WHAT'S INSIDE

ENAIRE ENSURES A SAFE TRANSITION TO NEW IP-BASED COMMUNICATION NETWORK WITH ITRINEGY SOFTWARE DEFINED TEST NETWORKS

ENAIRE is the Spanish air navigation service provider with responsibility for air traffic control, aeronautical information and the communication, navigation and surveillance networks necessary so that airlines can fly safely within Canarias, Sevilla, Madrid, Barcelona and Palma FIR airspace.

Barcelona control tower and ground-air communication antennas

It is the fourth largest air navigation service provider in Europe by volume of air traffic, with around 2 million flights per year and manages 2.2 million square kilometres of complex airspace from five air control centers and 21 control towers. Recognizing that most of its Voice communications systems were at the end of their life cycle, which made it difficult to incorporate new operational requirements into these legacy systems, ENAIRE looked to replace them with new IP-based alternatives. To help it ensure a smooth migration ENAIRE decided that it needed a suitable solution with which to test the resilience of the new communications systems and determined that the use of network emulation technology would be the most appropriate way to achieve its objective.

THE PROBLEM

Historically, the majority of Voice communications systems operating in ENAIRE's Air Traffic Control Centers were based on TDM/PCM (Time Division Multiplexing / Pulsed Code Modulation) circuit switching technologies, which, after years of service, were reaching technological obsolescence. In addition, telecommunications operating companies were phasing out support for the analogue transport infrastructure currently used for Air Traffic Service for voice communications.

THE PROBLEM (CONT./)

ENAIRE saw this situation as an opportunity to transition to newer systems that would facilitate the integration of voice and data over the same communication network. The adaptation to the new communication transport infrastructure, based on the IP protocol complying with the interoperability standard EUROCAE ED-137, would also deliver several advantages including:

- Alignment with the SESAR (Single European Sky ATM Research) programme and European requirements to harmonize technologies among participating European partners
- Incorporation of new operational capabilities that were not achievable by current VCS (Voice Communications Systems for ATS Communication) systems, such as increasing the number of airspace sectors that can be assigned to an Air Traffic Controller
- A more user-friendly human-machine interface

THE REQUIREMENT

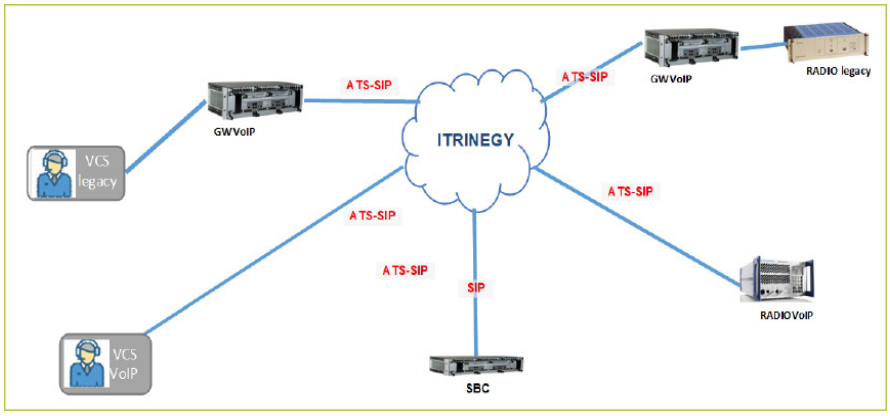
ENAIRE was looking to test the performance of its VoIP devices (mainly Voice Communication Systems and Ground Radio Stations) in real and degraded Network environments, to verify their compliance with the ED138 EUROCAE (Network Requirements for VoIP Air Traffic Management Systems) standard before transitioning them into the live operational environment.

In addition, the organization also wanted to verify the correct operation of some specific functionalities of its VoIP air-ground communication service, such as BSS (Best Signal Selection) and Climax in real modelled networks in order to understand how it would perform over a wide range of network conditions (bandwidth, latency, jitter, bit lost, etc.).

As these VoIP Communication Systems are going to be used for the safety-critical communications between pilots and air traffic controllers, ENAIRE also needed to complete testing with minimal impact of their live systems.

THE SOLUTION

ENAIRE began its search for a suitable solution by exploring the internet and approaching specialized equipment resellers it had previously dealt with including Ayscom. With Ayscom's assistance ENAIRE shortlisted three potential vendor products that they believed could be used to emulate the required network behavior needed to test their new VoIP-based systems, including iTrinegy's INE Enterprise network emulator with Mapping GUI.



Using the NE-ONE Enterprise, ENAIRE could create complex test environments which could be shared by several teams simultaneously and without the need for extra equipment such as routers

THE SOLUTION (CONT./)

Following demonstrations of the three products, the INE Enterprise emerged as ENAIRE's preferred option. ENAIRE's Department of ACC Voice Communications, explains why, "We chose the INE Enterprise as it offered the ability to emulate complex routing and network impairments in one single device. This enabled us to define a complete and complex test environment which could be shared by several test teams at the same time without the need of extra equipment, such as routers, and with no interference between testers, for example, one of our test teams could test radio service functionality while the other team focused on testing the telephony service at the same time."

ENAIRE continues, "The initial set-up of the NE-ONE Enterprise was quite involved compared with the other equipment we evaluated but that was because of the complexity of the test environment it allowed us to define. But now we can maintain the required test configurations and quickly retrieve them for several testing purposes."

When asked which three features of the NE-ONE Enterprise ENAIRE found most helpful in the testing of ENAIRE VoIP systems the following were listed:

- The ability to configure and apply impairments in independent flows, filtering them by IP source/destination or UDP/TCP source/destination port.
- The ability to create and save complex routing scenarios.
- The user-friendly impairments configuration interface.

CONCLUSION

The safety-critical nature of communications between pilots and air traffic controllers requires the highest levels of resilience to be maintained and through its use of the NE-ONE Enterprise, ENAIRE has been able to conduct rigorous testing of the new VoIP Communication Systems prior to their introduction into the live environment, and with minimal impact on existing systems.

NE-ONE ENTERPRISE PLATFORMS

The NE-ONE Network Emulator range is available as either industry standard rack-mount hardware appliances or downloadable virtual appliances.

www.itrinegy.com · T: (USA): +1 888 448 4366 · T: (UK): +44 (0)1799 252 200 · E: info@itrinegy.com

iTRINEGY Knowing You're Network Ready