



## COMSOFT AFTN/AMHS Products

by Peter Cornelius, Head of Department Centre Solutions for Air Traffic Control

### Transition to AMHS – COMSOFT's Experience from multiple Installations

### COMSOFT's Advanced Message Handling Product Line

ERNAM, Dakar, May 28/29, 2013

**COMSOFT**  
is making the link

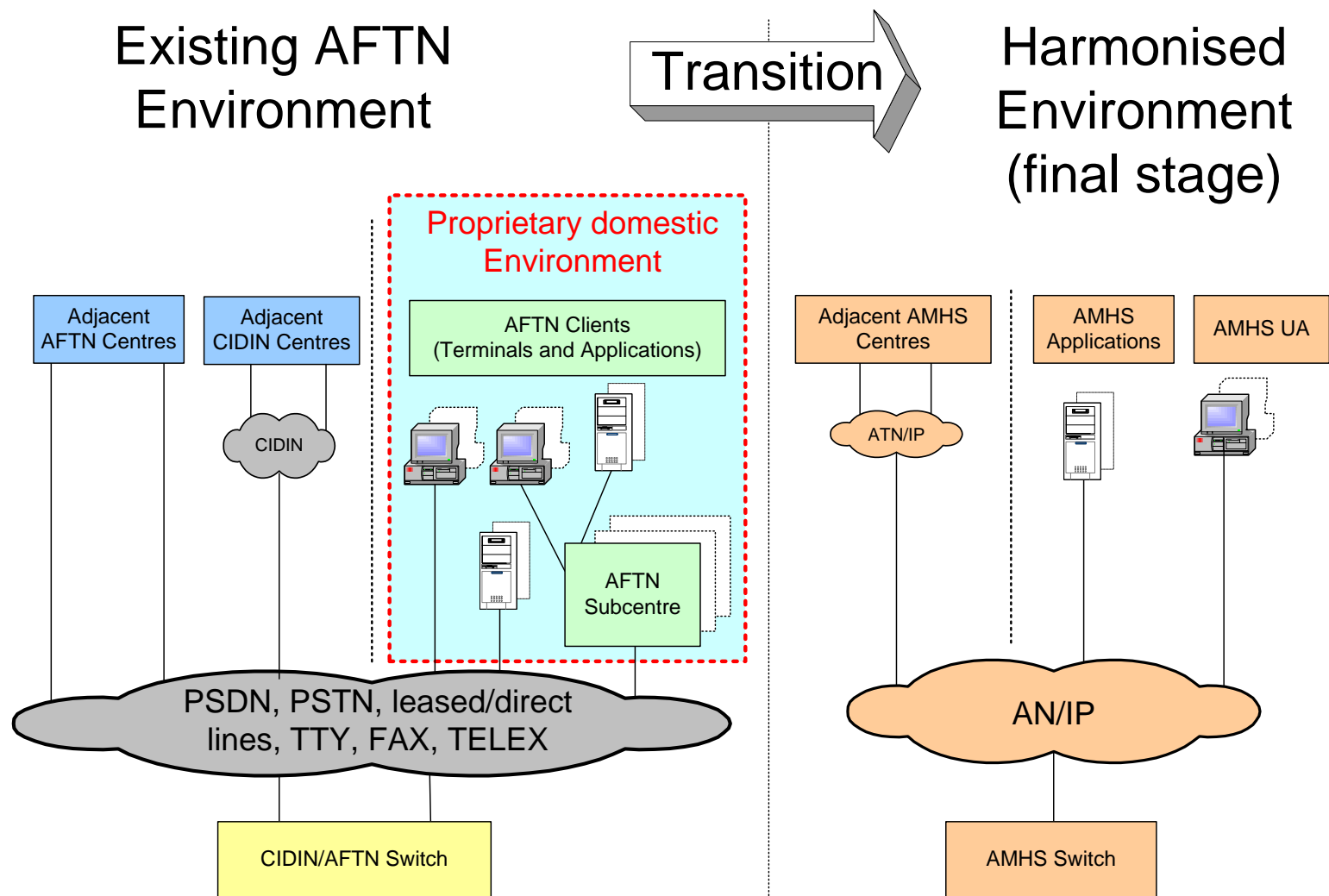
## The Transition to AMHS – A Global Issue

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- The transition to AMHS is a fundamental change in the world-wide provision of the Aeronautical Fixed Services (AFS)
- The existing AFTN COM-Centre structure and message work flows will be completely revised

This presentation summarizes the facts gained from multiple AMHS Installations

# Starting Point – Heterogeneous AFTN Environment

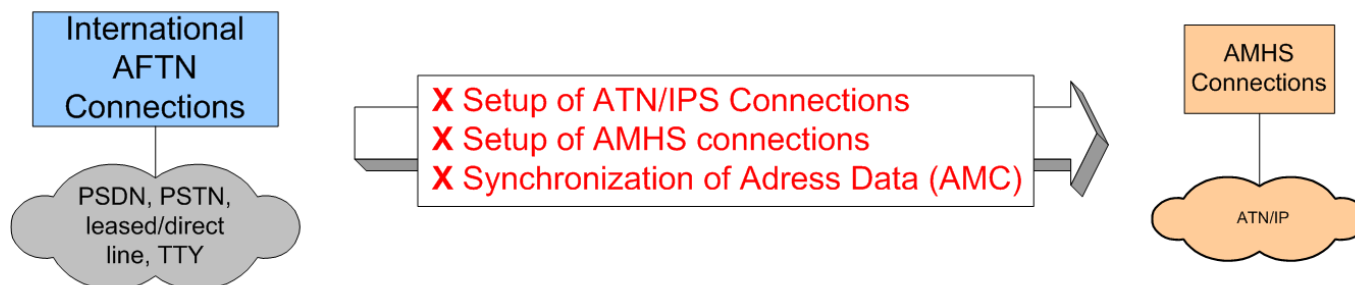


# Transition – Identification of “Crucial” Elements (X)

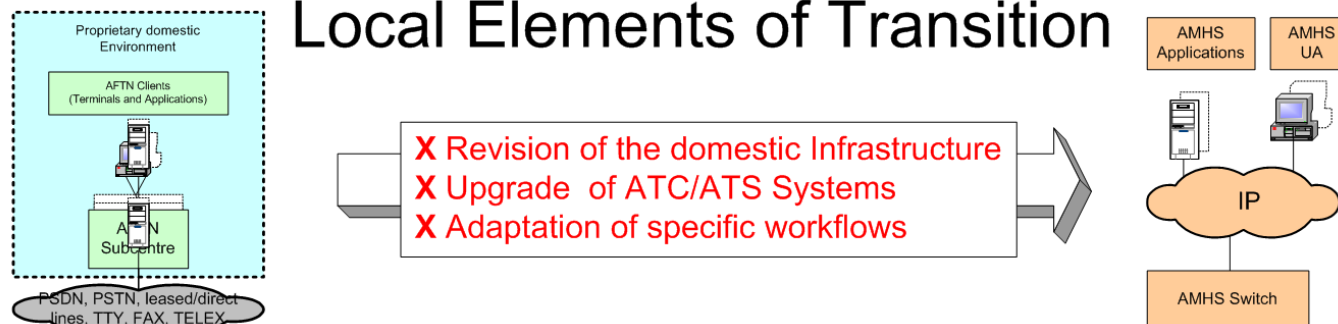
## The Initial Step



## Global Elements of Transition



## Local Elements of Transition

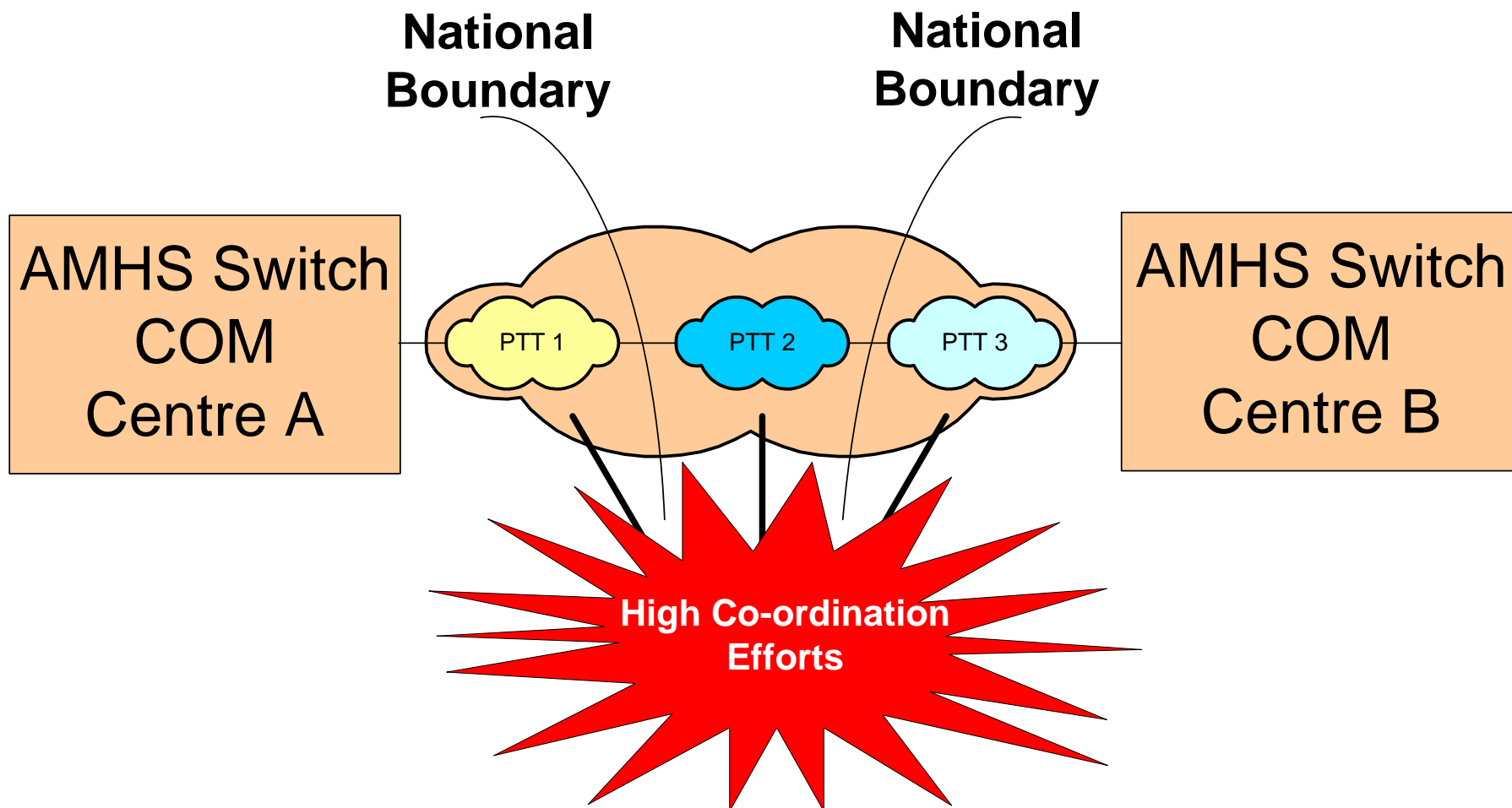




## Global Issues

# Global Issues

## Global Issue – Setup of the ATN/IPS Connection



## Global Issue – Setup of the AMHS Connection

- The setup of an AMHS connection with an adjacent country requires a strict sequence of test activities as described in the

### **ICAO EUR AMHS Manual**

1. Appendix D – AMHS Conformance Tests
2. Appendix E – AMHS Interoperability Tests
3. Appendix F – AMHS Pre-operational Tests

## Global Issue – Setup of the AMHS Connection

- AMHS systems who do not provide the AMHS conformity certificate in accordance with **Appendix D** caused during AMHS Interoperability Tests (**Appendix E**) the following problems:
  - ❑ Incompatibilities with basic AMHS Protocol Elements
  - ❑ Incompatibilities of AFTN  $\leftrightarrow$  AMHS conversion procedures
  - ❑ Non-conformant behaviour in error situations

## Global Issue – Synchronization with AMC

- ICAO requested 2009 all ANSPs per state letter to register at the AMC and to regularly update their own AMHS address database from the global AMC AMHS address database (AIRAC Procedure)
- AMHS systems working with outdated AMHS address databases caused
  - ❑ AFTN and AMHS routing problems/errors
  - ❑ AFTN/AMHS conversion errors

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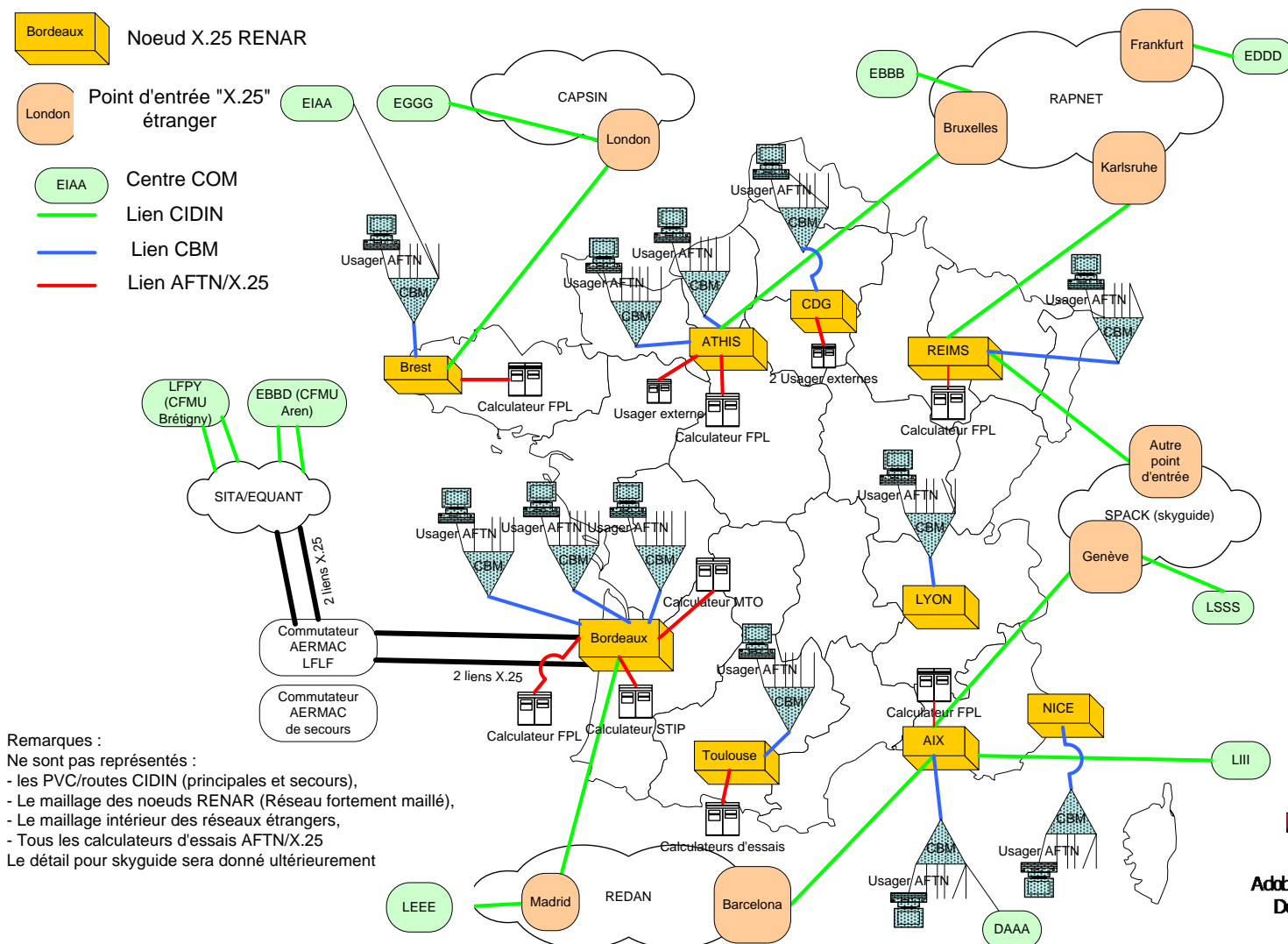
## Local Issues

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# Local Issues

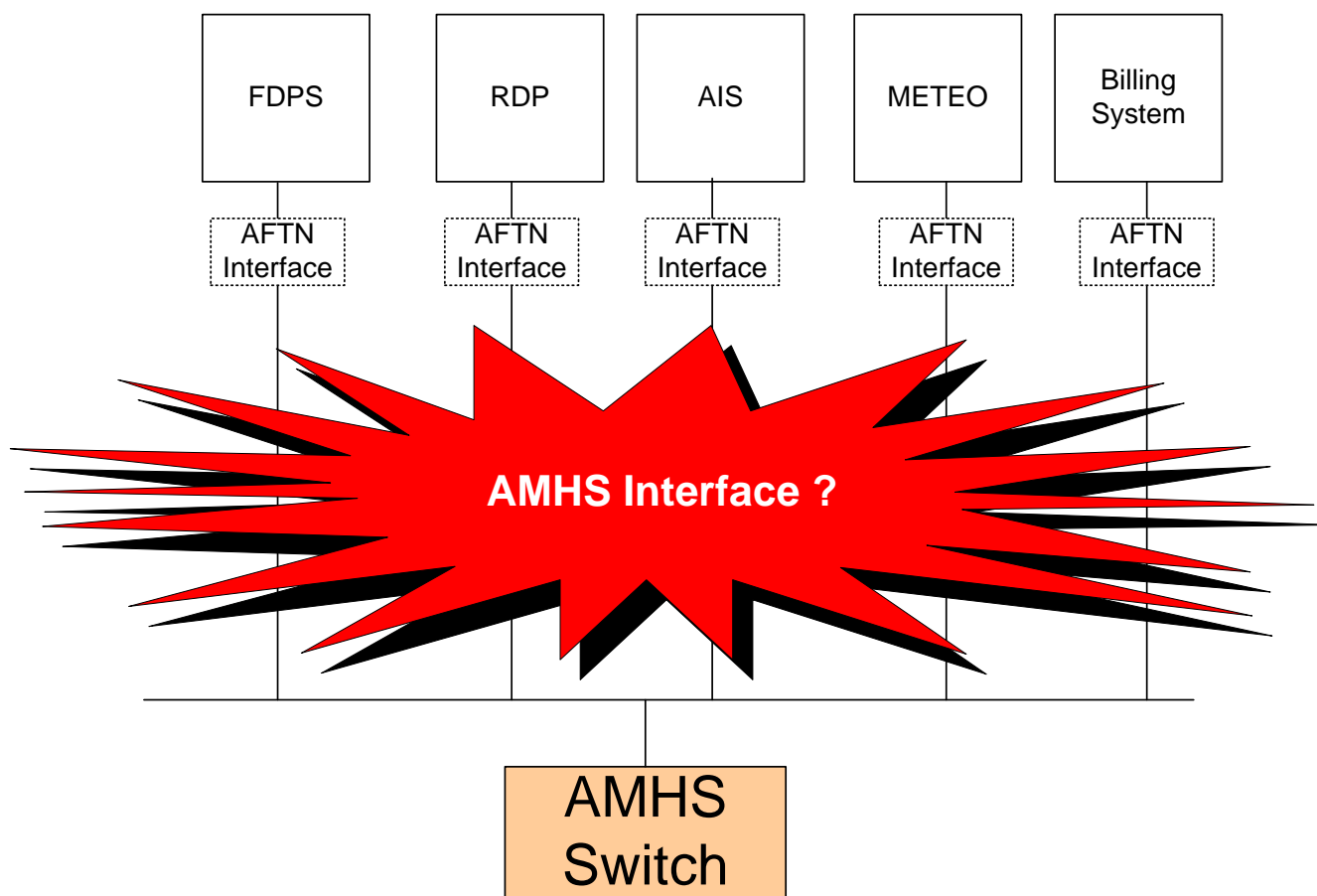


# Local Issue – Example of a complex domestic Infrastructure

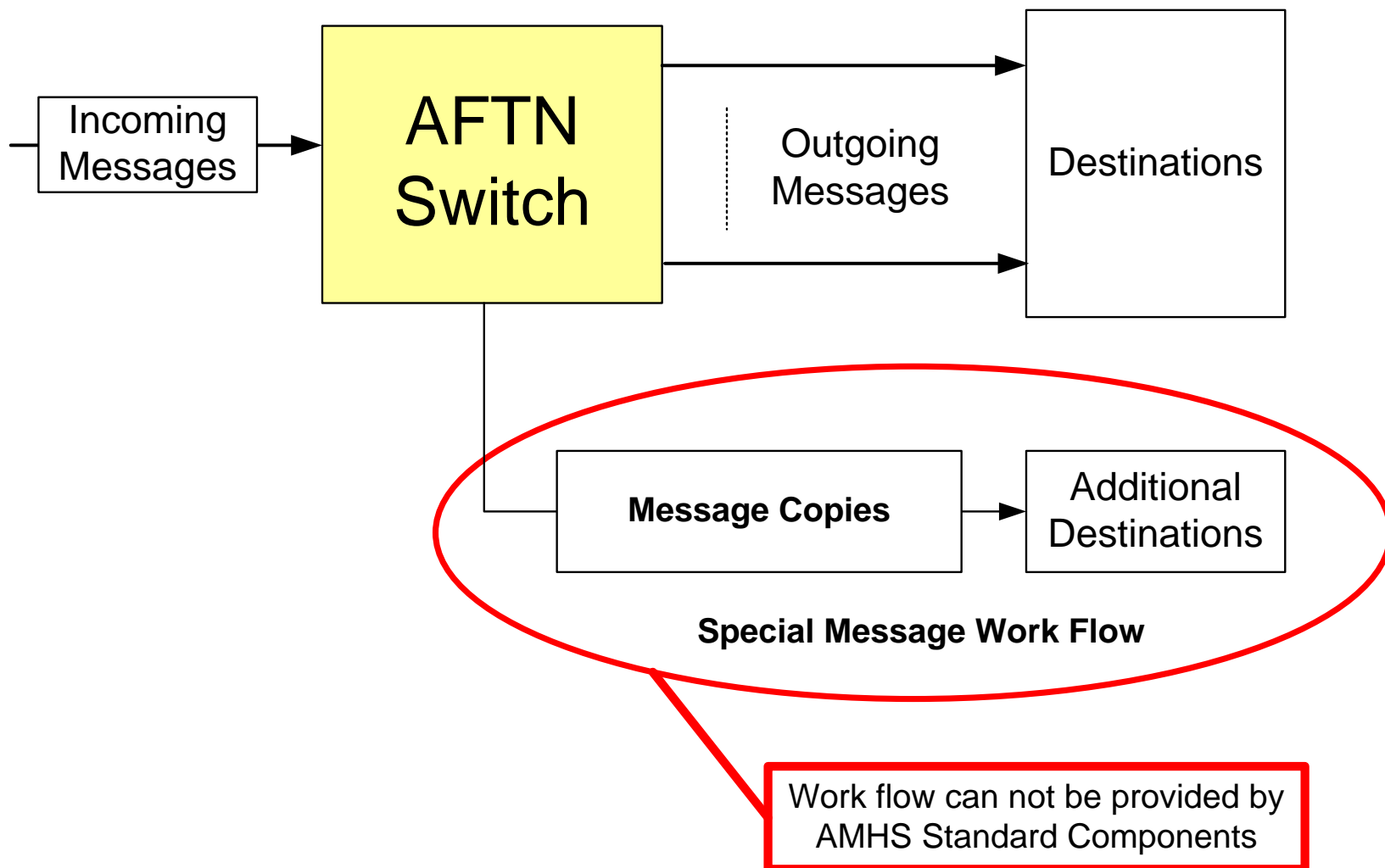


## Local Issue – Upgrade of existing ATC Systems

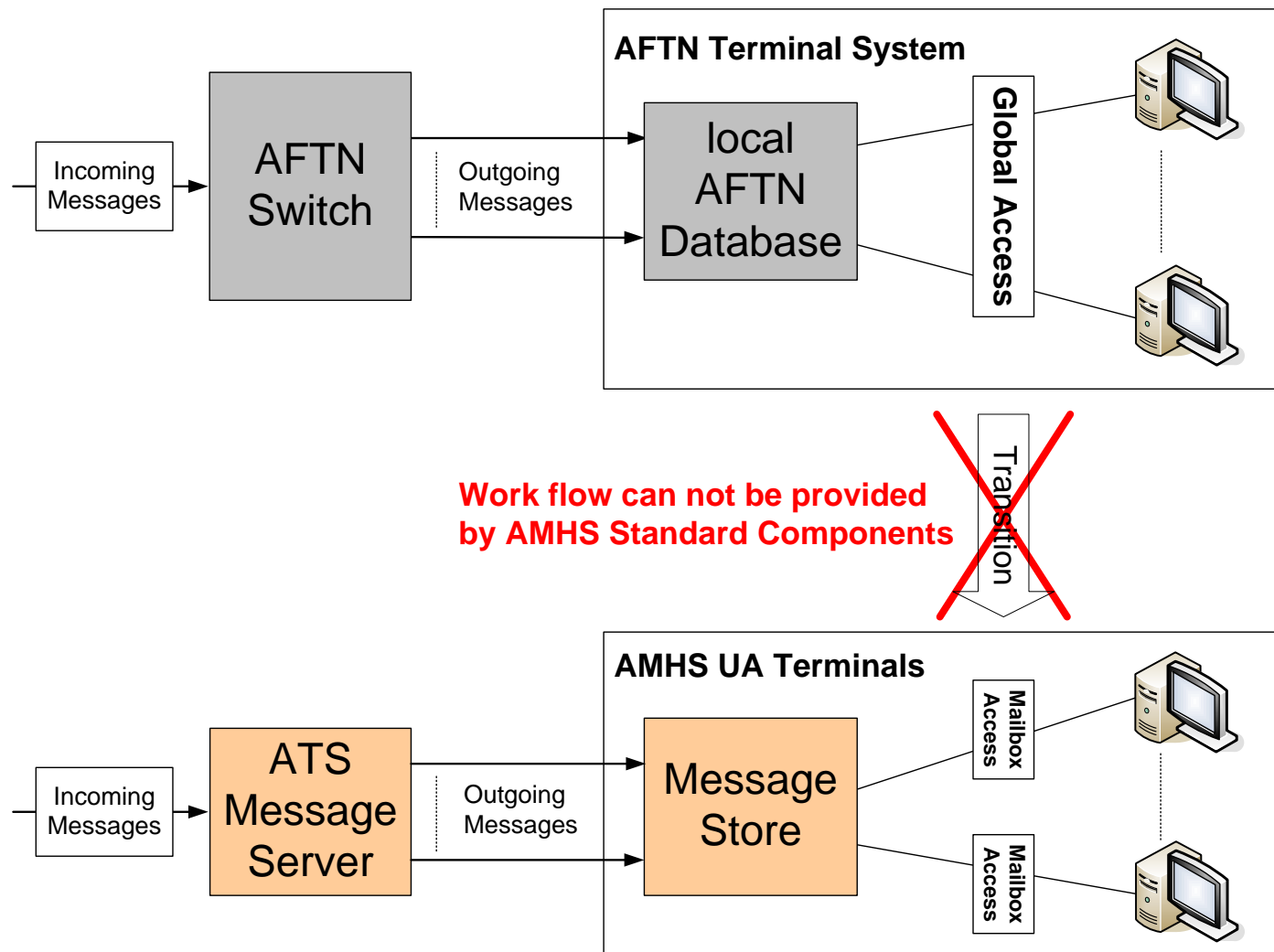
### ATC Systems



## Local Issue – Special Domestic Message Workflow



## Example 2 – Special Domestic Message Workflow



## Result

**Existing AFTN  
environments cannot be  
replaced by AMHS  
“in one shot”**

## AMHS Transition Strategy – Mixed Operation of AFTN and AMHS



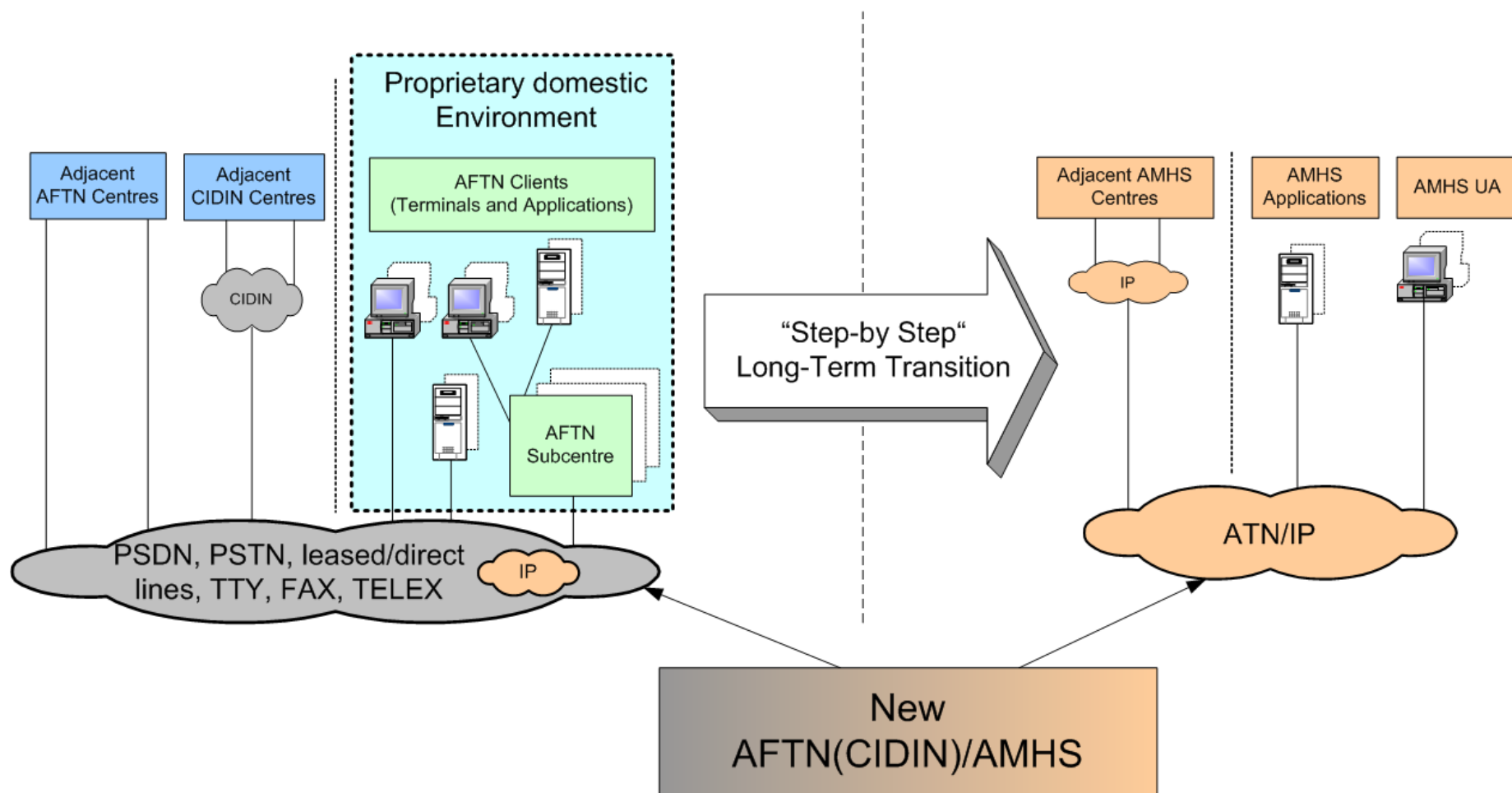
## AMHS Transition Strategy – How ANSPs proceed

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1. Installation of an AFTN/AMHS switch and operation in the **current AFTN environment**
2. Upgrade of the international/domestic communication infrastructure
3. Start of the “step-by-step” AMHS transition process



# AMHS Transition Strategy – “Step by Step”



Support by COMSOFT

# COMSOFT AMHS Transition Support

## AMHS Transition - COMSOFT's Support

- ✓ COMSOFT provides **as the only supplier on the market** an integrated AFTN/AMHS product suited at best for the mixed operation of AFTN and AMHS
- ✓ COMSOFT provides highest expertise in deploying AMHS systems; COMSOFT AFTN/AMHS customers operate **90%** of all worldwide operational international AMHS connections
- ✓ COMSOFT provides the AMHS/SOAP interface in order to facilitate the upgrade of existing customer end systems to AMHS
- ✓ COMSOFT owns a source code license of the X.400 Software (ISODE) and, if required, is able to implement specific workflows

## COMSOFT's Advanced Message Handling Product Line

# COMSOFT's AMHS Solution

## AIDA-NG – AFTN/CIDIN/AMHS Product

### **COMOSFT provides two products for AFTN/AMHS**

- **AIDA-NG**  
**Integrated AFTN/CIDIN/AMHS Switch**
- **CADAS**  
**Client-Server-based terminal system for the ATS end user**

**Both Products are native COMSOFT key-products, which have proven their high flexibility by being deployed in most different ATC environments**

# AIDA-NG – AFTN/CIDIN/AMHS Product

## AIDA-NG

**A**eronautical **I**ntegrated **D**ata Exchange **A**gent - **N**ext **G**eneration

**COMSOFT key product since more than 20 years**

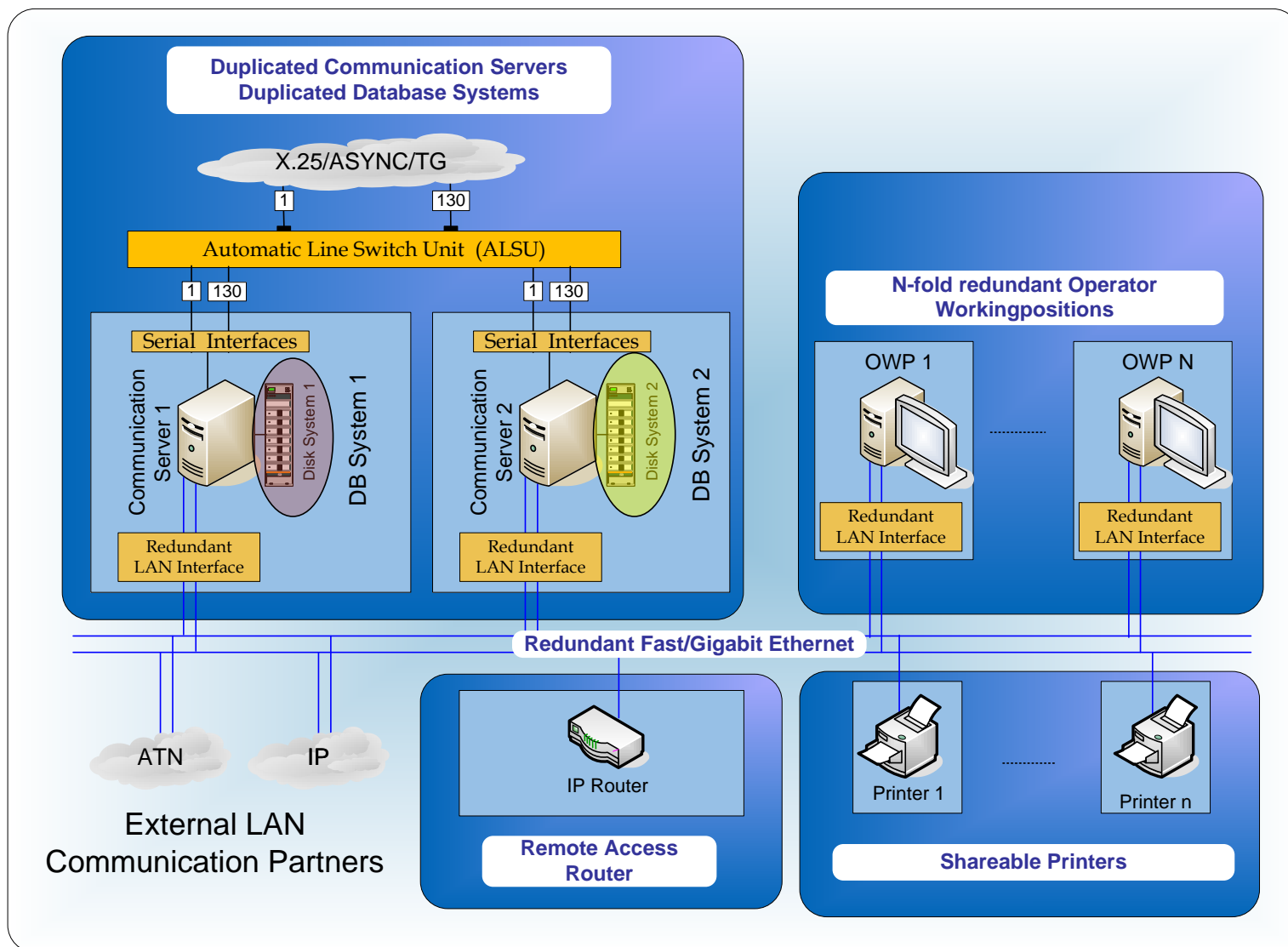
**Only MHS on the market providing a common  
messaging framework for all types of  
aeronautical data**

**(AFTN, CIDIN, AMHS, SITA, WMO, AIDC, OLDI....)**



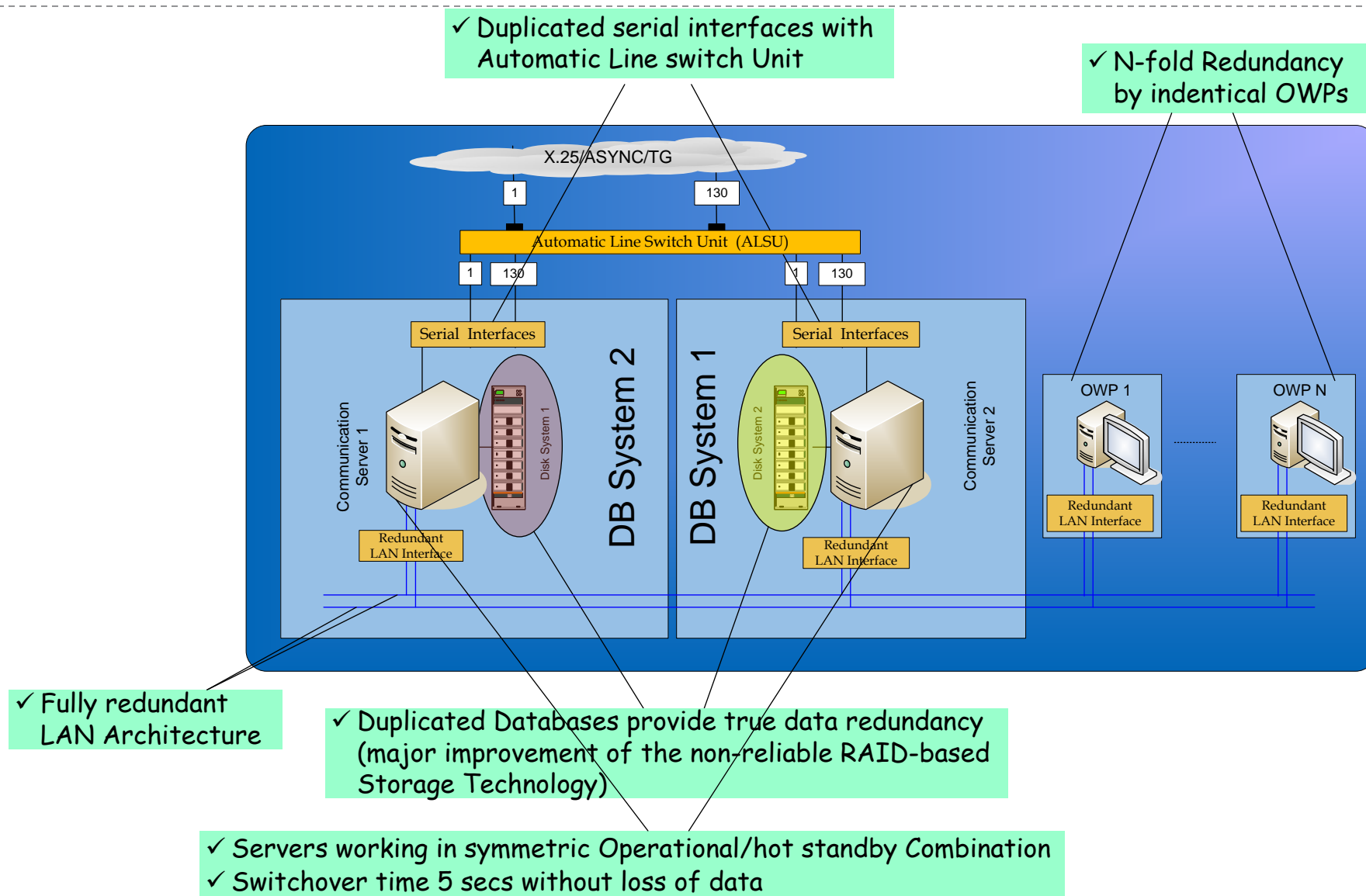
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# AIDA-NG – Fully Redundant System Architecture

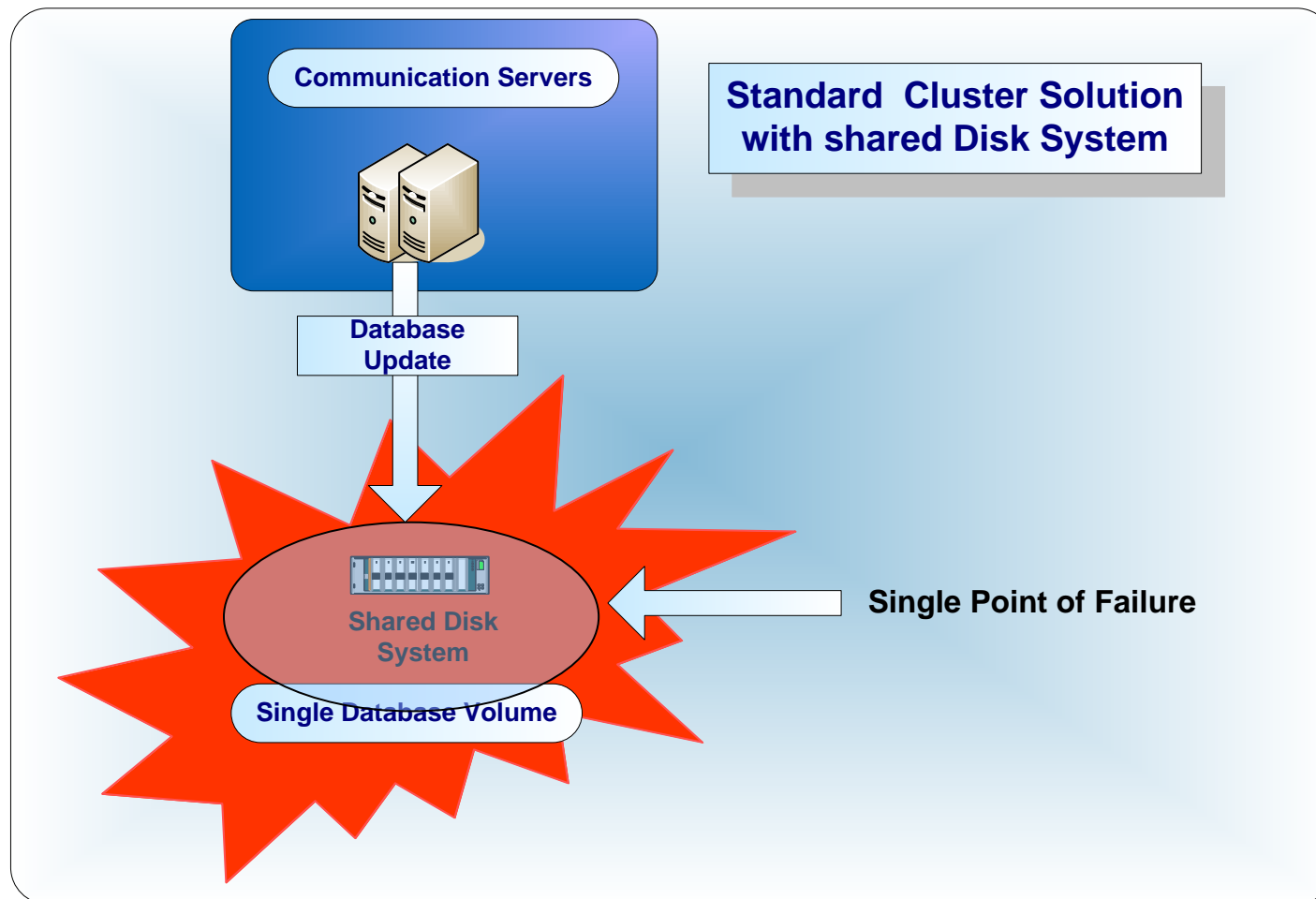




# AIDA-NG – Redundant in all Components



# AIDA-NG - What we avoid – Shared Storage Devices



Conventional Cluster Solutions typically use "shared" components, e.g. **Application Software**, **Data Volumes**, and **Storage Devices**.

## AIDA-NG – Integrated ATSMHS

AIDA-NG is powered by ECG Core Software  
(ECG = European Communications Gateway)

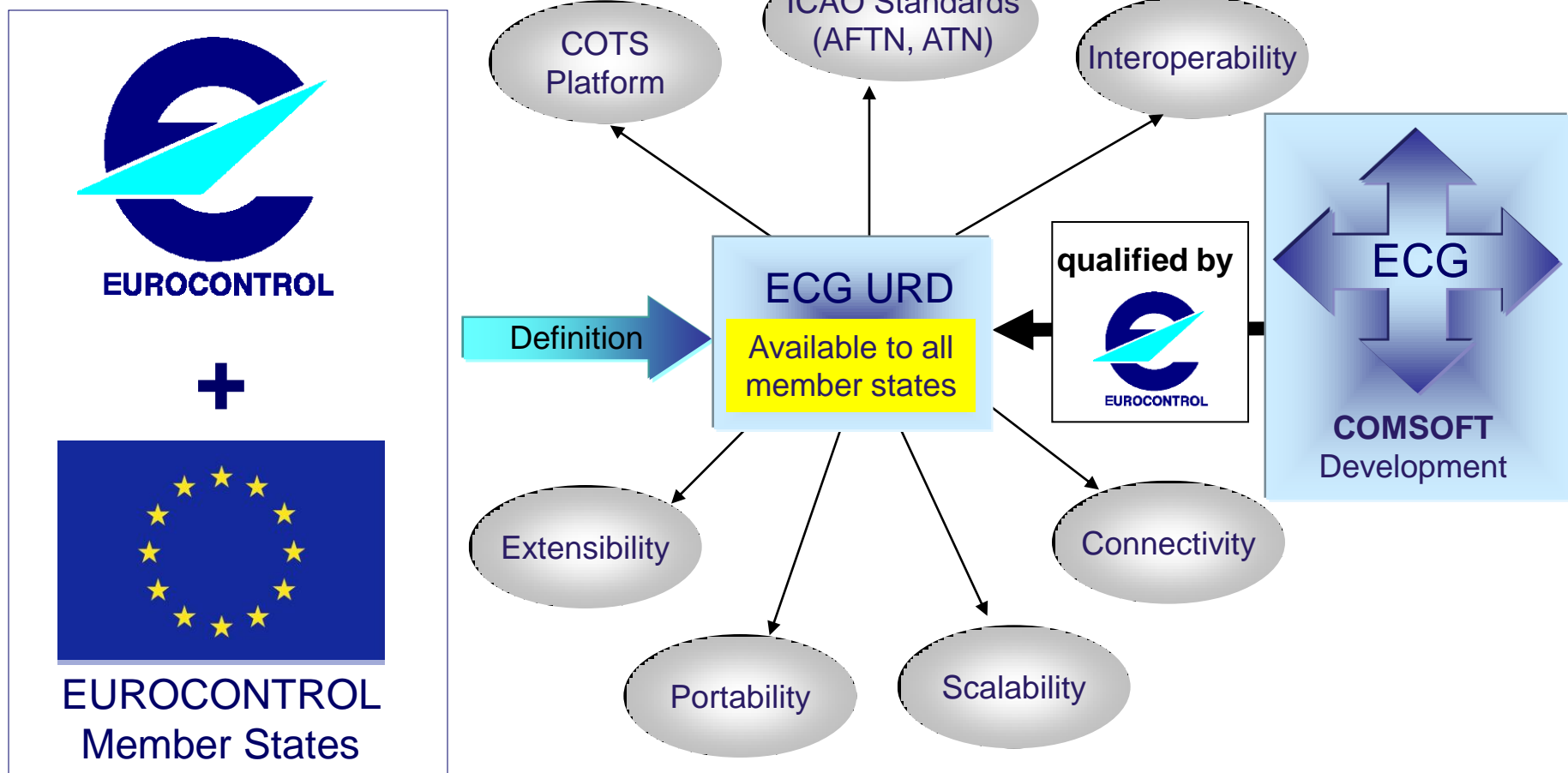


EUROCONTROL  
Member States

The ECG Core SW is the basis for the universal ground-ground communication service of the European ANSPs

**COMSOFT is official ECG supplier to EUROCONTROL**

# ECG Core Software – Realisation



URD = User Requirements Document

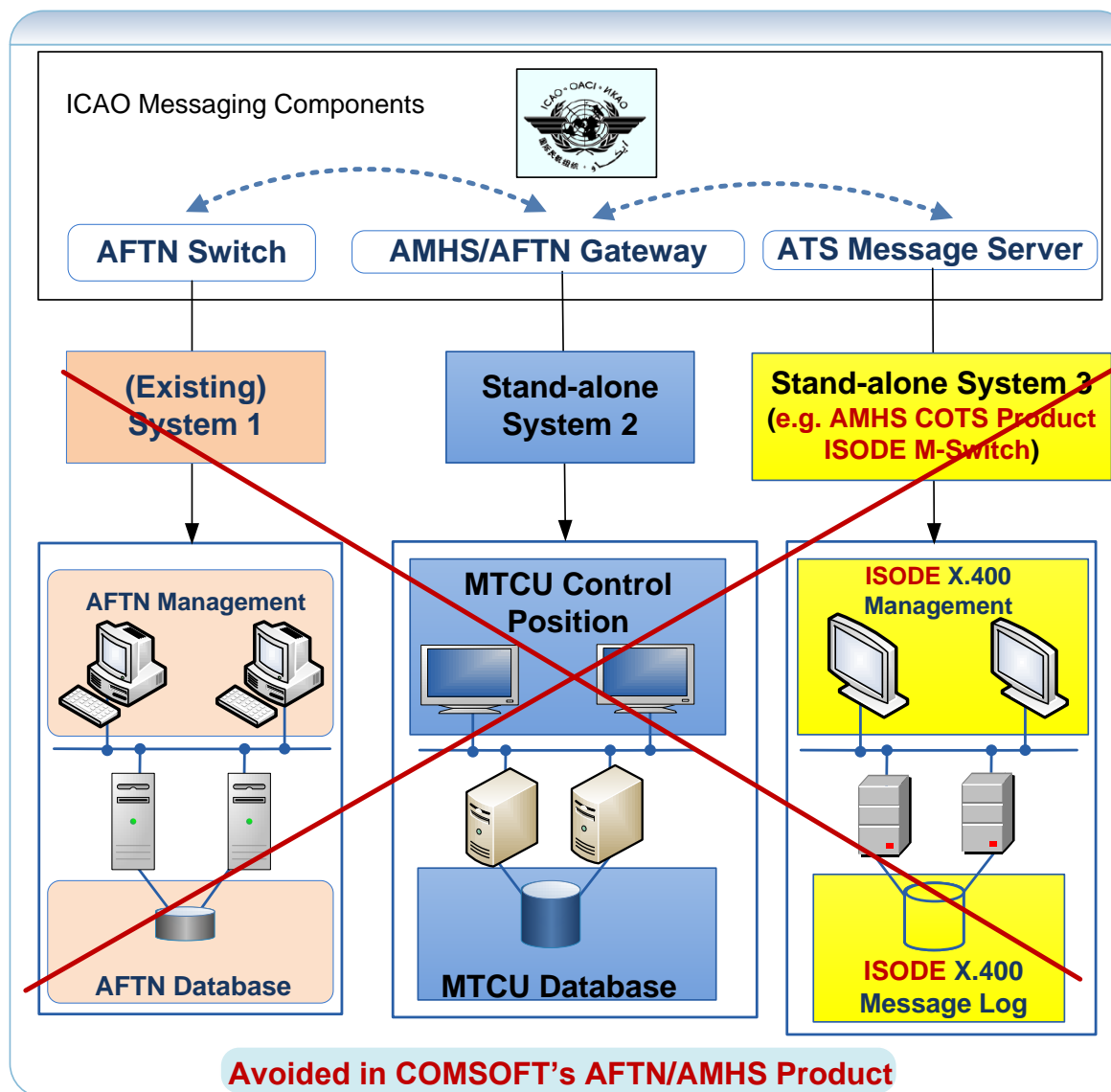
## ECG Core Software - Key Requirements

- Integrated on COTS Platform  
(standard server-based architecture)
- Universal Connectivity  
(AFTN, AMHS, SITA, WMO, OLDI, AIDC, etc.)
- Deployable in every ATS Environment  
(small(est), medium, big, obsolete, or advanced infrastructure...)
- Maximum Support of the AMHS Migration  
("online", without stopping the service)

# Long-Term Mixed Operation of AFTN and AMHS

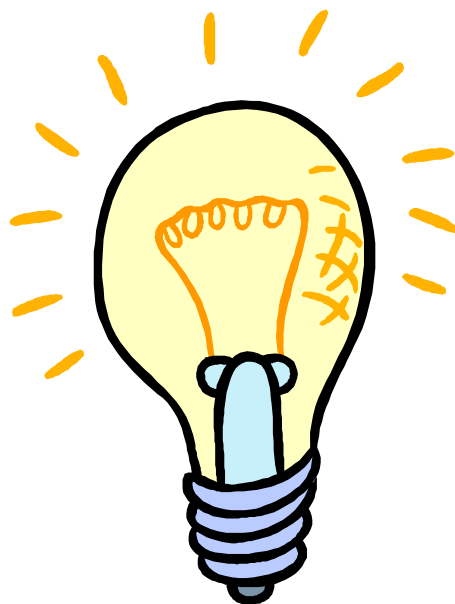


# Standard (Fragmented) Solution – Suitable ?



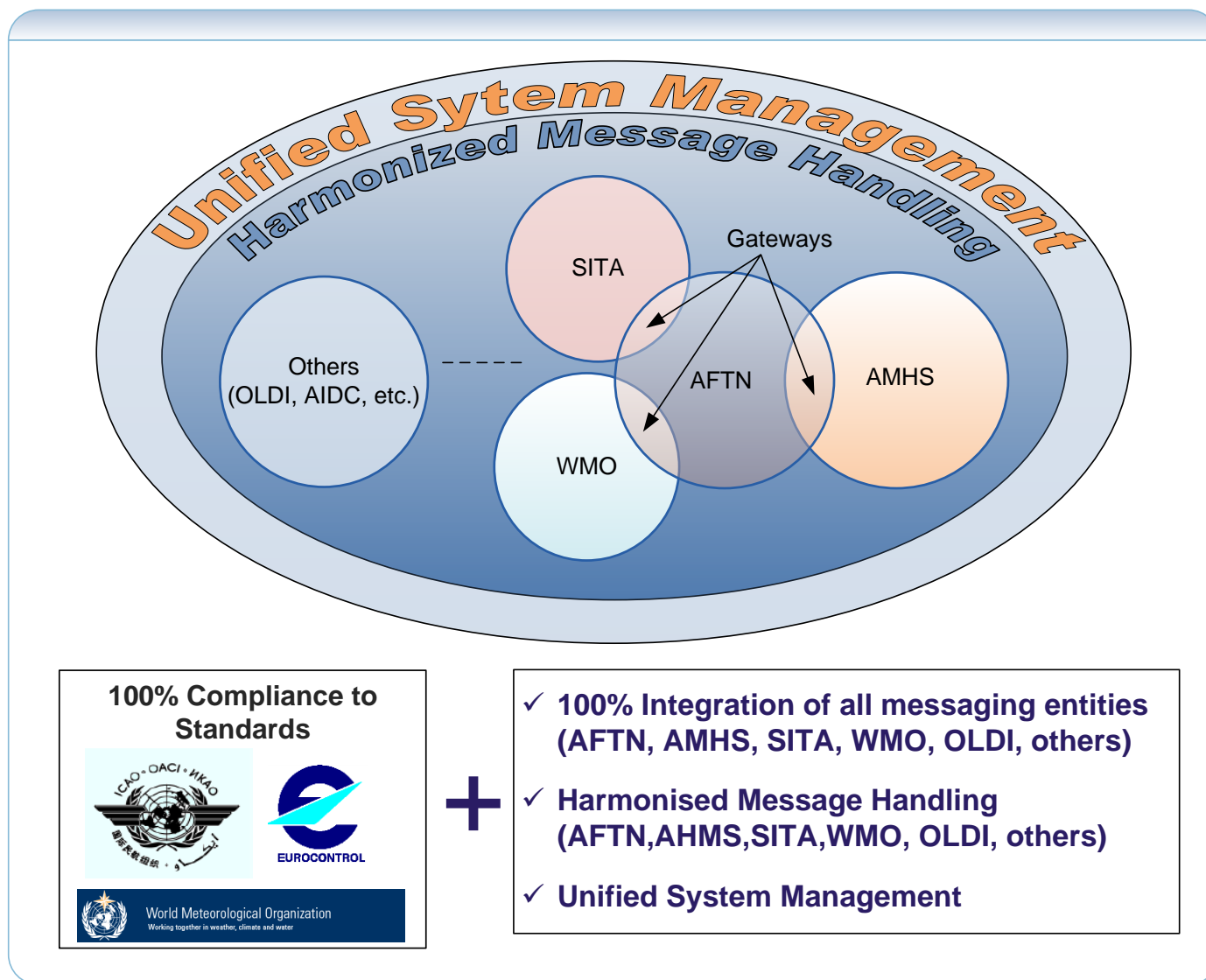


# The Solution

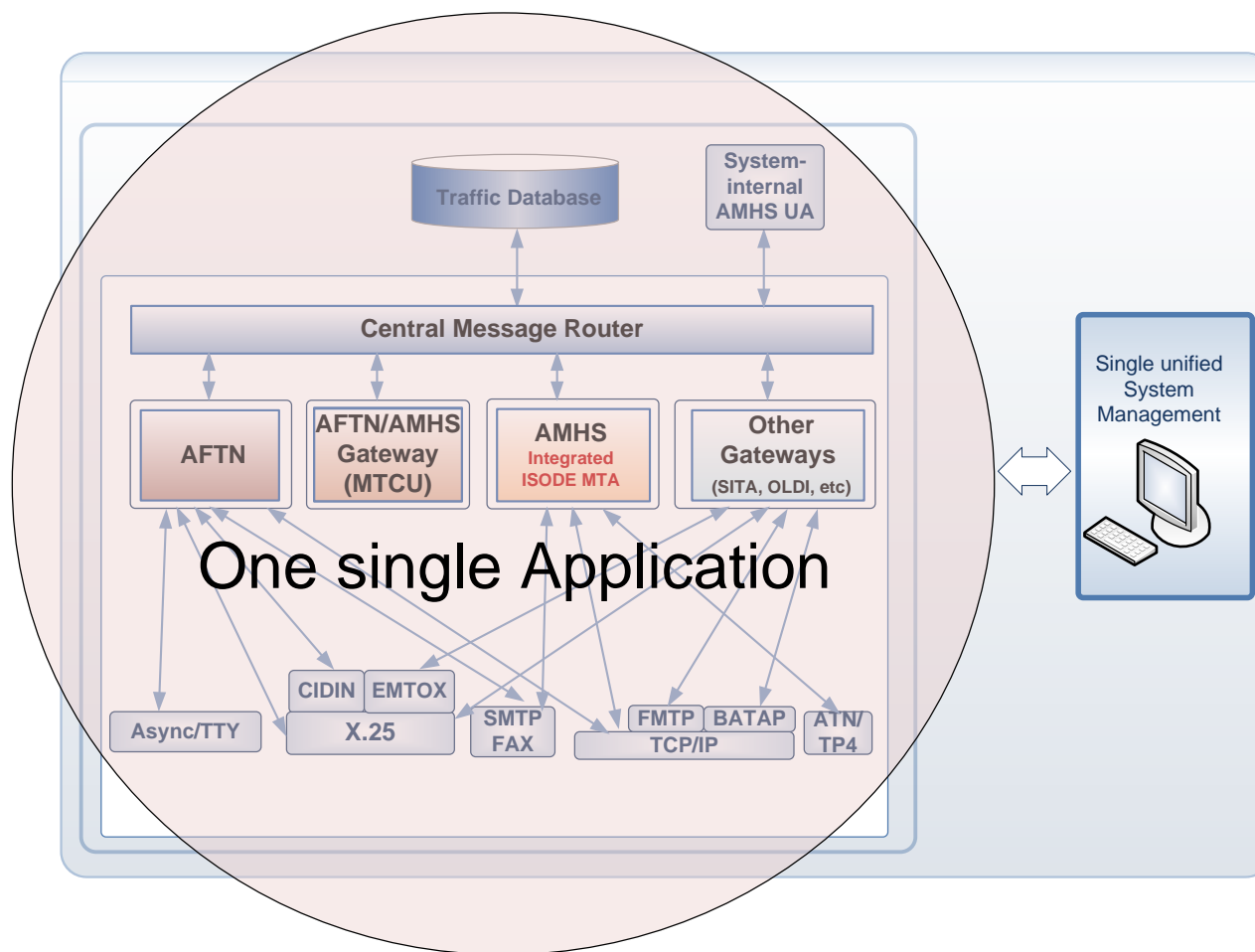


## Integrated System

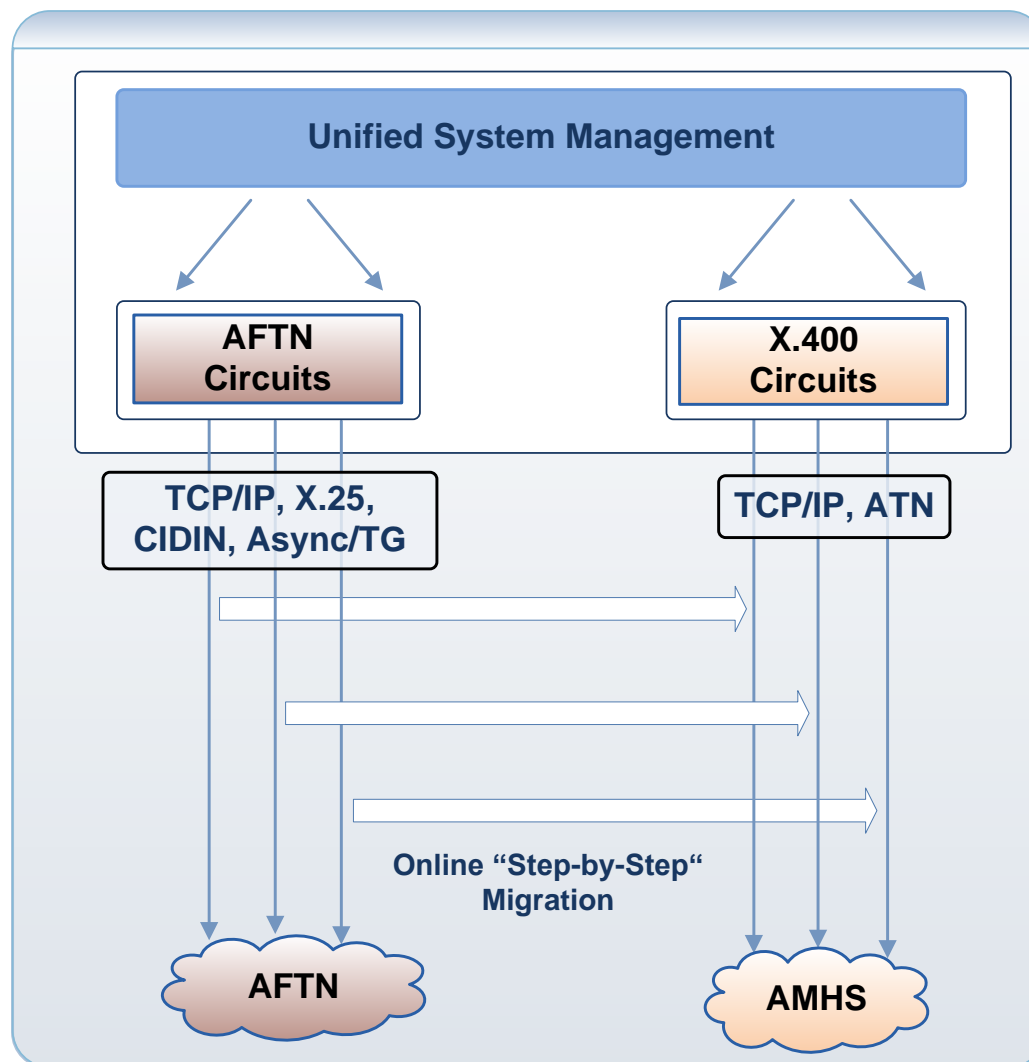
# AIDA-NG – Integrated Messaging Services



# AIDA-NG Strong Point – Horizontal/Vertical Integration

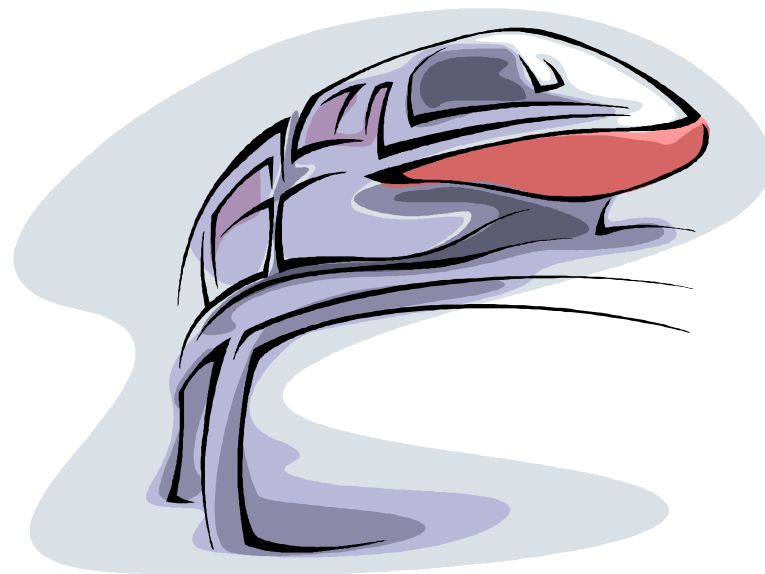


# AIDA-NG Strong Point - AFTN to AMHS Transition Support



## AIDA-NG Performance Values

- Platform
- Protocols/Messaging
- Throughput
- Reliability
- Maintainability
- Robustness
- Extended Supervision



## Server-Based Platform

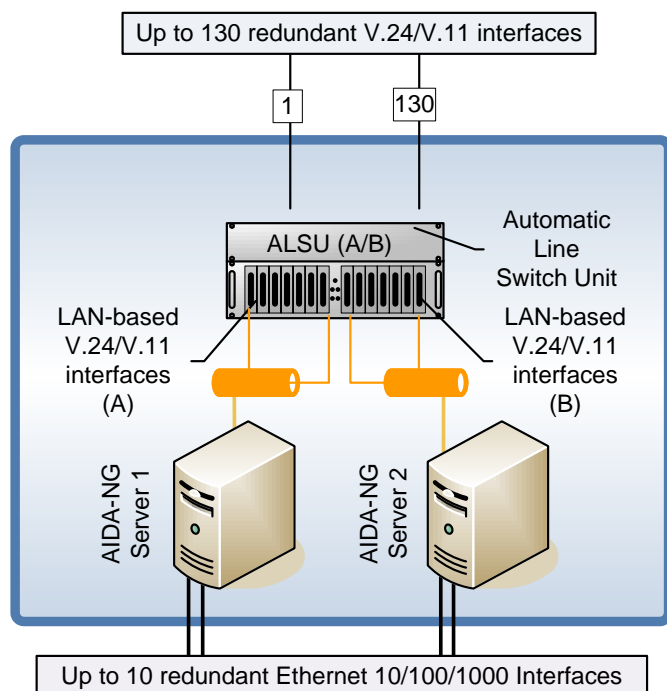
- | Integrated on Intel® processor-based servers and workstations of various vendors (IBM, HP, DELL, etc.)
- | RED HAT Linux Enterprise Distribution (Scientific Linux)
- | Fast real-time database of any capacity
- | X-Windows and Java-based GUIs



# AIDA-NG Strong Point - Interfaces and Protocol Stacks

## Messaging Interfaces supported in “one system”:

- Up to 130 serial redundant V.24/V.11 interfaces:
  - AFTN/ASync (direct, leased lines)
  - AFTN/Telegraphic Interface
  - AFTN/X.25 (PVC/SVC)
  - CIDIN/X.25 (PVC/SVC)
  - WMO/X.25 (PVC/SVC)
  - OLDI FDE ICD (X.25 SVC)
  - SITA/BATAP/EMTOX (X.25 PVC/SVC)
- Up to ten Ethernet LAN 10/100/1000 Interfaces
  - AFTN/TCP/IPv4,6 (bilateral agreement)
  - AFTN/SOAP
  - AMHS P1/ATN (via ATN Router)
  - AMHS P1,P3/TCP/IPv4,6
  - AMHS SOAP (**Service for SWIM**)
  - FMTP (TCP/IP)
  - SITA/BATAP/MATIP (TCP/IP)



# AIDA-NG Strong Point – Additional Gateways

- **AFTN/SITA Gateway**

Conversion of AFTN messages  $\leftrightarrow$  SITA messages

- **AFTN/E-mail Gateway**

Connection to E-mail Server via SMTP/POP3

Conversion of AFTN messages  $\leftrightarrow$  E-mail

- **AMHS/E-mail Gateway**

Conversion of AMHS Messages  $\leftrightarrow$  e-mail

Full support of extended services (attachments)

Generic/individual conversion configuration

- **E-mail/FAX Gateway**

Conversion of E-mail  $\leftrightarrow$  FAX (G3)

Fully applicable for the AFTN/AMHS  $\leftrightarrow$  E-mail GW

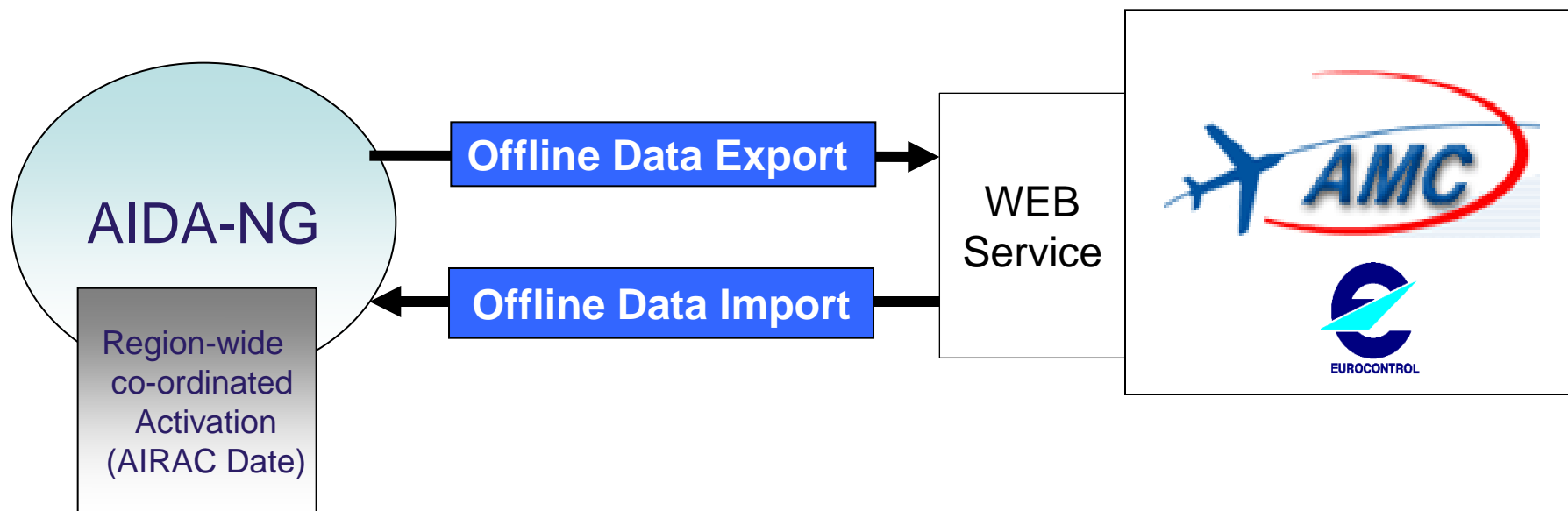
- **OLDI/FMTP Gateway**

Conversion of FDE ICD  $\leftrightarrow$  FMTP

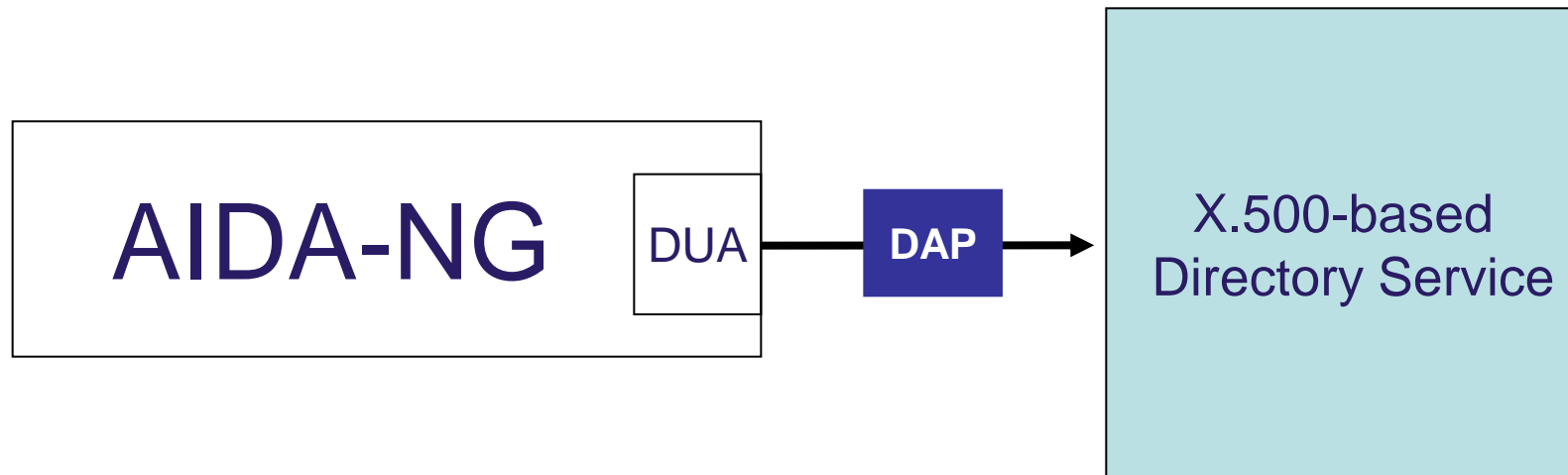


## AIDA-NG Strong Point – Access to the EURCONTROL AMC

**EUROCONTROL ATS Messaging Management Centre AMC**  
Centralized Information Database for all ATN users with  
“offline” access via WEB interface

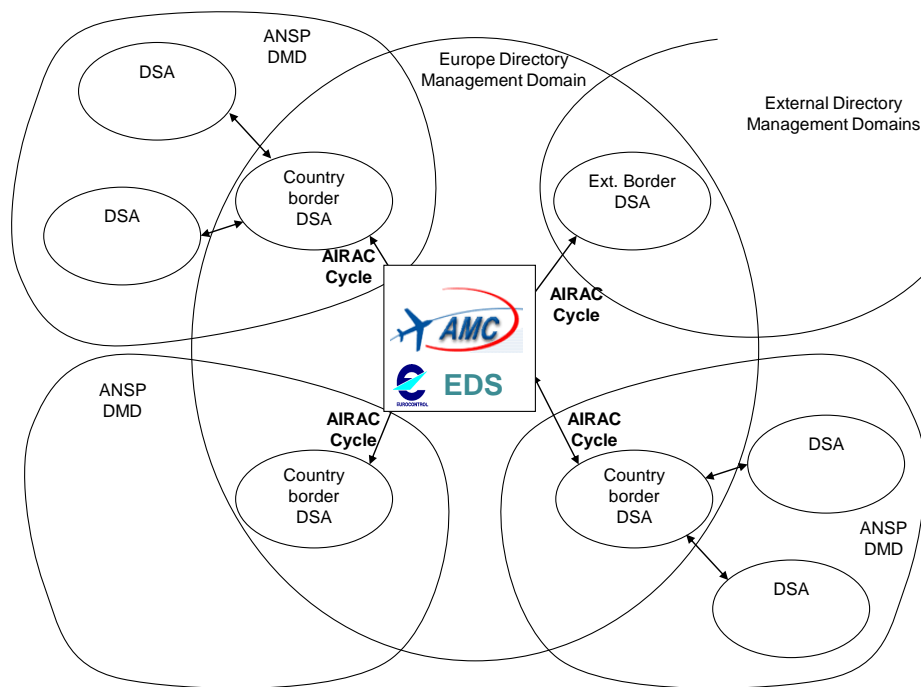


## Strong Point – Access to the Directory Service



## AIDA-NG Strong Point – EDS Extension

# EDS – X.500-based European Directory Service



COMSOFT is the **EDS** key supplier to



# Throughput Figures Example

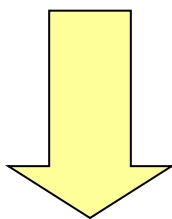
## Scenario

Source: European Customer, Peak Load Measurement

Traffic in/out <b>Required Throughput: 15 Million Messages / Day</b>	AMHS: 100 msg/sec in, 200 msg/sec out AFTN: 70 msg/sec in, 140 msg/sec out Total: 170 msg/sec in, 340 msg/sec out
AFTN/AMHS G/W Traffic	AMHS/AFTN: 50 msg/sec AFTN/AMHS: 50 msg/sec
Average msg length	1000 bytes
Queuing	No
Average Transit Time	AFTN → AFTN: 15 ms AFTN → AMHS: 200 ms AMHS → AFTN: 200 ms AMHS → AMHS: 500 ms average: 300 ms
Command Response Time	< 2 sec

## Strong Point - Message Congestion Handling

- ✓ System can hold more than 250,000 pending messages (AFTN/AMHS) in transmission queues
- ✓ Switching Performance and System Access is not degraded under this load
- ✓ System is fully protected against overload by flow control mechanisms



***Manual Contingency Procedures on message level (e.g. a message drain function) are not required***

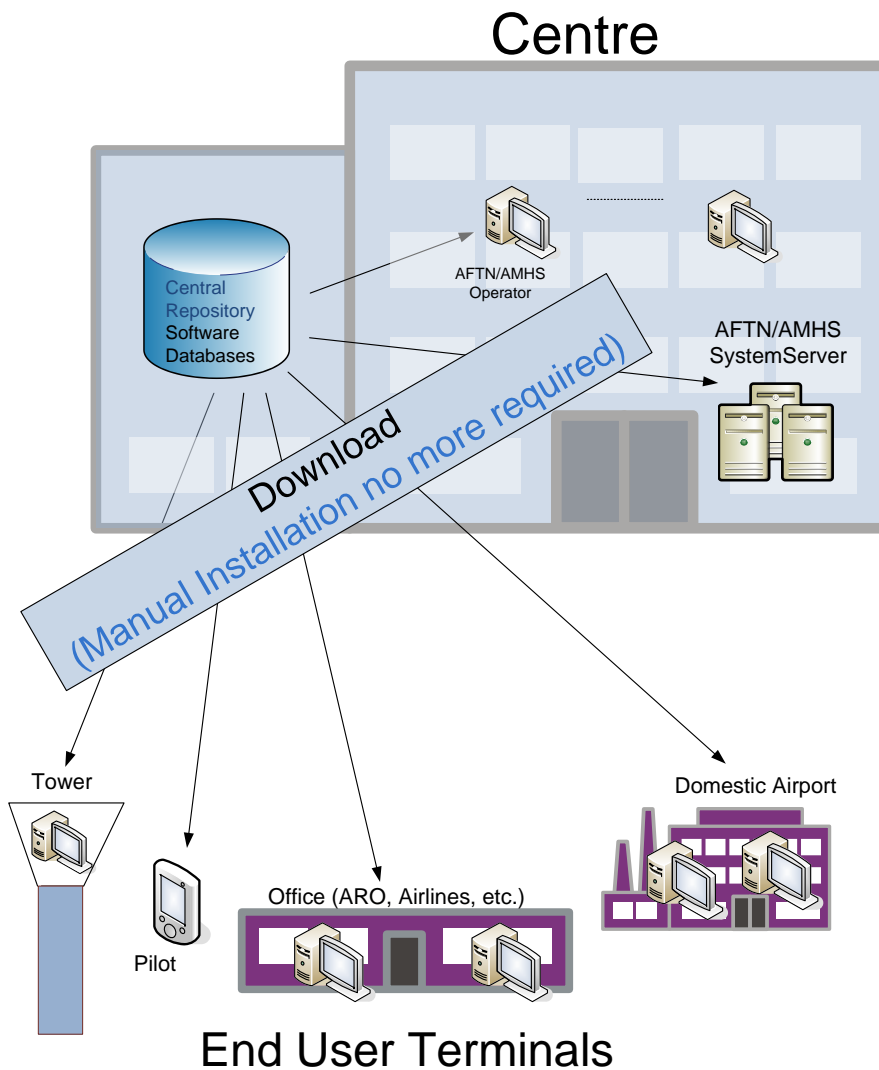
# AIDA-NG/CADAS – System Availability (April, 2013)

Excerpt of Customer Installations	Number of Operational Systems	Operational since ...	Number of operational hours/total
Germany	1	Mar-02	98400
Bosnia and Herzegowina	2	Dec-02	183600
Libya	1	May-04	79392
Eurocontrol CFMU	2	Nov-04	149952
Philippines	1	Dec-05	65496
United Kingdom	1	Jun-06	61128
Macedonia	1	Jul-06	60408
Serbia and Montenegro	1	Nov-06	57456
United Arabian Emirates	1	May-07	53112
Singapore	1	Jun-07	52368
Australia	1	Jul-07	51648
Oman	1	Nov-07	48696
Morocco	1	Dec-07	47976
Slovak Republic	1	Apr-08	45048
Egypt	1	Nov-08	39912
Total for all sites	17		912960

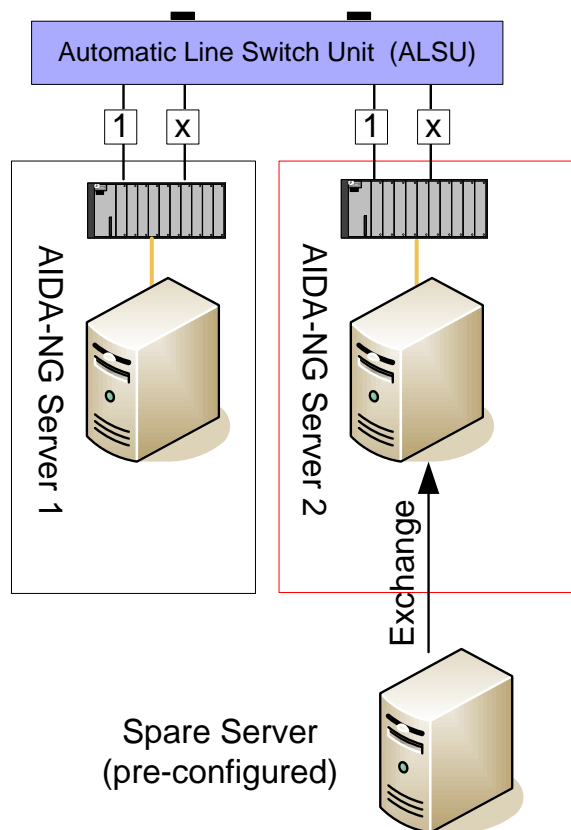
**Field-proven system availability: > 99,999945%**

# AIDA-NG – System Maintainability

## Central Boot/Configuration/Software Server



# AIDA-NG Strong Point – Example Server Exchange



Exchange of a spare server can be done in two steps:

1. Configure spare server via basic installation CD (5 minutes)
2. Reboot spare server

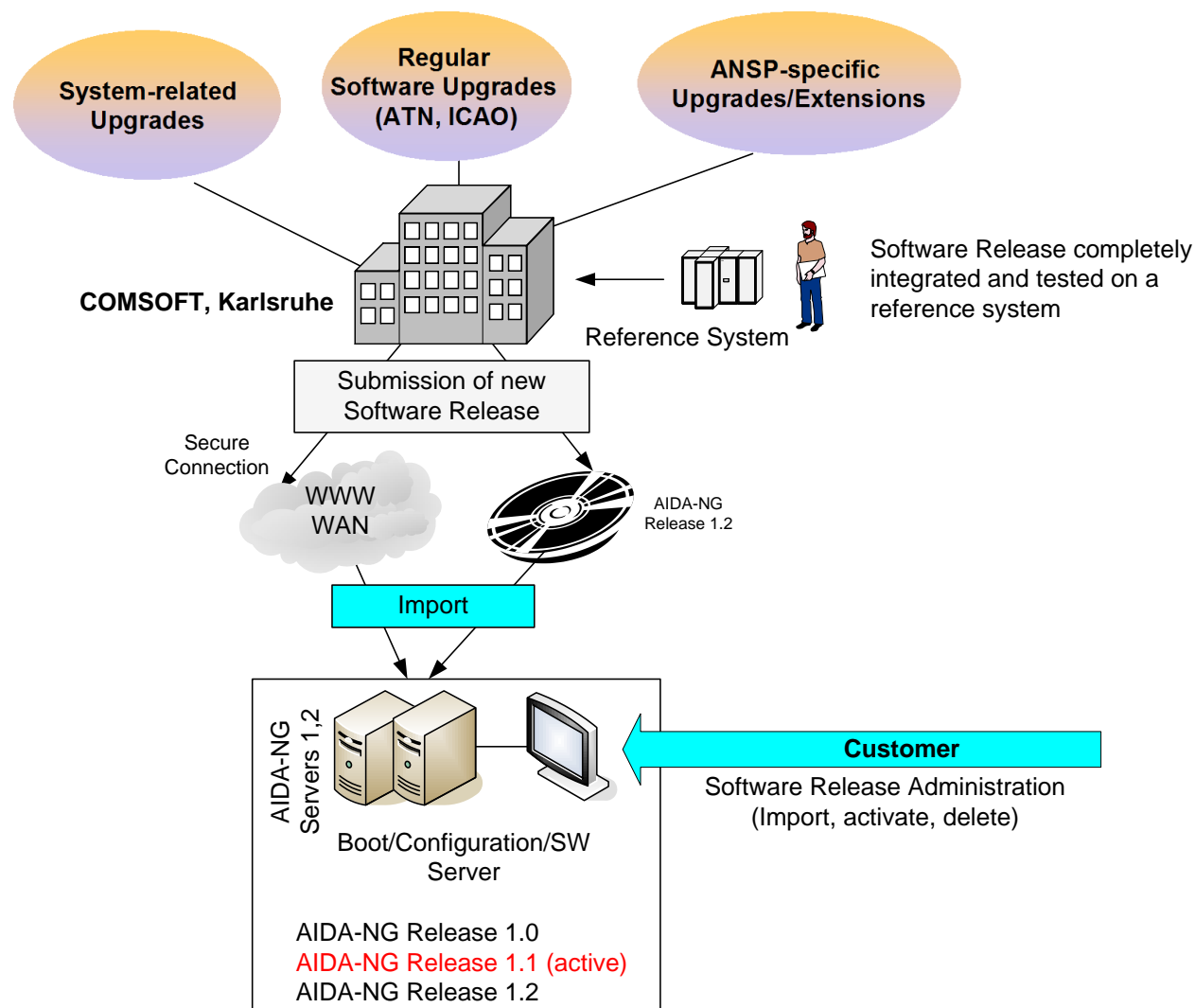
✓ Exchange can be done in approximately 10 minutes

✓ Installation of software, configuration, databases, etc. is not required

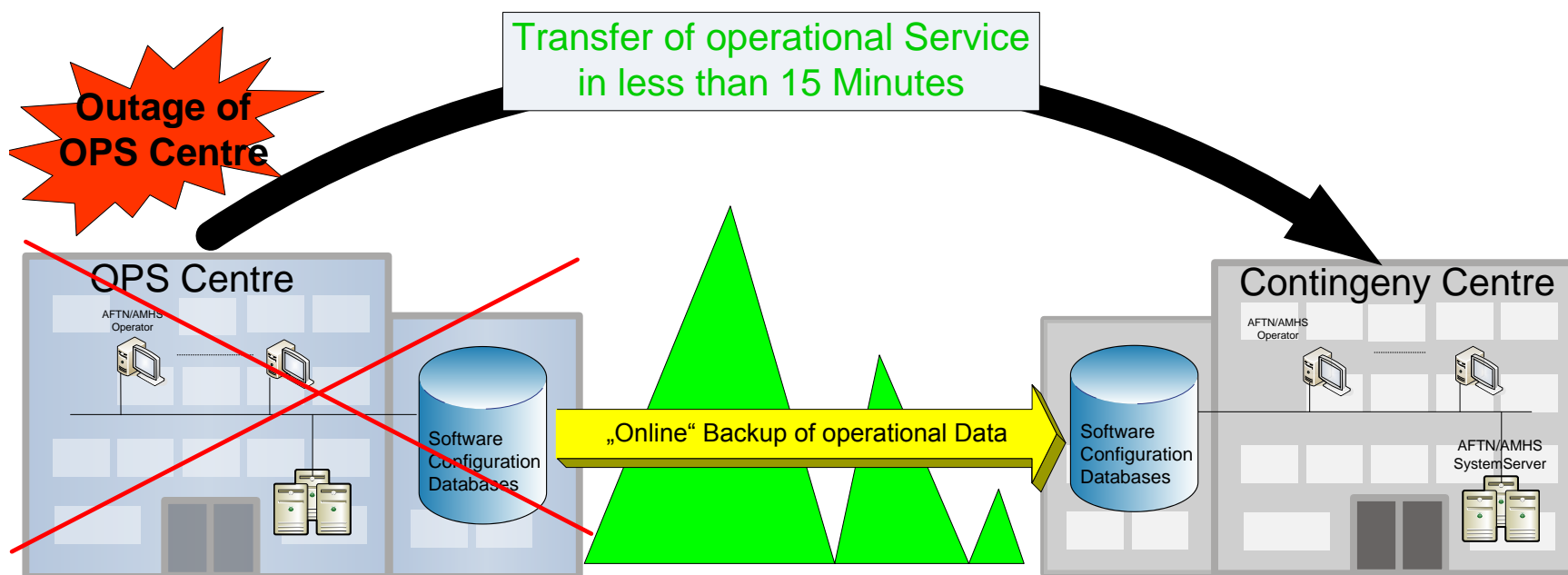
✓ No interruption of service during exchange of the server



# AIDA-NG – Strong Point - Software Maintenance



# AIDA-NG Strong Point - Dual Site Handling

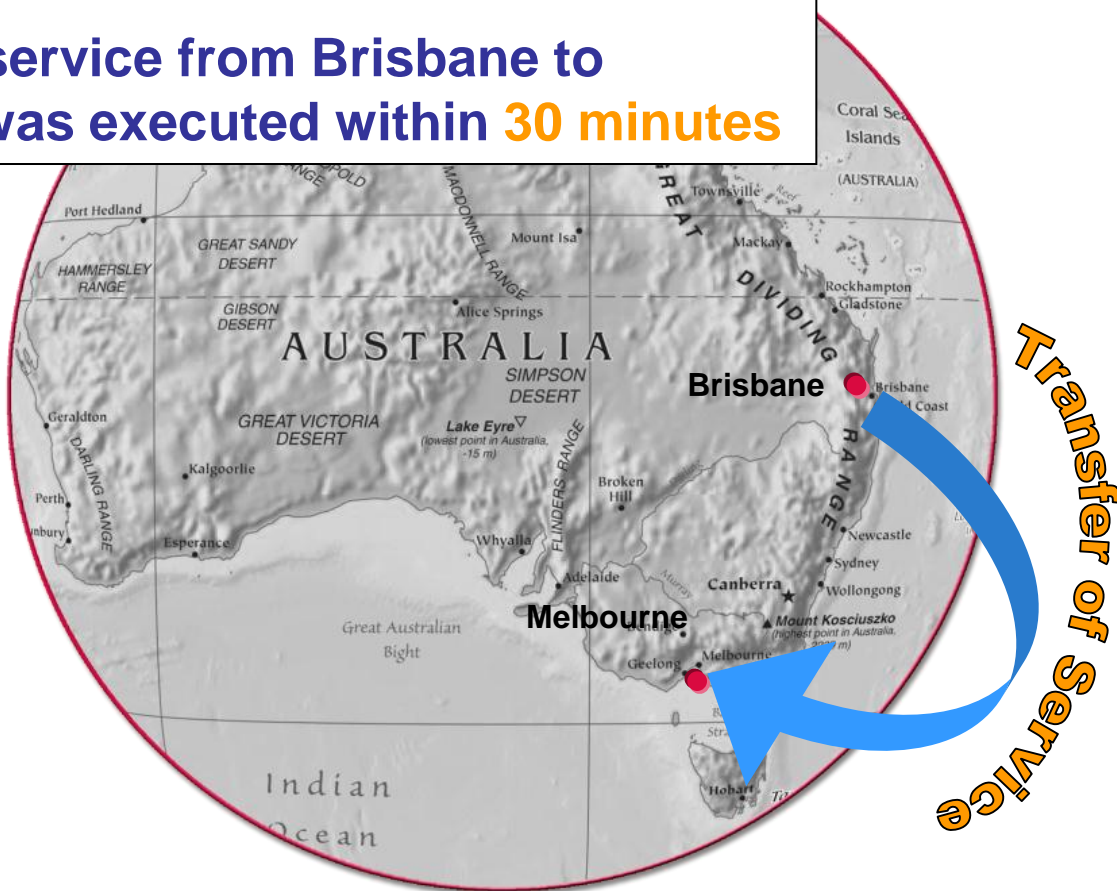


## In Operation – AIDA-NG Dual Site Configuration Australia

**Operational System: Brisbane**

**Contingency System: Melbourne**

**Transfer of service from Brisbane to Melbourne was executed within 30 minutes**



## Strong Point - Unrivalled Benefits for Users

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- ✓ Redundancy without any single point of failure
- ✓ Complete System Switchover in < 5 sec
- ✓ Fully integrated and tuned X.400 COTS product (redundancy, stability, throughput, extended queue handling, diagnostics, etc. )
- ✓ Unified System Management (AMHS, AFTN, legacy part, X.400, etc.)
- ✓ 100% protection against overflow situations
- ✓ Unmatched high message throughput
- ✓ Dual Site Operation/Contingency Management

# CADAS

## COMSOFT Aeronautical Data Access System

COMSOFT's advanced client/server-based ATS  
Terminal System

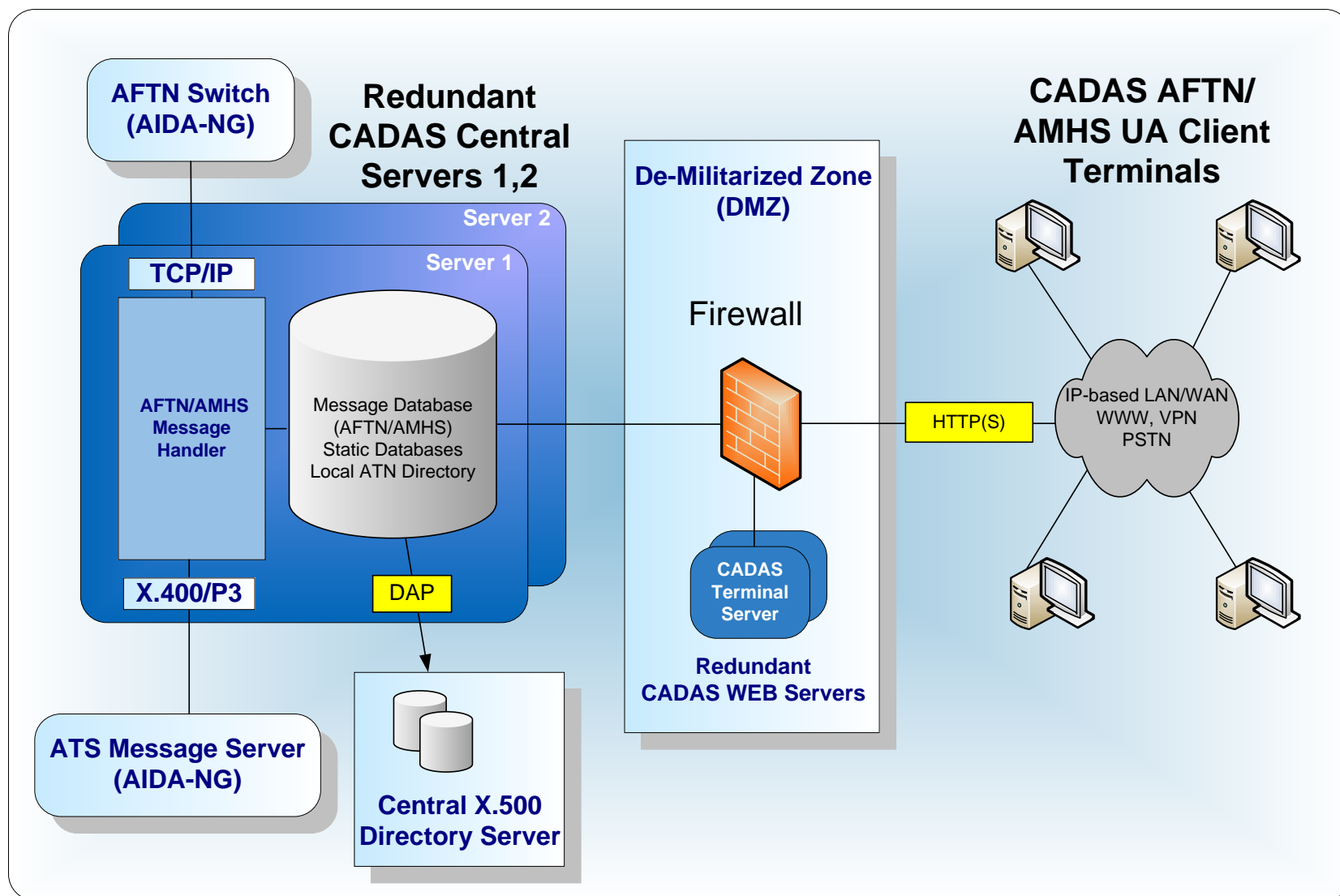


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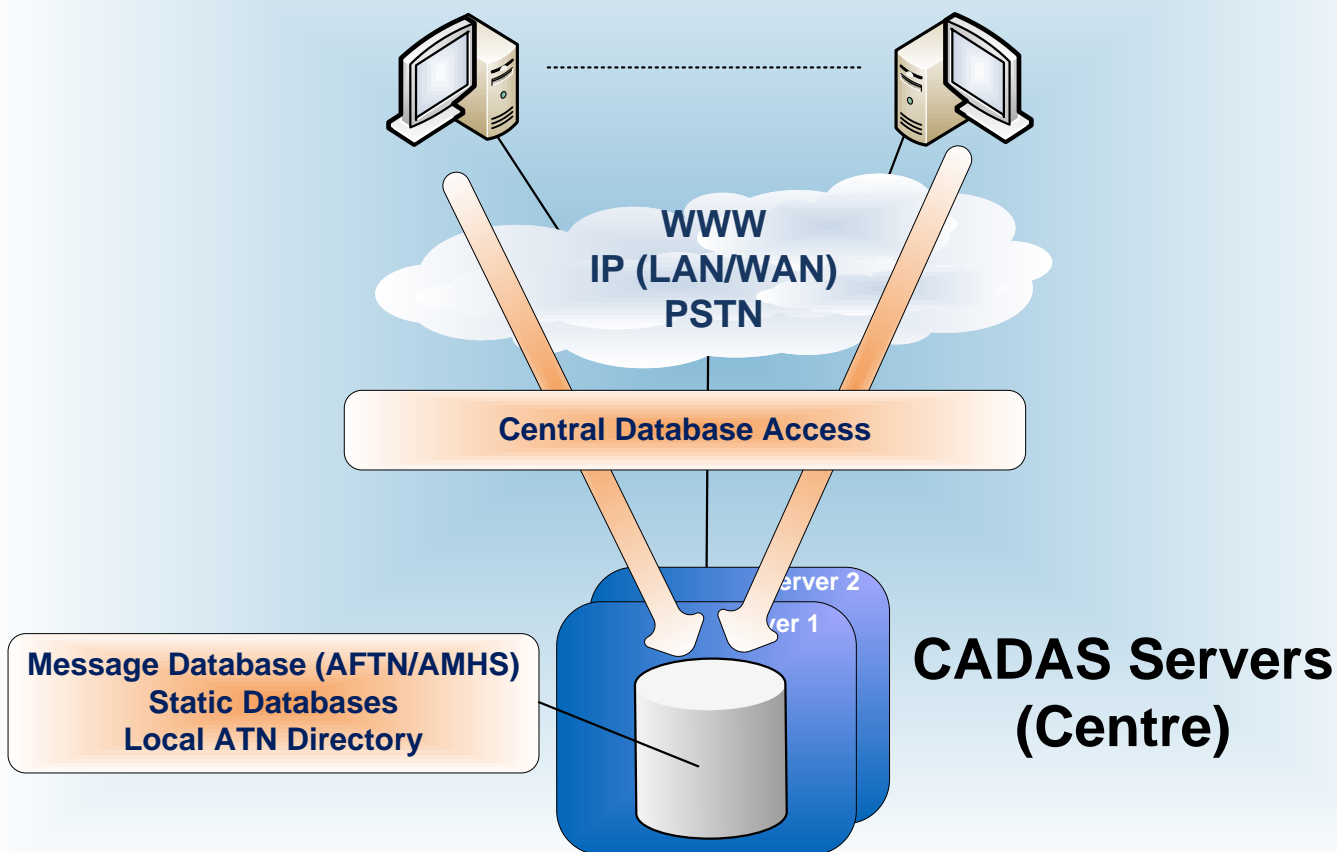
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# CADAS – Client/Server Terminal System with ATS/AFTN or ATS/AMHS UA Client Terminals



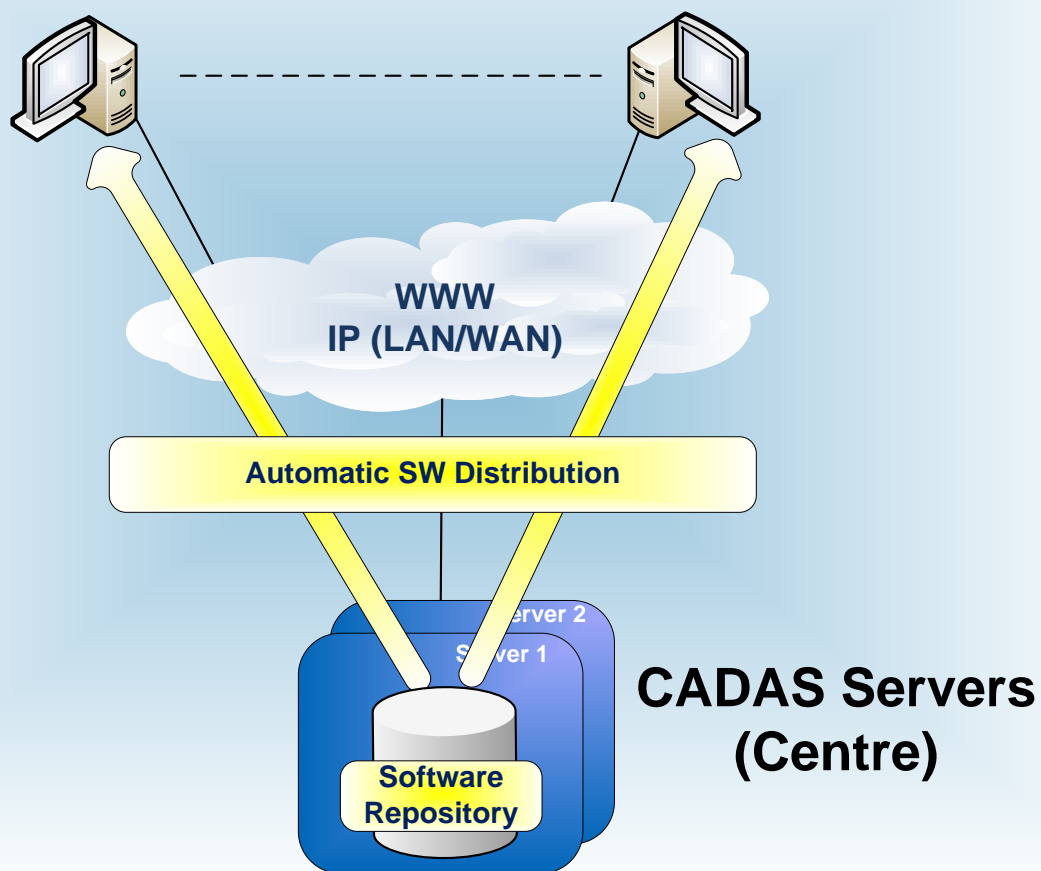
## Strong Point - Client/Server System Database Access

### CADAS AFTN/AMHS UA Client Terminals (Remote Locations, Domestic Airports, etc)



## Strong Point - Client/Server System Software Maintenance

### CADAS AFTN/AMHS UA Client Terminals (Remote Locations, Domestic Airports, etc)





# CADAS-ATS Security I

- CADAS security has been made bullet-proof in order to provide secure access to ATS over the Internet
- Messaging solutions based on SMTP cannot compete with CADAS' security, ease of use and richness of functionality

**Strong password checking**

**Pass phrase**

**Idle timer**

**Local cache clearance**

**Account locking on break-in attempts**

**Disclaimer**

## CADAS-ATS Security II

**CADAS' Internet security has been validated by independent IT Security Consultants**

**Procedures:**

**Analysis of system design and communication protocols**

**Hacking attempts over Internet and local network**

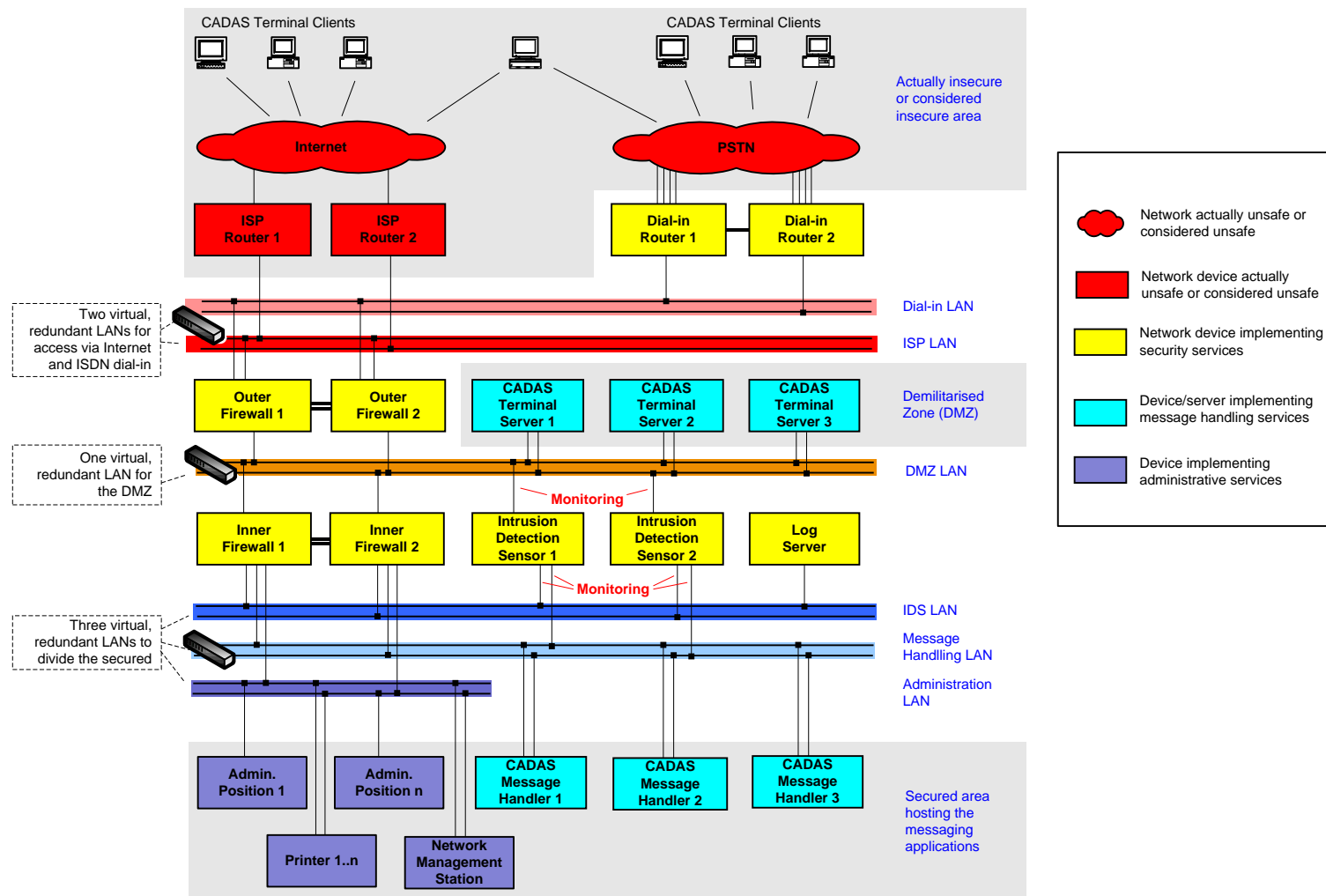
**Outcome:**

**CADAS does not exhibit any known security breaches and is immune to security threats**

**Conclusion:**

**CADAS can be safely used over the Internet for nation-wide services**

# Security Framework



# CADAS – Terminal Applications

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- Centre Terminal  
Full Scope of ATS Functions for ATC Controllers, Tower, ARO, Airlines
- ATS Terminal  
Management of ATS Messages (FLP+ associated, NOTAM, METEO, free text)
- Pilot Terminal  
Proposal filing (FPL, DLA, CHG, CNL), Active flight monitoring
- Flight Strip Printing Terminal  
Automatic generation, update and printing of flight strips
- Administration Terminal  
Supervision, control and configuration of the entire system

## CADAS – Terminal Applications

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# Full support of both ATS Formats

- ICAO DOC 4444 edition 15
- Amendment 1 to DOC 4444 edition 15

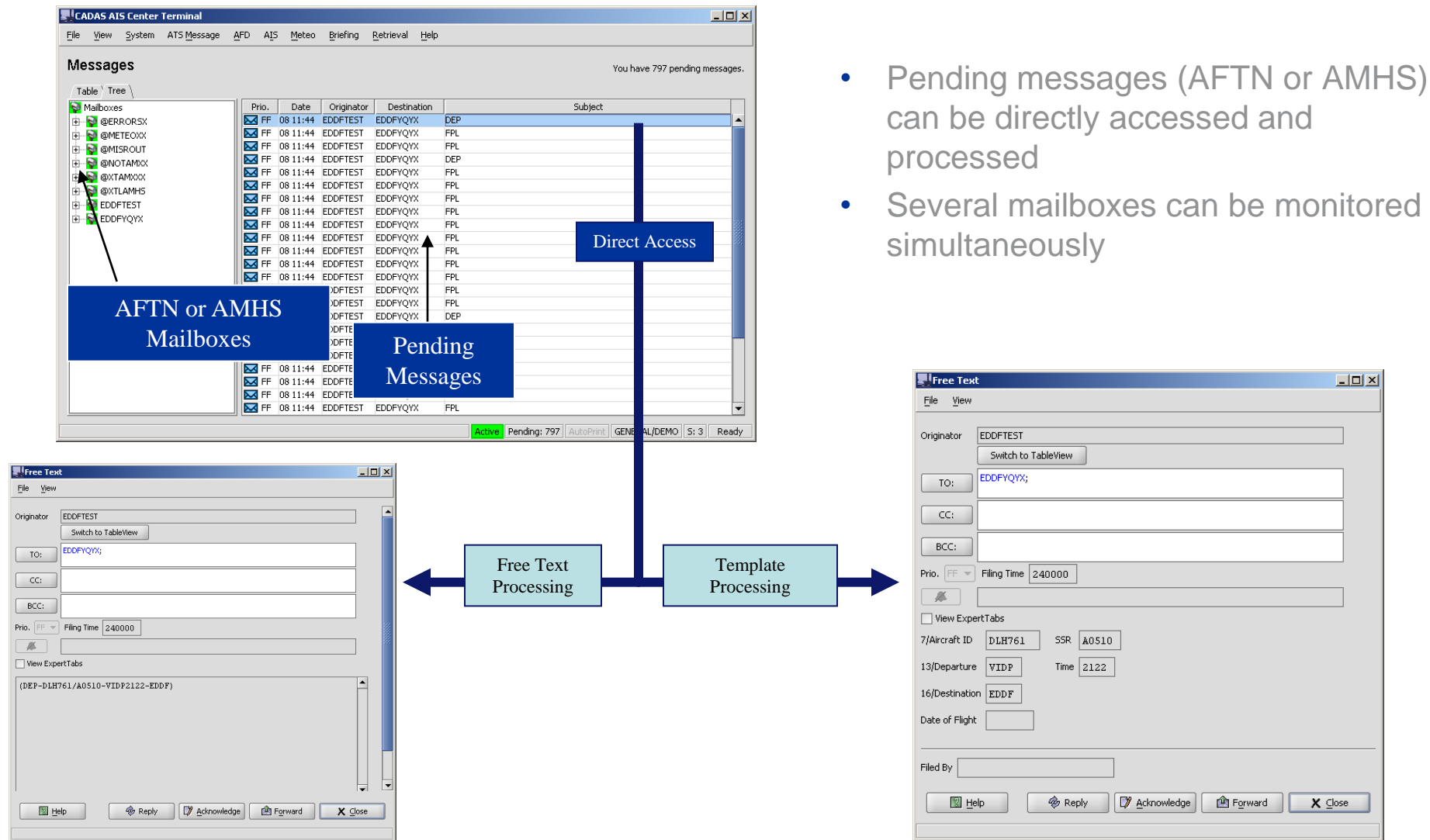
# CADAS – ATS Client Terminals (AFTN or AMHS)

The screenshot displays three overlapping windows from the CADAS ATS Client Terminal:

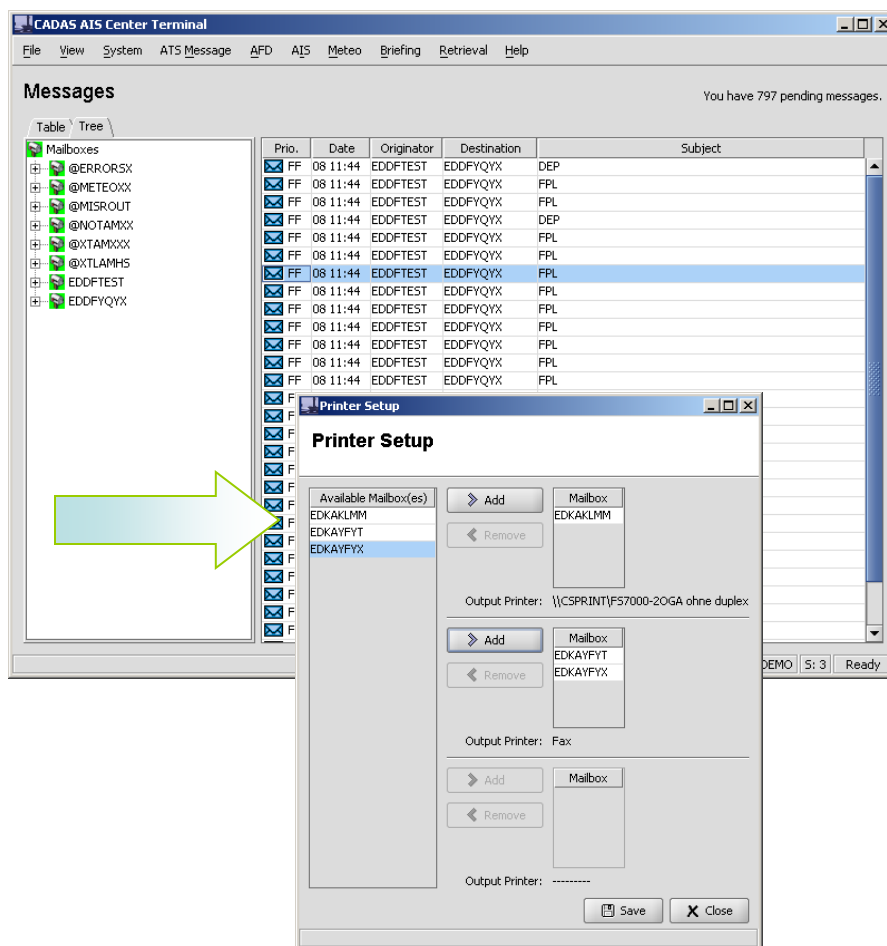
- NOTAM - Notice To Airmen:** A window for managing NOTAMs. It includes fields for Originator (YBBUSRA), TO (YBBUSRB), CC, BCC, and Priority (GG). It also has a 'View ExpertTabs' checkbox and a 'NOTAM Id' field with a value of 1734.
- FPL - ICAO Flight Plan:** A window for managing flight plans. It includes fields for Originator (YBBUSRA), TO (YBBUSRB), CC, and BCC. It also has a 'View ExpertTabs' checkbox and a 'Flight Plan' field with a value of 1734.
- METAR (SA):** A window for managing METAR data. It includes fields for Originator (YBBUSRA), TO (YBBUSRB), CC, BCC, and Priority (GG). It also has a 'View ExpertTabs' checkbox and a 'METAR' field with a value of 1734. Below the field, there is a table with columns for Message ID, Orig., Issued, and Corr., and a 'Send' button.

- Platform-independent Java Application
- "Online" monitoring of incoming messages (AMHS or AFTN)
- Syntactic/semantic checking of received messages with type detection (FPL, NOTAM...)
- Template-specific view of received messages
- Automatic printout of incoming/transmitted messages
- Templates for all kinds of ATS messages (FPL+ associated, etc.) with online checking mechanisms
- Highly sophisticated message retrieval function with a multitude of filter criteria
- Support by central static databases (aircraft types, flight routes, FIRs, aerodromes, etc.)

# CADAS ATS Client Terminal – Mailbox Monitoring



# CADAS ATS Client Terminal – Message Printing



EDKAYFYT ⇒ System Printer 1:



EDKAYFYX ⇒ System Printer 2:



EDKAKLMM ⇒ System Printer 3:



- Automatic printing of messages according to Printer Setup
- Up to three printers can be assigned for auto printing on each Terminal



# CADAS ATS Client Terminal - FPL Management

The screenshot shows the 'Send - FPL - ICAO Flight Plan' window. The interface includes a menu bar (File, View, Edit, Help) and a toolbar with icons for Send+Close, Load, Store, Create PIB..., Search Route, Store Route, and Search Area. Below the toolbar, there are several input fields and checkboxes for flight plan details, including Prio., Addressees, Filing Time, Originator, Bell, 7/Aircraft ID, 8/Flight Rules, 9/Number, 10/Equipment, 13/Departure, 15/Speed, 16/Destination, 18/Other, 19/Endurance, and Remark. A 'Route' field displays a list of waypoints and flight rules. A 'Search Aircraft Type' dialog box is open, showing a search result table with columns for Type, Name, and Wake Turbulence. The dialog box has a 'Search' button and 'Previous'/'Next' navigation buttons. The 'Search Aircraft Type' dialog box is titled 'Search Aircraft Type' and contains a search result table with columns 'Type', 'Name', and 'Wake Turbulence'. The table lists several aircraft types: GLF2, GLF3, GLF4, and GLF5. The 'Search' button is labeled 'Search' and the 'Cancel' button is labeled 'Cancel'. The 'OK' button is labeled 'OK'.


Callouts from the right side of the image point to specific features in the interface:

- Restricted Areas**: Points to the 'Search Area' button in the toolbar.
- Preferential Routes**: Points to the 'Search Route' button in the toolbar.
- Templates**: Points to the 'Store' button in the toolbar.
- Online Help**: Points to the 'Help' menu item.
- Syntax/Semantic Check**: Points to the 'Invalid SRR [A + 4 numeric characters]' error message.
- Static Data Support**: Points to the 'Search Aircraft Type' dialog box.

# Strong Point CADAS ATS Client Terminal – Integrated AMHS Functionality

**FPL - ICAO Flight Plan**


File Edit View

Originator: YBBBUSRA  Switch to TableView

TO: YBBBUSB

CC:

BCC:

Prio: FF 

☐ View ExpertTabs

7/Aircraft ID: QTR552 SSR

8/Flight Rules: I Type of Flight: S

9/Number:  Type of Aircraft: A306 Wake Turbulence: H

10/Equipment: SDEHIPRMW / S

13/Departure: OTBD Time: 0915




15/Speed: N0465 Altitude/Level: F240

Route: DCT DOH R659 ELOSA B457 BAH A791 HIL G662  
EGVOP/N0471F260 G662 NIMAR UL550 KITOT/N0476F280 UL550 MWB A791  
MENLI A411 CV0 A727 OTIKO/N0462F290 W725 NANVO/N0463F300 W725 BRN  
A411 LOSUL/N0461F310 A411 KHOMS V400 TPI DCT

16/Destination: HLLT Total EET: 0513 Alternate: DTTJ 2nd:

18/Other: EET/0BBB0007 OEJD0102 HECC0235 HLL0354 REG/A7ABN SEL/MSEP OPR/QTR  
DOF/050318 RMK/P/TBN R/UVE J/LF D/06 372 C GREY A/WHITE AND GREY  
NAV/TCAS C/

Filed By: GENERAL.YB

 Help  Send  Close

Attachment

Access to central address book

Display/hide AMHS Attributes

- Fully integrated AMHS User Agent
- Practically invisible to the end user

# ATS Terminal – Creation of NOTAMs

**NOTAM - Notice To Airmen**

File Edit View

**NOTAM - Notice To Airmen**

✖ Type in a series letter

Originator: EDKAAHMS

✖ TO:

CC:

BCC:

Prio: GG

Bell  Optional Header

☐ View ExpertTabs

NOTAM Id (  0001 / 05 ) Type NOTAM  N Reference NOTAM Id  /

FIR  Q  Code  Tfc  Purpose  Scope  Lower  000 Upper  999 Coordinates  Radius

Affected Aerodromes or FIRs

A)  B) 0507070947 C)

D)

E)

Lower Limit F)  Upper Limit G)

Filed By: GENERAL, JENS

- Auto NOTAM Series number allocation,
- Message Templates:
  - NOTAM N/R/C
  - SNOWTAM
  - ASHTAM

# ATS Terminal – OPMET Templates

**METAR (SA)**  
Type in a meteo report region

Originator: **EDKAAMHS** Switch to TableView

TO:

CC:

BCC:

Prio. **GG**

Bell ☐ Optional Header

☐ View ExpertTabs

Message ID	Orig.	Issued	Corr.
SA	EDDF	070948	

Location	Observed	
METAR	EDDF	070948 Z

Filed By: **GENERAL.JENS**

Help Send Close

- Sophisticated retrieval mechanism with a multitude of selection attributes available
- METEO Message Templates with formatted Inputs and online field checking mechanisms
- Various message templates including:
  - METAR
  - SPECI
  - SIGMET
  - AIRMET
  - TAF

## CADAS – Extensions

# Active Flight Database

# Active Flight Database

- Online monitoring of Inbound, Outbound, and Over-Flights
- Configurable time window
- Callsign filter and sorting criteria
- List of ATS message history of each flight

**AFD Monitor Setup**

Type

☒ Inbound flights

☐ Outbound flights

☐ Over flights

Aerodrome

FIR

Timeframe

☐ Next 1 hour

☐ Next 2 hours

☐ Next 12 hours

☒ Next 24 hours

☐ Next 6 days

Aircraft ID



**CADAS ATS Terminal**

File View System ATS Message ATFM Message AIS Briefing Retrieve Help

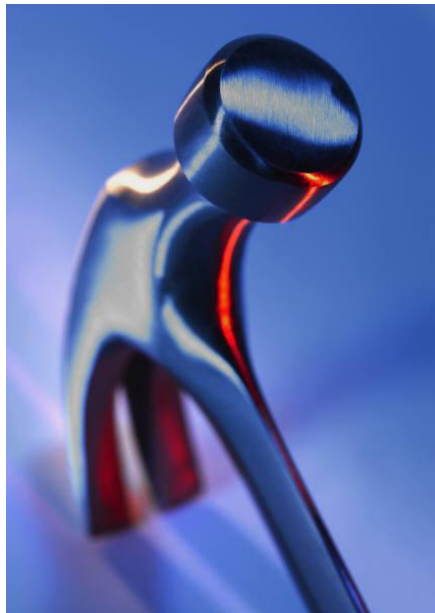
**Active Flights**

Aircraft ID	Departure	Est. Off-Block	Destination ▲	Route
AXL3923	EDDF	2004.05.22-05:05:00	EGLL	N0250F180 REFSO R1 LAM
AXL3923	EDDF	2004.05.23-05:05:00	EGLL	N0250F180 REFSO R1 LAM
AXL3923	EDDF	2004.05.24-05:05:00	EGLL	N0250F180 REFSO R1 LAM
KLM144	EDDF	2004.05.20-03:05:00	EHAM	N0460F320 AKBUK VG80 EK1 W102 VADEN ...
OHY965	EDDF	2004.05.24-03:05:00	EHAM	N0460F320 AKBUK VG80 EK1 W102 VADEN ...
LH400	EDDF	2004.05.22-08:00:00	KJFK	N0460F320 AKBUK VG80 EK1 W102 VADEN ...

Active AutoPrint AutoReadAck GENERAL/JENS S: 1 Ready

## Services - How you get it

---



COMSOFT delivers "turnkey" solutions

# Services – "Turnkey" Solution – Example





# Valuable Add-On: COMSOFT Network Management System

Central  
Supervision of the  
entire Location



# CNMS – Central Supervision of Components – Logical View

CNMS AMADEUS - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://cnmssrv/

CNMS AMADEUS History

**AMADEUS Logical View**

19-11-2008 09:49:24

CNMS Status: ✔

OWP99 not in use

- Top Level View
- AMADEUS Logical View**
- Cabinet View
- Network Load
- Tactical Overview
- Open Nagios View
- Event History Search
- SNMP Traps
- Downtime Tool
- Mars Web Interface

**AMADEUS Logical View Diagram:**

The diagram illustrates the logical architecture of the AMADEUS system. It shows a central core with multiple interconnected networks and services.

- External Networks:** LVNL Domestic Network, WWW SMS/Email Provider Remote Access, and PSTN.
- Core Networks:** LVNL LAN, Monitoring LAN, AAA LAN, ELAN, and ILAN.
- Services and Components:**
  - AMADEUS Application:** Includes AIDA-NG LAs, AIDA-NG Interfaces, Pending Message List (PML), Automatic Line Switch, and SNMP Traps.
  - AMADEUS Hardware:** Includes RCS A, RCS C, RCS B, Fan Unit A, Fan Unit C, and Fan Unit B.
  - AAA (Authentication, Authorization, Accounting):** Includes CADAS Health, Message Handler, Terminal Server, and VPN (LVNL: 0, Comsoft: 0).
  - ASA Firewall:** Includes Email-Fax-Gateway (CADAS), Fax Queues, Fax Lines, Hytalfax Port, SMTP Port, and Mail Queue.
  - NTP Server:** Includes OPS, Backup (Test), MARS, and CNMS Client.
  - Operator Consoles:** Includes Laser Printers and Chain Printers.

**Event History:**

Time	Type	Logentry
19-11-2008 09:37:25	External Command	EXTERNAL COMMAND: ACKNOWLEDGE_SVC_PROBLEM:CNMS Server:hw_interface-status eth0:2:1:1:regos:No LSMC available in Karlsruhe
19-11-2008 09:37:25	Service Notification	SERVICE NOTIFICATION: regos-admin:CNMS Server:hw_interface-status eth0:ACKNOWLEDGEMENT (WARNING:trap_servicestate.eth0:DOWN: 1 int NOK : WARNING:regos:No LSMC available in Karlsruhe
19-11-2008 09:35:35	Info Message	HOST DOWNTIME ALERT: ASA Firewall:STARTED: Host has entered a period of scheduled downtime
19-11-2008 09:35:35	Info Message	SERVICE DOWNTIME ALERT: ASA Firewall:disco_asa_load:STARTED: Service has entered a period of scheduled downtime
19-11-2008 09:35:35	Info Message	SERVICE DOWNTIME ALERT: ASA Firewall:disco_vpn_sessions:STARTED: Service has entered a period of scheduled downtime
19-11-2008 09:35:35	Info Message	SERVICE DOWNTIME ALERT: ASA Firewall:internal-interface:STARTED: Service has entered a period of scheduled downtime

**Scheduled downtimes:**

Host	Service	Author	Comment	End
IDS_Sensor	disco_service_memory	Oliver	Test Downtime	2008-11-19 11:18:00
IDS_Sensor	disco_idb_sensor_active	Oliver	Test Downtime	2008-11-19 11:18:00
IDS_Sensor	disco_idb_sensor_inactive	Oliver	Test Downtime	2008-11-19 11:18:00

**Disabled service checks:**

Host	Disabled Service Check
Laser Printer 4	
Laser Printer 5	
OWPS	

**Click here for Trap Details:**

**Most recent Mars traps:**

Time	Message
2008-11-19 09:00:14	MARS-1-101 Wed Nov 19 09:00:15 2008 %MARS-1-101: Rule 330297 (System Rule: Inactive CS-MARS Reporting Device) fired and caused green Incident 16040429, starting from Wed Nov 19 09:00:02 2008 to Wed Nov 19 09:00:02 2008 <a href="#">Event details</a>
2008-11-19 07:59:51	MARS-1-101 Wed Nov 19 08:00:19 2008 %MARS-1-101: Rule 330297 (System Rule: Inactive CS-MARS Reporting Device) fired and caused green Incident 16040428, starting from Wed Nov 19 08:00:05 2008 to Wed Nov 19 08:00:05 2008 <a href="#">Event details</a>
2008-11-19 07:59:46	MARS-1-101 Wed Nov 19 07:00:13 2008 %MARS-1-101: Rule 330297 (System Rule: Inactive CS-MARS Reporting Device) fired and caused green Incident 16040427, starting from Wed Nov 19 07:00:00 2008 to Wed Nov 19 07:00:00 2008 <a href="#">Event details</a>

http://cnmssrv/nagios/nagvis/nagvis/index.php?map=amadeus-logical

**N 11 hosts down 19 unknown services 24 service warnings 3 critical services**

# Central Supervision – Cabinets

19-11-2008 09:51:19

CNMS Status:

OWP99 not in use

- Top Level View
- AMADEUS Logical View
- Cabinet View**
- Network Load
- Tactical Overview
- Open Nagios View
- Event History Search
- SNMP Traps
- Downtime Tool
- Mars Web Interface

## Cabinet View

COMSOFT A	COMSOFT C	COMSOFT B
NTP Server		
SNL LAN Switch A		SNL LAN Switch B
RCS Rack A	RCS Rack C	RCS Rack B
Fan Unit A	Fan Unit C	Fan Unit B
AMADEUS Router 1		AMADEUS Router 2
ASA Firewall		MARS
E-Mail-Fax-Gateway		CNMS Server
Aida-NG Server 1		Aida-NG Server 2
Keybd/TFT		Keybd/TFT
ILAN Switch 1		ILAN Switch 2
ELAN Switch 1		ELAN Switch 2
LVNL LAN Switch 1		LVNL LAN Switch 2
AAA LAN Switch 1		AAA LAN Switch 2
Monitoring LAN Switch 1		Monitoring LAN Switch 2

### Application Status

**AIDA-NG**

- AIDA-NG LAs
- AIDA-NG Interfaces
- Pending Message List (PML)
- Automatic Line Switch
- SNMP Traps

**CADAS**

**CADAS UA**

- CADAS Health
- Message Handler
- Terminal Server

**EFG**

- CADAS Health
- Message Handler
- Terminal Server

**Email-Fax-Gateway**

- Fax Queues
- Fax Lines
- Hyfax Port
- SMTP Port
- Mail Queue

**OWPs**

- A:OP+
- B:STANDBY
- 1:OP+
- 2:OP+

**NTP Server Backup (Test)**

**Event History:**

Time	Type	Logentry
19-11-2008 09:49:54	External Command	EXTERNAL COMMAND: DEL_HOST_DOWNTIME:36
19-11-2008 09:49:54	Info Message	HOST DOWNTIME ALERT: ASA Firewall:CANCELLED: Scheduled downtime for host has been cancelled.
19-11-2008 09:49:54	External Command	EXTERNAL COMMAND: DEL_SVC_DOWNTIME:37
19-11-2008 09:49:54	Info Message	SERVICE DOWNTIME ALERT: ASA Firewall:cisco_asa_joad:CANCELLED: Scheduled downtime for service has been cancelled.
19-11-2008 09:49:54	External Command	EXTERNAL COMMAND: DEL_SVC_DOWNTIME:38
19-11-2008 09:49:54	Info Message	SERVICE DOWNTIME ALERT: ASA Firewall:cisco_vpn_sessions:CANCELLED: Scheduled downtime for service has been cancelled.

**Scheduled downtimes:**  
There are currently no scheduled downtimes.

**Disabled service checks:**

Host	Disabled Service Check
Laser Printer 4	
Laser Printer 5	
OWP5	

**Click here for [Trap Details](#).**

**Most recent Mars traps:**

Time	Message
2008-11-19 09:00:14	MARS-1-101 Wed Nov 19 09:00:15 2008 %MARS-1-101: Rule 339207 (System Rule: Inactive CS-MARS Reporting Device) fired and caused green Incident 16040429, starting from Wed Nov 19 09:00:02 2008 to Wed Nov 19 09:00:02 2008 <a href="#">Event details</a>
2008-11-19 07:59:51	MARS-1-101 Wed Nov 19 08:00:19 2008 %MARS-1-101: Rule 339207 (System Rule: Inactive CS-MARS Reporting Device) fired and caused green Incident 16040428, starting from Wed Nov 19 08:00:05 2008 to Wed Nov 19 08:00:05 2008 <a href="#">Event details</a>
2008-11-19 06:59:46	MARS-1-101 Wed Nov 19 07:00:13 2008 %MARS-1-101: Rule 339207 (System Rule: Inactive CS-MARS Reporting Device) fired and caused green Incident 16040427, starting from Wed Nov 19 07:00:00 2008 to Wed Nov 19 07:00:00 2008 <a href="#">Event details</a>

http://cnmssrv/nagios/nagvis/nagvis/index.php?map=cabinet

**11 hosts down 19 unknown services 24 service warnings 3 critical services**

# CNMS – Central Supervision of Components - Switches

19-11-2008 12:28:01

CNMS Status: ✔

OWP99 not in use

- Top Level View
- AMADEUS Logical View
- Cabinet View
- Network Load
- Tactical Overview
- Open Nagios View
- Event History Search
- SNMP Traps
- Downtime Tool
- Mars Web Interface

ELAN Switch 1

Aida-NG Server 1  
Pass Port 1

Aida-NG Server 2

Monitoring LAN Switch 1  
ELAN Switch 2 (FE 23)

ELAN Switch 2 (FE 24)

Catalyst 3560 series PoE-24

CPU: 455: OK ✔

Event History:

Time	Type	Logentry
19-11-2008 12:15:35	Process Info	Auto-save of retention data completed successfully.
19-11-2008 12:08:57	External Command	EXTERNAL COMMAND: DEL_HOST_DOWNTIME:48
19-11-2008 12:08:57	Info Message	HOST DOWNTIME ALERT: NTP Server OPS:CANCELLED: Scheduled downtime for host has been cancelled.
19-11-2008 12:08:57	External Command	EXTERNAL COMMAND: DEL_SVC_DOWNTIME:49
19-11-2008 12:08:57	Info Message	SERVICE DOWNTIME ALERT: NTP Server OPS:hopl_sync_state:CANCELLED: Scheduled downtime for service has been cancelled.
19-11-2008 12:08:57	External Command	EXTERNAL COMMAND: DEL_SVC_DOWNTIME:50

Scheduled downtimes:  
There are currently no scheduled downtimes.  
Disabled service checks: There are currently no disabled service checks.

Click here for Trap Details:  
Most recent Mars traps:

Time	Message
2008-11-19 12:00:13	MARS-1-101 Wed Nov 19 12:00:17 2008 %MARS-1-101: Rule 339297 (System Rule: Inactive CS-MARS Reporting Device) fired and caused green Incident 16040433, starting from Wed Nov 19 12:00:03 2008 to Wed Nov 19 12:00:03 2008 <a href="#">Event details</a>
2008-11-19 11:00:12	MARS-1-101 Wed Nov 19 11:00:15 2008 %MARS-1-101: Rule 339297 (System Rule: Inactive CS-MARS Reporting Device) fired and caused green Incident 16040432, starting from Wed Nov 19 11:00:03 2008 to Wed Nov 19 11:00:03 2008 <a href="#">Event details</a>
2008-11-19 10:15:23	MARS-1-101 Wed Nov 19 10:15:25 2008 %MARS-1-101: Rule 339172 (System Rule: CS-MARS IPS Signature Update Failure) fired and caused green Incident 16040431, starting from Wed Nov 19 10:15:16 2008 to Wed Nov 19 10:15:16 2008 <a href="#">Event details</a>
2008-11-19 10:00:13	MARS-1-101 Wed Nov 19 10:00:15 2008 %MARS-1-101: Rule 339297 (System Rule: Inactive CS-MARS Reporting Device) fired and caused green Incident 16040430, starting from Wed Nov 19 10:00:02 2008 to Wed Nov 19 10:00:02 2008 <a href="#">Event details</a>

Done

**11 hosts down 19 unknown services 24 service warnings 3 critical services**

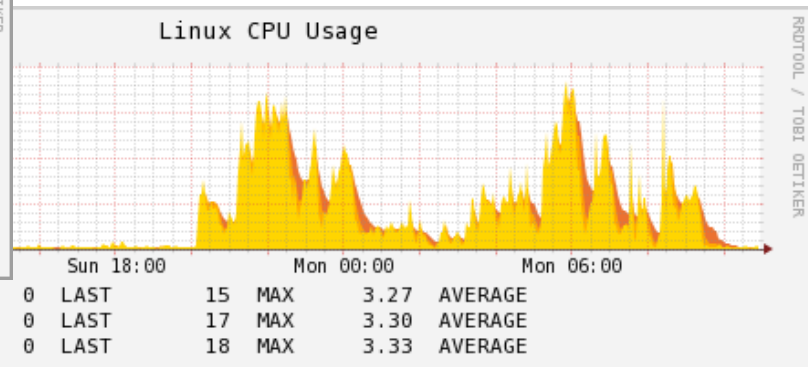
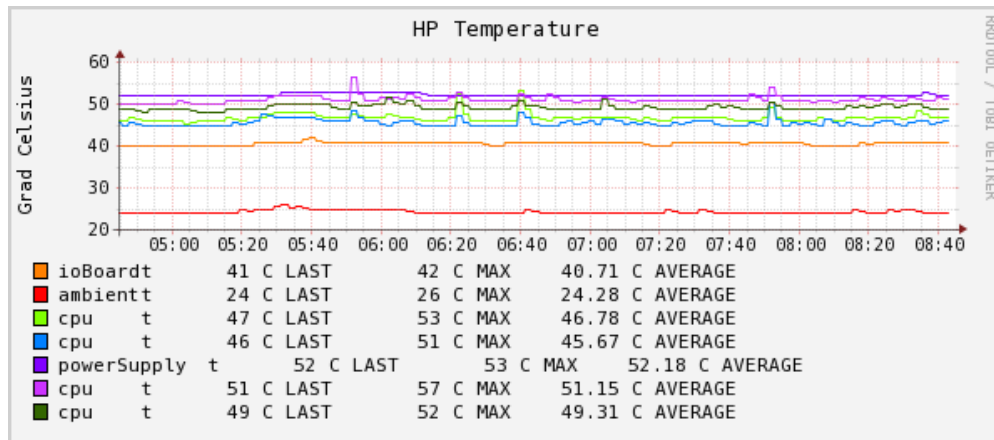
# CNMS – Central Supervision of Remote Terminals



# Visualisation of Performance Data

- | CPU Load
- | Memory Usage
- | Temperature
- | Availability Figures
- | Number of pending messages
- | .....

Performance graphics are generated automatically



# Services – Support During all Project Life Cycle Phases

- Design
- Production
- Commissioning
- Long-Term System Support





# The Goal: Satisfied Customers



Peter,

See note from Kevin confirming that the transition onto AMS-UK is now complete. I like to add my thanks to everyone at Comsoft for your support in achieving this important milestone.

The whole transition has gone very smoothly and the delay in transitioning the last Xx connections was due to a problem with the Xx system and NOT AMS-UK.

Could you please forward this on to all interested parties at Comsoft.

Regards,

Malcolm.

Gents,

I believe all of you are aware that following an extremely successful transition of almost all of the users by the 1st week in September, we were stuck with problems with Xx connections. Following another set of testing, we have subsequently been able to transition them to AMS-UK today and I can thus declare that the user transition is complete. Although this is a week later than I had planned, in comparison to previous transitions of this magnitude, I cannot emphasise enough how well this has gone and would not have been achieved without a magnificent team effort and I take my hat off to them.

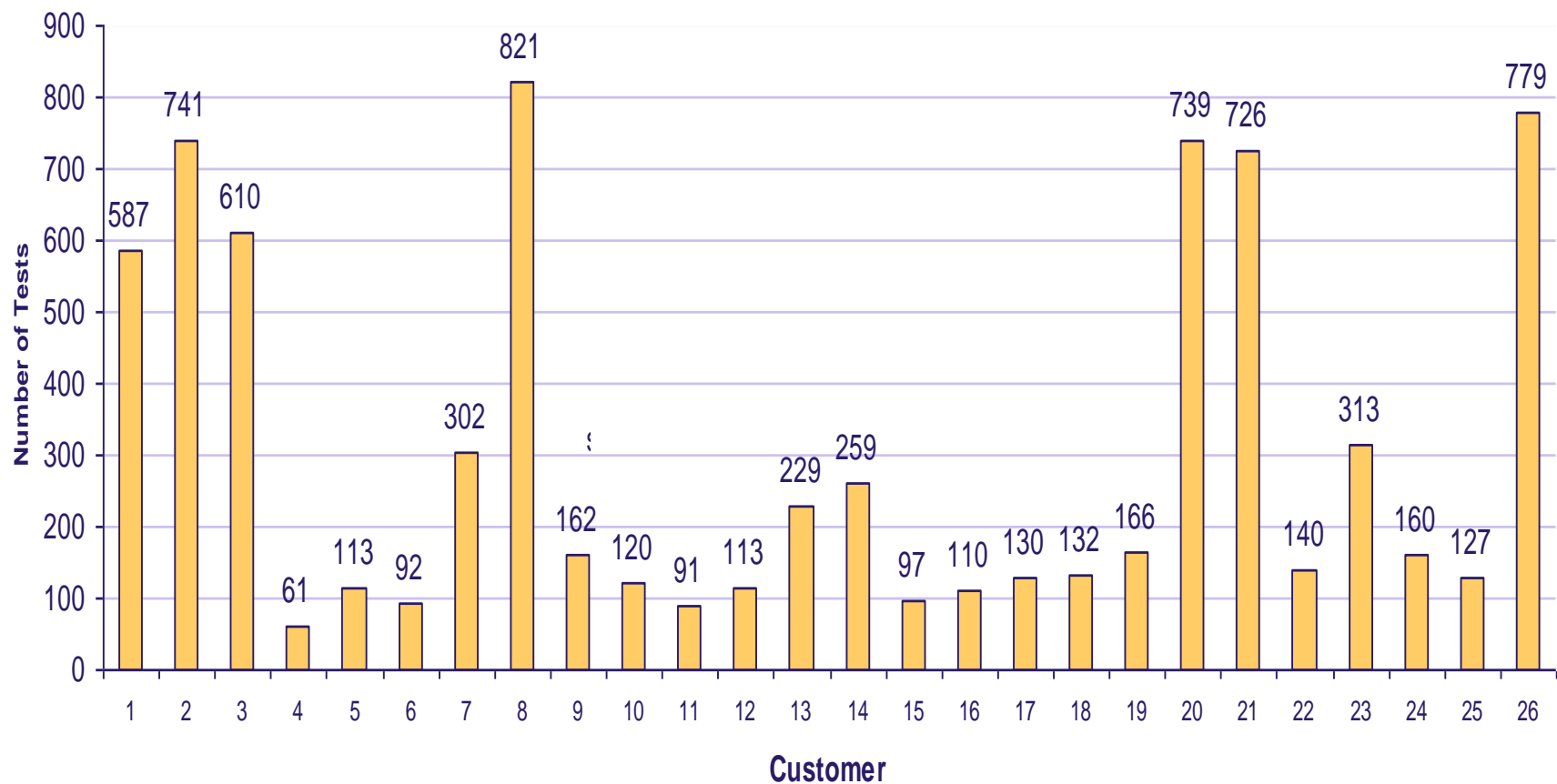
Regards, Kevin



## AIDA-NG Product Line – Outstanding Maturity Level

- ✓ More than **700,000** (!) automated module and integration tests for each customer baseline.
- ✓ The AIDA-NG product line has been excessively tested in a multitude of implementation projects:
- ✓ More than **7900** test cases witnessed by numerous FAT inspection teams since 2005

# System Testing – Acceptance Tests



## Added Value – Compliance with European Safety Regulations

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- ✓ Full compliance with **European Safety Regulations (ESARR1-6)**.
- ✓ Proven **Software Assurance Level (SWAL) 3** according to EUROCONTROL Safety Assessment Methodology (SAM) (SIL-2/IEC 61508 and AL 4/ED-109).

# COMSOFT – AMHS Conformance Testing



AMHS Conformance  
Verification

AMHS  
Implementation  
under Test

- ✓ Full Support of both, regional EUR + ASIA/Pacific AMHS Manuals (ATN/OSI, ATN/IPS)
- ✓ Highest Automation Grade (>95%) of Test Execution
- ✓ Platform-independent Test-Suites
- ✓ Test Message Repository in XML Format
- ✓ Evaluation of Test Results as integral part of Test Suites
- ✓ Detailed Logs and Test Reports

- Suitable for any AMHS
- Use of Standard AFTN/AMHS Interfaces and Configuration
- No specific IUT Test Harness required



Adobe Acrobat  
Document

## Customer References

Germany, EUROCONTROL, Netherlands, United Kingdom, Belgium, France, Suisse, Lithuania, Poland, Slovakia, Bosnia & Herzegovina, Serbia, Macedonia, Libya, Egypt, Saudi Arabia, Zimbabwe, Morocco, Emirates, Oman, Qatar, Pakistan, India, Macau, Singapore, Australia, Fiji, Hong Kong, Peru, Colombia, Angola, Nigeria, Kuwait, Mongolia

# COMSOFT – Experience in AMHS Interoperability Tests

## ➤ ECG

The COMSOFT ECG is used as AMHS Reference System by EUROCONTROL to perform interoperability tests for the evaluation of other AMHS products



## ➤ Customer Support

COMSOFT is prepared to support its customers for the setup and execution of Interoperability Tests with adjacent centres:

- ✓ Test Harness (System Configuration, Test Messages, etc.) in accordance with AMHS Manual is available
- ✓ Test Documentation (Configuration, Test Suites, etc.) is available
- ✓ COMSOFT can provide
  - remote support during test phase (Option A)
  - on-site support during test phase (Option B)

# IOP Tests – Supported COMSOFT Customers

(Blue Colour: COMSOFT Customers)

## Option A - Remote Support:

▪ Bratislava	↔	Vienna	AMHS IOP Tests according to EUR AMHS Manual
▪ Frankfurt	↔	Copenhagen	AMHS IOP Tests according to EUR AMHS Manual
▪ Frankfurt	↔	Brussels, CFMU	AMHS Interconnection Tests (Subset of IOP Tests)
▪ Mumbai	↔	Beijing	AMHS IOP Tests according to Asia/Pacific AMHS Manual
▪ Bordeaux	↔	Madrid	AMHS IOP Tests according to EUR AMHS Manual
▪ Singapore	↔	Bangkok	Pending due to X.400 Conformance Problems of Bangkok
▪ Hong Kong	↔	Macau	Operational AMHS connection
▪ Frankfurt	↔	Madrid	Operational AMHS connection
▪ Sarajevo	↔	Vienna	Operational AMHS connection
▪ NATS, UK	↔	FAA, Atlanta	Operational AMHS connection (inter-regional)
▪ NATS, UK	↔	Singapore	Operational AMHS connection (inter-regional)
▪ Peru	↔	Quito	Operational AMHS connection

## Option B - On-site Support:

▪ Bogota	↔	Peru	Operational AMHS connection
▪ Mumbai	↔	Singapore	Operational AMHS connection
▪ Abu Dhabi	↔	Muscat	Operational AMHS connection
▪ Abu Dhabi	↔	Doha	Operational AMHS connection
▪ Abu Dhabi	↔	Amman	Operational AMHS connection
▪ Abu Dhabi	↔	Egypt	Operational AMHS connection
▪ S. Arabia	↔	Egypt	Operational AMHS connection
▪ Fiji	↔	FAA, Atlanta	Operational AMHS connection (inter-regional)
▪ Macau	↔	Beijing	to be continued after Beijing version update

## COMSOFT – Customer Base

# Our Success



# Customer Base - References/Projects in Europe

## NATS, UK

Locations: Heathrow and Gatwick

- 2 redundant **AMHS**/CDIN/AFTN systems
- 1 redundant **AMHS**/CDIN/AFTN test system

## EUROCONTROL

Location: Brussels

ECG Core Software Package

**EUROCONTROL AMHS Reference System**

## EUROCONTROL, CFMU

Locations: Brussels and Paris

- 4 redundant **AMHS**/CDIN/AFTN systems

## Belgocontrol, Belgium

Location: Brussels

- 1 redundant operational **AMHS**/CDIN/AFTN system
- 1 redundant contingency **AMHS**/CDIN/AFTN system
- 1 redundant test/training **AMHS**/CDIN/AFTN system
- 45 CADAS **AMHS UA**/AFTN User Terminals

## EUROCONTROL

Location: Maastricht UAC

- 1 redundant **AMHS**/AFTN/CIDIN system
- 1 redundant test/development system

## LVNL, the Netherlands

Location: Amsterdam

- 1 redundant **AMHS**/AFTN/CIDIN system
- 1 redundant test/development system

## DSNA (Project: MESANGE), France

Location: Bordeaux and 10 remote sites

- 1 redundant operational **AMHS**/CDIN/AFTN system
- 1 redundant contingency **AMHS**/CDIN/AFTN system
- 1 redundant test/training **AMHS**/CDIN/AFTN system
- 1 redundant **AMHS**/CDIN/AFTN development system
- 16 concentrators installed on 10 remote sites
- up to 150 CADAS **AMHS UA**/AFTN User Terminals

## skyguide (Project: MESANGE), Switzerland

Location: Geneva

- 1 redundant operational **AMHS**/CDIN/AFTN system
- 1 single contingency **AMHS**/CDIN/AFTN system
- 1 redundant test/training **AMHS**/CDIN/AFTN system
- up to 40 CADAS **AMHS UA**/AFTN User Terminals

## Sakaeronavigatsia Ltd, Georgia

Location: Belgrade

- 1 redundant **AMHS**/AFTN switch
- 15 CADAS **AMHS UA**/AFTN Terminals

## Sakaeronavigatsia Ltd, Georgia

Location: Belgrade

- 1 redundant **AMHS**/AFTN switch
- 15 CADAS **AMHS UA**/AFTN Terminals

## Polish Military, Poland

Location: Warsaw

- 1 redundant **AMHS**/AFTN switch
- 63 CADAS **AMHS UA**/AFTN Terminals

## PANSA, Poland

Location: Warsaw

- 1 redundant **AMHS**/CDIN/AFTN switch

## Russian Federation (FGUP RTC AISS)

Locations: Rostov/Don

- 1 redundant CDIN/AFTN system
- 1 AFTN concentrator at a remote site

## DFS, Germany

Locations: Frankfurt and Langen

- 2 redundant **AMHS**/CDIN/AFTN systems
- 1 redundant **AMHS**/CDIN/AFTN test system

## LPS, Slovakia

Location: Bratislava

- 1 redundant operational **AMHS**/CDIN/AFTN systems + 1 single contingency **AMHS**/CDIN/AFTN system
- 1 redundant disaster recovery **AMHS**/CDIN/AFTN system + 1 single contingency **AMHS**/AFTN/CIDIN/ system
- 16 CADAS **AMHS UA**/AFTN Terminals

## FEDCAD, Bosnia and Herzegovina

Location: Sarajevo and Mostar

- 2 redundant **AFTN/AMHS/AM** Systems
- 17 CADAS AFTN Terminals

## RSCAD, Republic of Srpska

Location: Banja Luka

- 1 redundant **AFTN/AMHS** Systems
- 5 CADAS AFTN Terminals

## SMATSA, Serbia and Montenegro

Location: Belgrade

- 1 redundant **AMHS**/AFTN switch
- 1 **AMHS**/AFTN test/training system
- 34 CADAS **AMHS UA**/AFTN User Terminals

## MCAA, Macedonia

Location: Skopje and Ohrid

- 1 redundant **AMHS**/AFTN system
- 23 CADAS AFTN Terminals

## Aeronavigacia, Lithuania

Location: Belgrade

- 1 redundant **AMHS**/AFTN switch
- 15 CADAS **AMHS UA**/AFTN Terminals

## Bulatsa, Bulgaria

Location: Sofia

- 1 redundant **AMHS**/AFTN switch
- 20 CADAS **AMHS UA**/AFTN Terminals

## Croatia Control, Croatia

Location: Zagreb

- 1 redundant **AMHS**/AFTN switch
- 1 **AMHS**/AFTN test/training system
- 5 CADAS **AMHS UA**/AFTN User Terminals





## Customer Base - References/Projects in Middle East & Africa

### ONDA, Morocco

Location: Casablanca

- 1 redundant operational **AMHS/CIDIN/AFTN** system
- 1 **AMHS/CIDIN/AFTN** Test/Training System
- 5 CADAS **AMHS UA/AFTN** User Terminals

### CAA, Libya

Location: Tripoli, Benina, Metiga, Sirt, Sheba

- 1 redundant **AMHS/CIDIN/AFTN/AIM** system and
- 5 gateway sites with 30 CADAS **AFTN/AIM** User Terminals

### NAMA, Nigeria

Location: Lagos, Kano

- 1 redundant **AMHS/AFTN/AIM** System
- 1 redundant **AMHS/AFTN/AIM** Test System
- 120 CADAS **AMHS UA/AFTN** Terminals

### ENANA, Angola

Location: Luanda, Limbago

- 1 redundant **AMHS/AIM** System
- 1 test/training **AMHS/AIM** System
- 50 CADAS **AMHS UA/AFTN/AIM** User Terminals

### NANSC, Egypt

Location: Cairo

- 1 redundant **AMHS/CIDIN/AFTN** system
- Up to 200 CADAS **AMHS UA/AFTN** Terminals

### GCAA, Abu Dhabi

Location: Abu Dhabi, UAE

- 2 redundant **AMHS/CIDIN/AFTN** systems
- 20 CADAS **AMHS UA/AFTN** User Terminals

### DGMAN, Oman

Location: Muskat

- 2 redundant **AMHS/AFTN/AIM** system
- 1 contingency/test/training **AMHS/AFTN/AIM** System
- 1 test/training **AIM** System
- 25 CADAS **AMHS UA/AFTN** User Terminals

### QCAA, Oatar

Location: Doha

- 1 redundant **AMHS/AFTN/AIM** System
- 1 redundant **AMHS/AFTN/AIM** Test System
- up to 60 CADAS **AMHS UA/AFTN** Terminals

### DCA, Dubai

Location: Dubai, UAE

- 1 redundant AFTN switch

### CAA, Zambia

Location: Lusaka

- 1 redundant AFTN switch

### CAA, Zimbabwe

Location: Harare

- 1 redundant **AMHS/CIDIN/AFTN/AIM** Switch
- 18 CADAS **AMHS UA/AFTN/AIM** User Terminals

### GACA, Saudi Arabia

Location: Jeddah and Riyadh

- 1 redundant **AMHS/CIDIN/AFTN** System
- 1 single **AMHS/CIDIN/AFTN** Backup System
- Up to 60 local CADAS **AMHS UA/AFTN** Terminals

### DGCA, Kuwait

Location: Doha

- 1 redundant **AMHS/AFTN/AIM** System
- 1 contingency **AMHS/AFTN/AIM** System
- 1 test/training **AMHS/AFTN/AIM** System
- 12 CADAS **AMHS UA/AFTN/AIM** Terminals

## Customer Base - References/Projects in the Asia Pacific Region

### CAAN, Nepal

Location: Kathmandu  
**1** redundant  
**AMHS/AFTN** System  
**25** CADAS **AMHS UA**  
 User Terminals

### CAAB, Bangladesh

Location: Dhaka  
**1** redundant  
**AMHS/AFTN** System  
**12** CADAS **AMHS UA**  
 User Terminals

### CAAS, Singapore

Location: Singapore  
**1/1** redundant/single **AMHS/AFTN+ATN Router** system  
**12** CADAS **AMHS UA/AFTN** User Terminals

### HKCAD, China

Location: Hong Kong  
**2** redundant **AMHS/AFTN** systems  
**up to 150** CADAS **AMHS UA/AFTN** User  
 Terminals

### ATO, Philippines

Location: Manila  
**1** redundant **AMHS/AFTN** incl. **ATN Router**  
 system  
**40** CADAS **AMHS UA/AFTN** Terminals

### CAAM, Macau

Location: Macau  
**1** redundant **AMHS/AFTN** incl. **ATN Router** system  
**14** CADAS **AMHS UA** User Terminals

### PCAA, Pakistan

Location: Karachi  
**1** redundant **AMHS/AFTN/AIM** System incl.  
**ATN Router**  
**46** CADAS **AMHS UA** User Terminals

### AAI, India

Location: Mumbai  
**1** redundant **AMHS/AFTN** System incl.  
**ATN Router** system  
**25** CADAS **AMHS UA** User Terminals

### APII, Indonesia

Location: Palembang  
**1** redundant AFTN switch  
**10** CADAS AFTN User Terminals

### DOTC, Indonesia

Location: Djakarta  
**1** redundant **AMHS/AFTN/AIM** Test and  
 Reference System  
**10** CADAS **AMHS UA/AFTN/AIM** Terminals

### ASA, Australia

Location: Brisbane, Melbourne  
**2** redundant **AMHS/AFTN** incl. **ATN Router** systems  
**1** redundant test/development system  
**up to 60** CADAS **AMHS UA/AFTN** User Terminals

### Fiji

Location: Nadi  
**1** redundant **AMHS/AFTN/AIM +ATN Router** systems  
**1** single **AMHS/AFTN/AIM** test/training system  
**16** CADAS **AMHS UA/AFTN/AIM** User Terminals

### MCAA, Mongolia

Location: Ulan Bator  
**1** **AMHS/AFTN** Gateway

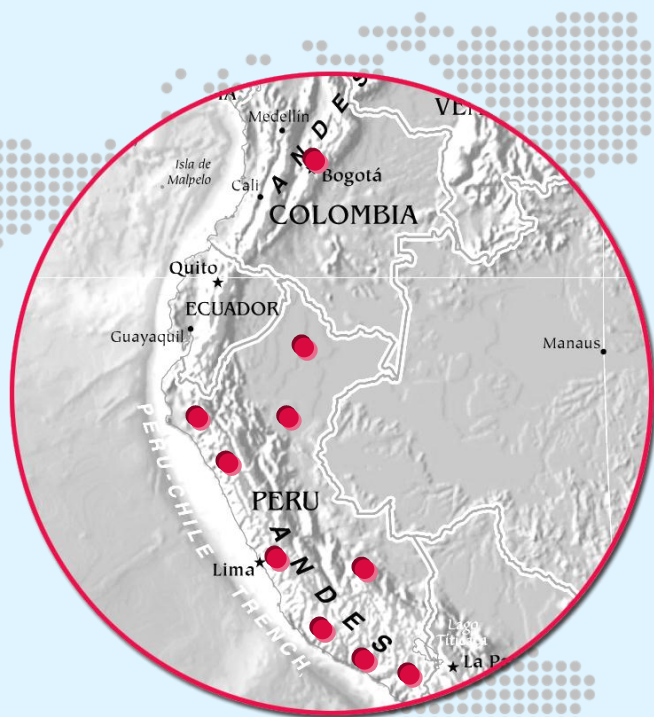
### Airways New Zealand

Location: Christchurch (OPS, DEV), Auckland (BCK)  
**3x** redundant **AFTN/AMHS** Systems (OPS, BCK,  
 DEV)  
**Up to 120** CADAS **AFTN/AMHS UA** User Terminals

### Papua New Guinea

Location: Port Moresby  
**1x** redundant **AFTN/AMHS** Systems  
**12** CADAS **AFTN/AMHS UA** User Terminals

## Customer Base – References/Projects in South America/Caribbean



### U.A.E.A.C, Colombia

Location: Bogotá and 6 domestic local and remote sites  
1 redundant AFTN/**AMHS** system  
**63** CADAS **AMHS UA** User Terminals

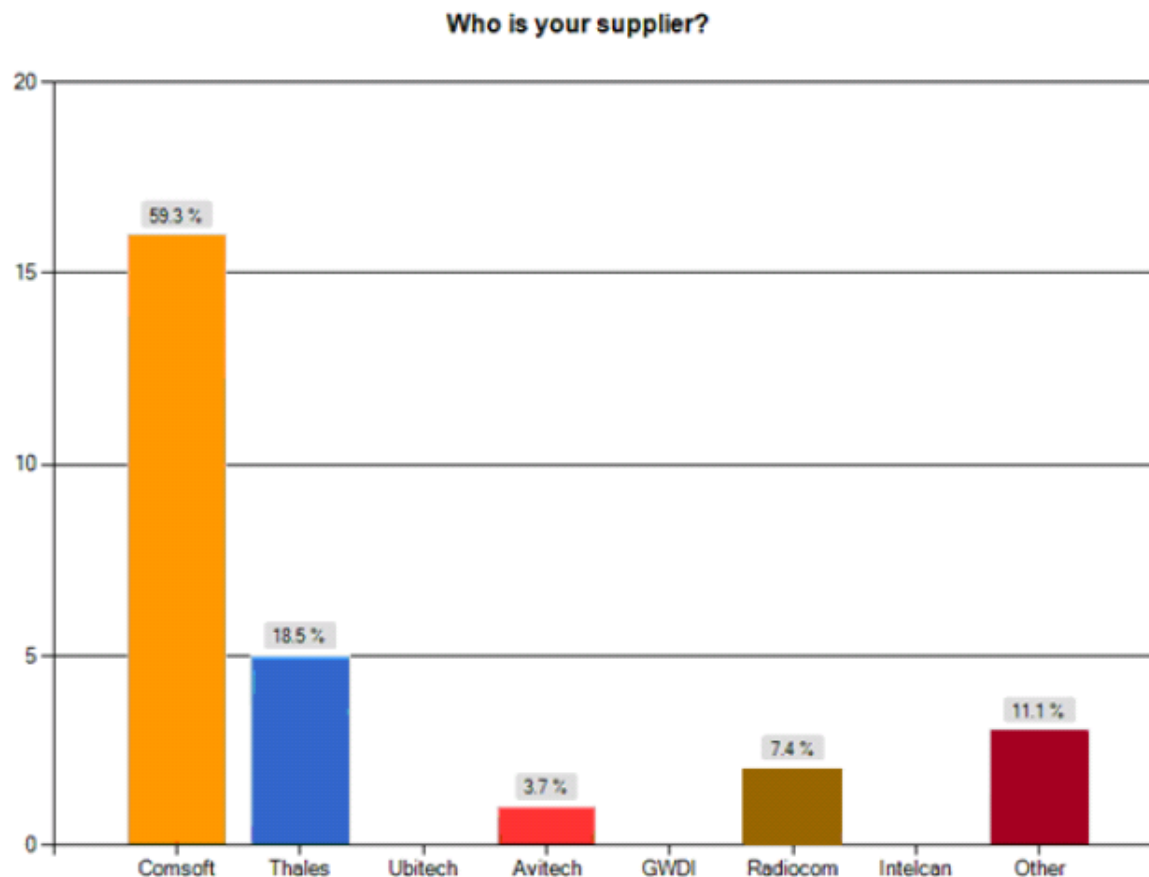
### CORPAC, Peru

Location: Lima and 31 domestic local and remote sites  
1 redundant AFTN/**AMHS** system with **AIM** extension  
**86** CADAS **AMHS UA/AIM** User Terminals

### TTCAA, Trinidad-Tobago

Location: Port of Spain and 14 Caribbean  
1 redundant AFTN/**AMHS** system  
**46** CADAS **AMHS UA** User Terminals

## SITA AMHS Market Survey (published on the ICAO AMHS workshop in Santo Domingo, November 26th, 2009)



### AIR TRAFFIC CONTROL KNOW-HOW

## COMSOFT – AMHS Activities 2010 - 2013

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In the period from 2010 – today COMSOFT was extremely successful and won multiple AFTN/AMHS customers:

**53 ANSPs are equipped with  
the AIDA-NG/CADAS  
AFTN/AMHS**



## AIDA-NG – Result of the Evolution



AIDA-NG has evolved to the most mature AFTN/CIDIN/AMHS system on the market

COMSOFT is the AMHS Market Leader

# CAUG – COMSOFT AIDA User Group



**CAUG** 6<sup>th</sup> Annual Meeting 07 – 08 May 2013, Karlsruhe, Germany

# Contact

Manfred Schmid  
Chief Executive Officer  
[manfred.schmid@comsoft.aero](mailto:manfred.schmid@comsoft.aero)

Peter Cornelius  
Head of Department CSA  
[peter.cornelius@comsoft.aero](mailto:peter.cornelius@comsoft.aero)

Headquarters  
COMSOFT GmbH  
Wachhausstr. 5a  
76227 Karlsruhe  
Germany  
Phone: +49 721 9497-0  
Fax: +49-721-9497-129  
[info@comsoft.de](mailto:info@comsoft.de)  
<http://www.comsoft.aero/>

Uwe Kurpat  
Product Manager AMHS  
[uwe.kurpat@comsoft.aero](mailto:uwe.kurpat@comsoft.aero)

Dominik Koch  
Account Manager, CSS  
[dominik.koch@comsoft-sat.com](mailto:dominik.koch@comsoft-sat.com)

Satellite and Terrestrial Communications  
COMSOFT Satellite Services GmbH  
Benzstr. 2  
71720 Oberstenfeld  
Germany  
Phone: +49 7062 91651-10  
Fax: +49 7062 91651-99  
[info@comsoft-sat.com](mailto:info@comsoft-sat.com)  
<http://www.comsoft-sat.com/>





# Thank You!