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Easy data access

Users expect aeronautical information services to be easily accessible, secure and adaptable to their exact needs

Increasing air traffic not only produces a larger amount of aeronautical data, but also an increasing demand to access and retrieve current data at any time from any place in the world. However easy data access must not reduce safety or increase costs. Therefore an Aeronautical Information System (AIS) must fulfil the highest safety standards and be resistant to abuse and intruders, while providing comprehensive features to facilitate the ANSP staff's routine work. Supporting features can be:

- Direct data access for airlines and pilots via the Internet and other networks as a cost-effective service, requiring few staff. Integrated Pilot Briefing, for instance, following the one-stop shopping principle, allows the user to directly access all relevant dynamic data such as NOTAM and METEO, and static data such as AIP, with one simple query.
- Automatic checks and processes instead of error-prone manual procedures, which will improve security and reduce workload. Relevant data for flight plans, for example, should already be checked for consistency when being entered into the system.
- High integration of the individual components for the generation of static aeronautical data, e.g. Chart and AIP Production systems, with the databases. This ensures swift handling and distribution of all static data.

Based on these considerations,

Comsoft developed its Comsoft Aeronautical Data Access System (CADAS), using the latest web technology and taking into account the actual needs of the users. CADAS thus became an aeronautical information and terminal system, which allows the safest and easiest access in the ATC centres and their countrywide enterprise networks, as well as VPN channels on the Internet.

Multi-application platform

Users expect an aeronautical information system to be an integrated platform that meets their needs and facilitates their work without compromise. The needs, however, are as different as the users and their environments; therefore, an AIS platform must be a perfect fit with any kind of application, providing for smooth enhancement. CADAS covers a wide range of aeronautical applications and offers many different services distributed over its various modules so that the system can be easily adapted to the needs of any ANSP. The CADAS applications fulfil all the requirements of ATS messaging, Integrated Self-Briefing, NOTAM and MET databases, RPL processing and Charting, and AIP. Figure 1 gives an overview of the architecture of CADAS and the use of the various terminal types.

Acceptance of new technologies and systems is best achieved by making their handling as easy as possible,

which minimises the training period. CADAS follows these principles with its logically structured graphical surface, offering quick access to all features and fostering intuitive operation by means of convenient functions and various system services.

As mentioned before, another intelligent feature of a terminal application is the system's ability to continuously check entered data against relevant standards and the static aeronautical data stored in the system, and to give the user immediate feedback about the result. Thus, the terminals give the user clear guidance, eliminating errors rather than correcting them.

A sophisticated user/group concept, as with CADAS, provides secure access to the databases while access rights to templates, filter specifications, mailboxes, and stored work results can be shared among the team members. Yet, it is not only any team member working in an ATC Centre who should be able to enjoy this comfort, but also users connected via the Internet. In order to realise this feature, the HMI of the CADAS application terminals does not consist of HTML thin clients, but of real Java applications that are downloaded from the server by means of the Sun Webstart technologies.

The built-in AMHS (Aeronautical Message Handling System) and ATS User Agent follow the concept of simple handling, and are the result of

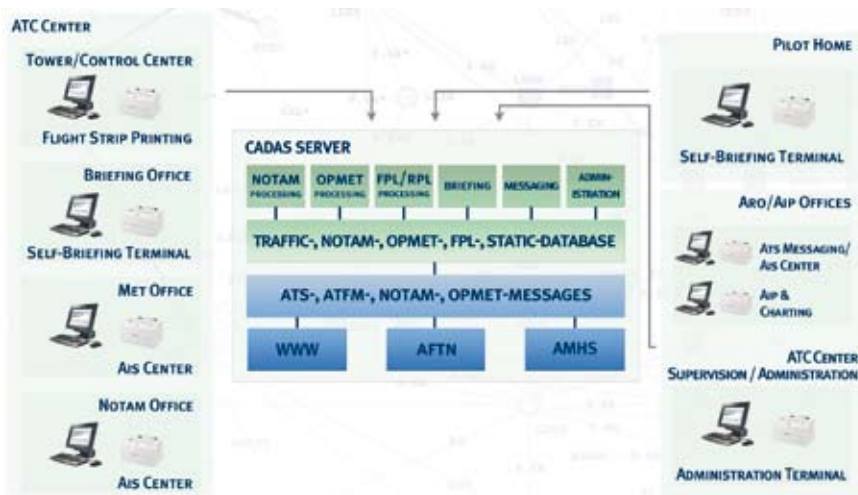


Figure 1: Multi-application platform

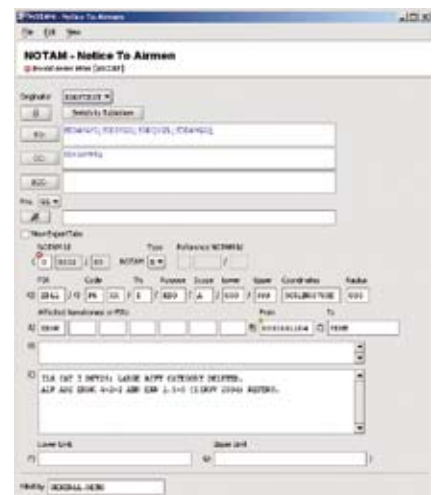


Figure 2: NOTAM template: Incorrect input is marked and corrections are proposed

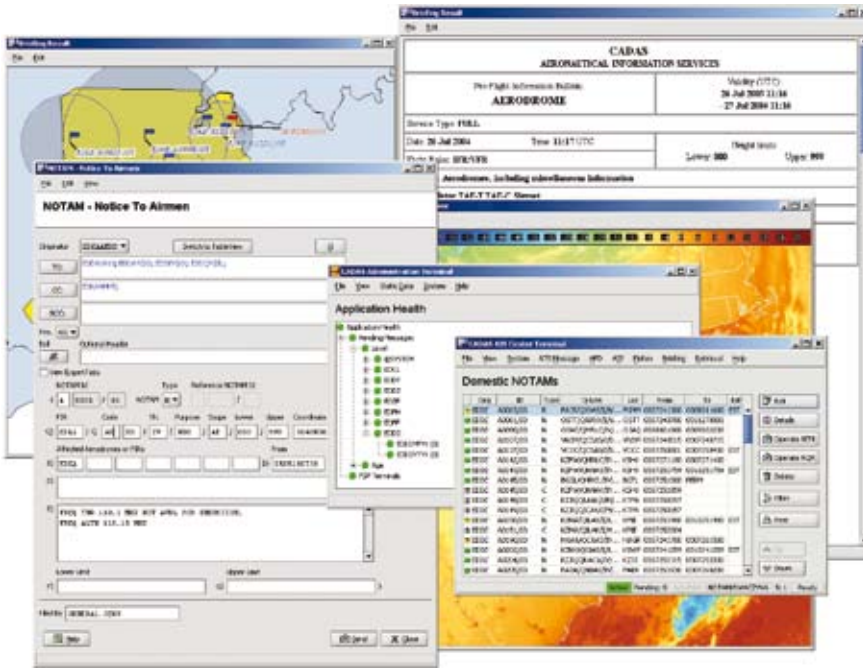


Figure 3: CADAS screenshots

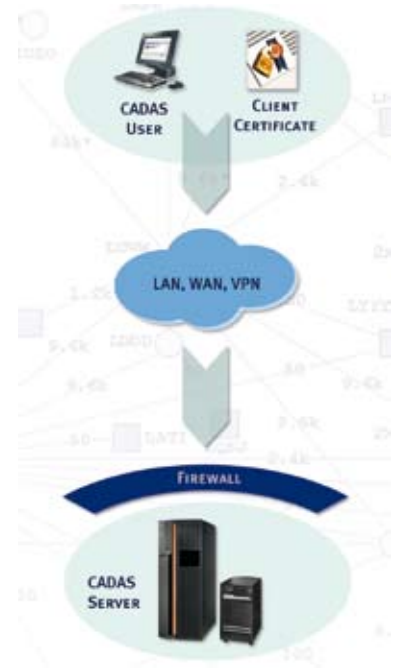


Figure 4: CADAS security concept

Comsoft's expert skills as a leading AMHS manufacturer. AMHS, based on X.400, is the likely candidate to take over the ATS services that are currently handled via the AFTN. The initial idea behind this development was to use standard X.400 equipment for ATC communications. However, conventional X.400 User Agents and COTS products on the market are unable to fulfil the demanding needs of ATS operators because X.400 focuses on the pure messaging aspect rather than on semantics of ATS messages. As a consequence, the basic properties of X.400 have to be enhanced by additional features to satisfy the users and convince them to adopt the new technology.

The CADAS User Agent provides the features and convenience functions of a highly sophisticated ATS message terminal and the message handling capabilities of an AMHS User Agent. For instance, the Active Flight Database helps the user to generate and file flight-plan-related update messages with a few mouse clicks.

Technology and security

CADAS is based on leading-edge Internet technology and provides superior performance compared to conventional AIS solutions. It is therefore optimally suited for large environments with a multitude of users and terminals.

The CADAS high-availability cluster configuration and the load-sharing facility provide utmost data integrity, reliability, and powerful performance. This results in high throughput and storage capacity, and the ability to simultaneously connect a great number of users to the system. It is based on up-to-date COTS servers and a powerful LINUX operating system, and thus can be hosted on a variety of current and future platforms.

Security is an important issue. Systems that are accessible via more or less open IP networks need to be relentlessly protected against intruders. Access to CADAS is controlled by a highly secure two-password and certificate-access procedure: the first password gives the user access on network level; and the second password is required to log on to the CADAS application. Central supervision and tracking of user activities allow the administrator to take appropriate action in the case of faulty system operation or system abuse.

Maintenance

Maintenance efforts and costs are reduced to a minimum since software updates are automatically distributed to the CADAS client terminals from the central server. This is particularly important if there are a large number of terminals or if the terminals are spread over several sites throughout

HIGHLIGHTS

- NOTAM, OPMET, AIP, Chart, Active Flight Databases
- Ease of use for ATC Centres and Internet users
- Integrated NOTAM, OPMET, AIP briefing
- Powerful database search facility
- Sophisticated AMHS and ATS user agent
- Centralised maintenance, software distribution and administration

the country. The CADAS client terminals check the CADAS server automatically for new software releases and download them on their own. CADAS terminals, databases and message mailboxes are all centrally maintained and monitored. All relevant data is stored on the CADAS cluster so that the utmost data safety and integrity are totally guaranteed. This concept minimises the risk of data loss and allows easy replacement of any defective terminal hardware.

Summary

CADAS has been designed to be a highly versatile system that fulfils the ASNPs needs for a very comfortable AIS, and an intelligent AMHS messaging solution.

Leading-edge web technology, automated processes, and centralised maintenance of the system provide aeronautical information services in an efficient and cost-effective way. ❖