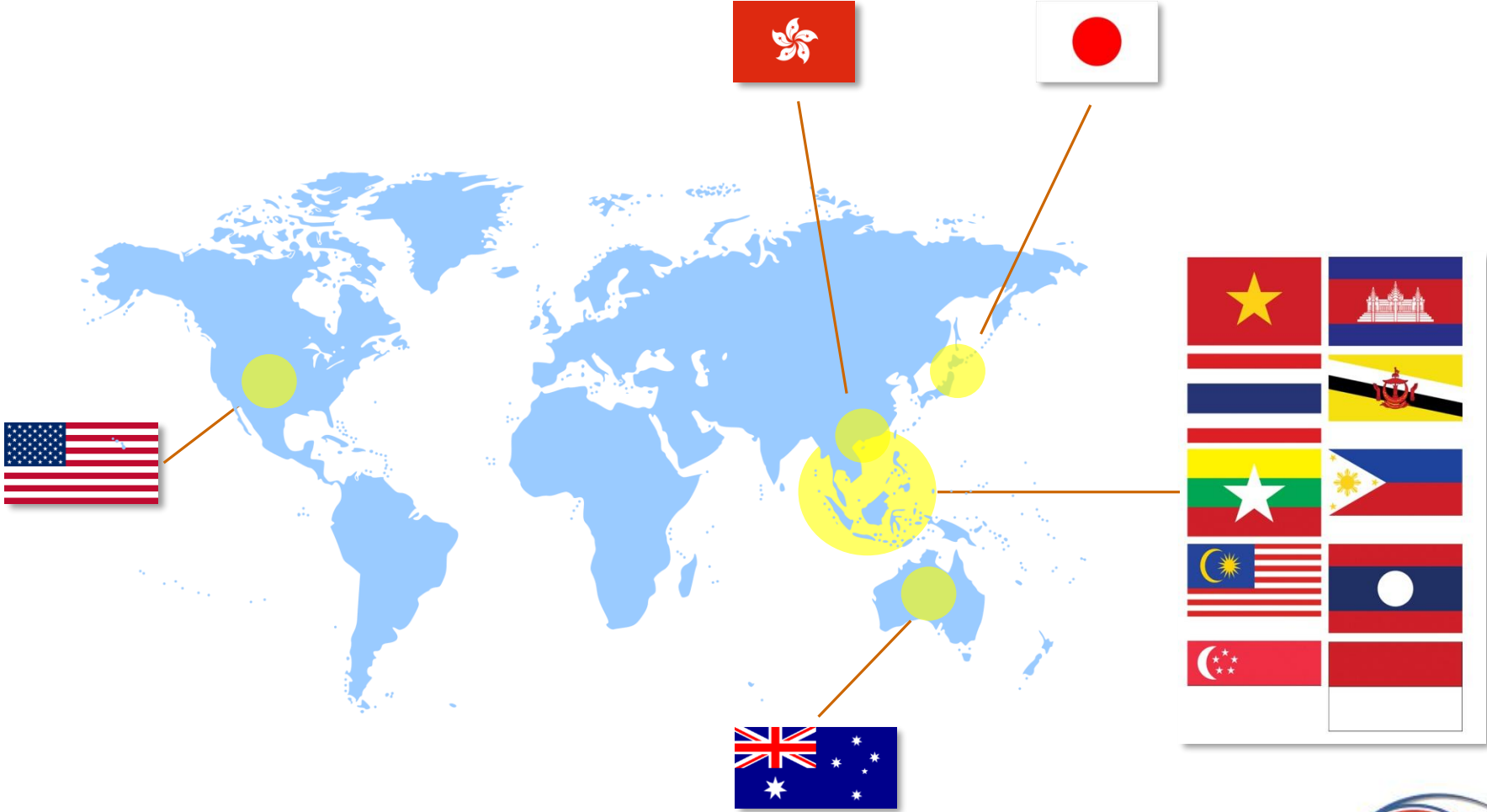




SWIM in ASEAN Demo Report



Scope of the Demonstration



Purpose of the Demonstration

To demonstrate the principles of SWIM

To show the potential benefits of SWIM

To demonstrate a model of SWIM implementation
for ASEAN and APAC region



Goals of the Demonstration

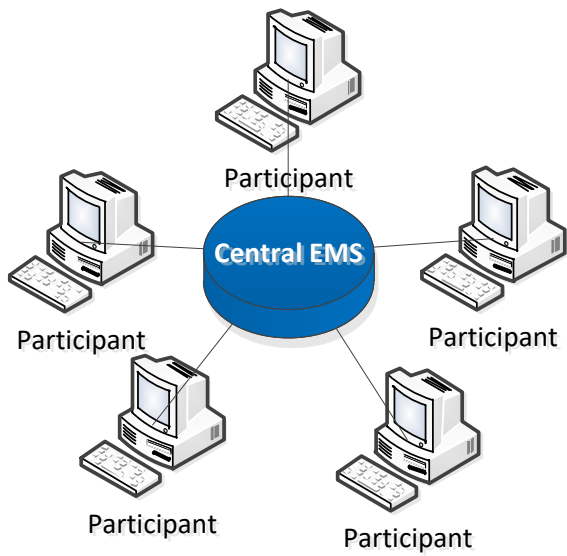
- Demonstrate operational values of SWIM, anchoring on scenarios based on Distributed Multi-Nodal ATFM Network concept
- Generate greater discussion among participants on SWIM and SWIM implementation in the region
- Achieve broad participation by ASEAN and Asia/Pacific aviation community
- Construct a Global Enterprise Messaging Service (GEMS) network

**Gain consensus for ASEAN and Asia/Pacific
to move forward on SWIM**

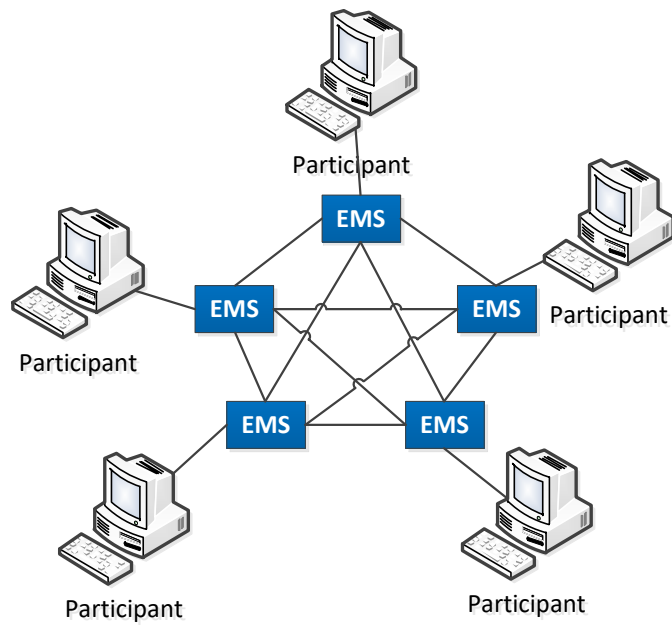


Demonstration Architecture

- Several possible architectures considered

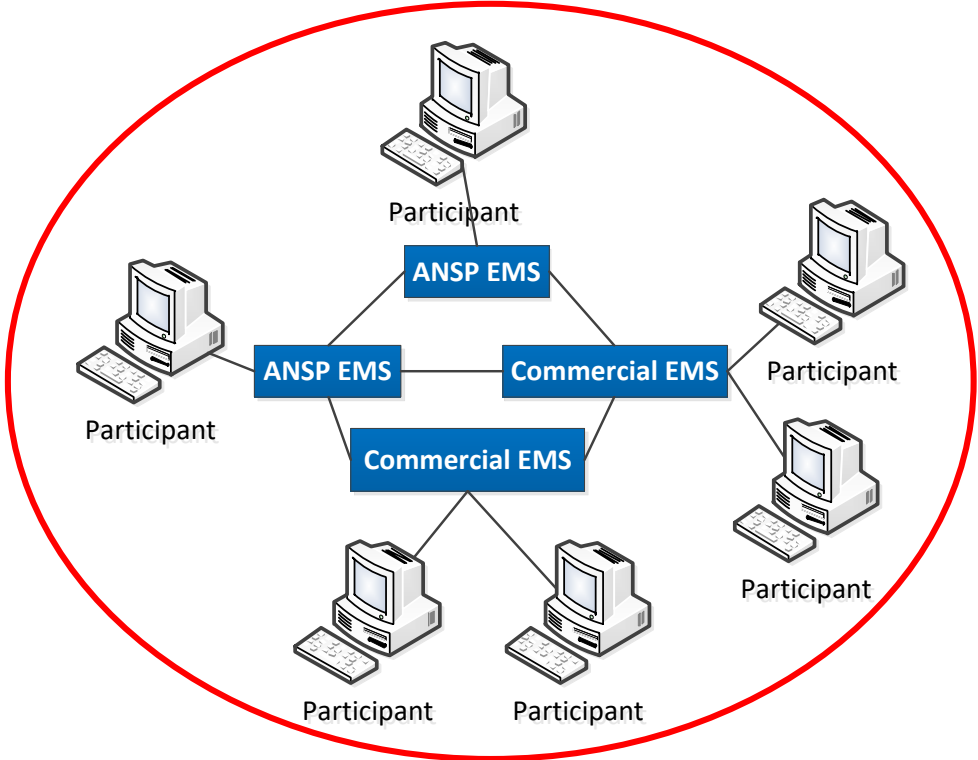


1



2

Selected
Most acceptable for all participants



3



Global Enterprise Messaging Service

- Global Enterprise Messaging Service (GEMS) – Interconnected EMSs
- GEMS Working Group (GEMS WG), consisting of participants implementing EMSs, established
- Decisions made
 - Using of AMQP V1.0 as the standard messaging protocol
 - Using of FIXM V4.1 with APAC Extension, AIXM V5.1 and IWXXM V2.0 as exchange models
 - Using of metadata for message routing
 - Current operational concept: ATS-message based
 - Transition
 - Future operational concept: FF-ICE



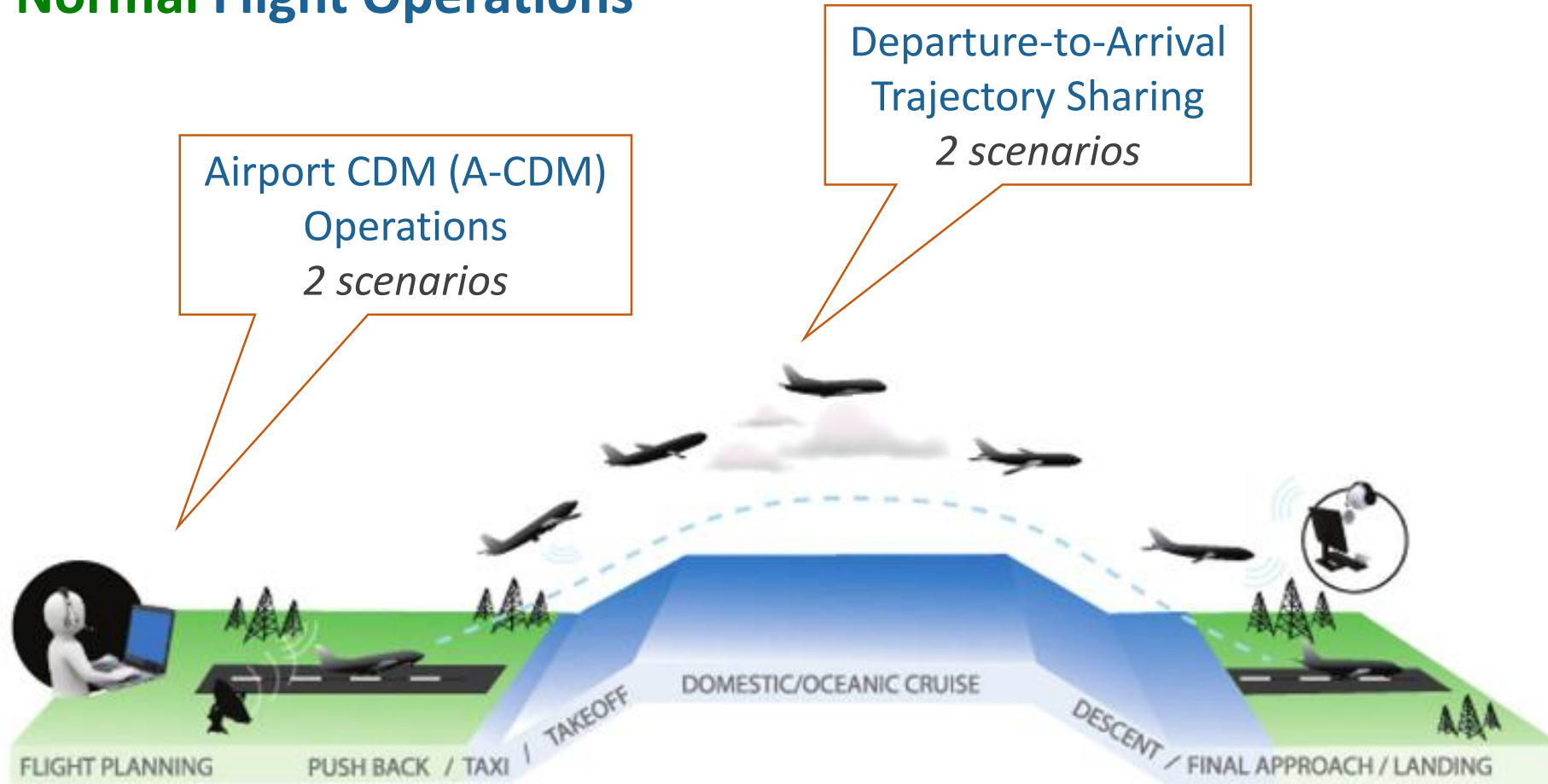
AMQP and Metadata

- The choice of AMQP turned out to be very important
 - All EMS providers had to standardize on using this protocol for inter-EMS communication
- Metadata was also very important for the correct routing of messages
 - Standardized fields and field-names in the metadata
 - Each field had a fixed and limited vocabulary
 - Aiding with message validation
 - Clear policies required, i.e. which fields are mandatory and how to interpret the metadata so that messages are routed properly



Scenarios Demonstrated

Normal Flight Operations

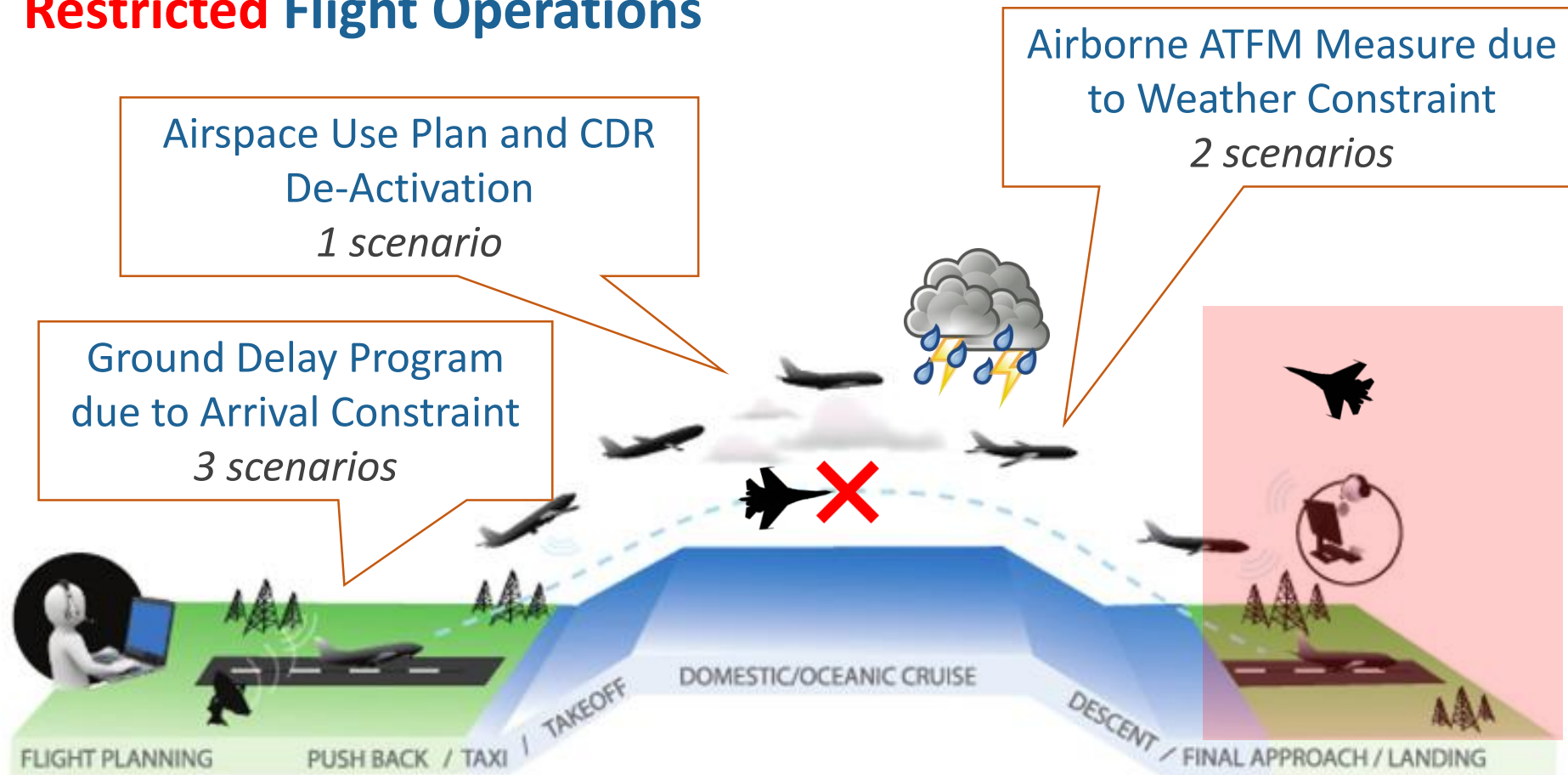


Current Operational Concept



Scenarios Demonstrated

Restricted Flight Operations

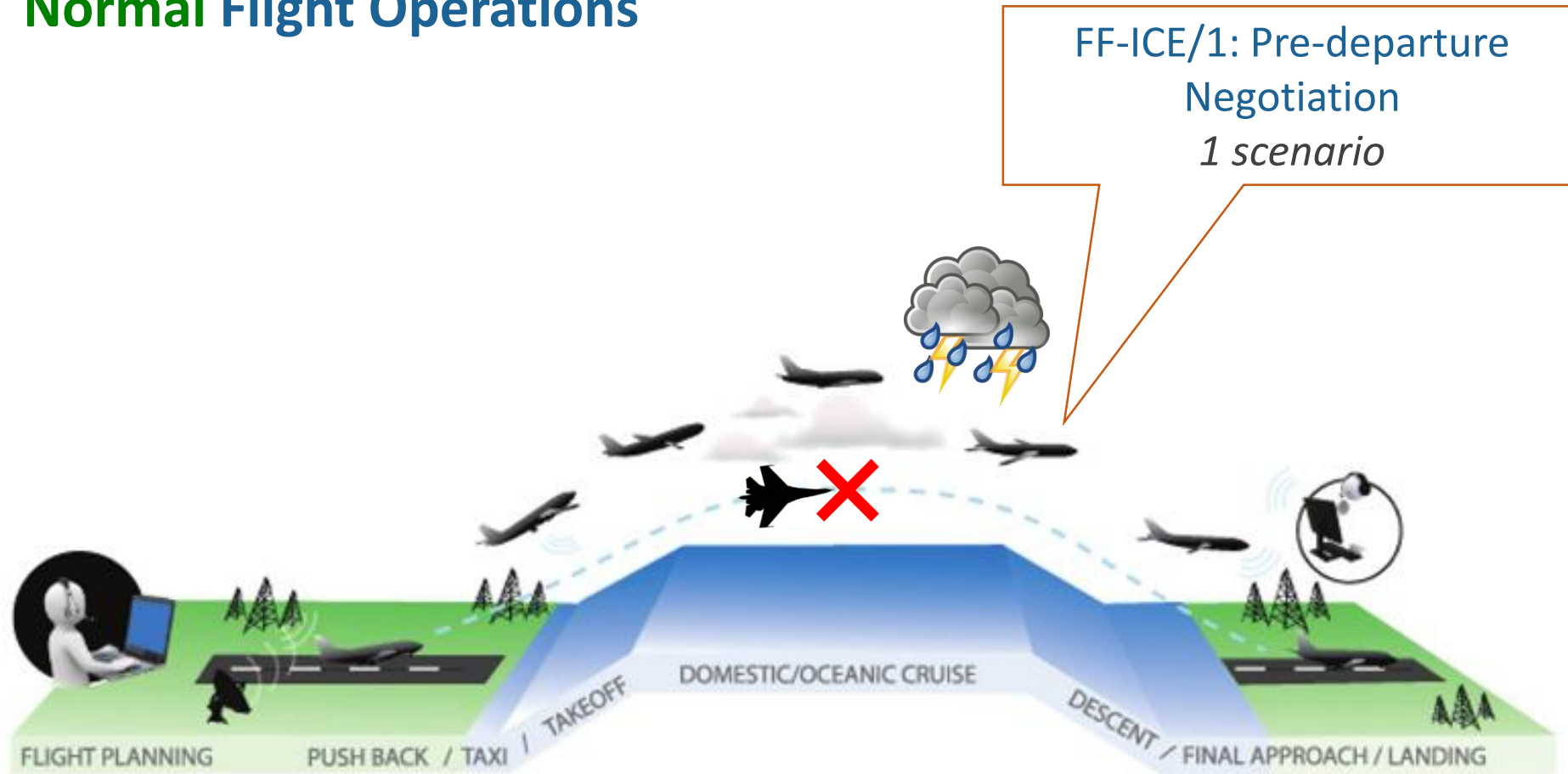


Current Operational Concept



Scenarios Demonstrated

Normal Flight Operations



Future Operational Concept



Services

Information Service		
Aeronautical information Service	PUB/SUB	AIXM v5.1
Flight Information Service	PUB/SUB	FIXM v4.1 with Asia/Pacific Extension
Weather Information Service	PUB/SUB , REQ/REP	IWXM v2.0
ATFM Daily Plan Information Service	PUB through Web Services	PDF

Additional Service
GUFI service
Flight object management
Data transformation

Application
Data Governance Module
Viewer
ATFM
A-CDM
FF-ICE/R1





Lessons Learnt



Observations / Lessons Learnt

- Seamless information exchange among stakeholders is critical
 - Common situational awareness
 - Predictability
 - Collaborative decision making
- Increasing need for SWIM is a fact
 - Improve current operations
 - Enable advance operations
- More distinct operational benefits can be achieved with increasing SWIM implementation **More SWIM capable, the better !**
- Participation of AU's FOC system via G/G SWIM tangibly contributes to improved ATM system performance



Observations / Lessons Learnt

- Interconnected-EMSs is a candidate model of SWIM implementation for ASEAN and Asia/Pacific region
 - Use of open standards, utilization of open-source messaging protocols
 - GEMS metadata
 - Defined format and possible values
 - Message routing
 - Standardized solution required to prevent message looping
 - Messages irregularly-continuously routed among GEMS providers
 - Relation between headers
 - Requiring defined relation between header defining message type and other related header

GEMS_MESSAGE_TYPE = FPL



GEMS_XML_VERSION, GEMS_ACID, GEMS_DEP_AIRPORT, GEMS_ARR_AIRPORT

- Required data elements of each message types



Observations / Lessons Learnt

- Use of AIXM, FIXM, IWXXM plays an important role in achieving interoperability
 - Regional requirements - Extensions to XM Core
- Mediation is a key to bring diverse stakeholders with different technical capabilities on board
- Technical enhancement discussion without operational view is challenging
 - Clearly defined operational use cases
 - Clearly defined process

Move forward on SWIM



Action by the Meeting

The meeting is invited to:

- a) note the information contained in this paper;
- b) discuss the possible adoption of the SWIM in ASEAN Demonstration's outcomes, e.g. architecture of SWIM infrastructure, messaging protocol, metadata for message routing, for Asia/Pacific regional SWIM implementation; and
- c) discuss any relevant matter as appropriate.

