Interface Design Description (IDD)
DeviceDiscovery

November 15, 2017

1 Interface Design Description Overview

This document describes how to realize the DeviceDiscovery service using DNS-SD.

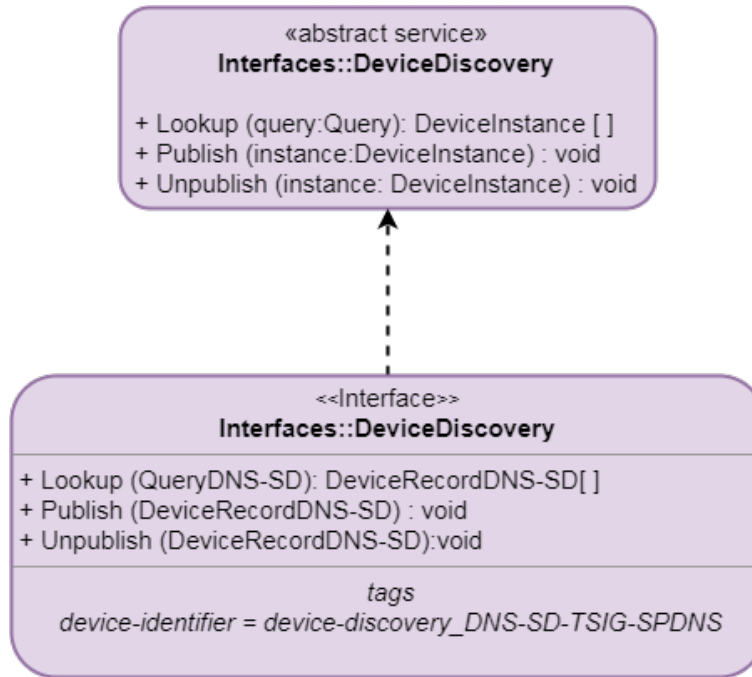
Figure 1: The DeviceDiscovery service interface and the abstract data types

1.1 Device Identifier

Device type identifier: **_ahfc-DeviceDiscovery**

1.2 Pointers to SD documents

The System Description (SD) document is located at the Arrowhead Framework git repository:
arrowhead-f/arrowhead-f.git/3_CoreSystems/2_SupportCoreSystems/4_DeviceRegistrysystem/Documentation/
SD_DeviceRegistry

Document title	Document type
DeviceDiscovery	IDD
Date	Version
November 15, 2017	1.1
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Table 1: Pointers to SD document

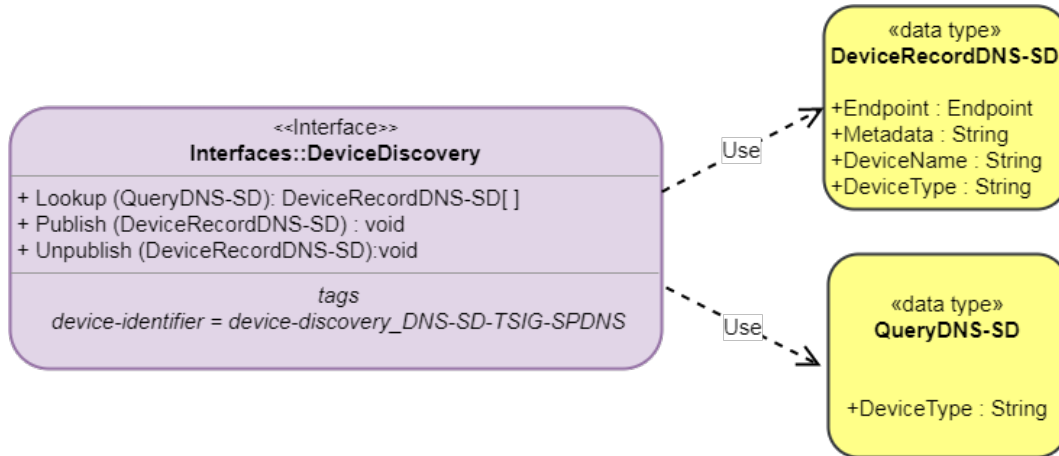| Service	SD Document Reference
DeviceDiscovery	https://forge.soa4d.org/plugins/scmgit/cgi-bin/gitweb.cgi?p=arrowhead-f/arrowhead-f.git;a=tree;f=3_Core+Systems/2_Support+Core+Systems/4_DeviceRegistry+system/Documetation/SD_DeviceRegistry;hb=fba7d498691a51ae22cb33ccf77ebb0eab48d9f5

2 Interfaces

Figure 2: The DeviceDiscovery service interface and the data types

2.1 Functions

Lookup   The lookup operation implements the Lookup method by searching for the registerd devices.

Publish   The publish operation implements the Publish method using DNS-SD device registration.

Unpublish   The unpublish operation implements the Unpuplish method using de-registration of device records in the DNS. The key identifier is the instance name.

2.2 Sequence Diagrams

Sequence Diagram for Lookup method   Figure 3 shows the sequence diagram for the lookup method of device registered in the DeviceRegistry.

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Figure 3: Sequence Diagram for the lookup method of the DeviceDiscovery service

Sequence Diagram for Publish method Figure 4 shows the sequence diagram when registering devices in the DeviceRegistry.
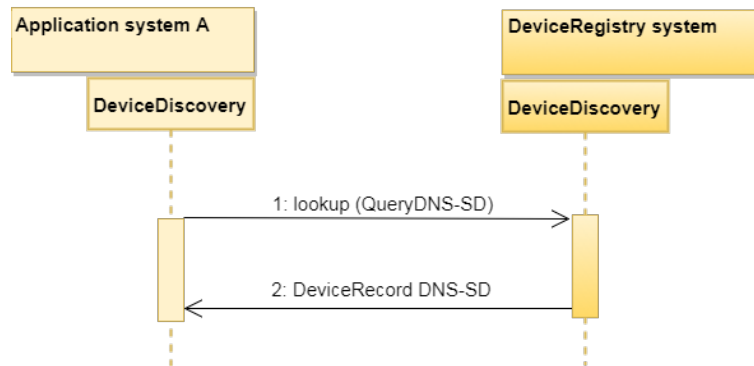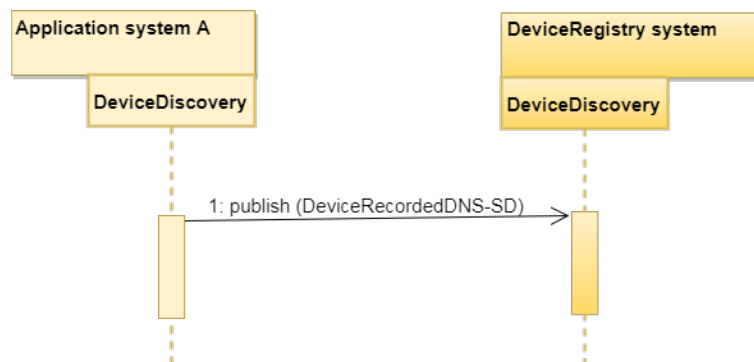

Figure 4: Sequence Diagram for the publish method of the DeviceDiscovery service

Sequence Diagram for Unpublish method Figure 5 shows the sequence diagram when unregistering devices in the DeviceRegistry.

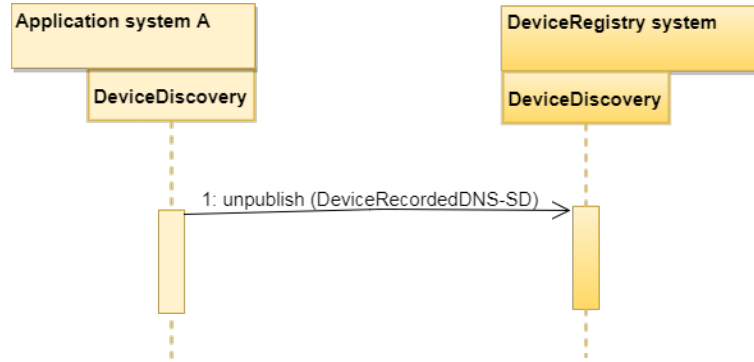| Document title	Document type
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Figure 5: Sequence Diagram for the unpublish method of the DeviceDiscovery service

3 Information Model

The information model shown in Figure 6 holds two data types: (i) DeviceRecordDNS-SD and (ii) QueryDNS-SD, as described in Table 2.
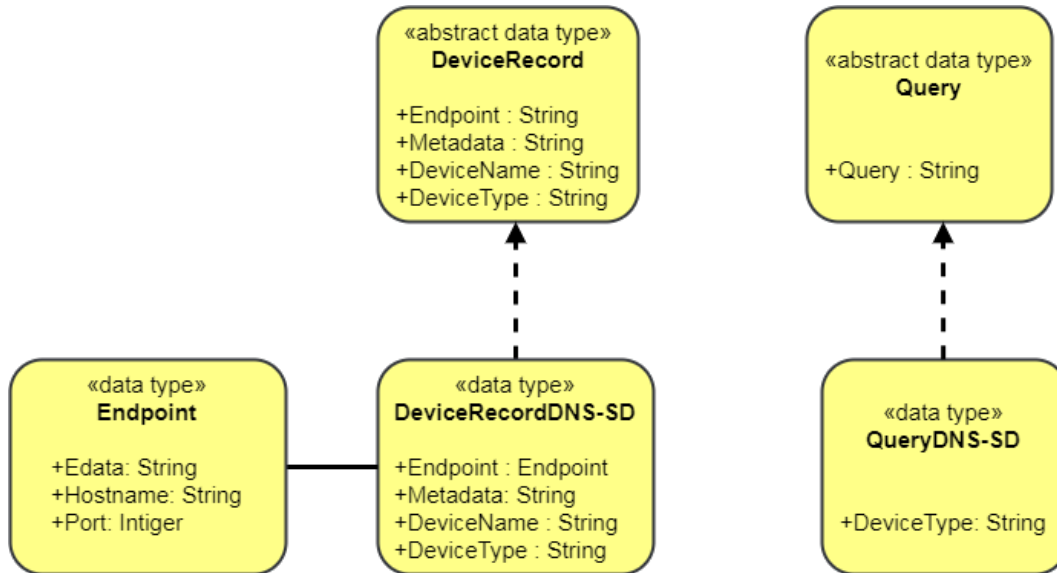

Figure 6: Information Model

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Table 2: Data type description

Field	Description

DeviceRecordDNS-SD	The DeviceRecord data type contains information of a device endpoint, such as name and physical address. Metadata can also be added here.
	
	• Endpoint is a datatype holding the necessary information to establish network connection. This data type implements a representation of an endpoint using SRV record of DNS.
	
	    – Hostname is a string containing the name of the host in format: name.domain.topdomain, e.g., app.arrowhead.eu
	    – Path e.g., 192.168.1.20
	    – Port is an Integer containing the port number, e.g., 8070
	    – Edata is a String containing additional information related to the endpoint. Any additional information that is required to identify the device instance should be stored in the mandatory DNS TXT record, as defined in the DNS-SD standard specification.
	
	• Metadata - String: Metadata should be provided through DNS TXT record using key pairs such as, $encode = syntax$, e.g., $encode = xml$, $compress = algorithm$, e.g., $compress = exi$, $semantix = XX$, e.g., $semantic = senml$
	
	• DeviceName is a String identifying the structured device instance name.
	
	• DeviceType is a String identifying the device name. This is referred to as a device type identifier in Arrowhead.

QueryDNS-SD	The QueryDNS-SD datatype implements the Query data structure using DNS address lookup. DeviceType is a String identifying the device name. This is referred to as a device type identifier in Arrowhead.

4   References

Any references must be placed here.

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5   Revision history

5.1   Amendments

No.	Date	Version	Subject of Amendments	Author
1	2017-09-10	1.0	Initial Version	Ani Bicaku
2	2017-11-15	1.1	Initial Version	Ani Bicaku

5.2   Quality Assurance

No.	Date	Version	Approved by
1			
2			