SAML V2.0 Profile for Token Correlation

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`urn:oasis:names:tc:SAML:2.0:cm:token correlation profile`

Abstract:

Based on Telecom Italia proposal of the Telecom SOA Requirement **[*SOA-TEL req*]**

This document defines the syntax to express a relation between two SAML assertion, a “main” one and a “related” one.

Status:

This is initial draft of Subject Management Protocol based on [*to add the quotation*]

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1 Introduction

In some advanced SAML use cases, in enterprise context, the execution of a business process might involve two or more logical transactions that span across one or more intermediaries.

Suppose that an intermediary is involved in almost every process and it needs to call the same services for different processes, if the authorization to call the services is granted to the intermediary without correlating this authorization to the process in execution, that would mean to authorize the intermediary to call every services, as a consequence there wouldn't be real security policy criteria and there would be reduced logging information.

This profile supply a normative extension to the [SAML2Core] in accord to the philosophy that every actor owns only the authorizations strictly necessary to do what it needs to do.

1.1 Terminology

The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this specification are to be interpreted as described in IETF RFC 2119 [RFC 2119].

1.2 Normative References

[*SOA-TEL req*] Ronco et al. *Telecom SOA Requirements Version 1.0* OASIS SOA-TEL TC, Date. http://docs.oasis-open.org/soa-tel/t-soa-req1.0/cd01/t-soa-req-01-cd-02.pdf .

[*SOA-TEL UC*] Ronco et al. *Telecom SOA Use Cases and Issues 1.0* OASIS SOA-TEL TC, Date. http://docs.oasis-open.org/soa-tel/t-soa-uci/v1.0/cs01/t-soa-uc-cs-01.pdf.

[SAML2Core] OASIS Standard, *Assertions and Protocols for the OASIS Security Assertion Markup Language (SAML) V2.0.* March 2005. http://docs.oasis-open.org/security/saml/v2.0/saml-core-2.0-os.pdf

[SAML2Prof] OASIS Standard, *Profiles for the OASIS Security Assertion Markup Language (SAML) V2.0.* March 2005. http://docs.oasis-open.org/security/saml/v2.0/saml-profiles-2.0-os.pdf

2 SAML V2.0 Token Correlation

2.1 Required Information

Identification: urn:oasis:names:tc:SAML:2.0:tcorr?????

Contact information: security-services-comment@lists.oasis-open.org

Description: Given below.

Updates: None.

2.2 Description

This token correlation requirement extends the message security models and enforces the security mechanism in environments where the message exchange pattern is more complex than the simple “requestor – provider” pattern.

This model should be useful when the definition and the use of a “simple” token doesn’t guarantee a sufficient level of security, since the authorization to access a specific service also depends on the fact that a previous token was released.

The syntax defined in this profile defines a new security profile, in which a SAML assertion is syntactically and semantically meaningful if it is built and presented in relation with another “related” SAML assertion; it enables to express a relation between two security SAML assertions, a “main” SAML and a “related” SAML.

The characteristics of the relation are that, when the token correlation is used,

1. the SAML assertion cannot be built and considered valid if it isn't presented together with another “related” SAML assertion,
2. The authorization is granted only in presence of both the subjects of the two SAML assertions.

2.3 Element <token-correlation>

The optional <Token-correlation> element of the section condition specifies the subject of the correlated SAML assertion; it contains an identifier.

<BaseID>, <NameID>, or <EncryptedID>[optiona].

The following schema fragment defines the <Token-correlation> element and its TokenCorrelationType complex type:

```
<element name="Token-correlation" type="saml:TokenCorrelationType"/>
  <complexType name="TokenCorrelationType">
    <choice>
        <element ref="saml:BaseID"/>
        <element ref="saml:NameID"/>
        <element ref="saml:EncryptedID"/>
    </choice>
  </complexType>
```

The element <Token-correlation>, if present, implies that a <Token-correlated> element must be present.

2.4 Element <Token-correlated>

The element <token-correlated>, contains a SAML assertion.

How can I express the type?

If the SAML authority signs the assertion, this element can be out of the assertion (it should be inserted by the SAML subject).

Where can I put the correlate SAML, in order that, if the SAML authority signs the assertion, the signature is not invalidated by putting the SAML correlated?

Processing roules

Assume the main SAML: *SAML2* and the correlated one: *SAML1*.

The requestor (that can obtain only token-correlated SAML for a specific service invocation)

- asks to the SAML authority for a SAML (SAML2); the SAML is of “token correlation” kind, it contains the condition <token-correlation>;
- after having obtained the assertion, the requestor inserts the correlated SAML (SAML1);
- the SAML1 subject ID is equal to the SAML2 token-correlation ID;
- after the other actions, such as signing, are performed, the message is sent to the service provider.

If **the service provider**, during the exam of the main SAML assertion (SAML2) finds the condition <token-correlation>, it searches for the correlated SAML (SAML1) in the message;

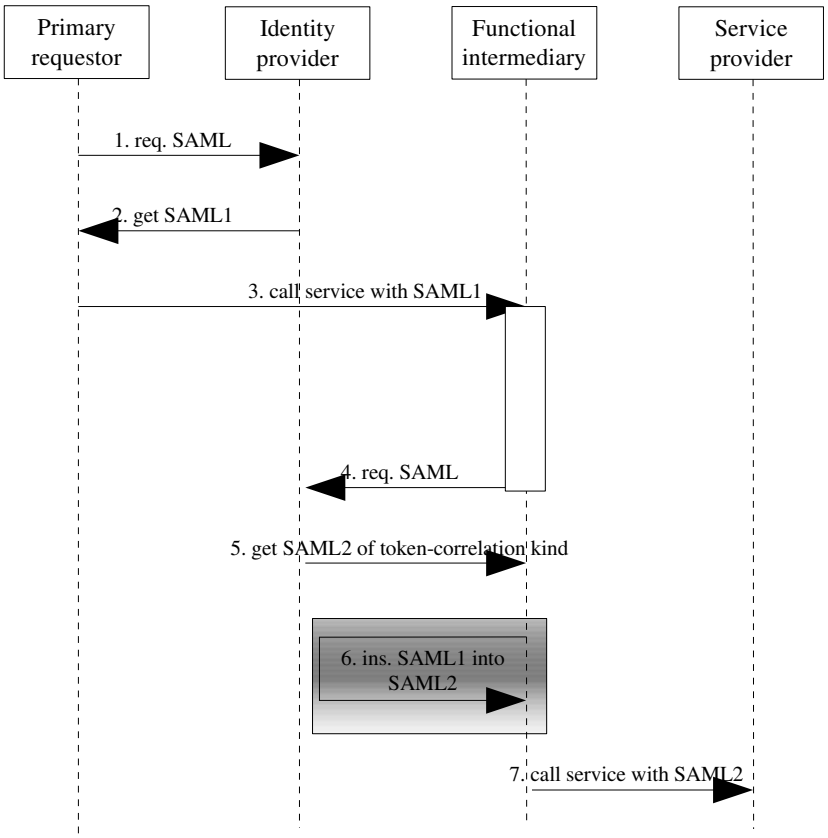
The authorization is granted if

- SAML1 is present and is authentic (released by a trusted SAML authority),

- the SAML1 subject ID is equal to the SAML2 token-correlation ID;
- all the other SAML2 conditions are verified, in accord to the SAML2 standard protocol.

Usually when <token-correlation> condition is present, the authorization should be granted to SAML2 subject only in presence of the SAML1 subject (i.e. token-correlation element).

SAML1 condition elements (for example < NotOnOrAfter>, <OneTimeUse>) could not be true any more.



3 Conformance

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Appendix A. Uses cases

Scenario/context

The business process under analysis is complex and necessitates to be orchestrated by a BPM (Business Process Management) application.

Such process is a “long-running” type process: in fact one of its tasks requires a human intervention, which can be executed within hours (or days).

This implies that the process must be handled in a different mode from the “security management” perspective.

Use case

The issue presented in this section derives from a concrete case of telecommunications services’ sales and post-sales: in particular the activation and provisioning of ADSL service to residential customers.

A consumer, e.g. a CRM application invokes a service to execute a specific business process.

A BPM (Business Process Management) application gets in charge of the orchestration/execution of such processes.

Given the fact that the process is “long-running”, the BPM shall, at a given point, suspend the orchestration/execution of the process until it will receive a specific “activity closure” event from a back office system once the appropriate technician will have terminated his manual tasks.

The following schema Figure 1 depicts a simplified transaction diagram, while Figure 2 provides a pictorial representation of the Use Case.

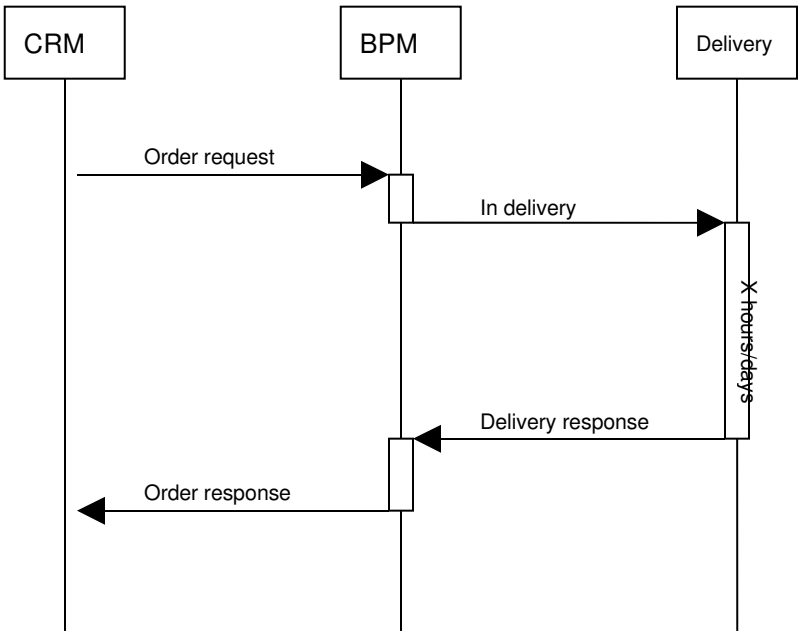

Figure 1: Simplified transaction diagram for the "SAML token correlation" use case

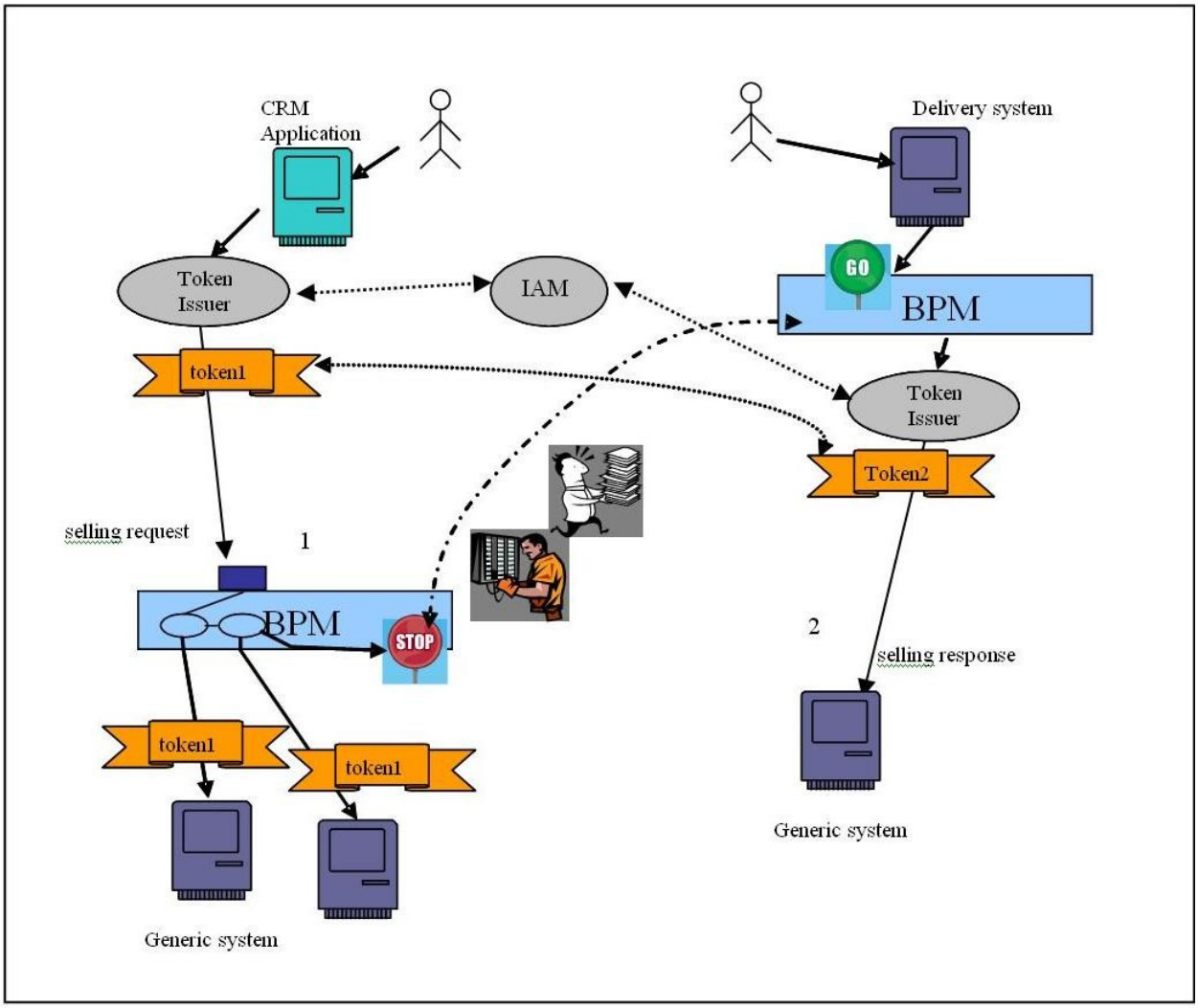

Figure 2: "SAML token correlation" use case: pictorial representation

Use Case steps.

- The CRM sends an ADSL activation request.
- The consumer (CRM) provides its credentials to a Security provider and obtains a SAML assertion, *"SAML1"*. The SAML assertion is associated to the initial message and has limited duration, since extending it would mean to have a weaker security policy.
- The BPM Security Enforcement Point, interacting with the policy decision point (IAM) (Identity Access Manager) applies the authentication and authorization policies.
- The BPM orchestrates the process interacting with the various services exposed by the involved systems within the company infrastructure. All interactions are executed with the *"SAML1"* as security token.
- When appropriate, the BPM invokes a service exposed by a Delivery system to obtain a physical configuration within the central office. At this stage the BPM suspends the execution of the business process (the duration of the task may require hours or days) awaiting for the reception of a specific "activity closure" event.

- The Delivery System activates the technical configuration task.
- A human intervention is performed within the central office.
- Once this task is terminated, the technician reports the “activity closure” on the Delivery system, which generates the “activity closure” event for the BPM.
- The BPM resumes the suspended process, invoking the “next step” in the ADSL activation process.
- The BPM requests the security provider to generate a new SAML, *“SAML2”*, since the previous is not valid any more.
- The remaining portion of the process is executed utilizing SAML2.

The BPM is responsible for the orchestration/execution of the process, and is the entity which is entitled to request the generation of the new SAML *“SAML2”*, so the subject of SAML2 is different from the system that started the process.

It is important for the “security architecture”, that an element of the middleware infrastructure (the BPM) use SAML assertions which are “correlated” (or “directly coupled”) to the real entity which requires the initiation of the business process (i.e. the CRM application, thus the CRM sales representative) and to the business process itself.

It enforces the security level that the BPM requests to the SAML Issuer to generate a SAML assertion “associated” to the *“SAML1”,* and to maintains evidence of that correlation, in order to authorize the BPM itself, once security checks are validated by the IAM, to invoke all pending services within the second part of the process, because such invocations are “really” part of a “security authorized” business process.

Appendix B. Acknowledgments

The following individuals have participated in the creation of this specification and are gratefully acknowledged

Participants:

- [Participant name, affiliation | Individual member]
- [Participant name, affiliation | Individual member]
- [Participant name, affiliation | Individual member]

Appendix A. Revision History

Document ID	Date	Committer	Comment