ATMACA

Air Traffic Management
and Communication Over ATN/IPS
Grant n° 101167070

Building the Future of Air-Ground Communication over ATN/IPS: Inside the ATMACA

5 February 2026

SUPPORTED BY sesar JOINT UNDERTAKING

Co-funded by the European Union

ATMACA

ATMACA Webinar series;
Webinar 1: 5 February 2026
Webinar 2: in September 2026 TBC

SUPPORTED BY sesar JOINT UNDERTAKING

WEBINAR PROGRAMME AND SPEAKERS

- Introduction to the ATMACA concept and project



Asst. Prof. Fulya Aybek Cetek

- What is the motivation for the ATMACA mobility management protocol?



Prof. Raouf Hamzaoui

- Use cases of the ATMACA project



Prof. Rosa Maria Arnaldo

- Technical background of the ATMACA project



Captain Pilot Sergun Özmen

- Q&A – 15 min

ATMACA

SUPPORTED BY sesar JOINT UNDERTAKING

- ✓ Introduction to the ATMACA concept and project



Asst. Prof. Fulya Aybek Cetek

Consortium and Partners Roles

ESKİŞEHİR TEKNİK ÜNİVERSİTESİ
ESKİŞEHİR TECHNICAL UNIVERSITY

✓ Project Management, DEC, ATM knowledge

deepblue CONSULTING & RESEARCH

✓ HMI Design and Development

saerco®

✓ Integration and Validation

DE MONTFORT UNIVERSITY LEICESTER

✓ Protocol Design, Implementation, and Testing

TURKISH AIRLINES

✓ Protocol Design, Implementation, and Testing

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

ENAC

✓ Concept Design and Definition of Requirements, GRO

POLITÉCNICA | UNIVERSIDAD POLITÉCNICA DE MADRID

✓ Development of ATS

ATMACA

Project Overview

SUPPORTED BY sesar JOINT UNDERTAKING

TRL1 → TRL2

Project start date
1 September 2024

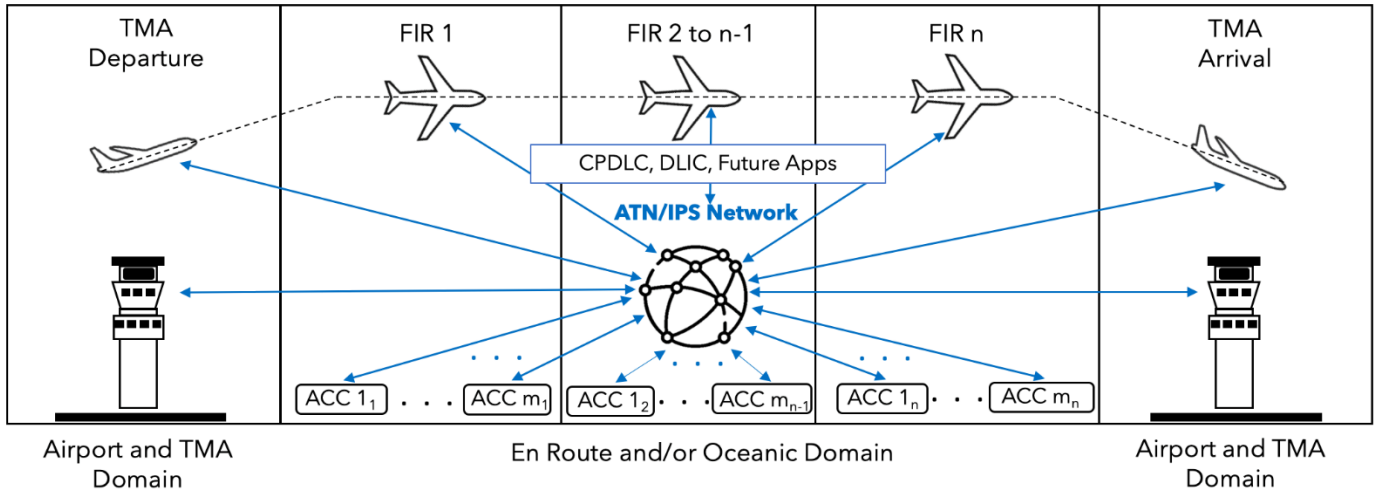
The ATMACA project was deemed worthy of support under the title of

“ATM application-oriented research for air-ground integration and autonomy”

HORIZON-SESAR-2023-DES-ER2-WA2-2

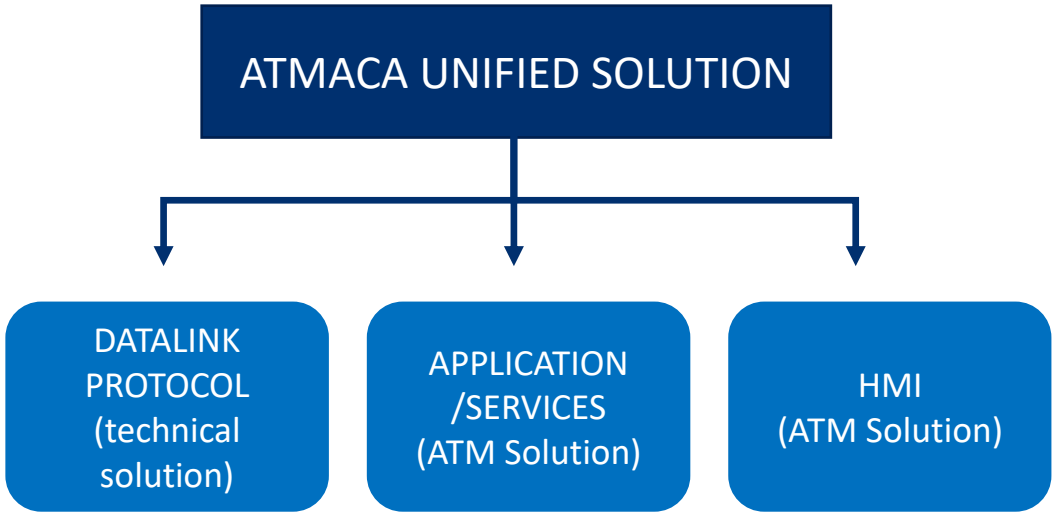
Air-ground Integration and Autonomy (Flagship)

- ✓ **Innovative air-to-ground communication** technologies
- ✓ **Seamless & interoperable** data exchange solution via mobility management
- ✓ **GRO for digital flight monitoring & management**
- ✓ **ATN/IPS-based** integration across all domains
- ✓ **Gate-to-gate** flight continuity via session management
- ✓ **Aircraft-to-Aircraft Communication** via air-to-ground comm. link



Project Overview

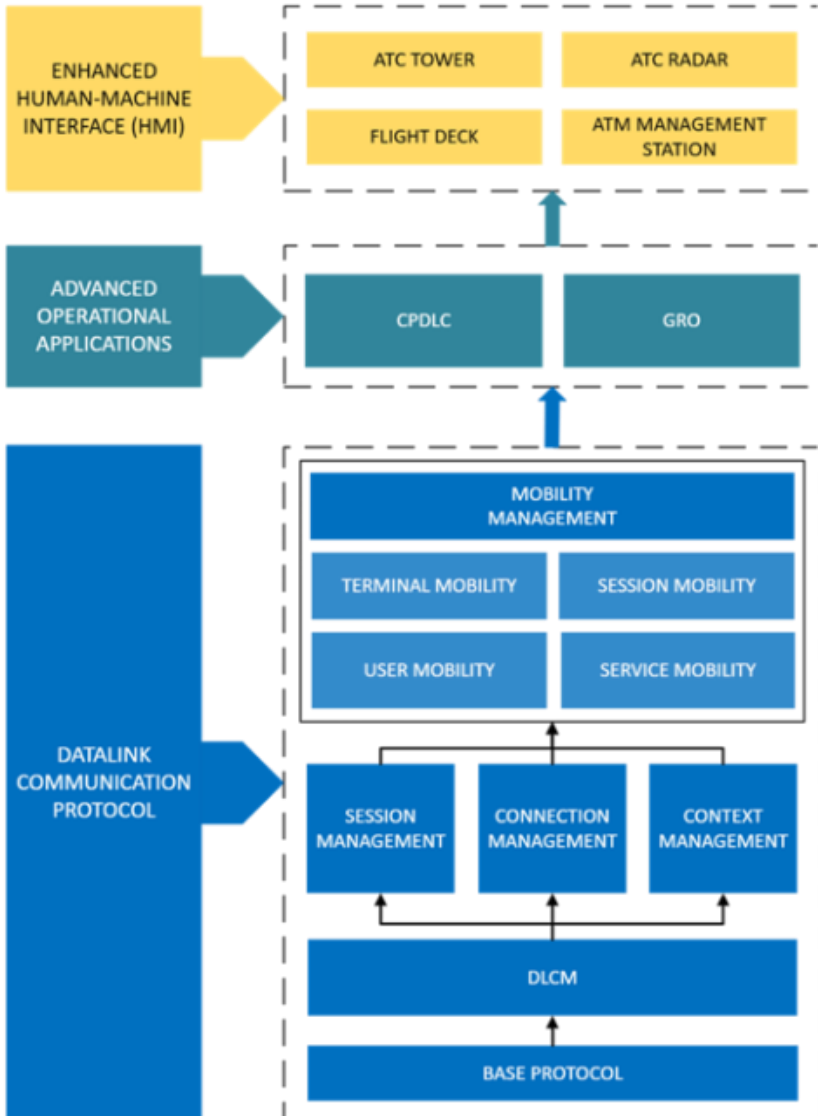
ATMACA context management protocol provides a unified ATM solution by introducing an IM (instant messaging) platform consisting of 3 elements:



Key Features

- **APIs for aeronautical applications** to simplify integration.
- **Real-time monitoring** and **dynamic adaptation** to network changes.
- **Simplifies migration** of existing applications from ATN/OSI to ATN/IPS, ensuring **smooth transitions** while leveraging the benefits of **modern IP-based infrastructure**.
- Facilitates the development of new applications by providing **standardized context management** interfaces, **reducing complexity** for developers.
- **Introduces an optimized user interaction** for ATM applications by adopting **User-Centered Design (UCD**) approach in designing **HMIs to support different profiles of users** and facilitate the main functionalities of ATMACA.

Project Overview



ATM solution for ATN/IPS, providing a scalable and flexible framework.

Specialised datalink communication protocol

Advanced operational applications

Enhanced HMI improving controller–pilot interaction and situational awareness

Ensures seamless, reliable communication and supports Green Route Operations (GRO).

Enables future-proof integration with evolving ATM infrastructures.

ATMACA Datalink Protocol - Technical Solution

ATMACA PROVIDES

CONNECTION MANAGEMENT

- User Login
- Login Status Monitoring
- Logout



SESSION MANAGEMENT

- Open Session with Session-Role Mapping
- Role Assignment Dynamics
- Session Display
- Authority Transfer Workflow



MOBILITY MANAGEMENT

- Terminal Mobility (intra-domain and inter-domain)
- User Mobility
- Session Mobility
- Service Mobility



ATMACA Application/Services - ATM Solution

GREEN ROUTE OPERATIONS

- Real-time Weather Information from Air to Ground
- Flight Trajectory Enhancement
- Trajectory Prediction Enhancement
- Enhanced AMAN and DMAN

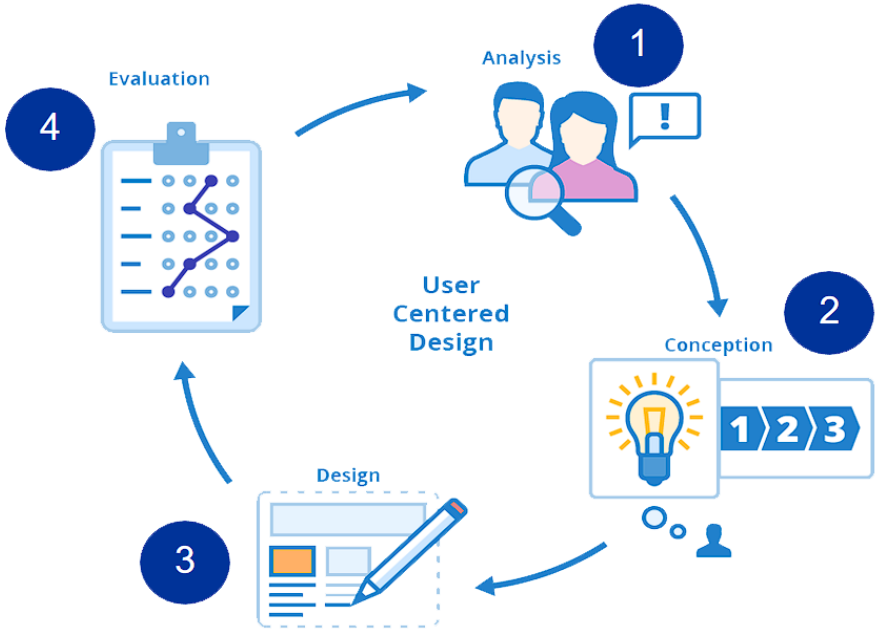




CPDLC APPLICATION

- Session integrity embedded in ATMACA
- ATN/IPS and multilink continuity
- Core service set: Supports standard CPDLC messages
- Operational benefits: Reduces voice channel congestion; improves traceability and reliability of instructions

ATMACA HMI - ATM Solution



User-Centered Design (UCD) for HMI

- **User Needs First** – Design based on user goals and requirements.
- **Usability & Accessibility** – Ensure ease of use for all users.
- **Iterative Process** – Continuously test and refine the design.
- **Feedback & Engagement** – Involve users throughout development.

+ Ensure design will be aligned with **SESAR Key Performance Areas safety, efficiency, and digitalization** in future ATM operations.

Expected Benefits

OPTIMISED CAPACITY:

- **Boosts capacity** with improved **air-to-ground communication** for all airspace users.
- **Enhanced trajectory prediction** ensures efficient & sustainable aviation.
- Integrates **trajectory prediction** enabled by **more accurate weather data** obtained through **datalink communication**.





INCREASED COST EFFICIENCY:

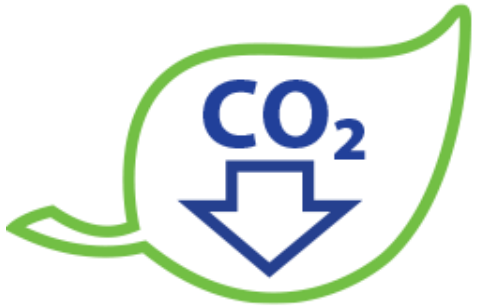
- **'Install and Use' Principle** – ATMACA ensures **cost-efficient** deployment and operation.
- **Mobility Management Strategy** – Enables **IPS usage without modifying** standard TCP/IP protocols.
- **COTS Systems Integration** – **Reduces installation & operational costs**, ensuring a cost-effective solution.

Expected Benefits

ENHANCED SAFETY:

- **Seamless mobility** ensures **continuous operations**.
- **Advanced HMIs** provide **accurate, real-time flight data**.
- **Reduces ATCO & pilot workload**, enhancing efficiency.
- **Clear communication & user-friendly interfaces** boost flight safety.





Reduced fuel consumption and emissions

- **Optimized trajectories** with **real-time wind & temperature data**, cutting **fuel use & CO_2 emissions**.
- **Reduced holding** by improving TMA entry predictions, minimizing **fuel burn**.
- **Accurate sector entry forecasts** ensure **eco-friendly operations**, supporting sustainability goals.

Expected Benefits

OPERATIONAL EFFICIENCY:

- **User-friendly HMIs** boost **pilot-ATC interactions** with **faster responses** and clear data display.
- **Automated communication** ensures accurate **message routing** between aircraft & ATC units.
- **Seamless frequency management** prevents **miscommunication**, auto-requests correct frequencies, and **reduces ATCO workload**.
- **Reliable air-to-ground link** solves signal loss, coverage gaps, and VHF bandwidth issues.
- **Optimized flight management** improves communication, integration, and air traffic efficiency.



ATMACA

SUPPORTED BY sesar JOINT UNDERTAKING

- ✓ Introduction to the ATMACA concept and project



Asst. Prof. Fulya Aybek Cetek

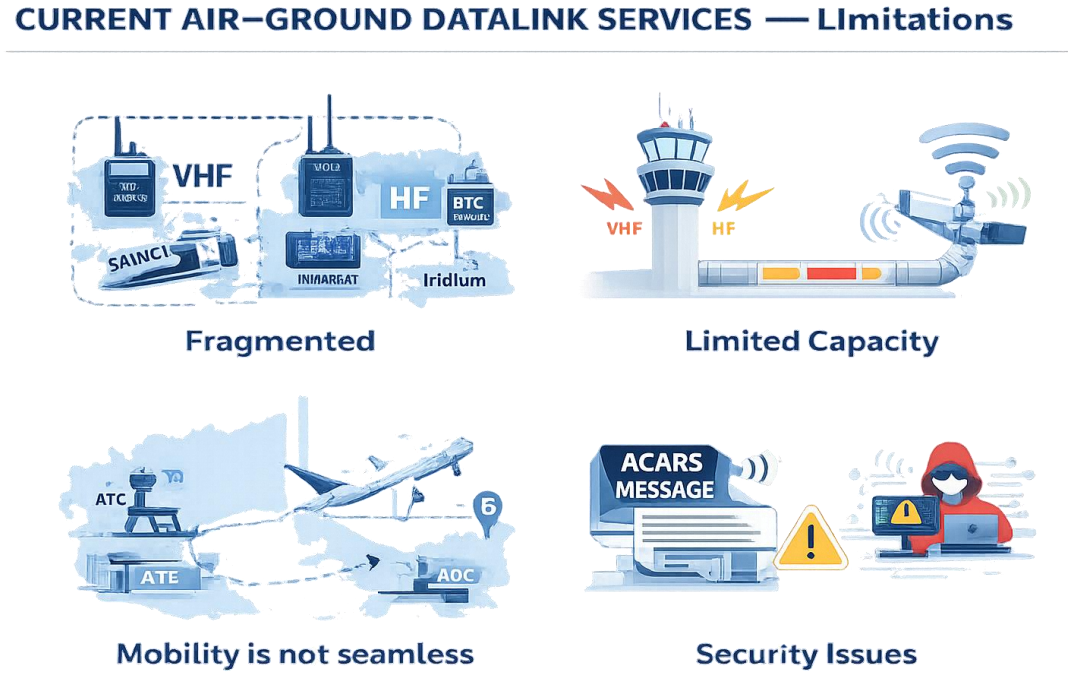
- ✓ What is the motivation for the ATMACA mobility management protocol?



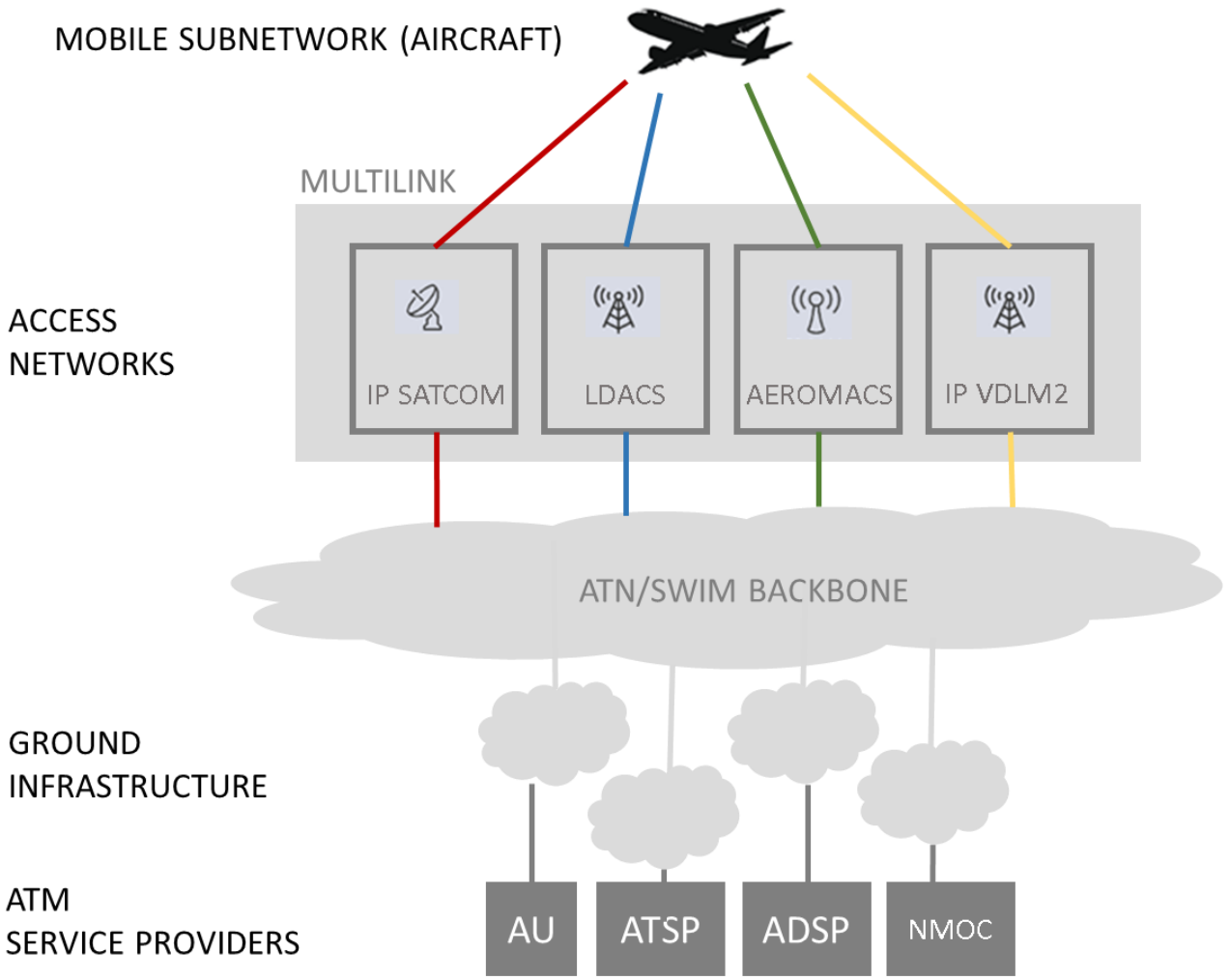
Prof. Raouf Hamzaoui

Current Air-ground Datalink Services

ATS application/service	Bearer (data link)	Protocol
CPDLC	VDL Mode 2, SATCOM, HFDL	ATN/OSI, FANS over ACARS
ADS-C	VDL Mode 2, SATCOM, HFDL	ATN/OSI, FANS over ACARS
ADS-B	1090ES; 978 UAT	ADS-B broadcast
DLIC	VDL Mode 2, SATCOM, HFDL	ATN/OSI, FANS over ACARS
D-ATIS	VHF ACARS, SATCOM	ACARS



Future Communications Infrastructure

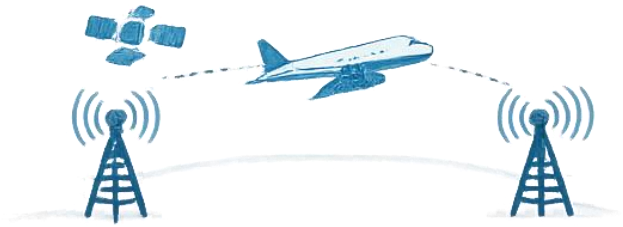


Source: EUROCONTROL

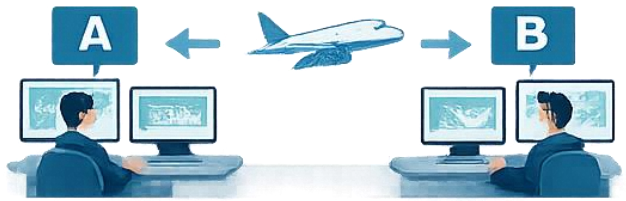
- Migration from ATN/OSI to ATN/IPS
- More capacity and scalability for growing datalink demand
- Better multilink support
- Stronger, standardised cybersecurity
- Simpler integration and lower lifecycle cost

Atmaca Mobility Types

Terminal mobility: Continuity of an active communication session as the aircraft changes its network attachment.



Terminal Mobility



Session Mobility

Session mobility: Continuity of an active communication session as it transfers between ground system endpoints.

User mobility: Continuity of an active user session as the user moves between workstations or roles.



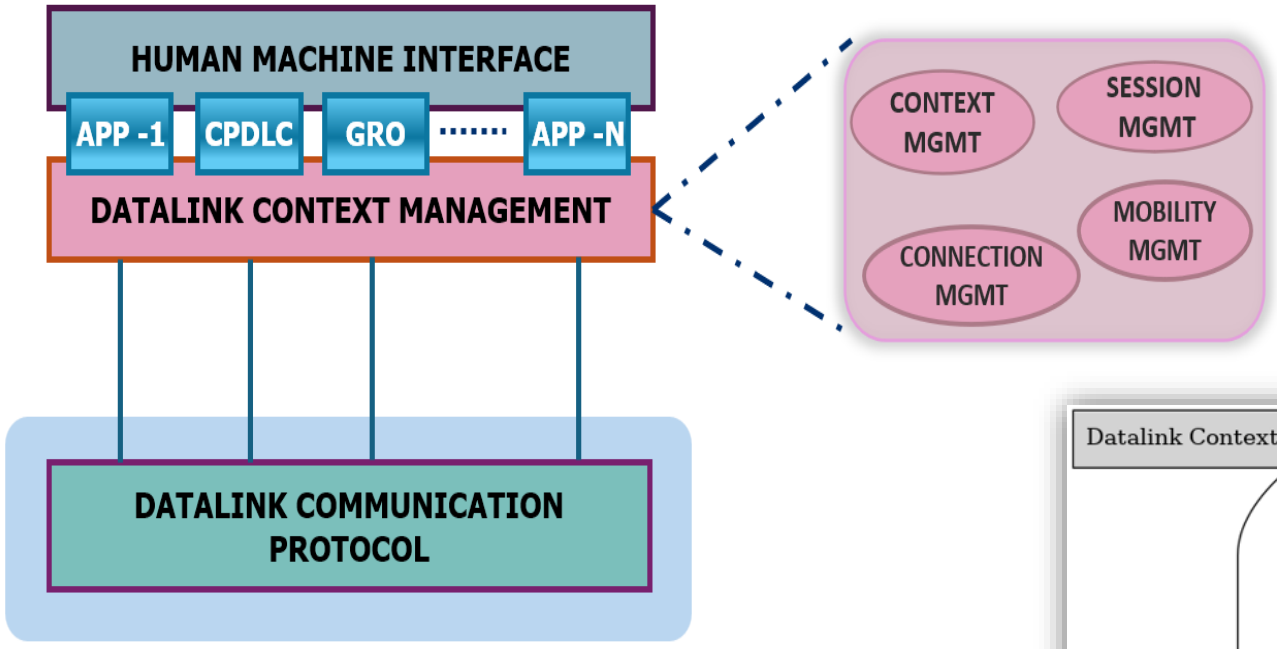
User Mobility

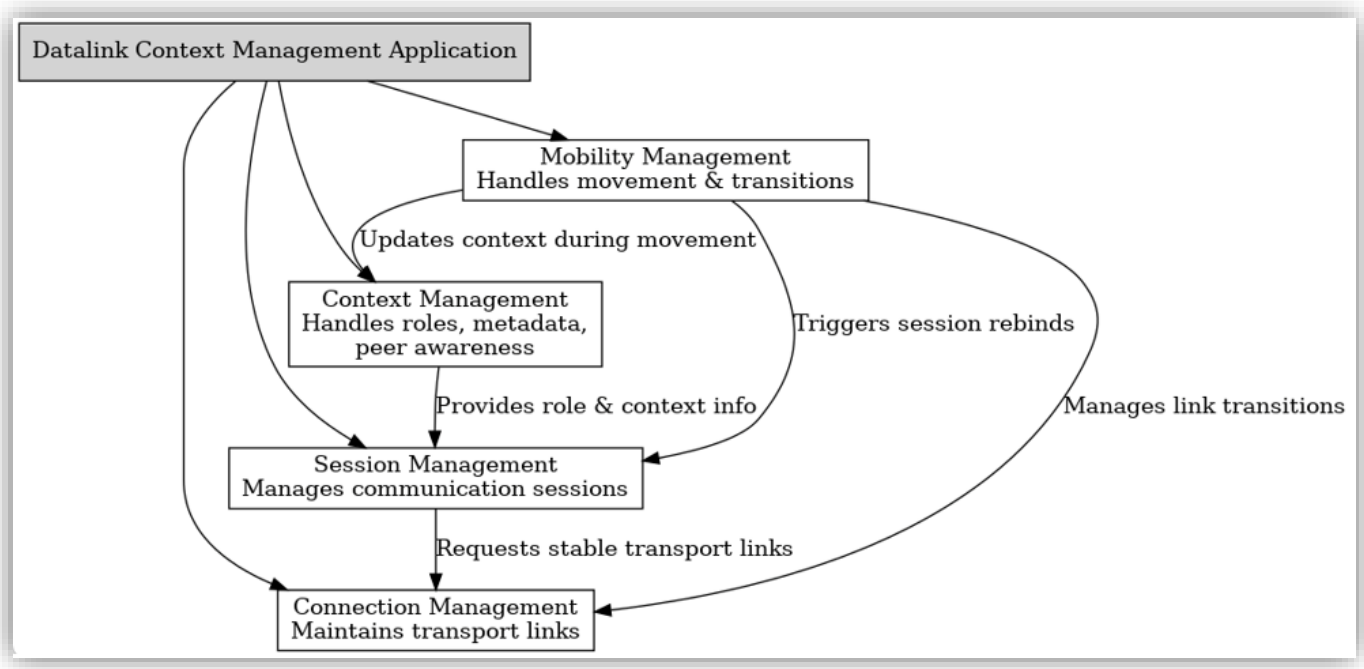


Service Mobility

Service mobility: Continuity of an active communication session as the service instance moves to another server or node.

Conceptual Architecture





ATMACA Project Public References

- **ATMACA deliverables**
  - D2.1: Review of Current and Future ATM Communication Networks (PU)
  - D3.1: Protocol Design Plan (PU)
  - D3.2: Protocol Development Technical Diagram (SEN)
  - D3.3: Protocol Testing Report (PU)
  - D4.3: DLCM (PU)
- **Publications**
  - E. Aydoğan et al., Air Traffic Management and Communication over ATN/IPS for Future Datalink Communication, in: Proc. 25th Integrated Communication, Navigation, and Surveillance Conference (ICNS), Brussels, April 2025.
  - S. Özmen et al., Mobility-Resilient Datalink Protocol for Next-Generation Aeronautical Communication, to appear in: Proc. 47th IEEE Aerospace Conference, Big Sky, Montana, March 2026.

ATMACA

SUPPORTED BY sesar JOINT UNDERTAKING

- ✓ Introduction to the ATMACA concept and project



Asst. Prof. Fulya Aybek Cetek

- ✓ What is the motivation for the ATMACA mobility management protocol?



Prof. Raouf Hamzaoui

- ✓ Use cases of the ATMACA project



Prof. Rosa Maria Arnaldo

Operational Scenarios

4 KEY OPERATIONAL IMPROVEMENTS AIMED BY ATMACA



Streamlined advanced ATC and communication handover

Fully flexible and customizable Flights' Sessions Management





Consistent and seamless datalink operations management featuring digitally enabled HMI for pilots and controllers

ATMACA concept will support Trajectory Prediction and Trajectory Improvement for GRO

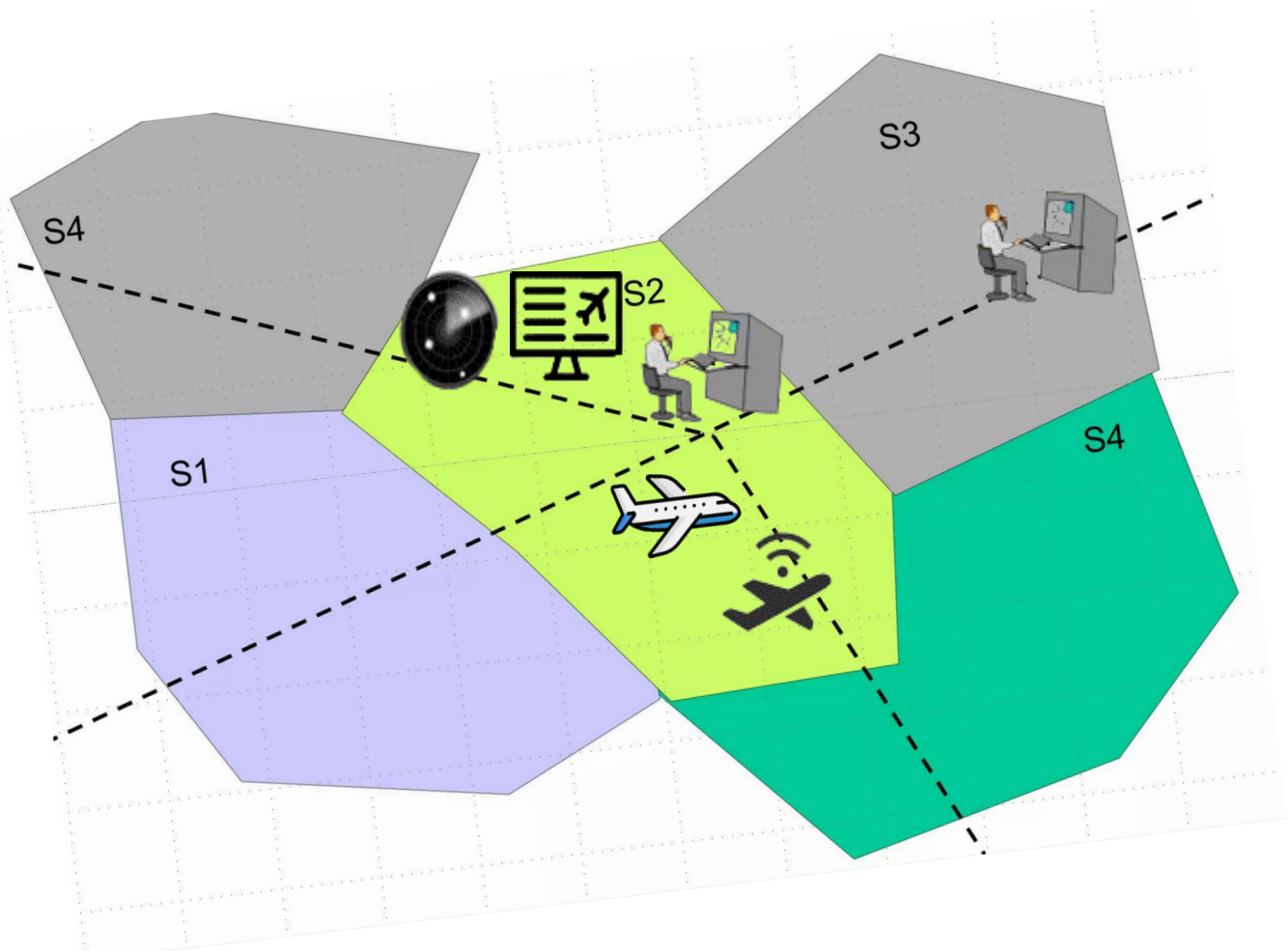


ATMACA

Operational Scenarios

SUPPORTED BY sesar JOINT UNDERTAKING

STREAMLINED ADVANCED ATC AND COMMUNICATION HANDOVER



Flight handover between ATCos involves **3 differentiated processes by different Providers**: ATC responsibility transfer (ATSP), datalink transfer (CSP) and ATM/flight data transfer (ADSP).

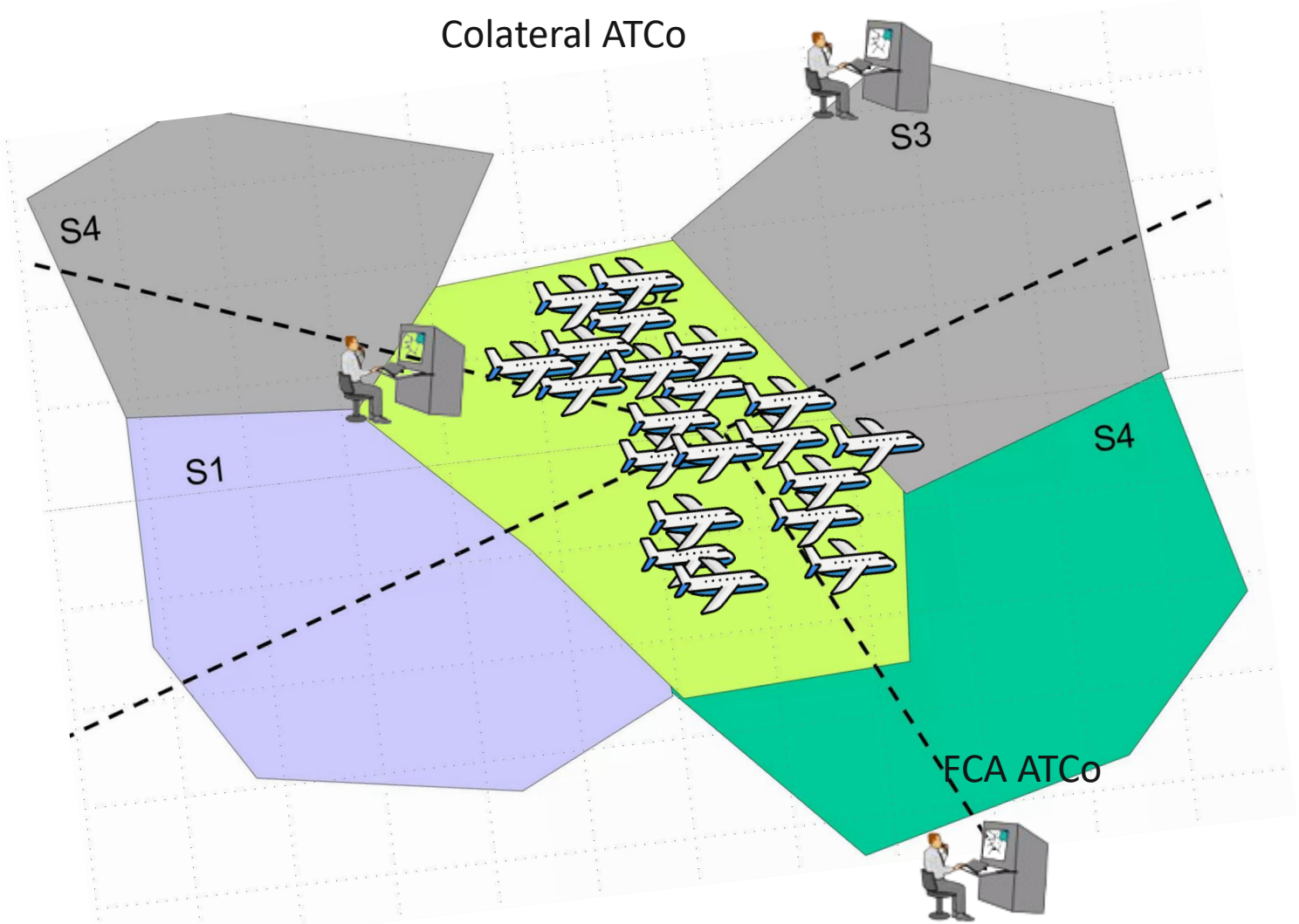
Some advanced SESAR concepts rely on predefined schemes and architectures:

- unbundle core ATC services and decouple them from physical control centers (Virtual Centre VC),
- flight-based division of airspace according to flight characteristics rather than geographic boundaries (Flight Centric Airspace FCA).

A **highly dynamic, flexible and seamless allocation and transfer of flights between ATCos is essential** to maximize the flexibility and benefits of advanced SESAR concepts.

Operational Scenarios

STREAMLINED ADVANCED ATC AND COMMUNICATION HANDOVER



VC ATCo



With ATMACA flights can be transferred and handed over from one controller to another with complete flexibility

ATMACA allows an ATCo to transfer all, some, or specific flights under his responsibility to any other ATCo, regardless of the ATCo's geographical location and area of responsibility, and regardless of whether ATC is based on sector, or flight centric approach.

FULLY FLEXIBLE AND CUSTOMIZABLE FLIGHTS SESSIONS MANAGEMENT BY ATCOS



Session Management is a cornerstone capability of the ATMACA system, ensuring the **establishment, maintenance, and seamless transition of Flight communication sessions across all operational phases of air traffic management. It ensures:**

- Presence information management,
- sessions are initiated, maintained, transferred, and terminated efficiently,
- real-time monitoring,
- session continuity during disruptions, and
- efficient handover mechanisms between roles and sectors.

FULLY FLEXIBLE AND CUSTOMIZABLE FLIGHTS' SESSIONS MANAGEMENT BY ATCOS

Session-to-Role Mapping

Aircraft: AG Com, flight data & context info,…



↓

Flight sessions

Role Assignment Dynamics

Actors and functions: ATCos, Pilots,..



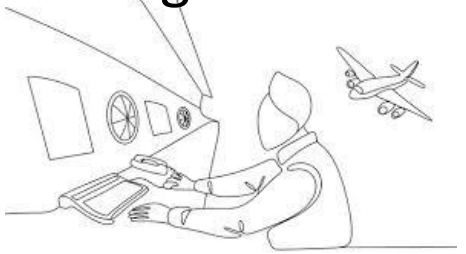
↓

Roles

Session Display

Authority Transfer Workflow

CWP Controller Working Position



↓

Workstations

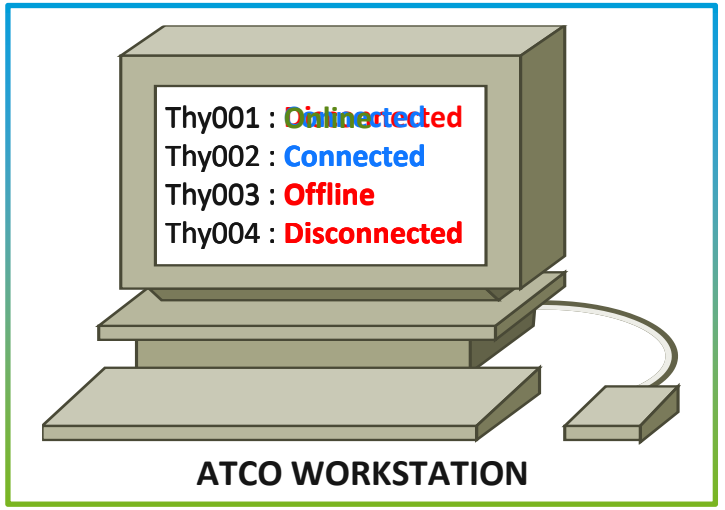
Session-to-Role Mapping: Each session is uniquely mapped to a role (sector) and remains tied to that role throughout its lifecycle. **Example:** Aircraft X in Sector East will always reference “Sector East” until it transitions to another sector.

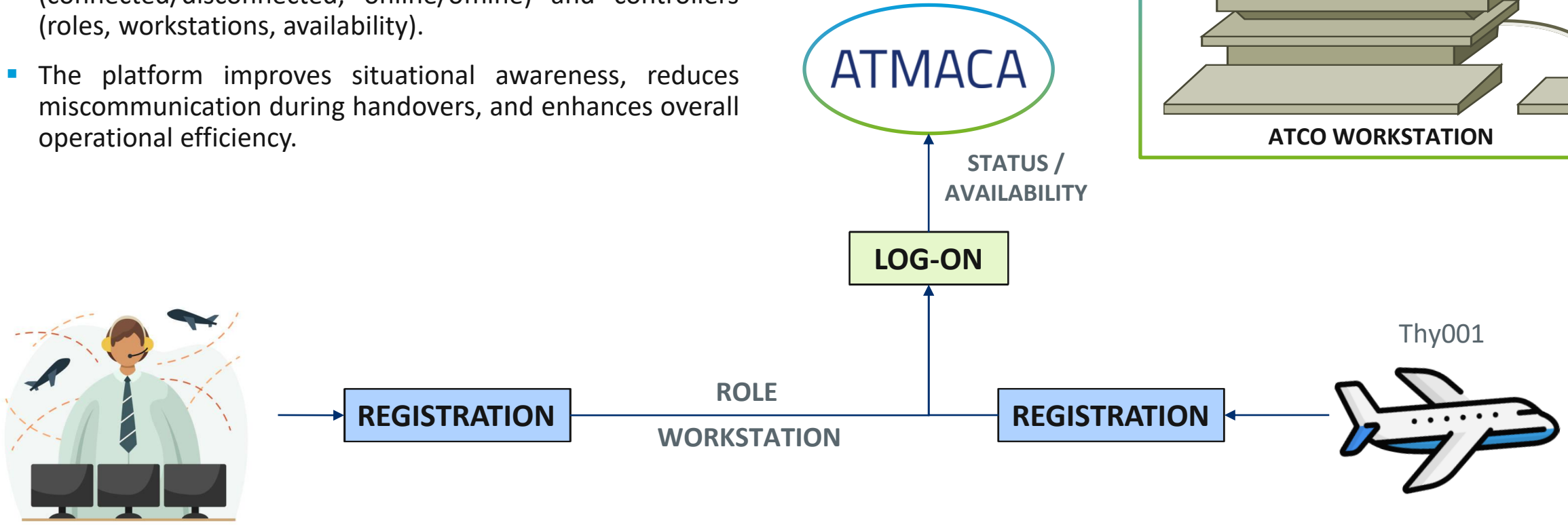
Authority Transfer Workflow: Authority transfers occur at the session level when an aircraft leaves a role’s jurisdiction. Transfers can be internal (within the same role across workstations) or external (to a different role).

FULLY FLEXIBLE AND CUSTOMIZABLE FLIGHTS' SESSIONS MANAGEMENT BY ATCOS

PRESENCE MANAGEMENT

- The protocol provides presence information for aircraft (connected/disconnected, online/offline) and controllers (roles, workstations, availability).
- The platform improves situational awareness, reduces miscommunication during handovers, and enhances overall operational efficiency.

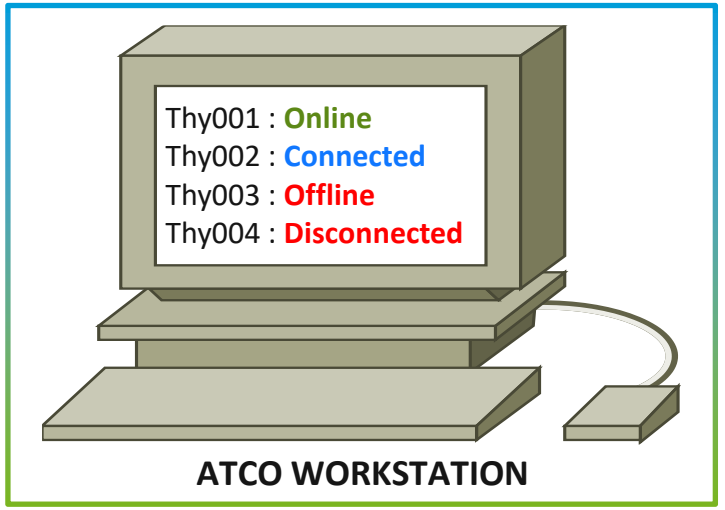


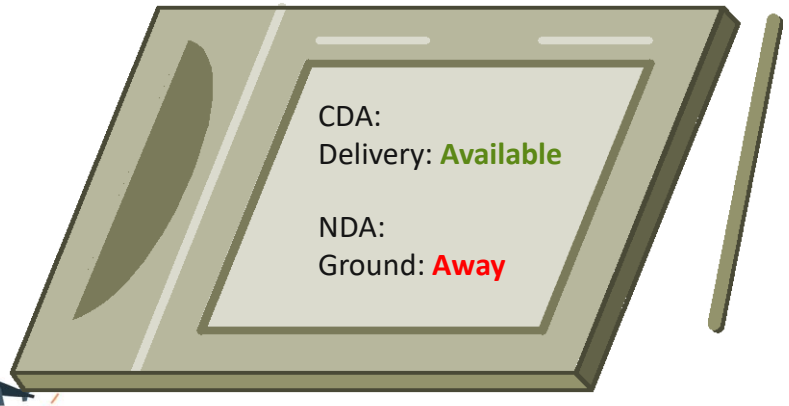


FULLY FLEXIBLE AND CUSTOMIZABLE FLIGHTS' SESSIONS MANAGEMENT BY ATCOS

PRESENCE MANAGEMENT

- It provides up-to-date status information for aircraft under control (and adjacent controllers) while maintaining situational awareness, including Data Authorities availability.

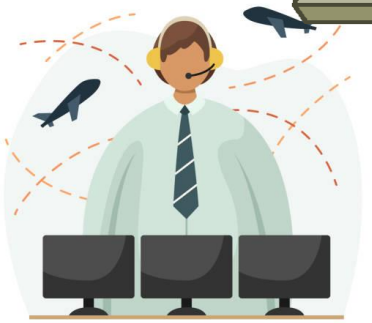




ATMACA

STATUS / AVAILABILITY

LOG-ON



REGISTRATION

ROLE

WORKSTATION

REGISTRATION

Thy001



Operational Scenarios

SUPPORTED BY sesar JOINT UNDERTAKING

FULLY FLEXIBLE AND CUSTOMIZABLE FLIGHTS' SESSIONS MANAGEMENT BY ATCOS

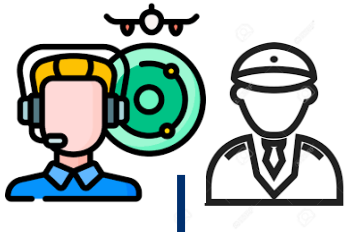
Aircraft: AG Com, flight data & context info,…



Flight sessions

Efficient transition and coordination

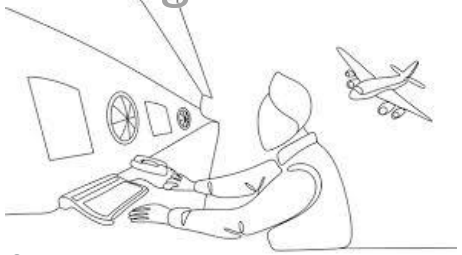
Actors and functions: ATCos, Pilots,..



Role-Based Session Management

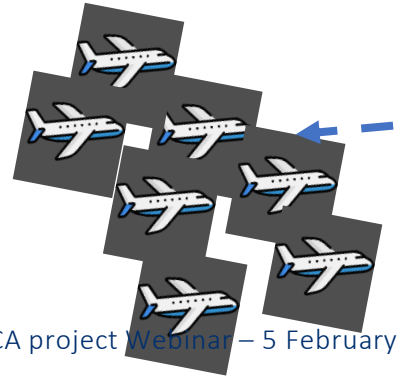
Roles

CWP Controller Working Position



Single workstation, multiple sessions

Workstations



1

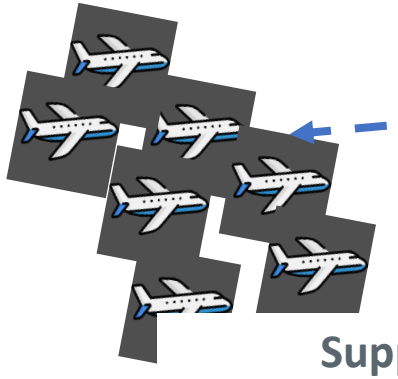




Managing Sessions for a Role in a Single ATC Workstation

Operational Scenarios

FULLY FLEXIBLE AND CUSTOMIZABLE FLIGHTS' SESSIONS MANAGEMENT BY ATCOS



2



Managing Sessions for a Role in Multiple ATC Workstations



Support for contingency situations

Enhanced mobility

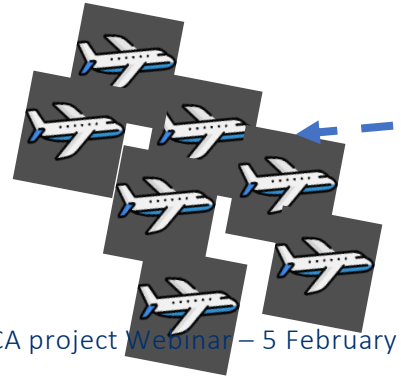
Multi-Device session replication

Efficient cross-domain coordination

Concurrent role handling

Role-Based interface customization

Cross-Domain Session Management





3



Managing Sessions for Multiple Roles in a Single ATC Workstation (Multi user session aggregation)



UNIFIED AND SEAMLESS DATALINK SERVICES MANAGEMENT DIGITALLY SUPPORTED HMI FOR PILOTS AND CONTROLLERS



- ATM Applications over datalink are increasing in volume and scope, with multiple datalink services current and under development.
- Manually handling datalink logon/off processes and dealing with disconnections and discontinuities could increase pilots ATCos workload, if not handled properly.

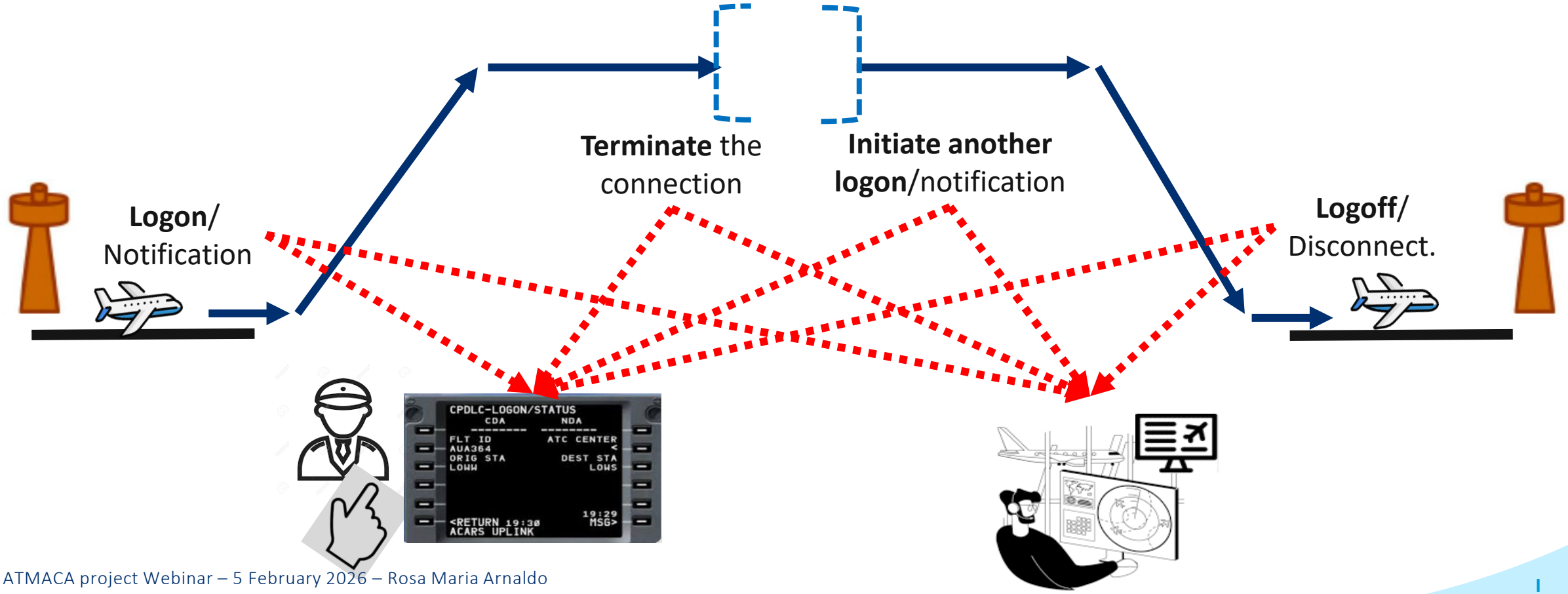
With ATMACA all data link services and applications are managed **through a simple supportive interface for**

pilots & ATCos.

- Pilots and controllers **will only need to open a session into the ATMACA system at the beginning of the flight or duty period.** The system will automatically manage for them all logon/off, connections & disconnections across all required data link services with a unified and fluid digital HMI.

UNIFIED AND SEAMLESS DATALINK SERVICES MANAGEMENT DIGITALLY SUPPORTED HMI FOR PILOTS AND CONTROLLERS

Management of logon/logoff, disconnections, failures, and gaps on the datalink implies Pilot/ATCo manual intervention and high WorkLoad.



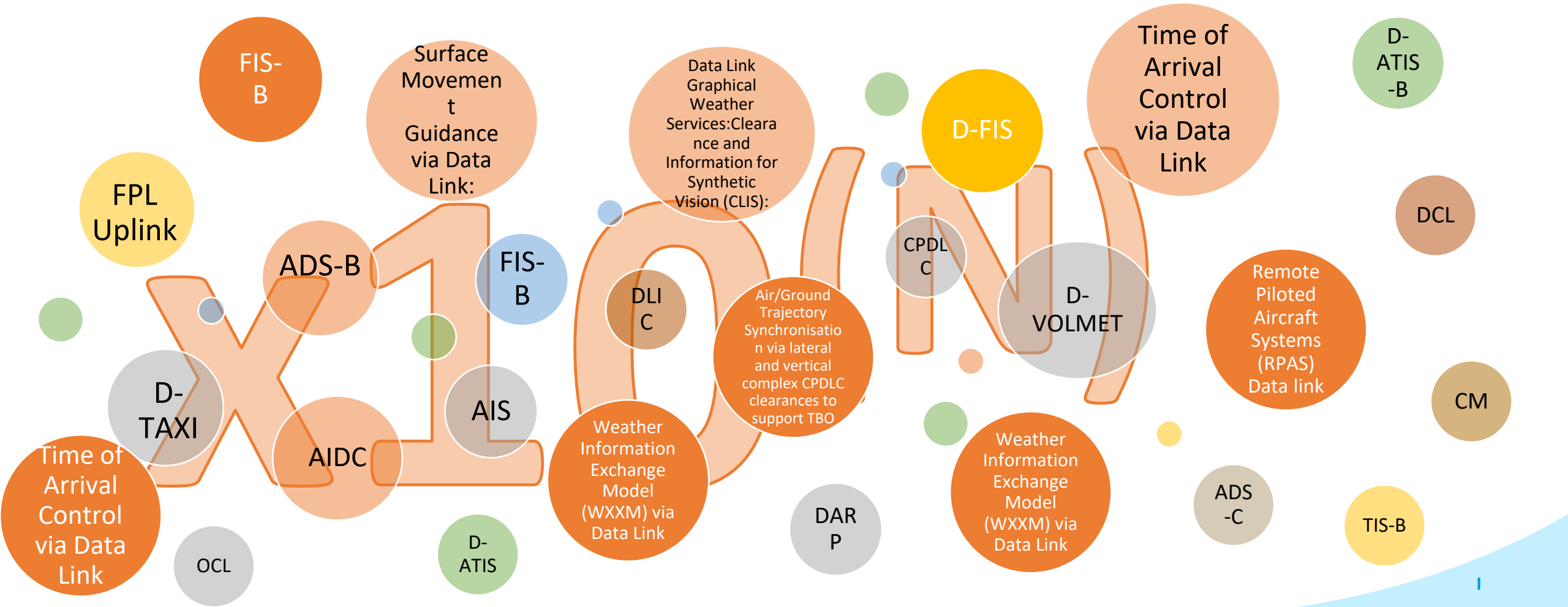
ATMACA

Operational Scenarios

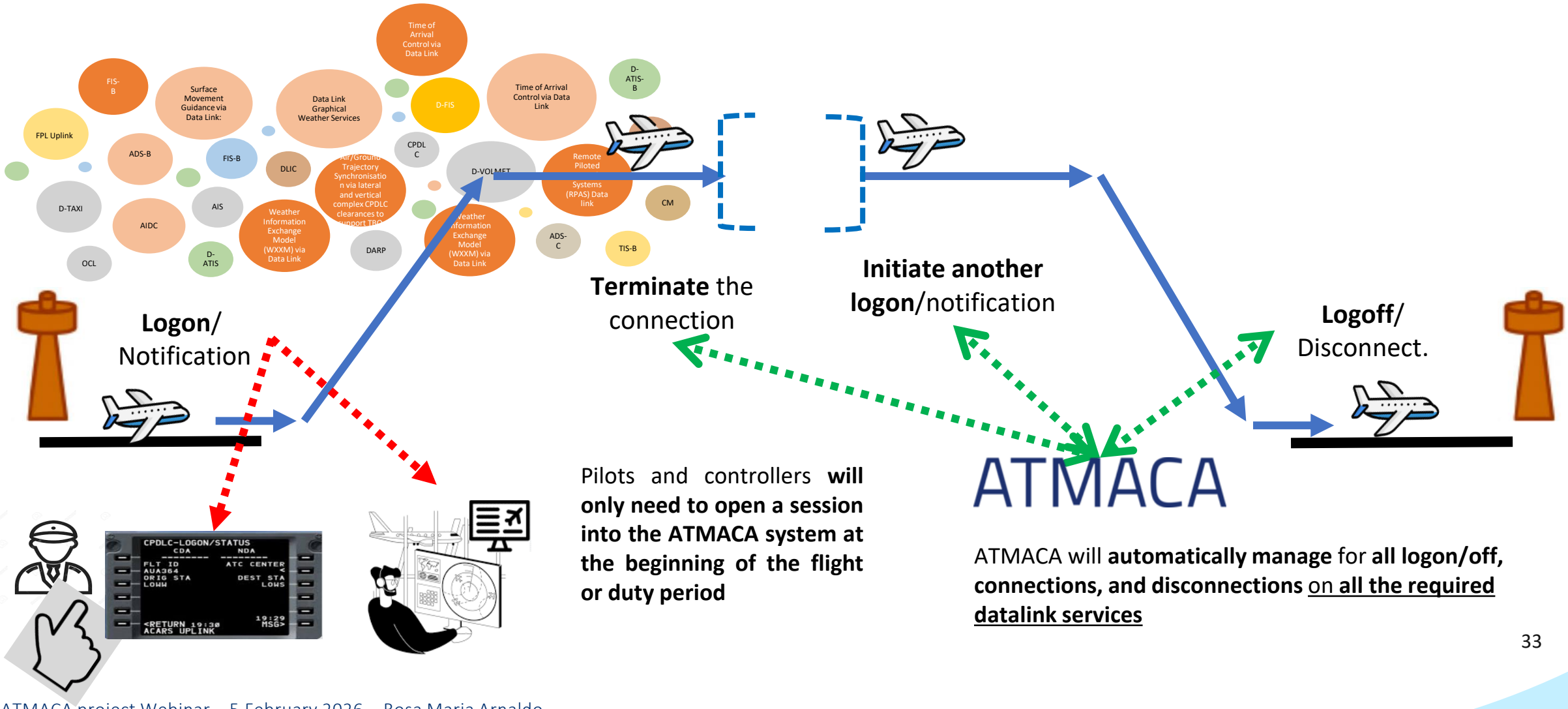
SUPPORTED BY sesar JOINT UNDERTAKING

UNIFIED AND SEAMLESS DATALINK SERVICES MANAGEMENT DIGITALLY SUPPORTED HMI FOR PILOTS AND CONTROLLERS

Applications over **datalink will increase** both in **volume and scope** making manual **interventions and WorkLoad unmanageable.**



UNIFIED AND SEAMLESS DATALINK SERVICES MANAGEMENT DIGITALLY SUPPORTED HMI FOR PILOTS AND CONTROLLERS



Pilots and controllers **will only need to open a session into the ATMACA system at the beginning of the flight or duty period**

ATMACA

ATMACA will **automatically manage** for **all logon/off, connections, and disconnections** on **all the required datalink services**

ATMACA

SUPPORTED BY sesar JOINT UNDERTAKING

- ✓ Introduction to the ATMACA concept and project



Asst. Prof. Fulya Aybek Cetek

- ✓ What is the motivation for the ATMACA mobility management protocol?



Prof. Raouf Hamzaoui

- ✓ Use cases of the ATMACA project



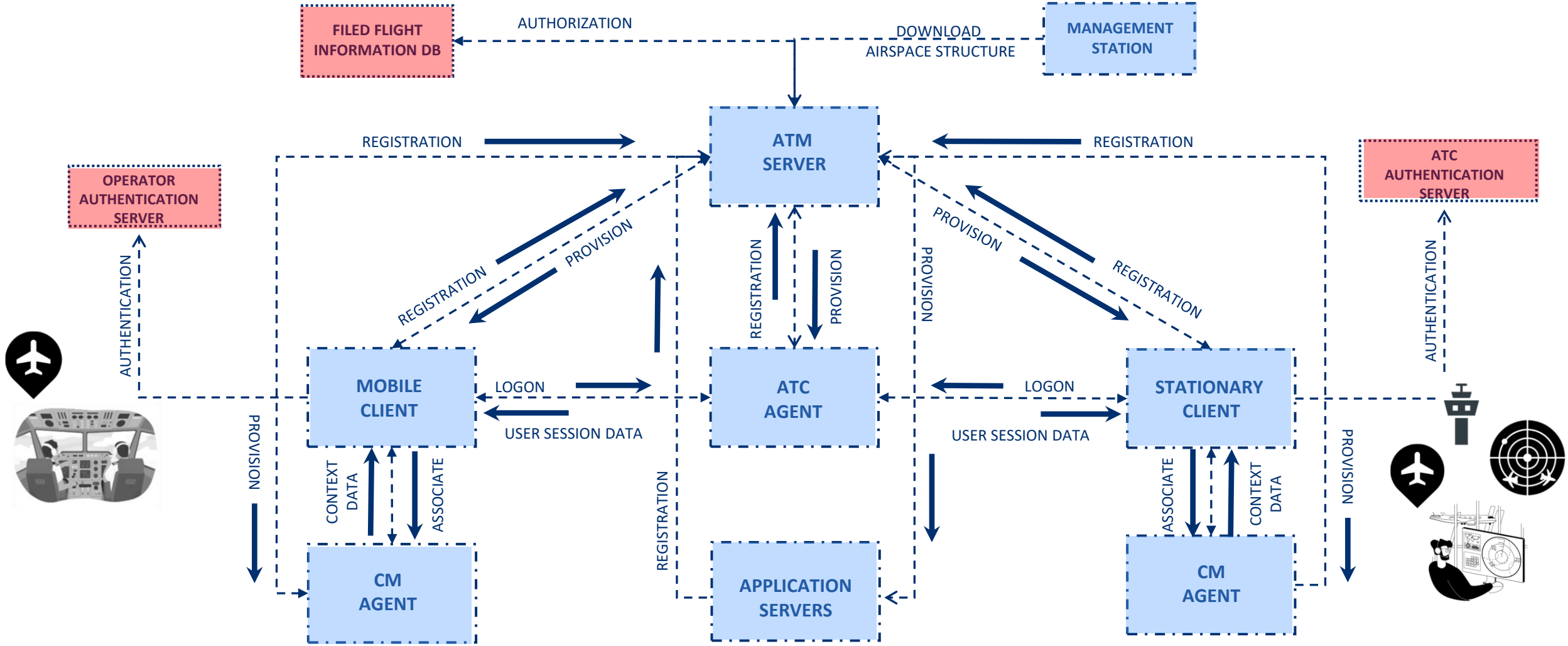
Prof. Rosa Maria Arnaldo

- ✓ Technical background of the ATMACA project

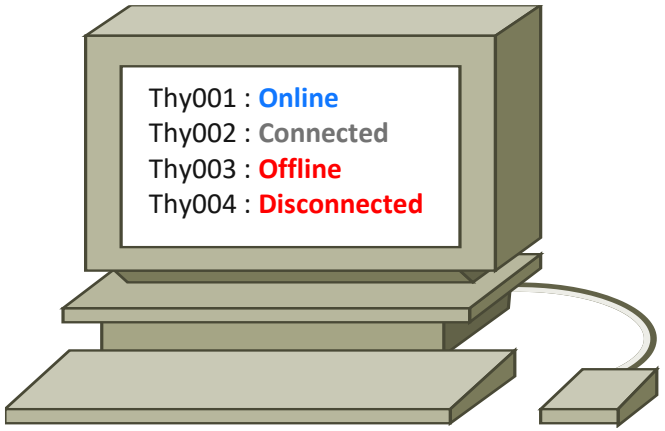


Captain Pilot Sergun Özmen

Architecture Overview



Presence Management



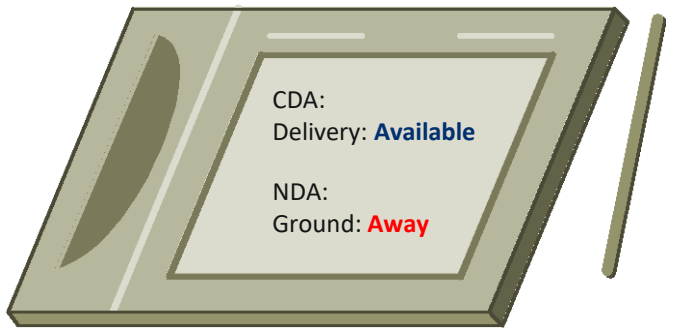
ATC COMMUNICATION HMI

Scenario: ATC controllers need real-time visibility of aircraft status and adjacent controllers to manage transitions efficiently.

Challenge: Provide up-to-date status information for aircraft under control and for adjacent controllers, while maintaining situational awareness.

Solution: The protocol provides presence information for aircraft (connected/disconnected, online/offline) and controllers (availability, roles, workstations).

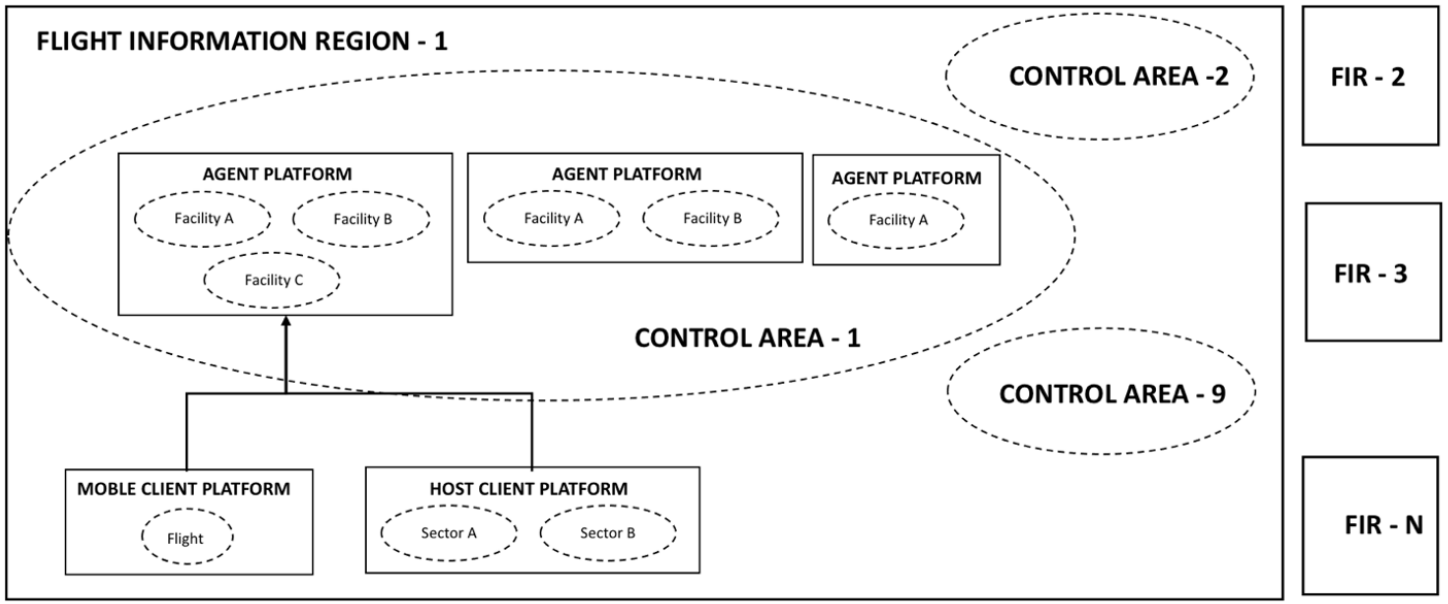
Impact: Improves situational awareness, reduces miscommunication during handovers, and enhances overall operational efficiency.



FLIGHT DECK HMI / EFB

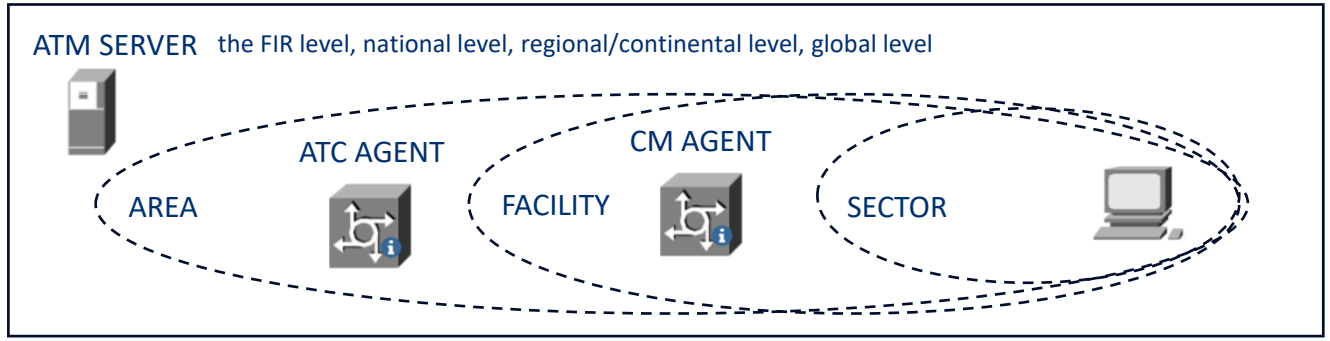
MANAGEMENT STATION = AIRSPACE STRUCTURE

SUPPORTED BY sesar JOINT UNDERTAKING



DEPLOYMENT MODELS

- **Centralized Architecture:**
  - A single server manages all network functions.
  - Ensures continuity through High Availability (HA) clustering and N+1 redundancy.
- **Distributed Architecture:**
  - Spreads operations across multiple servers.
  - Ensures load balancing for optimal resource utilization.



return

ATM SERVER = System Brain

The ATM Server is the **control and provisioning authority** of ATMACA.

- Registers **all nodes** (mobile, stationary, agents)
- Downloads **airspace structure**
- Applies **authorization policies**
- Provisions **roles, permissions, and routing context**

- This is **not** a data-plane element
- It does **not** forward CPDLC messages
- It defines *who can talk to whom, and under which role*

return

The ATC Agent is the **session anchor** for air-ground communication
The ATC Agent is not a standalone session owner.
It is the **operational execution point** for air-ground sessions.

- Maintains connection for live sessions
- Handles handovers
  - Executes **intra-area handovers**
  - Coordinates **inter-area handovers** with peer agents
  - Triggers context updates
- Shields applications from mobility
  - Do not see IP changes
  - Do not handle reconnection
  - Do not re-logon
- Routes messages based on **the domain identifier to IP endpoints**
  - The ATC Agent performs **context-aware routing**

return

CM Agents manage and distribute operational context used by the ATMACA framework.

CM Agents handle:

- Flight context (flight identity, state, phase)
- User/role context (ATCo role, responsibility)
- Association context (who controls which flight)
- Service context (which services are active)
- Location/domain context (area, facility, sector)

They do not:

- Route messages
- Terminate sessions
- Forward CPDLC payloads

return

STATIONARY CLIENTS = User Moves

Stationary Clients are anchored to a fixed network and agent domain.

In Stationary Clients, the user moves — not the terminal.

- Identity is **user- and role-based**
- Sessions are **not bound to a physical workstation**
- CM Agents **update role and responsibility context**
- ATC Agents **keep the same anchor point**

return

MOBILE CLIENTS = Terminal Moves

Mobile Clients are endpoints whose network anchor point may change during operation.

For aircraft:

- An IP address can change
- Access technology can change (VDL ↔ AeroMACS ↔ SATCOM)
- Serving an ATC Agent can change
- Area / FIR can change

Yet:

- Session identity stays the same
- Context stays attached to the flight

return

APPLICATION SERVER

Services can be transaction-based or session-based.

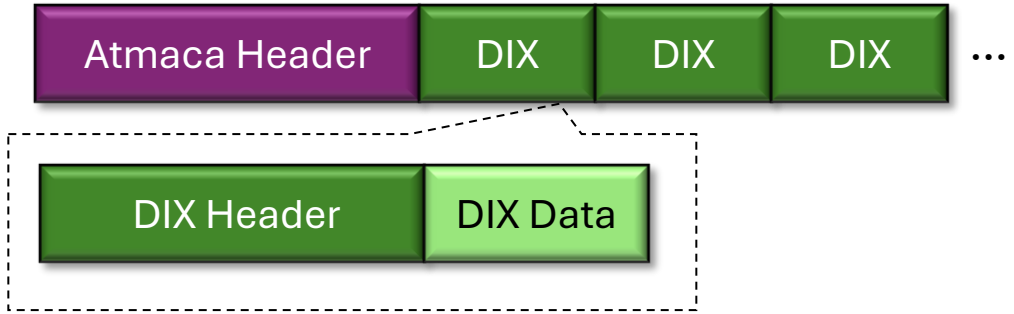
Services themselves are always hosted on application servers.

Applications can be implemented as client-based or server-based and may reside on either client platforms or application servers.

return

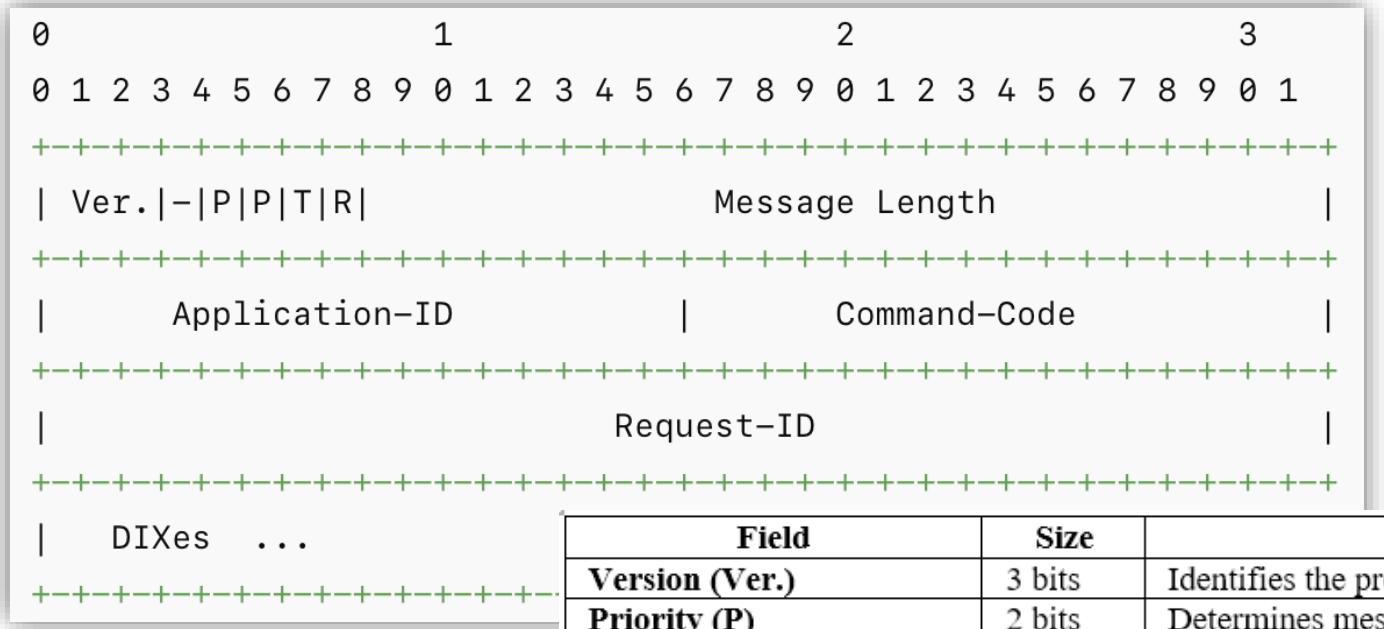
ATMACA Message Format – PDU

- ATMACA defines a binary message format which consists of an Atmaca header and concatenated information-elements called DIX (DLC Information eXchange)
- Each DIX consists of a header and data parts




```
Atmaca Header Flags:
    Ver. : Version (3 bits)
    P    : Priority (2 bits)
    T    : Retransmission bit
    R    : Request bit
```

MESSAGE HEADER



Field	Size	Description
Version (Ver.)	3 bits	Identifies the protocol version (Current version = 0).
Priority (P)	2 bits	Determines message priority for delivery.
Retransmission Flag (T)	1 bit	Signals whether the message is a retransmission.
Request Flag (R)	1 bit	Identifies whether the message is a **request** (R=1) or **response** (R=0).
Message Length	16 bits	Specifies the total length of the ATMACA message, including the padded DIX elements. The message length is always a multiple of 4.
Application-ID	16 bits	Identifies the intended ATMACA application or vendor-specific service.
Command-Code	16 bits	Identifies the command associated with the message (e.g., Register, Logon, Service Request).
Request-ID	32 bits	Tracks session-based transactions to link requests and corresponding responses.
DIX Entries	Variable	Encapsulated information elements for data exchange.

return

Domain-Based Addressing/Routing

ATC SECTORS

AIRPORT DOMAN	ATC FUNCTION	AIRPORT	COUNTRY IDENTIFIER	NETWORK DOMAIN
	delivery	IATA identifier		atm
	ground			aoc
	tower			

delivery@bhx.uk.atm

TMA DOMAN	ATC FUNCTION	AIRPORT	COUNTRY IDENTIFIER	NETWORK DOMAIN
	approach	IATA identifier		atm
	departure			aoc

approach@bhx.uk.atm

ENROUTE DOMAN	ATC SECTOR	FLIGHT INFRMATION REGION	COUNTRY IDENTIFIER	NETWORK DOMAIN
	Area identifier	ICAIO identifier		atm
				aoc

londonwest@londonfir.uk.atm

FLIGHTS

CALL SIGN	OPERATOR	COUNTRY IDENTIFIER	NETWORK DOMAIN

THY1ab@thy.tr.atm

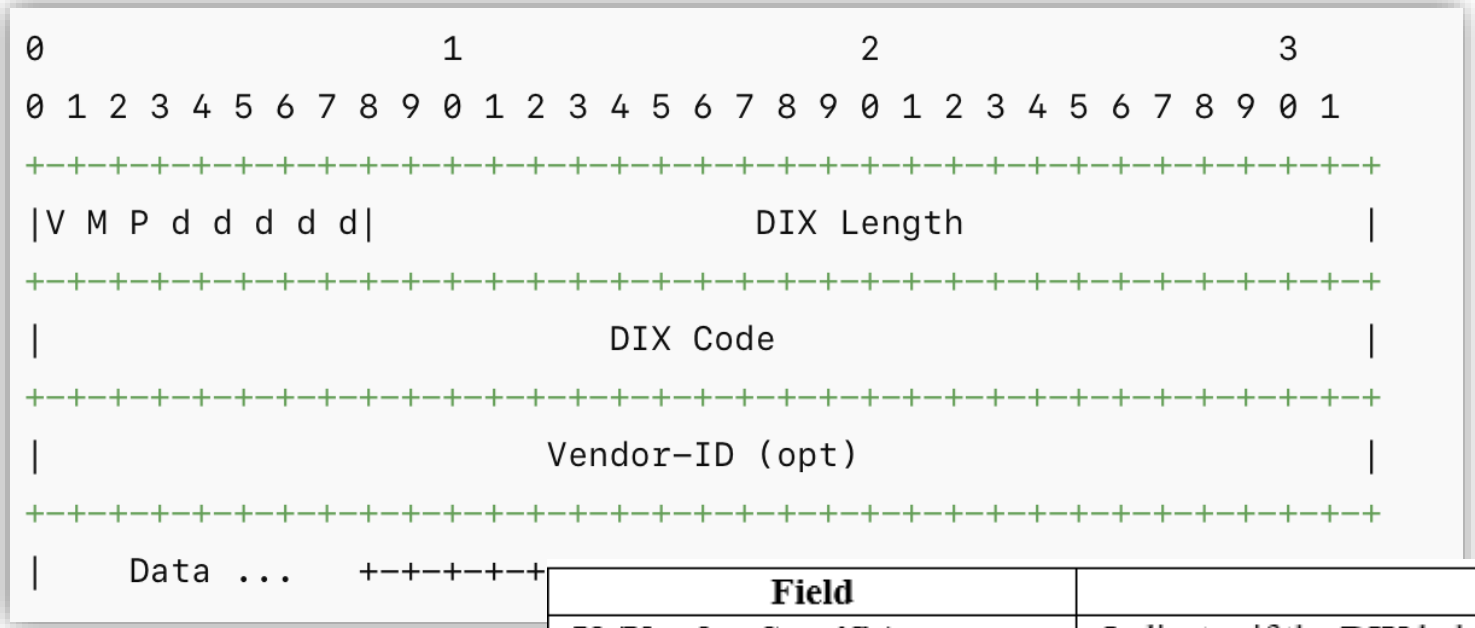
AIR TRAFFIC CONTROL COMMUNICATION

FLIGHT NO	OPERATOR	COUNTRY IDENTIFIER	NETWORK DOMAIN

TK1699@thy.tr.aoc

AIRLINE OPERATION CONTROL COMMUNICATION

DIX HEADER



Field	Description
V (Vendor-Specific)	Indicates if the DIX belongs to a vendor-specific space.
M (Mandatory)	Signals whether the receiver must understand this DIX.
P (Protection Flag)	Specifies the need for end-to-end security.
d-bits (Data Type)	Encodes the DIX data type (e.g., OctetString, Integer32, etc.).
DIX Length	Specifies the total length of the DIX, including padding.
DIX Code	Identifies the specific DIX attribute.
Vendor-ID (Optional)	Uniquely identifies the vendor if the V bit is set.
Data	Contains the actual payload of the DIX.

return

Mobility Management

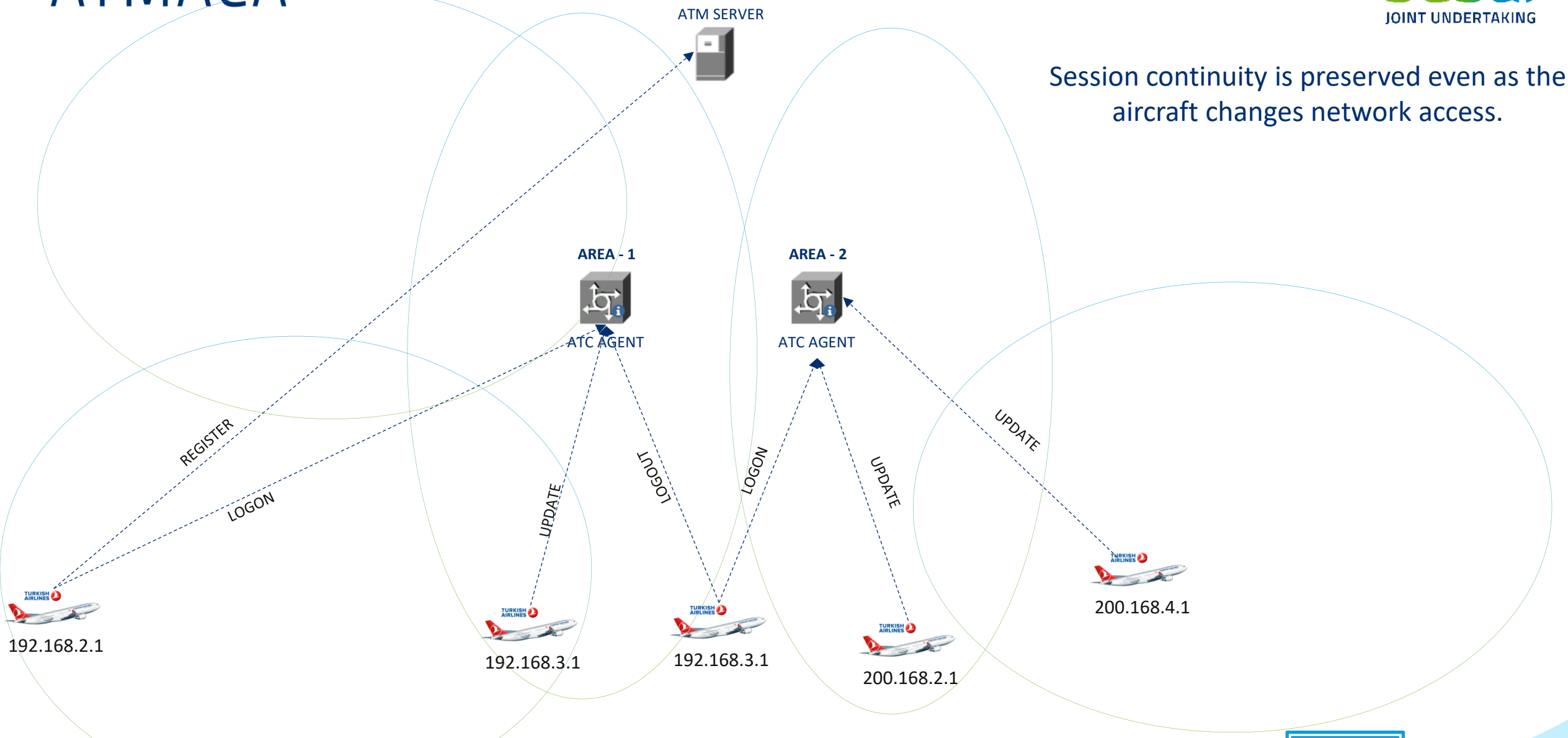
In aviation, mobility is the norm, not an exception, so communication must be designed to survive movement by default.

MOBILITY MANAGEMENT SUPPORT		
MOBILILITY MANAGEMENT REQUIREMENS	ATMACA	MOBILITY TIERS
HAND-OFF	✓	TERMINAL MOBILITY (Non-Real Time and real time)
REGISTRATION	✓	SESSION MOBILITY
CONFIGURATION	✓	USER MOBILITY
DYNAMIC ADDRESS BINDNG	✓	SERVICE MOBILITY
LOCATION MANAGEMENT	✓	

ATMACA treats mobility as a normal operating condition and manages it without breaking sessions, context, or services.

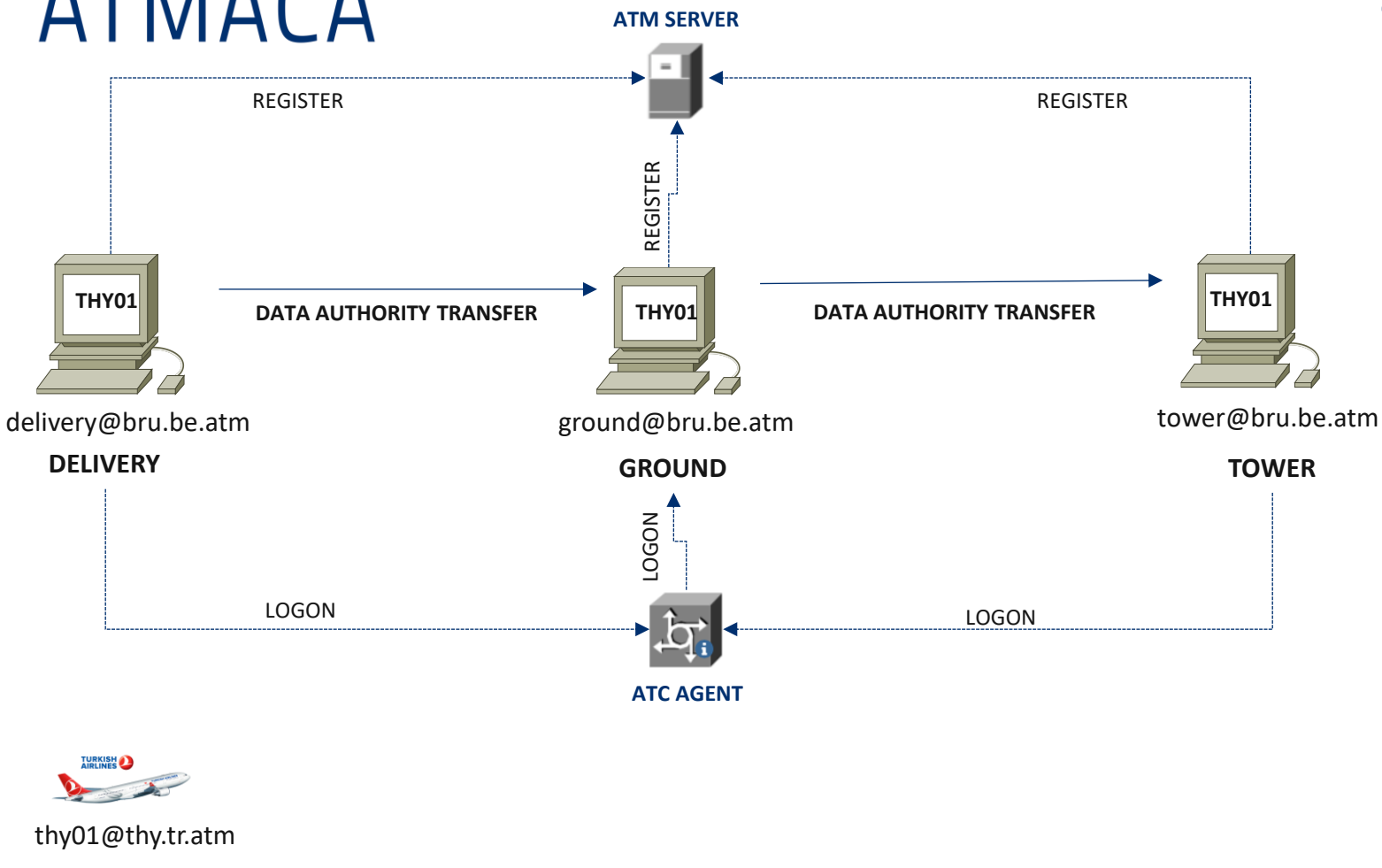
Terminal Mobility

Session continuity is preserved even as the aircraft changes network access.



return

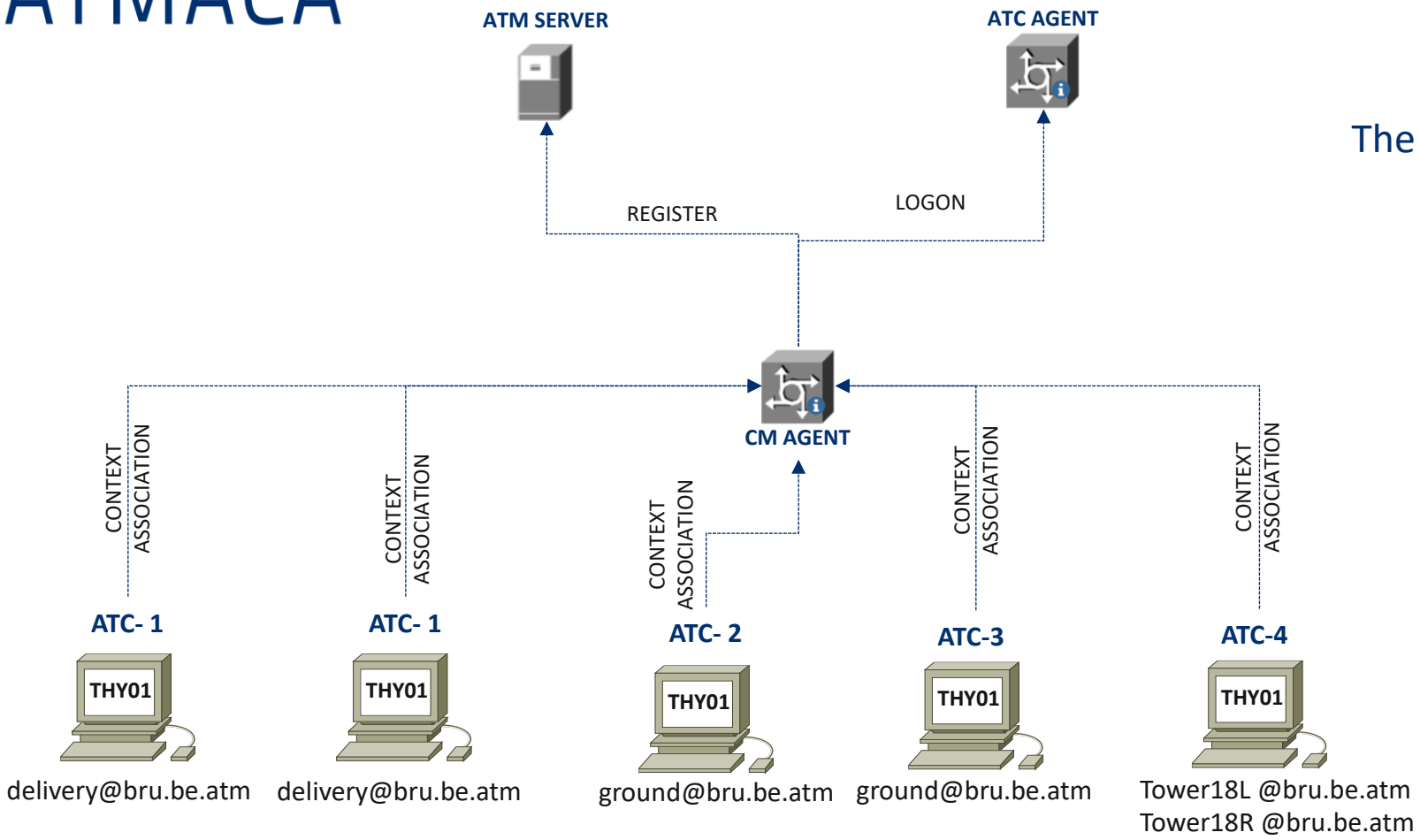
Session Mobility



- The active session moves without interruption.
- Session continuity is preserved across session mobility.
- The session transitions seamlessly between endpoints.
- The same session continues after the transfer.

return

User Mobility



The user moves between workstations while the active session remains continuous.

One active user session, independent of workstation and role.

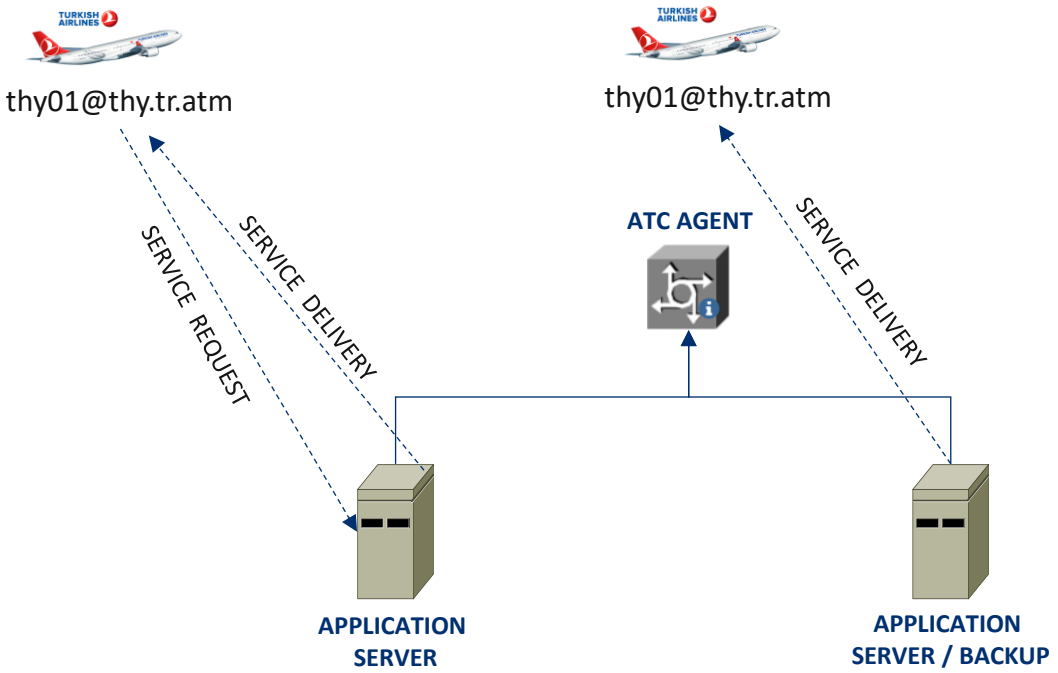
thy01@thy.tr.atm

return

Service Mobility

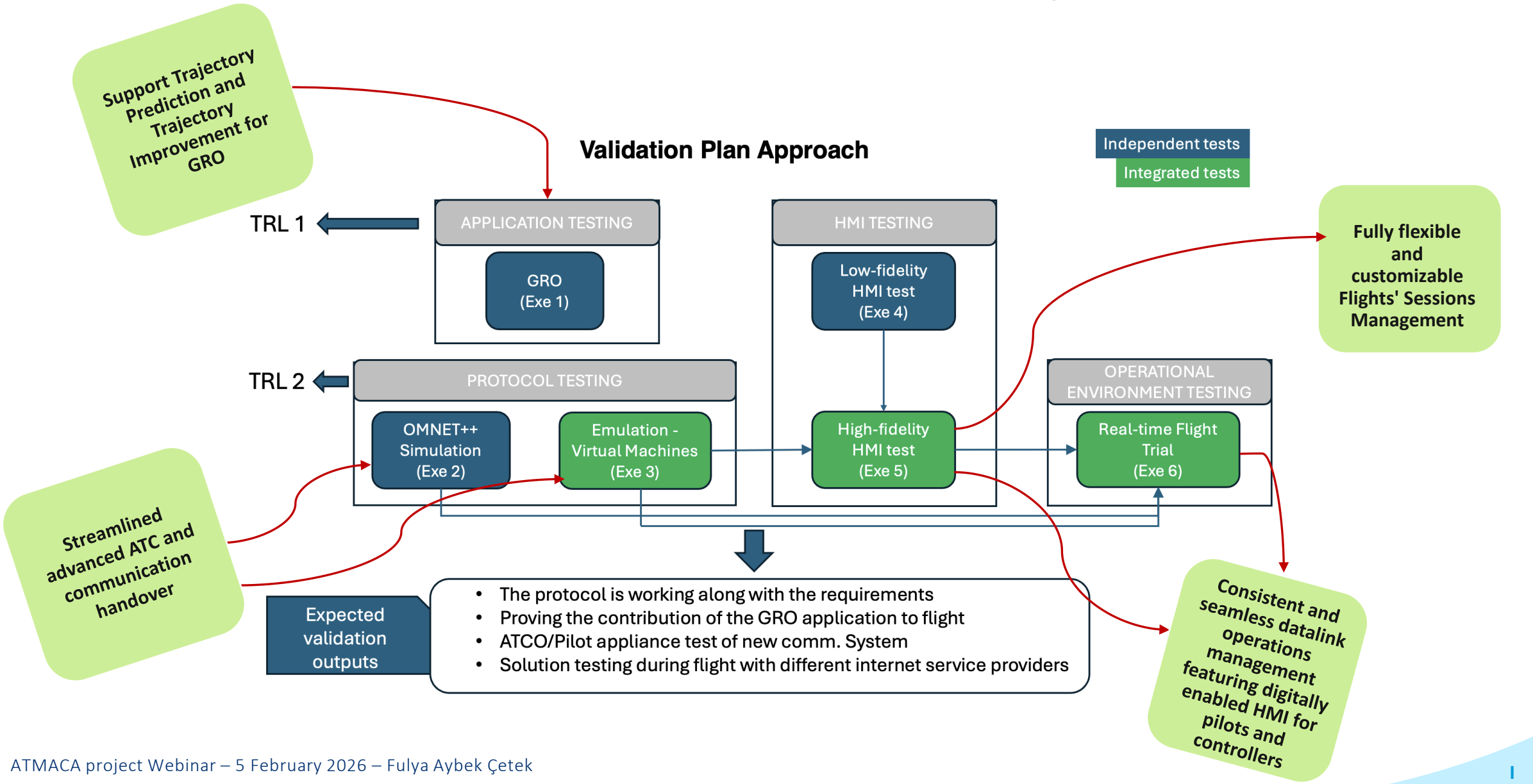
Service mobility allows services to relocate or change instances while the **active session remains continuous**.

- service instance moves to another server
- service switches to a regional or backup node
- service migrates due to load balancing or failure



return

ATMACA Validation Roadmap



ATMACA



Asst. Prof. Fulya Aybek Cetek
faybek@eskisehir.edu.tr



Prof. Raouf Hamzaoui
rhamzaoui@dmu.ac.uk



Prof. Rosa Maria Arnaldo
rosamaria.arnaldo@upm.es



Captain Pilot Sergun Özmen
sergunozmen@thy.com



www.atmaca-sesar.eu

@ ATMACA - SESAR

The answers to the remaining questions will be published on our website

ATMACA

Thank you!

SUPPORTED BY sesar JOINT UNDERTAKING

Co-funded by the European Union