



Network Manager
nominated by
the European Commission



FF-ICE/R1 Implementation

IATA Webinar – December 2019

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Network Strategy & Development
EUROCONTROL

Topics

- Current Environment
- FF-ICE/R1 Implementation Status

Current Environment

- Network Manager (NM) IFPS system provides:
 - Interface with flight plan originators / Operators
 - Flight planning frontend processor for European ANSPs
- Network Manager ETFMS system provides the overarching DCB function for Europe
- Supported Networks: AFTN/CIDIN/AMHS, B2B Web Services
- Formats:
 - AFTN/CIDIN/AMHS: ICAO FPL2012 (Doc.4444) & ATS Data Exchange Protocol (ADEXP)
 - B2B Web Services: Propriety xml

B2B Web Services



Flight

FlightPreparation

validateFlightPlan
evaluateFlowImpact
proposeRoutes

≡ Trial
Service

FlightFiling

fileNewFlightPlan
fileFlightPlanUpdate
fileFlightPlanCancellation
fileFlightDelay

≡ Filing
Service

FlightDeparture

fileFlightDeparture

≡ Notification
Service

FlightManagement

retrieveFilingstatus
queryFlightPlans
queryFlightsByKeys
queryFlightsByAircraftOperator
queryFlightsByAerodrome
queryFlightsByAerodromeSet
queryFlightsByAirspace
queryFlightsByPoint
queryFlightsByTrafficVolume
queryFlightsByMeasure
queryFlightsByHotspot
queryFlightsByAircraftRegistrationMark

≡ Flight
Data
Query
Service

FlightData

retrieveFlight
submitEarlyDPI
submitTargetDPItarget
submitTargetDPISequenced
submitAtcDPI
submitCancelDPI
submitPredictedDPI
submitFlightUpdate
submitTargetTakeOffAPI
submitTargetTimeOverAPI
submitGeneralAPI

FlightSafety

replaceACC3AccreditationList
replaceTCOAuthorisationList
updateTCOAuthorisationList

Common

Files

queryFiles

Flow

TrafficCounts

queryTrafficCountsByPoint
queryTrafficCountsByAerodrome
queryTrafficCountsByAerodromeSet
queryTrafficCountsByAirspace
queryTrafficCountsByAircraftOperator
queryTrafficCountsByTrafficVolume

Measures

queryRegulations
createRegulation
updateRegulation
cancelRegulation
queryRegulationProposals
fileRegulationProposal
updateRegulationProposal
revokeRegulationProposal
queryReroutings
createRerouting
updateRerouting
cancelRerouting
queryMCDMOnly
createMCDMOnly
updateMCDMOnly
cancelMCDMOnly
retrieveMeasureOpLog
removeFlightsFromMeasure
retrieveATFCMSituation
retrieveNetworkImpactAssessment

Mcdm

queryMCDM
updateMCDM
retrieveMCDMMessages
updateMCDMState

TacticalUpdates

retrieveSectorConfigurationPlan
updateSectorConfigurationPlan
retrieveCapacityPlan
updateCapacityPlan
retrieveTrafficVolumeActivationPlan
updateTrafficVolumeActivationPlan
retrieveOTMVPlan
updateOTMVPlan
retrieveRunwayConfigurationPlan
updateRunwayConfigurationPlan
queryHotspots
updateHotspots

Simulations

querySimulations
queryAvailableSimulations
startSimulation
stopSimulation

ScenarioRepository

retrieveRegulationsFromScenario
retrieveReroutingsFromScenario
retrieveMCDMOnlyFromScenario
queryScenarioRepository

Airspace

AirspaceAvailability

retrieveAUPChain
retrieveAUP
createAUP
updateAUP
validateAUP
deleteAUP
expandRSAAllocations
getAUPServiceConfiguration
retrieveEAUPChain
retrieveEAUPCDRs
compareEAUPCDRs
retrieveEAUPRSAs
compareEAUPRSAs
getManageableRoutesForAMC
getManageableRouteSegmentsForAMCAndRoute

AirspaceStructure

queryCompleteAIXMDatasets
queryIncrementalAIXMDatasets

General Information

AIMs

queryAIMs
retrieveAIMs

NMB2BInfo

queryNMB2BReferenceManuals
queryNMB2BWSDLs
queryNMB2BScenarios
queryNMB2BAAddendaErrata
retrieveNMRReleaseInformation

Pub/Sub

SubscriptionManagement

≡ Publication
Service

listSubscriptions
retrieveSubscription
subscriptionHistory

Messaging

pullMessages

Subscription Topics

AIXM_DATASETS
ATM_INFORMATION
EAUP
FLIGHT_PLANS
FLIGHT_DATA
FLIGHT_FILING_RESULT
REGULATIONS

B2B Web Services



GLOBAL REPORT - October 2019 OPS



Active Certificates
+ 1.47% vs October 2018



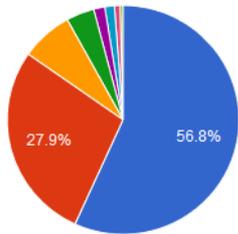
R/R Requests
+ 29.26% vs October 2018



P/S Messages
+ 48% vs October 2018

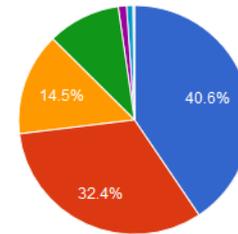
Load Per Organisation Type

R/R



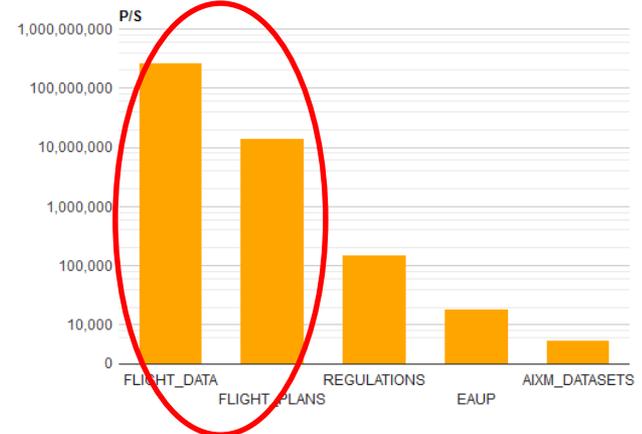
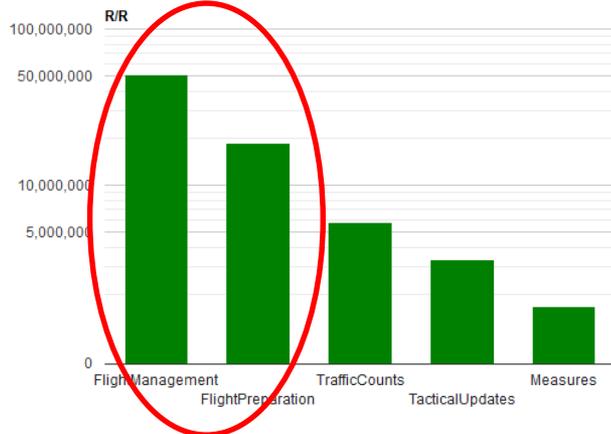
- Industry and Services
- ANSP
- Aircraft Operator
- Airport
- Independent
- Handling Agent
- International Organisation
- Government Body

P/S



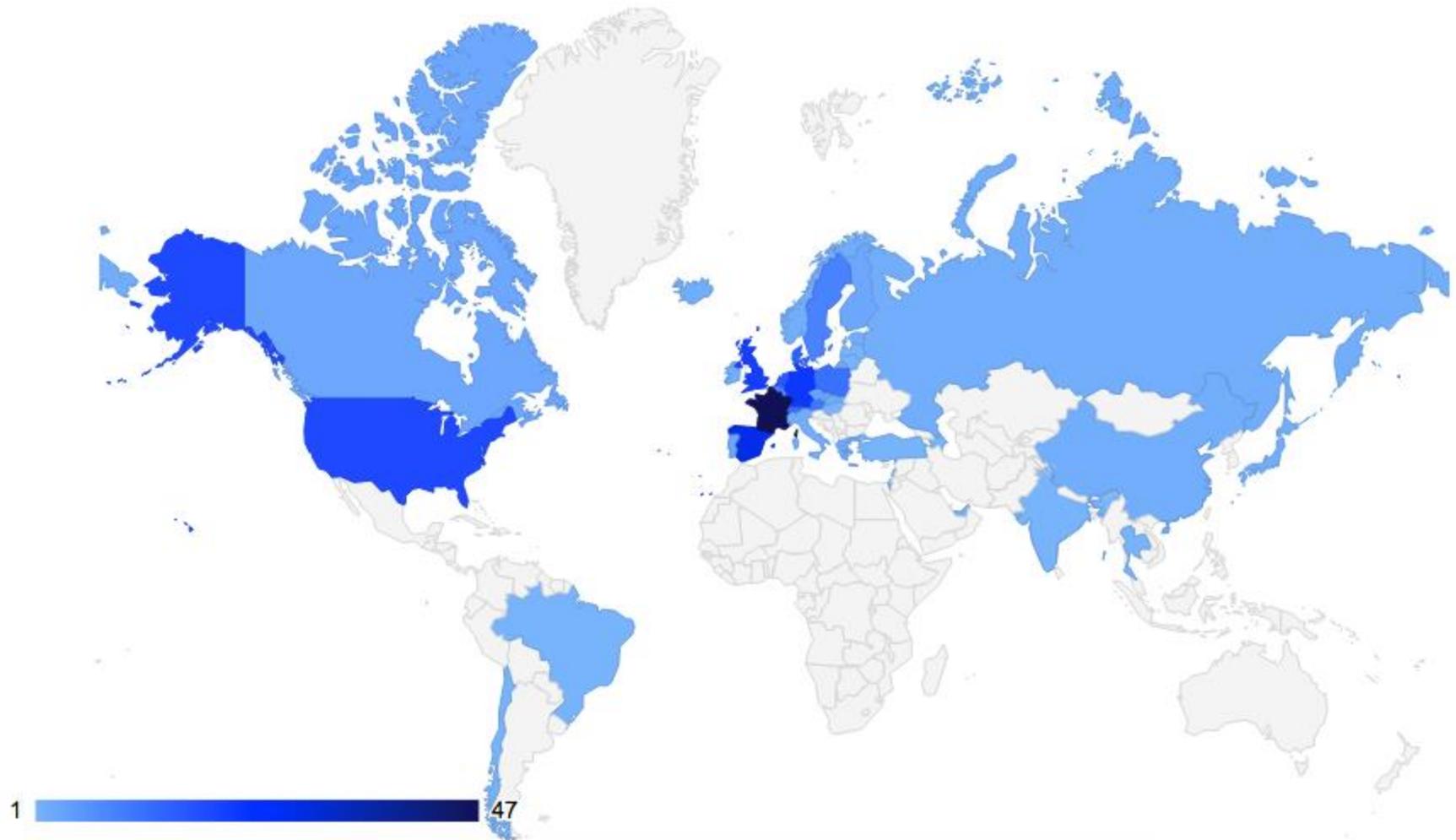
- Industry and Services
- ANSP
- International Organisation
- Independent
- Aircraft Operator
- Airport
- Other

Top 5 load Per Service (RR) and Top 5 load per Topic (PS)



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Requests per Country – October 2019



FF-ICE/R1 NM Implementation Timeline

- 2019-2020: Implementation using FIXM 4.1 and a hybrid (FF-ICE + Current B2B) service layer description
 - Filing Service
 - Flight Data Request Service
 - Trial Service
 - Notification Service
 - Publication Service

- 2021 : Implementation using FIXM 4.2 inc. service layer description

- 2021-2023
 - Planning Service

Current Activities

- PreOps testing with CFSP(s)
 - Reception, processing & reply - eFPL via B2B
 - Trajectory data validation
 - Parallel provision of eFPL to PreOps & FPL to Ops

- PreOps testing with ANSP(s)
 - Assessment by ANSP(s) of mixed mode impact / translation
 - Validity & predictability
 - Capture of FPL output resulting from eFPL input

- Creation of:
 - 'Acceptance Criteria' for successful testing
 - an Issue Tracking Tool



SWIM, FF-ICE, and TBO

FAA Plans

Presented to: IATA Webinar

By: tbd

Date: 2019-12-04



Federal Aviation
Administration



Federal Aviation
Administration

Agenda

- **Introduction- SWIM, FF-ICE, and TBO**
- **SWIM**
 - Where we are today
 - How SWIM will support FF-ICE and TBO
- **FF-ICE**
 - Current plan
- **TBO**
 - FAA planned evolution
- **FAA Collaborations**



FAA and SWIM

- FAA is evolving to use of SWIM for all external data exchanges
- The SWIM registry at <https://nsrr.faa.gov/> describes the services currently available
- Currently over 100 data products in 60 services
- Over 400 users



Federal Aviation Administration

NAS Service Registry and Repository (NSRR)

HOME

ABOUT NSRR

CONTACT US

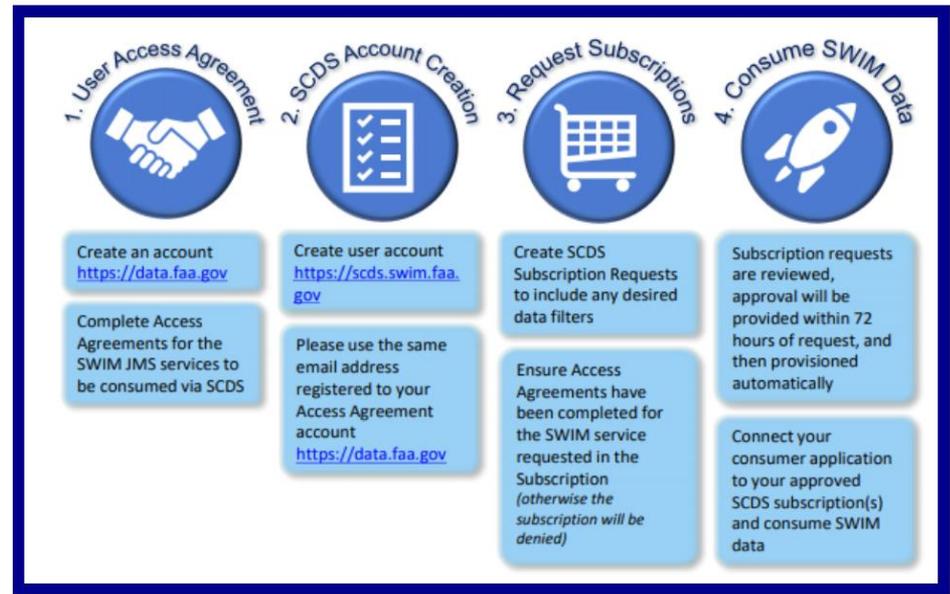
HELP



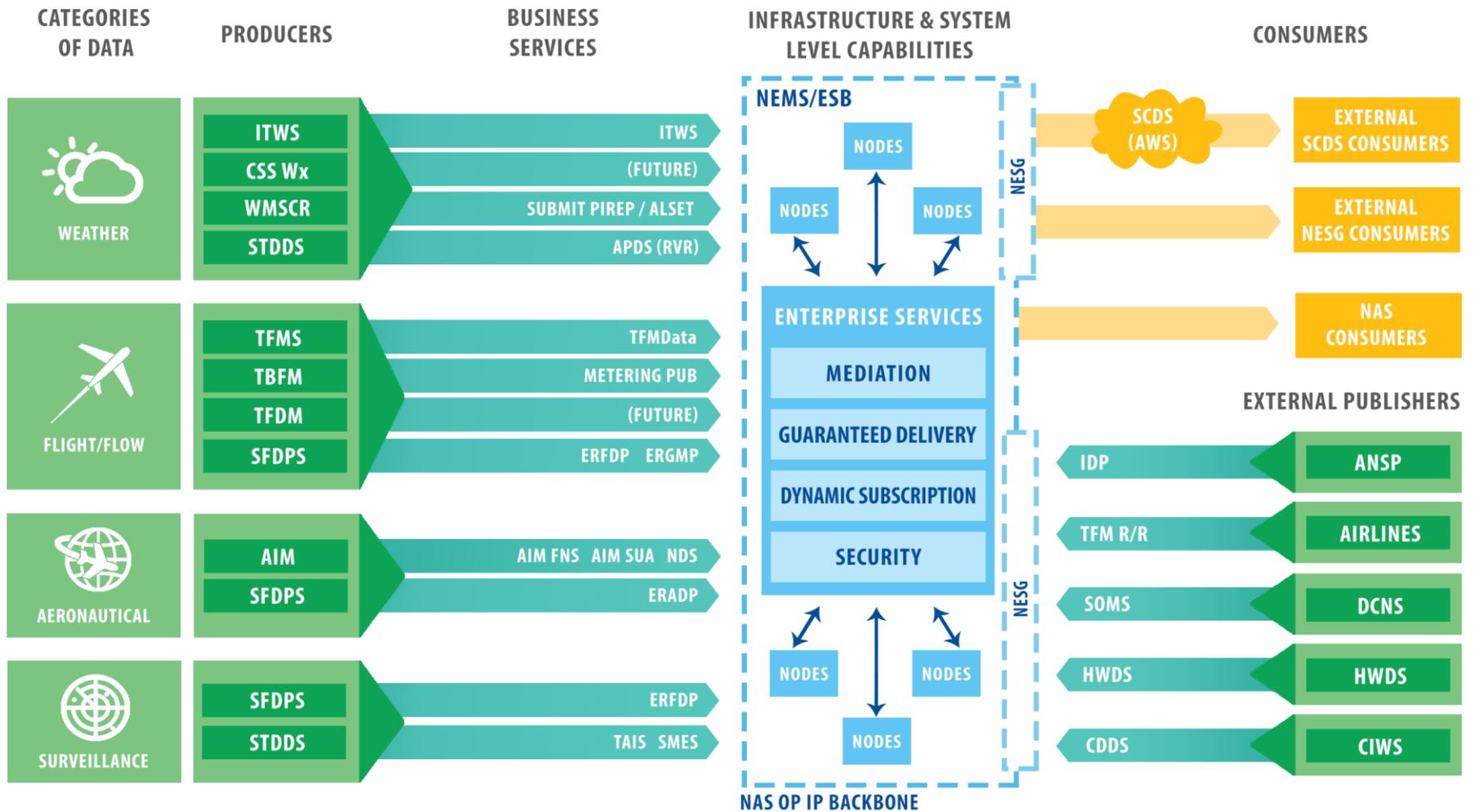
Federal Aviation
Administration

SWIM Access

- For access to SWIM data via the SWIM Cloud Distribution Service, follow instructions at
- https://www.faa.gov/air_traffic/technology/swim/products/get_connected/
- For collaborative services such as CDM, contact
- [Email: Data-To-Industry@faa.gov](mailto:Data-To-Industry@faa.gov)



SWIM Where are we today – Business Service



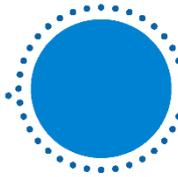
FF-ICE Implementation in FAA

- **FF-ICE investment and implementation**
 - Flight Data Sharing
 - Sharing of flight data among different domains and users
 - Will build on existing flight data publication services
 - Provides a reconciled set of flight data in FIXM format
 - Access will be via SWIM
 - Flight Planning and Filing
 - Users file flight plan using FIXM format (machine readable)
 - Allows users to communicate intent data and obtain feedback (and updates) regarding applicable restrictions and constraints
 - Access will be via SWIM
- **Capabilities will be incrementally implemented**
 - Will collaborate with community on plans



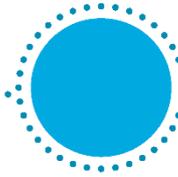
How is TBO different?

TBO enables aircraft to fly more precise flight paths using time rather than miles-in-trail. As it evolves, TBO will increase predictability, flexibility and throughput, and improve airspace, airport, and in-flight efficiency. This will reduce operation costs, fuel burn, and delays.



- Shift from Miles-in-Trail to Time-Based Management

FAA using Time Based Flow Mgmt and developing advanced spacing tools



- Increased PBN Usage

FAA continuing to develop PBN routes, evolving from RNAV to RNP routes



- Increased Collaboration

FF-ICE will provide the technical infrastructure to enhance data exchanges, standardization



- Meaningful Success Criteria and Metrics

Enhancing post-ops analysis tools, using data to drive decisions

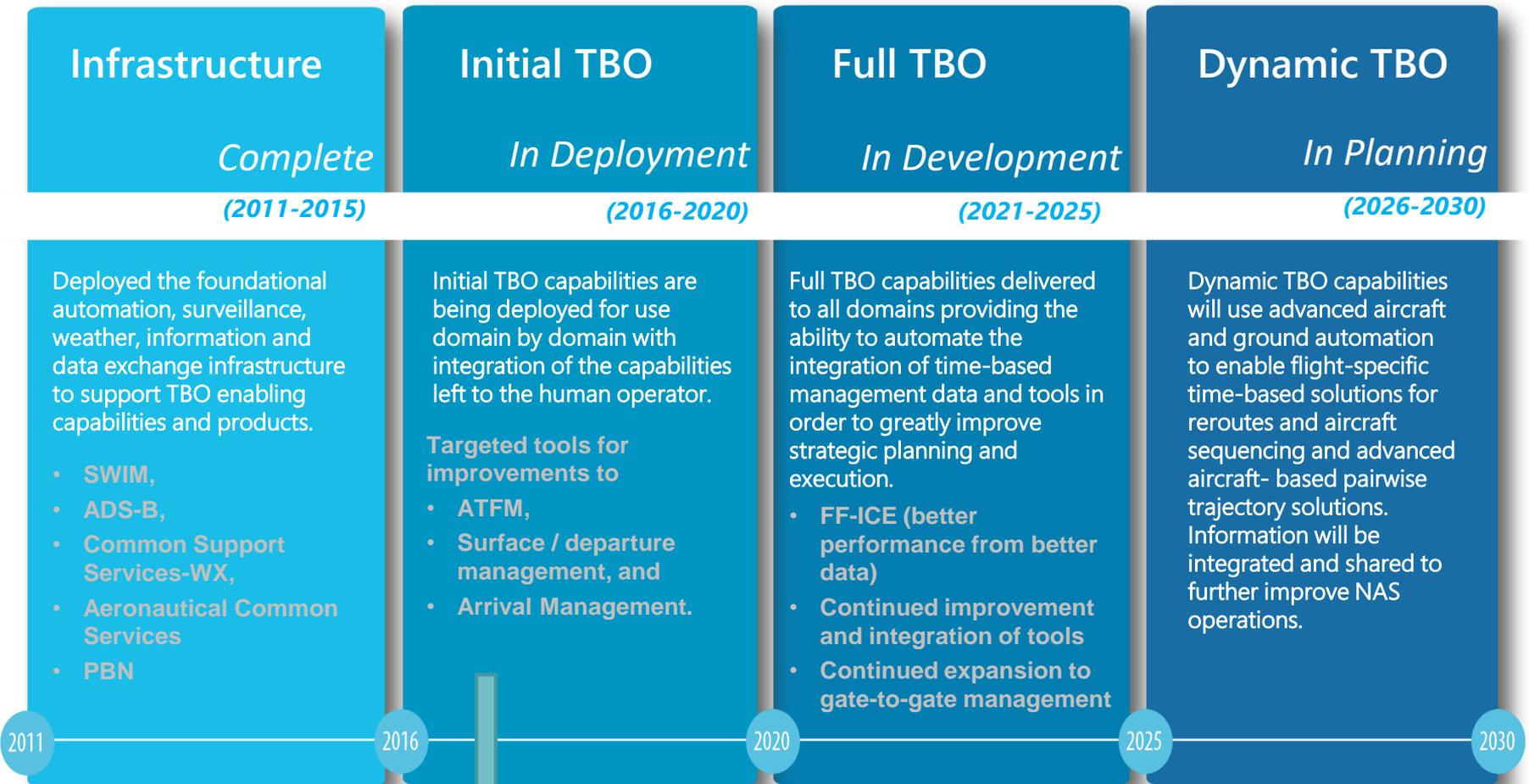


- Organizational Support

NextGen and Air Traffic Organization



TBO in the FAA



For related info...

<https://www.faa.gov/nextgen/snapshots/priorities/>



FAA Collaborations

- **SWIM**

- SWIM standards development, through ICAO Information Management Plan (IMP)
- SWIM registries collaboration, joint with SESAR

- **FF-ICE**

- FF-ICE standards development, through ICAO ATM Requirements and Performance Panel (ATMRPP)
- Demonstrations and workshops with various industry and international partners (see next slide)



Demonstration Activities

- **Mini Global (2016)** – demonstrated the concept of global SWIM for information sharing with Europe and Asia partners
- **International Interoperability Harmonization and Validation IIH&V (2018)** – conducted validation exercises on ICAO FF-ICE R1 in partnership with Japan
- **ASEAN SWIM demo (2019)** – collaborated with ASEAN states to demonstrate global SWIM and information sharing.
- **FF-ICE/X (2020)** – conduct lab demonstrations to assess FF-ICE R/2 in partnership with Japan



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Flight and Flow Information for a



Departamento
de Controle do Espaço Aéreo
Department of Airspace Control



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Asas que protegem o País



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□ OBJECTIVE

**TO PRESENTE AN OVER-VIEW OF FF-ICE
BRAZIL ACTIONS**



**Departamento
de Controle do Espaço Aéreo**
Department of Airspace Control



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□ ROADMAP

- What we have now;
- How we process; and
- What we plan

□ What we have now



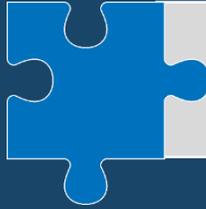
- **Brazil's ATMRPP representant:
Captain Davi**

- Lectures since 2014
 - International Day of ATCO
 - Seminars
 - Workshops
 - Embraer/Atech
- Tabletop exercise – 2018
 - Reports 2018
- Tabletop exercise – 2019
 - Reports 2019



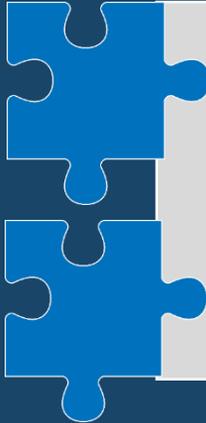
□ How we process

Part 1

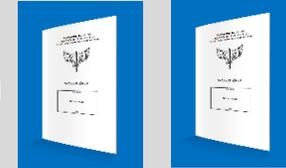


- Study of the FF-ICE Manual and provisions as a way to level the knowledge on the subject;

Part 2



- Study of its elements in the ASBU;
- Analysis of its enablers and sources;
- Adequacy of FF-ICE to Brazil;
- Analysis and update of Brazilian Legislation



Part 3



- Definition of a Planning

□ What we plan



▪ Creation of a Workgroup

- Chaired by the Project Manager FF-ICE;
- Define and manage the roadmap
- It has the support of the working subgroups

▪ Creation of a Subgroups

- It supports specialized, technical, functional and operational issues;
- Receive instructions and respond to the WG

▪ SIRIUS BRAZIL Program SCOPE



□ What we plan



- **SIRIUS BRAZIL Program** is based on the used of strategic solutions for the ongoing evolution of Brazilian Air Traffic Management, associated with the needs of the environment;
- Headed by the **Department of Airspace Control (DECEA)**, the gradual implementation of the SIRIUS Program will ensure to Brazil, over a time horizon of short, medium and long terms, the increase of the required operational capacity in view of the demands coming from the high air traffic growth forecasted for the first decades of the 21st century, maintaining at the same time, the desired levels of operational safety.

□ What we plan



- Since DECEA has as a governing principle, the delivery of an information, which should be processed in a timely manner, be relevant, accurate, reliable and quality assured, the **FF-ICE concept** will provide the necessary support to collaborative and guiding actions for the decision-making and will represent one of the goals of **SIRIUS BRAZIL Program**.



ROADMAP

- What we have now;
- How we process; and
- What we plan



□ OBJECTIVE

**TO PRESENTE AN OVER-VIEW OF FF-ICE
BRAZIL ACTIONS**



Flight and Flow Information for a Collaborative Environment – FF-ICE

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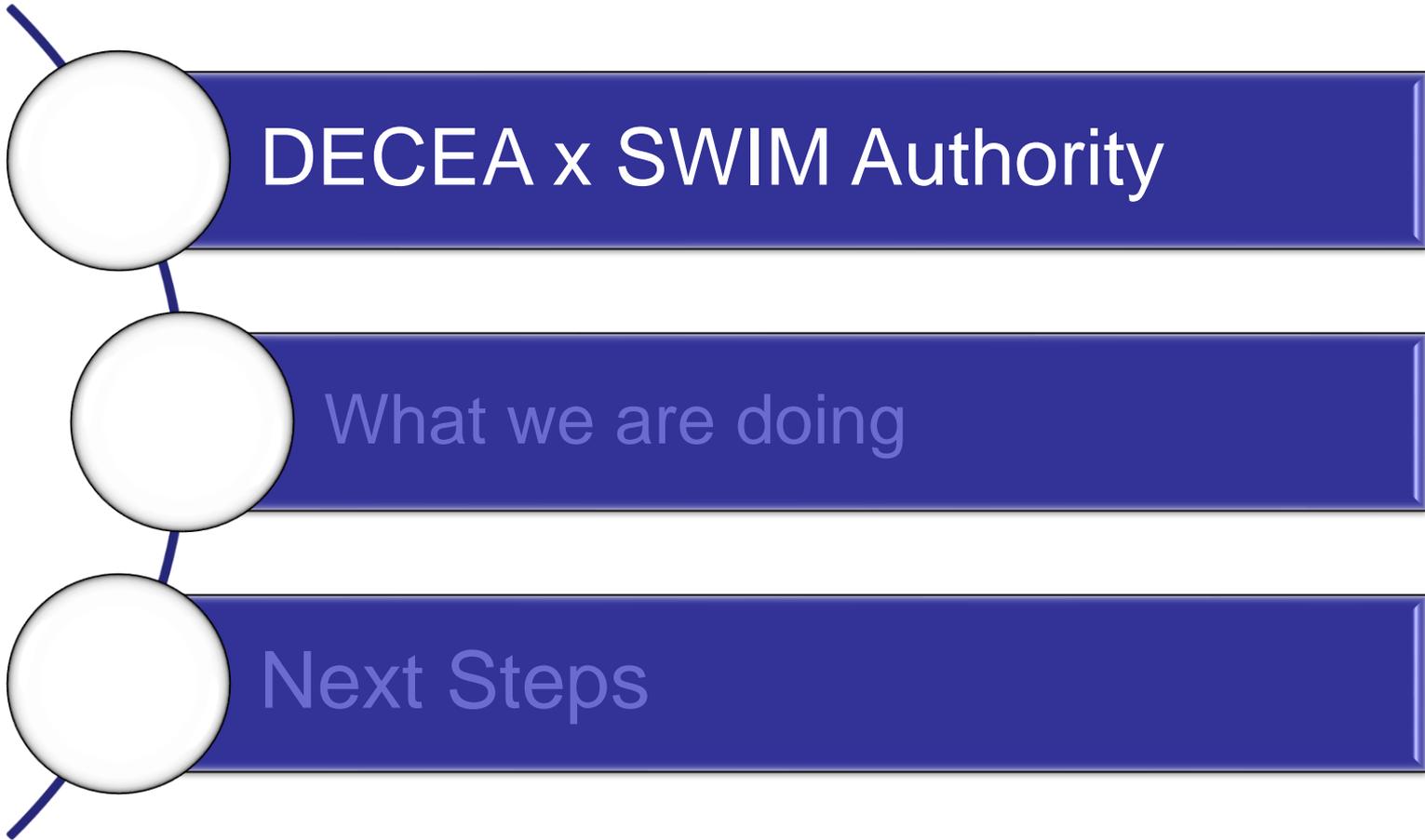
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Ongoing initiatives on SWIM lead by DECEA

IATA Webinar Series

3rd December 2019







Ministry of Defense

Department of Airspace Control

Brazilian Air Force

Brazilian Airspace Control System

SISCEAB



Air Traffic Management

Aeronautical
Communication

Aeronautical Information

Air Navigation Aids

Aeronautical Meteorology

Flight Inspection

Aeronautical Cartography

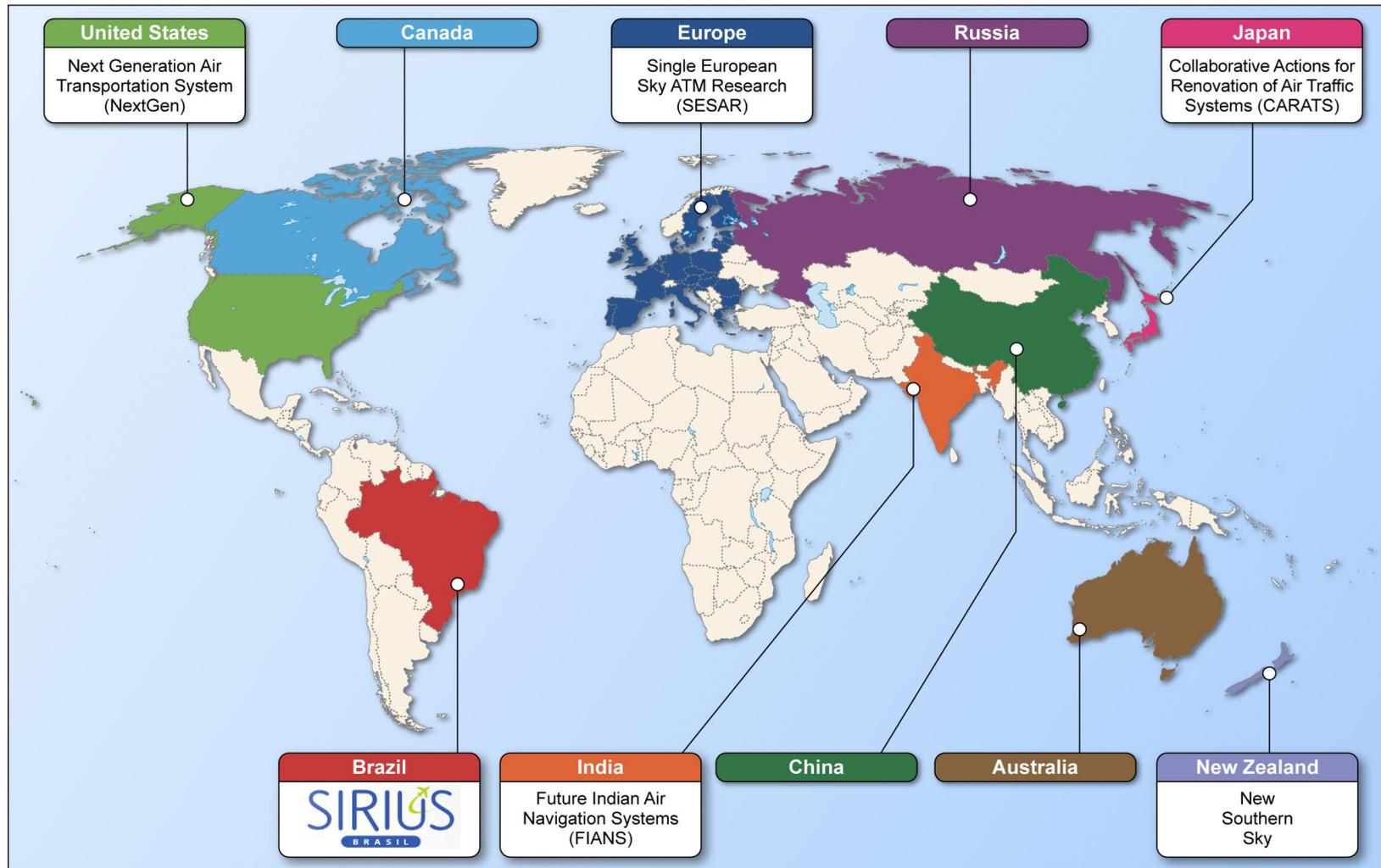
Search and Rescue

Military Air Operation
Support

Specialized Instruction

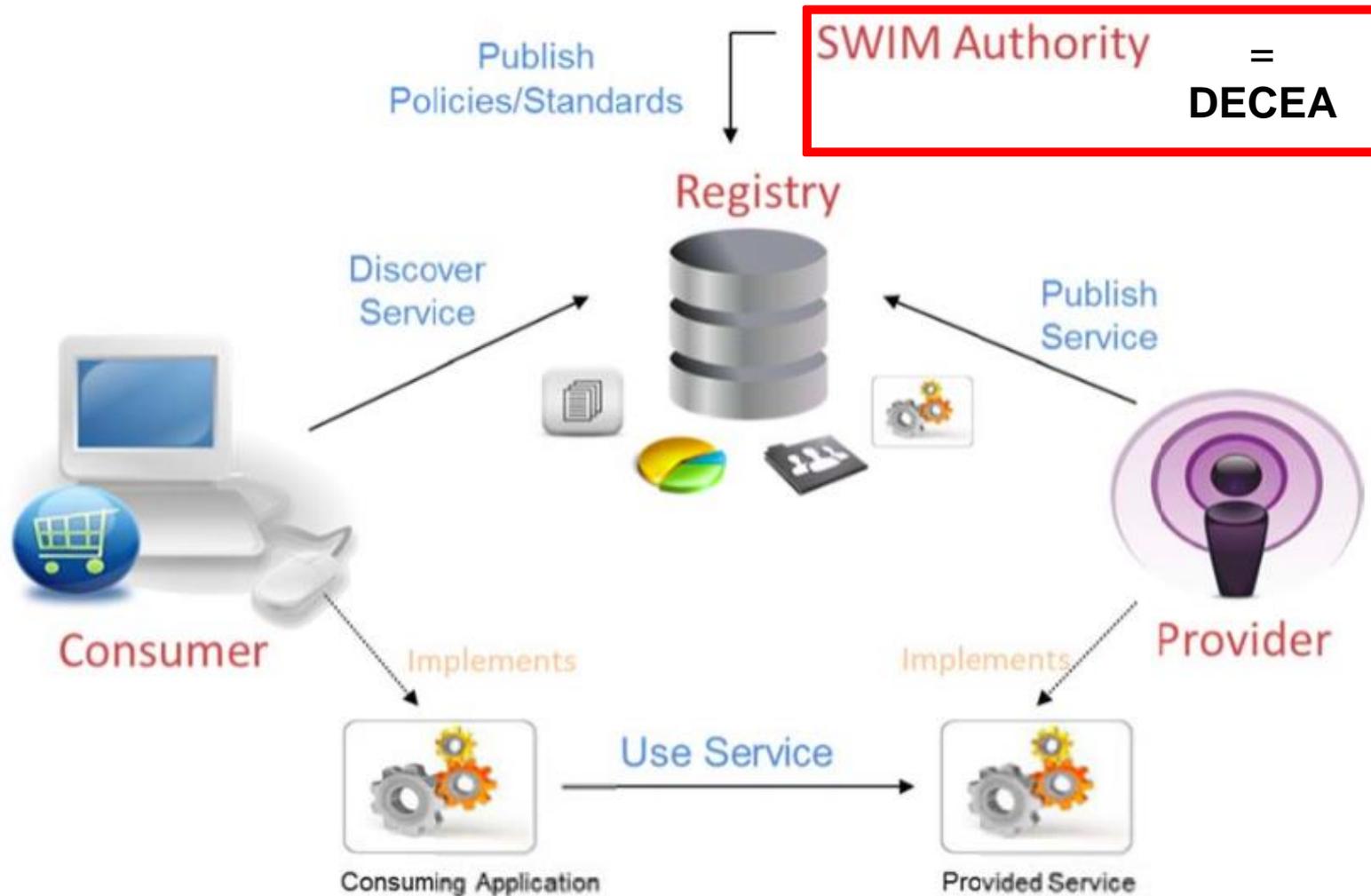
<https://www.decea.gov.br> // DECEA website | <https://www.youtube.com/watch?v=71uvybwAl14> // 22 Dimension
<https://www.youtube.com/watch?v=yrLUywBN84w&t=126s> // Institutional video - DECEA

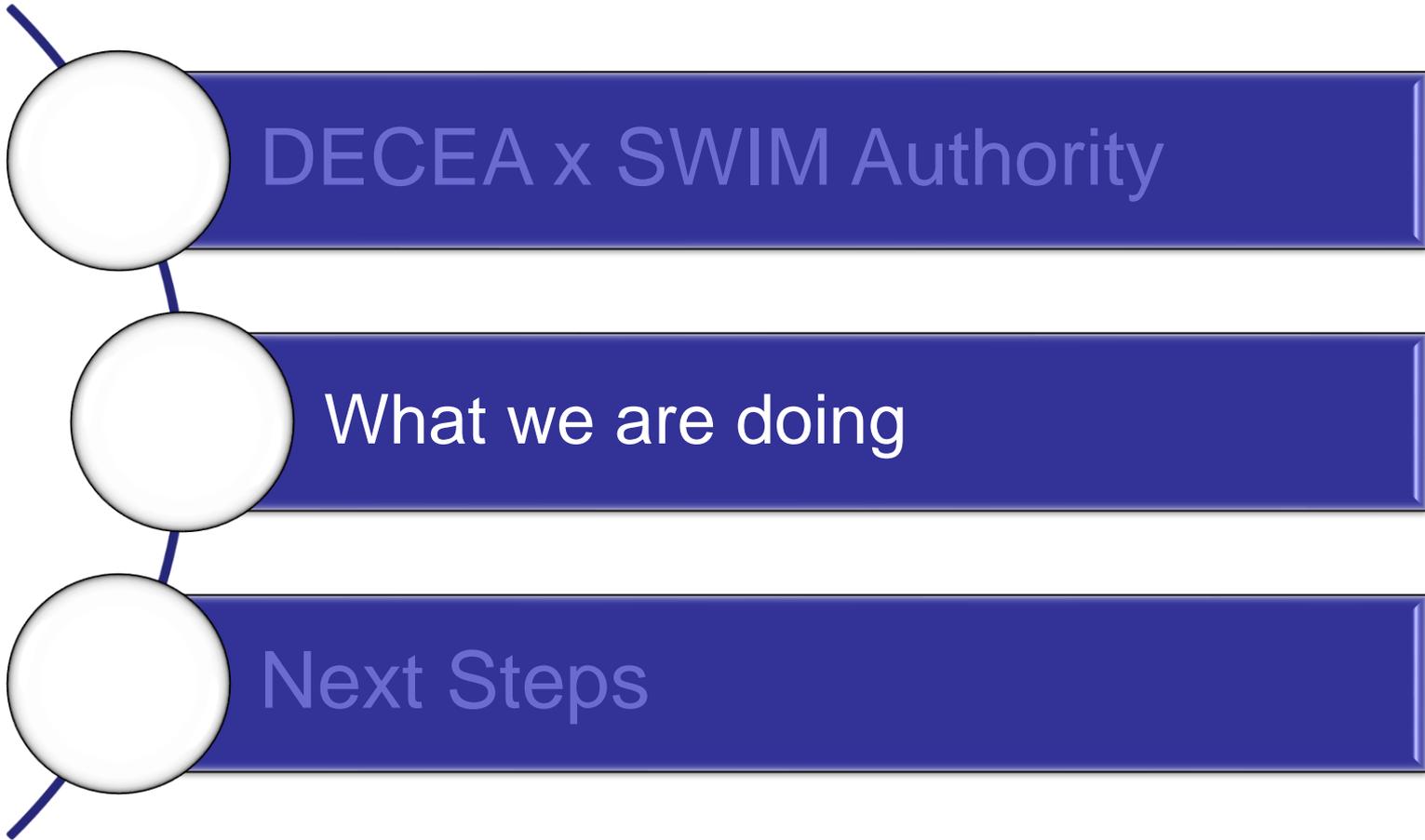
Examples of Air-Traffic Management (ATM) Modernization Programs Worldwide



Source: <http://www.gao.gov/assets/680/671755.pdf>

Services Oriented Architecture (SOA)







← May 2017

1st Demo
Nov 2017



2nd Demo
May 2018



<http://www.icea.gov.br/workshopcyberswim/>

1st Demo: SWIM Concept – SOA based

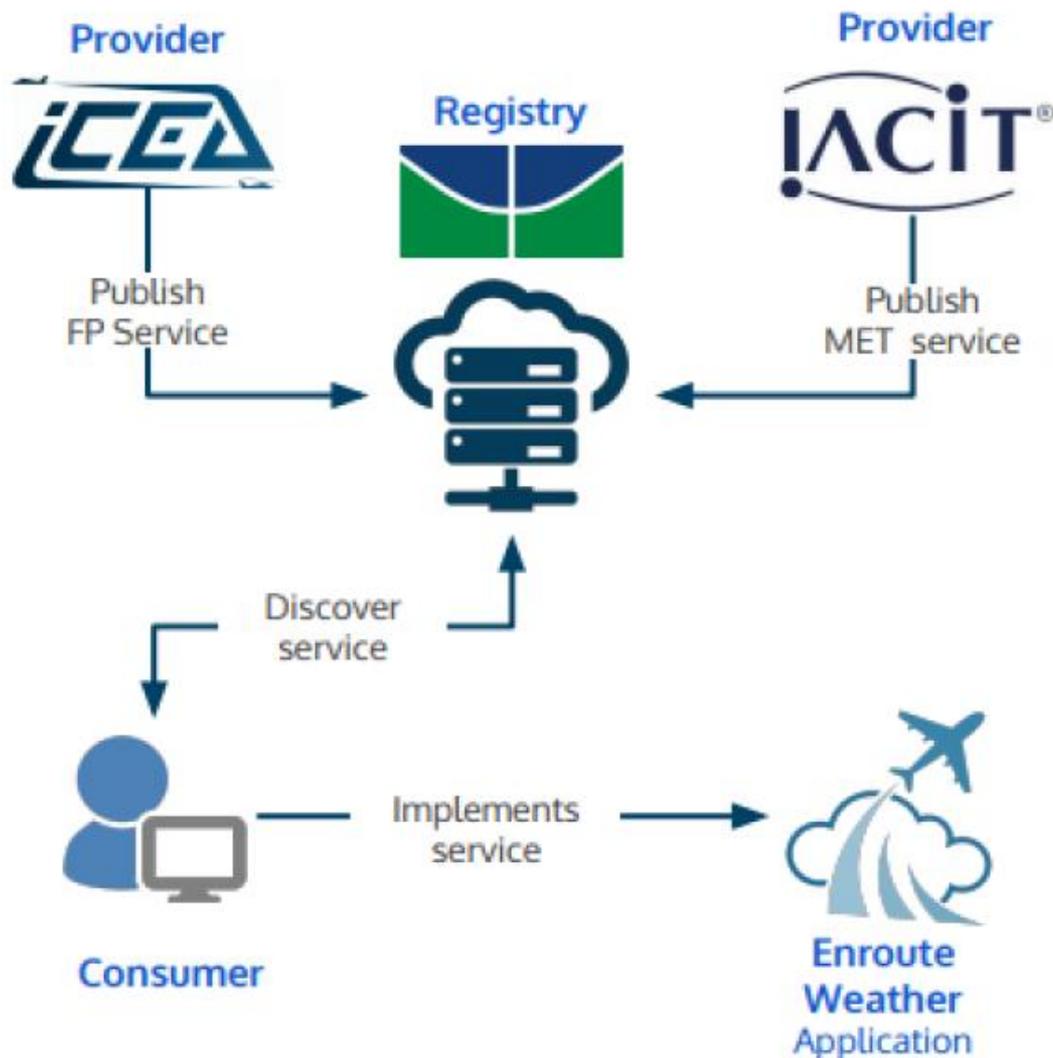
Main goal: Harmonize
SOA understanding

2st Demo: Step-to-step

Main goal: Highlight
benefits

Paper available at:

<<https://www.researchgate.net/project/Improving-data-and-systems-interoperability-through-the-adoption-of-SWIM-concept-on-SISCEAB>>



Technical Committee on SWIM

Main deliverables

1. Guidelines on the implementation of SWIM in Brazil
2. SWIM concept implementation Plan

Improving data and systems
interoperability through the adoption of
SWIM concept on SISCEAB





Zion ATM
Informática

GRUPO EMBRA



Soluções para Tráfego Aéreo e Aeroportos



ASSOCIAÇÃO BRASILEIRA DE PILOTOS DA AVIAÇÃO CIVIL

MINISTÉRIO DA DEFESA
COMANDO DA AERONÁUTICA



CONTROLE DO ESPAÇO AÉREO



Guidelines on the implementation of SWIM in Brazil

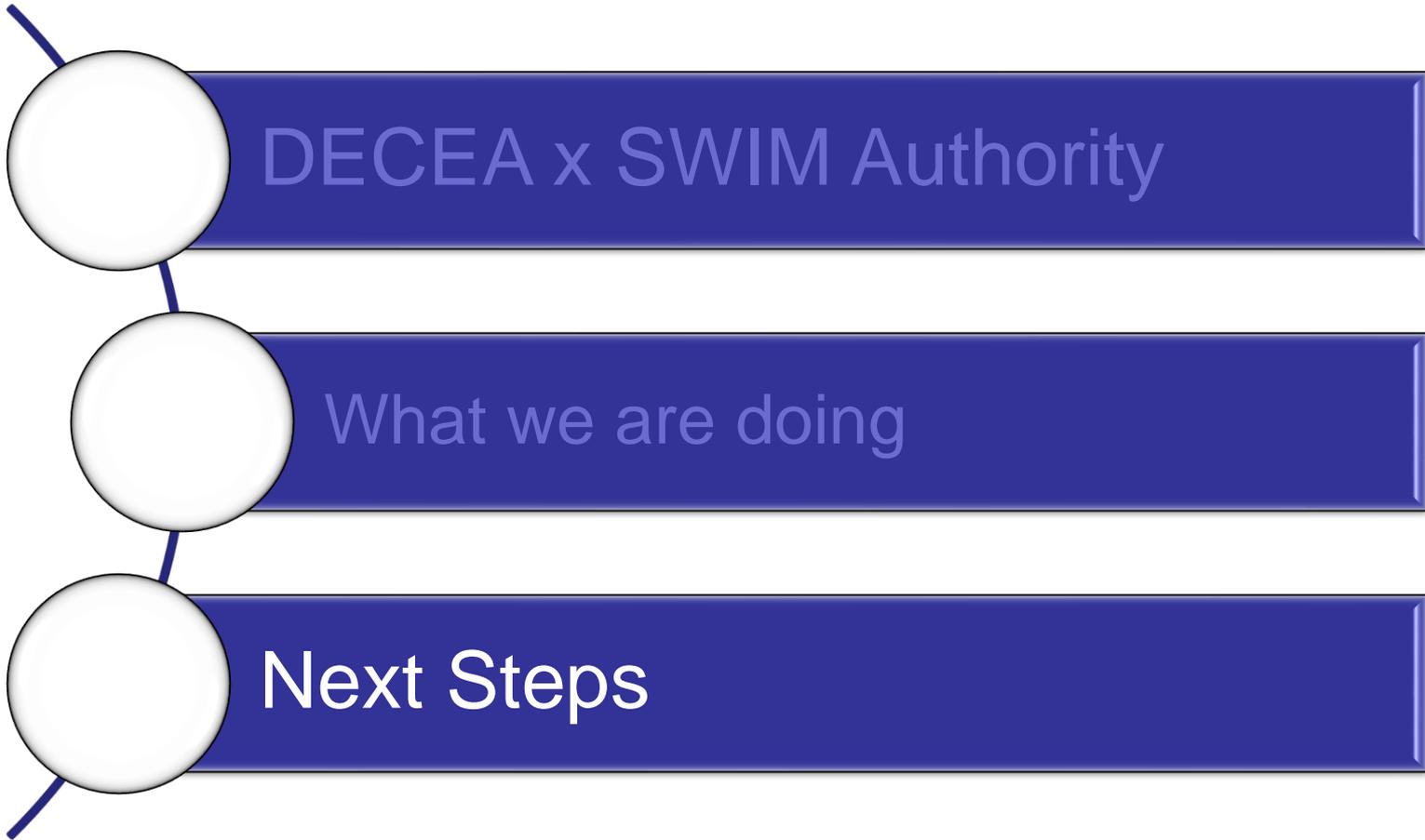
DCA 351-5 / September 2019

<https://publicacoes.decea.gov.br/index.cfm?i=publicacao&id=5037>

(Portuguese only)



Annex introducing FF-ICE



2019-2020

R&D

CONOPS
SWIM
Registry

Implementation
Plan



2020 - 2024

Annual Demos

2021

Governance policies

2024

Operational SWIM Registry

2020 - ...

SWIM Regional Demos

2023

Cyber resilience policies

2025 - ...

SWIM A/G





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