This lecture will be recorded!!!

#### Welcome to

#### CS 3516: Computer Networks

#### Prof. Yanhua Li

Time: 9:00am -9:50am M, T, R, and F Zoom Lecture Fall 2020 A-term

Some slides are originally from the course materials of the textbook "Computer Networking: A Top Down Approach", 7th edition, by Jim Kurose, Keith Ross, Addison-Wesley March 2016. Copyright 1996-2017 J.F Kurose and K.W. Ross, All Rights Reserved.



- Final Exam Review
- ✤ Grading

- QI: DHCP (2 points)
- Q2: TCP Fast
  Retransmission (2)
- Q3: LS and DV routing (2)
- ✤ Q4: LS and DV routing (2)
- Q5: IPv4 classful addressing (9 points)
- Q6: LS and DV routing (9 points)
- Q7: Inter-AS routing and BGP (6 points + 2 bonus points)

- (1) 7 questions
- (2) 32 points + 2 bonus
  points
- ♦ (3) Q1-4: Small
- (4) Q5-7: more points for each question

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DHCP client-server scenario



## **DHCP** client-server scenario





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- http://users.wpi.edu/~yli I 5/courses/CS3516Fall20 A/slides/CS3516-17-LSR-DVR.pdf
- http://users.wpi.edu/~yli l 5/courses/CS35 l 6Fall20 A/slides/CS35 l 6- l 8-IPv6-IntraDomain-Routing.pdf

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#### Interconnected ASes



- forwarding table configured by both intraand inter-AS routing algorithm
  - intra-AS sets entries for internal dests
  - inter-AS & intra-AS sets entries for external dests

DV: Routing Information Protocol (RIP), BGP LS: OSPF (Open Shortest Path First routing)

#### **BGP** basics: distributing path information

- session between 3a and 1c, AS3 sends prefix reachability info to AS1.
  - Ic can then use iBGP do distribute new prefix info to all routers in ASI
  - Ib can then re-advertise new reachability info to AS2 over Ib-to-2a eBGP session
- when router learns of new prefix, it creates entry for prefix in its forwarding table.



#### Example: setting forwarding table in router 1d

- suppose ASI learns (via inter-AS protocol) that subnet x reachable via AS3 (gateway Ic), but not via AS2
  - inter-AS protocol propagates reachability info to all internal routers
- router Id determines from intra-AS routing info that its interface e is on the least cost path to Ic
  - installs forwarding table entry (x,e)



#### Example: choosing among multiple ASes

- now suppose ASI learns from inter-AS protocol that subnet
  x is reachable from AS3 and from AS2.
- to configure forwarding table, router 1d must determine which gateway it should forward packets towards for dest x
  - this is also job of inter-AS routing protocol!
  - hot potato routing: send packet towards closest of two routers.



#### Overview

- Final Exam Review
- Grading

## Final Grade: 4 components

Labs: 10% 3 labs,

Lab I:5points; Lab2:25+2pts; Lab3:25 + 1 bonus pt Quizzes: 30%

9 Quizzes

the one with lowest percentage is not counted Projects: 30%

3 project, each worth of 10%

Exams: 30%

Mid-term exam: (32 + 2 pts) Final Exam: (32 + 2 pts)