



ASEAN SWIM Demonstration

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WMO VCP Workshop on AvRDP (8-10 Oct 2018, Hong Kong)



Why SWIM?

- Regional Investment Planning & Stability:
 - While remaining consistent with global standards, each Region can determine the most effective capabilities and enhancements to meet AU and ASP evolving needs
 - Represents a major advance from current mechanisms which require global, synchronous, expensive changes.
- Operational Value/Benefits:
 - Improved quality & access across stakeholders
 - Increased accuracy supports more informed decision making
 - Robust, dynamic information supports advanced capabilities and increases common situational awareness across stakeholders
 - Improved Predictability
 - Required for advanced, strategic ATFM
 - Cost savings available across stakeholders; including ground crew utilization and service logistics, crew time and fuel planning

Information Management Enabling SWIM



From the ICAO SWIM Manual (ICAO Doc. 10039):

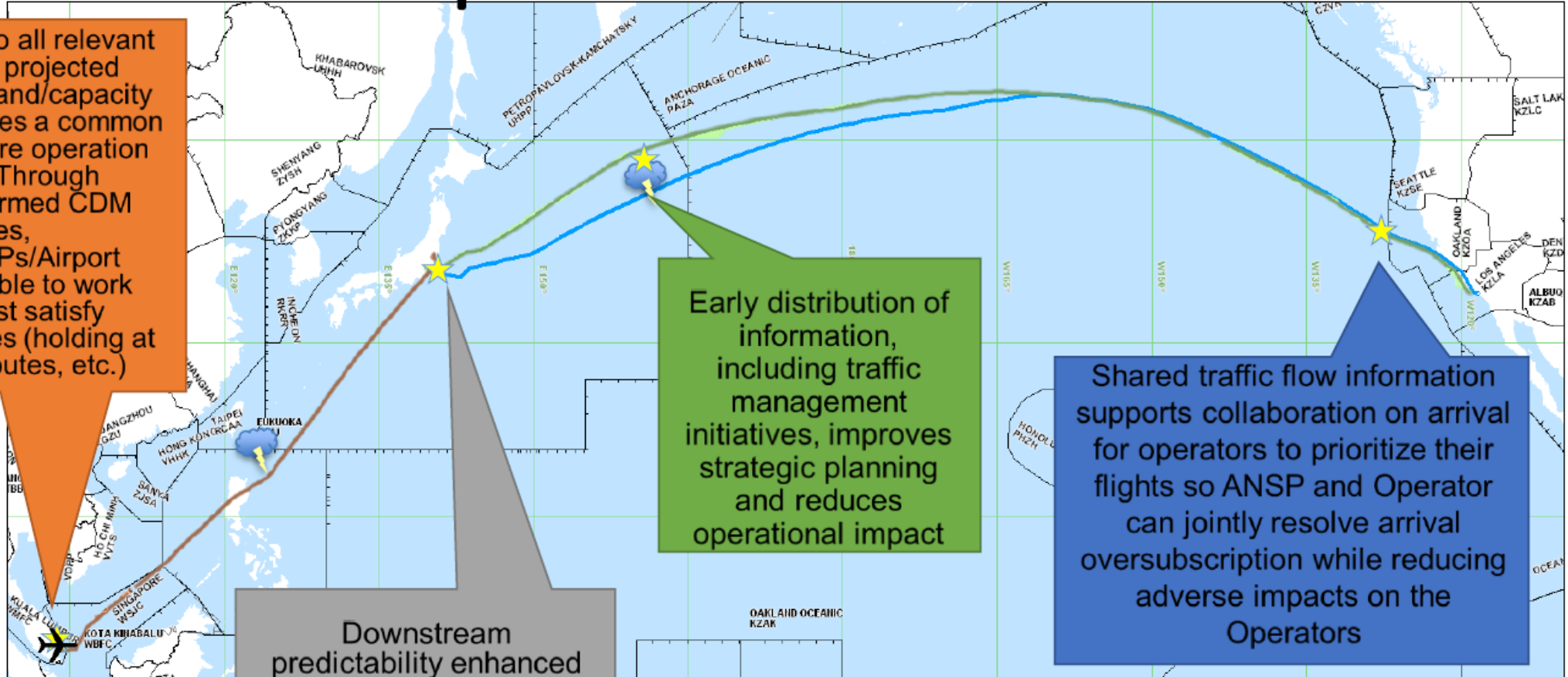
- “Information management supports the more integrated, complex systems of the future as envisioned by the ICAO aviation system block upgrade (ASBU) initiative. The timely exchange of high quality, secure exchange of information across borders is fundamental for future global ATM service provision. Adoption of common performance standards, business rules and exchange models is critical to optimize the ability to deliver seamless information services in a globally harmonized and interoperable fashion.”

Operational Improvements & Value of SWIM

- Allows each Region to implement the improvements of most value to their users
- More accurate and timely information available for decision-making
 - Common, shared situational awareness across stakeholders expands opportunities for collaborative decision making
 - Harmonized (complementary) ATFM actions across ANSPs based on the shared information –and predictions
 - More robust and dynamic information needed for the envisioned advanced capabilities
- Improved predictability across ANSPs
 - Allows ANSPs and AUs to plan more accurately
 - Cost savings gained through more effective utilization of ground crew, service logistics, crew time, and fuel planning
 - Improved planning with harmonized ATFM across ANSPs

Operational Improvement - Example

Early distribution to all relevant stakeholders of projected congestion – demand/capacity imbalance – provides a common awareness of future operation environment. Through established, informed CDM processes, Operators/ANSPs/Airport Authorities are able to work together to best satisfy Operator's priorities (holding at gate, different routes, etc.)



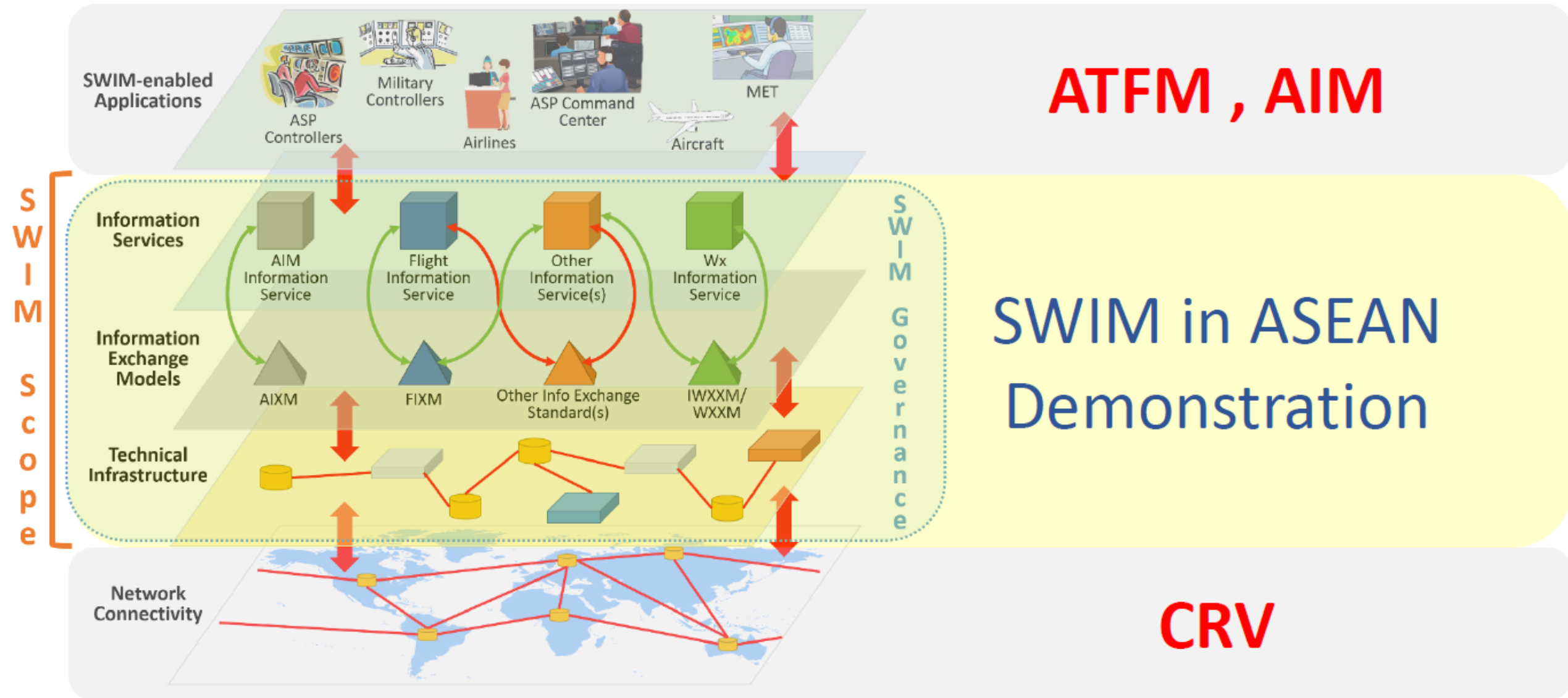
Early distribution of information, including traffic management initiatives, improves strategic planning and reduces operational impact

Shared traffic flow information supports collaboration on arrival for operators to prioritize their flights so ANSP and Operator can jointly resolve arrival oversubscription while reducing adverse impacts on the Operators

Downstream predictability enhanced by publication of amended flight trajectory; cost saving by informing ground crew, crew time and fuel planning

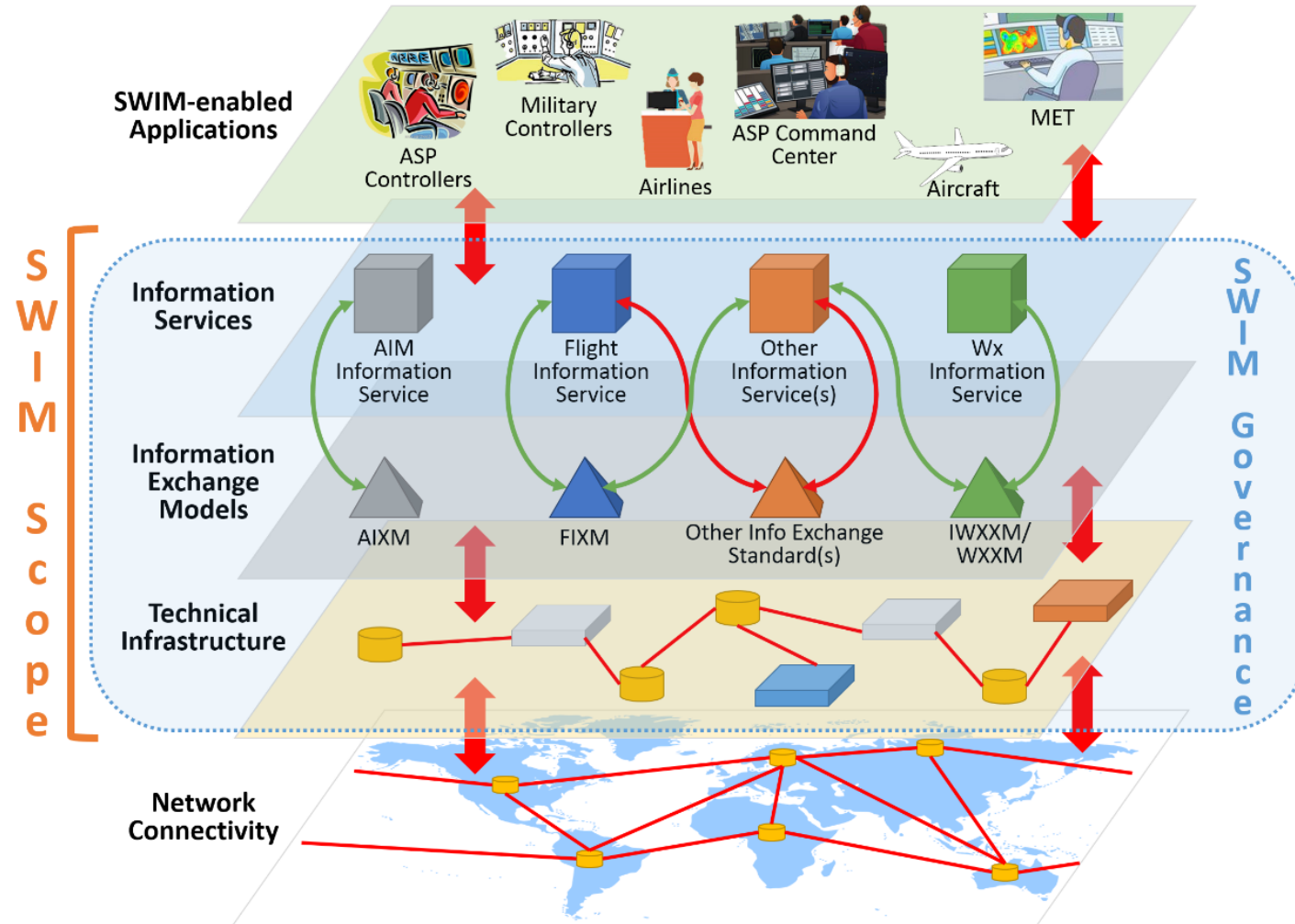
Using accurate information of future demand, ATFM provides early notification of demand/capacity imbalance constraints avoiding "false" constraint identification and imposition of unnecessary responses

ASEAN ATM Master Plan



SWIM Information Exchange Models

- AIXM
 - Aeronautical information
- FIXM
 - Flight information
- IWXXM
 - Weather Information



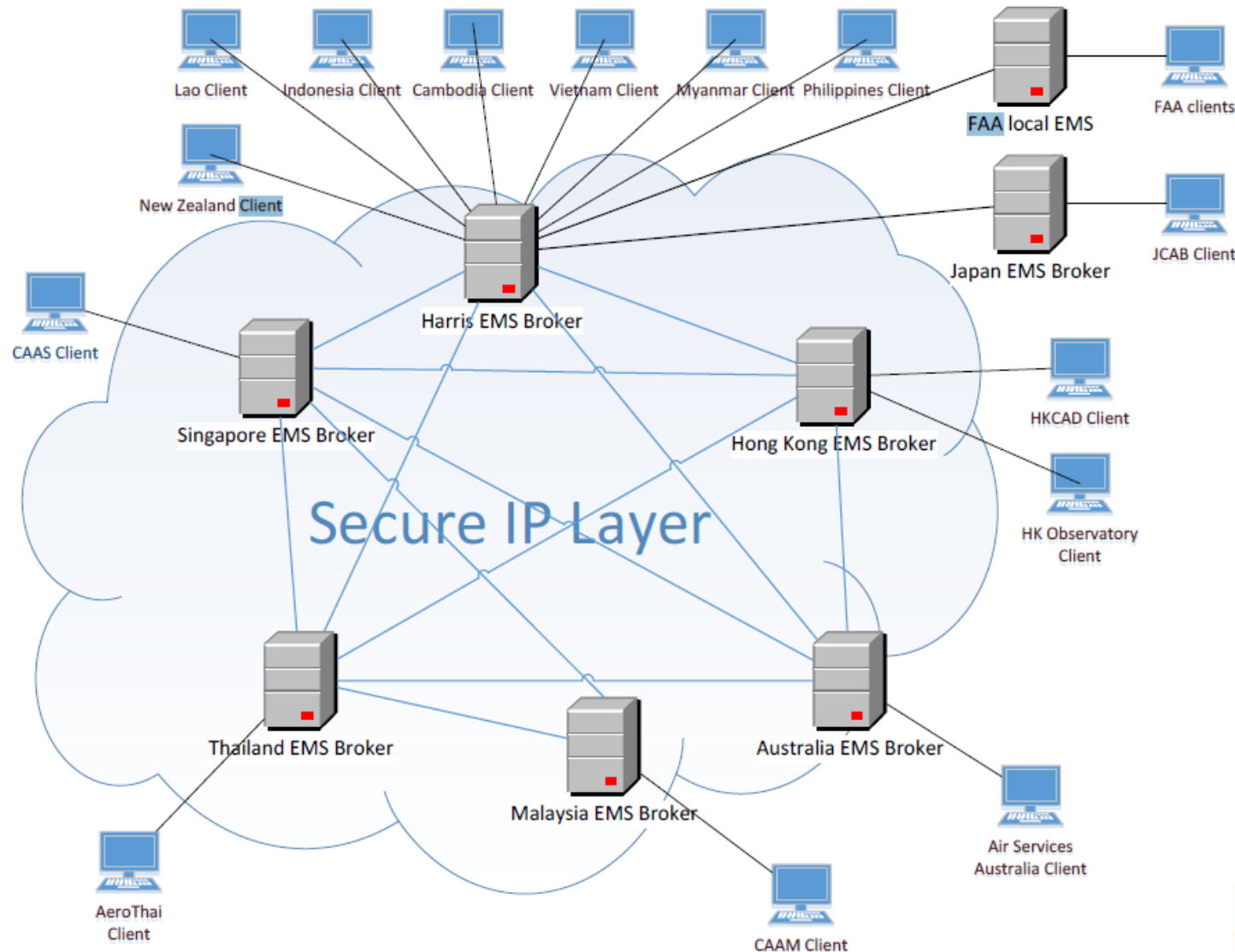


ASEAN SWIM Demo - Participating Members

- Core Team
 - led by AEROTHAI, CAAS, FAA
- Participating States
 - ASEAN countries
 - Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam
 - Non-ASEAN States
 - Australia, Hong Kong China, Japan, New Zealand, USA
- Participation of Hong Kong China (HKCAD and HKO)
 - Enterprise Message Service (EMS) Provider (HKCAD)
 - Interface for HKO to disseminate weather information (HKCAD)
 - Native-SWIM formation information provider and consumer (HKCAD and HKO)

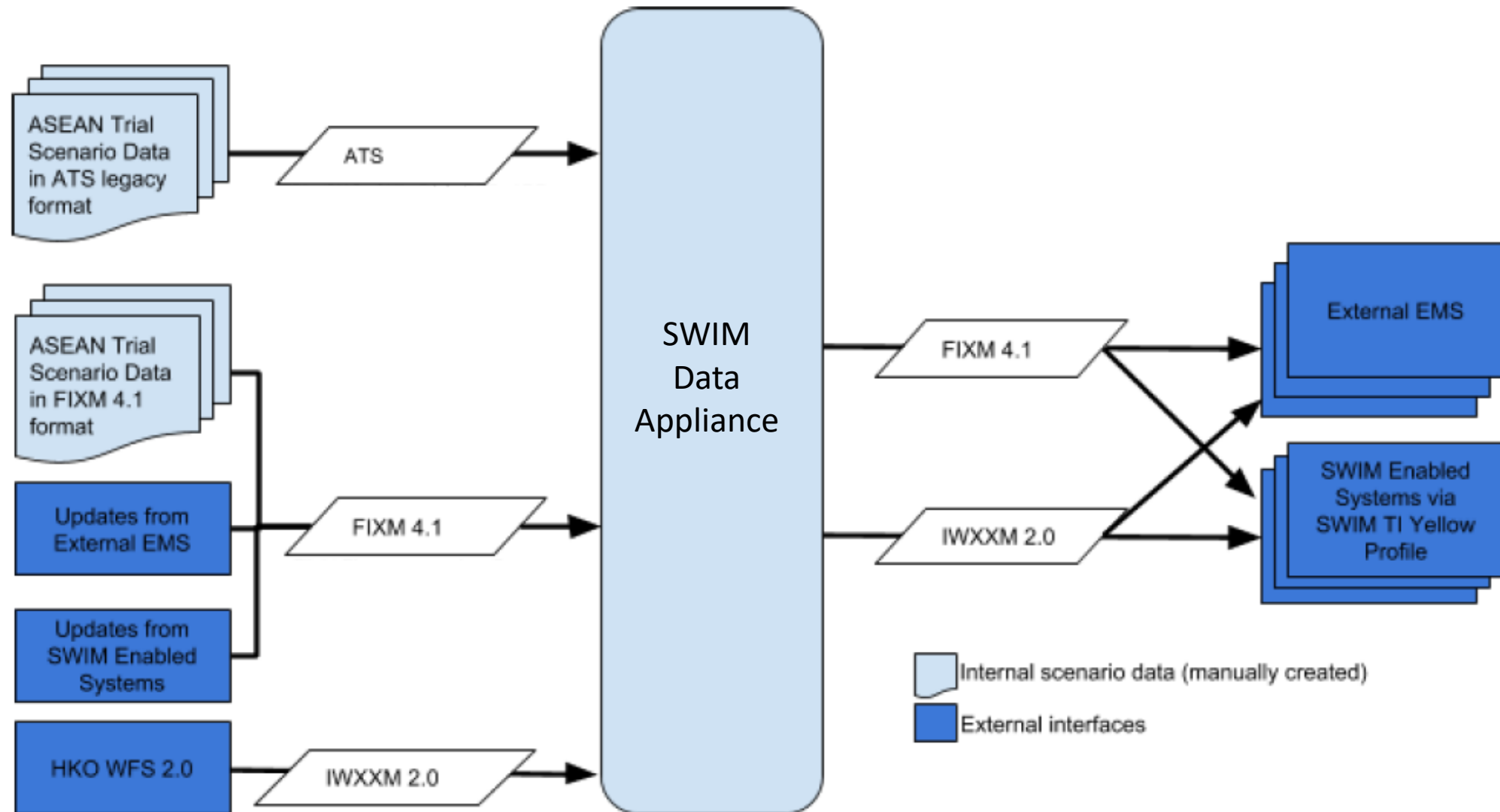
Global Enterprise Messaging Service (GEMS)

- GEMS consists of multiple connected EMSs;
- For this demo it is made up of the following EMSs
 - AEROTHAI EMS
 - AirServices Australia EMS
 - CAAM EMS
 - CAAS EMS
 - HARRIS EMS
 - Hong Kong CAD EMS
 - JCAB / ENRI EMS
 - US-FAA EMS





HKCAD Technical Development



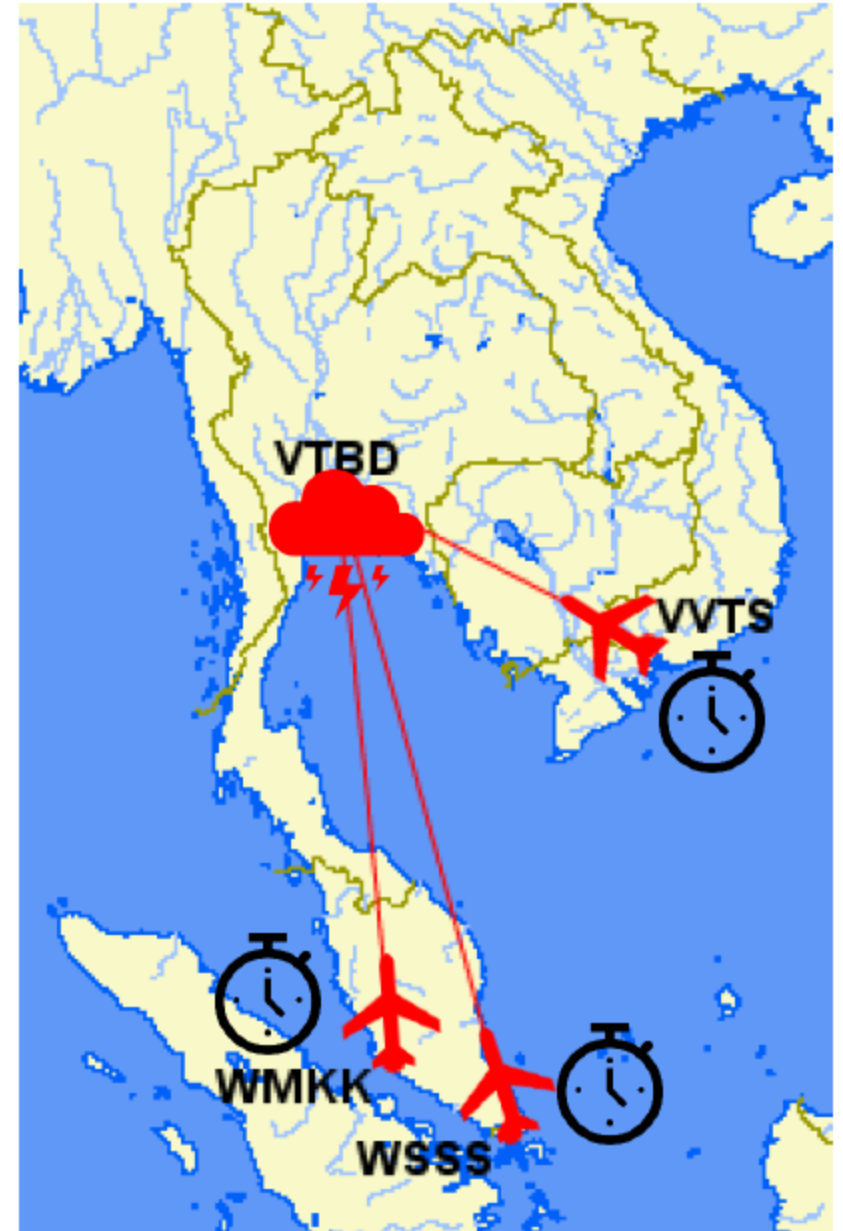
Summary of Operational Scenarios

Thread	Operational Concept	Scenario ID	City-Pair	Airline
1	Trajectory Sharing	1.1	PGUM - VTBS	THAI Airways
		1.2	PGUM - VTBS	THAI Airways
2	Aircraft Turnaround with A-CDM	2.1	WSSS A-CDM	THAI Airways
		2.2	WMKK A-CDM	Malaysia Airlines
3	Ground Delay Program	3.1	BKK ATFMU	AirAsia Group
		3.2	SIN ATFMU	SIA
		3.3	HKG ATFMU	Cathy Pacific
4	Airborne ATFM Measure (CTO)	4.1	KLAX - WSSS	United Airlines
		4.2	YMML - VTBS	Qantas
5	Pre-Tactical Rerouting due CDR	5	VVNB - VTBD	Thai Lion Air
6	Pre-Tactical Rerouting + Trajectory Sharing	6	WMKK – WBKK	Malaysia Airlines
7	Tactical Rerouting due WX	7	VHHH - RJAA	Japan Airlines
8	FF-ICE/1 – Pre-Dep Trajectory Negotiation	8	RJAA - KLAX	Japan Airlines

Scenario 3 – Ground Delay Program

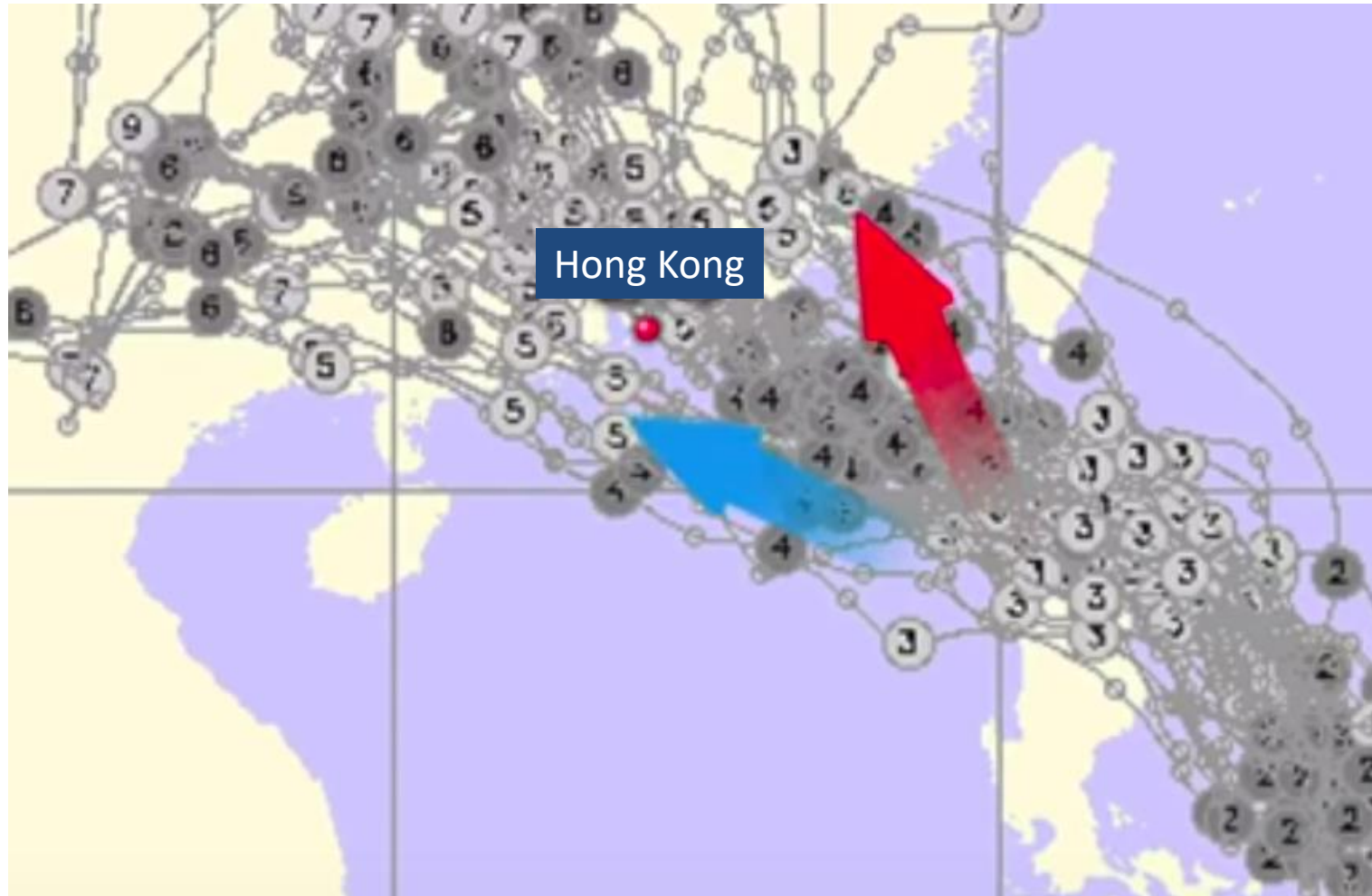


How improved ATFM communication, *made possible with SWIM*, can enhance Ground Delay Program operations

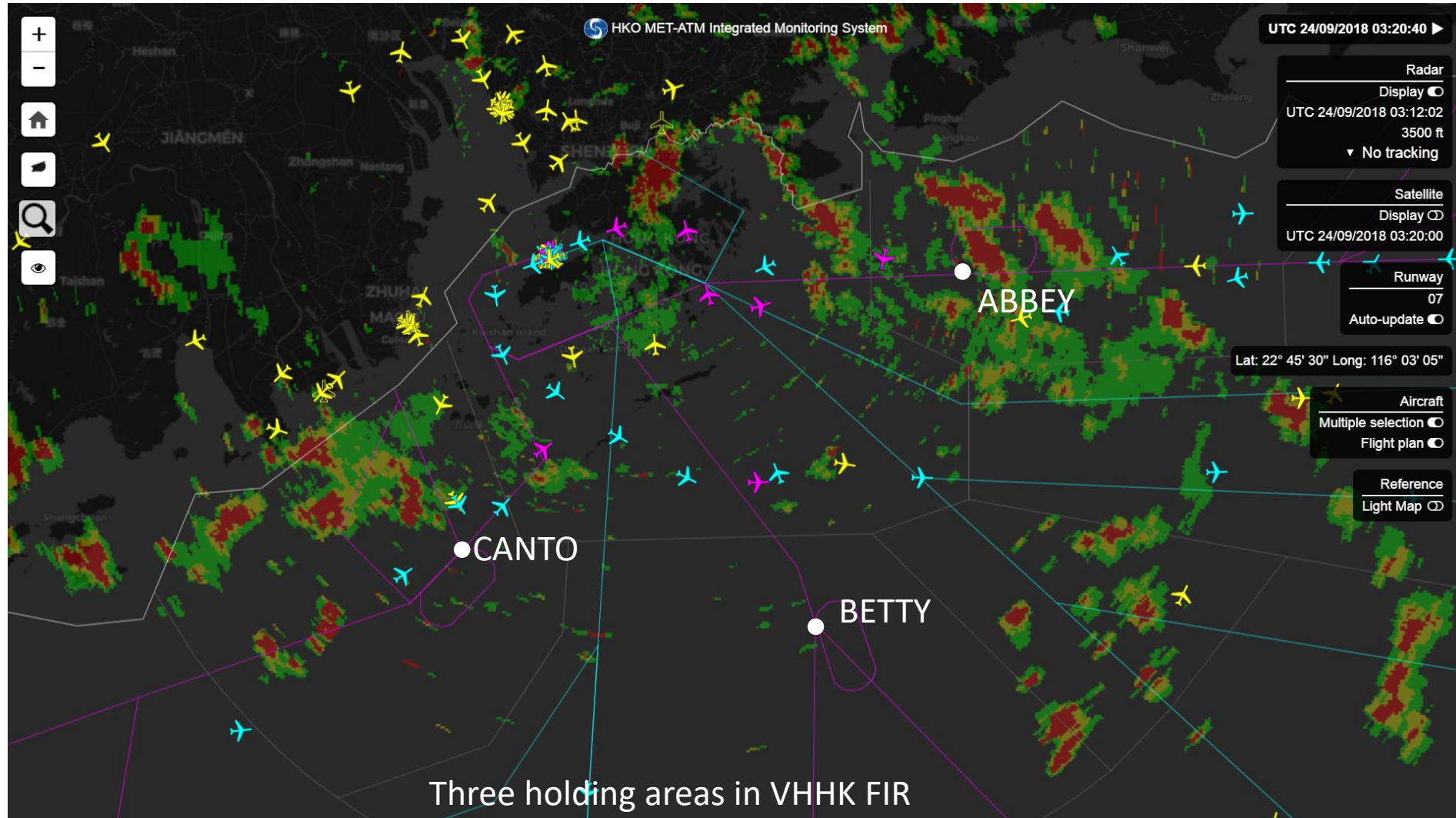


Story of MET Constraint for Scenario 3

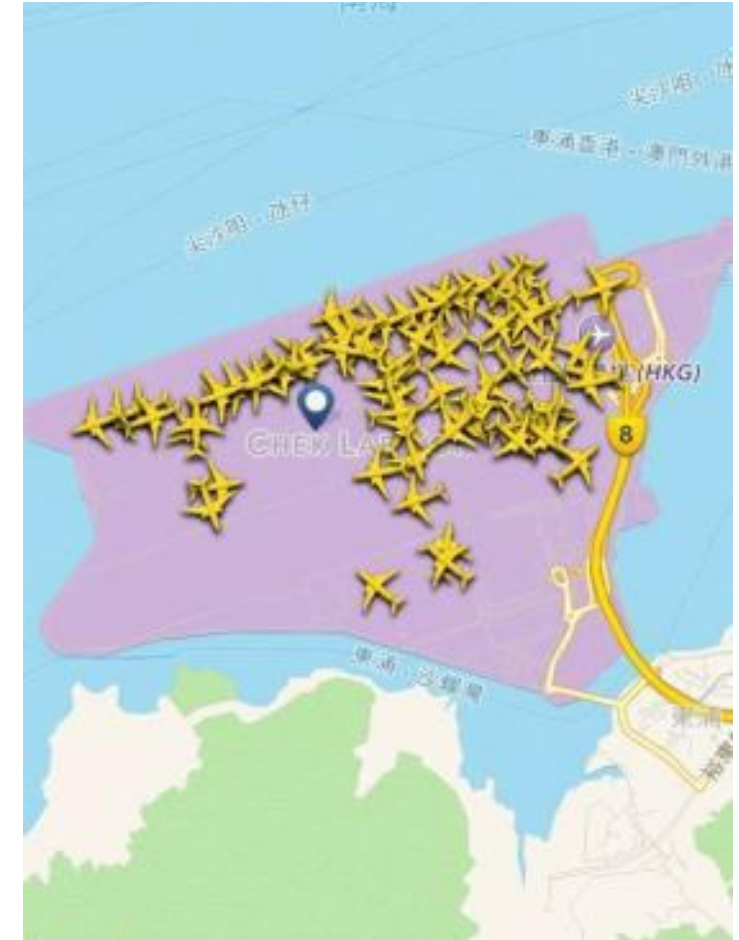
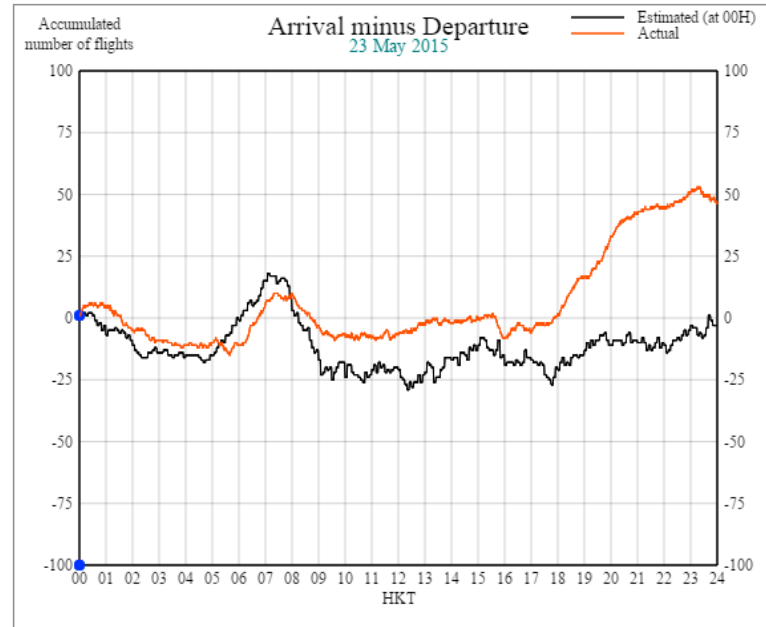
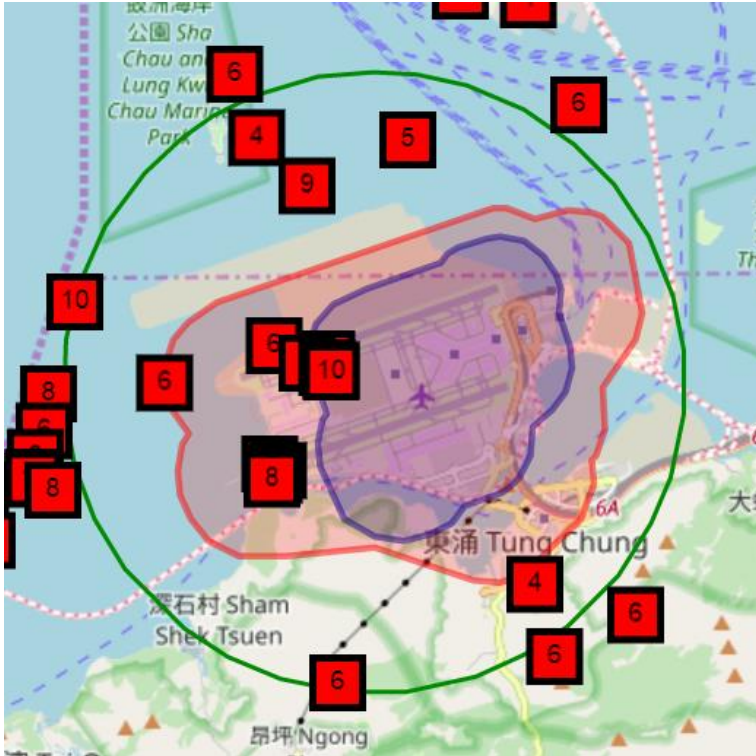
Delayed departure at ground at upstream airports due to high crosswind at VHHH brought by TC



Story: Ground Delay Program for VHHH due to convective activity affecting a holding area

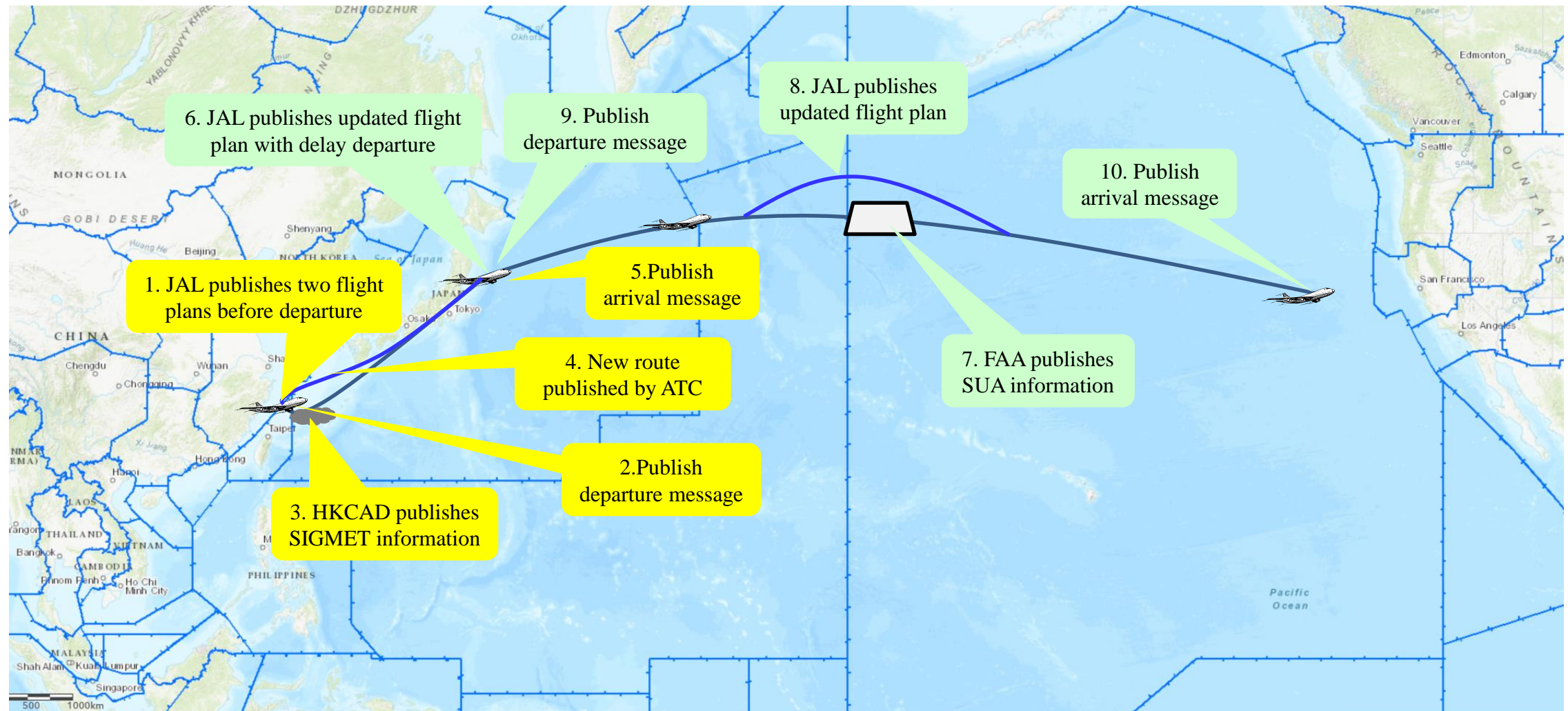


Story of MET Constraint 3: Reduced departure rate due to lightning apron



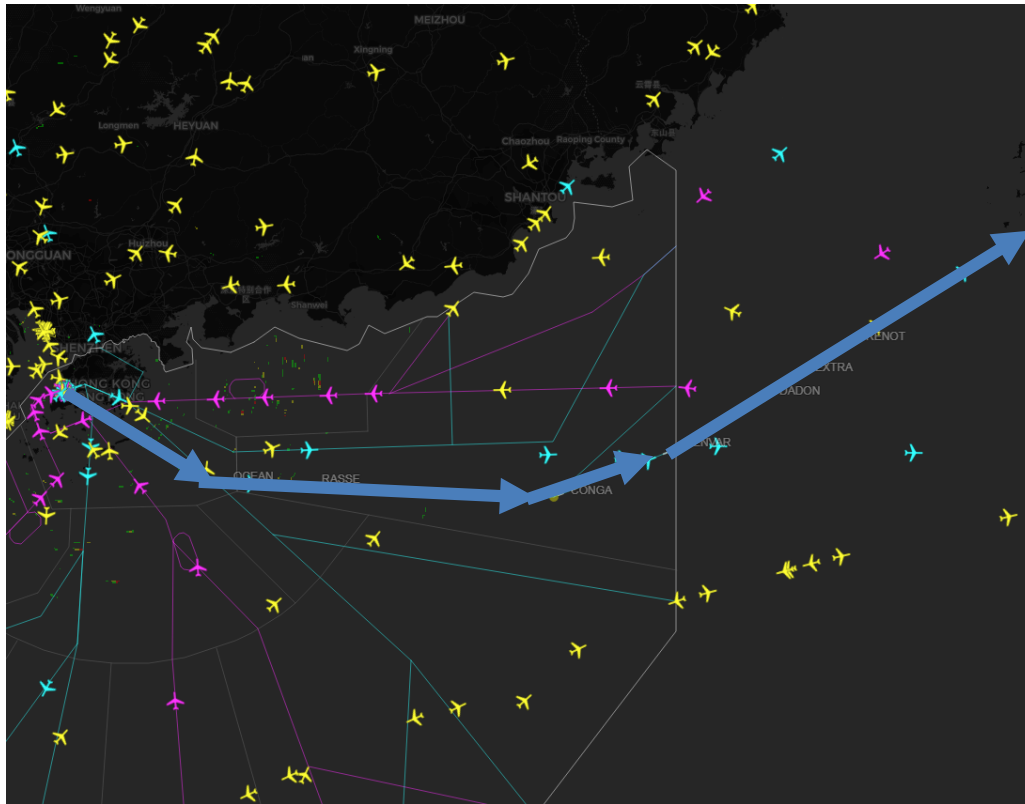
Scenario 7 and 8 for Long Range ATFM across FIRs

➤ Scenario Description (VHHH - RJAA - KLAX)

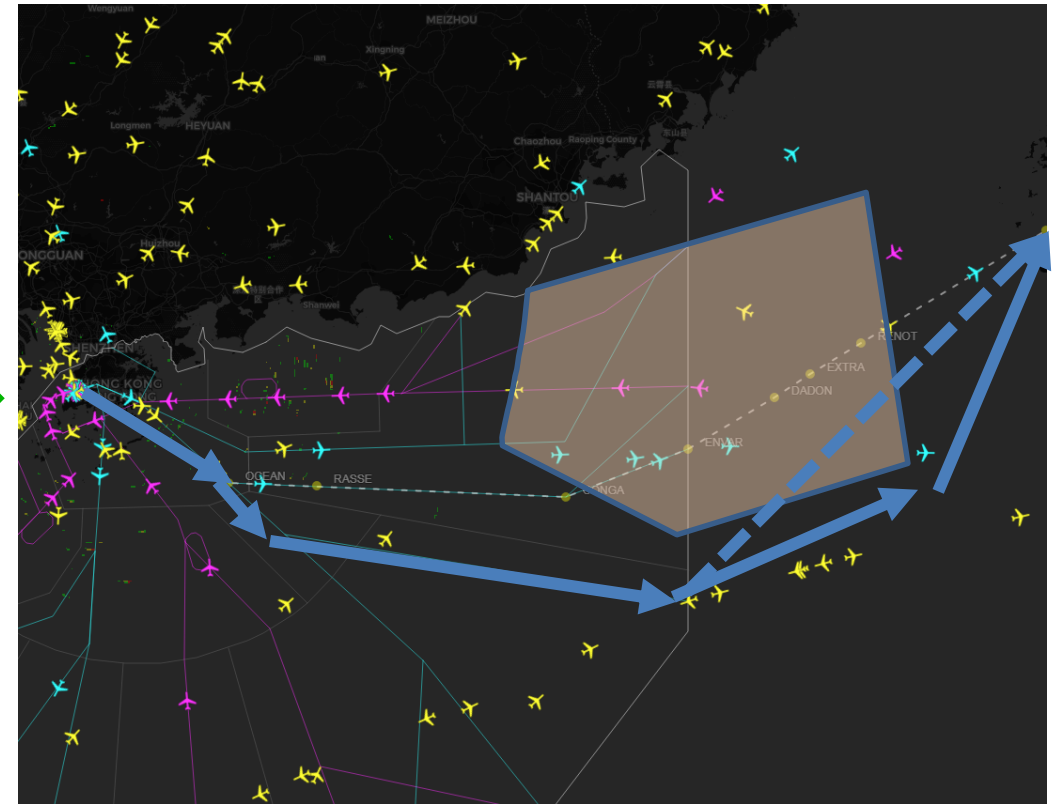


Story of MET Constraint for Scenario 7

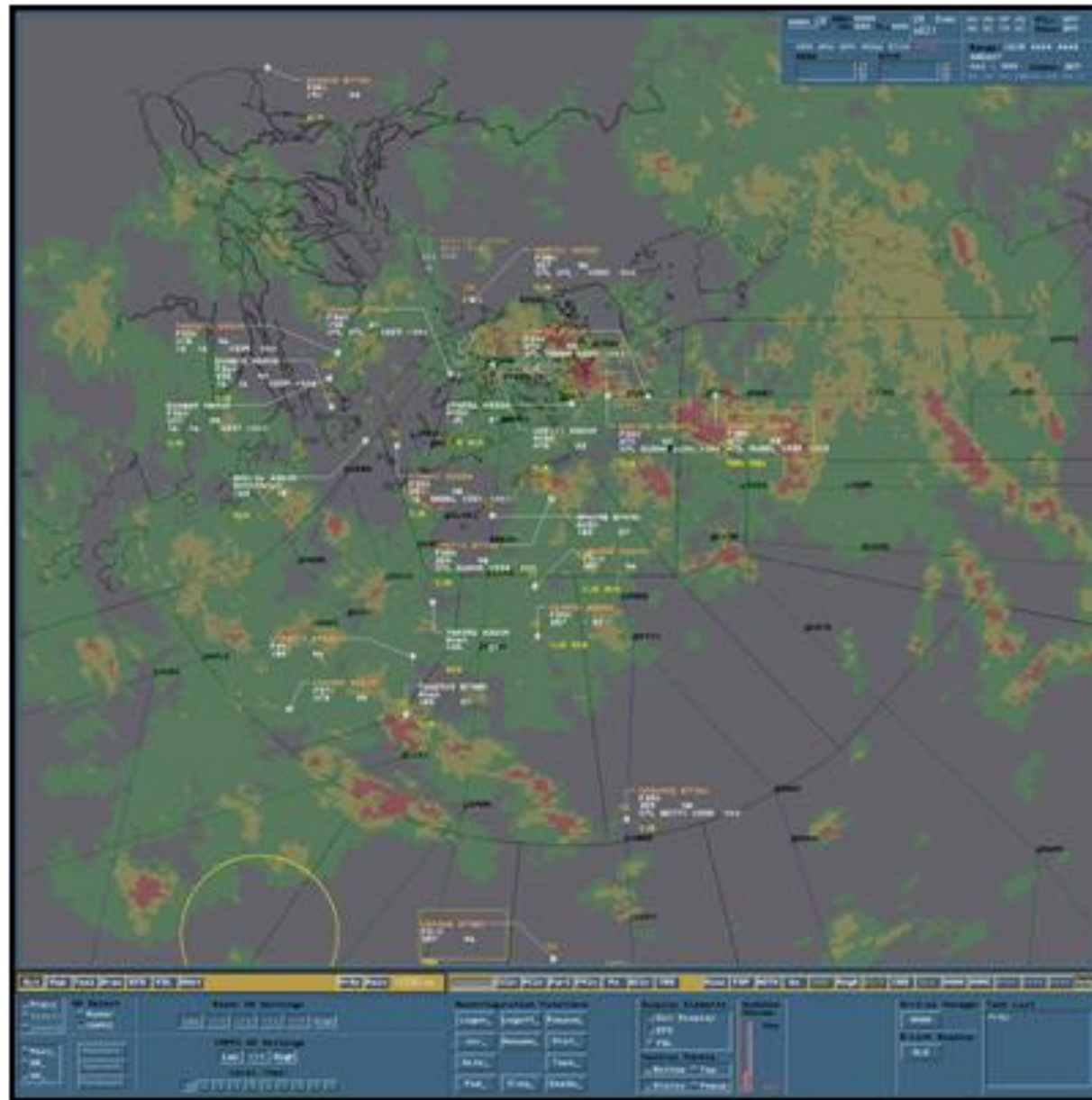
Airborne rerouting due to a TS SIGMET affecting enroute flight (VHHH-RJJJ) over the eastern parts of HKFIR



Planned route



Airborne rerouting





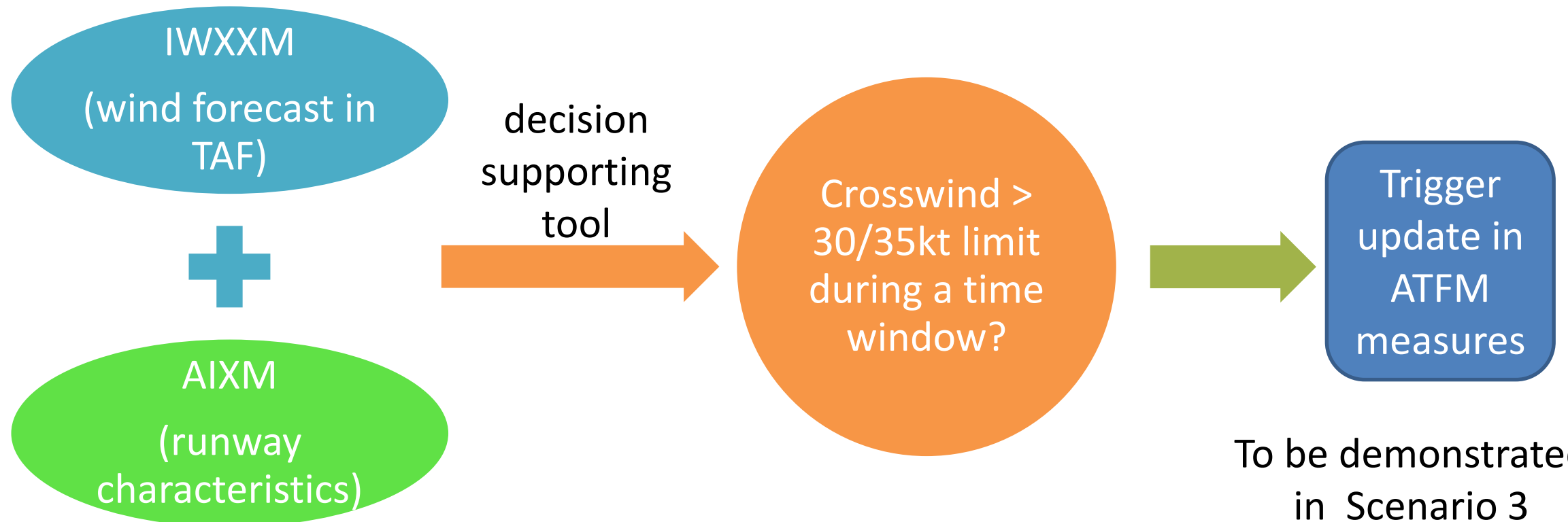
MET services to support SWIM demo

- IWXXM-2 messages for aerodromes in APAC
 - Including METAR/SPECI, TAF, SIGMET and VA/TC Advisories of the region
 - TAC-to-XML conversion services will be available for selected aerodromes/FIRs (though there are uncertainties whether it is still needed after operational use of the SWIM environment from 202x).
- IWXXM message utilization/visualization
 - Visual display of reported and forecast MET conditions cum aerodrome properties (e.g. runway direction) cum airport status (e.g. NOTAM)
- Integrated MET Situational Display
 - Visual display of primitive (MET only)/consolidated (MET cum others) products and planned/actual flights.
 - Intends to give stakeholders an overall view of the current weather situation and its immediate future (NOW+)



SWIM-enabled MET Applications – Operational benefits

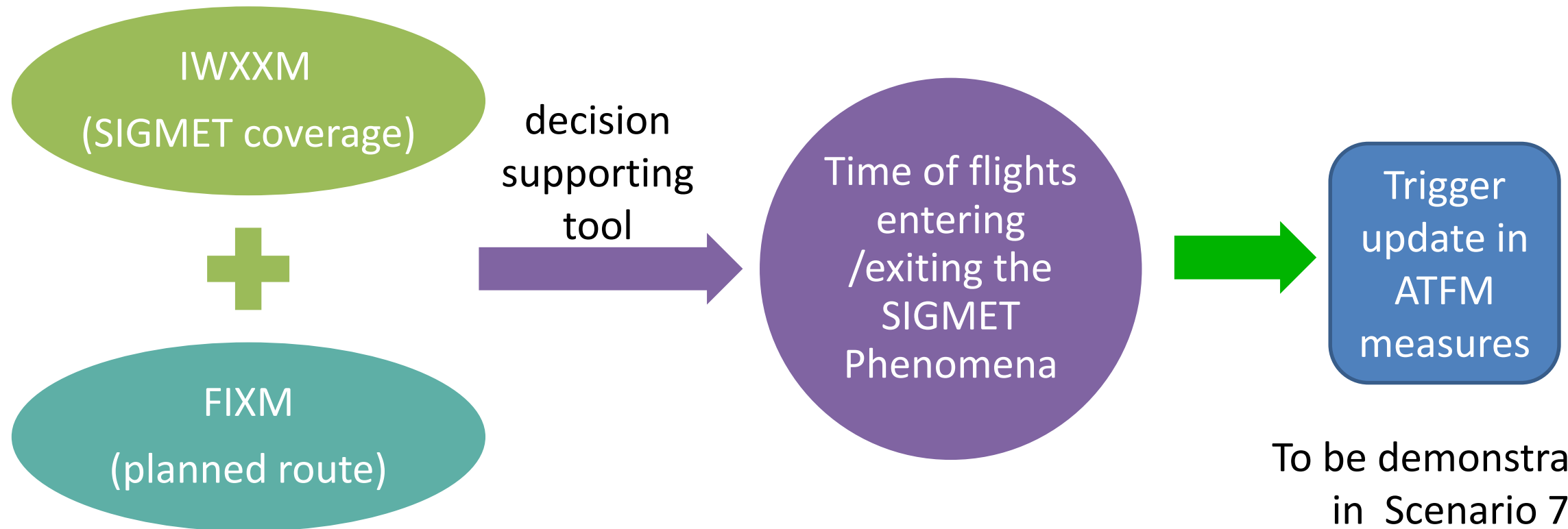
- Example 1: Integration of IWXXM and AIXM





SWIM-enabled MET Applications – Operational benefits

- Example 2: Integration of IWXXM and FIXM



Work Plan

- Demonstration Day : in June 2019
- Intermediate milestones:

Deadline	Activity
Sep-18	Establish EMS Connection Test
Oct-18	Initial List of Services (Week of 29 th Oct – 2 nd Nov Scenario Web Conference)
Nov-18	Complete Scenario development
Dec-18	Final service lock down and complete services development
Jan-18	Start testing of Scenarios (Propose TIM 2.5 in BKK – Scenario Testing session 14 Jan 2019)
Mar-18	Complete testing of all scenarios
TIM 3	Finalize list of demonstration scenarios
Apr-19	Start Scripting of scenarios
May-19	Complete run through of all scenarios



Thank you

IWXXM Roadmap

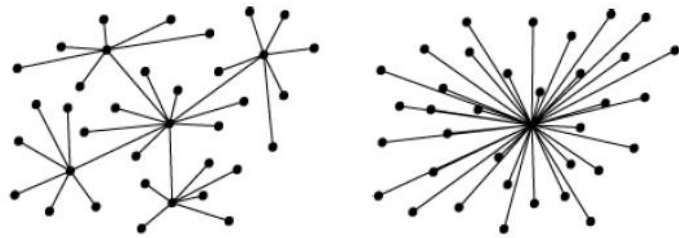
- Version 3.0 (Available Nov 2018. Expected approval mid-2019)
 - Legacy products including METAR/SPECI, TAF, SIGMET/AIRMET, VAA, TCA, SWA
- Version 3.1 (Expected availability 2019)
 - Add representations for WAFCs SIGWX products (Planned to become a Standard in 2022)
 - Develop generalized representations for area forecast products
 - Changes to facilitate exchanges in SWIM environment
 - ...



The MET-SWIM Plan and Roadmap

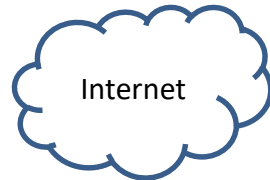
- Originally developed to align the understanding of working group members
- Now being considered to publish it either as a standalone document or as an appendix to ICAO Doc No. 10039 (Manual on SWIM Concept)
- Contains guiding concepts and proposed implementation roadmap on the provision of MET services and information through SWIM



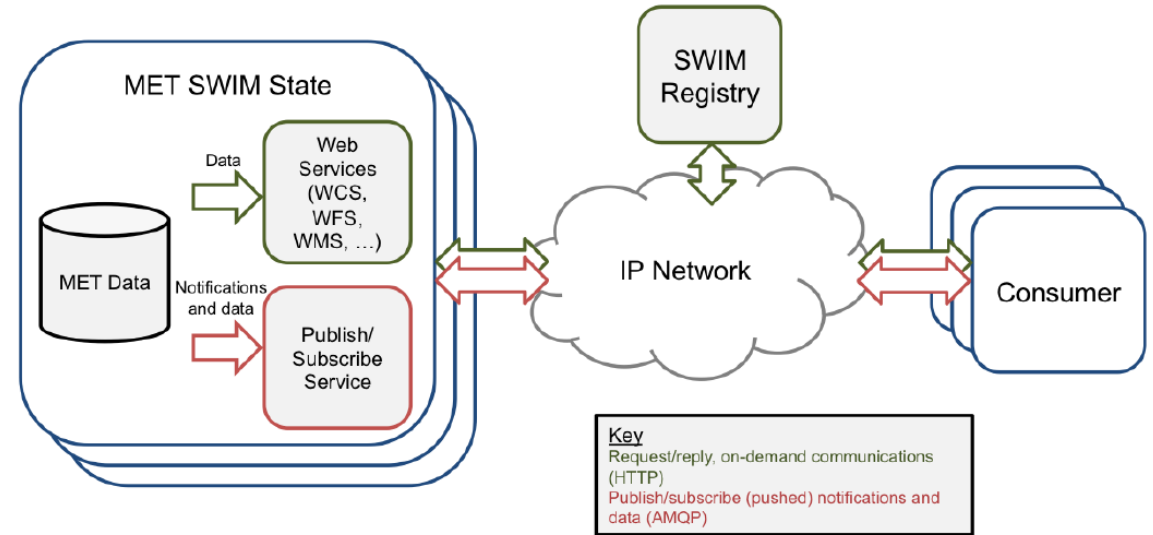


De-centralized and centralized dissemination architectures

AFS



Services and information may be available across both AFS and Internet



MET SWIM information exchange

IWXXM Image data
Gridded data

Standardized information exchange formats

Providers

Global, State and commercial providers may co-exist

