



# DWD: Every Second Counts in Weather Forecasting

## Speed Saves Lives

Deutscher Wetterdienst (DWD), Germany's national meteorological service, is the country's authority on weather.

No aircraft takes off the ground without first checking DWD's weather forecasts. Emergency first responders—by road, sea, and air—depend on real-time weather data from DWD to ensure that rescue missions are completed quickly and safely.

Aviation, shipping, and railway businesses use weather forecasts and warnings issued by DWD to keep business moving rain or shine. Weather warnings issued by DWD also help the public stay safe in extreme weather, such as heat waves, tornadoes, and thunderstorms. A failure to rapidly detect and warn the public of dangerous weather conditions could result in serious damage to property—even loss of life.

"Our customers depend on us," explains Hans-Joachim Koppert, head of Weather Forecasting Services at DWD. "We are constantly looking for ways to improve the speed and quality of our weather forecast information."

## A Perfect Data Storm

Around the clock, DWD's central data center takes in feeds from an astounding number of weather data sources, including more than 2,000 measuring stations, a network of 17 weather radar systems, numerous meteorological satellites, and approximately 200 international data sources.

The data is fed into complex forecast models and accessed through NinJo, DWD's weather visualization application. With NinJo, forecasters can create custom forecasts and warnings that combine satellite, radar, and forecast data.

With advances in radar and satellite technologies, the data collected by DWD has grown exponentially, making it increasingly difficult to deliver the fast response times customers need. The problem was particularly acute for the search-and-rescue pilots who depend on weather forecasts from NinJo to complete their operations safely. Retrieving the data needed for a search-and-rescue operation—including data on wind, clouds, and temperature—could take up to 15 seconds. For multiple queries, it could be even longer.

"Our biggest challenge is getting the data to forecasters quickly," adds Alexander Harth, head of the User Support Division at DWD.

"Imagine that you're waiting 15 seconds, and look at your watch," adds Harth. "It's a very long time—particularly when someone's life is in danger."

## Teaming for Speed

DWD teamed with NetApp to test a NetApp® All Flash FAS solution to prove that it could deliver the performance needed to speed data visualization for forecasters. Based on its long history with NetApp, DWD was confident that the solution could provide high performance and nonstop availability while integrating seamlessly with the service's existing environment.

"We have been running NetApp storage in our environment for more than 14 years with zero downtime," says Harth. "When it came time to select a flash vendor, we knew that NetApp could deliver more than just speed. We could count on NetApp to deliver the data our customers need whenever they need it."

## Accelerating Weather Insights

With NetApp All Flash FAS accelerating its NinJo application, DWD has reduced latency for data visualization to less than a millisecond, which has brought the response time for its NinJo

### Key Highlights

#### Challenge

Get critical weather data into the hands of first responders faster to improve safety and save lives.

#### Solution

Implement NetApp All Flash FAS for critical data visualization applications and NetApp FAS storage for data processing.

#### Results

- Reduced latency to less than a millisecond
- Reduced time to calculate weather conditions from 15 seconds to 1 second or less
- Enabled ad hoc visualization of sophisticated weather scenarios
- Accelerated development of new application features
- Streamlined management for more than 8PB of data and 164 storage systems across 21 sites throughout Germany
- Improved accuracy of weather forecasts and warnings

application from 15 seconds down to 1 second or less. Emergency responders now have real-time access to the information they need to complete their missions and save lives.

Businesses and individuals also benefit from faster forecasts and weather warnings. Aviation, shipping, and railway customers are able to minimize costly weather delays and plan more efficient routes. In aviation, for example, airlines use weather forecasts to minimize wind resistance, maximize speed, and optimize fuel consumption. And faster warnings enable the general public to better prepare for severe weather situations, such as tornadoes and thunderstorms.

The speed has also enabled DWD to provide new features in NinJo that help forecasters and customers gain better insight into the data. Since implementing All Flash FAS, DWD has introduced roaming vertical soundings for aviation forecasts. With this feature, a forecaster can trace the path of a plane on a map and instantaneously display three- or four-dimensional weather data for that location. This means that emergency first responders, rescue helicopters, and pilots can receive precise weather data for their flight coordinates in real time.

“Because we can move so much data so quickly, we are now able to provide features that forecasters had been requesting for a long, long time,” says Koppert.

### Looking Forward

Weather—especially bad weather—can be difficult to predict. But meteorologists such as Koppert live for the challenge. To continue DWD’s storied legacy of service to the people of Germany, Koppert and his team continue to advance DWD’s IT infrastructure to improve the accuracy and speed of weather warnings and forecasts.

“Technology is a very important component in the process of weather forecasting,” says Koppert. “Of course, we need very good science and good models, but if we don’t have the technology to bring the information to the desk of forecasters when they need it most, we can’t do our job. For more than a decade, NetApp has helped us fulfill our mission.”



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Alexander Harth, Head of the User Support Division, DWD

### About Deutscher Wetterdienst

Deutscher Wetterdienst (DWD), the National Meteorological Service of Germany, is responsible for protecting the life and property of Germany’s citizens through weather and climate information. DWD issues forecasts and warnings to safeguard aviation and marine shipping and maintain public safety. The organization also represents the meteorological interests of Germany nationally and internationally, participating in such organizations as the World Meteorological Organization (WMO).

### About NetApp

Leading organizations worldwide count on NetApp for software, systems and services to manage and store their data. Customers value NetApp teamwork, expertise, and passion for helping them succeed now and into the future.