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	Configuration		**SysD**
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Configuration

System Design Description (SysDD)

Abstract

This document describes a system capable of providing services for managing configurations and settings for Eclipse Arrowhead-compliant systems. The Configuration system provides features for systems to store and fetch configuration data.

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Contents

1 Overview

This document describes the Configuration system of the Eclipse Arrowhead [1]. The Configuration system provides services for configuration management [2] to enable Eclipse Arrowhead systems to have their configuration managed in a centralized approach. As the number of systems increase in an industrial environment [3], managing all configuration files manually becomes a daunting task. Common use-cases for the Configuration system are;

- Storage of configurations and settings for application systems

- Management of configuration parameters
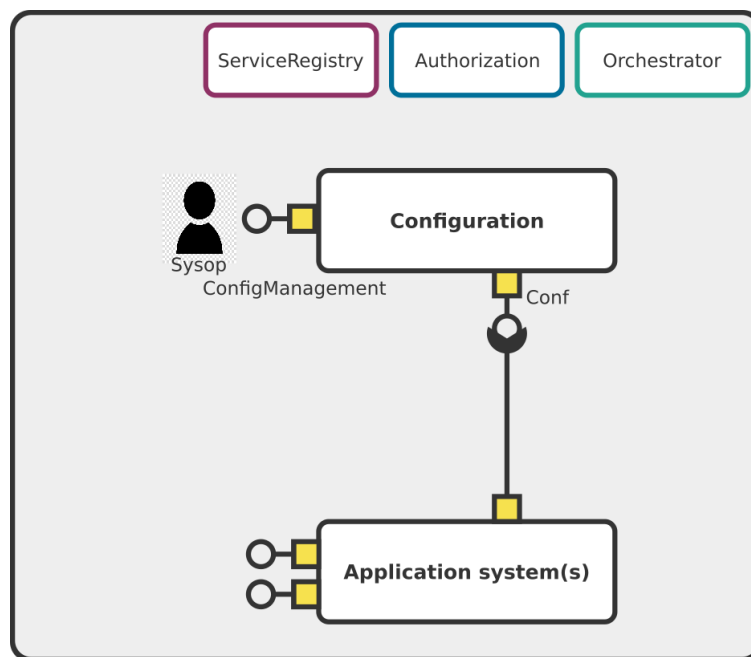
All these scenarios are illustrated in Figure 1.

Figure 1: An example of an Arrowhead local cloud which contains the Core systems, and a cloud operator (Sysop), the Configuration system producers and consumers.

The rest of this document is organized as follows. In the remainder of this section we comment on the status of this document. In Section 2, we outline the delimitations of the system, which is work-in-progress. Section 3 presents how the Configuraion system can be used in a local cloud. Finally, In Section 4, there is a description of the services that Configuration system consumes and produces.

1.1 Status of this Document

This document presents the current state of the Translator. However, since Eclipse Arrowhead is an actve open source project, changes will most like happen in the future. Features will be added, modified or in other ways altered. This document will thus be updated when needed. This document, an all other such part of the same Eclipse Arrowhead Core proposal, are still to be considered early drafts and might to have to undergo several significant revisions before becoming sufficient for most kinds of industrial deployments. If the reader has any comments or suggestions regarding the design or implementations, please contact Jens Eliasson <jens.eliasson@thingwave.eu>, who the maintainer of the Configuration system.

2   Important Delimitations

The primary purpose of the Configuration system is to handle management of settings and configurations for application systems. Currently, the following features are out of scope;

- Communication configuration. This is handled by the Orchestration system.

The main purpose of the Configuration system is to handle run-time changes to application system's configuration files.

3   System Role

As stated in Section 1, the Configuration system performs two main roles. Firstly, enables storage of configuration data, secondly; allows management of configuration files in an Arrowhead local cloud.

3.1   Data models

The table below shows the different encodings that can be used with the Configuration system. Today, only plain text, binary and JSON are supported.

Encoding	Description
JSON	Standard JSON. Pros; easy to work with. Cons: relatively verbose.
Text	Many applications use plain text configuration files.
Binary	A binary (black box) file can be used to store any type of information.

4   Services

The Configuration system produces and consumes the following services, as described in Figure 1.
More details regarding the consumed and produced services are given in the following subsection.

4.1   Consumed Services

This section presents an overview of consumed services.

4.1.1   Service Registry

This service is consumed to register produced services into an Arrowhead local cloud.

4.1.2   Authorization

This service is consumed to validate access control rules when configurations are being managed an Arrowhead local cloud.

4.2   Produced Services

This section presents an overview of produced services.

4.2.1   Echo

The Echo service is a simple service that can be used to determine if a system is available or not.

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4.2.2 Config

This service enables a client system to fetch its configuration. See the documents "Config SD" and "Config IDD" for more details.

4.2.3 RawConfig

This service enables a client system to fetch its configuration as a black-box binary file. See the documents "RawConfig SD" and "RawConfig IDD" for more details.

4.2.4 ConfigManagement

This service is used by a cloud operator to store configurations for application systems. See the documents "ConfigManagement SD" and "ConfigManagement IDD" for more details.

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5 References

[1] J. Delsing, "IoT Automation : Arrowhead Framework," 2017.

[2] O. Carlsson, P. P. Pereira, J. Eliasson, J. Delsing, B. Ahmad, R. Harrison, and O. Jansson, "Configuration service in cloud based automation systems," in *IECON 2016 - 42nd Annual Conference of the IEEE Industrial Electronics Society*, 2016, pp. 5238–5245.

[3] J. Jokinen and J. L. Martinez Lastra, "Industrial monitoring and control approach for dynamic and distributed intelligent systems," in *2016 IEEE 21st International Conference on Emerging Technologies and Factory Automation (ETFA)*, 2016, pp. 1–7.

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6 Revision History

6.1 Amendments

No.	Date	Version	Subject of Amendments	Author
1	2021-01-30	0.5	Initial	Jens Eliasson
2	2021-05-05	0.7	Services and data models added	Jens Eliasson
3	2021-02-08	1.0	Text updated, with figures	Jens Eliasson

6.2 Quality Assurance

No.	Date	Version	Approved by
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