

APAC SWIM TI and FF-ICE/R1 Services

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ATM Department

ENRI, Japan

August 25~27, 2026

Agenda



1. Background

2. APAC SWIM TI

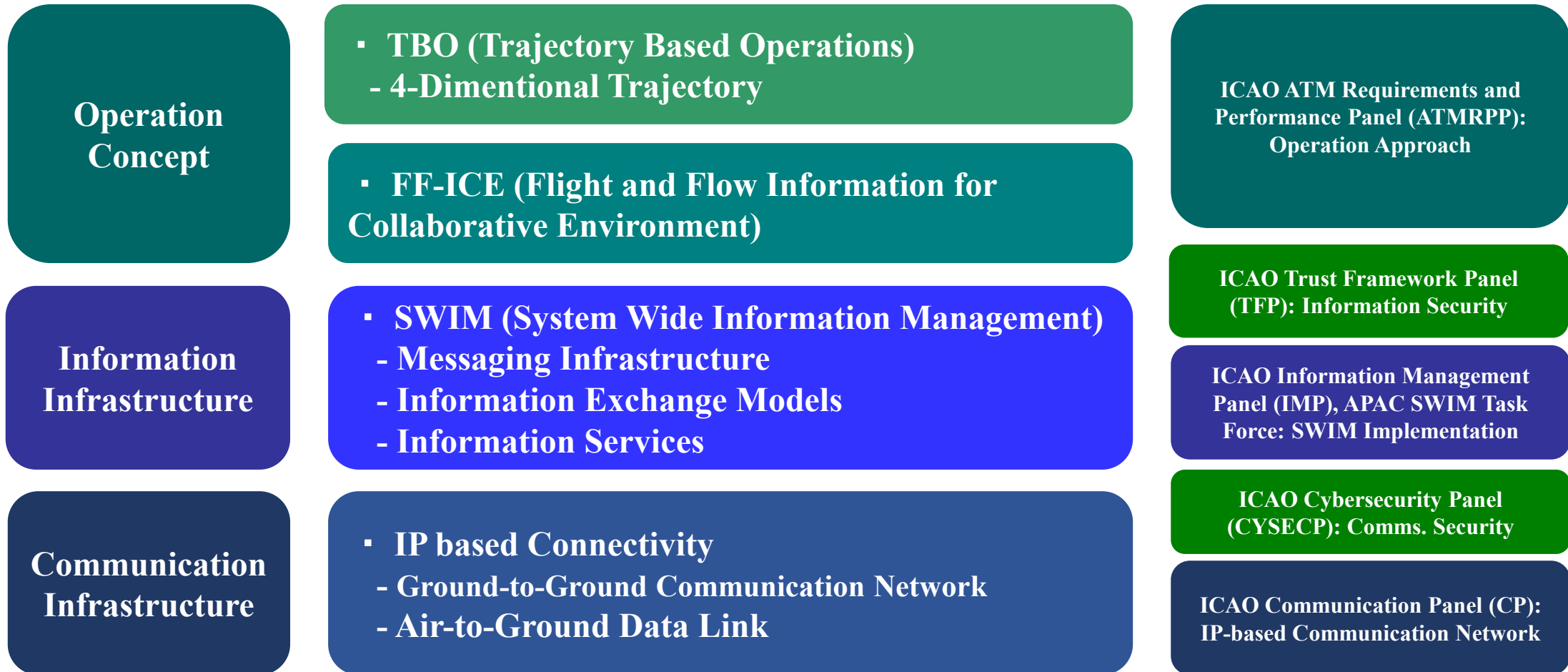
3. FF-ICE/R1 Services

4. Field Trials

Background

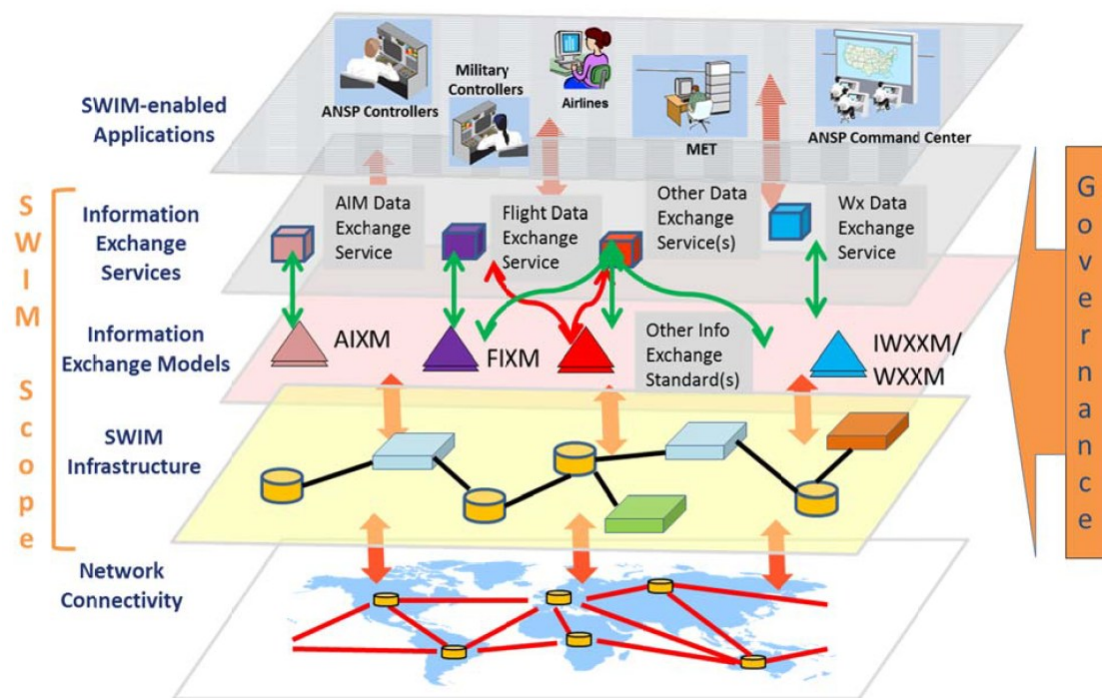


➤ Evolution of ATM Technologies



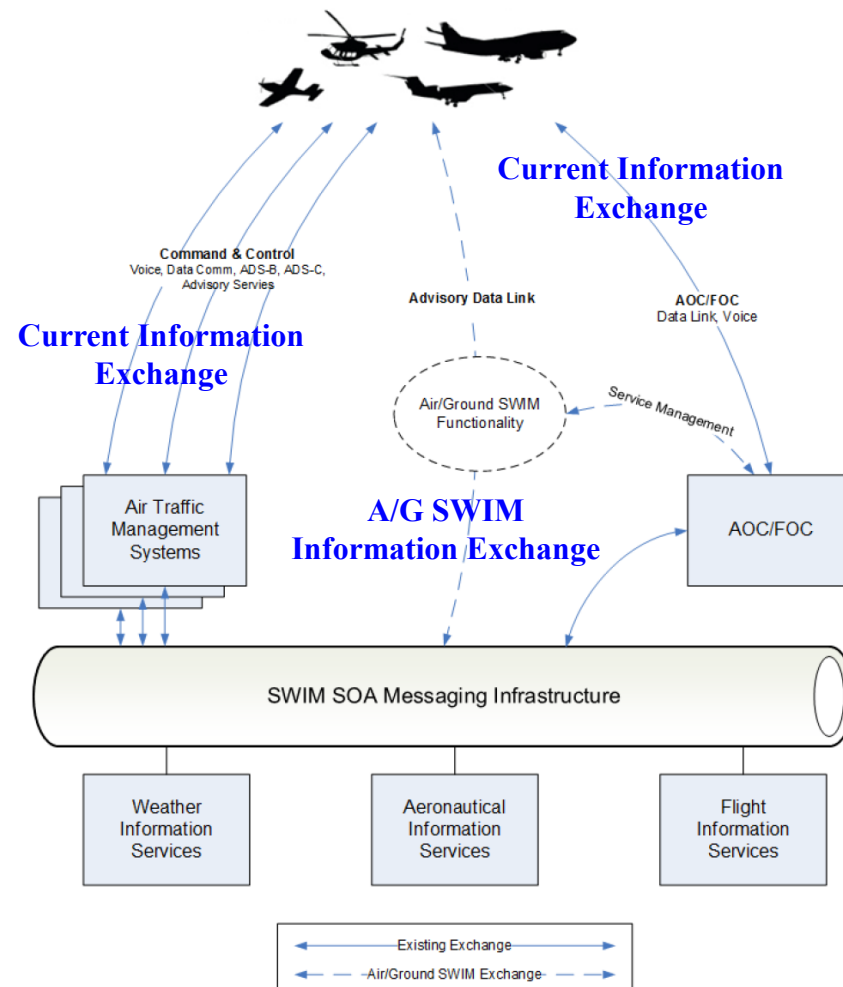
Background

➤ System Wide Information Management (SWIM)



ICAO SWIM Framework

- **FIXM (Flight Information eXchange Model)**
- **AIXM (Aeronautical Information eXchange Model)**
- **IWXXM (ICAO Weather Information eXchange Model)**

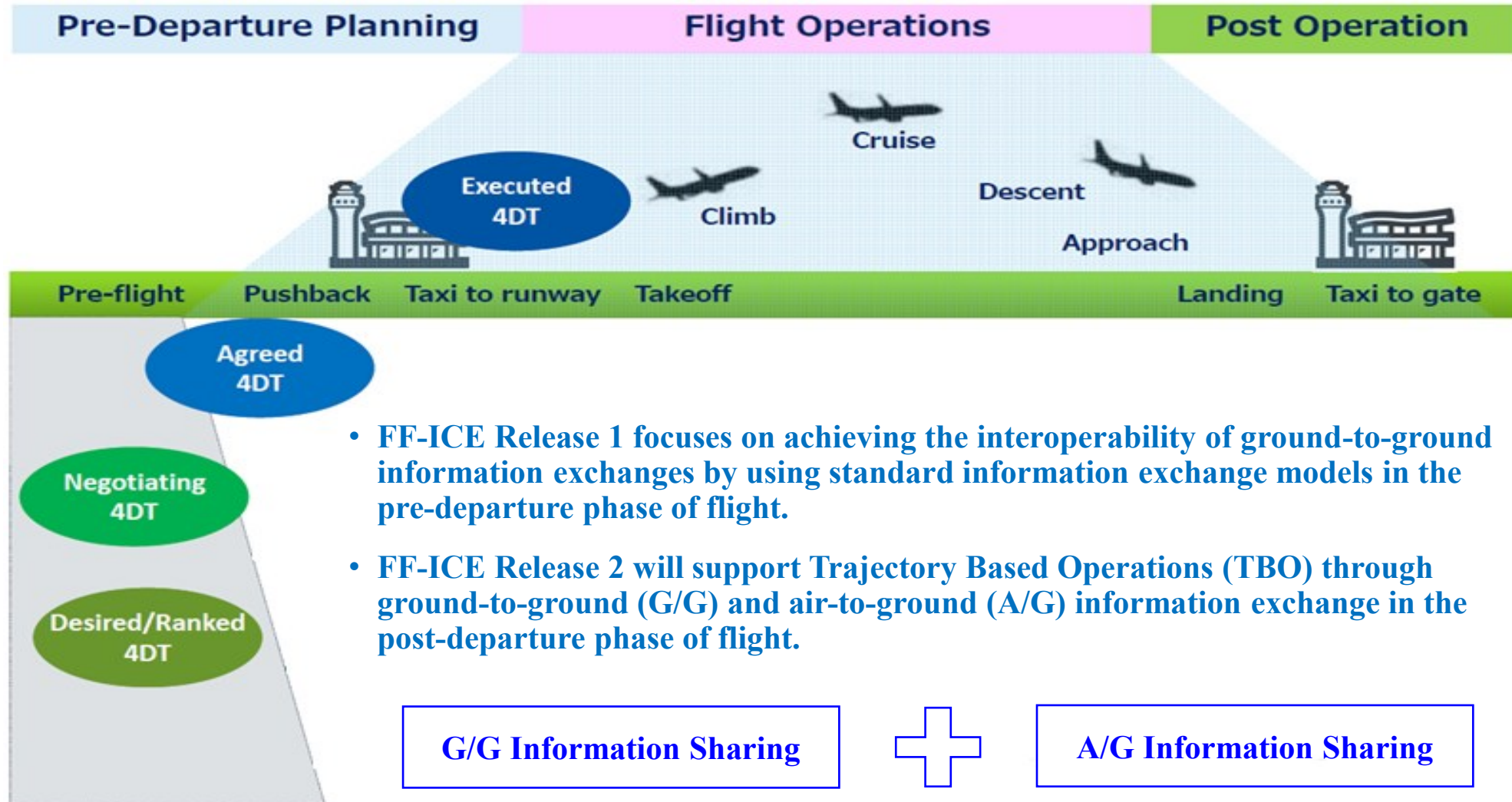


A/G Information Exchange with SWIM

Background



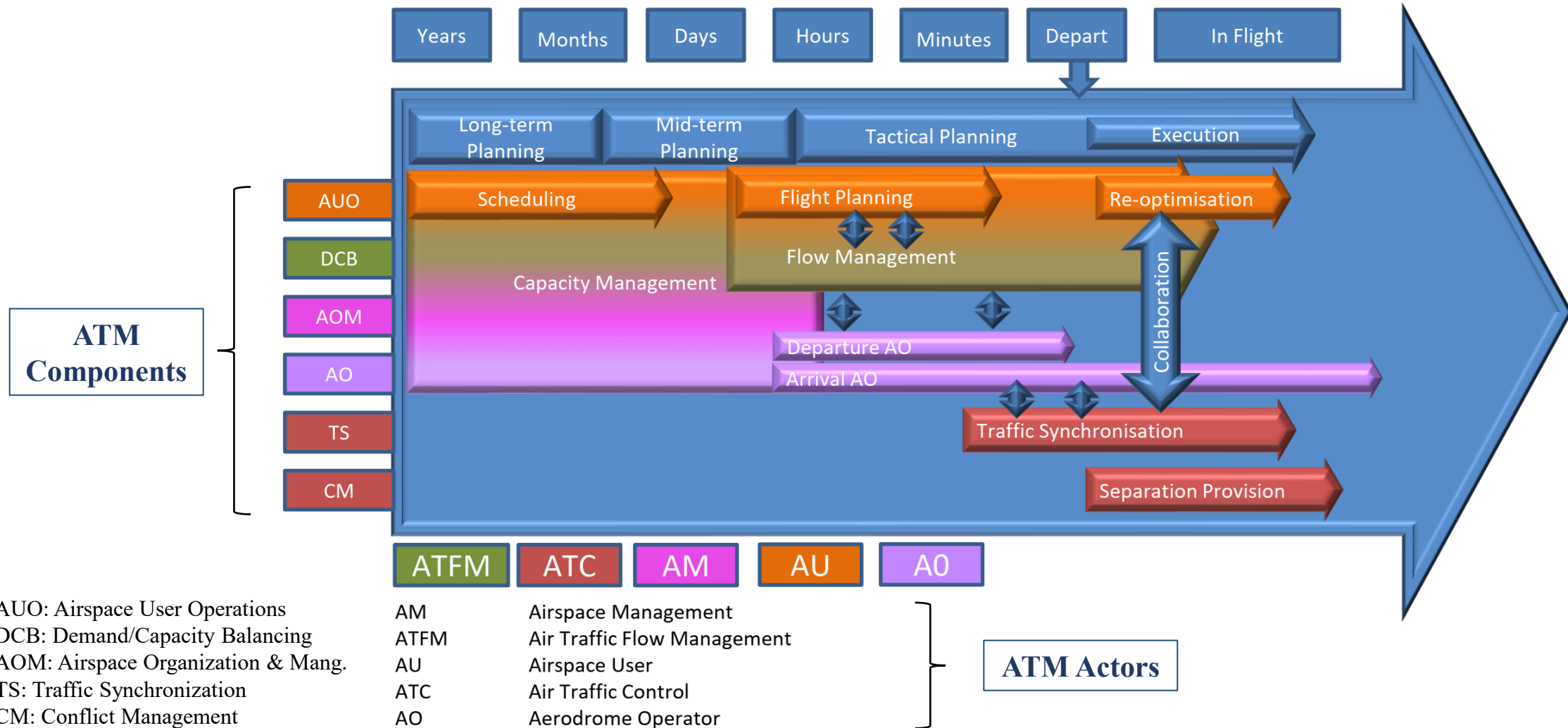
➤ Flight and Flow-Information for Collaborative Environment (FF-ICE)



Background



➤ Concept of Trajectory-Based Operations



Agenda



1. Background

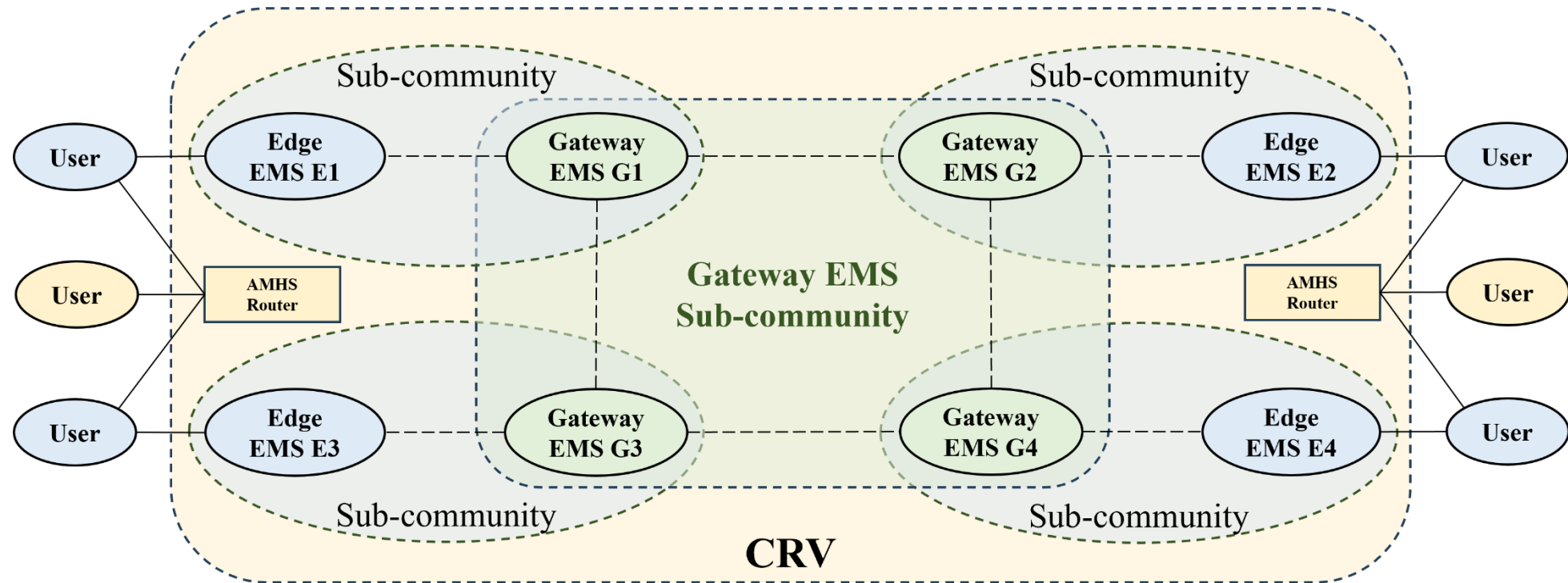
2. APAC SWIM TI

3. FF-ICE/R1 Services

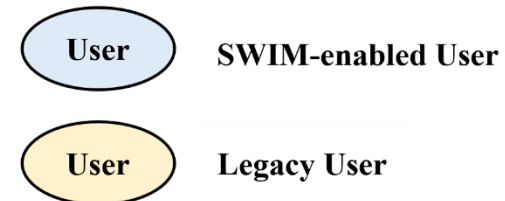
4. Field Trials



➤ Hierarchical Architecture



- * EMS: Enterprise Messaging Service
- * AMHS: ATS Message Handling System
- * CRV: Common aeRonautical VPN



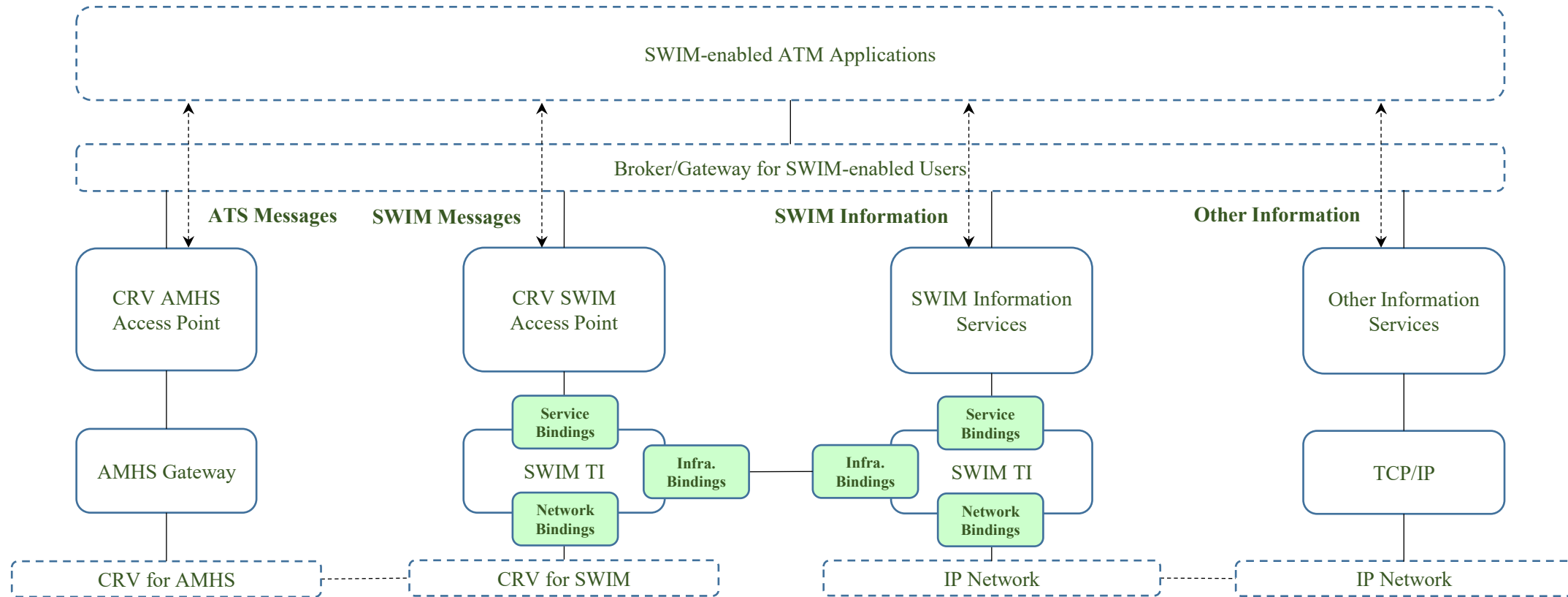


➤ Messaging Service: Message Exchange Patterns

MEPs	Process	Application	Approach
Synchronous Request/Reply	This pattern allows a requester to issue a request and block until a response is received within a defined timeout.	This pattern is appropriate for transactional operations, real-time queries, and service invocations where the requester cannot proceed without a response.	• HTTP/HTTPS • RESTful APIs
Asynchronous Request/Reply	This pattern temporally decouples the request from the reply. The consumer sends a request without blocking for a response, while the information service processes the request independently and sends a reply to a designated destination.	This pattern is suitable for non-time-critical and correlated message exchanges where processing latency may be variable.	• AMQP 1.0 • Queue-based messaging
Publish/Subscribe	This pattern enables publishers to disseminate information to an arbitrary number of subscribers without direct knowledge of the subscriber population.	This pattern serves as the primary mechanism for disseminating operational aeronautical and meteorological information.	• AMQP 1.0 • Topic-based messaging



➤ Interoperability Between Regions

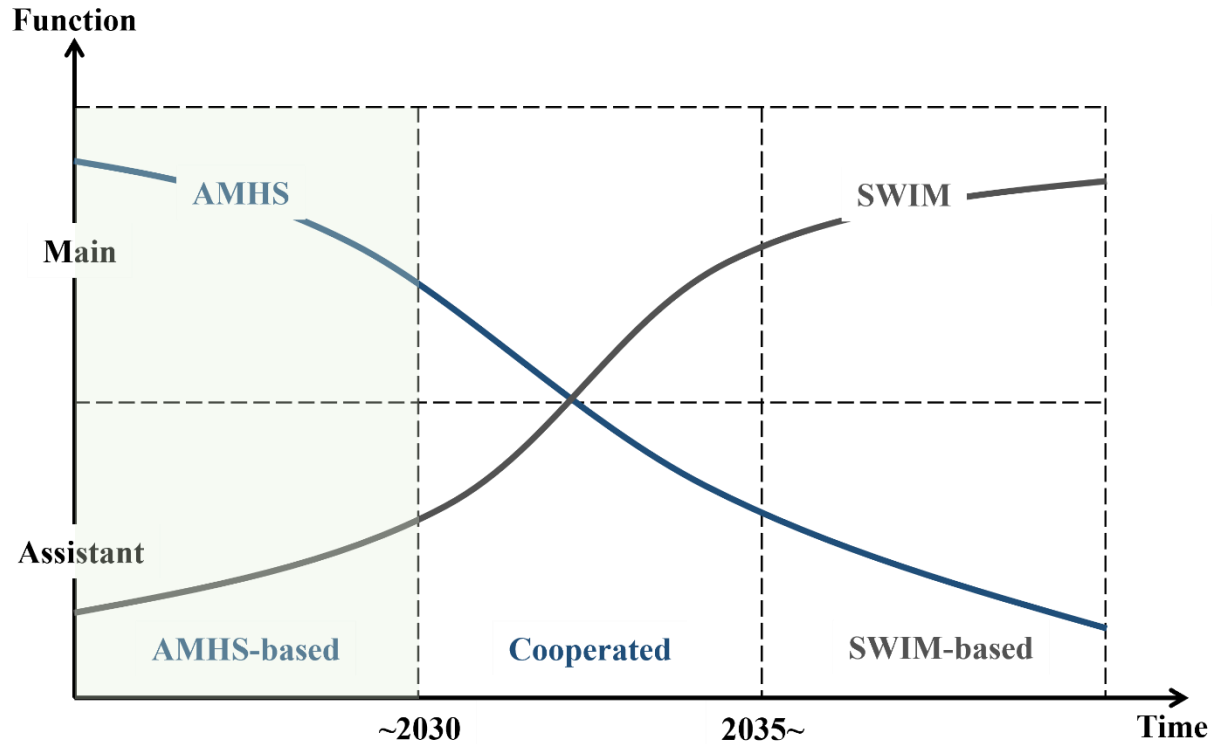


Without AMHS/SWIM Gateway

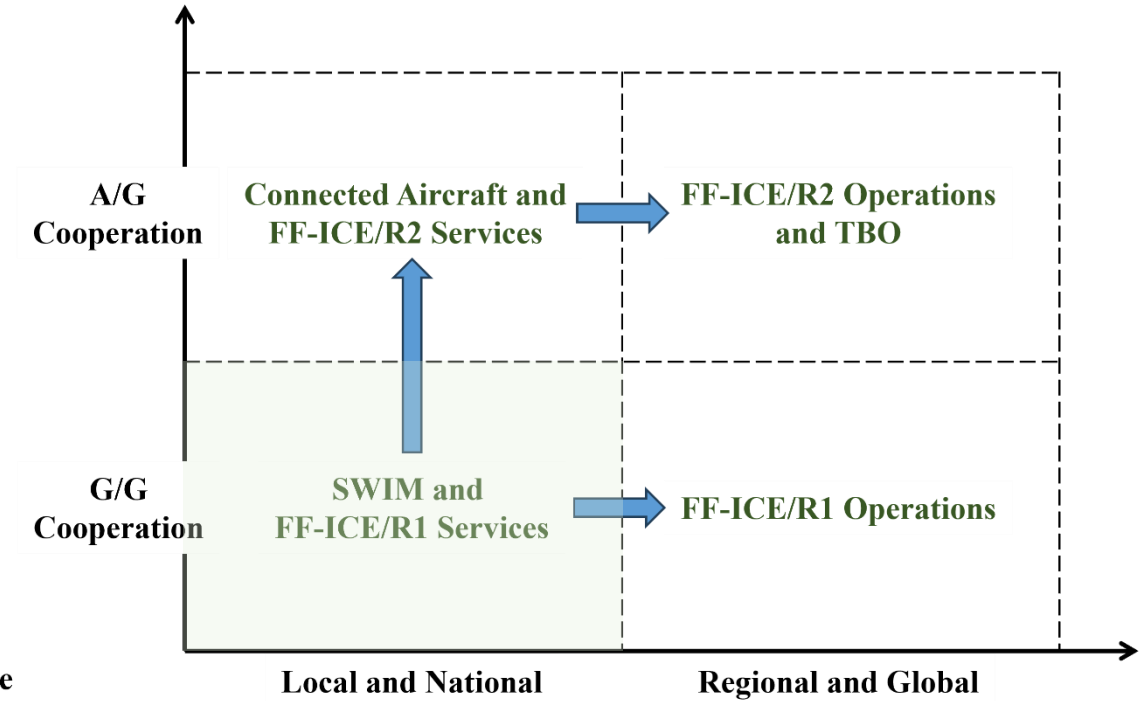
APAC SWIM TI



➤ Implementation Plan



From AMHS to SWIM



From Local to Global

Agenda



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2. APAC SWIM TI

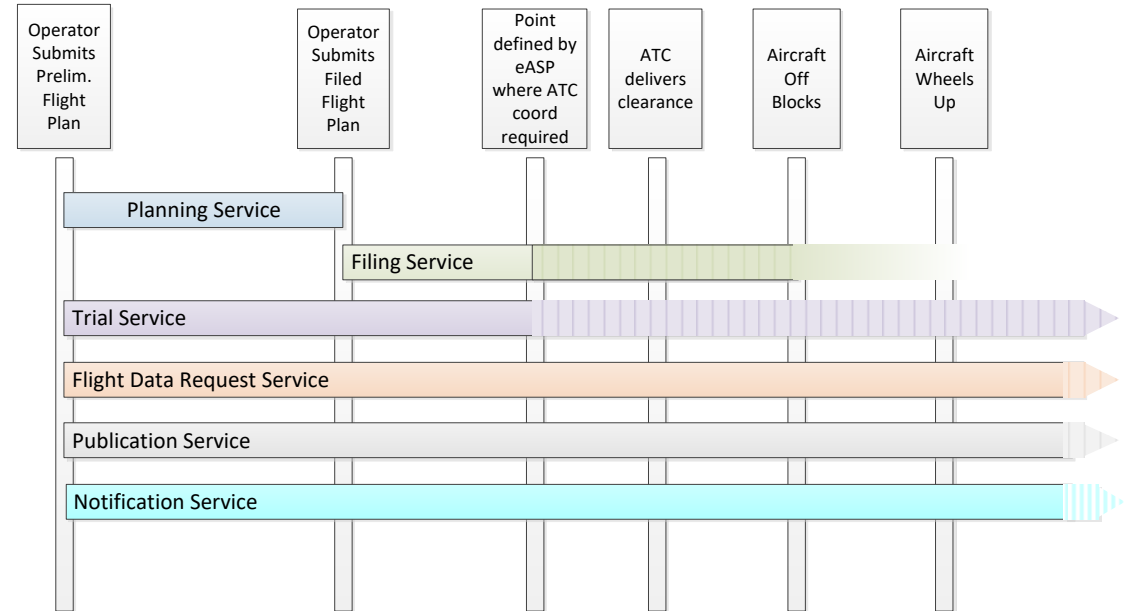
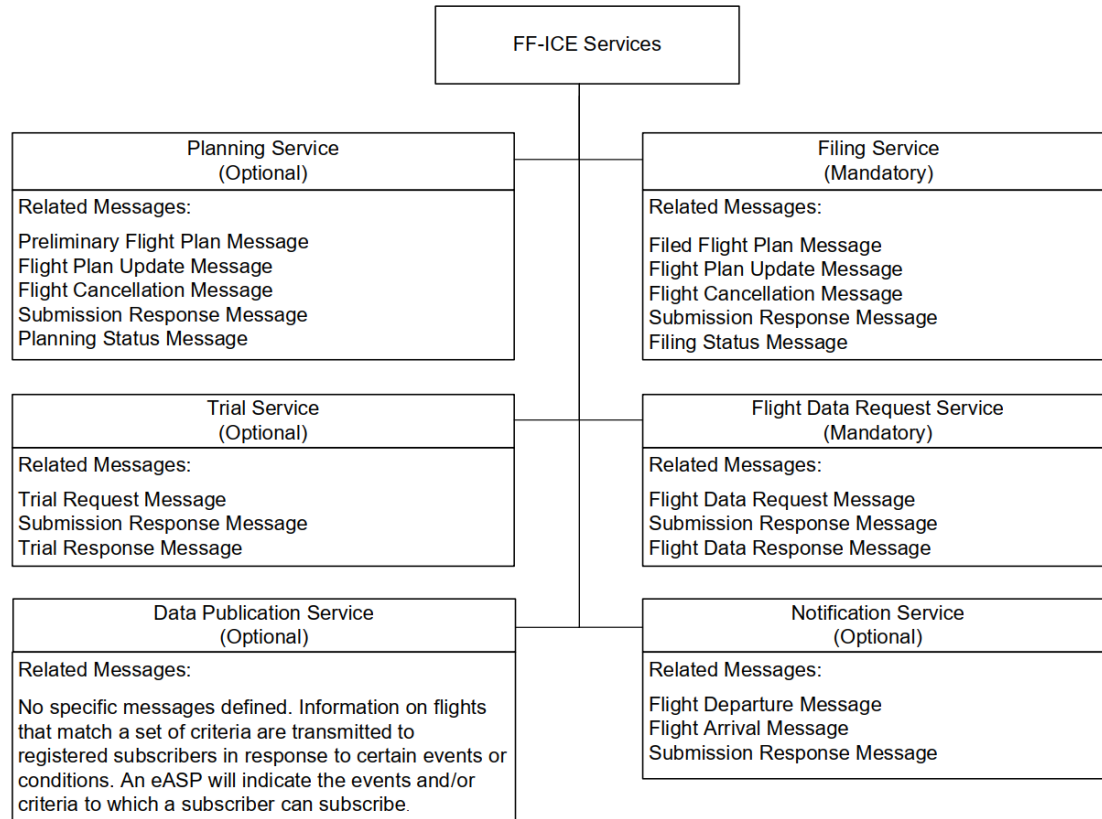
3. FF-ICE/R1 Services

4. Field Trials

FF-ICE/R1 Services



➤ FF-ICE/R1 Services



***eASP: FF-ICE capable ATM Service Provider**

***eAU: FF-ICE capable Airspace User**

FF-ICE Services Defined in the FF-ICE Implementation Guidance

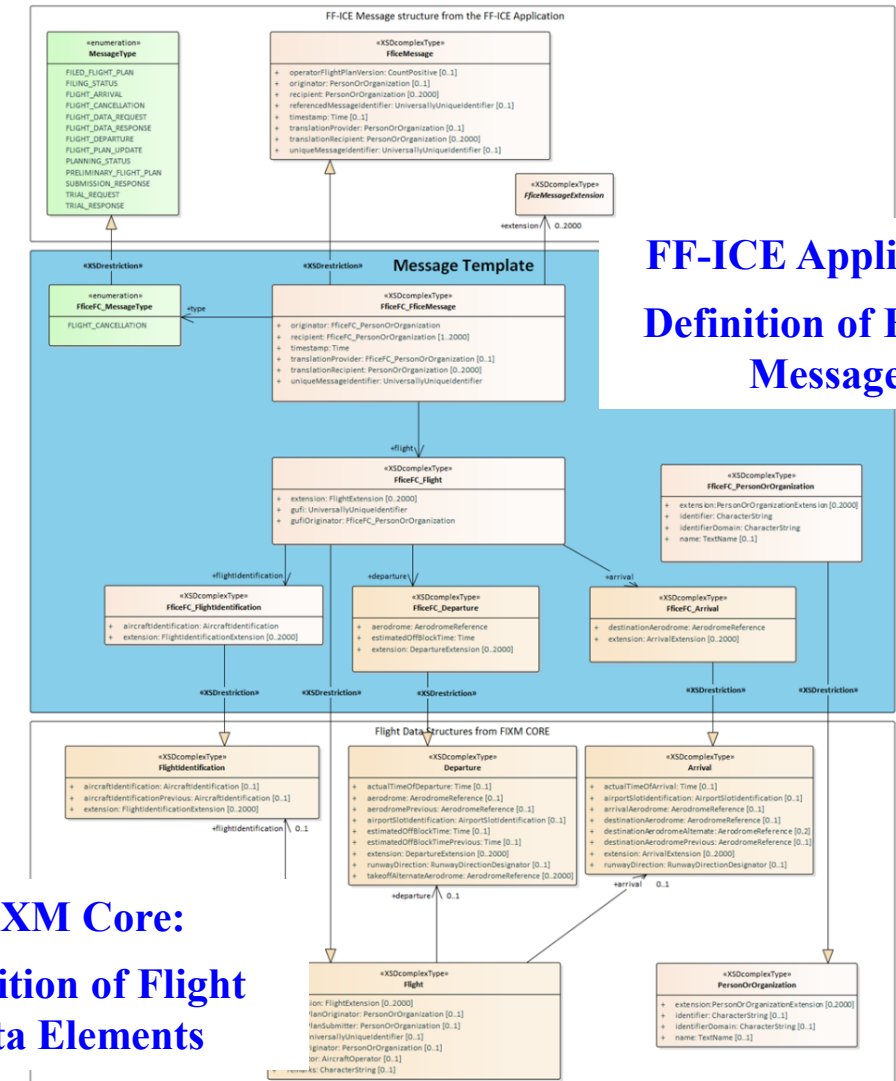
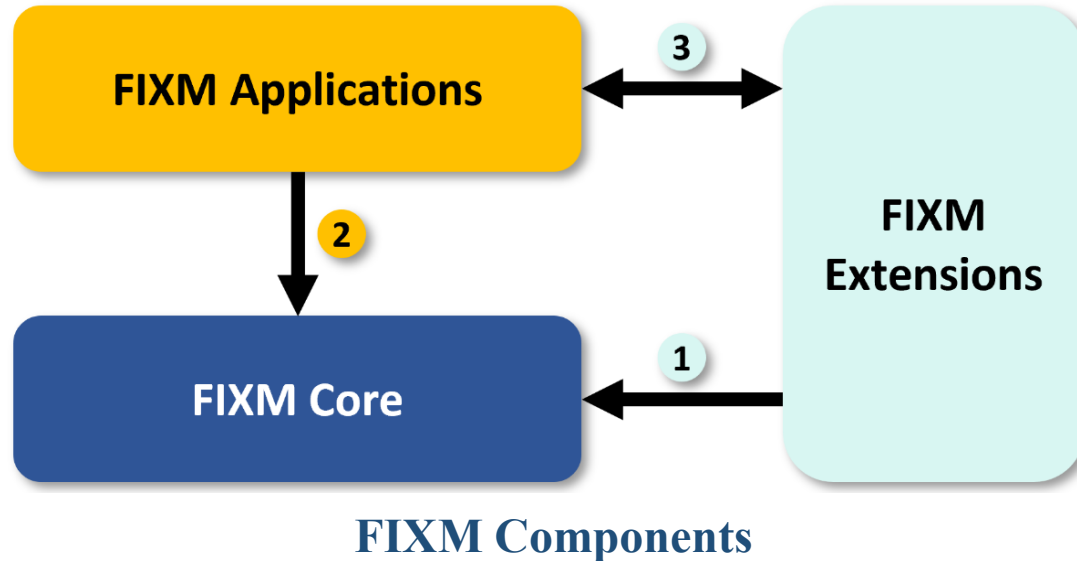
FF-ICE/R1 Services



➤ FIXM

• FIXM Components

- FIXM Core: Flight and Base
- FIXM Applications: Basic and FF-ICE
- FIXM Extensions: US, EU and APAC



FF-ICE Application: Definition of FF-ICE Messages

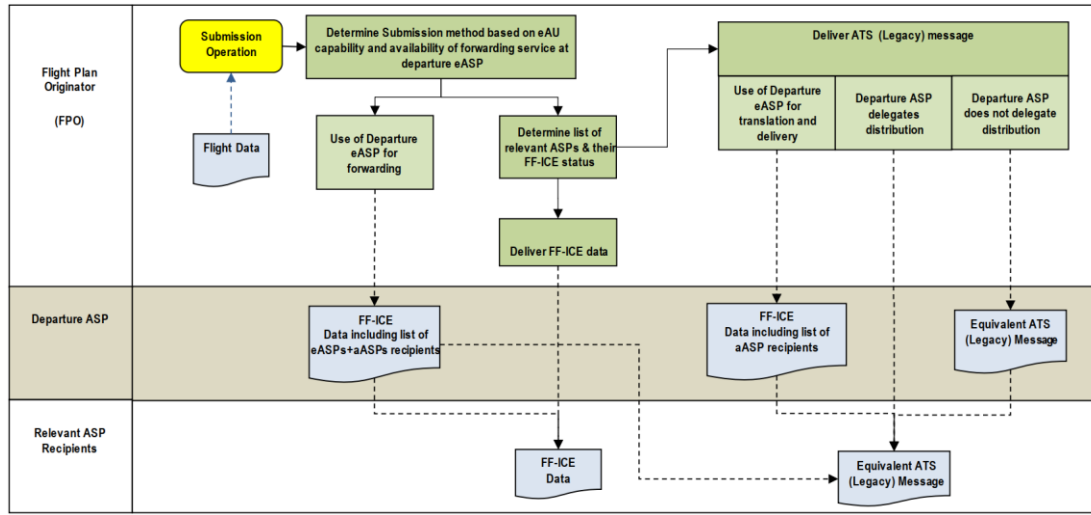
FIXM Core: Definition of Flight Data Elements

FIXM v4.3.0 Structure

FF-ICE/R1 Services

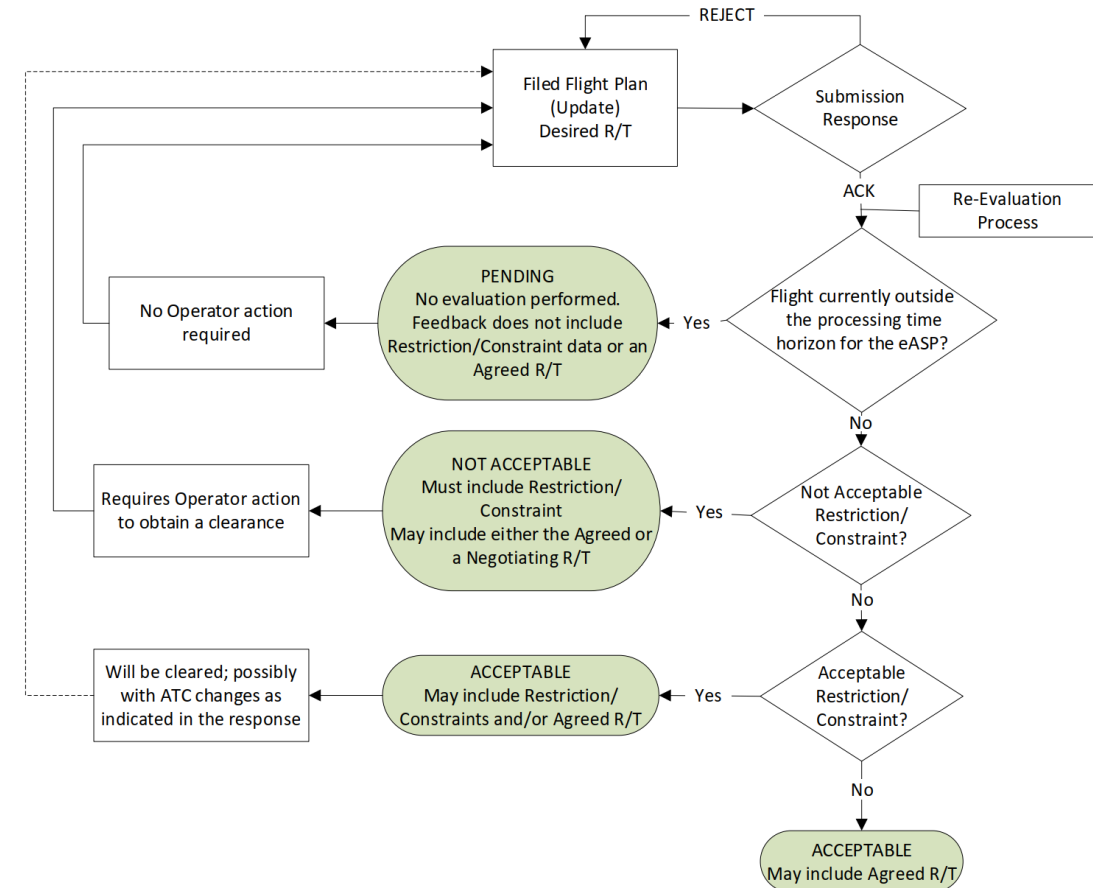


➤ Flight Plan Filing Service



Filed Flight Plan Submission Procedure

1. The eAU submits the Filed Flight Plan to each eASP.
2. The eAU submits the Filed Flight Plan to the Departure eASP, which then forwards to other relevant eASPs.

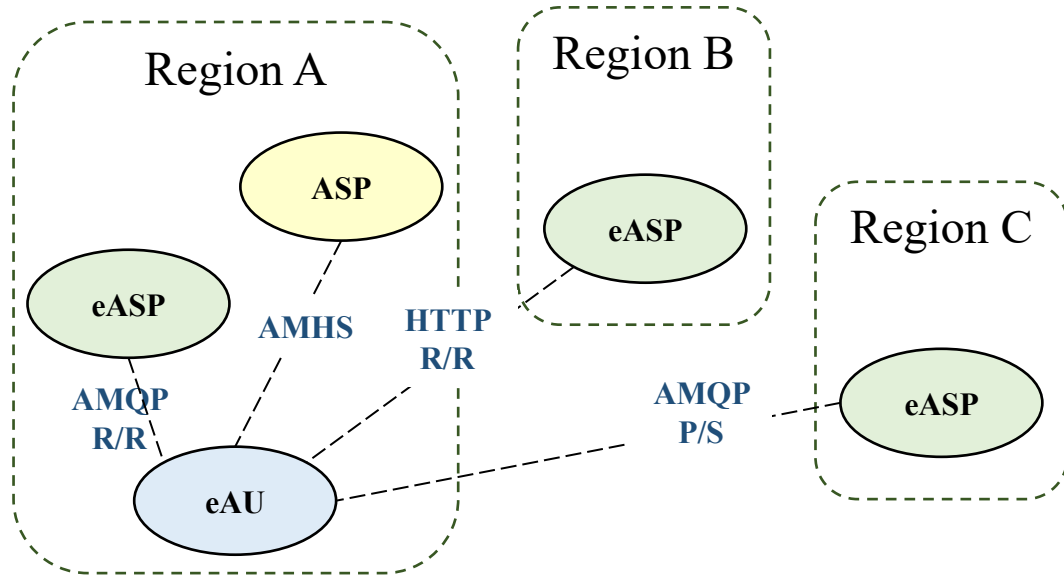


Filing Service

FF-ICE/R1 Services

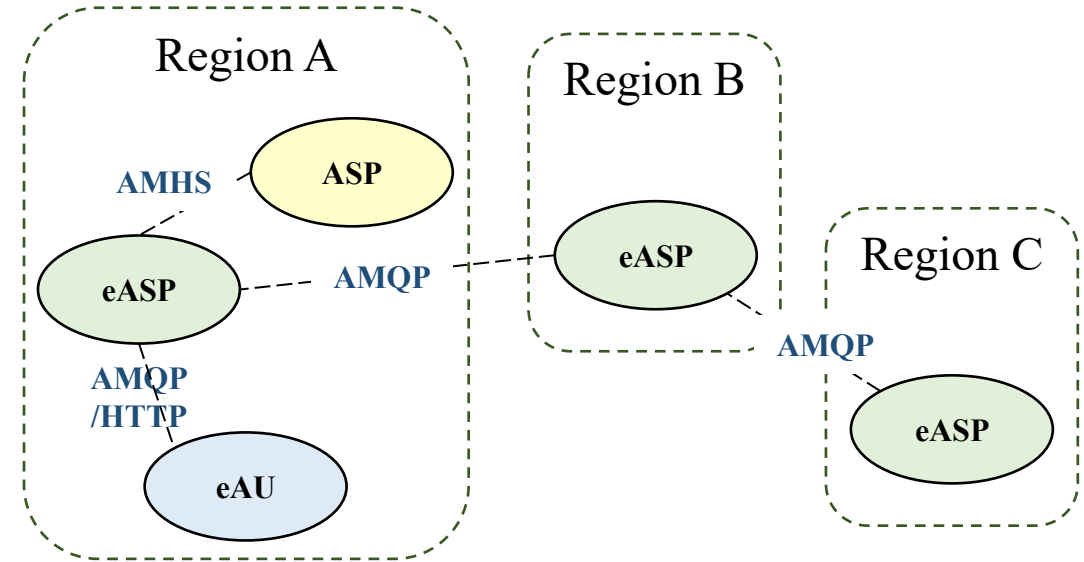


➤ Filed Flight Plan Submission



The eAU submits the Filed Flight Plan to each eASP or ASP using different communication protocols and approaches.

Local SWIM based operations
without Regional SWIM TI



The eAU submits the Filed Flight Plan to one eASP, which then forwards it to other relevant eASPs and ASPs using the agreed communication protocol and approach.

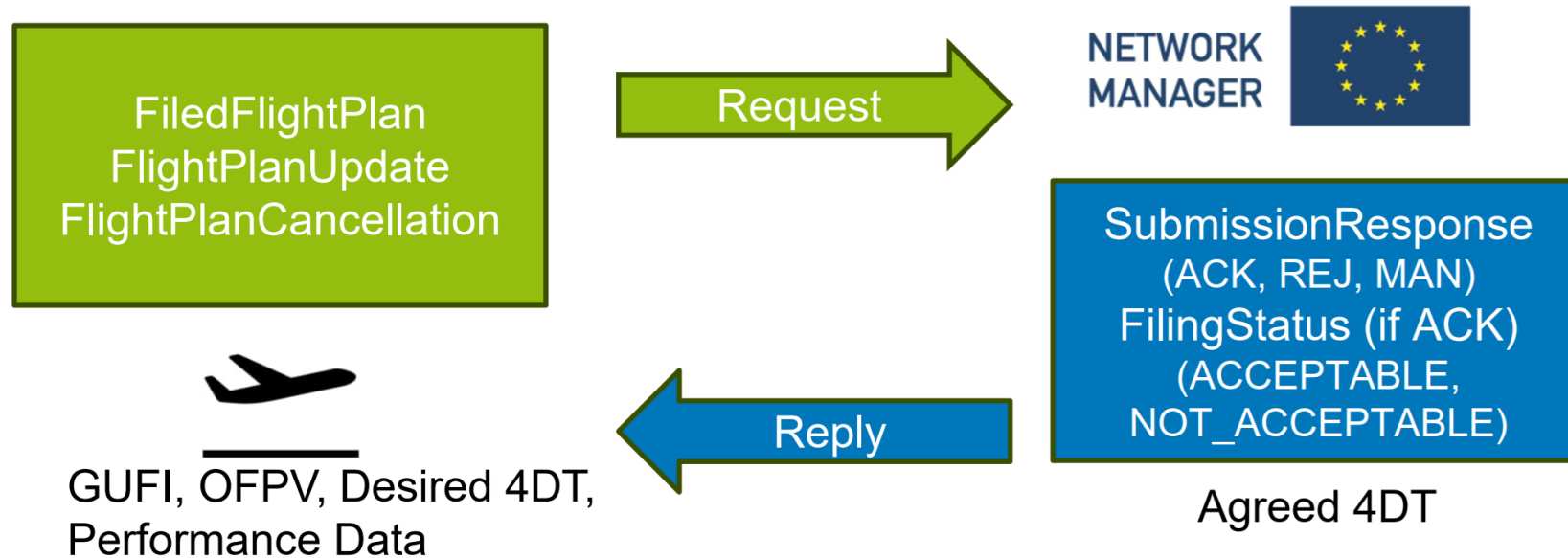
Local-Regional-Global SWIM based operations
with Regional SWIM TI

FF-ICE/R1 Services: EUROCONTROL



➤ FF-ICE Filing Service

- Enables operator to submit, update or cancel Filed Flight Plan
- Request/Reply NM B2B service



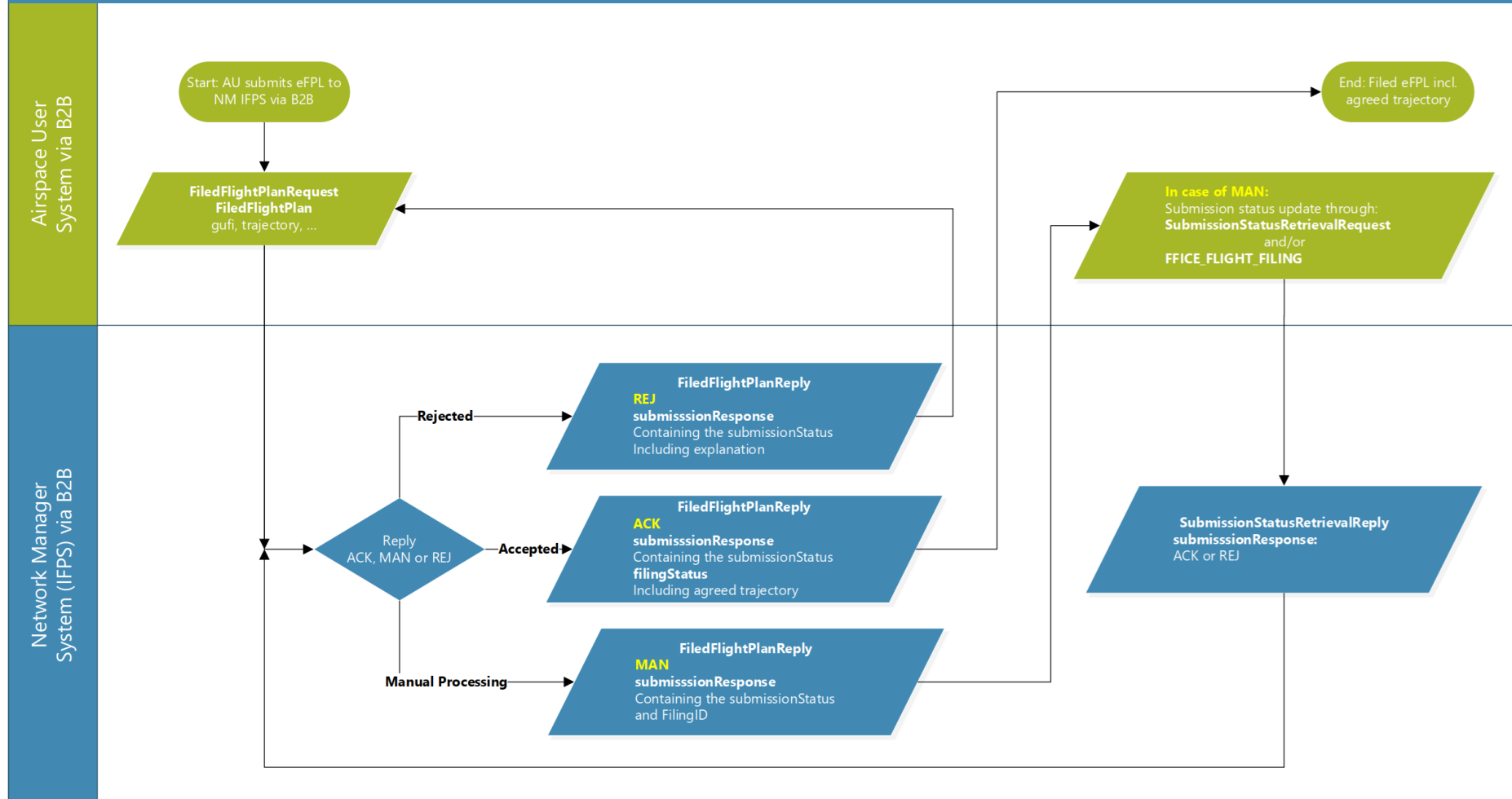
Submission Response: Data Validity
Filing Status: Operational Acceptability

FF-ICE/R1 Services: EUROCONTROL



➤ Filing Service: Filed Flight Plan Submission

Flight Planning Use Case 1: Submission of an eFPL



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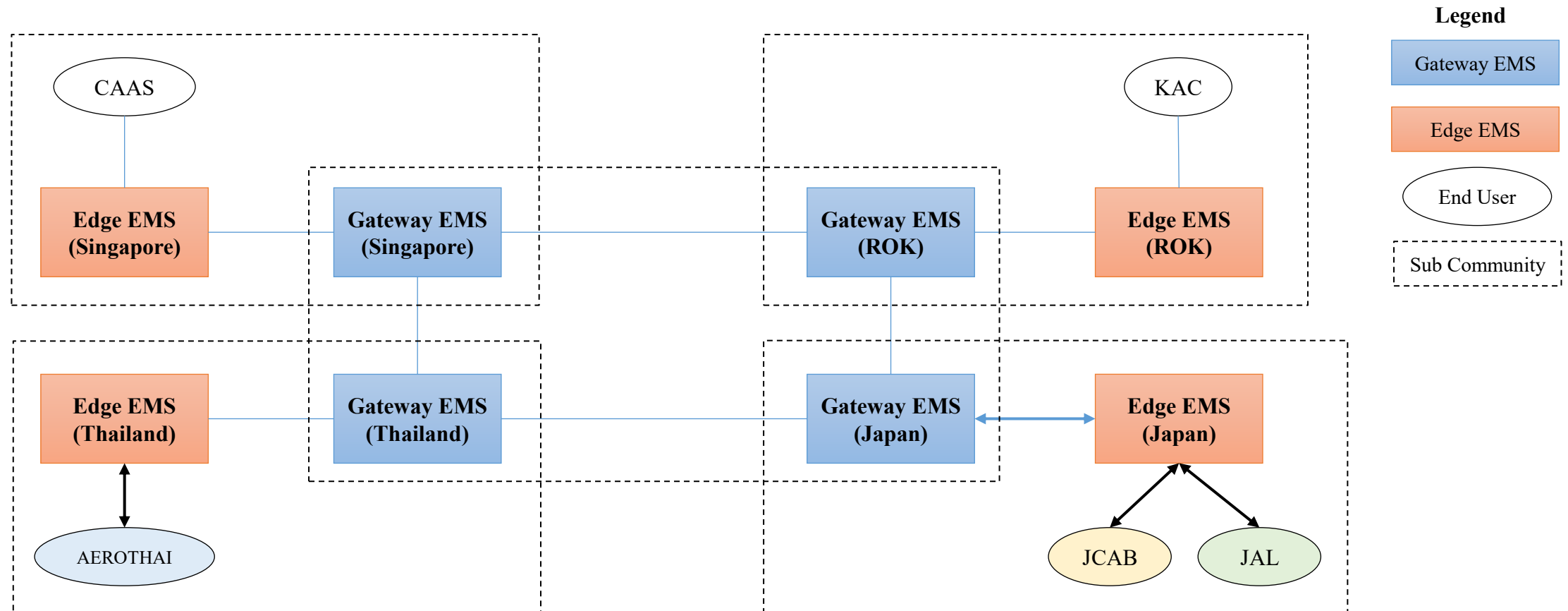
3. FF-ICE/R1 Services

4. Field Trials

Field Trials



➤ SWIM for Message Exchange



Field Trials



➤ SWIM for Information Sharing

Flight Viewer

UTC 2026-06-10 01:16:32 / JST 2026-06-10 10:16:32 AeroMACS

FLIGHT SIGMET NOTAM ME

RJJJ

Air Traffic Management Center

One SIGMET found as of 2026-06-10T01:09:03Z

RJJJ 09-V05

Begins: 2026-06-09T23:05:00.000Z
Ends: 2026-06-10T03:05:00.000Z

WSJP31 RJTD 092305
RJJJ SIGMET V05 VALID 092305/100305
RJTD-
RJJJ FUKUOKA FIR FRQ TS FCST WI N2445
E12842 - N2740 E12857 - N3239
E13836 - N2918 E13723 - N2445 E12842 TOP
FL510 MOV ENE 25KT NC=

**MET information sharing
with SIGMET message in
IWXXM format**

Flight Objects

No ↑	ACID	GUF1	Airline	Departure	Arrival	EOBT	Time	Latitude	
1	SIA631	d4087bb1-8727-4aaf-b0f1-eda36db0e2d9	SIA	RJTT	WSSS	2026-06-09T23:55:00Z	2026-06-10T01:06:53.000Z	32.386408	1
2	JAL562	04a68b81-aa7a-492b-9fb6-15043f6e4d2	JAL	RJCM	RJTT	2026-06-10T00:30:00Z	2026-06-10T01:08:40.000Z	40.38615	1
3	JAL142	f10c23c6-5621-4099-87c6-ac9d01cd14a4	JAL	RJSA	RJTT	2026-06-09T23:40:00Z	2026-06-10T01:08:58.000Z	36.115022	1
4	JAL313	1a3fd1e9-7397-44e3-bd13-67d349b68626	JAL	RJTT	RJFF	2026-06-10T01:00:00Z	2026-06-10T01:08:51.000Z	35.548174	1
5	APJ568	fc7c075e-667e-4c05-b042-eeec616aa093	APJ	RJCC	RJAA	2026-06-10T00:15:00Z	2026-06-10T01:08:58.000Z	39.432378	1

Field Trials



➤ SWIM for Information Sharing

Flight Viewer

UTC 2026-06-10 01:20:07 / JST 2026-06-10 10:20:07 AeroMACS

FLIGHT SIGMET NOTAM ME

TAX601/XJ601

Thai AirAsia X

RJAA/NRT VTBD/DMK

Tokyo Bangkok

TRACK

GUF	05079d17-fd9b-4a79-b9e9-99c7878c277d
Time	2026-06-10T01:19:53Z
Latitude	32.7583
Longitude	137.9573
Altitude	38,000 ft
Speed	381.445 kts
Bearing	247.7°

FLIGHT INFO

Flight Number	TAX601
Status	En Route / On Time
Departure	RJAA/NRT Narita International Airport
Departure Gate	2026-06-10T00:15:00Z
Departure Scheduled	2026-06-10T00:15:00Z
Departure Takeoff	2026-06-10T00:33:42Z
Departure Scheduled	2026-06-10T00:25:00Z
Arrival	VTBD/DMK Don Mueang International Airport
Landing	2026-06-10T06:58:42Z

Map of East Asia showing flight paths and aircraft positions. A red arrow points to a specific aircraft, with a callout box indicating flight information sharing with TRACK in FIXM format.

Flight Objects

Search

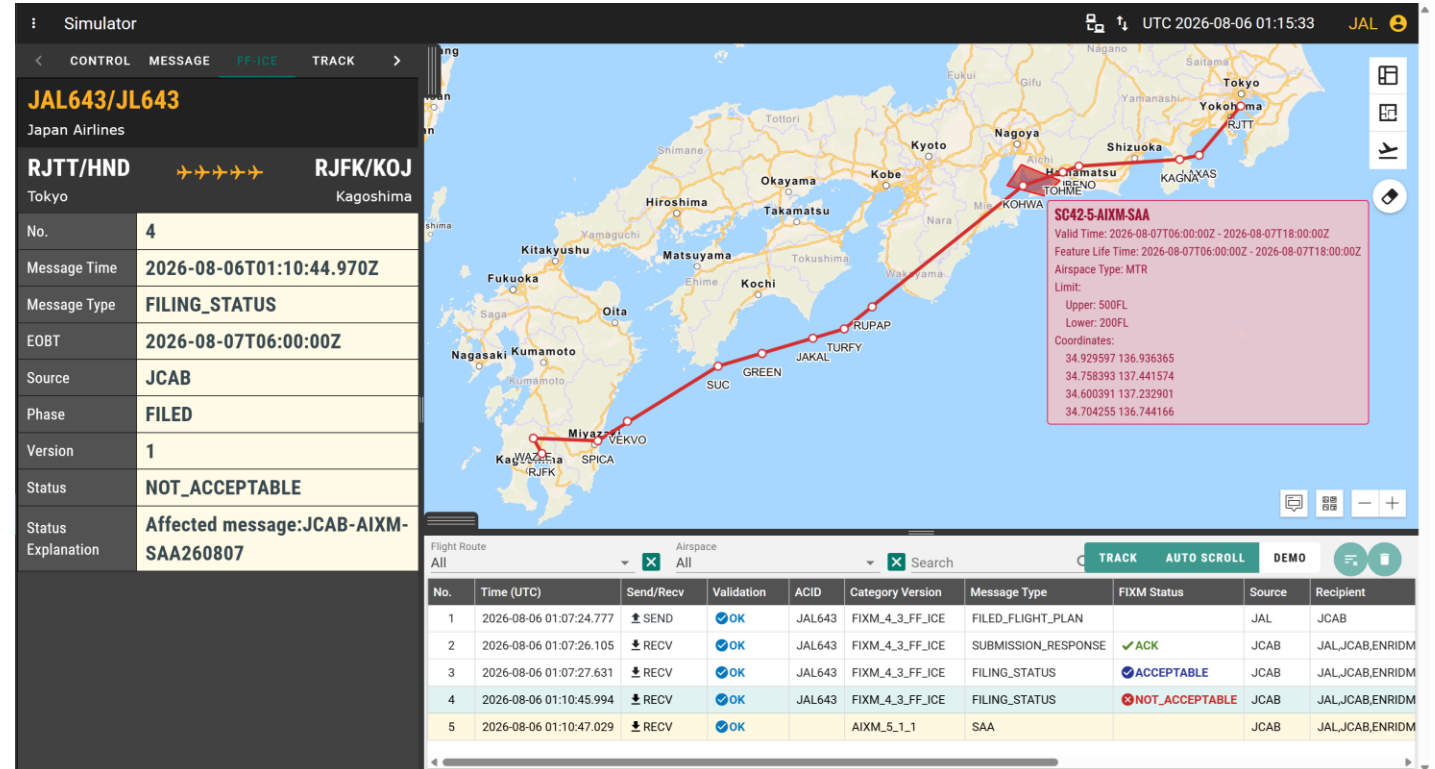
No ↑	ACID	GUF	Airline	Departure	Arrival	EOBT	Time	Latitude	
1	SIA631	d4087bb1-8727-4aaf-b0f1-eda36db0e2d9	SIA	RJTT	WSSS	2026-06-09T23:55:00Z	2026-06-10T01:06:53.000Z	32.386408	1
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Field Trials



➤ SWIM for Information Service Cooperation

- eASP: JCAB
- eAU: JAL
- Aircraft
 - JAL643: RJTT-RJFK
- Scenario
 - ① JAL: E_FPL (JAL643)
 - ② JCAB:
 - SUB_RESP (ACK)
 - FIL_STATUS (ACCEPTABLE)
 - ③ JCAB:
 - SAA (Special Activity Airspace)
 - FIL_STATUS (NOT_ACCEPTABLE)



Field Trials



➤ SWIM for Information Service Cooperation

- Scenario

④ JAL: TRIAL_REQ

⑤ JCAB:

- SUB_RESP (ACK)

- TRIAL_RESP (COUCUR)

⑥ JAL: FPL_UPDATE

⑦ JCAB :

- SUB_RESP (ACK)

- FIL_STATUS (ACCEPTABLE)

