

GOVERNMENT TECHNOLOGY

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SOLUTIONS FOR STATE AND LOCAL GOVERNMENT IN THE INFORMATION AGE

DECEMBER 2009

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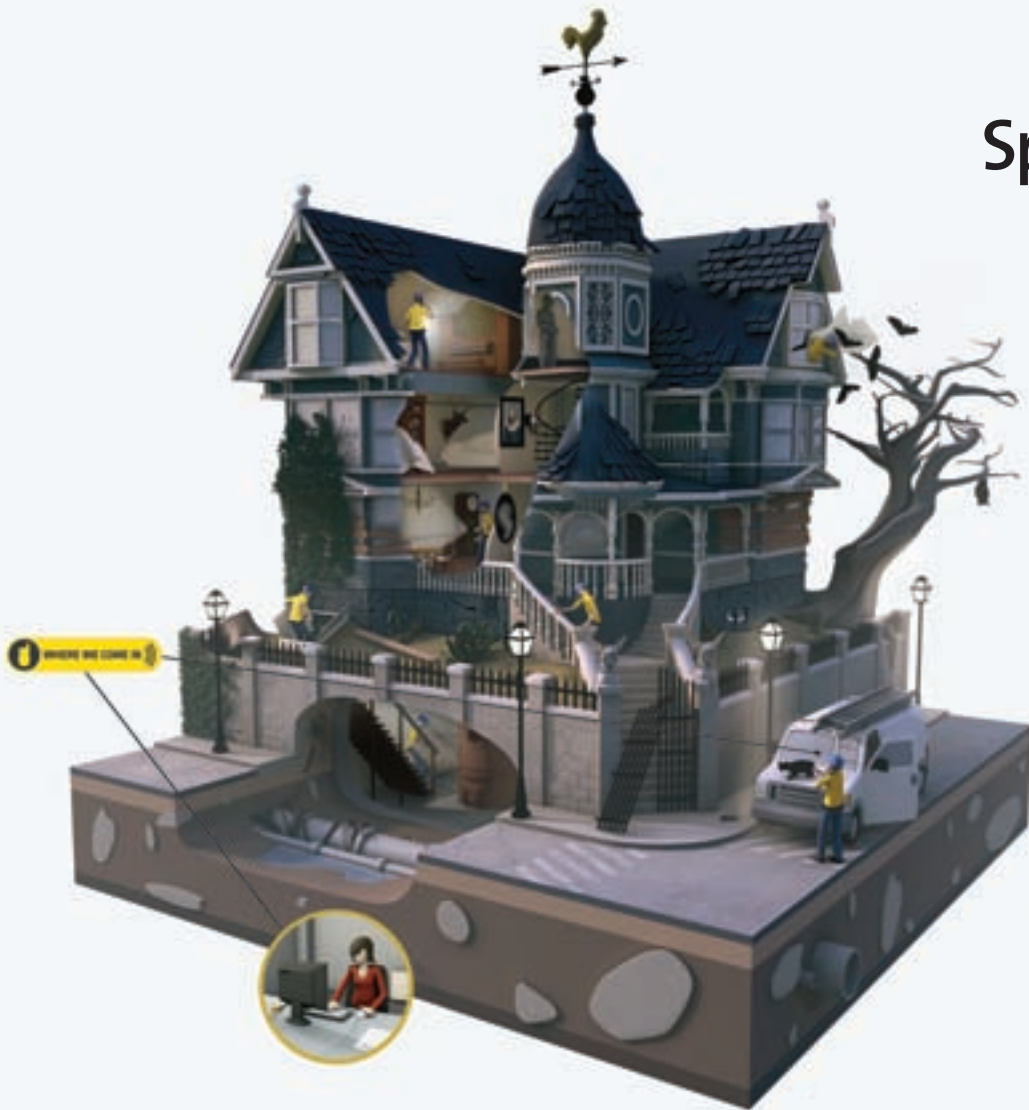


YEAR ⁱⁿ REVIEW

A look at the people and events that shaped 2009

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Portland's New ERP

When the time came to overhaul decades-old back-end technology in Portland, Ore., everyone knew it wouldn't be easy. But no one anticipated how difficult it would become. Yet the city persevered and built an IT foundation that will last well into the future. Find out how next month.

AN AWARD-WINNING PUBLICATION



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To Infinity and Beyond

Sometimes being “first” works out and sometimes it doesn’t. Neil Armstrong attained folk-hero status as the first man on the moon. But Laika, the first canine in orbit, died of overheating while aboard the Soviet spacecraft Sputnik 2.

Los Angeles Chief Technology Officer Randi Levin and employees working for

after Google Apps is in place for a matter of months or years that ultimately will dictate how L.A.’s decision is judged.

The peril of being first is that nobody knows exactly how public opinion will sway when — not if — Gmail suffers a widespread service disruption that wreaks havoc with government work. And in a worst-case event, if government data is compromised or lost,

The peril of being first is that **nobody knows exactly** how public opinion will sway when — not if — Gmail suffers a widespread service disruption that wreaks havoc with government work.

the department she directs, the Information Technology Agency, would be wise to remember Laika before they declare victory in the city’s decision to deploy Google Apps to its 30,000 employees.

Like Neil and Laika, L.A. is rocketing into the great unknown.

Yes, Google and its partner, Computer Sciences Corp., likely will execute a smooth transition for L.A. from Novell’s GroupWise, its existing e-mail system. After all, millions of people worldwide use Gmail for their personal e-mail — there would seem to be few surprises ahead from a technology standpoint. And after some prodding, Levin appears to have stemmed concerns voiced by the city’s law enforcement and public safety interests. Everyone (except Google’s competitors) seems to be on the same page.

But that’s not the central issue. Like any other enterprise project, it’s what happens

will L.A.’s citizens raise more of a stink than they would’ve otherwise because their personal data was located in an offsite Google server farm? What if the project implementation costs more than anticipated, and it doesn’t turn out to be the recurring money saver that the city’s budget analysts expect it to be? What if employees find that Web-based e-mail doesn’t meet their work needs?

There are many unanswered questions, and no precedent from which to judge. That’s why — despite the drumbeat that cloud computing is the future — it’s a good bet that other state and local government agencies will sit back a year or two and closely watch L.A. before venturing into the cloud themselves.

After all, sometimes, like Laika, you might not make it back. 

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on the scene

Govtech.com Hot List

Here are the 10 most popular stories from Oct. 23, 2009 to Nov. 22, 2009.

Rethinking Preparedness

ORLANDO, FLA. — At the 57th Annual International Association of Emergency Managers conference on Nov. 2, Gerry Galloway, professor of engineering at the University of Maryland, said climate change, population growth and the breakdown of levees and other flood control infrastructure causes a greater risk of floods. He also said the way we view flooding and protecting citizens must evolve.

To change that, policymakers and others in the know must communicate the risk to everyone, and terms such as “100-year flood” should be abolished. He said politicians don’t want to tell citizens they’re at risk and developers continue to build in flood-prone

areas to the great peril of those who move into those communities. “In New Orleans, we’ve convinced ourselves that 100-year flood protection is fine,” Galloway said. “That’s inadequate; 500-year flood protection is inadequate.”

Galloway said changing the population’s behavior is a must. During the 2004 Indian Ocean tsunami that killed more than 200,000 people, the populace simply didn’t know the risk. “We lead people to believe there’s no risk in making decisions regarding land use and zoning,” Galloway said. “It’s not popular for politicians to tell you that you are not safe.”

— JIM MCKAY, JUSTICE AND PUBLIC SAFETY EDITOR



New Energy Frontier

HELENA, MONT. — Though you can drive for hours without seeing another car, Montana is bustling. The bustling just happens to be going on in alternative energy production.

Government Technology sat down with Montana Gov. Brian Schweitzer to talk about what the state is doing to position itself as an alternative energy leader.

“Montana has, according to recent studies, the second best wind energy resources in the country, some of the best on the planet,” Schweitzer said. To harness that energy, wind farms large and small are cropping up in the “wind belt” portion of central and eastern Montana.

The state is also well known for coal production, and Schweitzer is advocating

for investment in clean coal technology. Clean coal is the process of capturing all the pollutants from coal firing before they reach the atmosphere and repurposing those captured chemicals for other uses.

“We have 30 percent of the coal in America — 10 percent of the coal on the planet,” he said. “Whether we’re talking about capturing carbon dioxide from existing coal-fired plants or creating new kinds of coal capturing devices for new kinds of plants, we’re excited about developing our coal.”

— CHAD VANDER VEEN, ASSOCIATE EDITOR

GTv LOOK FOR THE COMPLETE INTERVIEW WITH SCHWEITZER SOON ON GTv. WWW.GOVTECH.COM/GTTV

- 1 **Top Digital Cities Announced for 2009** Corpus Christi, Texas, and Santa Monica, Calif., are among the top finishers. www.govtech.com/732676
- 2 **Los Angeles City Council Approves Google E-Mail Plan** Microsoft and Google made final arguments in three-hour discussion. www.govtech.com/732223
- 3 **Texas Releases Recommended Fixes for Data Center Consolidation** Study suggests Texas renegotiate its contract with IBM. www.govtech.com/733336
- 4 **Personal Computing: Should You Upgrade to Windows 7?** Most existing computers with Vista or XP don’t need Windows 7 upgrade. www.govtech.com/732885
- 5 **Site Reveals Salaries of New York State Employees** Conservative think tank launches Web site with comprehensive state financial data. www.govtech.com/383701
- 6 **Chicago 911 Official Resigns Over \$2 Million Mistake** Deputy commissioner resigns to avoid being fired, according to newspaper report. www.govtech.com/268529
- 7 **Five Tips for Outsourcing or Sharing IT Resources** Pennsylvania and Minneapolis are among successful shared services and outsourcing models. www.govtech.com/732320
- 8 **Dozens of Governments Interested in Google Apps, Los Angeles Official Says** City’s plan to transition work force to Google Apps draws plenty of attention. www.govtech.com/733435
- 9 **New Mexico Lt. Gov. Diane Denish Touts Google Apps in Cost-Saving Plan** Budget proposal says using Gmail and other tools could save \$1.9 million annually. www.govtech.com/732926
- 10 **Enterprise Architecture Demystified** What is enterprise architecture and who is it intended to benefit? www.govtech.com/418008

Four Questions

for David Fletcher
CHIEF TECHNOLOGY OFFICER, UTAH

PHOTO COURTESY OF JONATHAN HIGLEY



UTAH WON THE TOP HONOR FOR STATE PORTALS AT THE CENTER FOR DIGITAL GOVERNMENT'S BEST OF THE WEB AWARDS CEREMONY IN HOLLYWOOD, CALIF., IN SEPTEMBER. UTAH.GOV USES GEO-IP TECHNOLOGY, WHICH READS A VISITOR'S IP ADDRESS IN ORDER TO DISPLAY LINKS AND CONTENT THAT ARE RELEVANT TO THE PERSON'S PHYSICAL LOCATION. FLETCHER DISCUSSED THE GEO-IP IMPLEMENTATION WITH *GOVERNMENT TECHNOLOGY*.

1 Explain the significance of using geo-IP technology on Utah's portal.

We wanted to localize services and information so they would mean more to citizens. Geo-IP enabled us to determine what public meetings and services would apply to citizens using the site. If they lived in the town of Provo, they would get different meetings and service notices than they would get if they lived in Salt Lake. They also get maps showing where their local parks, libraries and schools are.


2 How labor intensive was it to implement geo-IP technology?

It required work in a number of areas. We had to get some data sets from existing data — where the parks are and other local government services. In addition, we created a public meeting notice service that every state and local government entity is required by law to use. The Legislature set it up that way, so every public meeting in the state is in this system. We're able to localize jurisdictions by public meetings.

3 How often do you have to update this geo-IP database?

A lot of the information is updated automatically. For example, we have a central agency that coordinates GIS. There is ongoing collaboration between all the cities and counties, as well as the federal government. A lot of federal agencies operate in Utah like the Bureau of Land Management and the National Park Service. We have an agreement with all of those entities, ensuring that any GIS is shared across the state. It's part of what updates our centralized GIS repository, which feeds the localization service.

4 Should other states that want this type of project expect it to be expensive?

I don't think it has to be expensive, but it does require significant collaboration and determination of what data sources you're going to use. Most states have access to data sources that are updated regularly, so it really requires a focused effort. It doesn't require a lot of extra expense, other than the personnel. 

BY ANDY OPSAHL, FEATURES EDITOR

UMUC HOMELAND SECURITY



PROJECTED JOB GROWTH: 23% OVER THE NEXT DECADE.

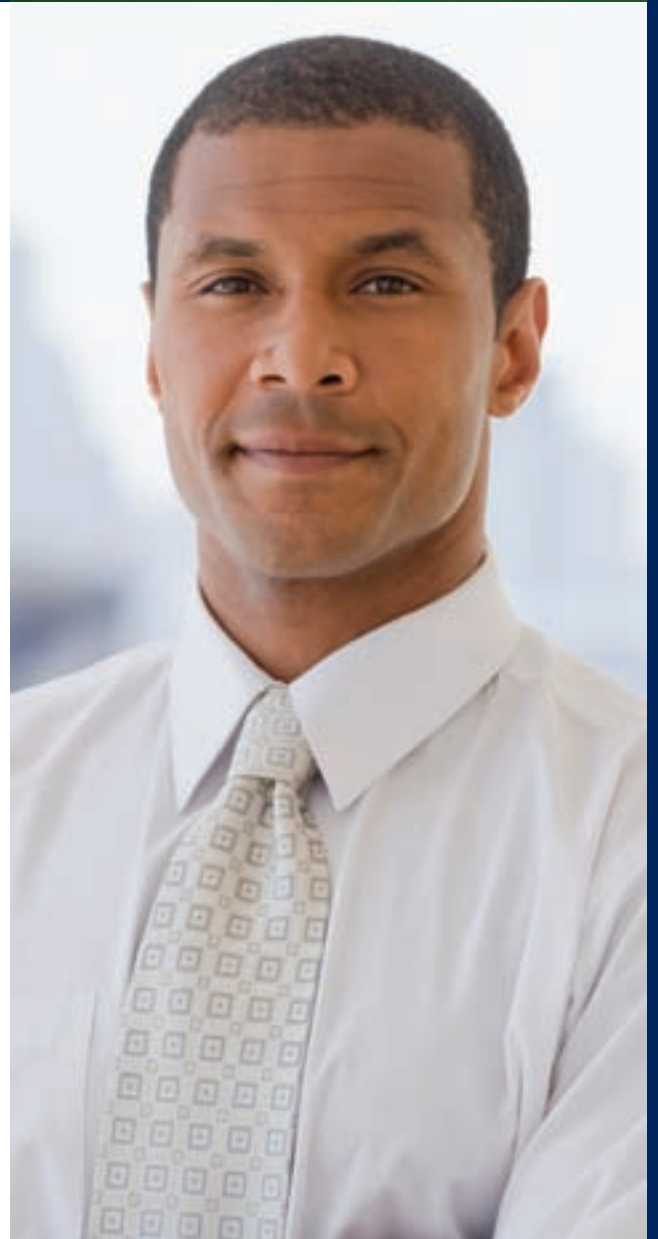
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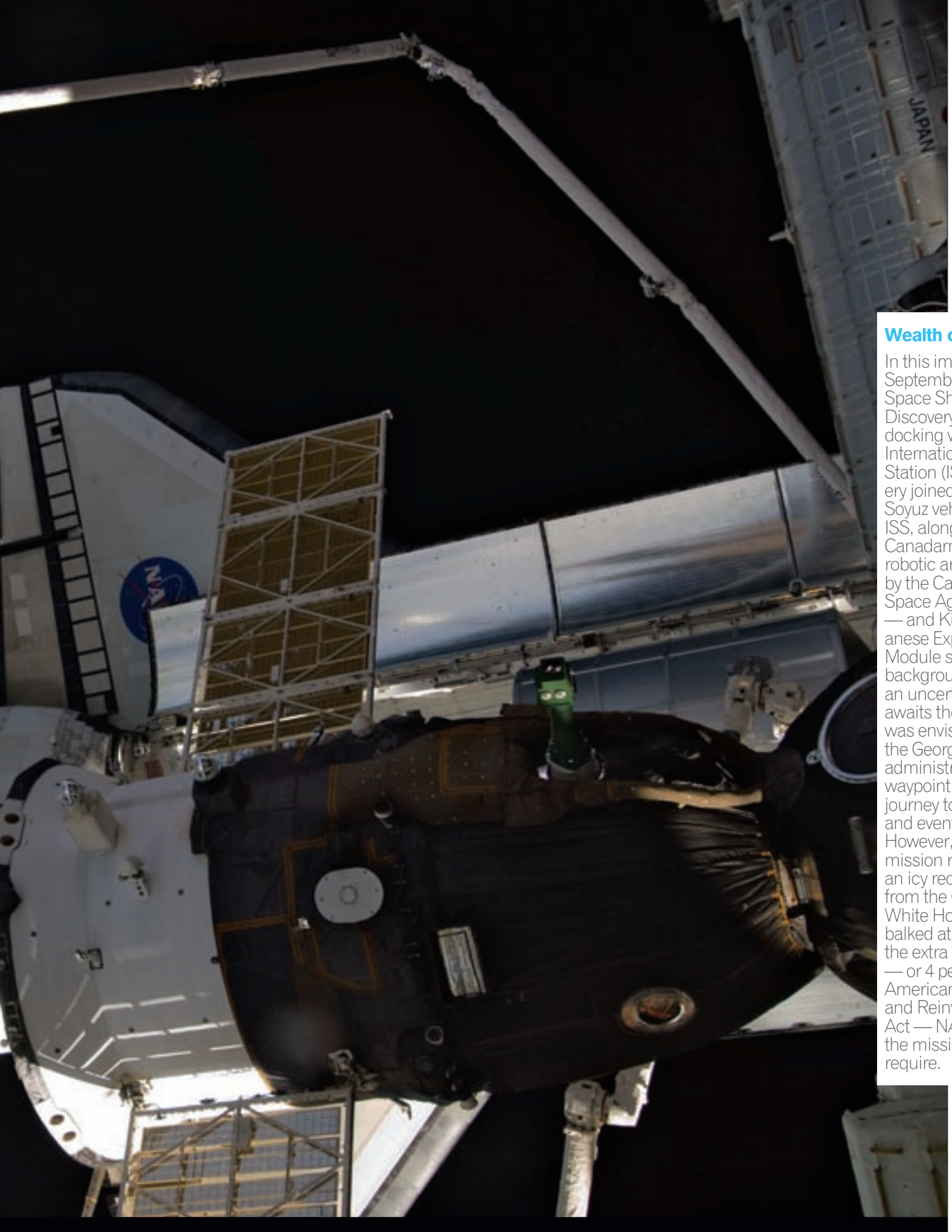
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big picture

PHOTO COURTESY OF NASA





Wealth of Nations

In this image from September 2009, Space Shuttle Discovery is shown docking with the International Space Station (ISS). Discovery joined a Russian Soyuz vehicle at the ISS, along with the Canadarm 2 — a robotic arm provided by the Canadian Space Agency — and Kibo, the Japanese Experiment Module seen in the background. Yet an uncertain future awaits the ISS. It was envisioned by the George W. Bush administration as a waypoint on a return journey to the moon and eventually Mars. However, such a mission received an icy reception from the Obama White House, which balked at spending the extra \$30 billion — or 4 percent of the American Recovery and Reinvestment Act — NASA said the mission would require.





The **YEAR** in **REVIEW**

A look at the people and events that shaped 2009.

In 1982, when Arthur C. Clarke wrote his novel *2010*, he imagined a world of technological progress wildly different from what resulted: Clarke envisioned that by 2010 we, with the Chinese and Soviets, would gallivant around the solar system in spaceships run by artificially intelligent — and occasionally murderous — computers.

In reality, our next-generation spaceships look suspiciously like those we built in the 1960s. But despite our unfulfilled interstellar ambitions, the first decade of the 21st century draws to a close heralding a forthcoming age even the most prescient science fiction authors could have scarcely predicted.

Technology, it was assumed, would be used to explore outward into the heavens. Although we've built an expensive outpost orbiting the Earth, the roads most of our technological advancements travel, draw us inward toward digital communities, transparent government and a global battle for information security.

Like much of the decade, 2009 has seen much uncertainty. Our technology has brought us closer together and driven us further apart. Plentiful times spurred largely by technology, have given way to economic despair. And escaping may largely depend on our technological prowess.

Still, the year dawned with renewed hope and optimism. Now, in its waning days, reality has tempered expectations, but we remain at the precipice of a new era — born of digital interconnectedness, of economic opportunity and expansion, of finally freeing ourselves from the shackles of foreign oil. But such possibilities will require steadfast leaders who expand the scope of their duties and embrace innovation like never before.

Though rife with difficulty, there was much to savor in 2009. So as you steel yourselves for the challenges ahead, take a moment to reflect on the year that was.



THE YEAR IN WEB 2.0

CHAD VANDER VEEN | ASSOCIATE EDITOR

Web 2.0, a cryptic term, has come to define any number of Web-based tools and applications designed to foster discussion and give a voice to users. In 2009, one Web 2.0 application, for good or ill, caught the fancy of both the public and private sectors at all levels — Twitter.

Some of the most practical government applications for Twitter began appearing in public safety and emergency notification. For example, the Los Angeles Fire Department updates its Twitter page with bulletins about structural fires, the number of responding firefighters, and injuries and casualties. A typical post could be something like: “12126 Burbank Bl* No ‘formal’ evacuations; Firefighters maintaining 500’ exclusion zone pending LAFD Hazmat arrival.”

Other agencies, like the Washington State Department of Transportation, began using Twitter to alert drivers of traffic conditions

and route changes to ferry vessels plying the waters of Puget Sound.

Such stories generated numerous comments on Govtech.com. Some readers offered their own ideas about how government could best use Twitter. Others cited examples of how their local and state governments, including Hermosa Beach, Calif., and Kansas, have already boarded the Twitter express.

In July, with Twitter-mania at an all-time high, some observers voiced concern that Web 2.0 tools were blurring the lines between our private and professional lives.

“I think what is happening today is our work worlds, social worlds and family worlds are all converging,” social media observer and *World Wide Rave* author David Meerman Scott told *Government Technology*. “They always have been interlinked, but I think social networking interlinks them even more. It’s difficult to keep

those separate unless you’re prepared to not use social networking.”

But Twitter wasn’t the only Web 2.0 star in 2009. Last year’s Web site *du jour*, Facebook, continued its meteoric rise while crushing its rivals — MySpace in particular — along the way. However, the sudden influx of social media into the workplace raised questions, such as what happens when employees and employers are Facebook “friends.” CIOs now have to decide if this new dynamic poses a threat to existing relationships or whether it’s simply a modern means for workers and bosses to communicate.

Anand Dubey, Alaska’s director of Enterprise Technology Services, weighed in on the Facebook debate. Dubey said Facebook is first and foremost a tool and should be treated as such.

“You need to be very clear-cut about your processes on a manual level,” he said. “Once you’ve optimized those, then pretty much

TWEET TIDBITS

Social networking platforms revolutionized not only how individuals interact with one another, but also created an avenue for governments to engage citizens. One such outlet is Twitter, which provides users with tiny morsels of information of no more than 140 characters long — all while creating a new vocabulary and universe of its own. Here’s a look at some tweets from 2009:

The White House

Next White House twitter mystery: How quickly can we reach 1,000,000 followers?

9:38 AM JUL 27TH FROM HOOTSUITE

Disability.gov

Emergency Preparedness Tip #4: Complete an emergency contact card. Visit <http://tiny.cc/A5hVB> for a sample.

2:01 PM AUG 30TH FROM API

Utah

Thanks to Center for Digital Government for recognizing <http://Utah.gov> as the #1 state portal in 2009 - <http://bit.ly/BivJX>

8:08 AM SEP 1ST FROM WEB

San Francisco

Volunteer and help clean up the beach and beautify District 1 <http://bit.ly/BXjpa> Saturday, Ocean Beach, Great Hwy, & Fulton start 9am

11:42 AM JUL 10TH FROM COTWEET



IN APRIL,

Government Technology spoke to **Shell Culp** at the California Department of Toxic Substances Control. Culp is rolling out Web 2.0 apps to improve internal processes and help make the public more aware of potentially harmful substances in consumer goods.

any tool can fit your need — and that's where this Facebook stuff comes in. People are doing it, but they don't really know why."

Evidence of Facebook's pervasive influence showed up in March, as *Government Technology* published its annual Top 25: Doers, Dreamers and Drivers. The list highlights 25 people who have had a significant impact in public-sector IT. 2009's list featured Facebook co-founder Chris Hughes. In addition to his indirect contribution by helping create the Facebook juggernaut, Hughes is responsible for my.barackobama.com, a Web site that achieved phenomenal success in organizing online grass-roots support for Barack Obama's bid for the White House.

In 2009, government adopted and integrated Web 2.0 like never before. Many of the year's Best of the Web survey winners — like Utah, California and Louisville, Ky. — feature home pages that look like a clearinghouse for Web 2.0 applications. Citizens of these and other locales have more, easier and faster ways than ever to connect with government, thanks largely to the rapid development and adoption of Web 2.0.

As they are wont to do, people keep discovering new ways to use existing tools. Web 2.0 technology is no different. Agencies across the country have deployed apps, blogs, wikis, social networks and more. In April, Shell Culp, CIO of the California Department of Toxic Substances Control, told *Government Technology* how her agency rolled out Web 2.0 applications to improve internal processes and help make the public more aware of potentially harmful substances in consumer goods.

Other organizations experimented with the latest Web 2.0 tools to reach a global

audience. Over the summer, the Chicago Chamber of Commerce used a concept known as "crowdsourcing" — using the Web to ask the world a question. The chamber's goal was to crowdsource for ideas on how to increase public transit ridership in Chicago, and it received hundreds of thoughtful responses from every continent.

2009 also saw government IT tackle nuts-and-bolts Web 2.0 issues like information security. IT security pros like Mark Weatherford, California's chief information security officer, and Elayne Starkey, CTO of Delaware, gave their advice on how to keep sensitive data secure as people grow more comfortable putting anything online.

"Most people don't want to do the wrong thing. They simply don't know what the right thing is in many cases. Laying those things out in policy is really the best way you can reach all of your employees," Weatherford said, echoing the sentiment of Alaska's Dubey.

Even Paul W. Taylor, *Government Technology's* venerable back-page columnist, found himself discussing Web 2.0 nearly every month. An excerpt from Taylor's June column sums up nicely the present state of Web 2.0 in the public sector.

"People responsible for enterprise technology worry ... Web 2.0 advocacy may be as dangerous to enterprise stability as a toddler with a fork waddling toward an electrical outlet. But the enterprise — or more properly, the federated state and local government environments — is resilient. What were once dismissed as toys are becoming platforms and platform extenders."

JANUARY 09

Delaware CIO **Tom Jarrett** announces his resignation. He's replaced by James H. Sills III.

Austin, Texas, names **Gail Roper** CIO. Roper had served as CIO of Raleigh, N.C. However, Roper would later leave Austin and return to North Carolina after being unable to sell her Raleigh home.



Chris Cummiskey ends his tenure as Arizona's CIO, stepping down after six years.

Bill Bryan — an 18-year veteran of the Missouri Attorney General's Office — is appointed state CIO. Missouri Gov. Jay Nixon moved Bryan in September, however, to deputy director of the Department of Natural Resources.

FEBRUARY 09

President Barack Obama names **Melissa Hathaway** his top cyber-security adviser. Hathaway, a former consultant at Booz Allen Hamilton who assisted the George W. Bush administration in creating the Comprehensive National Cyber Security Initiative, left the post in August.

U.S. Department of Homeland Security Secretary Janet Napolitano appoints **Mary Ellen Callahan** as the department's chief privacy officer.

MARCH 09

Craig Fugate is nominated to head FEMA. Fugate had served as Florida's emergency management director since 2001.



President Obama names Washington, D.C., CTO **Vivek Kundra** the nation's first federal CIO.

John McDonald becomes Virginia's deputy secretary of technology. McDonald previously served as an adviser to the governor on the Virginia Research and Technology Advisory Commission.

2009's MOST UNUSUAL STORIES

Some of the far-out features from the past year

» Sacramento, Calif.'s Failed Foray Into Plasma Gasification

In January, Sacramento was abuzz with news that the city was considering a plan to build the nation's first plasma gasification facility. Plasma gasification is the process of breaking down matter at the atomic level by exposing it to high temperatures. In a plasma gasification plant, it's garbage that would otherwise go to landfills. During the gasification process, garbage is vaporized by a plasma arc. This results in hydrogen and carbon monoxide byproducts, as well as an inert slag that can be used for industrial purposes.

Sacramento City Manager Ray Kerridge told *Government Technology* the facility would generate clean energy from trash while lessening the need for landfill space. He and city Economic Development Manager Jim Rinehart seemed poised to put Sacramento on the cutting-edge of green technology. Kerridge's vision wasn't to be, however, as Sacramento City Council members were swayed against the proposal by testimony from a Northern California energy consulting firm, which claimed the promised benefits of plasma gasification would never be realized.

» Everyone Gets an A

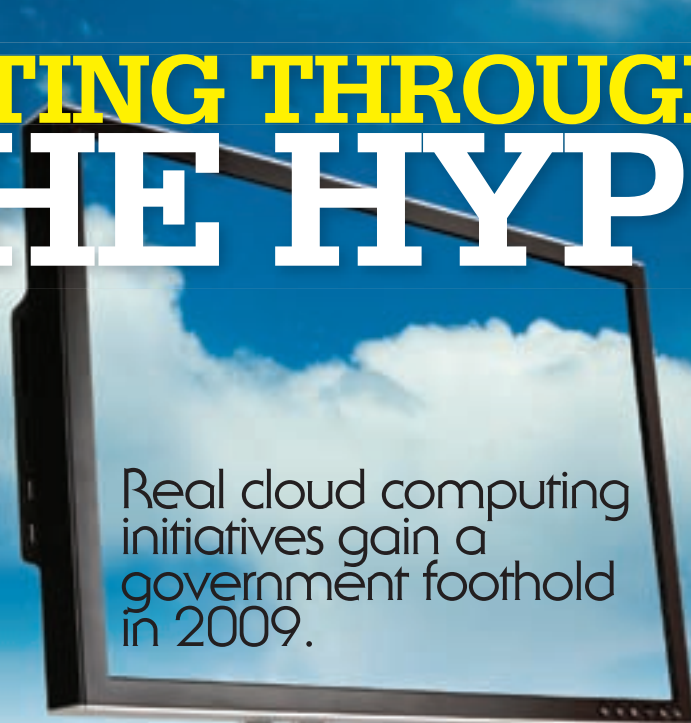
At Sunset Ridge School in Northfield, Ill., a music teacher with no technology training is teaching kids how to build Web sites that incorporate Flash animation. All students get an A grade, regardless of how many projects they complete or how well they complete them.

This curious teaching approach caught the attention of *Government Technology* Features Editor Andy Opsahl. He investigated the story and found that the music turned technology teacher, Carol Broos, was receiving accolades not admonishment.

"Apparently her unorthodox methods are effective," Opsahl wrote. "Many of her students work above their grade level and win national technology awards. Broos recently won the 2008 Golden Apple, a teaching accolade viewed by many as the most prestigious in the Chicago area."

CONTINUED ON PAGE 18

CUTTING THROUGH THE HYPE



Real cloud computing initiatives gain a government foothold in 2009.

STEVE TOWNS | EDITOR

It's hard to think of a technology trend that drew more attention in 2009 than cloud computing. Like Web 2.0 before it, the term was quickly attached to numerous projects and products — whether it belonged or not. And it doesn't help that cloud computing often was defined so loosely that it meant something different to each user.

But the hype shouldn't obscure the fact that real cloud computing initiatives started to gain a foothold in government.

"I do believe that the model is real, and more and more people are adopting it," said Georgia CIO Patrick Moore in an interview with *Government Technology*. "To an extent, all governments struggle with the same things. Maintaining and operating a sound infrastructure is very difficult in the government environment. I think a lot of people are going to be looking at cloud computing and the solutions cloud computing has to offer."

Of course, much attention around government's use of cloud computing was driven by Federal CIO Vivek Kundra, who championed the concept as an easier way for agencies to acquire needed infrastructure and applications.

In September, Kundra began turning that concept into reality with the launch of Apps.gov, an online storefront where federal agencies can purchase hosted services from companies like Google and Salesforce.com. The site offers hosted business, productivity and social media applications.

Along with tracking the launch of Apps.gov, state and local governments kept an eye on a July RFP released by the U.S. General Services Administration which outlined requirements for commercial cloud computing and software-as-a-service offerings.

L.A. CHOOSES GOOGLE

But state and local CIOs weren't just watching. They were launching cloud initiatives of their own.

One of 2009's biggest developments came in October, when the Los Angeles City Council approved a plan to move the city's 30,000 employees to Google's Gmail and productivity tools. The decision — which capped months of furious lobbying by Google and Microsoft — could build momentum for other government agencies considering cloud computing for enterprisewide IT services.



L.A. is thought to be the first public-sector enterprise to choose Google's Web-based e-mail service, which is hosted by the company's massive network of offsite servers. Los Angeles officials expect the move to save \$5.5 million over the length of the contract, reduce the number of servers needed for e-mail from 90 to a few dozen, and cut nine positions from the Los Angeles Information Technology Agency.

"[Gmail] is more than a way of the future; it's a way of the present," said city CIO Randi Levin, in pre-vote testimony to the City Council.

STATE CLOUDS FORM

Cloud computing activity also heated up in several states over the summer.

Utah and Michigan announced plans to create "government clouds" that would provide hosted services to state agencies, local governments and schools. Utah CIO Steve Fletcher said public-sector clouds — operated by state IT departments — are a natural outgrowth of consolidation initiatives that are under way in many states.

"We're consolidating and virtualizing [state government servers] now. So from there, we will have all of our state agencies essentially virtualized — they'll be in the cloud," said Fletcher. "Then we will start to add local entities."

The plan envisions a "hybrid cloud" that provides a mix of state-hosted services and commercially provided offerings — but they would all be delivered through the Utah Department of Technology Services.

Meanwhile, Michigan hopes to begin a public-private data center project in October 2010 that would provide application hosting and managed services for any public entity in Michigan.

"This is really big for us," said Theis. "It could potentially be an 80,000- to 100,000-square-foot data center. And we're not only looking at it from a shared services and cloud computing perspective, we're also looking at this for economic development."

Michigan officials expect the new facility to become a magnet for employers by offering low-cost hosting for startup companies.

INDUSTRY TAKES NOTICE

Of course, growing government interest in cloud computing wasn't lost on the vendor community. Throughout the year, industry heavyweights rolled out new services aimed at public-sector customers.

In April, Microsoft launched six on-demand applications designed for government agencies. All are built on the company's Microsoft Dynamics CRM platform and delivered as subscription-based services. Then in October, IBM announced the debut of LotusLive iNotes, a Web-based e-mail and calendar service that company officials say costs \$3 per month for each user.

Perhaps the biggest development came in September when Google announced that its government cloud — scheduled for launch in 2010 — would comply with rules spelled out in the Federal Information Security Management Act, as well as other public-sector privacy and security policies. Unlike the company's commercial offerings, which are hosted on infrastructure worldwide, the government cloud will rely on Google facilities and equipment located only in the U.S.

As 2009 ended, cloud computing remained overhyped and underdefined. But the picture was becoming clearer — and behind all the talk, there were concrete actions that ultimately will help government agencies decide where and how cloud computing, in its various forms, can help them solve the business challenges they face.

"Cloud computing, in totality, has gone from this big buzzword that meant nothing to a discussion of true value and a strategic analysis of when to use commercially provided clouds versus your own private cloud," said Theis.

And that, in itself, is progress.



VIVEK KUNDR
Federal CIO Vivek Kundra launched Apps.gov in September, giving agencies easier access to hosted solutions.

APRIL 09

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Martha Johnson is nominated as administrator of the U.S. General Services Administration. Since 2007, Johnson had served as a vice president at Computer Sciences Corp.

Carlos Ramos, director of the California Office of Systems Integration, leaves the public sector and joins the state and local government team at Citrix Systems.

CIO **Avi Duvdevani** departs from the New York City Housing Authority and returns to the City University of New York.

Aneesh Chopra, Virginia's secretary of technology, joins the Obama administration as the federal CTO.

MAY 09

Tony Tortorice, CIO of the Los Angeles Unified School District, replaces Washington state CIO Gary Robinson, who retired from Washington's Department of Information Services earlier in the year.

Karen Jackson, director of Virginia's Office of Telework Promotion and Broadband Assistance, joins John McDonald as a deputy secretary of technology.

Albert Hawkins retires from the Texas Health and Human Services System, where he had been executive commissioner since 2003.

JUNE 09

Virginia CIO **Lem Stewart** is fired by an oversight board of the Virginia Information Technologies Agency after he threatened to withhold payment to Northrop Grumman because of performance problems associated with a \$2.3 billion deal to outsource the state's IT services.



Colorado CIO Michael Locatis appoints Deputy State CIO **John Conley** executive director of Colorado's Statewide Internet Portal Authority.

The H1N1 pandemic went from possibility to inevitability.

FIGHTING THE FLU

JIM MCKAY | JUSTICE AND PUBLIC SAFETY EDITOR

Early this year, we began planning a feature story on what would happen if a pandemic were to hit a college campus. By early spring, it looked like a possibility. By September, it looked inevitable.

When the first case of the H1N1 flu virus was discovered in Southern California in April, health officials thought it was unusual, but something they could handle. When a second case turned up in a different location in the state, officials were alarmed. "The second case was highly unusual," said Dr. Gilberto Chavez, state epidemiologist and chief of California's Center for Infectious Diseases.

It was known then as the swine flu, but it was soon found to be a combination of swine, avian and human virus — thus the official term, H1N1. In many ways, the threat posed by the virus dominated emergency planning and business continuity discussions throughout the year.

In May, *Emergency Management*, a sister publication of *Government Technology*, looked at the unique challenges facing colleges and universities as the potential for pandemic rushed toward reality.

Questions were raised about whether dormitories and even entire schools should be closed, or if infected students should be quarantined. For some, the inevitability of



a pandemic and the chaos that follows was coming to fruition.

"I have been in this business for almost 20 years, and I remember 15 years ago, sitting in meetings and trying to talk to people about the danger of having a pandemic, and people couldn't grasp it — they just couldn't see it," said Valerie Lucus, emergency and business continuity manager of the University of California (UC) at Davis. "I think the H5N1 [avian flu] scare we all had about three years ago brought it more into the consciousness. People recognize it as a hazard that they really need to think about and address for themselves."

TURNING TO TECHNOLOGY

Technology tools quickly emerged to help cope with the threat. For instance, UC Ready, a Web-based business continuity tool developed by UC at Berkeley, lets schools in the UC system keep pandemic plans current. "Since it's online, you only have to go in and do it once," Lucus told *Emergency Management* magazine. "Then it's easy to keep up-to-date and it collects information in a more consistent way. We can pull the information out and it's sorted."

2009'S MOST UNUSUAL STORIES

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» That's a Lot of Legos

Government Technology's Managing Editor Karen Stewartson routinely scours the Web for tech-related odds and ends for the *Spectrum* section of the magazine. Earlier this year, she came across news from a most unusual source — Legoland. It seems Lego architects, using more than 22 million Legos, re-created President Barack Obama's Inauguration. The Lego landscape included more than 1,000 mini-figures, including politicians like California Sen. Dianne Feinstein, former Vice President Dick Cheney, the Bush family and many more.

» Have You Checked Your Zumbox?

In a classic episode of *Seinfeld*, Jerry's wacky neighbor Kramer opts out of the postal system. Sounds ludicrous, but that's sort of what New Lenox, Ill., is attempting. In May, *Government Technology* reported on the city's adoption of a technology called Zumbox, which is like an e-mail account, except it's tied to physical addresses. Each residence in America has a

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Purdue University virologist **SURESH MITTAL** works on a new bird flu vaccine.

In addition, researchers at Georgia Tech's School of Industrial and Systems Engineering (ISyE) created a model that simulates the spread of a pandemic geographically and across time. "This is a large-scale simulation model," said Pinar Keskinocak, a developer and ISyE associate professor. "We essentially simulate each person in a population according to age groups and social groups — such as households, school groups, work groups and community interaction. Taking all of these factors into account, the simulation model mimics the way the disease will spread both geographically and over time."

The developers feed information from the U.S. Census Bureau into the model, which has two forms: simulation and optimization. The simulation model gives a visual view of the disease and the optimization model is used to help decision-making. The optimization model, for example, could be used by the Red Cross to calculate food distribution planning by showing the best places to open facilities, such as food banks, and how to allocate resources over time.

SUSPEND CLASSES OR CLOSE CAMPUS?

Officials on college campuses also grappled with whether to close campuses or quarantine students. They found that voluntary quarantining significantly reduced the spread of the virus and might be a better option than school closures. "One of our main recommendations to public officials would be to seriously consider the potential social impact of closing schools versus edu-

cating the public and convincing them to stay home while they are sick," Keskinocak said.

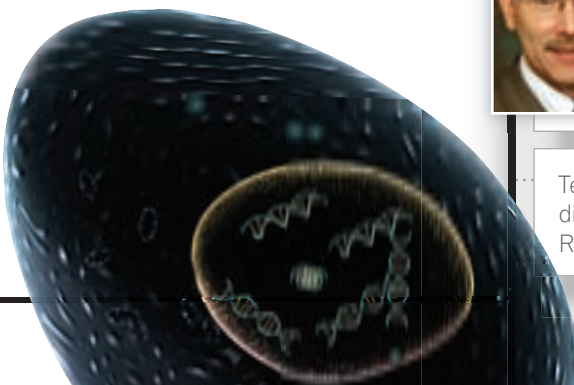
Indeed, officials found it probably wasn't feasible to close campuses because the virus would likely persist over several months. Lucus said closing a campus is difficult because they are like small cities. Suspending classes is a better option, she said. "We would still be operating, but we would be operating with only the people who need to be here to keep the facility running."

For students residing in dormitories, Lucus said the university would help them get home by providing transportation to the airport and other means. She said there would be ample warning and that a week's worth of food is stored and available at the university.

Lucus penned an *Emergency Management* article later in the year updating the H1N1 scenario and the unpredictability of the virus. It may linger and spread slowly for months or longer and then explode, she noted, adding that the Spanish flu of 1918 was relatively mild for about a year before it exploded and created death and mayhem.

"Picture an egg put in cold water over low heat so the water never actually boils," Lucus wrote. "How long does it take to get a hard-boiled egg? And where is the tipping point — where the momentum becomes unstoppable and the egg is going to be hard-boiled whether we want it to be or not?"

Toward the end of the year, Chavez was predicting that California inevitably would face a mutating virus that was likely to hit hard. Evidence of that was already present at college campuses, where thousands of students were infected. It looked, in September, that the tipping point Lucus wrote about was closer than ever before.



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California Department of Transportation Director Will Kempton retires, and **Randell Iwasaki** is named his replacement. Kempton left to become CEO of the Orange County (Calif.) Transportation Authority. Iwasaki had been the department's chief deputy director.



David Arbeit becomes Minnesota's first chief geospatial information officer. Arbeit was director of the state's Office of Geographic and Demographic Analysis before taking the new position.

JULY 09

Philip Baughn is appointed CIO of Kentucky. Baughn previously served as group director for operations and technology at the Council of State Governments in Lexington, Ky.

AUGUST 09

Software executive **George Coulter** is named CIO of Virginia.

Harris County, Texas, CIO **Steve Jennings** retires. Jennings joined the county in 1975 and served as its CIO since 1984.

SEPTEMBER 09

George Bakolia steps down from his role as CIO of North Carolina. Gerald Fralick becomes state CIO, while Bakolia stays on as senior deputy state CIO with the Office of Information Technology Services.



Seattle CTO **Bill Schrier** is elected president of Metropolitan Information Exchange, a national organization of CIOs and key technology executives for city and county governments with populations of more than 100,000.

Texas CTO **Brian Rawson** resigns as executive director of the state's Department of Information Resources after three years.

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PHOTO BY TOM CAMPBELL



LOUD AND CLEAR

Recovery Act spending prompts a clarion call for government transparency.

MATT WILLIAMS | ASSISTANT EDITOR

The government-sector IT community was abuzz during the first quarter of 2009 after the lobbying group Tech-America estimated that the nation's economic stimulus package would generate \$100 billion in technology spending.

Driven by that impressive total, many observers reactively predicted the infusion would spur a high-tech renaissance — powering communities with smart grids, transporting travelers in high-speed trains and linking together health records to rein in costs accrued by hospitals and doctors.

Those forward-looking projects someday may come to fruition through a combination of government leadership and funding disbursed by the American Recovery and Reinvestment Act of 2009. But the path for making the vision a reality quickly took unanticipated turns during the year.

In particular, state and local government technology offices were thrust into an unexpected dual role. Rather than serving primarily as first-line recipients of grants and contracts (as many originally anticipated), IT agencies were more immediately facilitating technology used for recordkeeping

of stimulus spending, and providing tools and services that promote government transparency.

The first role was of necessity because rules in the Recovery Act mandate stringent requirements for data reporting; the latter role came from President Barack Obama's first-year agenda, which he formalized in an Open Government Initiative spelled out during his opening week in office.

The Obama administration has said the "unprecedented" detail of reported data will improve government's accountability. In fact, some observers believe the lasting legacy of the stimulus won't be economic, but that it will cultivate a permanent culture of transparency. If and how that actually happens remains to be seen.

STIMULUS SHAPES NEW IT ROLES

The dollar amounts earmarked for IT in the Recovery Act are staggering: \$7.2 billion for broadband, \$20 billion for health IT, \$4.5 billion for the nationwide smart electricity grid, and \$3.2 billion for energy efficiency block grants. Millions more are set aside to modernize unemployment insurance

systems, construct high-speed rail lines and build smart transportation infrastructure.

Most of these spending categories will take at least a few years to progress from the contract phase all the way to a completed project. The fastest-moving piece of the pie in 2009 was broadband funding, a portion of which was administered jointly by two federal offices: the Rural Utilities Service and the National Telecommunications and Information Administration. In 2009, the agencies reportedly received 2,200 applications competing for \$4 billion — despite the fact that municipal government officials said their offices lacked the manpower to adequately pursue grants from that pot of money.

Notwithstanding the widespread interest in building broadband capacity, the stimulus forced government IT shops — or in some cases, finance departments — to focus their attention on inventing new workflows that would accurately collect billions of dollars worth of financial data from municipalities and contractors that received stimulus funds. The sea change this caused can't be overstated. Never before have states had to collect spending data from "sub-recipients" to fulfill obligations stipulated by federal funding.

Further complicating the effort was a short deadline set by the federal Office of Management and Budget (OMB): The first quarterly reporting period came in fall 2009, only eight months after Congress passed the Recovery Act. Also, government officials were

2009'S MOST UNUSUAL STORIES

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Zumbox now, provided for free by vendor Zumbox Inc. New Lenox is using these instead of e-mail addresses because maintaining an accurate e-mail list for citizens is time-consuming, Mayor Tim Baldermann told *Government Technology*.

Furthermore, the city hopes to transition from paper postage to Zumbox-only mail delivery. Citizens will receive utility bills, newsletters and other mailings in their Zumboxes, as well as in paper form, until they electronically opt out of the print versions. The city currently distributes thousands of items each time it does a mass mailing to residences.

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in limbo for the first half of the year as the OMB ironed out rules for the data tracking and how files would be formatted and uploaded to a centralized clearinghouse, FederalReport ing.gov.

To meet the demanding schedule, some governments opted to purchase a project management software solution tailored for the stimulus, from the likes of Microsoft, SAP, IBM and CA. Many of these products were made available in whole or in part via the cloud. Other decision-makers chose instead to maintain recordkeeping as they had done in the past, relying on tried-and-true Excel spreadsheets instead of a new IT dashboard.

By the end of 2009, the OMB continued work to improve the accuracy and completeness of data reported for the expenditures and jobs created through the stimulus. The ultimate goal is to create a data set that's completely transparent for the public.

TRANSPARENCY TAKES OFF

Making the stimulus data publicly available was only one facet of Obama's push for transparency during his first year in office.

Two technology "czars" familiar to state and local government are executing the president's Open Government Initiative. Former Washington, D.C., CTO Vivek Kundra was named federal CIO, and among his first accomplishments were the introduction of Data.gov — a Web portal making government data sets public that in the past could only be found in the dark corridors of bureaucracy — and USAspending.gov, which lists dollar amounts of the federal government's 7,000 IT projects.

Obama also named former Virginia Secretary of Technology Aneesh Chopra the nation's CTO. Chopra spent his first months pulling together a governmentwide transparency directive that would require federal agencies to utilize technology to engage citizens in policymaking, and bring forth interactive Web sites with real-time data feeds.

But many state and local officials didn't wait for a dictum from the feds. Several states green-lighted their own Web sites focused on



ANEESH CHOPRA

Federal CTO Aneesh Chopra spent his first months in the office pulling together a governmentwide transparency initiative.

results from the stimulus, as well as complementary sites that streamed real-time data onto the Web. And a few jurisdictions — led by Washington, D.C., (under Kundra's leadership) and New York City — went as far as hosting contests for programmers who were asked to "mash up" government data within lightweight software applications so citizens could access information conveniently on desktops and mobile devices.

Several municipalities integrated more transparency into public services. For example, the city and county government of San Francisco began accepting 311 requests for service from Twitter, the Web-based microblogging service that became a pop culture phenomenon in 2009. San Francisco joined the growing ranks of governments that now give citizens the ability to track the progress of service requests via the Web — a far cry from the old days when citizens phoned their local government, and then were left hoping that a city employee would fix a pothole or clean up roadside trash.

Citizens and watchdogs moved quickly to utilize the new wealth of information on the stimulus and the real-time data on government services. Perhaps the most prominent example during the year was a privately run Web site called Recovery.org, which during the early days of the stimulus was thought to be a better developed and easier to use version of Recovery.gov, the official site for the stimulus. Of course, Recovery.org never would have existed had the federal government not made data public in the first place.

But, again, the push for transparency was about much more than the stimulus. The Obama administration wanted to permanently change government culture so that openness, rather than secrecy, is its default mode.

Federal officials went so far as to move the internal code of WhiteHouse.gov to open source. The U.S. government's highest-profile Web site literally is open for everyone to see. It's yet another indicator that transparency, in its many forms, might be here to stay.

OCTOBER 09

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Former CIO **Gary Robinson** returns to Washington state as chief financial officer of the Department and Social and Health Services.

Washington, D.C., Mayor Adrian M. Fenty appoints **Bryan Sivak** CTO. Sivak replaced Chris Willey, who had been the district's interim CTO since Vivek Kundra's appointment as federal CIO earlier in the year.



NOVEMBER 09

Clifford Clarke, former CIO of Fort Wayne, Ind., is appointed CIO of the Public Technology Institute, a nonprofit organization that provides technology products and services to local governments.

Douglas Young, IT services chief for the Missouri Department of Conservation, is named Missouri state CIO, filling the vacancy left by Bill Bryan's move to the Department of Natural Resources.

Vermont's deputy commissioner of the Department of Information and Innovation, **David Tucker**, becomes state CIO. Tucker replaced Tom Murray, who left to become executive director of the Vermont Telecommunications Authority.



BIG MOVIES

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Local governments showed how IT could help keep agencies functional despite layoffs and sinking budgets.

LOCAL TECHNOLOGY LIFELINE

ANDY OPSAHL | FEATURES EDITOR

The economic desperation of 2009 gave new urgency to the IT cliché of “doing more with less.” The notion went from being a routine, laudable government mandate to a survival strategy in local governments that faced gutted budgets and layoffs. Not surprisingly, moving more government services online was a primary solution. Fewer citizens showing up for services at government buildings can mean that fewer employees are needed to provide assistance in person.

Nearly all of the top finishers in the Center for Digital Government’s 2009 Digital Counties Survey had new e-government services. However, some local governments reduced costs with solutions that ventured beyond the conventional realm, such as the District of Columbia’s Apps for Democracy program, which awards cash prizes to private software developers who create innovative applications using government data. The contest has generated applications worth millions of dollars for very little cost, the district says.

Other solutions stem from troubled times of years past. For instance, Oakland County, Mich., has mature cost-reduction strategies already in place due to an exodus of the state’s manufacturing jobs that started during the mid-1990s. Here’s a look at some of the notable ways technology filled in the gaps that were opened by layoffs and less funding.

BUDGET MISERY EXPERTS

The budget cutbacks in most local governments during 2009 likely garnered little sympathy among Oakland County employees. They’ve grappled with a shrinking budget for years and expect their situation to worsen. Analysts predict Oakland County’s property tax revenue will decline by 30 percent over the next three years, said county CIO Phil Bertolini. Finding ways to

save money is the job of everybody collecting a paycheck from that government, and employees are eager to contribute ideas, according to Jim Taylor, chief of e-government services for Oakland County.

“I think we all feel like a family in Michigan. We’re in this budget crisis together. If we can save costs, we can save jobs, and it’s better for citizens,” Taylor told *Government Technology*. The county made headlines for a blog forum it deployed in 2009 that lets employees submit their cost-reduction ideas. The project resulted in a \$600,000 elimination of annual IT costs. However, Bertolini credits more substantial savings to the government’s Clarity Project and Portfolio Management System. The Oakland County Department of Information Technology has cut \$7.1 million from its annual budget since 2003, and most of those savings came from nontechnical end-users, thanks to the portfolio management system. The tool lays out all IT projects in a centralized location in a format that displays each project’s timeline, tasks, estimated hours of work, budget and a return on investment analysis. Bertolini said it gives staff all the data they need to decide whether to cut a project or keep it going.

“That has immediate buy-in with the business units because they’re the ones who are sitting at the table making the changes. It enables them to play a larger role. It’s not us coming in and saying, ‘Hey, you need to knock off your ninth and 10th priority because we have a budget cut,’” Bertolini said.

CLOUD STARTS LOOKING BETTER

State and local governments have largely kept their distance from cloud computing, the practice of using software hosted by an outside entity. The idea of storing sensitive data offsite usually scares public officials, but staff reductions are warming some governments to the idea. Chris Willey, former interim CTO of the District of Columbia, told *Government Technology* of his city’s deployment of Google Apps. He insisted that the vendor’s cloud-computing products have saved the district millions of dollars.



PHIL BERTOLINI

Phil Bertolini, CIO of Oakland County, Mich., said employee suggestions submitted through an online forum cut \$600,000 in annual IT costs.

“Anytime we are deploying a new application, we look first to the cloud,” Willey said. “We look to see what cloud services are available before we look to applications that have to be developed or deployed inside our data center.”

Agencies in the nation’s capital created intranets, training videos, online surveys and other tools. Washington, D.C., also used Intuit’s QuickBase — a hosted collaboration tool — to program several new applications.

“We built 85 applications over the course of about 10 months, and it only cost us a couple hundred thousand dollars,” Willey said. “If we were trying to do the same thing using traditional tools, it would have taken years and it would have cost several million dollars.”

Bertolini said he spent much of 2009 advocating a particular type of cloud computing he’d like to see deployed in local governments. His idea is that a municipality should each specialize in hosting one type of application and then provide it as a service to other local governments.

“I think it’s the only way we’re going to be able to survive longer term,” Bertolini said. “Somewhere down the line, as governments, we have to stop owning, operating and maintaining expensive technologies. We have to start consuming it from others.”

Bertolini said he was open to the idea of vendors performing this service. However, he’s not yet comfortable with companies’ current selection of cloud computing offerings for human resources, taxes and other primary functions. Bertolini thinks governments would be better suited to offer relevant applications.

“Maybe we host e-health, and a county on the left side of the state hosts an ERP [enterprise resource planning system]. Perhaps there is a county in the northern part of Michigan that could host assessment and tax,” Bertolini said.

He figures if counties hosted these applications for one another in a cloud computing arrangement, the applications would only



WASHINGTON, D.C., makes hundreds of data sets available to the public, including this list of 311 service requests plotted on a Google map.

have operational expenses and no capital expenses.

Time will tell if budget pressures motivate governments to try Bertolini’s idea.

CROWD CREATIONS

One way to continue innovation on a shoe-string budget is to find people who are willing to create applications at prices far below typical vendor rates. A process known as “crowdsourcing” makes this possible. The District of Columbia showed how easy it is in 2009 with its second Apps for Democracy contest. The competition made city data sets available to the public, who used them to craft citizen-facing applications. The winning applications received cash prizes and free consulting from the city’s IT staff on how to develop their applications for sale to other local governments. The top \$10,000 prize went to a 311 iPhone application for requesting services, like debris removal. Users could also access the services through Facebook.

Willey explained changes the city made after its first contest in 2008.

“We called this one the Apps for Democracy Community Edition,” he said. “The first 30 days, we sent field teams out to talk to residents directly and asked them two questions: One, what problems do you think technology can help solve? Second, what would be the perfect platform to get citizen requests to government?”

“After that finished, we took all those insights and we gave them to the developers and said, ‘Based on this [data] and based on our open 311 [application programming interface] — which is a way for applications

to directly access our call center database — now go and build applications.”

The crowdsourcing trend spread to New York and San Francisco during 2009. Last June, New York Mayor Michael R. Bloomberg announced Big Apple Apps, releasing roughly 80 data sets for citizens to package into applications. San Francisco did its own version with DataSF.org. That project didn’t include a prize, but it aimed to post links to the notable applications for download off the city’s portal.

2009’S MOST UNUSUAL STORIES

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“If we go from sending out 10,000 pieces of mail to cutting that in half, just think of the savings we would achieve,” said Baldermann. “Depending on how heavy that piece of mail is, it might cost us \$1 for every piece we send out after printing and postage.” Not so wacky after all.

» World’s Largest Laser

What happens when 2 million joules of ultraviolet laser energy are fired onto a target the size of a BB? In July, *Government Technology* reported on the National Ignition Facility (NIF), part of the Lawrence Livermore National Laboratory in Livermore, Calif. The \$3.5 billion NIF houses the world’s largest laser, which went online earlier this year and will reach full power in 2010. Scientists there hope the intense beam of energy will spark a nuclear fusion reaction like the kind that powers the sun.

» Digital Aromas

Technology already exists for users to sense the touch of an object using a joystick device, *Government Technology* Managing Editor Karen Stewartson wrote in September. And very soon, the Japanese will be able to smell fragrances associated with content from their computer using i-Aroma, a device that emits premixed scents. The device takes six different oil-based scent cartridges. Small doses from the relevant vials are blended and vaporized to release a number of subtly different smells, all commanded over a USB connection to a PC. If the technology can be refined to match what Web pages a user is visiting, surfing the Net could get a lot better — or much worse.

LOOKING FORWARD

CIOs will continue to scramble for IT dollars next year.

EMILY MONTANDON | ASSOCIATE EDITOR

With 2009's budget issues, it's been a rough year for most jurisdictions. Experts say 2010 will bring more of the same. According to Doug Robinson, executive director of the National Association of State Chief Information Officers (NASCIO), tight budgets will continue to be the top challenge for state IT executives. "That's clearly going to be the major item on their mind," he said, adding that trends toward consolidation and shared services would continue into 2010.

But government IT officials will confront other issues that will demand their attention, and in some cases, they'll have to find creative ways to pay for them.

Cyber-security will grow in importance for governments, especially as security threats become more geared toward stealing sensitive information, Robinson said. "States are the nexus of everybody's identity."

Health IT may also require investment in 2010, as health-care expenses have overtaken education as the top state budget item, and reducing health-care costs has become a priority for governors. Also, many IT systems for administering federal programs like Medicaid are becoming antiquated and will need an overhaul in the next few years.

Changes in the nation's education systems also are likely,

and technology has a role to play there. The National Governors Association proposed new standards for testing and accountability in education, which could result in new legislation, he said. The federal stimulus package also may have an impact. "There's a fairly significant set of initiatives on the Recovery Act about student data systems, and there may be legislation that the states start looking at related to that."

Because education and health IT are important to governors, Robinson said CIOs will compete for funds to execute those projects. He said roads, bridges and public facilities also are under strain and require investment. "So the physical infrastructure, which is seen, may get a lot more attention than the digital infrastructure."

That means CIOs may need to get clever to secure project funding — a difficult task even in good times. Typically, Robinson said, 70 to 80 percent of CIOs' budgets go to maintenance and regular operations. "There's not a lot there for innovation and new services," he said. "So I think in 2010, it may just hold the line."

Finding money for technology may be tough, but it's not impossible. Robinson pointed to agencies using bond funds and shared savings arrangements with the private sector: "Rather than relying on general

fund or relying on fee-for-services, which they often do, looking at innovative funding arrangements can help them get over their current financial dilemma."


Shared services and other collaborative efforts also could help state and local jurisdictions cut costs. "That's certainly going to be something that's going to help jurisdictions survive the next couple of years — cross-boundary collaboration," Robinson said.

At the local level, Julia Pulidindi, senior policy analyst for the National League of Cities, said many local governments will focus their energies on broadband projects. Besides initial rollout efforts, she said the fact that broadband would become available in places where it previously wasn't would open many opportunities and challenges for governments in the IT arena. While broadband access will help governments better serve constituents, these localities can expect to put forth a significant investment into IT systems that power these improvements.

"How will they fund paying for upgrading technology, given the budget challenges local governments are facing right now?" she said. "And are there enough talented information technology people out there to meet the demands of maintaining an efficient technology system that really is useful for local governments as they do their work?"

Other noteworthy local government trends in 2010 are using social networks to reach constituents and using IT for better governance. Pulidindi offered Baltimore's CitiStat as an example of how technology can improve the way government does business. Although using IT to improve governance isn't new, said Pulidindi, it hasn't become commonplace in local government yet. "If they're able to hear about what's going on around the country, they can use these concepts and adapt it to the needs they have locally," she said.

One challenge of social networks is educating officials on Web 2.0's usefulness for government, she said. Robinson added that social media has security and legal challenges that must still be resolved.

"The policies are generally always behind the technology deployments," he said, "and they run to catch up." 



DOUG ROBINSON

NASCIO Executive Director Doug Robinson said tight budgets will continue driving interest in consolidation and shared services in 2010.



Corporate Profiles

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is expected to require agencies to mitigate the impact of cyber attacks by reducing the number of agency connections to the internet, monitor infrastructure activity and access points, and secure sensitive information within government systems.

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**Inside the
development
of Washington's
statewide GIS
transportation
project.**

TRANSPORTATION

OVER

OVER THE YEARS, Washington's state and local transportation agencies built numerous parallel transportation data sets. The systems served agencies' purposes, but when it came to working across boundaries, the state lacked cohesiveness. Six years ago, the Washington State Department of Transportation (WSDOT) launched an ambitious plan to connect disparate data into one seamless, Web-enabled GIS called the Washington State Transportation Framework Project (WA-Trans).

WSDOT monitors more than 18,300 miles of state highways and 3,600 bridges — including the four longest floating bridges in the United States. Besides building, maintaining and operating the state highway system, WSDOT runs the largest vehicle-ferry system in the world, with 23 vessels carrying 24 million passengers annually. The agency also is in its fifth year of a 20-year capital construction program that will deliver more than \$15 billion in projects, including \$11 billion for 390 highway projects.

WSDOT geospatial personnel are avid users of advanced GIS technology to collect, create, inventory and maintain detailed transportation data stores, and they use that information to enhance other business analyses and processes.

Many of the state's 39 counties mirror WSDOT's spatial data management initiatives to help them acquire and maintain an up-to-date and comprehensive view of countywide transport information. Many counties have been mapped to an extraordinarily accurate degree and county authorities benefit greatly from such rich data sets.

But parallel GIS approaches among the state and local counties also are problematic. Although each has amassed highly valuable transportation databases, they have done so with their own singular view and purpose — WSDOT focuses on state roads, counties focus on county roads. Data coverage ends at their border.

"Our transportation network is one of the backbones of our society," said WA-Trans GIS project manager Tami Griffin. "Fragmented backbones don't operate very efficiently. We wanted WA-Trans to connect our data divides to foster better collaboration and improve operations and services, and ultimately our bottom lines. Though we've really only begun with WA-Trans, we've conservatively estimated that the ROI to the state will reach \$26 million over 20 years."

The disparate nature of Washington's transportation data sets hindered data sharing and intergovernmental cooperation, particularly in the emergency response arena — where incidents often cross jurisdictional lines.

"Trying to fill in data gaps during an emergency is difficult," said Michael Leierer, assistant project manager and WA-Trans technical lead. "But even in non-emergency situations, local governments needing to do regional work have had to manually request data sets from other counties, and when the data arrived it wasn't in a format they could read. That makes it difficult to collaborate."

Instead, Washington needed a centralized, statewide transportation data set that mimicked the real world's continuous and connected roads, railways and ports.

ATION

DRIVE

All Roads Lead to 'How'

Putting forth such an objective would spark a relentless road of bedeviling “how” questions: How do we elicit the participation of the local counties? How do counties easily, securely and routinely provide spatial data? How do users quickly extract the data layers they need? How do we standardize diverse attribute data, such as addressing and linear reference systems? How do we ensure that the centralized database is maintainable and scalable for future growth? These are complex questions that very few, if any, state transportation departments have asked, let alone answered. The WSDOT had considered these questions before, but hadn’t adequately resolved them.

In 2003, the agency assigned Griffin to revisit this vision. Her approach was to first address the critical “why” and “who” questions.

“It was clear to me that if Washington state was going to develop a centralized, statewide transportation framework, we first needed to decide why we’re doing it and who we want it to serve,” Griffin said. “Once you know that, then you can start to figure out the how.”

Griffin formed a steering committee with representatives from 13 state and local authorities — including some savvy geospatial professionals — as well as a partners group. She then initiated an extensive business-needs assessment. Interviews

“Assessing and prioritizing the business needs was a great way to bring all the different parties together to agree to and commit to the project,” Griffin said. “Because everyone had a chance to collaborate — to voice their needs and priorities — they completely bought in to the assessment and the outcome.”

Building the WA-Trans Frame

The team wanted to adopt the transportation framework in a literal sense, meaning the state would construct the standard structure of the WA-Trans “house” and the counties would be the interior designers. They chose this design for two reasons: No. 1, local authorities typically maintain the best local data sets, so incorporating the county data would ensure WA-Trans offers the best available data; No. 2, local governments would resist participating in WA-Trans if they first needed to change or convert their data.

Providing the framework, however, meant the system had to integrate and normalize disparate county data into a centralized database and still allow authorities to work in their native GIS software and formats. The team also needed a back-end system that could manage, integrate and manipulate diverse data layers, as well as a user-friendly front-end Web portal for submitting and extracting data. Griffin and Leierer said the only way

“WA-Trans facilitated dialog and collaboration **between counties and entire regions** on a scale rarely achieved with previous data-management structures.”

Tami Griffin, GIS project manager, Washington State Transportation Framework Project

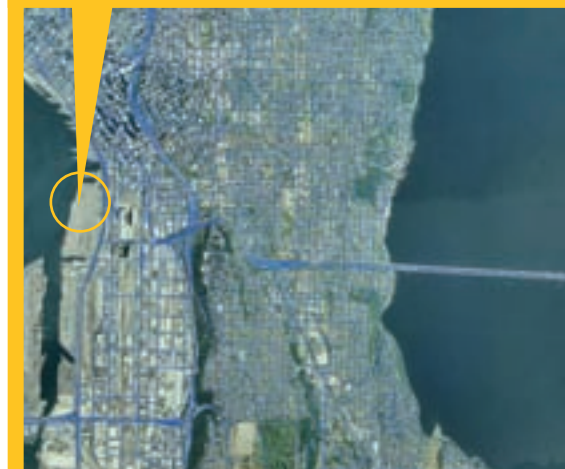
were conducted with various organizations across the state to assess their interest in WA-Trans, and they were asked to identify and rate the most important business functions they wanted the system to address. Based on that feedback, the WA-Trans team, steering committee and partner group developed a prioritized list of business needs — homeland security/emergency management and transport functions, such as planning, traffic safety and maintenance, topped the list. This became the core guide driving the framework’s development.

to resolve this interoperability and data-delivery challenge was with a spatial ETL (extract, transform, load) tool that could transform and deliver data in user-specified formats.

“It was essential that we developed processes to ensure data providers’ GIS and tabular data were placed into the WA-Trans database accurately and that they preserved the provider’s original meaning,” Leierer said. “We searched for translation tools as well as ETL tools, but they typically only work on tabular data. We needed a complete spatial ETL solution that offers data integration, translation



WA-Trans users have access to a variety of data layers. Users can view road data as vector data (above) or road data overlaid on an orthophoto (below). The road network shown includes I-5, I-405 and I-90 in Seattle, near Mercer Island and the Port of Seattle. On the orthophoto, the ferry docks are visible in the upper left portion of the image.



and transformation of disparate data sets as well as an electronic delivery mechanism.”

The WA-Trans team chose Vancouver, British Columbia-based Safe Software’s FME, a spatial ETL solution that enables GIS professionals to translate, transform, integrate and distribute spatial data from more than 225 formats.

Griffin and her team launched a pilot project in 2004 with Pierce County, King County and the Puget Sound Regional Council to evaluate WA-Trans initial structure.

For 18 months, the two counties provided tabular and spatial-based roadway data for the WA-Trans team to integrate into the system. One test was whether the system could accurately transform local information into the WA-Trans standardized data model without adversely affecting the original data. That capability was crucial because it would allow local authorities to use the WA-Trans



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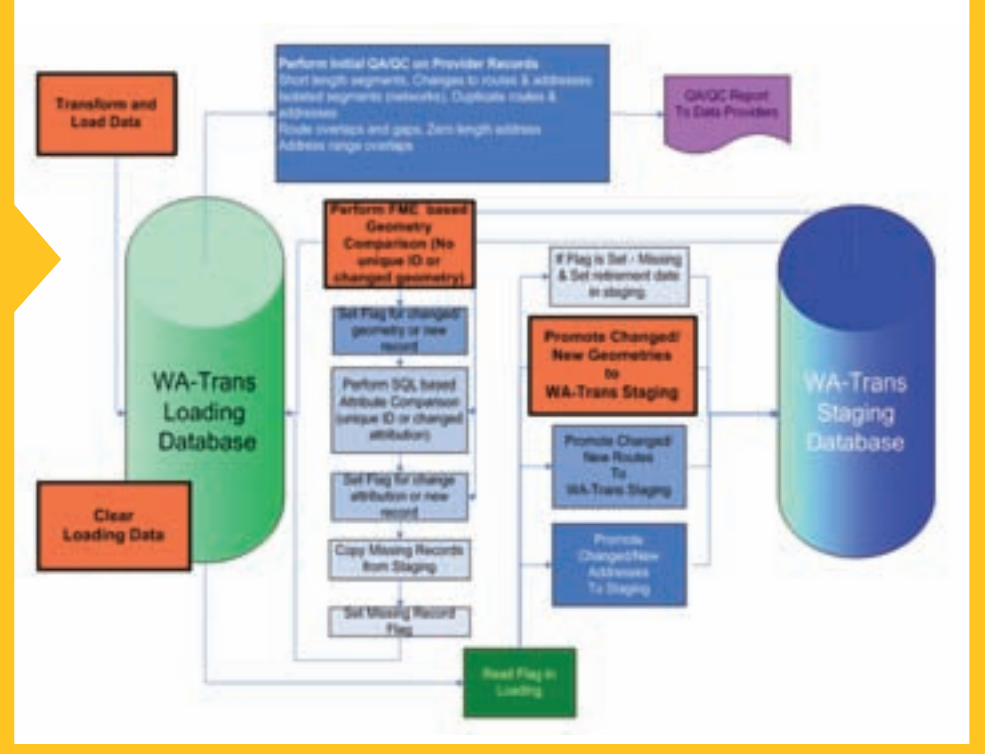
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This diagram shows the flow of two of the three WA-Trans databases during the system's change detection and change management processes. Orange boxes show functions of Safe Software's FME tool. The "Transform and Load" (upper left) refers to loading disparate provider data into the WA-Trans centralized loading database.

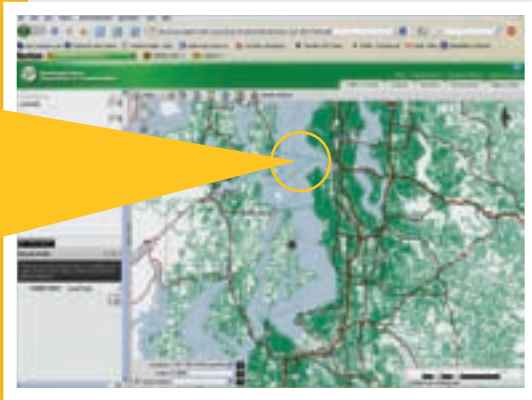


data as a base spatial resource to perform critical business functions, such as address geocoding and transportation planning.

"We first gave each county access to their own data sets in WA-Trans to let them analyze the accuracy and completeness of their data," Griffin said. "Then we integrated both counties' data layers using the counties' predetermined 'agreement points' [previously agreed positions of overlapping map features] to see if they could extract and integrate data layers from each other. It worked very well, and the feedback really helped us fine-tune the translation processes."

With the core infrastructure elements in place, Griffin and colleagues could begin inviting other counties to participate in WA-Trans. They initially solicited four other

Users retrieve WA-Trans data through the data-user portal. The FME solution extracts the chosen data layers, transforms them into the specified format and creates a zip file for users to download. Shown here is I-90 stretching over the I-90 floating bridge and Mercer Island in Seattle.



counties, including Kitsap and Walla Walla. WA-Trans now contains road-related data from eight counties and plans to include 16 counties by spring 2010. The remaining counties will require more time and funding.

Operational and Financial Benefits

With WA-Trans a reality, WSDOT personnel, other state agencies and county authorities see numerous operational and financial benefits, and they're creating strong collaborative bonds.

"WA-Trans facilitated dialog and collaboration between counties and entire regions on a scale rarely achieved with previous data-management structures," Griffin said. "With WA-Trans, suddenly everyone can be on the same data page, enabling people to perform E-911 planning and routing, transportation planning and maintenance, root cause incident analyses, and road-related reporting with far more efficiency and confidence. And they can do it on a countywide, region-wide or statewide basis."

By spring 2010, WA-Trans will include seven of the state's most populous counties, which Leierer said comprise more than 70 percent of the state's traffic incidents. That data will enable users to analyze the root cause of traffic incidents, a particular benefit to WSDOT and local jurisdictions. Previously counties and WSDOT could only analyze roadway incidents within their respective jurisdictions, giving them an incomplete view of traffic safety issues. WA-Trans provides a holistic base map to improve collision studies.

Now local law enforcement can identify the exact X,Y location of collisions and WSDOT personnel can combine those geolocations with other roadway-related information, such as bar locations or schools, to determine if other factors may

be contributing to the volume of collisions at the location. That can help the state spend transportation dollars more effectively to mitigate the root cause of problems.

As authorities add to WA-Trans, they expect more benefits and applications to emerge. Eventually WA-Trans also will include continuous and connected data sets for light rail, heavy rail, ferries, ports, airports and nonmotorized transportation. And that means the WA-Trans team will likely remain in overdrive for a good while longer. [GT](#)

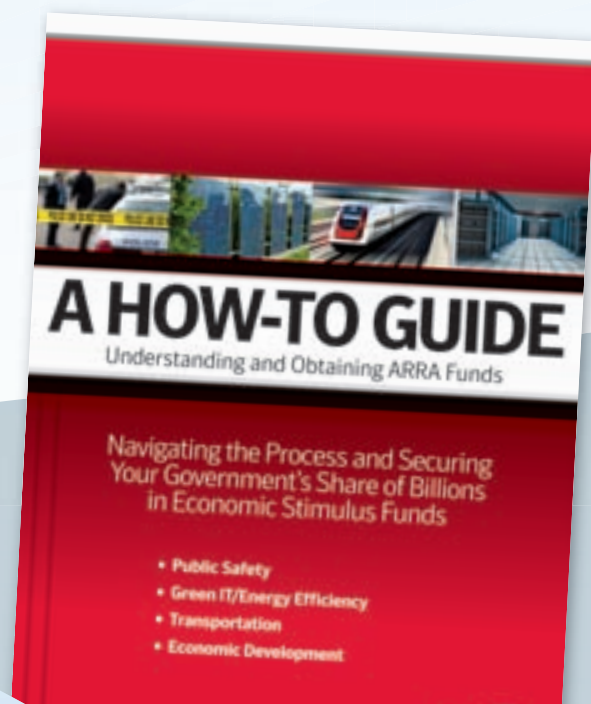
MARY JO WAGNER IS A VANCOUVER, CANADA-BASED WRITER WITH MORE THAN 15 YEARS' EXPERIENCE COVERING GEOSPATIAL TECHNOLOGY.

Constructive Collaboration

Several participants helped steer WA-Trans in the right direction, including:

- Puget Sound Regional Council
- Community Council Transit in Snohomish County
- Pierce County
- Spokane County
- Spokane County Engineers
- Mason County
- Lincoln County
- Walla Walla County
- WSDOT
- U.S. Census Bureau
- U.S. Geological Survey
- Oregon Department of Transportation
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¹ U.S. Government Accountability Office, July 2009

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Synopsis: The landscape of IT security has changed considerably with the advent of treacherous digital infiltrators.

Technologies: Anti-malware software.

Contact: Righard Zwienberg, president, Anti-Malware Testing Standards Organization, righard@zwienberg.org.

Keeping Up the Fight

BY HILTON COLLINS | STAFF WRITER

You don't have to look hard to find examples of public and private organizations that have been hacked by viruses and harmful worms — a quick Internet search will turn up plenty.

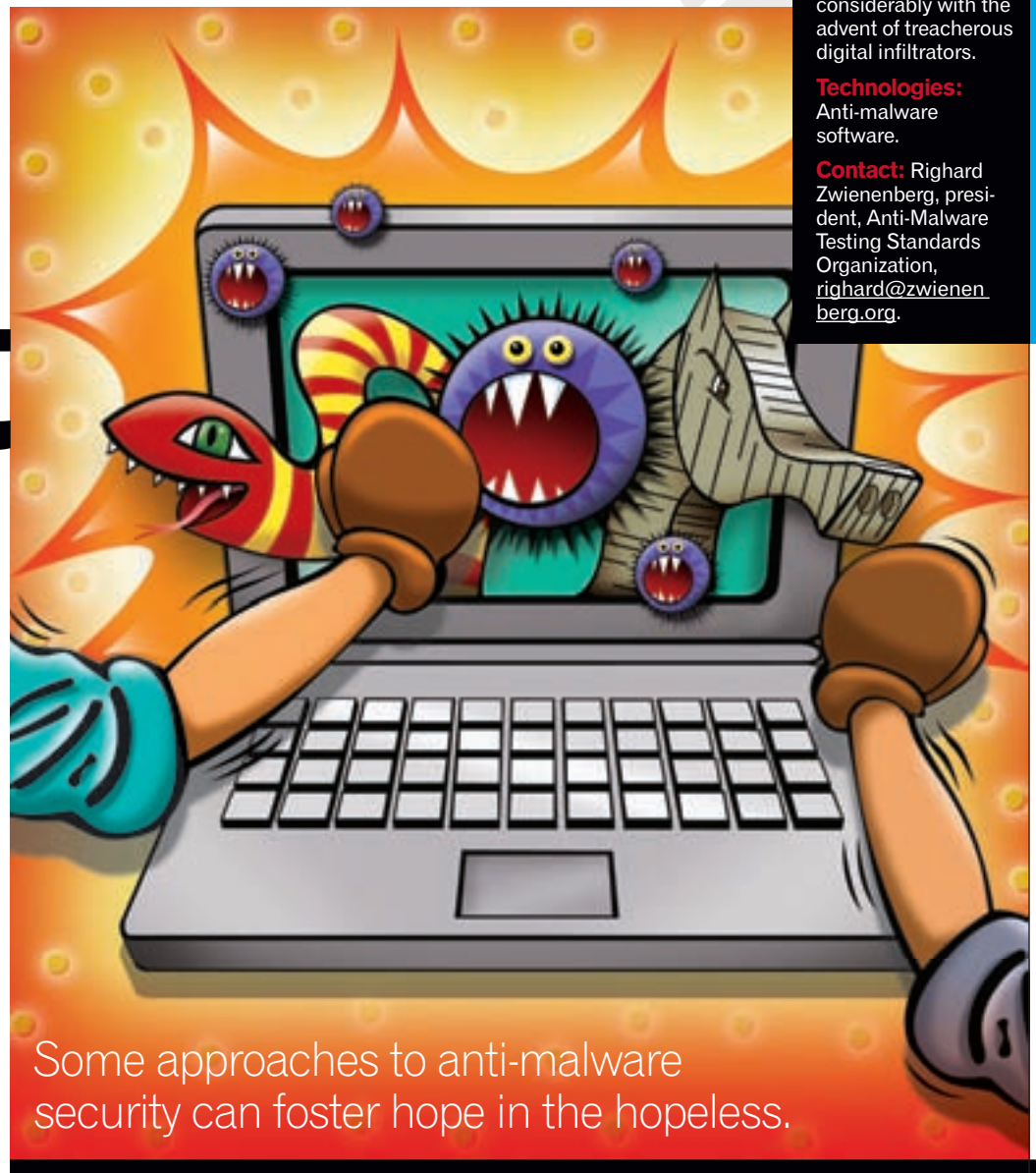
The Charlotte Observer in North Carolina reported on Sept. 25, 2009, that 236,000 records at the University of North Carolina at Chapel Hill were compromised by virus activity. The data was from the Carolina Mammography Registry and was being used for a university research project. The intrusion was detected in July, but may have occurred in 2007 and gone undetected for years.

SC Magazine reported in a May 29, 2009, blog post that the personal information of customers at Batteries.com, a provider of mobile equipment batteries, had been exposed and possibly used in identity crimes after a hacker infiltrated a company server. The breach occurred in February and was discovered in March after a customer notified Batteries.com about suspicious activity on a credit card account.

In September the UK's *Daily Mail* newspaper reported on the Clampi virus, a strain of malicious programming that infects computers when a user visits a site containing the code. The virus waits until the user visits a financial site, such as a bank or credit card company, and then captures login and password information. The article claimed that Clampi is spreading quickly across the United States and Britain.

Holes in Armor

These organizations had anti-virus software in place, as most places do, but that wasn't enough. And an August report from



Some approaches to anti-malware security can foster hope in the hopeless.

Virus Bulletin, a publication informing readers about computer viruses and prevention, offered minimal comfort.

The report revealed that 12 of 35 vendor-submitted anti-virus programs failed to secure a Windows environment during a test run in a recent company review. The 12 products included offerings from some of the biggest names in the industry.

While 12 out of 35 is much better than 35 out of 35 — there's still room for improvement. Is just installing an anti-virus program on your system enough?

"That's the safety belt. Putting on a safety belt doesn't stop

accidents. So if you think of it in that regard — that's the absolute bare minimum," said Jeff Moss, also known as the Dark Tangent, the founder of the Black Hat and DEFCON computer hacker conferences. Moss was sworn into the Obama administration's Homeland Security Advisory Council in 2009 and consults federal officials on security measures.

IT security professionals usually have to play catch-up with their adversaries.

"That's just the nature of the beast," Moss said. "It's always easier to attack than defend. It's always easier to destroy than to build. And the nature of our infrastructure is so complicated

Breach Statistics

This year, there were more than **220 million data breaches** with government accounting for more than **79 million** of those, according to the Identity Theft Resource Center.

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Senior anti-virus researcher **Roel Schouwenberg** said governments should seek help from consultants to scrutinize Web site codes to ensure that hackers can't find any weaknesses to exploit.

that it's easier to point out one fatal flaw here or there than it is to rebuild the whole system."

Many anti-virus programs come equipped with an assortment of detection and elimination measures. For example, one scans for known virus or malware signatures in a system. But strains of malicious code come so quickly that the programs can't identify every bad thing that's out there with a signature approach.

"If it's not obsolete already, it will be in the very near future because we see 60,000 new entries [malware signatures] a week. So that is basically a battle we are going to lose in the end," said Righard Zwienenberg, presi-

dent of the Anti-Malware Testing Standards Organization and an employee of Norman, a Norwegian company that produces malware prevention tools.

"This is a problem for the whole industry, so a new approach has to be found," he said.

Attacks aren't only becoming more dynamic and numerous, they're also increasingly targeted, which means that a target may be hit by something no one's seen before, called a zero-day attack. Cyber-criminals can keep developing attack software designed to bypass traditional security programs.

"They just buy the 10 most popular anti-virus things, test against them, and then they can tweak their virus to not be detected by anything. Then they go and launch it," Moss said.

But this doesn't mean all hope is lost. It just means that security professionals should ensure that their anti-virus programs use other approaches, and that no anti-virus program works in a vacuum. Of course, even if a program doesn't catch everything, it will likely catch many things, which is better than nothing.

"People have said that anti-virus has been dead for five, six years — that it can't keep up. But there's nothing better to replace it," Moss said.

Weaving a Tight Web

Many infiltrations happen after computer users visit compromised Web sites.

"The big problem when it comes to servers is that the bad guys have found ways to generically try to exploit poor coding in Web site development, and there is a real need for some scrutiny of the Web site code," said Roel Schouwenberg, a senior anti-virus researcher with Kaspersky Lab.

When programmers write Web site code, they might focus more on performance than on integrity — writing code that just does what it's supposed to do and not code that's also hard to crack.

Schouwenberg believes government officials should seek consultants to help scrutinize the code if they can't accomplish this in-house.

"Frankly, I'm a little bit surprised to see so many .gov domains still getting compromised," he said.

One related problem is that there isn't a really big market out there for securing Web sites this way because people are so focused on securing the computers that visit them.

"It's not like you can buy a Web site or server checker that will check everything for you, so maybe there's some development of that we will see pretty soon," he said.

Security and Integrity

When it comes to endpoint security, professionals still rely on standard procedures. The Center for Strategic and International Studies (CSIS) a Washington, D.C.-based nonprofit think tank that researches global government and social issues, published a report, *Twenty Important Controls for Effective Cyber Defense and FISMA* [Federal Information Security Management Act] *Compliance*, in August 2009 to advise people how to keep data under lock and key.

Critical Control No. 12 suggests automating anti-malware updates because "relying on policy and user action to keep anti-malware tools up-to-date has been widely discredited, as many users have not proven able to keep

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such tools up-to-date consistently.” And daily monitoring of workstations for anti-malware installation also is recommended to ensure that these tools and their requisite automated updates are everywhere they need to be.

And then there are the Web applications themselves, which can be threats-in-disguise to unsuspecting users. That nifty program or

This echoes Critical Control No. 7 of the CSIS report, which recommends installation of various tools, including Web application security scanning tools, source code testing tools and Web application firewalls to safeguard against compromised applications.

But the SANS Institute, a source for information security training and information, has

said. “If you install all of your software as an administrator, but then use all of your software as a user and something bad happens, under the user privileges, the outbreak is more contained and you can’t do as many things as you could have done had you been running as an administrator.”

Moss, Zwienerberg and Schouwenberg all said that implementing a white list — a list of applications, users, e-mail senders and operations that are allowed to interact with or operate within a network — can help tighten security. Conversely a black list — a list of the same sorts of operations and applications that are denied functionality on or access to a system — can also help. 

“The **big problem when it comes to servers** is that the bad guys have found ways to generically try to exploit poor coding in Web site development.”

Roel Schouwenberg, senior anti-virus researcher, Kaspersky Lab

document you downloaded with Adobe Flash or Reader? It might be infected a virus or worm you won’t know about until it’s too late. But don’t blame its creators — someone else came along and stashed some bad code in it.

“With an application-aware firewall, you can create a policy catching that,” Moss said.

recommended additional protocols like the “least privilege” security model to mitigate the threat of unknown viruses that other techniques might miss.

“The concept is you give an application the least amount of privileges necessary to do whatever it needs to do. No more,” Moss



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Special Report

BY STEVE TOWNS | EDITOR

Michigan CIO Leads Effort to Bring IT Jobs to State

Tech-based economic development initiative lures IBM, General Electric and others to Michigan.

IBM opened a new software development facility in East Lansing, Mich., in September that's expected to generate as many as 1,500 new jobs over the next five years. IBM's decision to locate in Michigan was followed by a similar move from General Electric, which announced in June that it would build an advanced technology and training center in Wayne County that will employ 1,200 people.

Both companies were lured to Michigan by an economic development initiative led by the state's Department of Information Technology (DIT) that combines traditional tax incentives with IT expertise and custom-tailored work force development programs.

"We've been working informally for over a year to position Michigan as a high-tech leader as it relates to IT economic growth," said state CIO Ken Theis, who is director of the DIT. "This is really a collaboration of a number of different entities to focus solely on the IT sector."

Theis formally announced the program — dubbed New Economy Partnerships — at the Detroit CIO Executive Summit in Dearborn. The program is a collaboration between the DIT; the Michigan Department of Energy, Labor and Economic Growth; and the Michigan Economic Development Corp.

The partnership allows the state to quickly assemble economic subsidies, college training packages and other incentives that are tailored to the needs of prospective high-tech employers. Theis said Michigan is using the approach to capture IT jobs that otherwise could be moved out of the country.

"These are jobs that we're bringing back into the U.S.," he said. "We also have a number




of IT firms here in Michigan that are taking advantage of this rural sourcing and urban sourcing methodology to almost double the size of their companies."

The DIT also expects to begin the process for building a public-private data center that would provide cloud computing services to state agencies, cities, counties and schools across the state. That facility also could offer low-cost hosting for startup companies and become a competitive substitute to offshore hosting for established companies. The state intends to break ground on the data center in October 2010.

Kelly Rogers, manager of the Michigan Economic Development Corp.'s Targeted Initiatives Group, said combining IT expertise, targeted work force development and economic incentives can be more important than

the sheer number of incentive dollars offered to a prospective employer.

"With economic development, we can get kind of myopic and think it's a numbers game when we are competing with other states for projects," she said. "But IBM didn't actually use our premium tax abatement program. It was the other stuff that made the deal happen."

Amy Baumer, the DIT's director of New Economy Partnerships, said the IBM deal was the first big test for Michigan's comprehensive economic development approach. "We actually entered that competition in the 11th hour, competing against five other states for the opportunity, and we were able to land it," Baumer said. "I think a large part of it was because of the fact that we were there as a unified front." 



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Synopsis: The Los Angeles City Council approved a plan to move the city's employees to Google's Gmail and productivity tools.

Jurisdiction: Los Angeles.

Technologies: Cloud computing and Google's Gmail and productivity tools.

Gambling on Gmail



The Los Angeles City Council approves citywide Google Apps implementation.

BY MATT WILLIAMS | ASSISTANT EDITOR

In October, the Los Angeles City Council unanimously approved a plan to move the city's employees to Google's Gmail and productivity tools, a decision that could build momentum for other government agencies that are considering cloud computing for enterprisewide IT services.

L.A. is believed to be the first U.S. government to adopt Google Apps enterprisewide. (Washington, D.C., previously adopted some parts of the solution, but use of the applications was voluntary and most district employees opted not to switch their e-mail.)

The Google suite includes Gmail, calendaring, instant messaging, video and other productivity tools — accessed from a Web browser and hosted by the company's massive network of offsite servers. L.A. will replace its e-mail system, Novell GroupWise, which it's used for the past seven years. The contract is worth \$7.2 million.

L.A. estimates that moving its 30,000 employees to Gmail will save at least \$5 million in hard costs, reduce the number of e-mail servers from 90 to a few dozen, and cut nine positions from the city's Information Technology Agency.

Some city councilmembers — and Google's competitors — questioned the reliability, security and cost-effectiveness of moving government data to the cloud. But L.A. Chief Technology Officer Randi Levin told the Council that Google's data storage and tools are more secure and technologically advanced than what the city currently has.

"[Gmail] is more than a way of the future; it's a way of the present," said Levin, in testimony to the City Council.

City Councilman Tony Cardenas said the city's GroupWise e-mail system has

been prone to crashes, which has hurt employees' productivity. In addition, Levin said the city lacks disaster recovery for its e-mail system — a shortcoming that she said Gmail will address.

City officials acknowledged that although Gmail isn't foolproof — a few high-profile service interruptions have occurred recently — L.A.'s employees have had to cope with outages on the current e-mail system.

Last-Minute Debate

For months prior to the vote, representatives from Microsoft and Google descended upon L.A. City Hall to lobby for or against the plan. The lobbying carried over into the public comment portion of the meeting. A Microsoft representative said its e-mail would cost half the price of Gmail, while Novell offered to upgrade the city to GroupWise 8 for minimal cost.

Retired L.A. County CIO Jon Fullinwider told the Council that its decision would be watched closely by municipalities nationwide. Switching to Gmail, he said, wasn't a leap of faith from a technology perspective. "This is the right solution at the right time," he said.


Before the Council approved the plan, several members peppered Levin with questions and comments.

"It's unclear to me if we're on the cutting edge or on the edge of a cliff and about to step off," said Councilman Paul Koretz. He claimed the city's cost estimates for the project were "a moving target" and that decision-makers hadn't adequately discussed how much better Gmail is than GroupWise for users.

Koretz voted for the plan after he introduced an amendment approved by the Council that asked the city to negotiate "liquidated liability" in case of a security breach.

Councilman Bernard Parks said he was troubled that the foundation of L.A.'s Gmail system — a self-contained "government cloud" — hasn't yet been launched.

Levin convinced the L.A. Fire and Police departments to back the plan, after some initial pushback. She said the U.S. Department of Justice approves of the project's technical specifications — a concern for law enforcement agencies that deliver sensitive and confidential information to the DOJ.

Google says it's in the process of earning Federal Information Security Management Act certification for Gmail and its other services. 

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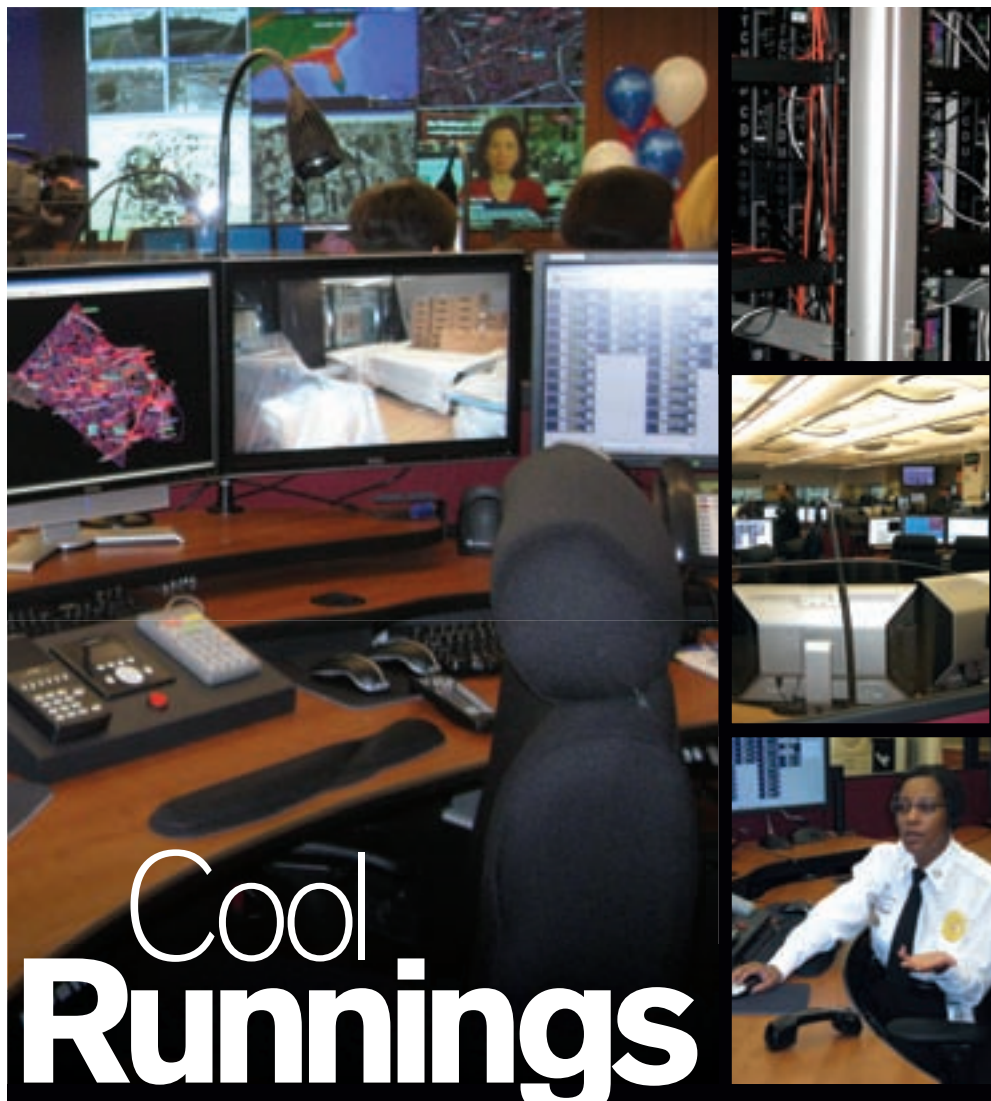
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Cool Runnings

Remote graphics units cut heat and noise in Arlington County, Va.'s new Emergency Communications Center.

In April 1993, Arlington County, Va., pulled together all its emergency communications capabilities into a single state-of-the-art Emergency Communications Center. But after little more than a decade, it was no longer up-to-date, so in May 2008 the county unveiled a new and considerably improved version.

With three times the prior footprint, the new 8,000-square-foot facility accommodates 24 positions, a video wall that can tap 250 feeds, a new digital radio system and three times as many 911 lines.

A key component is the computer network configuration. The new system, designed and implemented by Quebec-based Matrox, dramatically reduces heat and noise, and simplifies system operation and maintenance.

"We knew from day one it was going to be better," said Roger Waller, computer-aided dispatch (CAD) system manager and technology specialist for the Arlington County Office of Emergency Management. "Functionality is much better, reliability is much better, and that makes it a better place to work because everyone feels they can count on their system."

The newly renovated emergency communications center houses various technologies that increase interoperability among first responders and more 911 phone lines. In 2007, the emergency communications center fielded more than 458,000 calls.

Synopsis: Arlington County, Va., overhauls its Emergency Communications Center after nearly a decade making it easier to streamline 911 services.

Agency: Arlington County Office of Emergency Management.

Technologies: Digital radio system, fiber-optic cables, computer-aided dispatch (CAD) systems.

Contact: Roger Waller, CAD system manager, Arlington County Office of Emergency Management, rwaller@arlingtonva.us.

Up Off the Floor

At the core of the new solution are Matrox Extio F1400 remote graphics units, which provide as much as 820 feet of fiber-optic cable to separate user devices from the computer. Computers have been relocated away from the operator area to a separate space where they are all within an administrator's easy reach.

Previously one or more computers would be crowded into a single workspace. When troubles arose, administrators had to get down on their hands and knees in a hot and crowded space to untangle wires and address the problem.

By removing PCs from the work area, the system allows IT staff to remediate problems more easily. "The biggest thing from my perspective as a CAD systems manager is not just the fact that you are creating more room," Waller said. "It means that if we have a problem, I don't have to crawl under desks, trace wires and things of that nature."

Remote location of PCs also lets administrators access and maintain these systems without intruding on dispatchers' work environment, a potentially significant benefit in an atmosphere already buzzing with urgent activity.

Furthermore, the removal of PCs from the work floor helps administrators guarantee a certain level of privacy and security, said Liv Stewart, Matrox Graphics strategic sales representative.

"If it's a 911 center, people's personal information is coming in. There are all sorts of records management systems with phone numbers, housing information and incident-specific information. All kinds of personal information might be in there," she said.

Remove the physical PC, and it reduces the chances of such data being accessed inappropriately. "The fact that the PC is locked in another room and that the operators do

not have access to that information — that’s a plus from the IT manager’s standpoint,” Stewart said.

Such a remote solution could not have been achieved easily by traditional means. “[Category]5 or Cat6 cable were our first thought because that’s what was there,” Waller said. These would not offer sufficient reliability or support the intensive video needs of the CAD center. “We had been looking at video card solutions, but gaming video cards don’t do four, six or eight monitors.”

The center’s monitors may display applications such as an interactive map, a messaging window, an event entry window, and police and fire availability windows. Waller needed something to tie them together for the operator seamlessly and simultaneously.

“The key thing is being able to use those three screens as one,” Waller said. Matrox

Sheer volume also was a consideration. In 2007, the emergency communications center processed more than 458,000 phone calls.

But most troublesome were the more immediate issues of heat and noise. The old call center was hot and loud. Because of the numerous PCs crowding the space, temperature irregularities were a problem. “You could sit in a position where the top half of your body was 68 degrees and the bottom half was at 90 degrees,” Waller said.

The heat became more than a matter of comfort. Center managers found the high temperatures caused by under-the-desk PCs were taking a bite out of the bottom line. “We went through more motherboards simply from overheating,” Waller said. “When you shove these computers back where there is no airflow, where there are four or five of them under a desk, they are just not designed for that.”

from diverse sources, including bonds issued by Arlington’s Industrial Development Authority and U.S. Department of Justice state and local emergency preparedness grant funding. Simultaneous with the upgraded center, a new digital radio system covering all emergency services cost the county \$18 million.

For that money, the county got a significantly improved emergency communications capability, beyond just the increased capacity that upped the number of 911 lines from 16 to 48 lines.

With advanced graphics capabilities and high-capacity fiber-optic connections, Matrox removed the PCs from the room without diminishing performance levels for the end-user. “They are not sacrificing image quality; they are not sacrificing mouse cursor performance,” Stewart said. “It’s all just as if the PC was under the desk.”

Productivity has increased because computers are easier to reach and there are fewer malfunctions due to heat overload. “Our CAD system has 98 percent uptime,” Waller said. “Very rarely do we have to go into manual mode in this center.”

Matrox representatives said their solution is a bit more expensive than a standard graphics card. For many municipalities, price may be a discouraging factor, especially if they are under tight budget constraints. “But there are a lot of counties we are talking to about these more sophisticated upgrades,” Stewart said.

Waller also offers a word of caution: Planning is key in this type of upgrade. “Fiber comes in different grades, so you have to determine the size of the fiber, since that size will determine how far the fiber will carry the signal properly,” he said. “You can get fiber that goes 400 feet or fiber that goes five miles.”

Overall, Waller said, the new setup has created not just a more comfortable and more efficient center, but also a more effective communications operation. “The response to the end-user — the public and the responders out in the field — is a much smoother and more rapid process than it was before.” ^{GT}

“Fiber comes in different grades, so you have to determine the size of the fiber, since that size will determine how far the fiber will carry the signal properly.”

Roger Waller, CAD/IT Systems Manager, Arlington County Office of Emergency Management

allows a user to move a mouse seamlessly from one monitor to the next, without flipping from screen to screen. Up to four monitors at a time can operate in either “independent” or “stretched” mode, with a 1920x1200 maximum resolution per display.

Underneath each desk, a Matrox unit that’s 12 inches by 1.5 inches deep offers multiple USB ports to support mouse, keyboard and other peripherals.

Trouble Factors

When Arlington County moved to expand and enhance its communications center, several factors weighed heavily.

First there was the pressure of public visibility. After all, this was the installation that responded on 9/11 when a hijacked plane slammed into the Pentagon, killing 184 people. With its proximity to Washington, D.C., the county is a high-profile center that’s on call to respond to significant national events, and therefore is under unusually high public scrutiny.

The noise was likewise problematic, posing not just an irritation but also an operational distraction. “I have radio in one ear and all of this other noise in the other ear. It simply takes away your ability to hear,” Waller said.

In fact, call center noise is a common concern. At 60 to 65 decibels, a call center produces similar racket as a power tool, which is louder than the 55 decibels of a typical office space, according to Brendan B. Read, author of *Designing the Best Call Center for Your Business*. Move the PCs into another room, and the noise is significantly diminished.

“When we first moved into [the old center], it was a great space, but as time went on and we added new technologies and features, that space started to shrink,” Waller said.

Positive Outcomes

Arlington County put a lot of thought into its new call center and a lot of cash too. The Emergency Communications Center cost approximately \$9.6 million. Funding came

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reports from the IT horizon

Electronic Weatherproofing

Government agencies that spend millions of dollars replacing weather-damaged equipment can sigh with relief, thanks to a new coating process called **Golden Shellback**, developed by the Northeast Mari-

time Institute. The coating produces a vacuum deposited film that's nonflammable, has low toxicity and can make electronic devices and other surfaces splash-proof. The process is specifically designed to protect devices

commonly used in marine and hazardous environments against damage caused by exposure to moisture, immersion in water, dust, effects of high wind and chemicals.

— *Northeast Maritime Institute*

Domestic & International Stats

According to *U.S. Residential Broadband Speeds on the Rise*, a study by In-Stat, the average American Internet download speed is 5.6 Mbps.

A decade ago, there were **57,000 broadband subscribers** worldwide, however, that total now **exceeds 400 million**, according to the International Telecommunication Union.

3-D Rome in 21 Hours

There's an old adage that says "Rome was not built in a day," but a team of researchers at the University of Washington's Graphics and Imaging Laboratory (GRAIL) recently created a virtual Rome in 21 hours using 150,000 panoramic images from the popular user-generated Web site, **Flickr**.

The project — described in a research paper presented

at the 2009 International Conference on Computer Vision in Kyoto, Japan — pioneered a method for solving large-scale distributed computer vision problems.

GRAIL researchers developed a new system that uses parallel processing to rapidly match the huge number of individual images that were needed to create the detailed 3-D rendering.



Award-Winning Governments

The Urban and Regional Information Systems Association (URISA), a nonprofit association of GIS and IT professionals, announced its 2009 Exemplary Systems in Government (ESIG) Awards. Winners were recognized for exceptional use of IT to improve government services. Here's a look at the winners and their applications.

Charlotte, N.C.'s Virtual Charlotte enables the visualization of 311 calls, traffic accidents, construction projects, permits, street maintenance services and vehicle locations tracked with automated vehicle location technology.

Airdrie, Canada, was the first municipality in Alberta to move from a paper-based system to a completely electronic process for its annual citizen census. Through the Online Census

system, Airdrie implemented a secure, real-time, virtually paperless data collection method that simplifies the census process for clerks, enumerators and citizens. The system includes the use of biometrics to validate enumerator identities, use of tablets for in-field data collection and use of online PINs for secure data entry by citizens.

Forsyth County, Ga., developed its GIS Mobile Emergency Response System to enhance emergency management preparedness, response and recovery. The system provides emergency support for the county's emergency operations center or can be deployed in the field to provide direct support to first responders. — SOURCE: WWW.URISA.ORG/AWARDS/2009ESIG

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GammaTech's Durabook D14RM notebook computer is stylishly rugged, slim and lightweight.

The notebook has a Montevina Platform Intel Core 2 Duo, FSB 1066 or Intel Celeron processor. It measures 13.8x10x1.61 inches and weighs 5.5 pounds. The notebook comes standard with a 14.1-inch WXGA, 1280x800 resolution display and LED lighted keyboard. Hard drives are 160/320 GB and up, field-changeable, SATA. Memory consists of two 200-pin DDRII SODIMM sockets each for 1 GB/2 GB (8 GB maximum). The laptop is spill-, drop- and dust-resistant.

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Before You Try to Forget 2009

The first decade of the 21st century is going out the way it came in — with bubbles bursting: dot-com at the beginning and housing (and a tangled web of global financial shenanigans) at the end. Technically speaking, 2009 isn't the end of the decade, but for many households, businesses and public agencies — it felt like the end of the world.

This page has long invoked the credo attributed to Father Guido Sarducci's *Five Minute University* (of vintage *Saturday Night Live* fame), which condenses a world of knowledge into the five things you'll remember in five years. My year-end tradition continues.

1. The Public Record Is Alive

Our idea of public records (and the laws that prescribe the conditions of their disclosure) assumed a document in a filing cabinet in a physical location. The Internet took the physicality out of the equation, but we hung on to the notion of the record as static. No more, and everything from Apps for America/Democracy, NYC BigApps and Data.gov is just prolog. They provide the new platform on which governments will meet their obligation to interpret, contextualize and make data understandable to the public. But that game has been democratized.

2. The Rise of the Citizen Coder

If citizen journalists are bloggers on a mission, citizen coders are geeks similarly motivated to find meaning and value in government data feeds beyond what government would or could do for itself — and in some cases, beyond what government would want done in terms of scrutiny on spending and official acts. There are the makings of tension and even conflict here, but it's our zeitgeist

and the natural extension of all that citizen engagement we've been talking about.

3. The Portal Bypass

The portal is both less and more than it once was. The home page remains government's front door, and it's the standard-bearer for the growing suite of online applications that stand behind it. It's a gateway to the rapidly growing universe of mobile or smartphone apps that extend the portal's reach to the palm of the user's hand. Government home pages are being bypassed via back doors — search, mobile apps and collaborative filtering — in ways that make them invisible.

4. The Cloud Comes Down to Earth

The cloud will be (a) internal, (b) private, (c) public, (d) disruptive and (e) all of the above. There's fierce debate about whether it will be (a) secure, (b) cost-effective and (c) ultimately a friend or foe of the data center. It's also the newest face of consolidation of outsourcing.

5. City, County, State — Pick Two

City/state projects have redrawn boundary lines based on how things work, not on how things grew up historically. These have whittled more than 10,000 political subdivisions to 363 regions — each anchored by a large metropolitan area — that account for 65 percent of the U.S. population, 74 percent of the economic output and 77 percent of good-paying knowledge jobs. It underscores the argument for shared services and regional collaboration. It may portend what consolidation looks like in the future, and has sparked debate about which level of government — city, county or state — is the most redundant and should be voted off the political map.

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