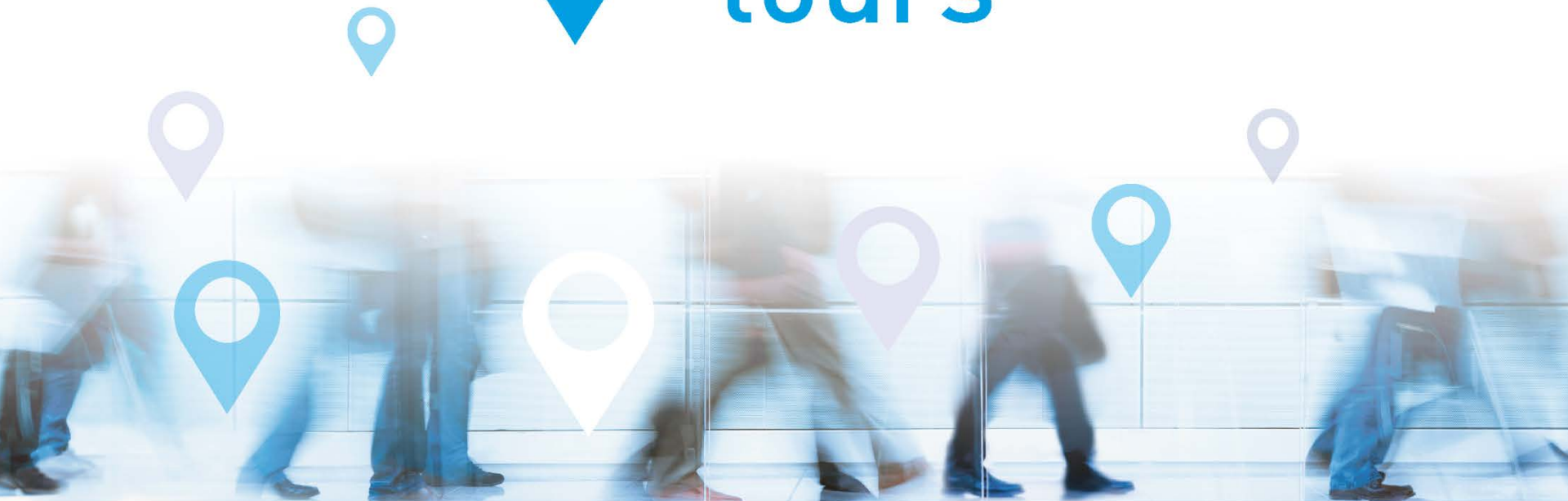




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SESAR
walking
tours



VoIP for ATC COMMUNICATIONS

BACKGROUND & BENEFITS

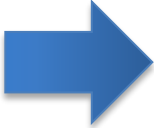
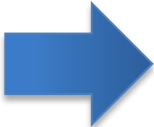
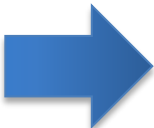
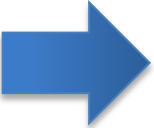
- Need of interconnecting european CAAs over PENS, in order to provide sovra-national Airspace, according to Single European Sky principles (e.g.FABs)
- Need of resource sharing across National Borders and across Civil-Military Domains



- Evolution of the Infrastructure to meet SESAR performance requirements and new operational features :
 - To provide a safe, efficient and cost-effective set of interoperable systems which enable the required functionality and performance;
 - In a globally compatible manner and with due regard for backward compatibility

VoIP for ATC COMMUNICATIONS

.....WHY VoIP ?

- Resource sharing across National Borders and across Civil-Military Domains 
 - Safety & interoperability requirements 
 - Cost Efficiency requirement 
 - Backwards Compatibility & Security 
- ATC VoIP allows directly connecting radio resource to several VCSS belonging to different ANSPs
 - ATC VoIP is a open and global standard, whose safety has been enhanced by EUROCAE WG-67 & SESAR Pj150210 work (e.g. RTP-HE)
 - Cost saving by abandoning legacy interfaces and circuit-mode voice;
• Use of less expensive COTS device
 - Use of Gateways to integrate legacy systems within new ATC VoIP infrastructure;
• Authentication & Encryption technology available

VoIP for ATC COMMUNICATIONS

EUROCAE Reference Standards

ED-136 “Voice over Internet Protocol (VoIP) Air Traffic Management System Operational and Technical Requirements”;

ED-137C Part 1 “Interoperability Standards for VoIP ATM Components – Part 1: Radio”

ED137C Part 2 “Interoperability Standards for VoIP ATM Components – Part 2: Telephone”

ED137C Part 3 “Interoperability Standards for VoIP ATM Components – Part 3: Recording”

ED137C Part 4 “Interoperability Standards for VoIP ATM Components – Part 4: Supervision”

ED138 Part 1 “Network requirements and performances for voice over internet protocol (VoIP) Air traffic management” - Part 1: Network Specifications

ED138 Part 2 “Network requirements and performances for voice over internet protocol (VoIP) Air traffic management” - Part 2: Network Design Guideline

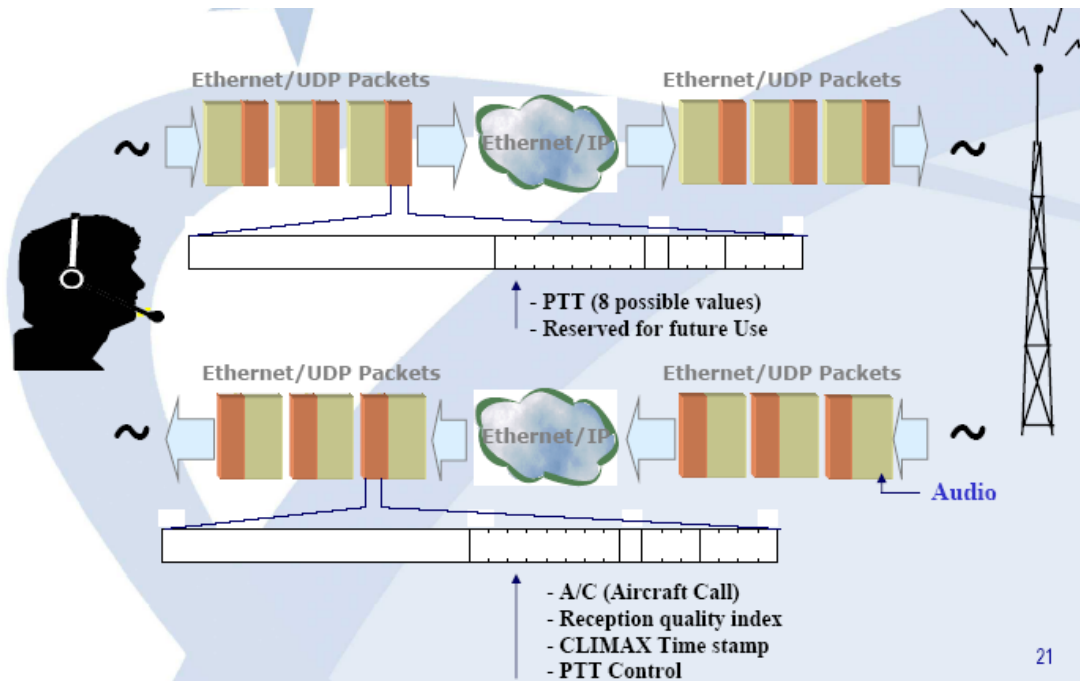


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Company General Use



Radio Signalling Principles



Safety Enforcement

- PTT is Synchronous to the voice;
- Keepalive provides quick & reliable indications of connection availability

- After the SIP session call setup between VCSS and radio equipment:
 - «Orange» packet header contains radio signalling;
 - «Yellow» payload of the packet is the voice frame ;
 - When no voice is present, packets without voice are transmitted as keepalive (R2S protocol)

VoIP for ATC COMMUNICATIONS

Leonardo Commitment – The Road to VoIP

- ETSI IoP tests: 2008, 2009, 2011



- FAA IoP tests: 2011



- DFS-DSNA Field Trial: 2009



- PENS Field Trial activities within SESAR WP15.2.10

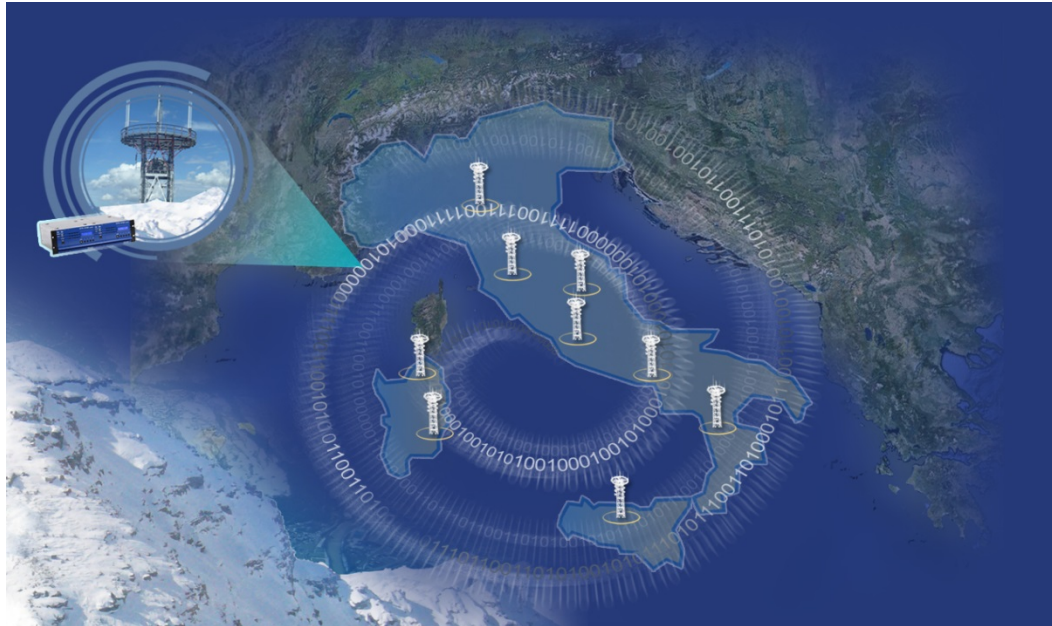


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VoIP for ATC COMMUNICATIONS

The ITAF Case Study



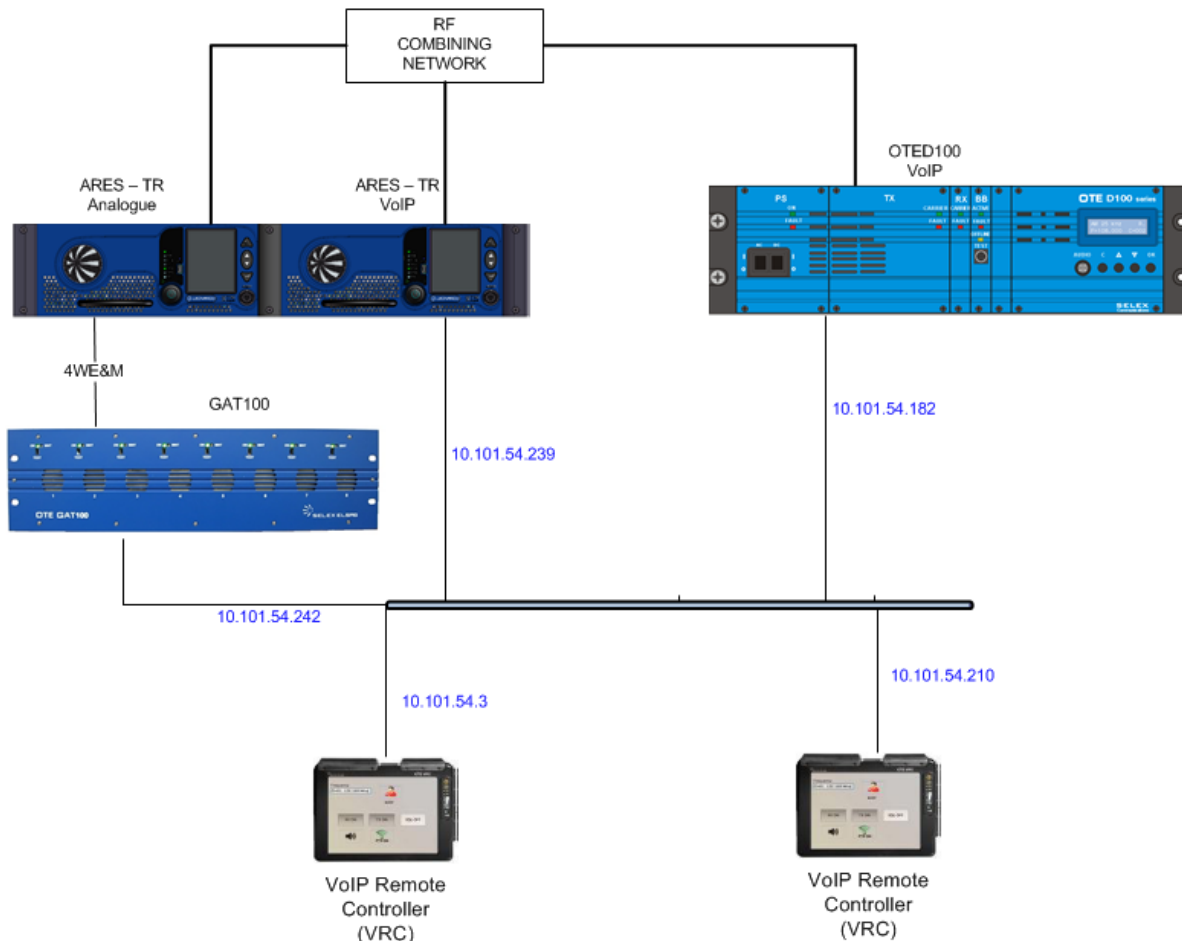
- Since 2010 Leonardo deploys VoIP radio networks EUROCAE ED137B.1 standard for communications with aircrafts
- All major airports, four ATC En-Route centres and C2 centres (Ground Stations and VCSS) are being networked according to VoIP ED137B.1 standard
- Every ACC /C2 centre is able to manage and any remote radio resource for dynamic airspace configuration and Joint Operation between ITAF Agencies



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ATC VoIP DEMO Description



- VRC – Radio connectivity;
- Radio resource sharing by two VRCs;
- Sector merging simulation;
- “Sidetone Mode” (Leonardo specific) for conference functions
- Coordination upon Frequency change from VRC