الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY

United Arab Emirates

UAE SWIM Gateway System

Air Traffic Flow Management Task Force

ATFM TF/1

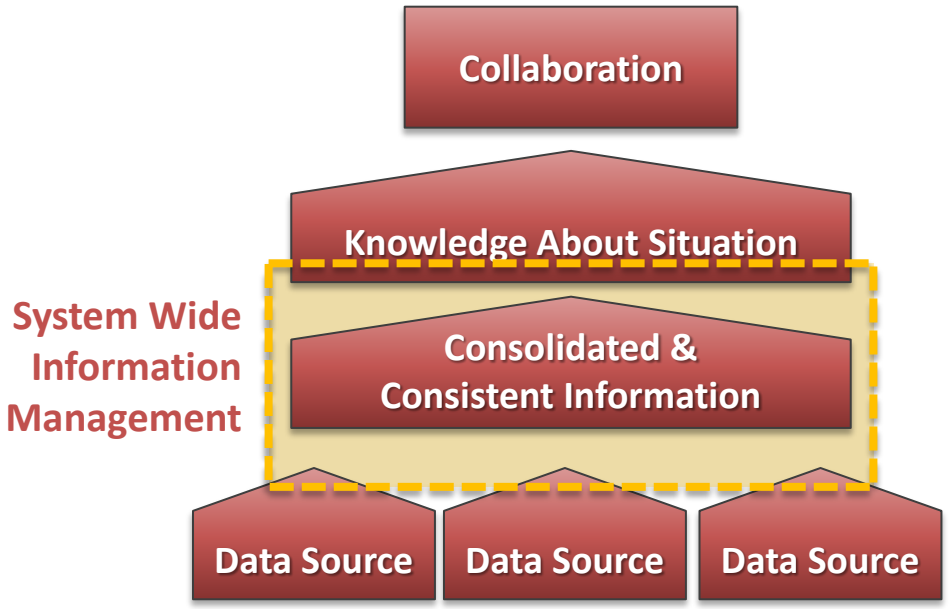
Muscat, Sultanate of Oman
Date 23 - 25 September 2018

UAE ATM Strategy

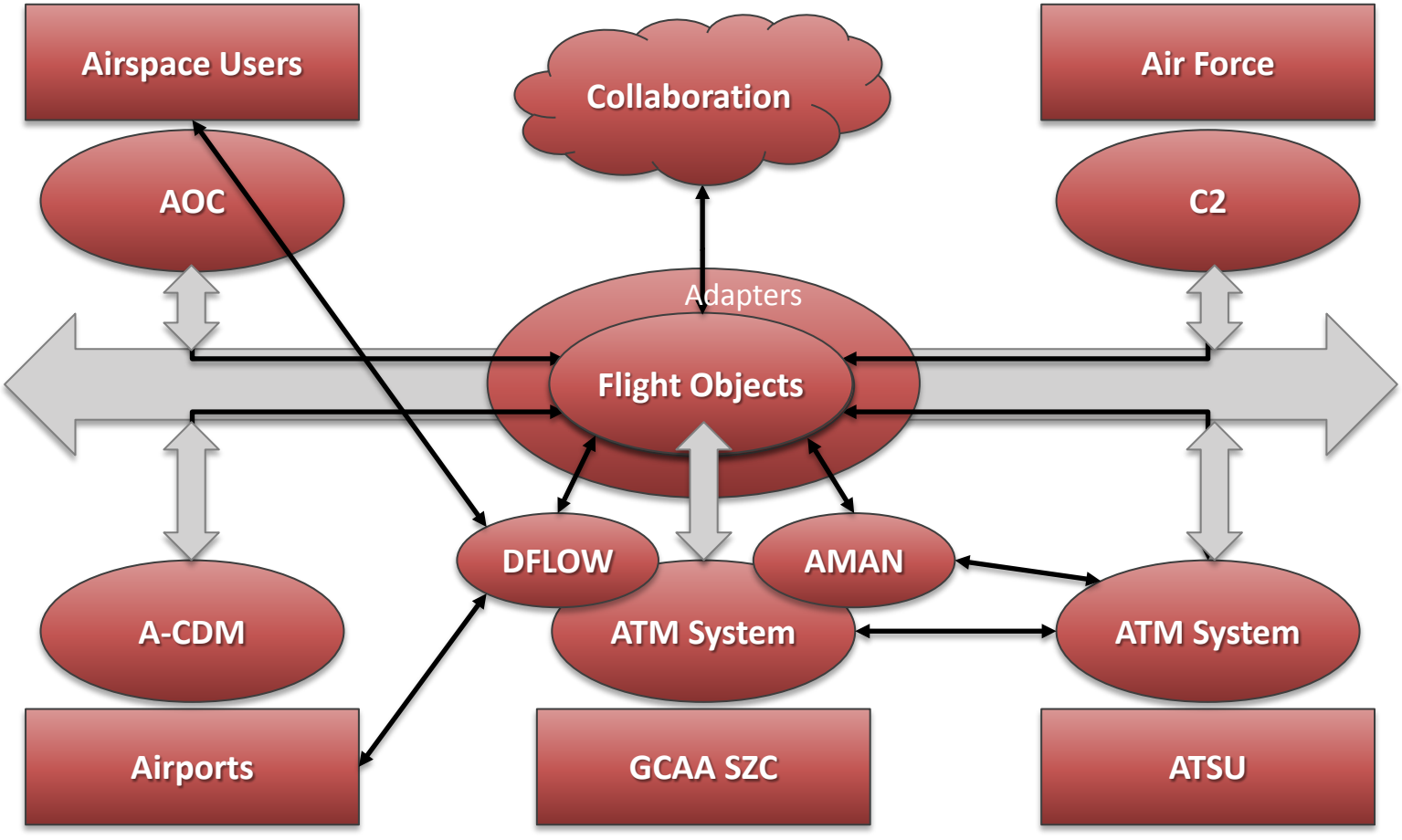
- Effective cooperation and collaboration between the ATM Community Members on various levels
- Support for ICAO's Global Air Traffic Management (ATM) Operational Concept and Global Air Navigation Plan (GANP)
- The adoption of the ICAO Aviation System Block Upgrade (ASBU) programme
- Enhanced ATM services for UAE airports.

Continuum of "Working Together"

Need for Data Sharing and Consolidation



- Pre-Requisite for Collaboration is Common Knowledge about the Situation
- To support right decisions the Common Knowledge about the Situation has to be based upon Consolidated Information
- Such information has to use aggregate available data from all relevant data sources.
- The Data is available in separate data stores and are fragmented in legacy systems design.


Airspace Users
Collaboration
Air Force
AOC
C2
Adapters
Flight Objects
DFLOW
AMAN
A-CDM
ATM System
ATM System
Airports
GCAA SZC
ATSU

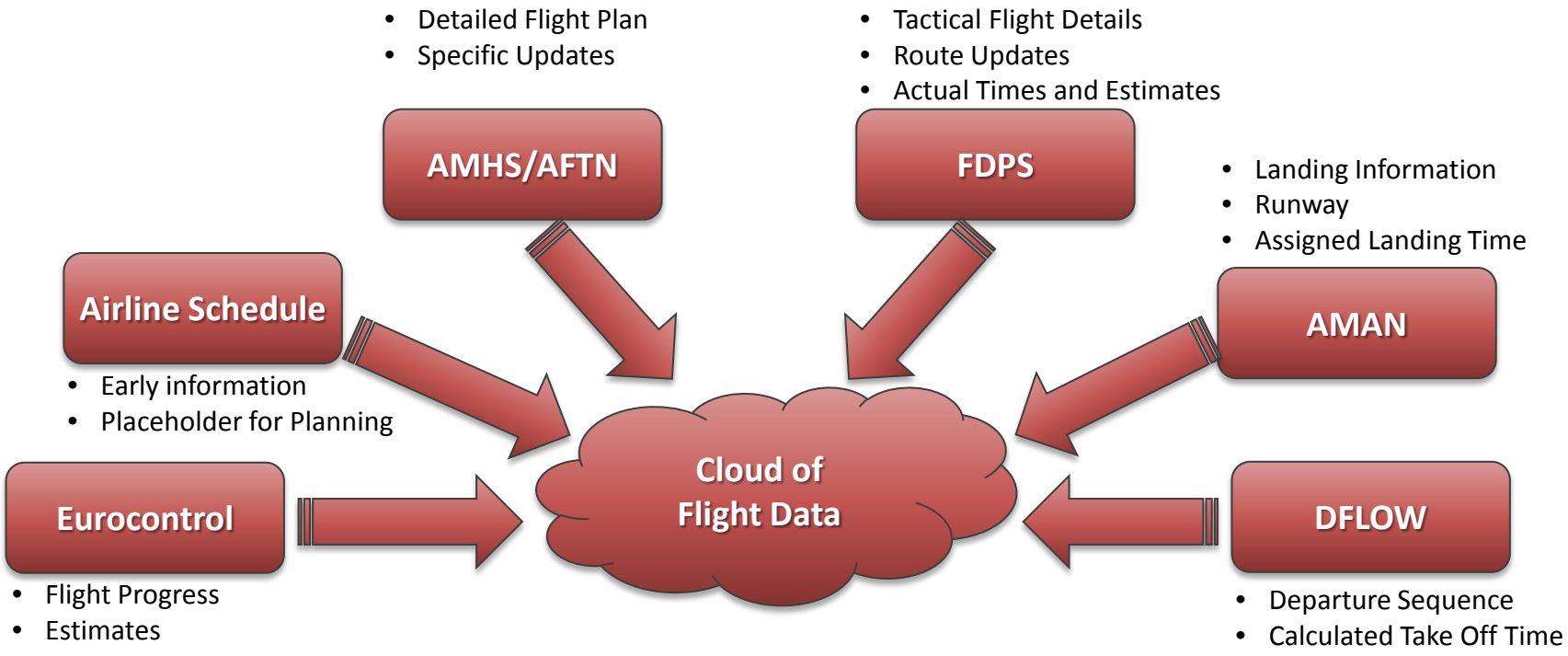
Objectives for the SWIM Gateway

- **Access to High Quality, Consistent and Consolidated Flight Related Information**
  - Flight Objects as perceived by GCAA Sheikh Zayed Air Navigation Centre
  - Allow Stakeholders to amend Flight Objects with additional information
  - Support bi-directional interfacing to Eurocontrol Network Manager
- **Standardised and Open Interfaces**
  - SWIM Platform compliant to Yellow Profile
  - Use of FIXM as a means for external data presentation
- **Expandability**
  - Supporting Dynamic Attributes, even in FIXM input and output without need for software modifications
  - Application Programming Interface for additional Business Logic
  - Supporting Collaborative Decision Making by providing the Data Exchange Service in an open, easily accessible data format.
  - Enabler to grow a national, regional and inter-regional SWIM landscape

Flight Related Information Sharing

- **Requirements from Stakeholders**
  - Validated and Consistent flight plan data
  - Accurate Traffic Forecast
  - Accurate Prediction of Landing Times based on AMAN timings
  - Departure slot times (CTOT) and dynamic slot availability
  - Data shall be available in real-time and as direct system-to-system exchange
  - Web Access for data browsing
- **Accessibility to Information**
  - Secured Public Internet Connections instead of costly private networks
  - Open Interfaces and long term roadmap to assure investment security
- **Pioneering Stakeholders**
  - Dubai Airports
  - Abu Dhabi Airports
  - Other UAE Airports
  - UAE National Airlines
  - IATA (In discussion)

Data Sources at Sheikh Zayed Air Navigation Centre



Implementation Challenges

- **Data Silos in fragmented designs of Legacy Systems**
  - Applications use individual Data Models and unconnected Flight Life Cycles
  - Use of Proprietary Data Formats
  - Inconsistencies between Systems
  - Data Duplications
- **Need for Flight Validation Checks**
  - Use of AIM Data published in AIXM format
  - Identification and Correction of Data Corruptions
  - Removal of Duplicates
- **Data Consolidation**
- **Cyber Security (ADCS)**

Implementation of the SWIM Gateway

- **IFPS Functionality**
  - Only validated Flight Plans are forwarded
  - If necessary, centralised correction within the Gateway is performed prior forwarding
- **Consistent Flight Object Database**
  - All data about a flight from various sources is consolidated in a single System “Flight Objects”
- **Enables Collaboration Services including ATFM**
  - SWIM Gateway provides consistent and up-to-date flight information
  - Flight Objects supports concepts for individual flights such as Ground Delays, User Driven Priortisation, and i4D trajectories
  - Consolidated Flight Objects database allow accurate demand forecast based on all available information
- **Extendable**
  - Open System Architecture
  - Application Programming Interface for Custom Extensions
  - Capacity to cover larger airspace by uploading additional AIM information.

Implementation Status

- **SWIM Gateway has received Operational Approval as of 10 September 2018**
  - Target Date for operation **25 September 2018**
- **Cornerstone for a SWIM enabled System Landscape**
  - Application independent System Flight Object Store
  - Bridging between legacy systems and SWIM architecture
  - Enabler for future Building Blocks and enhanced Applications that are SWIM capable
    - A-CDM and AODB Systems
    - ATM Automation System
    - Collaborative ATFM
  - Supporting National, Regional and Inter-Regional Connectivity

Outlook

- **The SWIM Gateway …**
  - Validate Flight Plans against AIXM encoded airspace information
  - Inform Flight Plan Originators through Operational Reply Messages about the processing status of filed Flight Plans
  - Distribute validated Flight Plans to ATSU using AMHS/AFTN
  - Distribute validated Flight Plan as FIXM to stakeholders via IP networks using SWIM technology
  - Maintain a Flight Objects containing all flight related information and updated all connected client systems
    - FIXM System to System Interface
    - Web Browser Interface
  - SWIM Gateway is able to encode ATFM related information
  - SWIM Gateway may act as inter-regional flight related information exchange

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