REAL-TIME NETWORK
Exercise series 1
April 16, 2018

1. Check if the task set below can be handled using worldFIP variable transfers (parameters: 2.5 Mbit/s; hint: you may assume the presence of some maximum length on-demand messaging)

Flow number	Data length [B]	Period=Deadline [ms]	
1	2	2	
2	3	4	
3	3	4	
4	8	8	
5	1	12	
6	8	240	

2. What will be the worst case response time in the above case if flow number 6 is handled as on-demand (aperiodic) traffic ?

3. Check if the traffic requirements used in the CAN chapter (see below) can be satisfied by worldFIP.

Message stream	Priority	Period	Deadline	Tx time
A	3	2.5 ms	2.5 ms	1 ms
B	2	3.5 ms	3.25 ms	1 ms
C	1	3.5 ms	3.25 ms	1 ms

4. Check if the above task set can be handled using worldFIP

Flow number	Tx Time (C) [ms]	Period=Deadline [ms]	
1	0.5	2.5	
2	0.5	2.5	
3	0.5	3.5	
4	0.5	3.5	
5	0.5	3.5	
6	0.5	3.5	

5. Check the results obtained in slide 64 of the Ethernet chapter

6. Estimate the efficiency of Ethernet Powerlink at 100 Mbit/s using hubs (max. 7 hubs between MN and CN)

7. Estimate the efficiency of Ethernet Powerlink at 100 Mbit/s using switches (max. 7 switches between MN and CN)

8. Calculate the response times for the following traffic with CAN at 125kbit/s

Node	Period=Deadline [ms]	Length [byte]
n1	10	8
n2	16	8
n3	16	8
n4	12	8
n5	12	8
n6	16	8

9. What will be probability to miss the deadline for each flow if the error rate λ=30 faults/s ?