

# Internet Technologies

A.K.A. Things you can on the Internet

# The Internet is a Communications Medium

- Almost all Internet technologies are designed to communicate a message.
- All internet systems by design include a server component and a client component.
- Software used to access the internet is called Client software
- Communications can include written, verbal, and visual types. The Internet can transmit any of these.

# E-mail

- E-mail - One of the oldest technologies from the Internet's early days.
- Allows you to send a message to one or many.
- You can include sounds, pictures, and video, but most is just text.
- Spam sucks!

# Instant Messaging

- IM: 40% usage in large organizations (1000+ employees)
- AOL Instant Messenger, Microsoft MSN Messenger and Yahoo Messenger are the top three; iChat is the main client on the Mac.
- Usually one-to-one
- Great for quick communication



# World Wide Web

- It's NOT the Internet!!! (The World Wide Web is just an Internet Technology)
- Web pages, video, and sound can travel on the web.
- Usually a mass medium designed to reach global audiences through Browsers
- Can be customized for individual users

# World Wide Web

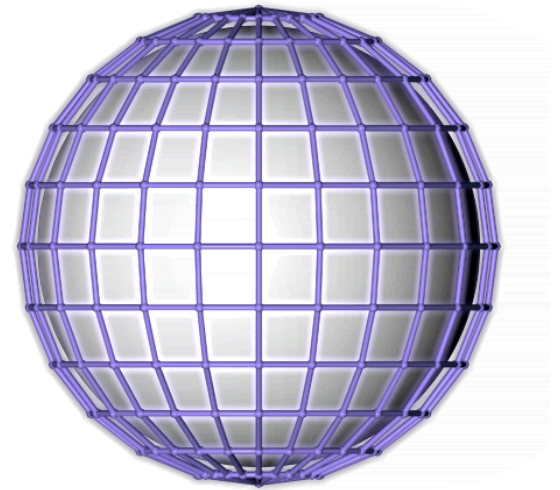
- Web browser clients include Internet Explorer, Mozilla, Firefox, Safari and Opera.
- Most new technologies travel via the web protocol because it is the most open.
- Companies have closed other protocols to prevent people from listening to streaming audio or to prevent viruses from attacking their computers, but closing off the web would break the internet.

# A Few Other Clients

- File Transfer Protocol (FTP), Apple File Protocol (AFP), Microsoft networking and other file sharing protocols
- iTunes and other music protocols, including bittorrent, which is for any kind of file, but often used for large music and video files.
- iCal and other client or address book clients, which actually use web protocols.

# How the Internet Works

- How packets of information move from your computer to computers on the Internet
- Internet Addresses: IP Addresses
- Routing
- DNS (Domain Name System)
- Servers



# How Packets Get There!

It's so exciting! No really. Ok, well it's still important!

# The “Post Office”

- The best way to visualize how information gets from your computer to another computer on the Internet is to think of the post office.

# The Post Office?

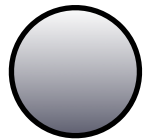
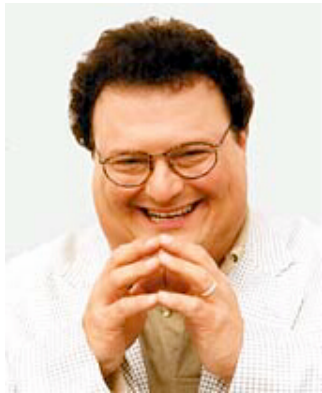
- They're similar, because they examine the "package" (or packet) and decided where it goes from there.
- A router on the Internet works just like a mail sorter at the post office. It looks at every packet and decides where it should go next. It doesn't care about the end destination, only where the next stop is!

# Here's an Example



- You pay your credit card bill via snail mail. It goes to Phoenix, AZ.
- At the Stillwater post office, they examine it, and determine it's destination is not a Stillwater address, so they forward it to Tulsa.
- The Tulsa “router” looks at it, then forwards it on to Phoenix. Once it reaches Phoenix, it is recognized as a local address, so it is delivered

# How it gets there



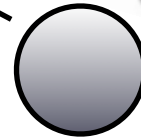
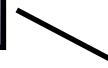
Stillwater post office  
passes it to the next stop  
because it's not a local address



Tulsa  
Post  
Office



Phoenix  
Post  
Office



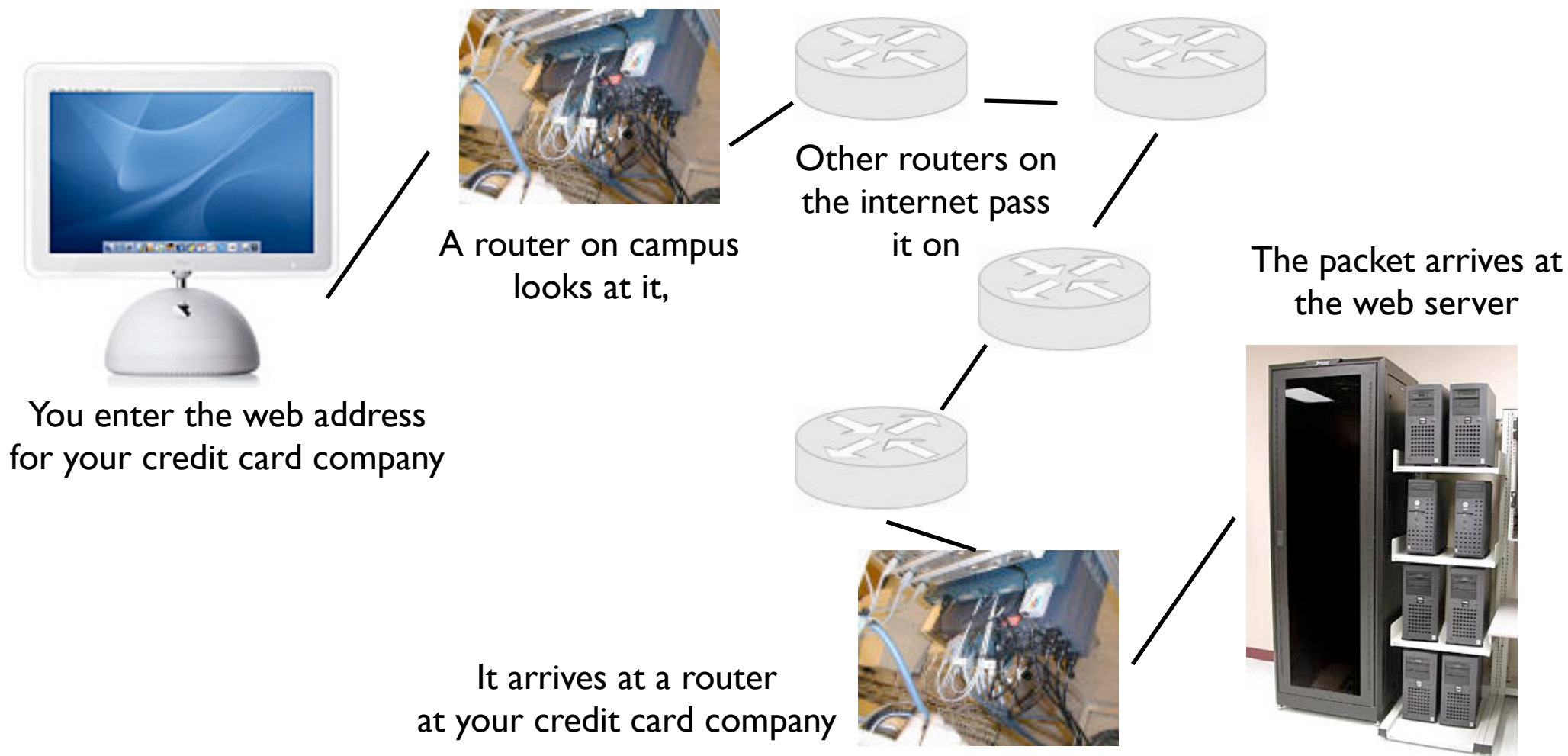
Phoenix Branch delivers  
to your credit card company



# Internet Example

- You want to connect to your credit card company's web site
- Your computer sends out a packet that is addressed to your credit card company's web site
- The router on campus looks at it, realizes it isn't a local address, and forwards it on to the next hop...

# Internet Example



# Important Points

- Packets travel to and from your computer when you access the Internet.
- A packet is a small fragment of information. One e-mail message may be made up of thousands of packets.
- Routers examine each packet and decide what to do with it based on its address.
- Each packet may make 20 or 30 hops before it reaches its destination.

# IP Address

- As important to the Internet as street addresses are to the post office
- IP = Internet Protocol
- 4 numbers separated by periods
- Each number can be 0-255
- Looks like this: 205.162.236.58
- Think of it as a phone number

# A phone # for the Net

**(405) 744-5555**

Middle Oklahoma    OSU    A phone at OSU

**139.78.47.128**

Qwest Internet    OSU    This computer  
This lab

# Routers Use IP Addresses

- Every router knows which IP addresses belong to it.
- If an address doesn't belong to it, it passes it to the next router its connected to.

# A simple plan



I'm a router:  
My IP address is 139.78.47.1

A packet comes through addressed to  
10.105.56.12

I pass it on to the next router because  
that IP address is not one of mine

Later, a packet comes through for  
139.78.47.128

That's one of my IP addresses, so I send  
it to .128, which is a computer in a lab

What's the problem  
with IP addresses?

You can't remember  
them!

# Domain Name System

- DNS = Domain Name System
- It's white pages for the Internet
- Stores every domain name on the Internet
- When queried, it gives you the IP address for any domain name
- Important for portability (you can move your server across the country if you want to and people can still get to it)

# DNS Example



You enter the web address  
for the class web server

DNS  
Server

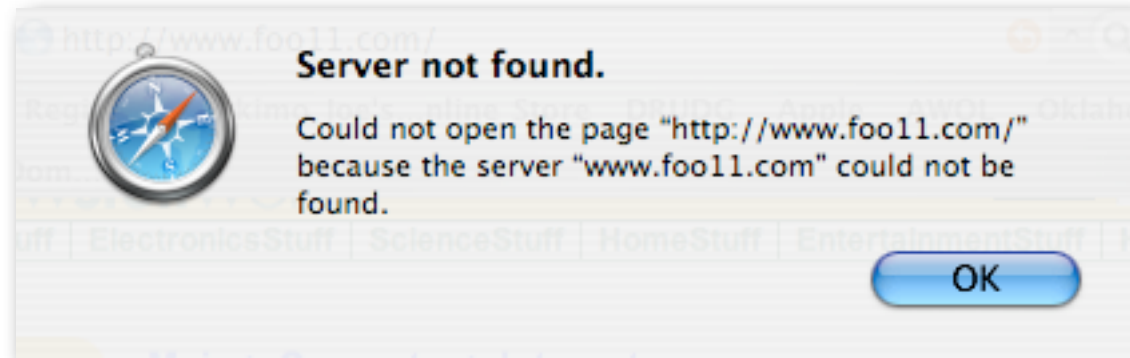
Your computer says:  
“Where is jb3623.com?”

The DNS server answers:  
“139.78.176.94” because that  
is the matching record.

Web  
Server

139.78.176.94

# DNS is Important

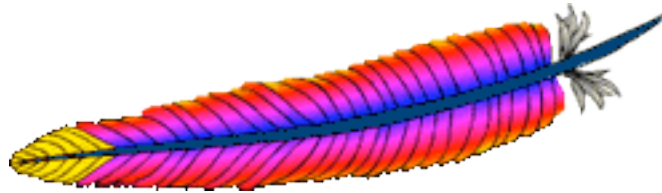


- Without it, no domain names would work
- A central authority controls domain names (grouped by countries/continents)
- Every domain name must be unique.
- Usually the cause of failure on the Internet

# So now we know

- How packets travel across the Internet to reach their destinations
- That IP addresses are unique numbers that identify computers on the Internet (like phone #'s)
- DNS and Domain Names make it easy to remember IP addresses

# What's Missing?



# Servers

# Servers Work Just Like Pizza Delivery

- You call up and ask for a specific item (by opening a web page, or clicking on a link)
- It “cooks up” what you asked for
- It’s then delivered back to you and the transaction is complete



# It's really that simple

- Servers are not smart. They just give you what you ask for as long as they have it.
- If a file is requested that it doesn't have, then you get an error
- Servers keep track of requests by IP address. (to keep everyone separate)
- Once your request has been delivered, the transaction is over

# You should know

- What a packet is
- What an IP address is
- How Routers work
- How DNS works
- How Bandwidth works
- What a Server is

