Some Stories about Computer Purchases

Roy Jenne
4 Jan 2001

1. Aug 1999: NCAR buys an IBM supercomputer (for $6.5m)

2. Sep 1999: Navy Monterey buys an SGI for $18m. Sustained 10 Gflop now; will be 100 Gflop in 2001.

3. Sep 1999: SGI has plans for a very fast computer.

4. Oct 1999: NOAA, Boulder gets a new fast computer from Compaq (Dec Alpha chips), for $15m.


   - 682 Compaq Alpha servers, each with 4 Alpha processors

   - Big, very fast, very expensive

   - They get an SGI
   - They had 15 Gflop in Sep 2000, real power
   - Will have 60 Gflop in Oct 2000
   - Will have 150 Gflop in Jun 2002
   - Total cost $34m, paid over 3 or 4 years
Supercomputer to speed climate research

By Karen Augé
Denver Post Staff Writer

BOULDER — A pair of 18-wheelers rolled into town last week from Poughkeepsie, N.Y., with a computer from Austin, Texas, that's going to carry scientists in Boulder into the next century.

The computer is IBM's RS/6000 SP, which Big Blue immodestly calls a supercomputer and touts as 10 times more powerful than the system that beat grand master Garry Kasparov at chess two years ago.

The scientists are those at the National Center for Atmospheric Research, who say they hope the $6.5 million system will bring NCAR's computing capacity up to speed — literally — with the most sophisticated environmental computing systems in the world.

"We'll be able to do more science in a shorter time," said Al Kellie, director of the scientific computing division at NCAR.

Saving hours, maybe days

And for these guys, faster means more than just shaving a few seconds off the time it takes to open the latest e-mailed joke.

We're talking a savings of hours, if not days.

NCAR doesn't predict weather — that's the job of the National Weather Service and the meteorologists on the 10 o'clock news.

But the agency's scientists do use information about weather to predict climate, which is basically weather over a long period of time.

To do that, the more than 100 scientists at NCAR create long-term climate models, taking information such as humanity's current output of carbon monoxide and asking NCAR computers to calculate what that will mean for, say, the Earth's temperature 100 years or 200 years from now.

Running those models can take days, even weeks, said an NCAR spokeswoman.

Scientists don't know how much time the RS/6000 will save them yet.

Kellie predicted it would be early September before NCAR staff have configured all the networks and have the new computer up and running for all the agency's functions.

When that happens, not only scientists at the Boulder offices of NCAR will benefit, but so will those at 63 NCAR-affiliated universities who will be able to log on to the system.

The new system is also compatible with systems at the National Oceanic and Atmospheric Administration and the U.S. Department of Energy's Oak Ridge National Laboratory.

NCAR scientists worked with IBM staff to tailor the new computer to the agency's particular needs, said IBM spokesman Bill Prater.

Although IBM has a large complex in Boulder County, this particular computer was built in Austin, Texas, and then shipped from there to Poughkeepsie, N.Y., to be tested.

When it passed its tests, it was shipped on two tractor-trailers to Boulder.

'The Black Forest'

In this age when computers are shrinking, the RS/6000 looks like a bit of a throwback. NCAR's system is actually 12 chassis, each of which is about 8 feet tall.

Standing together in their black casings, the chassis look like a forest of computers, Kellie said. So NCAR scientists have dubbed their new acquisition "the Black Forest."

NCAR, which is funded through the federal government, hopes this unit is just the first step in creating an increasingly sophisticated computer system.

If so, "ultimately, society gets the payoff," said Kellie. Because when scientists are able to predict what effects human activities could have on long-term climate, political leaders "will be able to adopt new policies or work with other countries or do whatever needs to be done" to avert climate-caused disasters, Kellie said.
Supercomputer Gives Navy An Accurate Early Warning

BY JAIKUMAR VIJAYAN

It cost the U.S. Navy an estimated $5 million to move part of its Atlantic fleet out of Norfolk, Va., in advance of Hurricane Floyd last week. But staying put could have proved even more expensive.

Helping the Navy arrive at its decision were supercomputers at the U.S. Navy Fleet Numerical Meteorology and Oceanography Center (Fleet Numerical) in Monterey, Calif.

Hurricane models crunched out by the center's battery of Cray supercomputers from Cray Research Inc., a unit of Silicon Graphics Inc., predicted three days before the event that Floyd would make landfall in the Carolinas — even as everybody else was predicting it would land in Florida.

Soon, a new batch of supercomputers will allow Fleet Numerical to predict such disasters with even more accuracy.

Hurricanes can currently be tracked only six days in advance, but the increased performance will let the center detect and track hurricanes like Floyd — and even much smaller ones — up to 10 days in advance, said Paul Moersdorf, scientific and technical director at Fleet Numerical. It will also let the center gather far more granular details on the wind and weather patterns of such storms, Moersdorf said.

Such improvements are crucial for Fleet Numerical. Apart from weather forecasts for different defense agencies, the center also provides operational forecasts for the U.S. military. In the 1991 Persian Gulf War, for instance, the center's computers were used to predict how dangerous Iraqi chemicals would be dispersed by the wind. The new computers will help the center predict such fallout within an accuracy of 3 kilometers — up from 150 kilometers in 1991.

The move to the new technology starts with the installation of a 128-processor SGI Origin 2000 system in November and will culminate with a 512-processor supercomputer in 2001.

When fully installed, the new computers will boost the center's overall processing capability tenfold from a current sustained peak performance of 10 billion floating-point operations per second (GFLOPS) to about 100 GFLOPS, Moersdorf said.

- Summary -

- Navy Fleet Numerical signs $18m deal with SGI for supercomputers.

- Now they have sustained speed of 10 billion operations/sec (10 Gflops).
  - They will have 100 Gflops in 2001.

- They will get a 128 processor SGI Origin 2000 in Nov 1999.
  - They will get a 512 processor SGI in 2001.

COMPUTERWORLD September 20, 1999
SGI Nears Deal To Sell Interest In Cray Unit

BY DAVID P. HAMILTON AND KHANH T.L. TRAN
Staff Report of THE WALL STREET JOURNAL
Silicon Graphics Inc. said it is nearing a deal to sell a large piece of its Cray supercomputer unit. Separately, SGI announced a plan to develop a supercomputer with the U.S. government.

The Mountain View, Calif., computer maker said it hopes to reach an agreement in the near future with a noncomputer maker that will take a majority stake in the Cray unit. Beau Vrolyk, an SGI vice president, declined to name SGI's partner, the price it is seeking or to say when those negotiations will be completed, saying only that SGI's potential partner isn’t in the computer industry.

That deal, if completed, would mark the beginning of the end of SGI's difficult history with Cray, which it acquired in early 1996. The market for Cray's high-end, specialty "vector" supercomputers had started to slump even before SGI purchased the struggling company, and the market continued to decline. One of the few parts of Cray's original business that has thrived was a unit that made high-end computers based on Sun Microsystems Inc.'s UltraSparc microprocessor—an operation that Sun purchased from SGI in mid-1996.

Although Cray has never come close to recapturing its former glory as the Rolls Royce of the computer industry, Mr. Vrolyk said SGI has succeeded in revamping it to the point that it can survive as an independent company. "Cray is going to be a little jewel of a company," he said. "It's not a piece of junk on the block we're selling off."

Mr. Vrolyk, for instance, pointed to a new deal in which SGI will work with the National Security Agency and other federal agencies to develop a high-end supercomputer. That machine, known as the Cray SV2, will combine two computer architectures known as vector and scalar processors. The company said the machine will be designed to handle operations for national defense, but it also could be used in areas such as weather forecasting and aerospace engineering.

SGI said the Cray SV2 will be able to handle 30 trillion computations a second, a rate 10 times faster than the fastest supercomputer available today. An NSA scientist involved in the project said the Cray SV2 will be the only machine made in the U.S. with such processing capabilities.

SGI said the government and the company each has invested over $10 million this year on the project. The company didn't disclose the total amount of the project or other federal agencies involved. SGI said it began the project six months ago and expects to introduce the new machine by the middle of 2002.

SGI Has Plans for a Very Fast Computer

- Will develop a supercomputer with federal agency partners
- The Cray SV2 will deliver 30 trillion computations a second
- The SV2 will be the only US computer with such power
- The project started about 03/1999
- Expect to introduce the computer in mid-2002.
Linux storms NOAA in $15 million pact

By Daniel Verton

In what may be the first competitive government contract involving the Linux operating system, the National Oceanic and Atmospheric Administration last month tagged a Reston, Va.-based company to provide a Linux-based supercomputer that promises drastic improvements in the ability to forecast dangerous weather patterns.

Under the terms of the $15 million contract, High Performance Technologies Inc. will install the first large-scale cluster of Compaq Computer Corp.'s XP1000 Alpha workstations running Linux at NOAA's Forecast Systems Laboratory in Boulder, Colo.

According to NOAA officials, the cluster will involve 277 workstations capable of crunching 300 billion arithmetic operations per second — a capability that is 20 times more powerful than the lab's current system. The cluster will represent one of the most powerful computers in the world, they said.

David Rhoades, director of High Performance Computing at HPTi, said the award is just the beginning of a significant swing toward the use of Linux. "There are fads and there are trends; we believe Linux is a trend," Rhoades said. "We also believe this is the supercomputing architecture of the future."

Industry sources said HPTi's Linux-based solution beat several industry giants in the supercomputing market, most likely including IBM Corp., Silicon Graphics Inc., Sun Microsystems Inc. and Compaq's own supercomputing solution. However, because the post-award review still is under way, officials declined to comment on exactly who the other bidders were.

"There are fads and there are trends; we believe Linux is a trend. We also believe this is the supercomputing architecture of the future."

"There are fads and there are trends; we believe Linux is a trend. We also believe this is the supercomputing architecture of the future."

Enhancements are distributed throughout the Linux community and subjected to a strict peer review process that examines the code changes for bugs and flaws. According to officials, the new Linux-based supercomputer will be used to support the development of accurate weather models and will enable analysts to run different models simultaneously.

NOAA also plans to use the system to develop ocean models and an upper-air observing system that will enhance the administration's ability to forecast current conditions.

The Forecast Systems Laboratory is one of the nation's leading weather technology centers, and it played a pivotal role in the effort to modernize the National Weather Service.

Officials at the lab expect the system to be installed by the first week of November and plan to upgrade it several times over the next 34 months.

NOAA's new supercomputer, however, is not the only system to run on Linux, according to Leslie Hart, a computer scientist at the Forecast Systems Laboratory. The FSL already runs two clusters of Intel Corp. Pentium III-based machines on Linux and supports a large number of the agency's desktop systems using the operating system.

"The focus [of this acquisition] was on price and performance," Hart said. "Benchmark results were used as a basis for the computational capabilities [of the system], and we were very happy with them."

He added that officials have no concerns about the ability of Linux to support large-scale clusters. He noted that NOAA FSL – Boulder

Gets lots of computer power (Compaq Dec Alpha)

FSL is a computational group, as opposed to an organization that is concerned with office applications, and Linux gives the organization the tools it needs.

Gary Newgaard, vice president of Compaq's federal division, said the Linux/Alpha solution won what he termed a "very competitive" award because of its cost effectiveness and high performance. Newgaard said he is seeing high-end users within some agencies embracing the Linux solution because those users typically are early adopters. He added that it is hard to predict how long it will be before Linux makes its way down to the desktop in large volumes.

Alan Horwitz, advanced technology director at Compaq federal, said the company is offering Linux as an alternative solution because its customer base is asking for more options.

"Compaq is truly embracing Linux as an OS that people will want, particularly in a clustered environment," he said.
Weather service unveils computer

Superprocessor will allow for more accurate long-range forecasts

By Lee Bowman
Scraps Howard News Service

WASHINGTON — The National Weather Service’s newest, fastest supercomputer became operational Tuesday, just in time to help forecast a major winter storm for the East Coast.

“This is giving us the ability to do regular forecasts with skill and confidence out to 10 days and to predict extreme weather events days in advance,” said Louis Uccellini, director of the National Centers for Environmental Prediction.

"What this increased capacity gives us is the ability to use ever more sophisticated models for better predictions, but they still won’t be perfect," National Weather Service Director Jack Kelly added.

On a daily basis, we should see a 10 percent improvement in predicting temperatures and humidity and pinpointing where and how much rainfall will occur," Kelly said.

"We’re trying to simulate the multitude of things that are going complex equations," said The supercomputer’s first prediction — a potential winter cy-cloidal along the East Coast, starting by the weekend when snow and wind chills down to minus 20 degrees below zero. The National Weather Service is able to digest all the information gleaned around the world by remote gauges and reporting stations. The new supercomputer will handle 2.5 trillion calculations per second, easily able to use it. We haven’t been able to do that you need five times faster than its predecessors, and by September 10, it will be able to work 20 times faster.

If that in hand, local officials will take steps to prepare and take extra precautions to protect the homeless and other vulnerable people," Uccellini said.

Computer models have been the backbone of weather forecasting for decades, with forecasters plugging instruction a processor at a speed of 600 billion instructions per second. Kelly said it would take a hand-held calculator 50 years to do the same thing.

Computer models have been the backbone of weather forecasting for decades, with forecasters plugging instructions a processor at a speed of 600 billion instructions per second. Kelly said it would take a hand-held calculator 50 years to do the same thing.

Please see WEATHER on 11A

Go to (3)

Jan 19, 2000
Daily Camera
in Boulder, Colo
R. Jones
France buys supercomputer

March 2000

French plan ‘virtual’ nuclear tests

Paris France’s Atomic Energy Commission announced a deal with the company Compaq last week to buy a 5-teraflop supercomputer for simulating nuclear tests. The machine, which can perform five trillion operations each second, will make the computer centre at Bruyères-le-Châtel, near Paris, the most powerful facility of its kind in Europe when it goes into operation in 2001.

The supercomputer forms part of the core of the French nuclear-simulation strategy that also includes the X-ray imaging facility Airix, located outside Paris, and the Laser Megajoule, being built near Bordeaux. The computer centre will also be open to scientists for other research.

They buy a Compaq
Made in USA

from Nature, page 10
2 March 2000
Government Diversifies Sourcing of Supercomputers

BY PATRICK THIBODEAU

In the Microsoft Corp. antitrust case, the government is trying to bring diversity to the PC operating system market through litigation. But one federal agency is using money rather than legal action to help ensure competition in an area of computing important to academic and industrial research: supercomputing.

When the National Science Foundation (NSF) in Arlington, Va., selected Compaq Computer Corp. this month to build its most powerful supercomputer to date, the NSF said it picked the firm that submitted the best proposal. The NSF also said that by choosing Compaq, it promoted diversity in supercomputing applications. That funding approach may help companies that are seeking more power for industrial and research applications, experts said.

“You want some diversity and competition in the program. . . . You don’t want everything stacked up in one place,” said Bob Borchers, director of the NSF’s division of advanced computational infrastructure and research. “On the other hand, if you have too many mounds to feed, it’s very, very hard to keep them all at the state of the art.”

Compaq will build a 6-teraFLOPS (6 trillion floating-point operations — or calculations — per second) computer at the Pittsburgh Supercomputing Center under a $45 million project approved by the NSF, which said the new machine could be the fastest civilian supercomputer.

Different systems are in use at the San Diego Supercomputer Center (SDSC) at the University of California and the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign. SDSC has an IBM machine operating at about 1 teraFLOPS (TF), and NCSA has a Silicon Graphics Inc. system operating at less than ITT, said Borchers.

More Benefits of Competition

“I think there is always a benefit for the government to having competition in the marketplace,” said Tom Tecco, director of global computer-aided engineering test systems at General Motors Corp. in Detroit. While price and performance are affected, different views on technical evolution can also be developed, he said.

“If they can show how to do new science on this type of machine, it will be a major step forward in applying supercomputers to industrial problems,” said Earl Joseph, an analyst at International Data Corp. in Framingham, Mass.

The Pittsburgh center will have a network of 682 Compaq AlphaServers, each of which will contain four Alpha processors. The system will run Compaq’s Tru64 version of Unix.

COMPUTERWORLD August 21, 2000

Supergrant The Pittsburgh Supercomputing Center (PSC) has won a $45 million competition to build one of the world’s fastest civilian science computers. The National Science Foundation (NSF) announced last week that a PSC-led team that includes the University of Pittsburgh and Carnegie Mellon University will host its new Terascale computer, to be built by Compaq. The machine, which will eventually complete 6 trillion operations per second, is expected to be online by early 2001. NSF hopes to fund a second terascale machine next year, but Congress has yet to approve funding.

Aug 21, 2000

Science 845

11 Aug 2000
Compaq reins in a ‘super’ DOE deal

BY JUDI HASSON

The Cold War may be over, but monitoring the condition of the U.S. nuclear weapons arsenal is not. To keep track of these deadly bombs’ health short of testing them via ignition, the Energy Department has awarded Compaq Computer Corp. a $200 million contract to build the world’s largest supercomputer to simulate nuclear tests.

The supercomputer is the size of five basketball courts with enough disk space to store the Library of Congress 20 times over. It will be housed in the Strategic Computing Complex being built at Los Alamos National Laboratory in New Mexico.

“This gives the government the ability to support the development of a system that promotes U.S. superiority in technology,” said Ron Ross, president of Compaq Federal.

A supercomputer-generated image shows an amplified view of nerve meeting muscle.

Code named “Q,” the system will be able to attain a peak performance of 30 trillion floating-point operations per second (teraflops). It contains about 375 AlphaServer systems, joined by more than 6,000 fiber-optic and copper cables.

Simulations of nuclear weapons testing have become necessary as treaties ban nuclear testing above or underground and U.S. policy shifts away from real tests.

“It’s been a number of years since the United States has tested nuclear weapons,” said defense analyst John Pike of the Federation of American Scientists. “But you need to have people around who know how they work so you can fix them if they break. This is basically the way to design and repair nuclear weapons without setting them off.”

Air Force Gen. John Gordon, who heads DOE’s newly formed National Nuclear Security Administration, said the supercomputer will give the federal government “an exceptionally powerful system for developing the simulation capability needed for stockpile stewardship.”

Lately, Compaq has been grabbing government business for building bigger and bigger computers. Earlier this month, the National Science Foundation selected a Compaq system as part of the Pittsburgh Supercomputing Center, which will build and manage the world’s largest supercomputer for nonmilitary scientific applications, such as weather forecasting, earthquake modeling and studying global climate change.

Aug 28, 2000
Federal Computer Week
New Computers for GFDL

Roy Jenne
6 Oct 2000

GFDL signed a contract with Raytheon to install and integrate computers at GFDL. The new computers are from SGI.

- GFDL now has a total real power of 15 Gflops (on Cray T90 and Cray T3E).
- The new SGI hardware will be delivered in mid-Oct 2000. Then GFDL will have a total of 60 Gflops.
- In June 2002, they will get an upgrade to 150 Gflops total real sustained power.

These eight main units have a total of 1024 processors (8 * 128 processor).

Note: Most jobs will be run on a limited number of processors in order to get better throughput.

ABOUT THE TIMING TESTS

The vendors ran timing tests on the models. GFDL is assured that they will have 4 times the power they now have. Actually, they probably will have somewhat over the 60 Gflops they are promised at first.

THE POWER THEY NOW HAVE

From the Cray T90 with 26 (or 30) processors, they get about 15 Gflops real. They have 160 processors of a Cray T3E (about 8 Gflops). And the T3E was never optimized well. Four T90 processors are used to drive the T3E. They have been losing T90 processors. They think that their total present real power is 15 Gflops.

LOTS OF DISKS

They will have 8 huge disks, a total of 8 TB of raid disk storage.

THE ANALYSIS CLUSTER

They will have 2 nodes, each with 64 processors for analysis problems. A number of these processors will be used to drive the mass storage devices. There will be about 95 processors left for the analysis jobs. Most of the analysis jobs run best as single processor jobs.

THE STORAGE SYSTEM

They had been worried whether they would have enough storage capacity. But now they feel good about the new contract.

- They will have 2000 terabytes of storage capacity by 2003.
- They will have 3 STK (Storage Tek) silos. The cartridges will hold about 200 GBytes each in 2003. Note that 200 GB $times$ 5000 cartridges $times$ 3 silos equals 3000 TBytes.
- They will have 40 tape drives in the three silos.

COST

The total cost of the computers and storage will be $34 million. The working period will be three years.

PRESS RELEASES

a. They now have information on the GFDL Web pages.
b. In 7 to 10 days, Raytheon will put out major press releases.