

# WEATHER.COM HANDLES WHATEVER NATURE SERVES UP

**AMD Opteron™ processor-based servers enable weather.com to provide consistent response times, even during hurricanes.**

## THE CHALLENGE:

- Needed to handle huge spikes in Web traffic, especially during severe weather events
- Had to eliminate slow response times or unavailability on the site
- Needed a hardware platform that would provide simultaneous 32- and 64-bit computing

## THE SOLUTION:

- Migrated Oracle weather database to IBM eServer e325s—each containing two 64-bit AMD Opteron™ processors
- Replaced existing servers with half the number of AMD Opteron processor-based servers
- Switched the database application to Linux on AMD Opteron processor-based servers with 32- and 64-bit capability

## THE IMPACT:

- Handles peak traffic volume without any performance problems, increasing customer and advertiser satisfaction
- The site was ranked number-nine by Nielsen/NetRatings
- Obtained leading-edge 32-bit performance today, plus transition to 64-bit computing
- Reduced costs of operating system and database software licenses

On a typical day, weather.com, the Web site for The Weather Channel in Atlanta, serves up between 15 million and 20 million page views. But in September 2004, when back-to-back hurricanes ransacked Florida, the peak traffic on one day more than tripled: over 70 million page views by more than 7 million unique visitors.

That day was Wednesday, Sept. 15. While Hurricane Ivan got ready to slam into the U.S. coastline, weather.com set a record with 5.1 million pageviews in a single hour. On that day, the site also delivered an extraordinary 2.3 million video streams—a 4,400 percent increase in the number of streams served on a typical day.



Despite the huge traffic increases, weather.com's performance was so polished that few site visitors detected any lag in response times. The technology platform that delivered such flawless performance is partially based on high-performance servers built with AMD Opteron™ processors, which provide simultaneous 32-bit and 64-bit computing, according to Dan Agronow, weather.com's technology vice president.

### FLEXIBILITY, SCALABILITY AND PERFORMANCE

To ensure consistent response times on its back-end Oracle 8i database, weather.com decided in late 2003 to replace the existing servers with IBM eServer 325 systems, each running two 64-bit AMD Opteron™ processors. Since the new servers doubled performance, weather.com needed only half the number of servers used previously.

The SUSE Linux Enterprise Server operating system runs on those servers. Initially, the application resided on Unix.

The AMD Opteron processor, built on AMD64 x86-compliant architecture, runs both 32-bit and 64-bit applications and operating systems natively, so no code rewriting is necessary to migrate applications.

That was a major consideration for weather.com's back-end database and map application.

Initially, weather.com sought to leverage the AMD Opteron processor's large memory address space for its 32-bit applications. That eliminated the need to purchase new hardware or rewrite legacy applications, saving valuable time and money.

Subsequently, weather.com installed AMD Opteron processor-based HP ProLiant DL145 servers to run its MapServer application. That application generates dynamic, localized maps on request for desktop applications and mobile phone subscribers.

By reducing the number of processors in its server farm, weather.com achieves significant savings on software licensing costs. Use of less-expensive open-source software reduces the total cost of ownership by an order of magnitude. The AMD Opteron processors also provide horizontal scalability: to gain capacity, weather.com has only to add more servers.

Of course, some people did notice what was happening with traffic patterns. For instance, Nielsen/NetRatings, the independent Internet audience measurement and analysis service, noted the dramatic increase in visitors and subsequently ranked weather.com's content the 9th most popular on the Web, moving it up from 10th place.

Advertisers, always eager to place messages on the sites that attract the most visitors, also noticed. Both these "notices" are financially important to weather.com, since it operates as a separate entity from its parent and derives income mainly from advertising.

Even though advertisers and Web trackers were aware

of the dramatic increase in traffic, site visitors were not. The millions of people who regularly use the site as their principal source of weather news and information—ranging from gardeners checking to see whether they should water, to moms deciding how to dress their kids for schools, to golfers planning an outing—simply could not tell that for several days in August and September, millions more visitors than usual joined them to follow the progress of the hurricanes and tropical storms that pounded the Southeast.

And that, says Agronow, is exactly the point.

### The Challenge: Predicting Stormy Weather

The information technology infrastructure climate at weather.com wasn't always so balmy, Agronow concedes. Before a 2003 technology refresh, weather.com had occasional performance issues, such as slow response times or unavailability, he says, and "we knew we were going to have more."

Agronow saw the storm clouds gathering. In the three months between Hurricane Isidore in September 2002 and the widespread snow and ice storms that plagued the nation in December of that year, the site's peak traffic for a single day jumped from about 26 million pageviews on Sept. 25 to more than 37 million on Dec. 4.

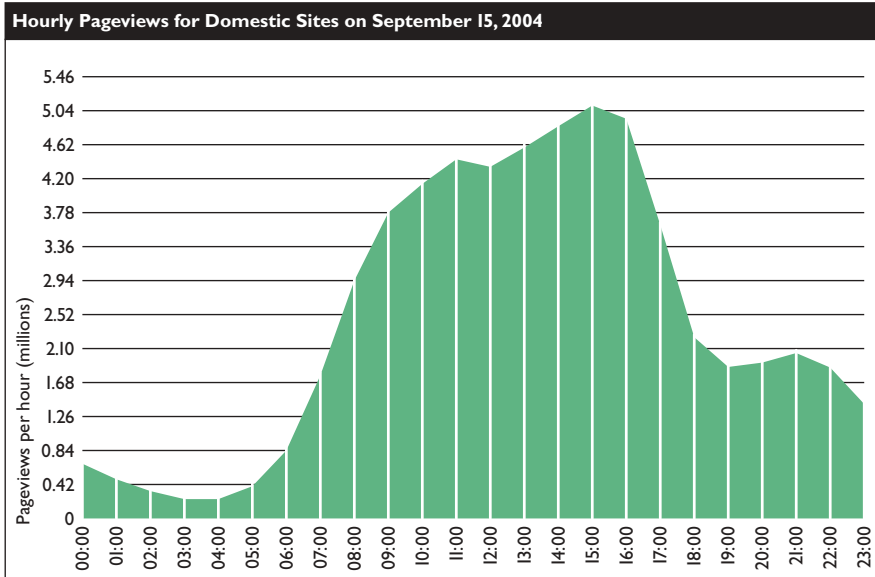
The following year, during Hurricane Isabel, peak traffic increased to more than 53 million pageviews on Sept. 18, 2003. "We knew then that we had some capacity issues," he acknowledges.

"We wanted to provide a consistent response time for everyone who visits the site," recalls Agronow. So he spearheaded a technology upgrade designed to accommodate expanded database activity, as well as to handle the spikes in traffic that accompany severe weather.

"We never want visitors to notice an increase in usage," he says. "We want them to know when they come to our site that they're not going to have to wait for a page to display."

To handle the constantly growing traffic volume, weather.com had to scrap older servers that were simply out of gas. In addition, the organization had no budget for additional licensing fees for the Oracle 8i database. These fees were based on "power units:" the number of CPUs and the speeds at which they run. Since each of the existing servers had four processors, "if I added a server, it could cost tens of thousands in additional licensing fees," Agronow says.





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In the wake of the economic downturn of 2000 and 2001 and the events of Sept. 11, Agronow began looking for ways to reduce software maintenance costs. “It was either that or reduce the number of databases, which was an unacceptable alternative,” he recalls.

Additionally, weather.com launched its free Desktop Weather by The Weather Channel product, which further increased database usage.

### The Solution: Better Performance

With his goals clearly in mind, Agronow charted his course. First, he needed to migrate the Oracle 8i weather database from the existing servers to IBM eServer e325s—each containing two 64-bit AMD Opteron processors. Since the new servers doubled performance, weather.com needed only half the number of servers used previously.

The AMD Opteron processor-based servers provide Agronow with leading-edge 32-bit performance today and enable him to transition to 64-bit computing at his own pace, without sacrificing the performance of his x86 technology investment. Eliminating the need to purchase new hardware or rewrite legacy applications saved valuable time and money.

Reducing the number of processors in use also enabled Agronow and his staff to avoid purchasing additional database software licenses, thus eliminating a substantial expense. The upgrade also delivers—by Agronow’s measurement—a 25 percent increase in the number of concurrent queries the database can handle without affecting performance.

Adding capacity by purchasing systems with powerful processors and superior architecture to help ensure optimal performance lets weather.com buy fewer machines, and that makes good business sense, according to Agronow. “With fewer processors, we don’t have to pay for additional software licenses, and we have more flexibility for what we want to do in the long run,” he says.

Agronow doesn’t see much on the horizon that will change his mind about these processors. “I value the AMD Opteron processors,” he says. “Initially, I bought them just for database servers, but lately I’ve been buying more AMD Opteron processor-based servers for other areas.”

In fact, Agronow installed HP ProLiant DLI45 servers from Hewlett-Packard, built on AMD Opteron processors, to run weather.com’s MapServer application. That application, which generates dynamic, localized maps on request for subscribers to weather.com subscription products, requires a 64-bit address space.

Agronow’s choice of the AMD Opteron processor-based servers, which are built around the industry-standard x86 architecture, is a reflection of his business philosophy to cut costs, boost performance and maintain flexibility. The servers let him continue running 32-bit applications for as long as he needs to do so. However, they also enable him to move to 64-bit applications in the future, eliminating the need to buy new hardware or rewrite legacy applications, thereby saving time and money.

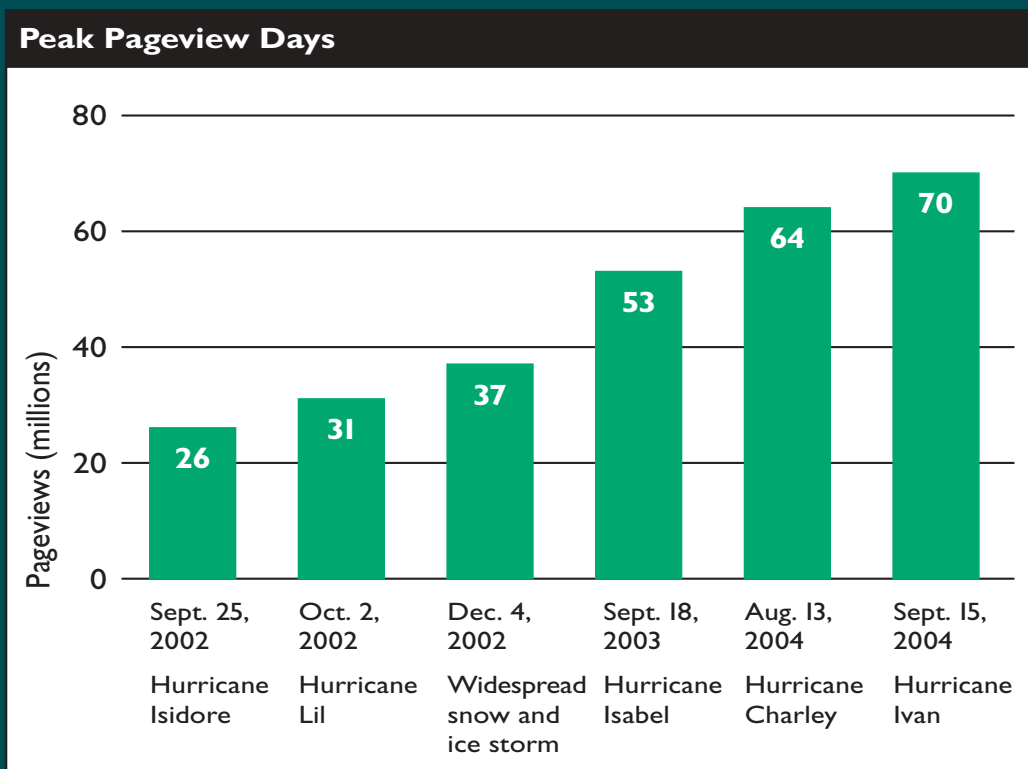
“If I had to do an application rewrite now,” he said, “there is no way I would survive.”

Agronow was among the first technology officers in large organizations to recognize the value of the AMD Opteron processor-based servers to mission-critical enterprise applications. He and his team also were quick to understand the benefits of switching the database application from Unix to the SUSE Linux Enterprise Server operating system.

The switch to Linux resulted in about a 33 percent reduction in costs and a corresponding 30 percent increase in Web site processing capacity, Agronow reports. He also points out that with open standards, he’s not dependent on a single vendor or architecture.



“It’s essential to make sure we have the capacity to deliver all the relevant information to everyone who wants it, when they want it,” Agronow says.



### The Impact: Smooth Sailing

The upgraded IT infrastructure was really put to the test during the 2004 hurricane season. When Hurricane Charley, the first of the 2004 hurricanes, converged on Florida and the Gulf Coast in August, peak traffic on weather.com jumped to 54 million pageviews on Aug. 13. The new servers easily handled the traffic, and Agronow and his staff breathed a sigh of relief.

“Hurricane Charley was the first time we handled a hurricane without any database problems since 2003,” Agronow reports. Before the upgrade, he says, “we’d run out of capacity on the database server.”

In fact, weather.com’s AMD Opteron processor-based servers performed so well during the peak traffic times of 2004’s hurricane season that Agronow had time to look at the competition’s Web sites. “They were painfully slow—sometimes taking 15 to 20 seconds for responses,” he says. That gave Agronow an unsettling peek into what could have been, if he hadn’t made the decision to go with AMD Opteron processor-based servers.

The IT upgrade also helped accomplish weather.com’s goal of continuing to grow its revenue. The site’s number-nine ranking by Nielsen/NetRatings and the lofty and

verifiable visitor numbers it racked up during the 2004 hurricane season enable weather.com to offer advertisers unique opportunities for reaching targeted audiences and building weather-triggered campaigns. Additionally, the technology supplies a level of performance that helps maintain user confidence in the brand, Agronow notes.

Even more important is that the AMD Opteron processor-based servers help weather.com achieve the consistent level of performance required to deliver on its mission to be the world’s weather information site of choice.

“It’s essential to make sure we have the capacity to deliver all the relevant information to everyone who wants it, when they want it—not just when there is a severe weather event,” Agronow says. “We want to ensure that every individual can get his or her weather information every time.”

