Ontology Specification Draft

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DASP Interaction Vocabulary

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Abstract

This document proposes a vocabulary for modeling web service interactions, including the requests, responses and contextual properties. It serves as one of the building blocks of DASP framework, whose primary goal is achieving fine-grained cross-domain security management for heterogenous environments and intelligent agents.

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1. Introduction

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Simplicity, clarity of the structure and its relationship with underlying standards and technologies are some of the factors that allowed RESTful architectural style to become broadly adopted approach in exposing web services. Nowadays, significant amount of the service-based intra and inter-domain interactions rely on Web APIs. There is a range of existing approaches to describe (traditional) web services or more recent REST APIs using syntactic or semantic descriptions. Many of them, however, do not deal with other aspects of client-service interaction, such as requests, responses, as well as parameters and contextual properties that characterize these interactions. DASP Interaction is a vocabulary that aims to fill that gap by providing a structured way to model and express interactions in diverse environments based on Web API integrations.

1.1. Namespace declarations

Table 1: Namespaces used in the document

ns	<http://creativecommons.org/ns#>
owl	<http://www.w3.org/2002/07/owl#>
xsd	<http://www.w3.org/2001/XMLSchema#>
rdfs	<http://www.w3.org/2000/01/rdf-schema#>
o	<http://www.daspsec.org/o/>
dasp-core	<http://www.daspsec.org/o/dasp-core/>
rdf	<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
terms	<http://purl.org/dc/terms/>
lear	<http://www.daspsec.org/o/lear/>
files	<https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/>
vann	<http://purl.org/vocab/vann/>
dasp-interaction	<http://www.daspsec.org/o/dasp-interaction#>
dc	<http://purl.org/dc/elements/1.1/>

2. DASP Interaction Vocabulary: Overview

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This ontology has the following classes and properties.

Classes

Access Client Context Element Restriction Extrinsic Context Intrinsic Context Request Resource Restriction Response Time

Object Properties

activatesIntent hasContext hasMethod hasParameter includes

3. DASP Interaction Vocabulary: Description

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DASP Interaction vocabulary is a part of a broader initiative implemented under Data Sharing and Processing Framework (DASP). The goal of this initiative is to address the challenge of cross-domain security automation and resource management for various contexts. Its aim is to provide a reference model and supporting components for the purpose of unified, collaborative and multi-organizational security management.

DASP consists of a conceptual framework, architectural and interaction models. These entities are complemented with semantic vocabularies, supporting tools and validation models that allow implementation and integration of the framework. DASP Interaction is one of these accompanying vocabularies that seamlesly integrate with DASP and its tooling stack.

In this vocabulary we introduce three main concepts (clases): Context, Request and Response. These are used to describe a client request or a service response in client-server interactions that get intercepted, evaluated, redacted and transformed in the scope of security-related activities. Using specified object properties, the concepts from this vocabulary can be related to the concepts from other vocabularies to provide a detailed picture of interactions. For instance, the description of client credetials can be performed by referencing external vocabularies, such as OAuth-2.0 vocabulary from the same framework.

4. Cross reference for DASP Interaction Vocabulary classes, properties and dataproperties

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This section provides details for each class and property defined by DASP Interaction Vocabulary.

4.1. Classes

Access Client[C]

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IRI: http://www.daspsec.org/o/dasp-interaction#AccessClient

Represents a client or agent that initiates access to some resource or service.

has super-classes
Extrinsic Context [C]

Context[C]

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IRI: http://www.daspsec.org/o/dasp-interaction#Context

Represents a particular situation. Context is typically used to express conditions or facts present in the system. It can refer to *intrinsic* context, which relates to the conditions that describe internal system states, or to *extrinsic* context, which deals with the conditions provided by the factors external to the system.

is equivalent to
context [C]
has super-classes
thing [C]
has sub-classes
Extrinsic Context [C], Intrinsic Context [C]
is in domain of
includes [OP]
is in range of
hasContext [OP]

Element Restriction[C]

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IRI: http://www.daspsec.org/o/dasp-interaction#ElementRestriction

Restricts the contextual condition to an element that may be exposed by the *Resource* directly or through its originating *Action*.

has super-classes
Intrinsic Context [C]

Extrinsic Context[C]

back to ToC or Class ToC

IRI: http://www.daspsec.org/o/dasp-interaction#ExtrinsicContext

Represents a particular situation in environment, system or other externally retrievable representation of situation

has super-classes
Context [C]

has sub-classes
Access Client [C], Time [C]

Intrinsic Context[C]

back to ToC or Class ToC

IRI: http://www.daspsec.org/o/dasp-interaction#IntrinsicContext

Represents a particular situation present in the request, action, response or a target resource

has super-classes
Context [C]

has sub-classes
Element Restriction [C], Resource Restriction [C]

Request[C]

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IRI: http://www.daspsec.org/o/dasp-interaction#Request

Represents a request issued to the service.

has super-classes
thing [C]

is in domain of
activatesIntent [OP], hasMethod [OP]

Resource Restriction[C]

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IRI: http://www.daspsec.org/o/dasp-interaction#ResourceRestriction

Restricts the contextual condition to a *Resource* that is dealt by in the interaction.

has super-classes
Intrinsic Context [C]

Response[C]

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IRI: http://www.daspsec.org/o/dasp-interaction#Response

Represents a response issued from the service.

is equivalent to
hasParameter [OP] **some** response parameter [C]

has super-classes
thing [C]

Time[c]

back to ToC or Class ToC

IRI: http://www.daspsec.org/o/dasp-interaction#Time

A time extent that refers to the particular moment or a time range.

has super-classes
Extrinsic Context [c]

4.2. Object Properties

activatesIntent hasContext hasMethod hasParameter includes

activatesIntent[op]

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IRI: http://www.daspsec.org/o/dasp-interaction#activatesIntent

Specifies the *intent* or an *action* activated by the *request*. The action is activated when the request targets a particular endpoint using an HTTP method that are both used to describe an action.

has super-properties
top object property
has domain
Request [c]
has range
action [c]

hasContext[op]

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IRI: http://www.daspsec.org/o/dasp-interaction#hasContext

Specifies a context provided by the *request* or a *response*. Typically context refers to the elements that describe client or environmental properties present at the time of the request or response interception.

has super-properties
top object property
has domain
Request [c] **or** Response [c]
has range
Context [c]

hasMethod[op]

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IRI: http://www.daspsec.org/o/dasp-interaction#hasMethod

Specifies that request uses a particular HTTP method to access the resource.

has super-properties
top object property
has domain
Request [c]
has range
access method [c]

hasParameter[op]

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IRI: http://www.daspsec.org/o/dasp-interaction#hasParameter

Specifies a parameter that is included along with the request or a response.

has super-properties
top object property

has domain
Request [c] **or** Response [c]

has range
parameter [c]

includes[op]

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IRI: http://www.daspsec.org/o/dasp-interaction#includes

Establishes relationship between the contexts on different abstraction levels.

has super-properties
top object property

has domain
Context [c]

has range
Extrinsic Context [c] **or** Intrinsic Context [c]

Legend

back to ToC

[c]: Classes
[op]: Object Properties
[dp]: Data Properties
[ni]: Named Individuals

5. References

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[XACML] eXtensible Access Control Markup Language (XACML) Version 3.0. OASIS standard, OASIS (2013).
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