

# 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 prioritising. Upon the protocol, detailed described in [1, NESD1], we settle the algorithms for the clock synchronisation.

Each node has divers hardware such as buttons, leds, a bulb, 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.

-Interne Koordination -Absprache der Termine -Vergabe und Kontrolle von Aufgaben

#### **Chief Technical Officer - CTO:**

-Der Technische Manager übernimmt die Bestandsaufnahme und das Design des Protokolls, sowie die Überprüfung auf technische Realisierbarkeit der Applikation  
-Planung und Aufarbeitung der technischen Inhalte -Letzte Instanz für technische Entscheidungen

#### **Chief Documentation Officer - CDO:**

-Der Dokumentationsmanager übernimmt die Aufsicht über die Dokumentation (Form, Rechtschreibung, Struktur, usw.). Dazu passend wären natürlich auch Codereviews, falls notwendig.  
-Erstellen des Laborprotokolls

### 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 - d1 project outline for the entire lab. 2011.