Guidance Material for Business Functionality of APAC Common SWIM Information Services

Developed by: SWIM Task Force (Task 6)

Purpose

- This Guidance Material has been developed to assist relevant APANPIRG Subsidiary Groups (e.g. MET/IE, SURICG, AAITF, FF-ICE Ad Hoc Group, ATFM SG) in specifying the relevant information associated with the high-level definition of planned APAC Common SWIM Information Services
  - Version 1 of the APAC Common SWIM Information Services has recently been published on the ICAO APAC eDocs site as per Decision APANPIRG/36/11:

    https://www.icao.int/sites/default/files/APAC/Documents/edocs/CNS/APAC-Common-SWIM-Information-Services.pdf
  - The purpose of list of APAC Common SWIM Information Services (including associated priorities) is to provide States/Administrations with **guidance on anticipated services** to **support their planning and implementation** of SWIM
    - Listed Information Services are expected to be at different levels of maturity, i.e. are not expected to be fully matured prior to being added to the list as an indicative roadmap for the Information Service
    - It is not intended to be overly prescriptive
      - This information will be captured in the Information Service Definitions (ISD)

Version Maintenance

- The latest published version of the Common APAC SWIM Information Services is available on the ICAO APAC eDocs site (CNS section)
- Between published versions, SWIM TF maintains an updated working version of Information Services to capture inputs from the APANPIRG Subsidiary Groups as they occur
  - APANPIRG Subsidiary Groups are recommended to regularly review/update the APAC Common SWIM Information Services document each time they meet, and to provide updates to SWIM TF as necessary to maintain the currency of the list relevant to their information domain (e.g. Aeronautical Information, Flight information, Meteorological information)
  - Between published versions, SWIM TF will update the working list at SWIM TF meetings based on inputs from Subsidiary Groups
    - The latest working version will be available following finalisation of each SWIM TF Report

Categories

- The Categories associated with the Business Functionality of APAC Common SWIM Information Services are:
  - Business Functionality of the information service
  - Brief description of the service
  - Type of information to be exchanged
  - Information exchange model / Message type
  - Message exchange pattern
  - Priority
- Guidance on each Category is provided in the following slides

Business functionality of the information service

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

- **What the Information Service is called**
  - **Wherever possible**, this should **align with Information Services that are being implemented globally,** defining APAC regional variations only where needed
    - e.g. FF-ICE filing service
  - It may be prudent (even advisable) to define **different information services** where the **same information** is provided in the payload, but which may serve a **different business need** (i.e. be utilised by different consumers of the information services at a different rate or have a different Quality of Service)
    - E.g. An information service providing surveillance data to support the provision of aircraft separation could be expected to be defined separately to an information service providing surveillance data to support ATFM purposes, as the business usage differs between the two information services

Brief description of the service (1)

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

- **Plain text description of the information service**
  - Includes **Intended usage** of the information service
    - Includes indication (where relevant) of the intended service consumers and/or associated business need
  - Includes **Identification of** (and link to) the **latest reference document** (where one exists)
    - Provides insight/clarity on how the intended information service is aligning with global or regional concepts/implementations
      - E.g. For FF-ICE filing service, **ICAO Doc 9965 (Manual on FF-ICE)**
      - E.g. for Surveillance data only sharing service, **Guidance Materials for the sharing of surveillance data in SWIM** developed by SURSG
    - As maturity increases over time, the document reference will change
      - **Goal** is to reference the relevant Information Service Description (ISD) once developed

Brief description of the service (2)

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

- **Plain text description of the information service**
  - The description of the information service should include proposed timeframe for implementation
    - Note: proposed implementation timing may be moved to a separate column in a future update of the table
  - The description of the information service should ***not*** include:
    - Proposed timeframe for implementation (this is proposed to be captured in a future update to the table)
    - Reference to the Information Exchange Model (e.g. FIXM)
    - Information to be exchanged (captured in the “information to be exchanged” column)

Type of information to be exchanged

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

- **The information that will be exchanged as part of the information service**
  - Describes the information in general terms only (rather than individual data elements)
    - E.g. Surveillance data with DAPs, Basic flight plan information (without trajectory), etc.
  - The ISD (once developed) will specify all mandatory and optional fields
    - Subsidiary groups may need to separately develop this additional granularity if the information service has not already been defined elsewhere
  - Timeframes for transitioning information types should not be included

Information exchange model / message type

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

- **The information exchange model (or message type) employed by the payload of the information service**
  - Identifies standard Exchange Models (FIXM, IWXXM, AIXM)
    - E.g. (FIXM, IWXXM, AIXM)
  - Where the content within the payload comes from another message type or data format, this can be identified
    - E.g. Surveillance data: JSON or RAW (derived from ASTERIX Cat 21)
  - Version / associated extensions of the Exchange Model is not required
  - If not yet known or confirmed, “TBD” is acceptable

Message exchange pattern (1)

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

- **The type of information that will be exchanged as part of the information service**
  - **At least one of**:
    - Request/Reply (**Req/Rep**), **including type if known** (see additional information on following slides)
      - Synchronous Request/Reply (**Sync R/R**)
      - Asynchronous Request/Reply (**Async R/R**)
    - Fire and Forget (**One-way**)
    - Publish/Subscribe (**Pub/Sub**)
  - If multiple MEPs are possible, identify which are mandatory or optional
    - E.g. Pub/Sub and Sync R/R
    - E.g. Req/Rep (mand), Req/Rep (opt), etc.
  - **"TBD" to be used where MEP is not yet known**

Fire and Forget vs. Publish / Subscribe

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

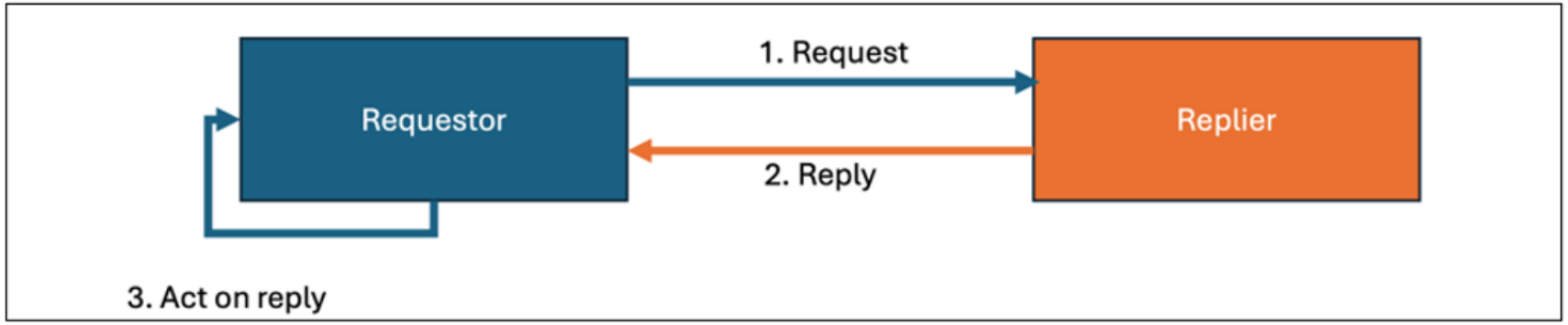
From the ICAO Manual on the SWIM Implementation (Doc 10203):

- For the **One-way ("Fire and Forget") MEP**, *the consumer initiates a message to an information service without expecting any response from the information service. This MEP is particularly useful at the lower application layer, where immediate message responses are not required*;
- For the **Publish/Subscribe MEP**, *the consumer initiates a subscription request to an information service. The subscription may be capable of providing details (such as through a filtering parameter) on the information being subscribed*
- The P/S MEP can be either a 'push' or a 'pull' mechanism:
  - For the 'push' mechanism, this requires that the consumer can receive messages at any time, and is not restricted from completing other operations while waiting for the Information Service to respond
  - For the 'pull' mechanism, this requires the Information Service to keep necessary updates available to the consumer, and that the consumer sends requests to the information service to receive the updates

Synchronous Request-Reply

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

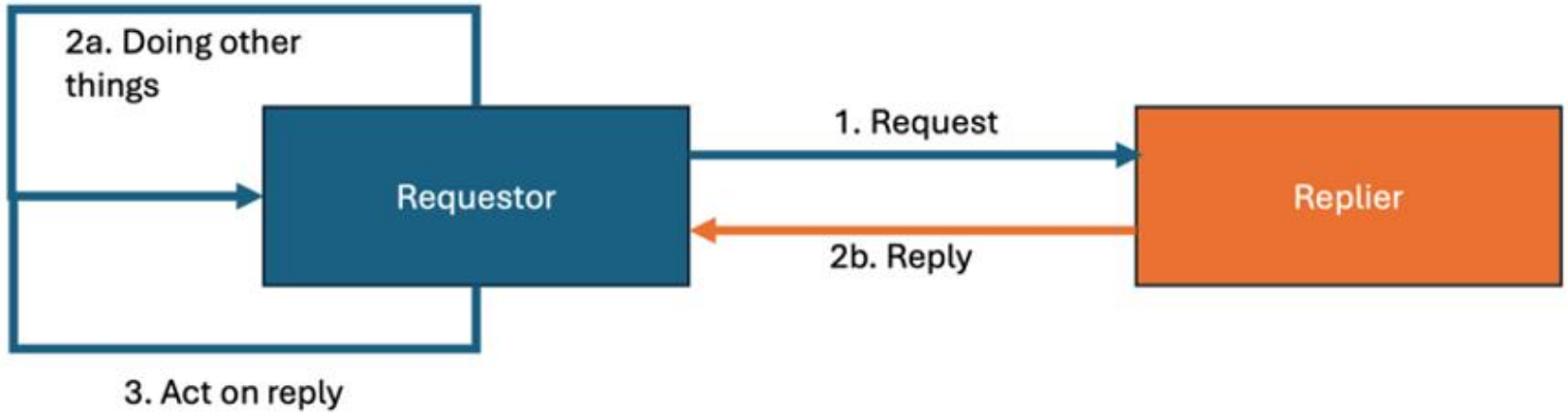
In Doc. 10203, **synchronous** R/R MEP is defined as – *The consumer initiates a request to an information service; the service processes the request and generates a reply to the consumer. The consumer waits for the information service to provide a response. During this waiting period, the consumer cannot send or receive any other requests or responses. This pattern is specifically applicable to information services that can quickly execute and respond to consumer requests*



Asynchronous Request-Reply

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

In Doc. 10203, **asynchronous** R/R MEP is defined as – *The consumer initiates a request to an information service; the service processes the request and generates a reply to the consumer. However, the consumer is not restricted from performing other operations while waiting for the information service's response. This MEP requires that the consumer be able to receive messages at any time and correlate them with prior requests*



Synchronous vs. Asynchronous Request-Reply

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

Index	Synchronous	Asynchronous
Time Coupling	Both requester and replier are available at the same time.	Requester sends a request and continues its process; replier can send the response later when available.
Space Coupling	Requester needs to know the exact service endpoint (protocol, address, API).	Requester sends to a known endpoint, but response may arrive via callback, polling, or correlation ID; looser coupling in response handling.
Reliability Handling	Retries and error handling happen at requestor side.	Retries and correlation of delayed responses must be managed at the requester side (e.g., matching reply with original request).
Use Cases	• Low latency expected • Both parties are available • Immediate response interaction	• Replier may not be immediate • Deferred or background processing acceptable
Typical Scenarios	• User Authentication • User Interface Interactions • Database Read and Immediate Write	• Order processing with delayed confirmation • Flight plan filing with later validation • Weather data request with queued response • Batch data processing

- Additional guidance can be found in "**Draft Guidance Material REQ REP MEP in Asia**" provided as **Appendix C** to the Working Paper

- If in doubt:
  - Specify Req/Rep only
  - Leave as TBD

Priority (1) / (2) / (3)

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)

- **Either 1, 2 or 3 as determined by:**
  - Priority (1): Recommended for region-wide implementation for region-wide benefits
  - Priority (2): Recommended for implementation as much as practicable
  - Priority (3): Additional information services without common regional requirements and not included as a part of common regional information services

- *Note: It has been proposed to separate applicability (region-wide vs. as needed by a subset of States) and desired timeframe into separate columns, however any change to table columns will be formally communicated to Subsidiary Groups separately*

Example update

Note: this is not an actual update, it has been provided to indicate *potential* updates to FF-ICE Common APAC SWIM Information Services content that would align with this Guidance Material

Example – FF-ICE Information Services - Current

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)
APAC Common SWIM Flight Information Services					
GUFI service	GUFI (Globally Unique Flight Identifier) generation and provision	GUFI	FIXM	Req/Reply	1
FF-ICE filing service	Provides a means to submit, update or cancel flight plans through a SWIM-based interface using FIXM.	Flight plan for registration, update or cancellation	FIXM	Req/Reply Pub/Sub	1
FF-ICE publication service	Provides harmonised sharing of flight plan information in a global standard supporting common situation awareness.	Flight information for publication	FIXM	Pub/Sub	2
FF-ICE trial service	Allows operators to test the effect of a potential change in a flight plan prior to committing to the change.	Proposed changes in a flight plan	FIXM	Req/Reply	2
FF-ICE flight data request service	Allows an operator to request the current status of a flight plan, or an ANSP can request an operator to submit the latest version of their flight plan.	Current status of a flight plan, a copy of flight plan or supplementary plan	FIXM	Req/Reply	1
FF-ICE notification service	Provides notification of a change in flight state, such as Departure (DEP) and Arrival (ARR) Air Traffic Service (ATS) messages.	ARR, DEP messages	FIXM	Req/Reply Pub/Sub	1
FF-ICE planning service	Allows operators to submit preliminary flight plans for early Air Traffic Flow Management (ATFM) planning and to obtain feedback regarding restrictions/constraints affecting the flight.	Preliminary flight plan for early ATFM planning	FIXM	Req/Reply Pub/Sub	2

Example – FF-ICE Information Services – *Potential* updates

Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	Priority (1) / (2) / (3)
FF-ICE filing service	Provides a means for Airspace Users to submit, update or cancel flight plans ~~through a SWIM based interface using FIXM.~~ Reference: ICAO Doc 9965 (Manual on FF-ICE) Target Implementation timeframe 2034	Full ~~F~~flight plan with trajectory~~for registration, update or cancellation~~	FIXM	~~Req/Reply~~ Async R/R and Pub/Sub	1
FF-ICE publication service	Provides ~~harmonised sharing of~~ flight plan information in a ~~global~~ standard format supporting common situation awareness. Reference: ICAO Doc 9965 (Manual on FF-ICE)	~~Flight information for publication~~Full Flight Plan with trajectory (latest agreed)	FIXM	Pub/Sub	2
FF-ICE trial service	Allows operators to test the effect of a potential change in a flight plan prior to committing to the change. Reference: ICAO Doc 9965 (Manual on FF-ICE)	Proposed changes in a flight plan	FIXM	~~Req/Reply~~ Sync R/R and Async R/R	2
FF-ICE flight data request service	Allows an operator to request the current status of a flight plan, or an ANSP can request an operator to submit the latest version of their flight plan. Reference: ICAO Doc 9965 (Manual on FF-ICE) Target Implementation timeframe 2034	Current status of a flight plan, ~~or~~a copy of full flight plan, or supplementary plan	FIXM	~~Req/Reply~~ Sync R/R and Async R/R	1
FF-ICE notification service	Provides notification of a change in flight state, such as Departure (DEP) and Arrival (ARR) Air Traffic Service (ATS) messages. Reference: ICAO Doc 9965 (Manual on FF-ICE)	~~ARR, DEP messages~~Movement information (e.g. ARR, DEP)	FIXM	~~Req/Reply~~ Pub/Sub and Sync R/R and Async R/R	1
FF-ICE planning service	Allows operators to submit preliminary flight plans for early Air Traffic Flow Management (ATFM) planning and to obtain feedback regarding restrictions/constraints affecting the flight. Reference: ICAO Doc 9965 (Manual on FF-ICE)	Preliminary full flight plan with trajectory ~~for early ATFM planning~~	FIXM	~~Req/Reply~~ Async R/R and Pub/Sub	2

Suggested Improvements?

- **SWIM TF is open to improving usability/clarity of information within the table of APAC Common SWIM Information Services prior to publishing the next version**
- **For the next version, SWIM TF is already considering a proposal:**
  - To replace “Priority” column with:
    - Applicability: region-wide (to achieve anticipated benefits) vs. as needed (to meet local needs), and
    - Desired implementation timeframe (e.g. immediate (before 2030), medium (2030-2035), longer term)
- **SWIM TF invites Subsidiary Groups to provide suggestions ahead of SWIM TF/11 in May 2026 for consideration for incorporation into the next version**
  - SWIM TF thanks you in advance for any suggestions

Suggested Improvements – FF-ICE/4

- **FF-ICE/4 (16-18 March 2026) has additionally recommended the following:**
  1. **Subsidiary Groups should focus on defining business rules and business process completion criteria for Information Services. FF-ICE/4 recommended SWIM TF should undertake the determination of the appropriate Message Exchange Patterns (MEPs) for each business process, as SWIM TF possesses the relevant technical expertise**
  2. **FF-ICE/4 noted that comprehensive operational scenarios, including operational requirements and business process completion criteria, are essential. Accordingly, such scenarios, where required, should be provided as an appendix to the Business Functionality of APAC Common SWIM Information Services document. A reference to the appendix should also be included in the 'Brief description of the service' column, as illustrated below:**

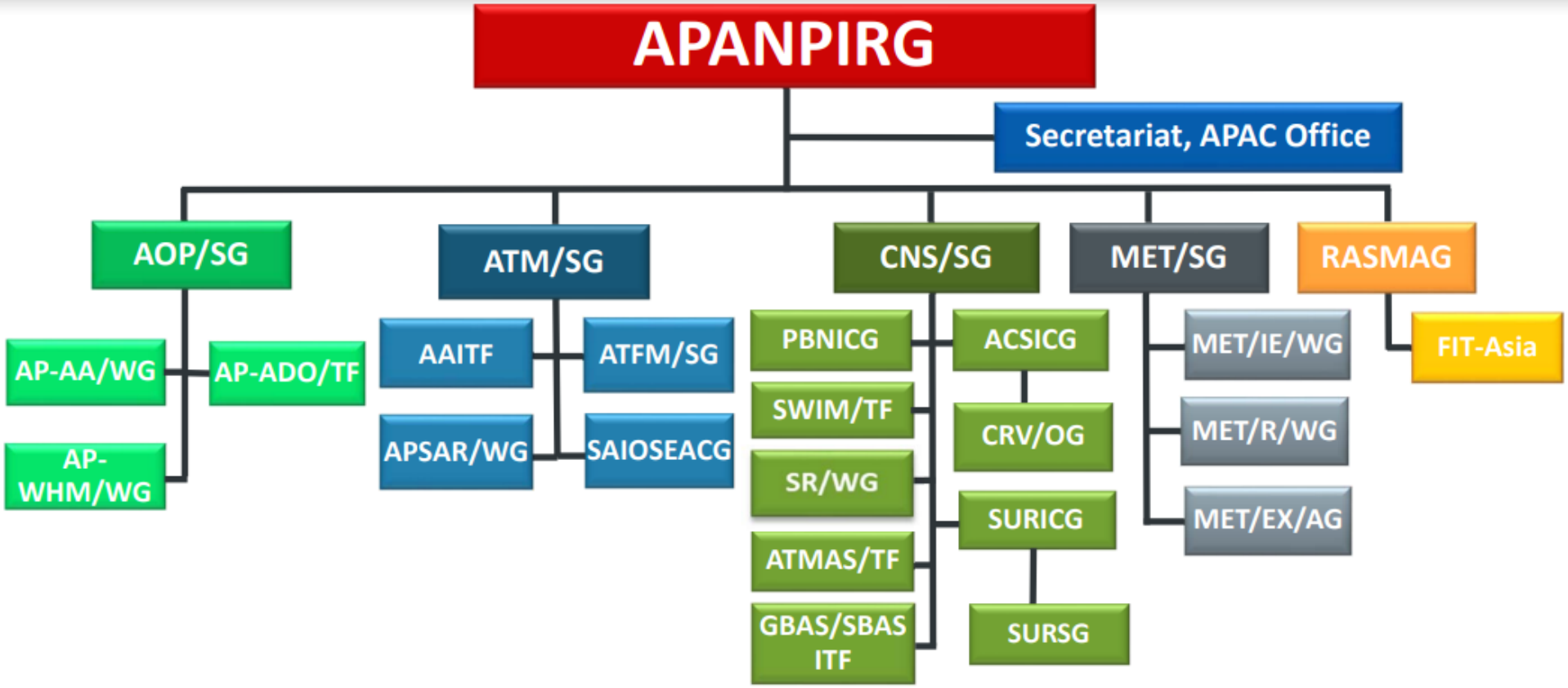
Business functionality of the information service	Brief description of the service	Type of information to be exchanged	Information exchange model / Message type	Message exchange pattern	~~Priority of Recommended sService in iInitial APAC Common SWIM IS~~ (1) / (2) / (3)
FF-ICE filing service	Provides a means to submit, update or cancel flight plans through a SWIM-based interface using FIXM. Appendix A: Filing Scenario	Flight plan for registration, update or cancellation	FIXM	Appendix A	1

SWIM TF to fill in

Appendix A: Filing Scenario

	Message	Details	Timeout	Comments	Message Exchange Pattern
1	eAU send eFPL (FFP) to eASP	Mandatory	N/A	-	
2	eASP returns Submission Response (SR) #1 to eAU	Mandatory (after eFPL received)	1 minute	eASPs validate message format and basic rules. SR ACK: Validation passed SR REJ: Validation failed SR MAN: Manual Processing needed	
3	eASP returns Submission Response (SR) #2 to eAU	Conditional (only if SR#1 = MAN)	Variable (manual processing time)	Any subsequent SR is provided after manual intervention of eFPL (after SR MAN)	

Reference



AOP/SG	-	Aerodrome Operations and Planning Sub Group
AP-AA/WG	-	APAC Aerodrome Assistance Working Group
AP-ADO/TF	-	APAC Aerodrome Design and Operations Task Force
AP-WHM/WG	-	APAC Wildlife Hazard Management Working Group

ATM/SG	-	ATM Sub Group
AAITF	-	AIS - AIM Implementation Task Force
APSAR/WG	-	APAC Search and Rescue Working Group
ATFM/SG	-	ATFM Steering Group
SAIOSEACG	-	South Asia Indian Ocean and South East Asia ATM Coordination Group

CNS/SG	-	CNS Sub Group
PBNICG	-	PBN Implementation Coordination Group
SWIM/TF	-	System-Wide Information Management Task Force
SR/WG	-	Spectrum Review Working Group
ATMAS/TF	-	ATM Automation System Task Force
GBAS/SBAS ITF	-	GBAS/SBAS Implementation Task Force
ACSICG	-	Aeronautical Communication Services Implementation Coordination Group
• CRV/OG	-	Common Regional Virtual Private Network (VPN) Operations Group
SURICG	-	Surveillance Implementation Coordination Group
• SURSG	-	Surveillance Study Group

MET/SG	-	Meteorology Sub Group
MET/IE/WG	-	Meteorological Information Exchange Working Group
MET/R/WG	-	Meteorological Requirements Working Group
MET/EX/AG	-	Meteorological Exercises Advisory Group

RASMAG	-	Regional Airspace Safety Monitoring Advisory Group
• FIT-ASIA	-	FANS Interoperability Team-Asia