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RESEARCH ■ COGNITIVE COMPUTING

Reverse engineering of human brain makes headway

Scientists report two advances: simulation matching cat's brain and new mapping algorithm

By Brandon Bailey
SAN JOSE MERCURY NEWS

SAN JOSE, Calif. — In an era when PCs perform like supercomputers, and supercomputers carry out inhuman feats of calculation, some of the brightest minds in Silicon Valley say there are still crucial ways in which a com-

puter can't match the problem-solving abilities of our own brains.

But last week, at a supercomputing conference in Portland, Ore., a team of scientists from IBM's Almaden Research Lab and several other institutions announced two developments that could one day lead to a new kind of computer: one that uses specially designed hardware and software to mimic what's inside our heads.

Researchers from IBM and the Lawrence Berkeley National Laboratory say they have performed a computer simulation that matches the scale and complexity of a cat's brain, and project members from IBM and Stanford University

have developed an algorithm for mapping the human brain at new levels of detail. Eventually, scientists hope that detailed knowledge will help them build a computer that replicates the more complex working of a human brain.

The developments may be early milestones on a long road that could one day yield applications for business, science or military forces.

Still, veteran computing analyst Rick Doherty at the Envisioneering Group called the scale and significance of their progress "jaw-dropping." The simulation, for example, did not exactly

'The brain has awe-inspiring capabilities. It can react or interact with complex, real-world environments, in a context-dependent way. And yet it consumes less power than a light bulb, and it occupies less space than a 2-liter bottle of soda.'

DHARMENDRA MODHA
IBM project manager

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INTERNET ■ REGULATION

Google, Yahoo line up against anti-filtering bill

Legislation would curb ability to limit Web searches abroad

By John Letzing
MARKETWATCH

SAN FRANCISCO — Google Inc. and other Internet companies have zeroed in on a resilient effort by a Republican lawmaker to pass legislation that could restrict their ability to take a nuanced approach to operating in "repressive" foreign countries, according to third-quarter lobbying reports.

Google, Yahoo Inc. and a trade group that includes Microsoft Corp. have focused lobbying efforts on the bill, dubbed the Global Online Freedom Act of 2009.

Introduced by U.S. Rep. Chris Smith, R-N.J., the legislation could upset the delicate balancing act required of companies trying to do business in countries such as China — where surging economies and expanding Internet access might be paired with censorship and political repression.

Google has struggled to compete in China, where it lags behind Baidu, a Chinese company, in Internet search market share.

The legislation proposes an Office of Global Internet Freedom, which would monitor any moves by U.S. companies to filter or limit their Internet search results in foreign countries.

In addition, if a company receives a user-information request from a foreign government for "other than legitimate law enforcement purposes," the U.S. attorney general could order the company not to comply — potentially setting it up for an impasse with local authorities.

Google has modified its search service for Chinese users at the government's request before. In 2006, for example, it began limiting search results there for those exploring topics such as the pro-democracy Tiananmen Square demonstrations in 1989.

In addition, the company has been targeted by other foreign governments unhappy with the content it makes available online. Google has argued that it's better to provide censored Internet search results in foreign markets than no results at all.

A previous effort by Smith to pass similar legislation in 2006 met with resistance, and he subsequently penned a column in the National Review blaming Google's efforts in tandem with a firm run by Washington-based lobbyist Anthony Podesta.

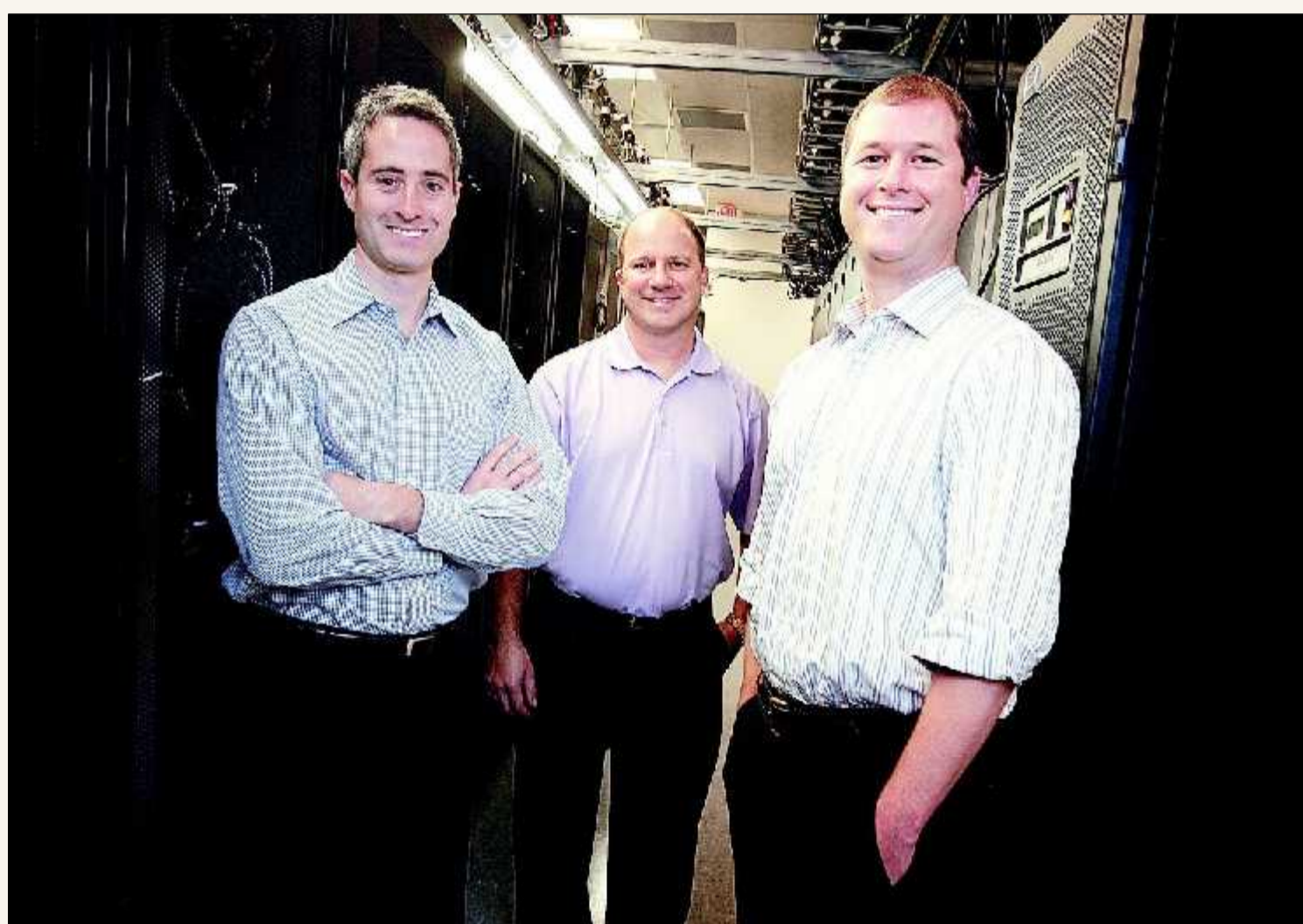
According to public records, in the third quarter of this year Google employed Podesta's firm, Podesta Group Inc., to lobby House and Senate members on the legislation, which was reintroduced in May. Podesta did not reply to a request for comment.

In addition, Google directly lobbied Congress, the Office of the U.S. Trade Representative, the U.S. Department of Commerce and the White House on the bill — often referred to as GOFA — according to third-quarter reports.

Google's director of corporate and policy

See **SEARCH**, next page

With new co-pilots, OnRamp sets sights on cloud services



Deborah Cannon AMERICAN-STATESMAN

After hunting for a year and a half for a tech company with the right potential, Lucas Braun, left, and Ryan Robinson, right, locked onto OnRamp, founded by Chad Kissinger, center. 'Humankind continues to create data at an exponential rate, and that is not going to stop,' Braun says.

After deal, data center company's founder still along for the ride

Over the past decade, Austin's computer data center business has been through a boom, a bust and, most recently, a steady rebound. Chad Kissinger has seen it all.

Fifteen years ago, he started OnRamp Access Inc. as a pioneering local dial-up Internet service provider. He bootstrapped his way from there into the data center business, concentrating on a broad array of commercial customers.

He expanded and diversified during the 1990s Internet boom, endured the dot-com bust and has steadily been adding customers to his Southeast Austin data center since it opened six years ago.



KIRK LADENDORF
PLUGGED IN

The business has nearly 500 customers of all shapes and sizes.

In September, Kissinger sold the lion's share — the exact portion has not been disclosed — of his company to a group of investors in a \$10 million transaction. He's still involved in management and works with

two new partners, Lucas Braun and Ryan Robinson, who will plot the growth of the business.

Kissinger had been looking for investors for several years to fuel the growth of his business. But he also wanted to retain jobs for himself and his workers. He passed on several offers that would have meant deep job cuts.

Braun and Robinson had worked in technology consulting and investing in California and had formed an investment group to look for a promising business with good growth prospects. They looked for 18 months before they found OnRamp.

They first talked with Kissinger in February and

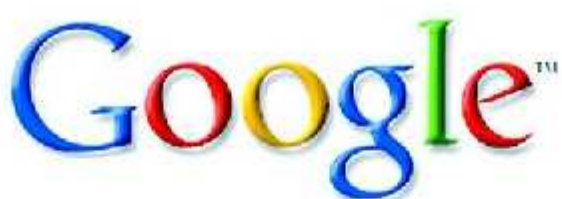
completed the deal after about seven months of study and negotiation. Braun and Robinson have moved to Austin to take an active role in managing and expanding the company.

Braun is CEO, Robinson president and Kissinger vice president of the company, but they describe themselves as the management team.

The new investors liked OnRamp's approach to the data center business, which involves many more services than the typical data center operation.

"It has been growing at double digits (in percentage) through the teeth of the recession," Braun said.

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TECH REVIEW

From giant histories of clicks, Google creates user biographies

Dashboard service offers peek into data collected — and saved

By Hiawatha Bray
THE BOSTON GLOBE

Now appearing on Google: The story of my life. And yours.

Not everyone can read it, but the engineers and advertising specialists at Google can. And now users can get a peek, thanks to Google

Dashboard, a new service developed at the search giant's outpost in Zurich.

Dashboard lets registered Google users see what the company knows about them. If you have a Google account, just punch up www.google.com/dashboard, and get ready to feel your skin crawl.

Google knows just about everything about me. No deep, dark secrets; just thousands of tiny data points which, when put together,

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what does google know

what does google know about me

what does google know about you

what does google know about us

Google Search

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TECH STOCKS

How tech stocks of local interest fared last week and over time.

Company name (Exchange)	Ticker symbol	Friday \$ close	1-wk. % chng.	4-wk. % chng.	52-wk. % chng.	52-wk. \$ high	52-wk. \$ low
Accenture (NYSE)	ACN	39.83	+0.7	+5.5	+50.0	40.50	26.25
Active Power (Nasdaq)	ACPW	1.06	-4.5	-26.4	+311.5	1.50	0.22
Advanced Micro Devices (NYSE)	AMD	6.95	+6.4	+24.1	+232.5	7.33	1.62
Apple Inc. (Nasdaq)	AAPL	199.92	-2.2	-2.0	+132.4	208.71	78.20
Applied Materials (Nasdaq)	AMAT	12.28	-3.5	-5.2	+51.1	14.19	7.80
Astrotech (Nasdaq)	ASTC	1.59	-14.1	-37.4	+401.5	3.84	0.20
BMC Software (Nasdaq)	BMC	38.65	-1.2	+4.0	+62.4	39.51	22.03
Cirrus Logic (Nasdaq)	CRUS	5.14	-3.9	-4.5	+40.1	6.22	2.16
Cisco Systems (Nasdaq)	CSCO	23.46	-1.1	-2.9	+57.0	24.83	13.61
Computer Sciences (NYSE)	CSC	54.33	+0.7	+4.9	+107.8	55.29	23.93
Cypress Semiconductor (Nasdaq)	CY	9.57	+0.1	+2.0	+224.1	11.66	2.54
Dell Inc. (Nasdaq)	DELL	14.29	-7.2	-7.7	+53.3	17.26	7.84
Emerson Electric (NYSE)	EMR	41.68	-0.2	+5.0	+36.5	42.93	24.39
Flextronics (Nasdaq)	FLEX	7.17	+1.1	-1.0	+217.2	7.97	1.23
Forgent (Nasdaq)	ASUR	0.25	-7.4	-19.4	+17.5	0.47	0.10
Hewlett-Packard (NYSE)	HPQ	50.04	+0.3	+3.0	+51.8	51.43	25.39
Intel (Nasdaq)	INTC	19.24	-2.9	-2.7	+59.0	21.27	12.05
IBM (NYSE)	IBM	126.96	-0.1	+5.5	+70.7	128.66	69.50
Luminex (Nasdaq)	LMNX	13.92	+4.9	-12.2	-33.8	24.14	12.75
Motorola (NYSE)	MOT	8.28	-5.7	+0.5	+148.0	9.45	2.98
Multimedia Games (Nasdaq)	MGAM	5.25	-2.4	-13.4	+124.5	6.35	1.55
National Instruments (Nasdaq)	NATI	28.28	+0.3	+4.7	+38.7	28.90	15.99
Perficient (Nasdaq)	PRFT	8.56	+5.0	+0.6	+215.8	9.50	2.31
Pervasive (Nasdaq)	PVSW	5.00	+0.4	+0.9	+24.6	6.35	3.25
Polycom (Nasdaq)	PLCM	22.23	-6.9	+2.1	+33.1	28.43	12.19
Qualcomm (Nasdaq)	QCOM	45.10	-1.5	+10.8	+52.4	48.72	28.16
Silicon Labs (Nasdaq)	SLAB	42.22	-2.4	+0.3	+114.9	49.08	17.05
SolarWinds (NYSE)	SWI	18.79	-5.3	-5.3	...	24.25	12.70
Texas Instruments (NYSE)	TXN	24.74	-2.8	+5.3	+73.1	26.08	13.38
3M (NYSE)	MMM	76.64	-0.2	-1.5	+34.9	79.25	40.87
TW Telecom (Nasdaq)	TWTC	14.64	-0.9	+1.9	+165.0	15.24	5.09
Valence Technology (Nasdaq)	VLNC	1.13	-6.6	-36.5	-28.6	2.90	1.09

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REVIEW: Simple steps can help limit risk of exposure

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could provide a pretty thorough biography.

Start with standard Web search data, the backbone of Google's business. Every search you perform is recorded and preserved for future analysis, to help Google improve its service.

Study a person's searches over months or years, and you can pretty much write his or her life story. Dashboard let me review my Web searches going back to 2006. Long-forgotten queries about airline tickets, books and magazine articles, a new clarinet for my daughter — they're all there.

"It's really unprecedented in the history of mankind what we're sharing," said Greg Conti, an assistant professor of computer science at the U.S. Military Academy and author of the book "Googling Security."

Conti refuses to get a Google account, the better to preserve his privacy. After all, you don't need an account to run Google searches. But that doesn't mean you're entirely anonymous.

Google puts a cookie inside your Web browser, a little bit of data that identifies the particular computer you're using. Google also tracks the Internet address of your computer, which gives it your approximate location. After nine months, the address data is deleted; the cookie information is wiped after 18 months. Only then are your stored searches truly anonymous.

Oddly, using Dashboard makes me glad to have a Google account. I can look up my past searches and know exactly what Google knows about me.

Of course, Google account holders can sign up for additional services — free e-mail, an online appointment calendar and address book, document creation and management, and the Google Voice telephone and messaging service. Each encourages you to hand over specific information about yourself, friends, relatives and colleagues.

The services provide instant access to your vital data through any Web-connected device. But they also provide the data to Google. How much

do you want them to know?

As a journalist, I want people to find me. So I have no objection to providing all my phone numbers to Google Voice. But what about other people's phone numbers?

I've accumulated thousands of numbers and e-mail addresses over the years. I recently uploaded them from my BlackBerry to my Google address book. Seeing them displayed on Dashboard helped me realize my folly.

There's no reason to think that Google will abuse the data. But what if its computer network is breached or somebody steals my password? Storing the information online endangers the privacy of many people. So I've wiped my Google address book.

Seeing all that I've shared with Google laid out on a single page got me thinking seriously about privacy for the first time in a while. That's the genius of Dashboard, and the creation of this tool gives me confidence that Google respects my right to privacy.

But what about everybody else? We pass around chunks of personal data to hundreds of other sites. Think about what Amazon.com knows about you or Facebook. Then there are the Internet advertising networks that follow you as you browse from one site to another, tracking everything you read.

"I think if we could lay out everything we've disclosed online, we'd be stunned," Conti said. And even if each individual site follows Google's lead and creates its own Dashboard, nobody has the time or patience to scour them all.

Want a simple solution? Unplug the computer. Otherwise, your only recourse is constant vigilance. Be choosy about giving personal data to Internet sites. Keep your address book to yourself. Regularly remove cookies from your browser. Consider using an ad blocking program because that will often block ad cookies.

Every little bit of caution helps, but only so much. You give away a little more of yourself with every Web site searched and every e-mail sent. Each keystroke helps to write the story of your life, and there's no telling who might be reading it.

YOUR TECH



Casio Exilim G EX-G1

Asus Videophone Touch AiGuru SVIT

TELECOMMUNICATIONS

Videophone calls via Web get a little easier

Asus is pitching its new videophone, the Asus Videophone Touch AiGuru SVIT, as a way to make free audio and video calls over Skype, no PC required. But there's a gotcha: Although a PC isn't necessary, a broadband Internet connection (and preferably a wireless network) are.

Setting up the Asus is simple: Plug in the phone and connect it to your wired or wireless network. I connected to my Wi-Fi network using an on-screen keyboard to enter my security password, then logged into Skype.

The Asus videophone has a 7-inch touch screen with a resolution of 640 by 480 pixels. Its user interface is novice-friendly; adding contacts and making phone calls are done with an on-screen keyboard. Call quality was quite good and sounded great on the speakerphone. Video isn't crystal clear, but it's roughly the same quality as from my MacBook Pro.

But is the Asus worth \$255? After all, you can make the same video calls from a laptop. Nonetheless, there is a certain convenience to making video calls without having to sit in front of your computer.

DIGITAL PHOTOGRAPHY

Camera's rugged look extends to its images

Casio's first rugged point-and-shoot camera, the Casio Exilim G EX-G1, is a lean model that's strong on tough features: It's shock-resistant (it can withstand drops of 7 feet), waterproof to a depth of 10 feet, dustproof and freeze-proof to 14 degrees.

The 12.1-megapixel EX-G1 has a stainless-steel frame and a fiberglass and polycarbonate body, yet weighs only 5.4 ounces and measures just 0.8-inch thick, making it the slimmest rugged camera on the market.

The \$300 EX-G1, which will hit the market next month, has a 2.5-inch LCD that is reinforced to withstand damage from water and drops. Its 3X zoom lens sits behind a waterproof seal. Likewise, a pressure-sealed case protects the battery and MicroSD card.

What's missing? The EX-G1 lacks image stabilization, which seems especially important for people using their cameras while constantly in motion. And the camera cannot shoot video in high definition; users will have to settle for a more rugged standard image.

— The New York Times

COMPLEX: New computer could handle data tsunami

Continued from previous page

mimic what a real cat does in catching a mouse. But it surpassed earlier efforts that simulated the much simpler brain structure of a creature the size of a mouse.

Researchers used an IBM supercomputer at the Lawrence Livermore National Laboratory to model the movement of data through a structure with 1 billion neurons and 10 trillion synapses, which allowed them to see how information "percolates" through a system that's comparable to a feline cerebral cortex.

The work is part of a federally funded effort to study what's known as cognitive computing, starting with what IBM project manager Dharmendra Modha calls "reverse-engineering the human brain," or designing a new computer by first getting a better understanding of how the brain works.

"The brain is amazing," said Modha, a computer scientist who waxes poetic about the capabilities of human gray matter. "The brain has awe-inspiring capabilities. It can react or interact with complex, real-world environments, in a context-dependent way. And yet it consumes less power than a light bulb, and it occupies less space than a 2-liter bottle of soda."

A key difference between human brains and traditional computers, Modha says, is that current computers are designed on a model that differentiates between processing and storing data, which can lead to a lag in updating information. The brain works on a more complex physical structure that can integrate and react to a constant stream of sights, sounds and other sensory information.

"The data can be very ambiguous," Modha said. "When we see a friend's face in a crowd, she could be wearing a red sweater or a blue dress, or her hair could be styled differently, but we're able to get to the fundamental essence of the pattern and recognize this is our friend."

Modha imagines a cognitive computer that could analyze a flood of constantly updated data from trading floors, banking institutions and real estate markets around the world, sorting through the noise to identify key trends. Or one that could evaluate pollution, weather and ocean data from real-time sensors around the world to monitor global water supplies.

"As our digital and physical worlds collide, there is a tsunami of information," Modha said. "There is a need for a new kind of intelligence that can sort through, prioritize and extract the most important information, much like how the brain deals with sight, sounds, tastes, touch and smell."

A cognitive computer might also help soldiers analyze and react to chaotic events on a battlefield. The research is the result of a \$5 million grant from the Pentagon's Defense Advanced Research Projects Agency, which also funded the forerunner of the Internet.

Jim Olds, a neuroscientist and director of the Krasnow Institute for Advanced Study at George Mason University, called the new research a "tremendous step."

Olds, who was not involved in IBM's work, said neuroscientists have been amassing data on the brain but without a way to tie it together.

"We've made tremendous advances in collecting data, but we don't have a collective theory yet for how this complex organ called the brain produces things like Shakespeare's sonnets and Mozart's symphonies," he said. "The holy grail for neuroscientists is to map activity from single nerve cells, which they know about, into how billions of nerve cells act in concert."

Modha says a simulation of a human cortex could come within the next decade if Moore's Law holds. That's the rule of thumb that the number of transistors on a computer chip tends to double every two years.

Additional material from The Associated Press.

PLUGGED: Data centers vary in services offered

Continued from previous page

And they like the data center market, which they have studied extensively.

"Humankind continues to create data at an exponential rate, and that is not going to stop," Braun said. "Any company that has the desire and the need to connect to the Internet, for any reason, from e-mail to hosting a Web site to hosting applications ... needs to be enabled in a smart way, and we provide that."

Outsourcing computer services is part of a steady trend that has worked its way down from giant corporations to smaller businesses, including retailers, law firms, doctors' offices, state agencies and other clients that make up OnRamp's customer base. It has also added a sizable number of Houston companies whose executives saw the wisdom of keeping a disaster recovery location for their computers after Hurricane Rita struck in 2005.

All of this fits with national trends, said analyst Rob Enderle with the Enderle Group in San Jose, Calif., who says the recession has accelerated the trend toward outsourcing computer services because companies see it as an efficiency move.

"Companies are looking at services as a way to cover their butts," Enderle said. "It is less risky to use a hosting service. Laying off people is expensive and disruptive."

Even small data centers the size of OnRamp — which soon will be expanding into 15,000 square feet — talk about using their version of "cloud services" as a way of driving growth.

Cloud computing essentially is the notion that a clump of computing resources — servers, networking and storage — can be efficiently shared for many different tasks.

Some computing companies envision giant clouds that serve many companies.

But OnRamp and others are backing the concept of "private clouds," wherein one company can rent the gear it requires and have it dedicated to its needs.

The growth of cloud services, Enderle said, is an extension of the cost consciousness precipitated by the weak economy.

"The big driver is cost savings," he said. "When the economy is in flux, companies get very value-oriented. And the cost savings involved in cloud services is undeniable."

Other data centers in Central Texas are growing, too.

The newest arrival is Houston-based CyrusOne, which opened a 50,000-square-foot data center in Southeast Austin in August.

CyrusOne has close ties to Houston's oil industry, and some of its clients wanted to have second data center location in Austin that would be far enough inland to be well away from hurricanes.

Cameron Brown, who manages the center, said it is being actively marketed to Austin-based companies as well and is already a quarter filled with customers' equipment, he said.

"One of the reasons we expanded here is, we felt Austin was underserved," he added.

CyrusOne primarily offers customers a secure location for their servers and redundant electrical power and Internet connections.

OnRamp, by contrast, has always offered a variety of services. It even has a small group of programmers who build Web applications for some customers.

Kissinger, on a tour of his center, shows off a well-stocked tool cabinet that serves both OnRamp's engineers and its customers.

The cabinet includes a bin of "caged nuts," the small metal components used in attaching servers and networking gear to the 7-foot-tall equipment racks in a data center.

They are a prosaic component, but they are also essential for customers if they haven't brought their own supply.

Many data centers, Kissinger said, don't provide the complete set of tools for clients who need to do work on their racks of equipment.

"We have been successful in going beyond the traditional model of a data center," he said.

Robinson, from his investment industry background, appreciates how that happened.

"A lot of that evolved through the simple questions: What can we be doing better, and what can we do for you?"

Customers say they like the approach.

"They are a great data center, and we have never had a problem," said Steve Axelrod, president of Universalnumber.com, a voice-mail service bureau. "They have tools we can use when we are there, all the screws that we need and all the assistance that we could possibly want. It has been very nice working with them."

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Kirk Ladendorf covers hardware technology for the Statesman.

SEARCH: Web giants disagree with bill's scope, not its ideals

Continued from previous page

communications, Bob Boorstin, said in a statement that the legislation could be "improved to avoid impeding the spread of technologies around the world that promote free expression."

Boorstin added that the issues of censorship and free expression might best be addressed as part of "international human rights accords and trade mechanisms."

Yahoo became ensnared in a human rights debacle after it was sued in 2007 for handing over personal information about pro-democracy users in China to local authorities, which helped lead to their imprisonment and torture.

Yahoo directly lobbied the State Department and Congress about the legislation in the third quarter and hired Mehlmann Vogel Castagnetti Inc. to take up the issue, records show.

Yahoo has pulled out of direct competition in China, though it retains an ownership stake in Hangzhou-based Alibaba Group. However, the legislation could apply to other countries where Yahoo does business.

A Yahoo spokeswoman said in a statement that, "While the

goals set forth by the sponsors of GOFA are noble, the bill's scope could ultimately mean that companies will have to cease providing information services in a number of countries.

"Yahoo will continue working with Congress as it addresses this legislation," the statement read.

In the wake of intense scrutiny in the media and on Capitol Hill of their operations in markets such as China, Yahoo, Google, Microsoft and other companies formed the Global Network Initiative last year. The group is dedicated to protecting "freedom of expression" in information technology, according to its Web site.

Still, Rep. Smith is pressing ahead. His bill has been referred to two House committees, and is being co-sponsored by Democrats Brad Sherman, D-Calif., and David Wu, D-Ore., as well as two other Republicans.

Smith said in a statement that the legislation "is aimed at ending the collaboration between U.S. companies and brutally repressive regimes when there is concern that U.S. products will be used to put innocent, pro-democracy advocates in jail."