1.3.2019 Versio 1.0

OP Tunnistuspalvelu

Sisällys

1 Yleiskuvaus

Luottamusverkosto koostuu Tunnistuspalvelun tarjoajina toimivista vahvojen tunnistusvälineiden liikkeellelaskijoista ja tunnistuksen välityspalvelun tarjoajina toimivista osapuolista. OP toimii Luottamusverkostossa vahvan sähköisen tunnistusvälineen tarjoajana. Tarjottava palvelu on OP Tunnistuspalvelu. Palvelu tarjotaan SAML2-rajapinnan kautta.

Tässä kuvauksessa kerrotaan, mitä toimenpiteitä OP Tunnistuspalvelu käyttöönotto vaatii. Kuvauksessa on mukana myös rajapintakuvaus ja sanomaesimerkit (Liite 1). Tunnistuspalvelussa ei käsitellä valinnaisia attribuutteja.

OP Tunnistuspalvelun käyttö edellyttää sopimuksen ja käyttöehtojen hyväksymistä. Sopimisen jälkeen käyttöönotto tapahtuu tämän kuvauksen mukaisesti.

Palveluissa ja rajapinnoissa noudatetaan Viestintäviraston määräystä 72 sähköisistä tunnistus- ja luottamuspalveluista. Määräyksen yksityiskohdat löytyvät https://www.viestintavirasto.fi/attachments/maaraykset/MPS_72_2016.pdf.

2 Vaatimukset käytettävälle ohjelmistolle

2.1 Käytettävä OP:n logo

Tunnistuksen välityspalvelun tulee käyttää palvelussaan OP:n logoa, jonka OP toimittaa sopimisen yhteydessä.

2.2 Käyttöliittymä

OP Tunnistuspalvelussa on selainpohjainen responsiivinen käyttöliittymä. Käyttöliittymä on käytettävissä suomeksi, ruotsiksi ja englanniksi. OP:n tarjoamaa OP Tunnistuspalvelun käyttöliittymää ei saa muokata ja se pitää tarjota asiakkaalle sellaisena kuin OP sen toimittaa.

Laatija	Postiosoite	Käyntiosoite	Puhelin	Sähköpostiosoite/Internet
OP Yrityspankki Oyj	PL 308 00013 OP	Gebhardinaukio 1 Helsinki	010 252 010	op.fi

2.3 Tuetut selaimet

OP Tunnistuspalvelu toimii kaikilla yleisimmillä selainohjelmilla. Suosituksena on käyttää uusimpia selainversioita. Palvelu vaatii toimiakseen istuntoevästeiden (http session cookies) ja JavaScript -selainkriptien sallimisen selaimessa.

Tuetut selaimet ja ohjeet evästeiden ja JavaScriptin käytöstä löytyvät op.fi:stä verkkopalveluiden käyttö -sivulta.

3 Sopiminen

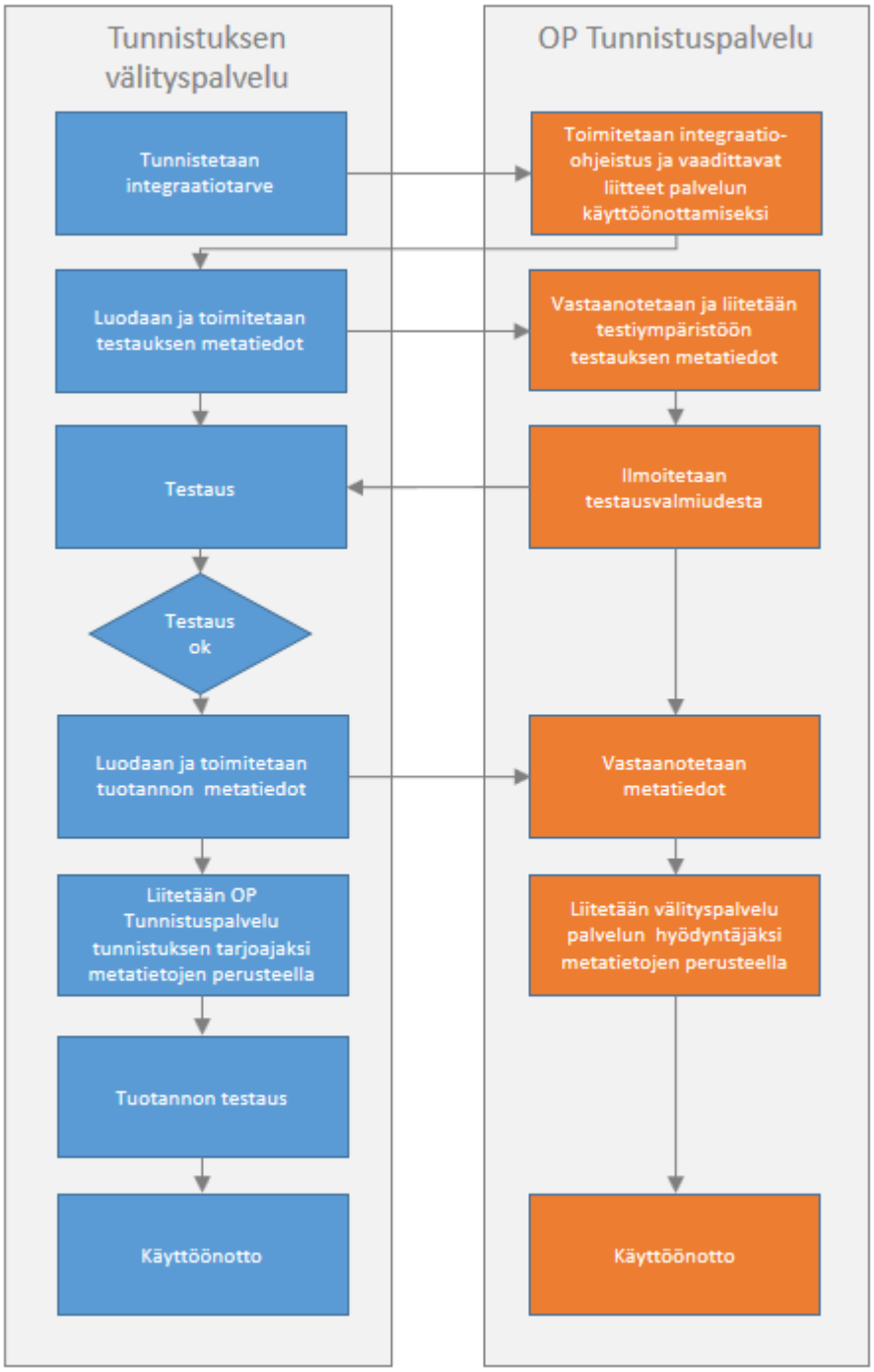
Tunnistusvälityspalvelun ja OP Tunnistuspalvelun välisessä sopimuksessa on valittu, missä tarkoituksessa tunnistusvälityspalvelu tulee käyttämään vahvaa sähköistä tunnistamista. Tunnistamisen lisäksi palvelua voi käyttää tunnusten ketjuttamiseen eli joko vahvojen sähköisten tunnusten myöntämiseen tai heikkojen tunnusten myöntämiseen. Näistä kolmesta eri käyttötarkoituksesta puhutaan tässä kuvauksessa sopimustyyppeinä: tunnistaminen, vahvojen tunnusten ketjuttaminen ja heikkojen tunnusten ketjuttaminen.

3.1 Sopimusmuutokset

Jos sopimukselle halutaan lisätä tai sopimukselta halutaan pois vahvojen sähköisten tunnusten ketjuttaminen tai heikkojen tunnusten ketjuttaminen, vaatii se sopimusmuutoksen.

4 Käyttöönottovaiheet

Palvelussa käytettävät metatiedot varmenteineen vaihdetaan OP Tunnistuspalvelun ja tunnistusvälityspalvelun omistajan välillä. Tarkempi rajapintakuvaus esimerkkeineen löytyy dokumentin lopusta Liitteestä 1.



4.1 OP:n metatiedot

Tunnistuksen välityspalvelun tulee noutaa OP:n tuotannon metatiedot käyttöönoton yhteydessä op.fi/varmennepalvelu-sivulta kohdasta 'OP Tunnistuspalvelu ja OP Tunnistuksen välityspalvelun varmenteet ja metatiedot'. Metatiedot ladataan linkistä, joka on nimetty seuraavasti:

– Lataa meta-tiedot OP Tunnistuspalvelun metatiedot (xml)

4.2 OP:n allekirjoitusvarmenne

OP:n allekirjoitusvarmenne on voimassa kaksi vuotta. OP julkaisee uuden varmenteen erääntymässä olevan varmenteen rinnalle ja ilmoittaa välityspalvelulle sen käyttöönottoajankohdan. Siirtymäaikana uutta ja vanhaa varmennetta voidaan käyttää rinnakkain.

Tunnistuksen välityspalvelun tulee noutaa OP:n allekirjoitusvarmenteen julkinen osa op.fi/varmennepalvelu-sivulta kohdasta 'OP Tunnistuspalvelu ja OP Tunnistuksen välityspalvelun varmenteet ja metatiedot'. Varmenteen linkki on nimetty seuraavasti:

– - Lataa varmenne OP Tunnistuspalvelun allekirjoitusvarmenne

4.3 Metatietojen ilmoittaminen (Profiili ja varmenteet)

OP lähettää suojatulla sähköpostilla asiointipalvelun tekniselle yhteyshenkilölle palvelun käyttöönottoon liittyviä tietoja kartoittavan lomakkeen. Lomake sähköisesti täytettynä ja liitteen 1 mukaiset SAML2 metatiedot palautetaan vastaamalla suojattuun sähköpostiin.

Jokaiselle sopimustyypille (tunnistaminen, vahvojen tunnusten ketjuttaminen, heikkojen tunnusten ketjuttaminen) tulee ilmoittaa lomakkeella oma PartnerId. PartnerId:llä yksilöidään tunnistusvälityspalvelu ja tunnistamisen käyttötarkoitus. PartnerId:n tulee olla lomakkeella juuri samassa muodossa kuin EntityId on metatiedoissa.

Jokaiselle sopimustyypille täytyy lähettää myös omat metatiedot. Metatiedot-tiedostot tulee nimetä selkeästi, jotta voidaan tunnistaa, mihin tarkoitukseen ne on tarkoitettu esim. Y-tunnus tai yhteisön nimi ja loppupääte sopimustyypistä riippuen tunnistus, heikkoketjutus tai vahvaketjutus. Tiedostojen nimet ilmoitetaan yllä mainitulla lomakkeella.

Tunnistusvälityspalvelun vastuulla on havaita oman varmenteen vanheneminen ja uusia varmenne ajoissa. Varmenteen suositeltu voimassaoloaika on kaksi vuotta. Tunnistusvälityspalvelu vastaa oman varmenteen uusimisesta ja toimittamisesta OPlle sähköpostilla osoitteeseen verkkopainikkeet@op.fi. Koko metatietotiedostoa ei tarvitse toimittaa. SAML2-rajapinta mahdollistaa uuden varmenteen lisäämisen vanhan varmenteen rinnalle, jolloin uusi varmenne tulee käyttöön kun vanha päättyy.

4.4 Testiympäristöön integroituminen

OP Tunnistuspalvelun ja integroituvan välityspalvelun välisen integraation testaus tapahtuu tuotannon kaltaisessa ympäristössä, jossa pätee samat vaatimukset kuin tuotantotoiminnassa. Testiympäristössä testataan tekninen integroituminen SAML2-rajapinnalla sekä metatietojen ja varmenteen toimivuus. OP:n testiympäristön toiminnallisuus vastaa toiminnaltaan OP Tunnistuspalvelua, mutta testiympäristön tunnistuksessa on käytettävissä vain määrätyt testitunnukset, joilla tunnistus voidaan tehdä. Testausta varten asiakkaan on lähetettävä testauksessa käytettävät SAML2 metatiedot vastauksena suojattuun sähköpostiin. Testiympäristö noudattaa luvun 4 käyttöönottovaiheita.

Tunnistukseen tulee käyttää testauksessa tunnuksia:

- käyttäjätunnus: 12345678
- salasana: 1234
- avainluku: 1234

Testiympäristössä palautuu aina seuraavat identiteettitiedot:

- henkilötunnus: 070770-905D
- nimi: Väinö Tunnistus
- syntymäaika: 07.07.1970

4.4.1 Testiympäristöön tarvittavat tiedot

OP:n testivarmenteet ja metatiedot on noudettavissa op.fi/varmennepalvelu-sivulta kohdasta 'OP Tunnistuspalvelun ja OP Tunnistuksen välityspalvelun allekirjoitusvarmenne'. Varmenteet ja metatiedot ladataan linkeistä, jotka on nimetty seuraavasti:

– Lataa varmenne, OP Tunnistuspalvelun testiympäristön allekirjoitusvarmenne
– Lataa metatiedot, OP Tunnistuspalvelun testiympäristön metatiedot

OP Tunnistuspalvelun testauksen rajapinnan url on:
s**aml-idp.test.op.fi/FIM/sps/BrokerIdP/saml20/login**

Testauksessa käytettävä osoite on myös OP:n metatietojen <md:EntityDescriptor> elementin attribuutissa **entityID:**
<md:EntityDescriptor xmlns:md="urn:oasis:names:tc:SAML:2.0:metadata" entityID="**https:// saml-idp.test.op.fi/FIM/sps/BrokerIdP/saml20/login**">

4.4.2 Testiympäristön rajoitukset

Testiympäristö on tarkoitettu SAML pyyntösanoman (request) ja SAML vastaussanoman (res-ponse) oikeellisuuden testaamiseen. Tästä syystä emme tarjoa keskeytyksen tai virheenkäsit-telyn testausta testiympäristössä.

4.5 Tuotannon todentaminen

Tuotanto tulee todentaa tunnistautumalla OP Tunnistuspalveluun OP:n myöntämillä vahvoilla sähköisillä tunnuksilla.

5 Yhteystiedot

Tunnistuspalvelun käyttöä koskevat yhteydenotot:

- Yritys- ja maksuliikepalvelut 0100 05151 tai
- sähköpostilla verkkopainikkeet@op.fi

Kaikki yhteyshenkilötiedoissa tapahtuvat muutokset tulee ilmoittaa OP:n ilmoittamalle sopimuksen yhteyshenkilölle.

6 LIITE 1 OP Luottamusverkosto integration guide

Contents

1 Terminology

Finnish Trust Network = FTN : The Finnish Trust Network is a cloud-based mechanism for connecting large scale, consumer facing services with trusted identity and service providers. It is formed by the actors in the network who are requesting, forwarding or providing authentications.

Service Provider = SP : The service which requests authentication

Identity Provider = IdP : The service which authenticates the user

Identity Service Broker: The service which forwards the requests and responses between SP and IdP

2 SAML

Service functionality follows specification of Viestintävirasto: Finnish Trust Network SAML 2.0 Protocol Profile and SAML2 spefication.

Finnish Trust Network uses SAML messages for moving identity information. SAML messages are signed and encrypted. They include all the necessary information for the authentication process.

When requesting authentication from OP's IdP, SAML AuthnRequst message needs to be sent. This message requests an authentication from the service to which it is sent. The user is forwarded into IdP:s authentication process and on completion of the process, a new SAML Response is created and sent back to the requesting service. The SAML Response is connected to the SAML Request message. SAML Response includes information on whether the authentication process was successful with the needed identity information on user, which tells to the requesting service that an actual user with credentials is using the system.

In FTN SAML messages will be moved between services with POST – method of HTTP standard. SAML 2.0 standard defines the bindings of HTTP-methods, how SAML-message is moved in each of HTTP-methods.

Service can request authentication from OP's IdP by sending a AuthnRequest message with a return destination by using users browsers POST-method.

OP's IdP will do the authentication process and then OP's IdP will send the response message for the requesting service by making POST-command into the return destination described in the request.

Metadata exchange is required before the integrating service can start using OP Idp.

All connections are protected by TLS 1.2. This means that all request and response messages will be transmitted using HTTPS-connections. OP's IdP should be requested by using HTTPS protocol.

All SAML-messages are signed to ensure on the sender, the integrity of the message and that the message has not been altered. All parties need to verify the signature of the received messages.

Next, SAML messages are introduced in detail and how the messages can be utilized in FTN. The focus will be on the integration into OP's IdP.

2.1 Certificates

OP SAML Idp accepts self-signed signature certificates.

OP uses certificate generated by OP's own CA.

The TLS server X.509 certificates that are used to protect communication with client web browsers MUST be generally trusted by browsers (95+%). OP will use Symantec Class 3 EV SSL CA - G3 at least until 30.10.2023.

Signature sertificates on request and response messages have to be SHA-256. In Finnish Trust Network the <saml2p:AuthnRequest> messages need to be signed, and Identity Providers will not not accept messages that are not signed, or where the verification of the signature fails.

2.2 Partner profile

To be able to make the integration, OP Identity provider and the service which are going to integrate, need to exchange metadata for to create Partner Profiles. With these partner profiles, different actors can integrate into others systems and identify others for right actions in FTN.

The following information is required for the partner profile:

- Certificate
- Response URL: all URLs have to be added to the metadata so that SAML responses go into the right destination. This should be put in element <md:AssertionConsumerService> in <location> attribute.
- PartnerId: At least one ID value is required. If SP is providing also service to create new credentials then one additional partnerId value is required for weak credentials and one for strong credentials case. PartnerId is mapped to Issuer on SAML request.

2.2.1 Metadata description

Specific metadata should be exchanged between Identity Service Broker and OP IdP for the integration to work. The partner profiles are created using the exchanged metadata. Partner profiles are then used to identify different actors in FTN. This enables the integration and provides information for right handling process.

Next table will present the metadata is described in detail. This metadata represents the metadata which Identity service broker will provide for OP's IdP.

Level	Name	Attribute	Value	Required	About
0	<md:EntitiesDescriptor>			Optional	Used if multiple entities are presented for metadata. Different entities can be included inside this element.
1	<md:EntityDescriptor>			MUST	
		xmlns:md	urn:oasis:names:tc:SAML:2.0:metadata		
		entityID	http://...	MUST	This is the ID with which the partners are recognized within FTN.
2	<md:SPSSODescriptor>				
		AuthnRequestsSigned	TRUE	MUST	
		WantAssertionsSigned	TRUE	MUST	Metadata must include value <WantAuthnRequestsSigned> element with value "true".
		protocolSupportEnumeration	urn:oasis:names:tc:SAML:2.0:protocol		
3	<md:KeyDescriptor			MUST	This includes the signing key.
		use	signing		
4	<KeyInfo	xmlns	http://www.w3.org/2000/09/xmldsig#	MUST	Cotains relevant key information.
5	<X509Data>				
6	<X509Certificate>		MIICRzCCA...WiHUsogetpcqg0qNk=		

3	<md:KeyDescriptor			MUST	This includes the encryption key.
		use	encryption		
4	<KeyInfo				
		xmlns	http://www.w3.org/2000/09/xmldsig#		
5	<X509Data>				
6	<X509Certificate>		MIICRzCCA...WiHUso-getpcqg0qNk=	MJST	
6	<md:EncryptionMethod			MUST	Key transport algorithm.
		Algorithm	http://www.w3.org/2001/04/xmlenc#rsa-oaep-mgf1p	MUST	
3	<md:ManageNameIDService >				
		Binding	urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST		
		Location	http://...		
3	<md:NameIDFormat>		urn:oasis:names:tc:SAML:2.0:nameid-format:transient	MUST	
3	<md:AssertionConsumerService>			MUST	Describes the endpoint of the assertion.
		Binding	urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST	MUST	The method for binding.
		Location	http://...	MUST	Desired response location.
		index	0		
		isDefault	TRUE		
2	<md:Organization>				The information of the organization are included in this element.
3	<md:OrganizationName>		OP		
		xml:lang	en		
3	<md:OrganizationDisplayName>		OP		
		xml:lang	en		
3	<md:OrganizationURL>				
		xml:lang	en		
2	<md:ContactPerson>				
		contactType	Technical		
3	<md:Company>		OP		The information of the company are included in this element
3	<md:GivenName/>				
3	<md:SurName/>				
3	<md:EmailAddress/>				
3	<md:TelephoneNumber/>				

2.2.2 Metadata/partner profile example

```
<?xml version="1.0" encoding="UTF-8"?>
<md:EntityDescriptor xmlns:md="urn:oasis:names:tc:SAML:2.0:metadata" entityID="http://...">
<md:SPSSODescriptor AuthnRequestsSigned="true" WantAssertionsSigned="true" protocolSupportEnumeration="urn:oa-
sis:names:tc:SAML:2.0:protocol">
<md:KeyDescriptor use="signing">
<KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
<X509Data>
<X509Certificate>MIICRzCCA...WiHUsogetpcqg0qNk=</X509Certificate>
</X509Data>
</KeyInfo>
</md:KeyDescriptor>
<md:KeyDescriptor use="encryption">
<KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
<X509Data>
<X509Certificate>MIICRzCCA...WiHUsogetpcqg0qNk=</X509Certificate>
</X509Data>
</KeyInfo>
<md:EncryptionMethod Algorithm="http://www.w3.org/2001/04/xmlenc#rsa-oaep-mgf1p"/>
</md:KeyDescriptor>
<md:ManageNameIDService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST" Location="http://...."/>
<md:NameIDFormat>urn:oasis:names:tc:SAML:2.0:nameid-format:transient</md:NameIDFormat>
<md:AssertionConsumerService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST" Location="http://..." index="0" isDe-
fault="true"/>
</md:SPSSODescriptor>
<md:Organization>
<md:OrganizationName xml:lang="en">OP</md:OrganizationName>
<md:OrganizationDisplayName xml:lang="en">OP</md:OrganizationDisplayName>
<md:OrganizationURL xml:lang="en"/>
</md:Organization>
<md:ContactPerson contactType="technical">
<md:Company>OP</md:Company>
<md:GivenName/>
<md:SurName/>
<md:EmailAddress/>
<md:TelephoneNumber/>
</md:ContactPerson>
</md:EntityDescriptor>
```

2.3 SAML request

SAML AuthnRequest is an authentication request which is sent from Identity service broker to OP's IdP. OP's IdP will receive the SAML AuthnRequest message and will provide the authentication service for the user.

SAML AuthnRequest messages MUST be signed, and Identity Providers will not accept messages that are not signed, or where the verification of the signature fails. In these cases, the Identity Provider will respond with an error message. The signature for an authentication request messages is applied differently depending on the binding.

The hash algorithm used in creation of signatures in SAML messages need to be SHA-256 or stronger.

HTTP-POST binding must be signed using signature –element.

Request must have valid Issuer –value which can be found from partner profile metadata.

NameIdPolicy urn:oasis:names:tc:SAML:2.0:nameid-format:transient is supported and allowCreate –element is set false.

RequestedAuthnContext is exact and only Finnish level of authentication is supported.

OP Idp accepts only signed requests and verifies signature certificate including expiration.

AssertionConsumerServiceURL is compared to partner profile and must match one of the values on partner's metadata.

ForceAuthn and IsPassive attributes have to be set true.

2.3.1 SAML Destination

The SAML request message needs a destination URL for the message to get into IdP. The destination should be put in the "Destination" attribute of the AuthnRequest message. The destination URL can be found from the metadata, provided by OP, in element <md:AssertionConsumerService> in attribute "Location".

Destination URL, where the SAML is wanted to be received, should be stated in AuthnRequest messages "AssertionConsumerServiceURL" attribute. It should also be stated in the metadata.

2.3.2 SAML request interface description

Next table will present the elements and attributes which are contained in the SAML request message.

Level	Element	Attribute	Required	Value	About
1	<saml2p:AuthnRequest>		MUST		This is the actual authentication request.
		AssertionConsumerServiceURL	MUST	URL	Desired response location URL
		Destination	MUST	URL	URL to which the Service Provider has instructed the user agent to deliver the request
		ID	MUST		An unique ID for a SAML message.
		ForceAuthn	MUST	true	A Boolean value. If "true", the identity provider MUST authenticate the presenter directly rather than rely on a previous security context. If a value is not provided, the default is "false".
		IsPassive	MUST	false	A Boolean value. If "true", the identity provider MUST authenticate the presenter directly rather than rely on a previous security context. If a value is not provided, the default is "false".
		IssueInstant	MUST	YYYY-MM-DDThh:mm:ss	The creation time of the request. Must use a form of DateTime type of W3C XML Schema: "YYYY-MM-DDThh:mm:ss" encoded in UTC without time zones.
		ProtocolBinding	Optional		A URI reference that identifies a SAML protocol binding to be used when returning the <Response>.
		Version	MUST	2.0	States the version of SAML.
	<saml:Issuer		MUST	http://...	ID of the responding service. References to the EntityID attribute in metadata. URL-format.

		Format	MUST	urn:oa-sis:names:tc:SAML:2.0:nameid-format:entity	
2	<ds:Signature>		MUST		<ds:Signature> is defined in [XMLDSig]
		Id	MUST	uuid13303fc8-...-d7a142aeadde	
3	<ds:SignedInfo>		MUST		
4	<ds:Canonicalization-Method>		MUST		
		Algorithm	MUST	http://www.w3.org/2001/10/xml-exc-c14n#	SAML implementations SHOULD use Exclusive Canonicalization [Excl-C14N].
4	<ds:SignatureMethod>		MUST		
		Algorithm	MUST		
4	<ds:Reference>		MUST		The signature must include a single <ds:Reference> containing the ID attribute value of the <samlp:AuthnRequest> element
		URI	MUST	#FIMREQ_d7a...aeadde	
5	<ds:Transforms>		MUST		
6	<ds:Transform>				
		Algorithm		http://www.w3.org/2000/09/xmldsig#enveloped-signature	
	<ds:Transform>				
		Algorithm		http://www.w3.org/2001/10/xml-exc-c14n#"	
7	<xc14n:InclusiveNamespaces>				
		xmlns:xc14n		http://www.w3.org/2001/10/xml-exc-c14n#	
		PrefixList		samlp xs saml xsi ds	
5	<ds:DigestMethod		MUST		
		Algorithm	MUST	http://www.w3.org/2001/04/xmlenc#sha256	
5	<ds:DigestValue>		MUST	eUT...KTM8=	
3	<ds:SignatureValue>		MUST	GM...STo=	
3	<ds:KeyInfo>		MUST		
4	<ds:X509Data>		MUST		
5	<ds:X509Certificate>		MUST		

2	<saml2p:NameIDPolicy>		MUST		
		AllowCreate	MUST	false	A Boolean value used to indicate whether the identity provider is allowed in the course of fulfilling the request, to create new identifier to represent the principal. Need to be false when using urn:oasis:names:tc:SAML:2.0:nameid-format:transient in NameIDPolicy.
		Format	MUST	urn:oasis:names:tc:SAML:2.0:nameid-format:transient	MUST be set to urn:oasis:names:tc:SAML:2.0:nameid-format:transient.
		SPNameQualifier	Optional	https://	Further qualifies an identifier with the name of a service provider or affiliation of providers. This attribute provides an additional means to federate identifiers on the basis of the relying party or parties.
2	<saml2p:RequestedAuthnContext>		MUST	MUST specify the exact authentication assurance level. Need to use Finnish level of authentication (ftn.ficora): loa2 or loa3	In FTN there are not yet loa3 services. So all will be Finnish level loa2.
3	<saml:AuthnContextClassRef>			http://ftn.ficora.fi/2017/loa2	

2.3.3 SAML AuthnRequest message example

```
<samlp:AuthnRequest
xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
xmlns:saml="urn:oasis:names:tc:SAML:2.0:assertion"
xmlns:samlp="urn:oasis:names:tc:SAML:2.0:protocol"
AssertionConsumerServiceURL="http://..."
Destination="http://..."
ForceAuthn="true"
ID="FIMREQ_5dbd2a-015b...-a4e95c10e08c"
IsPassive="false"
IssueInstant="2017-03-24T12:49:54Z"
ProtocolBinding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST" Version="2.0">
<saml:Issuer
Format="urn:oasis:names:tc:SAML:2.0:nameid-format:entity">
http://....
</saml:Issuer>

<ds:Signature
Id="uuid5dbd2b-015b-120c-...c10e08c">
<ds:SignedInfo>
<ds:CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#">
</ds:CanonicalizationMethod>
<ds:SignatureMethod
Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256">
</ds:SignatureMethod>
<ds:Reference
URI="#FIMREQ_5dbd2a-...-a4e95c10e08c">
<ds:Transforms>
<ds:Transform
Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature">
</ds:Transform>
<ds:Transform
Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#">
<xc14n:InclusiveNamespaces
xmlns:xc14n="http://www.w3.org/2001/10/xml-exc-c14n#"
PrefixList="samlp saml ds">
</xc14n:InclusiveNamespaces>
```

```
</ds:Transform>
</ds:Transforms>
<ds:DigestMethod
Algorithm=" http://www.w3.org/2001/04/xmlenc#sha256">
</ds:DigestMethod>
<ds:DigestValue>0CA7kzF2...Tzew7I=
</ds:DigestValue>
</ds:Reference>
</ds:SignedInfo>
<ds:SignatureValue>M6a0wC3+mjf0+fP8xCdvSQm0Bec...Bd3YQaszhxo0B4oTmw=
</ds:SignatureValue>
<ds:KeyInfo>
<ds:X509Data>
<ds:X509Certificate>MIICRzCCAbCgAwIBA...xHWWiHUsogetpcqg0qNk=
</ds:X509Certificate>
</ds:X509Data>
</ds:KeyInfo>
</ds:Signature>

<samlp:NameIDPolicy
AllowCreate="false"
Format="urn:oasis:names:tc:SAML:2.0:nameid-format:transient" SPNameQualifier="http://...">
</samlp:NameIDPolicy>
<samlp:RequestedAuthnContext>
<saml:AuthnContextClassRef>http://ftn.ficora.fi/2017/loa2</saml:AuthnContextClassRef>
</samlp:RequestedAuthnContext>
</samlp:AuthnRequest>
```

2.4 SAML response

Identity provider will always respond with SAML message containing user identity or error described on SAML specification. SAML response's assertion element is returned on encrypted EncryptedAssertion –element. In addition the whole response –element is always signed.

Natural person identity contains the following attributes:

- Family name
- First name
- Date of birth
- Identifier attribute (One need to be given)
  - HETU (Finnish personal identity code)
  - SATU (Finnish electronic client identifier)
  - *Person identifier (eIDAS – not currently supported)*

Subject .element contains always NameID –element and at least one SubjectInformation –element. SubjectConfirmation –element contains one SubjectConfirmationData –element.

SubjectConfirmationData –element contains InResponseTo –element which matches request's ID –attribute and SP assertion consumer service URL.

Also NotOnOrAfter –attribute is included on Conditions –attribute. TimeStamp is on UTC –time zone. All assertions indicate the LoA which in this case is Finnish level of authentication (ftn.ficora).

2.4.1 Response validations

The Identity Service Broker will verify that the assertion is not used more than once within its validity period through the NotOnOrAfter attribute in element.

Response is validated by using the provided certificates.

2.4.2 SAML Response – receive and -send destinations

SAML Response message needs a return destination for to direct the message into right place as it is sent for Identity Service Broker. This value will be the value of SAML AuthnRequests messages AssertionConsumerServiceURL attribute, from which OP's IdP collects it as a destination of SAML Response message. This value should also be in the metadata, in element <md:AssertionConsumerService> in attribute "Location", and these two values, one in SAML and other in the exchanged metadata, will be compared.

Error destination URL and cancel destination URL both need to be provided separately in technical information form. Errors and cancels from IdP will send an unsigned SAML re-sponse in the provided URL. Depending on the case, the included error code is either "AuthnFailed" or "AuthnDenied".

2.4.3 SAML response interface description

Next table will present the elements and attributes which are included into the SAML response message.

Level	Element	Attribute	Value	Required	About
1	<samlp:Response>			MUST	
		Destination	http://...	MUST	URI reference indicationg the address to which this response has been sent.
		ID	FIMRSP_5e02... 3afd	MUST	An unique ID for a SAML message.
		InResponseTo	FIMREQ_5db...10e08c	MUST	The ID of the requesters SAML message.
		IssueInstant	2017-03-24T12:50:12Z	MUST	The creation time of response message. Must use a form of DateTime type of W3C XML Sxhema: "YYYY-MM-DDThh:mm:ss" encoded in UTC without time zones.
		Version	2.0	MUST	Used SAML version.
2	<saml:Issuer>		http://...	MUST	The SAML authority that is making the claim(s) in the assertion. ID of the requesting service. References to the EntityID attribute in metadata. URL-format.
		Format	urn:oa-sis:names:tc:SAML:2.0:nameid-format:entity	MUST	
2	<ds:Signature>			MUST	An XML Signature that protects the integrity of and authenticates the issuer of the assertion.
		Id	uuid5e02df-0...8d56-96ec11413afd		An unique ID for a signature.
3	<ds:SignedInfo>			MUST	
4	<ds:Canonicalization-Method>				
		Algorithm	http://www.w3.org/2001/10/xml-exc-c14n#		
4	<ds:SignatureMethod>			MUST	
		Algorithm	http://www.w3.org/2001/04/xmldsig-more#rsa-sha256	MUST	

4	<ds:Reference>			MUST	Signatures MUST contain a single <ds:Reference> containing a same-document reference to the ID attribute value of the root element of the assertion or protocol message being signed. For example, if the ID attribute value is "foo", then the URI attribute in the <ds:Reference> element MUST be "#foo".
		URI	#FIMRSP_14f7...13c563f7	MUST	
5	<ds:Transforms>			MUST	Signatures in SAML messages SHOULD NOT contain transforms other than the enveloped signature transform (with the identifier http://www.w3.org/2000/09/xmldsig#enveloped-signature) or the exclusive canonicalization transforms (with the identifier http://www.w3.org/2001/10/xml-exc-c14n# or http://www.w3.org/2001/10/xml-exc-c14n#WithComments).
6	<ds:Transform>				
		Algorithm	http://www.w3.org/2000/09/xmldsig#enveloped-signature		
6	<ds:Transform>				
		Algorithm	http://www.w3.org/2001/10/xml-exc-c14n#		
7	<xc14n:InclusiveNamespaces			MUST	
		xmlns:xc14n	http://www.w3.org/2001/10/xml-exc-c14n		
		PrefixList	samlp xs saml xsi ds		
5	<ds:DigestMethod			MUST	
		Algorithm	http://www.w3.org/2001/04/xmlenc#sha256	MUST	
5	<ds:DigestValue>		MFeyJcaK...tmZ0=	MUST	
3	<ds:SignatureValue>		UfQyvR9wTdJEo...ou3StSnx/tlbo=	MUST	
3	<ds:KeyInfo>			MUST	XML Signature defines usage of the <ds:KeyInfo> element.
4	<ds:X509Data>			MUST	
5	<ds:X509Certificate>		MIICRTCCAa6gAwIBA-gIEWIHz6...TN1QJB5QhHEr+tr	MUST	
2	<samlp:Status>			MUST	Informs the requesting service about how the authentication process went. A code representing the status of the corresponding request.
3	<samlp:StatusCode>			MUST	A code representing the status of the activity carried out in response to the corresponding request.
		Value	urn:oasis:names:tc:SAML:2.0:status:Success – *The request succeeded*	MUST	The <StatusCode> element specifies a code or a set of nested codes representing the status of the corresponding request.

2	<saml:EncryptedAssertion>			MUST	This element includes the assertion, and all information included in it, as encrypted. Encrypted assertions are intended as a confidentiality protection mechanism when the plain-text value passes through an intermediary.
3	<EncryptedData>			MUST	The encrypted content and associated encryption details.
		xmlns	http://www.w3.org/2001/04/xmlenc#	MUST	
		Id	uuid14f77024-0...a24b13c563f7	MUST	
		Type	http://www.w3.org/2001/04/xmlenc#Element	MUST	
4	<EncryptionMethod>			MUST	Encryption method. Need to use aes-256.
		Algorithm	http://www.w3.org/2001/04/xmlenc#aes256-cbc	MUST	
4	<ds:KeyInfo>			MUST	
5	<EncryptedKey>			MUST	
		Id	uuid14f77025...8f4d-a24b13c563f7	MUST	
6	EncryptionMethod			MUST	
		Algorithm	http://www.w3.org/2001/04/xmlenc#rsa-oaep-mgf1p	MUST	Key transport algorithm.
6	<ds:KeyInfo>			MUST	
7	<ds:KeyName>			MUST	Name of the key.
6	<CipherData>			MUST	The CipherData is a mandatory element that provides the encrypted data.
7	<CipherValue>		Ob6JUy7ekGs-GXREZH5UPA...Vkqo2qPZCCAf-NQd/MQ=	MUST	The actual encrypted data is the value of this element.
4	<CipherData>			MUST	
5	<CipherValue>		Uf63y3x1AEG-XZQ1nXzujUpUdME0....ffljg97boZufdjUwsc2fpb8=	MUST	
<saml:Assertion> element is encrypted in the element <EncryptedAssertion>. Below is an example of the information in the Assertion element.					
2	<saml:Assertion>			MUST	The entire element issued by the Identity Provider MUST be returned in an encrypted element that is covered by the signature.
		ID	Assertion-...1413afd	MUST	
		IssueInstant	2017-03-24T12:50:12Z	MUST	
		Version	2.0	MUST	
3	<saml:Issuer>		http://...	MUST	
		Format	urn:oasis:names:tc:SAML:2.0:nameid-format:entity	MUST	
3	<ds:Signature>			MUST	
		Id	uuid5e02d7-015b...-bba1-96ec11413afd	MUST	
4	<ds:SignedInfo>			MUST	
5	<ds:CanonicalizationMethod			MUST	

		Algorithm	http://www.w3.org/2001/10/xml-exc-c14n#	MUST	
5	<ds:SignatureMethod			MUST	
		Algorithm	http://www.w3.org/2001/04/xmldsig-more#rsa-sha256	MUST	
5	<ds:Reference			MUST	
		URI	#Assertion-...6ec11413afd	MUST	
6	<ds:Transforms>			MUST	
7	<ds:Transform				
		Algorithm	http://www.w3.org/2000/09/xmldsig#enveloped-signature		
7	<ds:Transform				
		Algorithm	http://www.w3.org/2001/10/xml-exc-c14n#		
8	<xc14n:InclusiveNamespaces			MUST	
		xmlns:xc14n	http://www.w3.org/2001/10/xml-exc-c14n#		
		PrefixList	xs saml xsi		
6	<ds:DigestMethod>			MUST	
		Algorithm	http://www.w3.org/2001/04/xmlenc#sha256	MUST	
6	<ds:DigestValue>		rtyLMi...lxPsll8=	MUST	
4	<ds:SignatureValue>		FdVPaD-figTB3EghBTOxW8MGFs5NwylX2DiSB...	MUST	
4	<ds:KeyInfo>				
5	<ds:X509Data>				
6	<ds:X509Certificate>				
3	<saml:Subject>				
4	<saml:NameID>		uuid5e0257-...a6b7-96ec11413afd	MUST	
		Format	urn:oasis:names:tc:SAML:2.0:nameid-format:transient	MUST	
		NameQualifier	http://...		
		SPNameQualifier	http://...		
4	<saml:SubjectConfirmation>				
		Method	urn:oasis:names:tc:SAML:2.0:cm:bearer		
	<saml:SubjectConfirmationData>			MUST	
		InResponseTo	FIMREQ_5dbd2a-...-a693-a4e95c10e08c	MUST	The InResponseTo attribute MUST be present and its value MUST match the value of the corresponding request's ID attribute.

		NotOnOrAfter	2017-03-24T12:51:12Z	MUST	NotOnOrAfter timestamp MUST be 10 minutes or less into the future at the time of issuance
		Recipient	http://...	MUST	MUST also include a recipient attribute containing the SP assertion consumer service URL
3	<saml:Conditions>			MUST	Identity service broker MUST verify that the assertion is not used more than once within its validity period through the NotOnOrAfter attribute in element
		NotBefore	2017-03-24T12:50:12Z	OPTIONAL	
		NotOnOrAfter	2017-03-24T12:51:12Z	MUST	This is the time for how long the SAML is valid. The Identity Service Broker MUST verify that the assertion is not used more than once within its validity period through the NotOnOrAfter attribute in element.
4	<saml:AudienceRestriction>				
5	<saml:Audience>		http://...		
3	<saml:AuthnStatement>				
		AuthnInstant	2017-03-24T12:50:12Z		
		SessionIndex	uuid5dbdcb-...413afd		
		SessionNotOnOrAfter	2017-03-24T13:50:12Z		
4	<saml:AuthnContext>			MUST	
5	<saml:AuthnContextClassRef>		http://ftn.ficora.fi/2017/loa2	MUST	
3	<saml:AttributeStatement>			MUST	
4	<saml:Attribute>			MUST	There can be many <saml:Attribute> elements with different information in Assertion
		Name	urn.oid:1.2.246.575.1.14	MUST	saml:AttributeValue depends on the value given for saml:Attribute Name: urn:oid:2.5.4.4 – FamilyName urn.oid:1.2.246.575.1.14 – FirstNames urn:oid:1.3.6.1.5.5.7.9.1 – DateOfBirth urn:oid:1.2.246.21 - HETU urn:oid:1.2.246.22 - SATU *http://eidas.europa.eu/attributes/naturalperson/PersonIdentifier - PersonIdentifier (not supported)* MUST choose one of the two last ones (HETU, SATU (personIdentifier is not supported).
		NameFormat	urn:oasis:names:tc:SAML:2.0:attrname-format:uri	MUST	NameFormat SHALL contain the value urn:oasis:names:tc:SAML:2.0:attrname-format:uri
6	<saml:AttributeValue>		Väinö	MUST	The actual value of "Name" attribute. If Name was urn:oid:2.5.4.42 then here lies FirstName like "Matti".
		xsi:type	xs:string		

2.4.4 SAML Response sample message


```
<samlp:Response xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
xmlns:saml="urn:oasis:names:tc:SAML:2.0:assertion"
xmlns:samlp="urn:oasis:names:tc:SAML:2.0:protocol"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
Destination="http://...login"
ID="FIMRSP_14f77059-...-a24b13c563f7"
InResponseTo="FIMREQ_14f73740...91a1-c7a31aee6a66"
IssueInstant="2017-03-28T12:50:12Z"
Version="2.0">
<saml:Issuer
Format="urn:oasis:names:tc:SAML:2.0:nameid-format:entity">http://...
</saml:Issuer>
<ds:Signature Id="uuid14f7705c-015b...a24b13c563f7">
<ds:SignedInfo>
<ds:CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#"/>
<ds:SignatureMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"/>
<ds:Reference URI="#FIMRSP_14f77059-015b-...68-a24b13c563f7">
<ds:Transforms>
<ds:Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature"/>
<ds:Transform Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#">
<xc14n:InclusiveNamespaces xmlns:xc14n="http://www.w3.org/2001/10/xml-exc-c14n#"
PrefixList="samlp xs saml xsi ds"/>
</ds:Transform>
</ds:Transforms>
<ds:DigestMethod Algorithm="http://www.w3.org/2001/04/xmlenc#sha256"/>
<ds:DigestValue>I56zi0KE7Y9...U+R6UtjT8=
</ds:DigestValue>
</ds:Reference>
</ds:SignedInfo>
<ds:SignatureValue>UfQyvR9wTdSkQ0XTBEHQzh4yfLQjzJEo...ou3StC+0CdJ4CxiW3bD64Q7PSnx/tIbo=
</ds:SignatureValue>
<ds:KeyInfo>
<ds:X509Data>
<ds:X509Certificate>MIICRTCCAa6gAwIBAgIEWIHz6...TN1QJB5QhHEr+tr
</ds:X509Certificate>
</ds:X509Data>
</ds:KeyInfo>
</ds:Signature>
<samlp:Status>
<samlp:StatusCode
Value="urn:oasis:names:tc:SAML:2.0:status:Success"/>
</samlp:Status>
<saml:EncryptedAssertion>
<EncryptedData
xmlns="http://www.w3.org/2001/04/xmlenc#"
Id="uuid14f77024-015b-...-a24b13c563f7"
Type="http://www.w3.org/2001/04/xmlenc#Element">
<EncryptionMethod Algorithm="http://www.w3.org/2001/04/xmlenc#aes256-cbc"/>
<ds:KeyInfo>
<EncryptedKey
Id="uuid14f77025-015b-...-a24b13c563f7">
<EncryptionMethod
Algorithm="http://www.w3.org/2001/04/xmlenc#rsa-oaep-mgf1p"/>
<ds:KeyInfo>
<ds:KeyName>KeyName
</ds:KeyName>
</ds:KeyInfo>
<CipherData>
```

<CipherValue>Ob6JUy7ekGsA...Vkqo2qQd/MQ=
</CipherValue>
</CipherData>
</EncryptedKey>
</ds:KeyInfo>
<CipherData>
<CipherValue>Uf63y3x1AEGXZQdME0....ffljg97c2fpb8=</CipherValue>
</CipherData>
</EncryptedData>
</saml:EncryptedAssertion>
</samlp:Response>

Elements and attributes which are encrypted inside *EncryptedAssertion* element:

<saml:Assertion
ID="Assertion-uuid5e02d5-...-96ec11413afd"
IssueInstant="2017-03-24T12:50:12Z" Version="2.0">
<saml:Issuer
Format="urn:oasis:names:tc:SAML:2.0:nameid-format:entity">http://...
</saml:Issuer>
<ds:Signature
Id="uuid5e02d7-015b-...-96ec11413afd">
<ds:SignedInfo>
<ds:CanonicalizationMethod
Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#">
</ds:CanonicalizationMethod>
<ds:SignatureMethod
Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256">
</ds:SignatureMethod>
<ds:Reference
URI="#Assertion-uuid5e02d5-...-8d97-96ec11413afd">
<ds:Transforms>
<ds:Transform
Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature">
</ds:Transform>
<ds:Transform
Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#">
<xc14n:InclusiveNamespaces
xmlns:xc14n="http://www.w3.org/2001/10/xml-exc-c14n#"
PrefixList="xs saml xsi">
</xc14n:InclusiveNamespaces>
</ds:Transform>
</ds:Transforms>
<ds:DigestMethod
Algorithm="http://www.w3.org/2001/04/xmlenc#sha256">
</ds:DigestMethod>
<ds:DigestValue>rtyLMiXZY...LxLIxPsll8=
</ds:DigestValue>
</ds:Reference>
</ds:SignedInfo>
<ds:SignatureValue>FdVPaDfigTB3EghBT0xW...xTDphn2HkQ569NM1q0xNppJPQnjQSF4zfWu3mkypevXWBkvLX7urYQv+Q+QLU=
</ds:SignatureValue>
<ds:KeyInfo>
<ds:X509Data>
<ds:X509Certificate>MIICRTCCAa6gAwIBAg...BgkqhkiG9w0BAQUFADBRMtr
</ds:X509Certificate>
</ds:X509Data>
</ds:KeyInfo>
</ds:Signature>
<saml:Subject>

<saml:NameID
Format="urn:oasis:names:tc:SAML:2.0:nameid-format:transient"
NameQualifier="http://..."
SPNameQualifier="http://...">uuid5e0257-015b-...-96ec11413afd</saml:NameID>
<saml:SubjectConfirmation
Method="urn:oasis:names:tc:SAML:2.0:cm:bearer">
<saml:SubjectConfirmationData
InResponseTo="FIMREQ_5dbd2a-...-a4e95c10e08c"
NotOnOrAfter="2017-03-24T12:51:12Z"
Recipient="http://...">
</saml:SubjectConfirmationData>
</saml:SubjectConfirmation>
</saml:Subject>
<saml:Conditions
NotBefore="2017-03-24T12:50:12Z"
NotOnOrAfter="2017-03-24T12:51:12Z">
<saml:AudienceRestriction>
<saml:Audience>http://...
</saml:Audience>
</saml:AudienceRestriction>
</saml:Conditions>
<saml:AuthnStatement
AuthnInstant="2017-03-24T12:50:12Z"
SessionIndex="uuid5dbdcb-...a538-96ec11413afd"
SessionNotOnOrAfter="2017-03-24T13:50:12Z">
<saml:AuthnContext>
<saml:AuthnContextClassRef>http://ftn.ficora.fi/2017/loa2
</saml:AuthnContextClassRef>
</saml:AuthnContext>
</saml:AuthnStatement>
<saml:AttributeStatement>
<saml:Attribute
Name="urn:oid:2.5.4.4"
NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
<saml:AttributeValue xsi:type="xs:string">Väinö
</saml:AttributeValue>
</saml:Attribute>
<saml:Attribute
Name="urn:oid:1.2.246.575.1.1"
NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
<saml:AttributeValue xsi:type="xs:string">urn.oid.1.2.246.21
</saml:AttributeValue>
</saml:Attribute>
<saml:Attribute
Name="urn:oid:1.3.6.1.5.5.7.9.1"
NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
<saml:AttributeValue xsi:type="xs:string">1970-07-07
</saml:AttributeValue>
</saml:Attribute>
<saml:Attribute
Name="urn:oid:1.2.246.575.1.2"
NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
<saml:AttributeValue xsi:type="xs:string">070770-905D
</saml:AttributeValue>
</saml:Attribute>
<saml:Attribute Name="urn:oid:2.5.4.42"
NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
<saml:AttributeValue xsi:type="xs:string">Tunnistus
</saml:AttributeValue>
</saml:Attribute>
</saml:AttributeStatement>

</saml:Assertion>

2.5 Error situations

The authentication process can end up in error. If status is "urn:o-sis:names:tc:SAML:2.0:status:Success",this means that the authentication process was successful and there is no need for error handling.

The party which receives the error SAML is responsible of how the handling and/or communication of the error.

SAML protocol errors are returned immediately back to requester with SAML error message into AssertionConsumerService-URL found in request message.

Other unsuccessful events are returned to either error URL or cancel URL, depending on case. These URL-addresses are needed to be provided from integrating partner in the tech-nical information document. These addresses are added in the profile of the requester and they are used for returning an unsigned response SAML to the provided URLs.

All recoverable errors are shown on UI with dedicated return link. User can decide to go back to service provider (in this case broker) by clicking the return link. Return link sends an un-signed SAML error response with an error code “AuthnFailed” or “AuthnDenied” into the er-ror URL given by the Identity Service Broker.

User can cancel the identification flow by pressing the cancel button on UI. This creates an unsigned SAML response with error code “AuthnFailed” into the cancel URL given by the Identity Service Broker.

The party which receives the error SAML is responsible of how the handling and/or commu-nication of the error.

2.6 Metadata template

Metadata xml-file should be created with the instructions and examples below. Sections that need to be completed in the template are marked with “TODO”.

Level	Element	Attribute	Value	Required	About
0	<md:EntitiesDescriptor>			Optional	Used if multiple entities are pre-sented in metadata. Different entities can be included inside this element in <md:EntityDescriptor> elements.
1	<md:EntityDescriptor>			MUST	Describes information of one specific entity (partner).
		xmlns:md	urn:oa-sis:names:tc:SAML:2.0:metadata	MUST	Format
		entityID	TODO	MUST	This is the ID with which the partners are recognized within FTN. Should be in URL-format.
2	<md:SPSSODescriptor>			MUST	Includes information that is specific to service provider.
		AuthnRe-questsSigned	true	MUST	Indicates whether the <samlp:AuthnRequest> messages

					sent by this service provider will be signed. Need to be set TRUE.
		WantAsser-tionsSigned	true	MUST	This implies that the assertions need to be signed.
		protocolSupportEnu-meration	urn:oa-sis:names:tc:SAML:2.0:protocol	MUST	URI that identify the set of protocol specifications supported.
3	<md:KeyDescriptor>			MUST	This includes the signing key infor-mation
		use	signing	MUST	Declares the usage of the key. The key here is used for signing.
4	<KeyInfo>			MUST	
		xmlns	http://www.w3.org/2000/09/xmld-sig#	MUST	Format
5	<X509Data>			MUST	
6	<X509Certificate>		TODO	MUST	The signing key.
3	<md:KeyDescriptor>			MUST	This includes the signing key infor-mation
		use	encryption	MUST	Declares the usage of the key. The key here is used for encryption.
4	<KeyInfo>			MUST	
		xmlns	http://www.w3.org/2000/09/xmld-sig#	MUST	Format
5	<X509Data>			MUST	
6	<X509Certificate>		TODO	MUST	The encryption key.
6	<md:EncryptionMethod>			MUST	
		Algorithm	http://www.w3.org/2001/04/xmlenc#rsa-oaep-mgf1p	MUST	Key Transport algorithm.
3	<md:NameIDFormat>		urn:oa-sis:names:tc:SAML:2.0:nameid-format:transient	MUST	Saml-messages in FTN MUST sup-port the urn:oa-sis:names:tc:SAML:2.0:nameid-for-mat:transient name identifier format
	<md:AssertionConsum-erService>			MUST	Describes the endpoint of the asser-tion.
		Binding	urn:oa-sis:names:tc:SAM	MUST	The method for binding.

			L:2.0:bind-ings:HTTP-POST		
		Location	TODO	MUST	Desired response location in URL-format.
		index	0	MUST	Uniquely identifies multiple ACS end-points. Here always 0 as there will be one endpoint.
		isDefault	true	MUST	Defines which is the default endpoint. Must be true for index 0 endpoint.
	<md:Organization>			MUST	The information of the organization are included in this element.
	<md:OrganizationName>		TODO	MUST	Organization name. Eg. "OP"
		xml:lang	en	MUST	Language of the name.
	<md:OrganizationDis-playName>		TODO	MUST	Name of the organization which is visible in systems.
		xml:lang	en	MUST	Language of the name.
	<md:OrganizationURL>		TODO	MUST (value op-tional)	Organization URL. For example "op.fi"
		xml:lang	en	MUST	Language of the url.

2.6.1 Metadata example in xml-format

```
<?xml version="1.0" encoding="UTF-8"?>
<md:EntityDescriptor xmlns:md="urn:oasis:names:tc:SAML:2.0:metadata" entityID="TODO">
<md:SPSSODescriptor AuthnRequestsSigned="true" WantAssertionsSigned="true" protocolSupportEnumeration="urn:oa-
sis:names:tc:SAML:2.0:protocol">
<md:KeyDescriptor use="signing">
<KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
<X509Data>
<X509Certificate>TODO</X509Certificate>
</X509Data>
</KeyInfo>
</md:KeyDescriptor>
<md:KeyDescriptor use="encryption">
<KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
<X509Data>
<X509Certificate>TODO</X509Certificate>
</X509Data>
</KeyInfo>
<md:EncryptionMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"/>
</md:KeyDescriptor>
<md:NameIDFormat>urn:oasis:names:tc:SAML:2.0:nameid-format:transient</md:NameIDFormat>
<md:AssertionConsumerService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST" Location="TODO" index="0" isDe-
fault="true"/>
</md:SPSSODescriptor>
<md:Organization>
<md:OrganizationName xml:lang="en">TODO</md:OrganizationName>
```

<md:OrganizationDisplayName xml:lang="en">TODO</md:OrganizationDisplayName>
<md:OrganizationURL xml:lang="en"/>
</md:Organization>
</md:EntityDescriptor>