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Computer Science
Computer Systems & Telematics
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Telematics – Exercises No. 8

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Exercise 1, Bridge Classification:

1. Bridges can be classified as local and remote bridges. Discuss the differences.
2. What is the difference between transparent and source bridging?

Exercise 2, IEEE 802.1d:

1. What is the task of the spanning tree protocol and how does it work?
2. What are the disadvantages of the original Spanning Tree Protocol (STP)?
3. Capture and/or create an STP packet. In which types of networks can STP be used?

Exercise 3, Broken Links:

How can a LAN automatically resolve broken links or switches?

Exercise 4, Virtual LANs:

1. What is the purpose of a virtual LAN?
2. What information can be used to automatically assign hosts to a particular VLAN?

Exercise 5, IEEE 802.1q and IEEE 802.2:

1. Create, inject, and capture an Ethernet frame that contains an IEEE 802.1q header with the following values:
   - Priority = Excellent Effort
   - Canonical Format Indicator set to 1
   - VLAN ID = 0xA0
   - Type set to the value of ARP
2. Add a Logical Link Control header an 802.3 frame. Use the following values:
   - Unnumbered Frame Type
   - DSAP = Novell NetWare
   - SSAP = Xerox Network Systems
   - I/G = 0
   - C/R = 0
   - Choose any value for the command field
3. Add a SNAP header to the frame. Use the following values:
   - OUI = 0xABCD
   - Type = 0x88CE
4. What layer 3 PDU is stored as data in the frame?
5. How large is the 802.3 frame without the data?

Exercise 6, Features of Layer 2 Protocols:

1. List features and services of layer 2 protocols.
2. Do Ethernet, IEEE 802.2, ATM, and PPP provide these features and services? Are any additional features and services provided?

Exercise 7, Network Components:

Discuss the function(-s) of the following network components: Repeater, hub, switch, bridge, router, and gateway. Which “data” do they handle and on which layer of the ISO/OSI reference model do they operate?

Exercise 8, End of the Ethernet Frame:

Compared to the IEEE 802.3 frame the Ethernet frame has no length but a type field. How can a network interface card actually detect the end of the frame?