Orchestration system description (SysD)

**Abstract**

The Orchestration System is a component that handles configuration of components into System-of-System in an Arrowhead local cloud. The Orchestration can be either push-based or pull-based.

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1. Overview

# Significant prior art

The Orchestration system has been around in the SOA architecture since the beginning. The various predecessors to the Arrowhead Projects have all used different means to facilitate the function.

In the OpenSIS initiative from Ericsson the Sitsyst Builder and the Bootstrap was the tools to create orchestration configurations and to execute such configurations. These Sitsyst configurations mainly consisted of one-to-one configurations created in SQRL – Service Query Language although some limited “self-orchestrating” mechanisms were present. These tools included functions to append the SOA concept when creating graphical user interfaces, adding the orchestration concept into UI.

In generation 1 and 2 of the Arrowhead core services, orchestration was based on pulling the configurations from an orchestration system and each consumer of orchestration could interpret the orchestration information according to their needs. Arrowhead gen 2 added the push capability that meant that the orchestration system can push configurations or policies to entire system-of-systems.

# How this system is meant to be used

The Orchestration system is used to create and administer connections between producers and consumers in an Arrowhead cloud.

The overall operation is based on requirements for a system-of-system to fulfil a task. These requirements must be interpreted into a high-level language that the orchestration system can translate into allocation of suitable producers and connections that consumers should execute in order to fulfil the requirements. The interpretation process can either be manual by an operator of the system or it can be automatic, carried out by the orchestration system itself.

The Orchestration system has to take into account temporal decisions, meaning that some connections must be effectuated before or after other connections have been established or removed.

# System functionalities and properties

The Orchestration system should have push and pull capabilities.

In Orchestration pull mode the Orchestration system has a passive role, merely creating and storing the orchestration configurations and serving requests from application systems whenever they request orchestration.

In Orchestration push mode the Orchestration system creates connection policies and distributes them in the system to be executed by the receiving/connected systems.

The Orchestration system can consume other services when performing orchestration such as quality-of-service information, monitoring information and authorisation information.

# Important delimitations

None defined.

1. Services

The Orchestration system should produce services for Orchestration Pull and Orchestration Administration. It should consume Orchestration Push and Service Discovery.

# Produced services

The System Registry produces the following services:

|  |  |
| --- | --- |
| Service name | SD |
| Orchestration Pull | SD Orchestration |
| Orchestration Administration | SD Orchestration Administration |

# Consumed services

|  |  |
| --- | --- |
| Service name | SD |
| Service Discovery | SD Service Discovery |
| Orchestration Push | SD Orchestration Push |

1. Security

# Security Model

The information of the Orchestration system is important from a security point of view since it controls all information exchange in the Arrowhead cloud. The application systems that are to be orchestrated needs to be authenticated by the Orchestration system and vice versa.

Caching of Orchestration information should be considered in the Arrowhead cloud in order to minimise the impact of Orchestration system inaccessibility.

1. Revision history

# Amendments

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Date | Version | Subject of Amendments | Author |
| 1 | 2022-06-28 | 0.1 | First version for AH 5.0. | Per Olofsson |
| 2 |  |  |  |  |

# Quality Assurance

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Date | Version | Approved by |
| 1 |  |  |  |
| 2 |  |  |  |