Introduction to Computer Networks

COSC 4377

Lecture 24

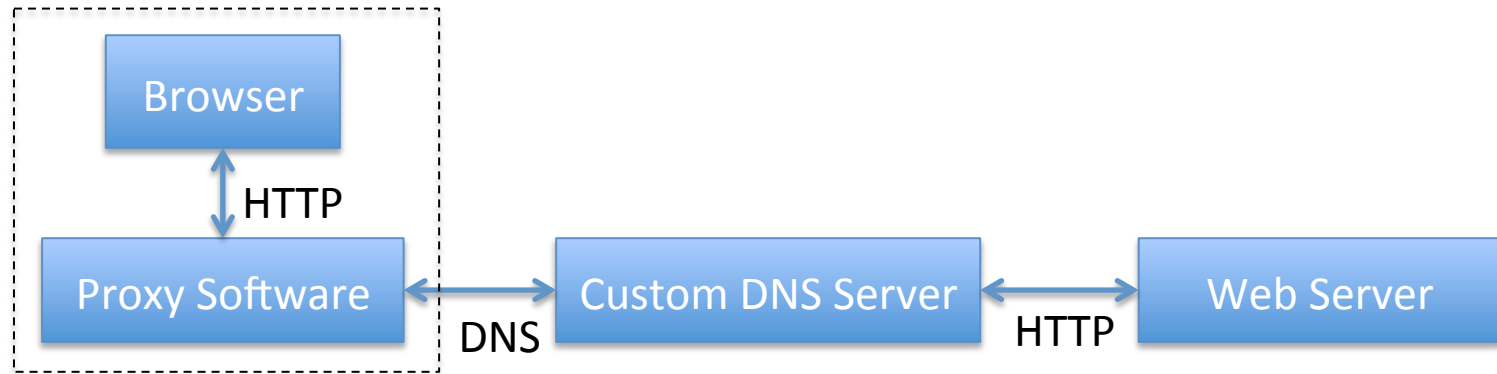Spring 2012

April 18, 2012

Announcements

- HW11 due this week
- HW12 preview
- Exam 2 next week
- Student presentations

HW11

- DNS Server
- Learn how to read an RFC
- Learn how to implement a server based on RFC

HW12

- HTTP proxy on top of DNS
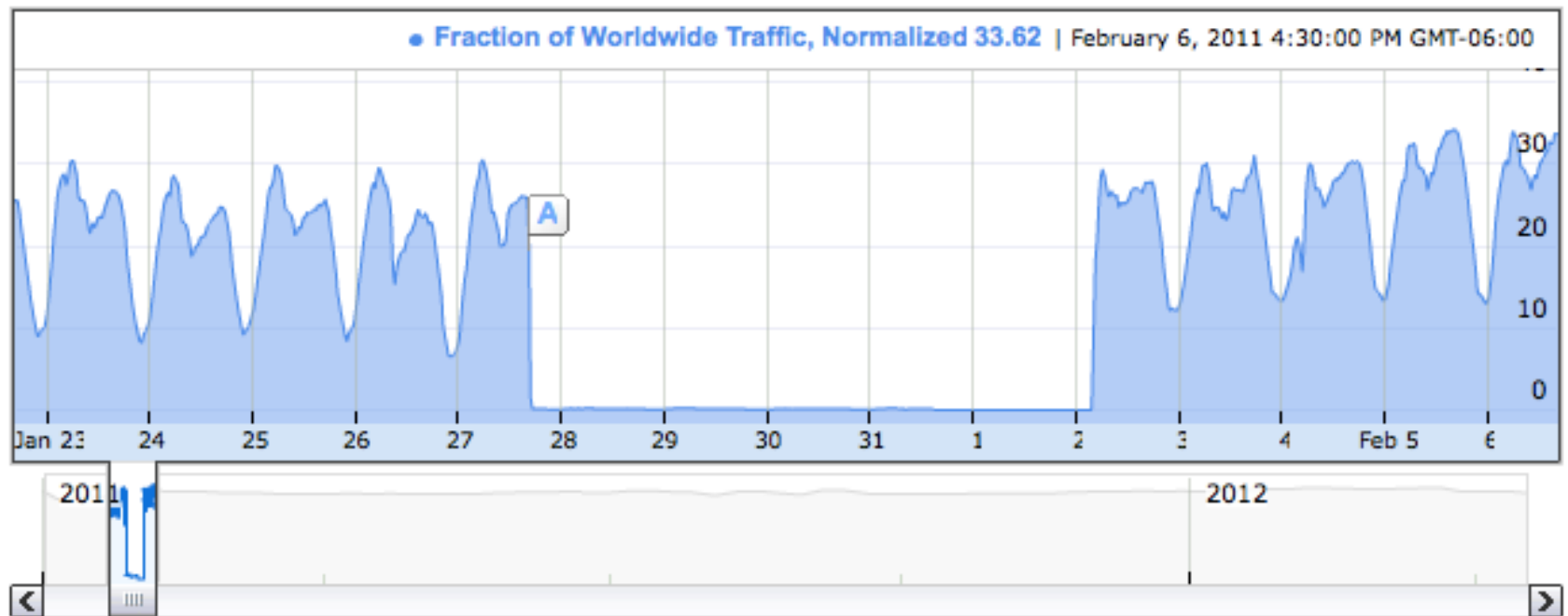- Learn how to run one protocol on top of another

Today's Topics
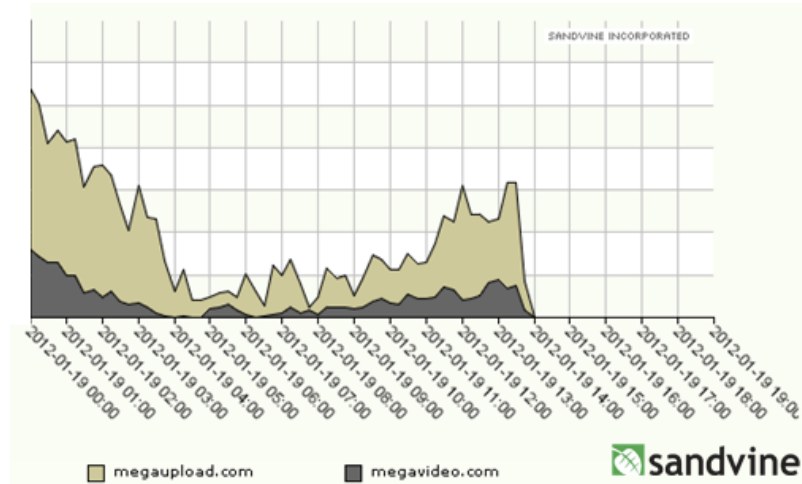
- Policy
- Exam Review

Internet and Policies Governing It

- Access
- Domain Names
- IP Addresses
- Government Control
- Privacy
- Neutrality
- Wireless Spectrum

All Products, Egypt Traffic Divided by Worldwide Traffic and Normalized

Fraction of Worldwide Traffic, Normalized 33.62 | February 6, 2011 4:30:00 PM GMT-06:00

Google Transparency Report 2011

SANDVINE INCORPORATED

2012-01-19 00:00
2012-01-19 01:00
2012-01-19 02:00
2012-01-19 03:00
2012-01-19 04:00
2012-01-19 05:00
2012-01-19 06:00
2012-01-19 07:00
2012-01-19 08:00
2012-01-19 10:00
2012-01-19 11:00
2012-01-19 12:00
2012-01-19 13:00
2012-01-19 14:00
2012-01-19 15:00
2012-01-19 16:00
2012-01-19 17:00
2012-01-19 18:00
2012-01-19 19:0.

megaupload.com   megavideo.com

sandvine

Access

- Who determines what networks are accessible?
  - Websites

- Technology
  - Enforcement / Circumvention

Domain Names

- Who should determine what names are allowed?
  - Organization
  - TLDs

- Technology
  - DNS
  - Alternative DNS roots

IP Address

- Is IP Address your "property" once allocated?
  - Organization

- Technology
  - What prevents use of somebody else's IP?

Government Control

- Should government "take over" critical network systems when under threat?
  - Legislation introduced

- Technology
  - What does "take over" mean?

Privacy

- Can we expect communication over the Internet to remain private?
  - Law enforcement (wiretapping)
    - Can your ISP turn over your emails to the government?
  - Company – employee/customers
- Technology
  - Encryption
  - Spyware

Net Neutrality

- Are ISPs required to be neutral to different services?
  - Comcast case

- Technology
  - How to detect if ISPs are neutral?

Google/Verizon Policy Recommendations

- Google and Verizon released their take on net neutrality debate in August 2010

- Support openness, neutrality, transparency in network access to third party and consumers

- …. but wireless is different

Comcast no longer following net neutrality principles.

Comcast should apply caps equally, or not at all.

I spent the weekend enjoying four good internet video apps on my Xbox: Netflix, HBO GO, Xfinity, and Hulu.

When I watch video on my Xbox from three of these four apps, it counts against my Comcast internet cap. When I watch through Comcast's Xfinity app, however, it does not count against my Comcast internet cap.

For example, if I watch last night's SNL episode on my Xbox through the Hulu app, it eats up about one gigabyte of my cap, but if I watch that same episode through the Xfinity Xbox app, it doesn't use up my cap at all.

The same device, the same IP address, the same wifi, the same internet connection, but totally different cap treatment.

In what way is this neutral?

Reed Hastings, CEO, Netflix

Wireless Spectrum

- Spectrum allocation
  - Auction
  - Alternatives?

- Should we be able to use any device or application on wireless networks?
  - Companies pay money to get the spectrum

Exam 2 Topics

- Routing
  - Distance Vector and Link State Routing
    - Able to work out examples
    - Loops, Count to Infinity
    - Pros and Cons of these two routing algorithms
  - BGP and Policies
    - Peering policies
    - Customer / Provider relationship
    - Unstable Configurations and Security
  - IP Addressing, NATs, and Forwarding

Exam 2 Topics

- Link and Physical Layer
  - CSMA
  - Ethernet
  - Switching and Spanning Trees
  - Basic Modulation and Framing
- Wireless Network
  - Hidden/Exposed Terminals, RTS/CTS, TDMA
  - ETX and Wireless Routing, RPL basic idea

Exam 2 Topics

- Security
  - Basics of Cryptography
  - Encryption and Signatures
  - HTTPS