



An Assault On Civilization

Call 9/11 what it really was. Christopher Hitchens writes
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The Best Ideas In Technology

Trouble-shooting software wins top honors this year
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MONDAY, SEPTEMBER 11, 2006 R1



And the Winners Are...

By MICHAEL TOTTY

COMPUTER SYSTEMS are notoriously finicky. They'll hum along just fine and then unaccountably slow down, freeze up or stop working altogether. Finding the cause of some unexplained problem is difficult and time-consuming, especially with complicated systems in real-life settings.

Bryan Cantrill and a team of engineers at Sun Microsystems Inc. have devised a way to diagnose misbehaving software quickly and while it's still doing its work. While traditional trouble-shooting programs can take several days of testing to locate a problem, the new technology, called DTrace, is able to track down problems quickly and relatively easily, even if the cause is buried deep in a complex computer system.

The DTrace trouble-shooting software from Sun was chosen as the Gold winner in The Wall Street Journal's 2006 Technology Innovation Awards contest, the second time

in three years that a Sun entry has won the top award. The panel of judges, representing industry as well as research and academic institutions, selected Gold, Silver and Bronze award winners and cited one technology for an Honorable Mention.

For the awards, now in their sixth year, judges considered novel technologies from around the world in several categories: medicine and medical devices, wireless, security, consumer electronics, semiconductors and others.

A Wall Street Journal editor initially screened more than 600 applications. The judges then considered 121 of the entries, selecting 12 category winners and 37 runners-up. Among the category winners are the top three award winners.

In selecting winners, judges considered whether the technology truly represents a breakthrough from conventional methods,

rather than just an incremental improvement. (One of the judges, Robert Drost, won the Gold award for Sun Microsystems in 2004; he recused himself from voting on Sun's DTrace software.)

The Silver award went to HelloVolt Corp., of Austin, Texas, which has come up with a way to make lightweight solar-energy panels that are powered by an alternative to the more common silicon solar material and that can be applied to glass or other building materials.

HelloVolt President and Chief Executive B.J. Stanbery developed the method for manufacturing thin-film solar material based on a compound called CIGS, for copper indium gallium selenide, which is more efficient at producing energy than silicon-based solar cells.

Dr. Stanbery's advance uses the same kind of printing process used in making integrated circuits to apply a power-producing coating to just about any building material. With \$8 mil-

lion in venture funding, he is developing prototype equipment to begin manufacturing CIGS film and hopes to have products available for testing by the end of next year.

Pfizer Inc. of New York and Nektar Therapeutics, of San Carlos, Calif., won the Bronze award for their development of a powdered, inhalable insulin designed to replace shots for the treatment of diabetes.

Almost 200 million people world-wide suffer from diabetes, Pfizer says. But because using insulin to control blood-sugar levels has required daily shots, many sufferers don't get the treatment they need, leading to serious complications.

The powdered insulin, along with a specialized inhaler that can disperse the powder effectively inside the lungs, was developed in the early 1990s by Nektar, a biotechnology company. The product, known as Exubera, was approved in January by the U.S. Food and Drug Administration and by the European Commission, and is available in Ger-

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LETTERFORM BY MICHAEL DORET

INNOVATION AWARDS

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reaches a sensor or when a fire's heat triggers a sprinkler system, the axonX system analyzes video images picked up by security cameras to spot smoke or flames before fire advances. In March, Johnson Controls Inc. announced it would distribute the technology as part of its building-controls products.

SEMICONDUCTORS

Semprius Inc., a start-up based in Chapel Hill, N.C., won for a process for making large-scale, high-performance electronic circuits that can be applied to any surface. The technology, developed by John Rogers, the company's president and co-founder, along with a team of researchers at the University of Illinois at Urbana-Champaign, does this by using a two-step process: In the first, electronic devices are formed on semiconductor wafer using conventional techniques. Then an extremely thin layer that contains the complete transistor is lifted from the wafer and printed

onto the desired material, which can include thin plastic sheets, fabric or rubber.

Among other things, the process can be used to make large flexible displays, or rubber gloves with built-in sensors that could be used by surgeons. Semprius recently developed a prototype automated printing system for cellphone displays.

SOFTWARE

Sun Microsystems, of Santa Clara, Calif., won in this category for its DTrace trouble-shooting software.

Mr. Cantrill came up with the general idea for DTrace in 1996, while he was a computer-science student at Brown University, but didn't get to start work on it until late 2001. It took nearly three years for him and his team—Michael Shapiro, a Sun distinguished engineer, and Adam Leventhal, a staff engineer—to make it work; a final version shipped early last year as part of Sun's Solaris 10 operating system.

Where most debugging takes place as software is being developed, DTrace ana-

lyzes problems with systems that are in production—running a company's database, say, or executing stock trades. It does this with a process called "dynamic tracing," which enables a developer or systems administrator to run diagnostic tests on a system without causing it to crash. Before DTrace, such tests often took days or weeks to reproduce the problem and identify the cause. With DTrace, performance problems can be tracked to their underlying causes in hours, even minutes.

"This allows much better visibility into performance problems than anything else out there," says judge Diane Greene, president of VMware Inc., of Palo Alto, Calif.

TECHNOLOGY DESIGN

Seagate Technology LLC, of Scott's Valley, Calif., won for a hard-disk recording technology that dramatically increases the amount of information that can be stored on a single disk. Seagate's "perpendicular" recording method stores data bits on end,

which allows information to be more tightly packed than traditional methods, which store data bits parallel to the disk surface. Seagate began shipping disk drives using the technology earlier this year, and expects that by the end of the year all of its disk-drive products will use the technology.

WIRELESS

Zensys Inc., of Fremont, Calif., won for wireless technology for controlling home lighting, entertainment and security systems. Like Sonos, Zensys uses a mesh network to transmit signals around a home—in this case, radio waves convey on-off commands to any electrical device connected to the system. By using a mesh network, instead of simple radio controls, the Zensys system can detect when a new device is added to or removed from the network and can route commands without interruption anywhere in a home. More than 125 home-electronics companies sell products that can work with the technology. ■

The Judges

The following served as judges for the Innovation Awards. None of them voted on any award, but they may have had an interest.

MARK BERNSTEIN

■ President and Center Director, Palo Alto Research Center

ASHEEM CHANDNA

■ Partner, Greylock Partners

ROBERT DROST

■ Distinguished Engineer and Director, Sun Microsystems Labs
■ Gold Winner, 2004 WSJ Technology Innovation Awards

PETER GRAF

■ Executive Vice President for Solution Marketing, SAP

DIANE GREENE

■ Co-Founder and President, VMware Inc.

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How to Be a Smart Innovator

Nicholas Carr talks about the right way to be creative—and the wrong way

CHALLENGING the conventional wisdom seems to delight Nicholas Carr. The former management consultant caused a stir with his May 2003 Harvard Business Review

article. In his view, the best areas for innovation may be in its manufacturing processes or in the way it manages its supply chain. For other companies, it may be in their products themselves. For still other companies, it could be in their brand-



can figure out a way to move with the market toward the new technology, I think you can do a lot better than jumping ahead.

Back in the dot-com era in the late 1990s, you had all sorts of new-media

from the competition. The innovations aren't necessarily the translate into superior products that powerful are innovations that reduce your costs. Just because tion isn't visible to your