

7th INTEGRATION TEST CAMP Review

How was the Integration Test Camp carried out?

It was performed as a virtual event where participants could test the interoperability of their components within an IDSA implementation composed of connectors, DAPS and Broker. The first part of Integration Test Camp was carried out as a technical training event for an IDSA related project. The participants took part in a four-hour presentation about the IDSA architecture, the ITC and the scope of the technical training. Then, each participant had a 45min slot to go over the difficulties they encountered during installation and to get a better understanding regarding the data space connector API.

Each participant aside from the technical training was assigned with a slot of two hours in which the SQS lab was entirely dedicated for them.

This Integration Test Camp mainly focused on the IDS Specification criteria for the connector to verify the different test cases it must meet for the base security profile.

The SQS team kept the same environment as the 5th Integration Test Camp. We are actively looking for an Appstore and a Clearing House.

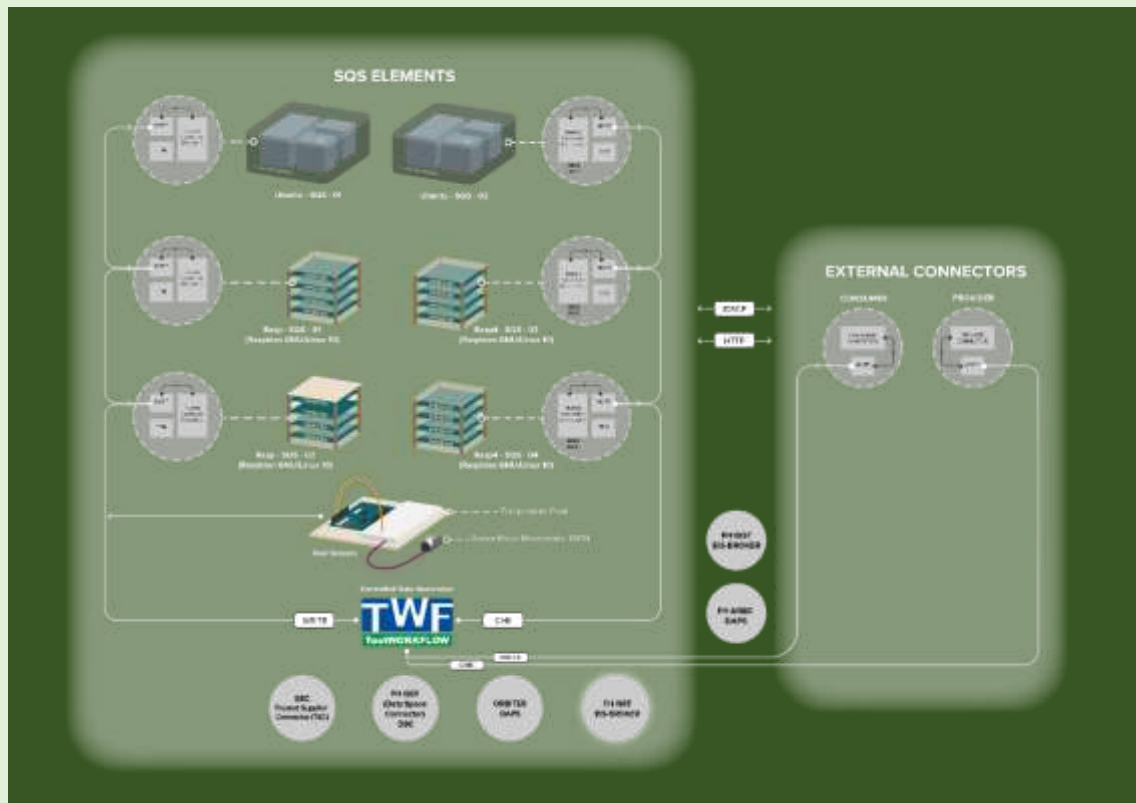


Figure 1 - SQS lab environment (5th edition)

With this architecture, the next scenarios were offered:

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1. Connector Under Test (CUT) as Provider and SQS lab connector as Consumer, with IDSCP, IDSCPv2 or HTTP communication protocol
2. Connector Under Test (CUT) as Consumer and SQS lab connector as Provider, with IDSCP, IDSCPv2 or HTTP communication protocol
3. Connector Under Test (CUT) and lab Orbiter DAPS
4. Connector Under Test (CUT) and lab Broker (FH IAIS Broker)

The DAPS in SQS lab (Orbiter DAPS) and the DAPS from FH were offered for all the scenarios. This Integration Test Camp mainly focused on the Dataspace Connector. We went deeper into the connector criterion for the base security profile, conducting multiple test cases for each of the criterion to make sure the connector under test correctly meets all the IDS specification requirements.

Who participated?

The schedule for this Integration Test Camp:

21-Apr	22-Apr	23-Apr
	9:45-10:30 TRIMEK	
		11:00-13:00 Eccenca
13:00-13:45 CRF/IPC		
13:45-14:30 ESMA/AIMEN		
14:30-15:15 Koplats		
15:15-16:00 Lucchini/Danobat		
16:00-16:45 Marlegno/TTS/SCM		
16:45-17:30 Holonix		

What were the participants able to do there?

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Participants were able to test the interoperability of their pre-commercial components within a real IDSA architecture. They could interact with real IDSA infrastructure components and verify how their components will act in the real world.

For that, SQS lab team proposed the next Test Scenarios:

- Step 1. Environment configuration
The participants receive the required information to connect to the Integration Test Camp components
- Step 2. Connection to the DAPS (Orbiter and Fraunhofer)
The participants are able to obtain a valid DAT from the DAPS and have the ability to verify it
- Step 3. Connection to the DAPS (Orbiter and Fraunhofer) (fail)
The participants try to obtain the DAT with invalid certificate or self-description
- Step 4. Data interchange
After a successful initial setup, the CUT is able to send/receive data correctly
- Step 5. Data interchange (fail)
Setup the connector in various ways, such that they all individually get rejected. Invalid certificate, DAT, self-description...
- Step 6. Connection with more than one provider/consumer (optional)
The CUT provides for more than one consumer
The CUT receives from more than one provider
- Step 7. Connection with more than one provider/consumer (optional) (fail)
While the CUT is sending/receiving data, one of the lab connectors is turned off. 2 minutes later, it is turned on. Connection is re-established and data flows correctly. Then, both connectors are turned off. 2 minutes later, they are turned on. The connections are re-established and data flows correctly.
- Step 8. Connector registers to the Broker with both Orbiter and FH DAPS
Connector performs all the current available Broker calls: register, update, query, ...
- Step 9. Connector registers to the Broker with both Orbiter and FH DAPS (fail)
The CUT is not able to register with an invalid certificate, DAT, self-description...

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What have been achieved during the Test Camp?

In the next tables the results of the Test Camp are shown:

IDS Specification			IDS Arch (Connector)		Fraunhofer (AISEC/AISECv2)	
Criterion group	Criterion Identity	Name	Test Case Approach		Provider	Consumer
Communication Integrity	COM 01	Protected connection	Get DAT Component gets a DAT from the DAPS, requesting it with a valid certificate.	Check authenticity	OK	OK
				Check encryption	OK	OK
				Check integrity	OK	OK
			Get DAT – Negative answer Component with an expired or invalid certificate, requests a DAT to the DAPS. The DAPS sends a negative response.	Check authenticity	OK	OK
				Check encryption	OK	OK
				Check integrity	OK	OK
	COM 02	Mutual authentication	Validate DAT Component providing data requests DAPS to verify an invalid or expired DAT given by a component requesting for data. DAPS gives a negative response.	Check DAT validity	OK	OK
Validate DAT – Negative answer Component providing data requests DAPS to verify an invalid or expired DAT given by a component requesting for data. DAPS gives a negative response.			Check DAT is not valid	OK	OK	
COM 03	State of the art cryptography	Cryptography What type of encryption? Communication transfer protocol?	Check encryption	OK	OK	
Data Usage Control	USC 01	Definition of usage policies	Usage policy Establish with the provided data and usage policy and receive this usage policy attached	Check valid usage policy	OK	OK
				Check wrong usage policy	OK	OK
			Re-establishment of usage policy Establish new usage policy for the data provided	Check new valid usage policy	OK	OK
				Check new wrong usage policy	OK	OK

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	USC 02	Sending of usage policies	Send usage policy The provider sends a usage policy and the connector accepts it	Check the consumer accepts the usage policy	OK	OK			
			Check the consumer rejects the usage policy	OK	OK				
			Negotiate usage policy Send usage policy and the consumer rejects it. The consumer renegotiates the usage policy	Check how the consumer renegotiates the usage policy	OK	OK			
			Information model	INF 01	Self-description at connector	Create self-description	Check self-description	OK	OK
						Share valid self-description	Check valid self-description	OK	OK
Share invalid self-description	Check wrong self-description	NOT TESTED				NOT TESTED			
Receive valid self-description	Check it is valid	OK				OK			
Receive invalid self-description	Check it is invalid	NOT TESTED				NOT TESTED			
INF 02	Self-description at broker	Currently deleted from the criterion		NA	NA				
INF 03	Self-description content	Contains the following information: a) Cryptographic hash of Connector certificate b) Connector operator c) Data endpoints offered by Connector d) Log format of data endpoints offered e) Security profile of connector f) Connector ID	Check the information that is included in the self-description	OK	OK				

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	INF 04	Self-description evaluation	Connector is able to verify the self-description of another connector	Check it is a valid self-description	OK	OK
	INF 05	Dynamic attribute tokens	Data interchange Consumer connector requests data, with a valid DAT, to the provider connector. Provider connector verifies DAT, and the data is interchanged.	Check validity of both DATs	OK	OK
			One invalid DAT	Check message one invalid	NOT TESTED	NOT TESTED
			Both invalid DATs	Check message both invalid	NOT TESTED	NOT TESTED
			Share DAT every connection, this is being able to validate yourself at every connection	Check your identity with connection	OK	OK
Identity and access management	IAM 01	Connector identifier	Get identification. The connector is unambiguously identified by means of an identifier derived from a X.509 certificate	Check X.509 certificate valid	NOT TESTED	NOT TESTED
				Check X.509 certificate not valid	NOT TESTED	NOT TESTED
	IAM 02	Time Service	Certificate is valid	Check valid	NOT TESTED	NOT TESTED
			Certificate is not valid (expired)	Check expired	NOT TESTED	NOT TESTED
			Switch off time service	Check message	NOT TESTED	NOT TESTED
			Modify time (forward)	Check message	NOT TESTED	NOT TESTED
			Modify time (actual)	Check message	NOT TESTED	NOT TESTED
Modify time (backward)	Check message	NOT TESTED	NOT TESTED			

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	IAM 03	Online certificate status check	Get online certificate status What type of online certificate status is used in the CUT?	Check valid -> Request valid/invalid	NOT TESTED	NOT TESTED
				Check invalid -> Request valid/invalid	NOT TESTED	NOT TESTED
	IAM 04	Attestation of dynamic attributes	Refer to COM 02 This criterion is already checked with the test cases in COM 02	Check COM 02	OK	OK
Broker service	BRK 01	Broker service inquiries	Register CUT is registered at the broker	Check registration	OK	OK
		Broker service inquiries	Query for connector with valid self-description	Check CUT at broker	OK	OK
		Broker service inquiries	Query for connector without a self-description or with a wrong self-description	Check CUT at broker	OK	OK
	BRK 02	Broker registration	Check CUT registration at broker	Check properly registered	OK	OK
				Check registration is denied	OK	OK
		Broker registration	Check CUT self-description at broker	Check valid self-description	OK	OK
				Check invalid self-description	NOT TESTED	NOT TESTED
	BRK 03	Broker registration update	Update connector information CUT updates its information to a broker	Check valid self-description	OK	OK
				Check invalid self-description	NOT TESTED	NOT TESTED
		Broker registration update	Update valid self-description Does it show? Does it show unavailable? Does it even update?	Check if it is implemented right	OK	OK
	Broker registration update	Unregister CUT The connector gets unregistered from a broker	Check the CUT is not available at the broker	NOT TESTED	NOT TESTED	

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Dataspace Connector Implementation

- Dataspace Connector is the connector developed by ISST Fraunhofer which has a really strong emphasis on implemented usage policies. The connector had nine usage policies that were easy to implement.
- During the Integration Test Camp, it was checked that the Dataspace Connector had all the API functionalities operational. This was part of the technical training mentioned above that the participants were really interested in learning about.
- In this scenario the following test cases were carried out:
 - Register, update, query, unregister from the Broker
 - Create resources and artifacts
 - Communicate with other connectors
 - Be able to obtain the resources created by another connector

What difficulties have been encountered?

- The participants had issues installing the connector, and those who were able to install it got stuck with some functionalities of the data space connector.
 - The participants were able to better understand through the shared screen as some of the steps had been overlooked.
- The connectors were not able to communicate with external connectors as the participants were not able to successfully install the certificate and change the according lines of code to adapt the connector.
 - Participants were taught what files had to be modified in order to adapt to the certificate. It was also checked they had the right format file for the connector and those without a certificate were provided one for the session.

Conclusions

SQS wants to thank all the participants that have taken part. It has been a great opportunity to meet each participant and to understand their component better. This Integration Test Camp has enabled through explanations and training given the understanding of the functionalities and management of the Data Space Connector for the companies that have taken part in the different slots.

Also, this Integration Test Camp has allowed us to get a deeper knowledge of what is being developed in IDSA environment. It has been a great opportunity to collaborate and face the needs of the components to work with each other.

With the feedback received and the lessons learned from the problems faced in the session, SQS will keep improving the lab environment and the organization for the next Integration Test Camp.