



SESAR 2020 GOF USPACE

Summary

FIMS

Design and Architecture

Deliverable ID

Dissemination Level:

Project Acronym: GOF USPACE

Grant: SJU/LC/343-CTR

Call: CEF-SESAR-2018-1

Consortium Coordinator: EANS

Edition Date:

Edition:

Template Edition: 02.00.01

Founding Members



1.1 GOF USPACE FIMS High Level Architecture

The following picture illustrates the GOF USPACE High Level Architecture focussing on services.

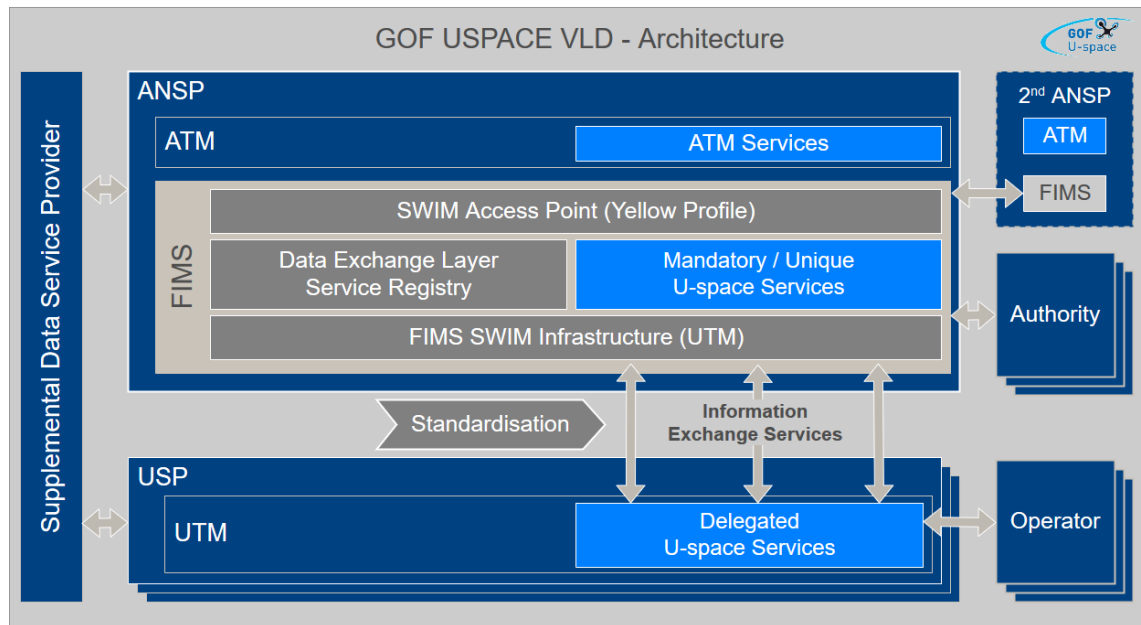


Figure: GOF USPACE HIGH LEVEL DESIGN AND ARCHITECTURE

GOF USPACE FIMS provides infrastructure required for data exchange and mandatory / unique U-space services, according to the GOF USPACE Service Categories based on the Common U-space Architecture by SJU and the CORUS ConOps.

ATM is integrated by FIMS using a SWIM Yellow Profile Access Point, connecting respective U-space Services with ATM / ATC services.

Based on SWIM principles information exchange services are introduced to achieve interoperability.

Information exchange services facilitate data exchange for information provided and consumed by U-space services. They are described using a layered approach to decouple logical, technical and runtime aspects. Standardized document templates are provided for formal documentation

Especially the description of services on a logical level allows for standardisation, developed and evolved by actors like ANSPs, USPs and authorities.

To enable service discovery and service delegation, a key component of the data exchange layer provided by FIMS is a Service Registry. It contains both design time and runtime information on the information exchange services available in GOF USPACE project setup. Hosting meta information on who / how / where allows for a flexible, scalable and adaptable system.

Spatial Awareness is implemented in the Service Registry to support the configuration of unique services within a region as well as federation of U-space services that can run in parallel.

Founding Members

GOF USPACE: Design and Architecture

“A microservice-oriented data exchange layer provides standard protocols to connect various UTM services from different UTM service providers. The value of standard protocols will be underlined by shuffling the capabilities of UTM service provision during the demonstration.”

“The data exchange layer will use several data sources and harmonize them for further provision to the various U2/U3 services and stakeholders.”

The following diagram comprises multiple dimensions such as deployment aspects, actors, dataflows, services & capabilities.

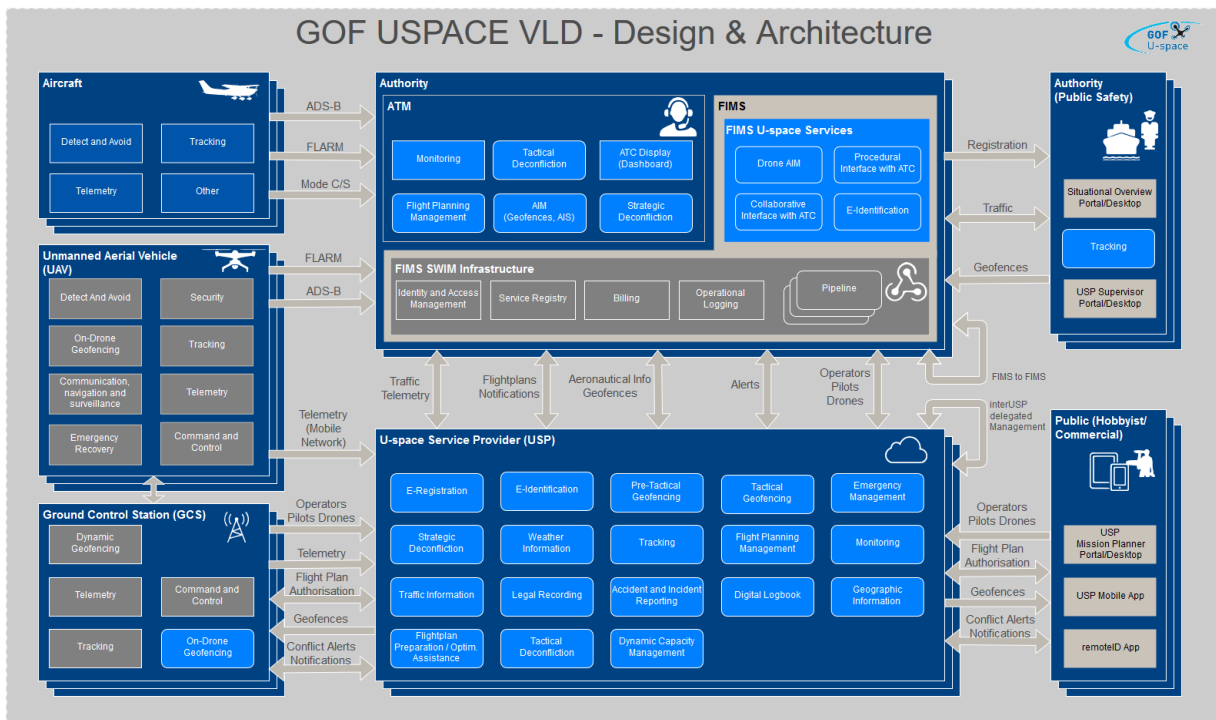


Figure GOF USPACE FIMS Design and Architecture

1.1.1 Actors

Based on the demonstrations foreseen in the project SESAR 2020 GOF USPACE FIMS Design and Architecture involves the following actors.

GOF USPACE Actor	CORUS ConOps Stakeholder
Aircraft	Aviation User
Unmanned Aerial Vehicle (UAV)	Drone Manufacturer, Drone Owner,
Ground Control Station (GCS)	Drone Manufacturer, Drone Owner, Drone Operator
Public (Hobbyist / Commercial)	The general public, Drone Owner, Drone Operator
U-Space Service Provider	U-space Service Provider

<p>Authority</p>	<p>Civil Aviation Authority, Air Navigation Service Provider (ANSP), Aeronautical Information Management Provider (AIMP), (Airfield/Airport) Aerodrome operator (civil, Military), Surveillance Service Provider, CNS Infrastructure Service Provider, Communication Service Provider, Navigation Service Provider, Weather Data Service Provider, U-space Service Provider (Principal USSSP)</p>
<p>Authority (Public Safety)</p>	<p>Authority for safety and security (police, fire brigade, search and rescue orgs)</p>

Figure GOF USPACE Actors

GOF USPACE actors were mapped to Stakeholders described in the CORUS ConOps document drafts. Especially for the actor “Authority” a high level of abstraction was chosen based on GOF USPACE project nature & scope, sub summarizing e.g. Civil Aviation Authority and Air Navigation Service Provider in one actor.

1.1.2 Information Exchange Services

Following SWIM based Information exchange services are supported by in the SESAR 2020 GOF USPACE FIMS Design and Architecture:

- Traffic / Telemetry
- Flightplans / Notifications
- Aeronautical Info / Geofences
- Alerts
- Registration
- Ground Control Station Integration

These services were identified based on the trials and U-space services foreseen to be demonstrated.

1.2 GOF USPACE FIMS: Service Descriptions

Information Exchange Services are described in a technology agnostic way. This is done in a *Service Specification*, using a standardized document template. *Service Specifications* facilitate a common view on service context, interfaces, data model used and behaviour. They allow to define spatial exclusiveness for a service, enabling an authority to ensure only one instance of a specific service is provided for a geographic region.

Actual implementations of those services will have to refer to the logical descriptions. The technical aspects are described in a *Technical Design*, using a standardized document template. At a minimum the logical contract defined in the *Service Specification* must be fulfilled. If more functionality (than a *Service Specification* requires) is implemented in an open and competitive market environment, it is not mandatory to document it.

Instances of services (compliant with a *Technical Design*) provided by actors are described in a *Service Instance Descriptions*, again using a standardized document template.

Instances are registered in a Service Registry, enabling all actors to discover available services.

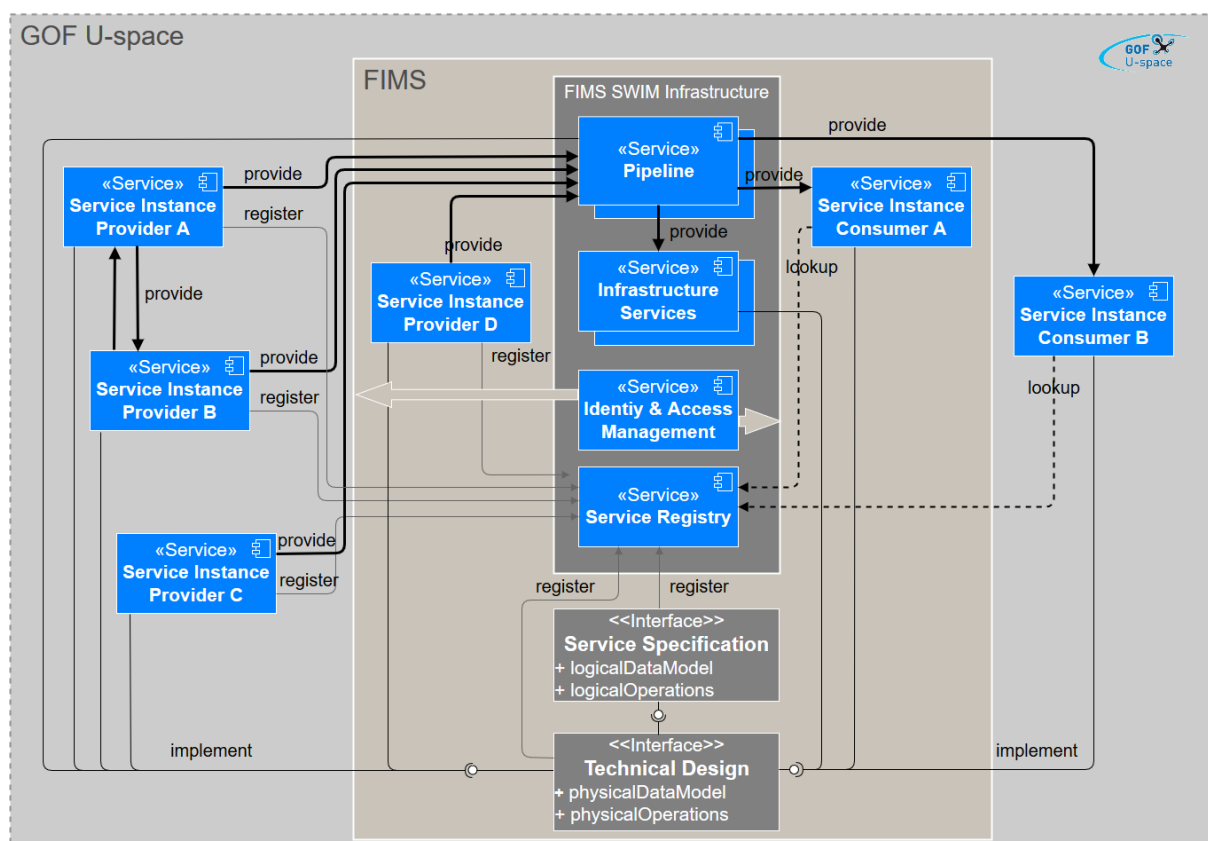


Figure: GOF USPACE FIMS Service Descriptions