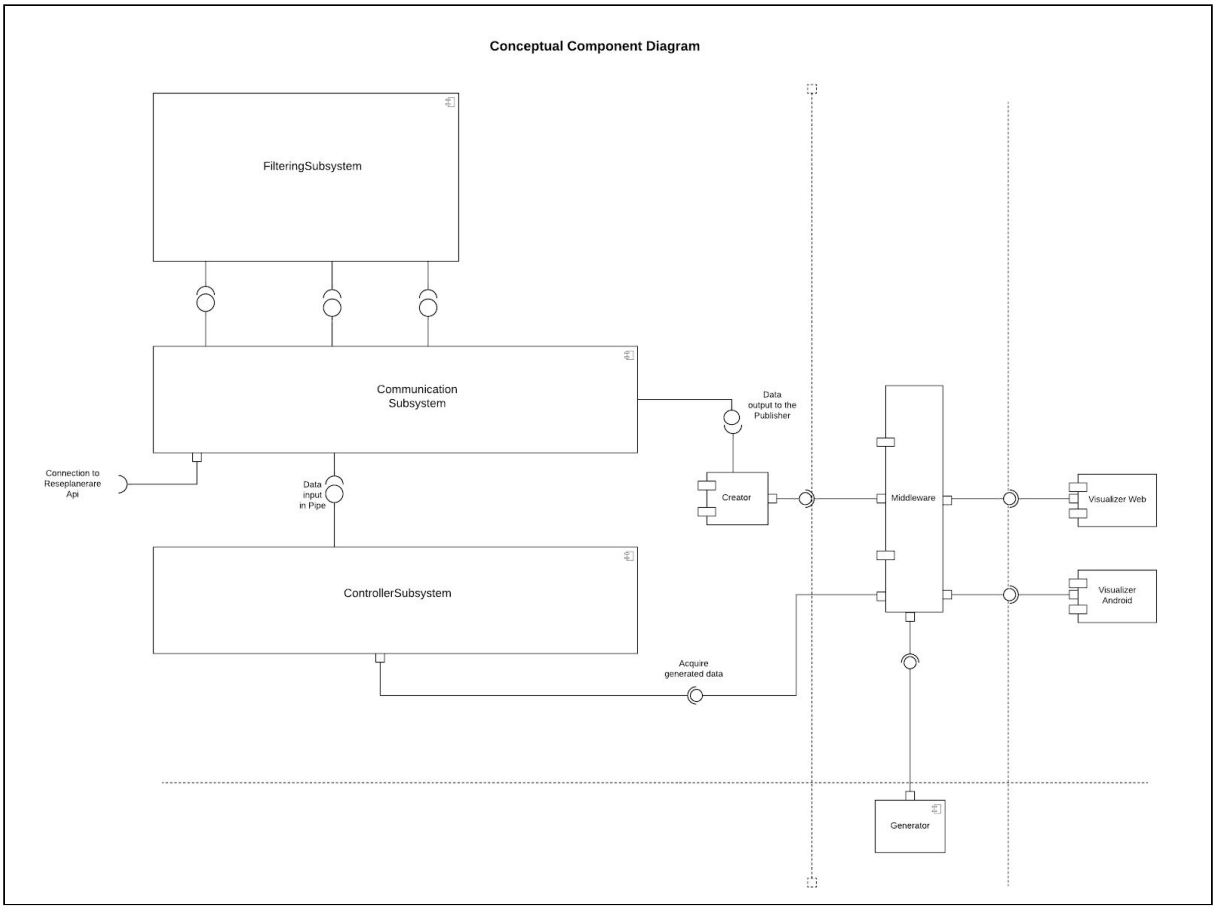
Group03 Software Architecture Document (SAD)

Conceptual Design of our architecture



Conceptual Component diagram (This diagram can also be found in the repository)

The conceptual component diagram allows to convey the initial plan and the idea for the system-components.

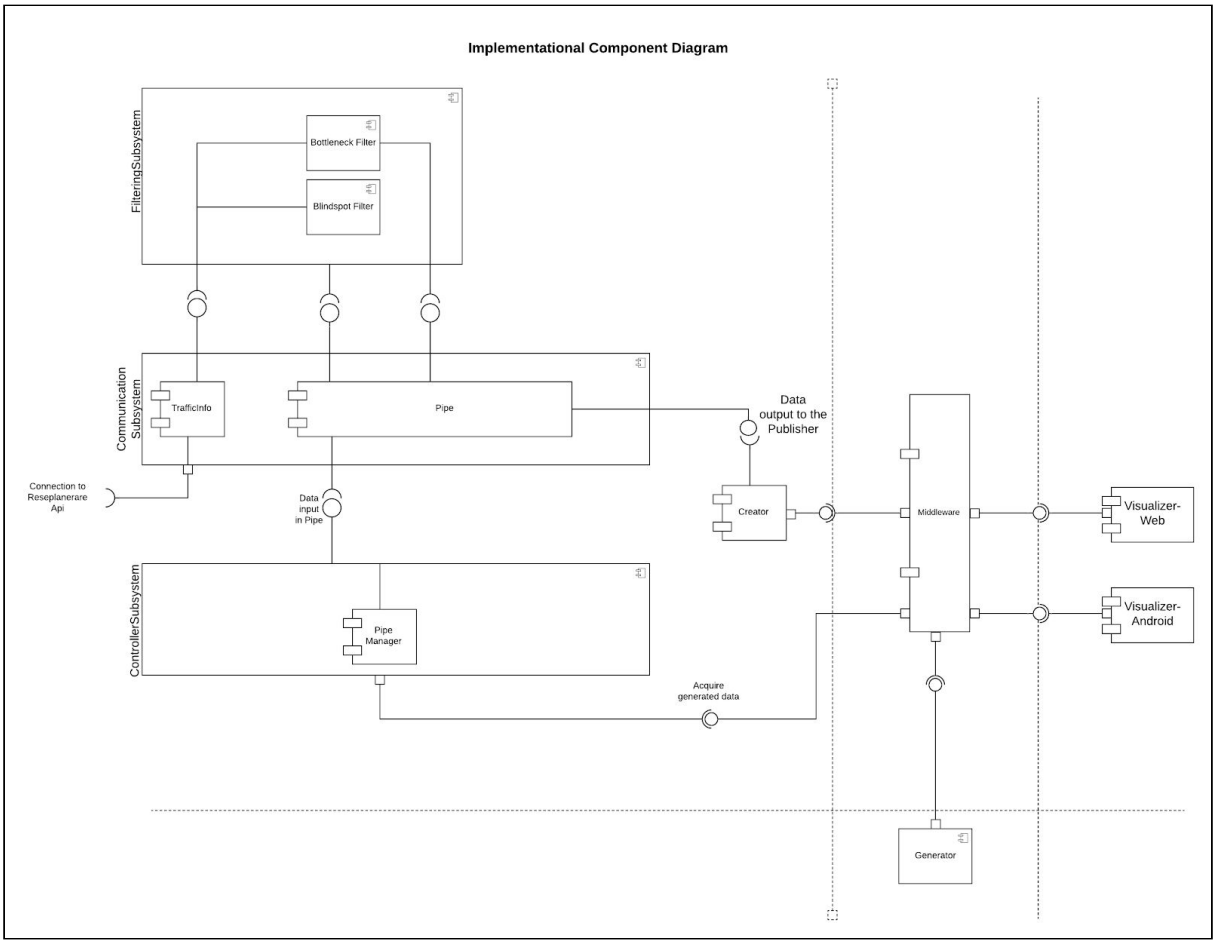
- List of components in the diagram:
- Filtering Subsystem
- Communication Subsystem
- Controller Subsystem
- Middleware
- Creator
- Generator
- Visualizer Web
- Visualizer Android

The communication subsystem is responsible for transferring data over pipes through the system.
The Generator component, an external entity that runs independently of other systems is mocking the requests of the commuters. It is broadcasting the generated data via MQTT.

The Controller subsystem transfers data to the communication subsystem, which transfers it to the Filtering Subsystem. In the next step, the manipulated data is transferred to the Creator component over the communication subsystem. The creator receives the filtered data and broadcasts it to the middleware.
The Visualizers are external entities that run independently of the others systems. They are subscribed to one or several topics and receive data over MQTT.

Architectural style:
We chose to use the architectural styles “pipe and filter” and “publisher-subscriber”. Pipe and Filter is implemented in the communication subsystem and the filtering subsystem. The communication subsystem holds the pipe and the filtering subsystem holds the filters.

Mapping to implementation:



Implementational Component diagram (This diagram can also be found in the repository)

Looking at the implementation, the filtering subsystem holds two filters, the Bottleneck and the Blindspot Filter. The Communication Subsystem holds the Pipe and the TrafficInfo component. The TrafficInfo component is handling the data input from the Västtrafik API.
The controller subsystem contains the PipeManager, which is responsible for the data flow in the application, this includes the communication between the filters, the pipe and the creator.

It is also subscribed to the generator component via MQTT. The pipe manager coordinates the transfer of data through the pipe to the filters and to the creator.
The Creator is responsible for handling the connection to the middleware, it broadcasts on a defined topic. The Visualizers are subscribed to such a topic through the middleware.