D1 - project outline for the entire lab

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1 Project Goal

1.1 Basic Idea

The basic idea of our project is to evaluate different distributed clock synchronisation algorithms over an asynchronous bus communication. Therefore we are going to implement a csma/ca protocol providing basic fault tolerancy methods and an easy way to estimate message round trip time and message priorising. Upon the protocol, detailed described in [1, NESD2], we settle the algorithms for the clock synchronisation.

Each node has divers hardware such as buttons, leds, a bulp, a lcd and some other things as its periferial. We want to display drift rates of clocks on the lcd and trigger faults in the nodes internal clock or cause bus overloads with the connected buttons.

The outcome of this project should be the experience in the field of asynchronous real time bus engineering and to be able to estimate influences of overloads and faults to applications upon them. We try to give a link between theoretical and practical aspects and how they relate.

1.2 Requirements

1.2.1 ULFTRTP

Req 1 ***analyzeable:*** *the protocol has to be relatively easy to analyze with respect to worst case timing.*

Req 2 ***interfacing:*** *the protocol design has to follow strictly interface guidelines. This means:*

1. *lower levels of the protocol can only be accessed by higher levels through the defined layer interfaces.*
2. *higher levels of the protocol cannot be accessed by lower levels. Data to higher layers can only be propagated using callback mechanisms.*

Req 3 ***migration:*** *the protocol has to be migratable in arbitrary applications with minimal effort.*

Req 4 ***resource consumption:*** *the protocol has to be adaptable to minimal hardware constraints.*

1.2.2 Clock Synchronization

Req 5 ***analyzeable:*** *the clock synchronisation has to be relatively easy to analyze.*

Req 6 ***exchangeable:*** *the specific clock synchronisation algorithms have to be easily interchangeable with other clock synchronisation algorithms, as we want to try out different algorithms.*
This Requirement correlates with Requirement 2.

2 Project Management

2.1 Roles

Chief Executive Officer - CEO
The duty of the CEO (or Projectmanager) is to monitor and adapt the tasks progresses and the timeplan, to justify deadlinemisses or delays in the development process.

The projectmanager also has to formulate a contract specification declaring certain requirements, claims, need to haves and nice to haves as well as to construct testcases in cooperation with the project team and the project partners.

Beside the depicted duties of the CEO, he/she is also responsible for project internal coordination, needed appointments and the assignment and monitoring of certain tasks.

Chief Technical Officer - CTO
The CTO is responsible to evaluate existing algorithms and protocols relating to the certain tasks as well as the design of the protocol and algorithms used in the application.

Another important task of the technical manager is to check the technically feasibility of the application or parts of it and to provide plannings and adaptions to technical contents.

By providing the outlined responsibilities the CTO has to be the last instance with respect to technical decisions.

Chief Documentation Officer - CDO

The CDO is responsible for the documentation process all over the project. His/Her aim is to provide a well structured documentation to monitor the documentation progress during coding, the compliance of the code with predetermined coding-guidelines.

Besides this he/she is responsible for codereviews, meeting protocols, and test protocols.

collective responsibilities
All project members are in charge to hand in their duties and responsibilities in time and as defined (as possible), to recheck decisions taken and to review, document and test their implementations on their own before handing in.

Reviews of documents, design decisions and implementations have to be rechecked by other project members as far as necessary. The final tests on certain implementations before assuming these valid have to be done by project members not involved in the implementation.

2.2 Role allocation

Description	Allocation
CEO (Project Manager)	Robert Annessi
CTO (Technical Manager)	Alexander Heinisch
CDO (Documentation Manager)	Nick Mayerhofer

References

[1] Mayerhofer Annessi, Heinisch. Nes 2011/12 - d2 specification and design of the bus protocol. 2011.