SWIFT: SWIM Industry-FAA Team

SWIFT #16 Collaboration Workshop

Date: 11/10/21

Who is in the “MS Teams Room” at SWIFT #16?

Attendee Organizations

Airline Industry	13
Education	3
FFRDC	14
Flight Operations (business/general aviation, UAS, etc.)	19
Government	85
International	3
Other	19
Professional Associations	7
Support Organization	68
Vendor to Industry	98

Other defined as: Consultant, Operator, Researcher, Safety, Academia, ATM Vendor, ANSP, and Airport,
Note: Data timestamp: **11am CT 11/10/2021**

Attended a SWIFT Meeting Before?

I’m a Veteran: 258

No, I’m New: 71

329 attendees

SWIFT

SWIFT Stakeholders

FAA Collaborative Workshop #16

- **On-line Virtual Conference Starts Promptly @ 12:30pm**
- **Welcome and Introductions**
  - Introductions: David Almeida (LS Technologies)
  - Mark DeNicuolo, Vice President Program Management Office (FAA)
  - Dan Hicok, Deputy Vice President Program Management Office (Acting) (FAA)
- **SWIFT Focus Group General Updates**
  - Operational Context – Ray Mitchell (LS Technologies)
  - Development & Analytics (DAFG) – Ray Mitchell (LS Technologies)
  - Operational Issues (Ops Group Focus)
    - Common Support Services – Flight Data (CSS-FD) update – Lucas Curns (Noblis)
    - New York Area Case Study – Chris Gottlieb (JetBlue), Xavier Pratt & Mark Hopkins (LS Technologies)
- **FAA NAS Producer Program: TFDM Update –** Lidiya Gavrilenko (FAA) & Doug Swol (FAA)

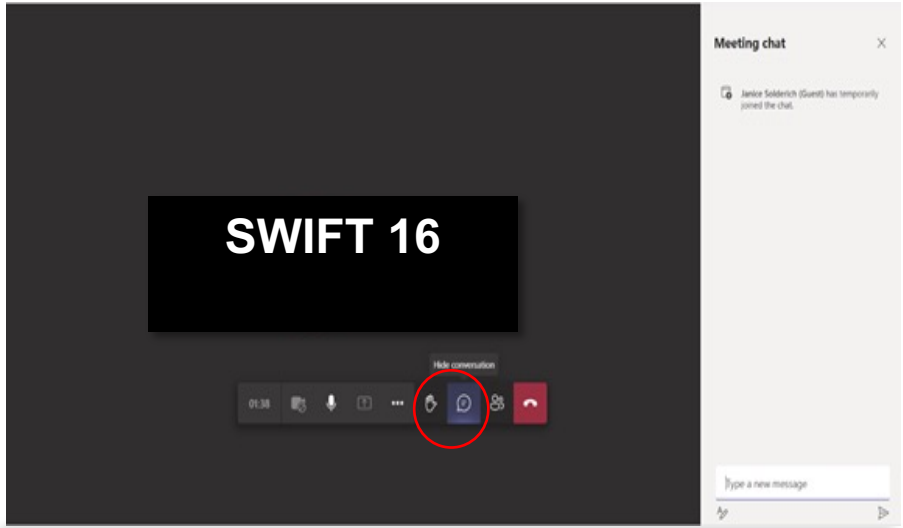
Intermission

- **Automation Evolution Strategy –** Summer Guerrero (FAA) & Chris Burdick (FAA)
- **SWIM Web – SCDS, Portal and ESCS Updates** – Michael Pozsgay (FAA) & Alexander Murray (Noblis), Ray Mitchell & Hugo Buitano (LS Technologies)
- **Cloud and You (NCIS & Cloud Infrastructure)** – Chris Pressler (FAA)
- **Information Services Roadmap Update** – Xavier Pratt (LS Technologies)
- **Close out**

“Airwave Procedures”

- Please note during the session all attendees are muted and cameras off. Attendees who would like to use Mic/Camera features should click on “raise hand” and the SWIFT team will assist.

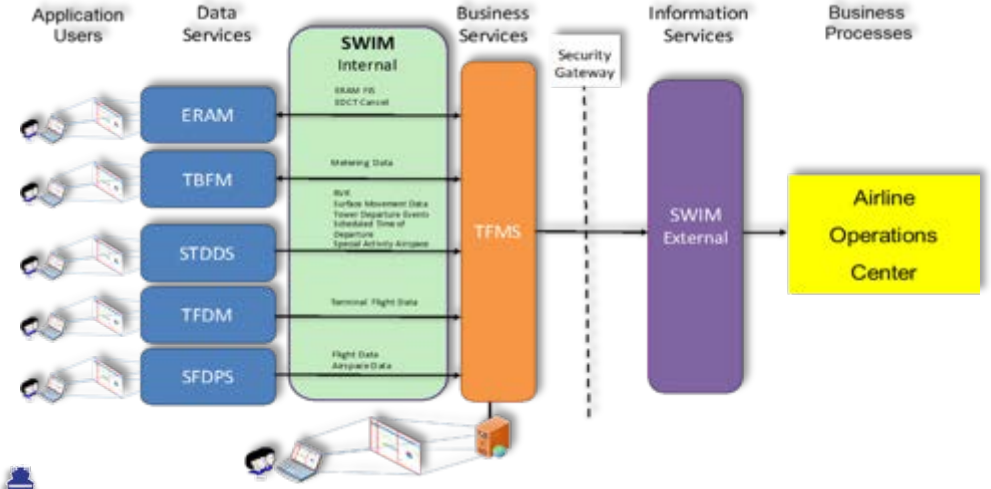
MS Teams Controls: Red Circle Highlights Chat & Raise Hand

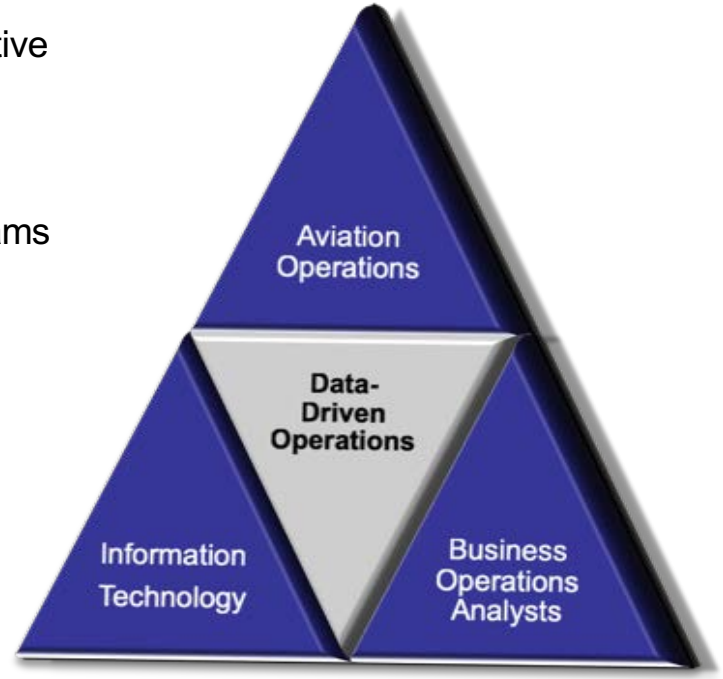


- To ask questions or engage during a topic of interest please use the “Chat” feature. The SWIFT Team will either announce your question/comment or unmute you (time permitting).

SWIFT: The Intersection of Operations, Technology & Data

- SWIFT addresses industry recommendation to:
  - A community forum that acts as a clearinghouse for collaborative engagement around NAS information and data sharing
  - **Educate**: Synchronize community on information services
  - **Collaborate**: Discuss issues most relevant to community
  - **Communicate**: Inform community about SWIM & NAS programs





SWIFT: Where we've been & way forward

2021
- Updates on NAS Programs (NOTAMS, weather) & initiatives (Automation Evolution)
- Engaged FAA and Industry on Flight Planning risk reduction (CSS-FD) activities
- Partnered with TBFM on Metering Information Service & new data enhancements
- NY Area Airport Study: refined issue, identified tools, source data & started analysis

2020
- Case Studies: "Art of possible in data"
- Expanded Vendor engagement
- Focus: Ops Issues & Data Analytics

2019
- Understanding data & ops context
- Partner with TFDM on new services
- Develop & review case studies

2018
- SWIM awareness & connectivity
- Standardize lexicon for services
- Airline access to SWIM data

Where we're heading in 2022

Support NAS stakeholder data exchange for:

- Evolution of operational concepts: TBO & FF-ICE
- Industry migration to information-centric Ops
- NASA's Digital Information Platform
- Applying analytical tools (AI/ML) to improve Ops
- New entrant integration via info-centric NAS Ops
- Vendor engagement for industry Ops improvements
- Delivering specific operational improvements

TFMS Announcement

- **TFMS Technical Webinar: Every Second Thursday of the month @ 1PM ET**
  - Next Meeting scheduled for November 18, 2021 (due to holiday Nov 11)
  - Send questions or topics to Chris.Burdick@faa.gov
- **TFMS R14 successfully deployed October 23, 2021**
  - TFMS R15 schema changes (v4.0) were moved forward into R14
  - R15 will no longer have any schema changes
  - The new TFMData Schema version for R14 is v3.2 (published on NSRR)
  - TFMData v3.2 to v2.0.5 mediation was deployed with R14
  - Request/Reply re-certification will be required

NOTAM API

Improving Access to NOTAM Data

Presented to: SWIFT16

By: Jeri Groce, Group Manager AJM-33

Date: November 10, 2021

Federal Aviation Administration

Overview

- NOTAM API developed in direct response to Industry feedback for simplified and modern machine interface
- Standards-based machine-to-machine interface providing query and filtering capability
- Integrates data from multiple sources and provides multiple formats to cater to different user needs
- Part of streamlining consumer access that meet distinct user needs
- Made available on FAA's Enterprise API Platform

NOTAM API Available for Use

Register for access at https://api.faa.gov

API Details

Features	Formats	Query Parameters
• OpenAPI specification compliant • REST service endpoints • Portal for registration and key management • Quick onboarding & access • Multiple formats • Query interface with filtering and sorting • Data integrated from FNS, TFR and SAA	• AIXM 5.1 – unmodified from FNS-NDS • GeoJSON containing NOTAM event details – TFR and SAA geometries where available • Legacy AIDAP – supports system transition from older NOTAM feed	• Location (domestic or ICAO identifier) • NOTAM type/classification • Location & NOTAM Number • Effective start and end dates • Affected feature types • Geometry search (location coordinates & radius in NM) • NOTAMs from a data (last update date)

SWIFT Focus Group Status Updates

Operational Context Document Focus Group

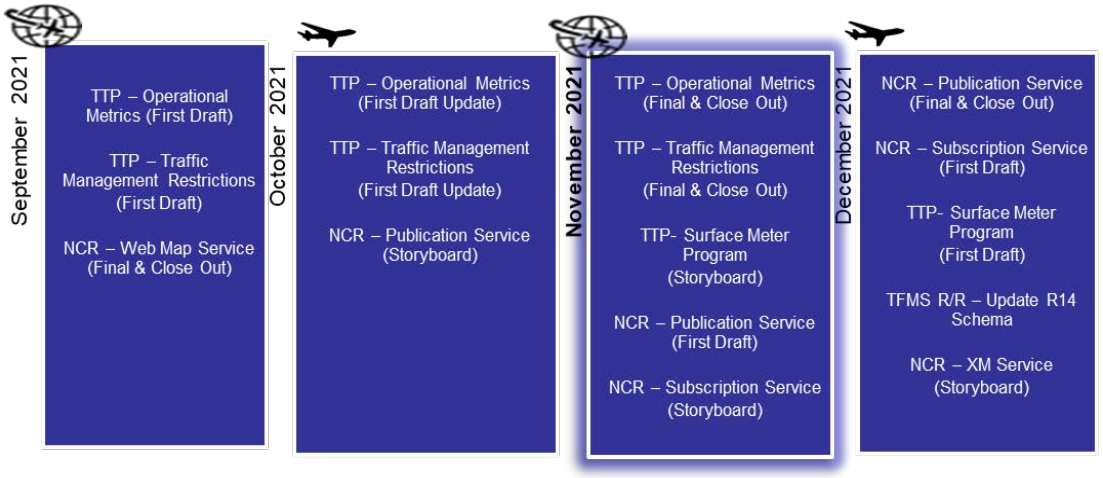
SWIFT 16 Update

Presenter: Ray Mitchell – LS Technologies

Date: November 10, 2021

Focus Group Updates & Schedule

- **Important Notices**
  - **Please submit any comments/feedback by our November 18th Session**
- **Schedule Subject to Change**
- ***Interested in Joining? Please contact Ray Mitchell @ ray.mitchell@lstechllc.com***



Development & Analytics Focus Group

SWIFT 16 Update

Presenter: Ray Mitchell – LS Technologies

Date: November 10, 2021

Development & Analytics Focus Group

Leads: Erin Cobbett (DAL), Mike Jagmin (UAL) and Ray Mitchell (LST) (Contract Support)

Background & Purpose Recap:

Data Analytics

- Identify smaller scale data, operational, and analytical problems that already exist in the community
- Identify services, messages, data elements, logical transformations to solve problems

Development

- Create logical software design to solve problems
- Develop physical representations of data as designed by group

Current Status:

- DAFG team is supporting the TBFM Sprint 2 resolution activities, continuing to meet with TBFM producer program team to discuss roll out / plans for selected enhancements to TBFM

Next Steps:

- Key members of the DAFG have been asked to support the Ops Issues Focus Group – New York Area Case Study. As progress continues with the study, the DAFG may spin off more ad hoc sessions or even another small working group

Want to join us? Contact Us:

Erin Cobbett - erin.cobbett@delta.com

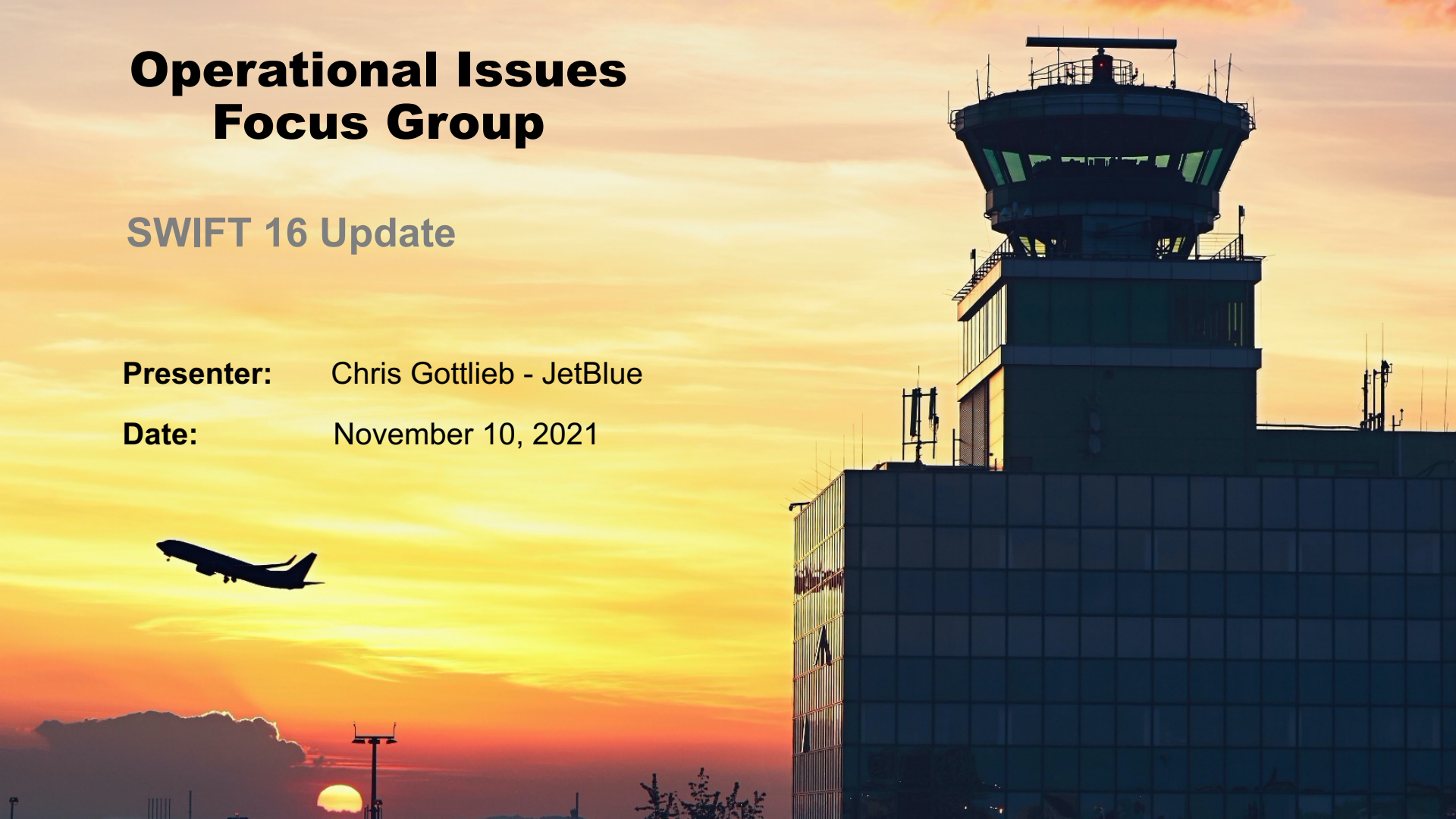
Mike Jagmin - michael.jagmin@united.com or Ray Mitchell – ray.mitchell@lstechllc.com

Operational Issues Focus Group

SWIFT 16 Update

Presenter: Chris Gottlieb - JetBlue

Date: November 10, 2021



Ops Issues Focus Group

- **Lead:** Chris Gottlieb, JetBlue
- **Goal:** Address NAS-wide operational issues that might benefit from information sharing between organizations
- **Current Prioritized Issues:**
  - **TBFM delays (UAL) who, what, why it matters**
  - **Flight Planning over IP (SWA)**
  - **Early Planning for Disruptions**
    - **Early Detection of Deviations over a Fix (JBU)**
    - **Early Detection of Airport Surface Delays (JBU)**
    - Taxi Out Return to Gate tracking / visibility (DAL)
    - Long taxi issues at JFK (JBU)
  - TBFM/TFMS double delays

•Bolded Issues – actively engaged

Analyzing potential linkages

Flight Planning over IP (CSS-FD)

Goal

- Align FAA Flight Plan Modernization efforts with Flight Operators' needs
  - *Understand operator systems' technical needs for Flight Planning, Filing and Data Sharing through CSS-FD*
  - *Better foresight into NAS constraints and impacts to Ops planning and decision-making*
  - *Improve service through increased reliability of operations*

Current Activities

- The CSS-FD team is collaborating with focus group members (airline, vendor and industry reps) to validate benefits of SWIM flight planning:
  - *Quantifying/Monetizing flight planning efficiency benefits through enhanced information exchange (e.g., data sharing amongst TFDM and TFMS automation)*
  - *Understanding how airlines could leverage CSS-FD constraint information and where benefits would occur (i.e., pre-planning or at the gate?)*

Early Planning for Disruptions (New York Area Case Study)

Goal

- Improve NAS stakeholder planning and execution for IROP events
  - *Identify factors and variables that drive suboptimal throughput*
  - *Accurately prioritize list of operations impacted by disruptions*
  - *Identify anticipated level of impact on operations*

Current Activities

- The Ops Issue Group is analyzing the business benefits model for airspace delay issues. Current actions are:
  - *Observe and measure costs (in-flight vs ground-based costs measured by additional minutes flown)*
    - *Compare flight operations for normal day vs "bad weather" delay-causing day*
  - *Investigate ground-based vs system-impacting costs of delay for operators*
  - *Reference "day-of" SWIM message data to validate measured delay and Ops impacts*

Want your Ops Issues to be heard?? Please join us!

For more information:

- Join the **SWIM Flight Planning Modernization** or **Early Planning for Disruptions** MS Teams Group page for updates and continued dialogue

OR…

Please contact us!

- Chris Gottlieb – Christopher.Gottlieb@jetblue.com
- Xavier Pratt- Xavier.Pratt@lstechllc.com

CSS-FD

Risk Reduction Activity Status

Presented to: SWIFT 16

By: Lucas Curns (Noblis)

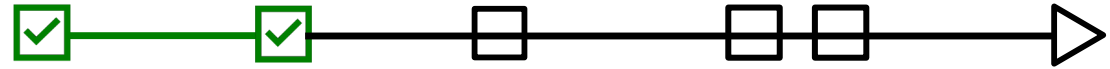
Date: November 10, 2021

Federal Aviation Administration

CSS-FD RRA Update

Sprint 1: Foundational Infrastructure

- Data Management & Security Framework
- Flight Plan Filing



Prototype Development Begins
11/3/2021

Notice to Industry (SAM.GOV)
11/4/2021

Closes 12/3/2021

Industry Kickoff
December 2021

Formal Demonstration

User Trials & Testing
Summer/Fall 2022

Sprint 1 & 2 functionality may be combined into one sprint to increase benefit and reduce the timeframe for the RRA activity at large.

*Sprint 2: Initial FPL Exchange / Feedback

- Evaluation of Constraints / Restrictions
- Flight Specific Feedback
- Re-evaluation Process

Goals of CSS-FD RRA

- Feedback on capabilities and constraint feedback
- Understand integration needs with eAU systems
  - Validate technical interfaces between FAA and operators
  - Ensure data reconciliation needs with eAU data
- Leverage capabilities of operator's modern analytics and SWIM interfaces

CSS-FD RRA Update

Industry Notice: Engagement for Sprint 1
(minimum requirements)

- Ability to send FF-ICE Flight Plans in FIXM 4.2 and Flight Plan Updates (with GUFI)
- Ability to receive a Submission Response (ACK/REJ with justification)
- Ability to receive a Filing Status (Accept/Not-Accepted) with feedback (ATC-amended Flight Plan)
- Current connection to the SWIM Test/Development environment via the NESG *(preferred but not required)*

https://sam.gov/opp/83d1d017abe94f238935f0d627603b78/view
Notice Posted 11/4/2021
Responses due by 12/3/2021

New York Area Study on
Early Planning For Disruptions

SWIFT 16 Update

Presenter: Chris Gottlieb - JetBlue
Xavier Pratt – LS Technologies
Mark Hopkins – LS Technologies

Date: November 10, 2021

SWIFT 15 Recap & Context

- **Case Study Origins:**
  - Selected NY Metro Area for case study due to their daily vulnerability for SWAP events
  - Sought alerting capabilities to support real-time tactical decisions by FAA and carriers
- **Case Study Modeling Approach:**
  - Identify correlation between stakeholder decisions and delay metrics during convective weather activity in ZNY airspace
  - Leverage SWIM data to mitigate stakeholder *information gaps* during IROP events
    - Identify ATC / industry challenges, desired outcomes, and Ops Impacts during IROP events
    - Select dates to serve as case study baseline for future predictive analytics / machine learning modeling
- **Case Study Status:**
  - Analyze delay and impacts resulting from aircraft deviation along flight trajectory
    - *Selected June 21, 2021, as candidate disruptive date for model baseline*
      - Severe convective WX activity with traffic demand impacted ZNY and ZOB operations
      - Convective WX and lightning events occurring from 1300Z through 2100Z
      - WX development over multiple N90 arrival, departure and jet routes

Case Study Problem Statement

- **No clear way to readily identify aircraft deviation indicators (e.g., weather, traffic volume) and anticipate en-route delays. We lack the means to strategically plan for fluctuating airspace conditions and pending resource constraints leading to operational impacts.**
  - Lack of available post-ops data analysis to determine threshold boundaries for traffic deviations and where disruptions were severe
  - Limits the operational community from effectively planning or implementing work-arounds for fluctuating airspace conditions and resource constraints

Case Study Vignettes

Deviation off Trajectories

Convective weather (e.g., thunderstorms) near N90 moving eastward impacts airspace capacity, departure routes and fix resources.

Drivers to Observe:

- *Weather Location & Intensity, TMI Restrictions, Departure Fix Utilization, Predicted Taxi Times, Flight Cancellations*

Flow Restrictions Workaround (NBAA)

Adjusting FCA ceilings to assist GA flights with ZNY flyovers.

Drivers to Observe:

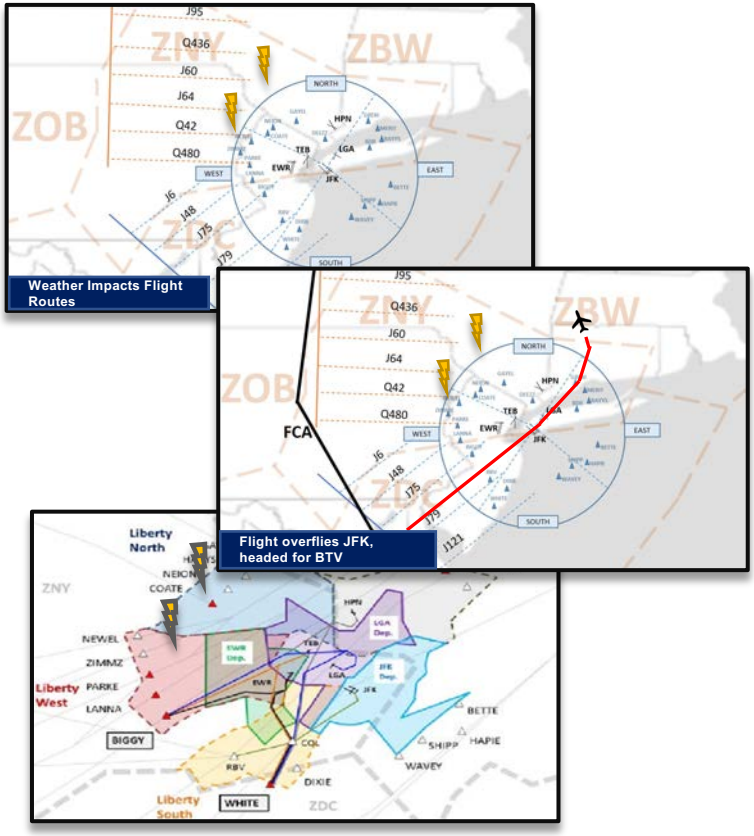
- *TMI Restrictions, Flight Scheduling, Gate & RWY availability, Jet Route & fix availability, N90 Airspace Traffic Demand*

Airport Surface Operations

Convective weather (e.g., surface winds) creating unfavorable conditions; EWR sees spike in average taxi times, doubling LGA and JFK taxi times.

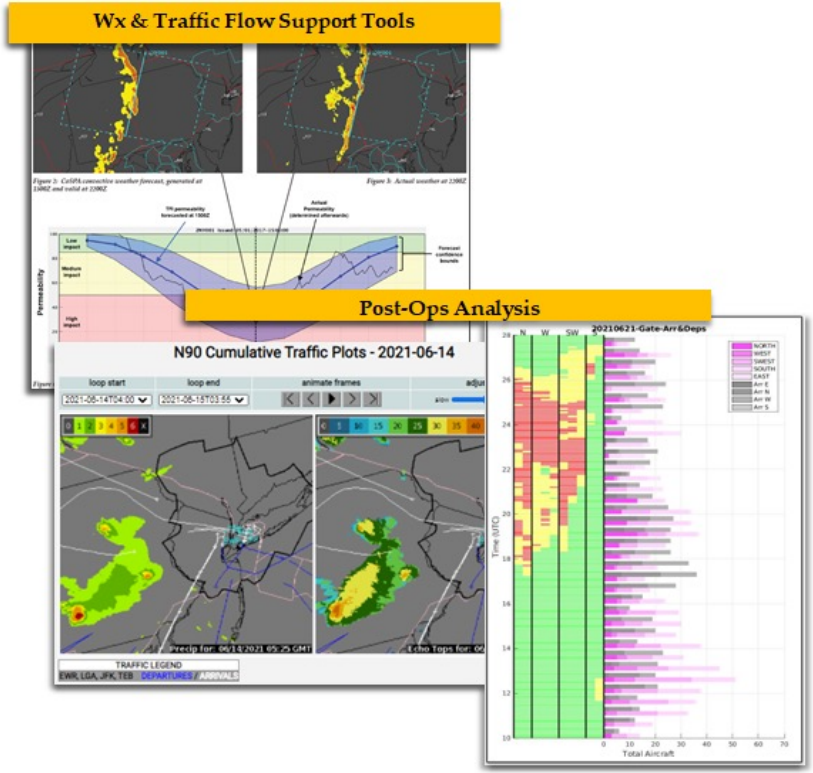
Drivers to Observe:

- *Weather Location & Intensity, Gate & RWY Assignments, Planned Taxi Times, Flight Scheduling*



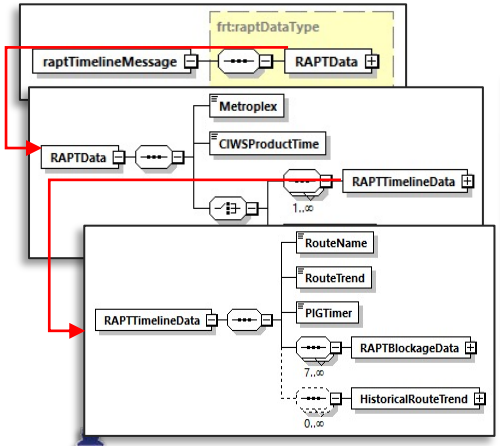
Leveraging Available Tools

- **SWIM SFDPS and TFMData services**
  - Correlating key drivers to IROP disruptions through ERAM and TFMS messages/data elements.
- **RAPT and TFI capabilities**
  - Evaluate areas where supplemental external data can best serve case study, for example:
    - Sector Throughput Information
    - Traffic Count against Sector Map Values
    - Fix Utilization Data



Leveraging SWIM Data

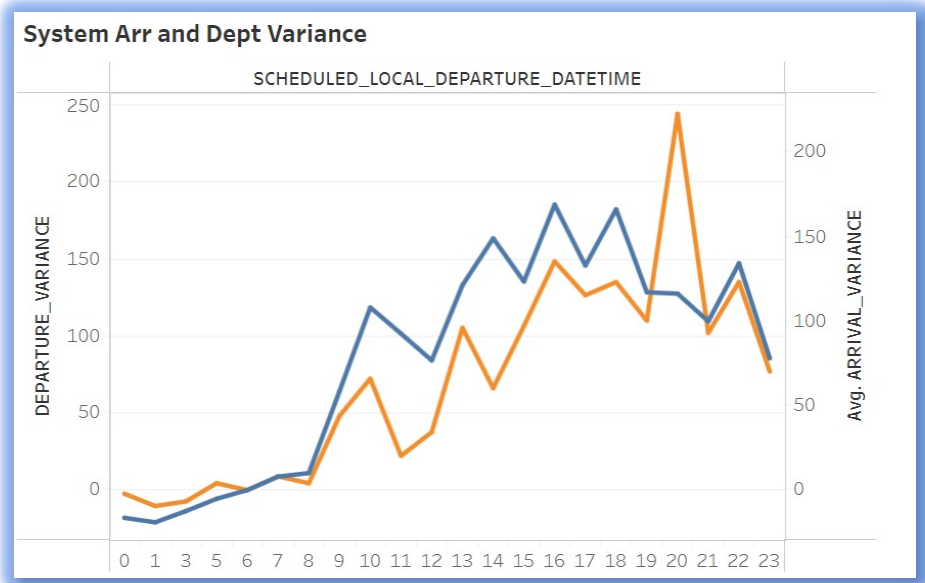
- **Parse XML archives from SFDPS, TFM Flight and Flow**
  - Parse RAPT data available in TFM Flow archive by msgType
  - SFDPS - En Route Airspace Data: Sector Assignment Status, Route Status, General Information Messages
  - SFDPS – En Route Flight Data: Flight Amendment Messages
  - TFMData: Reroute Messages, Restrictions Messages, Constraints Messages, Advisory and Compression Messages

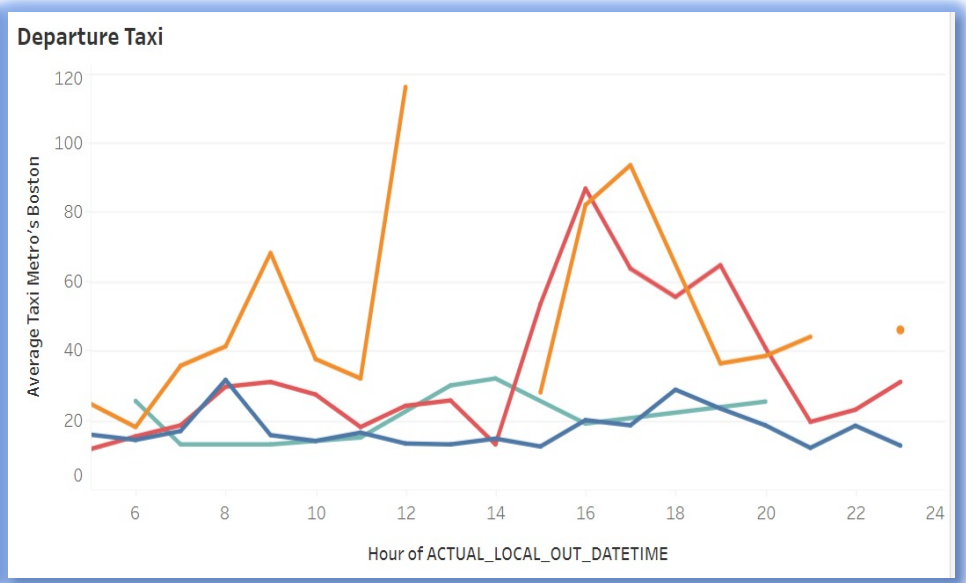


Data Element	Data Element Definition
raptTimelineMessage	Contains the current availability of departure routes due convective weather. Only sent for airports that have the Route Availability Planning Tool (RAPT) function. Updated frequently to show current status.
RAPTData	RAPT timeline data for a particular RAPT metroplex
RAPTTimelineData	RAPT timeline data for TSD display.

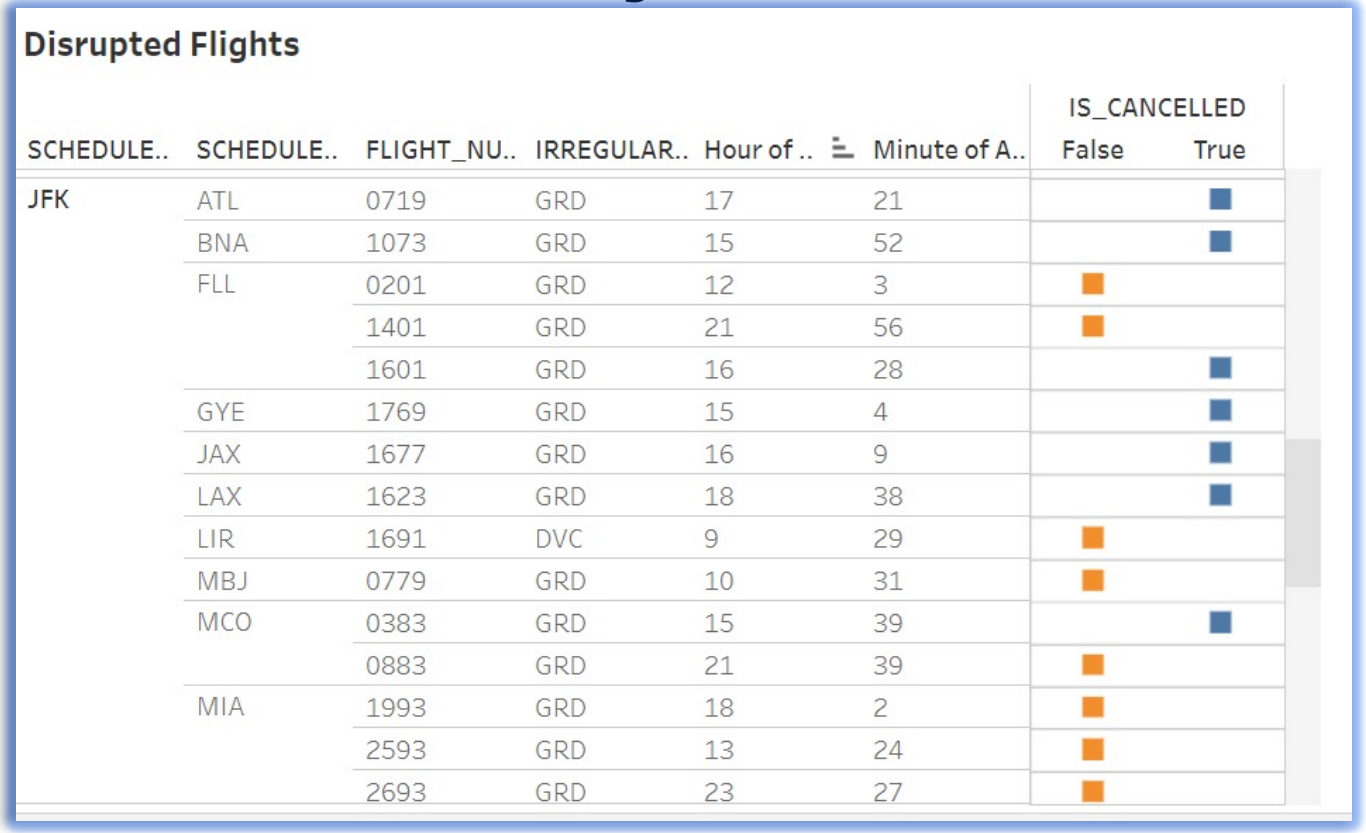
**Message structure is truncated*

Taxi Times Analysis





Flight Cancellation Analysis

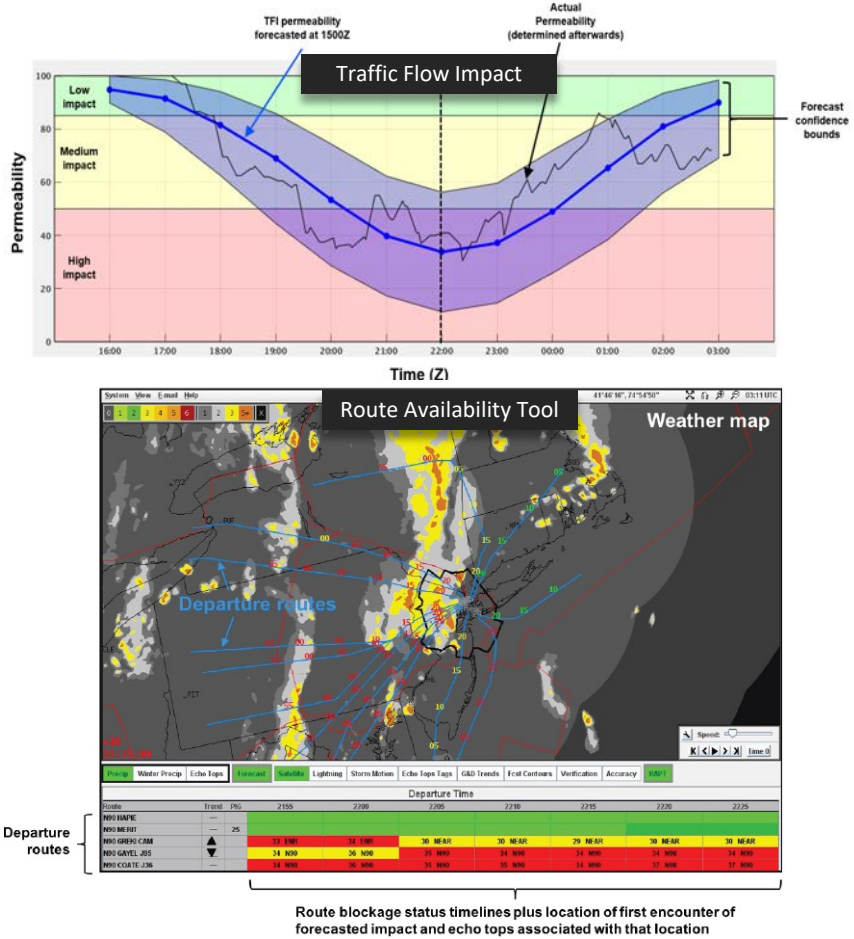


Disrupted Flights

SCHEDULE..	SCHEDULE..	FLIGHT_NU..	IRREGULAR..	Hour of ..	Minute of A..	IS_CANCELLED: False	IS_CANCELLED: True
JFK	ATL	0719	GRD	17	21		■
	BNA	1073	GRD	15	52		■
	FLL	0201	GRD	12	3	■	
		1401	GRD	21	56	■	
		1601	GRD	16	28		■
	GYE	1769	GRD	15	4		■
	JAX	1677	GRD	16	9		■
	LAX	1623	GRD	18	38		■
	LIR	1691	DVC	9	29	■	
	MBJ	0779	GRD	10	31	■	
	MCO	0383	GRD	15	39		■
		0883	GRD	21	39	■	
	MIA	1993	GRD	18	2	■	
		2593	GRD	13	24	■	
		2693	GRD	23	27	■	

Case Study Applications

- **The TFI tool can be used to evaluate the accuracy of selected AFP rates for the FCAs.**
  - We can leverage TFI to translate permeability into a target flow rate (aircraft/hour) representing the historical traffic level that can be sustained across that FCA under convective weather conditions. [*Vignette 1: deviation off trajectory*]
- **RAPT precipitation intensity and echo tops forecasts, together with airspace usage and flight trajectories, can be leveraged to forecast storm impacts for specific flight routes**
  - RAPT can assign a level of impact to specific routes based on precipitation intensity, storm height, and expected pilot or GA flight behavior. [Vignette 2: Flow Restrictions]



Case Study Steps

Observe

Case Study Applications

Traffic Flow Impact (TFI) Tool
- Analyze resource capacity, FCA rate setting, and start/end times of TMIs.

Route Availability Planning Tool (RAPT)
- Observe and assess the predicted overlap between convective weather and departure routes.
- Observe trends to indicate viability of routes.

RAPT Evaluation Post-Event Analysis Tool (REPEAT)
- Utilize playbacks and delay metrics for historical dates, in ZNY/N90.

Analyze

Problem Statement-Relevant Data

- Echo Tops, precipitation intensity and forecasting
- Airport rates
- TMI rates
- Departure fix utilization
- Arrival trajectories
- Departure trajectories
- Taxi times
- Route availability

Model

Machine Learning To Recognize Patterns

Level of ATC control via TMI Initiatives
- SOP-based or historical actions
- Predicting airport rates beyond 1-hour mark
- Adjusting parameters based on actual (real-time) NAS Ops performance

Surface Management execution
- Predicted departure fix availability and allocation

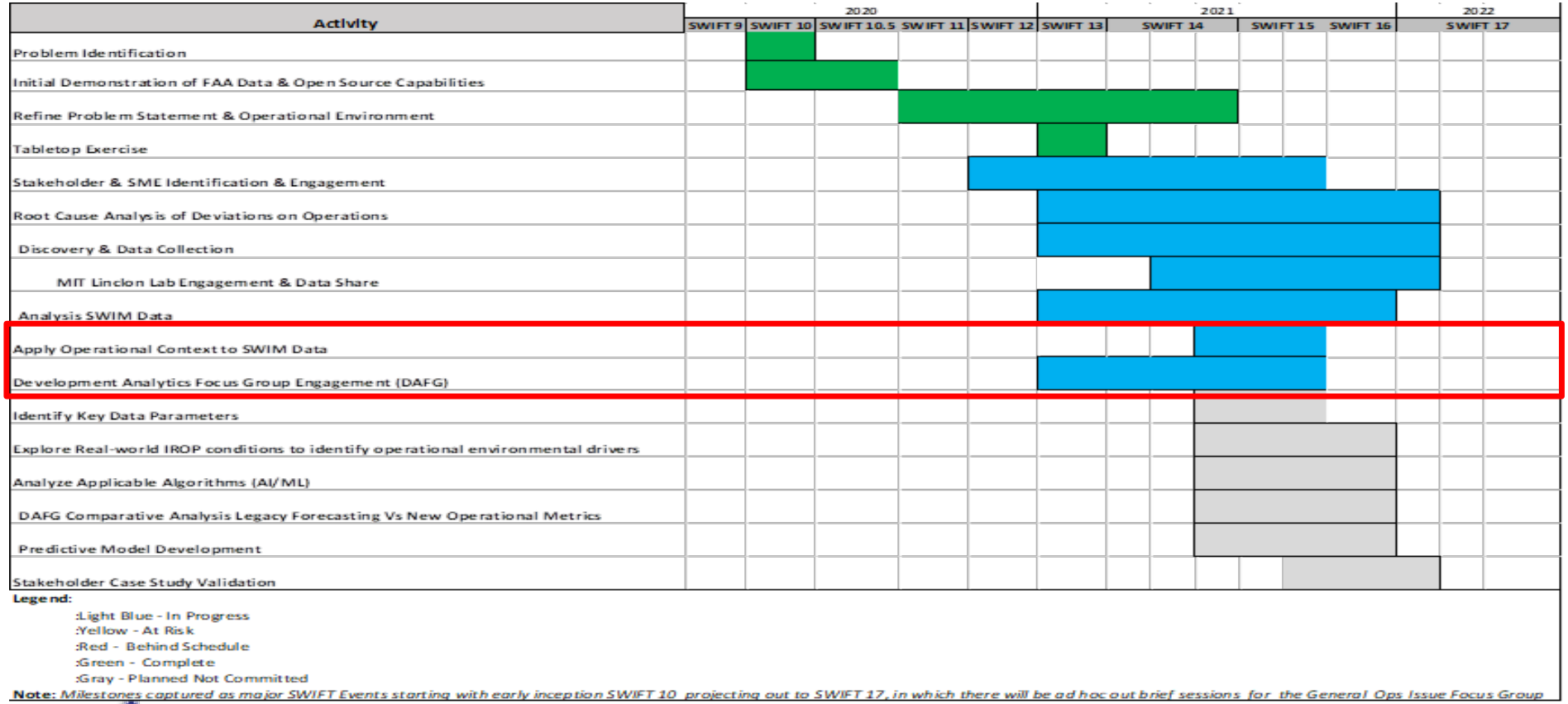
Test

Enabling for Predictions of a given Airspace

Planning and Execution for IROPs
- Reduction in gate returns (pushing)
- Prediction of overall delays
- Reduction in overall delays

Anticipated level of impact on operations
- Arrival trajectories
- Departure trajectories

Notional “Near Term” Timeline



Legend:

:Light Blue - In Progress
:Yellow - At Risk
:Red - Behind Schedule
:Green - Complete
:Gray - Planned Not Committed

Note: *Milestones captured as major SWIFT Events starting with early inception SWIFT 10 projecting out to SWIFT 17, in which there will be ad hoc out brief sessions for the General Ops Issue Focus Group*

Next Steps for SWIFT 17

- **Analyze Delay for IROPs via Post-Ops and Playback data**
  - Compare total flight time of each flight on a normal day to the flight time on candidate dates
    - Delta is the additional flight time caused by delay.
  - Identify individual flights as examples of specific flights that experienced significant delay
  - Correlate key SWIM data to IROP disruptions
    - TFM Flight and Flow, SFDPS messages
  - Apply operational context to data
    - Sector Throughput during convective weather activity
    - Traffic Count against Sector Map Values during convective weather activity
    - Fix Utilization during convective weather activity
- **Engage DAFG for Model Development & Support**
  - Support with SWIM data parsing
  - Opportunities for applying predictive analytics and machine learning

Want to get involved in with case? Join us!

Contact Us:

Chris Gottlieb – Christopher.Gottlieb@jetblue.com

Xavier Pratt- xavier.pratt@lstechllc.com

Mark Hopkins - mark.hopkins_nlst@lstechllc.com

Sandie Steele – sandie.steele@lstechllc.com

John Kelley – john.kelley@lstechllc.com

Terminal Flight Data Manager (TFDM):
Program Status and Data Elements for TBO

Presented to: SWIFT 16

By: Doug Swol (FAA), Lidiya Gavrilenko (FAA)

Date: November 10, 2021

Federal Aviation Administration

TFDM Program Overview

TFDM is the surface management solution for NextGen and iTBO.

https://www.faa.gov/air_traffic/technology/tfdm/

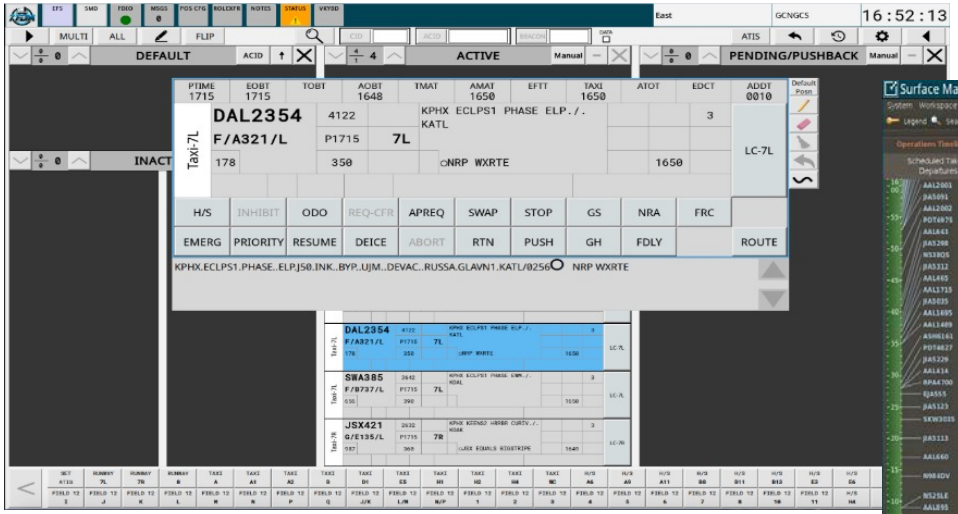
- **TFDM** will provide an integrated tower flight data automation system, which **will improve controllers' common situational awareness.**
- **TFDM will improve efficiencies** on the airport surface and terminal airspace by providing:

- Electronic Flight Strips in the Tower
- Traffic Flow Management Integration
- Collaborative Decision Making for the Surface
- Systems Consolidation

Key Benefits:

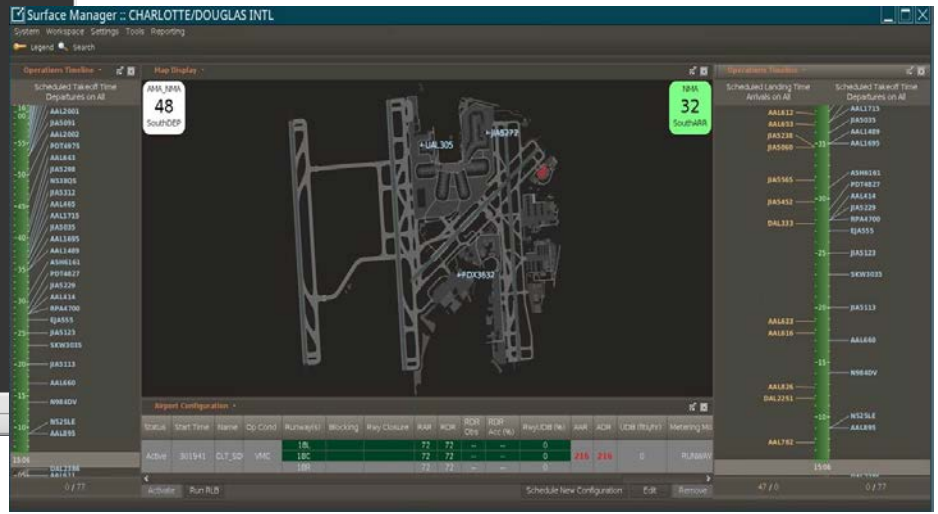
- Fuel Savings
- Carbon Emission Savings
- Improved Situational Awareness
- Expanded Data Access

TFDM System Displays



Electronic Flight Strip Display

Surface Management Display



TFDM Interfaces

Internal Interfaces

Two-Way Interfaces

- TFMS (via SWIM)
- TBFM (via SWIM)
- FDIO
- RMLS (via SWIM)
- STDDS (via SWIM)

One-Way Interfaces

- ASDE-X/ASSC
- STARS
- TDLS

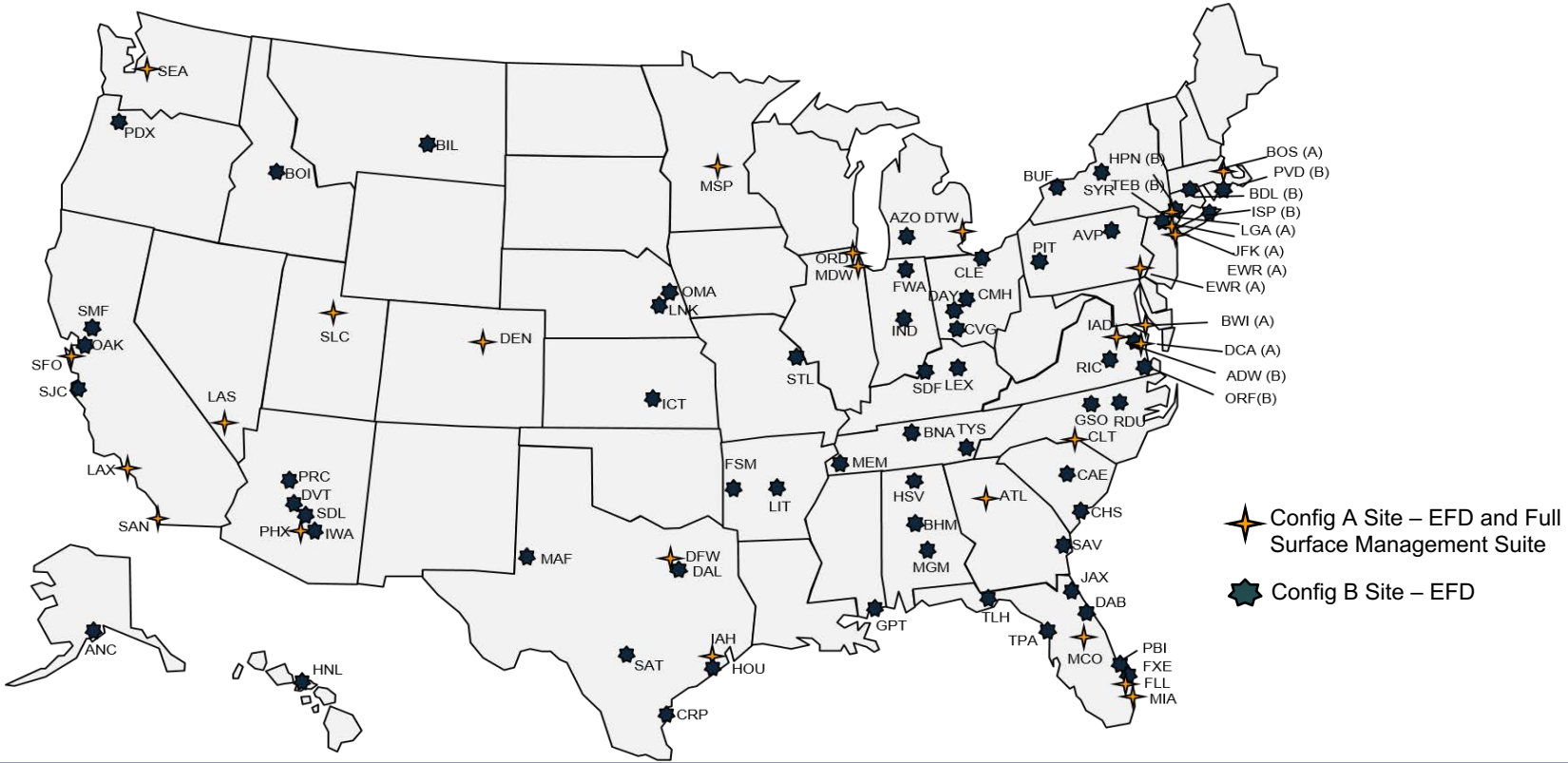
Facilities Affected

- Towers (93 at 89 airports)
- TRACONs (58 via TFMS Surface Viewer)
- ARTCCs (18 via TFMS Surface Viewer)
- ATCSCC (via TFMS Surface Viewer)
- WJHTC (Test and 2nd Level Engineering)
- MMAC (Academy and Depot)

External Interfaces (via SWIM)

- Flight Operators (TTP and TFCS)
- Airport Authorities (TTP and TFCS)

Planned TFDM Sites



TFDM Program Roll-Out Overview

Build 1

Key Site - PHX

- Full hardware development to support the deployment of Build 1 & 2
- Improved Electronic Flight Data Exchange and Electronic Flight Strips
- Runway Assignment Predictions
- Maintenance tools for life cycle support
- B1 TTP Service Offered

- Initial Operating Capability: ~~June 2020~~
- In-Service Decision: ~~September 2020~~

Dates being replanned due to COVID-19 Impacts
B1 IOC will not occur before Summer 2022

Build 2

Key Site - CLT

In addition to the Build 1 capabilities

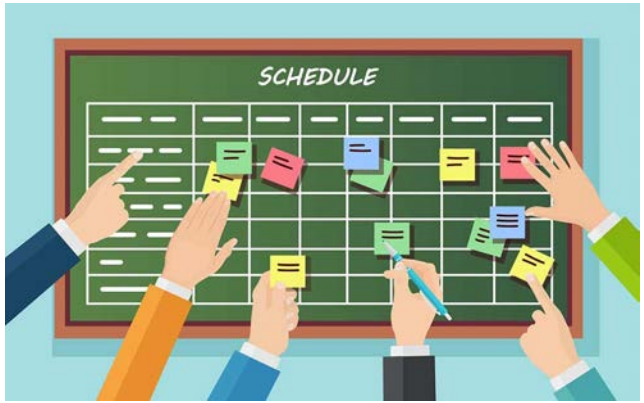
- Surface Scheduling
- Surface Metering
- Runway Load Balancing
- Metric Reporting & Analysis (MRA)
- B2 TTP and TFCS Services Offered

- Initial Operating Capability: ~~May 2021~~
- In-Service Decision: ~~September 2021~~

Dates being replanned due to COVID-19 Impacts
B2 IOC will not occur before Summer 2023

Program Status

- COVID Recovery Planning
  - Working to finalize new B1 and B2 IOC dates based on travel and facility access/staffing
  - Travel is starting to open up!!!
- Build 1 Testing @ WJHTC Ongoing
- Build 2 Preliminary Testing @ WJHTC
- Utilizing the TFDM Testbed with Vendors to simulate SWIM connection to TTP and TFCS data
- Waterfall Deployment Schedule
  - Target Draft Release in January 2022



TBO overview

Time-Based Management (TBM)

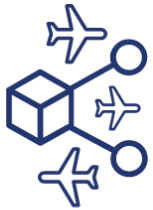
Dep Scheduling, Airborne Metering and Automated Surface Mngmt.
Complemented by Conventional TMIs as Needed

Helps Manage Trajectories by Scheduling and Metering Aircraft Through Constraint Points

Performance Based Navigation (PBN)

Metroplex
RNP w/RF Turns
Etc.

Enables Aircraft to More Accurately Navigate Along Their Trajectories



Enabling Technologies

SWIM
DataComm
Web-based Planning Tool
Etc.

Expands and Automates Sharing of Common Information About Aircraft Trajectories

Data Exchange: At the Core of TFDM

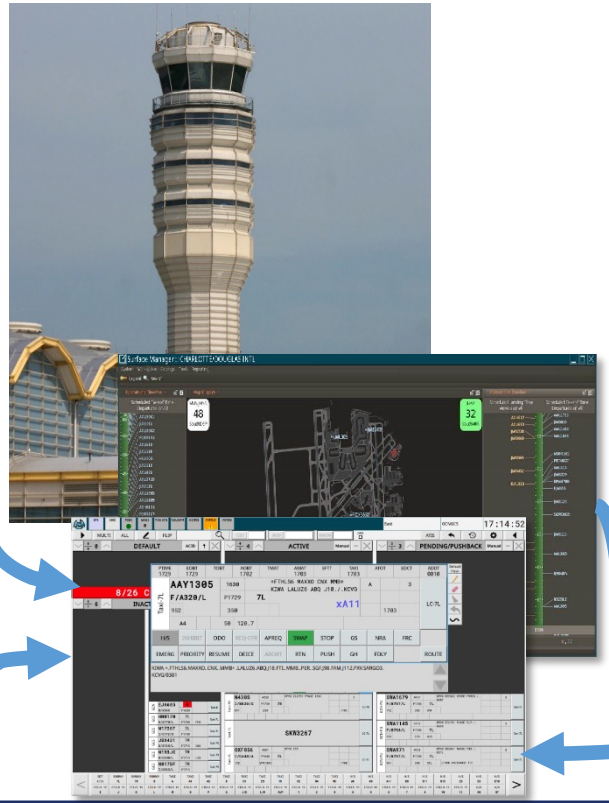
New Surface Data Elements from Industry (11+ elements via TFMS)

FAA Systems (via SWIM)

TFMS
TBFM

FAA Systems (direct interface)

ERAM via FDIO, ASDE-X/ASSC, STARS, TDLS



TFDM Data (via TTP SWIM Service)

- Flight Data
- 08L·26R Airport Information
- Flight Delay
- Operational Metrics
- Traffic Mgmt. Restrictions
- Surface Mgmt. Programs

Flight Operators / Airports / Vendors

TFDM Flight Operator Collaboration (via SWIM)

Substitution Requests / Ramp Closures

S-CDM Data Elements

These 11 data elements are provided by non-FAA CDM members (i.e., airline operations centers) to TFMS; they are ingested by TFDM to improve TFDM's departure scheduling accuracy, inform TFDM surface metering, facilitate S-CDM at airports.

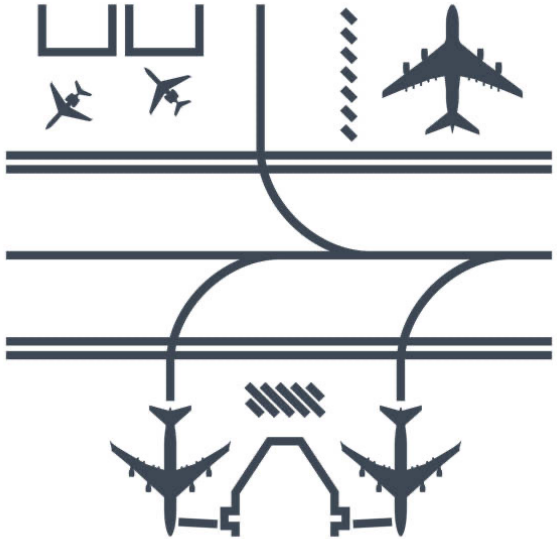
S-CDM Element	Description
Actual In Block Time (AIBT)	The actual time a flight has blocked in/arrived at the gate or parking location
Actual Off Block Time (AOBT)	The actual time at which a flight has blocked out/departed from a gate or parking location
Actual Landing Time (ALDT)	The actual time the flight has landed on the runway
Actual Takeoff Time (ATOT)	The time at which a flight departed the runway
Arrival Gate/Stand	The gate/stand at which a flight/aircraft is assigned
Departure Gate/Stand	The gate/stand at which a flight/aircraft is assigned
Aircraft Tail/Registration Number	The unique alphanumeric string that identifies a physical aircraft/airframe
Earliest Off-Block Time (EOBT)	Earliest time when the flight operator plans for an aircraft to blocked out/departed from its assigned gate
Flight Cancellation	Airline-submitted message indicating a flight is cancelled and removes the flight from the schedule
Initial Off-Block Time (IOBT)	The initial off-block time provided for a flight
Intent to Hold (Movement Area/Non-Movement Area)	Indicates a flight's desire/intent to hold a departing or arrival flight in the movement or non-movement area

Gate assignment

- TFDM automation estimates Aircraft Route Times and Locations for arrivals and departures
- Gate assignment provided by the flight operator via TFM Data serves as an input for the estimate
- Surface metering and planning requires accurate ETD and timely updates

EOBT for scheduling

- TFDM assigns runway for a flight with estimated taxi times
- Estimated Off Block Time (EOBT) is provided by the flight operator via TFM Data and is an input into metering and CFR coordination with TBFM
- Critical for more accurate estimate



Intent to Hold (MA/NMA)

- TFDM updates predictions and influences schedules based on intent to hold in a movement area (MA) or non-movement area (NMA)
- FOC transmits intent to hold to tower electronically in place of legacy voice communications
- Holds can have a potential impact on surface metering

Six TTP business functions

- Airport Information
- Flight Data
- Flight Delay
- Operational Metrics
- Traffic Management Restrictions
- Surface Management Programs

•Airport Information


•Flight Data


•Flight Delay


•Operational Metrics

•Traffic Management Restrictions


•Surface Management Programs

Data exchange for TBO

- We are relying on timely and accurate data from FOC in order to fully realize the TBO benefits
  - Collaborative data exchange such as accurate EOBT enables TFDM to efficiently schedule departures on the surface
  - Sharing information via a common service (TTP) creates a common understanding among stakeholders (including schedule/delay/metrics will be influenced by input)

Questions?

- **Doug Swol**
  Christopher.D.Swol@faa.gov
- **Lidiya Gavrilenko**
  Lidiya.Gavrilenko@faa.gov


INTERMISSION

Automation Evolution Strategy

SWIFT 16

Presented to: SWIFT 16

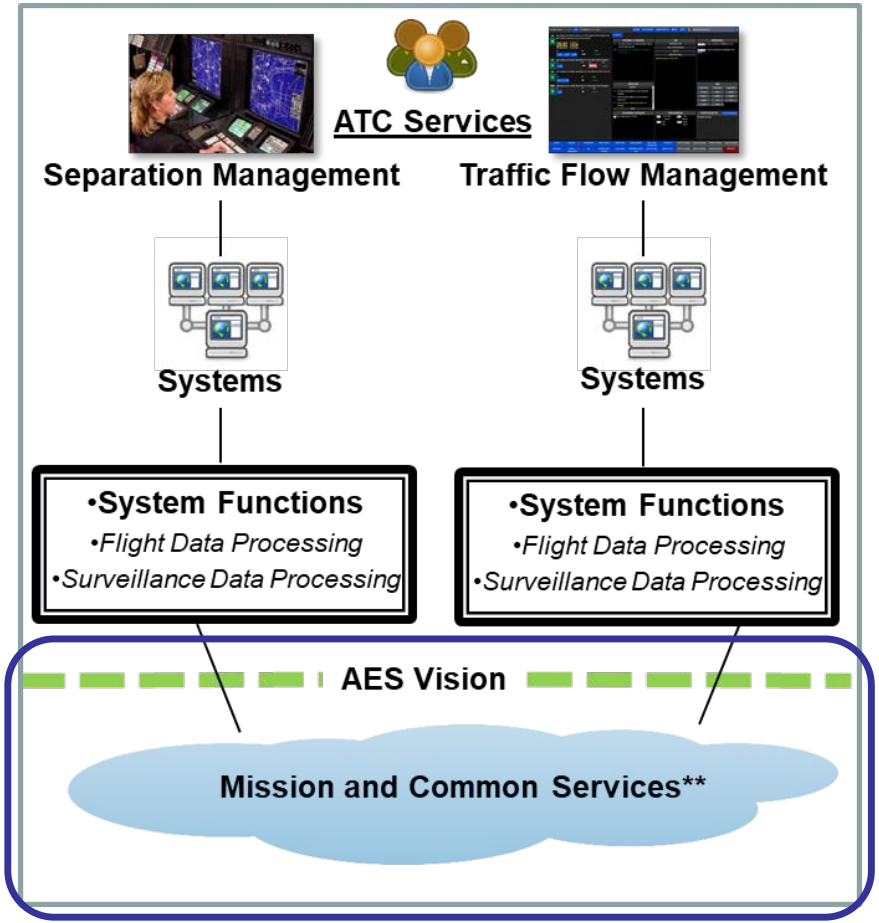
By: Summer Guerrero, FAA
Chris Burdick, FAA

Date: November 10, 2021

Federal Aviation Administration

Automation Evolution Strategy (AES): Scope

AES proposes a Service-Based Architecture* that encompasses ATC Separation Management and Traffic Flow Management Services



Today's Focus

* Service-based Architecture is an architecture framework in which different parts of a system-of-systems interoperate by exposing and accessing data and processing functions as services that can be accessed over a network.

** Mission services are software components that provides FAA with mission-specific data (e.g. flight data) and computation functions (e.g. tracking, conflict probe). Common Services are mission services intended for use by multiple consumers.

Why Modernize NAS Automation Development and Deployment Architecture?

- Seek efficiencies for developing, operating, and sustaining NAS automation systems/services
- Reduce time to develop, integrate, and deploy new capabilities
- Leverage commercial industry best practices
- Establish broad industry base to support the FAA across a range of development and deployment capabilities
- Establish a scalable, flexible, secure, and resilient architecture

Modernize NAS Automation Development and Deployment: Service-Based Architecture

Integrated Security

- DevSecOps w/Security "Baked in"
- Security Operations – Continuous Monitoring
- Secure Cloud w/Inheritance of Controls
- Zero Trust Architecture

NAS Mission Applications

*Software components including **user interfaces** that NAS specialists use as they carry out the NAS operational mission.*

NAS Mission Services

*Software components providing **aviation data and computation functions** needed by NAS applications.*

NAS Mission Software Layer

Applications Software Environment

Frameworks and environments for user interface applications.

Services Software Environment

Generic IT services and DevSecOps tools.

Standards -Based Software Platform Layer

End User Equipment

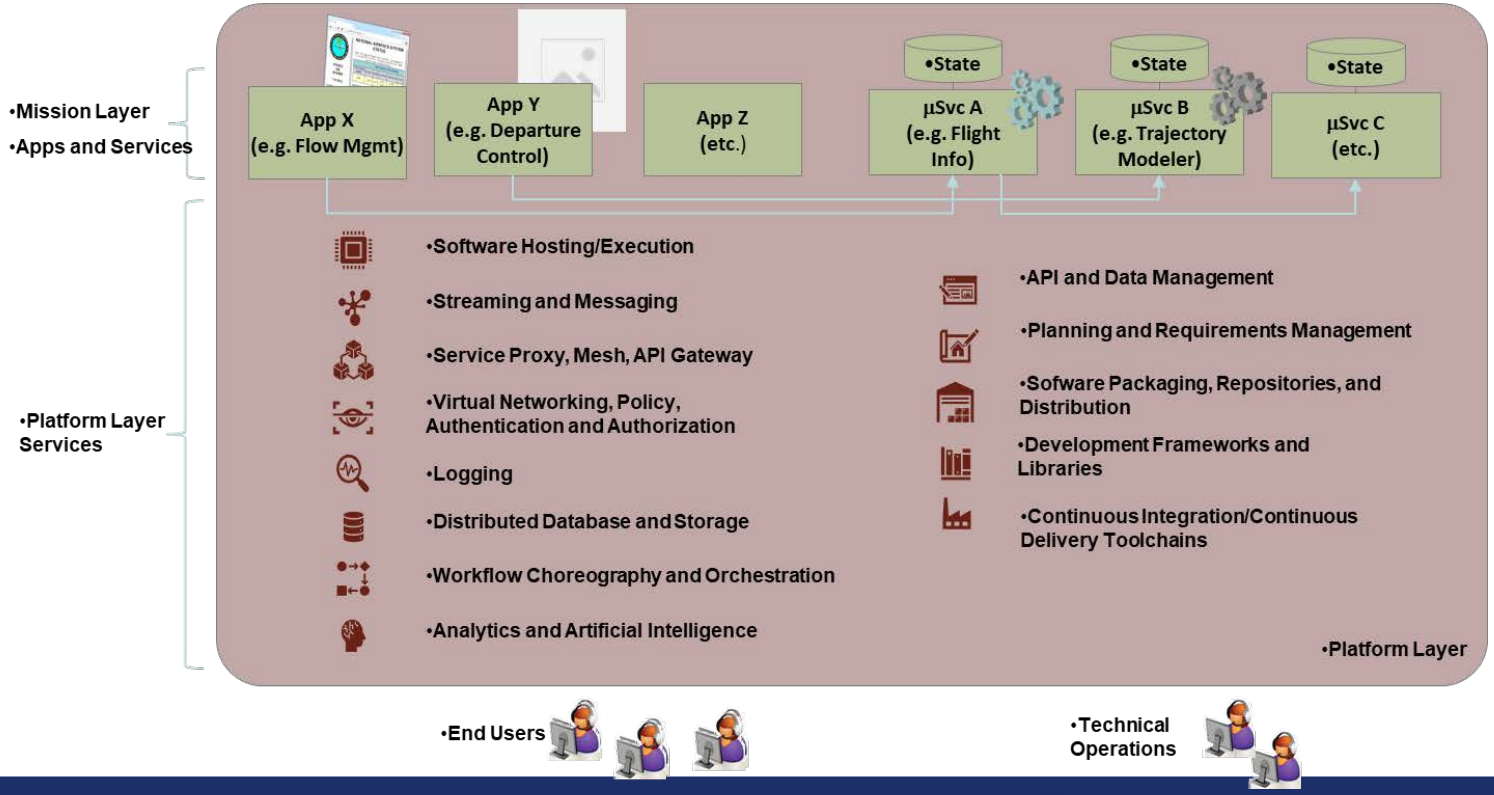
Devices that provide displays and input devices for NAS specialists.

Compute Infrastructure

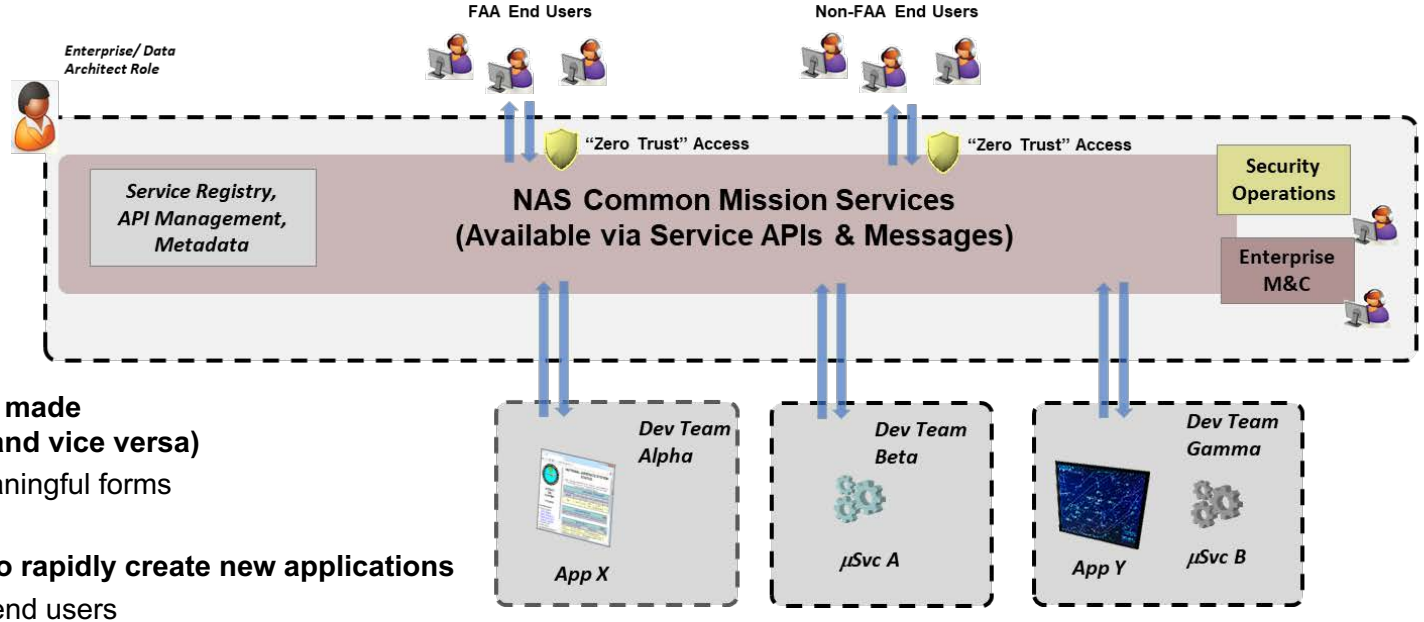
Equipment that provides the computing, storage, networking, etc.

Computing Resources Layer

Mission Layer Software Supported by Standards-Based Software Platform Layer

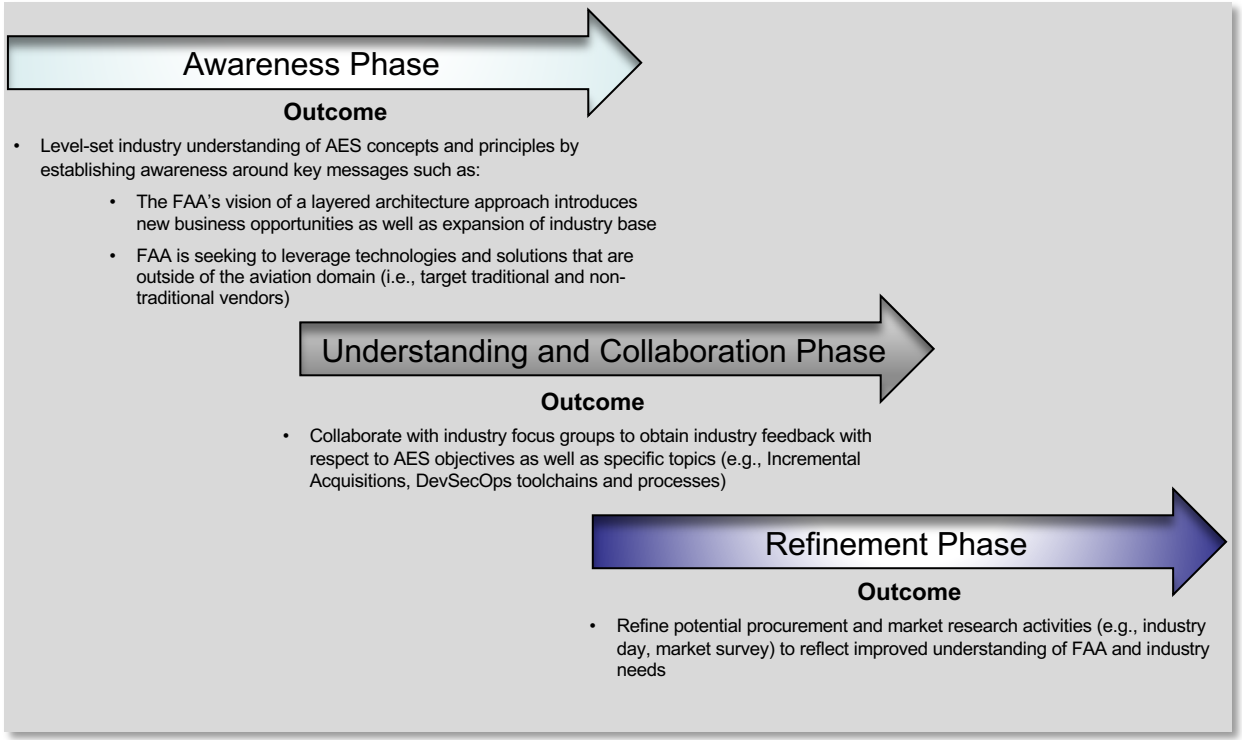


Increased Opportunities for Incremental Agile Development of Applications and Services



- **FAA's Mission Services can be made available to external partners (and vice versa)**
  - Fused data available in meaningful forms
  - Modernized Tech Stack
- **Mission services can be used to rapidly create new applications**
  - For both FAA and external end users
- **Agile framework allows FAA to partner with industry around apps/services**
- **Access to standardized platform lowers the barrier to entry for developers**

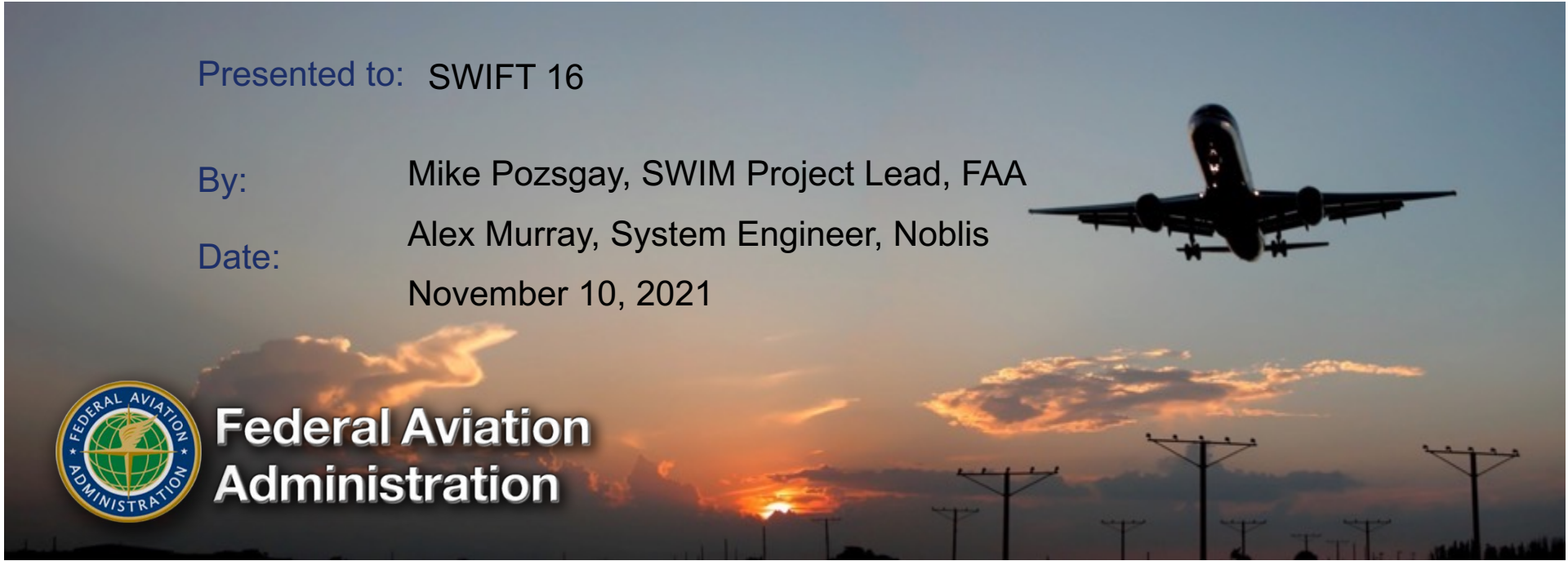
What's Next



- **Defining overall industry engagement activities to:**
  - Improve industry awareness of AES
  - Leverage industry innovations
  - Help shape strategy vision and address key challenges
  - Identify future pathfinder and transition opportunities
- **The FAA is targeting more industry engagement in 2022**

SWIM Cloud Services Update

SCDS, SWIFT Portal and Beyond



Presented to: SWIFT 16

By: Mike Pozsgay, SWIM Project Lead, FAA

Alex Murray, System Engineer, Noblis

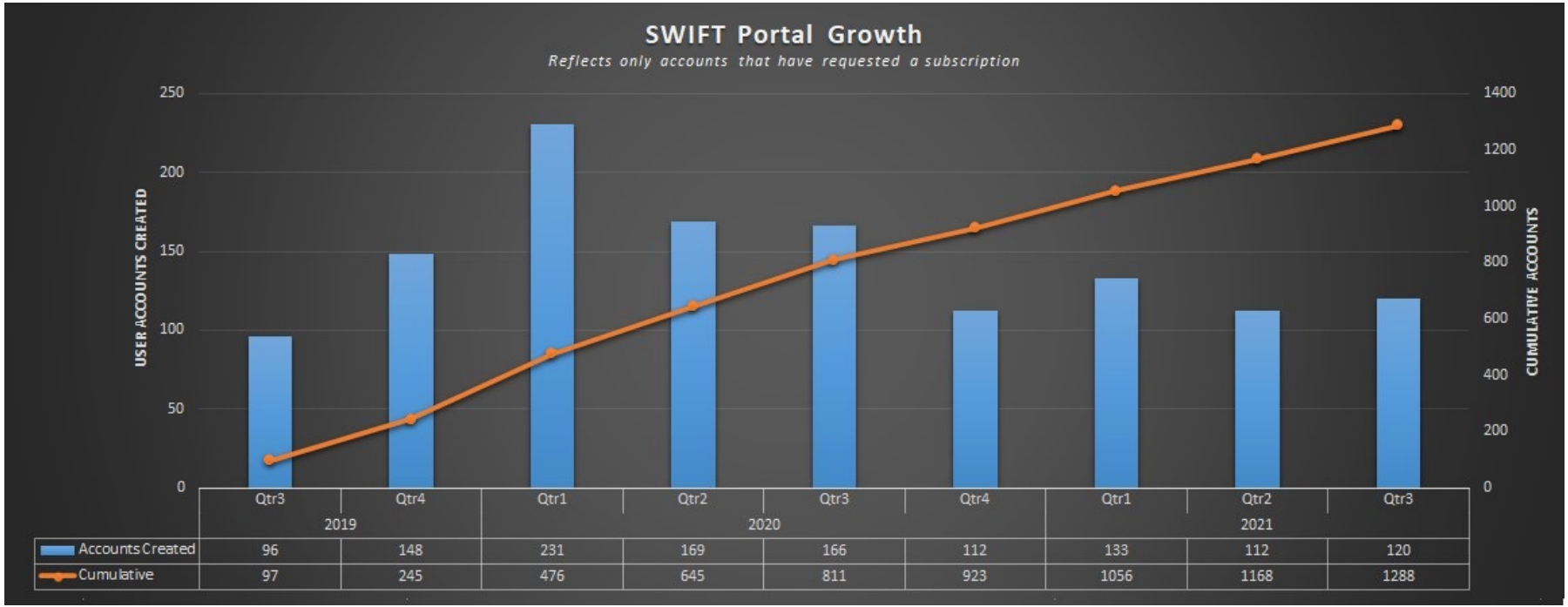
Date: November 10, 2021

Federal Aviation Administration

SWIM Cloud Products Release Overview

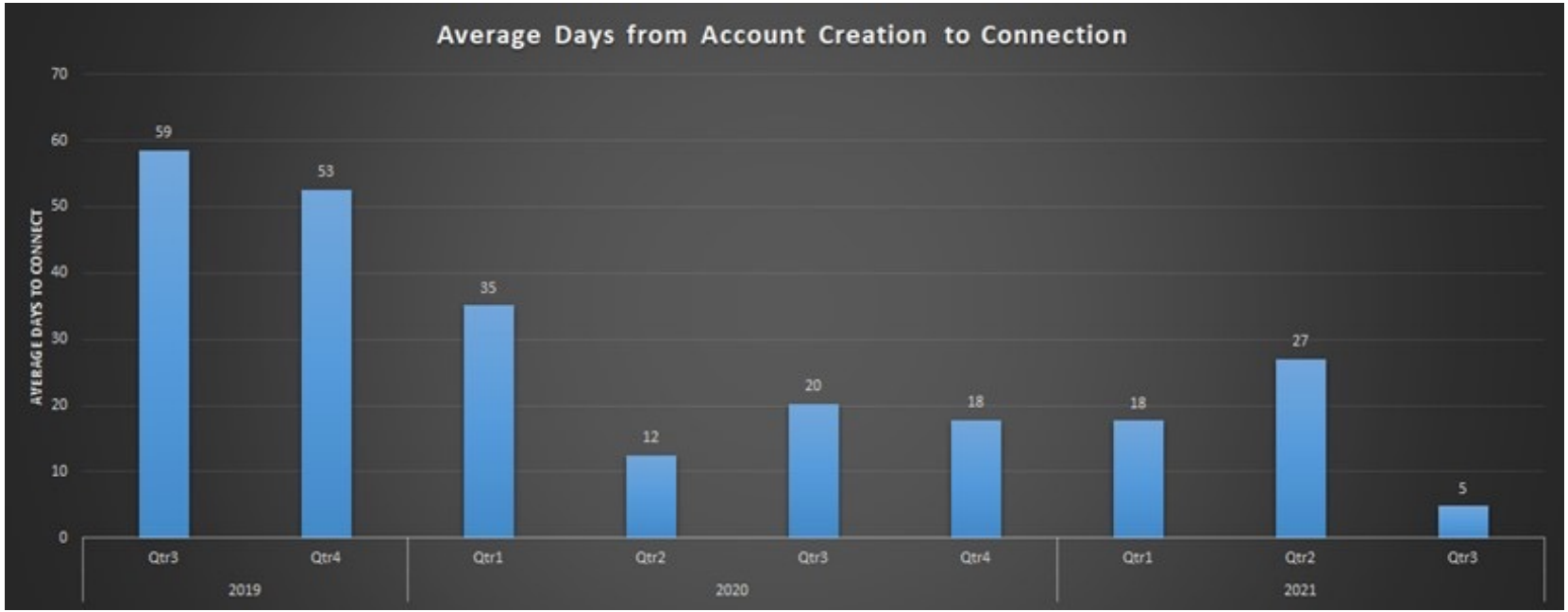
- **SCDS - SWIM Cloud Distribution Service (v1.0)**
  - Released in May 2019
  - Provides near real-time one-way data distribution of SWIM services via the AWS cloud
  - Allowed capability to transfer 50 users from the NESG (NAS Enterprise Services Gateway) to SCDS
  - Significantly reduced connection times (< 2 hrs. currently)

SWIFT Portal User Growth



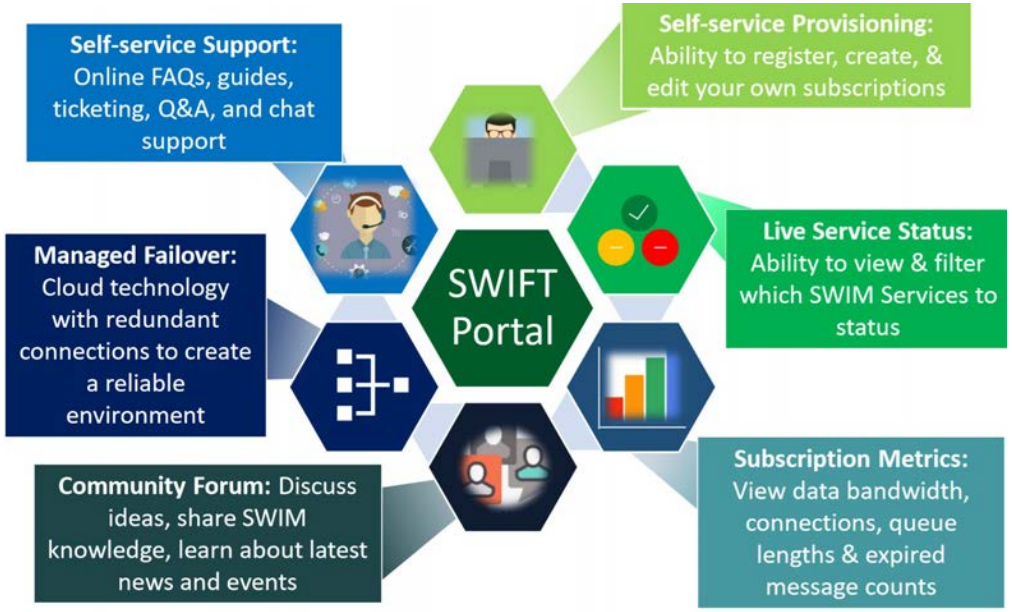
	Qtr3 2019	Qtr4 2019	Qtr1 2020	Qtr2 2020	Qtr3 2020	Qtr4 2020	Qtr1 2021	Qtr2 2021	Qtr3 2021
Accounts Created	96	148	231	169	166	112	133	112	120
Cumulative	97	245	476	645	811	923	1056	1168	1288

Connection Time Improving

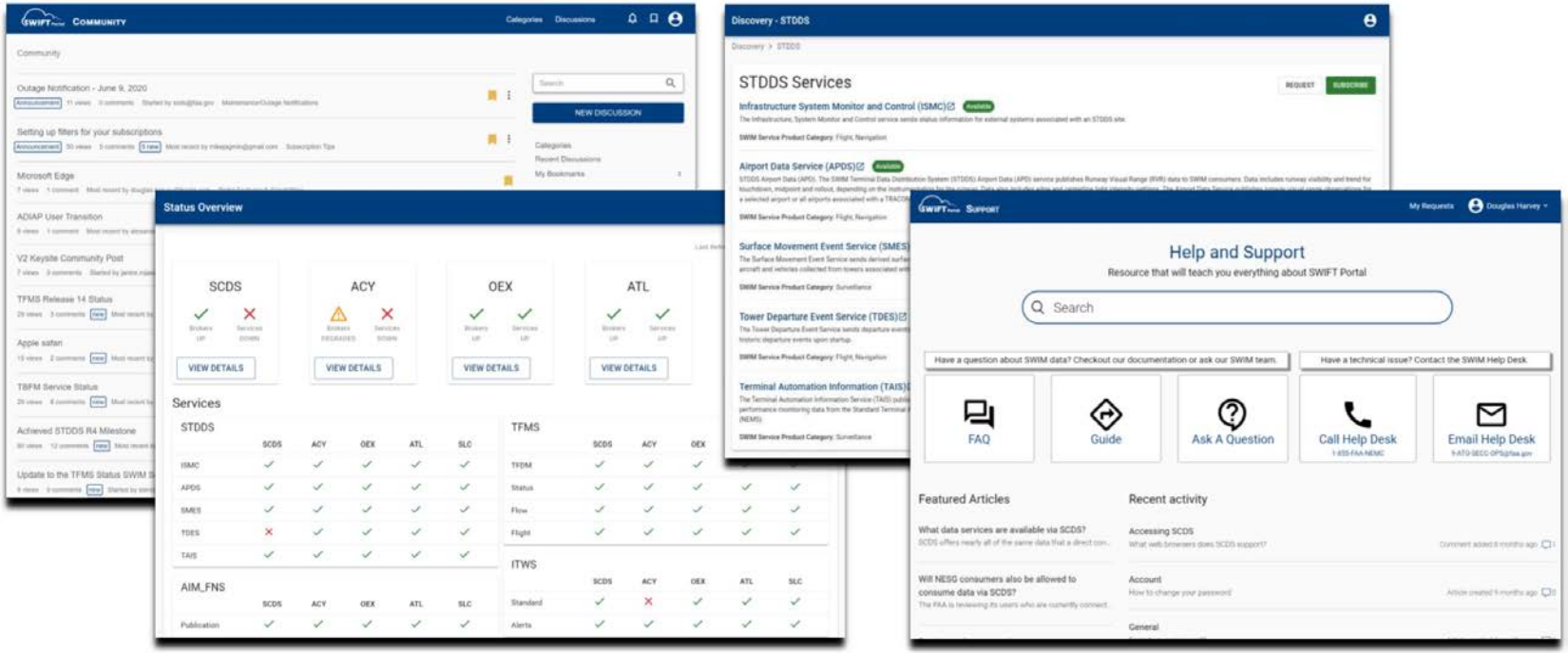


SWIFT Portal

- Considered v2.0 release, introduced significantly enhanced user experience through web portal
- Released in May 2021
- Many features inspired from discussions held in this forum
- Now over 200 users consuming from around 600 subscriptions



SWIFT Portal Demo



SWIM GitHub Overview

SWIM GitHub is Live!

5 Repositories w/ More to Come

SWIM GitHub provides the community with access to reference examples for connecting to and using SWIM services with the aim to make adopting SWIM easier.

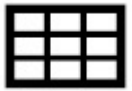
- **swim-utilities**
  - Basic set of utilities to help in working with consuming SWIM data
- **aixm-5.1**
  - Provides Java XML Bindings for the AIXM 5.1 Schema for use with the FAA SWIM FNS Service.
- **jms-client**
  - Provides a very basic JMS Client that simplifies connecting and consuming from FAA SWIM.
- **fns-client**
  - Provides an example implementation on how to establish and maintain a local instance of the FNS NOTAM Database through the use of the FNS Initial Load (FIL) and SWIM FNS JMS services.
- **BasicScdsAmqpDotNetConsumer**
  - Provides a basic example of how to connect to SCDS using AMQP in .net core.

**All code provided through the FAA SWIM GitHub site is for reference use only and the FAA takes no responsibility for its use.*

Upcoming SWIFT Portal Enhancements

Development is underway for additional features for the SWIFT Portal for early 2022 release (v3.0):

Maintenance Events: Information on SWIM Impacting Events; Status Page and Customized Notification Sent to Users



Customized Layout: Ability for user to customize landing page by selecting and arranging portal functions of interest

User Defined Alerting (v3.1): Alert users to changes in the status of selected data services with user customized thresholds; provide alerts within the portal and via email

Additional Future Enhancements

Features anticipated to be released in 2023 (v4.0):

Pre-production data: Provide access to pre-production data for services in R&D and FNTB; continuity of service by allowing users to prepare for release transition

Streamlined Access Agreements Acceptance: Automates and incorporate the service access acceptance process into the SWIFT Portal

SCDS / SWIFT Portal Usage Reminder

Data obtained via SCDS is NOT for operational use

- SCDS is intended for public external SWIM users
- FAA Partners that use SWIM in their operations should still consume data from their legacy NESG connection

SWIM Cloud Services Update

Enhanced SWIM Cloud Service (ESCS)

Presented to: SWIFT 16

By: Ray Mitchell SWIM Services Lead/Systems Engineer &
Hugo Buitano Chief Cloud Architect LST

Date: November 10, 2021

Federal Aviation Administration

Enhanced SWIM Cloud Service (ESCS)

Background:

ESCS supports the business directive to prepare for candidate NAS services to be cloud based in the future. ESCS provides a secure and highly scalable system that can be leveraged in the future to support increasing SWIM business services, mission partners, and consumption of international SWIM providers.

Goal:

Cloud-based ESCS that supports existing two-way messaging capabilities, current SWIM business services, and current mission partners.

Enhanced SWIM Cloud Service (ESCS)

Allows for bi-directional data exchange with airlines and other mission partners to enable operational usage in a cloud environment.

Key Features

ESCS – Capabilities at a glance

- **Improves Efficiency of On-Boarding SWIM Users**
  - Self-service portal for users to request services
  - Auto-provisioning of ESCS services; JMS Queues, Web Service Access, etc.
- **Improves Situational Awareness of Service Status**
  - User portal with visibility into their connections, message rate, drops, etc.
  - Visualization of ESCS services; up, down, degraded, maintenance (Service Status)

Current Methods of Connecting to SWIM Data

	ESCS	SCDS	NESG
Bi-directional data exchange	✓	✗	✓
Data supports operational decision making	✓	✗	✓
Service status awareness	✓	✓	✗
Auto-provisioning of SWIM services	✓	✓	✗
Supports cloud-to-cloud data exchange	✓	✓	✗

ESCS Benefits Evaluation

- **The SWIM program would appreciate your help as we evaluate the costs and benefits of ESCS**
- **We have developed a survey that allows SWIM users to provide an evaluation of the impact of ESCS on their organization**
  - SWIM will be reaching out to organizations within the next week to ask for their participation.
  - If your organization would like to participate in the survey, please contact our survey coordinator at: tmcinerney@regulus-group.com

ESCS Stakeholders

- **FAA internal consumers**
- **External Consumers**
  - Airlines
  - International ANSPs
  - Military

ESCS Key Dates

- **Investment decision targeted for end of FY2022**
- **Planned operational deployment: 2023-24**

National Cloud Integration Services (NCIS)

Cloud and You

NCIS Who We Are

❖ NCIS supports integrating ATO/PMO applications into the cloud

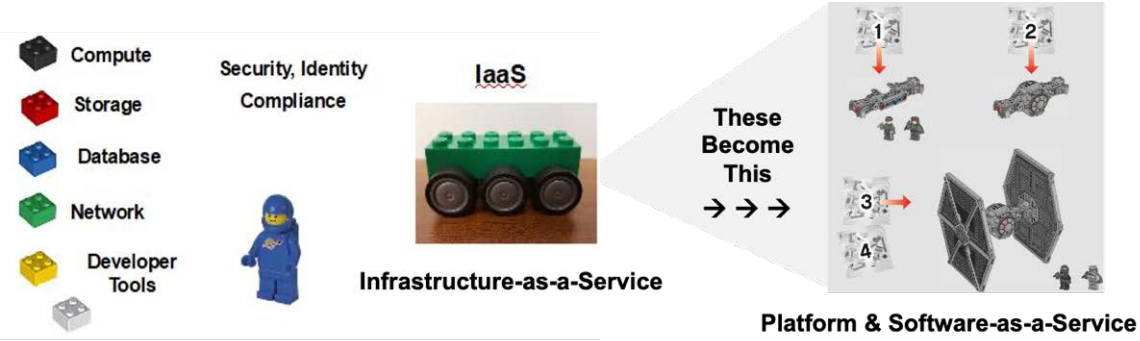
- Supports ATO/PMO programs transitioning to Cloud and Enterprise services
- Builds cloud infrastructure, tools, and process
- Advises programs on cloud and enterprise technologies for optimization and cost efficiency

❖ Goals:

- Commoditize hardware across the agency
- Free programs from worrying about infrastructure
- On demand self service model for computing
- Creating a FAA Compute, data, and process Ecosystem
- Shifts IT spending to OpEx rather than Cap Ex

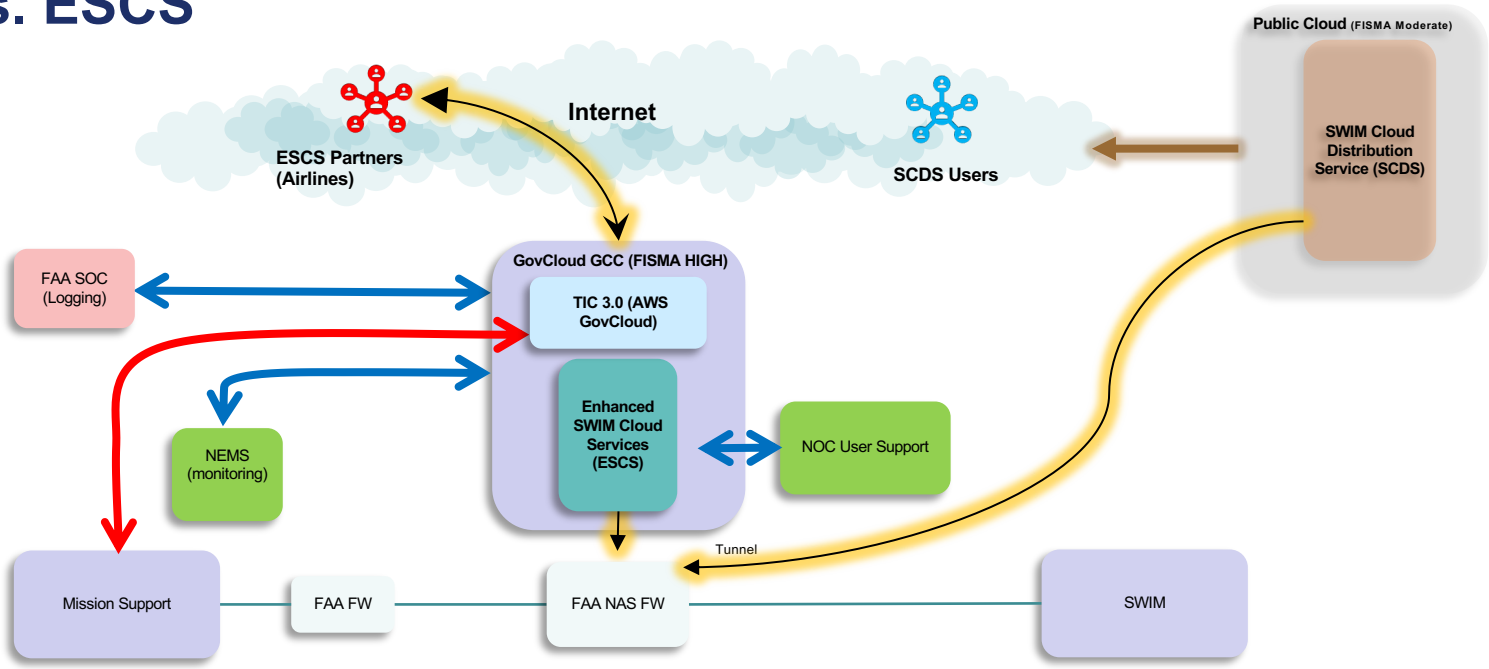
- Goals as cited from NIST SP 800-145

Viewing Things as Enterprise Lego Pieces, "Brick by Brick"



- Vision to have agency offer standardized, secure assets in an authorized environment such as:
  - Compute/Storage
  - Data
  - API's
  - Cloud Services (web, database, etc.)
- Standardized services and infrastructure afford a program to focus on their system development and meeting milestones

SCDS vs. ESCS

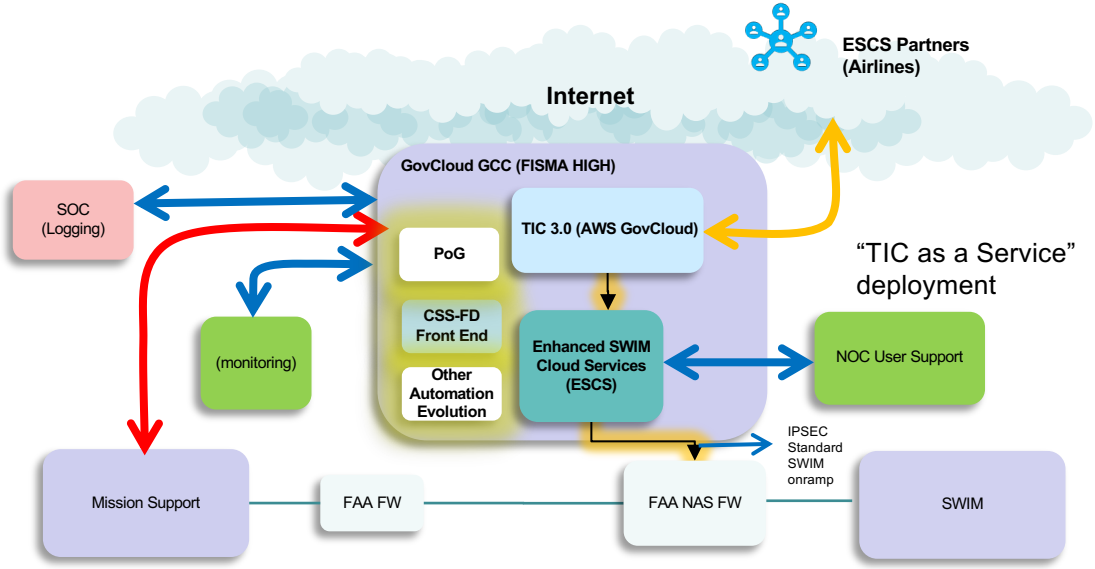


- **SCDS was deployed and categorized as FISMA Low system in Medium environment and leverages TIC 2.X infrastructure**
- **ESCS will be deployed in GovCloud at FISMA High and leverages TIC 3.0**

ESCS Needs and Challenges

- **Evolution needs for ESCS**
  - ESCS will be an application where Airlines and Aviation Partners (i.e., ANSP's, etc.) will subscribe and publish SWIM data into a cloud environment
  - ESCS will leverage the NESG for SWIM data
  - ESCS was determined to meet requirements of FISMA High deployment, since Airlines and Aviation partners will be using this data in day-to-day operations
    - The existing SCDS system only provides advisory/awareness and is rated FISMA Low
- **TIC 3.0 Challenges**
  - TIC 3.0 is abstract guidance provided by CISA that is environment agnostic and adaptable, as opposed to previous rigid TIC requirements
  - TIC 3.0 requires new FAA viewpoints, ideas and collaboration to confirm a design that was unprecedented for the FAA and its internet edge
- **Cloud to Cloud Connectivity/Secure connection**
  - Interfacing with ESCS will be simple for airlines
  - No complicated VPNs or on-boarding needed to start receiving FAA data
  - All connections transit and are secured by TIC 3.0

TIC 3.0 and NAS Scalability



- **FAA is building, expanding, and integrating NAS Cloud Initiatives with external and internal partners**
- **Reliable, cost effective, and expanded connectivity options for FAA systems and data**
- **Leveraging cloud resources allows for scaling**

Forecasting Tomorrow's Expectations, Today

- **TIC 3.0 Benefits:**
  - Gives the FAA and external partners a scalable, secure cloud-based internet interface
  - Leveraging cloud relieves onboarding complexity for FAA as well as Aviation Mission Partners
  - Easily replicated deployments to Operations using automation evolution principles, essential for the FAA NAS Cloud
  - FAA systems will continue to grow in availability and resiliency by using cloud service providers for internet edge

- **NAS Cloud Benefits:**
  - Cloud to cloud connections for airlines makes interfacing with FAA simple
  - Repeatable, immutable, baselined deployments under a common authorization model
  - ESCS establishes a framework for Flight Data and Precipitation on Glass (and other future FAA and external partner programs) to modernize their applications and leverage Cloud authorizations
  - FAA is incorporating cloud into the Automation Evolution Strategy

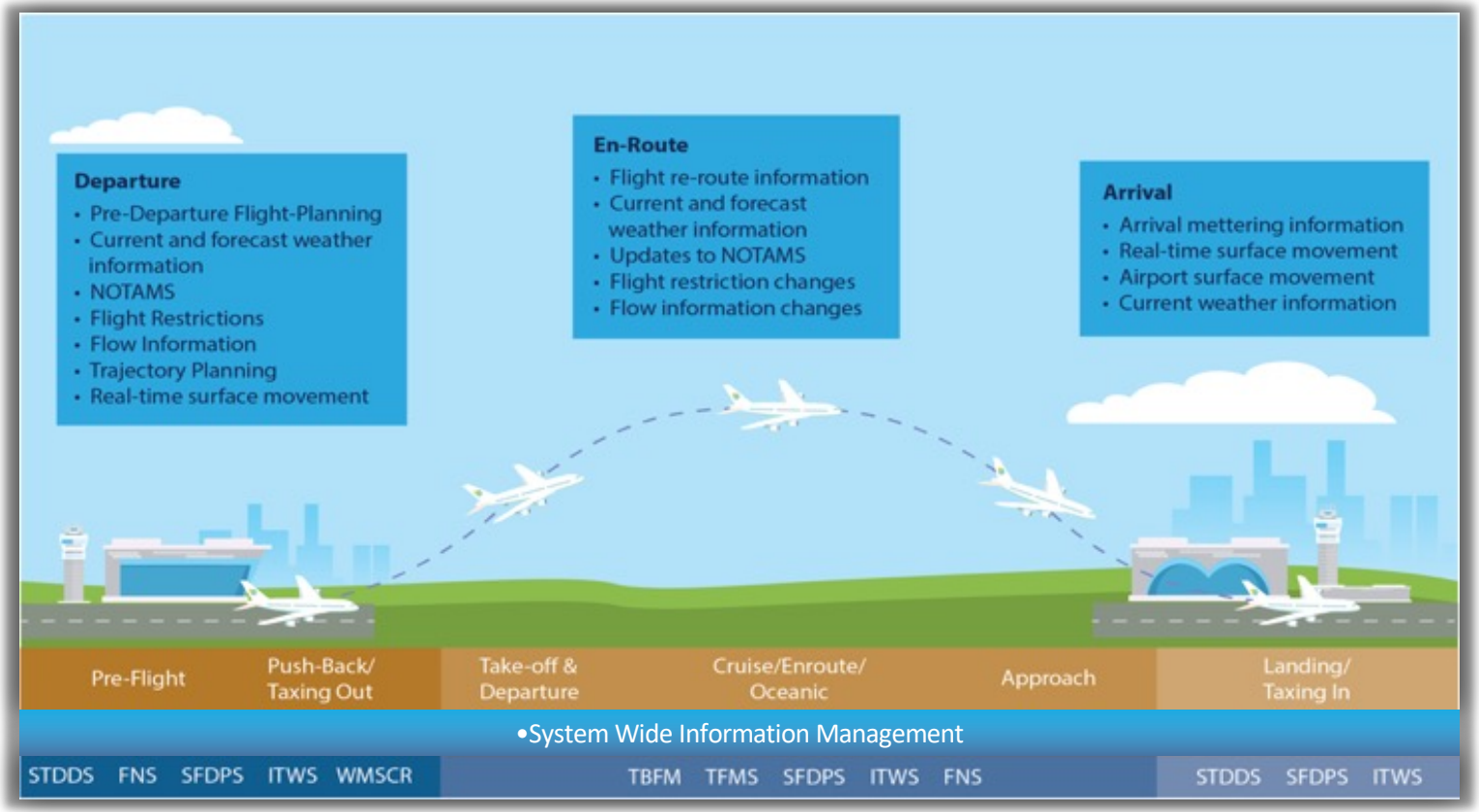
Information Services Roadmap

SWIFT 16 Update

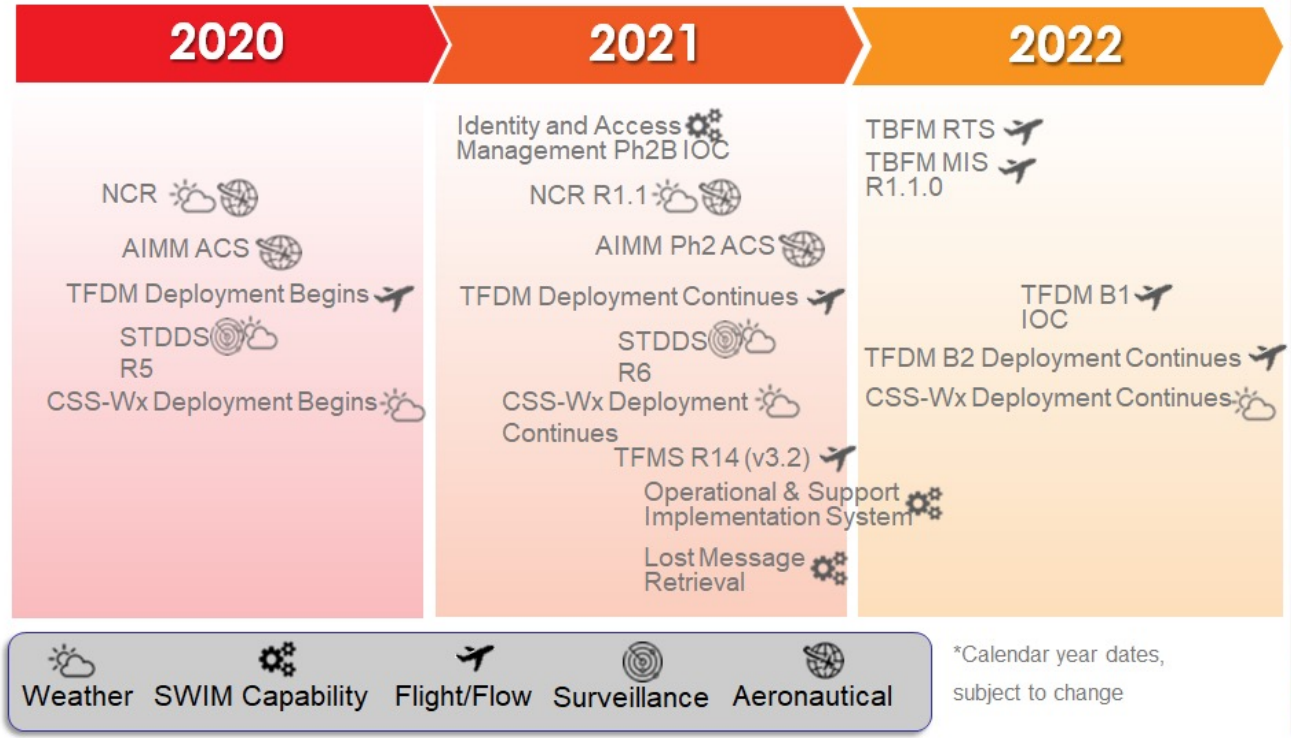
Presenter: Xavier Pratt – LS Technologies

Date: November 10, 2021

SWIM Services By Phase of Flight



SWIM Services Deployment (Near-Term)



*Calendar year dates, subject to change

What's New?

***IAM*: Ph2B IOC Mar 2021.** Digital authentication certificate service between NAS systems and external users.

***NCR*: R1.1 completed Aug 2021 for internal users.** Integrates NAS status information with AI and TMI constraint data.

***STDDS*: Ph2R6 completed Sep 2021.** Includes TAIS message enhancements, publish additional TDLS messages, and SMES runway event and CAT10 enhancements

***AIMM ACS*: Ph2 completed Sep 2021.** Feature requests via WFS and Data Query Service. Aeronautical information and mapping features via WMTS and WMS.

***SFDPS*: R1.5.0 completed Oct 2021.** Flight Plan, Route Status and SAA revised schema.

***OASIS*: Targeting Nov 2021.** Supports FAA Flight Service Specialists in providing weather briefing and FP services to GA pilots.

***TFMS*: TFMS R14 deployed Oct 2021.** *New* TFMData Schema version for R14 is v3.2. Includes TFMData v3.2 to v2.0.5 mediation.

***LMR*: Targeting Late Fall 2021. Available via NAS and NESG. Published as service in NSRR.** Request lost messages due to interrupted SWIM connection

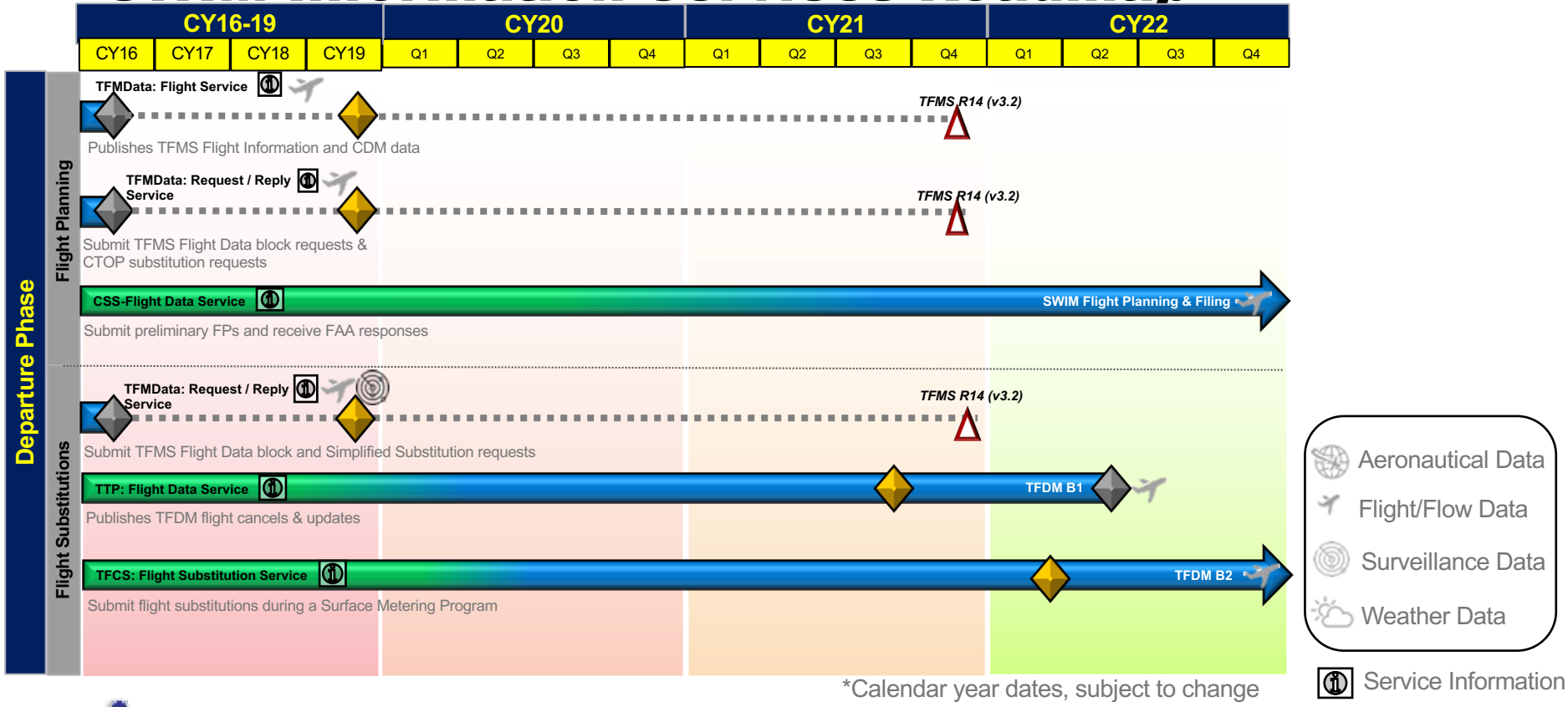
***TBFM MIS*: R1.1.0 targeting Spring 2022.** New JMS properties for message routing based on additional A/C data attributes,.

***TFDM Build 1 (PHX)*: IOC Summer 2022.** Includes TTP service & improved electronic flight strips.

***TFDM Build 2 (CLT)*: Includes TTP & TFCS services, targeting Summer 2023.**

***CSS-Wx*: Benefits analysis. Targeting IOC 2024.**

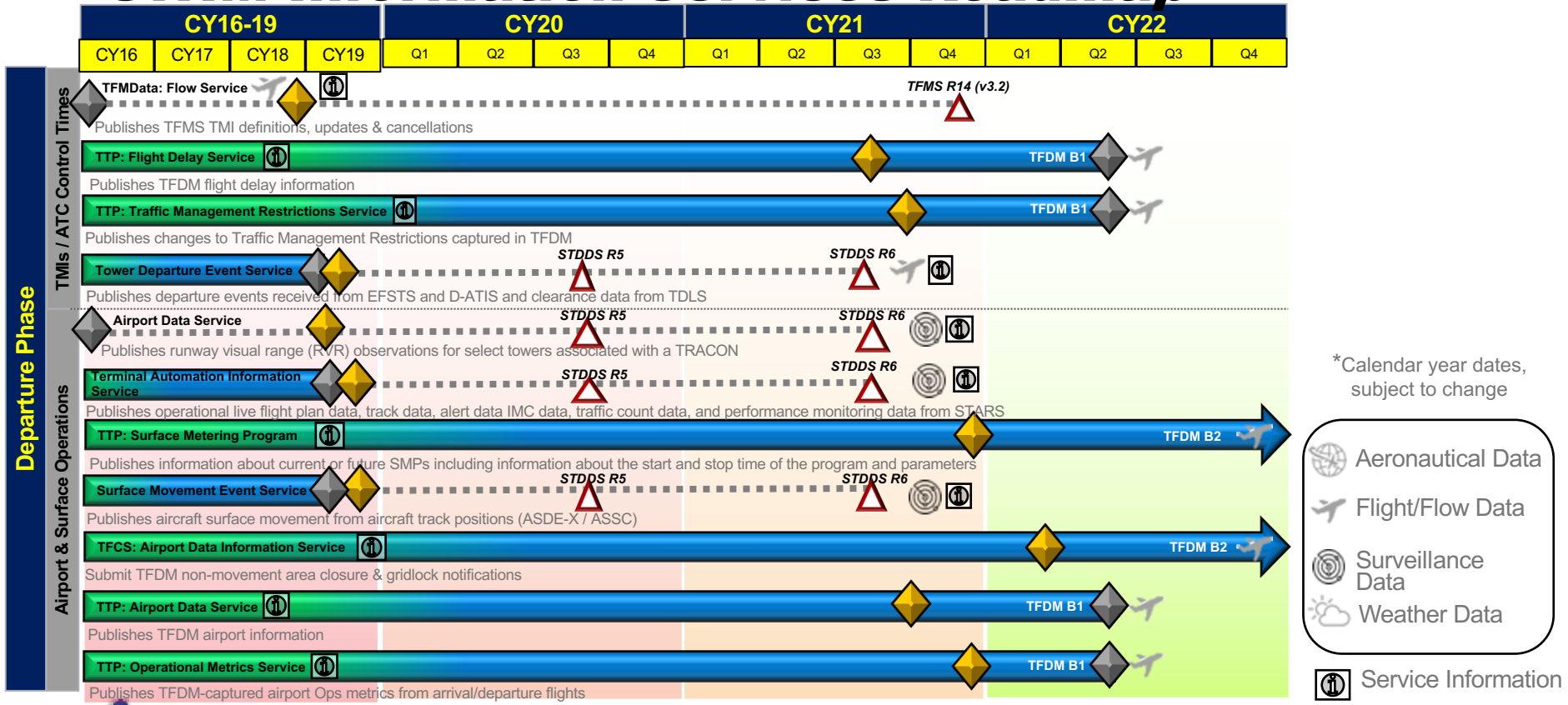
SWIM Information Services Roadmap



*Calendar year dates, subject to change

Legend:
Analysis/Design Phase
Implementation/Development Phase
Service Available
Ops Context Document Available
Service Update Available

SWIM Information Services Roadmap

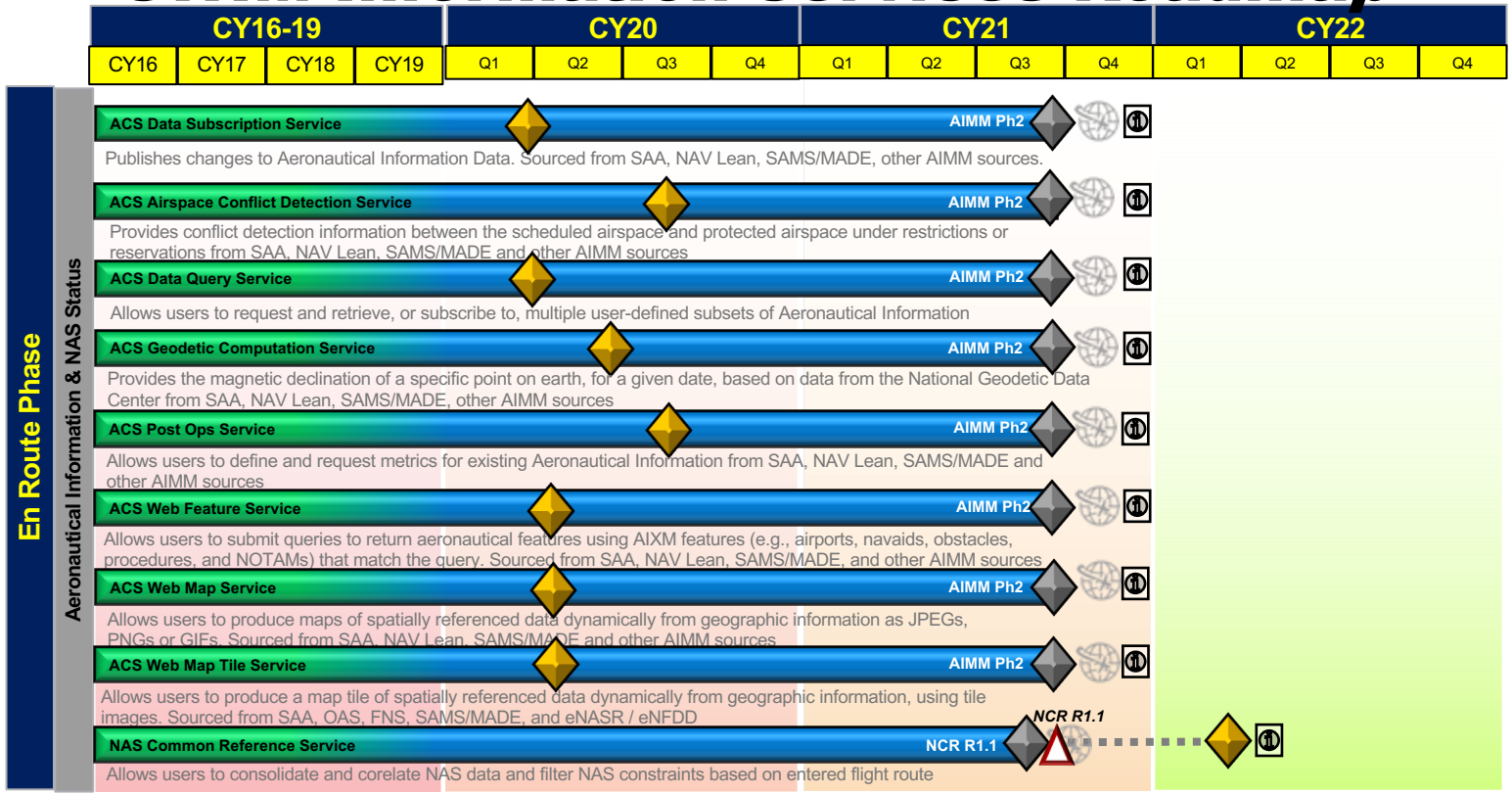


*Calendar year dates, subject to change

- Aeronautical Data
- Flight/Flow Data
- Surveillance Data
- Weather Data

Service Information

SWIM Information Services Roadmap



*Calendar year dates, subject to change

- Aeronautical Data
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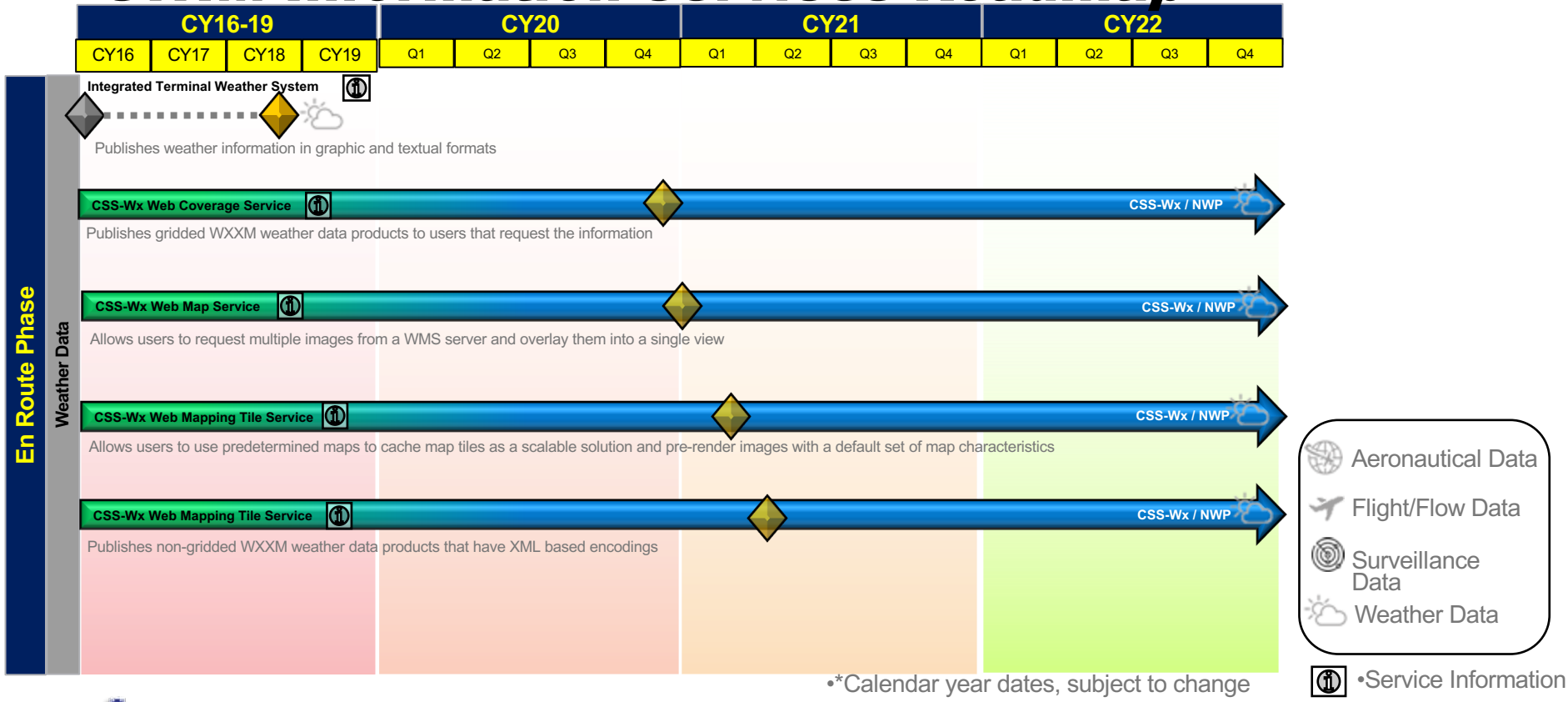
- Weather Data

Service Information

SWIM Information Services Roadmap



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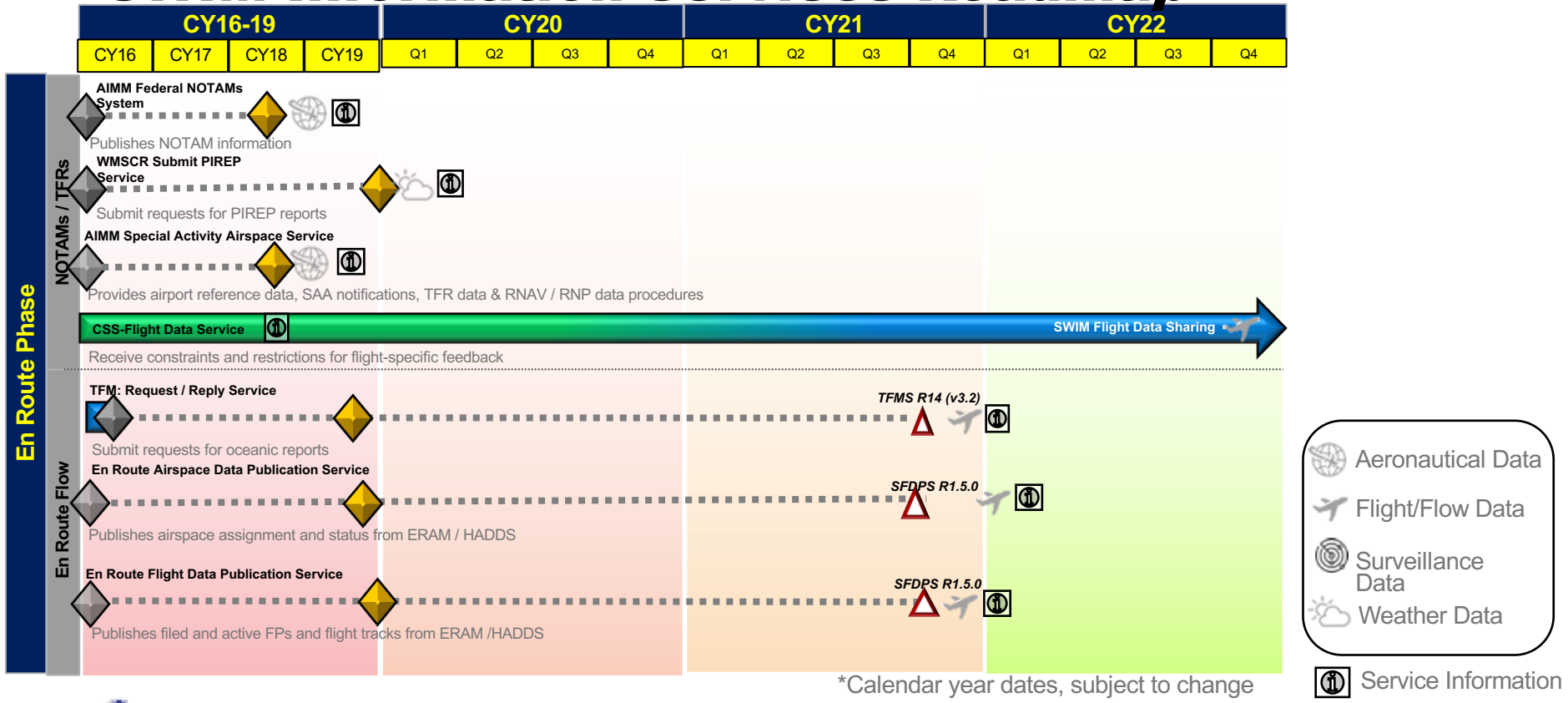
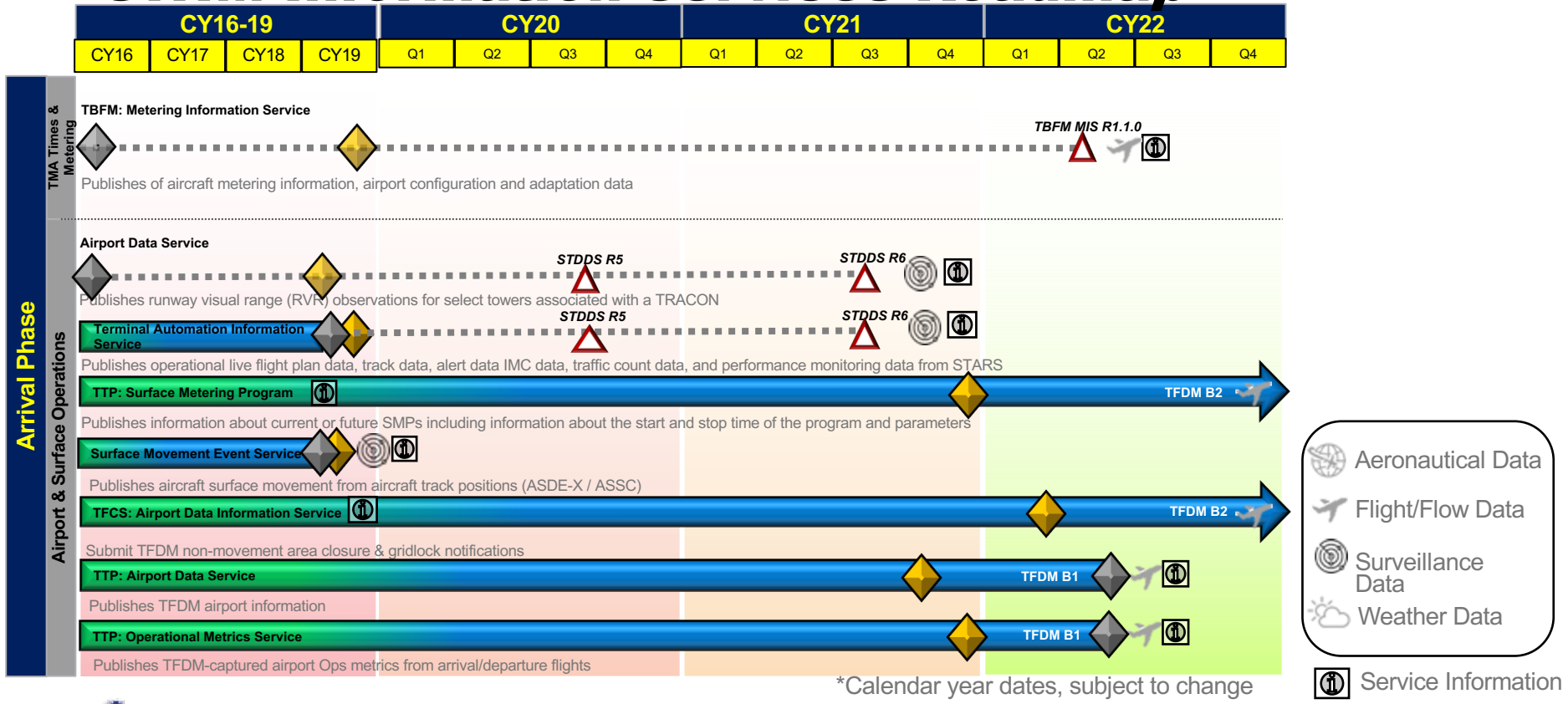


SWIM Information Services Roadmap



Final Announcements

SWIFT #17 Virtual Workshop

Date

- **Targeting March**

Location

- ***TBD Face to Face possible online option***

SWIFT Site Information

SWIFT@faa.gov
- Any SWIFT-related questions
- Sign up for SWIFT mailing list

https://www.faa.gov/air_traffic/technology/swim/swift
- Register for future SWIFT meetings
- Stay up to date with SWIFT
- Past meeting slides

SWIFT Contact Information

SCAN ME

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Back Up Slides

NY Area Case Study

Information Gaps SWIM Data (Summary)

Identified Information Gap during IROP Event	Relevant SWIM Service	Impacted NAS Stakeholder	Disrupted Operation
Need to aggregate data on DEP fix constraints to support alerting around crew issues.	SFDPS – En Route Airspace Data Publication	Flight Operator	Departure Deviations
Speed restrictions may be imposed at ARTCC when traffic begins to flow off-nominally. In certain cases, this may not be communicated to TRACON. In this case, speed restrictions could be deduced from the radar view (e.g. observing ground speeds).	SFDPS – En Route General Data	ATC, ARTCC & TRACON	Departure Deviations
Knowledge of where a pop-up storm could develop that could lead to deviations on a route. We could then coordinate ways around the weather, or ways outbound. Knowledge of when to reroute flights on the ground waiting; estimates on how long fixes would be impacted to make use of all available routes. This supports decision points for dispersing traffic over multiple available fixes.	TFMData: Flow, TFM:Data Flight, Integrated Terminal Weather System (ITWS)	ATC TRACON	Departure Deviations
Need to understand when and why ATC issues flight reroutes or events that involve changing a flight trajectory (e.g. DEP fix, ARR fix, waypoints)	SFDPS – En Route Flight Data Query, TFMData: Flow	Flight Operator	Arrival Deviations
During severe weather, we would want to move traffic out of ZNY, away from departures. Given ZNY tight route structure and coordination, we must know when and where to cut off the line and reroute flights..	SFDPS – En Route Flight Data, TBFM Metering Information Service, ITWS	ATC ARTCC & TRACON	Arrival Deviations
During weather events, we would typically restrict the entire flow into ZNY airports (e.g. AFPs, GDPS, etc.), but sometimes only the southern routes require restrictions. Combining routes (which is difficult to do in TRACON space) is something that wasn't done enough. ZDC does this routinely, which also helped manage flows into EWR and LGA without needing a GDP (ZNY-bound flights).	TFMData: Flow, SFDPS – En Route Data Airspace Query	ATC TRACON	Arrival Deviations

SFPDS Flight & Airspace Data Messages

SWIM Flight Data Publication Service (SFDPS)*: Provides flight data and updates to clients for filed and active flight plans

✓	Flight Plan information	✓	Tentative Aircraft identification Amendment Information
✓	Flight Amendment Information	✓	Tentative Flight Plan Removal
✓	Converted Route Information	✓	Tentative Flight Plan Amendment Information
✓	Cancellation Information	✓	Track Information
✓	Departure Information	✓	Drop Track Information
✓	Aircraft Identification Amendment Information	✓	Interim Altitude Information
✓	Hold Information	✓	Automated Radar Terminal System (ARTS) Flow Control Track/Full Data Block Information
✓	Progress Report Information	✓	Beacon Code Reassignment
✓	Flight Arrival Information	✓	Beacon Code Restricted
✓	Flight Plan Update Information	✓	Flight Plan Data Bank (FDB) Fourth Line Information
✓	Expected Departure Time Information	✓	Point Out Information
✓	Position Update Information	✓	Inbound Point Out Information
✓	Tentative Flight Plan Information	✓	Handoff Status

Airspace Data Publication Service*: Published by SFDPS

✓	Sector Assignment Status	✓	Special Activities Airspace (SAA)
✓	Route Status	✓	Altimeter Setting

Operational Data Publication Service*: Published by SFDPS

✓	Traffic Count Adjustment	✓	Beacon Code Utilization
✓	Instrument Approach Count Adjustment	✓	Geographic Beacon Code Utilization
✓	Sign In Sign Out		

General Information Message Publication Service*: Published by SFDPS

✓	General Information

ITWS Data Messages

Weather Data	
Integrated Terminal Weather System (ITWS) Data Publication: Provides specialized weather products in the terminal area	
✓ Configured Alerts	✓ Tornado Detections Wind Profile
✓ Forecast Accuracy	✓ Anomalous Propagation (AP) Indicated Precipitation
✓ Forecast Contour	✓ AP Status
✓ Forecast Image	✓ Gust Front Estimated Time to Impact
✓ Gust Front TRACON Map	✓ Hazard Text 5nm
✓ Microburst TRACON Map	✓ Hazard Text Long Range
✓ Precipitation 5nm	✓ Hazard Text TRACON
✓ Precipitation Long Range	✓ ITWS Status Information
✓ Precipitation TRACON	✓ Microburst Automatic Terminal Information Service (ATIS)
✓ Storm Motion (SM) Storm Extrapolated Positions (SEP) 5nm	✓ Runway Configuration
✓ SM SEP Long Range	✓ Storm Motion 5NM
✓ SM SEP TRACON	✓ Storm Motion TRACON
✓ Terminal Weather Text Normal	✓ Terminal Weather Text Special
✓ Tornado Alert	✓ Wind Shear ATIS

Information Services Roadmap

ITWS

•Back to Roadmap

Service Description

- ITWS receives data from a variety of weather and surveillance radars and sensors and converts this data to a format understandable by various software components able to present current weather information in graphic and text formats.

Service Interface

- Publish/Subscribe via JMS

Message Sets

Weather Data	
Integrated Terminal Weather System (ITWS) Data Publication: Provides specialized weather products in the terminal area	
✓ Configured Alerts	✓ Tornado Detections Wind Profile
✓ Forecast Accuracy	✓ Anomalous Propagation (AP) Indicated Precipitation
✓ Forecast Contour	✓ AP Status
✓ Forecast Image	✓ Gust Front Estimated Time to Impact
✓ Gust Front TRACON Map	✓ Hazard Text 5nm
✓ Microburst TRACON Map	✓ Hazard Text Long Range
✓ Precipitation 5nm	✓ Hazard Text TRACON
✓ Precipitation Long Range	✓ ITWS Status Information
✓ Precipitation TRACON	✓ Microburst Automatic Terminal Information Service (ATIS)
✓ Storm Motion (SM) Storm Extrapolated Positions (SEP) 5nm	✓ Runway Configuration
✓ SM SEP Long Range	✓ Storm Motion 5NM
✓ SM SEP TRACON	✓ Storm Motion TRACON
✓ Terminal Weather Text Normal	✓ Terminal Weather Text Special
✓ Tornado Alert	✓ Wind Shear ATIS

SFDPS - *En Route Flight Data Publication (ERFDP)*

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Service Description

– The En Route Flight Data Publication Service publishes flight plan, track, and other flight-related messages. Data published are derived completely from Common Message Set (CMS) messages received by SWIM Flight Data Publication Service (SFDPS) from the Host Air Traffic Management (ATM) Data Distribution System (HADDS) at each of the Contiguous United States (CONUS) Air Route Traffic Control Centers (ARTCCs). The source of the data received by HADDS is the En Route Automation Modernization (ERAM) at the ARTCC.

Service Interface

– Publish/Subscribe via JMS
– Request via SOAP WS with Replay via Subscribe JMS

Message Sets

SWIM Flight Data Publication Service (SFDPS)*: Provides flight data and updates to clients for filed and active flight plans

✓	Flight Plan information	✓	Tentative Aircraft identification Amendment Information
✓	Flight Amendment Information	✓	Tentative Flight Plan Removal
✓	Converted Route Information	✓	Tentative Flight Plan Amendment Information
✓	Cancellation Information	✓	Track Information
✓	Departure Information	✓	Drop Track Information
✓	Aircraft Identification Amendment Information	✓	Interim Altitude Information
✓	Hold Information	✓	Automated Radar Terminal System (ARTS) Flow Control Track/Full Data Block Information
✓	Progress Report Information	✓	Beacon Code Reassignment
✓	Flight Arrival Information	✓	Beacon Code Restricted
✓	Flight Plan Update Information	✓	Flight Plan Data Bank (FDB) Fourth Line Information
✓	Expected Departure Time Information	✓	Point Out Information
✓	Position Update Information	✓	Inbound Point Out Information
✓	Tentative Flight Plan Information	✓	Handoff Status

•**Latest News**

- **SFDPS R1.5.0 Preliminary deployment completed October 2021**
  - Update SFDPS software: SFDPS OARS table allowing current available data fields to be delivered to SFDPS from ERAM. Correct software defects tracked with Jira Tracking Tool. Flight Plan, Flight Plan Amendment and Flight Plan Update
  - Data Base Reconstitution: Flight Plan and Track

SFDPS - *En Route Airspace Data Publication (ERADP)*

•Back to Roadmap

Service Description

- The En Route Airspace Data Publication service publishes route, sector, altimeter setting, and special activities airspace information. Data published are derived completely from Common Message Set (CMS) messages received by SWIM Flight Data Publication Service (SFDPS) from the Host Air Traffic Management (ATM) Data Distribution System (HADDS) at each of the 20 Contiguous United States (CONUS) Air Route Traffic Control Centers (ARTCCs). The source of the data received by HADDS is the EnRoute Automation Modernization (ERAM) at the ARTCC.

Service Interface

- Publish/Subscribe via JMS
- Request via SOAP WS with Replay via Subscribe JMS

Message Sets

Airspace Data Publication Service*: Published by SFDPS			
✓	Sector Assignment Status	✓	Special Activities Airspace (SAA)
✓	Route Status	✓	Altimeter Setting
Operational Data Publication Service*: Published by SFDPS			
✓	Traffic Count Adjustment	✓	Beacon Code Utilization
✓	Instrument Approach Count Adjustment	✓	Geographic Beacon Code Utilization
✓	Sign In Sign Out		
General Information Message Publication Service*: Published by SFDPS			
✓	General Information		

•**Latest News**

- **SFDPS R1.5.0 Preliminary deployment completed October 2021**
- Update SFDPS software: SFDPS OARS table allowing current available data fields to be delivered to SFDPS from ERAM. Correct software defects tracked with Jira Tracking Tool.
  - Route Status messages: Provides an increase in a data field
  - Data Base Reconstitution: Route Status
  - Special Activity Airspace (SAA): Updated with additional data to reflect expanded controller changes to SAA schedules

SFDPS - *En Route General Message Publication (ERGMP)*

•Back to Roadmap

Service Description

- The En-Route General Message Publication Service publishes general information and status messages. Data published are derived completely from Common Message Set (CMS) messages received by SWIM Flight Data Publication Service (SFDPS) from the Host Air Traffic Management (ATM) Data Distribution System (HADDS) at each of the Contiguous United States (CONUS) Air Route Traffic Control Centers (ARTCCs). The source of the data received by HADDS is the En Route Automation Modernization (ERAM) at the ARTCC.

Service Interface

- Publish/Subscribe via JMS
- Request via SOAP WS with Replay via Subscribe JMS

Message Sets

Message Name	Description	Supported Properties
ERAM Status Information	The ERAM Status Information message is sent when an ERAM status change occurs.	SourceFacility
General Information	A general information message is used to communicate a free-form text message from one facility to one or more other facilities. The content of the message is free-form text, contained in an inter-facility remarks field.	
Hold Status Information	The Hold Status Information message provides hold information (holding fix, and estimated fix departure time for definite-duration holds) on all active aircraft to a client during the initialization process.	
Interim Altitude Status Information	The Interim Altitude Status Information message provides interim altitude status information on all active aircraft to a client during the initialization process.	
Unsuccessful Transmission Information	The Unsuccessful Information Transmission (UI) message is sent by ERAM when transmission of flight data to a remote facility is unsuccessful either due to a transmission error or because transmission of the flight data to the remote facility is inhibited.	

STTDS - *Airport Data Service (APDS)*

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Service Description

- STDDS Airport Data (APD). The SWIM Terminal Data Distribution System (STDDS) Airport Data (APD) service publishes Runway Visual Range (RVR) data to SWIM consumers. Data includes runway visibility and trend for touchdown, midpoint and rollout, depending on the instrumentation for the runway. Data also includes edge and centerline light intensity settings.

Service Interface

- Publish/Subscribe via JMS

Message Sets

Message Name	Description	Supported Properties
RVR Data Update Message	Sent periodically (nominally every 60 seconds) and upon change of any published fields received from RVR.	airport

WMSCR – *Submit PIREP Service*

•Back to Roadmap

Service Description

- The Weather Message Switching Center Replacement System (WMSCR) collects, processes, stores, and disseminates textual aviation weather products such as PIREPs and Altimeter data.

Service Interface

- Publish/Subscribe via JMS

Message Sets

WMSCR PIREP Data Publication	• PIREPs	• Altimeter settings

STTDS – *Tower Departure Event Service (TDES)*

•Back to Roadmap

Service Description

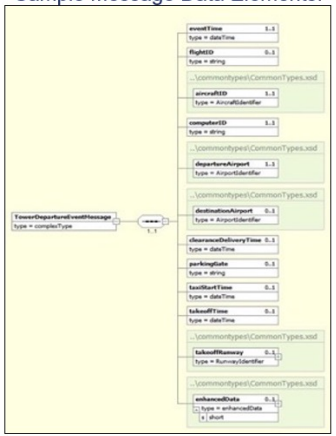
- STDDS Airport Data (APD). The SWIM Terminal Data Distribution System (STDDS) Airport Data (APD) service publishes Runway Visual Range (RVR) data to SWIM consumers. Data includes runway visibility and trend for touchdown, midpoint and rollout, depending on the instrumentation for the runway. Data also includes edge and centerline light intensity settings.

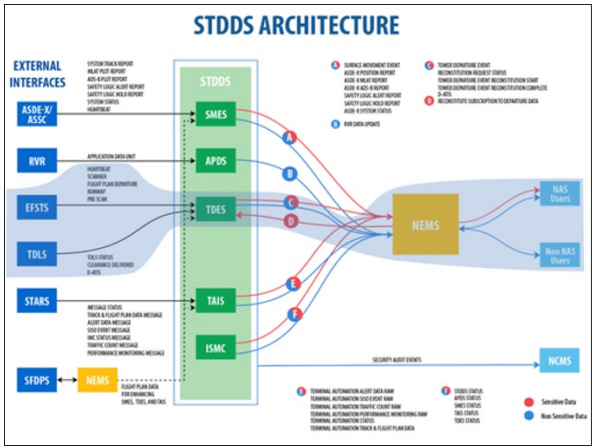
Service Interface

- Publish/Subscribe via JMS

Message Sets

Sample Message Data Elements:





•Latest News

•STDDS Ph2R6 completed September 2021

- Publish additional TDLS data in TDES messages
  - Adds beacon code, ECID and aircraft type from TDLS to all TDES messages except the D-ATIS message.
- Parse and publish entire dataHeader in DATISMessage
  - Includes the Data Type, ATIS code, and Data Generation Timestamp found in the DATIS message header –
  - R6 will continue publishing the dataHeader field containing raw D-ATIS data, for backwards compatibility.

STTDS – *Surface Movement Event Service (SMES)*

•Back to Roadmap

Service Description

- The Surface Movement Event Service sends derived surface movement events for all aircraft monitored at select towers associated with a TRACON. In addition, the service sends ASDE-X/ASSC track positions for all aircraft and vehicles collected from towers associated with a TRACON.

Service Interface

- Publish/Subscribe via JMS

Message Sets

Message Name	Description	Supported Properties
ASDEX Message	Sent upon the receipt of a System Track message, a Status message, an ADS-B Plot Report, or a MLAT Plot Report from ASDE-X or ASSC. The MsgType indicates the type of message as follows: AT – PositionReport AY – SystemStatus AD - adsbReport ML - mlatReport	airport
Safety Logic Alert Report	Sent upon the receipt of a Safety Logic Alert Report from ASDEX or ASSC.	
Safety Logic Hold Bar Message	Sent periodically (nominally every 60 seconds) and upon change of any published fields received from ASDE-X or ASSC.	
Surface Movement Event Message	Provides surface movement events derived from ASDE-X or ASSC position data.	

•Latest News

- **STDDS Ph2R6 completed September 2021**
- Enhance SMES with 2 additional airport movement events:
  - Runway in—target has entered the geographical boundaries (lat/lon) of a runway
  - Runway out—target has exited the geographical boundaries (lat/lon) of a runway
- Add *_COVAR and DF type fields to the MLAT and ADSB CAT10 messages to improve track precision measure
- Extend SFDPS data enhancement to the ASDE-X/ASSC CAT10 data (MLAT and ADSB messages)

STTDS – *Terminal Automation Information Services (TAIS)*

•Back to Roadmap

Service Description

- The Terminal Automation Information Service (TAIS) publishes operational live flight plan data, track data, alert data, Instrument Meteorological Conditions (IMC) data, traffic count data, and performance monitoring data from the Standard Terminal Automation Replacement System (STARS) to authorized SWIM service consumers.

Service Interface

- Publish/Subscribe via JMS

Message Sets

Message Name	Description	Supported Properties
TA Status	STARS status sent periodically (nominally every 60 seconds) and upon change of any published fields received from STARS.	Source Tracon
TA Track and Flight Plan	A package of track and flight plan data. Only track data with altitude below an adaptable threshold (nominally 18000ft) is published.	
TA Raw	Full base64 encoded contents of a STARS AIG message. The MsgType indicates the type of AIG message as follows: AR – Alert Data SI – SISO Event IR – IMC Status CR – Traffic Count Data PR – Performance Monitoring Data	

•**Latest News**

- **STDDS Ph2R6 completed September 2021**
  - Reduce flight plan repetition –
  - Add rawFlightRules field to TerminalAutomationFlightPlan message
    - rawFlightRules can contain more than ‘V’ for VFR, ‘P’ for VFR on Top, and ‘E’ for Enroute IFR (site adapted)

AIMM – *Aeronautical Common Services (ACS)*

•Back to Roadmap

Service Description

- AIMM Phase 2 is leveraging the prior aeronautical information modernization efforts to provide a common platform via the ACS to provide services that integrate static and dynamic aeronautical information, making integrated Aeronautical Information available for information consumers over SWIM.
- The ACS provides a set of web services for information consumers that provide integrated static definitions for aeronautical information such as airports, NAVAID, airspace, and obstacles with dynamic status updates such as schedules and NOTAMs.

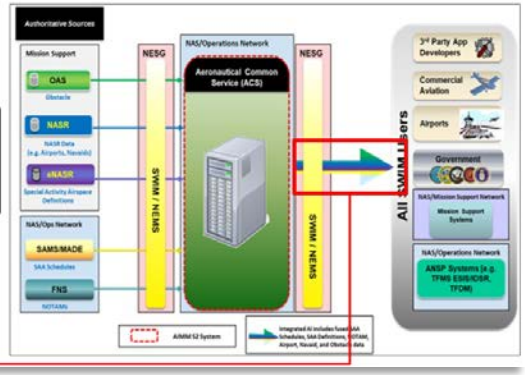
Service Interface

- Request/Reply via OGC

Message Sets

Sample Message Data Elements:

- Web Feature Service
- Data Query Service
- Data Subscription Service
- Web Map Service
- Web Map Tile Service
- Airspace Conflict Detection
- Geodetic Computation
- Post Operational Metrics



•Latest News

- **ACS capabilities are operational and available to internal FAA consumers and external consumers September 2021.**
  - Feature requests via a WFS and a Data Query Service.
  - Feature change notification service.
  - Aeronautical information image services
  - ACS mapping services to support viewing aeronautical information and NOTAM data
  - Airspace confliction detection service
  - Geodetic calculation service
  - Post –Ops metrics service

AIMM – *Federal NOTAMs System (FNS)*

•*Back to Roadmap*

Service Description

- The Federal Notice to Airmen (NOTAM) System (FNS) Publication is a subscription-based service for publishing NOTAMS. It supports all NOTAMS, legacy and digital, published in the United States NOTAM System (USNS).
- The Federal Notice to Airmen (NOTAM) System (FNS) NOTAM Distribution Service (FNS-NDS) is a web service that provides digital NOTAM messages in Aeronautical Information Exchange Model (AIXM) format in response to requests by end users. The FNS-NDS is a system-to-system interface that enables end systems to receive digital NOTAMs from FNS. The FNS-NDS uses the event schema developed by the international Digital NOTAM Focus Group jointly led by EUROCONTROL and the FAA. Digital NOTAM messages exchanged through the FNS-NDS include static baseline features as well as the temporary changes due the NOTAM event and enable the graphical display of NOTAMs. The FNS NDS supports the distribution of all NOTAMs, to include the digital NOTAMs originated through the FNS as well as legacy NOTAMs originated through the legacy system.

Service Interface

- Publish/Subscribe via JMS
- Request/Reply via SOAP Web Service

Message Sets

Message Name	Description			
Get Capabilities	GetCapabilities is a discovery request, which provides information related to the options provided by the FNS-NDS Web Feature Service.			
Get Feature	**Property Name**	**Description**	**Permissible Values**	
	Source Type	Specifies the NOTAM classification	• Domestic (D) • FDC (F)	• Military (M) • Local Military (L)	• International (I) • Others (O)
	Location Designator	NOTAM location designator of the affected airport/heliport or facility	Any active NOTAM location identifier		
	NOTAM Function	New, Replacement, Cancelled	• NOTAMN	• NOTAMR	• NOTAMC
	NOTAM Keyword	Keyword associated with the NOTAM	• AD • APRON • AIRSPACE • CHART • COM • IAP • NAV	• OBST • ODP • ROUTE • RWY • SECURITY • SID • SPECIAL	• STAR • SVC • TWY • VFP • CONSTRUCTION • LTA
	Airspace Usage	Additional message property to filter airspace related NOTAMs	• TFR	• SUA	• CARF
	NOTAM Status	Status of the NOTAM	• ACTIVE	• CANCELLED	

•**Latest News**

- **NOTAMs API target launch Fall 2021**
  - Quick on boarding and access
  - Multiple formats for user needs
  - Enables direct NOTAM query
  - All NOTAM and available geometry from single source
    - *Integrates TFR and SAA*
    - *Enables graphical visuals*

TFDM Build 1 – *TTP Airport, Flight Data, Flight Delay, Ops Metrics, TMR Services*

Service Description

- TFDM is the surface management solution for NextGen. TFDM is planned to provide Airport and Flight Information Service (AFIS), which is expected to be deployed in the timeframe. AFIS data includes airport configurations, airport specific demand and delay information, and airport-initiated departure stop restrictions. AFIS will provide more timely and specific information on individual flights from the operators, including gate and estimated off block times as well as schedule and surface metering information from TFDM to operators. TFDM services will interface with other information services to provide airport-specific arrival predictions and schedules, call for release data exchanges, flight data, and surface situational awareness

Service Interface

- Publish/Subscribe via JMS

Message Sets

Business Function	Steady State Flow Message Types
Airport Information	Airport Information Heartbeat
Flight Data	Flight Add Flight Update Flight Notification Flight Delete Heartbeat
Flight Delay	Flight Delay Heartbeat
Surface Metering Programs	SMP Data Message SMP Flight List Update Heartbeat
Traffic Management Restrictions	Traffic Management Restrictions Heartbeat

•**Latest News**

- **Developed remote TFDM lab access for developmental testing of the TFDM software**
  - Completed Build 1 software updates and completed most of testing
  - Waterfall Deployment Schedule Target Release in January 2022
- **TFDM Build 1**
  - Testing at WJH Tech Center
  - Key Site: Phoenix Sky Harbor International Airport (PHX)
  - New Projected* IOC Date: Summer 2022

•Back to Roadmap

TFDM Build 2 – *TTP Surface Meter Program, TFCS Flight Sub Services*

Service Description

- TFDM is the surface management solution for NextGen. TFDM is planned to provide Airport and Flight Information Service (AFIS), which is expected to be deployed in the timeframe. AFIS data includes airport configurations, airport specific demand and delay information, and airport-initiated departure stop restrictions. AFIS will provide more timely and specific information on individual flights from the operators, including gate and estimated off block times as well as schedule and surface metering information from TFDM to operators. TFDM services will interface with other information services to provide airport-specific arrival predictions and schedules, call for release data exchanges, flight data, and surface situational awareness.

Service Interface

- Request/Reply via JMS

Message Sets

- TBD

•Latest News

- **Completed Build 2 preliminary software development**
  - Completed TFDM testbed for early industry connection to TFDM
  - Waterfall Deployment Schedule Target Release in January 2022
- **TFDM Build 2**
  - Preliminary testing at WJH Tech Center
  - Key Site: Charlotte-Douglas International Airport (CLT)
  - New Projected* IOC Date: Summer 2023

•Back to Roadmap

TBFM – *Metering Information Service (MIS)*

•Back to Roadmap

Service Description

- The TBFM Metering Information Service publishes metering information to allow the TBFM system, FAA systems (e.g., TFMS), and industry to collaborate, share TBFM data and be informed of TBFM STAs that are in effect during metering events.

Service Interface

- Publish/Subscribe via JMS

Message Sets

Message Name	Description	Supported Properties
Aircraft Information	Provides metering information about an aircraft; specifically: flight plan (relevant subset), STAs, ETAs, Meter Reference Elements (MREs) Assignments, and scheduling group information	Data Group, ARTCC
Configuration Information	Provides metering information about the configuration of the system; specifically: airport configurations, airport acceptance rates, TRACON acceptance rates, gate acceptance rates, Meter Point acceptance rates, runway acceptances rates, super stream class configurations, and satellite airport configurations	
Other Information	Provides metering information about the status of metering and the status of system interfaces	
Adaptation Information	Provides information about applicable system adaptation to include TRACON names, gate names, configuration names, Meter Reference Point names, and stream class names	
Sync	Sent only to indicate an impending refresh of all TBFM data, either as a result of system startup or a periodic synchronization event.	

•Latest News

- **New JMS Properties for more efficient message routing based on:**
  - Departure Airport, Destination Airport
- **Additional Aircraft Data Attributes**:
  - Computer Identifier (CID) , Global Unified Flight Identifier (GUFI)
- **New Heartbeat Message**
  - Heartbeat Message indicating TBFM MIS service is operational. Requires 3rd (new) .xsd file
- **TBFM connecting to Solace vs WebLogic broker**
  - New service version v1.1.0 to provide SWIM based

NCR – *NAS Common Reference*

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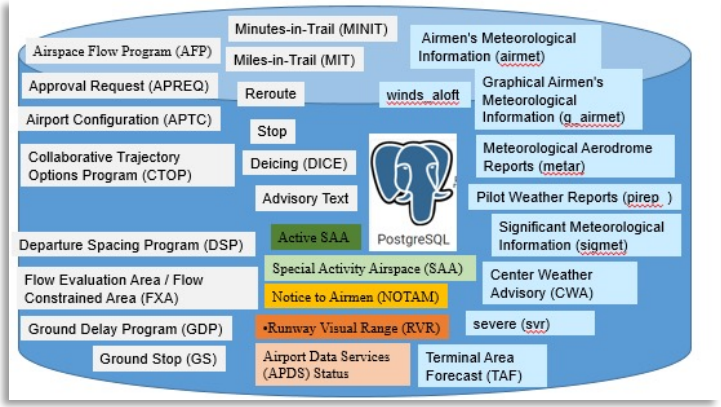
Service Description

- NCR is a NAS Program that provides SWIM Services for parsing, storing, and correlating NAS data. Consumes multiple SWIM producers across NAS domains such as Aeronautical, Traffic Flow Management and Weather. Provides data standardization such as geo-referencing, units of measure and Coordinate Reference Systems (CRS). NCR enables dynamic queries for any combination of geospatial, temporal and attribute filters, which are submitted as subscriptions. NCR can apply constraints to trajectories 2D, 3D or 4D. NCR GML or GeoJSON responses integrate with open-source code.

Service Interface

- Request/Reply via GeoServer and NEMS

Message Sets



•Latest News

- **NCR R1.1 currently in Ops as of August 31, 2021, for internal users**
  - Will monitor stability and performance
  - Will be doing some performance tuning in the next few months
- **External NESG users will be on-ramped in the first half of CY2022 in batches**
- **Before on-ramping, NCR will help users in building their client software and testing in FNTB environment**
  - Based on FNTB availability

TFMS – *TFMData: Flight Data Service*

•Back to Roadmap

Service Description

- Flight Data is comprised of data from a variety of systems but the main contributor of input data is the Enroute Computer System and International Data Providers. TFMS has a consolidated view of the entire system and adds value to that information such that the resulting output is an accurate reflection of the state of the NAS in terms of traffic flow management. Flight Data is sent as it is updated, when there is a commanded change, or when there is a computed change.

Service Interface

- Publish/Subscribe via JMS

Message Sets

Message Name	Description
Track Information	Track Information messages are used to provide a position update for the identified flight. In cases where the track position causes a route re-conformance (trajectory modeling) additional route data is provided. The messages are transmitted as received by TFMS on a cyclic basis.
Flight Plan Amendment Information	The flightPlanAmendment message provides revised flight plan data as the result of a flight plan being successfully amended.
Arrival Information	Arrival Information Message is used to provide arrival date and time information for all eligible arriving flights.
Beacon Code Information	The Beacon Code Information Message provides beacon code data on eligible flight plans.
Departure Information	The Departure information messages is transmitted for all eligible initially activated flight plans.
Flight Plan Information	The Flight Plan Information Message is used to provide flight plan data for all eligible flight plans.
Flight Plan Cancellation	Flight Plan Cancellation messages are used to provide cancellation data for all eligible flight plans when a cancel message is received from the Host/ERAM or IADE interface or an operator action associated with the schedule database that causes previously Schedule Activated flights inserted into the NCSM to be canceled.
Boundary Crossing Update	Boundary Crossing Update is used to provide TFMM with current flight plan information on active eligible flights that are inbound from one ARTCC to another ARTCC facility.
Oceanic Report	Oceanic Report Type provides flight information for transoceanic flights and is generated when an Oceanic Position Report is received via NADIN.
NCSM Flight Create	NCSM Flight Create message is used to provide create data when CDM a flight create message is received.
NCSM Flight Modify	NCSM Flight Modify message is used to provide modify data when CDM a flight modify message is received.
NCSM Flight Route	NCSM Flight Route message is used to provide route data for events that cause the flight route to be updated. The events are associated with CTOP or Reroute TMIs. They are also used to update the route information when the weekly adaptation data update is performed.
NCSM Flight Times	"NCSM Flight Times message is used to provide updates of flight time data when departure or arrival times change due lateness in departure, a TBFM issued Scheduled Time of Departure, or STDDS surface movement events.."
NCSM Flight Schedule Activate	NCSM FlightScheduleActivate message is used to provide data flight data whenever an operator command or automatic timer causes a flight in the schedule database to be inserted into the NCSM. The timer is a five minute timer that causes flight's to be entered into the NCSM for demand prediction purpose 24 hours prior to their departure time.
NCSM Flight Control	NCSM Flight Control message is used to provide control data for messages/events that cause EDCT to be issued.
NCSM Flight Sectors	NCSM Flight Sectors message is used to provide updated sector crossing data an Airspace Assignment message is received..

•**Latest News**

- **TFMS R14 deployment completed October 2021**
  - The new TFMData Schema version for R14 will be v3.2
  - TFMDatav3.2 to v2.0.5 mediation will be deployed with R14
  - Request/Reply re-certification will also shift with R14 deployment
- **Due to COVID-19 impacts, TFMS R14 is deployed without Surface Viewer capability enabled.**
  - Surface Viewer capability (real-time display of airport surface and flight data) may be enabled sometime after R14 deployment.(exact date TBD)
- **All TFMData Request/Reply clients will be need to re-certified for R14 v3.2**
  - Users will not be expected to re-test for SWIM connectivity
  - Users who license their clients from a third party will not need to individually re-certify if the third-party product client is re certified

TFMS – *TFMData: Flow Data Service*

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Service Description

- Flow Information is data that describes the TFM initiatives that are created, updated, or deleted from the system. Flow Information is created by TFM users; the information is used by TFMS to monitor capacity, to assist in controlling capacity of the system, or to describe characteristics of the system. Flow information provides a shared state of TFMS with authorized users in support of situational awareness and potentially to be used by CDM users in their own automation and research activities. Users consuming Flow Information can construct a dataset (or database) consistent with TFMS.

Service Interface

- Publish/Subscribe via JMS

Message Sets

Message Name	Description
AFP Advisory	Initial/Update Airspace Flow Program Message.
AFP Cancel	Cancel Airspace Flow Program Message.
AFP Compression	Initial/Update GDP/UDP Compression Message.
Airport Config Message	The airport configuration report.
CDM Update Data	TMI related data messages.
CTOP Cancel	Cancel Message.
CTOP Definition	Initial/Update CTOP Message.
Deicing Message	Deicing report.
ERAM Amendment Status Update	Details of the flights last ERAM amendment request.
FADT Broadcast	FADT Broadcast - R13 preferred way of communicating updates, cancellations of AFP,GDP, and GS programs.
FEA/FCA	Initial/Update/Cancel FEA/FCA Message.
FOS Data	FOS Flow Information output.
FEA/FCA Secondary Filters Delete	Initial/Update FEA/FCA secondary filters delete.
FEA/FCA Secondary Filters Update	Initial/Update FEA/FCA secondary filters update.
GDP Advisory	Initial/Update GDP/UDP Message.
GDP Blanket	Initial/Update GDP/UDP Blanket Message.

Message Name	Description
GDP Cancel	Cancel GDP/UDP Message.
GDP Compression	Initial/Update GDP/UDP Compression Message.
General Advisory	General Advisory Message.
GS Advisory	Initial/Update GS Message.
GS Cancel	Cancel GS Message.
AFP/GDP Update	Air Flow Program (AFP) or Ground Delay Program (GDP) TMI parameter create/update.
Blanket Update	AFP/GDP Blanket parameters create or update for TMI.
Compression Update	AFP/GDP Compression parameter update or create TMI.
Delete	Parameter delete for Fuel Advisory Delay TMI.
GS Update	Ground Stop (GS) TMI parameter create/update.
RAPT Timeline Message	The RAPT Timeline data.
Reroute	Initial/Update/Cancel Reroute Message.
Restriction Message	The restriction report.
TMI Flight Data List	General flight data for flights associated with any TMI or monitored airports.

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TFMS – *TFMData: Request/Reply Service*

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Service Description

- The TFM Request/Reply Business Function exposes all of the TFMS services and makes them available to the SWIM community. TFMS Request/Reply is managed by TFMS by authorizing user request to ensure only FAA approved users are requesting services of the TFMS. These include requests that can impact the TFM system and/or the behavior of Air Traffic Flow.

Service Interface

- Request/Reply via JMS

Message Sets

Message Name	Description
Airport Fix Reply Data	Airport arrival and departure fixes.
Slot List	Slot assignment list.
CTOP Reply Data	
EDCT Check Report	
EDCT List Report	
EDCT Show Report	
EDCT Slot List Report	
EDCT Sub Show Report	
EDCT Unassigned Slots Report	
Flight Recon Data	
Forwarded Slot List	
FOS Reply Data	
Hist Popup Data	
Reroute Reply Data	
RRIA Reply Data	
Substitution Response Data	
TMI Reply Data	

Message Name	Description
Oceanic Position Report	There are three types of Oceanic Position Reports described in this
Flight Recon Request	
Flight Schedule Request	
FOS Request	
FEA/FCA Request	
Reroute Request	
Hist Popup Request	
Reroute Model Request	
Sub Block Request	
TMI Resync Request	

Message Name	Description
Advisory Request	Advisory Related Requests.
TMI ID Request	Request for a unique TMI ID to be used in a subsequent request for the creation of a TMI.
Airport Request	Request for candidate flights by airports.
AFP/GDP Update Request	Request to create or update an Air Flow Program (AFP) or Ground Delay Program (GDP) TMI.
GS Update Request	Request to create or update an Ground Stop (GS) TMI.
Blanket Update Request	Request to create or update an AFP/GDP Blanket parameters for TMI.
Compression Update Request	Request to create or update an AFP/GDP Compression TMI.
Delete Request	Request to delete parameters for any Fuel Advisory Delay TMI.
Fuel Advisory Delay Request	Request to create or update any Fuel Advisory Delay TMI.
Airport FIX Request	Identifies the airports for which arrival and departure fixes are to be supplied.
CTOP Request	Includes all of the CTOP requests.
EDCT Request	Includes all of the EDCT possible requests.

•Latest News

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SWIM Flight Planning – *Common Support Services: Flight Data (CSS-FD)*

Service Description

- **Flight Planning & Filing: A standards-based flight planning & filing environment.** To be used by flight operators and the FAA to negotiate preliminary and filed flight plans. Constraint sharing/feedback will enable the flight operator to receive and address constraints early in the planning phase
- **Flight Data Sharing: Provide a single common reference** for legacy and FF-ICE capable users facilitating operational flight data sharing across the NAS ecosystem in accordance with centralized and managed business rules.
- CSS-FD will support Additional flight data for **Trajectory Based Operations (TBO), International data exchange standards** *(i.e. Flight Information Exchange Model (FIXM)),* **Enhanced Collaborative decision-making and** International Civil Aviation Organization (ICAO) provisions for **Flight and Flow – Information for a Collaborative Environment (FF-ICE) and mixed-mode**

Service Interface

- TBD

Message Sets

- TBD

•Latest News

- **CSS-FD Risk Reduction Activities seek to (1) obtain feedback on capabilities and constraint feedback, (2) Understand integration needs with eAU systems (3) Leverage capabilities of operator's modern analytics and SWIM interfaces**
  - Sprint 1: Foundational Infrastructure
    - Data Management and security framework activities.
    - Prototype Development and Notice to Industry commenced November 2021
  - Sprint 2: Initial FPL Exchange/Feedback
    - Evaluation of Constraints/Restrictions, Flight Specific Feedback and Re-evaluation Process.
    - Industry kickoff targeted December 2021 and User Trials targeting Summer/Fall 2022

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NextGen Weather – *Common Support Services: Weather (CSS-Wx)*

Service Description

- **CSS-Wx will function as a single provider of weather data products within the NAS, using standards-based weather dissemination. The service makes weather products available from NOAA, NWP and other data sources for integration to air traffic systems, and provides weather products via a set of common Web Services for weather, using international data access and data format standards.**

Service Interface

- TBD

Message Sets

Gridded Weather Data

- Precipitation (VIL)
- Precipitation (VIL) with Mask
- Precipitation (VIL) Forecast
- Precipitation (VIL) Forecast with Mask
- Echo Tops
- Echo Tops Forecast
- Precipitation (Base Reflectivity)
- Precipitation (Composite Reflectivity)
- Precipitation (Composite Reflectivity) with Mask
- Surface Precipitation Phase
- Surface Precipitation Phase Forecast
- Icing Layer
- Composite Icing
- Icing Layer Forecast
- Composite Icing Forecast
- Turbulence Layer
- Turbulence Layer Forecast
- Composite Turbulence
- Composite Turbulence Forecast
- Convective Weather Avoidance Fields
- Convective Weather Avoidance Field Forecast
- Satellite
- Terminal Winds
- *NOAA Model Data (RAP, HRRR, GFS, NAM)**

Non-Gridded Weather Data

- Precipitation (VIL) Forecast Accuracy
- Precipitation (VIL) Forecast Contours
- Echo Tops Forecast Accuracy
- Echo Tops Forecast Contours
- Lightning
- Storm Information Hazard Text
- Storm Information Leading Edges
- Storm Information Motion Vectors
- Fronts Forecast
- Growth Trends
- Decay Trends
- Forecast Confidence
- Convective Weather Avoidance Polygons / CWAP Forecast
- Wind Profiles
- Tornado Detections
- Icing Layer Contours
- Composite Icing Contours
- Turbulence Layer Contours
- Composite Turbulence Contours
- Pilot Report (PIREP)
- Urgent Pilot Report (PIREP)
- *ICAO Aircraft Report (AIREP)**
- *Significant Meteorological Information (SIGMET)**
- *Convective Significant Meteorological Information (Convective SIGMET)**
- *TFM Convective Forecast (TCF)**
- *Airmen's Meteorological Information Advisories (AIRMET)**
- *Graphical AIRMET (G-AIRMET)**
- *Winds Aloft Forecast**
- *Surface Weather Observations*
- *Aviation Watch Notification**
- *Tornado Warnings**
- *Severe Thunderstorm Warnings**
- *Public Severe Weather Watch Notification (SEL)**
- *Volcanic Ash Advisory Statement (VAAS)**
- *Terminal Area Forecast (TAF)**
- *Center Weather Advisories**
- *Meteorological Impact Statements**
- *Severe Weather Statements (SVS)**

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Latest News

Recently completed re-planning approved by JRC in May 2021

- Decommission Weather and Radar Processor (WARP) and Corridor Integrated Weather System (CIWS)
- Team currently performing Benefit analysis to monetize Flight Planning benefits through SWIM

Key Site Initial Operational Capability (IOC) in 2024

- NOAA NextGen IT Web Services (NGITWS) targeting August 2021 release
- Currently conducting CSS-Wx interface testing with ERAM at WJHTC
- Ongoing CSS-Wx interface testing with ERAM at WJHTC
- End user systems and SWIM to support CSS-Wx and NWP testing by 2024