

---

---

---

---

---

---

---

---

## Customer Premises Equipment

- Private networks usually have their own equipment.
  - ✓ Your private (home or business) network usually is made up of computers, laptops, WAPs, and switches.
  - ✓ All of your private devices can connect to your switch with the switch connecting to the ISP's equipment via a network cable.
  - ✓ With this setup, all private devices can access the Internet and share the same Internet connection.

---

---

---

---

---

---

---

---

## Leasing an IP Address

- ISPs lease IP addresses to subscribers.
  - ✓ Your private (home or business) network usually utilizes private IP addresses.
  - ✓ The ISP typically leases your location one public IP address.
  - ✓ The ISP's equipment is provided with a public IP address to connect to the ISP's public network.
  - ✓ The ISP's equipment is also provided with a private IP address to connect to your private network.

---

---

---

---

---

---

---

---

## Leasing a Dynamic IP Address

- The ISP's equipment is able to translate addressing between the private and public networks.
- ISPs generally provide you with an IP address that may change from day to day.
  - ✓ This is a typical leased, dynamic IP address and is included in the monthly fee.

---

---

---

---

---

---

---

---

### Leasing a Static IP Address

- ISPs can also lease an IP address for the duration of the contract.
  - ✓ The static IP address will not change.
- Most Web sites use static IP addresses so that their domain name will be reliably mapped to one IP address.
- ISPs charge more each month for static IP address. The charge ranges from \$5 to \$100, depending on provider.

---

---

---

---

---

---

---

---

### DNS - Another ISP Service

- ISPs provide a first-level of DNS servers.
  - ✓ ISP DNS servers connect to global DNS root servers for help when they cannot resolve a name to an IP address.
  - ✓ Using an ISP's DNS servers makes for a speedier browsing experience!

---

---

---

---

---

---

---

---

### Searching the Internet

- Search engines search Web pages for information using an algorithm.
  - ✓ Information includes keywords and other information found on Web pages.
  - ✓ Not a Web directory, which is a site that manually lists sites by category, etc.
  - ✓ The Web site Craigslist offers a Web directory and search engine on its site.

---

---

---

---

---

---

---

---

## Search Engine Providers

- Google – [www.google.com](http://www.google.com)
- Bing (Microsoft) - <http://www.bing.com/>
- Yahoo! - <http://www.yahoo.com/>
- Ask - <http://www.ask.com/>
- Others?

---

---

---

---

---

---

---

---

## How Do Search Engines Function?

- Search engines gather data.
- Web crawler programs are programmed with proprietary algorithms to gather HTML coding on Web pages.
- Search providers own proprietary algorithms that provide distinct search results.
  - ✓ An algorithm is a set of instructions set out logically to solve a problem or reach a desired goal.
  - ✓ Some algorithms are better than others.

---

---

---

---

---

---

---

---

## How Do Search Engines Function? (cont'd)

- Gathered data is analyzed and indexed and used to provide search results.
  - ✓ Indexed data is stored in a database, owned by the search provider.
- Search engine software searches its indexed data based on your search criteria.

---

---

---

---

---

---

---

---

## Using a Search Engine

- Search using a phrase (also known as a query).
  - ✓ Engine analyzes its indices, looking for pages that most closely match.
- Type “what is the internet” (without quotes) in a search line.
  - ✓ Try it now and select the Wikipedia entry near the top of the page.

---

---

---

---

---

---

---

---

## Using a Search Engine (cont'd)

- Use wildcards in your search phrase.
  - ✓ Searching for “search engine list 20\*” (without quotes) returns sites listing search engine rankings for the year 2000 through 2099.
  - ✓ Try it now!

---

---

---

---

---

---

---

---

## Using a Search Engine (cont'd)

- Use Boolean operators AND, OR, and NOT to restrict or augment the search phrase.
  - ✓ AND – searching for “cardiac and arrest” (without quotes) will list Web pages containing both words (not one word or the other).
  - ✓ OR – Searching for “cardiac or arrest” (without quotes) will list Web pages containing either word or both words.
  - ✓ NOT – Searching for “cardiac and arrest not flu” (without quotes) will list Web pages containing “cardiac” and “arrest” but not the word “flu”.

---

---

---

---

---

---

---

---

## Web Search Tips

- ✓ Web searching is not case-sensitive.
- ✓ Be specific. Don't search for "car" (a generic noun) when you could be specific with a make, model and year.
- ✓ Use short search phrases of 2-3 words when possible. Less is more!
- ✓ Searching with phrases in quotes restricts the search results.

---

---

---

---

---

---

---

---

## Web Search Tips (cont'd)

- Using Quotes Matters
  - ✓ Searching for "phantom of the opera" (with quotes) will return Web pages that contain that phrase, in that word order.
  - ✓ Searching for phantom of the opera (without quotes) will return Web pages that contain the words "phantom" and/or "opera" in no particular order.

---

---

---

---

---

---

---

---

## Search Results in a Nutshell

- What does it mean when a Web site is shown at the top of a results list?
  - ✓ Keywords found on Web site by Crawler match your search phrase.
  - ✓ Popular Web sites (those visited often) match your search phrase.
  - ✓ Paying sites may appear on the top or side of the page, near the unpaid for search results.

---

---

---

---

---

---

---

---

## Internet Security and Privacy Concerns

- Why be concerned about Internet Security?
  - ✓ Your personal data is always at risk when connected to the Internet, regardless of connection type.
  - ✓ Checking account may be drained before you can act.
  - ✓ Credit may be destroyed if personal data stolen (and impersonated).
  - ✓ Corporate secrets may be stolen and sold to competitors.

---

---

---

---

---

---

---

---