

HIGH- PERFORMANCE METEOROLOGICAL DATA MANAGEMENT

BUSINESS PROFILE

METEOSWISS

Swiss meteorological and climatological service provider

INDUSTRY

Government

IONA PRODUCTS

Orbacus™ v4.1

BENEFITS

- Time-saving solution
- High performance and reliability
- New product functionality
- Increased accuracy of information



“Accurate, up-to-date weather information is absolutely critical for safe aviation. We need to produce weather condition reports at our airports every 30 minutes to ensure that aircraft have the most recent information possible at all times. Orbacus allowed us to automate data acquisition and distribution, ensuring error-free, timely weather reports at our major airports.”

- Simon Rohling, SMART Project Manager, MeteoSwiss

MeteoSwiss is the Swiss national weather service. It is a federal office, with responsibility for providing meteorological and climatological information for use in public, businesses, and public institutions. MeteoSwiss cooperates closely with other European weather services and the meteorological organizations WMO and ICAO.

Headquartered in Zurich, MeteoSwiss employs approximately 250 staff. The history of MeteoSwiss dates back to 1863 when the Swiss Nature Research Society began weather observations at 88 stations in Switzerland. It provides weather information for all airlines using Swiss airports. The aviation weather unit has offices at Zurich and at Geneva airports that collect, analyze, and interpret data from its weather sensors distributed in the airports and their immediate vicinity.

MeteoSwiss uses Orbacus to automate the data acquisition, analysis, and distribution at Swiss international airports in Zurich and Geneva. The project is called SMART (System for Meteorological Automated Reporting), and has been implemented in Zurich since January 2002.

ACCURATE AVIATION INFORMATION

The safety of airplane take-off and landing depends heavily on weather conditions. Air traffic control and pilots need to consider conditions such as wind, temperature, and cloud cover. They need to be updated

regularly so that all controllers and pilots have access to up-to-date information at all times. Sudden changes in wind conditions can have critical effects on the control of an aircraft, specifically during take-off and landing. Any aircraft entering or leaving an airport must have constant access to local weather information.

MeteoSwiss has operations at Geneva and Zurich airports. Its purpose is to provide air traffic control with the most up-to-date weather information for the vicinity of the airport. There are many weather sensors in and around the airport that provide constant data about the current climatic conditions. MeteoSwiss gathers this information every 30 minutes and collates it into a report that is then distributed to the controllers. The report is also sent to all airlines that are landing or taking off from the airport. The weather sensors either provide data to a data acquisition application, or the data is read directly from the device. This type of weather analysis is called 'now-casting'.

Until January 2002, MeteoSwiss staff collated the data manually every 30 minutes. They then updated the information manually using an editor, which created the report. This was a time-consuming task that was open to error. MeteoSwiss needed to automate the process so that errors were removed and the information could be checked automatically before distribution.

"Even though the process we had in place worked, it was very time consuming and left our staff with little time to carry out other tasks. Also, the process was prone to error, and a great deal of time was spent checking the syntax of the data to ensure that it was formatted correctly before distribution. We decided to automate everything to save time, reduce errors, and allow our staff to work on more challenging tasks," said Mr Rohling.

HIGH-PERFORMANCE AUTOMATION

SMART went live in Zurich Airport in January 2002. It automates data processing and report creation, and then when the report has been created, it distributes it to the relevant parties. SMART uses Orbacus v4.1 for the data acquisition and report distribution. In between these two steps, the MeteoSwiss staff—called observers—can edit the data in the report before it is published. This process is executed every 30 minutes, 24 hours a day, 365 days a year. Performance and reliability are essential for such a system.

With SMART in place, the observers do not need to spend time carrying out manual tasks such as reading weather sensor devices and data checking. The entire process is automated. All the information is updated automatically in an on-line form so that edits can be made. Once the information has been prepared, SMART uses Orbacus to distribute the information to the interested parties.

SMART saves a considerable amount of time per report, and because a report is created every 30 minutes, this corresponds to an enormous time saving for MeteoSwiss staff. Because the process is automated and human intervention is supported by sophisticated integrity check facilities, this removes the possibility of error in the data. With Orbacus handling the data acquisition and distribution, MeteoSwiss can deliver its weather report much more accurately than with the old process.

"SMART increases the accuracy of our reporting capability and saves our staff a significant amount of time in data collection and validation. Orbacus is at the center of SMART, and it allows us to provide crucial information to the right people at the right time. It also gives our staff the time to do less manual tasks and carry out work that is more challenging and interesting," said Mr Rohling.

TRUSTED TECHNOLOGY

When the SMART project began, MeteoSwiss did not investigate other technologies or products. Orbacus is a trusted technology within MeteoSwiss. MeteoSwiss knew Orbacus' performance would handle the requirements of SMART. Also, IONA delivers the Orbacus source code with the product. This is a benefit to MeteoSwiss, as it allows the developers to diagnose and resolve problems quickly.

CORBA is important for MeteoSwiss, as it plans to develop Java clients for the application. The main application is built using C++, so CORBA's language independence will be an important factor for the future.

"CORBA and Orbacus are trusted technologies for us. They are used in other applications within our organization, and have served their purpose well. We did not need to investigate other solutions or vendors for the SMART project. Our knowledge of Orbacus' strengths combined with IONA's strong track record was enough for us to make our technology choice," said Mr Rohling.

NEW OPPORTUNITIES

SMART is a highly configurable distributed means for data acquisition, calculation, reporting, and visualization in real time. The system's architecture is based on pipes and filters provided as CORBA services on dedicated workstations within MeteoSwiss. The calculation pipeline contains the meteorological rules and algorithms to produce the necessary data from the sensors' measured values. It is triggered by the arrival of new measurements or by reading them periodically. A client, or SMART Editor, subscribes to the server and is informed when a new report is produced. The client is a distributed observer and retrieves the new report itself on notification by the server. If necessary, the user can then edit the presented report using syntax tools and other validity checks.

"The SMART system is implemented in C++ using CORBA middleware. With the mixed language support of Orbacus, we have the ability to provide another SMART client, which will be JAVA based. This will allow users to visualize specific data in a geographical context on a map, or as time series," said Mr Rohling.

PRODUCTS

Orbacus is a fully CORBA compliant ORB that is distributed as source code. It is intended for organizations needing a customizable, high-quality, high-performance ORB. Orbacus users routinely extend the standard product by porting it to new platforms, linking it to non-standard transports, developing new ORB services, or otherwise customizing the ORB to meet their precise needs. Orbacus is available in two language versions: C++ and Java.

Orbacus is CORBA 2.5 compliant and is designed for rapid development and deployment in your choice of C++ or Java. It offers support for such advanced features as the Portable Object Adaptor (POA), and Objects by Value (OBV). Orbacus also supports some of the features in the CORBA 3 standard, including Portable Interceptors.

Corporate Headquarters

IONA Technologies PLC
The IONA Building
Shelbourne Road
Dublin 4
Ireland
Tel: +353 1 637 2000
Fax: +353 1 637 2888

US Headquarters

IONA Technologies, Inc.
200 West Street
Waltham, MA 02451
USA
Tel: +1 781 902 8000
Fax: +1 781 902 8001

Asia-Pacific Headquarters

IONA Technologies Japan, Ltd
SKI Akasaka Building
3-21-16 Akasaka, Minato-ku
Tokyo 107-0052
Japan
Tel: +813 3560 5611
Fax: +813 3560 5612

Sales: info@iona.com

FTP site: ftp.iona.com
www.iona.com

IONA, IONA Technologies, the IONA logo, Orbix, E2A, End 2 Anywhere, End To Anywhere, Orbix E2A, IONA E2A, IONA e-Business Platform, Orbix E2A Web Services Integration Platform, SureTrack, IONA XMLBus, Adaptive Runtime Technology, Orbacus, Orbix/E, IONA University and Total Business Integration are trademarks or registered trademarks of IONA Technologies PLC and/or its subsidiaries. Java and J2EE are trademarks or registered trademarks of Sun Microsystems, Inc in the United States and other countries. CORBA is a trademark or registered trademark of the Object Management Group, Inc in the U.S. and other countries. All other trademarks that may appear herein are the property of their respective owners.