Document title	Document type
aiClusterService	**SD**
Date	Version
2025-10-20	**X.Y.Z**
Author	Status
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Contact	Page
oscfah-1@student.ltu.se	**1 (9)**

aiClusterService
Service Description

Abstract
This is the template for Service Description (SD document) according to the Eclipse Arrowhead documentation structure.

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1 Overview

This document describes the aiCluster service, which enables other system the use of trained ai models for tasks such as production optimization, prediction analysis and so on.

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1.1   How This Service Is Meant to Be Used

This service will either produce a set of parameters for the consumer given by a specific model trained for a certain use case or produce a list of models that can be used for the earlier point.

1.2   Important Delimitations and Dependencies

For this service to give the desired results it will require continues data from other provider systems. Data which both can be used for deriving datasets for training of models, but also for providing consumers with optimization parameters and such. As of now the service and system of the aiCluster does not have the processing power of developing any meaning full LLMs. But can finetune existing LLMs for more specialized applications.

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2 Service Interface

This section describes the interfaces to the "aiCluster" service. In particular, each subsection names an abstract operation, an input type and an output type, in that order. The input type is named inside parentheses, while the output type is preceded by a colon. Input and output types are only denoted when accepted or returned, respectively, by the interface in question.

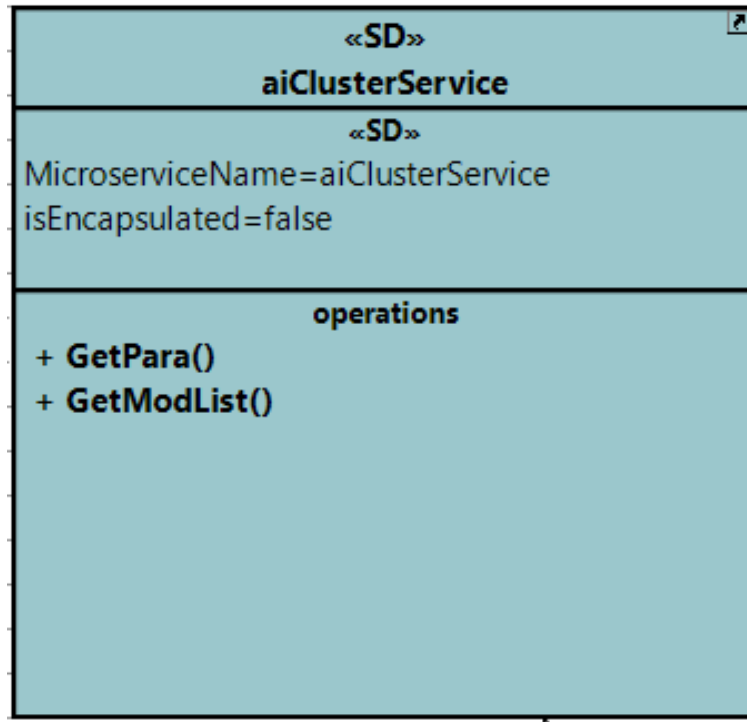All abstract data types named in this section are defined in Section 3.

Figure 1: SysML block description diagram of the aiClusterService and its interface

The following interface operations are available.

2.1 operation GetPara (ModelName) : Parameters

This function GetPara produces a new set of parameters from the designated model given the current timestep.

2.2 operation GetModList () : List of models

The GetModList operation is used to get a list of available models and their respective input-output parameters.

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3   Information Model

Here the Structure of the operations of the aiCluster services is shown.

3.1   struct GetPara

This structure is used to produce a set of parameters from a model in the aiCluster system.

Field	Type	Description
endofValidity	DateTime	Service is available until this UTC timestamp.
List	List<A>	List of parameters.
metadata	Metadata	Metadata
providerSystem	Name	Name of the provider system.
secure	SecureType	Type of security the service uses.
serviceDefinition	Name	Service Definition.
serviceUri	URI	URI of the service.
version	Version	Version of the service.

3.2   struct GetModList

This structure is used to return a list of available models.

Field	Type	Description
endofValidity	DateTime	Service is available until this UTC timestamp.
address	Address	Address of the provider systems.
port	PortNumber	Port of the provider system.
secure	SecureType	Type of security the service uses.
system_name	Name	System name of the provider system
service_definition	Name	Service Definition of the unregistered service.
List	List<A>	List of available models.

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3.3   Primitives

Types and structures mentioned throughout this document that are assumed to be available to implementations of this service. The concrete interpretations of each of these types and structures must be provided by any IDD document claiming to implement this service.

Type	Description
Address	A string representation of the address
Boolean	One out of `true` or `false`.
Interface	Any suitable type chosen by the implementor of the service.
DateTime	Pinpoints a specific moment in time.
List<A>	An *array* of a known number of items, each having type A.
Name	A string identifier that is intended to be both human and machine-readable.
PortNumber	Decimal number in the range of 0-65535
Version	Specifies a service version.

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4   References

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5   Revision History

5.1   Amendments

No.	Date	Version	Subject of Amendments	Author
1	2020-12-05	X.Y.Z		Tanyi Szvetlin
2	2021-07-14	X.Y.Z	Minor updates	Jerker Delsing
3	2022-01-10	X.Y.Z	Minor updates	Jerker Delsing

5.2   Quality Assurance

No.	Date	Version	Approved by
1	2022-01-10	X.Y.Z	