Annex 3: Answers of ATTRAkTIVE and CONNECTIVE projects to the questionnaire

Answers provided in red

Interoperability Services

1- In general, do you have any need for translation of data to/from different formats (mostly preserving the semantics of the information)?

If Yes:

From Orchestrators point of view,

Y.1- How often such transformation/conversion happens?

It is needed a conversion per each traveller request that is necessary to manage.

Y.2- How much is the volume of data needed to be transformed?

It depends on the request and the TSP needed, but for the moment the biggest interface managed is the TRIAS standard (for shopping) structure. On the other hand, the volume of request the system expects to receive is not too big because we are in a proof of concept environment without real users. User's inquiry triggers the transformation. The user expects the immediate answer, so the speed has to be high.

Y.3- How do you describe the type of data you are converting?

Historical, Real-time, Reference data, meta-data

The type of data converted is real-time data, historical data and meta-data. Not sure about "reference" data (will need clarification)

Both Historical and real-time.

Some historical data might need to be converted.

Y.4- Do you have any time constraints for the execution of a single conversion/translation?

E.g., if your system needs to transform an Event message coming from some Event-source, then the conversion must be done in real-time and quickly. In other cases, for example, when retrieving a timetable, you might only need to convert the data at the end of a day/week/month?

The system needs two types of conversions/translations. One of them is asynchronous for topologies and tariffs data but the rest of the services needs real time and quick response (associated with travellers requests (requests from a travel companion) through the mobile app)

Always the same type of conversion and data takes place. Data on partial trip tracker could be an exception.

Y.5- In general, how must such transformation/conversion be achieved?

i. Streaming processing/conversion (e.g., processing of a stream of events). Only in the partial trip tracker to relieve stress, otherwise too many events.
ii. Batch processing/conversion (when system accumulates data performs the conversion once, e.g., to compute statistics about delays).

The transformation/conversion has been achieved by streaming processing for real-time requests and batch processing for asynchronous services. Trip tracking in the IF is out if the IF scope at this moment.

Y.6- Could you provide the most frequent use-case scenario in your initiative which requires some sort of data/query/message/specification/artefact being converted to other types of structured data/format/specification/query representation/meta-data?

From the S2R-IP4 point of view, internally at the moment it manages two main conversions TRIAS <-> S2R-IP4 and IT2Rail <-> S2R-IP4 (where IT2Rail means the interface used by the brokers in IT2Rail projects, S2R-IP4 is an interface based on the current reference ontology of IP4 considered for the ongoing CFM projects, and TRIAS is the standard used by several IP4 orchestrators).

On the other side, it is necessary to translate between the current IF and each TSP's interface.

Y.7- How many different types of messages do you need to take into account?

The different types of messages identified by the IP4 components include itineraries, offers, preferences, alerts, user data and payment data. Partial meta-network will most likely be included.

Y.8- Is the structure of your message plain e repetitive or is it complex and deeply nested?

From the point of view of the internal components of the IP4, the structure of the message is complex and deeply nested.

Y.9- How big is a single message in your scenario?

IP4 manages different type of messages and they could differ from the size but, currently, the biggest is 10 KB.

2- Is your organization dealing (e.g., interacting) with legacy systems? Do you need to interpret legacy data formats/standards?

If Yes:

From the point of view of the relation among IF and TSPs

Y.1- How often does such transformation/conversion happen?

The organization deals with legacy system of the TSPs. In order to expose the services transparently through an interoperability system, it is needed the transformation in each request. No need for real-time transformation.

Y.2- How much is the volume of data needed to-be transformed?
It depends on the TSP take into consideration.

Y.3- How do you describe the type of data you are converting?
The type of data that is needed to be converted are historical (topology and tariffs), real-time (availability, disruption) and meta-data (semantic interface's meaning).

Y.4- Could you provide some example of such interaction?
We send in email attachment an example of VBB shopping request, an example TMB GTFS and example Amadeus booking response.

3- Consider the following example:

A person's journey requires a multi-modal trip using heterogenous mobility services; in this case, the person might need to validate his/her information (e.g., tokens) in different transportation systems/sectors, where the used standards might be different. In such cases, one might need to translate such information defined in one specific format to the other one.

Do you need to face similar situations/use cases to the described example? If so, could you explain/describe an example (not necessarily in the validation domain)? Do you deal with cross-border journeys?

Yes, being part of S2R-IP4, that wants to achieve a door-to-door, multimodal journey across Europe. An example of it is that a user would like to make a journey from Madrid to Berlin using different transportations mode. She/he evaluates the offers returned by the personal application and issues the journey that is the most suitable with her/he needs taking into account also her/his preferences. Taking into account that offered service is a door-to-door it could include personal transport modes which are part of different domain (e.g. parking and toll).
Validation use cases being considered in Co-Active and later in MaaSive. Currently no IF involved in validation.

Asset Manager

4- Do you provide some services (or are you a service provider)?

If Yes:

From the TSP point of view

Y.1- Of which kind of services? Could you provide some example/explanation?
The services provided could be different depending on the TSP (journey planning, booking, tickets issuing, after sales etc). The planning service/data is the only one necessary.

Y.2- Which technologies and formats do you use for your service description?
The technologies and formats of the service description could be SOAP/XML, REST/XML and REST/JSON.

Y.3- Do you support some kind of machine-readable service description?
It could be a WSDL, JSON schema.

Y.4- Does your organization follow specific standards or uses particular technologies for describing services (WSDL, Swagger, etc.)?
Depending on the TSP, it could provide them or only documentation.

Y.5- Does your initiative need some means for service discovery (Hub, search engine, registry, etc.) or you are relying on external sources for that?
YES. General resolvers (Location resolver, travel expert resolver etc.). There is a need for discovery, but now it is not used because the ecosystem is small. Resolvers do a very specific part of discovery. Service discovery can be distributed, federated like DNS. Way of discovering should be unified.

Y.6- Do you normally create meta-data/semantic annotations for your service description/asset/artefact? Do you create/provide such meta-data or do you expect to use some external system for this purpose?
NO

Y.7- Do your services/APIs compel the consumer to use a single specific data format/standard?
YES. Trip tracking requires TRIAS (or any other common format).

Y.8- Does your organization impose any rate limit on the requests to your Services/APIs? If yes, it is to address the *scalability* concerns or *privacy* concerns such as the restriction on data usage per client account/organization?
Normally services providers do have these types of concerns and restrictions, but it depends on the business to the business agreement achieved between parties. We needed it, so implemented our own.
The governance of the IF may also define roles and privileges for working on different types of assets. E.g., if you are not a TSP, you can't see certain info.

5- Are you a consumer of external services?

If yes:

From the S2R-IP4 IF the point of view

Y.1- How do you manage the discovery of new services?
Nowadays, the discovery of new services is made manually.

Y.2- Does your initiative provide some means for service discovery (Hub, search engine, registry, etc.) or you are relying on external sources for that?
Nowadays, we are relying on external sources such as description service technology or documentation.

Y.3- How do you process/analyze the service description to pick up the best service?
Manually and agreement among providers.

Y.4- Does your organization consume services that follow specific standards or use particular technologies for describing services (WSDL, Swagger, etc.)?
It depends, we manage services that use standards and others which described the services using technologies such as WSDL, XSD, Swagger and JSON schema.

Y.5- Is your organization capable of interacting with any types of services (e.g., REST, SOAP)?
The organization is able to interact with services like REST, SOAP and proto buffer.

Security and data sovereignty

8- In the case of service provision, do you have any privacy concern on-*who* can consume it?

From the S2R-IP4 point of view (especially from the Travel Companion view)

Y.1- Which particular technology do you use for managing such access control?
We have components, which use JWT as access control. Others are free to access because in the current design they are only called by other internal components.

Y.2- Do you examine the authorized user per session or per API request?
Yes, at this stage, one of the components which uses JWT is based on session access and other ones on request.

Y.3- Do you allow external registries to store and advertise information about your service?
No, we are taking into account the possibility to connect another app to our cloud wallet (such as the app developed by MyTRAC project).

Access from TC happens through a specific layer called an access manager. The IF doesn't have access control at this moment. Everybody has access, and it is wrong. The orchestrator access with special user roles.

9- Do you mandate particular usage restrictions for your data and services? E.g., to give read access to the code list without the right of making the statistical analysis on them

If yes:

Y.1- Do you enforce such restrictions? How (e.g., legal contract)?

From the S2R-IP4 projects, we are analysing the needed of legal contract as user register (B2C) and TSP register (B2B).

10- Do you allow access to your data/service for free, or under some payment scheme?

SPRINT Objectives wrt. CFM Projects Objectives

11- Are there any integration steps that you are currently performing to add new features/services to the Interoperability Framework?

If Yes:

Y.1- Which integration process are you currently using?

From the S2R-IP4 IF point of view, the process is the following:

- Collect the TSP information (interface, services)
- Include the topology and tariffs into the meta-network
- Create manually the services calls
- Create manually the annotation for mapping

Y.2- Which of such steps do you believe they might be automated?

From the S2R-IP4 point of view, it could be useful to create automatically a skeleton based on the configuration of the services graphically by the functional team of the TSP which must be complete by S2R technical team and automated translation generated from an annotated description file.

12- Are you currently using Semantic Web technologies (RDF, SPARQL, …) to implement new converters?

Yes, S2R-IP4 IF is using Semantic Web Technologies as RDF Framework and SPARQL.

13- Are you currently using Semantic Web technologies (RDF, SPARQL, …) to implement new resolvers?

Yes, S2R-IP4 IF is using these kinds of technologies.

14- Which components of the Interoperability Framework are you currently using?

The components that are currently used by the IF are the following: resolvers, asset manager, GraphDB, Converters, brokers and service Implementations.

15- How many (and which) ontologies are you currently using?

The ontology that has been used in the S2R-IP4 IF is the IT2Rail but we also need to use different TSPs ontologies. From the integration of the IF with the rest of the IP4 environment, it also uses the new S2R-IP4 reference ontology and the standard TRIAS.

16- How are you performing the mappings between the input/output formats and the ontologies?

Currently, the IF of IP4 is performing the mapping in two different ways. In the service implementations, which are the point of communication with the TSPs, the transformation is based on annotated java classes. In the converters developed for the IP4 integration (integration among broker and orchestrators) the mapping has been done through reference ontology but using one-to-one assign.