Tutorial 5 - SS2021
Communication Systems and Protocols

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Task 1: FireWire

A) FireWire uses a special coding scheme with an additional STROBE signal. Indicate the impulse diagram for the case that the following bit sequence (given in binary notation) should be transmitted. Use figure 1.1.

$$100110100011011110111100_b$$

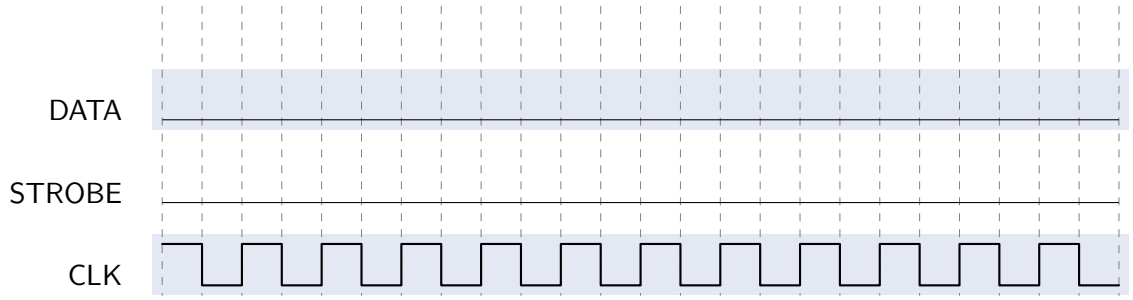


Figure 1.1: FireWire impulse diagram

Several FireWire devices are interconnected using cables as shown in Figure 1.2.

B) Perform the three steps of system configuration for this network. Assume that every node needs one time unit for processing and forwarding of a signal. Every node can process several incoming signals in parallel. In Figure 1.2 fill in the unique ID that is obtained by every node. Which node becomes root of the tree?

C) Now nodes having ID 0,2,4,6 would like to transmit data and start requesting at the same time. Describe in which order are the nodes granted request ?
Assume that every node needs one time unit for processing and forwarding of its request signal. If a node receives multiple bus requests, it will always forward the request that it receives from the port with the lowest number.

D) Now assume that the node highlighted in grey is not part of the network any more. What is the problem now during system configuration?
How could this problem be solved?

Task 1.1: FireWire structures

A) Different FireWire structures were built during a student laboratory. During test phase you notice that not all FireWire systems are working correctly. Please state if the FireWire systems given below are working correct. Mark the roots, if the systems are correct. Give a reason, if the FireWire system is not working correctly.

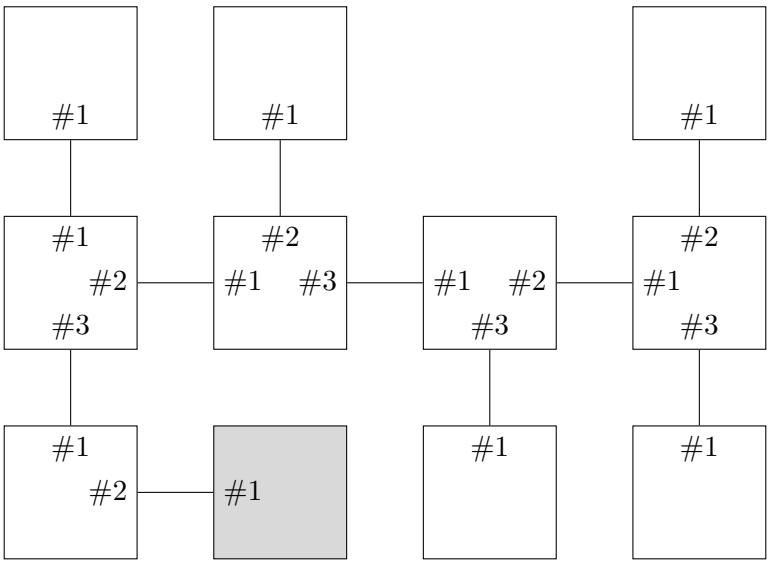


Figure 1.2: FireWire network

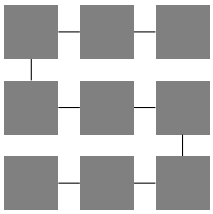
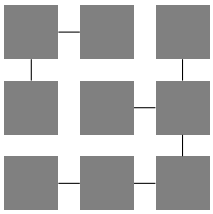
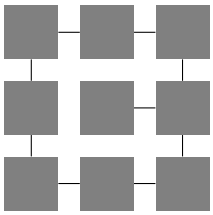
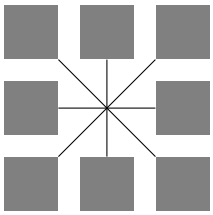
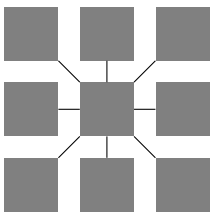
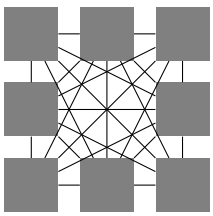
	Correct	Wrong	Reason
			
			
			
			
			
			

Table 1.1: FireWire structures