AU Engineering

I4SWT Mandatory Exercise

Air Traffic Monitoring

Team 16-1-6

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CI build jobs

Unit tests:
`http://ci1.ase.au.dk:8080/job/Team%2016-1-06%20ATM%20(Unit%20Test)`

Integration tests:
`http://ci1.ase.au.dk:8080/job/Team%2016-1-06%20ATM%20(Integration%20Test)`

Code metrics:
`http://ci1.ase.au.dk:8080/job/Team%2016-1-06%20ATM%20(Code%20Metrics)`

April 20, 2016

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1 Introduction

The purpose of this journal is to reflect upon the design, implementation and test of the Air Traffic Monitor system.
The exercise required not only a working system, but a special effort had to be made to obtain a generic design with an appropiate amount of tests which should be simple to maintain if changes in the exercise requirements were to be made.

2 Design

As earlier stated the design of this solution was given thought as it had to be extensible and adaptive to changes in requirements. This section describes the process of obtaining such design and the outcome of the reflections.

2.1 Design considerations

An effort were made to design the system based on the five basic principles of object-oriented programming and design, SOLID. These principles applied to a system tend to make this maintainable and extendable.

2.2 Implementation

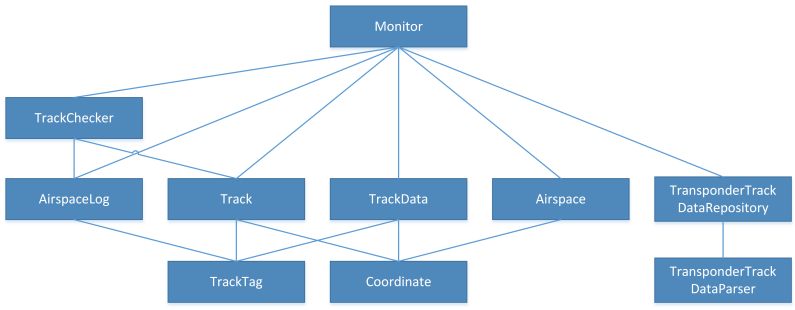

Figure 0.1. Dependency tree

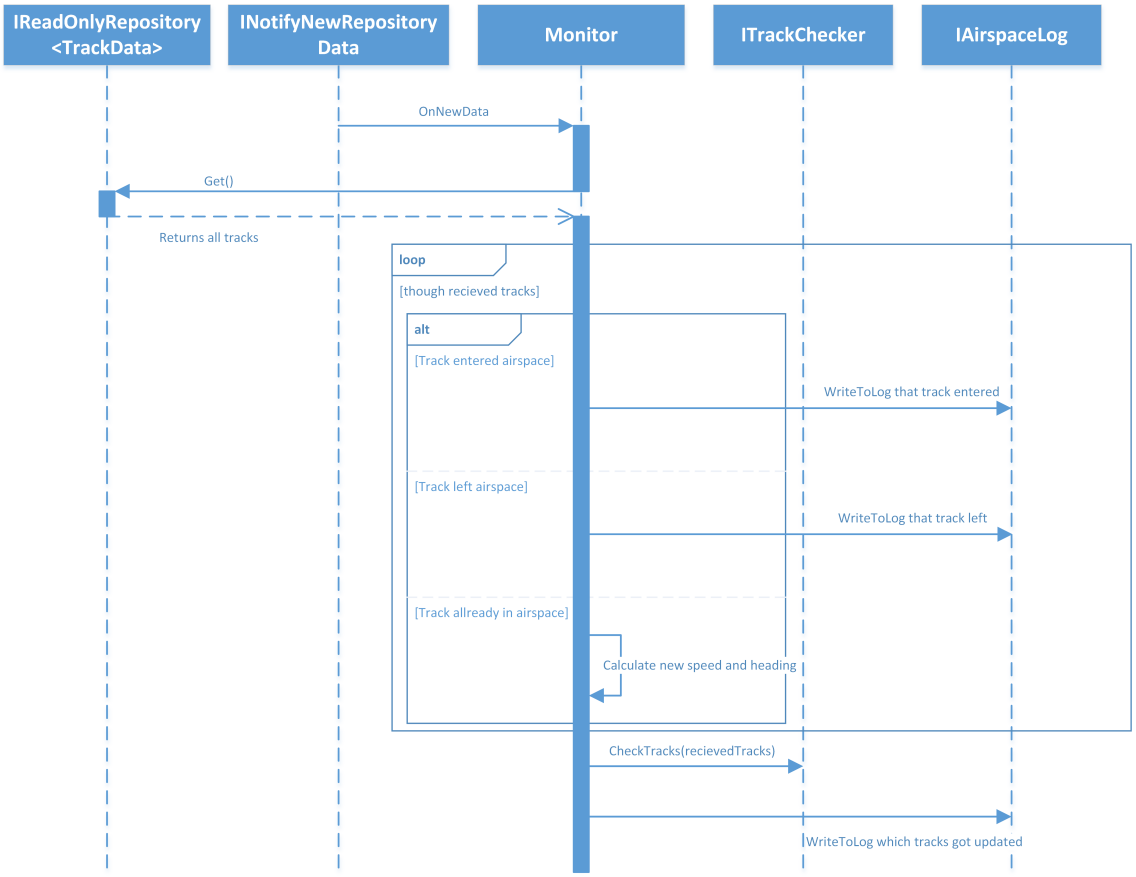

Figure 0.2. Sequence diagram for monitor

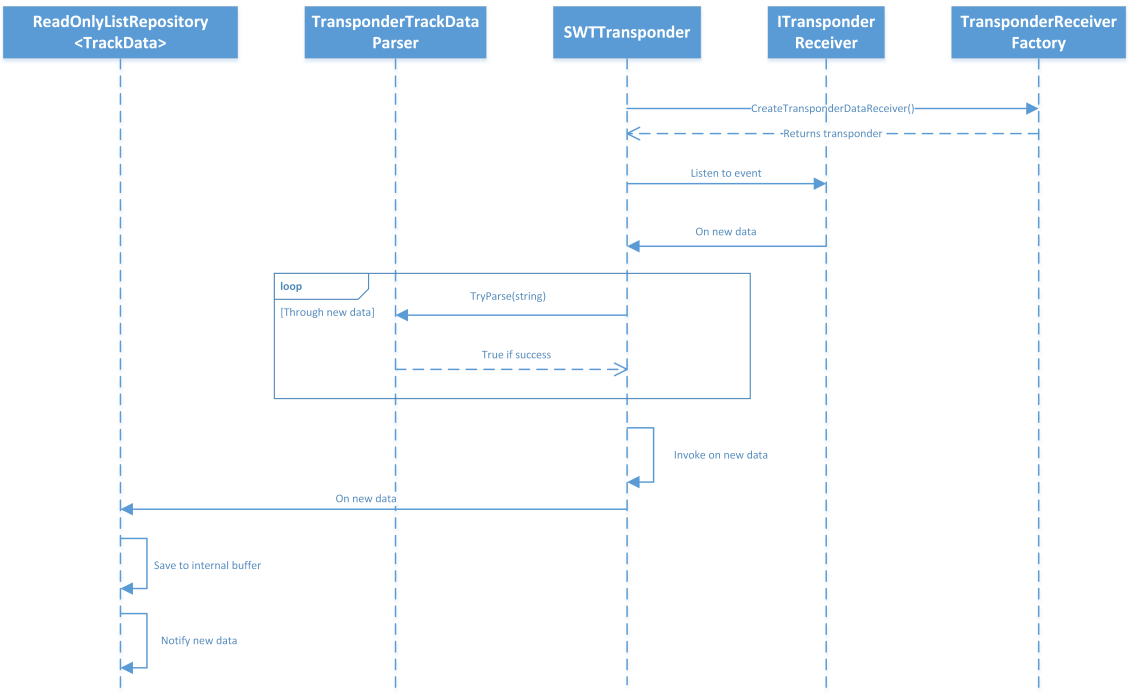

Figure 0.3. Sequence diagram for SWTTransponder

3 Test

3.1 Strategies

4 Teamwork

In this section the teamwork is described. The requirements were 3-4 people in a group and no more than two persons should share a computer while programming. Another requirement was the use of *Continuous Integration*, which helps the developers commit to a shared build server multiple times during the development process.

4.1 Strategies

Earlier experience from working with some of the strategies from *Extreme Programming* in the course I4SWD, this was found suitable for the software development of the Air Traffic Monitor too.
One of these strategies was *Pair programming*. Code is then written by pairs which shares the workstation. One will be in control of the keyboard and write the code while the other will watch the code and work towards the best implementation. The pair switches place every now and then. This ensures that both programmers are engaged in the software.

4.2 Continuous integration

As the group was divided into two pairs of developers each working on classes of their own, the continuous integration helped the two groups to gain a shared understanding on how the software development progress.
Another benefit was the automatic generated code coverage report and software quality metrics which were used to determine whether the written software and tests were satisfying. If not, it was easy to gather information where the code standards should be optimized for better statistics.
As with every other git project a version history was obtained making it simple to revert to a previous build if changes caused a broken build.

5 Conclusion

The process of developing the Air Traffic Monitoring system and compile this journal was made in two weeks. During these weeks multiple strategies from the courses I4SWT and I4SWD were used to satisfy the requirements given.