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8. Embedded Systems Lab Exercises

FlexRay Cluster Example (10 Points)

Develop the following FlexRay cluster: The cluster consists of the 5 nodes A, B, C, D and E. All nodes should be connected via two channels. The topology of the cluster is a bus topology. The nodes A, B and C are executing safety critical task and therefore their bus requests should be guaranteed at the time of 20 macroticks.

Tasks:

- Download from „ls12-www.cs.uni-dortmund.de/edu/scripts-en.html" the file „leviFRP.zip". For installing the training module you have to unpack the zip file.

- Start the training module by executing the file „leviFRG.jar".

- Construct the described FlexRay cluster within the training module.

- Configure the communication cycle in a way that the nodes A, B and C have a guaranteed bus access within a maximal delay of 20 macroticks. The nodes D and E should use only the dynamic segment.

- Configure the node bus requests. The node A sends a message every cycle. The Nodes B and C send a message every second cycle. The node D sends a message of the length of 2 minislots every cycle and the node E sends every second cycle a message of the length of 2 minislots.

- Start the visualization and check if the bus requests of the nodes A, B and C are guaranteed.

- Switch the position of the nodes D and E in the dynamic segment. What is the resulting behaviour.

- Please fill in the questionnaire of the training module leviFRP.