System-of-Systems Design Description (SoSDD) Template

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1 System-of-Systems Design Description Overview

This document should describe how a "System-of-Systems Design Description" document is instantiated into an existing System-of-Systems describing the technologies being used. Therefore, this document should point out all necessary Black Box System Description (SysD) and White Box System Design Description (SysDD) documents, which describe the systems used in this realization.

This section should contain a high level overview of the system, complementing the abstract design contained in "System-of-Systems Description (SoSD)" with implementation details.

The formal picture, presented on the "System-of-Systems Description" document, shows the relations between the different components should be complemented with the technologies being used (COAP, XMPP, XML, ZigBee, etc). A pointer to the SoSD document must also be placed here.

Table 1 Pointers to SoSD documents

Pointer to SoSD doc:	Path the document on the repository

Since it is a deployment description, the entire setup of the system must be explained. It must describe the pilots in detail, in order to be deployed.

2 Systems

This section MUST contain pointers to SysD and SysDD documents, which implements the systems.

Table 2 Pointers to SysD documents

System name	Path
System1	Path the document on the repository
System2	Path the document on the repository

Table 3 Pointers to SysDD documents

System Design name	Path
SystemDesign1	Path the document on the repository
SystemDesign2	Path the document on the repository

3 Use-cases refinement

High level use-cases regarding relations and information exchange between actors, which are specific to the technologies being deployed or represent a more detailed by view of what has been presented on the correspondent "System-of-system Description" document, should be presented.

UML use-case diagrams are suggested to graphically represent the use-cases. If needed a UML sequence diagram can also be added. To include more detail on the use-case section, use the table format, depicted in Table 4.

Table 4 Use-case description table

Name of the Use-case
ID: Unique ID
Brief description: Give a brief description of the use-case.
Primary actors: Present the primary actor, e.g.,Prosumer
Secondary actors: Present the secondary actors, e.g., Virtual Market of Energy
Preconditions: If there are any
Main flow: Present in a sequence of steps the interactions among the actors 1- 2- 3- . . . . .
Postconditions: If there are any
Alternative flows: Any possible alternative flows to the sequence presented in the Main flow section.

4 Structure and Behaviour Diagrams

The diagrams proposed in this section could show two different views:

- Structure
- Behavior

For the Structure, the UML Component diagram or the SysML Block Definition diagram defines the SoS in terms of the Systems listed in Section 2.

For the Behavior, usage of an UML Sequence diagram is suggested.

5 Physical description (Optional)

This section should describe non-ICT details. This section should provide details only regarding what is related to the physical implementation, location of devices, constraints, etc.

6 Security implementation

This chapter describes how security is implemented into the System-of-Systems.

6.1 Technical Security Requirements

In this chapter the technical realization of the non-technical security requirements, specified in chapter 6.3 of the document SoSD is specified.

6.2 Decomposition of the System-of-Systems

In this section a detailed description of the System-of-Systems is required. This may partly be covered by chapter 4. The description needs to cover the following points:

- Architecture of the System-of-Systems (diagrams, explanations, technologies used)
- Technical description of interface implementation (interfaces between Systems)
- Description of implementation of access control mechanisms
- Programming languages used

6.3 Technical Security Requirements

In this chapter the technical realization of the non-technical security requirements, specified in chapter 6.3 of the document SoSD is specified.

6.4 Data Flow Diagram

Provide a Data Flow diagram of the SoS.

6.5 Threats and Vulnerabilities

This chapter contains any known threats and vulnerabilities to the SoS.

7 Non-functional requirements implementation

This section describes requirements regarding QoS, response time, resources, reliability, etc. Note that some of these requirements can be optional.

The following table should specify which non-functional requirements are implemented.

Table 5 Non-functional requirements

Name	Description	Type	Value	Use-case

The above table must report the non-functional requirements, by providing the following information:
Name: The name of the non-functional requirement.
Description: Description of the non-functional requirement.
Type: The type of the non-functional requirement (e.g., hardware, software, performance).
Value: Any constrains it imposes to the use-case(s) (e.g., serve 1000 houses per aggregator, perform 100000 transactions per minute, have a delay of less that 1ms on a message).
Use-case: Provide the ID of the use-case(s) it refers to.

8 Domain realization contextualization

This section contextualizes the implementation into an Arrowhead Area, e.g. DNS structure.

9 References

Any references must be put here

10 Revision history

10.1 Amendments

No.	Date	Version	Subject of Amendments	Author
1	2013-11-06	0.0	Creation	Luis Lino Ferreira
2	2013-11-25	0.1	Revisions, nomenclature changes	Christos Chrysoulas, Luis Lino Ferreira
3	2013-12-03	0.2	Revisions	Christos Chrysoulas
4	2013-12-18	0.3	Text Revisions	Christos Chrysoulas
5	2014-01-11	0.4	Quickparts and format to dotx	Ove Jansson
6	2015-02-20	1.0	Revision of text	Michele Albano / Luis Ferreira
7	2015-09-30	1.1	Refinement of the structure	Michele Albano / Luis Ferreira
8	2015-09-30	1.1	Revision	Iker Martínez de Soria
9	2016-03-19	1.2	Transfer to Latex	Jerker Delsing

10.2 Quality Assurance

No.	Date	Version	Approved by
1	YYYY-MM-DD	1.0	Nnnnn Nnnnnnn
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