

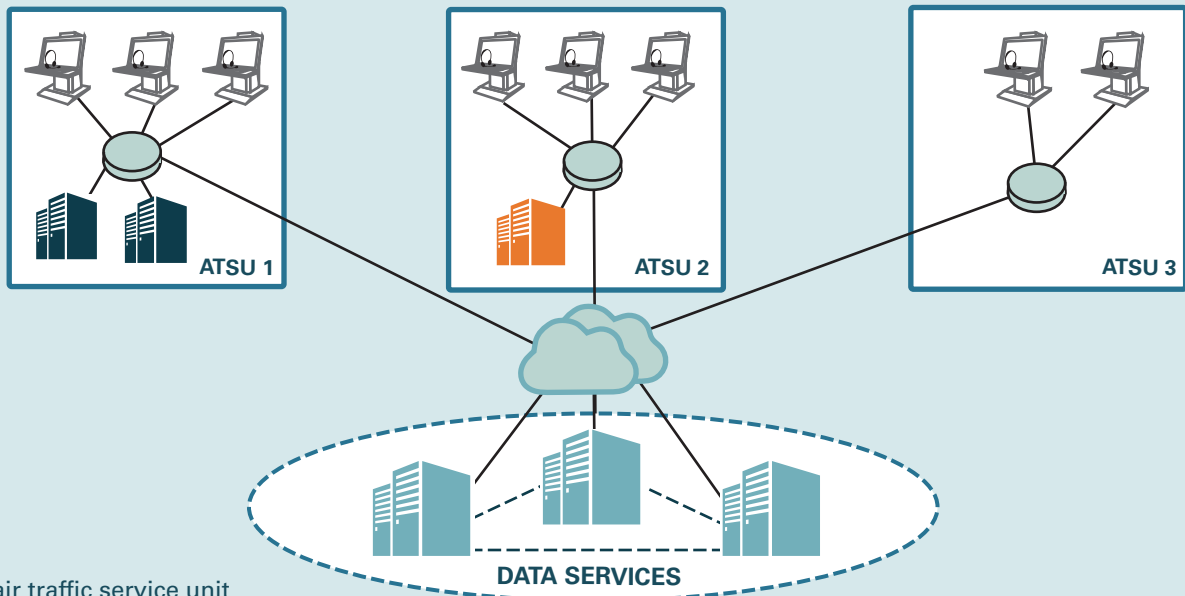
### 1 WHAT IS THE VIRTUAL CENTRE CONCEPT?

The so-called “Virtual Centre” concept refers to the virtualisation ambition captured within the European ATM Master Plan. The concept is built upon a number of elements, including system-wide information management (SWIM) principles of data exchange protocols and open service-oriented architecture (SOA). These principles will also enable other closely related advanced SESAR solutions and applications, such as collaborative decision making, airport operations centre (APOC), and remote tower services. This concept is primarily enabled by the decoupling of the controller working position (CWP) as the client through the remote provision of ATM data and technical services, such as flight data distribution and management, as well as surveillance data.



### 2 HOW IS SESAR PROGRESSING THE CONCEPT?

The first SESAR results are promising in terms of increased flexibility in organising ATC operations in and between the air traffic service units (ATSUs), as well as enabling multiple ATSUs to perform services seamlessly from an airspace user’s perspective. Further R&D activities are planned and details will be refined in SESAR 2020 in order to pave the way for a broader uptake of virtualisation, enabled by SWIM applications.



ATSU - air traffic service unit

### 3 WHY IT IS NEEDED?

Europe’s air traffic management (ATM) is in many cases composed of country-based systems and processes, each requiring customised system adaptations. This fragmentation or proliferation of systems results in a lack of interoperability and increased costs of air navigation services across Europe, which ultimately stands in the way of a more sustainable and competitive aviation industry.

### 4 WHAT ARE THE EXPECTED BENEFITS OF VIRTUAL CENTRES?

The concept of “virtualised” ATC centres based on standard service interfaces is expected to bring the following benefits:

- ✓ Increased cost efficiency with the rationalisation and standardisation of systems and services, enabling ATC infrastructure and processes;
- ✓ Increased flexibility made possible through workload balancing between ATSUs;
- ✓ Harmonised ATM functionalities and seamless cross-border and cross-ATSUs transitions for airspace users, allowing for overall increased capacity;
- ✓ Increased agility and cost efficiency to implement and commission new ATM functionalities throughout European ANSPs;
- ✓ Increased capability for contingency planning.



# SESAR Virtual Centres

## FREQUENTLY ASKED QUESTIONS

### 5 WHAT RESEARCH WORK HAS BEEN UNDERTAKEN BY SESAR?

The initial focus in SESAR on “Virtual Centres” has been to demonstrate the technical feasibility of the decoupling of CWPs from the ATM data service provision. As an initial step, SESAR members have started to define open service interfaces that could be used across a wide area of network connections interoperable across air navigation service providers (ANSPs) and vendor independent ATC centre system solutions. Furthermore, the interfaces and the data transmitted have been designed to allow remote connections between CWPs and ATM data and technical service providers, as well as for the local deployment at ANSP premises (ATSUs).

More specifically, SESAR members have worked on defining and evaluating open and standardiseable service interfaces for the controller workstation, including:

- Flight data distribution and management
- Coordination and transfer management
- Correlation distribution and management
- Surveillance data distribution

Other service interfaces are under definition: safety nets, conflict detection, flight data for arrival management services and flight track deviation detection.

### 6 WHAT IS THE OUTCOME OF THIS R&I?

Through a series of demonstrations with ANSPs (DFS, DSNA, Enaire, ENAV, EUROCONTROL, NATS, Skyguide) and system manufacturers (Frequentis AG, Indra, Finmeccanica – formerly Selex ES, Thales Group), SESAR made steps towards demonstrating the application of these service interfaces in a variety of vendor independent scenarios with increasing complexity. A set of common operations have been used by 9 different CWPs and 5 different ADSPs, in a multivendor scenario, demonstrating that the common data defined in the services are really consistent with the CWP needs.

### 7 WHAT ARE THE NEXT STEPS?

Building on the work completed in SESAR, the following objectives will be addressed in SESAR 2020:

- Evaluate, prioritise and validate the business use cases, economic impacts and the performance benefits, in line with the concept definition;
- Further develop and validate the system and service architecture in the SWIM architecture context;
- Further extend the functional scope, including voice communication and air traffic flow and capacity management (ATFCM) to validate its performance and business applicability, as well as the system architecture implications;
- Improve the definition of the service interfaces up to a level of detail that is sufficient for standardisation at the performance requirements level and that allows for interchangeable and vendor independent services for ATSUs;
- Address safety, security, performance and all requirements needed to achieve the level of maturity required for standardisation and subsequent industrialisation readiness.

## SESAR MEMBERS AND PARTNERS INVOLVED IN THE VIRTUAL CENTRE CONCEPT:

