

Let's put the
“C”
Into CNS

Dieter Eier, ICNS 2025

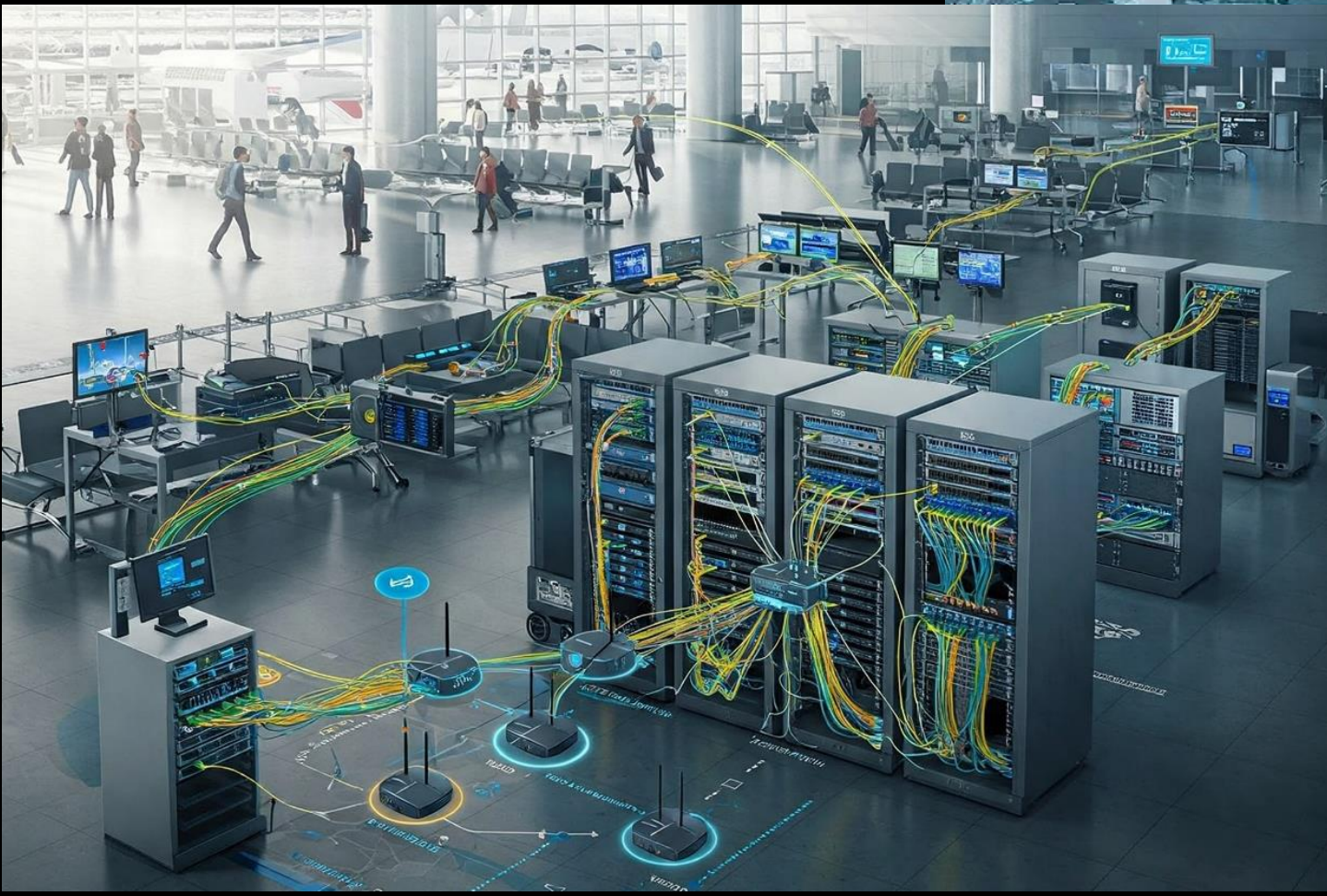






Digital Age in Aviation ?

Aviation ? Yes



ATC ? Not so much



What about
the






In some countries the
Voice  is still analog.

*“... Migration of
ATM voice services to Voice-over-IP
is forecasted to be
finalized by
December 2020 ...”*



In 2025 Less than 20% of All
193 ICAO Members Have
Completed the
Migration



What Makes the Migration so Hard ?

Transformation to IP



Before and After the Transformation

- Telecom Test S
- Tone generator
- Punch Down B
- What goes wro
 - Noise on telco
 - Telco circuits
 - Replacement

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- e-over-IP
- ster (Wireshark)
- ng packet generator
- ng
- g?
- y, Jitter
- new servers/services

➤ Worst case:

The "Oscilloscope"

➤ Worst case:

Type in Linux commands using the
"Command Line"



Key Considerations

- VoIP requires sufficient bandwidth *Much more than non-IP traffic*
- Quality of Service to prioritize voice traffic *Must be configured*
- Allocate latency budget to all network segments *Test Test Test*
- A well-designed network has minimized jitter *Test Test Test*
- IT security to protect the VoIP network *Test Test Test*
- Redundancies for ATM-grade availability *Use the “Five-Niners” Approach*
- Extensive user training *Include basic computer training, especially Linux*
- Service monitoring *Monitor truly end-to-end, and not segmentized*

Key Considerations

What NOT to do!

- Do NOT assign network segments to different providers *Trouble ahead!*
- Do NOT cut short extensive load testing *Trouble ahead!*
- Do NOT cut short testing of all possible fault cases *Trouble ahead!*
- Do NOT cut short testing of fault recovery use cases *Trouble ahead!*
- *Do NOT skip rollout of IT security patches* *Trouble ahead!*

Workforce

A group of seven IT professionals, including men and women, are gathered in a server room. They are looking at a server rack on the left, with one man pointing at a specific component. The room is filled with server racks and a complex network of cables. The lighting is bright, and the overall atmosphere is professional and focused.

*Education of
Technical Workforce is key*

*“Linux,
Wireshark,
VLAN, VPN,
IP addresses,
SIP addresses,
keys, ...”*



Thank You