

KEY FACTS

Overview

The Weather Channel uses an internally developed application for weather prediction and reporting; the HiRAD system extrapolates the weather at 1.9 million points of interest in the United States.



Challenge:

The Weather Channel wanted HiRAD to increase data collection output from the 10,000 data point level up to 1.9 million observations, while staying at the 5-7 minute mark per cycle.

Solution:

The Weather Channel selected Cluster Resources' Moab Cluster Suite® to run their memory-intensive application.

Results:

Moab allows The Weather Channel to specify exactly when they want a calculation to run, how often, and on which hardware—in an easy-to-use manner. This fine-grained control lets administrators extract the maximum value out of their clusters.

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The Weather Channel Takes Forecasting To a Higher Level with Moab®

ABOUT THE WEATHER CHANNEL

The Weather Channel (TWC) uses an internally developed application for weather prediction and reporting. After collecting data from approximately 1,700 observation sources, the software combines that data, along with radar information and other meteorological facts from unmanned sources such as buoys. Then, using a sophisticated algorithm, it extrapolates synthetic observations for all of the points in between; it does this in 5-7 minutes.

TWC is now working to improve weather predictions with a high-powered supercomputer that runs their innovative weather prediction algorithm, called High Resolution Aggregated Data or HiRAD. An HP ProLiant DL385 cluster using two Dual Core AMD Opteron CPUs/per node with 16 gigabytes of RAM/CPU calculates data using the HiRAD system to extrapolate the weather at 1.9 million points of interest in the United States.

CHALLENGE

TWC wanted the information from the initial 1,700 observation sources to combine with all other ancillary data to generate 1.9 million observations (as opposed to the 10,000 observation level available from HiRAD at the time) in the same 5-7 minute span. This meant the final collective observations would be no more than 2.5 kilometers apart, allowing TWC to report on weather and climate conditions such as rain, cloud level, wind speed, and temperature to within 2° of actual. Additionally, the TWC IT team needed to move to commoditized hardware; in 2005, they began building system support architecture for this undertaking.

As the project advanced, the IT team needed software for scheduling & parallel processing, compute clusters, batch processing, and more.

SOLUTION

The Weather Channel selected Cluster Resources' Moab Cluster Suite® to run their memory-intensive application. The calculations utilize 97% of the clusters' CPU and 98% of the RAM. To run the complex calculations without taking all the administrators' and developers' time, TWC employs Moab's event policy engine—a tool used to automate administrative tasks—to monitor and command the system to run calculations three times per hour, 365 days per year.

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— Dorren Schmitt,
Senior UNIX
administrator for The
Weather Channel

RESULTS

Moab allows The Weather Channel to specify exactly when they want a calculation to run, how often, and on which hardware. Such fine-grained control lets TWC administrators extract the maximum value out of their clusters.

“Moab has been rock solid since the beginning,” said Dorren Schmitt, Senior UNIX administrator for The Weather Channel. “It kicks off beautifully like clockwork needing no human intervention, unlike so many other schedulers. There weren’t very many environments out there that allowed us to do this level of automation, where we set it up and it drives itself.”

“Cluster computing is providing supercomputing performance to organizations that want access to considerable computing power but don’t have a big IT budget,” said Bruce Toal, director of marketing for High Performance Computing Division at HP. “HP is working with partners like Cluster Resources to provide solutions that allow customers to tackle larger, more difficult problems than ever before.”

“TWC’s situation is unique in that we’re assimilating a collection of live weather data that’s normally used separately and apart from each other to create a single integrated and nearly continuous field of information. Rather than guessing the local weather based on reports from observation points typically found only at nearby airports or military bases, interested parties now have accurate information for specific points of interest, such as Dodger Stadium, for instance.”



“We designed Moab to take the burden off administrators,”

Dave Jackson, CTO of Cluster Resources said. “Moab’s event policy engine empowers administrators by letting them set policies that define exactly what they want to have happen. Moab automatically enforces these policies, letting administrators put their clusters on auto pilot and freeing them to work on more pressing projects.”

According to Schmitt, Moab has allowed The Weather Channel to create an automation that runs with almost no human intervention—three times per hour, 24 hours per day, 365 days per year. In the course of production, TWC has created more than 2 million tiles in approximately one year. Said Schmitt, “[Moab] allows the IT team to, in a config file, do all their specs in terms of when we want the run, how we want the run to proceed, who the user will be, and how often it runs.”

BUILDING ON SUCCESS

The Weather Channel increased their CPU count in 2007 by 75% to accommodate new projects. The benefits that Moab offers to the overall integrity and efficiency of the system has contributed significantly to the ongoing success enjoyed by the Weather Channel. TWC augmented their number of Moab licenses to accommodate this increase in the number of nodes and continue to add Moab licenses as projects are added to the cluster’s workload.

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