



D8.10

Integration Testing Report (3)

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1. Executive Summary

This document is the deliverable D8.10 “Integration Testing 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 deliverable is constructed upon the deliverable D8.9 “Integration Testing Report (2)” and it covers the third iteration on integration testing efforts.

Throughout the course of the project, integration testing is carried out in three iterations and at each iteration a periodic report on integration testing is published. This document D8.10 – Integration Testing Report (3) is the third iteration testing report on integration testing of LIGHTest components at the system level. The main contents of this deliverable include updated test cases and test case executions given in D8.9 according to the applied Minder Test Assertion Model. 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	02/09/2019	TUBITAK	Update and inclusion of Test cases
0.2	04/11/2019	TUBITAK	Update and inclusion of Test cases and test executions
0.3	07/11/2019	TUBITAK	Update and inclusion of Test cases and test executions
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3.3 Table of Acronyms

API	Application Program Interface
ATV	Automatic Trust Verifier
CC	Conformance Clause
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
PTR	Pointer
PKI	Public Key Infrastructure
REST	Representational State Transfer (service)
RR	Resource Record
S/MIME	Secure/Multipurpose Internet Mail Extensions
SUT	System Under Test
TA	Test Assertion
TA id	Test Assertion Identification Number
TCP/IP	Transmission Control Protocol / Internet Protocol
TP	Trust Policy
TPL	Trust Policy Language
TSLTS	Trust Service Status List Technical Specification
TSL	Trust Service Status List
TSP	Trust Service Provider
TSPA	Trust Scheme Publication Authority

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TTA	Trust Translation Authority
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 basically provides an infrastructure to realize the most important principles and driving factors of eIDAS on a global level.

Integration testing is a level of software testing where individual LIGHTest components are connected to each other and tested as a group. The purpose of this level of testing is to expose faults/defects in the interfaces and in the interactions between integrated components or systems. Task 8.4 is dedicated to integration testing. In this task, we test outputs of other WPs in order to see whether they 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 scope of this deliverable. Section 5 includes the methodology to execute and report test executions. Section 6 presents integration testing scenarios and Section 7 presents the integration test execution results that includes the execution status and details of integration test cases for TSPA, TTA and DP Lightest component. Section 8 includes the conclusions about the testing activities.

4.2 Scope

Within the course of the LIGHTest project, integration testing of the software components developed in WP3, 4, 5, and 6 is carried out using Minder Testbed and the results are reported periodically. D8.10 Integration testing report (3) is the third report of this series and focuses on executing test cases and reporting test results. Although the testing duties within the LIGHTest project include conformance and interoperability testing and code quality review in addition to the integration testing within the WP8 activities, Task 8.4 is dedicated to the automatic integration testing of the LIGHTest components.

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5. Integration Testing Execution Methodology

The main testing methodology is already described in D8.9, section 5. This section focuses on the test case executions and reporting of the executions on the Minder Testbed.

The following figure illustrates the components built in Minder architecture to enhance the executions and reporting of integration test cases.

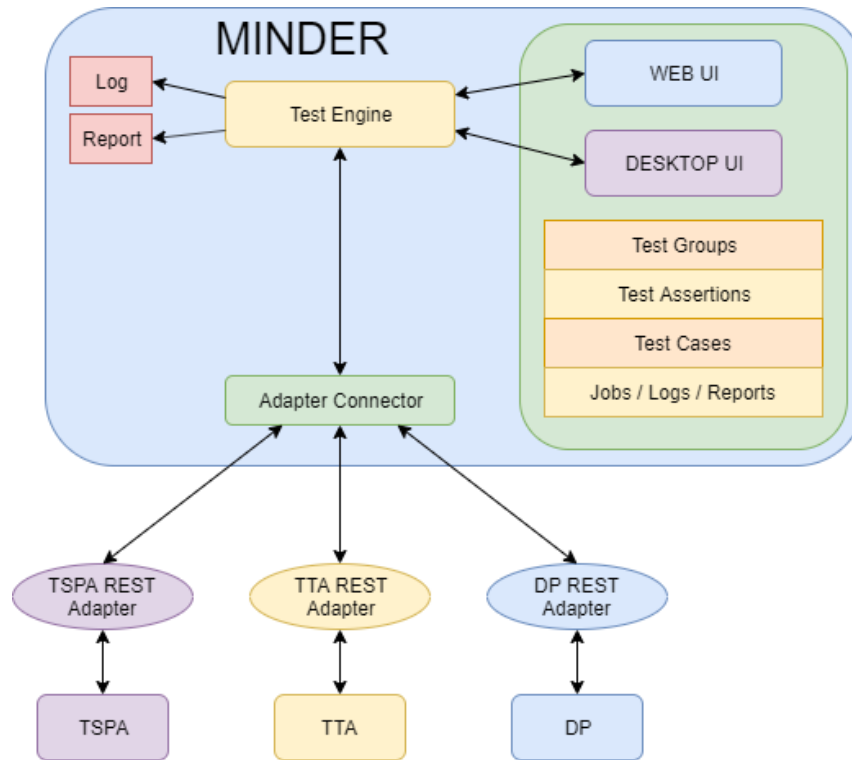


Figure 1 Minder Testbed testing components

The basic flow for the execution is as follows:

1. Prepare data for integration testing scenario
2. Define/Update integration test cases on Minder Test Manager using Desktop UI
3. Define test jobs for each test case on Minder Test Manager
4. Execute the test jobs on Minder Test Manager
5. Analyze 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

Please note that integration test executions are performed in an iterative manner. Three iterations have been performed to cover the integration interfaces between TSPA-DNS, TTA-DNS and DP components. The issues/bugs/defects/corrective actions are reported after completion of all iterations.

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5.1 Test Criteria

Test criteria include pass/fail and suspension criteria. The criteria are taken from OASIS TAM¹.

5.1.1 Pass/Fail Criteria

The completion criterion for conformance test iteration is the execution of the ALL test cases generated from test assertions in a test cycle/job. Test cases should cover all the test assertions and they should be written in a sufficient level of detail. Test Assertions Guideline² should be referenced to write assertions.

Each Test Case can have two possible values: **Passed** or **Failed**.

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 satisfied with the inclusion of the test case id with the title of the bugs/defects/issues created on GitLab.

Please recap the naming convention of test case ID given in D8.9 as follows:

TC_INT_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.

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 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 are re-deployed with the fix inclusions.

¹ <http://docs.oasis-open.org/>

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

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6. Integration Test Cases

This section lists the second release of test cases derived from test assertions of TSPA, TTA, and DP given in D8.8.

Following the methodology described in the previous section, test cases are created and updated based on the integration scenarios Querying of Trust Scheme Membership, Querying of Trust Translation List and Discovering of Trust Delegation already described in D8.9, section 6.

Also note that the following figure illustrates the PKI used to generate test assets that are used as input data in the test cases executions. Test assets can be certificates, signed electronic transactions and signed trust lists.

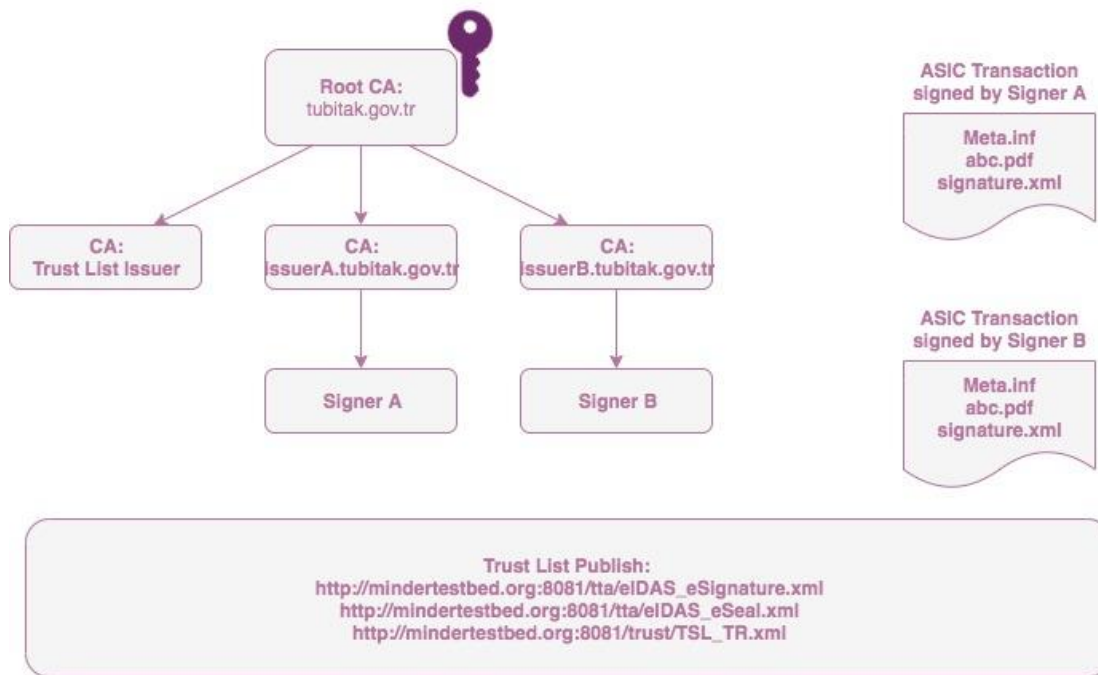


Figure 2 PKI for test scenarios

For traceability purposes, the identifiers of the test case definitions are done using the following convention: **TC_INT_LightestComponentName(TSPA,TTA,DP)_TestCaseID**

6.1 ATV – TSPA Integration Testing

The normative and conformance clauses are already given in D8.8 Section 7.1. The revisited test assertions are already given in D8.9 Section 7.

This section includes the list of updated test cases and the descriptions of the test cases.

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6.1.1 ATV - TSPA Integration Test Case List

Table 1 List of ATV – TSPA integration test cases

ID	Purpose
TC_INT_TSPA_1	Check if TSPA-DNS server exists and is configured to be used by TSPA.
TC_INT_TSPA_2	Verify that RR response to the issuer name is a PTR record and DNSSec validation is successful
TC_INT_TSPA_3	Verify that RR response to the issuer name is a URI record and DNSSec validation is successful
TC_INT_TSPA_4	Verify that trust list pointed on the URI RR record, signature validation is successful
TC_INT_TSPA_5	Verify that an invalid trust list pointed on the URI RR record, signature validation fails
TC_INT_TSPA_6	Verify that TSPA could provide trust scheme declarations successfully
TC_INT_TSPA_7	Verify that TSPA could provide trust list URLs for the trust scheme successfully
TC_INT_TSPA_8	Verify that TSPA-DNS provides certificate constraints to validate trust lists successfully
TC_INT_TSPA_9	Verify that TSPA-DNS provides certificate constraints with different parameters to validate trust lists successfully
TC_INT_TSPA_10	Verify that TSPA-DNS provides certificate constraints with different parameters to validate trust lists successfully
TC_INT_TSPA_11	Verify that trust list validation fails in case of invalid certificate
TC_INT_TSPA_12	Verify that TSPA can persist Boolean trust scheme declarations successfully
TC_INT_TSPA_13	Verify that TSPA can persist ordinal trust scheme declarations successfully
TC_INT_TSPA_14	Verify that received DNS works in synchronization with TSPA
TC_INT_TSPA_15	Verify that received TSPA works in synchronization with DNS entries

6.1.2 ATV - TSPA Integration Test Case Details

ID	TC_INT_TSPA_1	
Assertion(s)	TA_TSPA_1	
Test Purpose	Check if TSPA-DNS server exists and is configured to be used by TSPA.	
Pre-Test Conditions	TSPA should already be deployed. DNS deployment should be available.	
Step	Test Activity	Expected Result
1	On the terminal, type the following command: <i>dig lightest.nlnetlabs.nl</i>	<pre> ; <<>> DiG 9.10.6 <<>> lightest.nlnetlabs.nl ;; global options: +cmd ;; Got answer: ;; ->>HEADER<<- 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: </pre>

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		<pre>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 with eidas.kamusm.gov.tr-example scheme name</i>	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>; <<>> DiG 9.10.6 <<>> _scheme 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. 3600 IN PTR _scheme._trust.eidas.kamusm.gov.tr-example</pre>

ID	TC_INT_TSPA_2	
Assertion(s)	TA_TSPA_2	
Test Purpose	Verify that RR response to the issuer name is a PTR record and DNSSec validation is successful.	
Pre-Test Conditions	TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with eidas.kamusm.gov.tr-example should be published with turkey.lightest.nlnetlabs.nl 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 PTR</i>	<pre>; <<>> DiG 9.10.6 <<>> _scheme 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</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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ID		TC_INT_TSPA_3
Assertion(s)		TA_TSPA_3
Test Purpose		Verify that RR response to the issuer name is a URI record and DNSSEC validation is successful.
Pre-Test Conditions		TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running. A valid trust scheme: with eidas.kamusm.gov.tr-example should be published with turkey.lightest.nlnetlabs.nl domain name in TSPA.
Step	Test Activity	Expected Result
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/IntegrationTSL_TR.xml</i> trust list and certificate [{"usage":"dane-ee", "selector":"cert", "matching":"full", "data":" Base16 encoded public key"}]	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/trust/IntegrationTSL_TR.xml</i>

ID		TC_INT_TSPA_4
Assertion(s)		TA_TSPA_4
Test Purpose		Verify that trust list pointed on the URI RR record, signature validation is successful.
Pre-Test Conditions		TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running. A valid trust scheme: with eidas.kamusm.gov.tr-example should be

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	published with turkey.lightest.nlnetlabs.nl domain name in TSPA A valid trust list is defined in TSPA (TC_INT_TSPA_3 should be executed).	
Step	Test Activity	Expected Result
1	On the terminal, type the following command: <i>dig _scheme._trust. turkey.lightest.nlnetlabs.nl URI</i>	<pre> ; <<>> 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 http://www.mindertestbed.org:8081/trust//trust/Integration TSL_TR.xml </pre>
2	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> with <i>http://www.mindertestbed.org:8081/trust//trust/IntegrationTSL_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> ; <<>> DiG 9.10.6 <<>> _scheme._trust. turkey.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: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA (3 0 0) with Base16 encoded public key of trust list signer </pre>
5	Execute Minder-ATV <i>checkCertificateFromSMIMEA</i> service that performs certificate validation	The certificate validation result should return TRUE The SMIMEA record on DNS should be IN SMIMEA 3 0 0 "Base16 encoded public key of trust list signer"

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ID		TC_INT_TSPA_5
Assertion(s)		TA_TSPA_4
Test Purpose		Verify that an invalid trust list pointed on the URI RR record, signature validation fails.
Pre-Test Conditions		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with eidas.kamusm.gov.tr-example should be published with turkey.lightest.nlnetlabs.nl domain name in TSPA.
Step	Test Activity	Expected Result
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 with http://www.mindertestbed.org:8081/trust/Invalid-TSL-XML.xml trust list and certificate [{"usage":"dane-ee","selector":"cert","matching":"full","data":" Base16 encoded public key of a different signer"}] parameter</i>	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>;<<> 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 http://www.mindertestbed.org:8081/trust/InvalidTSL-XML.xml</pre>
3	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA</i>	<pre>;<<> DiG 9.10.6 <<> _scheme._trust.turkey.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: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION:</pre>

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		<i>_scheme._trust.turkey.lightest.nlnetlabs.nl. IN SMIMEA (3 0 0) with Base16 encoded public key of a different signer</i>
4	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> with http://www.mindertestbed.org:8081/trust/InvalidTSL-XML.xml parameter	The trust list should be downloaded.
5	Execute Minder-ATV <i>verifyTrustList</i> service that performs signature validation	The trust list verification should return FALSE
6	Execute Minder-ATV <i>checkCertificatefromSMIMEA</i> service to verify the certificate used to sign the trust list	Certificate validation result should be FALSE

ID		TC_INT_TSPA_6
Assertion(s)		TA_TSPA_5, TA_TSPA_6
Test Purpose		Verify that TSPA could provide trust scheme declarations successfully.
Pre-Test Conditions		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	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> ; <<>> DiG 9.10.6 <<>> _scheme 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. 3600 IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example </pre>

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ID	TC_INT_TSPA_7	
Assertion(s)	TA_TSPA_7	
Test Purpose	Verify that TSPA could provide trust list URLs for the trust scheme successfully.	
Pre-Test Conditions	TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with eidas.kamusm.gov.tr-example should be published with turkey.lightest.nlnetlabs.nl domain name in TSPA.	
Step	Test Activity	Expected Result
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 eidas.kamusm.gov.tr-example trust scheme
2	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	<pre> ; <<>> DiG 9.10.6 <<>> _scheme 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. 3600 IN PTR 1 1 _scheme._trust.eidas.kamusm.gov.tr-example </pre>
3	Minder sends to TSPA the following HTTP GET request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list with http://www.mindertestbed.org:8081/trust/TSL-XML.xml parameter</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> ; <<>> 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 </pre>

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		;; ANSWER SECTION: ;_scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 http://www.mindertestbed.org:8081/trust/TSL-XML.xml
--	--	--

ID	TC_INT_TSPA_8	
Assertion(s)	TA_TSPA_8	
Test Purpose	Verify that TSPA-DNS provides certificate constraints to validate trust lists successfully.	
Pre-Test Conditions	TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running. A valid trust scheme: with eidas.kamasm.gov.tr-example should be published with turkey.lightest.nlnetlabs.nl domain name in TSPA.	
Step	Test Activity	Expected Result
1	Minder sends to TSPA the following HTTP PUT request: https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list with http://www.mindertestbed.org:8081/trust/TSL-TR.xml and certificate value [{"usage":"dane-ee","selector":"cert","matching":"sha256","data":"sha256 hash of DER encoded certificate"}] as parameter	The service should return HTTP 200 OK
2	On the terminal, type the following command: <code>dig _scheme._trust.turkey.lightest.nlnetlabs.nl URI</code>	;<<>> 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 http://www.Mindertestbed.org:8081/trust/TSL_TR.xml
3	Minder parses DNS query and Execute Minder-ATV verifyTrustList service that performs signature validation for the trust list downloaded in http://www.mindertestbed.org:8081/trust/TSL_TR.xml	Trust List validation result should be successful

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4	<p>On the terminal, type the following command: <i>dig _scheme._trust. turkey.lightest.nl netlabs.nl SMIMEA</i></p>	<pre> ; <<>> DiG 9.10.6 <<>> _scheme._trust. turkey.lightest.nl netlabs.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: _scheme._trust. turkey.lightest.nl netlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust. turkey.lightest.nl netlabs.nl IN SMIMEA (3 0 1) with sha256 hash of certificate </pre>
5	<p>Minder-ATV parses the DNS query and execute Minder Minder-ATV <i>checkCertificateFromSMIMEA</i> service base256 encoded certificate</p>	<p>T service base256 encoded certificate he certificate validation result should be TRUE</p>

ID	TC_INT_TSPA_9
Assertion(s)	TA_TSPA_8
Test Purpose	Verify that TSPA-DNS provides certificate constraints with different parameters to validate trust lists successfully.
Pre-Test Conditions	TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running. A valid trust scheme: with eidas.kamusm.gov.tr-example should be published with turkey.lightest.nl netlabs.nl domain name in TSPA.

Step	Test Activity	Expected Result
1	<p>Minder sends to TSPA the following HTTP PUT request: https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nl netlabs.nl/trust-list with <i>http://www.mindertestbed.org:8081/trust/TSL-TR.xml</i> and certificate value [{"usage": "dane-ee", "selector": "cert", "matching": "sha512", "data": "sha512 hash of DER encoded certificate"}] as parameter</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.nl netlabs.nl URI</i></p>	<pre> ; <<>> DiG 9.10.6 <<>> _scheme._trust. turkey.lightest.nl netlabs.nl URI ;; global options: +cmd ;; Got answer: ;; ->>HEADER<<- 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 URI ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI 1 1 http://www.mindertestbed.org:8081/trust/TSL_TR.xml</pre>
3	Minder parses DNS query and Execute Minder-ATV verifyTrustList service that performs signature validation for the trust list downloaded in http://www.mindertestbed.org:8081/trust/TSL_TR.xml	Trust List validation result should be TRUE
4	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl SMIMEA</i>	<pre><<<> DiG 9.10.6 <<<> _scheme._trust. turkey.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: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA (3 0 2) with sha512 hash of certificate</pre>
5	Minder-ATV parses the DNS query and execute Minder Minder-ATV checkCertificateFromSMIMEA service with base512 encoded certificate	The certificate validation result should be TRUE

ID	TC_INT_TSPA_10	
Assertion(s)	TA_TSPA_8	
Test Purpose	Verify that TSPA-DNS provides certificate constraints with different parameters to validate trust lists successfully.	
Pre-Test Conditions	TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with eidas.kamusm.gov.tr-example should be published with turkey.lightest.nlnetlabs.nl domain name in TSPA.	
Step	Test Activity	Expected Result

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1	<p>Minder sends to TSPA the following HTTP PUT request: https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lighthouse.nl/netlabs.nl/trust-list with http://www.mindertestbed.org:8081/trust/TSL-TR.xml and certificate value [{"usage":"dane-ee","selector":"cert","matching":"full","data":"base16 encoded form of public key certificate"}] as parameter</p>	<p>The service should return HTTP 200 OK</p>
2	<p>On the terminal, type the following command: <code>dig _scheme._trust.turkey.lighthouse.nl netlabs.nl URI</code></p>	<pre>;<<> DiG 9.10.6 <<> _scheme._trust.turkey.lighthouse.nl netlabs.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.lighthouse.nl IN URI ;; ANSWER SECTION: _scheme._trust.turkey.lighthouse.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 verifyTrustList service that performs signature validation for the trust list downloaded in http://www.mindertestbed.org:8081/trust/TSL_TR.xml</p>	<p>Trust List validation result should be successful</p>
4	<p>On the terminal, type the following command: <code>dig _scheme._trust.turkey.lighthouse.nl netlabs.nl SMIMEA</code></p>	<pre>;<<> DiG 9.10.6 <<> _scheme._trust.turkey.lighthouse.nl netlabs.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: _scheme._trust.turkey.lighthouse.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lighthouse.nl IN SMIMEA (3 0 0) with base16 encoded public key</pre>

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5	Minder-ATV parses the DNS query and execute Minder Minder-ATV <i>checkCertificateFromSMIMEA</i> service base16 encoded certificate	The certificate validation result should be TRUE
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ID	TC_INT_TSPA_11	
Assertion(s)	TA_TSPA_8	
Test Purpose	Verify that trust list validation fails in case of invalid certificate.	
Pre-Test Conditions	TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid trust scheme: with eidas.kamusm.gov.tr-example should be published with turkey.lightest.nlnetlabs.nl 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.	
Step	Test Activity	Expected Result
1	Minder sends to TSPA the following HTTP PUT request: https://lightest-dev.iaik.tugraz.at/tspa/api/v1/turkey.lightest.nlnetlabs.nl/trust-list with <i>http://www.mindertestbed.org:8081/trust/TSL-TR.xml</i> and certificate value [{"usage": "dane-ee", "selector": "cert", "matching": "full", "data": "invalid certificate"}] as parameter	The service should return HTTP 200 OK
2	On the terminal, type the following command: dig _scheme._trust.turkey.lightest.nlnetlabs.nl IN URI	; <<>> 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>
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/TSL_TR.xml</i>	Trust List validation result should be false

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4	<p>On the terminal, type the following command: <i>dig _scheme._trust. turkey.lightest.nlnetlabs.nl SMIMEA</i></p>	<pre>;<<>> DiG 9.10.6 <<>> _scheme._trust. turkey.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: _scheme._trust. turkey.lightest.nlnetlabs.nl IN SMIMEA ;; ANSWER SECTION: _scheme._trust.turkey.lightest.nlnetlabs.nl IN SMIMEA (3 0 0) with invalid certificate</pre>
5	<p>Minder-ATV parses the DNS query and execute Minder Minder-ATV <i>checkCertificateFromSMIMEA</i> service with invalid certificate</p>	<p>The certificate validation result should be false</p>

ID		TC_INT_TSPA_12
Assertion(s)		TA_TSPA_9
Test Purpose		Verify that TSPA can persist Boolean trust scheme declarations successfully.
Pre-Test Conditions		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running.
Step	Test Activity	Expected Result
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/schemes with boolean.eidas.kamusm.gov.tr-example parameter</i></p>	<p>The service should return HTTP 200 OK. (Total 2 trust scheme with <i>.eidas.kamusm.gov.tr-example</i> and Boolean. <i>.eidas.kamusm.gov.tr-example</i> should be available)</p>
2	<p>On the terminal, type the following command: <i>dig _scheme._trust. turkey.lightest.nlnetlabs.nl PTR</i></p>	<pre>;<<>> 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.boolean.eidas.kamusm.gov.tr-example</pre>

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ID		TC_INT_TSPA_13
Assertion(s)		TA_TSPA_10
Test Purpose		Verify that TSPA can persist ordinal trust scheme declarations successfully.
Pre-Test Conditions		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running.
Step	Test Activity	Expected Result
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 parameter</i>	The service should return HTTP 200 OK. (Total 3 trust scheme with <i>.eidas.kamusm.gov.tr-example</i> and Boolean. <i>.eidas.kamusm.gov.tr-example</i> and <i>ordinallevelname.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> ; <<>> 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. ordinallevelname.eidas.kamusm.gov.tr- example </pre>

ID		TC_INT_TSPA_14
Assertion(s)		TA_TSPA_10
Test Purpose		Verify that received DNS works in synchronization with TSPA .
Pre-Test Conditions		TSPA should already be deployed and running. DNS deployment with DNSSec extension should be running.
Step	Test Activity	Expected Result
1	On the terminal, type the following command: <i>dig _scheme._trust.turkey.lightest.nlnetlabs.nl PTR</i>	<pre> ; <<>> 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 </pre>

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		; 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	Disconnect DNS Zone Manager connection with TSPA	
3	Minder sends to TSPA the following HTTP POST request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/tubitak-test.lightest.nlnetlabs.nl/scheme</i>	The service should return HTTP 500 with “Zone Manager could not be reached” response message.
4	Minder sends to TSPA the following HTTP POST 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 value <i>[{"usage": "dane-ee", "selector": "cert", "matching": "full", "data": "base 16 encoded certificate"}]</i> as parameter	The service should return HTTP 500 with “Zone Manager could not be reached” response message.
5	Minder sends to TSPA the following HTTP DELETE request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/tubitak-test.lightest.nlnetlabs.nl/scheme</i>	The service should return HTTP 500 with “Zone Manager could not be reached” response message.
6	Minder sends to TSPA the following HTTP DELETE request: <i>https://lightest-dev.iaik.tugraz.at/tspa/api/v1/tubitak-test.lightest.nlnetlabs.nl/trust-list</i>	The service should return HTTP 500 with “Zone Manager could not be reached” response message.

6.2 ATV – TTA Integration Testing

The normative and conformance clauses are already given in D8.8 Section 6.2. The revisited test assertions are already given in D8.9 Section 7.2.

This section includes the list of updated test cases and the descriptions of the test cases. Also, 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

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6.2.1 ATV – TTA Integration Test Cases List

Table 2 List of ATV – TTA integration test cases

ID	Purpose
TC_INT_TTA_1	Verify that TTA publishes translation agreements schemes for a boolean trust scheme.
TC_INT_TTA_2	Verify that TTA publishes translation agreements schemes for a ordinal trust scheme.
TC_INT_TTA_3	Verify that TTA publishes translation agreements schemes for a tuple trust scheme.
TC_INT_TTA_4	Verify that RR response to the issuer name is a URI record for a boolean scheme and DNSSec validation is successful.
TC_INT_TTA_5	Verify that RR response to the issuer name is a URI record for ordinal schemes and DNSSec validation is successful.
TC_INT_TTA_6	Verify that TTA published more than one translation schemes for a tuple trust scheme.
TC_INT_TTA_7	Check that the verification result of translation list signature is successful for a boolean trust scheme.
TC_INT_TTA_8	Check that the verification result of translation list signature is successful for an ordinal trust scheme.
TC_INT_TTA_9	Check that the verification result of translation list signature is successful for a tuple trust scheme.
TC_INT_TTA_10	Verify that the certificate provided by DNS is not valid and translation list verification fails due to certificate validation.

6.2.2 ATV – TTA Integration Test Case Details

ID	TC_INT_TTA_1	
Assertion(s)	TA_TTA_3	
Test Purpose	Verify that TTA publishes translation agreements for a boolean trust scheme.	
Pre-Test Conditions	TTA should already be deployed and running. DNS deployment with DNSSec extension should be running.	
Step	Test Activity	Expected Result
1	Minder sends to TTA the following HTTP PUT request: <i>http http://tta-lightest.eu:8441/ /ttaFM/mng/rsc/translation with "test-agreement" Boolean trust scheme.</i>	The service should return HTTP 200 OK. The response message { "agreename": " test-agreement ", "xmlFile": " targetschemename.xml", "tplFile": " targetschemename.tpl.p7s", }
2	On the terminal, type the following command: <i>dig _translation._trust. targetschemename.lightest.nlnetlabs. nl URI</i>	; <<>> DiG 9.10.6 <<>> _translate._trust. tubitak.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: ;_translate._trust.tubitak.lightest.nl IN URI ;; ANSWER SECTION: _translate._trust.tubitak.lightest.nl. 3600 IN URI https://tta- lightest.eu:8445/ttaFM/mng/TrustTranslationDeclaration/ targetschemeName</pre>
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ID	TC_INT_TTA_2	
Assertion(s)	TA_TTA_3	
Test Purpose	Verify that TTA publishes translation agreements for a ordinal trust scheme.	
Pre-Test Conditions	TTA should already be deployed and running. DNS deployment with DNSSec extension should be running.	
Step	Test Activity	Expected Result
1	Minder sends to TTA the following HTTP PUT request: https://tta-lightest.eu:8441/ttaFM/mng/rsc/translation with "test-agreement-ordinal" Ordinal trust scheme. Translation definition is given in Test Scenario for TTA	The service should return HTTP 200 OK. The response message { "agreename": " test-agreement-ordinal ", "xmlFile": " targetschemeName-ordinal.xml", "tplFile": " targetschemeName-ordinal.tpl.p7s", }
2	On the terminal, type the following command: dig _translate._trust.targetschemeName-ordinal.lightest.nl IN URI	<pre><<>> DiG 9.10.6 <<>> _translate._trust. targetschemeName-ordinal.lightest.nl IN 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: ;_translate._trust.targetschemeName-ordinal .lightest.nl IN URI ;; ANSWER SECTION: _translate._trust.targetschemeName- ordinal.lightest.nl. 3600 IN URI https://tta- lightest.eu:8441/ttaFM/mng/TrustTranslationDe claration/targetschemeName-ordinal</pre>

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ID		TC_INT_TTA_3
Assertion(s)		TA_TTA_3
Test Purpose		Verify that TTA publishes translation agreements schemes for a tuple trust scheme.
Pre-Test Conditions		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running.
Step	Test Activity	Expected Result
1	Minder sends to TTA the following HTTP PUT request: <i>http:// tta-lightest.eu:8441/ttaFM/mng/rsc/translation</i> with “test-agreement-tuple” Ordinal trust scheme. Translation definition is given in Test Scenario for TTA	The service should return HTTP 200 OK. The response message { "agreename": " test-agreement-tuple ", "xmlFile": " targetschemename-tuple.xml", "tplFile": " targetschemename-tuple.tpl.p7s", }
2	On the terminal, type the following command: <i>dig</i> <i>_translate._trust.targetschemename-tuple.lightest.nlnetlabs.nl URI</i>	; <<>> DiG 9.10.6 <<>> _translate._trust. targetschemename-tuple.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: _translate._trust. targetschemename-tuple.lightest.nlnetlabs.nl. IN URI ;; ANSWER SECTION: _translate._trust.turkey-tuple.lightest.nlnetlabs.nl. 3600 IN URI <i>https://tta-lightest.eu:8445/ttaFM/mng/TrustTranslationDeclaration/targetschemename-tuple</i>

ID		TC_INT_TTA_4
Assertion(s)		TA_TTA_2
Test Purpose		Verify that RR response to the issuer name is a URI record for a boolean scheme and DNSSec validation is successful.
Pre-Test Conditions		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”.
Step	Test Activity	Expected Result
1	On the terminal, type the following command: <i>dig_translation._trust.targetschemename.lightest.nlnetlabs.</i>	; <<>> DiG 9.10.6 <<>> _translate._trust. <i>targetschemename.lightest.nlnetlabs.nl</i> URI; global options: +cmd ;; Got answer:

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	<i>nl URI</i>	<pre>;; ->>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: ;_translate._trust. targetschemename.lightest.nlnetlabs.nl. IN URI ;; ANSWER SECTION: _translate._trust. targetschemename.lightest.nlnetlabs.nl. 3600 IN URI https://tta- lightest.eu:8445/ttaFM/mng/TrustTranslationDe claration/argetschemename</pre>
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ID		TC_INT_TTA_5
Assertion(s)		TA_TTA_1, TA_TTA_5
Test Purpose		Verify that RR response to the issuer name is a URI record for ordinal schemes and DNSSEC validation is successful.
Pre-Test Conditions		TTA should already be deployed and running. DNS deployment with DNSSEC extension should be running.
Step	Test Activity	Expected Result
1	On the terminal, type the following command: <i>dig_translation._trust.tubitak-ordinal.lightest.nlnetlabs.nl URI</i>	<pre>; <<>> DiG 9.10.6 <<>> _translate._trust.tubitak- ordinal.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: ;_translate._trust.tubitak-ordinal.lightest.nlnetlabs.nl. IN URI ;; ANSWER SECTION: _translate._trust.tubitak-ordinal.lightest.nlnetlabs.nl. 3600 IN URI https://tta- lightest.eu:8445/ttaFM/mng/TrustTranslationDe claration/tu bitak-ordinal</pre>

ID		TC_INT_TTA_6
Assertion(s)		TA_TTA_1
Test Purpose		Verify that TTA published more than one translation schemes for a tuple

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		trust scheme.
Pre-Test Conditions		TTA should already be deployed and running. DNS deployment with DNSSec extension should be running.
Step	Test Activity	Expected Result
1	Minder sends to TTA the following HTTP PUT request: <i>http http://tta-lightest.eu:8441/ /ttaFM/mng/rsc/translation with "test-agreement-tuple" tuple trust scheme.</i>	The service should return HTTP 200 OK. The response message { "agreename": " test-agreement-tuple ", "xmlFile": "tubitak-tuple.lightest.nlnetlabs.nl.xml", "tplFile": "tubitak-tuple.lightest.nlnetlabs.nl.tpl.p7s", }
2	Minder sends to TTA the following HTTP PUT request: <i>http http://tta-lightest.eu:8441/ /ttaFM/mng/rsc/translation with "test-agreement-tuple2" tuple trust scheme.</i>	The service should return HTTP 200 OK. The response message { "agreename": " test-agreement-tuple2 ", "xmlFile": "tubitak-tuple.lightest.nlnetlabs.nl.xml", "tplFile": "tubitak-tuple.lightest.nlnetlabs.nl.tpl.p7s", }
3	On the terminal, type the following command: <i>dig _translation._trust.tubitak- tuple.lightest.nlnetlabs.nl URI</i>	; <<> DiG 9.10.6 <<> _translate._trust. tubitak- tuple.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: ;_translate._trust.tubitak-tuple.lightest.nlnetlabs.nl. IN URI ;; ANSWER SECTION: _translate._trust. tubitak-tuple.lightest.nlnetlabs.nl. 3600 IN URI <i>https://tta- lightest.eu:8445/ttaFM/mng/TrustTranslationDeclaration/tu bitak-tuple</i>
4	<i>Open the tubitak-tuple.xml file and check the agreements.</i>	Two agreements are listed in the tubitak-tuple.xml file.

ID	TC_INT_TTA_7		
Assertion(s)	TA_TTA_8		
Test Purpose	Check that the verification result of translation list signature is successful for a boolean trust scheme.		
Pre-Test Conditions	TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid translation with tubitak-boolean scheme name is defined on TTA.		
Step	Test Activity	Expected Result	

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1	<p>On the terminal, type the following command: <i>dig_translate._trust.tubitak-boolean.lighttest.nlnetlabs.nl URI</i></p>	<pre> ; <<>> DiG 9.10.6 <<>> _translate._trust.turkey-boolean.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: _translate._trust.tubitak-boolean.lighttest.nlnetlabs.nl. IN URI ;; ANSWER SECTION: _translate._trust.turkey-boolean.lighttest.nlnetlabs.nl. 3600 IN URI https://tta-lighttest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/tubitak-boolean </pre>
2	<p>Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> for the following translation list <i>https://tta-lighttest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/tubitak-boolean</i></p>	<p>The trust lists should be downloaded as an XML file</p>
3	<p>Execute Minder-ATV <i>verifyTrustTranslationList</i> service that performs signature validation and SMIMEA verification</p>	<p>The trust list verification should return TRUE</p>

ID	TC_INT_TTA_8
Assertion(s)	TA_TTA_8, TA_TTA_8
Test Purpose	Check that the verification result of translation list signature is successful for an ordinal trust scheme.
Pre-Test Conditions	TTA should already be deployed and running. DNS deployment with DNSSec extension should be running. A valid translation with tubitak-ordinal scheme name is defined on TTA.

Step	Test Activity	Expected Result
1	<p>On the terminal, type the following command: <i>dig_translate._trust.tubitak-ordinal.lighttest.nlnetlabs.nl URI</i></p>	<pre> ; <<>> DiG 9.10.6 <<>> _translate._trust.tubitak-ordinal.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, </pre>

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		<p>ADDITIONAL: 1</p> <p>:: OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096</p> <p>:: QUESTION SECTION: ;_translate._trust.tubitak-ordinal.lightest.nlnetlabs.nl. IN URI</p> <p>:: ANSWER SECTION: _ translate._trust.turkey-ordinal.lightest.nlnetlabs.nl. 3600 IN URI <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/tubitak-ordinal</i></p>
2	<p>Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> for the following translation list <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/tubitak-ordinal</i></p>	<p>The trust lists should be downloaded and should be opened via an XML editor</p>
3	<p>Execute Minder-ATV <i>verifyTrustTranslationList</i> service that performs signature validation and SMIMEA verification</p>	<p>The trust list verification should return TRUE</p>

ID		TC_INT_TTA_9
Assertion(s)		TA_TTA_7, TA_TTA_8
Test Purpose		Check that the verification result of translation list signature is successful for a tuple trust scheme.
Pre-Test Conditions		TTA should already be deployed and running. DNS deployment with DNSSEC extension should be running. A valid translation with tubitak-tuple scheme name is defined on TTA.
Step	Test Activity	Expected Result
1	<p>On the terminal, type the following command: <i>dig _translate._trust.tubitak-tuple.lightest.nlnetlabs.nl URI</i></p>	<p>; <<>> DiG 9.10.6 <<>> _translate._trust.tubitak-tuple.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</p> <p>:: OPT PSEUDOSECTION: ; EDNS: version: 0, flags::; udp: 4096</p> <p>:: QUESTION SECTION: ;_translate._trust.tubitak-tuple.lightest.nlnetlabs.nl. IN URI</p>

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		;; ANSWER SECTION: _ translate._trust.turkey-tuple.lightest.nlnetlabs.nl. 3600 IN URI <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/tubitak-tuple</i>
2	Minder-ATV parses the DNS query and Execute Minder-ATV <i>downloadservice</i> for the following translation list <i>https://tta-lightest.eu:8441/ttaFM/mng/TrustTranslationDeclaration/tubitak-tuple</i>	The trust lists should be downloaded and should be opened via an XML editor
3	Execute Minder-ATV <i>verifyTrustTranslationList</i> service that performs signature validation and SMIMEA verification	The trust list verification should return TRUE

ID	TC_INT_TTA_10	
Assertion(s)	TA_TTA_7	
Test Purpose	Verify that the certificate provided by DNS is not valid and translation list verification fails due to certificate validation.	
Pre-Test Conditions	TSPA should already be deployed and running. DNS deployment with DNSSEC extension should be running. A valid trust list URI record is already defined on TTA-DNS. An SMIMEA record including an invalid certificate to be used in trust translation list validation.	
Step	Test Activity	Expected Result
1	On the terminal, type the following command: <i>dig _translate._trust.tubitak-tuple.lightest.nlnetlabs.nl SMIMEA</i>	;; <<>> DiG 9.10.6 <<>> _translation._trust.tubitak-tuple.lightest.nlnetlabs.nl SMIMEA ;; global options: +cmd ;; Got answer: ;; -->HEADER<<- opcode: QUERY, status: NOERROR, id: 20630 ;; flags: qr aa rd; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 3 ;; WARNING: recursion requested but not available ;; OPT PSEUDOSECTION: ; EDNS: version: 0, flags:; udp: 4096 ;; QUESTION SECTION: _translation._trust.tubitak-tuple.lightest.nlnetlabs.nl. IN SMIMEA ;; ANSWER SECTION: _translation._trust.tubitak-tuple.lightest.nlnetlabs.nl. 0 IN SMIMEA 3 0 0 with base16 encoded certificate(invalid)

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2	Minder-ATV parses the DNS query and execute Minder Minder-ATV <i>checkCertificateFromSMIMEA</i> service with invalid certificate	The certificate validation result should be FALSE
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6.3 ATV – DP Integration Testing

The normative and conformance clauses are already given in D8.8 Section 6.3. The revisited test assertions are already given in D8.9 Section 7.3.

This section includes the list of updated test cases and the descriptions of the test cases for DP component.

6.3.1 ATV – DP Integration Test Case List

Table 3 List of ATV – DP integration test cases

ID	Purpose
TC_INT_DP_1	Verify that DP publishes the delegation successfully.
TC_INT_DP_2	Verify that DP does not publish an invalid delegation.
TC_INT_DP_3	Verify that DP does not publish a valid delegation with publicKeyHash not belonging to Proxy.
TC_INT_DP_4	Check that DP verifies the delegation successfully.
TC_INT_DP_5	Check the content of delegation from the response when delegation is verified.
TC_INT_DP_6	Check the response of the revoked delegation.
TC_INT_DP_7	Check the response of the valid delegation queried on DP.
TC_INT_DP_8	Check if a revoke command interface on DP is available.
TC_INT_DP_9	Verify that DP respond with an error/notification message if delegation is not found.

6.3.2 ATV – DP Integration Test Case Details

dpUrlAddress is used in place of *lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/*

ID	TC_INT_DP_1	
Assertion(s)	TA_DP_1	
Test Purpose	Verify that DP publishes the delegation successfully.	
Pre-Test Conditions	Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format. Proxy is TUBITAK Tester.	
Step	Test Activity	Expected Result

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1	Minder-ATV sends to DP the following HTTP POST request: <i>https://dpUrlAddress/publish with delegation.xml (delegation, public key and publicKeyHash) parameters</i>	The service should return HTTP 201. The response data should include the receipt including delegation type, Mandator's private key, Proxy public key, validity time, domain settings and address of DP.
2	Minder-ATV sends to DP the following HTTP POST request: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/publish_key (with id, encrypted public key, publicKeyHash parameters)</i>	The service should return HTTP 200 OK with appropriate response message.
3	Execute Minder-ATV <i>downloadservice</i> with the following parameter: delegation URL	<i>https://mindertestbed.org/delegation/tubitak_delegation.xml</i> should be downloaded and opened in an XML editor.

ID	TC_INT_DP_2	
Assertion(s)	TA_DP_1	
Test Purpose	Verify that DP does not publish an invalid delegation.	
Pre-Test Conditions	Delegation Provider is accessible. Delegation is prepared by TUBITAK as 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: <i>https://dpUrlAddress/publish with delegation.xml (invaliddelegation, public key and publicKeyHash) parameters</i>	The service should return HTTP 500.

ID	TC_INT_DP_3	
Assertion(s)	TA_DP_1, TA_DP_3	
Test Purpose	Verify that DP does not publish a valid delegation with publicKeyHash not belonging to Proxy.	
Pre-Test Conditions	Delegation Provider is accessible. Delegation is prepared by TUBITAK as 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://dpUrlAddress/publish with <i>delegation.xml (invaliddelegation, public key and publicKeyHash) parameters</i> Note that publicKeyHash does not belong to Proxy	The service should return HTTP 500
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ID		TC_INT_DP_4
Assertion(s)		TA_DP_1, TA_DP_3
Test Purpose		Check that DP verifies the delegation successfully.
Pre-Test Conditions		Delegation Provider is accessible. Delegation is prepared by Mandator as a signed and encrypted delegation in XML format.
Step	Test Activity	Expected Result
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: https://dpUrlAddress/publish with <i>delegation.xml (delegation, public key and publicKeyHash) parameters</i>	The service should return HTTP 201. The response data should include the receipt including delegation type, Mandator's private key, Proxy public key, validity time, domain settings and address of DP.

ID		TC_INT_DP_5
Assertion(s)		TA_DP_1, TA_DP_3
Test Purpose		Check the content of delegation from the response when delegation is verified.
Pre-Test Conditions		Delegation Provider is accessible. Delegation is prepared by TUBITAK as 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://dpUrlAddress/publish	The service should return HTTP 201.

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	<i>with delegation.xml (delegation, pk and publicKeyHash) parameters</i>	
2	Execute Minder-ATV <i>downloadservice</i> with the following parameter: delegation URL	https://mindertestbed.org/delegation/tubitak_delegation.xml I should be downloaded and opened in an XML editor

ID	TC_INT_DP_6	
Assertion(s)	TA_DP_2, TA_DP_1, TA_DP_6	
Test Purpose	Check the response of the revoked delegation.	
Pre-Test Conditions	Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format. A Revoked delegation for TUBITAK Tester is published in DP.	
Step	Test Activity	Expected Result
1	Minder-ATV sends http request below to DP searchServer to query status of delegation <i>https://dpUrlAddress/search?delegation{id}?&token={token}</i>	DP Service should return HTTP 200 with the following response { "id" : INTEGER, "hash" : STRING, "status" : "Revoked"}
2	Minder-ATV executes <i>verifyRevocationResponse service to validate the revocation result</i>	The verification result should be successful.

ID	TC_INT_DP_7	
Assertion(s)	TA_DP_1, TA_DP_3	
Test Purpose	Check the response of the valid delegation queried on DP.	
Pre-Test Conditions	Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format.	
Step	Test Activity	Expected Result
1	Minder-ATV sends HTTP request below to DP searchServer to query status of delegation <i>https://dpUrlAddress/search?delegation{id}?&token={token}</i>	DP Service should return HTTP 200 with the following response { "id" : INTEGER, "hash" : STRING, "status" : "Active"}



ID		TC_INT_DP_8
Assertion(s)		TA_DP_1, TA_DP_5, , TA_DP_6, TA_DP_7
Test Purpose		Check if a revoke command interface on DP is available.
Pre-Test Conditions		Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format.
Step	Test Activity	Expected Result
1	Minder sends HTTP request below to DP searchServer to query status of delegation <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/search/{989}</i>	The service returns HTTP 200. The response message should include <pre>{ "id" : 989 "hash" : STRING "status" : ACTIVE }</pre>
2	Minder sends HTTP request below to DP service: <i>https://lightest-dev.iaik.tugraz.at/DelegationProvider/api/v1/revoke/{989}?reason=test</i>	The service returns HTTP 200. The response message should include <pre>{ "id" : 989 "hash" : STRING "status" : REVOKED }</pre>
3	Minder executes <i>verifyRevocationResponse</i> service to validate the revocation response	Verification of revocation should be successful

ID		TC_INT_DP_9
Assertion(s)		TA_DP_1, TA_DP_8
Test Purpose		Verify that DP respond with an error/notification message if delegation is not found.
Pre-Test Conditions		Delegation Provider is accessible. Delegation is prepared by TUBITAK as Mandator as a signed and encrypted delegation in XML format.
Step	Test Activity	Expected Result
1	Minder-ATV sends HTTP request below to DP searchServer to query status of delegation <i>https://lightest-</i>	DP Service should return HTTP 200 with response message stating that delegation does not exist.

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	<i>dev.iaik.tugraz.at/DelegationProvider/api/v1/search/{id}?token={token}</i>	
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7. Test Execution Results

This section presents the latest results of integration test executions achieved over the development time periods in LIGHTest project. Three main iterations have been held for the integration 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_INT_TSPA_1	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_2	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_3	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_4	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_5	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_6	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_7	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_8	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_9	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_10	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.






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TC_INT_TSPA_11	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_12	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TSPA_13	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_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 https://extgit.iaik.tugraz.at/LIGHTest/TrustSchemePublicationAuthority/issues/25</p>






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_INT_TTA_1	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TTA_2	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TTA_3	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TTA_4	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TTA_5	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.








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TC_INT_TTA_6	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TTA_7	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TTA_8	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TTA_9	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_TTA_10	 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_INT_DP_1	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_DP_2	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_DP_3	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_DP_4	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_DP_5	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_DP_6	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_DP_7	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.

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TC_INT_DP_8	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.
TC_INT_DP_9	 Passed	The test case steps are executed successfully. Expected result conditions are already satisfied.

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8. Conclusions

For integration testing, 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. Critical integration defects resulting from these iterations are verified and closed. Defects, in trivial severity, that do not affect the functionality of the integrated components should be resolved before the components are to be used in production.

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.

Integration testing activities aim to ascertain the integration of all TSPA, TTA and DP components with DNS libraries, etc. through systematic and extensive testing measure. For this purpose, three main iterations have been performed to cover the all integration scenarios of TSPA, TTA and DP components. 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_INT_TSPA_14. The TSPA already satisfies the integration scenario test steps referred in the test specifications but the expected response message is 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. It can be concluded that the TTA component fulfills the requirements and satisfies the functionality referred in the test specifications.

The DP component final test iteration has been completed with a successful test list run. It can be concluded that the TTA component fulfills the requirements and satisfies the functionality referred in the test specifications.

In conclusion, TSPA, TTA and DP components are fully integrated and integration testing has already assured that all components are working together seamlessly and they are good candidates for further improvements to be used in production mode.

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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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