Annex A: Architecture Description Template

This annex defines the placeholders for the contents of an architecture description in the form of a template. This template aids in the documentation of an architecture and is instantiated for the different experimental systems that are expressed in chapters 5 to 10. The template is structured as follows:

A.1 Problem space

The purpose of this section is to capture the constructs pertaining to the arena where many problems are posed and attempted. Often, problem space is considered as the boundaries which determine the area that needs to be examined in order to solve a set of problems [129] [27].

A.2 Solution space

The purpose of this section is to capture the constructs pertaining to the arena where the system should function in the target environment. Often, solution space is considered to be the boundaries within which the concerns pertaining to a problem space is addressed [27].

A.3 Requirements

The purpose of this section is to capture the stakeholders and their requirements from the system-of-interest. The architecture of a system is influenced by the stakeholder requirements to a large extent and they are derived from the different needs and wants that are expressed by the stakeholders.

A.4 Quality characteristic

This section captures the desired quality characteristics of the architected system. Quality characteristics of a system are a set of essential and distinguishing attributes that have a pragmatic interpretation of the system’s inferiority or superiority. By controlling the quality characteristics, it is possible to ensure that the system delivers desired value to its stakeholders [100-102] [132-133].
A.5 Component decompositions

This section captures the components decomposition of the architected system. Decomposition is a hierarchical and incremental break-down of a problem into components that are easier to conceive, understand, specify and maintain in such a way that the software system can be reconstructed from those decomposed components by composition. The greatest value of decomposition is the insight it provides into the structure of the software system. By successive decomposition, a set of components and the logical/formal structure by which these components interact can be arrived at.

A.6 Principles

This section captures the principles based on which the architected system is synthesized and operates. Often, principles correspond to the best commercial practices of the domain and are formulated while taking into account the strategic, operational and tactical aspects of the identified scenarios.

A.7 Architectural abstractions

This section captures the architectural abstractions for the candidate architecture of the system-of-interest. Architectures are synthesized by the application of architectural abstractions which determine the style and manner in which the architected system is built. Architecture abstractions define common elements and their configurations that arises to address the desired function. It is through these abstractions that architectures can be characterised. Often, each category of abstractions have their own specific characteristics which could be based on a) Level of abstraction, b) Degree of domain specificity, c) Level of granularity and d) Degree of completeness.