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Shared Internet Of Things Infrastructure Platform:

Domain Analysis

Software Architecture (H09B5a and H07Z9a) – Part 1

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1. Domain analysis

1.1 Domain models

This section shows the domain model(s).

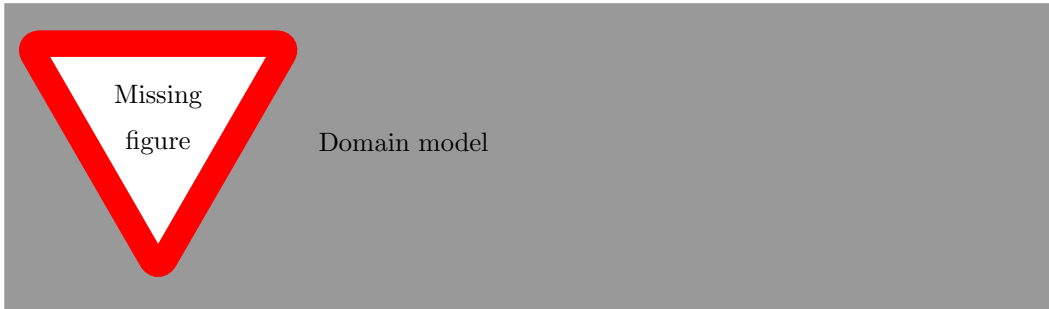


Figure 1.1: The domain model for the system.

1.2 Domain constraints

In this section we provide additional domain constraints.

- This is a first constraint.
- This is a second constraint.

1.3 Glossary

In this section, we provide a glossary of the most important terminology used in this analysis.

- **Term1**: definition
- **Term2**: definition

2. Functional requirements

Use case model

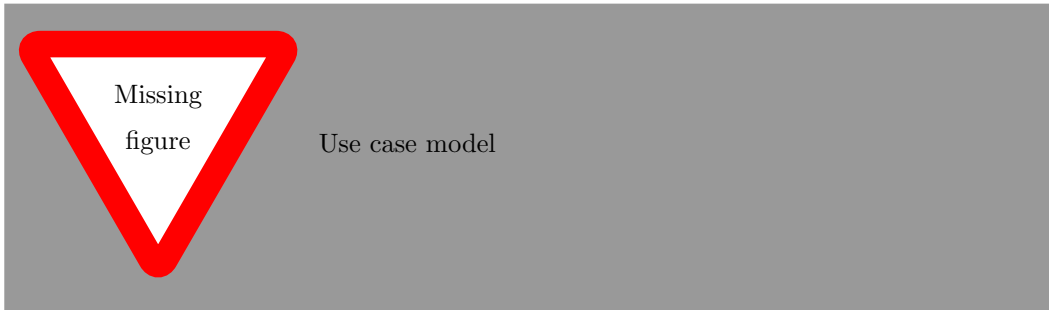


Figure 2.1: Use case diagram for the system.

2.1 Use case overview

UC1: Name Short summary of this use case scenario

2.2 Detailed use cases

2.2.1 *UC1*: Name

- **Name:** Name of use case 1
- **Primary actor:** primary actor
- **Secondary actor(s):** secondary actor(s)
- **Interested parties:**
 - *Name of interested party:* reason why party is interested
- **Preconditions:**
 - First precondition.
 - Second precondition.
- **Postconditions:**
 - First postcondition.
 - Second postcondition.
- **Main scenario:**
 1. Step 1
 2. Step 2
 3. Step 3
 4. ...

- **Alternative scenarios:**

- 3b. Alternative at step 3

- **Remarks:**

- First remark

3. Non-functional requirements

In this section, we model the non-functional requirements for the system in the form of *quality attribute scenarios*. We provide for each type (availability, performance and modifiability) one requirement.

3.1 Availability

3.1.1 *Av1*: Database is down and a replica is used

A database in our system does not send any data.

- **Source:** External: Database server
- **Stimulus:**
 - The database crashed.
 - The database does not send any response.
 - The database returns invalid data or response.
 - ...
- **Artifact:** Persistent storage
- **Environment:** Normal operation
- **Response:**
 - Use a working replica until the server can be used again.
 - If the server cannot fix the by itself, send a technician to fix the problem with the database.
- **Response measure:**
 - A working replica should be used within a range of 1s to 5s.

3.1.2 *Av2*: Sensor breaks

A sensor breaks. Another sensor is used for the responsibility of the broken one.

- **Source:** External: sensor
- **Stimulus:**
 - No data received anymore from sensor
- **Artifact:** Communication channel between sensor and gateway
- **Environment:** Any state of operation, At run-time, ...
- **Response:**
 - The gateway uses another sensor to be used for the same responsibility as the broken one.
- **Response measure:**
 - A new sensor should be chosen within the range of 1ms to 10s

3.2 Performance

3.2.1 *P1*: Name of the quality attribute scenario

Shortly describe the context of the scenario.

- **Source:** source
- **Stimulus:**
 - Description of a first stimulus.
 - Description of a second stimulus.
- **Artifact:** the stimulated artifact
- **Environment:** the condition under which the stimulus occurs
- **Response:**
 - Describe how the system should respond to the stimulus.
- **Response measure:**
 - Describe how the satisfaction of a response is measured.

3.3 Modifiability

3.3.1 *M1*: Name of the quality attribute scenario

Shortly describe the context of the scenario.

- **Source:** source
- **Stimulus:**
 - Description of a first stimulus.
 - Description of a second stimulus.
- **Artifact:** the stimulated artifact
- **Environment:** the condition under which the stimulus occurs
- **Response:**
 - Describe how the system should respond to the stimulus.
- **Response measure:**
 - Describe how the satisfaction of a response is measured.

3.4 Usability

3.4.1 *U1*: Name of the quality attribute scenario

Shortly describe the context of the scenario.

- **Source:** source
- **Stimulus:**
 - Description of a first stimulus.
 - Description of a second stimulus.
- **Artifact:** the stimulated artifact
- **Environment:** the condition under which the stimulus occurs
- **Response:**
 - Describe how the system should respond to the stimulus.
- **Response measure:**
 - Describe how the satisfaction of a response is measured.