

REGIONAL FOCUS

SYSTEM WIDE INFORMATION MANAGEMENT IMPLEMENTATION IN AFRICA

Part 1 - Awareness

Wednesday 29 September 2021

12:00 – 14:30 CAT



Ms. Boni Dibate

Director Africa Affairs

CANSO



Mr. Prosper Zo'o Minto'o

Regional Director

ICAO WACAF



ICAO

Regional Focus : System Wide Information Management Implementation In Africa

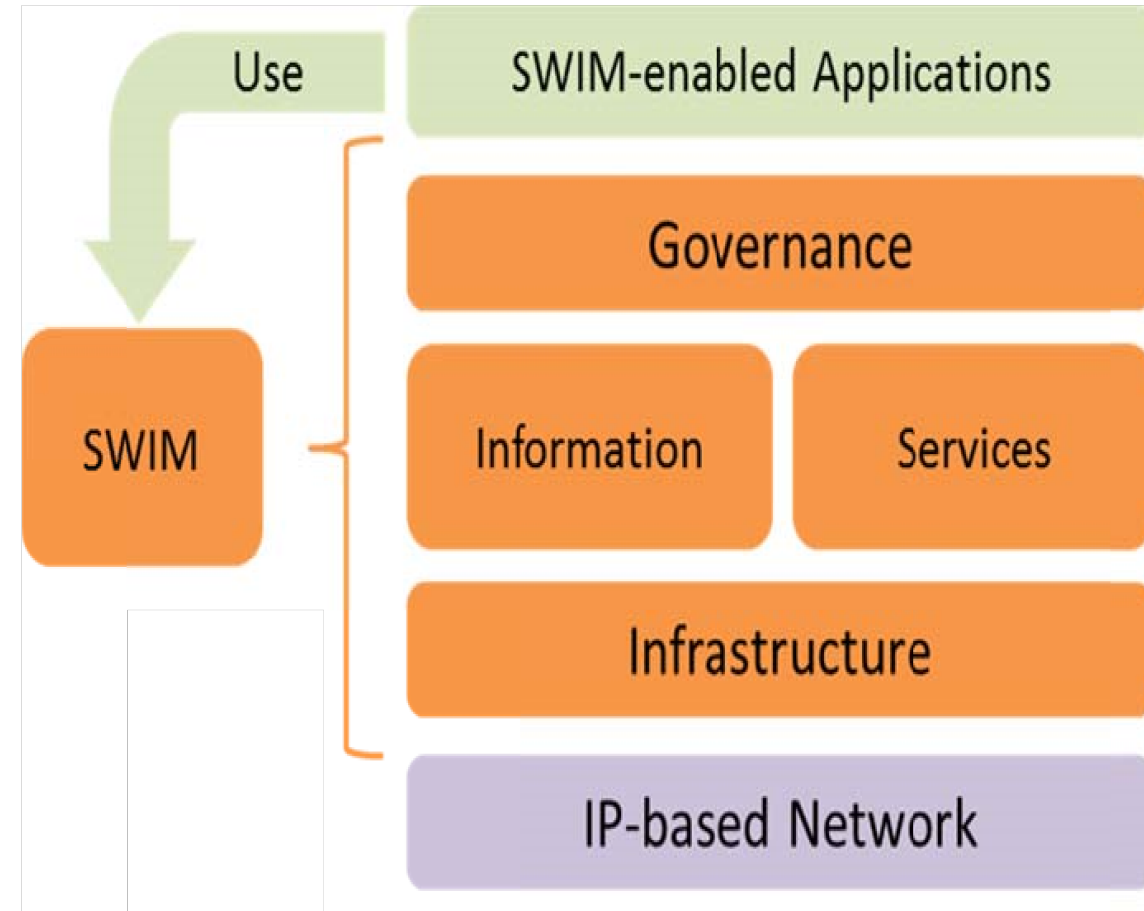
Prosper Zo'o Minto'o, ICAO Regional Director, Western And Central Africa

SWIM DEFINITION

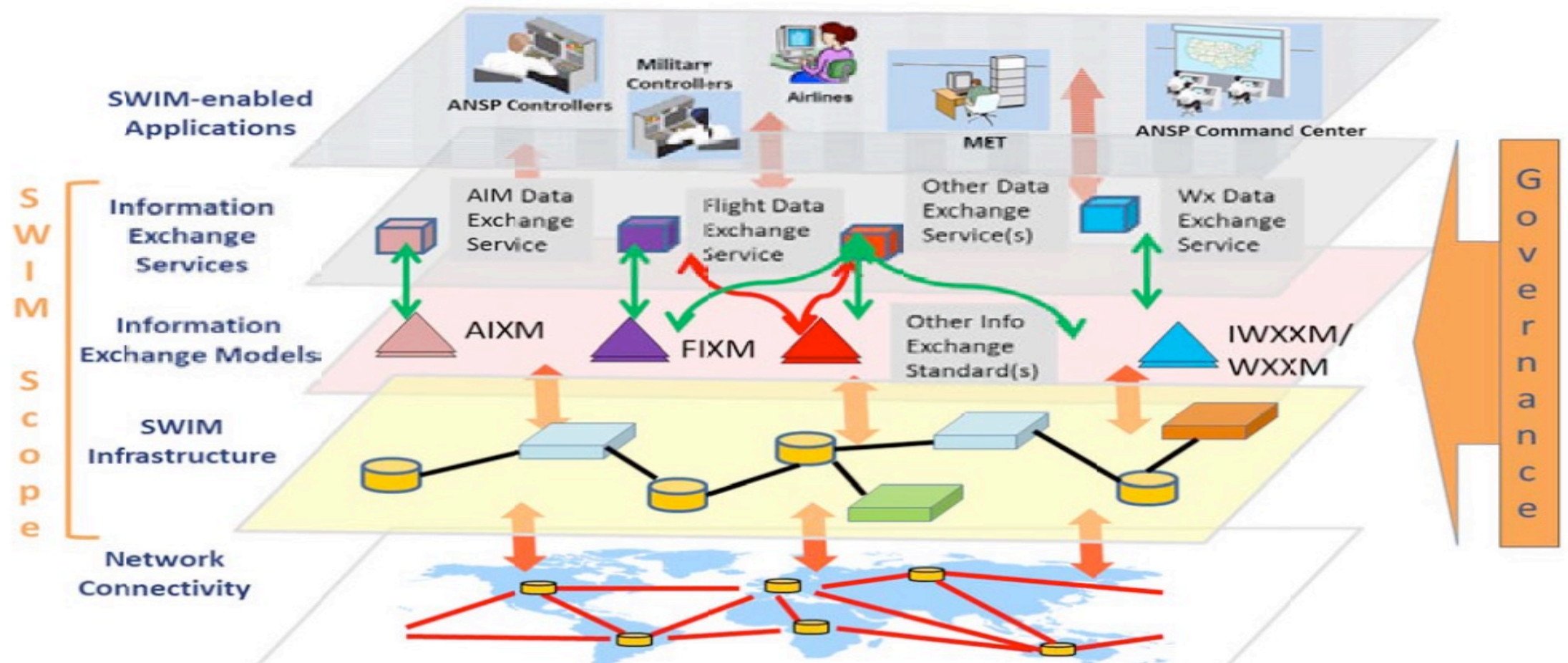
SWIM consists of standards, infrastructure and governance enabling the management of the ATM-related information and its exchange between qualified parties via interoperable services.

The scope of SWIM includes information exchange standards and the infrastructure required to exchange information between SWIM-enabled applications.

ATM SWIM-enabled applications consume or provide SWIM information services using SWIM standards.



SWIM GLOBAL INTEROPERABILITY FRAMEWORK



SWIM BENEFITS

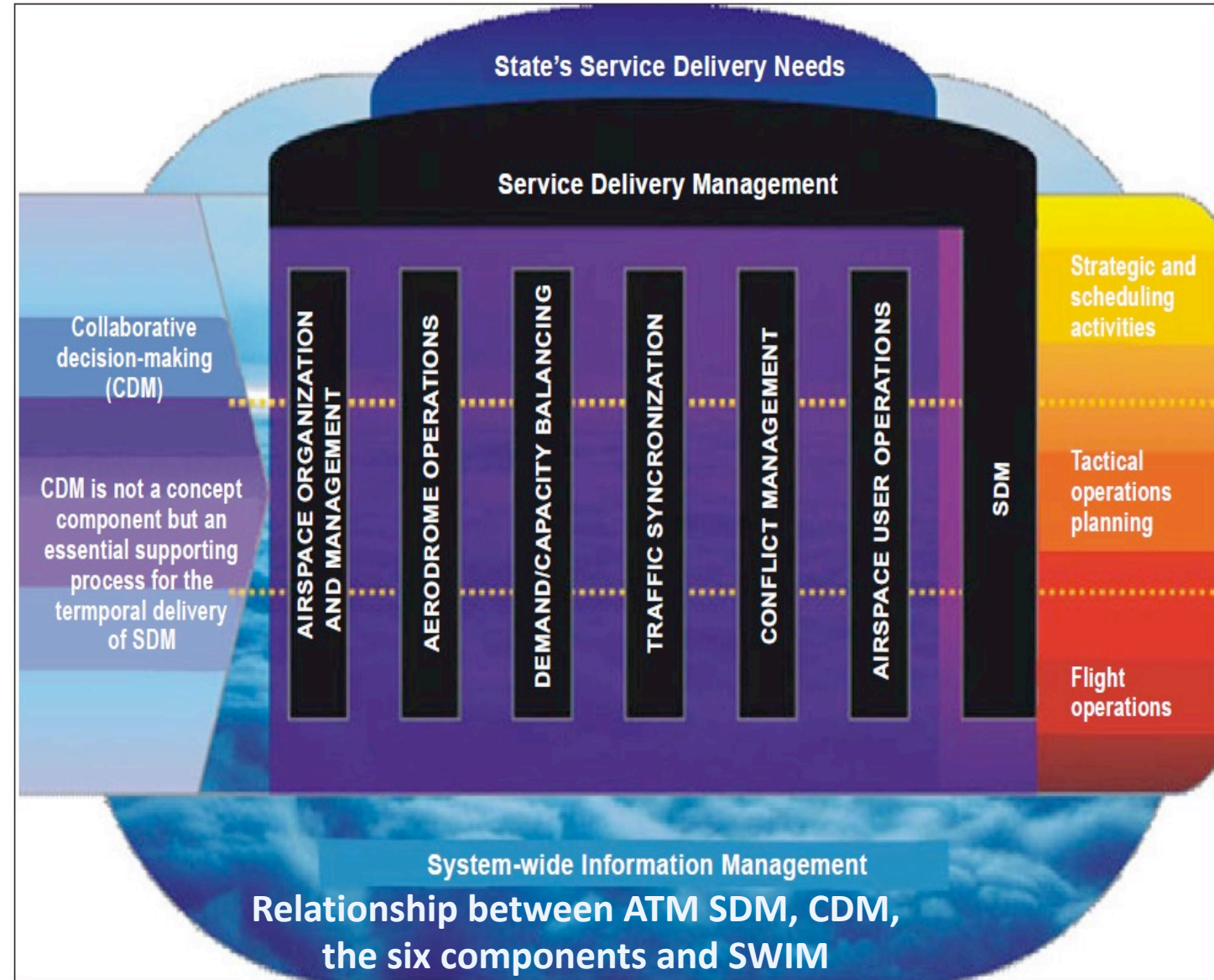
SWIM contributes to achieving the following benefits:

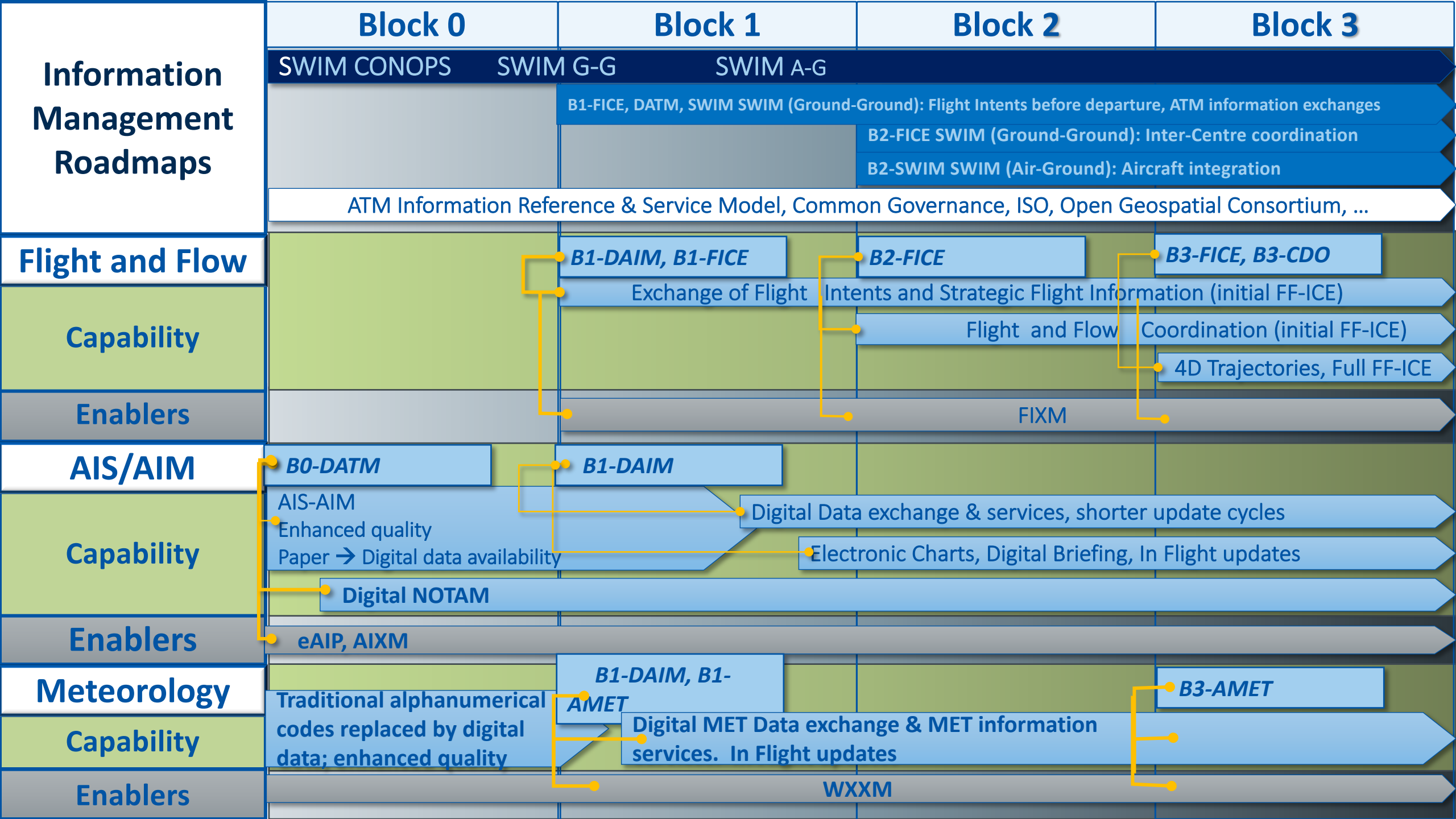
- improved decision making by all stakeholders during all strategic and tactical phases of flight (pre-flight, in-flight and post-flight) through:
 - improved shared situational awareness; and
 - improved availability of quality data and information from authoritative sources;
- increased system performance;
- more flexible and cost-effective communications by the application of common standards for information exchange;
- loose coupling which minimizes the impact of changes between information producers and consumers; and
- **support of ATM Service Delivery Management (SDM)**

Planning and conducting of SWIM will take place through the ATM SDM component, which defines the rules and means for safe and secure information sharing between all the participants.

It acts as a focal point for coordination between the different service providers through:

- *LoAs, SLAs, information sharing, delegation of service provision.*





SWIM Module	Main Purpose	New Capabilities	Maturity Level
SWIM B2/1	To define the requirements for an information service provider to make aviation-related information available as an information service.	<p>Once an information service is created by an information service provider, it can be discovered by the ATM community through its service overview made available via a registry. The service overview includes metadata specifying the characteristics of the provided information service including the means by which the service is accessed by the authorized users.</p> <p>SWIM Information services typically apply publish/subscribe or request/reply message exchange patterns. SWIM information services facilitate integration with automation systems.</p>	<ul style="list-style-type: none">• Validation

SWIM Module	Main Purpose	New Capabilities	Maturity Level
SWIM B2/2	<ul style="list-style-type: none"> To define the requirements for an information service consumer to discover and access aviation related information provided via information services. 	<p>An information service consumer has access to a registry to discover available information services. A registry's search and filter capability helps an information service consumer discover an information service appropriate to their specific needs. The information service consumer needs to implement publish/subscribe and request/reply message exchange patterns over an Internet protocol-based communication infrastructure in order to consume information services.</p>	<ul style="list-style-type: none"> Validation
SWIM B2/3	<ul style="list-style-type: none"> A registry is a means for the information service producer to publicize and for an information service consumer to discover information services within a SWIM environment. 	<p>A registry contains a listing of service overviews. It has a search and filter capability to identify and select information services, permits managing service overviews, and provides user access control mechanism.</p>	<ul style="list-style-type: none"> Ready for implementation

SWIM Module	Main Purpose	New Capabilities	Maturity Level
SWIM B2/4	<ul style="list-style-type: none"> Exchange of non-safety critical information with the aircraft to improve operational awareness and efficiency. 	Air/Ground (A/G) SWIM leverages inflight internet connectivity (e.g., broadband) capabilities, along with the air navigation service provider's ground SWIM infrastructure, to enable information exchange with the aircraft.	<ul style="list-style-type: none"> Validation
SWIM B2/5	<p>SWIM governance helps establish global access to aviation-related information by connecting information service providers and consumers within a global interoperability framework.</p>	Air/Ground (A/G) SWIM leverages inflight internet connectivity (e.g., broadband) capabilities, along with the air navigation service provider's ground SWIM infrastructure, to enable information exchange with the aircraft.	<ul style="list-style-type: none"> Validation
SWIM B3/1	<p>Exchange of safety critical information with the aircraft to improve operational awareness and efficiency.</p>	A/G SWIM capability is extended to address the exchange of safety critical information with the aircraft.	<ul style="list-style-type: none"> Concept

APIRG RELATED PROJECTS

- AIM1 - Quality Management System (QMS)
- AIM2 - Aeronautical Information Exchange Model (AIXM)
- AIM3 - Electronic Terrain and Obstacle Data (e-TOD)
- COM1 – Ground-ground Communications
- COM2 - Ground-ground Supported Applications
- COM3 – Air-ground Communications
- COM4 - Infrastructure Integration
- COM5 - Cybersecurity
- MET1 - Quality Management System (QMS)/Significant Meteorological Information (SIGMET)
- MET2 - Terminal Area Warnings & Forecast/WAFS Forecast/OPMET Data Exchange
- MET3 - Space Weather Information

KEY REFERENCES

- ICAO Global Air Traffic Management Operational Concept (Doc 9854)
- ICAO Global Air Navigation Plan (Doc 9750)
- ICAO System Wide Information Management Manual (Doc 10039)
- ICAO Air Traffic Management – Service Delivery Management (Circular 335)
- ICAO AFI Planning and Implementation Regional Group Meeting Reports



ICAO

THANK YOU!



Mr. Raoul Bester

Aeronautical Information Specialist

ATNS



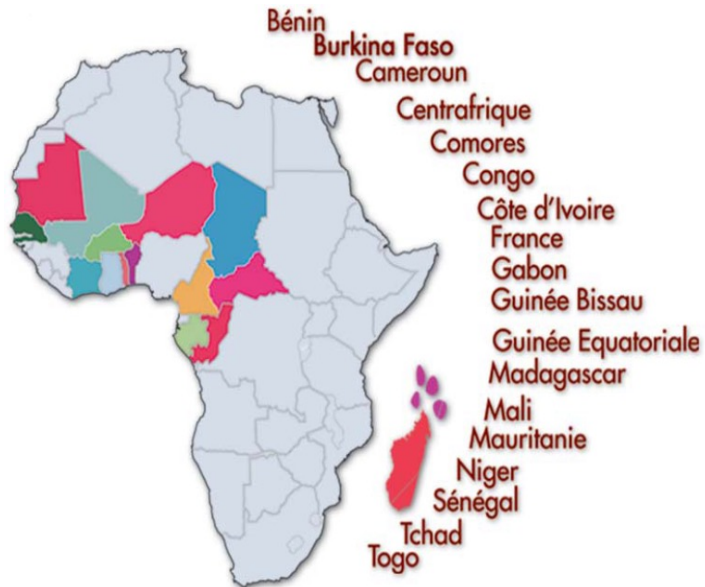
Mr. Josiah Ulrich Backobi

CNS/ATM & MET Infrastructure Project Manager

ASECNA



Benin, Burkina Faso, Cameroun, Centrafrique, Congo, Côte d'Ivoire, France, Gabon, Guinée Bissau, Guinée Equatoriale, Madagascar, Mali, Mauritanie, Niger, Sénégal, Tchad, Togo, Union des Comores



SYSTEM WIDE INFORMATION MANAGEMENT IMPLEMENTATION IN AFRICA



AGENDA

- ➔ Introduction
- ➔ SWIM Overview
- ➔ Information Management Technology Roadmap
- ➔ ASECNA planning framework for SWIM
- ➔ ASECNA SWIM Concept for Information Services
- ➔ SWIM Infrastructure – Network Services for ATM
- ➔ ASECNA SWIM Deployment plan
- ➔ Conclusion



INTRODUCTION

Current Environment – Today's Information Exchange

Stakeholders



States and regions





INTRODUCTION

Current Environment – Today's Information Exchange



Current ATM
Service
Provision

Diverse applications with autonomous Information Systems

Diverse customized communication procedures and protocols

Environmental constraints, economic pressure, traffic volume increase



FUTUR ATM SYSTEM

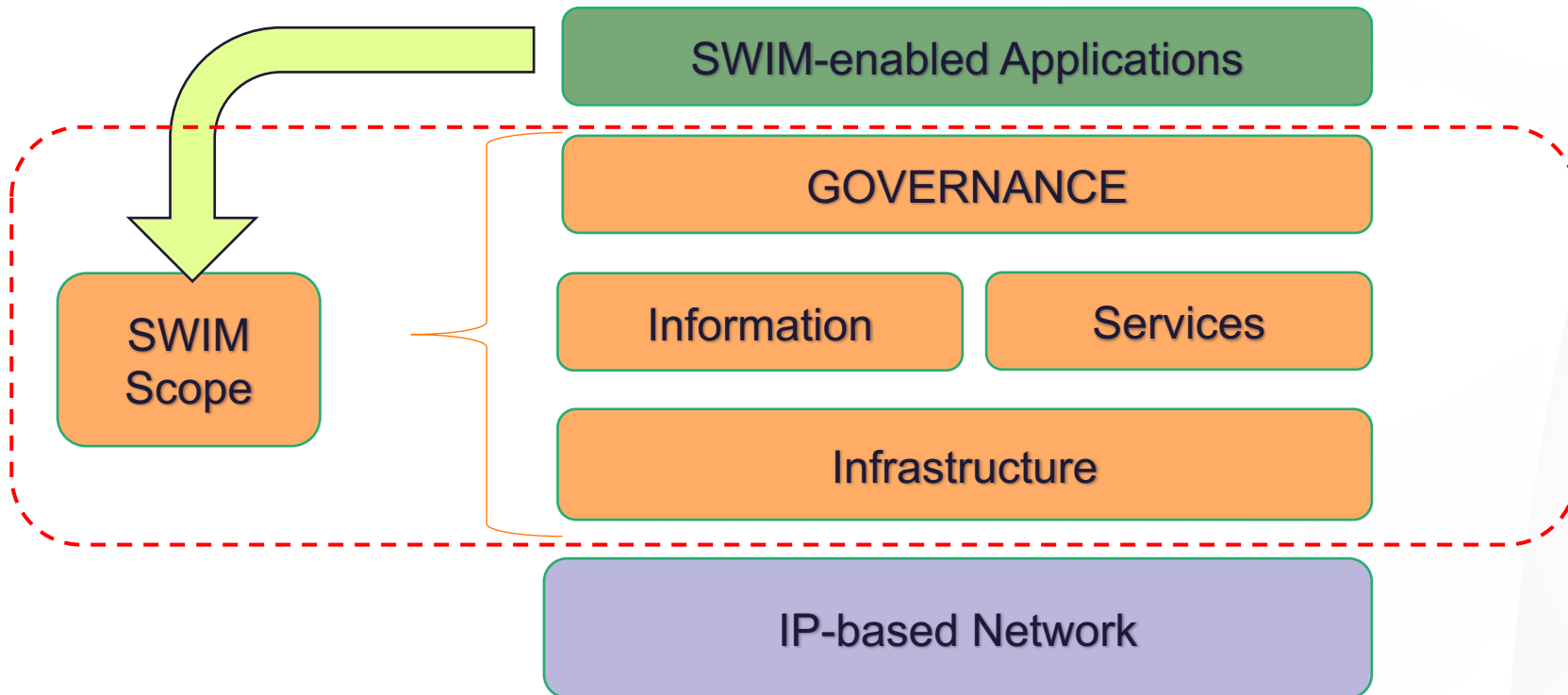
ACCURATE & UPDATED INFORMATION

GANP provides a planning framework for harmonization and interoperability



SWIM OVERVIEW

SWIM Definition & Scope

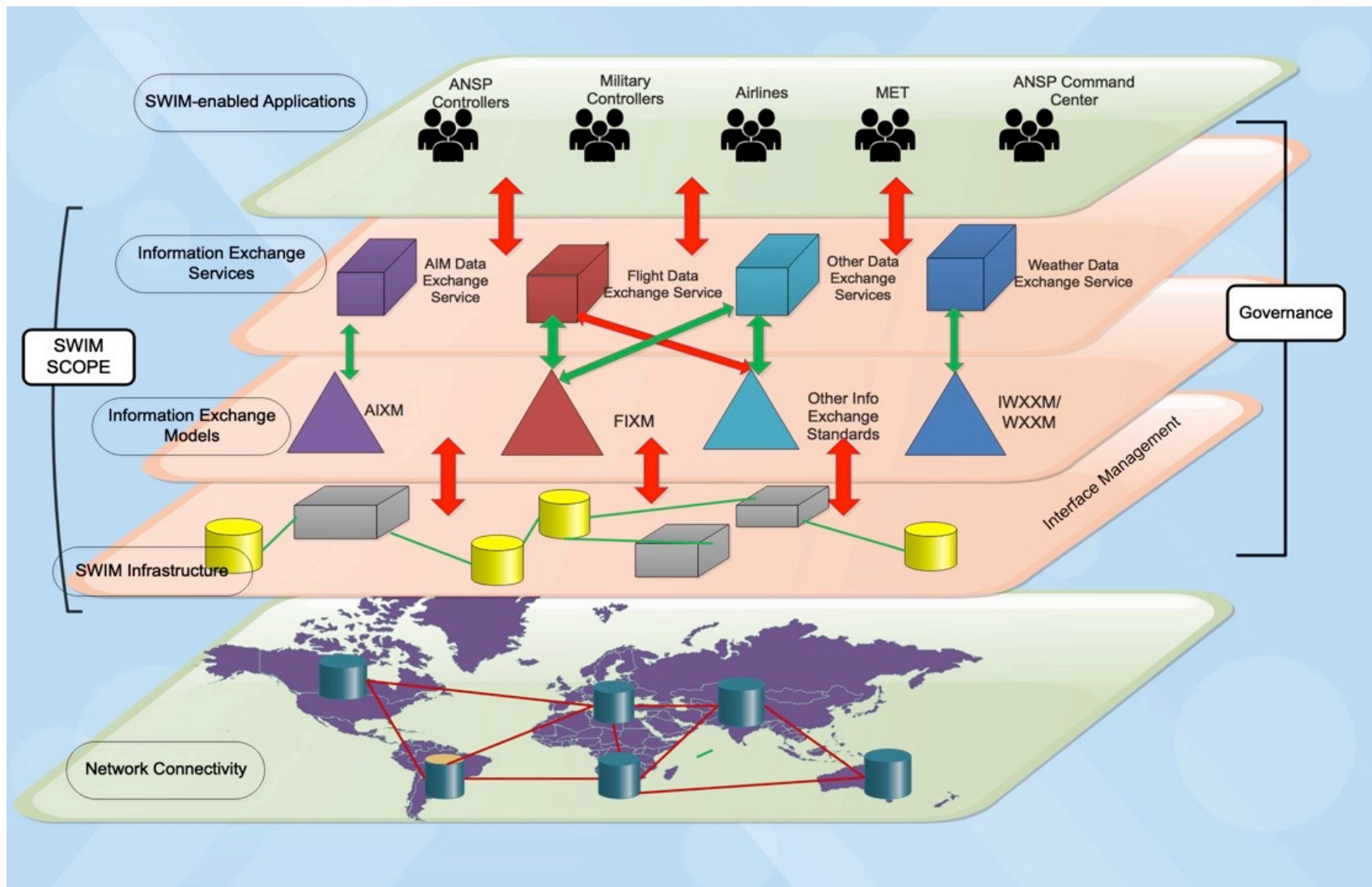


Definition: SWIM consists of standards, infrastructure and governance enabling the management of ATM information and its exchange between qualified parties via interoperable services.



SWIM OVERVIEW

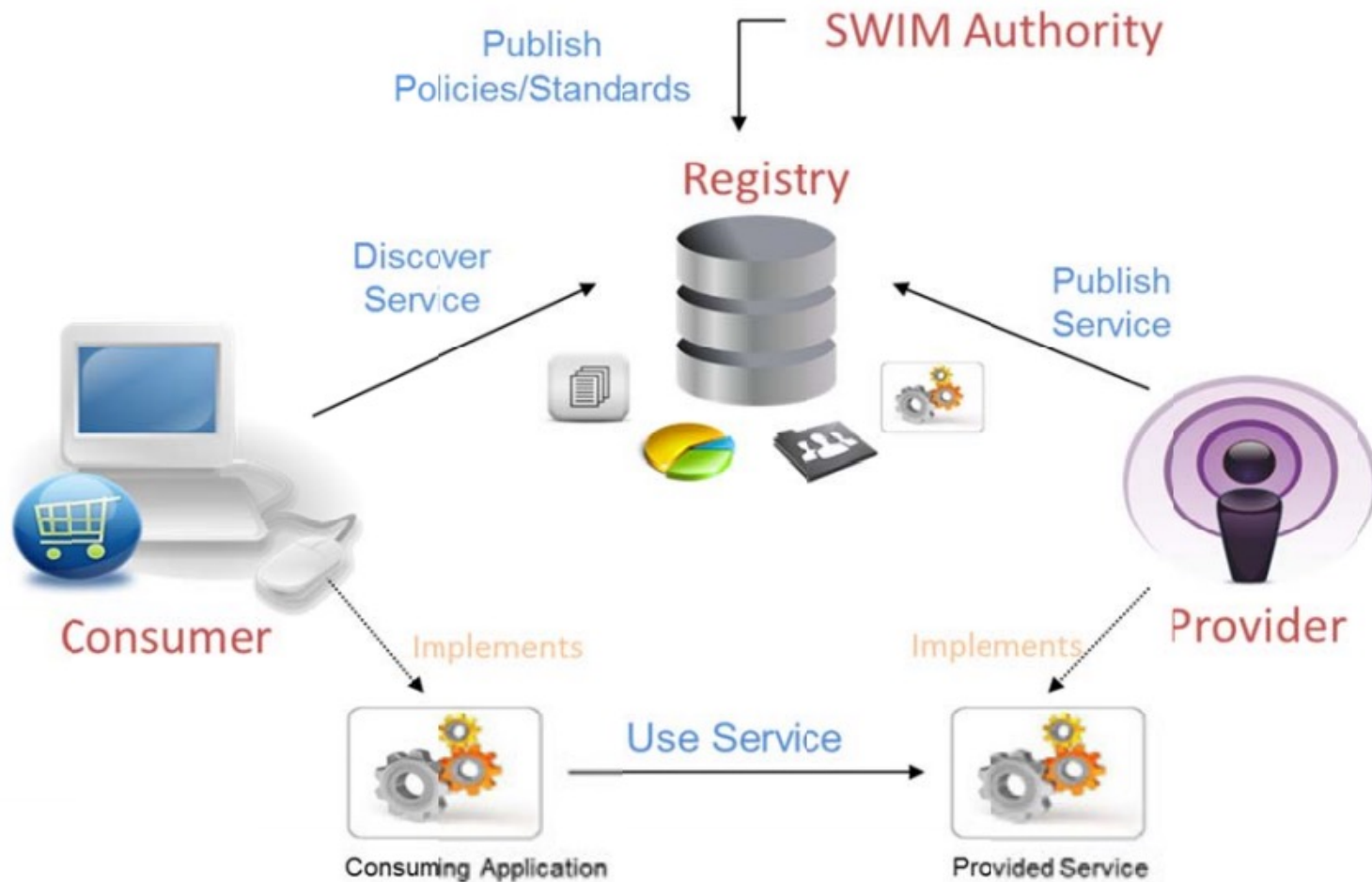
SWIM Layers & Global interoperability Framework





SWIM OVERVIEW

SWIM Registry



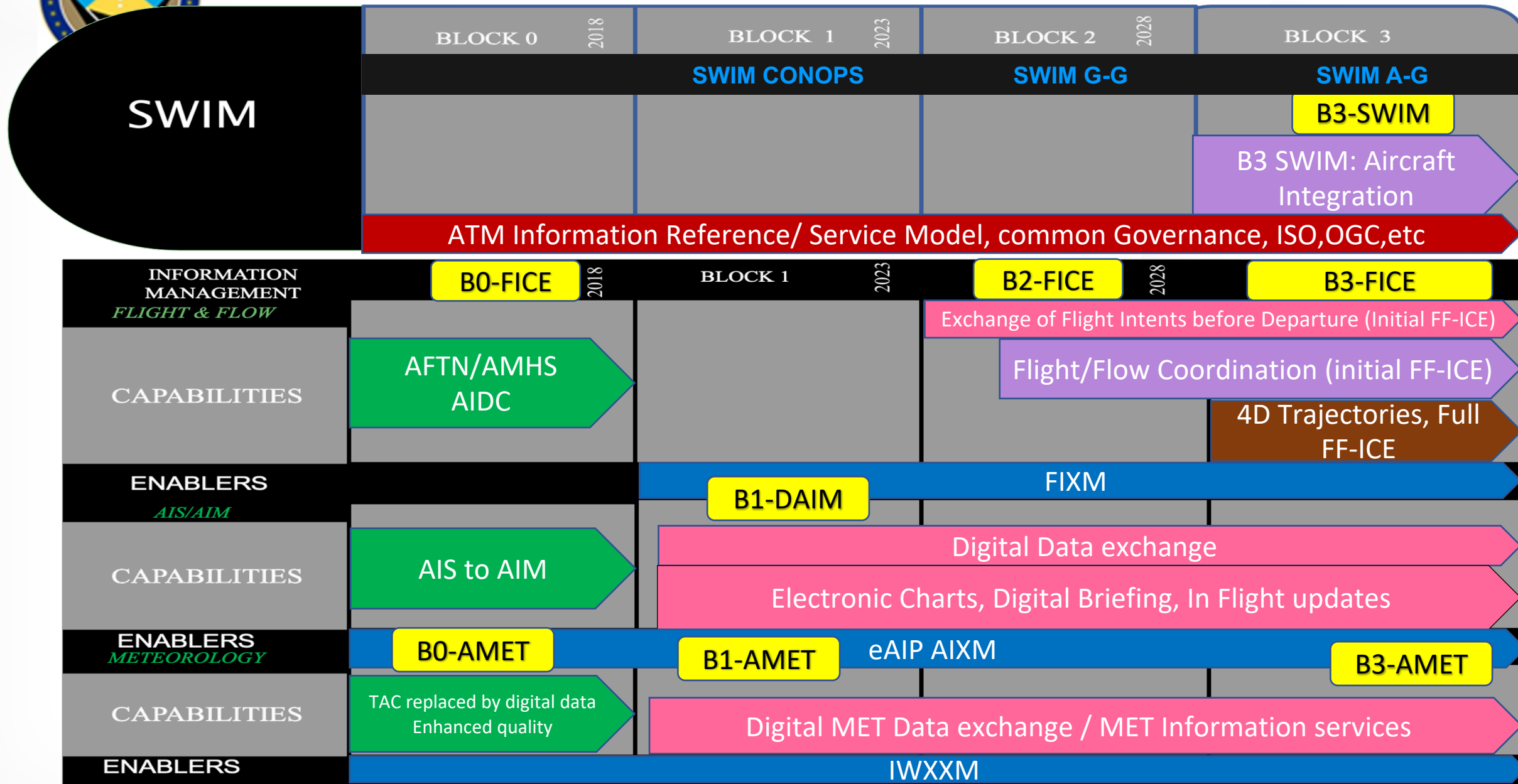
The information services and their lifecycles must be stored in a catalogue and managed. Information service providers maintain and expose these services with their implemented instances through a SWIM registry.

SWIM registry supports the governance of SWIM and provides the inventory of reference for service related resources in SWIM. It improves the accessibility to information facilitating a common understanding of SWIM.



Information Management Technology Roadmap

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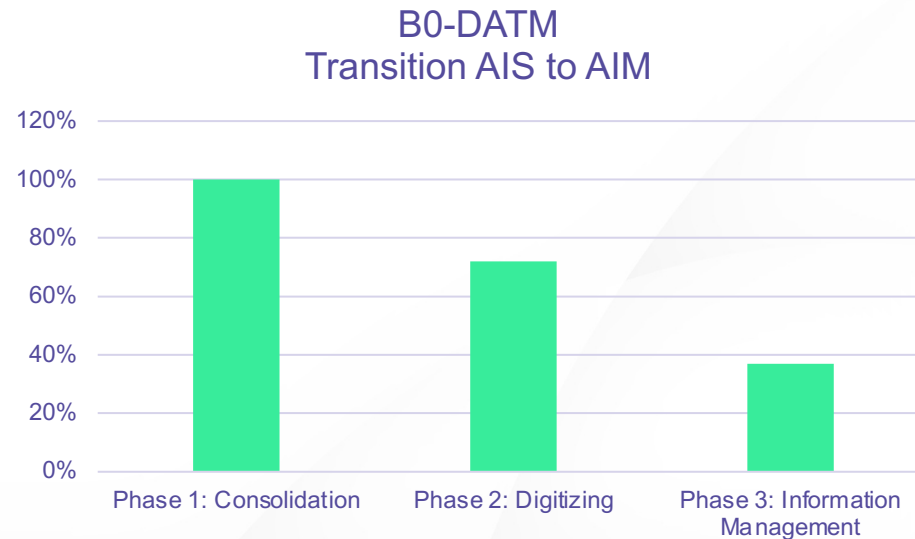
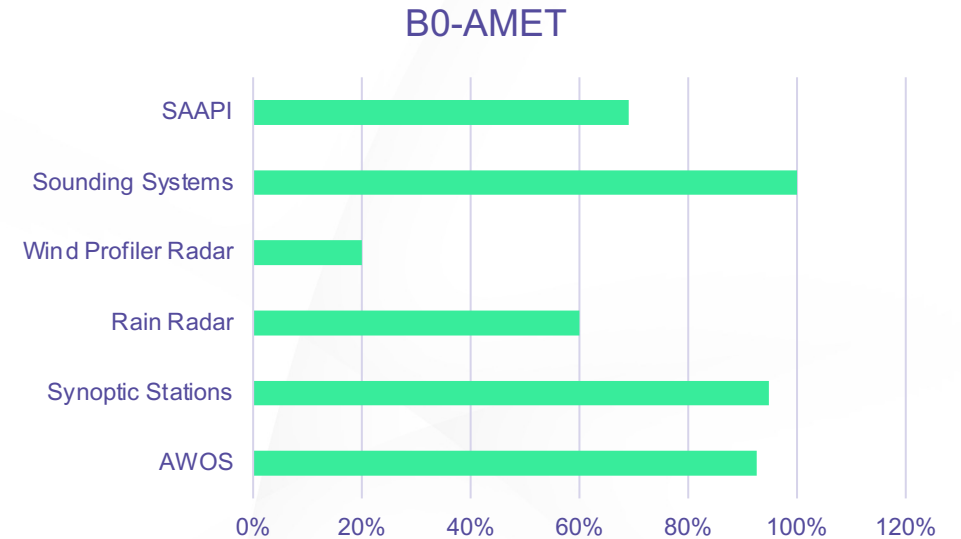
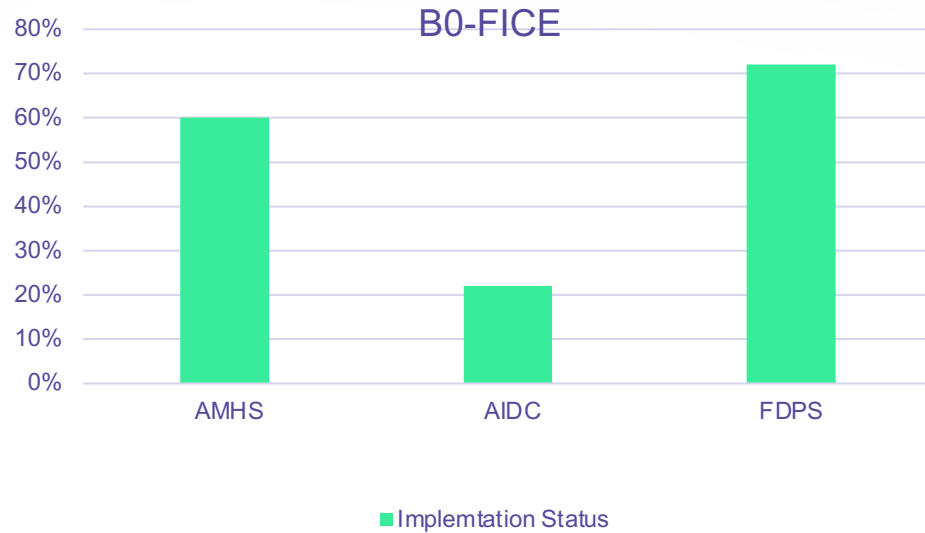




ASECNA Planning Framework for SWIM



Implementation Status of ASBU Modules



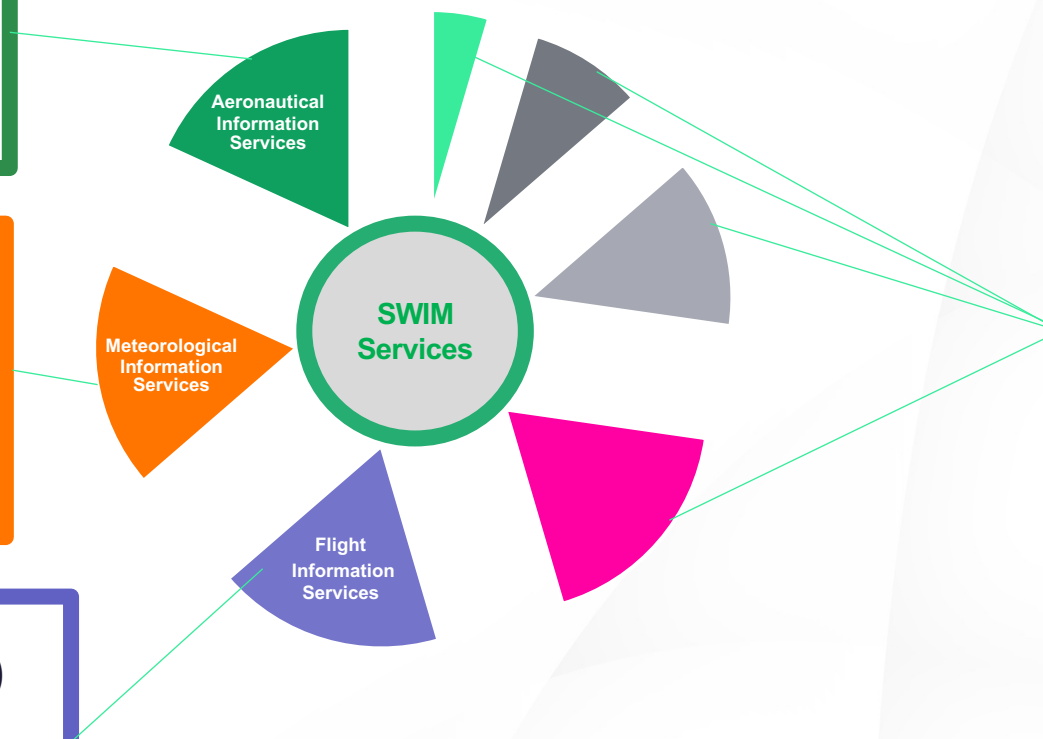


ASECNA SWIM Concept for Information Services

- Aeronautical Information Publication (AIP) Service
- Flight Procedure Information Service
- Aerodrome Mapping Information Service
- Obstacle Information Service

- Observed Meteorological Information Services
- Nowcast Meteorological Information Service
- Forecast/Protection Meteorological Information Services
- Space Weather Information Service

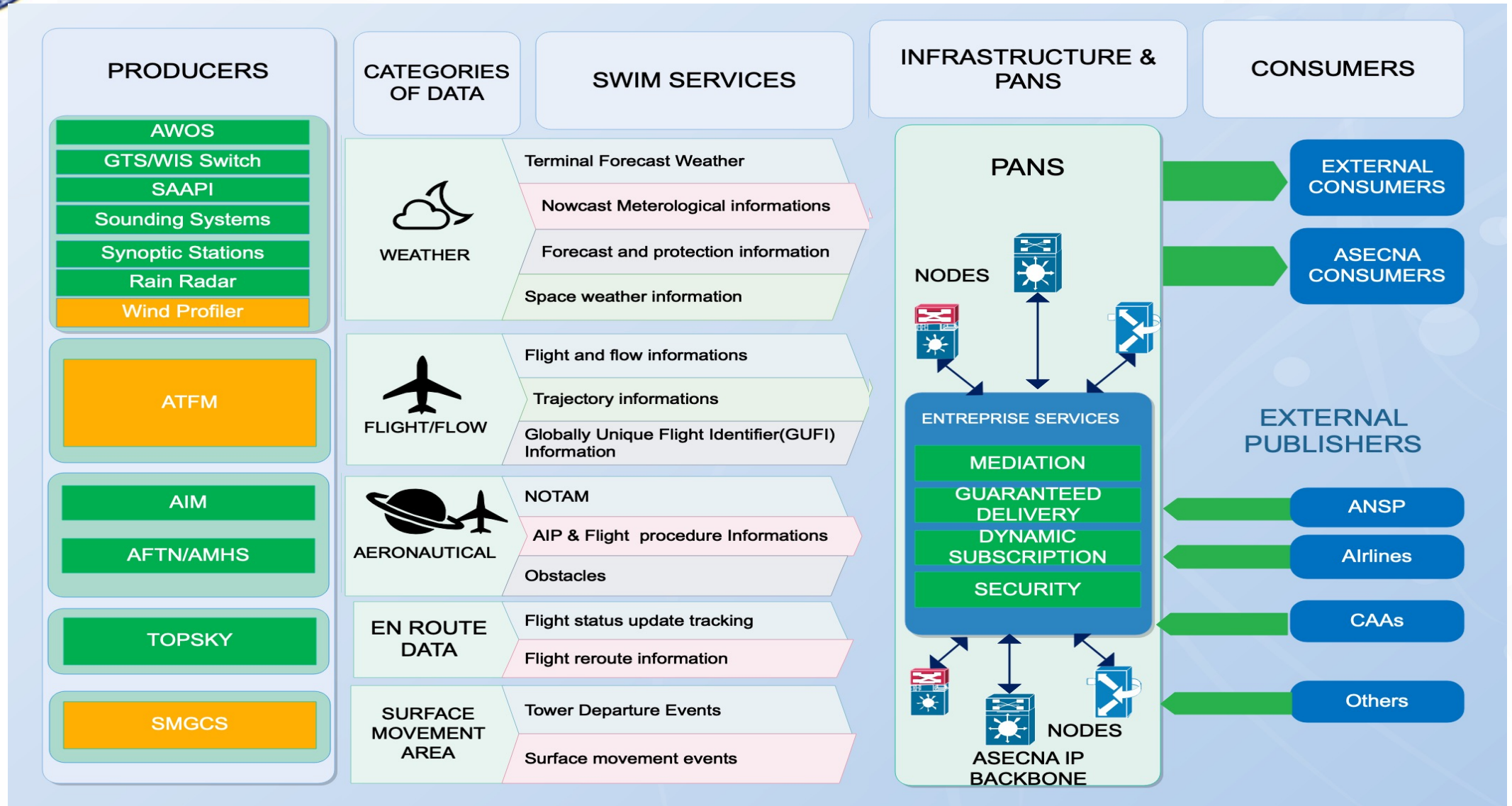
- Flight Information Service
- Globally Unique Flight Identifier (GUFI) Information Service
- Trajectory Information Service
- Air Traffic Flow Management (ATFM) Information Service



Future Related Services



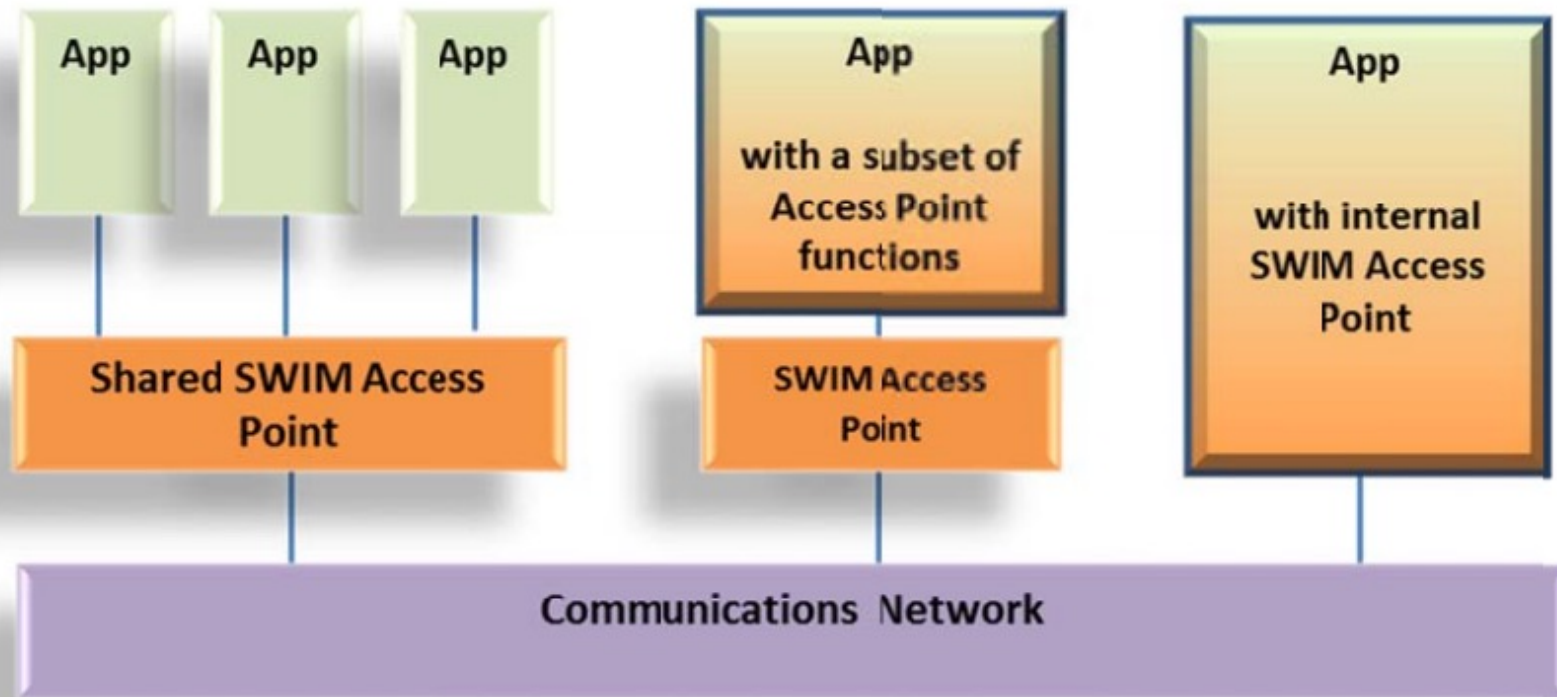
ASECNA Planning Framework for SWIM





ASECNA Planning Framework for SWIM

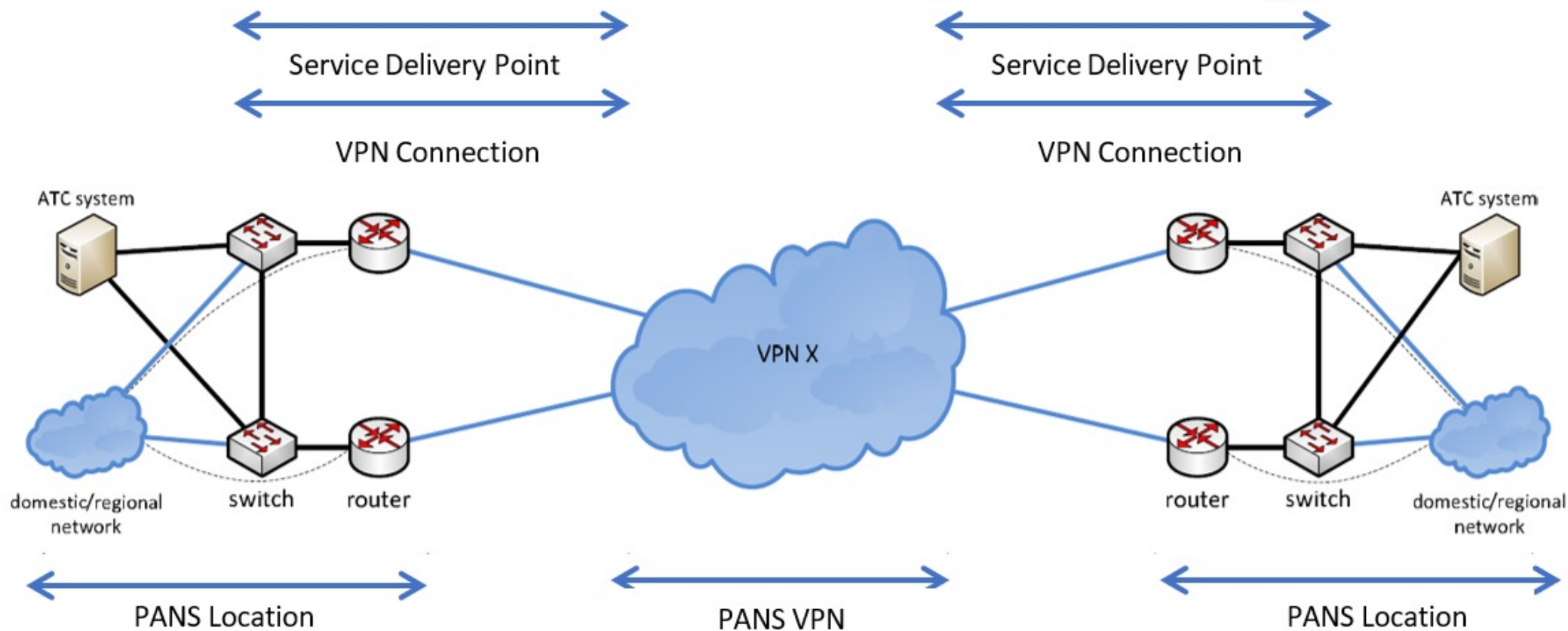
SWIM Infrastructure – Network Services for ATM





SWIM Infrastructure – Network Services for ATM

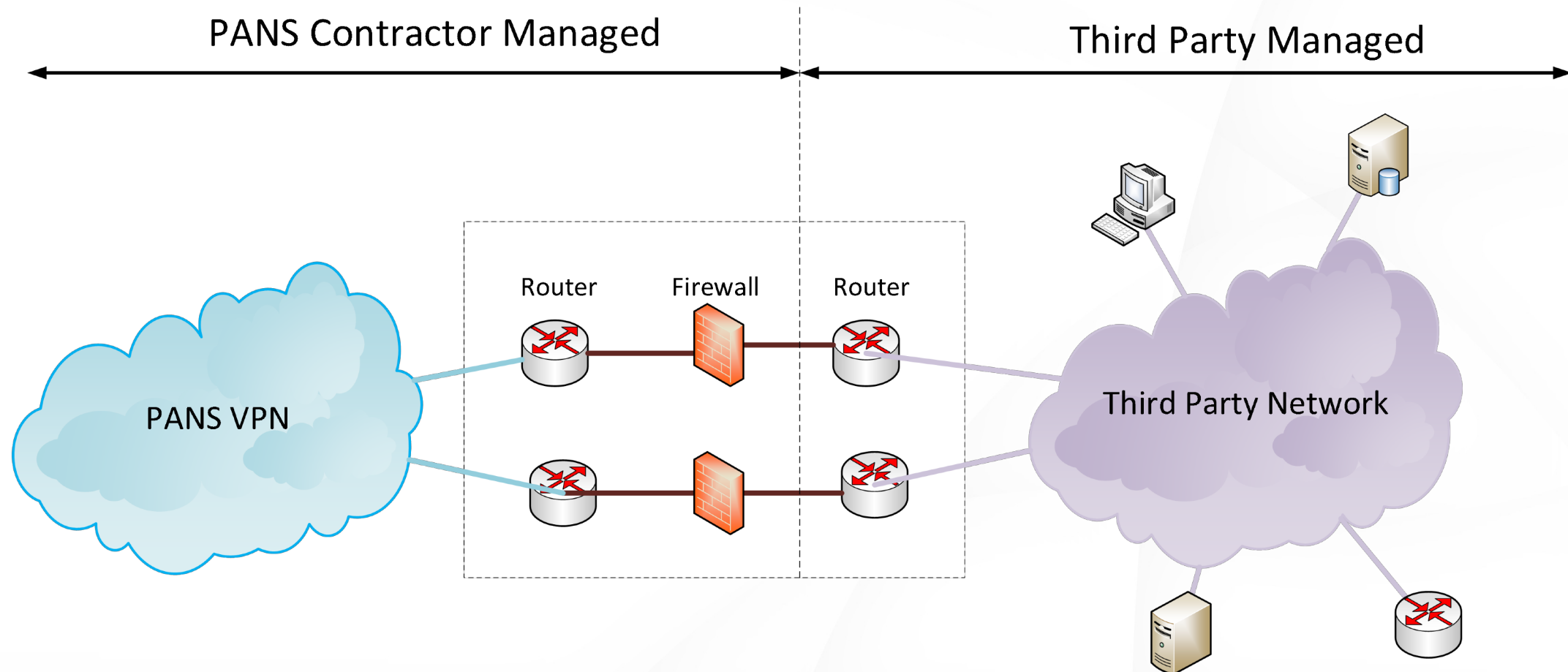
Technical Service Catalogue Structure (Private Network)





SWIM Infrastructure

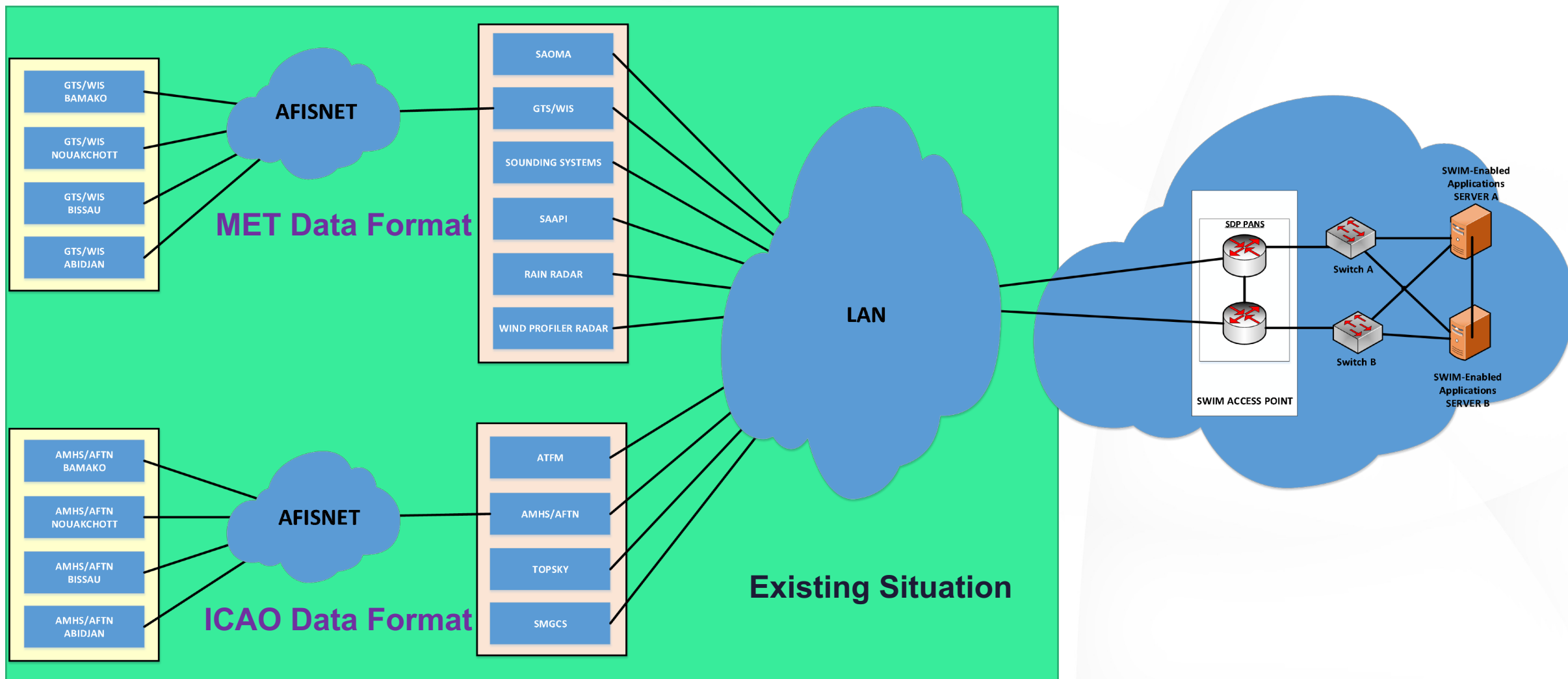
Network to Network Interconnectivity (e.g PANS & Telco)





SWIM Infrastructure

Data-producing systems (e.g. : Dakar Centre)

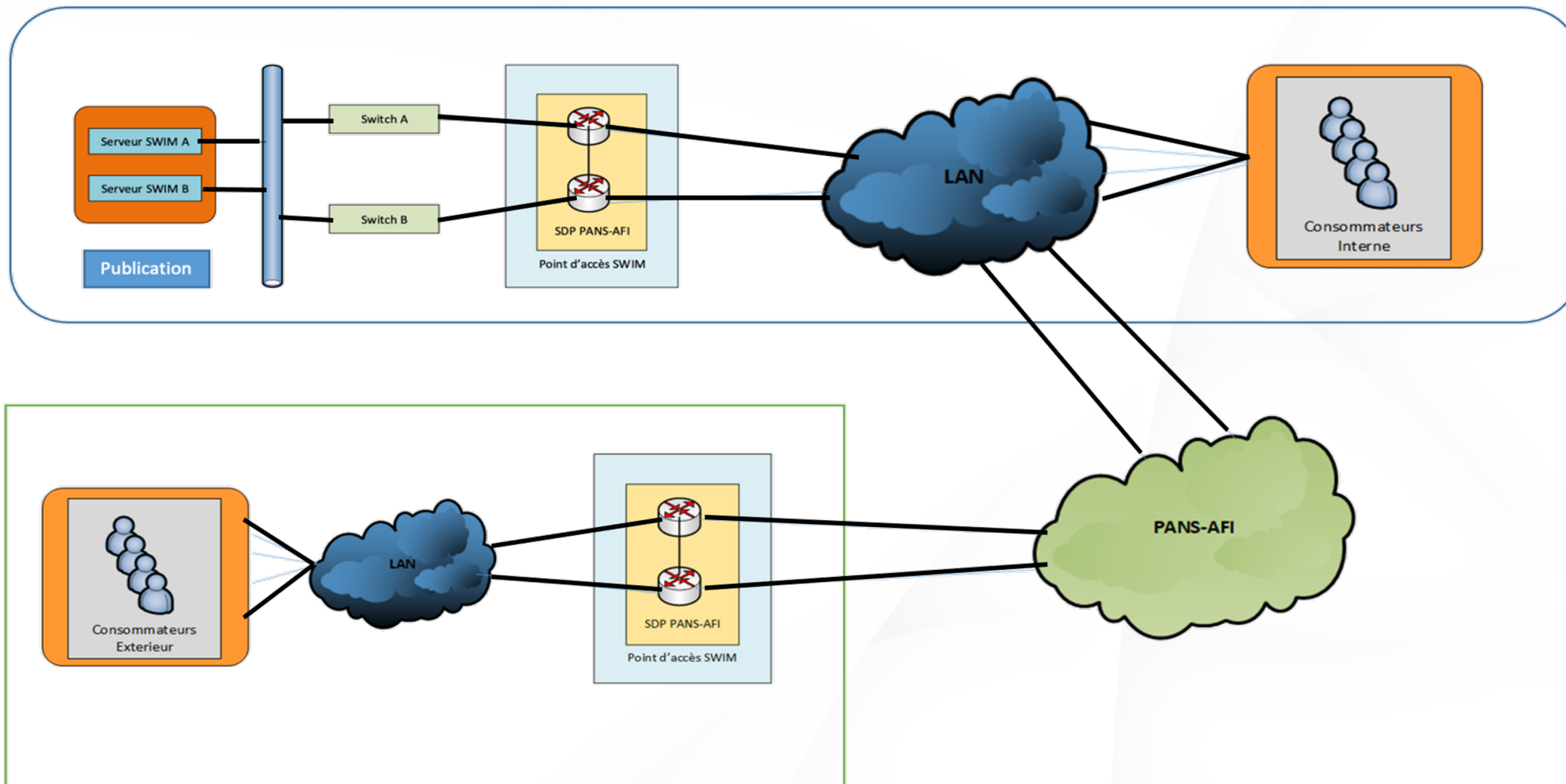




SWIM Infrastructure

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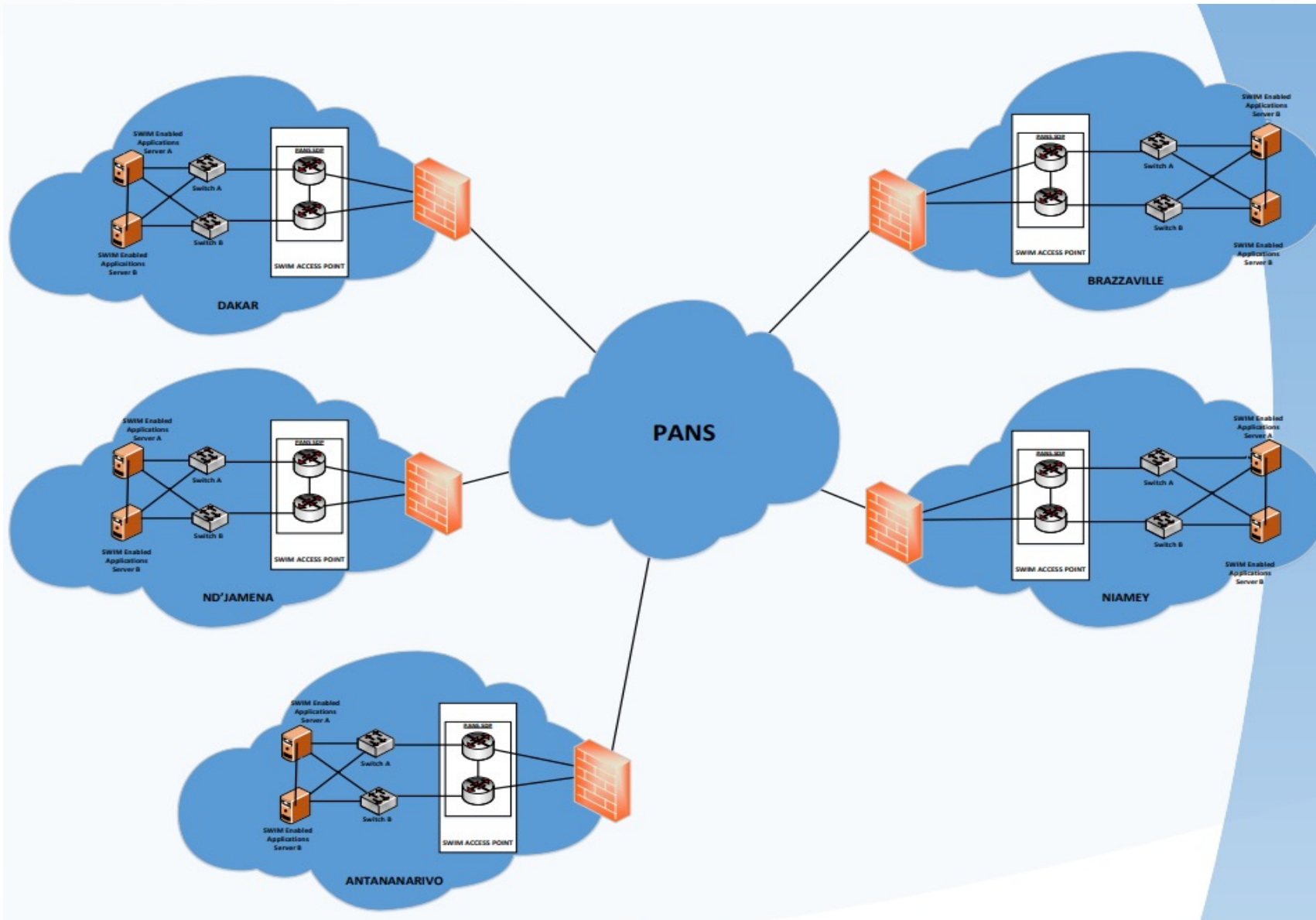
Internal & External Data Consumers





SWIM Infrastructure

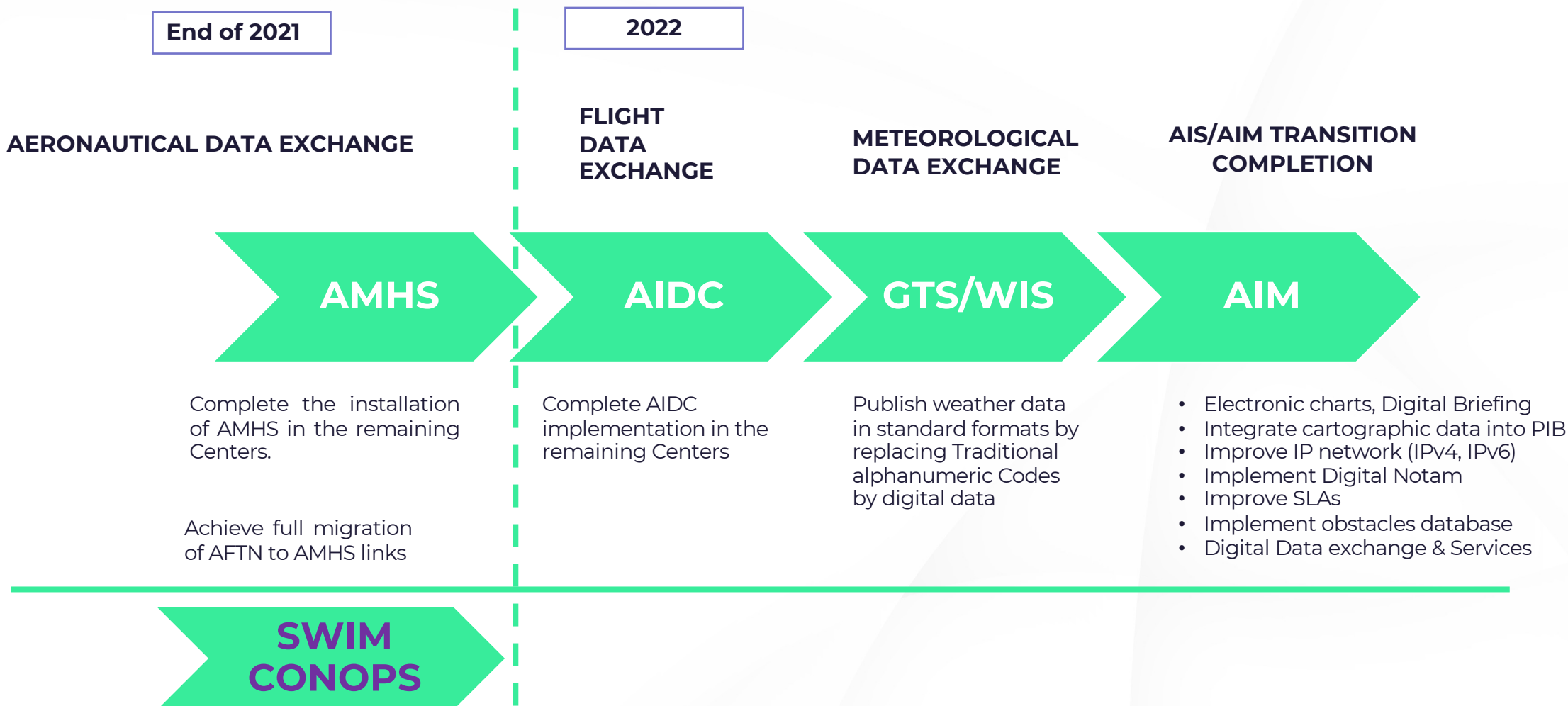
SWIM Cloud's Architecture Framework





ASECNA SWIM - Deployment Plan

Completion of ASBU Block 0&1 Modules' Implementation





ASECNA SWIM - Deployment Plan

Completion of ASBU Block 1&2 Modules' Implementation



2022

**Flight Data
Exchange & Flight
Flow Management**

FIXM

- Share Flight Information (ATFM//AMHS/FDPS)
- Manage Flight Flows
- Digital data Exchange

2023

**Meteorological
Data Exchange**

IWXXM

- Use of weather information to support automated decision-making or decision-making processes relating to:
- Digital MET data exchange/MET information services;
 - Conversion of bulletins;
 - Impact of the conversion of bulletins on the ATM;
 - Support of ATM decisions

SWIM

- **Proof Concept**
- **PANS Deployment**
- **Initial provision of Flight Intents before Departure (B1-SWIM)**

- **Flight & Flow Coordination**
- **Aircraft Integration**
- **In Flight updates**
- **4D Trajectory & Full FF-ICE (if justified)**



CONCLUSION

- ➔ Global improvements related to IM are envisioned to be applied on a System Wide Information Management (SWIM) basis in order to integrate the ATM network for a performance-enhancing operational expectations.
- ➔ The development of SWIM infrastructure and services should proceed in alignment with a globally-accepted operational concept that articulates the expected SWIM implementation in terms of the benefits, enablers, features, and principles for development and transition.
- ➔ ASECNA invites other AFI/ANSP States to participate in the development and governance of the regional PANS network based on optical fiber in order to facilitate the implementation of projects that will require greater bandwidth consumption.
- ➔ ASECNA SWIM will be fully interoperable with other regional SWIM or regional initiative thanks to:
 - separation of information provision and information consumption;
 - interface compatibilities;
 - use of open standards;
 - use of interoperable services,



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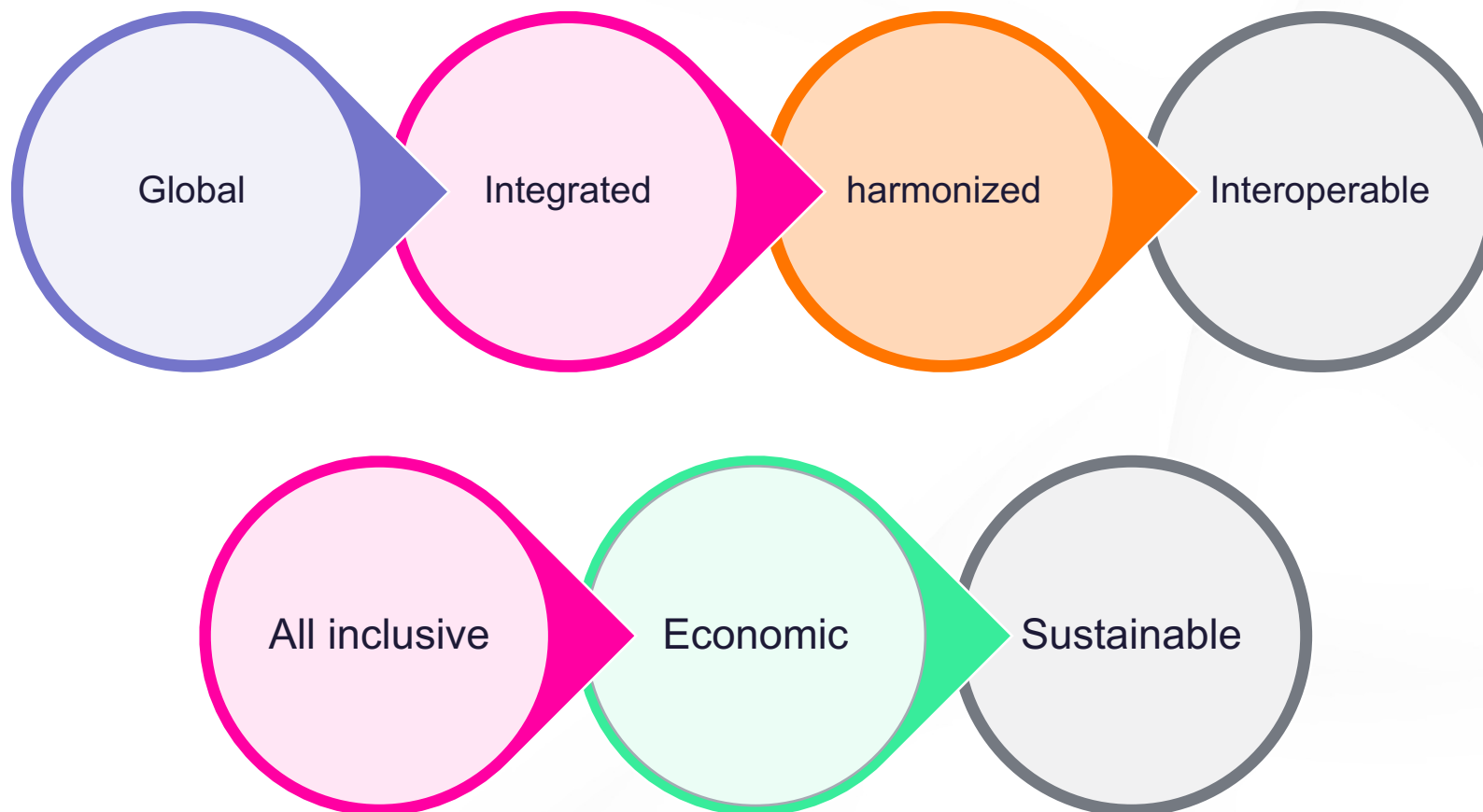


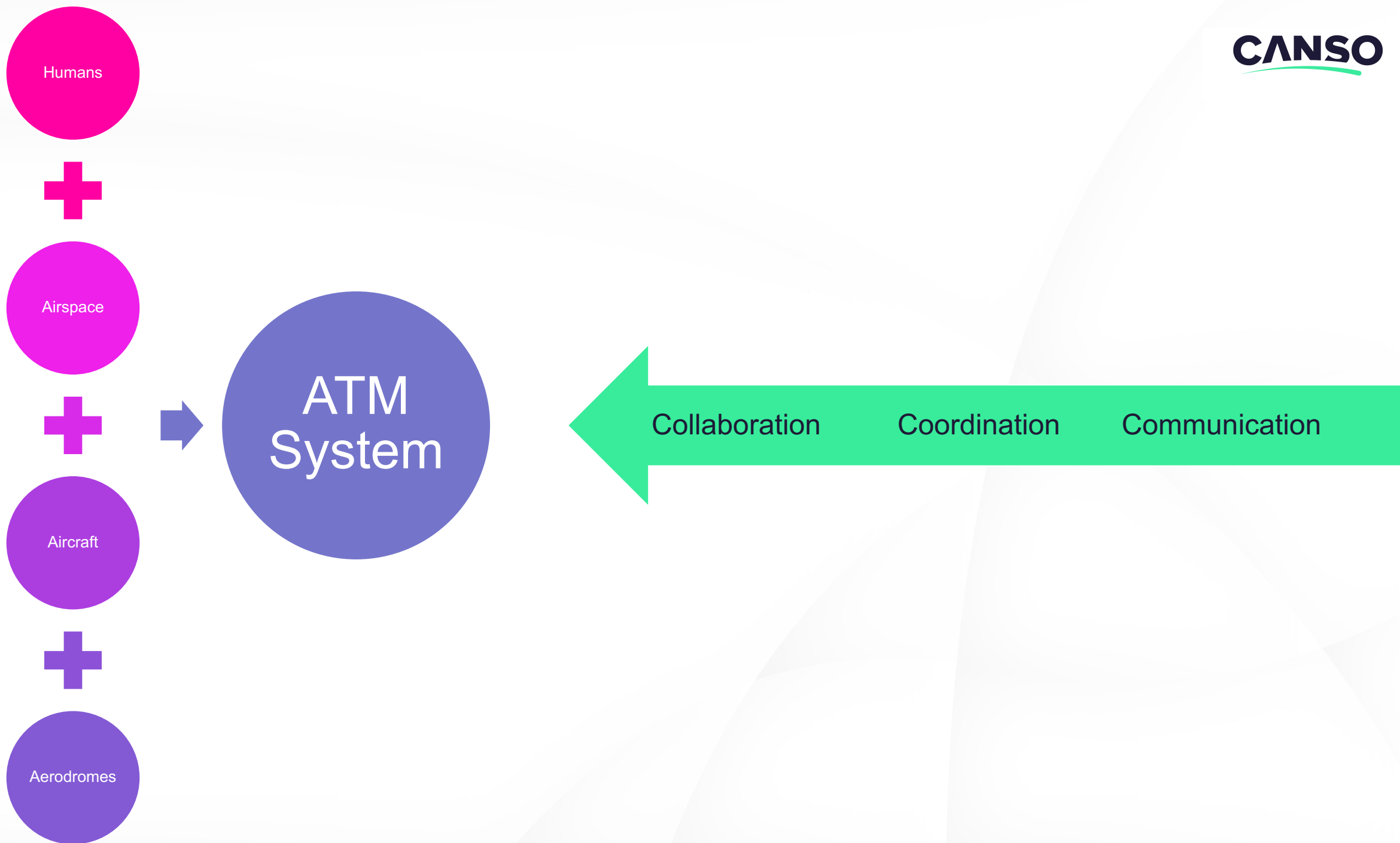
Ms. Lindi-Lee Kirkman

Manager Safety & Flight Operations - ATM Infrastructure

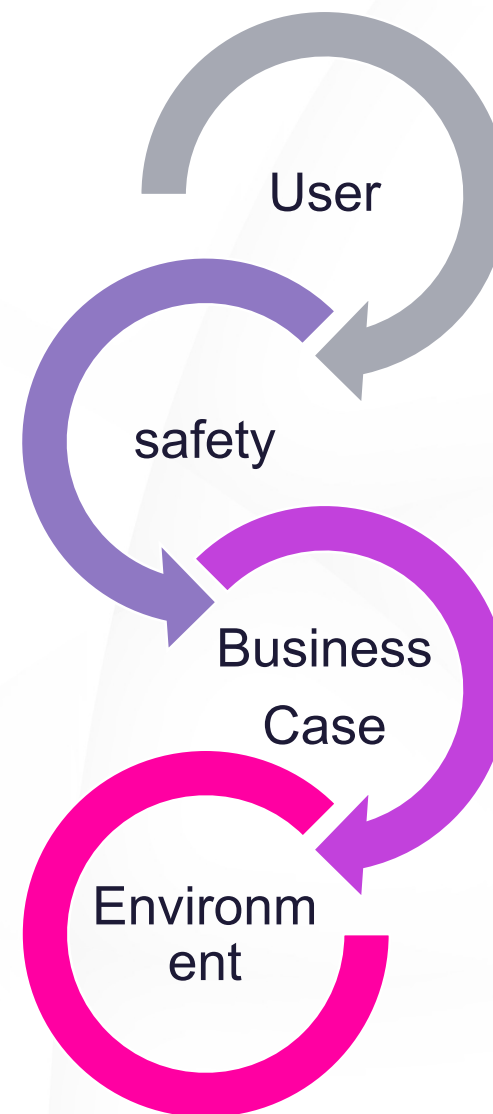
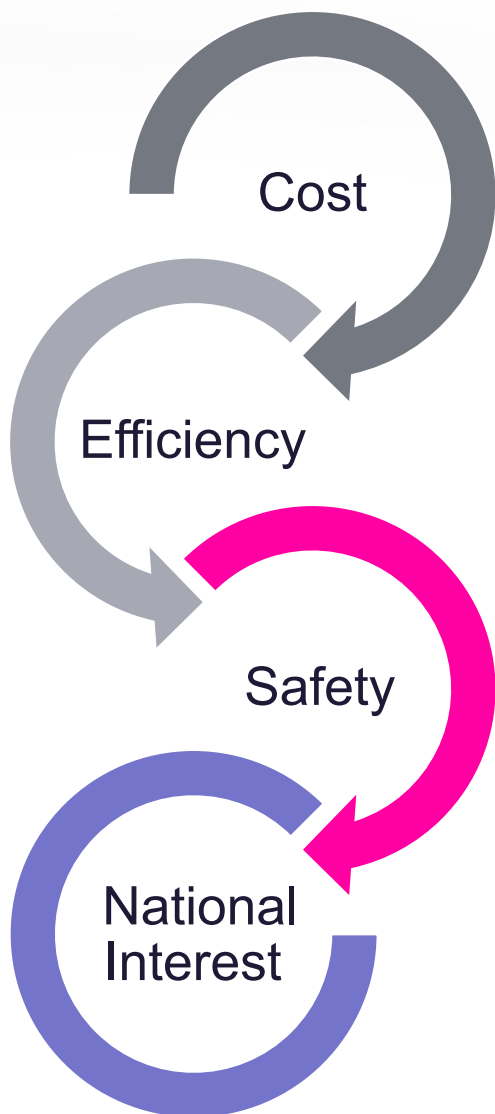
IATA Africa and Middle East

Global ATM Operational Concept





Drivers of Change

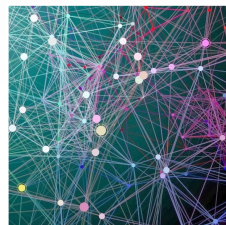


System Wide Information Management



Definition

- Standards
- Infrastructure
- Governance
- Interoperable exchange
- One “truth” used throughout the system



Enables

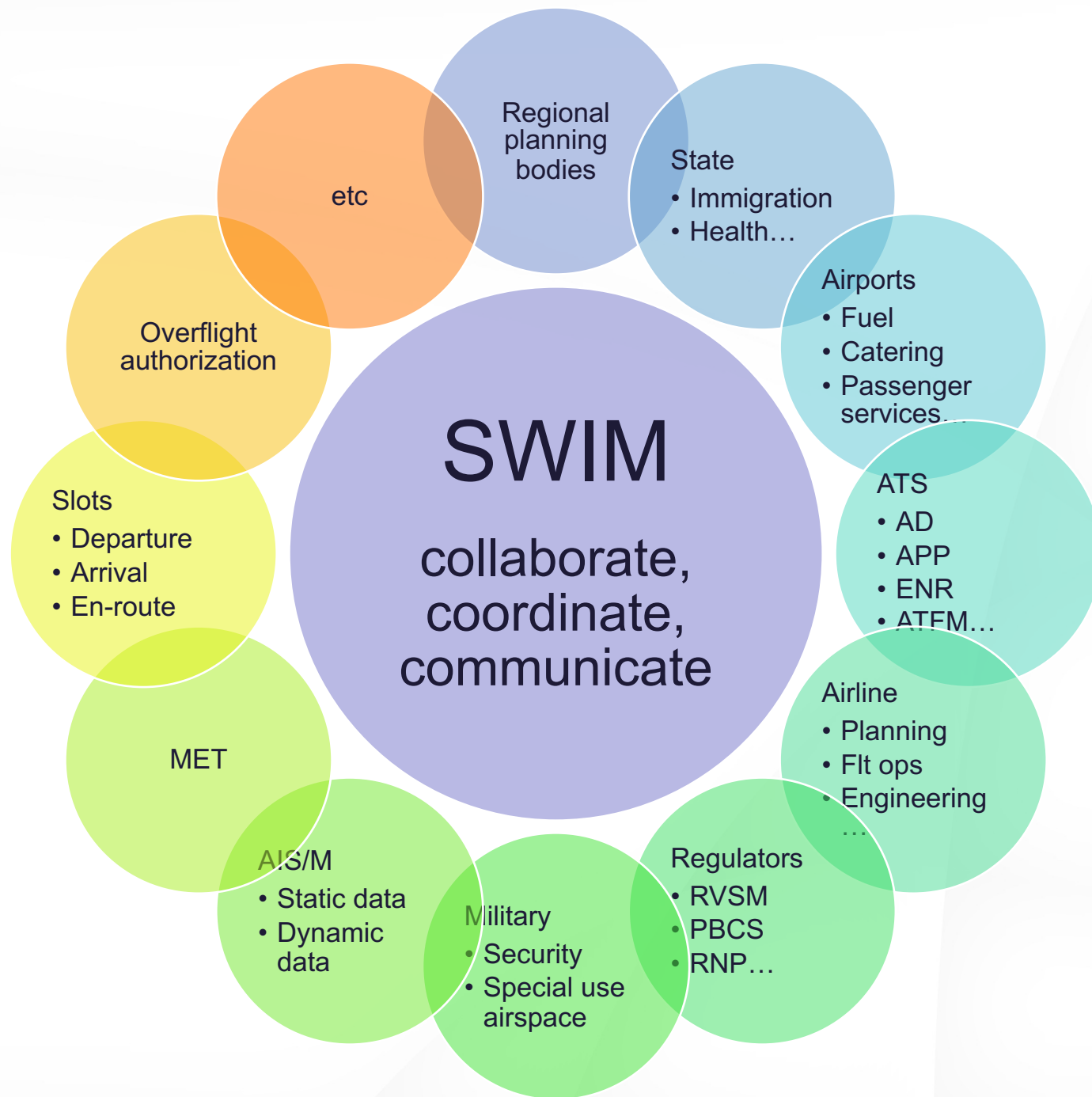
- Information Exchange
- Collaborative processes
- Digitalization and modernization
- Future operational implementations
- Right information,
- Right person,
- Right time

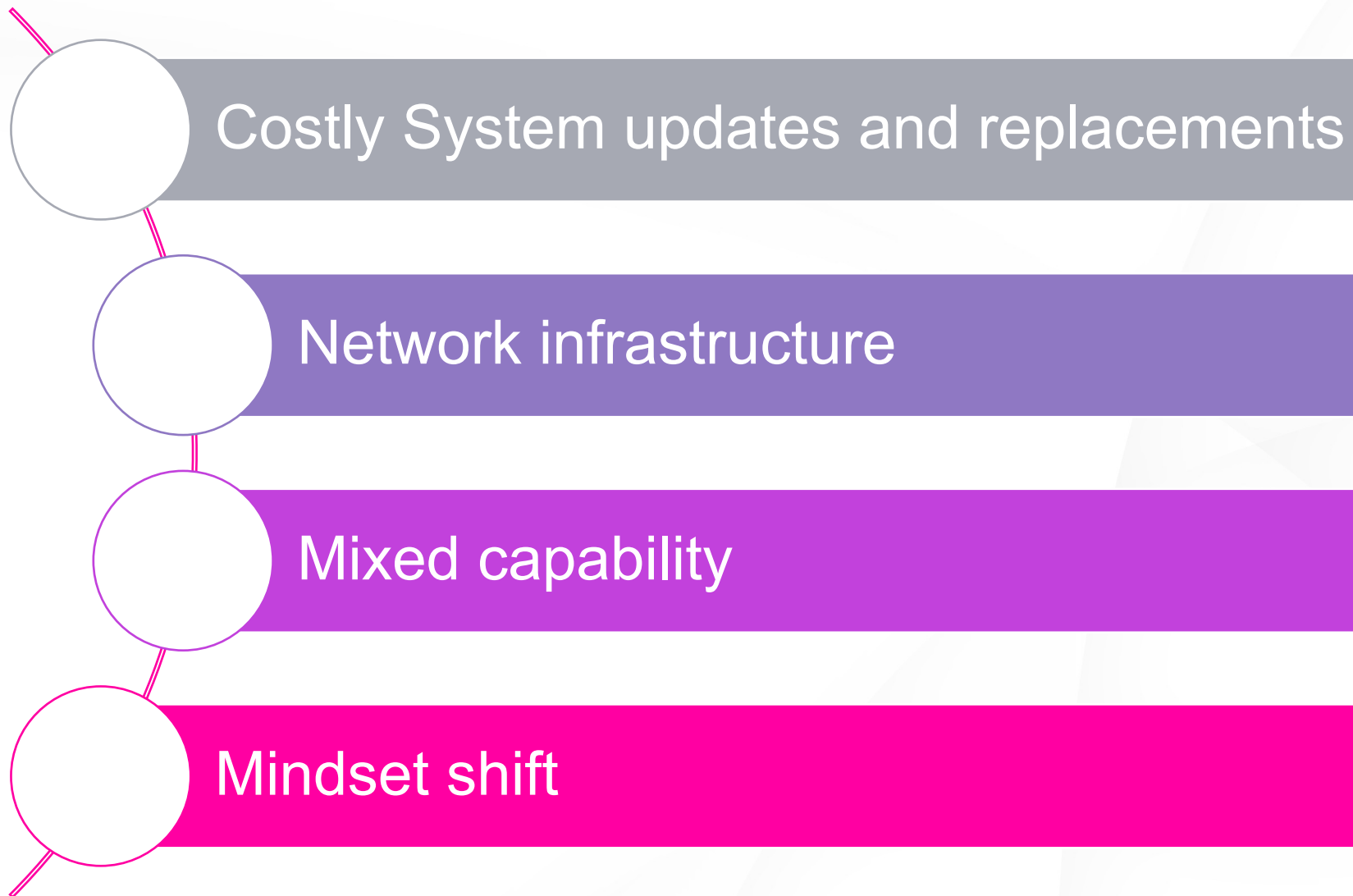


Supports

- Collaboration
- Decision making
- Interoperability
- Removal of silos
- Common Services
- Harmonized information



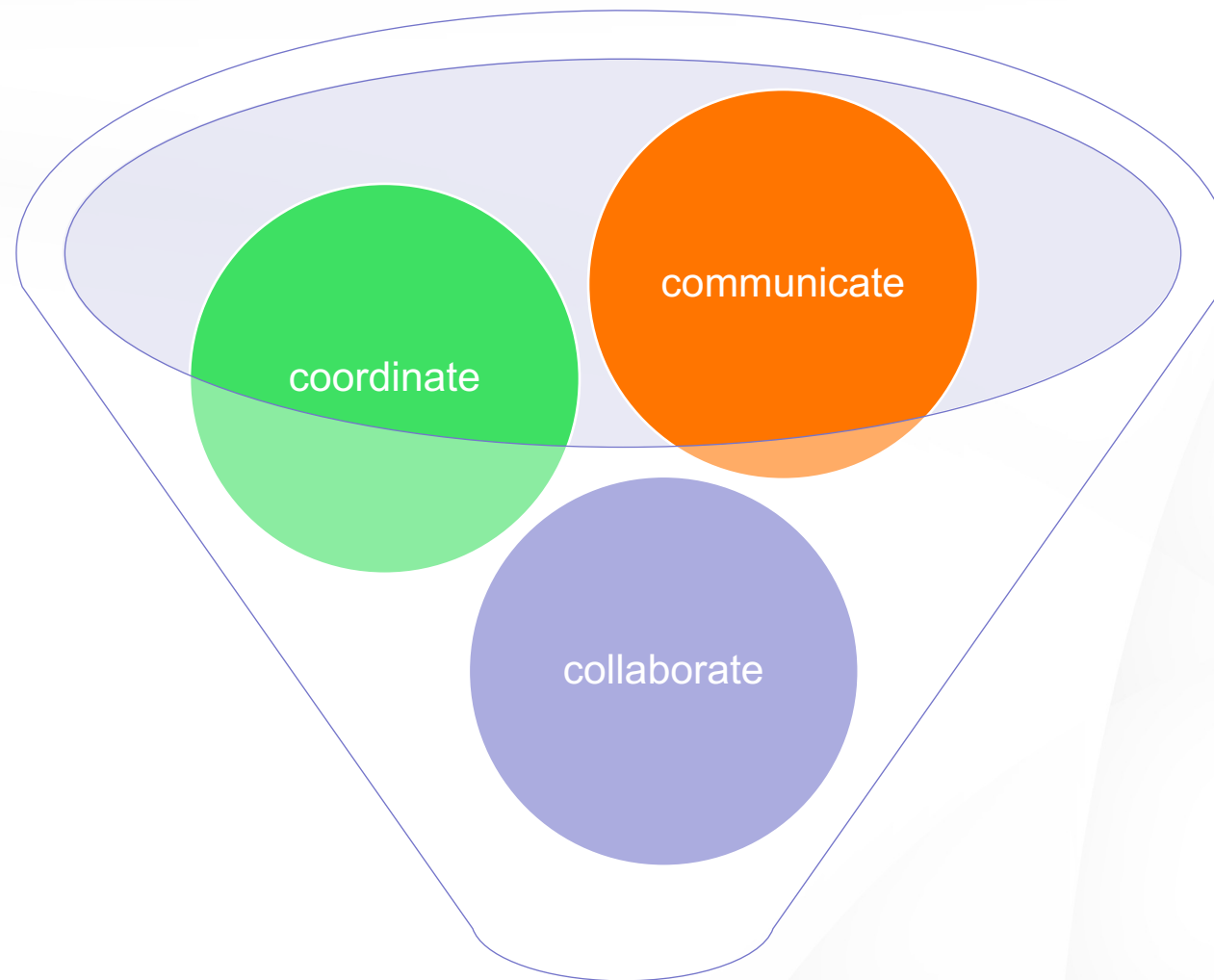




Mindset

Connecting

Governance



SWIM



THANK YOU



PANEL DISCUSSION

PANELLISTS



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Khambule**

Senior Aeronautical Met Services
Manager
SAWS



**Mr. Hlophe
Khonzumusa**

Senior Application Manager
ATNS

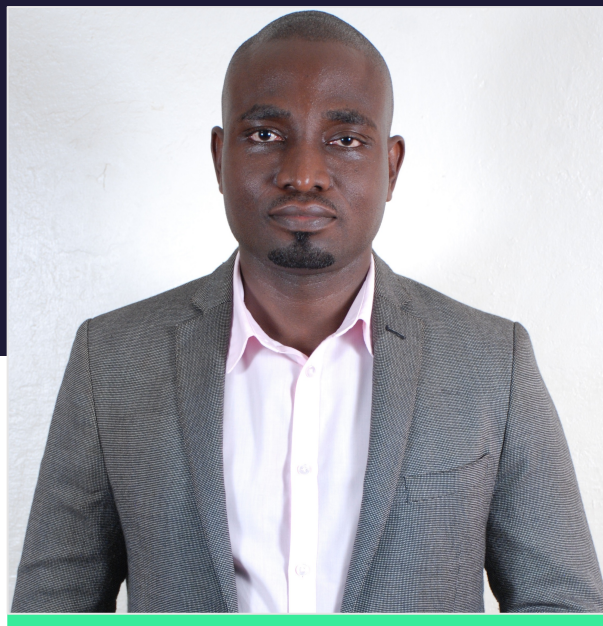


Ms. Patricia Abbo

Principal Aeronautical
Information Management Officer
Uganda CAA



QUESTIONS AND ANSWERS



Mr. Daniel Bateeze

Principal Aeronautical Information Management Officer
Uganda CAA



Ms. Boni Dibate

Director Africa Affairs

CANSO



THANK YOU

