



# FREQUENTIS

FOR A SAFER WORLD

The best of two AIM Worlds

# Agenda

I Frequentis and Comsoft Solutions – best of two AIM Worlds

II Frequentis - Position in the AIM Market

III Comsoft Solutions - Position in the AIM Market

IV Summary

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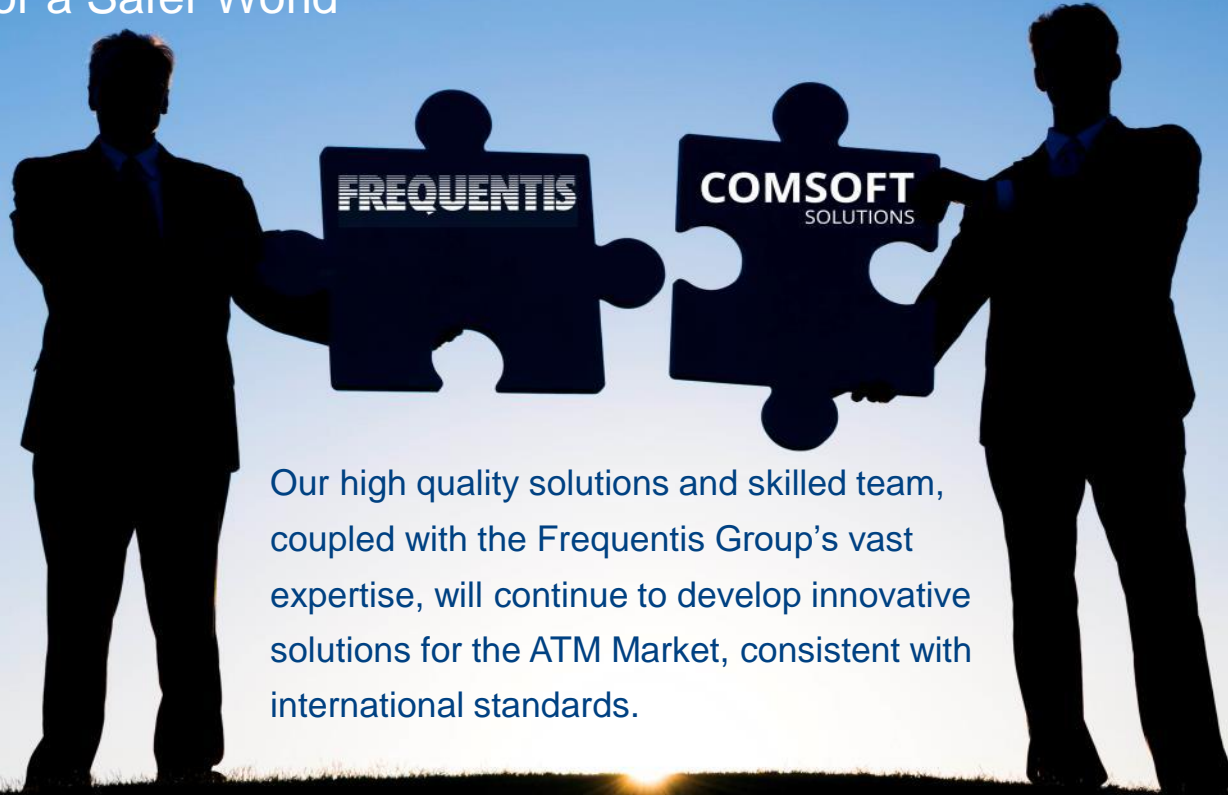
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# Together for a Safer World



Our high quality solutions and skilled team, coupled with the Frequentis Group's vast expertise, will continue to develop innovative solutions for the ATM Market, consistent with international standards.

# Comsoft Solutions member of Frequentis Group

- At the begin of 2016 *Comsoft Solutions GmbH* (a new company) became a 100% member of the Frequentis Group.
- Most of the employees, products and projects have been transferred to the new *Comsoft Solutions GmbH*.
- The merger complemented Frequentis' ATM portfolio perfectly.
- In the AIM sector it created an extremely comprehensive AIM product and service portfolio
- Frequentis/Comsoft now has an outstanding market share in the AIM / AMHS business sector.

# Best of two AIM Worlds

Frequentis/Comsoft AIM Solutions

## Karlsruhe (Comsoft Solutions)

- Highly modular and configurable standalone systems
- AIXM 5 Know-How since 2007
- Large international installed base



## Vienna, Prague, Cluj

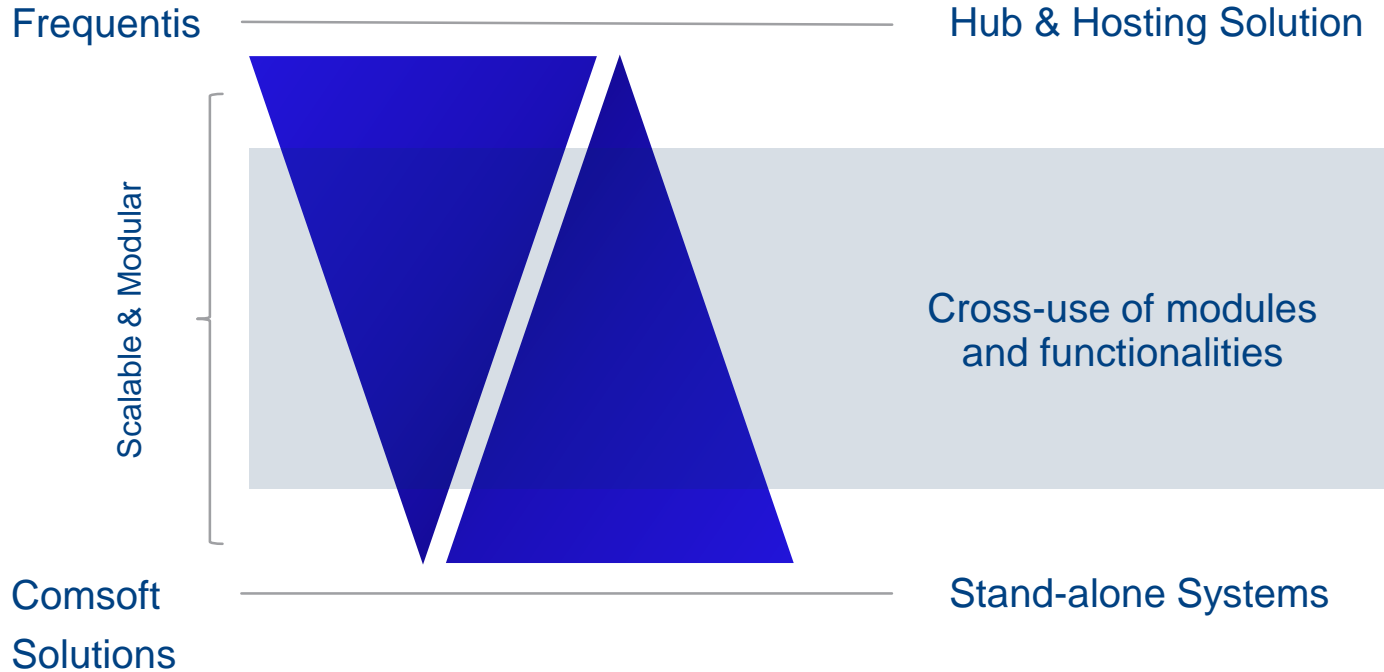
- Large Hub Systems
  - EAD (Europe)
  - South Africa
  - GroupEAD Asia Pacific
  - 240 customers
- GroupEAD (AIM services)
- Member of SESAR Joint Undertaking



outstanding capabilities in the AIM sector

# Best of two AIM Worlds

Matching product portfolios



# Best of two AIM Worlds

## Current installed base

### „Continuity with new perspectives“

- All products will be continued and further developed – protecting the investment
- Smooth transitions in the development strategy to make the best functionalities and modules available for everyone
- New options for complementing existing systems already available now



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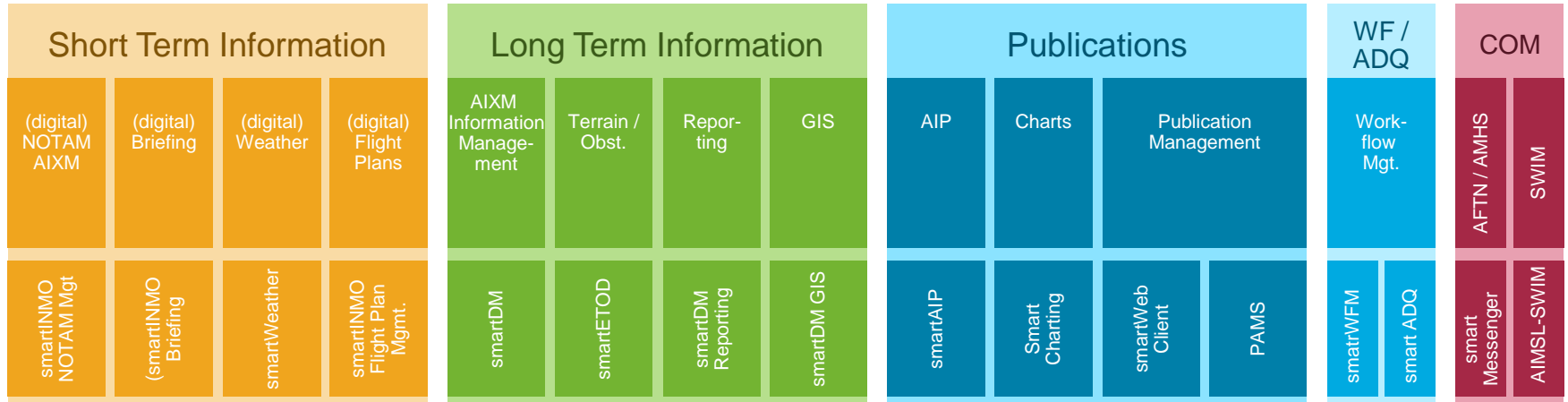
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# Functional blocks

## smart™ AIM



- Portfolio of 16 modular Components – based on Specialist Expertise
- Dedicated to open Standards - allowing Mix & Match Deployments
- Fully aligned with ASBU
- Fulfilling all ADQ Requirements
- Dedicated to open Data Exchange and Hub Data Platforms
- Dedicated to Data Quality both Upstream and Downstream – without Media Breaks

# Market Position of Frequentis/Comsoft (for AIM)

- **Complete Portfolio**

Frequentis/Comsoft owns a complete AIM Portfolio, including but not limited to AIXM 5.1 database, Data Management, NOTAM, FPL, (digital) Briefing / Internet Briefing, METEO, Charting, AIP, Workflow Management; all Frequentis IPRs

- **Main Provider for AIM**

Frequentis/Comsoft is one of the main providers for AIM solutions worldwide and has a major market share. For AMHS (part of the AIM portfolio) Frequentis/Comsoft has about 65% market share worldwide.

- **EAD supplier**

Frequentis is the supplier of the European AIS Database (EAD), owned by Eurocontrol.

- **GroupEAD shareholder**

Frequentis is shareholder of GroupEAD, an international AIM service provider

# Market Position of Frequentis/smartAIM

- **AIM/AMHS platform delivery**

Frequentis/Comsoft delivers AIM/AMHS solutions worldwide, hardware and software; major examples: EAD, Canada, Hong Kong, UAE, Singapore, South Africa, New Zealand, DFS, LGS (Latvia) and many others

- **AIM platform/system operation**

Frequentis offers operation of the IT platforms of AIM solutions; major examples: EAD, Internet Briefing Websites e.g. for NATS, Hungarocontrol, Airport Data Provider Platforms (ADV) and others

- **Data migration services**

Frequentis offers data migration services (usually in co-operation with GroupEAD) for customers following the roadmap from AIS to AIM, e.g. for initial data migration when implementing an AIM solution

# Market Position of Frequentis/smartAIM

- **AIM/AMHS Training**

Frequentis provides training either on-site, in the Frequentis Factory Centre Vienna (e.g. during FAT) or through GroupEAD in the training centre Frankfurt

- **Operational Support**

Frequentis offers initial support in the phase from acceptance to cut-over and beyond

- **24/7**

Frequentis offers 24/7 technical Helpdesk services for it's AIM/AMHS customers

# Market Position of Frequentis/smartAIM

- **Standards / Safety Engineering**

smartAIM is developed due to modern development standards and can cope with complex Safety Case requirements; example: EAD

Frequentis runs a 24/7 safety monitoring executed by certified safety engineers of the AIM team.

- **240+ customers use smartAIM**

# AIM Deployment – Data Hub Network

## Turning Ideas into Action

Establishment of  
Data Hubs ->  
Obsolescence of  
Data Messaging

Network of 3 AIM hubs world-wide in operational use



# AIM Deployment – Enhancement of Data Quality

## Turning Ideas into Action

Enhance data to  
allow automatic  
exchange and  
usage

- ADQ compliant EAD system available at low cost
- EASA certification (Q2 2016)
- ADQ through the data chain to originators





# AIM Deployment – The Data Chain

## Turning Ideas into Action

Track data and overcome media-breaks

- Respective workflows in place
- Automatic management of originators and meta-data
- In operational use by airports – direct data provision
- Cooperation with airlines for data consumption and processing

# AIM Deployment – AIXM5.1

## Turning Ideas into Action

- Numerous users using AIXM5.1 or are preparing for migration

*Operational use of  
a more complete  
and sophisticated  
data structure*

# Market Position of Frequentis/smartAIM

- **AIM solutions for data providers (airports)**

Example is the ADV platform which serves all German airports

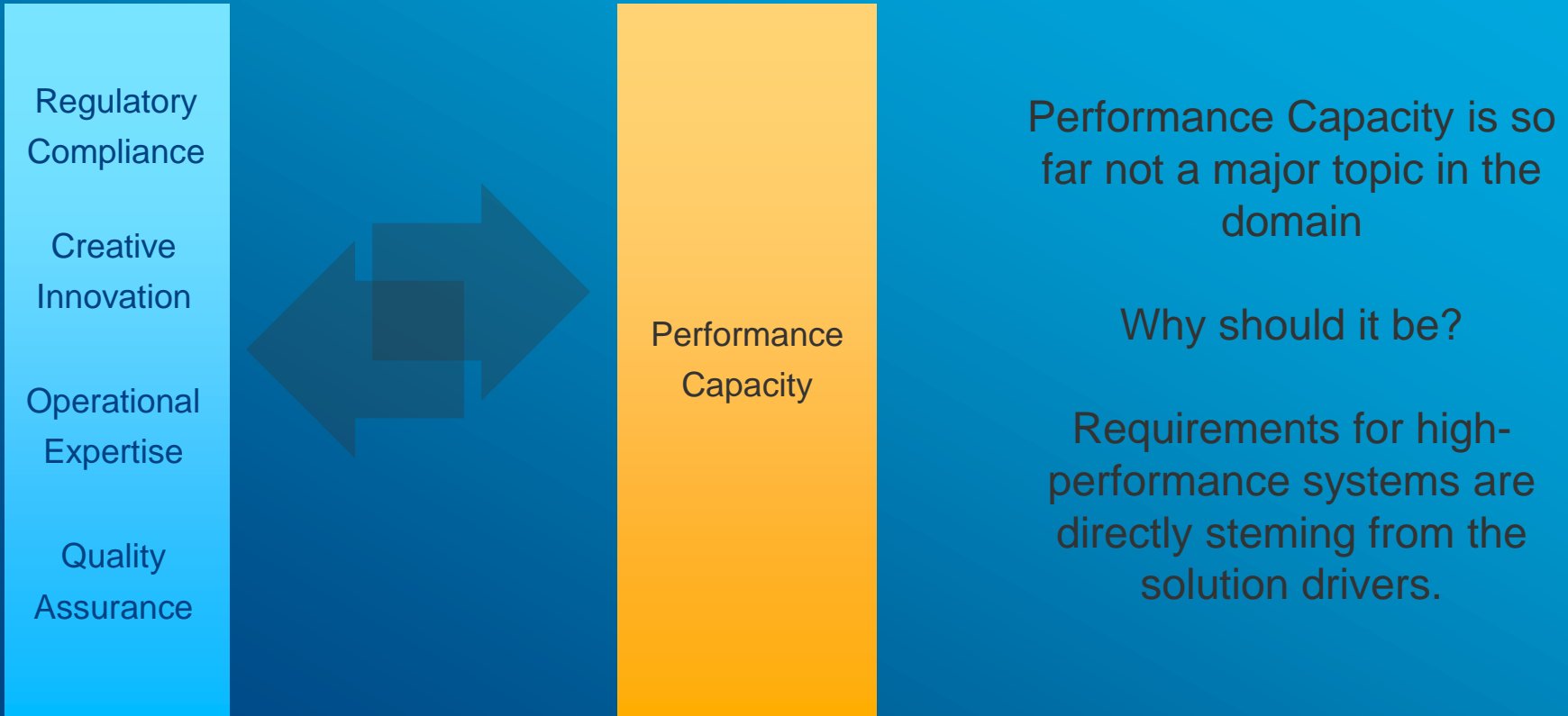
- **AIM solutions for airlines**

Many airlines use smaller EAD based installations but also large smartAIM systems

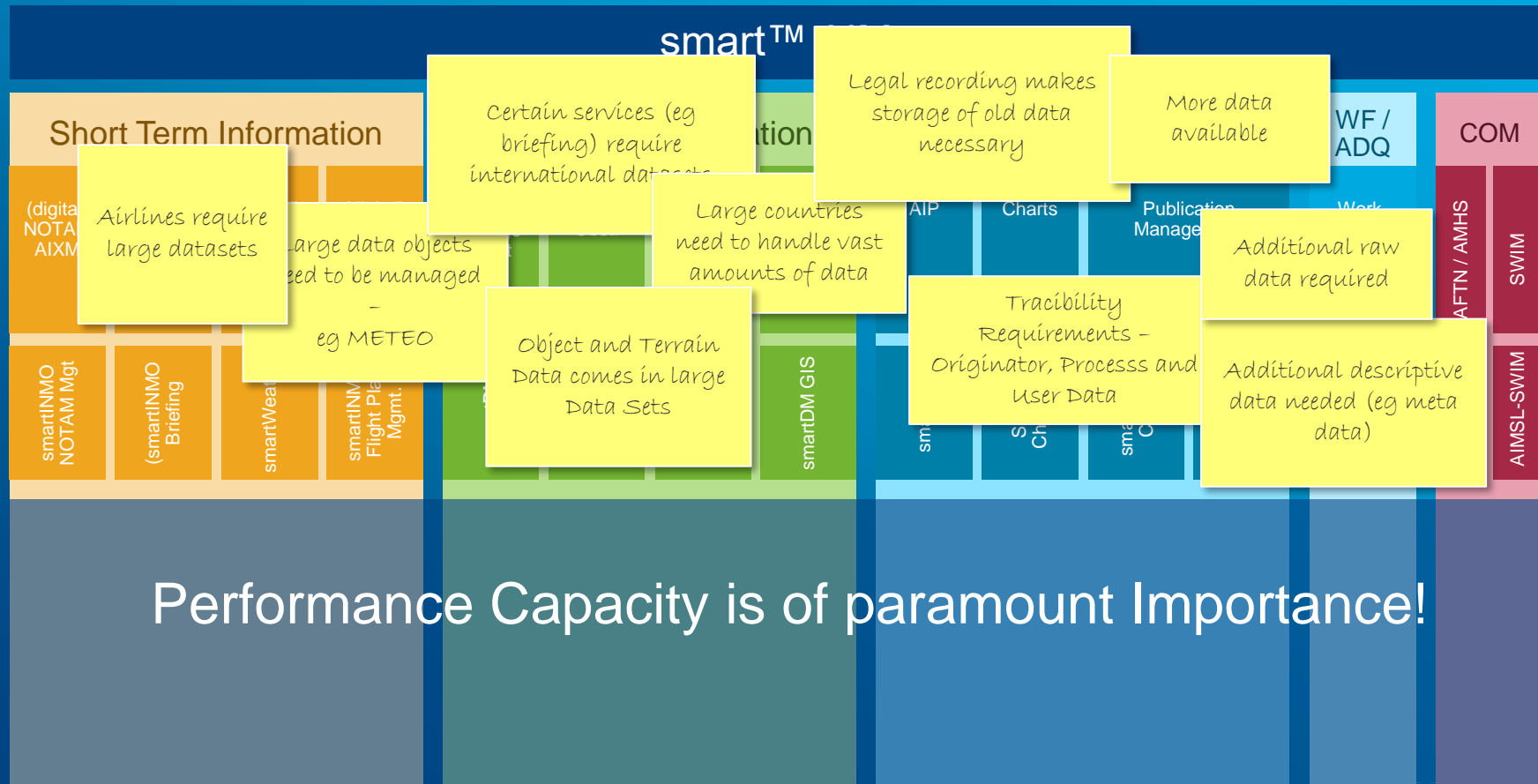
- **New drivers for AIM development**

These two customer types add further drivers to the AIM development

# AIM - Role of Performance Capacity



# Functional blocks

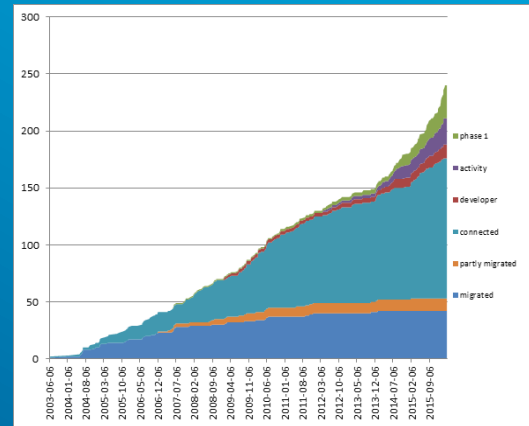
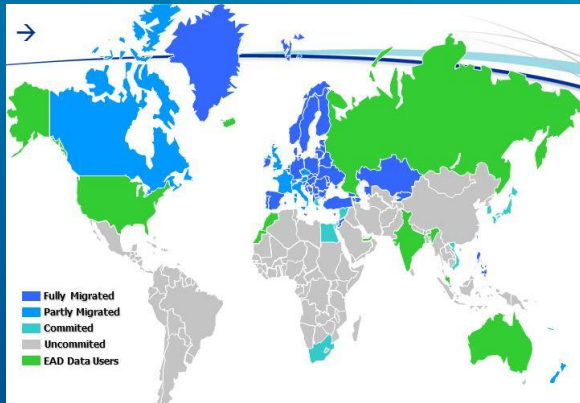


Performance Capacity is of paramount Importance!

# Data Growth – AIM Hub Systems - EAD

## smartAIM

Suite of AIM Solutions and Modules. Scalable up to international Data Hubs. Example: EAD/Eurocontrol



**Synchronous Data Management of numerous ANSPs  
for 240 User Organizations, Data Depth of 12 Years**

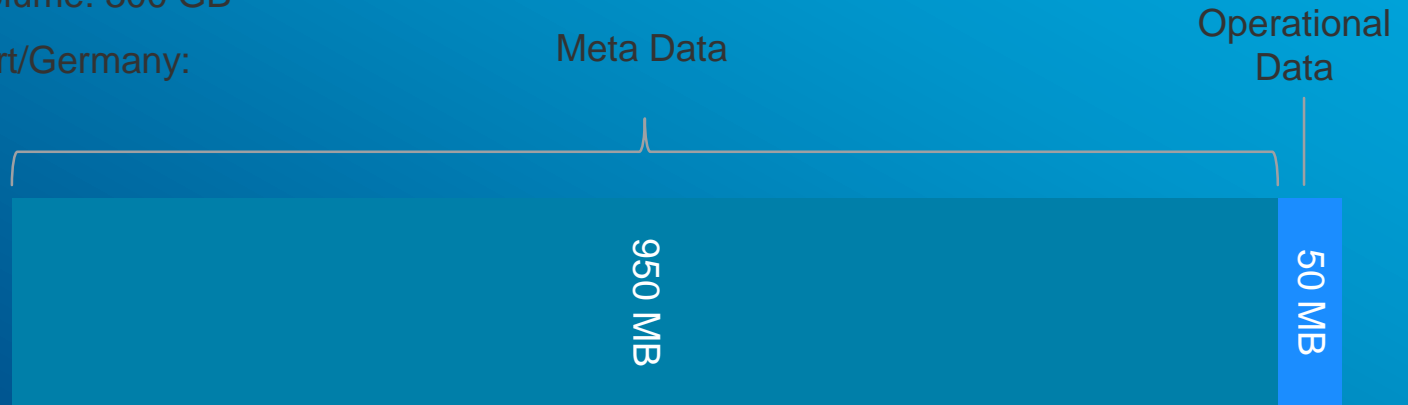
# Data Growth - Reg 73/2010 (ADQ)

## smartADQ

ADQ system for data origination and AIXM5.1 data conversion. Currently deployed for German airports.

Current EAD data volume: 300 GB

Airport data Frankfurt/Germany:

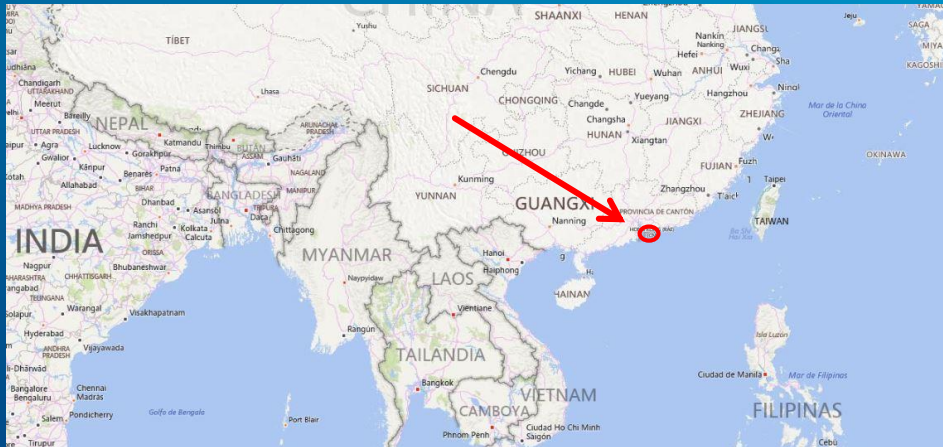


**60.000 Features, increase in data volume by factor 20**

# Data Growth – Obstacle and Terrain Data

**smartETOD**

Solution for comprehensive Management of Terrain and Obstacle Data. Example: Hong Kong



**Hong Kong, 1.104 km<sup>2</sup> - 2.000 GB LIDAR data**



Performance Capacity is of  
paramount Importance!  
smartAIM addresses that

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# References – AIM solutions

## North America

 **AFOD, USA**

## South America

 **CORPAC, Peru**

## Europe

-  **BMLV, Austria**
-  **FEDCAD, Bosnia & Herzegovina**
-  **EANS, Estonia**
-  **AFOD, Germany**
-  **CAA, Macedonia**
-  **LVNL, Netherlands**
-  **Polish Armed Forces, Poland**
-  **SMATSA, Serbia & Montenegro**
-  **LFV, Sweden**
-  **Skyguide, Switzerland**
-  **NATS, UK**

## Middle East

-  **DGCA, Kuwait**
-  **DGMAN, Oman**
-  **QCAA, Qatar**
-  **GCAA, UAE**

## Africa

-  **ENANA, Angola**
-  **NANSC, Egypt**
-  **CAA, Libya**
-  **DCA, Malawi**
-  **ONDA, Morocco**
-  **NAMA, Nigeria**
-  **TCAA, Tanzania**
-  **CAA, Zimbabwe**

## Asia & Oceania

-  **Airservices Australia, Australia**
-  **Airport Fiji Ltd., Fiji**
-  **Sakaeronavigatsia, Georgia**
-  **HKCAD, Hong Kong**
-  **Sekolah Tinggi Penerbangan, Indonesia**
-  **CAA, Macao**
-  **CAAN, Nepal**
-  **CAA, Pakistan**
-  **PNG Air Services, Papua New Guinea**
-  **ATO, Philippines**
-  **CAAS, Singapore**
-  **VATM/VNAIC, Vietnam**

# COMSOFT's Modular AIM Solution



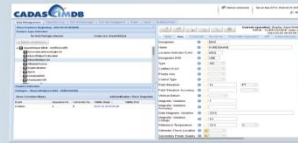
**Briefing**



**NOTAM Office**



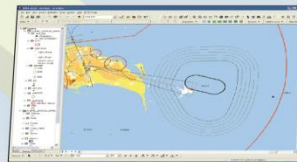
**Flight Planning**



**Central AIM Database**



**Electronic AIP**



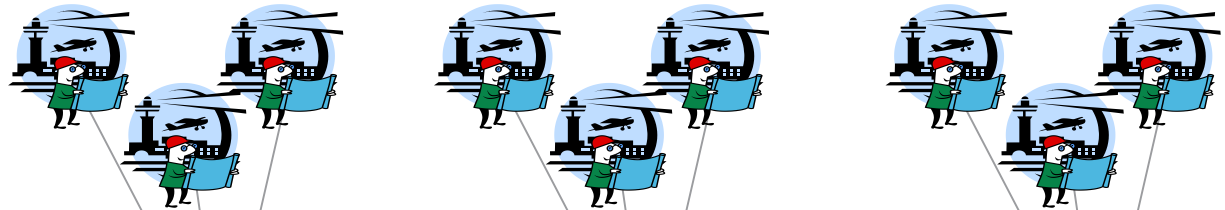
**Procedure Design**



**Aeronautical Charting**

# AIM Data Chain – Overview

**Airport**



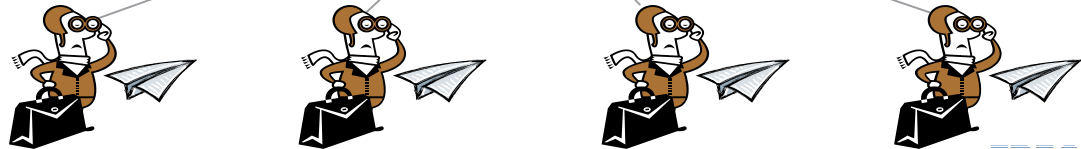
**ANSP/AIS Office**



**AIM Hub**



**Airspace Users**



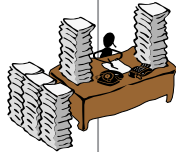
# AIM Data Chain – Product Mapping COMSOFT Solutions

## Airport



- Airport System (FRQ)
- Measuring Equipment

## ANSP/AIS Office



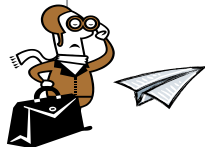
- CADAS-AIMDB (CS)
- CADAS-ATS (CS)
- CADAS-IMS (CS)
- CADAS-EPS (CS)/smartAIP (FRQ)
- smartCharting (FRQ)
- smartETOD (FRQ)
- Procedure Design (3rdParty)

## AIM Hub/Hosting



- smartAIM (FRQ)

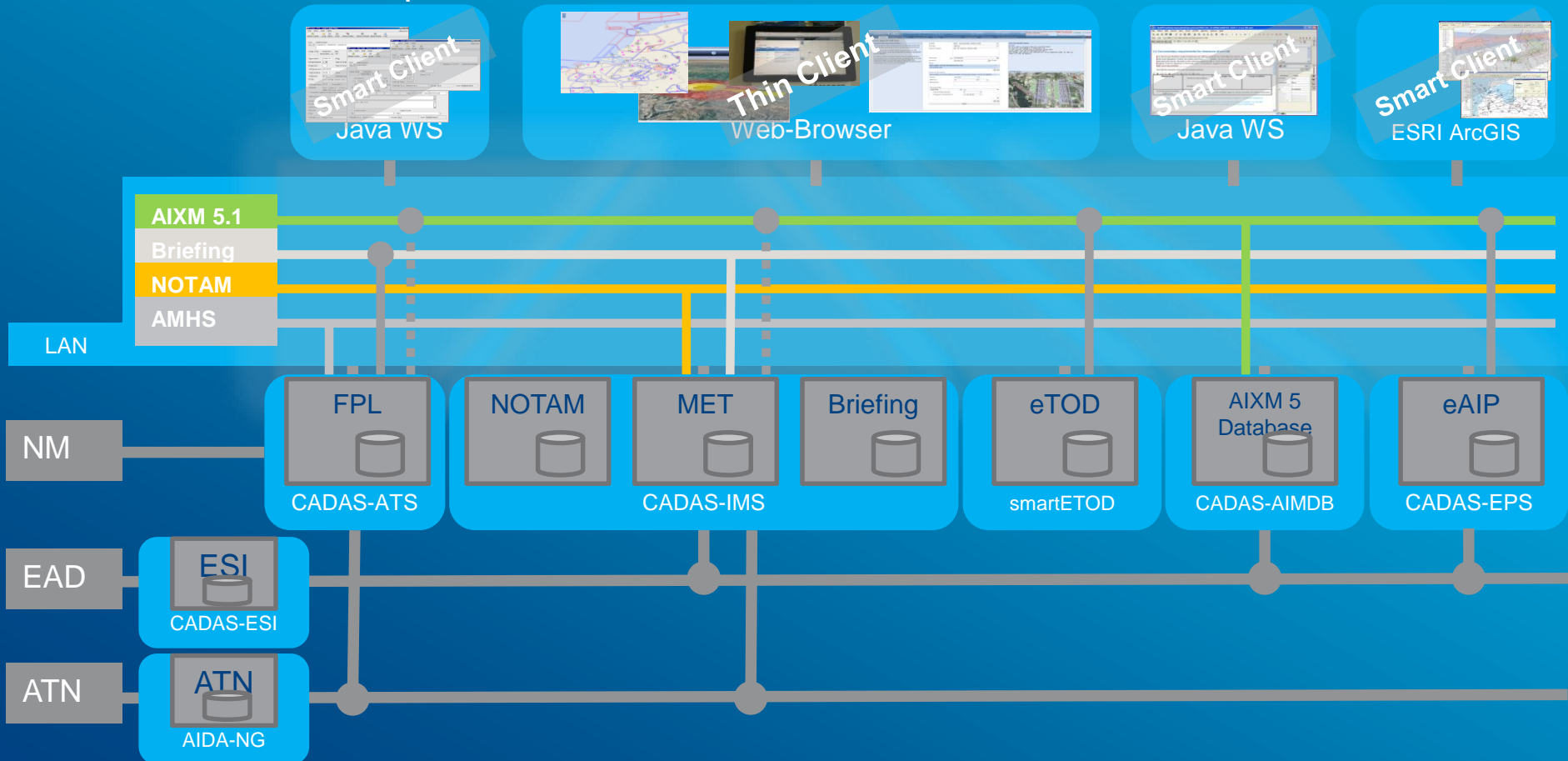
## Airspace Users



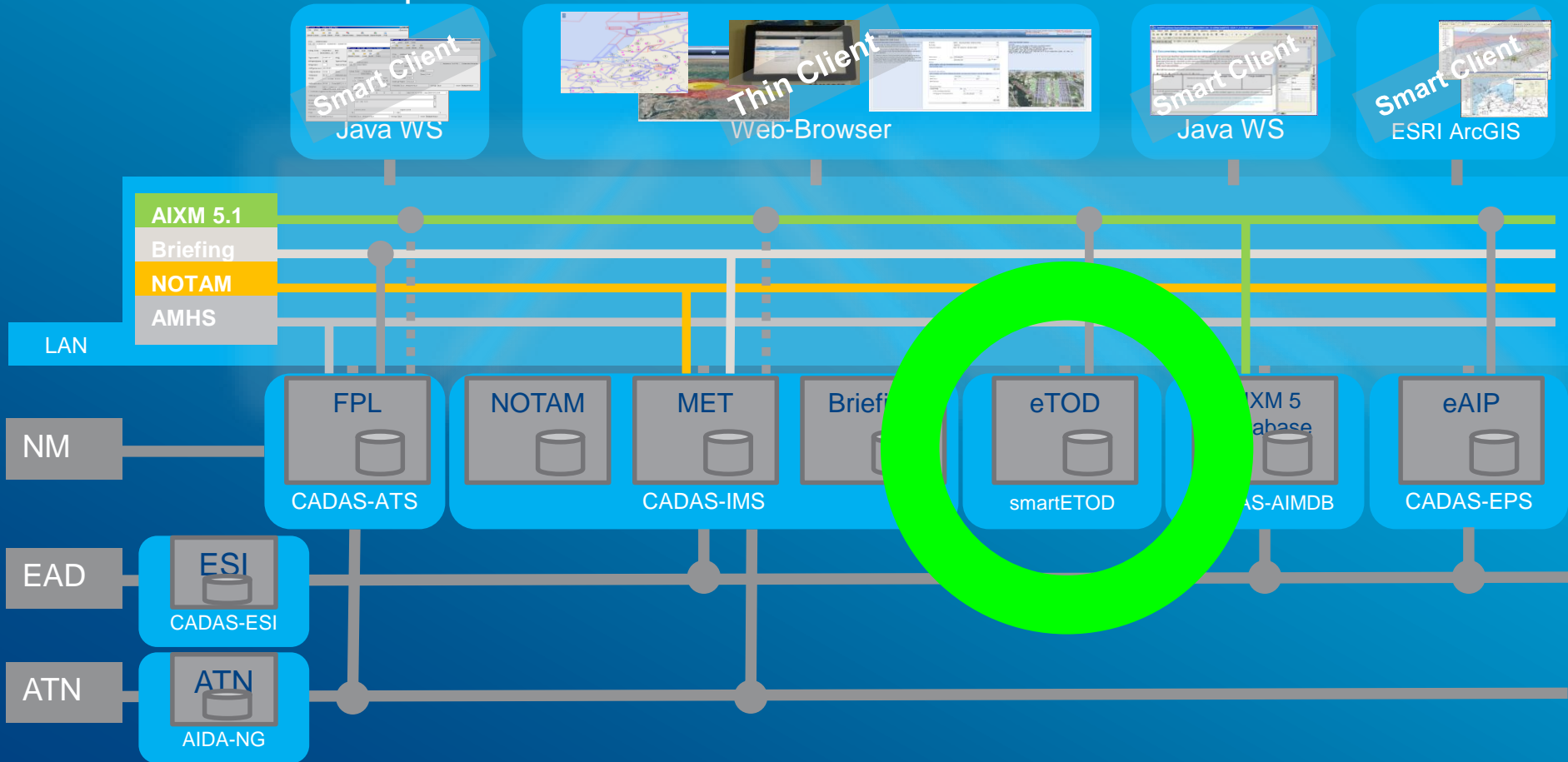
- smartAIM (FRQ)/CADAS-AIMDB (CS)

smartWFM

# SWIM/SOA Concept



# SWIM/SOA Concept





# FREQUENTIS+COMSOFT Solutions: QuickWins and Some Further Planning



Airport



digital NOTAM

Static Data

- World ATM Congress 2016: CADAS-AIMDB and smartWFM
- IFAIMA Global AIM 2016: Integrated digital NOTAM demonstration (CADAS-AIMDB and digital Briefing)
- Integration with smartETOD
- AIXM 5.1 Interoperability
- Data Converter ARINC 424



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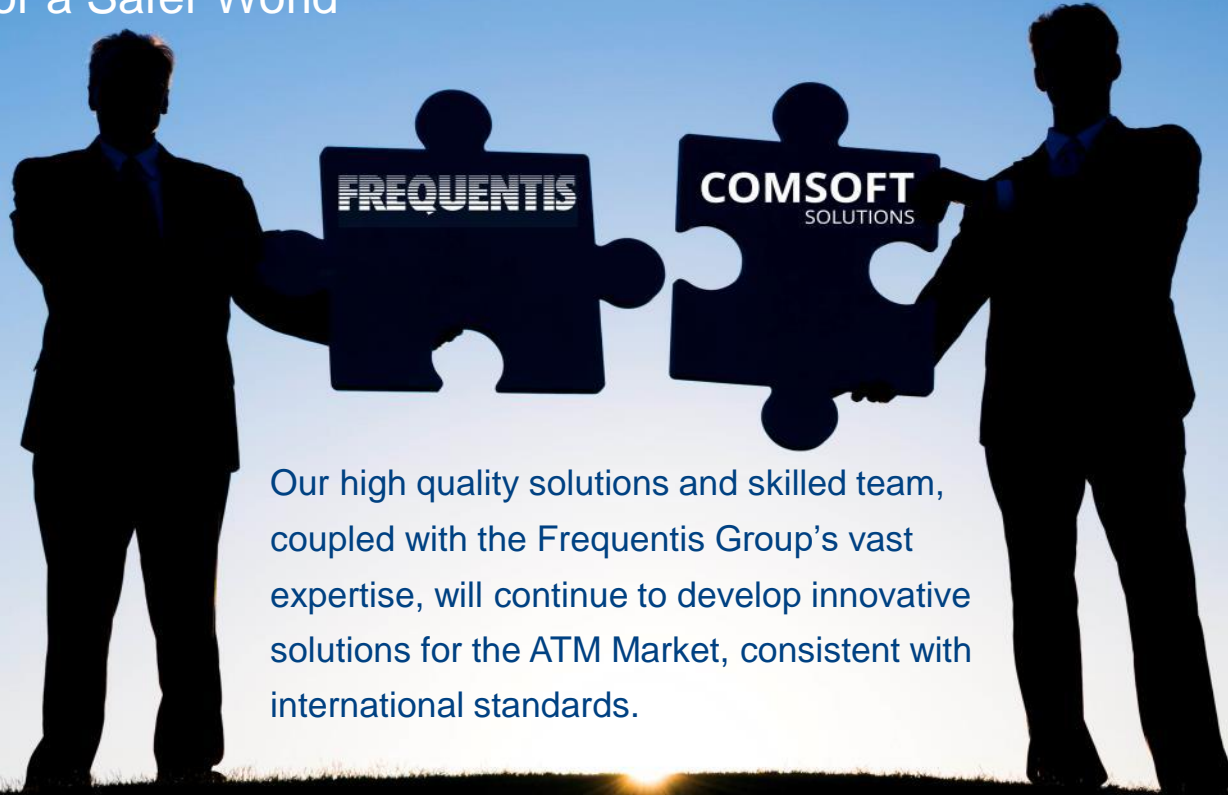
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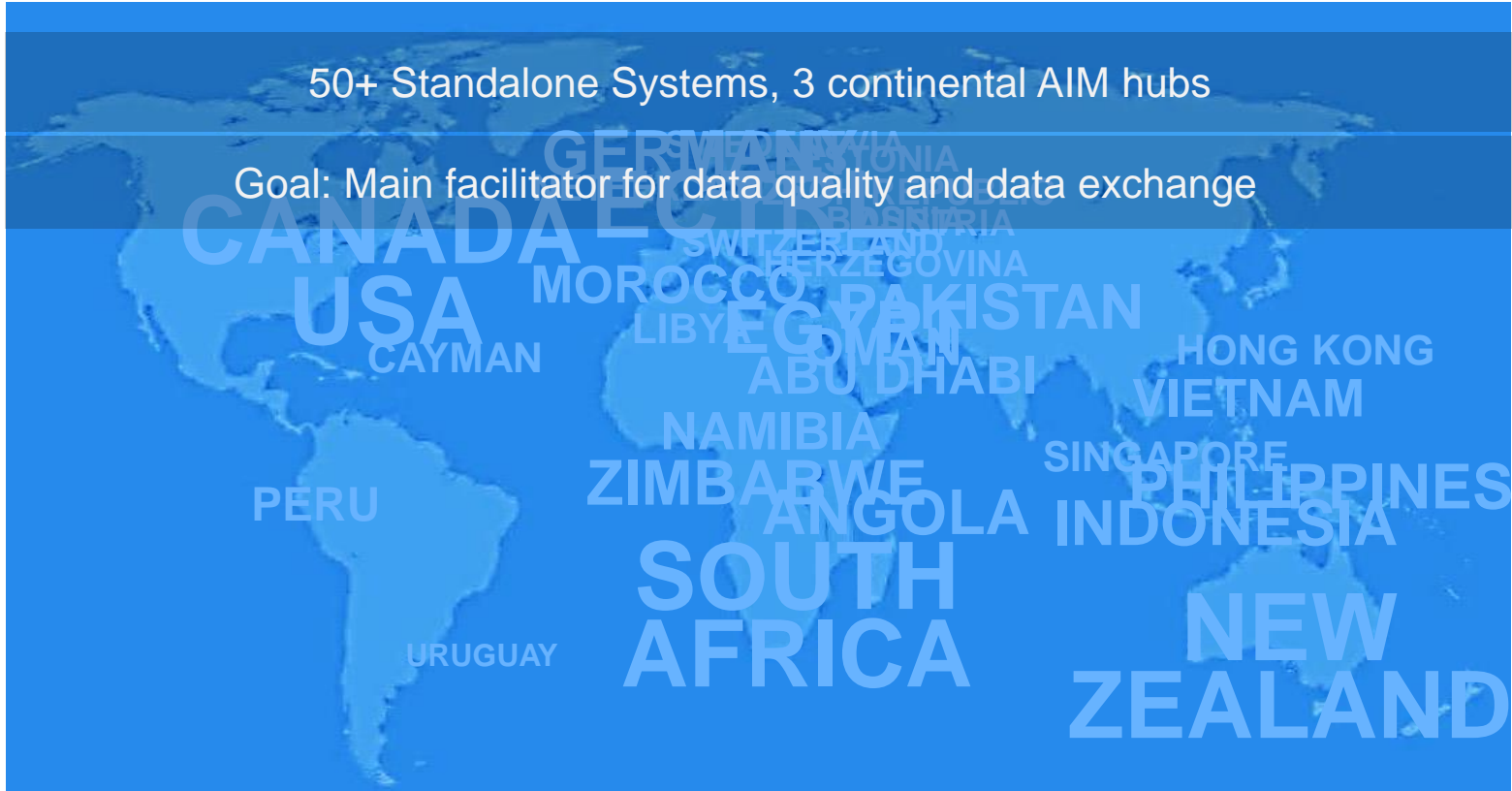
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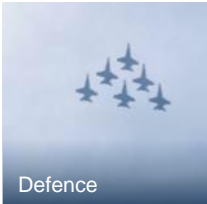
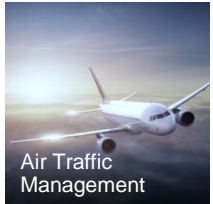
# Best of two AIM Worlds

Frequentis and Comsoft Solutions

50+ Standalone Systems, 3 continental AIM hubs

Goal: Main facilitator for data quality and data exchange





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