Master Thesis –
Efficient Design Patterns for Fast Compilation

Background
A compiled language will usually offer a more efficient use of hardware resources compared to an interpreted language, which is necessary in performance critical applications. However, as the size and complexity of the project increases, compilation times will inevitably also increase. Certain features of languages are also known to impact the compilation times, such as templates in C++ and using mocked objects in testing frameworks. The subjects for this Master Thesis are defined to investigate what software development patterns and paradigms can be used to decrease the compilation time to support a faster development cycle.

Thesis Description
Many software components at Ericsson all use the same compiler and the same programming language, C++, for the design. Despite this, internal investigations have shown that compile times can vary greatly between different components and may even be disproportionate to the size (line of codes) of the software component.

The thesis work is proposed to cover:

- Investigate the impact of programming patterns and paradigms on compilation time
- Investigate the tradeoff between compilation and run time efficiency
- Propose a way of working for dealing with ever increasing compilation times. Either proactive, where developers are knowledgeable about the impact on compilation time that their code might have, or a reactive monitoring for jumps in compilation time

The thesis will be concluded with a presentation for the Ericsson team.

Qualifications
This project aims at students in electrical engineering, computer science, computer engineering or similar.

Extent
1-2 students, 30hp each

Location
Ericsson AB Mjärdevi, Linköping

Preferred Starting Date
Spring 2022

Keywords
C++, Mobile Telecommunication, Optimization, Air Interfaces, Coding Schemes

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