Welcome to

CS 3516: Computer Networks

Prof. Yanhua Li

Time: 9:00am -9:50am M, T, R, and F

Location: AK 219 Fall 2018 A-term

Updates

Quiz 6, Mid-term exam Graded!

Quiz 7
Grading by next Mon

Project 2

Due tomorrow

Extra office hour: today 11AM-12PM

Regular office hour: today and tomorrow 1-3PM

Chapter 4-5: network layer

chapter goals:

- understand principles behind network layer services:
 - network layer service models
 - forwarding versus routing
 - IP addressing
 - datagram format
 - IPv4 addressing
 - Classful addressing
 - Classless Inter-Domain Routing
 - routing (path selection)

IP datagram format

layer overhead

IP protocol version 32 bits total datagram number length (bytes) header length head. type of ver length (bytes) len service for "type" of data fragment fragmentation/ 16-bit identifier | flgs offset reassembly max number time to upper header remaining hops layer live checksum (decremented at 32 bit source IP address each router) 32 bit destination IP address upper layer protocol to deliver payload to e.g. timestamp, options (if any) record route data taken, specify how much overhead? (variable length, list of routers 20 bytes of TCP typically a TCP to visit. 20 bytes of IP or UDP segment) = 40 bytes + app

Datagram forwarding table

Destination Address Range	Link Interface
11001000 00010111 00010000 00000000 through	0
11001000 00010111 00010111 11111111	O
11001000 00010111 00011000 00000000 through	1
11001000 00010111 00011000 11111111	1
11001000 00010111 00011001 00000000 through	2
11001000 00010111 00011111 11111111	_
otherwise	3

Q: but what happens if ranges don't divide up so nicely?

Longest prefix matching

longest prefix matching

when looking for forwarding table entry for given destination address, use *longest* address prefix that matches destination address.

Destination Address Range	Link interface
11001000 00010111 00010*** ****	****
11001000 00010111 00011000 ****	· * * * * 1
11001000 00010111 00011*** ****	****
otherwise	3

examples:

DA: 11001000 00010111 00010110 10100001

DA: 11001000 00010111 00011000 10101010

which interface? which interface?

IP addressing: Classful addressing

White board

Questions