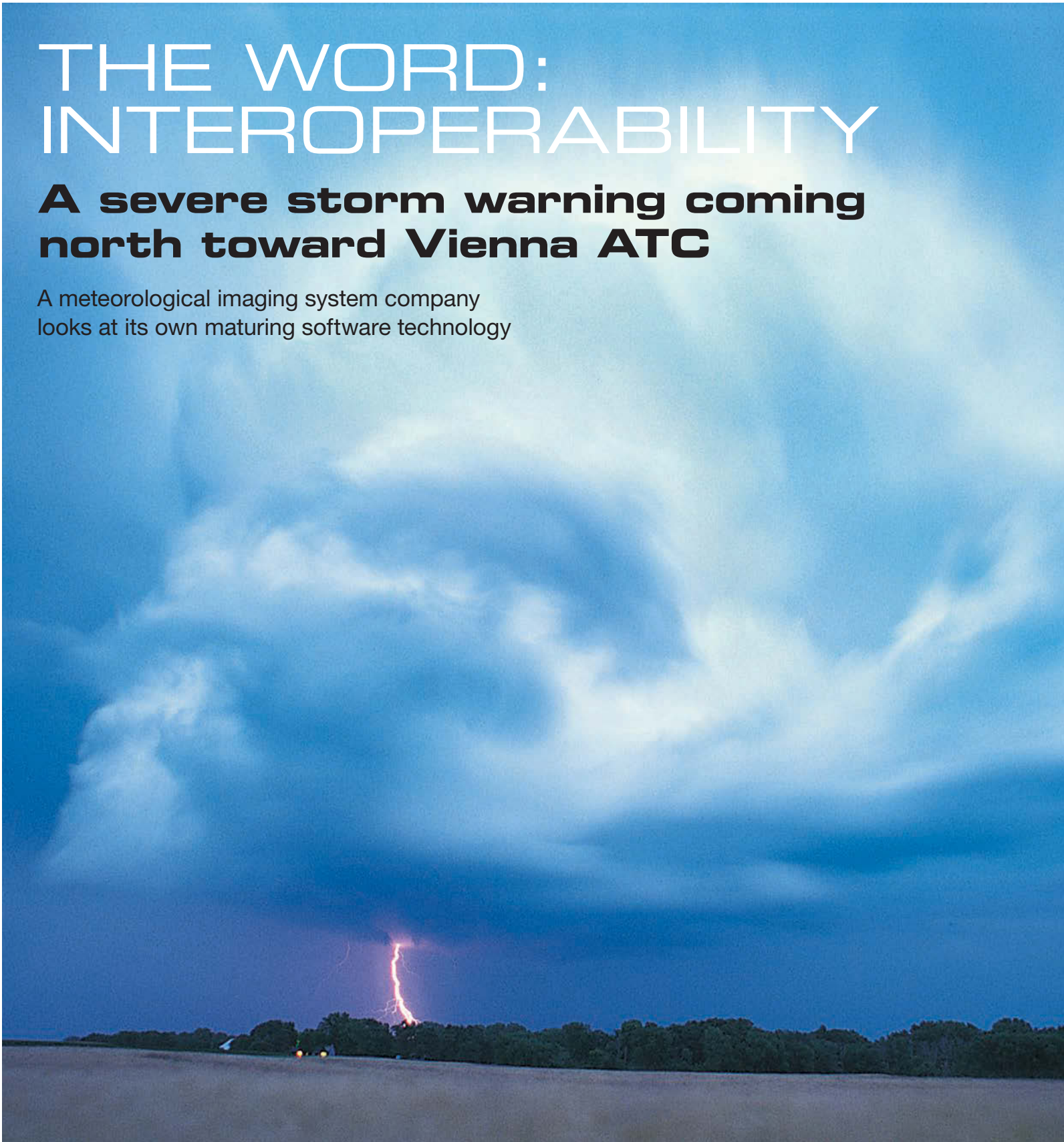


THE WORD: INTEROPERABILITY

A severe storm warning coming north toward Vienna ATC

A meteorological imaging system company
looks at its own maturing software technology



At Meteorological World Expo 2012 in Brussels, CineSat's developers presented plans and achievements for new levels of interoperability. And one year later, the same company is keen to know how it is progressing along this road and is seeking user feedback and forecaster experiences to help in this.

CineSat is a fully featured meteorological imaging system covering all aspects of processing images from current weather satellites and merging them with other meteorological data to create highly informative weather products.

A special feature of the system is its unique set of automated real-time nowcasting tools, including cloud motion and development analysis; CB analysis and prediction of future movement; and predicted satellite images several hours into the future.

Bringing safety to aviation

Weather is still one of the main causes of air traffic accidents, and real-time short-range weather prediction adds extra safety in an ever denser airspace. Air traffic control authorities have reported that CineSat helped to prevent critical situations and enabled scheduled flights to fly safely in situations where other forecast data failed to reflect the actual situation.

ATC weather service in Vienna

The Austrian ATC met office studied a six-day period with severe weather and pessimistic forecasts. A supercell with severe storms and rainfall was moving toward Albania and northern Greece.

Based on other forecasts, several flights would have had to be cancelled, resulting in delays and unexpected costs for the airlines.

This was the case with flight OS851 from VIE to LATI. For the destination of LATI, CineSat showed that the supercell would have passed the destination area by about 09:30am, and that this flight could be operated on schedule.

For flight OS881 to LGTS, a decision was needed on whether the supercell would move over northern Greece. CineSat analysis for the next few hours showed an interesting split in the atmospheric flow and, in contrast with numerical weather predictions, that the cell would not move east-south-east, but would progress on the northern branch of the stream in a north-easterly direction. This was contrary to NWP model forecasts and enabled a safe flight on schedule.

For flight OS831 to LQSA, forecasters were asked if the runway would be wet or dry at 10:30am as, for this type of plane, a wet runway would have been too short for landing. CineSat showed that the cloud system was decaying and that the chance of rain showers, as indicated by the Terminal Area Forecasts, was no longer a given.

In another case, an airline had asked about sending a transport plane with degraded de-icing facilities to UKKK. CineSat forecast images to show that a front with cold cell tops would stay in this area at the time of arrival, and in contrast to SigCharts, the company had to warn the pilots of some slight or medium icing on approach.

Breaking boundaries between weather services

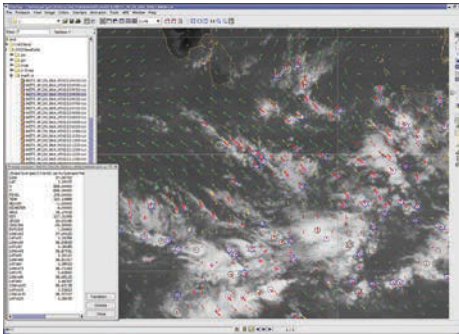
Weather as a borderless worldwide process should be a seamless operation between

FAULT TOLERANCE

- CineSat can handle missing, corrupted and delayed input data
- It can survive full-disk and network failures
- It will automatically recover from accidental process kills
- It will even survive power outage, and smoothly resume normal operation after power-on

The CineSat team installed automated, failsafe features for some very demanding operational solutions in the Meteosat First Generation Ground Segment, 1990-1995.

Nowcasting: Detecting hazardous developments well in advance



Cloud cell analysis and prediction over the Indian ocean (Photo: EUMETSAT)

meteorological systems. But while interoperability saves cost and improves services, in practice it does not always happen. For many weather services, it is still a challenge to obtain and correctly use data from another department.

CineSat's system architecture is especially designed to support close cooperation and exchange of data, procedures and methods between partners.

With dozens of data interfaces and a wide-ranging set of fast and accurate transformations, the system allows for a very smooth exchange of data between weather services.

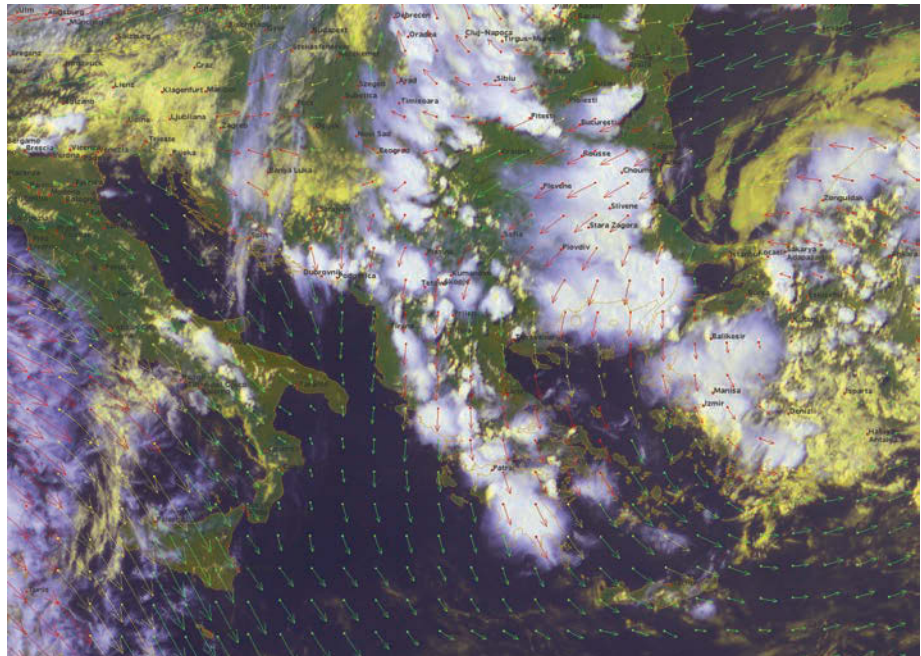
Interoperability, flexibility and integration

Most weather services require a very high level of interoperability between CineSat and their other systems. The company integrates into an existing environment that can be fully tailored to the needs of different applications.

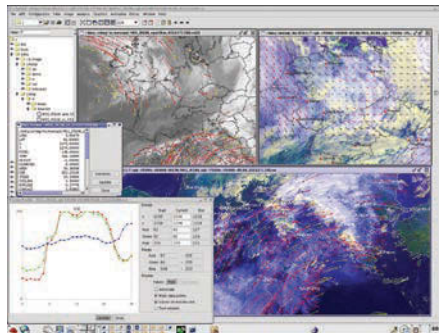
Users have full control over every single algorithm and production parameter, and can add their own processing. All configuration is stored in hierarchical profiles, which allow setting of company and group defaults, and quick creation of variants and research testbeds.

CineSat can be set up as a main data processing and display system, or act invisibly in the background to provide other systems and programs with data sets, images, tables, nowcasts, weather graphics and animation movies.

Several national weather centers use CineSat as a main production workhorse for all their imaging applications, calling their own programs and applications from its automation framework. Others integrate CineSat components into their own systems



Real-time prediction of cloud movement showing a split of atmospheric streams north of Greece (Photo: EUMETSAT)



Real-time nowcasting increases airspace safety (Photo: EUMETSAT)

— such as for NinJo, the Nowcasting SAF, and some of the sophisticated nowcasting solutions at MeteoSwiss.

Robustness and operation

Users have found CineSat to be extremely robust. When upgrading systems at customer sites, the company has often encountered instances of CineSat running continuously without any problems for several years. CineSat's automatic production survives full disks, network failures and even power outages.

In an incident at one national weather service, a user reported that its IT department had accidentally switched off a CineSat server after two years of uninterrupted, fault-free operation. When its forecasters complained about missing images and nowcasts, the operator was somewhat at a

HUNDREDS OF METEO PRODUCTS PER HOUR

A typical application of CineSat at national meteorological centers is the continuous automated real-time production of hundreds of products per hour for internal and external end-users. These are provided for road services, construction business, search and rescue, agriculture and health, tourist areas, power plants, and many others who have expressed an interest in having the best possible planning, savings and decision support.

loss as to the CineSat start-up procedures, as for years there had been no need to do this.

In the first instance, they simply powered-up the server again and, to their great surprise, this did the trick perfectly. CineSat resumed normal real-time production automatically, without any further operator interaction.

Since then, a standard operator instruction has been: Don't pull the plug. ■

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