Mittuniversitetet
MID SWEDEN UNIVERSITY

DT154G Network Technology B

Homework Assignment 1

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Contents

Aids Course literature, dictionary and lecture materials.

The Overhaul

This homework assignment is part of the first half of the course Network Technology B.

1 Aim

After completion of homework 1 you will have shown that you

- have the knowledge about different network redundancy schemes and when they are suitable to use.
- know the fundamentals of wireless networks.
- have good knowledge about practical applications of routing protocols in different types of network topologies.

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2 Reading instructions

Before starting Homework 1, you must have read up to and including Chapter 8 in [1], and attended or read the lectures from the first part of this course.

3 Tasks

This section contains the tasks of this homework assignment.

1. Layer 2 redundancy

(1p) (a) Describe the benefits of layer-2 redundancy.

(1p) (b) Write down the consequences of layer-2 loops.

(2p) (c) Give a brief explanation of how PVST+ works.

2. Wireless

(1p) (a) Give a brief overview of the different Wireless Ethernet standards available. Speed, frequencies and various features.

(1p) (b) Name the three organisations that have an influence in WLAN standards

(1p) (c) When planning a wireless network, three key ackronyms are often encountered, describe *BSS*, *ESS* and *DS*.

(2p) (d) When using switched ethernet you really do not have any problems with collisions any more, due to the fact that switches separates the network into very small collision domains. However, wireless networks cannot achieve this, so how do wireless networks avoid collisions and ensure access control in the physical layer?

(3p) (e) How is digital data represented in ethernet. More specifically, how does it work in wireless networks? Write down a few sentences about the different Frequency Channel Saturation schemes (DSSS, FHSS, OFDM)

3. OSPF

(1p) (a) In OSPF there were this problem with multi-access networks and creating unnecessary adjacencies. Before even considering OSFP, you should look up the details of this. Explain the problem with running OSPF in a multi-access network, where you will have multiple adjacencies with routers placed within the same subnet.

(2p) (b) How does OSPF solve this problem? Make sure to mention the election process of DR and BDR and how to control which router becomes the DR or BDR.

(2p) (c) How about that neat feature OSPF has with multi-area networks. Explain the need for multi-area networks and also the four types of routers that can be involved in this.

4. EIGRP

(2p) (a) What are the main characteristics of the EIGRP-routing protocol?

(2p) (b) OSPF are using this SPF algorithm to find the best way to a destination, how about EIGRP, how does it find the best route?

(2p) (c) EIGRP use this system based upon successor, feasible successors, feasible distance and reported distance to ensure the loop-free routes. Explain how this system works.

(2p) (d) Both EIGRP and RIP are distance vector routing protocols that have their own mechanisms to ensure that a route is loop-free. Which one do you think is better? And why?

References

[1] Scaling networks : companion guide, 2014. ISBN 9781587133282 (hbk.) :.