

DT153G Network Technology A

## Homework Assignment 2

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**Aids** Course literature, dictionary and lecture materials.

**Maximum points** 22

**Questions** 11

## Homework assignment 2

This homework assignment is part of the second half of the course Network Technology A.

### 1 Reading Instructions

Before being able to finish Homework II, you must have read [1, Chapters 1-11], and attended or read all the lectures given in the second part of this course. *After a lecture you should be able to answer one or more questions found in this homework assignment. Therefore make a habit of after you have read a chapter or attended a lecture, check the homework assignment and see if you can answer some of its questions.*

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## 2 Tasks

- (1p) 1. Discuss about the different types of metrics that can be used by routing protocols to determine the best path. Name at least three and for which scenarios that specific metric is suitable.
- (1p) 2. Create *one* access list that matches the following networks:
- 172.16.16.0
  - 172.16.17.0
  - 172.16.18.0
  - 172.16.19.0
- (1p) 3. For some reason you would like to create an access list that matches all IP-addresses that have an odd number in the last octet. How would that access-list look like? You may pick the network-ID yourself.
- (2p) 4. Discuss about legacy router-on-a-stick VLAN routing, what situations it is suitable to use, and what are some disadvantages with this solution?
- (2p) 5. Explain the four main types of static routes and when each type is used.
- (1p) 6. Discuss the difference between using an IP-address instead of an interface as the next-hop when defining a static route.
- (1p) 7. For each layer in the three-layer hierarchical model. Name the layer and explain the purpose of it.
- (1p) 8. Discuss usecases of VLAN. Do not just go with large company networks, think in terms of small home networks as well.
9. With regards to the topology shown in Figure 1 on the next page.
- (2p) (a) Calculate what path the packets will take when sent from a LAN connected to router A to network connected to router F, when the routing protocol in use is RIPv2.
- (2p) (b) What will the cost of this path(RIPv2) be?
- (2p) (c) Based on your new knowledge about the network, would it be better to configure static routes or use a routing protocol?
10. *IPv6* can self generate the suffix to create a unique IP-address, *EUI-64*, or to just randomly generate the last 64 bits). 'Then what is the point with *DHCPv6*??
- (2p) (a) Give an explanation of how the address hierachy of IPv6 is built.
- (1p) (b) Inform about Stateless Address Autoconfiguration (SLAAC)
- (1p) (c) Inform about SLAAC with DHCPv6
- (1p) (d) Finally explain stateful DHCPv6.
- (1p) 11. Discuss some good ideas on how to remember the different NAT-terminology; Inside Local, Inside Global, Outside Local and Outside Global.

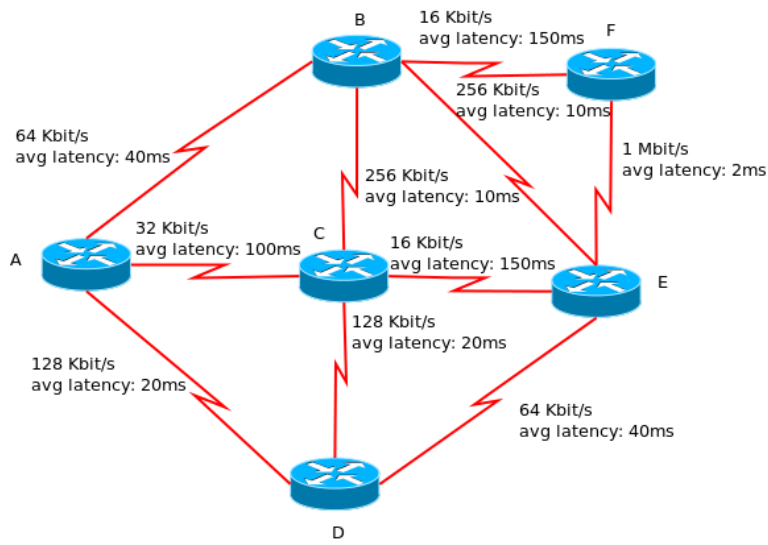


Figure 1: Network topology over company routers.

### 3 Submissions

This assignment should not be submitted.

### References

[1] Scott Empson and Cheryl Schmidt. *Routing and Switching Essentials – Companion Guide*. Cisco Press, 2014. ISBN: 978-1-58713-320-6.