

Secure Information Sharing in Air Traffic Management

In the past, ATC optimisation was mainly done locally, within a single sector and with coordination just between neighbouring sectors, and ATC systems had a very low level of integration with other systems, e.g. at airports. Now, in order to deal with the enormous growth of traffic, ATC (and also Total Airport Management) has to be done at a larger scale, based on information from multiple sources and in a much larger time frame. This turns ATC in a problem of distributed optimisation between multiple domains with many stakeholders like control centres, airports or airlines. But things are not easy. How can flight delays detected as early as possible? What are the impacts of this delayed flight? Does another plane need the plane's gate at the departure airport? Can the plane en route phase take place without congestion? What is the impact on the plane's further usage during the day? All this needs timely information exchange and optimisation between many stakeholders.

Although the importance of introducing a System-Wide Information Management (SWIM) capability facilitating co-operation among stakeholders is now generally recognised, there is still no clear indication on how to implement this capability and, in particular, which technologies would enable its successful operation.

The SWIM-SUIT EU FP6 project contributes to this "need for technological assessment by developing a SWIM prototype providing the basis for assessment of the technological solutions adopted. The significant involvement of users will also ensure that requirements for SWIM implementation will be identified and legal and financial implications will be assessed" (www.swim-suit.aero).

In the past, IT security of ATC systems was considered a minor concern. To a certain degree, this was acceptable, since



these systems were really a difficult target for attackers, as they were mainly proprietary, often based on low tech communication means like fax or voice and not directly connected to public networks. In the future, the trend to collaborative ATM systems will dramatically increase the IT security requirements.

ObjectSecurity Ltd. (www.objectsecurity.com), one of FAC's new members and a member of the SWIM-SUIT consortium, has worked towards solutions for the SWIM security challenge for a number of years. The company has previously worked on the AD4 project, where an innovative Virtual Air-Space representation for ATM simulation systems was supported by model driven security and middleware, to support shared views of information and interoperability allow workers to cooperate, managing efficiently complex operations (www.ad4-project.com).

ObjectSecurity Ltd., headquartered in Cambridge with a US office in San Jose/USA, is an innovative SME that specialises in information security for complex, distributed applications, especially in mission-critical, heterogeneous environments. Successful projects include air traffic management,

airports, defence, telecoms and more.

To meet the security management needs for complex systems like SWIM, ObjectSecurity advocates "model driven security" (www.modeldrivensecurity.org), an emerging approach to simplifying information security management and enforcement for changing, large, networked IT landscapes. According to IT forecast firm Gartner, model driven security is predicted to have a significant impact and benefit to industry over the next couple of years. Model driven security is one of the concepts behind OpenPMF 2.0 (www.openpmf.com) ObjectSecurity's leading model driven security solution in the market today. OpenPMF 2.0 goes much beyond traditional identity and access management solutions by providing rich, fine-grained, and highly flexible central management and local enforcement at each endpoint, and its modular architecture allows the integration of practically any endpoint IT system. The patent-pending technology is based on 9 years of solid research of customer requirements and technical R&D by leading distributed systems experts at ObjectSecurity and University of Cambridge and is the most thought-through solution currently on the market.

