



## D8.5

### Conformance and Interoperability Testing Result Report (3)

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## 1. Executive Summary

This document is deliverable D8.5 “Conformance and Interoperability Testing Result Report (3)” of the project “Lightweight Infrastructure for Global Heterogeneous Trust management in support of an open Ecosystem of Stakeholders and Trust schemes” (LIGHTest, project nr. 700321) with the objective to create a global cross domain trust infrastructure that renders it transparent and easy for verifiers to evaluate electronic transactions.

This document presents the third iteration of the “Conformance and Interoperability Testing” and is built upon deliverable D8.4 Conformance and Interoperability Testing Result Report (2) where test cases are updated that are derived from test assertions/normative specifications given in D8.3 and derived from use case specifications and requirements. Test execution results and analysis on the issues reported for each test case are provided in this report.

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## 2. Document Information

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### 2.2 History

Version	Date	Author	Changes
0.1	09/09/2019	Burçin BOZKURT GÜNAY	First Draft, TOC
0.2	16/09/2019	Neslihan KIZILBEY	Update on the TSPA test cases
0.3	04/11/2019	Burçin BOZKURT GÜNAY	Inclusion of the test executions
0.4	07/11/2019	Burçin BOZKURT GÜNAY	Inclusion of the latest test executions
1.0	25/11/2019	Neslihan KIZILBEY	Update on the review results

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### 3.3 Table of Acronyms

API	Application Program Interface
ASiC	Associated Signature Containers
ATV	Automatic Trust Verifier
AQAA	Atlanta Quality Assurance Association
CA	Certificate Authority
CC	Conformance Clause
DANE	DNS-based Authentication of Named Entities
DNS	Domain Name System
DNSSEC	Domain Name System SEcURITY extensions
DP	Delegation Publisher
eIDAS	Electronic Identification, Authentication and trust (Services)
eT	Electronic transaction
FR	Functional Requirement
HTTP(S)	Hypertext Transfer Protocol (Secure)
ISTQB	International Software Testing Qualifications Board
MTDL	Minder Test Definition Language
M1	Minder END User ATV Adapter
M2	Minder ATV Adapter
NS	Normative Statement
OASIS	Advancing Open standards for information society
PDF	Portable Document Format
RA	Reference Architecture
PKI	Public Key Infrastructure
PTR	Pointer
REST	Representational State Transfer (service)
RR	Resource Record
S/MIME	Secure/Multipurpose Internet Mail Extensions
SUT	System Under Test
TA	Test Assertion
TP	Trust Policy
TPL	Trust Policy Language

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TSLTS	Trust Service Status List Technical Specification
TSL	Trust Service Status List
TSP	Trust Service Provider
TSPA	Trust Scheme Publication Authority
TTA	Trust Translation Authority
UI	User Interface
URI	Uniform Resource Identifier
XML	Extensible Markup Language

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## 4. Scope of the deliverable

### 4.1 Overview

The overall focus of the LIGHTest project is to develop a lightweight trust infrastructure providing parties of electronic transactions with automatic validation of trust based on their individual trust policies. By using an existing infrastructure of the global Domain Name System (DNS) for publication, querying, and cross-jurisdiction translation of information relevant to make such decisions, including levels of assurance, LIGHTest aims to enable the use of truly “global trust lists”. With this approach LIGHTest will basically provide an infrastructure to realize the most important principles and driving factors of eIDAS on a global level.

Conformance testing, also known as compliance testing, is a methodology used in software engineering to ensure that a product, process, computer program or system meets a defined set of standards. In this task, we will test outputs of other WPs in order to see whether they conform to the proposed specifications and standards. Interoperability testing, on the other hand, verifies whether all the systems exchange and use information properly, interpret the exchanged information meaningfully, and multiple entities work together in a harmonious way.

This deliverable is structured as follows. Section 1 presents the executive summary. Section 2 basically includes document information and Section 3 gives the table of contents. Section 4 presents an overview of WP8 and the scope of this deliverable. Section 5 includes the methodology to execute and report test executions. Section 6 presents the updated test cases for TSPA, TTA, and DP derived from conformance and interoperability test assertions of TSPA, TTA and DP. If available, updates on the test assertions and normative statements are also given in this section. Section 7 presents the test execution results that includes the execution status and details of test cases for each LIGHTest component. Section 8 presents conclusions on the test results.

### 4.2 Scope

Within the course of the LIGHTest project, conformance and interoperability testing for the software components developed in WP3, 4, 5, and 6 are carried out by using Minder Testbed and the results are reported periodically. D8.5 Conformance and interoperability testing report (3) is the third report of this series and focuses on execution of test cases and analyses the maturity of the LIGHTest components in the scope of conformance and interoperability testing.

The main contents of this deliverable include the updated test case definitions/scenarios given in deliverable D8.4 and test executions for each test case. The testing environment architecture has also been updated to enhance the execution of the test cases and reporting.

Section 5 content is updated in this deliverable to include the methodology for test execution and reporting. Section 6 content is updated to include the latest definition and number of test cases and test scenarios. Section 7 presents test execution results for TTA, TSPA and DP components. Section 8 presents conclusions on the test results.

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## 5. Test Execution and Reporting Methodology

The main testing methodology is already described in deliverable D8.4 Section 6. This section focuses on the test case executions and reporting of the executions in a compact and trackable manner.

The following figure illustrates the Minder Testbed components and adapters that are implemented to manage automatic testing execution and reporting lifecycle.

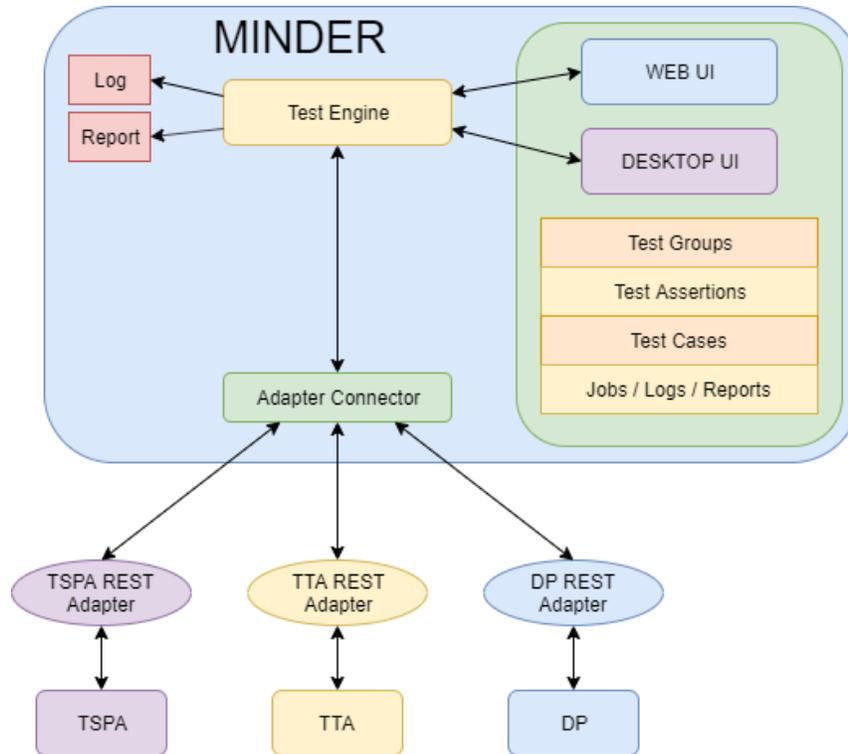


Figure 1 Minder Testbed components

1. Prepare test assets for testing scenarios according to the architecture defined in Section 6 Figure 2.
2. Define/Update test cases on Minder Test Manager using Desktop UI.
3. Define test jobs/groups for the test cases on Minder Test Manager using Desktop UI.
4. Execute and report the test jobs/groups on Minder Test Manager.
5. Analyse the execution results on Minder Test Manager and identify the bugs/corrective actions.
6. Report bugs/corrective actions: Bugs/Corrective actions are reported as “issue” records on the gitlab deployed on <https://extgit.iaik.tugraz.at/>.
7. Re-execute the test cases after the bugs/corrective actions are resolved by the implementers.

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Please note that test cases are executed iteratively. Iterations can be defined according to the requirements implemented within each cycle of the development and bug-fixes done by the implementers for a period of time.

For conformance and interoperability testing, at least three iterations have been performed to cover the all TSPA, TTA and DP components test cases. Also, more than four iterations have been performed within each component to cover the corresponding test cases.

The issues/bugs/defects/corrective actions are reported after completion of each iteration.

## 5.1 Test Criteria

Test criteria include pass/fail, suspension and resumption criteria. The criteria are taken from OASIS TAM<sup>1</sup>.

### 5.1.1 Pass/Fail Criteria

The completion criterion for conformance test iteration is the execution of ALL the test cases generated from test assertions in a test cycle. Test cases should cover all the test assertions and they should be written in a sufficient level of detail. Test Assertions Guideline<sup>2</sup> should be referenced to write assertions.

Each Test Case can have two possible values: **Pass** or **Fail**.

### 5.1.2 Suspension Criteria

There exists NO suspension criteria that make sense to stop the test; All test runs that include test case executions can be completed and test results are reported in the Test Execution/Summary Report.

## 5.2 Traceability

Each test cycle takes test cases for the selected TSPA, TTA and DP components. The traceability of the items tested with the test results (defects/bugs detected and test reports) can be figured as follows:

**Component Name || Test Case ID || Result Reference || Date**

Please recap the naming convention of test case ID given in deliverable D8.4 as follows:

**TC\_ LIGHTestComponentName(TSPA,TTA,DP)\_TestCaseID**

## 5.3 Defect Management

A defect/bug is something that may cause a failure. A failure is the result of a defect as seen by the User, the system crashes, etc.

<sup>1</sup> <http://docs.oasis-open.org/>

<sup>2</sup> <http://docs.oasis-open.org/tag/guidelines/v1.0/testassertionsguidelines.html>

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When a test cycle is completed on Minder, each test case is completed with **Success** or **Fail**. Failed test cases are sources for the detected defects.

Defect Management is performed with the support of the GitLab deployed on <https://extgit.iaik.tugraz.at/>.

Defect records will be created as “issue” record with “Bug” label for each failed test cases. More than one defect can be generated for an executed test case. The severity of the defects can be **Low, Medium** and **High**. The priority of the defects can be **Low, Medium** and **High**.

Resolution of each defect can be tracked from gitLab repository located in <https://extgit.iaik.tugraz.at/> .

Test case executions are performed in a new iteration after the defects are resolved and a new version of the components is re-deployed with the fix inclusions.

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## 6. Conformance and Interoperability Test Assertions and Test Cases

This section lists the second round of test cases for TSPA, TTA, and DP respectively. Initial versions of test case definitions and test scenarios are already given in deliverable D8.4. This section includes the updated version of test cases with test scenarios.

Following the methodology described in the deliverable D8.3 Section 6.2, test cases are updated and new test cases are included for conformance to these specifications.

Test asset generation is based on the following infrastructure where a fictional PKI is created for signing and validation transactions and trust-lists.

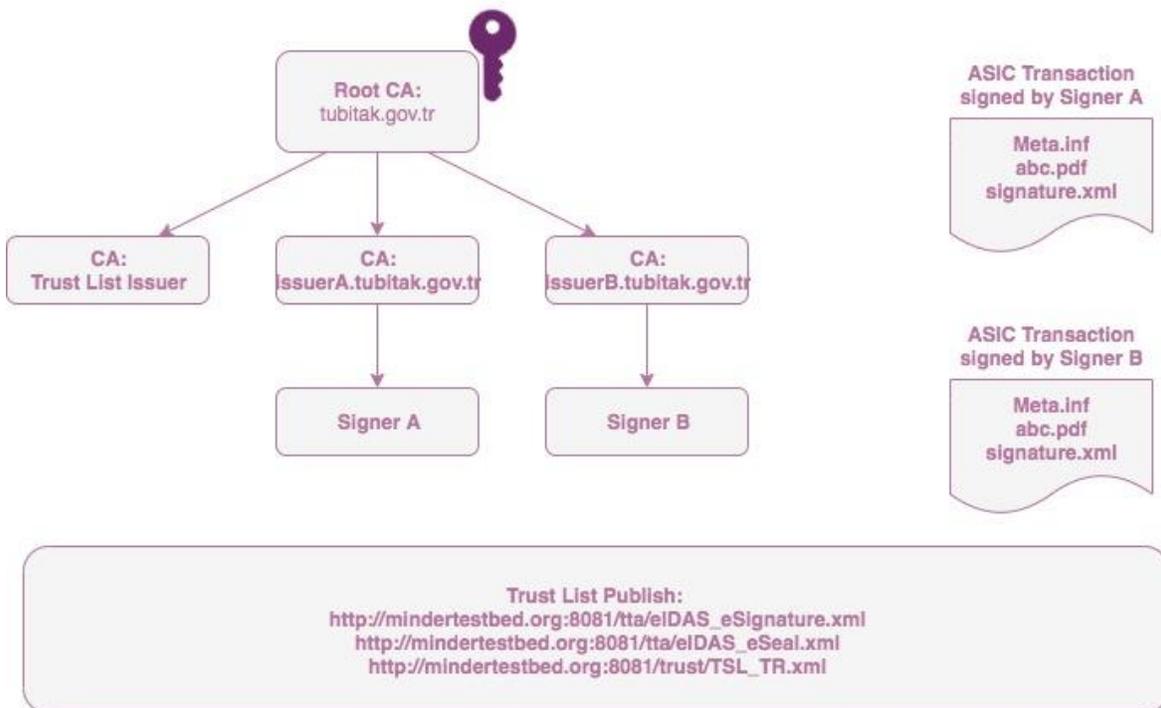


Figure 2 PKI Infrastructure for test scenarios

### 6.1 TSPA

#### 6.1.1 TSPA Normative Statements

The normative statements are already provided in deliverable D8.4 Section 7.1. For brevity, the normative statements are not included in this document, since they are not updated.

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### 6.1.2 TSPA Test Assertions

The test assertions are already given in deliverable D8.4 Section 7.1.3. The updated are given in the following. Please note that updated parts are in italic form.

<b>TA ID</b>	TA_TSPA_3
<b>Normative Source</b>	NS_TSPA_4, NS_TSPA_5, NS_TSPA_6, NS_TSPA_7
<b>Target</b>	TSPA
<b>Prerequisite</b>	The TSPA DNS Name Server is up and running and contains published trust scheme membership declarations in the form of PTR Records. The ATV has issued an IssuerName query to the TSPA.
<b>Prescription Level</b>	Mandatory
<b>Predicate</b>	The RR response to the IssuerName query is a PTR Record and its DNSSEC validation is successful.

<b>TA ID</b>	TA_TSPA_12
<b>Normative Source</b>	NS_TSPA_6, NS_TSPA_7, <i>NS_TSPA_8</i>
<b>Target</b>	TSPA
<b>Prerequisite</b>	The TSPA DNS Name Server is up and running and contains published trust list declarations in the form of signed trust lists. The ATV has issued an SchemeNameTuples query to the TSPA.
<b>Prescription Level</b>	Mandatory
<b>Predicate</b>	The RR response to the SchemeNameTuples query is a set of tuples retrieved from the pointer of the respective trust list entry.

The new assertions are given in the following:

<b>TA ID</b>	TA_TSPA_13
<b>Normative Source</b>	NS_TSPA_8, NS_TSPA_2
<b>Target</b>	TSPA
<b>Prerequisite</b>	The TSPA DNS Name Server is up and running.
<b>Prescription Level</b>	Mandatory
<b>Predicate</b>	A publish service for trust list should be provided by TSPA.

<b>TA ID</b>	TA_TSPA_14
<b>Normative Source</b>	NS_TSPA_8
<b>Target</b>	TSPA
<b>Prerequisite</b>	The TSPA DNS Name Server is up and running.

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<b>Prescription Level</b>	Mandatory
<b>Predicate</b>	A publish service for trust scheme should be provided by TSPA

<b>TA ID</b>	TA_TSPA_15
<b>Normative Source</b>	NS_TSPA_8
<b>Target</b>	TSPA
<b>Prerequisite</b>	The TSPA DNS Name Server is up and running.
<b>Prescription Level</b>	Mandatory
<b>Predicate</b>	A trust scheme retrieval service should be provided by TSPA

<b>TA ID</b>	TA_TSPA_16
<b>Normative Source</b>	NS_TSPA_11
<b>Target</b>	TSPA
<b>Prerequisite</b>	The TSPA DNS Name Server is up and running and contains published trust scheme membership declarations in the form of PTR Records. The ATV has issued a CertificateConstraints query to the TSPA.
<b>Prescription Level</b>	Mandatory
<b>Predicate</b>	The RR response to the SMIMEA query contains four possible constraint fields that are CA constraints, Service Certificate Constraints, Trust Anchor Assertion are Domain-Issued Certificate.

### 6.1.3 TSPA Test Scenario

#### Electronic Signature Law of Turkey:

A trust scheme for Turkey is published on a domain “**turkey.lightest.nlnetlabs.nl**”. eIDAS format is used as a trust scheme format. The name of the trust service is “eIDAS electronic signature trust service”. It is assumed that there is a Root CA and two issuers under this CA (issuerA and issuerB)

The verifier claims a membership with a trust scheme identified as **eidas.kamusm.gov.tr-example** (which is the fictional domain used by Turkey for their trusted list owned by Kamu SM in Turkey).

The verifier discovers the trust list for that via another DNS query. It should download that list and see if the issuer certificate (**signerA**) from the electronic transaction appears on that list.

The trust list is signed with “**Turkey Trust Provider CA TR**”. The verifier will check whether the

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“Turkey Trust Provider CA TR” used for signing the trusted list is valid with SMIMEA record.

The trust lists are published at <http://www.mindertestbed.org:8081/trust folder>.

#### 6.1.4 TSPA Test Cases

This section includes the list of all test cases and test case details.

##### 6.1.4.1 TSPA Test Case List

**Table 1 List of TSPA test cases**

ID	Purpose
TC_TSPA_1	Check if TSPA-DNS server exists and is configured to be used by TSPA.
TC_TSPA_2	Verify that RR responses are signed by a valid Zone Key of DNS.
TC_TSPA_3	Verify that RR response to the issuer name is a PTR record and DNSSec validation is successful.
TC_TSPA_4	Verify that RR response to the issuer name is a URI record and DNSSec validation is successful.
TC_TSPA_5	Verify that trust list, pointed on the URI RR record, signature validation is successful.
TC_TSPA_6	Verify that an invalid trust list, pointed on the URI RR record, signature validation fails.
TC_TSPA_7	Verify that received DNS query is of the form given in TA_TSPA_6.
TC_TSPA_8	Verify that trust scheme and trust lists can be successfully retrieved from TSPA.
TC_TSPA_9	Verify that a trust list for the given trust scheme can be published successfully.
TC_TSPA_10	Verify that trust list published on TSPA validation fails in case of invalid certificate constraints.
TC_TSPA_11	Verify that a Boolean trust scheme can be successfully defined and published on TSPA.
TC_TSPA_12	Verify that an ordinal trust scheme can be successfully defined and published on TSPA.
TC_TSPA_13	Verify that trust schemes on TSPA can be successfully retrieved.
TC_TSPA_14	Verify that received TSPA works in synchronization with DNS entries.
TC_TSPA_15	Verify that delete service of TSPA for scheme name works successfully.
TC_TSPA_16	Verify that delete service of TSPA for trust-list works successfully.
TC_TSPA_17	Verify that delete service of TSPA for a trust scheme works in synchronization with DNS records.
TC_TSPA_18	Verify that delete service of TSPA for trust-list works in synchronization with DNS records.
TC_TSPA_19	Verify that tuple schemes can be defined and published on TSPA successfully.
TC_TSPA_20	Verify that trust schemes on TSPA can be successfully retrieved.
TC_TSPA_21	Verify that RR response to the scheme name is a URI record and DNSSec validation is successful and verify that publish service of TSPA for trust list works successfully.

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TC_TSPA_22	Verify that publish service of TSPA for trust list works successfully for different SMIMEA parameters (sha256 parameters).
TC_TSPA_23	Verify that publish service of TSPA for trust list works successfully for different SMIMEA parameters (sha512 parameters).
TC_TSPA_24	Verify that publish service of TSPA for trust list works successfully for invalid SMIMEA parameters (matching:sha512, data:sha256hash).
TC_TSPA_25	Verify that publish service of TSPA for trust list works successfully for invalid SMIMEA parameters (matching:sha256, data:sha512hash).
TC_TSPA_26	Verify that publish service of TSPA for scheme name works successfully.
TC_TSPA_27	Verify that a non-existing trust list deletion works properly on TSPA.

6.1.4.2 TSPA Test Case Details

<b>ID</b>		<b>TC_TSPA_1</b>
<b>Assertion(s)</b>		TA_TSPA_1
<b>Test Purpose</b>		Check if TSPA-DNS server exists and is configured to be used by TSPA.
<b>Pre-Test Conditions</b>		TSPA should already be deployed. DNS deployment should be available.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig lightest.nlnetlabs.nl</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; lightest.nlnetlabs.nl ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 8688 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:;, udp: 4096 ;; QUESTION SECTION: ;lightest.nlnetlabs.nl.                IN      A  ;; ANSWER SECTION: lightest.nlnetlabs.nl.                3600   IN      A 185.49.141.61                     </pre>
2	Minder sends to TSPA the following HTTP PUT request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/scheme</i> with <i>eid.kamusm.gov.tr-example</i> scheme name	The service should return HTTP 200 OK
3	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761                     </pre>

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	<pre>;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ;_scheme._trust.turkey.lightest.nlnetlabs.nl. IN PTR  ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl. 3600 IN PTR _scheme._trust.eidas.kamusm.gov.tr-example</pre>
--	---

<b>ID</b>	<b>TC_TSPA_2</b>	
<b>Assertion(s)</b>	TA_TSPA_2	
<b>Test Purpose</b>	Verify that RR responses are signed by a valid Zone Key of DNS.	
<b>Pre-Test Conditions</b>	TSPA DNS is up and running with DANE protocol enabled in the configured DNS.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	<p>On the terminal, type the following command:</p> <pre>dig lightest.nlnetlabs.nl +noall +comments</pre>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; lightest.nlnetlabs.nl +noall +comments ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 10833 ;; flags: qr rd ra aa; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1</pre>

<b>ID</b>	<b>TC_TSPA_3</b>	
<b>Assertion(s)</b>	TA_TSPA_3	
<b>Test Purpose</b>	Verify that RR response to the issuername is a PTR record and DNSSEC validation is successful.	
<b>Pre-Test Conditions</b>	TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running. A valid trust scheme: with <i>eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	<p>On the terminal, type the following command:</p> <pre>dig _scheme._trust. turkey.lightest.nlnetlabs.nl PTR</pre>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ;_scheme._trust.turkey.lightest.nlnetlabs.nl. IN PTR</pre>

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		;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl. 3600 IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example
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<b>ID</b>		<b>TC_TSPA_4</b>
<b>Assertion(s)</b>		TA_TSPA_4
<b>Test Purpose</b>		Verify that RR response to the scheme name is a URI record and DNSSec validation is successful.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i>	;<<>> DiG 9.10.6 <<>> _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION: ;_scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 <i>http://www.mindertestbed.org:8081/trust/TSL_TR.xml</i>

<b>ID</b>		<b>TC_TSPA_5</b>
<b>Assertion(s)</b>		TA_TSPA_5
<b>Test Purpose</b>		Verify that trust list, pointed on the URI RR record, signature validation is successful.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA. A valid trust list is defined in TSPA (TC_TSPA_4 should be executed).
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i>	;<<>> DiG 9.10.6 <<>> _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

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		<pre>;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:: udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 http://www.mindertestbed.org:8081/trust/TSL-XML.xml</pre>
2	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> with <i>http://www.mindertestbed.org:8081/trust/TSL_TR.xml</i> parameter	The trust list should be downloaded
3	Execute Minder-ATV <i>verifyTrustList</i> service that performs signature validation	The trust list verification should return TRUE
4	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA</i>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:: udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA (3 0 0) with the full certificate</pre>
5	Execute Minder-ATV <i>checkCertificatefromSMIMEA</i> service to verify the certificate used to sign the trust list	Certificate validation result should return TRUE

<b>ID</b>	<b>TC_TSPA_6</b>
<b>Assertion(s)</b>	TA_TSPA_5
<b>Test Purpose</b>	Verify that an invalid trust list, pointed on the URI RR record, signature validation fails.
<b>Pre-Test Conditions</b>	TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running. A valid trust scheme: with <i>eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.

Step	Test Activity	Expected Result
1	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer:</pre>

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		<pre>;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lighttest.nlnetlabs.nl IN URI ;; ANSWER SECTION: _scheme._trust.turkey.lighttest.nlnetlabs.nl IN URI 1 1 http://www.mindertestbed.org:8081/trust/InvalidTSL_TR.xml</pre>
2	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> with <code>http://www.mindertestbed.org:8081/trust/InvalidTSL_TR.xml</code> parameter	The trust list should be downloaded
3	Execute Minder-ATV <i>verifyTrustList</i> service that performs signature validation	The trust list verification should return FALSE
4	On the terminal, type the following command: <code>dig _scheme._trust.turkey.lighttest.nlnetlabs.nl SMIMEA</code>	<pre>&lt;&lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&lt;&gt;&gt; _scheme._trust.turkey.lighttest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lighttest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lighttest.nlnetlabs.nl IN SMIMEA (3 0 0) with the full certificate</pre>
5	Execute Minder-ATV <i>checkCertificatefromSMIMEA</i> service to verify the certificate used to sign the trust list	Certificate validation result should NOT be successful

<b>ID</b>	<b>TC_TSPA_7</b>	
<b>Assertion(s)</b>	TA_TSPA_6	
<b>Test Purpose</b>	Verify that received DNS query is of the form given in TA_TSPA_6.	
<b>Pre-Test Conditions</b>	TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidass.kamusm.gov.tr-example</i> should be published with <i>turkey.lighttest.nlnetlabs.nl</i> domain name in TSPA.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>

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1	Minder sends to TSPA the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/scheme/turkey.lightest.nlnetlabs.nl</i>	The service should return HTTP 200 OK
2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	<pre> ;&lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ;_scheme._trust.turkey.lightest.nlnetlabs.nl. IN PTR  ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl. 3600 IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example                     </pre>

<b>ID</b>		<b>TC_TSPA_8</b>
<b>Assertion(s)</b>		TA_TSPA_7
<b>Test Purpose</b>		Verify that trust scheme and trust lists can be successfully retrieved from TSPA.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/scheme/turkey.lightest.nlnetlabs.nl</i>	The service should return HTTP 200 OK with response data including <i>eidas.kamusm.gov.tr-example</i> trust scheme
2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	<pre> ;&lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ;_scheme._trust.turkey.lightest.nlnetlabs.nl. IN PTR                     </pre>

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		;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl. 3600 IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example
3	Minder sends to TSPA the following HTTP PUT request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i> with <i>http://www.mindertestbed.org:8081/trust/TSL_TR.xml</i> parameter	The service should return HTTP 200 OK
4	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i>	;<<>> DiG 9.10.6 <<>> _scheme._trust.eidas.kamusm.gov.tr-example URI ;; global options: +cmd ;; Got answer: ;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:;, udp: 4096 ;; QUESTION SECTION: _scheme._trust.eidas.kamusm.gov.tr-example IN URI ;; ANSWER SECTION: _scheme._trust.eidas.kamusm.gov.tr-example IN URI 1 1 <i>http://www.mindertestbed.org:8081/trust/TSL_TR.xml</i>

<b>ID</b>		<b>TC_TSPA_9</b>
<b>Assertion(s)</b>		TA_TSPA_8, TA_TSPA_16
<b>Test Purpose</b>		Verify that a trust list for the given trust scheme can be published successfully.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/scheme/turkey.lightest.nlnetlabs.nl</i>	The service should return HTTP 200 OK with response data including <i>eidas.kamusm.gov.tr-example</i> scheme
2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	;<<>> DiG 9.10.6 <<>> _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

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		<pre>;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ;_scheme._trust.turkey.lightest.nlnetlabs.nl. IN PTR  ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl. 3600 IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example</pre>
3	<p>Minder sends to TSPA the following HTTP PUT request:  <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i> with <i>http://www.mindertestbed.org:8081/trust/TSL_TR.xml</i> and "certificate":[] parameters</p>	The service should return HTTP 200 OK
4	<p>On the terminal, type the following command:  <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i></p>	<pre>&lt;&lt;&gt; DiG 9.10.6 &lt;&lt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; -&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 http://www.mindertestbed.org:8081/trust/TSL_TR.xml</pre>
5	<p>Execute Minder-ATV <i>verifyTrustList</i> service that performs signature validation for the trust list downloaded in <i>http://www.mindertestbed.org:8081/trust/TSL_TR.xml</i></p>	Trust List validation result should be successful
6	<p>On the terminal, type the following command:  <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA</i></p>	<pre>&lt;&lt;&gt; DiG 9.10.6 &lt;&lt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION:</pre>

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		_scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl... IN SMIMEA (3 0 0) with the full certificate
7	Execute Minder-ATV <i>checkCertificateFromSMIMEA</i> service that includes the certificate to be used during the validation of the trust list signer certificate	The certificate validation result should be successful

<b>ID</b>	<b>TC_TSPA_10</b>	
<b>Assertion(s)</b>	TA_TSPA_8, TA_TSPA_16	
<b>Test Purpose</b>	Verify that trust list published on TSPA validation fails in case of invalid certificate constraints.	
<b>Pre-Test Conditions</b>	TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA. A valid trust list URI record is already defined on TSPA-DNS. An SMIMEA record including an invalid certificate to be used in trust list validation.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI</i>	;<<>> DiG 9.10.6 <<>> _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION: ;_scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 <i>http://www.mindertestbed.org:8081/trust/TSL_TRL.xml</i>
2	Minder parses DNS query and Execute Minder-ATV <i>verifyTrustList</i> service that performs signature validation for the trust list downloaded in <i>http://www.mindertestbed.org:8081/trust/TSL_TR.xml</i>	Trust List validation result should be successful

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3	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lighttest.nlnetlabs.nl SMIMEA</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lighttest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lighttest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lighttest.nlnetlabs.nl IN SMIMEA (3 0 0) with the base16 encoded certificate(invalid)                 </pre>
4	Minder parses DNS query and Execute Minder-ATV <i>checkCertificateFromSMIMEA</i> service with invalid certificate	The certificate validation result should return FALSE

<b>ID</b>	TC_TSPA_11	
<b>Assertion(s)</b>	TA_TSPA_9	
<b>Test Purpose</b>	Verify that a Boolean trust scheme can be successfully defined and published on TSPA.	
<b>Pre-Test Conditions</b>	TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP PUT request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lighttest.nlnetlabs.nl/schemes</i> with <i>boolean.eidas.kamusm.gov.tr-example</i> parameter	The service should return HTTP 200 OK. (Total 2 trust scheme with <i>.eidas.kamusm.gov.tr-example</i> and <i>boolean.eidas.kamusm.gov.tr-example</i> should be available)
2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lighttest.nlnetlabs.nl PTR</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lighttest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lighttest.nlnetlabs.nl IN PTR                 </pre>

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		; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example _scheme._trust.boolean.eidas.kamusm.gov.tr-example
3	Minder sends to TSPA the following GET request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/scheme/turkey.lightest.nlnetlabs.nl</i>	The service should return HTTP 200 OK

<b>ID</b>		<b>TC_TSPA_12</b>
<b>Assertion(s)</b>		TA_TSPA_10
<b>Test Purpose</b>		Verify that an ordinal trust scheme can be successfully defined and published on TSPA.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP PUT request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/schemes with ordinallevelname.eidas.kamusm.gov.tr-example</i> parameter	The service should return HTTP 200 OK. (Total 3 trust scheme with .eidas.kamusm.gov.tr-example and boolean.eidas.kamusm.gov.tr-example and ordinallevelname.eidas.kamusm.gov.tr-example should be available)
2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	; <<>> DiG 9.10.6 <<>> _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:;, udp: 4096 ; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR ; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example _scheme._trust.boolean.eidas.kamusm.gov.tr-example _scheme._trust.ordinallevelname.eidas.kamusm.gov.tr-example

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3	Minder sends to TSPA the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/scheme/turkey.lightest.nlnetlabs.nl</i> with no parameter	The service should return HTTP 200 OK.
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<b>ID</b>		<b>TC_TSPA_13</b>
<b>Assertion(s)</b>		TA_TSPA_10, TA_TSPA_15
<b>Test Purpose</b>		Verify that trust schemes on TSPA can be successfully retrieved.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	; <<>> DiG 9.10.6 <<>> _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:;; udp: 4096 ; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR ; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example _scheme._trust.boolean.eidas.kamusm.gov.tr-example _scheme._trust.ordinallevelname.eidas.kamusm.gov.tr-example
2	Minder sends to TSPA the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/scheme/turkey.lightest.nlnetlabs.nl</i>	The service should return HTTP 200 OK

<b>ID</b>		<b>TC_TSPA_14</b>	
<b>Assertion(s)</b>		TA_TSPA_13, TA_TSPA_14, TA_TSPA_15	
<b>Test Purpose</b>		Verify that received TSPA works in synchronization with DNS entries.	
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>	

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1	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lighttest.nlnetlabs.nl PTR</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lighttest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ; QUESTION SECTION: _scheme._trust.turkey.lighttest.nlnetlabs.nl IN PTR ; ANSWER SECTION: _scheme._trust.turkey.lighttest.nlnetlabs.nl IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example _scheme._trust.boolean.eidas.kamusm.gov.tr-example _scheme._trust.ordinallevelname.eidas.kamusm.gov.tr-example                 </pre>
2	Disconnect the Zone Manager connection from the TSPA testing environment	
3	Minder sends to TSPA the following HTTP DELETE request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/scheme/turkey.lighttest.nlnetlabs.nl/schemes</i>	The service should return HTTP 500 with message ZoneManager is currently not reachable!

<b>ID</b>		<b>TC_TSPA_15</b>	
<b>Assertion(s)</b>		TA_TSPA_11	
<b>Test Purpose</b>		Verify that delete service of TSPA for scheme name works successfully.	
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>	
1	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lighttest.nlnetlabs.nl PTR</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lighttest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ; QUESTION SECTION:                 </pre>	

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		<pre>_scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR ; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example _scheme._trust.boolean.eidas.kamusm.gov.tr-example</pre>
2	<p>Minder sends to TSPA the following HTTP DELETE request:  <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/schemes</i></p>	<p>The service should return HTTP 200 OK.  <i>eidas.kamusm.gov.tr-example</i>  <i>boolean.eidas.kamusm.gov.tr-example</i></p> <p><i>Should be deleted.</i></p>
3	<p>On the terminal, type the following command:  <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i></p>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1  ; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR ; ANSWER SECTION:</pre>

<b>ID</b>		<b>TC_TSPA_16</b>
<b>Assertion(s)</b>		TA_TSPA_11
<b>Test Purpose</b>		Verify that delete service of TSPA for trust-list works successfully.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: <i>with eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	<p>Minder sends to TSPA the following HTTP PUT request:  <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i>  with <i>http://www.mindertestbed.org:8081/trust/TobedetedTSL_TR.xml</i> trust list parameter</p>	The service should return HTTP 200 OK
2	<p>On the terminal, type the following command:  <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i></p>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1</pre>

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		<pre>;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 http://www.mindertestbed.org:8081/trust/TobedeletedTSL _TRL.xml</pre>
3	Minder sends to TSPA the following HTTP DELETE request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i>	The service should return HTTP 200 OK
4	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION:</pre>

<b>ID</b>	<b>TC_TSPA_17</b>	
<b>Assertion(s)</b>	TA_TSPA_11	
<b>Test Purpose</b>	Verify that delete service of TSPA for a trust scheme works in synchronization with DNS records.	
<b>Pre-Test Conditions</b>	TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: <i>with tobedeleted.eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1</pre>

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		<pre>;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl /N PTR ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR _scheme._trust.tobedeleted.eidas.kamusm.gov.tr- example</pre>
2	Disconnect the TSPA-Zone Manager connection.	
3	Minder sends to TSPA the following HTTP DELETE request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest /schemes</i>	The service should return "HTTP 500" with reasonable error message "Zone Manager could not be reached"
4	On the terminal, type the following command: dig <i>_scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl /N PTR ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR</pre>

<b>ID</b>		<b>TC_TSPA_18</b>
<b>Assertion(s)</b>		TA_TSPA_11
<b>Test Purpose</b>		Verify that delete service of TSPA for trust-list works in synchronization with DNS records.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP PUT request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i> with <i>http://www.mindertestbed.org:8081/trust/TobedeletedTSL-XML.xml</i> trust list parameter	The service should return HTTP 200 OK

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2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 http://www.mindertestbed.org:8081/trust/TobedeletedTSL- XML.xml                 </pre>
3	Disconnect the Zone Manager connection with TSPA	
4	Minder sends to TSPA the following HTTP DELETE request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i>	The service should return HTTP 500 with "Zone Manager could not be reached" error message

<b>ID</b>		<b>TC_TSPA_19</b>
<b>Assertion(s)</b>		TA_TSPA_12
<b>Test Purpose</b>		Verify that tuple schemes can be defined and published on TSPA successfully.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP PUT request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/schemes with tuplesnameandbirth.eidas.kamusm.gov.tr-example parameter</i>	The service should return HTTP 200 OK. (Total 1 trust scheme with <i>tuplesnameandbirth.eidas.kamusm.gov.tr-example</i> should be available)
2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761                 </pre>

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		;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR ; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR 1 1 _scheme._trust.tuplesnameandbirth.eidas.kamusm.gov.tr-example
3	Minder sends to TSPA the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/scheme/turkey.lightest.nlnetlabs.nl/schemes</i>	The service should return HTTP 200 OK where it contains the 1 scheme name: <i>tuplesnameandbirth.eidas.kamusm.gov.tr-example</i>

<b>ID</b>		<b>TC_TSPA_20</b>
<b>Assertion(s)</b>		TA_TSPA_15
<b>Test Purpose</b>		Verify that trust schemes on TSPA can be successfully retrieved.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. Domain name is not published on TSPA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/scheme/turkeytest.lightest.nlnetlabs.nl</i>	The service should return HTTP 200

<b>ID</b>		<b>TC_TSPA_21</b>
<b>Assertion(s)</b>		TA_TSPA_4, TA_TSPA_13
<b>Test Purpose</b>		Verify that RR response to the schemename is a URI record and DNSSec validation is successful and verify that publish service of TSPA for trust list works successfully.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>

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1	<p>Minder sends to TSPA the following HTTP PUT request:  <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i>                  with <i>http://www.mindertestbed.org:8081/trust/TSL_TR.xml</i> trust list parameter with "certificate":<i>["usage":"dane-ee","selector":"cert","matching":"full","data":"Base16 encoded public key"]</i></p>	<p>The service should return HTTP 200 OK</p>
2	<p>On the terminal, type the following command:  <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i></p>	<pre>;&lt;&lt;&gt; DiG 9.10.6 &lt;&lt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; -&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 http://www.mindertestbed.org:8081/trust/TSL-XML.xml</pre>
3	<p>Minder parses DNS query and Execute Minder-ATV <i>verifyTrustList</i> service that performs signature validation for the trust list downloaded in <i>http://www.mindertestbed.org:8081/trust/TSL_TR.xml</i></p>	<p>Trust List validation result should be successfull</p>
4	<p>On the terminal, type the following command:  <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA</i></p>	<pre>;&lt;&lt;&gt; DiG 9.10.6 &lt;&lt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA (3 0 0) with the base16 encoded certificate</pre>

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5	Minder parses DNS query and Execute Minder-ATV <i>checkCertificateFromSMIMEA</i> service base16 encoded certificate	The service should return TRUE
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<b>ID</b>		<b>TC_TSPA_22</b>
<b>Assertion(s)</b>		TA_TSPA_4, TA_TSPA_13
<b>Test Purpose</b>		Verify that publish service of TSPA for trust list works successfully for different SMIMEA parameters (sha256 parameters).
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP PUT request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i> with <i>http://www.Mindertestbed.org:8081/trust/TSLSecond_TR.xml</i> trust list parameter with "certificate": [{"usage": "dane-ee", "selector": "cert", "matching": "sha256", "data": "sha256 hash of DER encoded certificate"}]	The service should return HTTP 200 OK
2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i>	; <<>> DiG 9.10.6 <<>> _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION : ; EDNS : version : 0, flags ;; udp : 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION: ;_scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 <i>http://www.Mindertestbed.org:8081/trust/TSLSecond_TR.xml</i>

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	Minder parses DNS query and Execute Minder-ATV <i>verifyTrustList</i> service that performs signature validation for the trust list downloaded in <a href="http://www.mindertestbed.org:8081/trust/TSLSecond_TR.xml">http://www.mindertestbed.org:8081/trust/TSLSecond_TR.xml</a>	Trust List validation result should be successful
3	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA (3 0 1) with the base256 encoded certificate                     </pre>
4	Minder parses DNS query and Execute Minder-ATV <i>checkCertificateFromSMIMEA</i> service base256 encoded certificate	The service should return TRUE

<b>ID</b>		<b>TC_TSPA_23</b>
<b>Assertion(s)</b>		TA_TSPA_4, TA_TSPA_13
<b>Test Purpose</b>		Verify that publish service of TSPA for trust list works successfully for different SMIMEA parameters (sha512 parameters).
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidasm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP PUT request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i> with <i>http://www.mindertestbed.org:8081/trust/TSLThird_TR.xml</i> trust list parameter with "certificate":[{"usage":"dane-ee","selector":"cert","matching":"sha512","data":"sha512hash of DER encoded certificate"}]	The service should return HTTP 200 OK

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2	<p>On the terminal, type the following command:  <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i></p>	<pre>;&lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 http://www.mindertestbed.org:8081/trust/TSLThird_TR.xml /</pre>
3	<p>Minder parses DNS query and Execute Minder-ATV <i>verifyTrustList</i> service that performs signature validation for the trust list downloaded in <a href="http://www.mindertestbed.org:8081/trust/TSLThird_TR.xml">http://www.mindertestbed.org:8081/trust/TSLThird_TR.xml</a></p>	<p>Trust List validation result should be successful</p>
4	<p>On the terminal, type the following command:  <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA</i></p>	<pre>;&lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA (3 0 2) with the base512 encoded certificate</pre>
5	<p>Minder parses DNS query and Execute Minder-ATV <i>checkCertificateFromSMIMEA</i> service with base512 encoded certificate</p>	<p>The service should return TRUE</p>

<b>ID</b>	<b>TC_TSPA_24</b>
<b>Assertion(s)</b>	TA_TSPA_4, TA_TSPA_13

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<b>Test Purpose</b>		Verify that publish service of TSPA for trust list works successfully for invalid SMIMEA parameters (matching:sha512, data:sha256hash).
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidas.kamasm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP PUT request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i> with <i>http://www.mindertestbed.org:8081/trust/TSLFourth_TR.xml</i> trust list parameter with "certificate":[{"usage":"dane-ee","selector":"cert","matching":"sha512","data":"sha256hash of DER encoded certificate"}]	The service should return HTTP 200 OK
2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i>	<pre>; &lt;&lt;&lt;&gt; DiG 9.10.6 &lt;&lt;&lt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl ;; global options: +cmd ;; Got answer: ;; -&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 http://www.mindertestbed.org:8081/trust/TSLFourth_TR.xml</pre>
3	Minder parses DNS query and Execute Minder-ATV <i>verifyTrustList</i> service that performs signature validation for the trust list downloaded in <i>http://www.mindertestbed.org:8081/trust/TSLFourth_TR.xml</i>	Trust List validation result should be successful
4	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA</i>	<pre>; &lt;&lt;&lt;&gt; DiG 9.10.6 &lt;&lt;&lt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1</pre>

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		<pre>;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA (3 0 2) with the base256 encoded certificate(invalid)</pre>
5	Minder parses DNS query and Execute Minder-ATV <i>checkCertificateFromSMIMEA</i> service with invalid certificate	The service should return FALSE

<b>ID</b>		<b>TC_TSPA_25</b>
<b>Assertion(s)</b>		TA_TSPA_4, TA_TSPA_13
<b>Test Purpose</b>		Verify that publish service of TSPA for trust list works successfully for invalid SMIMEA parameters (matching:sha256, data:sha512hash).
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with <i>eidas.kamusm.gov.tr-example</i> should be published with <i>turkey.lightest.nlnetlabs.nl</i> domain name in TSPA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP PUT request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list</i> with <i>http://www.mindertestbed.org:8081/trust/TSLFifth_TR.xml</i> trust list parameter with "certificate":[{"usage":"dane-ee","selector":"cert","matching":"sha256","data":"sha512hash of DER encoded certificate"}]	The service should return HTTP 200 OK
2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</i>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl URI ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI ;; ANSWER SECTION:</pre>

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		<code>;</code> <code>_scheme._trust.turkey.lightest.nlnetlabs.nl</code> IN URI 1 1 <code>http://www.mindertestbed.org:8081/trust/TSLThird_TR.xml</code> <code>/</code>
3	Minder parses DNS query and Execute Minder-ATV <code>verifyTrustList</code> service that performs signature validation for the trust list downloaded in <code>http://www.mindertestbed.org:8081/trust/TSLFifth_TR.xml</code>	Trust List validation result should be successful
4	On the terminal, type the following command: <code>dig _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA</code>	<code>;&lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt;</code> <code>_scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA</code> <code>:: global options: +cmd</code> <code>:: Got answer:</code> <code>:: -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761</code> <code>:: flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1</code>  <code>:: OPT PSEUDOSECTION:</code> <code>; EDNS: version: 0, flags::; udp: 4096</code> <code>:: QUESTION SECTION:</code> <code>_scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA</code> <code>:: ANSWER SECTION:</code> <code>_scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA</code> <code>(3 0 1) with the base512 encoded certificate(invalid)</code>
5	Minder parses DNS query and Execute Minder-ATV <code>checkCertificateFromSMIMEA</code> service with invalid certificate	The service should return FALSE

<b>ID</b>	<b>TC_TSPA_26</b>	
<b>Assertion(s)</b>	TA_TSPA_14	
<b>Test Purpose</b>	Verify that publish service of TSPA for scheme name works successfully.	
<b>Pre-Test Conditions</b>	TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP PUT request: <code>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/schemes</code> with <code>publisheidas.kamusm.gov.tr-example</code> parameter	The service should return HTTP 200 OK

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2	On the terminal, type the following command: <i>dig_scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _scheme._trust.turkey.lightest.nlnetlabs.nl PTR ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ; QUESTION SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR ; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN PTR 1 1 _scheme._trust.publisheidas.kamusm.gov.tr-example                 </pre>
---	---	--

<b>ID</b>		<b>TC_TSPA_27</b>
<b>Assertion(s)</b>		TA_TSPA_11
<b>Test Purpose</b>		Verify that a non-existing trust list deletion works properly on TSPA.
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TSPA the following HTTP DELETE request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkeynon-exist.lightest.nlnetlabs.nl/trust-list</i>	The service should return HTTP 404 with a response message trust list does not exist

## 6.2 TTA

### 6.2.1 TTA Normative Statements

The normative statements are already provided in D8.4 Section 7.2.2. The only updated normative statement is given below:

<b>NS ID</b>	NS_TTA_10
<b>Reference</b>	NS_TTA_6, D4.4 Section 6.1
<b>Description</b>	A TTA is composed of a public Rest API (HTTP Server (Trust Translation Provider)) that contains Signed Trust Translation Lists. TTA provides publish, download, delete and retrieval services

### 6.2.2 TTA Test Assertions

The assertions are already provided in deliverable D8.4 Section 7.2.3. The updated test assertions are given below. Please note that updated parts are in italic form.

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<b>TA ID</b>	TA_TTA_4
<b>Normative Source</b>	NS_TTA_1, NS_TTA_3, NS_TTA_5, NS_TTA_7
<b>Target</b>	TTA-DNS
<b>Prerequisite</b>	The TTA DNS Name Server is up and running.
<b>Prescription Level</b>	Mandatory
<b>Predicate</b>	For Boolean trust scheme, the prefixes for the TTA DNS record is set as “_translation” for the aspect and “_trust” for the application with the following format and the received DNS query form is:  <pre>;; QUESTION SECTION: Client/ATV to the TTA _translation._trust.etimestamp.eidas.eu.lightest.nl.netlabs. nl IN URI  ;; ANSWER SECTION: from the TTA _translation._trust.etimestamp.eidas.eu.lightest.nl.netlabs.n l 3599 IN URI 10 1 "https://tta- lightest.eu:8441/integration/ttaFM/mng/TrustTranslationDecla ration/etimestamp.eidas.eu "</pre>

<b>TA ID</b>	TA_TTA_5
<b>Normative Source</b>	TA_NS_1, TA_NS_3, NS_TTA_4
<b>Target</b>	TTA-DNS
<b>Prerequisite</b>	The TTA DNS Name Server is up and running. The names of the assurance levels just published by the TSPA have to be already retrieved from the TSPA by ATV.
<b>Prescription Level</b>	Mandatory
<b>Predicate</b>	For Ordinal&Tuple Trust Scheme, the prefixes for the TTA DNS record are set as “_translation” for the aspect and “_trust” for the application and the assurance level (obtained from TSPA for the trust scheme) with the following format and the received DNS query form is :  <pre>;; QUESTION SECTION: Client/ATV to the TTA _translation._trust.qualified.esel.eidas.eu.lightest.nl.net labs.nl IN URI  ;; QUESTION SECTION: Client/ATV to the TTA _translation._trust.name-and-year-of-birth.kamusm.gov.tr- example.lightest.nl.netlabs.nl IN URI  ;; ANSWER SECTION: from the TTA _translation._trust.qualified.esel.eidas.eu.lightest.nl.netl abs.nl IN URI "https://tta- lightest.eu:8441/integration/ttaFM/mng/TrustTranslationDecla ration/qualified.esel.eidas.eu"</pre>

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```
;; ANSWER SECTION: from the TTA
_translation._trust.name-and-year-of- birth.kamusm.gov.tr-
example IN URI
"https://tta-
lightest.eu:8441/integration/ttaFM/mng/TrustTranslationDecla
ration/name-and-year-of-birth.kamusm.gov.tr-example"
```

**TA ID** TA\_TTA\_6

**Normative Source** NS\_TTA\_2, NS\_TTA\_3, NS\_TTA\_4, NS\_TTA\_5, NS\_TTA\_12, NS\_TTA\_13

**Target** TTA-Trust Translation Provider

**Prerequisite** The TTA DNS Name Server is up and running.

**Prescription Level** Mandatory

**Predicate** *Trust Translation Provider provides a file for each recognized trust level with XML and TPL formats for the trust scheme.*

**TA ID** TA\_TTA\_9

**Normative Source** NS\_TTA\_6, NS\_TTA\_8, NS\_TTA\_9, NS\_TTA\_14

**Target** TTA

**Prerequisite** The TTA DNS Name Server is up and running.  
Trust translation lists are already defined for the trust schemes.  
The names of the assurance levels just published by the TSPA have to be already retrieved from the TSPA by ATV, in order to build the right domain name for asking for the translation.

**Prescription Level** Mandatory

**Predicate** *Trust translation list documents, XML and TPL formats, are signed by the TTA with X.509 certificates.*

The new test assertions are given below:

**TA ID** TA\_TTA\_12

**Normative Source** NS\_TTA\_10

**Target** TTA

**Prerequisite** The TTA DNS Name Server is up and running.  
Trust translation list is published on TTA.

**Prescription Level** Mandatory

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<b>Predicate</b>	TTA provides a download service to download trust translation declaration file. <ul style="list-style-type: none"> <li>a. If Accept header is set to “application/xml”, trust translation file downloads as an xml file.</li> <li>b. If Accept header is not set to “application/xml”, trust translation file downloads as a tpl file.</li> </ul>
------------------	---

<b>TA ID</b>	TA_TTA_13
<b>Normative Source</b>	NS_TTA_10
<b>Target</b>	TTA
<b>Prerequisite</b>	The TTA DNS Name Server is up and running.
<b>Prescription Level</b>	Mandatory
<b>Predicate</b>	TTA provides five retrieval services that get information about agreements by Trust Scheme, get trust scheme, get trust scheme details, retrieve names of available agreements of translation and retrieve details of agreement of translation.

### 6.2.3 TTA Test Scenario

Turkey Trust Provider has negotiated with an EU General Trust Provider on whether their schemes trust each other, and in what way. The outcomes of these negotiations are then provided to the TTA, which represents the translation scheme for automated processing in LIGHTest. This means the TTA becomes a function that allows the interoperability of trust schemes published by different entities, even across different trust domains, by defining the relation between the trust scheme levels.

The discovery of Boolean, tuple and ordinal trust schemes are possible in the test scenario. Agreement details are already given in deliverable D4.3, Figure 6.

#### 6.2.3.1 Boolean Trust Scheme

Source Trust Scheme: *timestamp.eidas.kamusm.gov.tr-example* with qualified assurance level  
 Target Trust Scheme: *tr-eidas-eseal.lightest.nl-netlabs.nl.xml* with qualified assurance level.

For this translation, there exists a translation list with TPL and XML formats on TTA.

The translation lists are deployed in [https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslation Declaration](https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration)

#### 6.2.3.1 Ordinal Trust Scheme

A query is sent to the TTA to know about its equivalent levels of **eseal.eidas.kamusm.gov.tr-example** for qualified level name in other trust schemes. The verifier needs to check this claim by locating the trust translation declaration.

The Evidence Record trust service in the eIDAS trust scheme provides two levels of trust, namely, High and Low.

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A query is sent to the TTA to know about its equivalent levels of **evidence.eidas.kamusm.gov.tr-example** for qualified level name in other trust schemes. The verifier needs to check this claim by locating the trust translation declaration.

A translation with an invalid translation list is defined on TTA “invalid-agreement-ordinal” with the following translation list: <https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/eseal.eidas.kamusm.gov.tr-example>

### 6.2.3.2 Tuple trust scheme

Definition of tuple-based trust scheme in the TSPA should be: (attribute name, attribute value)  
A new “test-agreement-tuple” translation is defined.

These assurance levels are derived from both the quality assurance level of the eID itself as well as the maximum of the quality assurance levels of each of the attributes in the group. (1-4 AQAA Level)

A fictional eID scheme eid.kamusm.gov.tr-example defines an attribute group name-and-year-of-birth that contains the attributes for the name and year of birth of the holder of the eID.

It constructs the domain name to query as `_translation._trust.name-and-year-of-birth.kamusm.gov.tr-example` and queries for URI records.

A translation with an invalid translation list is defined on TTA “invalid-agreement-tuple” with the following translation lists: <https://tta-lightest.eu:8441/integration/ttaFM/mng/TrustTranslationDeclaration/name-and-year-of-birth.kamusm.gov.tr-example>

## 6.2.4 TTA Test Cases

This section includes the test case list and test case details.

TTA Test cases assume that scheme information is obtained from TSPA and electronic transaction is parsed on Minder-ATV and is sent to TSPA to conform the trust scheme membership.

### 6.2.4.1 TTA Test Case List

**Table 2 List of TTA test cases**

ID	Purpose
TC_TTA_1	Check if TSPA-DNS server exists and is configured to be used by TTA.
TC_TTA_2	Verify that RR responses are signed by a valid Zone Key of DNS.
TC_TTA_3	Verify that TTA published more than one translation schemes for a boolean trust scheme.
TC_TTA_4	Verify that TTA published more than one translation schemes for an ordinal trust scheme.
TC_TTA_5	Verify that TTA published more than one translation schemes for a tuple trust scheme.

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TC_TTA_6	Verify that RR response to the issuename is a URI record for a boolean scheme and DNSSec validation is successful.
TC_TTA_7	Verify that RR response to the issuename is a URI record for ordinal schemes and DNSSec validation is successful.
TC_TTA_8	Verify that RR response to the issuename is a URI record for tuple schemes and DNSSec validation is successful.
TC_TTA_9	Check that the verification result of translation list signature is successful for a boolean trust scheme.
TC_TTA_10	Check that the verification result of translation list signature is successful for an ordinal trust scheme.
TC_TTA_11	Check that the verification result of translation list signature is successful for a tuple trust scheme.
TC_TTA_12	Verify that an invalid trust list, pointed on the URI RR record, signature validation fails for boolean trust scheme.
TC_TTA_13	Verify that an invalid trust list, pointed on the URI RR record, signature validation fails for ordinal trust scheme.
TC_TTA_14	Verify that an invalid trust list, pointed on the URI RR record, signature validation fails for tuple trust scheme.
TC_TTA_15	Verify that received TTA works in synchronization with DNS entries.
TC_TTA_16	Verify that delete service of TTA for scheme name works properly.
TC_TTA_17	Verify that delete service of TTA for non-existent translation works properly.
TC_TTA_18	Verify if the translation file is downloaded in XML format.
TC_TTA_19	Verify if the translation file is downloaded in TPL format.
TC_TTA_20	Verify that trust schemes are listed successfully.
TC_TTA_21	Verify that trust scheme details are listed successfully.
TC_TTA_22	Verify that agreements for the translations are listed successfully.
TC_TTA_23	Verify that details of agreements for the translations are listed successfully.
TC_TTA_24	Verify that TTA responds properly for agreements that have inconvenient attributes.
TC_TTA_25	Verify that TTA responds properly for agreements that have missing attributes.
TC_TTA_26	Verify that TTA responds properly for non-existing trust schemes retrieval.
TC_TTA_27	Verify that TTA works properly for non-existing trust scheme related agreement retrieval.
TC_TTA_28	Verify that TTA responds properly in case of non-existing trust scheme translation download.

### 6.2.4.2 TTA Test Case Details

<b>ID</b>	<b>TC_TTA_1</b>	
<b>Assertion(s)</b>	TA_TTA_1	
<b>Test Purpose</b>	Check if TSPA-DNS server exists and is configured to be used by TTA.	
<b>Pre-Test Conditions</b>	TTA should already be deployed. DNS deployment should be available. Test Inputs are generated according to Test Scenario for TTA section.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig lightest.nlnetlabs.nl</i>	; <<>> DiG 9.10.6 <<>> lightest.nlnetlabs.nl ;; global options: +cmd ;; Got answer:

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		<pre> :: -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 8688 :: flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  :: OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 :: QUESTION SECTION: ;lightest.nlnetlabs.nl.          IN      A  :: ANSWER SECTION: lightest.nlnetlabs.nl.        3600    IN      A 185.49.141.61                     </pre>
2	<p>Minder sends to TTA the following HTTP POST request:  <i>http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</i>  with "test-agreement" Boolean trust scheme.</p>	<p>The service should return HTTP 200 OK with</p> <pre> {   "agreename": "test-agreement",   "xmlFile": "tr-eidas-eseal.lightest.nlnetlabs.nl.xml",   "tplFile": "tr-eidas-eseal.lightest.nlnetlabs.nl.tpl.p7s", }                     </pre>
3	<p>On the terminal, type the following command:  <i>dig _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl URI</i></p>	<pre> ;&lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl URI; global options: +cmd :: Got answer: :: -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 :: flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  :: OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 :: QUESTION SECTION: ;_translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl IN URI  ; ANSWER SECTION: _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl 3599 IN URI 10 1 "https://tta- lightest.eu:8441/integration/ttaFM/mng/TrustTranslationD eclaration/tr-eidas-eseal "                     </pre>

<b>ID</b>	<b>TC_TTA_2</b>	
<b>Assertion(s)</b>	TA_TTA_2	
<b>Test Purpose</b>	Verify that RR responses are signed by a valid Zone Key of DNS.	
<b>Pre-Test Conditions</b>	TTA DNS is up and running with DANE protocol enabled in the configured DNS.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>

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1	On the terminal, type the following command:  <i>dig lightest.nlnetlabs.nl +noall +comments</i>	<pre>;&lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; lightest.nlnetlabs.nl +noall +comments ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 10833 ;; flags: qr rd ra aa; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1</pre>
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<b>ID</b>		<b>TC_TTA_3</b>
<b>Assertion(s)</b>		TA_TTA_3, TA_TTA_10
<b>Test Purpose</b>		Verify that TTA published more than one translation for a boolean trust scheme.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSEC extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP POST request: <i>http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</i> with "test-agreement1" Boolean trust scheme. Translation definition is given in Test Scenario for TTA	The service should return HTTP 200 OK { "agreementname": "test-agreement1", "xmlFile": "target scheme name.xml", "tplFile": "target scheme name.p7s" }
2	Minder sends to TTA the following HTTP POST request: <i>http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</i> with "test-agreement2" Boolean trust scheme. Translation definition is given in Test Scenario for TTA	The service should return HTTP 200 OK { "agreementname": "test-agreement2", "xmlFile": "target scheme name.xml", "tplFile": "target scheme name.p7s" }
2	Minder sends to TTA the following HTTP GET request: <i>https://tta-lightest.eu:8441/ttaFM/mng/rsc/getAgreementsRelatedToATrustScheme/targetschemename</i>	The service should return HTTP 200 OK. The return JSON value should include the list of agreements: test-agreement1 and test-agreement2

<b>ID</b>		<b>TC_TTA_4</b>
<b>Assertion(s)</b>		TA_TTA_3, TA_TTA_10
<b>Test Purpose</b>		Verify that TTA published more than one translation schemes for an ordinal trust scheme.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSEC extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP POST request:	The service should return HTTP 200 OK { "agreementname": " test-agreement1-ordinal ", "xmlFile": "target scheme name.xml", }

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	<p><a href="http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation">http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</a> with "test-agreement1-ordinal" Ordinal trust scheme. Translation definition is given in Test Scenario for TTA</p>	<pre>"tplFile":"target scheme name.p7s", }</pre>
2	<p>Minder sends to TTA the following HTTP POST request:  <a href="http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation">http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</a> with "test-agreement2-ordinal" Ordinal trust scheme. Translation definition is given in Test Scenario for TTA</p>	<p>The service should return HTTP 200 OK</p> <pre>{   "agreename":" test-agreement2-ordinal ",   "xmlFile":"target scheme name.xml",   "tplFile":"target scheme name.p7s", }</pre>
3	<p>Minder sends to TTA the following HTTP GET request:  <a href="https://tta-lightest.eu:8441/ttaFM/mng/rsc/getAgreementsRelatedToATrustScheme/targetschemename">https://tta-lightest.eu:8441/ttaFM/mng/rsc/getAgreementsRelatedToATrustScheme/targetschemename</a></p>	<p>The service should return HTTP 200 OK. The return JSON value should include the list of agreements: test-agreement1-ordinal and test-agreement2-ordinal</p>

<b>ID</b>		<b>TC_TTA_5</b>
<b>Assertion(s)</b>		TA_TTA_3, TA_TTA_10
<b>Test Purpose</b>		Verify that TTA published more than one translation schemes for a tuple trust scheme.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	<p>Minder sends to TTA the following HTTP POST request:  <a href="http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation">http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</a> with "test-agreement1-tuple" Tuple trust scheme. Translation definition is given in Test Scenario for TTA</p>	<p>The service should return HTTP 200 OK</p> <pre>{   "agreename":" test-agreement1-tuple ",   "xmlFile":"target scheme name.xml",   "tplFile":"target scheme name.p7s", }</pre>
2	<p>Minder sends to TTA the following HTTP POST request:  <a href="http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation">http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</a> with "test-agreement2-tuple" tuple trust scheme. Translation definition is given in Test Scenario for TTA</p>	<p>The service should return HTTP 200 OK</p> <pre>{   "agreename":" test-agreement2-tuple ",   "xmlFile":"target scheme name.xml",   "tplFile":"target scheme name.p7s", }</pre>
3	<p>Minder sends to TTA the following HTTP GET request:  <a href="https://tta-lightest.eu:8441/ttaFM/mng/rsc/getAgreementsRelatedToATrustScheme/targetschemename">https://tta-lightest.eu:8441/ttaFM/mng/rsc/getAgreementsRelatedToATrustScheme/targetschemename</a></p>	<p>The service should return HTTP 200 OK. The return JSON value should include the list of agreements: test-agreement1-tuple and test-agreement2-tuple</p>

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<b>ID</b>		<b>TC_TTA_6</b>
<b>Assertion(s)</b>		TA_TTA_4
<b>Test Purpose</b>		Verify that RR response to the issuename is a URI record for a boolean scheme and DNSSec validation is successful.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. Published trust translation list declarations are available for “test-agreement”.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig_translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl URI</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl URI; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags;; udp: 4096 ;; QUESTION SECTION: ;_translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl IN URI  ; ANSWER SECTION: _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl 3599 IN URI 10 1 "https://tta-lightest.eu:8441/integration/ttaFM/mng/TrustTranslationDeclaration/tr-eidas-eseal "</pre>

<b>ID</b>		<b>TC_TTA_7</b>
<b>Assertion(s)</b>		TA_TTA_5, TA_TTA_6
<b>Test Purpose</b>		Verify that RR response to the issuename is a URI record for ordinal schemes and DNSSec validation is successful.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. Published trust translation list declarations are available for “test-agreement-ordinal”.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig_translation._trust.eseal.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN URI</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _translation._trust.eseal.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN URI; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1</pre>

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		<pre> ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ; _translation._trust.e seal.eidas.kamusm.gov.tr- example.lighttest.nlnetlabs.nl IN URI  ;; ANSWER SECTION: _translation._trust.e seal.eidas.kamusm.gov.tr- example.lighttest.nlnetlabs.nl. 0 IN URI 10 1 "https://tta- lighttest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/e seal.eidas.kamusm.gov.tr-example"                 </pre>
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<b>ID</b>		<b>TC_TTA_8</b>
<b>Assertion(s)</b>		TA_TTA_5, TA_TTA_6
<b>Test Purpose</b>		Verify that RR response to the issuername is a URI record for tuple schemes and DNSSec validation is successful.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. Published trust translation list declarations are available for “test-agreement-tuple”.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP GET request: <i>http://tta-lighttest.eu:8441/ttaFM/mng/rsc/translation with “test-agreement-tuple”</i>	The service should return HTTP 200 OK. The return JSON value should include the translation information given in the Test Scenarion for TTA “test-agreement-tuple”
2	On the terminal, type the following command: <i>dig _translation._trust.name-and-year-of-birth.kamusm.gov.tr-example.lighttest.nlnetlabs.nl IN URI</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _translation._trust.name-and- year-of-birth.kamusm.gov.tr-example.lighttest.nlnetlabs.nl IN URI; global options: +cmd ;; Got answer: ;; -&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ; _translation._trust.name-and-year-of- birth.kamusm.gov.tr-example.lighttest.nlnetlabs.nl IN URI  ;; ANSWER SECTION: _translation._trust.name-and-year-of-birth.kamusm.gov.tr- example.lighttest.nlnetlabs.nl. 0 IN URI 10 1 "https://tta- lighttest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/n ame-and-year-of-birth.kamusm.gov.tr-example"                 </pre>

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<b>ID</b>		<b>TC_TTA_9</b>
<b>Assertion(s)</b>		TA_TTA_10, TTA_9
<b>Test Purpose</b>		Check that the verification result of translation list signature is successful for a boolean trust scheme.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid translation with test-agreement scheme name is defined on TTA Accept_Header is set to "application/xml".
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig_translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl IN URI</i>	; <<> DiG 9.10.6 <<> _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl URI; global options: +cmd ;; Got answer: ;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags;; udp: 4096 ;; QUESTION SECTION: ; _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl URI  ;; ANSWER SECTION: _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl. 0 IN URI 10 1 "https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/tr-eidas-eseal "
2	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> with <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/tr-eidas-eseal</i>	The trust list should be downloaded as an XML file
3	Execute Minder-ATV <i>verifyTrustTranslationList</i> service that performs signature validation and SMIMEA verification	The trust list verification should return TRUE

<b>ID</b>		<b>TC_TTA_10</b>
<b>Assertion(s)</b>		TA_TTA_10, TA_TTA_7, TA_TTA_9
<b>Test Purpose</b>		Check that the verification result of translation list signature is successful for a ordinal trust scheme.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid translation with test-agreement-ordinal scheme name is defined on TTA. Accept header is set to "application/xml".
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>

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1	On the terminal, type the following command: <i>dig _translation._trust.eseal.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN URI</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _translation._trust. eseal.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN URI; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:; udp: 4096 ;; QUESTION SECTION: ; _translation._trust.eseal.eidas.kamusm.gov.tr- example.lightest.nlnetlabs.nl IN URI  ;; ANSWER SECTION: _translation._trust.eseal.eidas.kamusm.gov.tr- example.lightest.nlnetlabs.nl. 0 IN URI 10 1 "https://tta- lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/eseal.eidas.kamusm.gov.tr-example"                 </pre>
2	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> with <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/eseal.eidas.kamusm.gov.tr-example</i>	The trust list should be downloaded as an XML file
3	Execute Minder-ATV <i>verifyTrustTranslationList</i> service that performs signature validation and SMIMEA verification	The trust list verification should return TRUE

<b>ID</b>	TC_TTA_11
<b>Assertion(s)</b>	TA_TTA_10, TA_TTA_8
<b>Test Purpose</b>	Check that the verification result of translation list signature is successful for a tuple trust scheme.
<b>Pre-Test Conditions</b>	TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid translation with test-agreement-tuple scheme name is defined on TTA.

<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig _translation._trust.name-and-year-of-birth.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN URI</i>	<pre> ; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _translation._trust.name-and- year-of-birth.kamusm.gov.tr-example.lightest.nlnetlabs.nl URI; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1                 </pre>

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		<pre>;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ;_translation._trust.name-and-year-of- birth.kamusm.gov.tr-example.lightest.nl IN URI  ;; ANSWER SECTION: _translation._trust.name-and-year-of- birth.kamusm.gov.tr-example.lightest.nl. 3600 IN URI 10 1 "https://tta- lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/n ame-and-year-of-birth.kamusm.gov.tr-example"</pre>
2	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> with <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/name-and-year-of-birth.kamusm.gov.tr-example</i>	The trust list should be downloaded as an XML file
3	Execute Minder-ATV <i>verifyTrustTranslationList</i> service that performs signature validation and SMIMEA verification	The trust list verification should return TRUE
4	On the terminal, type the following command: <i>dig _translation._trust.name-and-year-of-birth.kamusm.gov.tr-example.lightest.nl IN SMIMEA</i>	<pre>; &lt;&lt;&gt;&gt; DiG 9.14.4 &lt;&lt;&gt;&gt; _translation._trust.name-and- year-of-birth.kamusm.gov.tr-example.lightest.nl IN SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 2176 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4000 ; COOKIE: 35ebe6be767ed9d4 (echoed) ;; QUESTION SECTION: ;_translation._trust.name-and-year-of- birth.kamusm.gov.tr-example.lightest.nl. IN SMIMEA  ;; ANSWER SECTION: _translation._trust.name-and-year-of-birth.kamusm.gov.tr- example.lightest.nl. 0 IN SMIMEA "with certificate constraints"</pre>

<b>ID</b>	<b>TC_TTA_12</b>
<b>Assertion(s)</b>	TA_TTA_9

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<b>Test Purpose</b>	Verify that an invalid trust list, pointed on the URI RR record, signature validation fails for boolean trust scheme.	
<b>Pre-Test Conditions</b>	TTA should already be deployed and running. DNS deployment with DNSSEC extension should be running. There exists an translation agreement "invalid-agreement" that includes an invalid trust list for a boolean trust scheme.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP GET request: <i>http://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</i>	The service should return HTTP 200 OK. The following translations should be listed: { "agreementNames": [ "invalid-agreement" ] }
2	On the terminal, type the following command: <i>dig _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl IN URI</i>	; <<>> DiG 9.10.6 <<>> _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl URI; global options: +cmd ;; Got answer: ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ; _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl URI  ;; ANSWER SECTION: _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl. 0 IN URI 10 1 "https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/tr-eidas-eseal "
3	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> with <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/tr-eidas-eseal</i>	The trust list should be downloaded as an XML file
4	On the terminal, type the following command: <i>dig _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl SMIMEA</i>	; <<>> DiG 9.10.6 _translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION:

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		<code>_translation._trust.tr-eidas-eseal.lightest.nlnetlabs.nl IN SMIMEA</code> ;; ANSWER SECTION: <code>_translate._trust.tr-eidas-eseal.lightest.nlnetlabs.nl IN SMIMEA (3 0 0) with the base16 encoded certificate</code>
5	Minder parses SMIMEA result and Execute Minder-ATV <code>verifyTrustTranslationList</code> service that performs signature validation with a different certificate/public key obtained from SMIMEA query	The trust list verification should return FALSE

<b>ID</b>		<b>TC_TTA_13</b>
<b>Assertion(s)</b>		TA_TTA_9, TA_TTA_7
<b>Test Purpose</b>		Verify that an invalid trust list, pointed on the URI RR record, signature validation fails for ordinal trust scheme.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. There exists a translation agreement "invalid-agreement-ordinal" that includes an invalid trust list for an ordinal trust scheme.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP GET request: <code>http://tta-lightest.eu:8441/integration/ttaFM/mng/rsc/translation</code>	The service should return HTTP 200 OK. The following translations should be listed: <pre>{   "agreementNames": [     "invalid-agreement-ordinal "   ] }</pre>
2	On the terminal, type the following command: <code>dig _translation._trust.eseal.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN URI</code>	<pre>; &lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _translation._trust.eseal.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl URI; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ; _translation._trust.eseal.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl URI  ;; ANSWER SECTION: _translation._trust.eseal.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl. 0 IN URI 10 1 "https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/eseal.eidas.kamusm.gov.tr-example "</pre>

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3	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> with <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/eseal.eidas.kamusm.gov.tr-example</i>	The trust list should be downloaded as an XML file
4	On the terminal, type the following command: <i>dig _translation._trust.eseal.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl SMIMEA</i>	<pre>;&lt;&lt;&gt; DiG 9.10.6 _translation._trust eseal.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _translation._trust.eseal.eidas.kamusm.gov.tr- example.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _translate._trust.eseal.eidas.kamusm.gov.tr- example.lightest.nlnetlabs.nl IN SMIMEA (3 0 0) with the base16 encoded certificate</pre>
5	Minder parses SMIMEA result and Execute Minder-ATV <i>verifyTrustTranslationList</i> service that performs signature validation with a different certificate/public key obtained from SMIMEA query	The trust list verification should return FALSE

<b>ID</b>	<b>TC_TTA_14</b>	
<b>Assertion(s)</b>	TA_TTA_9, TA_TTA_8	
<b>Test Purpose</b>	Verify that an invalid trust list, pointed on the URI RR record, signature validation fails for tuple trust scheme.	
<b>Pre-Test Conditions</b>	TTA should already be deployed and running. DNS deployment with DNSSEC extension should be running. There exists an translation agreement "invalid-agreement-tuple" that includes an invalid trust list for a tuple trust scheme.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following <i>HTTP GET</i> request: <i>http://tta-lightest.eu:8443/integration/ttaFM/mng/rsc/translation</i>	The service should return HTTP 200 OK. The following translations should be listed: <pre>{   "agreementNames": [     "invalid-agreement-tuple "   ] }</pre>

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2	<p>On the terminal, type the following command:  <i>dig _translation._trust.name-and-year-of-birth.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN URI</i></p>	<pre>;&lt;&lt;&gt;&gt; DiG 9.10.6 &lt;&lt;&gt;&gt; _translation._trust.name-and-year-of-birth.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN URI; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: ; _translation._trust.esel.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl URI  ;; ANSWER SECTION: _translation._trust.esel.eidas.kamusm.gov.tr-example.lightest.nlnetlabs.nl. 0 IN URI 10 1 "https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/name-and-year-of-birth.kamusm.gov.tr-example "</pre>
3	<p>Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> with <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/name-and-year-of-birth.kamusm.gov.tr-example</i></p>	<p>The trust list should be downloaded as an XML file</p>
4	<p>On the terminal, type the following command:  <i>dig _translation._trust.name-and-year-of-birth.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN SMIMEA</i></p>	<pre>;&lt;&lt;&gt;&gt; DiG 9.10.6 _translation._trust name-and-year-of-birth.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN SMIMEA ;; global options: +cmd ;; Got answer: ;; -&gt;&gt;HEADER&lt;&lt;- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096 ;; QUESTION SECTION: _translation._trust. name-and-year-of-birth.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _translate._trust name-and-year-of-birth.kamusm.gov.tr-example.lightest.nlnetlabs.nl IN SMIMEA (3 0 0) with the base16 encoded certificate</pre>
5	<p>Minder parses SMIMEA result and Execute Minder-ATV <i>verifyTrustTranslationList</i> service that performs signature validation with a</p>	<p>The trust list verification should return FALSE</p>

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	different certificate/public key obtained from SMIMEA query	
6	Execute Minder-ATV <i>checkCertificatefromSMIMEA</i> service to verify the certificate used to sign the trust list	Certificate validation result should be successful

<b>ID</b>		<b>TC_TTA_15</b>
<b>Assertion(s)</b>		TA_TTA_1, TA_TTA_2
<b>Test Purpose</b>		Verify that received TTA works in synchronization with DNS entries.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	On the terminal, type the following command: <i>dig_translation._trust. timestamp.lighttest.nlnetlabs.nl IN URI</i>	;<<>> DiG 9.10.6 <<>> _translation._trust. timestamp.lighttest.nlnetlabs.nl URI; global options: +cmd ;; Got answer: ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:; udp: 4096 ;; QUESTION SECTION: ; _translation._trust. timestamp.lighttest.nlnetlabs.nl URI  ;; ANSWER SECTION: _translation._trust.timestamp.lighttest.nlnetlabs.nl. 0 IN URI 10 1 "https://tta- lighttest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/ti mestamp"
2	On the terminal, login to DNS with ssh with ssh -i id_rsa tubitak@lighttest.nlnetlabs.nl Goto /usr/home/zonemgr/etc folder Edit Open the zone file with the following command: <i>vim lighttest.nlnetlabs.nl</i> Delete the corresponding record with timestamp.lighttest.nlnetlabs.nl and https://tta-lighttest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/timestamp" Close the ssh session	DNS should be updated.

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3	Minder sends to TTA the following HTTP GET request: <i>https://tta-lighttest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/timestamp</i>	The service should return HTTP 404 Not Found
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<b>ID</b>		<b>TC_TTA_16</b>
<b>Assertion(s)</b>		TA_TSPA_7
<b>Test Purpose</b>		Verify that delete service of TTA for scheme name works properly.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A translation with “test-agreement4” should be already defined on TTA.
Step	Test Activity	Expected Result
1	On the terminal, type the following command: <i>dig</i> <i>_translation._trust.trustscheme1.lightest.nlnetlabs.nl IN URI</i>	; <<>> DiG 9.10.6 <<>> _translation._trust. trustscheme1.lightest.nlnetlabs.nl URI; global options: +cmd ;; Got answer: ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53761 ;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:;; udp: 4096 ;; QUESTION SECTION: ; _translation._trust.trustscheme1.lightest.nlnetlabs.nl URI  ;; ANSWER SECTION: _translation._trust.trustscheme1.lightest.nlnetlabs.nl. 0 IN URI 10 1 "https://tta-lighttest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/trustscheme1"
2	Minder sends to TTA the following HTTP DELETE request: <i>https://tta-lighttest.eu:8441/ttaFM/mng/rsc/translation/test-agreement4</i>	The service should return HTTP 200 OK.
3	Minder sends to TTA the following HTTP GET request: <i>https://tta-lighttest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/trustscheme1</i>	The service should return HTTP 404 Not Found with “Agreement name not found” message

<b>ID</b>		<b>TC_TTA_17</b>	
<b>Assertion(s)</b>		TA_TTA_11	
<b>Test Purpose</b>		Verify that delete service of TTA for non-exist translation works properly.	
<b>Pre-Test Conditions</b>		TSPA should already be deployed and running.	

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DNS deployment with DNSSec extension should be running.		
Step	Test Activity	Expected Result
1	Minder sends to TTA the following HTTP DELETE request: <i>https://tta-lightest.eu:8441/ttaFM/mng/rsc/translation/test-agreement-dummy</i>	The service should return HTTP 404 "Agreement name not found"

ID		TC_TTA_18
Assertion(s)		TA_TTA_11
Test Purpose		Verify if the translation file is downloaded in XML format.
Pre-Test Conditions		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A translation with "test-agreement" should be already defined on TTA Accept header is set to "application/xml".
Step	Test Activity	Expected Result
1	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> . <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/targetschemename</i>	The trust list should be downloaded as an XML file
2	Execute Minder <i>validateXML</i> service	The service should return true
3	Open the timestamp.xml file and check the attributes of agreement of translation.	Attributes should be conforming to the specification.

ID		TC_TTA_19
Assertion(s)		TA_TTA_11
Test Purpose		Verify if the translation file is downloaded in TPL format.
Pre-Test Conditions		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A translation with "test-agreement" should be already defined on TTA Accept header is NOT set to "application/xml".
Step	Test Activity	Expected Result
1	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> . <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/targetschemename</i>	The trust list should be downloaded as an TPL file

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2	Execute Minder <i>validateTPL</i> service	The service should return true
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<b>ID</b>		<b>TC_TTA_20</b>
<b>Assertion(s)</b>		TA_TSPA_13
<b>Test Purpose</b>		Verify that trust schemes are listed successfully.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A translation with "test-agreement" should be already defined on TTA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP GET request: <i>https://tta-lightest.eu:8441/ttaFM/mng/rsc/trustScheme</i>	The service should return HTTP 200 OK Trust schemes should be listed.

<b>ID</b>		<b>TC_TTA_21</b>
<b>Assertion(s)</b>		TA_TSPA_13
<b>Test Purpose</b>		Verify that trust scheme details are listed successfully.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A translation with "test-agreement" should be already defined on TTA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP GET request: <i>https://tta-lightest.eu:8441/ttaFM/mng/rsc/trustScheme/targetschemename</i>	The service should return HTTP 200 OK Trust scheme details should be listed.

<b>ID</b>		<b>TC_TTA_22</b>
<b>Assertion(s)</b>		TA_TTA_13
<b>Test Purpose</b>		Verify that agreements for the translations are listed successfully.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A translation with "test-agreement" should be already defined on TTA.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP GET request: <i>https://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</i>	The service should return HTTP 200 OK Agreements of translation should be listed.

<b>ID</b>	<b>TC_TTA_23</b>
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<b>Assertion(s)</b>	TA_TTA_13	
<b>Test Purpose</b>	Verify that details of agreements for the translations are listed successfully.	
<b>Pre-Test Conditions</b>	TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A translation with "test-agreement" should be already defined on TTA.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP GET request: <i>https://tta-lightest.eu:8441/ttaFM/mng/rsc/translation/test-agreement</i>	The service should return HTTP 200 OK Details of agreement of translation should be listed.

<b>ID</b>	TC_TTA_24	
<b>Assertion(s)</b>	TA_TTA_13	
<b>Test Purpose</b>	Verify that TTA responds properly for agreements that have inconvenient attributes.	
<b>Pre-Test Conditions</b>	TTA should already be deployed and running. DNS deployment with DNSSec extension should be running.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP POST request: <i>https://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</i> with <i>activation-date</i> earlier than <i>creation/leaving date</i> OR <i>activation-date</i> later than <i>leaving-date</i>	The service should return HTTP 409Conflict with a warning message that activation date must later than or equal to creation date.

<b>ID</b>	TC_TTA_25	
<b>Assertion(s)</b>	TA_TTA_13	
<b>Test Purpose</b>	Verify that TTA responds properly for agreements that have missing attributes.	
<b>Pre-Test Conditions</b>	TTA should already be deployed and running. DNS deployment with DNSSec extension should be running.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP POST request: <i>https://tta-lightest.eu:8441/ttaFM/mng/rsc/translation</i> with <i>agreement definition that doeshave some missing attributes (name, source etc.)</i>	The service should return HTTP 409Conflict with a warning message that error parsing agreement details some of the data is not present or has incorrect format.

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<b>ID</b>		<b>TC_TTA_26</b>
<b>Assertion(s)</b>		TA_TTA_13
<b>Test Purpose</b>		Verify that TTA works properly for non-existing trust scheme retrieval.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP GET request: <i>https://tta-lightest.eu:8441/ttaFM/mng/rsc/trustScheme/testtsteidas.kamusm.gov.tr-example</i>	The service should return HTTP 200 OK with a response message that the trust scheme is not available

<b>ID</b>		<b>TC_TTA_27</b>
<b>Assertion(s)</b>		TA_TTA_13
<b>Test Purpose</b>		Verify that TTA works properly for non-existing trust scheme related agreement retrieval.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends to TTA the following HTTP GET request: <i>https://tta-lightest.eu:8441/ttaFM/mng/rsc/getAgreementsRelatedToATrustScheme/invalid-scheme</i>	The service should return HTTP 200 OK with a response message that includes: <pre>{   "trustSchemeName": " invalidscheme",   "TargetOfTrustIn": [],   "OriginOfTrustIn": [] }</pre>

<b>ID</b>		<b>TC_TTA_28</b>
<b>Assertion(s)</b>		TA_TTA_11
<b>Test Purpose</b>		Verify that TTA responds properly in case of non-existing trust scheme translation download.
<b>Pre-Test Conditions</b>		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. Accept header is set to "application/xml".
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> . <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/test</i>	The service should return HTTP 404 Not Found with response message that the origin server did not find a current representation for the target resource or is not willing to disclose that one exists.

## 6.3DP

### 6.3.1 DP Normative Statements

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The normative statements for DP are already provided in deliverable D8.4 Section 7.3. For brevity, the normative statements for DP are not included in this document, since they are not updated.

### 6.3.2 DP Test Assertions

The test assertions are already given in deliverable D8.4 Section 7.3. The updated TA\_DP\_13 is given as follows:

<b>TA ID</b>	TA_DP_13
<b>Normative Source</b>	NS_DP_10
<b>Target</b>	DP
<b>Prerequisite</b>	
<b>Prescription Level</b>	Mandatory
<b>Predicate</b>	DP MUST authenticate the user for search and download services.

### 6.3.3 DP Test Scenario

TUBITAK wants to empower an employee (TUBITAK Tester) to do purchasing tasks on behalf of the company. The employee shall only have the allowance to do purchases up to a certain amount. All purchases above that amount require the authorization of the manager of the company. The employee receives the delegation for a special purpose, as the employee will be able to do purchases on behalf of the company.

The structure of a delegation in XML :

```
<?xml version="1.0"?>
<delegation version="1.0">
  <!-- Mandatory Information -->
  <issuedDate> 2017-05-14T23:59:59 </issuedDate>
  <proxy> TUBITAK Tester </proxy>
  <issuer> Tubitak </issuer>
  <bilateral />
  <substitutionAllowed>false</substitutionAllowed>
  <delegationAllowed>false</delegationAllowed>
  <validity>
    <notBefore> 2019-05-15T00:00:00 </notBefore>
    <notAfter> 2020-15-15T23:59:59 </notAfter>
  </validity>
  <domain name="purchase" version="0">
  </domain>
  <ds:signature>
  </ds:signature>
</delegation>
```

The Delegation Provider is located at “lightest-dev.iaik.tugraz.at”. The test case executions are performed on that DP.

TUBITAK Tester delegation is published in [https://mindertestbed.org/delegation/tubitak\\_delegation.xml](https://mindertestbed.org/delegation/tubitak_delegation.xml)

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TUBITAK Tester invalid delegation is published in  
[https://mindertestbed.org/delegation/invalidtubitak\\_delegation.xml](https://mindertestbed.org/delegation/invalidtubitak_delegation.xml)

### 6.3.4 DP Test Cases

This section includes the test case list and test case details.

#### 6.3.4.1 DP Test Case List

**Table 3 List of DP test cases**

ID	Purpose
TC_DP_1	Verify that DP publish delegation service is working properly with publish endpoint
TC_DP_2	Verify that DP publish delegation service is working properly with publish_key endpoint
TC_DP_3	Verify that DP publish_key service is responding correctly to invalid parameters (public key hash, encrypted key)
TC_DP_4	Verify that DP publish service is responding correctly to invalid parameters (public key hash, delegation data)
TC_DP_5	Check the response when DP verifies the delegation.
TC_DP_6	Check content of delegation from the response when delegation is verified.
TC_DP_7	Check the response when a revoked delegation is queried
TC_DP_8	Check the response when a valid delegation is queried
TC_DP_9	Check if a revoke command interface is available
TC_DP_10	Check if DP works properly in case where delegation is not a published delegation
TC_DP_11	Verify that download service is working properly
TC_DP_12	Verify that download service is responding properly in case of an invalid token
TC_DP_13	Check if the DP responds properly in case where delegation is revoked for the current data given
TC_DP_14	Check if the DP authentication service is working properly
TC_DP_15	Verify that search service is responding properly in case of invalid token
TC_DP_16	Check if the DP authentication service is responding properly in case of invalid result
TC_DP_17	Verify that DP is working properly when an existing delegation content is to be re-published
TC_DP_18	Check if the revocation service works properly in case of missing parameters reason and/or token
TC_DP_19	Check if the DP authentication service responding properly in case of invalid public key

#### 6.3.4.2 DP Test Case Details

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<b>ID</b>	<b>TC_DP_1</b>	
<b>Assertion(s)</b>	TA_DP_1, TA_DP_2	
<b>Test Purpose</b>	Verify that DP publish delegation service is working properly with publish endpoint.	
<b>Pre-Test Conditions</b>	Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format. Proxy is TUBITAK Tester. The requester should use authentication service and obtain a <i>token</i> (LTIwOQ==).	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV sends to DP the following HTTP POST request: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish (with delegation data given in the scenario, publicKey and publicKeyHash parameters)</i>	The service verifies the delegation and returns HTTP 201. The response data should include the "id" value with the following attributes: <pre>{   "id" : 1 }</pre>
2	Minder-ATV sends to DP the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/search/{id}</i> with <i>token(LTIwOQ==)</i>	The service returns HTTP 200 with the following response message { "id": 1, "hash": "lloq18txF97bH5ChyNj5x9irPII=", "key": "MIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQCkI1IFecTayNbLUOIE6w3EogpnsidozNTOT3LzdrW37DCa eujZvV9p2320re6W1U6MBjgWm1/EUdXAFqpc6McULh1g BeWT9mlPBWiTUGCMI7kH7qTTYxxNsBEye7FrE9hd2u1 xjkt/6GZstd39aDcb74gENukCur5baYwkn14ERQIDAQAB" , "status": "ACTIVE", "data": "Delegation 01" }

<b>ID</b>	<b>TC_DP_2</b>	
<b>Assertion(s)</b>	TA_DP_1, TA_DP_2	
<b>Test Purpose</b>	Verify that DP publish delegation service is working properly with publish_key endpoint.	
<b>Pre-Test Conditions</b>	Delegation Provider (DP) is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation. Proxy is TUBITAK Tester. The requester should use authentication service and obtain a <i>token</i> (LTIwOQ==).	

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Step	Test Activity	Expected Result
1	https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish_key (with id, encrypted key, publicKeyHash parameters)	The service verifies the delegation and returns HTTP 201

<b>ID</b>	<b>TC_DP_3</b>
<b>Assertion(s)</b>	TA_DP_1, TA_DP_2, TA_DP_3, TA_DP_6
<b>Test Purpose</b>	Verify that DP publish_key service is responding correctly to invalid parameters (public key hash, encrypted key).
<b>Pre-Test Conditions</b>	Delegation Provider is accessible. Delegation is prepared by Mandator as a signed and encrypted delegation in XML format.

Step	Test Activity	Expected Result
1	Minder-ATV sends to DP the following HTTP POST request:  https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish_key (with id, invalid encrypted key, invalid publicKeyHash parameters)	The service should return HTTP 400 with appropriate response message that invalid parameters are used for the service.

<b>ID</b>	<b>TC_DP_4</b>
<b>Assertion(s)</b>	TA_DP_1, TA_DP_2, TA_DP_3, TA_DP_6
<b>Test Purpose</b>	Verify that DP publish service is responding correctly to invalid parameters (public key hash, delegation data).
<b>Pre-Test Conditions</b>	Delegation Provider is accessible. Delegation is prepared by Mandator as a signed and encrypted delegation in XML format.

Step	Test Activity	Expected Result
1	Minder-ATV sends to DP the following HTTP POST request:  https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish (invalid delegation data, invalid encrypted key, invalid publicKeyHash parameters)	The service should return HTTP 200 OK with appropriate response message that invalid parameters are used for the service.

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<b>ID</b>		<b>TC_DP_5</b>
<b>Assertion(s)</b>		TA_DP_1, TA_DP_2, TA_DP_3, TA_DP_6
<b>Test Purpose</b>		Check the response when DP verifies the delegation.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. Delegation is prepared by Mandator as a signed and encrypted delegation in XML format. Details of the delegation is defined in Test Scenario for DP.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Mandator creates a delegation for TUBITAK Tester.	Delegation.xml that conforms to ETSI 119 621 is created
2	Execute Minder-ATV <i>verifydelegationservice</i> with the following parameter: <i>delegation.xml</i>	The expected result is True
3	Minder-ATV sends to DP the following HTTP POST request: <a href="https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish">https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish</a> ( <i>delegation.xml, pk and publicKeyHash</i> ) parameters	The service should return HTTP 201. The response data should include the receipt including the delegation id that is generated during publish.

<b>ID</b>		<b>TC_DP_6</b>
<b>Assertion(s)</b>		TA_DP_7
<b>Test Purpose</b>		Check content of delegation from the response when delegation is verified.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format. The requester should use authentication service and obtain a <i>token</i> ( <i>LTlwOQ==</i> ).
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV sends to DP the following HTTP POST request: <a href="https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish">https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish</a> ( <i>delegation.xml, pk and publicKeyHash</i> ) parameters	The service should return HTTP 201. The response data should include the ID (2) of the delegation that is generated during publish by DP.

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2	<p>Minder-ATV sends to DP the following HTTP GET request:  <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/download/{ID}</i> with <i>token(LTIwOQ==)</i></p>	<p>The file should include the following content {                  "id": "2", "data": "Delegation 01", "key":                  "MIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQCkl1IFEcTayNbLUOIE6w3EogpnsidozNTOT3LzdrW37DcaeujZvV9p2320re6W1U6MBjgWm1/EUdXAFqpc6McULh1gBeWT9mIPBWiTUGCMI7kH7qTTYxxNsBEye7FrE9hd2u1xjkt/6GZstd39aDcb74gENukCur5baYwkn14ERQIDAQAB"                  }</p>
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<b>ID</b>	TC_DP_7
<b>Assertion(s)</b>	TA_DP_8
<b>Test Purpose</b>	Check the response when a revoked delegation is queried.
<b>Pre-Test Conditions</b>	Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format. Proxy is TUBITAK Tester. A Revoked delegation for TUBITAK Tester is published in DP with id:234. The requester should use authentication service and obtain a <i>token (LTIwOQ==)</i> .

Step	Test Activity	Expected Result
1	<p>Minder-ATV sends HTTP request below to DP searchServer to query status of delegation  <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/search/{234}</i> with <i>token (LTIwOQ==)</i></p>	<p>DP Service should return HTTP 200 with the following response</p> <pre>{ "id": 234, "hash": "lloq18txF97bH5ChyNj5x9irPII=", "key": "MIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQCkl1IFEcTayNbLUOIE6w3EogpnsidozNTOT3LzdrW37DcaeujZvV9p2320re6W1U6MBjgWm1/EUdXAFqpc6McULh1gBeWT9mIPBWiTUGCMI7kH7qTTYxxNsBEye7FrE9hd2u1xjkt/6GZstd39aDcb74gENukCur5baYwkn14ERQIDAQAB" "status": "REVOKED", "data": "Delegation 01"}</pre>
2	<p>Minder-ATV executes <i>verifyRevocationResponse</i> service to validate the revocation result</p>	<p>The verification result return TRUE.</p>

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<b>ID</b>		<b>TC_DP_8</b>
<b>Assertion(s)</b>		TA_DP_9
<b>Test Purpose</b>		Check the response when a valid delegation is queried.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format. A valid delegation for TUBITAK Tester is already published in DP with ID value "678". The requester should use authentication service and obtain a <i>token</i> (LTlwOQ==).
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV sends HTTP request below to DP searchServer to query status of delegation <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/search/{678}</i> with token (LTlwOQ==)	DP Service should return HTTP 200 OK with the following response  { "id": 678, "hash": "lloq18txF97bH5ChyNj5x9irPII=", "key": "MIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQCkl1IFEcTayNbLUOIE6w3EogpnsidozNTOT3LzdrW37DcaeujZvV9p2320re6W1U6MBjgWm1/EUdXAFqpc6McULh1gBeWT9mIPBWiTUGCMI7kH7qTTYxxNsBEye7FrE9hd2u1xjkt/6GZstd39aDcb74gENukCur5baYwkn14ERQIDAQAB "status": "ACTIVE", "data": "Delegation 01"}

<b>ID</b>		<b>TC_DP_9</b>
<b>Assertion(s)</b>		TA_DP_11, TA_DP_12
<b>Test Purpose</b>		Check if a revoke command interface is available.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format. A valid delegation with ID value "33" for TUBITAK Tester is already published in DP. The requester should use authentication service and obtain a <i>token</i> (LTlwOQ==).
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV sends HTTP request below to DP searchServer to query status of delegation	DP Service should return HTTP 200 OK with the following response

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	<i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/search/{33}</i> with token (LTIwOQ==)	{ "id": 33, "hash": "lloq18txF97bH5ChyNj5x9irPII=", "key": "MIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQCkI1FEcTayNbLUOIE6w3EogpnsidozNTOT3LzdrW37DcaeujZvV9p2320re6W1U6MBjgWm1/EUdXAFqpc6McULh1gBeWT9mIPBWiTUGCMI7kH7qTTYxxNsBEye7FrE9hd2u1xjkt/6GZstd39aDcb74gENukCur5baYwkn14ERQIDAQAB "status": "ACTIVE", "data": "Delegation 01" }
2	Minder sends HTTP request below to DP service: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/revoke/{33}?reason=test test</i>	The service returns HTTP 200. The response message should include  { "id": 33, "hash": "lloq18txF97bH5ChyNj5x9irPII=", "status": "REVOKED" }
3	Minder-ATV sends HTTP request below to DP searchServer to query status of delegation <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/search/{33}</i> with token (LTIwOQ==)	DP Service should return HTTP 200 OK with the following response  { "id": 33, "hash": "lloq18txF97bH5ChyNj5x9irPII=", "key": "MIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQCkI1FEcTayNbLUOIE6w3EogpnsidozNTOT3LzdrW37DcaeujZvV9p2320re6W1U6MBjgWm1/EUdXAFqpc6McULh1gBeWT9mIPBWiTUGCMI7kH7qTTYxxNsBEye7FrE9hd2u1xjkt/6GZstd39aDcb74gENukCur5baYwkn14ERQIDAQAB "status": "REVOKED", "data": "Delegation 01" }
4	Minder executes <i>verifyRevocationResponse</i> service to validate the revocation response	Verification of revocation should be TRUE

<b>ID</b>	<b>TC_DP_10</b>	
<b>Assertion(s)</b>	TA_DP_14	
<b>Test Purpose</b>	Check if DP works properly in case where delegation is not a published delegation.	
<b>Pre-Test Conditions</b>	Delegation Provider is accessible. Delegation ID (5678) is not available on DP The requester should use authentication service and obtain a <i>token</i> (LTIwOQ==)	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>

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1	Minder-ATV sends HTTP request below to DP searchServer to query status of delegation <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/search/{5678}</i> with token (LTIwOQ==)	The service should return HTTP 400 with response message "No data exists on the delegation provider for the search parameters" or "No data for the given id exists"
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<b>ID</b>		<b>TC_DP_11</b>
<b>Assertion(s)</b>		TA_DP_2, TA_DP_1
<b>Test Purpose</b>		Verify that download service is working properly.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. A delegation is already published with id value "3333". The requester should use authentication service and obtain a <i>token</i> (LTIwOQ==).
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/download/3333?token=LTIwOQ==</i>	The service returns HTTP 200. The response message should include  { "id": 33, "data": "Delegation 01", "key": "MIGfMA0GCSqGSIsb3DQEBAQUAA4GNADCBiQKBgQCkI1lFEcTayNbLUOIE6w3EogpnsidozNTOT3LzdrW37DcaeuJZvV9p2320re6W1U6MBjgWm1/EUdXAFqpc6McULh1gBeWT9mIPBWiTUGCMI7kH7qTTYxxNsBEye7FrE9hd2u1xjkt/6GZstd39aDcb74gENukCur5baYwkn14ERQIDAQAB"}
2	Minder executes <i>verifyDownloadResponse</i> service to validate the download response	Verification of download should be TRUE

<b>ID</b>		<b>TC_DP_12</b>
<b>Assertion(s)</b>		TA_DP_2, TA_DP_1
<b>Test Purpose</b>		Verify that download service is responding properly in case of an invalid token
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. A delegation is already published with id value "33" An invalid token is used for the service
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>

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1	Minder sends the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/download/33?token=InvalidToken</i>	The service should return HTTP 401 – Unauthorized.
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<b>ID</b>		<b>TC_DP_13</b>
<b>Assertion(s)</b>		TA_DP_15
<b>Test Purpose</b>		Check if the DP responds properly in case where delegation is revoked for the current data given.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. Expired delegation is prepared with id value 765. A valid token is generated from the authentication service with value 1235.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV sends HTTP request below to DP searchServer to query status of delegation <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/download/{765}/key?token=1235</i>	The service should return HTTP 200 OK with the following response message:  { "id": 765, "data": "Delegation 01", "key": "MIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQCkl1IFEcTayNbLUOIE6w3EogpnsidozNTOT3LzdrW37DcaeujZvV9p2320re6W1U6MBjgWm1/EUdXAFqpc6McULh1gBeWT9mIPBWiTUGCMI7kH7qTTYxxNsBEye7FrE9hd2u1xjkt/6GZstd39aDcb74gENukCur5baYwkn14ERQIDAQAB" }

<b>ID</b>		<b>TC_DP_14</b>
<b>Assertion(s)</b>		TA_DP_13
<b>Test Purpose</b>		Check if the DP authentication service is working properly.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. "application/x-www-form-urlencoded" parameter should be set to use /auth/result
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV sends HTTP POST request below to DP <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/a</i>	DP Service should return HTTP 200 OK with challenge as response body message

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	<i>pi/v1/auth</i> with <i>base64Encoded publickey</i>	
2	Minder executes <i>decodeFromChallenge</i> service to validate the revocation response	This service should return the result parameter as "decoded-challenge"
3	Minder-ATV sends HTTP POST request below to DP <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/auth</i> with <i>base64Encoded publickey</i> and <i>decoded-challenge</i>	The service should return HTTP 200 OK with the token value in the response message

<b>ID</b>		<b>TC_DP_15</b>
<b>Assertion(s)</b>		TA_DP_2, TA_DP_1
<b>Test Purpose</b>		Verify that search service is responding properly in case of invalid token.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. A delegation is already published with id value "3333" An invalid token is generated for the service.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV sends the hash of proxy's public key to pub/keyication server. HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/search/{3333}/key?token=invalidtoken</i>	The service returns HTTP Status 401 – Unauthorized with response message indicating that token is not valid

<b>ID</b>		<b>TC_DP_16</b>
<b>Assertion(s)</b>		TA_DP_13
<b>Test Purpose</b>		Check if the DP authentication service responding properly in case of invalid result.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. "application/x-www-form-urlencoded" parameter should be set to use /auth/result.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV sends HTTP POST request below to DP	DP Service should return HTTP 200 with challenge as

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	<i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/auth with base64Encoded publickey</i>	response body message
2	Minder executes <i>decodeFromChallenge</i> service to validate the revocation response	This service should return the result parameter as "decoded-challenge"
3	Minder-ATV sends HTTP POST request below to DP <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/auth/result with base64Encoded publickey and invalid-decoded-challenge</i>	The service should return HTTP 400 with "Error during authentication" response message

<b>ID</b>	<b>TC_DP_17</b>	
<b>Assertion(s)</b>	TA_DP_1, TA_DP_2	
<b>Test Purpose</b>	Verify that DP is working properly when an existing delegation content is to be re-published.	
<b>Pre-Test Conditions</b>	Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format. Proxy is TUBITAK Tester.	
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV sends to DP the following HTTP POST request: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish (with delegation data given in the scenario, publicKey and publicKeyHash parameters)</i>	The service verifies the delegation and returns HTTP 201. The response data should include the "id" value with the following attributes: { "id" : INTEGER }
2	Minder-ATV sends to DP the same parameters in Step 1 following HTTP POST request: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish (with delegation data given in the scenario, publicKey and publicKeyHash parameters)</i>	The service should return HTTP 201 with the response data stating that delegation is updated or delegation already exists.

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<b>ID</b>		<b>TC_DP_18</b>
<b>Assertion(s)</b>		TA_DP_11, TA_DP_12
<b>Test Purpose</b>		Check if the revocation service works properly in case of missing parameters reason and/or token.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format. A valid delegation for TUBITAK Tester is published in DP. A valid token (LTIwOQ==) should be generated from authentication service.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder sends HTTP request below to DP service: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/ revoke/{989} without passing the reason parameter</i>	The service should return HTTP Status 400 – Bad Request indicating that the request is incorrect.

<b>ID</b>		<b>TC_DP_19</b>
<b>Assertion(s)</b>		TA_DP_13
<b>Test Purpose</b>		Check if the DP authentication service responding properly in case of invalid public key.
<b>Pre-Test Conditions</b>		Delegation Provider is accessible. An invalid Base64 encoded public key is generated and sent as a parameter.
<b>Step</b>	<b>Test Activity</b>	<b>Expected Result</b>
1	Minder-ATV sends HTTP POST request below to DP <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/auth with invalid base64Encoded publickey</i>	DP Service should return HTTP 400 with “Wrong data provided, could not create a challenge” as a response message
2	Minder executes <i>decodeFromChallenge</i> service to validate the revocation response	This service should return FALSE

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## 7. Test Execution Results

This section presents the latest results of test executions achieved over the development and testing time periods in LIGHTest project. Four main iterations have been held for the test executions. At each iteration, bugs that were stated to be fixed and to be ready to test have been verified and for each bug the resolution status has been set on the GitLab repository.

The results listed in the subsections correspond to the latest iteration results. The bugs issued for the previous iterations are summarized in the next section.

### 7.1 TSPA Test Results

This section presents the execution status and details of the test cases for the TSPA components that are executed on Minder Testbed. The GitLab links corresponding to the defects/issues/bugs are also included in the table.

Test Case ID	Execution Result	Details
TC_TSPA_1	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_2	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_3	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_4	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_5	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_6	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_7	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_8	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_9	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_10	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.

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TC_TSPA_11	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_12	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_13	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_14	 Passed	<p>When a trust-scheme is to be deleted in case of Zone Manager connection with TSPA is corrupted, it should return HTTP 500 with "Zone Manager could not be reached" response message. But, current deployed version TSPA returns HTTP 502 with "502 Bad Gateway" response message.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TrustSchemePublicationAuthority/issues/25">https://extgit.iaik.tugraz.at/LIGHTest/TrustSchemePublicationAuthority/issues/25</a></p>
TC_TSPA_15	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_16	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_17	 Passed	<p>When a trust-scheme is to be deleted in case of Zone Manager connection with TSPA is corrupted, it should return HTTP 500 with "Zone Manager could not be reached" response message. But, current deployed version TSPA returns HTTP 502 with "502 Bad Gateway" response message.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TrustSchemePublicationAuthority/issues/25">https://extgit.iaik.tugraz.at/LIGHTest/TrustSchemePublicationAuthority/issues/25</a></p>
TC_TSPA_18	 Passed	<p>When a trust-list is to be deleted in case of Zone Manager connection with TSPA is corrupted, it should return HTTP 500 with "Zone Manager could not be reached" response message. But, current deployed version TSPA returns HTTP 502 with "502 Bad Gateway" response message.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TrustSchemePublicationAuthority/issues/25">https://extgit.iaik.tugraz.at/LIGHTest/TrustSchemePublicationAuthority/issues/25</a></p>
TC_TSPA_19	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_20	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.

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TC_TSPA_21	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_22	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_23	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_24	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_25	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_26	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TSPA_27	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.

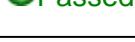
### 7.2 TTA Test Results

This section presents the execution status and details of the test cases for the TTA components that are executed on Minder Testbed. The GitLab links corresponding to the defects/issues/bugs are also included in the table.

Test Case ID	Execution Result	Details
TC_TTA_1	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_2	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_3	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_4	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_5	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_6	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_7	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.

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TC_TTA_8	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_9	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_10	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_11	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_12	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_13	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_14	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_15	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_16	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_17	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_18	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_19	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_20	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_21	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_22	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_23	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_24	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.

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TC_TTA_25	Passed	
TC_TTA_26	Failed	When a non-existing trust scheme is called to get trust scheme details, it is expected to return HTTP 200 stating that the trust scheme is not available. But, the TTA returns HTTP 500 Internal Server Error.  The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/11">https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/11</a>
TC_TTA_27	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_TTA_28	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.

### 7.3DP Test Results

This section presents the execution status and details of the test cases for the DP components that are executed on Minder Testbed. The GitLab links corresponding to the defects/issues/bugs are also included in the table.

Test Case ID	Execution Result	Details
TC_DP_1	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_2	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_3	Passed	The service currently returns HTTP 201 Created. When we inspect the logs, it is observed that publish_key is not verifying the format/content for the parameters (key and public_key_hash)  The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/24">https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/24</a>
TC_DP_4	Passed	The service currently returns HTTP 201 Created. When we inspect the logs, it is observed that publish_key is not verifying the format/content for the parameters (key and public_key_hash)  The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/24">https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/24</a>
TC_DP_5	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_6	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_7	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.

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TC_DP_8	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_9	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_10	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_11	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_12	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_13	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_14	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_15	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_16	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_17	Passed	<p>When the same delegation content is intended to be published, it is expected to return HTTP 201 stating that the delegation is overwritten or HTTP 400 stating that the same delegation content exists already. But DP returns HTTP 400 Bad Request.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/20">https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/20</a></p>
TC_DP_18	Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_DP_19	Passed	<p>When an invalid base64Encoded public key is generated and sent to the authentication service, the service returns HTTP 500 Internal Error with "java.lang.NullPointerException: Key is null!"</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/25">https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/25</a></p>

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## 8. Conclusions

The main goal of the project is to meet the TRL (Technology Readiness Level) 7+ for overall project and TRL 9 for the TSPA, TTA and DP components.

Conformance and interoperability testing activities all aim to measure and analyze the quality status of the TSPA, TTA and DP components. For this purpose, four main iterations have been performed to cover the all TSPA, TTA and DP components related test cases. Inside each iteration, we have performed continuous test executions that enable testers to provide the detailed log information and the developers to focus and dig on the defects (bugs/issues) created in each execution.

Defects are categorized according to the severity levels. Critical defects with high priority are verified and closed. Minor defects with low priority are not expected to be resolved in the iterations. Trivial defects could be resolved before the components are prepared in production mode.

The TSPA component final test iteration has been completed with a successful test list run that includes warning for TC\_TSPA\_14, TC\_TSPA\_17 and TC\_TSPA\_19. The TSPA satisfies the functionality referred in the test specifications but the expected response messages are not compliant with the given response messages in TSPA-API description document. Either the API description should be updated according to the source code or the source code should be updated according to the description.

The TTA component final test iteration has been completed with a successful test list run that includes a minor bug that is created after TC\_TTA\_26. It can be concluded that the TTA component fulfills the requirements and satisfies the functionality referred in the test specifications. The bug can be swiftly resolves and verified.

The DP component final test iteration has been completed with a successful test list run that includes warning for TC\_DP\_3, TC\_DP\_4, TC\_DP\_17 and TC\_DP\_19. The DP satisfies the functionality referred in the test specifications but the expected response messages are not compliant with the given response messages in DP-API description document. Either the API description should be updated according to the source code or the source code should be updated according to the description.

In conclusion, TSPA, TTA and DP components are good candidates for further improvements to be used in production mode.

### 8.1 Failed Test List

The following list includes the failed test list that includes the most important defects that are created on Gitlab from the first iteration forward. Most of them are fixed and resolved by the implementers and verified by the testers and closed. For further analysis, please look at the GitLab Server.

Test Case ID	Previous Execution Result	Current Execution Result	Details	
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TC_TSPA_27	Failed	Passed	<p>When a non-existing trust list is intended to be deleted, it is expected to return “there exists no trust list with the given trust scheme parameter “.</p> <p>But the service returns “Coudn’t delete trust list “.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TrustScheme/PublicationAuthority/issues/19">https://extgit.iaik.tugraz.at/LIGHTest/TrustScheme/PublicationAuthority/issues/19</a></p>
TC_TTA_3	Failed	Passed	<p>When a POST translation is called with the following parameters, it returns the following, which is not valid for json format:</p> <pre>{„agreename“:“final_test“,„xmlFile“:“tr_eidas.xml“, „tplFile“:“tr_eidas.tpl.p7s“, }</pre> <p>The comma should be removed from the result.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/8">https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/8</a></p>
TC_TTA_18	Failed	Passed	<p>When <a href="https://tta-lightest.eu:8441/ttaFM/mng/">https://tta-lightest.eu:8441/ttaFM/mng/</a> TrustTranslationDeclaration/test.lightest.nlnetlabs.nl is called, the downloaded file content is incorrect for level attribute.</p> <p>Although it should be in the source scheme, it is in the target scheme.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/15">https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/15</a></p>
TC_TTA_25	Failed	Passed	<p>When a post translation service is called with invalid parameter (mandatory fields missing), it is expected to return HTTP 409 Conflict stating that error parsing agreement details some 85ort h data is not present or has incorrect format. But TTA returns HTTP 500 Interval Server Error.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/9">https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/9</a></p>
TC_TTA_27	Failed	Passed	<p>When a non-existing trust scheme is called to get agreement details, it is expected to return HTTP 200 stating that TargetOfTrustIn and OriginOfTrustIn fields are empty. But TTA returns HTTP 500 Interval Server Error.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/14">https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/14</a></p>
TC_TTA_28	Failed	Passed	<p>When translation declaration service is called with a non-existing trust scheme, it is expected to return HTTP 404 Not Found with „An appropriate message stating that trust scheme is not defined should be returned“ message.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/16">https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/16</a></p>
TC_TTA_24	Failed	Passed	<p>When translation creation service is called with the activation date earlier than creation/leaving date OR activation date later than leaving data, it should return that activation date</p>

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			<p>cannot be earlier than creation date OR activation date cannot be later than leaving date. But TTA returns „activationdate must be sonner than leaving date“ when activation date later than leaving data.</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/10">https://extgit.iaik.tugraz.at/LIGHTest/TTA/issues/10</a></p>
TC_DP_10	Failed	Passed	<p>The service currently returns HTTP 200 OK with NULL value as response message. The service is expected to return HTTP 400 with “No data exists on the delegation provider for the search parameters“ and/or “No data for the given id exists“</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/23">https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/23</a></p>
TC_DP_14	Failed	Passed	<p>The service currently returns HTTP 204 with empty response message. The service is expected to return HTTP 200 with the response message including the challenge that is used to generate token for usage of search and download services.</p> <p>However local deployment of DP returns HTTP 200 OK with the challenge information in the response message</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/22">https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/22</a></p>
TC_DP_16	Failed	Passed	<p>When an invalid result parameter is sent for the authentication token generation service, the service returns HTTP 500 Internal Server Error. But It is expected to return HTTP 400 with “Error during authentication“ response message</p> <p>The issue for the corresponding bug is available on <a href="https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/26">https://extgit.iaik.tugraz.at/LIGHTest/DelegationProvider/issues/26</a></p>

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## 10. Project Description

### **LIGHTest project to build a global trust infrastructure that enables electronic transactions in a wide variety of applications**

An ever increasing number of transactions are conducted virtually over the Internet. How can you be sure that the person making the transaction is who they say they are? The EU-funded project LIGHTest addresses this issue by creating a global trust infrastructure. It will provide a solution that allows one to distinguish legitimate identities from frauds. This is key in being able to bring an efficiency of electronic transactions to a wide application field ranging from simple verification of electronic signatures, over eProcurement, eJustice, eHealth, and law enforcement, up to the verification of trust in sensors and devices in the Internet of Things.

Traditionally, we often knew our business partners personally, which meant that impersonation and fraud were uncommon. Whether regarding the single European market place or on a Global scale, there is an increasing amount of electronic transactions that are becoming a part of peoples everyday lives, where decisions on establishing who is on the other end of the transaction is important. Clearly, it is necessary to have assistance from authorities to certify trustworthy electronic identities. This has already been done. For example, the EC and Member States have legally binding electronic signatures. But how can we query such authorities in a secure manner? With the current lack of a worldwide standard for publishing and querying trust information, this would be a prohibitively complex leading to verifiers having to deal with a high number of formats and protocols.

The EU-funded LIGHTest project attempts to solve this problem by building a global trust infrastructure where arbitrary authorities can publish their trust information. Setting up a global infrastructure is an ambitious objective; however, given the already existing infrastructure, organization, governance and security standards of the Internet Domain Name System, it is with confidence that this is possible. The EC and Member States can use this to publish lists of qualified trust services, as business registrars and authorities can in health, law enforcement and justice. In the private sector, this can be used to establish trust in inter-banking, international trade, shipping, business reputation and credit rating. Companies, administrations, and citizens can then use LIGHTest open source software to easily query this trust information to verify trust in simple signed documents or multi-faceted complex transactions.

The three-year LIGHTest project starts on September 1st and has an estimated cost of almost 9 Million Euros. It is partially funded by the European Union’s Horizon 2020 research and innovation programme under G.A. No. 700321. The LIGHTest consortium consists of 14 partners from 9 European countries and is coordinated by Fraunhofer-Gesellschaft. To reach out beyond Europe, LIGHTest attempts to build up a global community based on international standards and open source software.

The partners are ATOS (ES), Time Lex (BE), Technische Universität Graz (AT), EEMA (BE), G&D (DE), Danmarks Tekniske Universitet (DK), TUBITAK (TR), Universität Stuttgart (DE), Open Identity Exchange (GB), NLNet Labs (NL), CORREOS (ES), University of Piraeus Research Center – UPRC (GR) and Ubisecure (FI). The Fraunhofer IAO provides the vision and architecture for the project and is responsible for both, its management and the technical coordination.

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