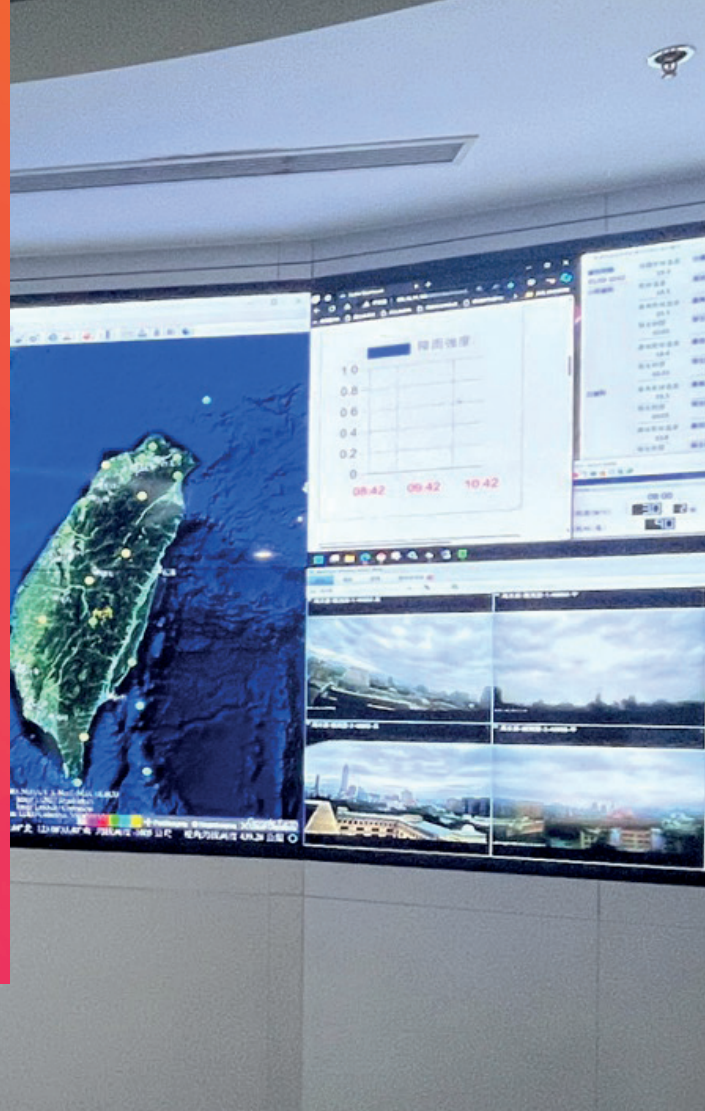




Central Weather Administration

Next generation weather forecasting



Fujitsu has established a sixth-generation supercomputer system for Taiwan's Central Weather Administration (CWA). The solution will improve the accuracy of weather forecasts and help mitigate the impact of extreme weather events.

Challenge

With its tropical and subtropical climate, Taiwan sits in one of the regions of the world most vulnerable to natural disasters including typhoons and heavy rain.

Solution

Fujitsu's supercomputer "FUJITSU Supercomputer PRIMEHPC FX1000" system will help mitigate the threats posed to Taiwan by extreme weather events. It will also help CWA to provide more accurate daily information to the public.

Outcomes

- Promote advanced weather observation
- Improve observation and forecast accuracy of weather disasters
- Observe and analyze the long-term impacts of climate change

"With the use of a sixth-generation high-performance computer from Fujitsu, we estimate that the horizontal resolution would be improved to 1km from 3km under the previous system."

Cheng, Chia-Ping (程家平), Central Weather Administration Administrator



Better meteorological predictions for a changing climate

Extreme weather events, catastrophic cold spells, and floods have caused significant damage in Taiwan over recent years. “Our terrain is complex,” explains CWA Administrator Cheng, Chia-Ping (程家平). “Taiwan is at the junction of the continent and the ocean so there are many disastrous weather conditions like typhoons, heavy rains, and summer heat waves that impact us. That means accurate weather and climate information are vital. As such we need state of the art equipment, high resolution data, and world-leading computing power.”

Executive Yuan, the executive branch of the government of Taiwan, has invested in the Meteorological Information Smart Application Project, with the aim of strengthening the connection between meteorological information and government, industry, and people’s daily lives. The initiative seeks to provide the government and the public with real-time and precise meteorological information to achieve disaster prevention and reduction, address climate change vulnerability, and minimize the impact on the environment.

Leveraging Taiwan's fastest supercomputer

CWA initiated a project to replace the Fujitsu PRIMEHPC FX-100 system, used in current operations since 2012, with a sixth-generation high-performance computing system. The system is a Fujitsu FX1000 high-speed computer built with 7-nanometer chips made by Taiwan Semiconductor Manufacturing Co. It has achieved a computing performance of 10 PFlops, making it the fastest supercomputer in Taiwan.

The system is primarily based on Fujitsu’s supercomputer “FUJITSU Supercomputer PRIMEHPC FX1000” hardware, which features the same A64FX CPU as the supercomputer Fugaku, jointly developed by RIKEN and Fujitsu. The system has a total performance capacity that is seven times greater than the CWA’s fifth-generation system.

The new system will help mitigate the threats posed to Taiwan by extreme weather, and enable the CWA to promote advanced weather observation, improve forecast accuracy of weather disasters, and better analyze the long-term impacts of climate change. For example, the CWA can produce typhoon forecasts 10 days before their arrival. Under the old system, the agency could only begin making forecasts about tropical storms and typhoons seven days ahead,

“With the use of a sixth-generation high-performance computer, we estimate that the horizontal resolution would be improved to 1km compared with 3km under the previous system. The accuracy of weather and climate forecasts in countries around Taiwan would also be enhanced, with the resolution for the global weather model being improved to 13km from 25km previously,” explains Cheng, Chia-Ping.

Industry:
Public Sector

Location:
Taiwan

Website:
cwa.gov.tw/eng/

About the customer

The Central Weather Administration is the government meteorological research and forecasting institution of Taiwan. The agency's mission is to make thorough meteorological observations, refine meteorological forecasts, create diversified meteorological services, and support disaster prevention and mitigation as well as promoting economic development promotion.



46,000

Taiwan's fastest
supercomputer equivalent
to 46,000 desktop
computers

Helping CWA empower the citizens of Taiwan

The system will also further support the CWA to promote smart and advanced weather services to the public, one of the key targets of the agency's mid-term plan. "Due to these technological advancements, anyone can access the network at any time and get weather forecast or warning messages from their mobile phone. We look forward to making more refined and more accurate forecasts that are available for everyone to use. We want the weather agency to become a friend to the public and an enabler of a safe life," explains Senior Technical Specialist, Wu, Woan-Hwa.

In the future, Fujitsu will continue to support the CWA's weather forecast services by providing its high reliable technical expertise in high performance computing (HPC) and know-how in weather services in general. "Fujitsu has very a good team of artificial intelligence experts. We have a good relationship with Fujitsu, they assist us with HPC high-speed computing power and help us utilize AI to forecast data with higher temporal and spatial resolutions," Cheng, Chia-Ping concludes.

Customer:



Fujitsu

askfujitsu@fujitsu.com

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