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# CLOUD COMPUTING OPTIONS

UNDERSTAND THE CHOICES: PUBLIC, PRIVATE & HYBRID



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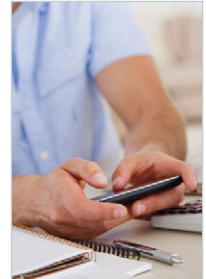


TECHNOLOGY FOR BUSINESS

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What should you consider before moving applications, processes, and workloads to the cloud? What are the primary options when it comes to cloud computing? What are the pros and cons associated with various facets of cloud computing, such as capacity, security, application development and testing, archiving, and IT management? Turn to the Essential Business Tech department to find articles that will help you determine what is best for your organization.



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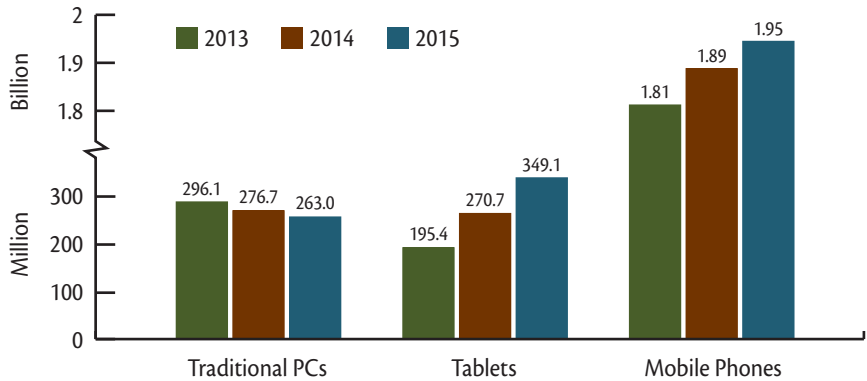


## “FOUR PILLARS” DRIVING BUSINESS TECHNOLOGY

► You’ve heard the terms before: cloud, social, mobile, and analytics. Much of the buzz can be tied to one of those four areas, and IDC’s latest look at technology spending in the United States shows just how much companies are investing in those technologies. “Investments in these key areas are driving business funded technology to reach \$275.2 billion in the U.S. in 2014, accounting for 55% of total technology spending,” says Eileen Smith, IDC program manager. Those “four pillars,” as IDC calls them, are also changing business processes such as the technology purchase decision and budget holder, with buying power for technology purchases shifting from CIOs to CMOs, CFOs, vice presidents of sales, and other line executives, IDC reports.

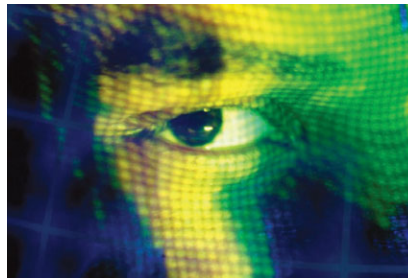
## PC MARKET SHIFT IN PERSPECTIVE

► Shipments of the devices we traditionally refer to as personal computers—namely, desktop and laptop computers—are continuing to slide, according to Gartner, but the rate of decline is expected to slow next year. While 296.1 million traditional PCs shipped in 2013 and 276.7 million are expected to ship in 2014, Gartner forecasts 263 million shipments in 2015, almost cutting in half the rate of decline. Mobile computing devices, meanwhile, continue their ascent, particularly as businesses shift their perspective about what constitutes a worthwhile computing device to include tablets.



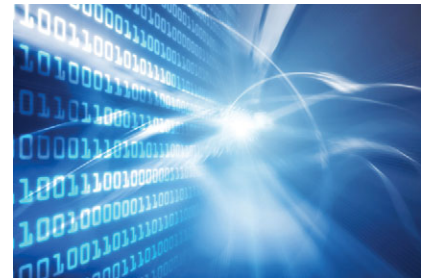
## DIGITAL BUSINESS BLURS CONNECTIVITY LINES

► By 2020, more than 7 billion people and businesses and at least 30 billion devices will be connected to the Internet. All of that will launch the world of digital business, according to Gartner. “Digital business will break down traditional barriers between industry segments, creating completely new value chains and new business opportunities,” says Jorge Lopez, Gartner vice president and distinguished analyst. Digital businesses, Gartner notes, will be focused on spotting new opportunities to drive revenue. Some of these opportunities may last just seconds, or a transient opportunity that is exploited dynamically.



## DATA PRIVACY CONCERNS GROWING

► Research firm GfK surveyed 1,000 U.S. consumers in March and found that while 88% were concerned to some degree about personal data privacy (59% said they were more concerned than they were a year ago), only 48% said they were acting on those concerns by changing their online habits. Of course, the unknown factor here is the extent to which that 48% already had good habits related to online commerce, banking, etc. The survey found that health care was the most trusted category of online services (70% said they trust hospitals, health care providers, and the like) and social networks (at 39%) were the least trusted.



## BUSINESS INTELLIGENCE SYSTEMS POPULAR

► The worldwide market for business intelligence and analytics software grew 8% from 2012 to 2013, according to Gartner, with revenues rising from \$13.3 billion to \$14.4 billion during that period. Numerous factors, including confusion about how best to use analytics with big data, have interfered with greater growth, says Gartner. “Overall, just like last year, the market is shifting gears, which is keeping growth in the single digits,” says Dan Sommer, research director for Gartner. “At the same time, paradoxically, we’re at the cusp of a series of tipping points which will facilitate unprecedented interest and adoption of analytics.”

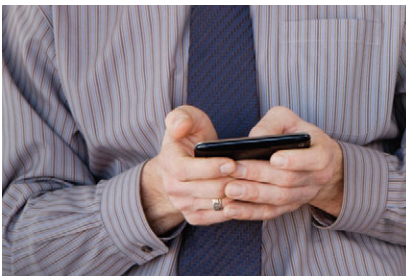
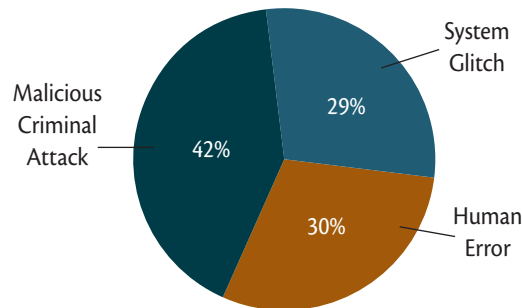


## HOW TO CUT THROUGH THE IOT “NOISE”

- Gartner suggests enterprises consider four fundamental usage scenarios when contemplating how to take advantage of the IoT (Internet of Things).
- **MANAGE.** To optimize asset utilization in end-user organizations, you need to gather and report real-time data using sensors.
  - **MONETIZE.** Ensure that you are accurately measuring the use of physical assets.
  - **OPERATE.** As it relates to the manufacturing industry, companies should move more toward “mainstream technology, software, and architectures” so that IoT assets come to the attention of CIOs and IT.
  - **EXTEND.** Prepare for the new digital supply chain, in which “digital services and products can be delivered to the asset” after it is connected.

## TRACKING THE COSTS OF A DATA BREACH

► The “2014 Cost Of Data Breach Study” from the Ponemon Institute derives insights from personnel within businesses and government agencies that have been through data breach occurrences. According to the report, the average cost to organizations was highest in the U.S., costing an average of \$5.4 million per company in 2013; the projected total for 2014 is \$5.85 million. When asked whether their organizations had security strategies in place for areas often affected by data breaches, 45% said they had such a strategy to protect information assets, 42% to protect their online presence, and only 38% to protect IT infrastructure. Looking ahead, Ponemon is most concerned with malicious code and sustained probes, as those threats are increasing dramatically relative to other threats. The chart below illustrates the breakdown of data breach origins in 2013, according to the report.



## BUSINESSES TO DEPLOY MORE MOBILE APPS

► About half of all companies currently deploy between one and 10 apps on employee mobile devices, and that number should increase this year as we see more exciting advancements in apps, according to a report from Frost & Sullivan. Wireless email and mobile sales force automation are considered the two most necessary apps for businesses. The report found that efficiency, productivity, and improved collaboration are the primary benefits of providing mobile apps to employees, but concerns over the security of company and customer data and the high cost of implementation still hold companies back.



## IDC SEES STRENGTH IN INTEGRATED SYSTEMS

► According to IDC, the integrated infrastructure and platforms market grew to almost \$7.6 billion in 2013, representing a 45.6% year-over-year increase. IDC defines integrated systems as “pre-integrated, vendor-certified systems containing server hardware, disk storage systems, networking equipment, and basic element/systems management software.” Jed Scaramella, research director, enterprise servers, for IDC, says, “Integrated systems have been one of the most important developments in the evolution of the enterprise data center.” He adds, “IDC expects the market to continue on its growth trajectory in 2014.”



## COMPTIA: BUSINESS CONFIDENCE LOOKING UP

► The CompTIA “Industry Business Confidence Index” measures IT executives’ impression of the U.S. economy. The Q2 2014 index indicates a positive confidence trend, having risen 2.7 points since Q1 to 61.3 on a 100-point scale. The overall increase is modest compared with the 8% jump in the “disruptive technologies and business models” area. “Two areas—cloud computing and mobility—are key factors,” says Tim Herbert, vice president of research for CompTIA. “With such far-reaching impacts of these technologies, firms across the IT channel are still working through how to best meet the needs of their customers and their businesses.”



## STUDY REVEALS INTERNET ANNOYANCES

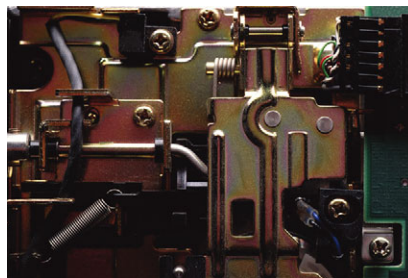
► Research firm Harris Interactive unearthed some interesting information about people’s email and social media annoyances when it surveyed 2,234 adults in the U.S. in March. Older respondents were more forgiving of emails written in all caps than younger people, for example. And younger respondents appeared to be less shaken by brief or terse emails. The table below offers a few more highlights from the study; the percentages represent the portion of respondents who were annoyed by the associated behaviors.

	Total	Millennials (18-36)	Gen Xers (37-48)	Baby Boomers (49-67)	Matures (68+)	Have Children In Household	No Children In Household
Emails written in ALL CAPS	<b>60%</b>	67%	59%	57%	49%	63%	58%
Overly brief or terse emails	<b>40%</b>	33%	41%	43%	51%	37%	42%
Overuse of “reply all” in email messages	<b>51%</b>	41%	54%	54%	64%	46%	54%
People who don’t reply to emails	<b>49%</b>	59%	46%	46%	36%	54%	46%
Excessive complainers on social media	<b>55%</b>	60%	54%	53%	48%	58%	54%
Excessive braggers on social media	<b>45%</b>	40%	46%	47%	52%	42%	46%



### STOLEN SMARTPHONE RATE DOUBLES

► According to Consumer Reports, about 3.1 million smartphones were stolen in 2013, doubling the 1.6 million devices that were taken from users in 2012. On the upside, more smartphone users, about 50% more than in 2012, are getting better at setting four-digit passcodes, though most fail to take greater security precautions. “Our survey revealed that the number of lost and stolen smartphones is on the rise, and too many smartphone users are needlessly imperiling their personal data by not taking basic security measures,” says Glenn Derene, electronics editor at Consumer Reports.



### INTERNET OF THINGS TO IMPACT SECURITY

► The IoT (Internet of Things), meaning the interconnectedness of countless devices via the Internet and other networks, “is redrawing the lines of IT responsibilities for the enterprise,” says Earl Perkins, research vice president at Gartner. Perkins offers many security recommendations to organizations embracing IoT-related technologies, including a fundamental bit of advice: “start small” and build based on specific IoT projects and use cases. “Governance, management, and operations of security functions will need to change,” he says, “to accommodate expanded responsibilities . . .”



### PARENTS USE PHONES WHILE DRIVING KIDS

► According to a University of Michigan study published in “Academic Pediatrics,” more than 130,000 children aged 12 and younger are treated for vehicle collision-related injuries every year, and about one in six fatal collisions involve driver distraction. It’s startling, then, to find that parents surveyed for the study reported participating in the same behaviors while driving their children (about two thirds say they’ve talked on their phone, about one third say they’ve exchanged texts) as the overall population. Making matters worse, those driving children have more distractions than others.



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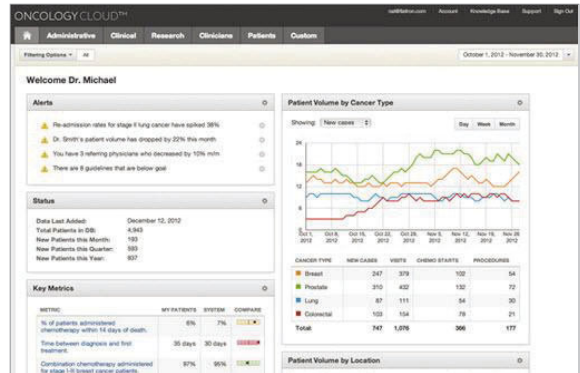


## MODULAR CLOUD APP DEVELOPMENT STARTUP RAISES \$9M

► Cloud app development shouldn't be all that difficult. That's the message behind the service ElasticBox offers, which takes a modular approach to cloud app development. The San Francisco-based startup provides numerous "boxes" of pre-configured application architecture components that can be used, reused, and combined, either with each other or with boxes businesses create for themselves, to make, deliver, and maintain applications in the cloud. ElasticCloud recently closed a \$9 million Series A funding round led by Nexus Venture Partners and Intel Capital. The company is hiring new employees, but hasn't specified how it plans to use the new funding.

## \$130M FUNDING ROUND FOR STARTUP OFFERING ANALYTICS FOR CANCER CARE PROVIDERS

► Google Ventures recently led a \$130 million Series B funding round for Flatiron Health, a New York-based startup dedicated to providing BI (business intelligence) and analytics capabilities for cancer care providers. Flatiron also announced it will acquire Altos Solutions, which offers a Web-based oncology and EMR (electronic medical records) system that Flatiron will integrate into its own offerings. Flatiron's system brings together disparate and otherwise scattered data related to oncology patient care (EMR, billing data, etc.) and makes all of that data immediately usable by care providers. "Oncology is one of the fastest growing and unique segments of the health care industry, and oncologists and researchers need new and advanced tools to keep up," says Dr. Krishna Yeshwant of Google Ventures.



tresorit



## KNOW YOUR DOCS BETTER, GET BETTER ROI

► How often do you send digital documents out into the world (such as via email) only to wonder whether they are being read carefully, forwarded to others, or discarded without being read at all? San Francisco-based startup DocSend offers a Web-based service designed to answer these types of questions. It can even notify you when documents are opened and tell you how long a reader kept the document open. These types of analytics have been helpful for sales, marketing, and fundraising efforts, according to the company, which has thus far raised \$1.7 million in funding.

## STARTUP ENCRYPTS CLOUD STORAGE

► Hungarian-Swiss startup Tresorit offers cloud storage with a twist: end-to-end encryption, meaning that only the user has the keys to the data they store on Tresorit's servers. By simply dragging and dropping folders, users of the service create online stores of their data called "treasures." Users can then access those files via Tresorit's apps for Windows, Mac, Android and iOS. As with other online storage services, Tresorit, keeps the data in sync across all devices. Encryption is maintained even for mobile devices. The company recent raised \$3 million in Series A funding and plans marketing efforts across Europe and the U.S.

## WEBSITE OPTIMIZATION STARTUP RAISES \$57M

► Need to optimize or test your website but don't know where to begin? Looking to make your website more engaging to visitors? San Francisco-based startup Optimizely offers a service of the same name that delivers optimization, improved site interactivity, analytics, and other features for organizations of all sizes with varying degrees of technical capabilities. Optimizely has caught the eye of venture capital firm Andreessen Horowitz, which recently led a \$57 million Series B funding round. The company plans to grow its team from 175 people to more than 250 by the end of the year.



# Cloud Computing Options

## Why A Hybrid Environment May Be In Your Future

DESPITE THE FACT THAT cloud computing has been around for years, confusion and misconceptions remain among companies as to how public, private, and hybrid cloud models exactly work. This also goes for what each model's respective requirements, abilities, positives, and negatives are and in terms of which model would be most beneficial to an organization.

While some companies are built on a public cloud foundation, for example, others covet control and adopt a private cloud solution to keep sensitive data local while still taking advantage the self-service and quick scaling

abilities a public cloud offers. Yet other organizations embrace hybrid cloud environments to reap the best worlds of both public and private clouds.

The following identifies key differences among these cloud types, explores typical reasons why companies choose each model, and illustrates why many experts believe hybrid deployments will eventually be most advantageous for many companies.

### CLOUD DISTINCTIONS

Generally, decisions concerning which cloud model to enlist are predicated on various aspects specific to

an organization, such as its distinct industry and business requirements, financial situation, infrastructure, IT skills and experience, and overriding culture and philosophy. Given that each organization is unique and requires a specific needs assessment, Todd Thibodeaux, CEO and president of CompTIA ([www.comptia.org](http://www.comptia.org)), says there are several considerations possible for evaluating public vs. private vs. hybrid cloud adoptions, including security, scalability, cost, and regulatory compliance factors (especially for financial services, government, and health care industries).

### Key Points

Although a private cloud can provide the greater control many companies desire, it's costlier up front and more demanding skills-wise to maintain vs. using a public cloud.

Many organizations still face challenges in enabling the type of automation, allocation of resources, and self-service ability that typifies a true private cloud.

Many cloud experts believe hybrid clouds will ultimately be the most advantageous approach for many companies seeking both flexibility and control.

Adopting a hybrid cloud environment can enable organizations to move applications and other resources to the cloud environment that is ideal for them while keeping certain data and resources on premises.



In public clouds, private entities own the infrastructure (compute, storage, and network.), and users access those resources via the Internet, resulting in cloud-based and remotely delivered services. Thibodeaux counts lower costs, improved cash flow from converting capital expenses to operating expenses, universal accessibility, and automatic backups and upgrades as public cloud benefits. Potential pitfalls include the fact that most public cloud applications run on a multi-tenant basis, meaning that while an organization's data is segregated from other organizations' data, the same application software code processes all the data. This is "why some companies may prefer to keep some applications and data on premises," Thibodeaux says.

A private cloud entails building and maintaining an internal cloud infrastructure or relying on a third party to build, manage, or host it. The channel plays a critical role in developing private clouds by providing consulting, design, deployment, implementation, and ongoing support services, Thibodeaux says. Private cloud strengths include greater ability to more directly control and manage resources, although costs are typically greater. Lynda Stadtmueller, program director, cloud computing, with Frost & Sullivan ([www.frost.com](http://www.frost.com)), says although a hosted private cloud is costlier than public cloud and requires a capacity or term commitment, the advantage is server and storage hardware isn't shared.

Hybrid clouds, meanwhile, combine two or more deployment models, such as private and public Web applications, says Thibodeaux. According to Mike Kavis of The Virtualization Practice ([www.virtualizationpractice.com](http://www.virtualizationpractice.com)), an organization might employ a hybrid model because it wants to keep certain data local but recognizes the huge cost savings and agility public cloud offers. Thus, the organization only moves certain workloads it doesn't have data concerns about to



"A hybrid approach brings common enablement and management functionality across whatever environments are already in use and may be added in the future."

**Lynda Stadtmueller**

program director, cloud computing, Frost & Sullivan



"A private cloud should also offer the same self-service capability as found in any public cloud provider. A standard virtual data center does not inherently have these features."

**Todd Thibodeaux**

CEO and president, CompTIA

the public cloud. In other situations, a company might adopt a hybrid approach because it has older, legacy workloads it doesn't want to put into the public cloud.

Who decides which model to use within an organization isn't typically the CIO, says James Staten, Forrester Research ([www.forrester.com](http://www.forrester.com)) principal analyst. Instead, a business department (marketing, manufacturing, HR, etc.) might view a public cloud service "as a fast path to achieving a business objective." Commonly, SaaS (software as a service, or Web-based) applications that meet a perceived immediate need are first entry points. This is true even if the organization already provides a similar tool because it may not provide features the public cloud service does.

A similar scenario is true with public cloud platforms, such as Amazon AWS or Microsoft Azure, Staten says. Here, developers working closely with the business often drive adoption because a public cloud platform offers fast access to resources they can acquire and manage themselves without going through IT, which they perceive as a slower, more expensive route. As such, IT may respond by building a private cloud so

users don't circumvent IT, Staten says. This is "usually a recipe for disaster," he says, as private clouds may lack the ease of use, self-service capabilities, and "pay-by-the-drink" economics of public clouds.

## WEIGH THE OPTIONS

Commonly, agility, delivery speed, and cost savings entice companies to public clouds. Public cloud, for example, can free a company from having to invest in consolidating, expanding, or building a new data center when it outgrows a current facility, Kavis says. IT really doesn't "want to go back to the well and ask management for another several million dollars," thus it dives into the public cloud, he says. Stadtmueller says the public cloud is the least expensive way to access compute and storage capacity. Plus, it's budget-friendly because up-front infrastructure capital investments aren't required. Businesses can instead align expenses with their revenue and grow capacity as needed. This is one reason why numerous startups choose all-public-cloud approaches.

In addition to offering monthly or annual subscription service models, Brad Shimmin, Current Analysis

([www.currentanalysis.com](http://www.currentanalysis.com)) service director, says a public cloud service may provide advanced features, such as data integration services, training, and support. While smaller companies are thought to particularly benefit from public clouds, there are well-understood use cases about public cloud services that apply to all company sizes, Shimmin says. "It's not just specialty use cases . . . but all of the utilities that we've come to expect from an IT department," he says.

Private cloud adoption, meanwhile, is "basically about control," Kavis says, including for companies that believe their data won't be secure in a public cloud. "Some companies, especially financial institutions, totally write public cloud off as an option because they don't want any data leaving their walls," he says.

Shimmin describes private clouds as "an on-premises manifestation of the same kind of philosophy and approach you see from SaaS providers." Private clouds especially appeal to organizations that seek high performance and control and that operate in sensitive vertical markets (finance, medical, utilities, etc.), he says. Due to the high performance and control requirements and simple economics involved, he says, it's typically larger enterprises that gravitate to private clouds.

Notably, investing in private clouds can mean employing certain methodologies (software-defined networking, converged infrastructures, etc.) that many data centers still grapple with, Shimmin says. "In many cases, the data centers that exist today simply aren't architected to support that." A company may have a good grasp on server virtualization, for example, but still find virtualization of resources challenging.



"Perhaps the most appealing and practical scenario is where a private database-as-a-service is located in close proximity to the public cloud provider, where the Web tier resides."

**Michael Warrilow**  
research director, Gartner

Thibodeaux says a true private cloud uses software that manages resources automatically, dynamically allocating them as needed without manual intervention. "A private cloud should also offer the same self-service capability as found in any public cloud provider," he adds. "A standard virtual data center does not inherently have these features."

Thibodeaux says moving from a public cloud to a true private cloud may be the most complicated migration type due to the technical skills required to build and operate a private cloud infrastructure. "The most popular way to build out a private cloud is to look to a third party," he says. "Seventy percent of companies have either worked with their existing IT provider or contracted with a specialist in building private clouds."

Michael Warrilow, research director with Gartner ([www.gartner.com](http://www.gartner.com)), agrees that maturing to a true private cloud is challenging for most organizations. "It must be done one service at a time," he says. Ultimately, he says, a desire for both agility and security leads organizations to adopt a hybrid cloud.

### A HYBRID APPROACH

Though hybrid is the least mature cloud model, Stadmueller says, it holds the greatest promise, and more businesses are building their

cloud and IT strategies around it to gain "the greatest flexibility to place and move applications and databases to whatever environment is best." Warrilow describes hybrid clouds as "the intersection of public, private, and community," which means there are many ways to employ one. "Perhaps the most appealing and practical scenario is where a private database-as-a-service is located in close proximity to the public cloud provider, where the Web tier resides," he says. "The database has a fast connection to the public cloud but remains under the control of the organization."

Clifford Grossner, Infonetics Research ([www.infonetics.com](http://www.infonetics.com)) directing analyst, data center and cloud, says that when thinking of hybrid clouds, he imagines a world where a LOB (line of business) unit could request an application to deploy via a self-service portal, "at which time billing for data center resource consumption would start." IT would pre-define components (application delivery control, security, etc.) that are needed to run an application via a cloud management portal, and as the service's demand grows, IT could request more resources from a cloud services vendor without service interruption, he says. "In effect, the resources available to run IP applications can be expanded

Ultimately, a desire for both agility and security  
leads organizations to adopt a hybrid cloud.



on demand and occur automatically,” he says. “Delivering on this vision requires a data center architected for the cloud with an application-aware infrastructure.”

An example of how an organization might keep some services and data in the public cloud while keeping applications and other data on premises might look something like this: placing a collaboration service (Web conferencing, hosted voice and email, etc.) in the public cloud and storing patient records (as in a health care environment) on premises.

Overall, a recent Infonetics North American survey on cloud service strategies indicates that enterprises are shifting from public clouds to hybrid clouds, with private cloud adoptions remaining fairly steady, Grossner says. He believes this signifies a recognition among organizations that an option is available to balance the risk taken with adoption of cloud services. “Of course, this is partially due to the maturation of the technologies needed for hybrid cloud,” he says.

### IS HYBRID THE FUTURE?

There’s growing sentiment among many cloud experts that ultimately hybrid adoption will be most advantageous for many organizations. Warrilow says “for some time Gartner has advised that hybrid is the most likely scenario for most organizations.” Staten agrees with the notion for two reasons. First, “some applications and data sets simply aren’t a good fit with the cloud,” he says. This might be due to application architecture, degree of business risk (real or perceived), and cost, he says. Second, rather than making a cloud-or-no-cloud decision, “it’s more practical and effective to leverage the cloud for what makes the most sense and other deployment options where they make the most sense,” he says. In terms of strategy, Staten recommends regularly analyzing deployment decisions. “As cloud services mature, their applicability increases,” he says.



“... it’s more practical and effective to leverage the cloud for what makes the most sense and other deployment options where they make the most sense. . . . As cloud services mature, their applicability increases.”

**James Staten**

principal analyst, Forrester Research

Stadtmueller says future IT environments will definitely be hybrid. Even today, she says, businesses use a heterogeneous compute environment with some combination of cloud software, on-premises compute resources (PC-based and client-server), and, more frequently, some type of cloud infrastructure services for compute, storage, or backup. “A hybrid approach brings common enablement and management functionality across whatever environments are already in use and may be added in the future,” she says. “That functionality makes a hybrid approach more cost-effective, flexible, and easier to manage than multiple individual delivery models and environments.”

Infonetics’ data confirms the trend toward hybrid adoptions. Many enterprises start by adopting a cloud architecture for their data center, move to a private cloud, and then to a hybrid cloud, he says. Some enterprises find the public cloud too costly as they scale usage and hit a tipping point where it makes sense to bring functionality in-house. “Using the public cloud to meet new requirements at a small scale gives internal IT staff time to gain experience with new technologies, making it feasible to then move the functionality in-house,” he says.

Kavis believes hybrid adoptions will prevail but also expects more workloads will move to public cloud as companies see better results at lower costs and faster-to-market experiences. He also expects more companies to be born on the public cloud,

including due to the “huge competitive advantage” it can provide. A downside to building companies on public clouds is the possibility of encountering customers that will refuse to use products run in a public cloud. Thus, a service provider born in a public cloud, for example, might need to figure out how to deploy its solution locally as well to get certain customers, Kavis says.

One obstacle to implementing a hybrid cloud is it requires a hybrid IT organization, Warrilow says, and “the adoption (or sourcing) of capabilities in cloud management and cloud brokerage.” These skills and offerings are still emerging, he says. Stadtmueller says few providers currently offer hybrid clouds that match what businesses are looking for. “Businesses want their hybrid environment to tie together all possible options: virtualized and non-virtualized; on-premises, colocation, managed hosting, and cloud; public and private; and multiple vendors’ clouds,” she says.

Without standards it’s very difficult to achieve this, Stadtmueller says. “Most hybrid cloud offers just connect a few environments,” she says. “Another issue is ‘hybrid’ consists of a direct-connect network interface, thus there’s a physical connection but little logical connection at the management layer,” she says. “Without the ability to easily and seamlessly migrate, burst, and failover from one environment to another, the ‘hybrid cloud’ is of limited value to the business.” ●



# Cloud Expansion Pros & Cons

## Determine Whether Or Not The Cloud Will Meet Your Business Needs

THERE ARE SO MANY use cases for the cloud that it can be difficult to figure out which ones are truly a fit for your company. While it's true there are many benefits to using cloud computing, there are also a few remaining concerns that companies need to consider as they decide how much to extend their infrastructure to the cloud. Here we cover major cloud computing benefits and potential drawbacks, and offer verdicts to help you decide what might work best for your business.

### CAPACITY

► **Pros:** One of the most—if not *the* most—common use cases for cloud is having the flexibility to add storage capacity as needed as well as to remove cloud capacity when it's not in use. "It's certainly a big pro," says Amy Larsen DeCarlo, principal analyst at Current Analysis ([www.currentanalysis.com](http://www.currentanalysis.com)). "Companies can expand their capacity, whether it's for storage or compute, without having to make a big capital investment to add more storage hardware

or servers. In a lot of cases, the pricing is relatively transparent and you're paying much closer to what you actually use than you might if you were trying to build out your own facility."

Dave Bartoletti, principal analyst at Forrester Research ([www.forrester.com](http://www.forrester.com)), agrees and says that if you use cloud capacity, you "don't have to build out your data center for peak load," which often leads to "adding infrastructure for your peak load and 80% of the time, half of that infrastructure might be sitting

### Key Points

Capacity is a great use case for the cloud because of flexibility and scalability, but make sure you don't give up too many controls and that your provider is reliable.

Building and testing applications is a great use case for the cloud, but plan to use the same environment for both development and deployment to avoid compatibility issues.

Backup, disaster recovery, and archiving are all great cloud use cases as long as you make sure the service is as reliable, if not more so, than your data center.

Cloud security is still a hot topic for many companies and while many providers are making efforts to increase their security measures, you should consider picking and choosing which apps and data to migrate.



idle." Cloud capacity makes it so that you have much more flexibility and you turn what was once a capital expenditure investment into an operational expenditure investment.

► **Cons:** When you use the cloud for capacity, you're using someone else's data center, which means "you'll introduce latency and you will cede some aspects of control and insight," says Ed Anderson, research vice president at Gartner ([www.gartner.com](http://www.gartner.com)). He adds that not all in-house, on-premises applications are built to have the same scalability as cloud-based alternatives, so you may struggle with integration between your data center and the cloud environment. The key here is to remember that you may have to actually rewrite your application to work with the cloud if you want to take full advantage and "the application needs to know how to scale," Anderson says.

► **Verdict:** As long as you are well-prepared and understand what applications will work best with the cloud, you shouldn't have much trouble using it for additional capacity. It just depends on how far you want to go and what types of data and applications you want to migrate. Another important thing to do beforehand is to find a vendor "you know is going to be around for the long haul because you're trusting them with the crown jewels of your organization," says Jennifer Koppy, research manager at IDC ([www.idc.com](http://www.idc.com)). If you can find "a partner that's going to have skin in the game with you," she says, you should feel comfortable through the migration process and beyond.

## APPLICATION DEVELOPMENT & TESTING

► **Pros:** App development and testing is one of the most promising use cases for the cloud. "The great thing about those kinds of environments is that they're very easily accessible, have very low cost of entry, and a very low skill set requirements," says Anderson. "A lot of the cons that come with a production



Many organizations "have mandates that they need to look at cloud first when they're considering an outsourcing situation or buying new equipment. . . . They need to determine what their application requirements are and whether it is going to be a good fit for a cloud environment."

**Amy Larsen DeCarlo**

principal analyst, Current Analysis

environment, you won't have in a cloud development environment. You don't have to worry about integration, you won't have the same kinds of management and monitoring issues, and you generally won't have latency and performance issues. . . ."

If you're building applications specifically for use in the cloud, this is "a perfect scenario" because "you can mirror or mimic the specific conditions in terms of the number of users accessing an application, look at different ways of architecting an application, and you can do it all in a controlled environment at a pretty minimal cost," DeCarlo says. And because cloud resources are available on-demand, you can add capacity as needed and spin them down after you're done.

► **Cons:** One of the only major downsides to developing and testing applications in the cloud is that if you choose one cloud provider for a project, it's relatively difficult to make that app work on another cloud provider's service. "If your developers are out using database services from Amazon, you're going to have to deploy to the same place that you're building it because those services have to be there," Bartoletti says. "If you build something in Azure using Microsoft tools and expect the app to have Azure underneath it, then you're building for a specific cloud."

► **Verdict:** The great thing about cloud-based app development and testing is that the cons aren't really cons as much

as issues to consider during the planning process because "you can choose whatever cloud suits your needs the best," Bartoletti says. You may need to consider other aspects, such as protecting intellectual property information in the cloud, but you can always look for a provider that puts a strong emphasis on security. And if you have any doubts about a certain project, you can take it on a case by case basis and only develop applications in the cloud that make good business sense.

## BACKUP & DISASTER RECOVERY

► **Pros:** Cloud backup is highly beneficial from a pricing perspective because "the cost of cloud storage is falling faster than the cost of enterprise storage and that's the reason it makes so much sense to use the cloud as a place to find cheap storage," Bartoletti says. The cost of on-site storage goes beyond capacity itself to things such as power, cooling, and maintenance; but with cloud storage, the provider takes care of those aspects and simply gives you the capacity you need. This is great for companies that want to back up terabytes of data and applications to the cloud and be able to recover it in case of a disaster rather than spend money building an off-site facility to take care of both backups and DR (disaster recovery) practices.

Speaking of DR, the cloud is also great because it offers "redundant mirroring of your images and data," which "lay dormant" in the cloud and then in the case of a disaster, "you just

provision those out into the cloud and spin it up as a redundant data center," Anderson says. The lower price of cloud storage and the advent of cloud-based DR solutions also make it practical to back up seemingly less vital systems, such as email, according to DeCarlo. "It's more economical for companies to use the cloud to support these applications and it also gives companies that are mid-tier or smaller an option that has better recovery times and also may be more reliable than some of the low-end options," she says.

► **Cons:** The major cons around backup and DR in the cloud go back to the traditional concerns companies have always had about the cloud. You have to find a provider that provides a highly available and reliable service and is capable of meeting your recovery time objectives. DeCarlo says you have to find out how experienced a provider is with DR and business continuity and that the company will be around for years to come, because "we've seen issues where storage providers have disappeared."

► **Verdict:** The good news about these cons are that most of these reliability issues are tied to low-end providers, so if you exercise due diligence, you should be able to find a company that will meet your needs relatively easily. Bartoletti adds that you should consider location when choosing a cloud provider for DR purposes. "If I'm in Seattle, it might not make sense to use the U.S. West Seattle site as my DR site," he says. "I might want to replicate to U.S. East." And you should make sure the provider will let you move your backups to different facilities as needed so that your data is always right where you need it to be.

## ARCHIVING

► **Pros:** The benefits of using the cloud for archiving are similar to those for backup and DR. Because the cost of cloud storage is relatively inexpensive and continuing to drop, you can feel safe storing massive amounts of archived data in the cloud without



"You want a company that you know is going to be around for the long haul because you're trusting them with the crown jewels of your organization. It comes down to picking a partner that's going to have skin in the game with you."

**Jennifer Kopy**

research manager, IDC

spending too much money. Anderson also adds that you don't have to worry about "integration or latency issues, because you're not transacting with the data" on a regular basis. But if you do need to access that information "for auditing, reporting, or compliance issues, in general, the facilities are pretty good as well," he says.

► **Cons:** As with other aspects of cloud computing, the only real con for cloud archiving has to do with the trustworthiness and reliability of your provider. DeCarlo stresses the importance of making sure that your archived data is stored and protected and that the environment is "compliant with whatever requirements your business is trying to meet." She also says "there could be a tendency to go a little bit too cheap on this, but you don't want to risk losing the data because there are often issues that crop up where that data does need to be accessed."

► **Verdict:** Archiving is another one of those nearly perfect use cases for the cloud, which means that if you do your homework, you should be able to find a provider that will offer the inexpensive storage you need and can jump into action if you ever do need access to that archived data. Anderson says that many more cloud providers are also willing to partner up with companies to support compliance initiatives such as HIPAA and open up new cloud possibilities for companies in that and other industries. "For HIPAA compliance in a hosted environment, the provider has to

actually sign an agreement saying that they will represent and enforce the compliance requirements in their domain of management," Anderson says. "It's not just [the provider] saying, 'oh, our cloud environment is HIPAA certified,' they're also saying we're willing to sign one of these agreements with you and enter into a formal business relationship related to your compliance."

## CLOUD SECURITY

► **Pros:** For companies that are still concerned about storing their data and running applications in the cloud, Bartoletti says "that's probably the last thing to worry about," especially when it comes to protecting intellectual property and other sensitive information. He says that many Web 3.0 startups and other companies have "the core IP (intellectual property) of their company there and they aren't worried about someone stealing it in the cloud." Bartoletti also points out that "most cloud data centers are more secure, at this point, than a lot of corporate data centers," so you may actually be able to improve your security and data protection by migrating to the cloud.

DeCarlo agrees that a lot of individual providers "have done things to strengthen and fortify their cloud services" and are implementing encryption, identity and access management, and many other useful features. These cloud providers are also more sensitive to compliance issues "whether it's a country, industry, or individual company requirement," she says. You can have much more control over who has



access to your data and where it's actually located.

► **Cons:** Anderson agrees that at least for data protection issues, "confidence is rising for the people that are using it," but when it comes to certain privacy factors, "concerns are rising." A lot of these concerns are based on recent news about the U.S. government gathering information from seemingly protected data sources without the knowledge of the public and it's an issue that deeply concerns some companies. "We hear a lot of questions from companies about 'where is my data going to be, how can I ensure it's going to stay in a certain political domain, and can I move all my stuff to Canada and have it be protected from U.S. government snooping?'" Anderson says.

► **Verdict:** Security is one facet of the cloud that is at least partially up in the air, especially when compared to the other obvious benefits of using these services. On one hand, DeCarlo says, many companies have a "higher comfort level" with the cloud and are expanding their deployments, which points to their not being overly concerned with the provider's security stance. But as companies start to move more mission-critical data to the cloud, "then it increasingly becomes a target for hackers," DeCarlo says, and you may see an escalation in attacks. It remains to be seen whether or not this will actually be the case, but it's certainly something to keep an eye on when considering cloud expansion.

## IT MANAGEMENT & THE CLOUD

► **Pros:** A major benefit of using the cloud is that moving some management responsibilities over to the provider can help your IT team "take a step back from the IT drudgery and focus a little more on the innovation side of things because they're not having to worry about greasing the wheels," says Kopyy. "It's the whole idea that companies spend an inordinate amount of



"When you move to a cloud environment you'll be delegating or outsourcing the management of those services to the third-party provider . . . The reality is that your operations team largely will transition to a different kind of role. In other words, rather than performing operations tasks against a server, they will perform operation tasks on service management, service integration, or vendor management."

**Ed Anderson**

research vice president, Gartner

time, money, and other resources on just keeping the business going. In order to be competitive, you need to make that shift into driving that business. That would be one of the pros. You're taking advantage of the latest and greatest," she says.

As you move an increasing amount of your workloads to the cloud, you can start to consolidate your existing infrastructure. Your IT teams can start thinking about new ways to move the business forward, rather than worrying about the on-site management and maintenance of equipment. In other words, "it's focusing on the business rather than focusing on running the business," says Kopyy.

► **Cons:** Cloud management and how the cloud affects the internal IT team are two major sticking points for some companies. With cloud management, Bartoletti says you need to watch out for "the uneven handshake" where you may think a cloud provider is handling most if not all of the management, but in fact they are only handling the servers, storage, and networking facets of the cloud. You are still as responsible for the applications as you would be if they were stored in your own data center, which means you still need an IT employee to monitor capacity, performance, and other aspects of an application to make sure it's running properly.

DeCarlo also points out that as companies start to implement the cloud more and more, and hand over more management responsibilities to third-party providers, the perceived need for a dedicated on-staff IT team can start to dwindle. "It depends on what it is they're outsourcing and how aggressive their company is being about budget cuts," she says. "There is some opportunity there, but at the same time there is some risk for the IT team." DeCarlo does point that some providers offer tools that actually empower IT teams and help them prove their value as they continue to monitor and manage applications in the cloud, so that can help assuage some of those concerns.

► **Verdict:** If you decide to move major systems to the cloud, it's vital to understand how it will impact your current processes. There will be an adjustment period as you figure out exactly what's necessary on-site after more resources are dedicated to the cloud. This may involve buying new management tools to help monitor not only what's happening in your data center, but also in the cloud, Bartoletti says. "That's really the key management challenge when you move to the cloud," he says. "How can IT teams retain control and convince the business, 'you're still going to have my support here even though we're running stuff in the cloud?'" ●



# Your Cloud Solution Is Clear

**Q. What Applications & Workload Environments Can You Entrust To The Cloud?**  
**A. All Of Them**

YOU'VE READ ABOUT cloud computing options and the business benefits of moving applications and processes to the cloud. Now you might be wondering how best to make the leap. We spoke with Richard Rivera, Head of Cloud for trusted vendor Peer 1 Hosting ([www.peer1.com](http://www.peer1.com)), to find out more about the company and what's involved in moving to the cloud.



**Richard Rivera**  
Head of Cloud, Peer 1 Hosting

## COUNTING YOUTUBE AS AN EARLY CUSTOMER, PEER 1 UNDERSTANDS SCALE

"One of our earliest customers was YouTube, an infant company at the time with about three to 10 servers," says Rivera. "They grew to over 2,000 servers by the time Google acquired them. So what folks know of us is that we know how to scale. We also understand clients' global requirements. Clients that are growing in different geographic areas need their servers or services closer to their customers so as to remove latency as much as possible. We own and operate our 10-gig fast fiber network, and we have data center locations throughout the world, so that clearly differentiates us from competitors."

## SECURITY IS AMONG THE TOP BENEFITS OF THE CLOUD

Rivera says the three fundamental benefits clients obtain from cloud computing are a reduction in costs, an increased speed to market, and security. "There's a myth that by going into the cloud, you reduce your security parameters. In essence that's not the case. In our environment, customers have a peace of mind knowing that we are a data center organization, that we

understand VLANs and separating clients accordingly, and that we have not only intrusion detection, we have intrusion protection, we manage firewalls, and we load balance the environments."

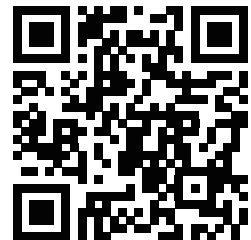
## FOCUS ON YOUR CORE BUSINESS WHILE PEER 1 HANDLES THE REST

"If you're in, say, the health care industry," says Rivera, "you should focus on what you do best: your industry. And let us focus on the infrastructure, which is what we do best." One of the chief benefits of cloud computing is that while you're focusing on your own business, you are also staying on the cutting edge of technology. "Technology changes so fast," Rivera says, "that within six months of your investment in new hardware, that hardware can be obsolete." By using the cloud, "you're not having to play catch-up from a life cycle perspective." With Peer 1 Hosting specifically, you don't have to waste weeks before deploying a solution. Peer 1 works with you," Rivera says, "to create an environment that is all inclusive." Support is also included and ongoing, with a technical account manager assigned to each client.

## MISSION CRITICAL DATA? NO PROBLEM

"Clients come to us knowing that we can handle mission-critical applications," Rivera says, and cites energy and utility companies and the grid using Peer 1's Mission Critical Cloud solution, supported by nine data centers worldwide with more coming online soon. So are there any limits to what you can do in the cloud? Rivera says no. "We have many customers pushing the limits of cloud and I have yet to see anything that cannot be in the cloud, whether it be a private or public cloud environment." ●

Find out more on Mission Critical Cloud  
[go.peer1.com/enterprise-cloud](http://go.peer1.com/enterprise-cloud)







COURTESY OF HEWLETT-PACKARD

# From The Garage To The Moon

HP Uses Its 75 Years Of Experience To Help You Drive Your Business Forward

HEWLETT-PACKARD ([www.hp.com](http://www.hp.com)) is always looking for new ways to put powerful technology into the hands of its customers. Throughout the years, HP has released a wide range of products and introduced major innovations that have helped shaped the business world. Before we show you the most recent innovations HP offers its customers, let's take a look at where the company started and how much it has changed over the past 75 years.

## GETTING OUT OF THE GARAGE

Like many great technology startups (especially those involved in the Silicon Valley PC boom of the 1970s), HP started off in a garage. But the company was actually ahead of the curve because Bill Hewlett and Dave Packard established the business in the late 1930s. In the first few months, the two founders invented a new resistance-tuned audio oscillator that would become the company's first product. This oscillator was

unique because it used a light bulb to reduce distortion, improved performance with a circuit design that was simpler than those currently in use, and cost about a one-tenth as much as other oscillators on the market. After the release of the HP 200A audio oscillator, HP refined its design with the Model 200B and ended up selling eight of them to Walt Disney Studios for use in the production of Disney's musical animated film "Fantasia."

### Key Points

HP started in the late 1930s and actually sold eight of its HP Model 200B audio oscillators to Walt Disney Studios as they worked on the animated musical "Fantasia."

HP went on to build many other products, including the first programmable pocket calculator as well as its first personal computer in 1980 and its first laptop in 1984.

HP offers a wide range of business services designed to help companies better manage their data and infrastructure as well as take advantage of the cloud.

HP Moonshot is a highly scalable and easy-to-implement software-defined server system that gives companies the resources they need to embrace big data, the cloud, and other emerging technologies.

Following this breakthrough, Hewlett and Packard moved out of the Palo Alto garage, which is now a California Historical Landmark; hired two employees; and opened a new headquarters in 1940. Over the next few years, HP would continue to innovate and improve upon existing products as well as invent new ones. Some highlights include a fast frequency counter in 1951 and a line of oscilloscopes in 1956, all of which were used for measurements and testing. In 1963, the company developed a frequency synthesizer called the HP 5100A that was used for vehicles in deep-space. HP got a little closer to becoming the company most people recognize today in the 1970s with the release of the HP-35 calculator followed closely by the HP-65, which was the first programmable pocket calculator in the world.

But it was in 1980 that HP introduced its first PC, the HP-85, which offered peripheral add-ons and was capable of communicating with other computers. From this point on, HP has experienced exponential growth in innovation. HP created a touchscreen PC in 1983, a laptop in 1984, and the DeskJet printer in 1988. In the 1990s, HP continued to hone its capabilities and offered home computers, all-in-one printers, PDAs, and much more. Today, HP is known for many of the same products, including laptops, desktops, and tablets, but the company has also expanded into the server and enterprise storage markets, and many other business-focused data center technologies. In addition to hardware, HP now offers a wide variety of services designed to help companies compete in today's business world.

## BUSINESS SERVICES

HP knows that it isn't enough to push a product out the door and then let customers fend for themselves. For that reason, the company offers a wide range of enterprise services intended to either help you take better advantage of your existing infrastructure or expand into other areas, including the

cloud. HP offers analytics and data management services to help you embrace big data; application services to help you manage every aspect of application implementation from development through to deployment; and business process services to help you implement best practices that will positively impact the way you run your business.



Alongside these solutions, HP offers enterprise security services to help protect your data and prevent outsiders from gaining access to your internal infrastructure. The company also provides mobility and workplace services to help you better manage the many different devices in use throughout the company, whether that's in the main office, at satellite locations, or during employee travels. For enterprises with data centers or those looking to gain access to more resources, HP offers business continuity, network, and storage services, as well.

But where HP is looking to make a bigger splash is in the cloud computing market. In fact, the company recently announced plans to increase its cloud computing investments by as much as \$1 billion over the next 18 months and go from two existing data centers up to twenty. Right now, HP provides applications management and transformation services as well as enterprise cloud service offerings for multiple platforms. It also offers IaaS (infrastruc-

ture as a service) solutions under the Helion brand, which include Managed Private Cloud and Managed Virtual Private Cloud solutions for businesses.

## CONSULTING & SUPPORT

HP also gives its customers avenues for tapping into its 75 years of experience through its technology consulting services. The company offers big data,

HP has elevated the tablet to fully capable business-ready status. Its ProBook x360 310 G1 runs 64-bit Windows 8.1 Pro and includes multi-core processors. (Image courtesy of Hewlett-Packard)

mobility, network, and storage services as well as education and training for employees. HP's big data solutions include analytics and data management services, which help you tap into your organization's data to obtain insights and utilize that data in more meaningful ways. With mobility, HP can show you how to embrace consumerization and support BYOD (bring your own device) policies without making your company vulnerable to data leaks and other security risks. And with network and storage services, HP will help you better optimize your systems to get the most out of your infrastructure and continue growing for years to come. Add to this the company's wealth of data center consulting services, including Converged Infrastructure, critical facilities, and IT Infrastructure, and you can optimize your existing data center even as you take advantage of more cloud-based solutions.

To further support you and your infrastructure, HP also has services



designed to help you manage the life cycles, maintenance, and licensing of your hardware and software investments. Not only will HP help you install and deploy these solutions; it will also help you manage and maintain them for years to come. In short, HP brings its years of experience to its customers in order to make sure that your equipment runs for as long as possible and that you don't spend more money than necessary on software.

### HP MOONSHOT

In conjunction with its plans to expand much further into the cloud computing space, HP offers solutions that help organizations become successful participants in the cloud. For instance, HP recently released its HP MSA 1040 Storage system, which provides better performance and is priced 25% lower than previous models. These mass storage solutions support up to 348TB of data, which is also in line with the company's focus on big data and analytics services. In other words, every HP product can work with another product or service to help build a stronger and more integrated technological foundation for your company.

Another new and innovative product from HP is worth paying attention to as it could change the way data centers and enterprises operate. HP's Moonshot System is a series of software-defined Web server products developed specifically for use in the modern business world. As companies embrace big data, mobility, and the cloud, they need a flexible way to increase capacity on the fly and gain access to crucial resources. This is a problem the Moonshot System is built to solve.

The Moonshot System takes a workload-by-workload approach to computing and helps you optimize your server for the application or solution that will run on it. For instance, HP offers the HP ProLiant m700 Server Cartridge, which is designed to work with hosted desktops with a po-

tential 44% decrease in TCO (total cost of ownership) compared to running traditional desktops throughout your organization. For Web-based applications and solutions, HP offers its HP ProLiant m300 Server Cartridge, HP ProLiant Moonshot Server Cartridge, and HP Moonshot 1500 Chassis.

The HP Moonshot 1500 is unique because it is a 4.3U chassis that supports 45 low-energy servers, all of which can be tuned to handle individual workloads. Imagine being able to give individual mission-critical applications access to their own server resources without having to worry about how it will affect the rest of your infrastructure. You can add or remove servers as needed, move workloads around, and optimize your overall layout with the easy-to-use server cartridges.



HP's Moonshot System is a server product designed with today's big data, cloud, and mobility requirements in mind. (Image courtesy of Hewlett-Packard)

HP has compared Moonshot servers to traditional servers and has found that they require 89% less energy, 80% less space, and 77% less cost; and that they are 97% less complex. All of this leads to a lower TCO and makes it possible for your company to embrace newer technologies on a regular basis because you know you'll meet ROI goals within a reasonable amount of time. Faster innovation and newer technology in your data centers means that you'll be able to better compete with other companies in your industry and not fall behind on the technology curve.

### HP LABS & FURTHER INNOVATION

Considering all of these innovations, especially those that have occurred over the past 34 years, you might think that HP would simply focus on optimizing the products that have already proven successful. But, in fact, the company established HP Labs back in 1966 and still uses the unit as a major research and development tool for the organization as a whole. Over the years, HP Labs has worked to create brand new products, including Resistive Random Access Memory in 2009, as well as push IT efficiency forward with breakthroughs like the HP Net-Zero Energy Data Center in 2012.

You may have noticed by now that all of HP's products have three things in common. They are all designed to

improve performance while simultaneously helping organizations reduce costs and improve efficiency. HP wants to put more powerful technology into the hands of its customers more quickly so they can continue to innovate, themselves, and drive the entire technological world forward. But the company wants to encourage this growth while also remaining environmentally responsible and improving sustainability wherever possible. HP Labs is a major component of that goal and will surely introduce new, efficient innovations for decades to come. ●



Courtesy of Hewlett-Packard

# HP BladeSystem Improves Data Centers

Key Performance & Efficiency Innovations Take HP Servers To Another Level

WHEN UPGRADING SERVERS, your main goals are usually improving performance while maximizing efficiency in order to use less energy and cut down on costs. But there are many other important facets to servers and overall data center infrastructure that should be taken into account when looking for new equipment. In addition to power and efficiency, it's important to consider modularity, configurability, and management. With HP BladeSystem solutions, you can get all of these benefits and the tools you need to improve nearly every aspect of your data center.

## PERFORMANCE & EFFICIENCY

The HP BladeSystem portfolio is loaded with products designed

to increase memory, speed up networking, and support virtualized environments. This boost in performance is no more evident than with HP's ProLiant line of server blades, which have recently been upgraded with new Gen8 features. Take the HP ProLiant BL460c Gen8 Server Blade, for example. This product fully supports one or two Intel Xeon processors with a range of processor core options from two up to 12, as well as up to 512GB of memory. And when it comes to storage, the BL460c lets you work with SAS, SATA, or SSD drives, depending on the types of applications you plan to run on it.

In addition to other performance-related features, including support for 40Gb Ethernet and 16Gb fibre channel

blade switches that help speed up networking and connectivity, HP's BladeSystem ProLiant server blades are intelligent systems that help you maximize efficiency. It's the ProActive Insight architecture built into every Gen8 ProLiant server that truly helps you manage your data center space, minimize power consumption, and determine how much cooling is needed for your equipment. Also included are HP's 3D Sea of Sensor technologies, which are designed to monitor the location, power utilization, and thermal demand of the servers to help you create the most efficient layout possible.

Performance and efficiency meet with HP Virtual Connect, a product line that will help you improve your



virtual environments, which are typically more efficient than traditional computing environments in their own right. These products not only make the servers themselves simpler and easier to manage, but can also reduce hardware costs and improve power and cooling efficiency. Every new innovation HP makes with its BladeSystem product line aims to close the gap between performance and efficiency and make sure that you don't have to sacrifice one for the other.

### MODULARITY & FLEXIBILITY

HP understands that data center infrastructure is fluid and that equipment changes and upgrades are made on a fairly consistent basis. Traditionally, IT employees have had to think carefully about the server enclosures they choose because integration issues might emerge down the line as newer systems may not be compatible with older ones. But if you go with one of HP's BladeSystem enclosures, such as the c3000 or c7000, you'll know that if you ever need to upgrade to add more capacity, switch out blades, or add expansion cards, you'll be able to do so without headaches.

HP built the HP BladeSystem c3000 Platinum Enclosure to work for a wide range of companies. Potential customer types include smaller business or remote offices that only need a handful of server blades, midsize companies that need up to 100 servers, or large-scale data centers looking to improve power and cooling efficiency, maximize space utilization, and still get the desired performance. Even if you start with one of these enclosures and only a few blades, you can add more later on in almost a plug-and-play manner. Everything is designed to work well together, so future server upgrades will be painless.

This level of modularity and flexibility extends down to the individual server blade level as well. For

example, the HP Integrity BL890c i4 Server Blade supports 4- to 8-core Intel Itanium 9500 series processors with caches ranging from 20MB L3 up to 32MB L3. It can also support up to 1.5TB of memory, as many as 12 expansion cards, and up to eight disk drives. All of these products, whether they're the larger enclosures or individual components, work together to give you the exact configuration you need to meet your company's computing requirements now and in the years to come.

### SUPPORT SERVICES & MANAGEMENT TOOLS

HP isn't a company that releases a product into the market and then backs away into a passive support role. Instead, HP stays involved and offers a variety of services targeted at its many BladeSystem solutions, including ProLiant, Integrity, Workstation, and Storage Infrastructure Blade Services; and CloudSystem Matrix. Needless to say, if you have any questions about how to best configure, manage, and maintain your HP solutions, there is a service that will answer them.

For internal infrastructure management needs, HP also offers its OneView software solution, which gives provides you with an in-depth view of your BladeSystem equipment and takes a software-defined approach to managing systems. There are multiple tools inside of OneView, all of which are accessible from a single central platform. HP Map View lets you look at the current status of your server resources and troubleshoot problems on-the-fly. HP Activities will actually send out alerts to IT employees to let them know what's going on in the system. The HP Dashboard gives you an in-depth view of every device throughout your data center and company and is accessible remotely using a mobile client.

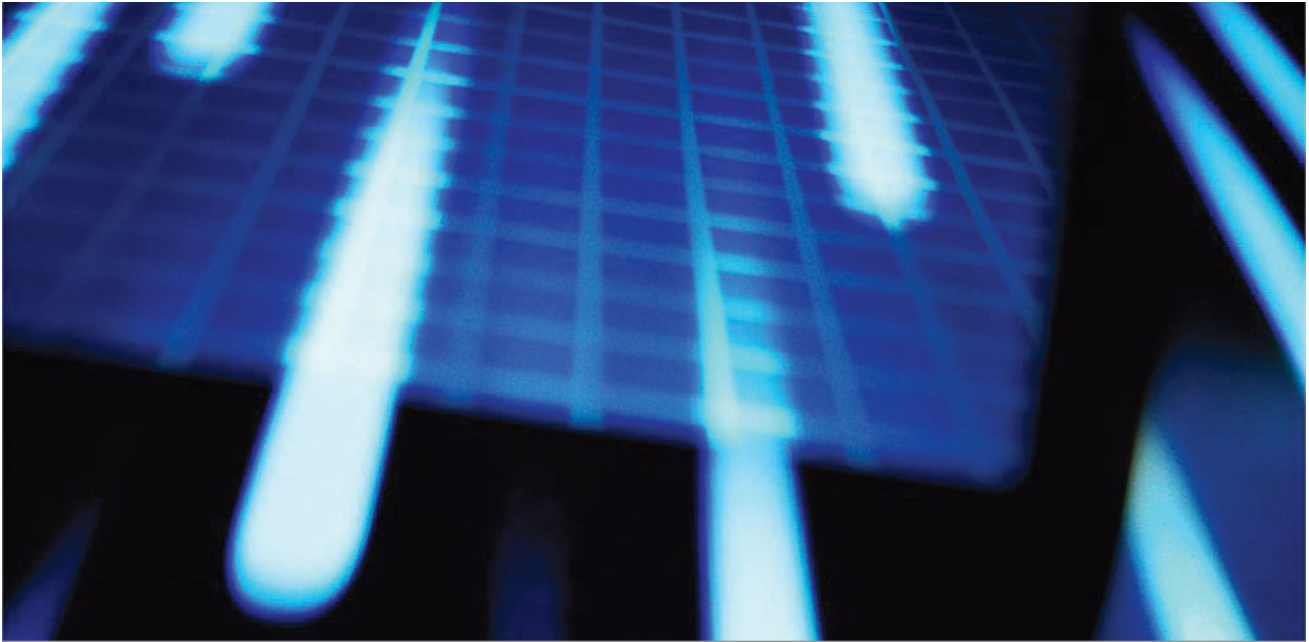
HP offers a combination of hardware, software, and support services that make it possible to fully upgrade

your data center quickly, easily, and at a much lower cost. But the key benefits of HP's BladeSystem products are that you will gain more control over your infrastructure, extend the life cycle of your equipment, and have the ability to perform upgrades as needed to expand your capacity. It's a step-by-step process that lets HP's products to not only grow alongside your company, but also encourage further growth well into the future. ●

## HP BLADESYSTEM SAVES TIME & MONEY

A recent IDC ([www.idc.com](http://www.idc.com)) study about a financial services institution further illustrates the benefits of BladeSystem solutions as well as the HP OneView management tool. The institution has a call center that requires at least 99.9999% availability and, back in the summer of 2013, was looking for a way to build upon its HP BladeSystem foundation to improve reliability and also cut down on operating costs. It decided to implement HP 3PAR StoreServ storage products and the HP OneView management platform on its existing BladeSystem infrastructure.

Since the deployment, the group was able to cut down on overall storage costs by using the 3PAR StoreServ products and to improve management efficiency with OneView. In fact, the institution says its IT teams have moved away from performing more repetitive and mundane tasks, or are at least completing them more efficiently, so they can better focus on projects that pertain directly to the long-term success of the business as a whole. The HP deployment also led to an ROI of 293% and a payback time frame of only 4.3 months.



# HP Big Data Management & Analytics

With HAVEn & HP Services, Big Data Challenges Are A Thing Of The Past

PERHAPS THE TWO biggest topics floating around businesses today are big data and analytics. If you haven't already starting embracing these necessary technologies, it's likely you're at least in the research phase and determining exactly how big data analytics could change the way you do business. But even if you're fully on board with big data and analytics, it can be difficult to sort through the many different solutions and services on the market, because it seems like every company out there offers something in the space.

What you need to look for is a vendor that not only offers these solutions, but backs them up with experience and make their experts available to support you throughout

the implementation process. HP is different from some other vendors because it not only offers support for third-party storage and big data solutions (in addition to its own services), the company also places a strong emphasis on the intelligence and expertise behind the technology.

## INVALUABLE EXPERTISE & SERVICES

HP's approach to big data focuses on the data management and analytics facets of getting more control over your data, improving access, and making it easier to gain insights. It all starts with the company's network of data scientists, business analytics gurus, information consultants, and other experts who are available to

share their wealth of knowledge and help guide you through your ongoing big data analytics implementation. This partnership is key because as more and more data becomes available to you, the methods you use to access it and analyze it must change. It's an ongoing relationship that is absolutely crucial to fully embracing the technologies.

In addition to its expertise, HP also offers a wide range of services targeted at improving data management and helping your organization fast forward to the point at which you can actually take advantage of actionable insights. HP's Information Advisory and Information Management Services let you aggregate your data into a more centralized destination so



that all of the pieces are better integrated and you don't have to search through terabytes of information to find the one bit you truly need. But for those situations, HP also offers Big Data Discovery Experience Services, which makes it much faster to find the gold hidden within massive data stores.

In addition to these services, HP also offers Actionable Analytics, Information Governance, and Enabling Information Technology Services, all designed to derive even more value from your business's data. Add in solutions such as the HP Interactive Media Command Center, which gives you access to insights from social media, video, audio, and other digital content, and you can harness virtually any type of data and gather insights for making decisions in the future.

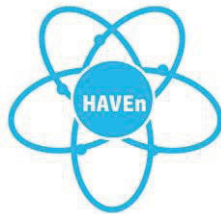
NASCAR takes advantage of the Interactive Media Command Center and commissioned HP to build it a FMEC (Fan and Media Engagement Center) meant to help NASCAR executives gain insight from multiple types of media, including social networking media, video, and even television, radio, and print media. NASCAR then uses the data gathered from the FMEC to better interact with and improve the experience of fans and media as well as encourage growth with sponsors. And because HP's technological backbone to the FMEC is so strong, NASCAR is able to access and analyze big data in real time, meaning it can make crucial business decisions on the fly.

### A CENTRALIZED, FEATURE-RICH PLATFORM

The foundation of HP's overall big data and analytics approach is its HAVEN platform, which combines multiple products and technologies into one easy-to-use solution that brings all organizational data to the forefront. HAVEN is an acronym that stands for Hadoop/HDFS, Autonomy IDOL, Vertica, Enterprise

Security, and nApps. Each part of HAVEN takes care of one crucial aspect of big data analytics without forcing you to leave the centralized platform. It's this flexibility that makes it possible to speed up the analytics process by giving you access to the information you need when you need it.

Hadoop is a well-known technology designed to help you group massive amounts of data together and make it much easier to find and access, but it's the way that HP processes the stored data that makes HAVEN truly unique. HP Autonomy is a technology that helps you go beyond structured data and take advantage of the often overlooked, but



quite prevalent, unstructured data your company stores. Autonomy lets you gain insight from every type of data, including things like emails, Web pages, images, voicemails, recorded calls, and much more.

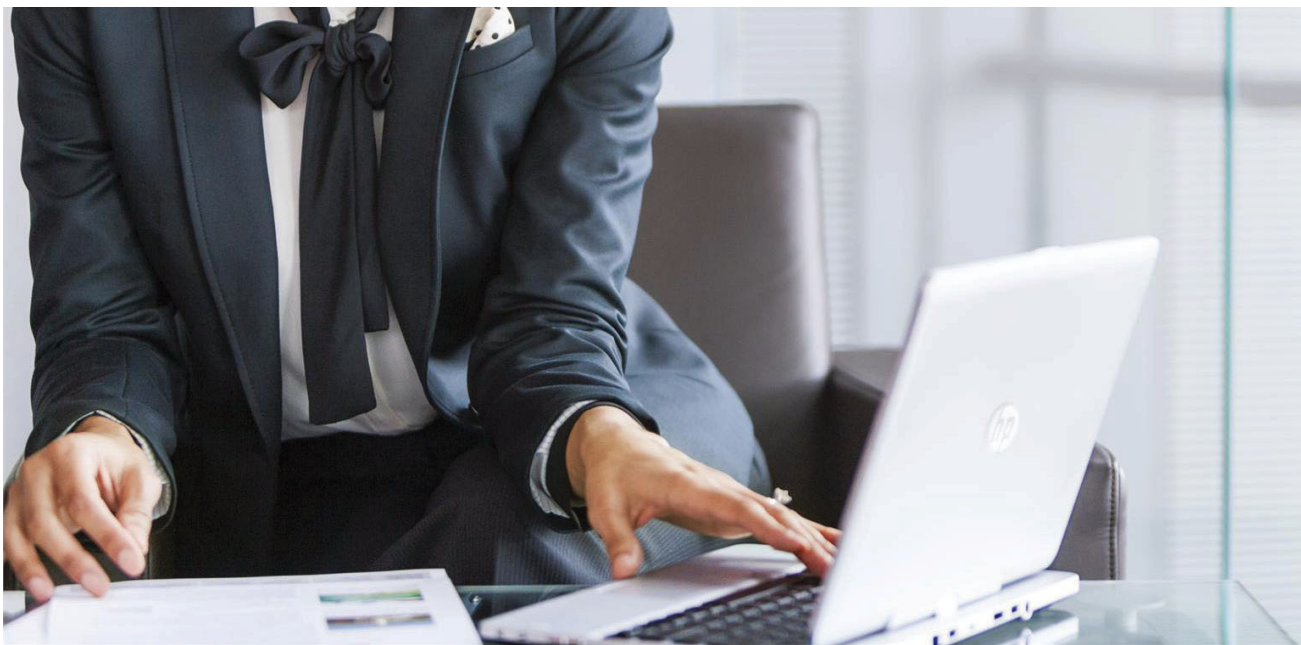
Imagine having a phone meeting with a customer months ago where an important piece of insight was revealed. Instead of potentially missing out on that information by only focusing on structured data, you can use Autonomy to pull that data back up so you can use it in conjunction with the rest of your analysis. In fact, a major component of HP Autonomy revolves around mixing old and new data on a real-time basis to make sure you always have the most valuable information at your disposal when performing analytics tasks.

The actual analytics process is where the HP Vertica analytics platform comes into play. Vertica is an

in-depth analytics platform that, while complex, is also designed to be highly customizable and easy to use. It offers high availability and contains flexible administration tools so you can make changes on the fly without taking the platform offline. Vertica is also fast, making it possible to analyze data at a much more efficient rate and scale up or down to meet the demands of any given project. HP Vertica 7 is the current version, and there is an Enterprise Edition; HP has updated the entire platform with vital security tools that protect your data as you work with it.

HP uses Vertica to analyze the clickstream data on the company website. HP.com is not only sprawling, but, as you might imagine, has quite a few visitors, which means the website has the potential to see billions of clicks at any given time. Instead of just using those clicks to get an idea of how many unique visitors are coming to the website, HP also uses Vertica to gather data from those clickstreams to determine what pages are visited most often or where visitors tend to veer away from the site altogether. This information is integral to HP's approach on customer service and improving the overall experience for site visitors.

The final part of HAVEN is nApps, which are applications built by HP and its partners. The inclusion of nApps in HAVEN is all about giving you access to these applications as well as supporting your own applications. One aspect of this, for example, is the HP Digital Marketing Hub, which is an ecosystem of third-party application partners that work with HP to offer their products to customers. All of these partner applications are designed to integrate well with HP's big data analytics platforms and help you use insights to improve customer outreach and encourage future success. ●



# HP Mobility & Workplace Services

Facilitate Mobile Productivity, Encourage Collaboration & Improve Overall Management

WITH THE INTRODUCTION of laptop computers, employees were empowered to work in more places, whether it was at the office or while traveling the world. Now, tablets and smartphones are ubiquitous in the mobile business world and companies are searching for new ways to provide the data and applications they need without putting the business at risk. And because employees could be thousands of miles apart while still working on the same project, communication and collaboration solutions are important to consider as well.

Fortunately, HP provides multiple business services designed to give you a better handle on your ever-evolving workplace. These solutions make it possible for employees to

stay in contact with each other and collaborate regardless of location to ensure the highest possible level of productivity. But perhaps the greatest benefit of HP's mobility, UC (unified communications), and workplace management services is that they will actually take care of the management side of things for you, which can help you cut down on support costs and free up your IT team's time to focus on more pressing matters.

## MOBILITY SERVICES

HP understands that budgets and consumerization don't allow for every company to issue devices to its employees and therefore have total control over them. For that reason, HP offers a variety of managed mobility

services that give companies more management capabilities for employee used tablets and smartphones without hampering the performance of those devices. In fact, employees can use their own devices for business purposes while also maintaining their own personal applications and data. In essence, you can separate the device into two distinct categories, business and personal, and manage those categories separately. This distinction makes it possible for companies to more safely embrace BYOD (bring your own device) policies and give employees access to the devices and features they want.

Mobile devices, themselves, are more tools or delivery mechanisms for applications and data.



Smartphones and tablets, regardless of manufacturer, are more advanced than ever before and require powerful applications to unlock their true potential. HP's mobile application services help you control every aspect of application delivery from the actual development and testing of those applications to deployment, integration, and management. These powerful tools make it possible to develop native applications for specific types of devices, build hybrid apps that can be deployed on a wide variety of devices and for many different environments, or help you build a mobile website that can be accessed from virtually any browser. And because HP fully manages these services, you can simply focus on making the best application possible without worrying about the computing resources behind it.

In addition to tailoring its services based on the individual customer's requirements, HP also offers Enterprise Mobility Services for SAP. Included in these service offerings, which are actually delivered using HP's secure Converged Cloud technology, are mobile development and testing tools as well as MDM (mobile device management), MAM (mobile application management), and MIM (mobile infrastructure management) solutions. All of HP's mobility services are designed to take the management burden away from the company and let them focus on doing business. They work together to give you powerful application development, app management, and mobile management tools that will give you full control over every aspect of your mobile strategy.

### UNIFIED COMMUNICATIONS, COLLABORATION & MORE

UC is about bringing all of your telephony, videoconferencing, instant messaging, and other communication tools together into a connected set of solutions. These presence-based solutions ensure that your employees are always in contact with each other and

that they can complete tasks on time to help the business succeed. HP helps make the move to UC much easier by offering their solutions as on-premises deployments or in hybrid or private cloud environments as fully managed solutions. With these options, you can determine just how hands-on you want to be with your UC deployment and how many internal resources you want to dedicate to the system. But regardless of which style you choose,

### HP UNIFIED COMMUNICATIONS EQUALS FASTER ROI

Black & Veatch, an engineering and construction firm that generally works with utilities, deployed an HP-designed UC solution built on Microsoft technology that enabled them to move from a traditional phone systems to softphones, integrate their fax and voicemail systems with their email system, and introduce new communication avenues into the company, including application and desktop sharing for its employees. Not only did this HP-deployed UC system give Black & Veatch more features and more control over communications, but it will also pay for itself in about 18 months, according to the company.

you can be sure that your employees will be much better connected than ever before.

In addition to solely UC-focused services, HP offers collaboration and messaging services that are built on Microsoft SharePoint and Exchange, respectively. HP's Collaboration Services, much like its UC offerings, can be deployed on-premises or in a cloud-based environment and are designed help you take all of those UC solutions and empower employees to work together more efficiently and more productively. And

for email, HP's Messaging Services can take email system management out of your data center and help you free up internal resources. In essence, HP can take your entire communications infrastructure and move it to the cloud, if you so choose, which can aid in consolidation and help you save money in the process.

### WORKPLACE MANAGEMENT

If offloading mobility and UC management responsibilities seems like a fit for your company and you want to dig even deeper into managed services, you might want to consider HP's other offerings. For instance, HP has solutions that will help you with asset management so you can understand what hardware and software you have throughout your company, keep track of product life cycles, and aid in the disposition process if necessary. HP also offers Managed Logistics Services, which track old and new assets as they leave or enter your company, so you can make sure you have a proper plan in place for hardware and software updates or refreshes.

There are too many HP managed service offerings to cover here, but the company does provide services for virtually any aspect of your company. These include Managed Print Services so you can cut down on print costs; Service Desk Services, which provide technical support for your employees and other users; Site Support Services, where HP experts help troubleshoot and support hardware devices or software; and many others. And if you seek to offload as many management functions as possible, HP also offers Workplace360 Services, which handle all of your employees' hardware, software, and support needs with a subscription-based pricing model. As with all of HP's managed solutions, you have control over how many responsibilities you want to outsource and can trust in HP's expertise to deliver the support your employees need. ●





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Up to **112** Avoton UP Nodes in 6U



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Industry's Densest  
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### Highest Density for Best Space Savings

- 112 Avoton UP Nodes in 6U
- Up to 99% cable reduction compared to 1U servers

### Best Performance-per-Rack for Compute Intensive Applications

- Up to 6272 Avoton cores per 42U rack

### SDN (Software Defined Switch)

- Redundant GbE switches with 40G/10G uplinks, and more...

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- High-efficiency Supermicro system design (as low as 10 watts per node)
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# Data Breach Prevention

## Ward Off The Threats That Are Knocking At The Door

MAJOR DATA BREACHES have become so common that it's almost easy to ignore the startling statistics tied to them. Based on Verizon's "2014 Data Breach Investigations Report," principal author Wade Baker bluntly stated that "after analyzing 10 years of data, we realize most organizations cannot keep up with cybercrime—and the bad guys are winning." Worse, in addition to no companies being immune, Baker says that it can take criminals just minutes or hours to break into a company's system, while it can often take weeks or months to identify those compromises.

Symantec offers a similarly bleak outlook in its "2014 Internet Security Threat Report," with results indicating "we're now living in the era of the 'Mega Data Breach.'" A few of the more disturbing statistics the report highlights for 2013 include a 91% increase in targeted attack campaigns, a 62% increase in breaches, and more than 552 million identities exposed.

Based on the number of breaches, identities exposed, and severity of damage, there's a good deal businesses can learn and use in their favor. The following explores such lessons, including preventative methods to employ.

### LESSONS LEARNED

According to Verizon's report, in three-quarters of breaches it takes criminals days or less to compromise a system, while less than a quarter of breaches are discovered in the same amount of time. Baker states "if this is the 10-year study of where we've come, the bad guys are winning at a faster rate than the good guys are winning, and we've got to solve that; we've got to do something different."

For Kyle Prigmore, ESG (Enterprise Strategy Group; [www.esg-global.com](http://www.esg-global.com)) research associate, the lesson businesses should be gleaning is clear. "Invest in

### Key Points

While external threats should be a definite area of focus, many companies don't focus strongly enough on preventing insider threats.

Beyond emphasizing prevention, it's becoming increasingly important for companies to stress the speed at which they detect and react to security breaches.

Criminals use stolen data in numerous ways, including selling it on black markets to other criminals who use it for their own gains.

When a breach does occur, prevailing advice is that companies disclose quickly that the incident occurred and what it is doing to remedy the situation.

detection and response for now because prevention is a pipe dream.” Eric Ahlm, Gartner ([www.gartner.com](http://www.gartner.com)) research director, agrees. He says a “prevention strategy alone is flawed, and even the best preventative systems on the planet get hacked from time to time.” Today, companies should be aiming to focus on reducing the detection-to-response time, he says. “If you’re able to block 80% with preventative systems, then detect the other 20% in a short enough time to stop the attacker” before any data is stolen, Ahlm says. “Then really, it’s a non-event as far as the business is concerned.”

IT-Harvest ([www.it-harvest.com](http://www.it-harvest.com)) chief research analyst Richard Stiennon says businesses must first recognize that even organizations with mature security infrastructure are being breached. “Attackers have not stood still. Technologies and tools you deployed two to four years ago aren’t good enough to counter today’s targeted attacks,” he says. Michela Menting, ABI Research ([www.abiresearch.com](http://www.abiresearch.com)) cybersecurity practice director, adds that beyond external malicious targeted attacks, breaches can stem from “an inadvertent mistake internally or even an insider threat.” As cybercriminals continue to discover ways to leverage automated attacks, she says, “it’s only a matter of time before a vulnerability is found and a breach occurs.”

How criminals use stolen data varies, although all data types “can be sold on the black market,” Menting says. “Primarily data is stolen to facilitate identity theft or to gain further access to more secure databases or organizations.”

Beyond hactivists simply liking to “show they can breach company X,” Menting says, they use data acquired on the black market to forge identities, create fake bank accounts, and buy goods or services. They may also sell the information to other groups, including “very aggressive marketers.” Overall, if an organization is breached, the most likely places data will wind up



“Attackers have not stood still. Technologies and tools you deployed two to four years ago aren’t good enough to counter today’s targeted attacks.”

**Richard Stiennon**  
chief research analyst, IT-Harvest

is on “Pastebin or in private cybercrime trade forums,” she says.

Prigmore explains that there are three tiers to the criminal underground. The top tier creates tools and writes malware that’s sold or licensed to the second tier. The criminals that make up the second tier use the tools to steal data, and then they sell it to a third tier, which uses the data for profit. Prigmore describes the process of selling stolen data to a third tier as “the most time-consuming and high-risk job, which is why it falls to the lowest tier.” Criminals in this tier “take unencrypted credit card numbers and try to garner enough other information (name, expiration date, CCV code, etc.) to use the card for illicit purchases,” he says. They may also try to pair Social Security numbers with names, birth dates, and other information to open new credit lines or sell the information for forged-identity purposes. “This can happen over days, weeks, or months,” he says.

Verizon’s report found that two of three breaches exploit weak or stolen passwords, “making a case for strong two-factor authentication.” In addition to authentication, Menting says encryption can be helpful but is commonly overlooked/undervalued. “Businesses should offer different layers of access to different employees, applications, and databases,” she says. “It offers too many potential access points for attackers.”

### ARM YOURSELF

Alan Tang, senior consulting analyst with Info-Tech Research Group ([www.infotech.com](http://www.infotech.com)), says that based on his experience, organizations should

devote more attention to security policies (“sometimes people cause data breaches”), formal risk-management policies, clearly defined security roles and responsibilities, privileged access management (“security incidents caused by privileged accounts usually have much greater impact than by normal users”), and physical security (lost or stolen devices, for example). In terms of formal risk-management processes, Tang says most organizations, especially small to midsize ones, don’t have one implemented, “which means usually they don’t have a clear picture of what are the risks and, in turn, how to address them.”

Elsewhere, Menting says, many companies don’t leverage national competencies enough. “If you don’t have the IT team to handle the breach, contact the national CERT (computer emergency readiness team) and the police,” she advises. “If you can’t help yourself, find someone who can.” Although data breaches aren’t completely preventable, “the next best solution is to encrypt everything” so if a breach occurs, the risk of losing valuable data or being liable is reduced, she says. Also important is sifting through data the organization holds and produces and building varying security perimeters around the different data islands. The more valuable the data, the stricter the perimeters around them should be. Stiennon suggests using a full UTM (unified threat management) stack at every gateway and whitelisting known good applications and blocking, or at least alerting to, unknown applications.





**“Any organization can always do more, but it’s unique to the situation as to whether they are doing ‘enough.’”**

**Kyle Prigmore**

research associate, Enterprise Strategy Group



**“Many organizations feel it would tarnish their reputation if it got out that they were breached. I’d argue on the contrary. Their reputation[s] will suffer if they aren’t open about breaches.”**

**Michela Menting**

cybersecurity practice director, ABI Research

Overall, Prigmore says, the core technologies and practices companies should have implemented is much more a “practice” issue than “technology” issue. “Most companies do invest in the technologies they need to minimize damages from an attack. However, they often have difficulties implementing them correctly and managing them,” he says. “Good security products are easy to find; good security people to work them are not.”

### USE WHAT YOU HAVE

Among preventative measures organizations possibly have access to but overlook or undervalue, Stiennon points to full packet captures of network traffic and security analytics to identify when a breach is underway and guide an immediate and effective response. “New skill sets are needed and 24/7 eyes-on-glass are required,” he says. Prigmore, meanwhile, says he believes in the context of prevention—there isn’t some amazing fix that people overlook. “I think it’s more about maximizing the better-known resources for prevention,” he says. Antivirus suites, for example, typically have entire tool sets that businesses don’t know how to take advantage of. “I don’t know anyone

who uses their AV’s encryption capabilities, which many [suites] come with,” he says. Further, some antivirus programs provide a virtual keyboard that could help guard against keystroke loggers. “Even if people only used them for their high-value passwords a lot of money would be saved, but no one does,” Prigmore says.

Another area companies could emphasize more but often don’t is insider threats. Stiennon says most businesses “still rely on trust as their only defense against insider abuse,” whereas strong access controls and activity monitoring are what’s required. Menting adds that many companies focus on external threats “often to the detriment of insider threats.”

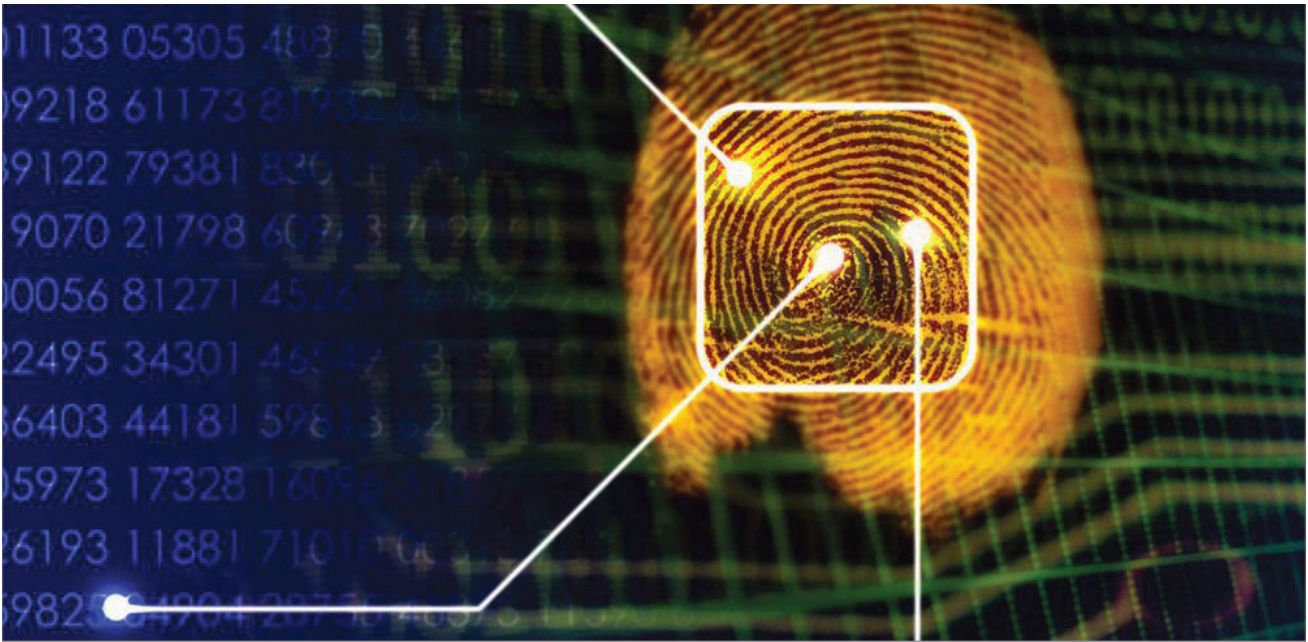
Prigmore says insider threats are difficult to categorize because there’s a gray area between malicious intent and benign error. For example, he cites a CPA firm that recently mailed a USB drive containing unencrypted names and Social Security numbers to a client, but the drive was missing when the envelope arrived. “A security person would look at that series of events and say ‘no way could anyone be that reckless, that’s almost suspiciously incompetent.’ A non-security person might look at it and say ‘well that’s

unlucky,’” he says. Whether a business should perhaps focus on basic training for non-IT employees, take the decision out of employees hands and ban physical storage devices altogether, automatically encrypt all work-related content, or tightly monitor behavior and access privileges depends on the businesses’ resources and priorities, Prigmore says. “Any organization can always do more, but it’s unique to the situation as to whether they are doing ‘enough,’” he adds

### WHEN THE LEVY BREAKS

One facet of data breaches many companies don’t consider until too late is forging a strategy for how the company will react when a breach occurs, including how it will disclose the incident. Prigmore says the best responses are when companies “own” the news and take responsibility. It’s when companies don’t that “we see a bigger backlash from the consumers,” he says. Menting agrees that transparency is vital. “Many organizations feel it would tarnish their reputation if it got out that they were breached. I’d argue on the contrary. Their reputation[s] will suffer if they aren’t open about breaches,” she says.

Stiennon says while there’s no “ideal” way to handle disclosures, consumer-facing companies should be forthcoming about what has happened, what has been done to prevent future breaches, and how consumers’ identities will be protected to reduce risks of financial loss. If lacking an incident response team, Menting says, organizations should contact authorities or hire an external company as soon as possible to assist with the response and to repair the damage. If operating in a regulated industry, contact appropriate national authorities. “The longer you wait, the more a company can get in trouble,” she says. “Further, the authority will be able to provide some guidance as to the remediation process.” ●



# Biometrics: Great Promise, Hidden Perils

## Beware Of Unexpected Costs & Obsolete Assumptions

FROM THE DATA CENTER to high-end consumer goods (think shiny laptops and Apple's newest iPhone), biometrics (the use of physical characteristics to prove identity) are making a splash: Purveyors of biometric solutions implore us to invest in technology that promises to add still another layer (perhaps the most sophisticated layer yet) of security to our digital transactions and to protect human access to those transactions.

And yet, experts point out that this approach may not be the silver bullet we seek, and that—as always—we need to do our homework before jumping on this latest bandwagon. As with all technologies, there are things to think about before we make any rash moves.

### WHAT IS BIOMETRICS?

First, let's define a few terms. When discussing the technology, biometrics

refers to tools used to identify specific individuals by some personal characteristic—a facial shape, a retinal pattern, a fingerprint, or some other such identifier—and then using that identification to allow (or disallow) access to a system or building.

It sounds like a brave new world of almost perfect security, and the technology has certainly proven convenient and useful in many respects. But the use of biometrics is far from

### Key Points

In practical technological terms, biometrics refers to the tools used to identify specific individuals by way of certain physical characteristic, such as a fingerprint or iris.

Although technologists have found many positive uses for biometrics and will surely continue to do so, there are some weaknesses that should be considered.

Alternatives to biometrics such as RFID (radio frequency identification) systems can be more beneficial in some circumstances, such as building access control.

One main drawback to biometrics is the rate of false positives (where a user is improperly granted access to an area) and false negatives (where someone who should have access is denied).



foolproof, and even its most fervent proponents are not afraid to point out its weaknesses as well as its strengths.

### IS THIS REALLY THE BEST WAY TO GO?

Jim O’Gorman, president of North Carolina-based Offensive Security ([www.offensive-security.com](http://www.offensive-security.com)), points out that a purely biometric approach (retinal scans, fingerprint IDs, etc.) may not always be the best first choice.

“I would suggest that the organization first look at the use case and ensure that biometrics is really the way to go,” says O’Gorman. “There are good reasons why RFID (radio frequency identification) cards and similar [technologies] are far more popular building access controls, and those solutions should be seriously considered.”

In fact, says O’Gorman, one of the issues that bothers some people about biometrics is that everyone is required to make physical contact with the same device. Squeamishness aside, there are tangible cleanliness issues related to this aspect of biometrics that adopters must be ready to manage.

### WHERE TO USE BIOMETRICS

O’Gorman envisions the best use of biometrics in locations to which a very limited number of employees are allowed access. Typically this involves the use of RFID cards or similar devices to control access to a building, and the use of a biometric device to control access to a specific room or area within the building. “This helps control the costs by reducing the number of employees that need to take part,” says O’Gorman.

### COST CONSIDERATIONS

Sure, you’ve got a quote on devices and installations, but have you thought about other variables? Are

you really looking at the TCO (total cost of ownership), or just a piece of it? Hidden costs of biometrics can include dealing with the rate of false reads, and the time between device failure. Management costs are often ignored as well, including costs that become part of the enrollment process, procedures required to secure the data, and so on.

### WEAKNESSES TO CONSIDER

Biometrics are cool, but imperfect, says Chris Hadnagy, “chief human hacker” with Social-Engineer.com ([www.social-engineer.com](http://www.social-engineer.com)) and author of *Social-Engineering: The Art of Human Hacking*. Keep in mind that your fingerprints are everywhere, notes Hadnagy. And an inexpensive reader installation can be (and many have been) fooled—some by something as simple as some gelatin and a copy of the real fingerprint. And, once a biometric measurement has been hacked, it’s finished; it’s not as if you can go get yourself a new fingerprint because the old one has been compromised.

Is fingerprint verification always the way to go? “Is it cool to unlock your phone,” asks Hadnagy? “Sure, I think that is a sexy new addition that will make life easier.” But to log into a mission-critical cloud account? To give access to purchases? “That I am not feeling too safe about,” he says. “Personally, I think that there are still way too many vulnerabilities to keep in mind.”

### FINDING THE RIGHT BALANCE

As with any other technology decision, one balances risks and rewards before diving in. “The main benefit,” says James Alexander, senior vice president with Info-Tech Research Group ([www.infotech.com](http://www.infotech.com)), “is convenience for end users. In this era of a

million different passwords, the one thing you can’t forget is your finger or your face. So it not only simplifies things for end users, it also alleviates support calls. In general, almost 50% of calls to corporate help desks are password resets, so that can equate to a big savings.”

But there are pitfalls related to biometrics, as well, notes Alexander. “The biggest issue is false positives, which may allow access to unauthorized users, and false negatives, where I can’t authenticate. False positives are the more common and more costly issue, although false negatives actually present the greatest risk.”

Risks vary, too, among the various types of biometrics. “Facial recognition can be tough because people’s faces do change shape over time. Meanwhile, there are significant privacy issues with retina/iris scans. Many communicable diseases, as well as pregnancy and even some chronic health issues, are detectable through the eyes, and that presents a whole other set of privacy issues,” says Alexander. “One of the big issues,” he adds, “is ease of use. Many facial systems need you to place your face in some kind of fixed stirrup. Iris scans also require a fixed position. Given the nature of the risk you are mitigating, fingerprint scans probably make the most sense.”

### DO I NEED A BACKUP PLAN?

Absolutely. Systems fail. People make mistakes. Things change, often suddenly. What would you do about an employee who has cut a finger? Or about someone who has sustained an eye injury and must wear an eye patch? Or about someone who, for some other reason, suddenly finds himself unable to utilize a previously-installed biometric device?

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... once a biometric measurement has been hacked, it’s finished;  
it’s not as if you can go get yourself a new fingerprint ...

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“Obviously you need a fail-safe or backup plan,” says Alexander. “So, for employees who physically may be unable to use a particular type of biometrics, be prepared to either implement another one or allow alternate password access. Ditto for cases where devices may suddenly prove to be non-functional. Even if you implement biometrics, you need more than one way to gain access, in order to account for such failures and for other unexpected occurrences.”

### WHERE TO USE BIOMETRICS: ENTERPRISE-WIDE? JUST IN THE DATA CENTER? ON SPECIFIC LAPTOPS?

“Well, to use consulting weasel words, it depends,” says Alexander. “Time and attendance is a great application. You should also consider biometrics for both physical premises access [and] workstation login. Of course you need to balance any potential gains with the cost of implementing biometric technologies.”

Are there biometric capabilities already present in existing equipment? If not, you will need to add it, and, Alexander says, “there’s a cost for that. As well, there’s the issue of integrating recognition software with other software and login processes. In more heterogeneous environments, this could well be a significant exercise, and then there’s the ongoing support to think of. The cost of users not being able to access devices anywhere and at any time could well be a significant loss for the enterprises.”

### IS THIS WHOLE THING REALLY NECESSARY?

Say you’re interested in (and must be vitally invested in) secure access. The safest way to ensure that, says Alexander, is to take a three-fold approach, which involves using: “Something I know (a password), something I have (a swipe card), and something I am (biometrics). So having all three is really the most secure approach.” He adds, “Changing



“In this era of a million different passwords, the one thing you can’t forget is your finger or your face. So [biometrics] not only simplifies things for end users, it also alleviates support calls.”

**James Alexander**

senior vice president, Info-Tech Research Group

from a password to a biometric solution may not make things more secure, but it may ease issues relating to the need to administer and support quality passwords. If a higher level of security is necessary, then implementing two of the three measures is obviously an advantage to risk mitigation, but also a potential drag on productivity and access. As always, it’s a balance.”

### ENSURE A SUCCESSFUL IMPLEMENTATION

The big issue is integration, not just with all of the different devices and their operating systems, but also in terms of all of the different systems. End users today face a virtual phalanx of passwords to traverse amongst all of the different systems they need to access. So trying to create a biometric-enabled version of a single sign-on would be much preferred.

Of course, the single biggest point of failure on any technology implementation is the piece between the chair and the keyboard. Thus, the real key will always prove to be end user training and access to immediate support when there’s an issue.

### ONE POPULAR USE: MOBILE DEVICES

Alexander points out that there are lots of capabilities for both BYOD (bring your own device) and company-owned devices, and we’re beginning to see these shipped natively with biometrics already included; we can expect that growth to continue. Says Alexander, “I would suggest that

securing mobile devices today is a much larger concern than desktop or on-premise devices. Let’s face it: mobile devices are mobile, after all; so the chance for a malfasant to get hold of them is far higher than them gaining an opportunity to break into a data center or to access an on-premises system. The incidence of mobile malware attacks grows each year by an exponential amount. Programs like Dropbox, Evernote, and even Google Apps mean that IP (Internet Protocol) has left the building,” referring to the swelling use of cloud-based services. “So securing endpoints in the best way possible is critical.”

### IT MAY BE TIME TO FORGET ABOUT REAL SECURITY IN I.T.

“Look, the era of ‘security’ in IT is over,” says Alexander. “The idea that you can architect a solution for this by keeping ‘bad guys’ out and the ‘good stuff’ in is an arcane construct. Today, IP is on the move and it goes from place to place and device to device at speeds and with a regularity we can’t control or even observe.”

The concept of “trusted access” is disintegrating, as well, Alexander says, as “we often open up our IP to folks outside of that circle of trust: suppliers, customers, prospects, and even the world in general. So now it’s really about mitigating enterprise risk. So having a good think about the return on investment for opening ourselves up to IP risk is really the discussion that has to occur, and this goes beyond IT; it’s an enterprise issue.” ●





# Better Servers, Better Business

## Upgrade Your Infrastructure To Better Serve Customers & Encourage Growth

IF YOU DON'T regularly visit your company's data center or have any direct interaction with it, then it's easy to see why you might take it for granted or at least not fully understand its importance to the company. In fact, the data center is the technological foundation of the entire business. It's the reason why employees have access to the applications that let them do their jobs and why customers can interact

with the business quickly and easily. The customer part of the equation has expanded in recent years with the advent of mobile and social technologies, which means that if your data center isn't operating at its peak level, you could be missing out on potential sales.

If the data center is the foundation of the business, then servers are the backbone of the data center. These systems are more than just hunks of

metal that take up space and require large amounts of power and cooling. They provide all of the computing resources you need to run your business efficiently and effectively, as long as you keep them up-to-date and upgrade on a regular basis. If you repeatedly ask why you need to frequently invest in new servers, the answer is relatively simple. "The resources that you put into your data center is really to keep your

### Key Points

The data center is the backbone of the company and you need to upgrade your servers regularly to provide the best performance possible for employees and customers.

Server innovation is fast, and efficiency gains in even three to five years can be massive. You can save money and improve performance using the same power and cooling.

Many servers are now intelligent and can diagnose their own hardware or software issues and alert the IT administrator so they can respond quickly.

Combined with cloud-based solutions, DCIM (data center infrastructure management) tools help to better maintain and track your servers. Having newer servers also makes it easier to implement these tools.

customers happy,” says Jennifer Kopyy, IDC ([www.idc.com](http://www.idc.com)) research manager.

### WHY SERVER UPGRADES ARE IMPORTANT

Building on the idea that servers are crucial for a business and its data center, Greg Schulz, founder StorageIO ([www.storageio.com](http://www.storageio.com)), suggests looking at your data center “as an information factory, and like any factory, you have tools and technologies to put inside of it.” One of those key tools is a server, which lets you set up certain business processes. How you do this depends on how well you use the available data center tools “to deliver a good quality product that meets or exceeds your customer’s expectations with the minimum amount of waste,” Schulz says.

The newer your servers are, the more efficient they will be. Even through upgrades you can get better energy efficiency, improve the effectiveness of your cooling, free up some extra floor space, and more, but this is just a starting point. When you really get to the bottom of it, you’ll realize that the biggest benefit of implementing new servers is to improve productivity.

“You tie in the efficiencies, effectiveness, and all those related things, but let’s pull it back to productivity,” says Schulz. “You can take the costs out of doing things while also boosting productivity, getting work done quicker in the same amount of physical space or smaller, and getting work done quicker with the same or less amount of power to run it or cool it. You’re taking the cost out of doing things like that, but the other side is that as you start to do more business. You’ve taken the cost out of doing each function and can do it quicker, so now you can grow the business while addressing both the top and bottom lines.”

This potential for growth extends to even the smallest companies.



Server innovation has improved to the degree that many new systems are “quiet to the point where you could put a super server underneath your desk and not even know it’s running.”

**Greg Schulz**  
founder, StorageIO

Schulz points out that server innovation has gotten to the point where many new systems are “quiet to the point where you could put a super server underneath your desk and not even know it’s running.” Smaller offices can benefit from having a high-speed, high-performance server “without the need for a traditional data center,” Schulz says. And for larger organizations, it simply means that the footprints are continuing to get smaller, so you can do more with less.

Kopyy agrees and says that server innovation runs in line with Moore’s Law of technology “where you get better performance and much lower energy consumption in a smaller form factor.” She adds that building a new data center is “a long, painful, and expensive process,” so “if you can expand your capacity by pulling in servers that are much more dense, whether it’s blades or just servers with very high core counts that are drawing a lot less energy,” you can get that performance boost without having to invest in a brand new facility. “If you can get a server that consumes less energy or puts out less heat, you can get a lot more life out of your existing data center,” Kopyy says. “That’s a huge reason to upgrade.”

### EFFICIENCY GAINS & COST SAVINGS

When you consider the actual cost savings of upgrading your servers, look no further than maintenance.

Kopyy says that “once a system is off maintenance after five years, the maintenance increases a lot and you’re paying so much for that and the labor for someone to keep the system running.” If your company waits to refresh for five years or even longer, imagine how those maintenance costs continue to rise year after year.

“You can save so much money just by having a regular refresh cycle,” Kopyy says. “What’s difficult for a lot of people is that when they purchase or lease servers, they have this idea that yes they want to replace them after three years, but when it comes down to it, they don’t have the agility or asset management and tracking tools.” That’s why it’s so important to have an upgrade path in place and give yourself the opportunity to take advantage of new server technologies as they come out.

Speaking of innovation, Schulz says that if you haven’t upgraded in one-and-a-half to three years even, you’re already going to see big gains, but if you’ve waited three to five years, you may be surprised that newer servers are much more efficient. For one, servers continue to get smaller and take up less space, meaning they can aid in consolidation others. A lot of servers can give you twice the performance or more while requiring the same amount of power and cooling as your existing systems.

“There are two sides to this,” says Schulz. “If your objective or mandate



“If you can get a server that consumes less energy or puts out less heat, you can get a lot more life out of your existing data center. That’s a huge reason to upgrade.”

**Jennifer Koppy**  
research manager, IDC

is to remove or reduce costs, you can get into the new technology to do the same amount of work or similar work and lower your costs. On the other hand, if your objective is to stay within your cost footprint, but you need to double the amount of work being done and you need to get it done in a shorter amount of time, that’s the other benefit.”

### **BUILT-IN FUNCTIONALITY & MORE INTELLIGENT SERVERS**

In addition to being more powerful and efficient, servers are also getting more intelligent. For instance, many new server models come with onboard diagnostic capabilities. Where you used to have to manually go in and see why a server failed, the server will now tell you if there are potential issues on the horizon or help you pinpoint why a failure occurred in real-time. The server can even send out alerts and notifications so your IT team can respond to and fix issues remotely if necessary. But the great news for smaller organizations is that “the functionality that you used to have for diagnostics, troubleshooting, maintenance management, and alerts and warnings that used to be only on the high-end, enterprise-class big mainframe servers, are now common today all the way down to small SMB-based servers.”

Another major server innovation designed to improve system intelligence and make the IT administrator’s job easier is to include things such as virtualization technology

that’s “built right into the server to help accelerate and offload some of the common processing tasks,” Schulz says. It all goes back to the idea of being able to do more with less. These new servers can run multiple operating systems, which is often taken for granted, and can now handle more computing tasks that were once handled by separate cards and components that would need to be installed in the server. In other words, new servers require much less tinkering and attention than they did in the past, which frees up the IT team’s time to focus on other projects.

“If you’re a small environment, it means that your staff can be more productive,” Schulz says. “It just allows them to troubleshoot and address problems quicker. On the other hand, if you have a larger environment where you have many servers, it allows your staff to leverage that automation and let the servers handle more things so those people can spend more time on thought work and addressing other issues.”

### **BETTER MANAGEMENT TOOLS IMPROVE PERFORMANCE & AGILITY**

Koppy says that new server management tools may actually be the game-changing features that separate new servers from older ones. You can now take advantage of DCIM (data center infrastructure management), IT service management, and cloud orchestration tools. There are so many more management

tools available to IT teams now that give you “that single pane of glass and that single version of the truth in order to be that agile,” Koppy says. But she warns that this process starts with a lot of up-front work and a commitment to tracking your systems and keeping logs of all the workflows.

“A lot of times companies have a hard time going in and applying that methodology and discipline to an existing data center, but if they upgrade, they can do that with a new system and get closer to the whole idea of that software-defined data center, which is the utopia where people want to be,” says Koppy. “That’s getting toward that agility and being able to move your workloads around and use your data center like a single server basically. That all requires a very strong base level of management.” She adds that companies need to look at management tools as being just as important as the hardware, which will be reflected in the server management market as vendors start to release new tools that make it easier to manage and maintain your systems.

### **INTERNAL COOPERATION**

Truly understanding the importance of server upgrades means that you have to start looking at servers differently. In the same way that you upgrade smartphones every couple of years, you may need to start upgrading servers just as frequently, depending on the needs of your company. It’s important for the business and IT sides of the company to communicate on these issues and for the business side, executives included, to remember that the data center is the information factory for employees and customers alike, and that upgrading servers to improve performance, efficiency, and productivity will have long-reaching effects and ensure the future growth and success of your company. ●



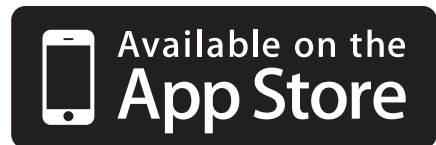


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ENERGY-CONSCIOUS TECH

# Greenovations

The technologies that make our lives easier also produce some unwanted side effects on the environment. Fortunately, many researchers, manufacturers, and businesses are working to create solutions that will keep us productive while reducing energy demands to lessen our impact on the environment. Here, we examine some of the newest “green” initiatives.

A small thermoelectric generator could power your smartwatch in the future.



PHOTO COURTESY OF KAIST.

## STARTUP SHINES LIGHT ON DEVELOPING COUNTRIES

► The use of oil lamps in developing countries such as India, Kenya, and Tanzania may change dramatically if one startup has its way. LED Safari recently announced a program that teaches people to build solar lamps using commonly available materials. For example, using an electrical wire, a mobile phone battery, an LED bulb, and an empty bottle or box, together with an imported solar panel, a person can build a solar lamp that converts five or six hours of sunlight into roughly four or five hours of usable light. This solar lamp offsets the potential cost and health risks associated with burning kerosene lamps, not to mention the environmental damage that results from carbon dioxide emissions. LED Safari provides training to community leaders or volunteers who, in turn, conduct a three-day workshop to educate beneficiaries on the importance of solar energy, and then show them how to make the lamps.

## POWER WEARABLE DEVICES WITH YOUR BODY

► Researchers at KAIST (Korea Advanced Institute Of Science and Technology) created a wristband thermoelectric power generator that's capable of producing electricity from the heat of the human body. The flexible band measures about 10cm long and can be bent as many as 120 times without impacting performance.

The research team synthesized liquid-like pastes of the thermoelectric particles needed to transform body heat into energy, and then screen printed the paste onto a glass fabric with a mesh pattern. This process allowed them to arrange hundreds of these thermoelectric particles onto one area of the band.

Although thermoelectric generators are not new technologies, this particular solution opens up possibilities for wearable devices. Although the research is in its early stages, KAIST scientists see the potential for a future where wearable devices will only need a small battery, or no battery at all, and depend almost entirely on a thermoelectric generator. If tech companies can eventually use this technology to manufacture wearable devices that don't need to be charged often or at all, such devices will likely be more appealing to consumers.

## RESEARCHERS HARNESS ABSORBENT PROPERTIES OF JELLYFISH

► An Israeli's startup's discovery could lead to a variety of environmentally friendly products. Cine'al developed a strong, flexible material called Hydromash, which is composed of highly absorbent jellyfish tissue and nanoparticles infused with antibacterial properties. Cine'al reports that its Hydromash material is just as absorbent as super-absorbing polymers, which are commonly used in diapers and similar products, and will biodegrade in about 30 days.

Among the benefits of using this new material is that it addresses two current environmental issues: diapers and similar products filling up the landfills, and the growing jellyfish populations in the oceans. Hydromash could essentially turn jellyfish into a manufacturing commodity where Cine'al could set up a plant near the ocean, harvest the jellyfish, and then create highly absorbent, biodegradable products for use as medical sponges, diapers, and many other products.

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## BRITAIN PLANS TO STOCK UP ON SOLAR POWER

► The U.K.'s Department of Energy & Climate Change recently announced plans to add 900 square miles of photovoltaic solar panels to south-facing rooftops throughout Britain to aid in its goal of using renewable power to supply 15% of its total energy consumption by 2020. This goes hand-in-hand with Britain's transition away from ground-mounted solar installations toward building-mounted alternatives. Officials stress that not only will this help the U.K. meet its alternative energy goals over the next few years, but it also will cut down on residents' energy costs.

## COMPANY PLANS TO DEPLOY WORLD'S HIGHEST WIND TURBINE AT 1,000 FEET

► For people living in remote communities, accessing an energy source can be a struggle. Altaeros Energies hopes its BAT (Buoyant Airborne Turbine), a high altitude wind turbine, is a workable alternative to current methods. The wind energy company recently announced an 18-month, \$1.3 million project in which it will deploy a BAT in Alaska. The project, partially financed by the Alaska Energy Authority's Emerging Energy Technology Fund, will be the first long-term demonstration of the BAT.



Altaeros Energies will deploy its BAT (Buoyant Airborne Turbine) in Alaska as part of an 18-month project. The high-altitude wind turbine is an alternative energy source for people living in remote areas.

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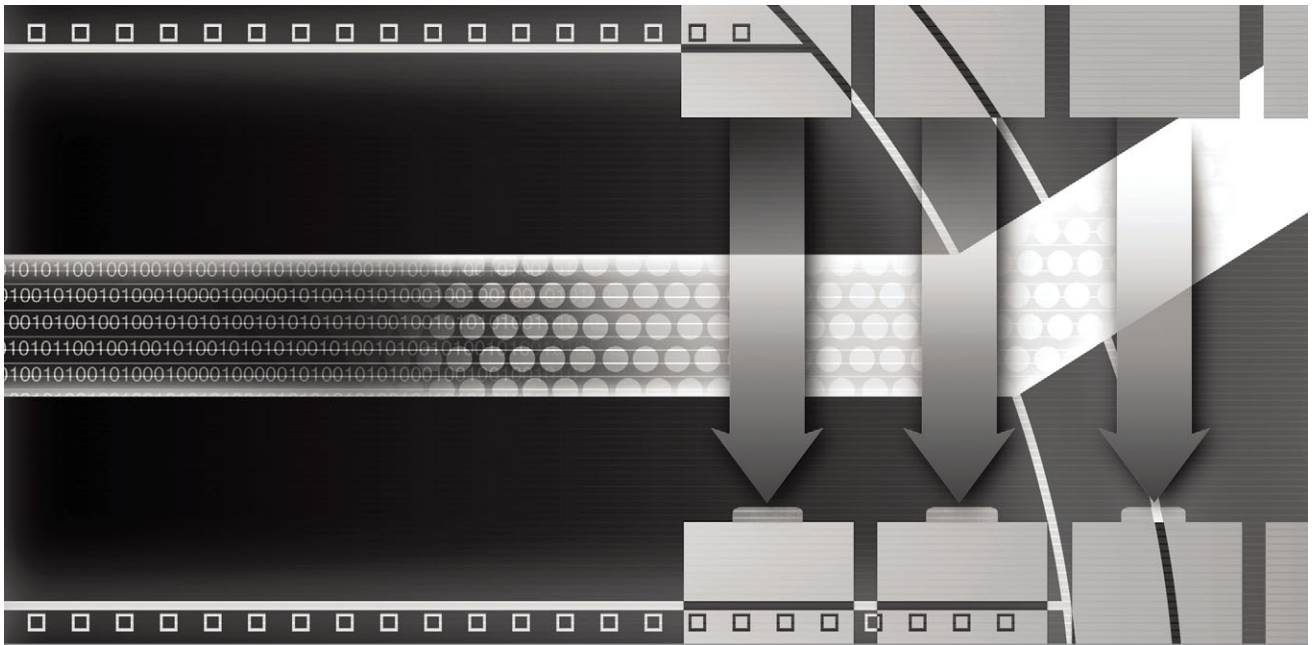
When deployed, the BAT's helium-filled shell will lift it to a record-setting height of about 1,000 feet above the ground. The turbine will use the height advantage to provide consistent wind energy to the homes and buildings below. The BAT uses a technology similar to that which blimps use to provide solid amounts of energy without being connected to a massive tower. This particular wind turbine is also rated to perform even in hurricane force winds and, when necessary, to slowly descend to the ground to prevent damage to itself or anything that lies beneath. The goal is for the BAT to supply power to agriculture, mining, and telecommunications firms; remote areas, including village or island communities; and even disaster relief organizations.

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## NEW TWO-PART APPROACH TO SOLAR POWER

► MIT researchers have developed a way to combine the benefits of both photovoltaic and thermal-based solar power generation systems into one efficient solution. Current photovoltaic cells can only achieve efficiency rates of around 20%; by contrast, solar-thermal systems can hit 30% but with a larger footprint and fewer potential applications. MIT's thermophotovoltaic solution is small, about the size of a fingernail, and can theoretically reach an efficiency level of 20% or more. The hybrid device creates heat via carbon nanotubes that absorb sunlight. The heat then moves on to a photonic crystal. When the temperature of the crystal reaches 1,000 degrees Celsius, the device emits a wavelength of light that can generate electricity when it strikes the photovoltaic cell. The thermophotovoltaic device is currently capable of about 3% efficiency.





# The Art Of The Backup

## The SMB Guide To Best Data Backup & Restore Practices

TODAY, IT'S WELL UNDERSTOOD that data is king and must be always available or businesses face service disruptions and lost revenue. Given this, it seems obvious companies would emphasize the importance of having a rock-solid backup/restore strategy in place. However, many don't. To that end, what follows are key aspects specifically for SMBs (small and midsize businesses) for devising a backup plan that will be beneficial when it's necessary to recover lost or missing data.

### THE KEYS

It's particularly vital for SMBs to know what their in-house staff and assets can accomplish in terms of backup tasks. Charles King, principal analyst at Pund-IT ([www.pund-it.com](http://www.pund-it.com)), says SMBs face two major challenges: they typically lack the financial resources and experienced staff larger organizations possess, and backup/recovery processes

tend to fall down the priority list. Thus, it's smart to determine what the organization can and can't do well.

Another key is determining the data that's most important to back up, which may sound like common sense but is something many companies ignore, says Greg Schulz, founder of Storage I/O ([www.storageio.com](http://www.storageio.com)). Some companies also fail to plan for backup situations most likely to occur. For example, Midwestern businesses should plan for tornado-like conditions and not hurricanes, Schulz says.

Russ Fellows, senior partner at Evaluator Group ([www.evaluatorgroup.com](http://www.evaluatorgroup.com)), says disasters that cause data or equipment loss at one or more sites is the most important event to protect against. Fellows advises starting with the basics and work up to higher protection levels. "A good guide is the share-protection levels established about 20-plus years ago, as well as the amount of time

needed to recover ([RTO] recovery time objectives) and amount of data at risk ([RPO] recovery point objectives)."

Specifically, levels include 0 (no protection or backups), 1 (local protection only), 2 (remote protection with a complete data copy kept at a location at least 100 miles from the primary data center), and 3 through 7 (increasingly higher levels of concurrency [RPO] and decreased time to recover [RTO]). The most common data protection/restoration situation stems from local users or events that accidentally delete data, says Fellows. Protecting against this can be done with level 1 protection, he adds.

### THE SPECIFICS

For small businesses, Fellows recommends protecting all data at level 2, though a small amount may require level 3. The easiest, lowest-cost way to do so is to implement a local-data protection plan using primarily disk media.



**“Backup is something that has to be done well, but it’s not a core competency of IT and provides no competitive advantage. Therefore, it’s a cost, and if it can be done more economically as a service, IT can turn its internal focus to other tasks. . .”**

**David Hill**

principal, Mesabi Group

Remote protection can involve either a remote backup service or using removable disk media stored off-site. Midsize businesses should protect all data at level 2 and business- and mission-critical data at level 3 or higher, which means using a form of asynchronous replication to copy data to another location and enabling a small window for RPO and RTO. The best approach is to use disk-based snapshots as the primary data protection for fast recovery, Fellows says, with backups made at least weekly using a disk target and data replicated to another location between backup targets. Companies without another site can use a backup/recovery service to enable data replication to a hosted facility, he says.

David Hill, principal at Mesabi Group ([www.mesabigroup.com](http://www.mesabigroup.com)), recommends classifying data into categories based on RPO and RTO. Mission-critical data needs rapid recovery, while less time-sensitive data won’t require the same level of protection. In other words, “establish SLAs (service-level agreements) for categories of data,” he says. Moreover, mission-critical systems may require additional data protection, such as replication to another array while still requiring backup, says Hill. “One reason is that replication only provides for physical data recovery, whereas backup provides not only against physical loss of the original data, but also against logical loss, such as file corruption due to a virus,” he says.

Hill advises staging recovery in a “triage fashion,” recovering the most critical applications first. If possible,

recovery should be granular, because many recoveries aren’t due to physical or external logical problems but due to user-created logical problems, he explains. “Recovering a single file, or even a single email, easily is important,” says Hill.

### CLLOUD CONSIDERATIONS

Where cloud solutions are concerned, storage processes, including backup and recovery, have been successful, King says. Thus, there are numerous options and vendors to choose from. After completing an initial internal assessment, create a list of services required before contacting vendors, he says. If already working with a trusted vendor/channel partner, gauge its abilities.

Hill advises including private and public clouds in the planning process, if only to give IT a complete view of options and costs. Options will include BaaS (backup as a service) and DRaaS (disaster recovery as a service) solutions. “Backup is something that has to be done well, but it’s not a core competency of IT and provides no competitive advantage,” Hill says. “Therefore, it’s a cost, and if it can be done more economically as a service, IT can turn its internal focus to other tasks, such as innovation.” Cloud solutions may also offer greater reliability, easier ability to integrate backup into disaster recovery, and better testing.

### TEST & TEST AGAIN

No backup/recovery plan is complete without testing specifics. Though regularly testing that your business can

actually restore data is crucial, it’s not necessarily easy to do. King explains that testing and simulations seldom capture or replicate the confusion and chaos that may occur during a system failure or disaster scenario. Typically, businesses don’t do a good job of testing internally, Hill says, including because creating realistic scenarios and testing in a non-disruptive fashion isn’t easy. Additionally, other priorities often take precedence.

Schulz says it’s key that testing surpasses just restoring a file, volume, etc. by actually ensuring you can open and use the data, restore data to another location, restore permissions, and meet other data usage requirements. It’s also important to have “B team” members test restores vs. always “A team” members who may not be available in mission-critical situations. Software to aid in testing is available, Hill says, but isn’t typically available for SMBs.

### IF VIRTUALIZING

Although traditional backup/recovery products weren’t designed for virtualized environments, Hill says, they’ve been modified to work in such environments. Compared to working with a single OS on a physical machine, each virtual machine will have its own backup stream and perhaps different SLAs from other VMs, he says. “That is at the front end. Then at the back end, the backup/recovery software has to work with server virtualization software,” he says. “Altogether, organizations have to make sure that their SLAs for their backup/recovery infrastructure will work in a virtualized environment.”

King says virtualization is an area where it’s wise to ensure a vendor’s experience, success history, and SLAs are ironclad. Though some solutions for virtualized environments can be complex, a range of solid solutions are available from numerous vendors, he says. “Investigating these options should also impact how an SMB assesses cloud providers, because they, by definition, are supporting storage processes in virtualized infrastructures,” he says. ●



# What Malware Can Do

## Know The Dangers Of Malicious Software

If a program's purpose is to destroy, steal, deceive, extort, spam, circumvent, or spy, then chances are good that the term "malware" is applicable. Short for malicious software, malware is a catchall term that describes virtually any software that threatens the data on your PC, including spyware, adware, ransomware, worms, Trojan horses, rootkits, keyloggers, dialers, rogue security software, and, of course, self-replicating threats referred to as viruses. It's easy to imagine malware as the software equivalent of the most diabolical James Bond villains rolled into one. But the fact is, all of malware's infections, breaches, and corrupted files are ultimately preventable.

This article seeks to answer the question of just how much damage a person can unleash on his computer, organization, and life if he fails to take the proper precautions.

Actions such as accidentally clicking a questionable hyperlink, opening a sketchy attachment, or downloading so-called "free" software can create more trouble than you might think. Sometimes the damages are minor and recovery is quick. Other times the costs far exceed the price of the hardware and the losses become irreplaceable; your business can collapse, cherished memories can be lost forever, and your identity could be tarnished for years.

### THE USUAL SUSPECTS

Trojans, for instance, often show up on your system piggybacking on another, more legitimate, piece of software, such as an ordinary executable program, ActiveX component, or Java applet. When Trojans become active on your system, they tend to corrupt and destroy data or collect sensitive information, such as passwords, credit

card numbers, and contact information, forwarding it to cybercriminals.

As we mentioned previously, the goal of a virus is to replicate itself among computers. A worm is a type of virus that resides in a computer's memory and can make the leap between networked systems fairly automatically. Traditionally, a virus needs some user interaction to spread, such as launching an infected executable or plugging in an infected USB drive. Some malware, on the other hand, uses a variety of exploits that exist in software you trust and use on a regular basis to spread to other systems undetected.

Viruses (and other types of malware) are often self-contained executables, but they can also exist as scripts, sometimes referred to as macro viruses. Cybercriminals write these scripts, or a list of commands designed to be executed by a



program that exists on your computer, to tinker with office documents, email, and Web applications without your approval. Script virus attack vectors include HTML (HyperText Markup Language), JavaScript, and Microsoft Office documents. For instance, a Word document with support for embedded code (or macros) will execute the code when you open the document, which can cause your computer to experience all sorts of problems.

Rootkits are a type of malware that can be particularly difficult to excise. By bypassing security software, a rootkit can install to a low-level location of the computer that requires administrator access, which lets it hide from typical antivirus and malware scanners and run commands that the OS would normally have no reason to

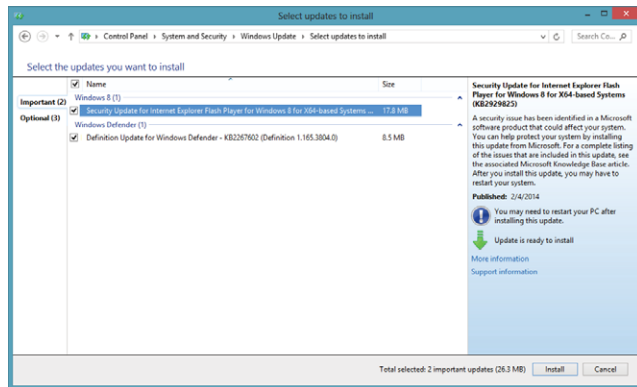
suspect as being potentially dangerous. Rootkits are most often used to allow the installation of other types of malware for the purposes of stealing sensitive data, tracking browsing history, or deactivating security software. Rootkits have even been used in the past to enforce DRM (digital rights management). Sometimes a user may install a rootkit on purpose, such as to bypass Microsoft Product Activation, conceal software that enables cheating in online games, or to wipe the hard drive in the event that the device becomes lost or stolen.

### MALWARE AGNOSTIC ATTACKS

Although the different types of malware we covered do have a handful of typical purposes, some kinds of attacks can come to be on your system through any of the above.

Keystroke loggers (or keyloggers), for instance, are a type of malware that can record your keystrokes and browsing activity. They're typically used to collect usernames and passwords and transmit that information to cybercriminals. Hardware-based keyloggers, plugged into a PC or notebook (sometimes disguised as a generic keyboard connector), can perform the same function but are often easy to spot.

If you've ever done a generic search for free software, chances are good that your results list was populated with a number of spyware-infected shareware. These programs can display pop-up advertisements and transmit your browsing history to the software's shady authors. It is risky running this kind of software, but you may encounter even more problems



You can configure Windows Update to automatically install new updates to make sure vulnerabilities are patched as often as possible.

simply because the software is poorly written. Such adware can gobble up system memory, corrupt files, gunk up the Windows Registry, and slow down your computer considerably.

Many types of malware seek to open up a back door to the infected system, which enables remote cybercriminals to access the PC directly, remove files, observe activity, and hijack the operation of the system.

A bot is one type of malware attack designed to yield control of your system over to another user or a series of automated processes. For cybercriminals, a lone bot infection isn't useful for much more than stealing a contacts list or opening a back door to the system, but when combined with hundreds or thousands of bot-infected computers to form a botnet, they can deluge the Web with spam, inundate Web servers with requests to the point of shutting down, and facilitate the rapid spread of other types of malware.

### PRACTICE SAFE COMPUTING

We've only scratched the surface of malware and the ways it can threaten your data. If you practice due diligence and heed some of the tips in the "Suggestions For Safe Computing" sidebar, then you can lessen your chances of becoming a victim of malware. ●

## SUGGESTIONS FOR SAFE COMPUTING

The following tips can help you protect your computer's data.

- Keep your operating systems and software up-to-date.
- Install and run current versions of antivirus and anti-malware software.
- Only select reputable sites when downloading apps and media from the Web.
- Generate strong passwords to confound brute-force cracking software, and never share them.
- Use your antivirus software to scan files you suspect are malware.
- In email messages, avoid clicking links and dispose of questionable attachments without opening them.
- Always read the fine print before installing anything.
- Make sure everyone who accesses your computer also knows how to keep safe.



# WLAN Optimizations

## How Larger Organizations Can Improve Their Wireless Networks

YOU WOULD HAVE TO BEEN sleeping on the job during the last few years to have not noticed the flood of mobile devices entering organizations and the increasing reliance that employees are placing on those devices to do their jobs. What may be less obvious but still of major importance is the extra load these devices are placing on the wireless networks within an organization; so much so that many are finding they need to make improvements to their WLANs (wireless local area networks) in the form of upgrading equipment, implementing new

management solutions, expanding coverage areas, and more.

The following discusses such improvements as recommended by several experts specifically where larger organizations, including midsized and large enterprises, are concerned.

### CHANGE YOUR THINKING

With the number of mobile devices coming into the workplace on the rise, many experts suggest that organizations build or adapt their wireless networks with capacity foremost in mind as opposed to coverage, which was a greater concern in the past.

Building for coverage now, says Mark Tauschek, Info-Tech Research Group ([www.infotech.com](http://www.infotech.com)) principal consulting analyst, will probably result in network failures. Building for capacity—and not just in order to meet immediate needs but those the organization anticipates will exist years out—will generally reduce the chance of encountering problems related to coverage gaps, building interference, channel allocations, power levels, and other issues, he says.

As a baseline, Tauschek recommends organizations assume that every employee will be connecting up to three

### Key Points

When building out or upgrading a wireless network, it's increasingly suggested that organizations place greater importance on building for capacity than on coverage.

Where design and daily operation is concerned, it's important to have skilled and experienced staff oversee the wireless network to avoid consistent problems and complaints.

Many experts consider adding more access points to a network as the first step that organizations should employ to handle more users and extend coverage.

Many organizations face a need to upgrade their networks to embrace the new 802.11ac Wi-Fi standard, which adds extra capacity over 802.11n.

devices (tablet, smartphone, and notebook, for example) to the WLAN, although he expects that number to increase in coming years, with wearable devices potentially playing a significant role in that growth. Although current wearables rely on Bluetooth connectivity, Tauschek says improvements to WLAN technology and 802.11 (wireless protocol) standards in the future should enable connecting wearables directly to wireless networks.

Chris DePuy, vice president at Dell'Oro Group ([www.delloro.com](http://www.delloro.com)), says three to five years ago, some organizations implemented WLANs just to ensure wireless coverage was available, something that was possible for smaller organizations via a SOHO-class AP (access point). As WLANs have become more critical, even smaller companies are upgrading their networks beyond that single AP to multiple APs to obtain greater benefits and more throughput. Although managing multiple APs is more difficult, affordable enterprise-class management systems are available to help oversee the task, he says.

Where capacity is concerned, DePuy says his firm has observed that "50 to 100 connections can be made to high-capacity access points, but practically speaking, once the number of high-bandwidth consuming users exceeds five or 10, today's access points run out of capacity. These figures vary widely from vendor to vendor, of course, as some vendors pack in more radios to access points or use different antenna systems, for instance."

## BIGGER WORRIES

Compared with smaller organizations, larger organizations typically have to deal with issues of scale more often, says Bob Laliberte, senior analyst at ESG (Enterprise Strategy Group; [www.esg-global.com](http://www.esg-global.com)). This can involve scaling for more users and accommodating for larger areas and remote locations. Scaling can pertain to the number of devices that organizations must handle, which might be due to



"Wi-Fi access points have a limit on data throughput rates and number of concurrent users. The more access points installed will help to improve overall coverage. LAN backhaul, of course, might need to be upgraded to support the extra access points."

**Daryl Schoolar**  
principal analyst, Ovum

more people owning and using more wireless devices but "could also be [due to] machine-to-machine communications or the Internet of Things early stages," Laliberte says. "So, improvements would include providing increased coverage areas, seamless integration between areas in the campus, and quick and easy sign-on while still maintaining secure access."

In terms of easy sign-ons, Daryl Schoolar, Ovum ([www.ovum.com](http://www.ovum.com)) principal analyst, says it's worth it for organizations to investigate Hotspot 2.0, which is essentially an authentication and handoff technology that enables a device to discover an AP automatically in a "Wi-Fi roaming" manner to improve the ease of network logons. First and foremost, however, Schoolar says the way to improve wireless networks is simply invest in more APs. "Wi-Fi access points have a limit on data throughput rates and number of concurrent users," he says. "The more access points installed will help to improve overall coverage. LAN backhaul, of course, might need to be upgraded to support the extra access points." As part of an installation, organizations should engineer APs (adjust antennas, for example) so that their close proximity doesn't increase interference.

Engineering-wise, Lee Badman, who is an author and Syracuse University ([www.ischool.syr.edu](http://www.ischool.syr.edu)) IT professional and network architect, says the best thing organizations can do to improve the WLAN is ensure any engineering,

installation, or support staff "know what they're doing." Whether in terms of design or daily operation, he says, "skilled expertise is the difference between constant headaches and user complaints and a system that just works." Badman also advises developing a WLAN solution that enforces and enables business operational goals. Afterwards, however, "don't do weird stuff with it like trying to make all sorts of consumer-grade junk work on it at the cost of reliability," he says.

For organizations that use a controller-based WLAN, Mike Fratto, Current Analysis ([www.currentanalysis.com](http://www.currentanalysis.com)) principal analyst, says distributing controllers closer to APs can "take traffic off the network, closer to where it originates." Many vendors offer split controller functionality, which maintains the benefits of centralized control of all APs while terminating WLAN traffic on the AP and puts it directly onto the wired network, he says. This approach also maintains survivability because if the AP loses touch with the controller, it will continue to operate with the last good configuration, Fratto says.

Elsewhere, Fratto suggests that organizations take advantage of 802.11 standards' automation features, which share airspace and leverage new technologies (including beam forming) so as to ensure better connections. Further, monitor the organization's airspace for interference from unauthorized APs on the network; radios operating in 2.4GHz or 5GHz range;





“... newer APs may accommodate more users per AP,” meaning a “greater density of users without having to deploy as many APs.”

**Bob Laliberte**

senior analyst, Enterprise Strategy Group

and other sources of interference. “Work with neighbors to make sure there are no APs using overlapping channels,” he says, because “the overlapped channel is treated like interference and causes errors over the air,” degrading performance. “Letting 802.11 radios work out fair access will improve performance for everyone,” he says. Using directional antennas that form a beam in one primary direction (across the office, for example), meanwhile, will help cut down, but not eliminate, interference from other sources, he says.

### 802.11AC'S PROMISE

For many organizations, upgrading to the new 802.11ac Wi-Fi standard will be in order. Compatible with the previous 802.11n and 802.11a standards, 802.11ac's biggest impact on organizations will likely be the extra capacity it provides. The standard supports up to roughly gigabit Wi-Fi speeds, as well as more users and added abilities for beam forming, says Laliberte. Especially for larger organizations, the key with 802.11ac will be greater throughput to handle bandwidth-intensive video or unified communications applications, he says. “Also, newer APs may accommodate more users per AP,” meaning a “greater density of users without having to deploy as many APs,” he says. Laliberte does caution that some organizations will want to consider upgrading their wired infrastructures to 10GbE (10-gigabit Ethernet) to keep pace with the demand.

Schoolar similarly says 802.11ac will increase network throughput and the ability to handle multiple users vs. 802.11n. “It bonds channels to increase

throughput, with channel sizings going from 80MHz to 160MHz,” he says. A downside of 802.11ac is it operates in the 5GHz spectrum, Schoolar says, “so its radio range isn't as great as 2.4GHz radios like 802.11n.” Beyond a “rate over range” advantage, Badman sees support for more clients per AP and the move of clients to 5GHz from 2.4GHz as big wins associated with 802.11ac. He cautions, however, that 802.11ac is “just as subject to interference and bad installations as any other WLAN technology.”

Fratto sees increased capacity over the air as 802.11ac's main improvement but adds that “while many commenters are making a big deal out of the relatively lightly used 5GHz space, the fact is that as APs are replaced, the 5GHz range will get congested, as well.” Additionally, he says, “the higher the throughput on 802.11ac, the fewer channels that are available because the higher throughput comes at the expense of wider channels. Thus, faster capacity means fewer channels which results in more contention.”

### EQUIPMENT CONSIDERATIONS

Compared with the equipment that smaller organizations might use, there's not much of a difference in what larger organizations require to provide the best wireless coverage. Fratto says “it's more about environment.” Badman, meanwhile, says smaller companies arguably have more cloud-based options available to them, but ultimately, organizations in general require a “quality switch and AP components, good cabling, and sound methodology regardless of size.”

Larger enterprises, Schoolar says, will likely use a higher-grade AP (and more of them) than smaller organizations. “A small business, like a real estate or insurance office, might get away with a single consumer-grade AP if it only supports a few users and has no public access,” he says. “A large enterprise network is more like a carrier-grade network found in airports and shopping malls.” Laliberte, meanwhile, says equipment likely will vary depending on location needs and number of users involved. In addition to more APs, larger organizations may need larger controllers (if required), he says.

In terms of network management, Badman says there really haven't been recent new solutions that would make management easier for larger organizations. “It's quite the opposite actually. Most wireless network management systems are hyper-proprietary, and versioning between the NMS (network management system) and the WLAN can be a real pain,” especially as vendors drop support for older equipment after a set amount of years, he says.

Schoolar does say that certain vendors have hosted WLAN-management solutions that can centralize the controller and network management, something that “alleviates the need to purchase some equipment and can make it easier to manage the overall network with fewer people.” Fratto says despite really no new solutions being introduced, a few vendors do have WLAN controller modules that “can be placed in switches and routers in wiring closets to distribute management.”

Overall, Laliberte says two key considerations that organizations should think about when managing a large distributed environment include ensuring there is common management, or at least common policy management, from a central location. The second key is having the ability for distributed APs to run autonomously if disconnected from a central policy/management engine. ●



# Mobile Privacy

## Is True Privacy A Thing Of The Past?

THERE'S A SENTIMENT AMONG many experts that in exchange for the convenience mobile devices provide users give up chunks of privacy to various parties. Although privacy barely registers a blimp of concern for some users, it's a predominant worry for others as fallout from the recently exposed NSA (National Security Agency) surveillance program strongly indicates. Moving forward, the mobile device-privacy issue will likely only become more of a hot-button issue. The following explores the issue, examining how much privacy mobile device users really have, common beliefs they hold,

how accessible mobile communications are, and more.

### MILLION DOLLAR QUESTION

Considering the details and raft of attention the NSA-Edward Snowden affair has generated, a fair question to ask is whether there even is such a thing as mobile privacy. Opinions vary. Trevor Hughes, CEO and president, International Association of Privacy Professionals ([www.privacyassociation.org](http://www.privacyassociation.org)), says privacy standards vastly differ globally, with regulator action and social and cultural norms driving them. "With the privacy landscape changing so quickly it's

not that there isn't any mobile privacy, it's just difficult for users to understand the risks associated with it," he says.

Rob Enderle, principal, Enderle Group ([www.enderlegroup.com](http://www.enderlegroup.com)), flatly says the answer is "no." "Between the NSA and Google, mobile privacy is a myth," he says. Once Google Glass is established, he says, "the entire concept of privacy may be obsolete." Seth Schoen, senior staff technologist with the Electronic Frontier Foundation ([www.eff.org](http://www.eff.org)), labels the entire mobile infrastructure concerning user privacy and security "abysmal in every respect," including on levels of technical

### Key Points

Coverage of the NSA's surveillance program has raised awareness of mobile device privacy, but some experts believe many users don't understand what that surveillance really means.

Many experts believe privacy isn't something entirely possible with mobile devices, while others believe mobile privacy can exist, although not in a perfect sense.

Depending on the type of communication and wireless carrier, traces of mobile phone communication can stay on a carrier's network up to several years or longer.

Users have a responsibility and burden to be knowledgeable and aware of the guidelines and policies that various parties have in place regarding how their data is being used and stored.

infrastructure, culture and incentives of mobile carriers, and law and regulation surrounding mobile networks. "At the cultural level, most phone companies have extraordinarily close connections with government," he says. "In many countries the largest—or only—telephone company is directly government-owned or is the successor of a government agency that operated a post and telecommunications monopoly."

Worldwide, telephone companies are among the most extensively regulated, Schoen says. They're also "accustomed to asking governments for permission for almost everything that they do," including requesting spectrum rights. "Far from the culture of fighting for their users' privacy rights that the press has been attributing to parts of the IT industry, the phone world is generally acquiescent and cooperative on surveillance. Sometimes, it's even proactive in offering governments its help with spying on the public," he says.

In the digital world, says Dionisio Zumerle, Gartner ([www.gartner.com](http://www.gartner.com)) principal research analyst, there's no such thing as "perfect privacy." Beyond surveillance issues, he says, "consumerization and mobile apps follow a business model that requires access to private data to survive. Leakage occurs from data sent to a number of parties for commercial reasons." Users consent to some of this, but much is done with their inadvertence, he says. "Typically, there's little effort in anonymizing that data," he says.

Carsten Casper, Gartner Europe research VP, privacy and security, also says "privacy isn't perfect," as varying degrees of effort can circumvent most controls. Ensuring these efforts are higher than the value of information on the device is the "challenge for every user; not just business executives," he says. Users in developed countries, says J. Gerry Purdy, Compass Intelligence ([www.compassintelligence.com](http://www.compassintelligence.com)) chief mobile analyst, trade privacy for convenience and ease of communication. "We blog, post, text, and email, and when we



Recent revelations and increasing commercial use of private data for analytical and other purposes "make it evident there will be a need to reassess existing gray areas in regulations and perhaps even the overarching model of governance of certain shared communication resources."

**Dionisio Zumerle**

principal research analyst, Gartner

do that with our mobile phone[s] we're doing it with our location stamped to every message," he says.

#### WHAT WE BELIEVE

Among mobile device users, knowledge and beliefs concerning privacy and personal information varies widely. For example, some users believe email and text messages are secure, Enderle says, despite employers often having access to those communications and email and text not being secure communication methods to begin with.

Zumerle says most enterprise users are comfortable with the mobile communication security they perceive, though recent events have "caused a slight surge in Gartner inquiries for solutions that provide voice and texting privacy." Casper believes the common user doesn't differentiate various threats. "Mobile communications are created by a whole ecosystem consisting of domestic and international carriers, device manufacturers with open or closed technical systems, operating systems and applications, but also wireless hotspots, home networks, and Web-based servers from banks, e-commerce shops, and others," he says. Every party is interested in protecting some of users' information (primarily for reputation and legal reasons) but also in exploiting some to finance products and services, he says.

"Many users don't see this variety. They read about a specific privacy incident and conclude that mobile

devices are inherently insecure and that mobile privacy doesn't exist," he says. Still, most people continue using mobile devices upon concluding the benefits outweigh the risks to their information. "If they're wrong, they become another data point in one of these data loss and breach statistics and move on," he says. The problem is business executives often do "the same type of intuitive risk assessment" vs. a fact-based, structured one and "can't simply move on when their company is ruined," Casper says.

#### STICKING AROUND

Ken Westin, Mobileprivacy.org founder, says one SMS (short message service) produces at least 20 log files throughout a carrier's network, with records kept anywhere "from 90 days to forever." Further, "there's no guarantee that the archived data hasn't been siphoned off and provided to law enforcement, like the NSA," he says. Hackers, government, and corporations all use data for different purposes, Westin adds. If there's a profit possible, odds are it's being compromised, he says. Enderle says from the NSA disclosures, it's apparent that content, call logs, and address books have been compromised and email is being monitored by various entities.

Zumerle says regional and national regulations factor into how long data traces remain on carrier networks. The European Union's Data Retention Directive, for example, requires





**“Policymakers capture societal developments and lawmakers create legal frameworks that have a long-term impact, but nobody takes the burden of personal responsibility off today’s mobile users.”**

**Carsten Casper**

research VP, privacy and security, Gartner Europe

providers retain data related to public communications six to 24 months. Typically, only metadata (data that identifies actual callers, time of communication, etc.) is stored. Generally, he says, other regions apply similar measures. “Depending on the country, a court order may or may not be necessary to obtain access to such data for a law enforcement authority,” he says.

Policy-wise, Schoen says the phone industry “is consistently more proactively cooperative with the government, less transparent about government requests, and much less apt to challenge those requests.” He says many phone companies log massive amounts of communications data, keeping it potentially for years, which exposes them “to future subpoenas or government requests even under programs that didn’t exist when the data was first collected.” Technology-wise, Schoen says cell phone networks inherently know where individual devices on the network are, and carriers can track an individual’s location and hence his activities and relationships. This ability, he says, “is regarded by the industry as a commercial opportunity rather than a terrible mistake.”

The U.S. government has consistently argued that users don’t own any data that phone companies collect about them and don’t have any privacy interest in that data “unless a specific statute affirmatively grants you one,” Schoen says. He believes most users haven’t thought about phone-related security and privacy problems at all or really articulated what the threats are. “I think there’s been enough press

coverage of location tracking and phone tapping that a general awareness is emerging that phones are insecure, but maybe not of what that means,” he says.

Some businesses may think foremost about security as it relates to trade secrecy, believing they don’t have much to fear from the government in terms of exposing trade secrets, Schoen says. Surveillance, however, is a global problem. “If a French or Russian or Chinese spy agency has an IMSI [International Mobile Subscriber Identity] catcher set up in an office building around the corner, [it] can intercept a U.S. business’ mobile calls,” he says. Elsewhere, he says, it seems clear most spy agencies are directly spying on cellular communications in other countries. American businesspeople traveling to these countries will likely roam onto mobile phone networks and their communications likely “exposed directly to those carriers even without particularly high-tech surveillance or even without malware attacks,” he says.

### TAKE GUARD

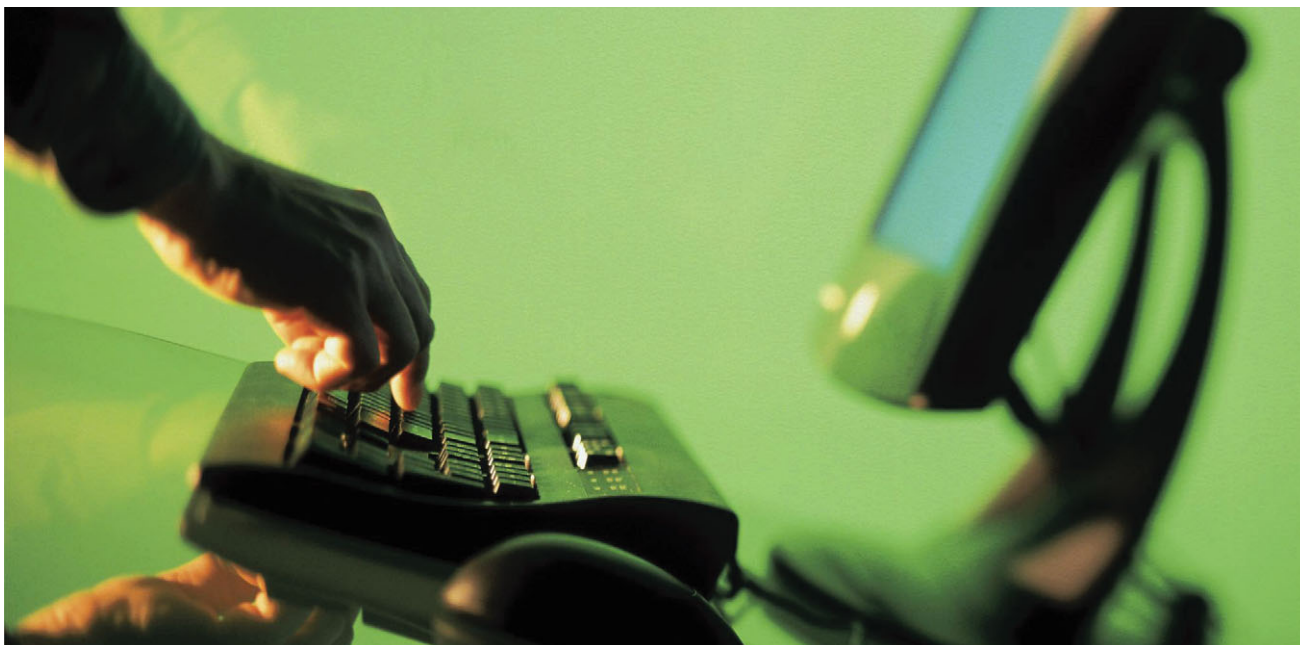
With relatively little money and average-to-higher technical skills, Zumerle says, it’s possible to attack GSM devices/networks. While 3G and newer communication technologies provide better security, they aren’t immune to attacks, he says. “When it comes to mobile public network communications, the security mechanisms in place don’t guarantee confidentiality. A mobile phone conversation offers the same degree of confidentiality as a conversation with someone in a public place,” he says.

Schoen says while many companies are creating “secure” mobile apps that attempt to address mobile app-security concerns, users should be skeptical and informed about what “secure” means. For example, are voice calls being protected but metadata still being exposed? In terms of privacy-related guidelines, laws, and other measures, Zumerle says recent revelations and increasing commercial use of private data for analytical and other purposes “make it evident there will be a need to reassess existing gray areas in regulations and perhaps even the overarching model of governance of certain shared communication resources.”

Casper says the problem with “paper-based” controls is they can’t adapt as quickly as technology changes. “Sure, guidelines can be written quickly and best practices emerge as a community effort, but the more authoritative a legal requirement is, the longer it takes to go through the legislative process,” he says. “Policymakers capture societal developments and lawmakers create legal frameworks that have a long-term impact, but nobody takes the burden of personal responsibility off today’s mobile users.”

Westin advises users to “realize that if you aren’t paying for the product, odds are you are the product. Assume everything has been compromised and work backwards. The best way for a service to protect your data is to not collect it.” Ultimately, he says, “it’s not up to the government or companies to protect your data and privacy. We need to take responsibility for our own privacy because like integrity, once lost, it’s difficult to regain.”

Hughes says while privacy is still a maturing space, one thing organizations can do is provide privacy training to employees. “An organization’s privacy is not just for the CPO or compliance professionals anymore,” he says. “While there’s still a need for the core privacy team, every employee that touches data in a significant way should know enough to at least spot rudimentary issues in their jobs,” he says. ●



# Internet Tracking

## How Websites & Companies Glean Information From Your Web Browsing Activity

NEARLY EVERY WEBSITE YOU visit uses cookies or some other form of Internet tracking technology to store information about your browsing history and your Web behavior. Although this sounds potentially nefarious, the reality is that many websites simply use this data to help you save time and provide you with relevant information the next time you visit. Internet tracking has grown much more sophisticated over time, however, as companies try to use the technology to gather more data about customers and their online activity. It's important to not only know where this phenomenon is going, but also how and why it originated.

### HTTP & FLASH COOKIES

The use of cookies traces back to the 1990s when Web browsing became prevalent. A computer services company wanted a way to check whether

visitors to its website had stopped at the site previously. "At that time, there was no such technology to do that, so the website companies developed cookies to track users and their activities," says Alan Tang, senior consulting analyst at Info-Tech Research Group ([www.infotech.com](http://www.infotech.com)). HTTP or browser cookies are simply "small pieces of data sent from a website and stored in a user's Web browser," Tang says. Each time the user visits the website, Tang explains, "the browser sends the cookie back to a server to save information about [his] previous activity."

HTTP cookies are commonly used by online retailers for personalization and customization purposes. For instance, if you visit an online store and search for books about football, the next time you visit that online store, you may see recommendations for more books

and other football-related products. Websites can also use cookies to store passwords or track browsing history and user behavior.

However, traditional HTTP cookies are limited to a degree because they can only store about 4KB of data. For companies that want more storage space to keep as much information as possible about the people visiting their websites, there are Flash cookies. Created in 2000, Flash cookies, also known as local shared objects, take advantage of the Flash technology that some websites use, and they are capable of storing as much as 100KB of data. This gives websites the ability to not only store more data at once, but to also get more context from that data.

You can store Flash cookies on your computer rather than your Web browser, and some websites will even back up traditional HTTP



“Cookies are your friends, but they can also be used against you. You can get information that’s more relevant to you, but [cookies] can also be leveraged by malware to steal information from you. The most important thing from a security perspective is that the technology isn’t necessarily bad, but the collection of this information should be more transparent to the end user and the customer should have control over it.”

**Alan Tang**

senior consulting analyst, Info-Tech Research Group

cookies to those local shared objects. That way, even if you delete a cookie in your browser, a Flash website can still grab information from a Flash cookie saved on your computer. This can raise security concerns for some companies and can put your personal information at risk if you aren’t careful.

### FRIEND OR FOE?

Although cookies can be helpful and allow a website to provide a custom experience for an individual visitor, “they can also be leveraged against you by malware to steal information,” Tang says. He explains that there are thousands of groups dedicated to using a person’s information against him. Cookies and other Internet tracking technologies gather information about your browsing history and general behavior, and hackers can use those cookies to spot and exploit certain vulnerabilities in the future.

For that reason, it’s important that your employees, especially those with access to sensitive information, be aware of such threats. “You have to teach your end user how to protect [his] information when searching online,” says Tang. “The first step is to promote awareness.

The next step is to research and keep your anti-malware applications and browser up-to-date. Every time you visit a website, it could be tracking your information. There are tools that will give you a full list of websites that are tracking your information, and you can choose whether or not to allow those websites to track you.”

### MORE WEB TRACKING

With the increased use of mobile devices (which don’t use cookies), advertisers sought new forms of tracking technology. So-called digital fingerprinting, for example, involves collecting all of the hardware and software information available about a user’s device as the user browses the Internet. In this way a “fingerprint” is formed that is associated with a particular user, allows for tracking of that user, and remains unaffected when the user deletes stored Internet tracking data.

Technologies such as digital fingerprinting are often used for targeted advertising. For instance, after visiting a company’s website or searching for a specific product available from an online retailer, you may notice that advertisements

for those items or retailers begin to appear as you browse other websites. This is often the work of a marketer trying to target you with ads and increase the chance of a sale by maintaining your awareness even when you navigate away from the company’s website.

Internet tracking doesn’t stop there. Companies including Google and Microsoft continually look for ways to move away from traditional cookies and even digital fingerprinting, which tracks only one platform at a time, to platform-independent tools that track your profile regardless of which device you use. Tang says the ultimate goal for profile-tracking technology is to “bring data from different platforms together and take the performance and accuracy of information collection to the next level.”

Using Microsoft as an example, Tang explains that this approach can lead to “cross-channel” profile tracking where it follows you from your smartphone to your laptop and even to your television. “If you’re running a Windows laptop [and] an Xbox, and using Internet Explorer and Bing Search, Microsoft can immediately consolidate those platforms together and gather more accurate information about your behavior,” he says.

Perhaps the most interesting thing about the profile-tracking approach, according to Tang, is that it will have a “huge impact on online advertising.” In the past, Tang explains, companies like Google and Microsoft only “controlled one item in the supply chain,” but now with tracking technology that can span across multiple platforms, “they can take control of the whole industry.” Both companies are already using profile tracking to some degree, but it will be interesting to see where the technology goes from here and how the technology will impact the way consumers and businesses interact with the Web in the future. ●





# Plan Early For Mobile Growth

Consider Device Types, Operating Systems, Wireless Carriers, Applications & More

AS YOUR SMALL BUSINESS GROWS, you will learn that with success comes more responsibility. In the beginning, you focus solely on getting your company off the ground, offering the best product possible and providing solid customer service. Then, as you increase your customer base and bring in additional employees to support demand, things may become more complicated.

One aspect of a business that you may not consider initially is how to handle mobile devices in the workplace. A growing staff means more mobile devices, which could overwhelm your IT department. While you may not want to implement MDM (mobile device management) software or other advanced mobile security solutions right now, there

are some things you can do before mobile device use in your company gets out of hand.

## START SMALL, THEN EXPAND

Initially, you can ensure that these mobile devices increase productivity rather than introduce distractions. "No matter what companies do, mobile devices are in the workplace, and that comes with a certain amount of distraction," says Mike Battista, Ph.D., senior consulting analyst at Info-Tech Research Group ([www.infotech.com](http://www.infotech.com)). "The best thing a company can do is enable productive use of mobile devices rather than attempting to cut off distractions. Most attempts to unnecessarily lock down devices are futile at best and can even backfire to decrease productivity."

You'll also want to consider allowing devices and OSes (operating systems) that your IT staff is comfortable using and already knows how to support. Battista says that "the greater the device variety, the greater the complexity of support." This means that you can't let employees bring in whatever devices they prefer, because doing that could lead to security vulnerabilities or integration issues that your company or IT staff isn't prepared for.

However, this doesn't mean you should limit employee choice too much. Instead you could actively encourage the use of supported devices or provide company-issued devices to employees that need them the most. Then, "as support issues are worked out and more device-agnostic technology is put in



“No matter what companies do, mobile devices are in the workplace, and that comes with a certain amount of distraction. The best thing a company can do is enable productive use of mobile devices rather than attempting to cut off distractions. Most attempts to unnecessarily lock down devices are futile at best, and can even backfire to decrease productivity.”

**Mike Battista, Ph.D.**

senior consulting analyst, Info-Tech Research Group

place, more variety can be introduced gradually,” Battista says. And you can open up mobile device usage to more employees in more departments. Eventually, you can get to the point where regardless of device type or operating system, you’ll be able to provide adequate support and point users toward applications and services that will help improve productivity.

## WIRELESS CARRIER CONSIDERATIONS

Next to device types and OSes, the choice of wireless carrier can also have a big impact on employee usage as well as the ability for the company to support those devices. There are a variety of wireless carriers available, including the major ones that require two-year contracts as well as smaller ones that may use a month-to-month model. It all depends on how your employees plan to use their devices and what types of plans they can afford on their own, which is more of a problem for BYOD programs than company-issued devices.

“For company-issued devices that the company pays telecom expenses for, it usually pays to stick with a single carrier,” says Battista. “BYOD gets more complicated. Corporate plans on personal devices can be complex enough and could be an outright nightmare with multiple carriers. An alternative is to allow users to choose and set

up their own telecom plans, as they’d need to do with their personal devices anyway, but provide a flat monthly telecom stipend to users who require their plans for company work.”

Although company-issued devices give a business more control over which carrier its employees use, it simply isn’t an option for some smaller businesses that may not be able to afford paying for numerous devices. To help with this, some wireless carriers will offer company discounts, which may encourage an employee to choose one carrier over another because he can save money on his monthly bill. With this option, your company can still opt for a BYOD program but also make it more likely that your employees will stick with your preferred carrier.

## PROMOTE THE USE OF PRODUCTIVITY APPS

After you nail down your carrier options and have a clear plan for how your company will support mobile devices and OSes now and in the future, you can then look at applications. As Battista advised previously, avoid trying to “lock down” employee devices and dictating what types of applications they can and cannot use, especially if the app they prefer is better than one your company currently supports. It’s important to “provide and promote apps” as a way to “enable productive use of mobile

devices,” Battista says, because it will encourage employees to properly use their devices for business and make it less likely for them to go against company policy. It all comes down to giving your employees options rather than forcing them to download company-supported alternatives they would rather not use.

“This is one area where choice and variety is not necessarily a bad thing,” says Battista. “Users can often benefit from using apps they’re already used to . . . rather than being provided with a clunky enterprise alternative. There can be surprising uses for apps that IT never even thought of, so it helps to collaborate with users. When awesome app use cases are identified, IT can help make them more widespread by informing the user groups that would benefit.”

Another way to encourage this type of collaboration and promote the use of certain apps is to implement an internal private app store. Battista says that a private app store can “suggest a set of apps that integrate with existing services, as well as with each other,” which means you won’t have to worry about building new support capabilities into your existing infrastructure. A private app store also lets you curate the selection. You can have your IT team test certain applications, make sure they work well in your business environment, and then push them out to users.

Battista emphasizes the importance of not burdening your employees with company controls. You want your employees to use their devices for business, especially if they travel regularly, because they’ll always have access to potential sales tools and will be able to promote company growth. “There are security and support issues to work out, of course, but again I’d flip the traditional thinking on its head,” says Battista. “Instead of asking ‘how can we . . . lock down all apps except the ones we approve of,’ ask ‘how can we enable safe use of the apps people are already using to do their jobs better?’” ●



# Smartphone Tips

A Roundup Of Shortcuts & Other Swift Moves

## WINDOWS PHONE

### SPECIAL CHARACTERS WITHOUT SWITCHING KEYBOARDS

► If you're typing and need to insert just the occasional special character, you can do so without switching to a different keyboard. Press and hold the Numbers And Symbols (&123) key and, without removing your finger from the screen, move your fingertip until it lands on the character you wish to type. The Numbers And Symbols key is also helpful when you need to enter an email address or website URL and the .com and @ keys are not present on the keyboard.

### TAKE ADVANTAGE OF AUTO-CORRECT

► As with other mobile operating systems, Windows Phone offers numerous automatic text correction features that are designed to speed up typing. When you reach the end of a sentence, for example, tap Space twice to automatically place a period at the end of the sentence and capitalize the next word if you should decide to type another sentence. Windows Phone also adds accents and apostrophes where it seems they might be needed (for example, it will change "werent" to "weren't," and will even try to determine whether the word "well" is meant to be left as it is or changed to "we'll"). As you type words that Windows Phone doesn't recognize, the OS might try to change them; this can be annoying, but it can also be helpful if you are typing unusual words you intend to type again because Windows Phone will add them to its dictionary. If you should ever need to reset the dictionary, access Settings and tap Keyboard, Advanced, and Reset Suggestions.

### DELETE EMAIL IN BULK

► To quickly delete a single email, on Start tap an email account that has the unwanted email(s), tap the email you want to delete, and then tap Delete. To trash multiple emails simultaneously, tap to the left of the email author to display a row of checkboxes beside each email. Next, tap the checkboxes that correspond to each email you want to delete and then tap the Delete (trash can) icon to complete the operation.



ANDROID

Snap photos while  
capturing video

ACCOMPLISH TWO THINGS  
AT ONCE: SNAP A PHOTO  
WHILE TAKING A VIDEO

► Your particular phone may not support this feature, but Android 4 has the ability to perform dual image captures. When you're using your phone to record video, you can tap the screen and a hi-res still image will be shot at the same time, without pausing the video recording. Android will save the still image to your photo gallery.

SWITCH QUICKLY  
BETWEEN APPS

► Tiny screen sizes aside, smartphones continue to become increasingly similar to full-sized computers in terms of their capabilities. Case in point: task switching. To switch between apps that are currently running on an Android 4.x smartphone, tap the Recent Apps icon (two overlapping horizontal rectangles), slide down if necessary to find the app you're looking for, and tap that app's thumbnail.

CREATE SHORTCUTS FOR FREQUENTLY USED APPS

► Whether you have 20 apps or dozens of apps installed on your Android smartphone, it can be useful to create shortcuts to the ones you use most often. To begin, access the Applications menu, press the Home button, swipe to access the right screen, tap the Apps icon, and locate the app you want to add as a favorite. Tap and hold that application icon and then drag it to wherever you would like it to appear on the Home screen.

DELETE APP SHORTCUTS

► Whether you have 20 apps or dozens of apps installed on your Android smartphone, it can be useful to create shortcuts to the ones you use most often. To begin, access the Applications menu, press the Home button, swipe to access the right screen, tap the Apps icon, and locate the app you want to add as a favorite. Tap and hold that application icon and then drag it to wherever you would like it to appear on the Home screen.

USE GOOGLE NOW  
TO SEARCH QUICKLY

► With the Google Now app installed on your Android smartphone, you can quickly search your device or the Web by either typing or speaking a search query. Google recently updated the app based on user feedback, so now in addition to being able to search for such things as certain contacts or Web destinations, you can ask for information that pertains specifically to your recent activities and upcoming plans, provided you have used Google services to keep track of these things. Here are some of the query formats available, according to Google:

- "What is my flight status?" will keep you abreast of current and upcoming flight statuses based on real-time information
- "Where are my purchases?" will serve up current tracking and delivery information about recent purchases
- "What are my plans for . . .?" will summarize your agenda for the next day, a specific date, or whatever point in time you ask about



The Samsung Galaxy S5 (shown here), which is set for release in June, runs the Android 4.4.2 (aka Kitkat) operating system; the earlier Galaxy S4 runs 4.2.2. (Jellybean). Our tips apply to both operating systems.

## BLACKBERRY

### QUICK KEY SHORTCUTS

► There are dozens of shortcuts in BlackBerry 10 that let you type specific words or press certain keys to quickly perform an associated action. Here are some single-key shortcuts that are especially handy for business users.

#### Calendar

*A* - switch to agenda view  
*C* - create new calendar item  
*D* - switch to schedule view  
*M* - switch to month view  
*S* - search calendar items  
*T* - switch to current day  
*W* - switch to week view

#### Contacts

*B* - jump to bottom of contact info  
*E* - edit contact information  
*T* - jump to top of contact info

#### Web Browser

*H* - access browsing history  
*I* - zoom in  
*K* - access bookmarks  
*L* - refresh the Web page  
*N* - go to next page (forward)  
*O* - zoom out  
*P* - go to previous page (back)  
*S* - search for text on a Web page

### USE BROWSER SHORTCUTS TO NAVIGATE QUICKLY

► The browser included with BlackBerry 10 features numerous single- and double-key shortcuts you can use to move around quickly within the browser. The browser included with BlackBerry 10 features numerous single- and double-key shortcuts you can use to move around quickly within the browser. Below is a list of a few shortcuts we think you'll find most handy. Most are easy to remember, with the letter corresponding to the action. Refresh and bookmarks, though? They just require some memorization.

*L* - Refresh the Web page  
*I* - Zoom in on a page  
*O* - Zoom out on a page  
*R* - View the page in "reader" mode  
*S* - Search for text on a page  
*N* - Forward to the next Web page  
*P* - Back to the previous Web page  
*K* - Access your bookmarks  
*H* - View your browsing history

### FILTER CONTACTS FOR QUICKER ACCESS

► The Contacts app in BlackBerry 10 does an excellent job of bringing all of your contacts together into one place. You can even tap into social media contact information to access photos that you can then use as the main photo for a given contact. After you import contacts from multiple sources, however, you might find that some people have been pulled into your contact lists who you don't want in that list, particularly if you follow numerous people via social media who you don't know personally. One way to filter these people out is to open Contacts, swipe down to access Settings, find Show Accounts In Contact List, and switch an account type to Off; you can hide Twitter contacts in this way, for example.

Another technique for filtering contacts in BlackBerry 10 is to limit the view to show only those contacts you typically connect with, say, via BBM (BlackBerry Messenger). With the Contacts app open, tap the Contact icon and then tap to choose the set of contacts you want to view. When you're looking at any set of contacts (whether it be all contacts, all Facebook contacts, or some other view), you can organize them further by accessing Settings and changing the option under Sort Contacts By to First Name, Last Name, or Company Name.



If you're using a BlackBerry 10 (such as the Q10 shown here) smartphone with a physical keyboard, browser shortcuts can come in handy.

Keyboard shortcuts  
let you navigate quickly

iOS

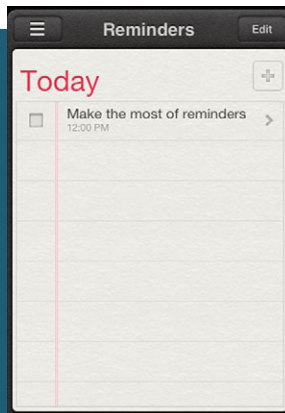
### QUICKLY ENTER .COM & OTHER DOMAINS

► Beginning with iOS 7, the Safari browser no longer has a .com key for quickly entering a domain. With iOS 7, when you type a Web address directly into the address bar, as soon as you reach the point at which you need to enter a domain simply tap and hold the period key. This brings up a small menu that lets you choose from a short list of common domains: .com, .us, .org, .edu, and .net. If the website you want to visit uses a different domain, you'll have to type it manually.

### QUICK KEYBOARDING TIPS

► Having to enter a submenu just to access the apostrophe really muddles typing words with apostrophes, such as the conjunctions it's, we'll, we're, and they're. Often times, your iPhone automatically suggests the appropriate word, which lets you press the Space key to input it. When auto suggest utterly fails to read your mind, however, you can type certain words a certain way to get auto suggest to display the word you want. To type it's, we'll, we're, or they're, just type **itss**, **welll**, **weree**, and **theyrr**, respectively, followed by a Space.

There are tricks for  
quicker typing in iOS



The Reminders app is part of iOS and integrates with your Microsoft Outlook Tasks.

### MAKE THE MOST OF REMINDERS

► The Reminders app, which is native in (or built into) Apple iOS 6 and later, can help you keep track of day-to-day to-do items as well as tasks associated with projects you are managing or tracking through Microsoft Outlook.

#### Works With Outlook

If your iPhone is set up to work with Microsoft Exchange, the Reminders app will automatically sync with Outlook's Tasks feature. You can view Outlook tasks (along with all of their associated details) in the Reminders app, and likewise you can see tasks you add to the Reminders app on-the-fly when you return to your computer's Outlook program. The Tasks list is the default list in the Reminders app; you can create additional lists, which will automatically sync with Outlook as well.

#### Establish Sync Preferences

Access your iPhone's settings, scroll down, and tap Reminders. Here you will see the period of time the Reminders app will cover when syncing with Exchange. Tap Sync if you would like to change the time period. Options are 2 weeks back, 1 month back, 3 months back, 6 months back, or all reminders; tap one of these options, tap the Reminders button to go back, and tap the Settings button to return to the main settings screen.

#### Add, Modify & Delete Reminders

To add a reminder, open the app, tap the Add icon (plus sign), and type the reminder text. Tap Done or, if you have another reminder to add, tap Return and enter the text for the next reminder. Tap any reminder in any list to modify it (set a reminder notification or due date, set the reminder to repeat, etc.) or delete it (swiping to the right and tapping Delete also works).



# DIGITAL *Diversions*

The Latest Premium Electronics



## ASUS ET2702IGTH ALL-IN-ONE PC

► Especially where the eyes are concerned, Asus' ET2702IGTH All-In-One PC (\$1,899; [www.asus.com](http://www.asus.com)) may be the epitome of a "digital diversion" due to its sprawling 27-inch screen. Beyond supporting 10-point multi-touch input, the display offers a 2,560 x 1,440 WQHD experience that, by nearly all accounts, is visually crisp, colorful, and tantalizing. This all-in-one doesn't just go easy on the eyes, though; it also entices the ears via audio that Asus SonicMaster technology enhances. Combine all this with the prowess of a 4th Gen Intel Core processor, AMD Radeon HD8890A 2GB onboard graphics, and integrated 802.11ac Wi-Fi support and the system is also strong on performance. Versatility is another trademark, as the ET2702IGTH's integrated Blu-ray Disc combo drive (with select models) and bevy of ports would indicate. Ports include HDMI in and out options, so users can connect a game console or set-top box to the system for viewing, use the ET2702IGTH screen as a display when connected to another system, or use the All-In-One as a standalone HDTV using an optional built-in TV tuner.

### ADATA DASHDRIVE ELITE UE700

► “Neat. Sweet. Complete.” That’s how ADATA ([www.adata.com](http://www.adata.com)) describes its DashDrive Elite UE700 (starting at about \$27). Sleek in shape (the drive measures just 2.5 x 0.8 x 0.3 inches), stately in appearance (a brushed-aluminum exterior gives the UE700 an appreciated touch of class), and matter-of-fact in approach (a blue LED indicator lets you know when the drive is in use), the DashDrive Elite UE700 presents an aura that it’s here to do business. The drive is available in 16GB, 32GB, 64GB and 128GB storage options. The 128GB model offers fast data transfers, with 220MBps read speeds and 135MBps write speeds, and includes support for Windows XP/Vista/7/8 and Mac OS 9.X or higher operating systems without the need for a driver installation. When not in use, the Elite UE700’s connector retracts into the main body for extra protection. For convenience, a loop in the drive’s body lets users connect it to a lanyard (included) or keychain.



### CREATIVE HITZ WP380 WIRELESS HEADSET

► For traveling purposes, it’s hard to beat a pair of wire-free headphones that fold neatly when it comes time to stow them. Creative’s Hitz WP380 wireless headset (\$99.99; [www.creative.com](http://www.creative.com)) offers this exact convenience and more. The Hitz WP380 includes 34mm neodymium magnet drivers and uses high-definition aptX and AAC audio codecs to bolster audio quality and combat latency. A host of connectivity features includes ShareMe technology (which lets you link to another set of ShareMe-enabled headphones and share audio from the same smart device), Tap & Play NFC (near field communication), and Creative Multipoint (which enables you to connect to two Bluetooth devices simultaneously). ClearSpeech Engine technology, meanwhile, works with a battery-powered integrated microphone to subdue external noise and digitally enhance conversations. The headphones also work without battery power in passive mode, connecting to devices with a detachable cord (included) that is flat and resists tangles.



# The World Of Connected Vehicles

## Auto Manufacturers Announce Web-Based Features In Future Models

The Internet is readily available in most places when we need it. In the modern home and office, online connectivity is a given, and smartphones have made it possible to access the Web when you're on the go. But there's one place where smartphone use isn't convenient and is often dangerous: your vehicle. The connected car is the next frontier when it comes to broadband Internet access, and a number of automotive manufacturers

have recently announced Web-based features for future lineups. U.S. buyers are taking note too, as more than half (59%) say that in-vehicle technology was an important factor when purchasing a new vehicle within the past year, according to a report from the Consumer Electronics Association. Forty-two percent of those surveyed also intend to purchase an in-vehicle technology device or accessory in the next year. Here, we'll examine the

ways network connectivity might be integrated into your next vehicle.

### OVERCOMING CAR CONSTRAINTS

Obviously, any application that's integrated into a vehicle must be designed so that it doesn't distract the driver. As such, connected features need to provide timely, actionable information or data on demand without physical input from the driver. It

### Key Points

More than half of U.S. buyers report that in-vehicle technology was an important factor when making a new vehicle purchase within the past year.

Many current connected car implementations use a mix of voice and dashboard controls, but future HMI (human machine interface) designs could be very different.

The integration of V2V (vehicle-to-vehicle) communication into future vehicles could provide significant benefits with respect to crash reduction.

The next generation of vehicles will be a good barometer of how well auto manufacturers have been able to integrate online connectivity with controls that let drivers keep their eyes on the road.



is a much different experience than what you have come to expect from a smartphone or tablet. According to the tech research firm Gartner ([www.gartner.com](http://www.gartner.com)), "It's not about Internet browsing in the car and instead about Internet snacking. That means getting the right amount of information contextualized at the right time." For instance, some examples of quick, practical features could be an alert about an upcoming traffic jam displayed in the vehicle's instrument cluster, the ability to select an Internet radio station via voice command, or a vehicle's capability to read text messages aloud.



Select Chevrolet models equipped with MyLink technology will let you view and download apps from the dash.

Embedded connectivity has been around since General Motors launched its OnStar service in 1996, but the ability to affordably incorporate high-speed mobile broadband changes what car manufacturers can do. At the Consumer Electronics Show in January, GM announced its AppShop and built-in LTE (Long-Term Evolution) connectivity for select 2015 Chevrolet models with MyLink technology. From the MyLink screen, you'll be able to view available apps and download them directly to your vehicle. Chevrolet indicated that the apps will let you connect with things like online music, news, weather reports, travel information services, and current vehicle data.

Imagine the benefits of a car that could self-diagnose a problem, inform you of the nearest repair shop, and let you schedule a dealer service appointment through the dash. Thilo Koslowski, vice president and distinguished analyst at Gartner, says, "What we're seeing now is that some car manufacturers are beginning to really think about how they can create completely different experiences in the car that are connected and Internet-enabled. The features go beyond the radio streaming and location-based services of the past."

For example, the OAA (Open Automotive Alliance) was recently established to help create better integration between cars and Android devices, as well as to improve how the car itself can function as an Android device. "The OAA is aimed at fostering Android mobile devices and ecosystems in the car, as well as new features to facilitate the use of Android as an embedded vehicle OS," says Dominique Bonte, vice president and group director at ABI Research ([www.abiresearch.com](http://www.abiresearch.com)). The car manufacturers that have joined the OAA currently include Audi, GM, Honda, and Hyundai.

## COMMAND & CONTROL

For drivers to effectively take advantage of connected features, car manufacturers must further develop the way we issue commands to a vehicle. Automotive designers call this process HMI (human machine interface). Currently, most connected car implementations utilize a mix of voice and dashboard controls, but future HMI designs could be very different.

"It's going to be a combination of all kinds of user interface technology, such as haptic feedback and gesture recognition," says Koslowski. For instance, cameras inside the car could monitor your hand and finger gestures, so a physical cue would tell the car to skip

a song, bring up the next turn in a selected route, or turn on voice recognition. Voice control is one area where app developers will likely have control of what you'll need to say to activate a given feature. It will be up to the app developers to come up with voice commands that are easy to remember while you're busy driving the car.

Advanced driver assistance commands will likely be used in conjunction with traditional dashboard controls. "Physical buttons will also be key, because in a vehicle environment you can repeat muscle memory and know that a certain function will operate when you press a button," says Koslowski. "With physical buttons, you'll also receive feedback that you've actually pressed the button—that's unbeatable."

When it comes to future HMI tech, car companies are testing different implementations. "Both gesture control and the use of eye movement/focus are being actively explored by companies such as Visteon and Continental AG," Bonte says. "Audi has showcased its next-generation user interface and predictive user experience approach." Continental is taking what it calls a holistic approach to HMI. For example, interior cameras can monitor the driver's head and viewing angle, and if there's a danger the driver might not see, the car can activate acoustic and haptic warnings that alert him to the problem.

## COMMUNICATIONS

Some car manufacturers have created ways to utilize mobile devices in vehicles. For instance, Ford's SYNC AppLink connects to your smartphone through Bluetooth (for Android and BlackBerry devices) or USB (for iPhones). You can control apps through voice commands or the vehicle's dashboard. SYNC AppLink only works with apps that have been certified SYNC AppLink-compatible. Some examples of popular Android

applications include Amazon Cloud Player, AT&T Navigator, iHeart-Auto, Pandora, Scout by Telenav, and Slacker Personal Radio. iPhone users can access MLB.com At Bat, NPR News, Pandora, Spotify, and USA TODAY, among others.

“Automotive app stores are quickly becoming mainstream, with GM OnStar announcing its AppShop, Ford extending AppLink, and all other car original equipment manufacturers showcasing their apps approach at CES 2014,” says Bonte. Another example of smartphone integration in automobiles is Jaguar Land Rover’s InControl Apps. The first wave of apps for InControl include iHeart Radio, Stitcher, Glympse, Parkopedia, Cityseeker, and AirMotion News. InControl Apps can run on Android or Apple smartphones, and InControl can transfer the app’s interface to the in-car touchscreen.

In the future, app designers will likely be working hand in hand with car manufacturers to implement the technology in a way that works best. One such method could be HTML5. Bonte says, “HTML5 apps are gaining momentum, with Abalta Technologies and Delphi showing a low-cost head unit implementation, while Mazda announced a partnership with OpenCar for tools to facilitate HTML5 application development, optimization, and branding.” TeleNav has also recently showcased an HTML5 navigation app. We’ll point out that these are some of the first HTML5 apps to be developed for vehicles.

### CONNECTED CARS THAT KEEP YOU SAFE

Safety features are among the most important in any car, and advancements in environmental sensors, electronics, and connectivity make it possible to significantly improve vehicle safety. The United States NHTSA (National Highway Traffic Safety Administration) is working on



Continental is working on a holistic HMI (human machine interface) that uses interior cameras to monitor the driver’s head and viewing angle. The car’s detection technology could alert the driver to dangers where they aren’t looking.

integrating V2V (vehicle-to-vehicle) communication into future cars. With V2V, cars broadcast a BSM (basic safety message) with safety-related information, such as speed and location, 10 times per second. Your vehicle can receive this information and analyze the data to determine whether you’re at risk.

Recently, the NHTSA performed a real-world test of V2V with nearly 3,000 vehicles in Ann Arbor, Mich. NHTSA communications director Nathan Naylor says, “Our research indicates that various applications enabled by V2V technology could provide significant benefits with respect to crash reduction.” For those concerned about privacy, V2V will not involve exchanging or recording personal information or tracking your car’s movement. “The information sent between vehicles does not identify those vehicles, but merely contains basic safety data,” Naylor says.

V2V can improve more than vehicle safety. “We believe future applications

will be developed that could lead to reduced congestion and improved mobility,” Naylor says.

Automotive supplier Continental is working with IBM to identify ways vehicle electronics can improve the safety, economy, and comfort of driving. In a January press release, Continental explains, “In the future, the Connected Electronic Horizon will add sensor data from networked vehicles to static card data.” The information could allow cars to “see” where you can’t, as well as collect data that all connected vehicles could access in real time. “The car could . . . tell you things like when a stoplight is changing or the speed you will need to maintain to have a smooth, continuous drive,” says Koslowski.

In-car technology may also help drivers detect nearby motorcyclists and pedestrians. Continental recently started installing a stereo camera system (two high-resolution CMOS [complementary metal-oxide

## PERSONAL ELECTRONICS TECH FOR HOME & LEISURE

semiconductor] cameras) that can measure distances to road obstructions, such as pedestrians, and apply an emergency brake to avoid an accident. Honda also recently announced it has been researching V2P (vehicle-to-pedestrian) and V2M (vehicle-to-motorcycle) technologies that will help protect everyone on the roadway. Honda recently introduced a Forward Collision Warning system on Honda and Acura models that uses a camera situated behind

the windshield to warn the driver of potential collisions.

### CAR IMPROVEMENTS

The next generation of vehicles will be a good barometer of how well car manufacturers have been able to integrate online connectivity with HMI controls that let you keep your eyes on the road. There are many potential hang-ups that could delay adoption, including government safety regulations and conflicts between technology

companies and car manufacturers. At the very least, the initial wave of connected cars will include several popular entertainment apps found on smartphones and tablets. Already available in cars and on phones, navigation tools should be greatly improved, too. Consumer cars may not be driving themselves anytime soon, but if you're in the market for a new vehicle, it would certainly be smart to pay attention to what types of connected car capabilities are available. ●

## SPECS IN MOTION

The connected features in vehicles are evolving quickly. The following chart briefly sums up what you can expect from some of the leading vehicle manufacturers.

	Audi Connect	Apple CarPlay	BMW ConnectedDrive	Ford SYNC AppLink	General Motors AppShop	Jaguar/Land Rover InControl	Mercedes-Benz Digital DriveStyle
<b>Cost</b>	Cost varies by data plan	Free with iOS device	Cost varies by service selected	Free with compatible devices	Cost varies by OnStar 4G LTE data plan	Free with compatible vehicles	Free with iOS device
<b>Controls</b>	Voice commands, in-car display	Voice commands and text input via iOS device	Voice commands, in-car display	Voice commands, in-car display	Voice commands, in-car display	In-car display	In-car display
<b>Communications</b>	Text function	Voice calls, send and read text messages	BMW ConnectedDrive Services	Voice calls and audible text messages	None	Voice call, Mobile Day for conference calls	None
<b>Vehicle Data Monitoring</b>	None	None	Remote services	Vehicle Health Report	Vehicle Health App	None	Roadside Assistance
<b>Navigation</b>	Audi MMI navigation	CarPlay Supported GPS tools	BMW Routes, real-time traffic	Sync Navigation (subscription fee)	Through OnStar	INRIX, Sygic	Navigon
<b>Travel</b>	In-vehicle destination search, Google Local Search	CarPlay supported apps	BMW Concierge Services	SYNC AppLink supported apps	The Weather Channel, PriceLine.com, Eventseeker, Glympse, Cityseeker	Glympse, Parkopedia, Hotelseeker, Cityseeker	Glympse
<b>Entertainment</b>	Supported Audi Connect services	CarPlay supported apps	BMW Online Entertainment	SYNC AppLink supported apps	iHeartRadio, NPR, Slacker Radio, TuneIn Radio	Winston, Airmotion, iHeartRadio for auto	AUPEOI, Facebook, Twitter, Internet Radio
<b>How It's Different</b>	Select Audi vehicles can function as Wi-Fi hotspot	iOS for use in the car	BMW offers a variety of services, and it also works with iOS devices.	Works with Android, BlackBerry, and iOS	You can download the apps you want to use in-car	Pairs with existing Android and iOS smartphone	All compatible apps are part of Mercedes-Benz Digital DriveStyle app





# Mobile Data Best Practices **SYNC & BACKUP OPTIONS FOR YOUR TRAVELS**

THE THEFT OR LOSS OF A LAPTOP, tablet, smartphone, or other mobile device ranks among the worst productivity catastrophes that can befall a traveling professional. For all intents and purposes, our devices are our offices when we travel, and losing them disrupts our ability to work and communicate. There is an obvious financial hit associated with the loss of hardware, but there is a potentially greater hit that occurs in the loss of corporate data. It's important, then, to know where your data is at all times, so in the event that you no longer have access to your devices, you'll know what is lost and what is accessible elsewhere. And, if you follow a few mobile best practices, you'll never

have to worry about losing much data at all—if any.

## ► KNOW WHAT GETS BACKED UP AUTOMATICALLY

Depending on your smartphone's or tablet's operating system, there is a certain amount of device data that automatically gets backed up on a regular basis. If you use a USB cable to directly sync your iPhone or iPad with your computer, for example, the sync process backs up all of the OS and app data stored on that device; there is an option to encrypt and password-protect the backed-up data, too. If you use the iCloud service with your iOS device, specific sets of data will automatically be backed up in the

background as long as your device has a Wi-Fi Internet connection, is plugged into a power source, and has a locked screen; backed up data can include camera roll images, documents, audio, and settings, depending on the options you choose.

Android users can manage incremental backups for apps and device settings by signing into the associated Google Account from the smartphone or tablet. The Android Auto Sync feature routinely syncs in the background; how and what it syncs partly depends on the options you choose, but by default the feature backs up OS data, contact information, documents, and select app data (such as Facebook and Twitter).

If you have a device running one of the latest versions of Windows Phone, you can sync documents stored on your device with Microsoft's OneDrive cloud storage solution; you can also retrieve documents from OneDrive that were uploaded from a different source. To sync all of the photos, audio files, and videos stored on your Windows Phone device, you must install Microsoft's Zune software on your computer and connect the mobile device to the computer via USB.

### ► DON'T FORGET YOUR APP DATA

"App data" encompasses a broad range of digital information, but in our context it means third-party apps and the content you create using those apps. Consider, for instance, note-taking services that exist as both cloud services (where all of the information associated with those services is stored in the cloud) and applications (where your app-related information is stored locally). As you take notes with the app, it stores those notes locally and in the cloud simultaneously and in real-time. Such an app-service combination is different from a note-taking app that does not have an associated cloud service; with this type of app, everything you add is stored only in the device and is therefore vulnerable to loss. Make sure you know how your apps work so you don't get caught unawares.

Also keep in mind that some apps are more flexible than others. Apple's Notes app in iOS, for example, can keep your notes on the device only or on both the device and in the cloud, depending on how you set it up.

### ► BE CAREFUL WHEN TRAVELING

If you travel frequently, you probably have quite a few travel-related routines. When it comes to keeping all of your data intact, though, it's important to remember that travel disrupts the routines you've established at the office. For example, if you regularly sync your tablet and smartphone with your computer but typically leave the computer behind when traveling, the backup that otherwise occurs with every physical sync won't take place during your travels. If you keep that sort of thing in mind while traveling, you will remain aware of what data resides in the "danger zone" (i.e., stored on your device, but not backed up anywhere else) in the event your device gets lost or stolen.

### ► USE CLOUD SERVICES, AT LEAST TEMPORARILY

If you're reluctant to sync key data to a cloud backup or storage service on a regular basis, consider using an alternative cloud solution—at least temporarily—to meet specific requirements while traveling. For example,

you could set up an account with a major online storage provider to use with only a handful of files that are necessary for a specific trip. Providers offering this type of service typically also offer a mobile app that makes the service more useful on your mobile device. And some major storage services also sync with productivity apps you might already have installed on your devices.

Another stop-gap alternative is to use a Web-based email service to email documents to and from a corporate account. Doing this ensures that a copy of the document is maintained on the corporate network even after you delete the associated email from the Web email account.

### ► PHYSICAL BACKUP

Finally, you can't sync a certain amount of valuable device data to the cloud (or to your main computer via the cloud), so be sure to back up that data as often as possible to a second device (such as a laptop) or storage solution (such as a microSD card or portable hard drive). ●



► To locate the Storage & Backup menu on your iOS device, tap Settings, iCloud, and Storage & Backup. From this screen you can view available storage and switch iCloud off and on.

◀ You can customize which apps are backed up in iCloud by toggling the ON/OFF button next to each app. Be sure to activate the Find My iPad feature in case you need to locate a lost iOS device.





# Quick Cloud Collaboration **KEEPS PROJECTS IN SYNC**

AS THE NUMBER OF EMPLOYEES doing business outside the walls of the traditional office environment increases, companies of all sizes are adopting new ways of getting work done. Namely, they're moving toward more flexible, efficient cloud-based services. Although the purposes of online SaaS (software as a service) options vary, users are taking advantage of seamless conferencing, file sharing, idea generating, and so much more. Read on to find a service that suits your collaborative needs.

## ► TAKE DOCUMENTS OFFLINE

It seems inevitable that wireless Internet availability determines when and where you edit online documents while you are on the road. But with the help of the right device-specific offline app, you don't have to postpone work

until you are within range of a Wi-Fi hotspot. Some basic apps primarily let you read docs offline, whereas more feature-packed options let you edit and save changes to collaborative documents, spreadsheets, and presentations. Microsoft, for instance, provides a solution for offline workers through Office 365's SharePoint Online ([office365.microsoft.com](http://office365.microsoft.com)). Using the program's MySite tool, you can create copies of documents on your PC and work on them when you are offline. Then, when you connect to the cloud again, SharePoint automatically syncs your work.

## ► DON'T FORGET YOUR WEBCAM

Collaboration is accomplished on an international level these days, which means that face-to-face conversations with globetrotting team members are

commonly conducted via LCD touchscreens. Whether you're working on a smartphone, tablet, laptop, or PC, using your webcam as a collaboration tool connects you to colleagues and clients more intimately than the routine conference call. We suggest using a videoconferencing app or software that supports multiuser conversations. Some options let you incorporate shared whiteboards and simultaneous document editing.

## ► CONSIDER USING FILE-SHARING TOOLS

If you need to share documents that don't contain particularly sensitive data, you can do so using a file-sharing service. Most file-sharing services let you securely upload and store a limited number of gigabytes (2 to 5GB is common) of data. Some services also give you the tools to organize your files. Sharing from



your mobile device makes on-the-go collaboration convenient, so it's beneficial to check out file-sharing apps appropriate for your device.

### ► CONSIDER ONLINE PRODUCTIVITY TOOLS

A plethora of Web apps fall under the umbrella of "productivity," but in no way is that a bad thing because there is an app for practically every task, priority, project, and goal. For instance, you can use project management tools to juggle deadlines, manage to-do lists, track workflows, and more. Adding to these capabilities, Microsoft Office 365 gives team members shared access to master documents via user-created intranet sites, so they can edit in real-time and manage file access among customers and partners.

### ► USE WHITEBOARDS

When you can't meet in person, you and your virtual team can interact and brainstorm on full-featured online whiteboards. Browser-based whiteboards typically let you invite meeting participants to create and sketch on the same board. A number of whiteboard apps also support real-time collaboration in which everyone in the session is an equal participant. This is a good tool for tablet users who want to share ideas on the go but need input from others.

### ► ACCOMPLISH MORE WITH WEB APPS THAT COMBINE DIFFERENT CAPABILITIES

Multitaskers take note: Not only can you collaborate with more team members in the cloud than ever before, but you can also complete more tasks within the same service. Want to walk your team through a live slideshow from a presentation sharing service? No problem. Need to create flow diagrams and share relevant images with your colleagues online? There's a service for that. And, if your team and a third-party developer are working on a website, for example, you can work together in a virtual space where anyone can add comments, crop images, and more.

12/14/2010

### Sale Prices

Contoso Hotel - Chicago agrees to purchase Fabrikam furniture according to the following prices:

Furniture	Price	Quantity
King-size Bed	\$8,100	40
Queen-size Bed	\$7,500	50
3-drawer Chest	\$2,000	7
Ottoman	\$450	85

Cost of Sale

Authors editing this document

Contoso Hotel - Chicago agrees to purchase Fabrikam for furniture purchased within 60 days of placing an order based on the following prices:

With a cloud service such as Microsoft Office 365, you can co-author Word documents, Excel sheets, and other files with colleagues. Unlike traditional Office products, you don't have to save a separate version for yourself or wait until another person closes the file.

Microsoft Office

OneNote: + New page, All. Includes: Microsoft Office on Windows Phone 7, Using OneNote, School Supplies, Shopping list, Bills to pay this month, Colors.

Documents: + New document. Includes: Budget details, Half Yearly Sales Report, Marketing plan, Job waiver, Interview questions.

SharePoint: All. Includes: Introduction to Sales Presentations, Handbook, Tag Team Site, Specifications, Contract templates and forms, Marketing, Returning devices.

If you're a Windows Phone user, you can easily access Office 365 apps from your device. Specifically, you can start a new OneNote page, create a new Office document, or edit files saved in SharePoint.

### ► MANAGE TIME & TASKS

Organizing schedules and all the associated meetings, deadlines, projects, and so forth can become a daunting task. Among the available cloud-based sites and mobile device apps, you can find apps and services that will help you manage your work life. Consider utilizing event-based planners, group-oriented reminder apps, services for meeting coordination, and visual to-do lists to keep your busy life on track.

### ► PRINT DOCUMENTS

When you need to print content from your mobile device, you can use one of many available apps to print documents to supported printers anywhere

in the world. For example, if you are working on a presentation on your tablet while traveling and need to distribute copies to colleagues, you can print the presentation to a printer in your main office. Some mobile printing apps let you search a directory for nearby printers (such as those in hotels or airports) or locate a printer via GPS, so if you need to print a boarding pass or other content from your device while traveling, you can do that, too. Some cloud-based printing apps and services also provide the option to print by sending an email attachment to a supported printer, or to print documents saved in an online storage service. ●



# PowerPoint Tips For **ADDING CHARTS & GRAPHS**

THE SCENARIO IS FAMILIAR to traveling professionals: your PowerPoint presentation is all set when new and relevant information comes to light and must be added. If you're on the road or in the sky and find yourself having to add charts or graphs to a PowerPoint presentation, this article will help. We include tips designed for PowerPoint novices and adept PowerPoint users seeking specific chart-making advice.

## ► CREATE A BASIC CHART OR GRAPH

To insert a colorful chart or graph illustration into your PowerPoint presentation, locate the Insert tab and select Chart. Next, look through the available chart types, select the design that best represents the information you want to share, and click OK. A Microsoft Excel chart will open with placeholder

text and figures you can replace with relevant data. When you finish entering information, click File and Close to open the finished chart in PowerPoint.

## ► SAVE & MANAGE CHART TEMPLATES

If you want to adjust the look of an existing chart, click the chart in the PowerPoint slide and the Chart Tools contextual tab appears. Keep in mind Chart Tools will only appear when you select a chart. Open the Design tab and you can manipulate the overall layout of a chart, adjust its style, and save it as a template for future presentations. To adjust the orientation, size, or spacing of a chart's data and graphical elements, expand the Charts Layouts pane and choose one of the nine layout options. You can also change chart elements and background

colors by selecting options from the Chart Styles section on the Design tab. When you've fashioned a chart you'd like to reuse, click the Save As Template button on the Design tab. Name the chart and PowerPoint saves it with the .CRTX file extension, which indicates it is a chart template.

## ► HIGHLIGHT IMPORTANT DATA IN A POWERPOINT CHART

Whether you're presenting numerous charts or need to add emphasis to specific data within a chart, sometimes it's beneficial to call out key points. Locate the Drawing pane in the Home tab and expand the Shapes menu. Select one that is appropriate for emphasizing information in your chart, and then click anywhere in the chart to place the shape. To customize the shape, select it and click the Shape Fill, Shape Outline, Shape

Effects, and Quick Styles options in the Drawing pane.

### ➤ INSERT A CHART THAT'S LINKED TO EXCEL

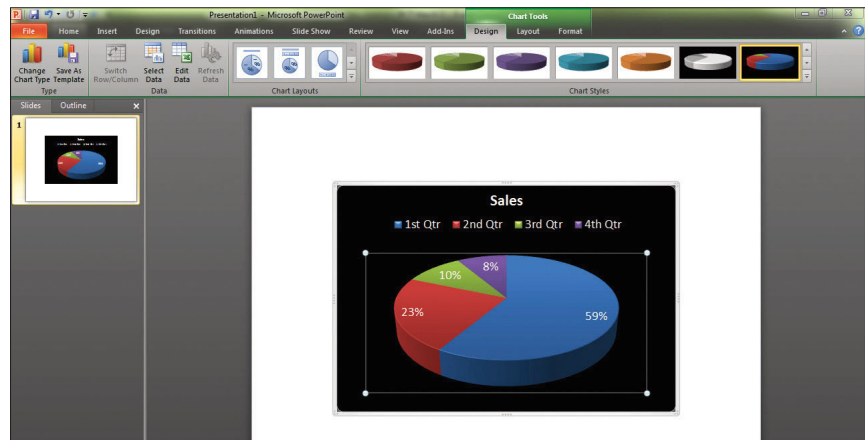
If you're used to working in Excel and prefer to construct the skeleton of your chart first, you can use Excel to compile data and create a chart for use in PowerPoint. Start by entering values in an Excel workbook. Highlight all necessary data cells, click Insert, and apply a preferred chart style in the Charts pane. Next, select the newly created chart and click Copy in the Home tab. Open a current or new PowerPoint slide and find the Clipboard pane. Click the Paste drop-down arrow and choose Keep Source Formatting & Link Data (to maintain the appearance of the Excel file) or Use Destination Theme & Link Data (to match the chart appearance with the presentation).

### ➤ EDIT & ADD LABELS

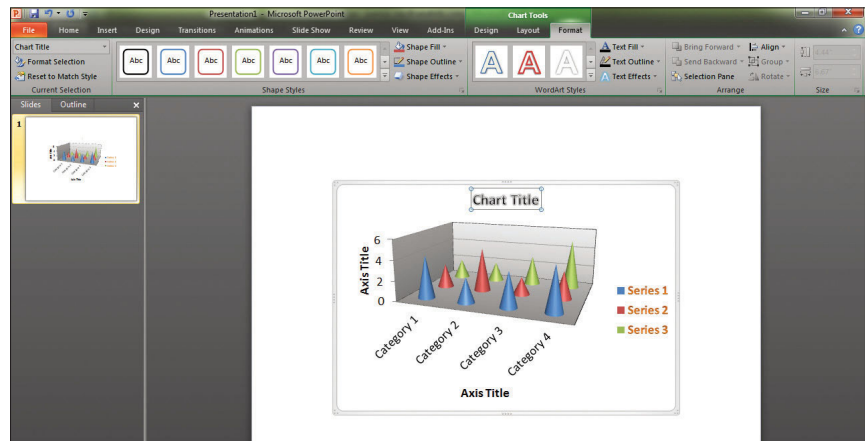
A chart that includes a lot of numbers or a detailed legend may require some editing, especially because you want it to look polished for presentation purposes. These fine-tuning tools are located in the Labels pane of the Layout tab on the Chart Tools contextual tab. If you notice that your chart is missing a title, you can add one by clicking Chart Title and selecting Centered Overlay Title or Above Chart—this displays a title at the top of the chart. You can browse the remaining label options to add axis titles, insert legend variations, and manipulate data.

### ➤ ADJUST STYLE & TEXT

To put the finishing touches of color and contrast on a chart, start by clicking the Format tab in the Chart Tools contextual tab. You can enhance backgrounds, category shapes, and 3D chart elements when you use options on the Shape Styles pane for each feature. Options on the WordArt Styles pane let you apply fill colors, outlines, and effects to chart text. To view every part of your chart (such as depth, floor, horizontal axis, side wall, and so on), click



Microsoft PowerPoint's Design tab in the Chart Tools contextual tab lets you modify the layout of your chart and adjust its style. These settings help you create one-of-a-kind charts and graphs that illuminate important statistics or values.



You can outline a graphical element, change its color, and add unique effects to a chart or graph all within PowerPoint. In addition, applying WordArt Styles will change the fill color, shade, and outline of selected text.

the drop-down arrow at the top of the Current Selection pane.

### ➤ MODIFY DATA IN AN EXISTING CHART

Regardless of whether you created your chart in Excel or PowerPoint, you should be able to modify data without much hassle. In PowerPoint, click the chart you intend to change and select the Design tab in the Chart Tools contextual tab. Next, click Edit Data in the Data pane. Excel opens the data sheet in a new window and from here you can click and edit individual cells. Simply closing the Excel file will refresh and save the new content.

### ➤ ADD ANIMATION

If you want to emphasize a particular data group, you can add animations to a graph or chart. Under the Animations tab, the Animation pane has approximately 30 default animations you can apply to a chart. Explore extra effects by clicking More Entrance Effects, More Emphasis Effects, or More Exit Effects at the bottom of the Animation menu. To stagger the animation of individual objects, click Effect Options and select one of the following functions: As One Object, By Series, By Category, Be Element In Series, or By Element In Category. ●





# Rootkit Attacks

## WHAT TO DO TO FIGHT BACK

EVEN SEEING THE WORD “rootkit” can send shivers up the spine of someone who has suffered through the inconvenience and damage a rootkit can exact. According to Dan Olds, principal at Gabriel Consulting Group ([www.gabrielconsultinggroup.com](http://www.gabrielconsultinggroup.com)), “rootkits are some of the most insidious and dangerous pieces of malware out there today.” That’s due to the fact that rootkits are both extremely difficult to detect and get rid of completely. Therefore, the more you know about rootkits, the better.

### ► WHAT IS A ROOTKIT?

A rootkit is software that infects and gains privileged access to a computer. “This means it can perform administrator-level type tasks,” says Michela Menting, senior analyst with ABI Research ([www.abiresearch.com](http://www.abiresearch.com)). “The

primary feature is that it can hide itself in the system and remain undetected.”

One way to think of how a rootkit wreaks havoc, says Jim O’Gorman, an instructor of offensive security measures, is to envision that you are driving a car but someone else is intercepting all your movements and deciding if he should pass them on to the car or not. “In some cases, he might decide to just insert some of his own commands, as well,” O’Gorman says.

Although rootkits are similar to viruses or Trojans, says Chris Hadnagy, a security training professional, viruses and Trojans usually delete data, stop services, or cause harm while a rootkit provides an attacker system access to get at data. Not all rootkits are malicious (a company might install one to remotely access and control employee computers, for example), however,

Menting says they are “extremely popular with malicious hackers and cyber criminals, which is why they have such a negative connotation.”

### ► THE DAMAGE DONE

Essentially, rootkits give an attacker free reign to perform any task desired, include installing software; deleting files; modifying programs; transmitting data; and using spyware to steal credit card numbers, passwords, keystrokes, etc. A rootkit’s ability to modify existing programs and processes, says Menting, enables it to avoid detection by security software that would normally catch such software.

“There really aren’t any limits to how much damage it can do to a PC,” Olds says. “It can delete data files and then rewrite gibberish on the hard drive to ensure that the data can’t be

recovered, or it can quietly work in the background and log user keystrokes, eventually capturing workplace, e-commerce, or banking usernames and passwords." Ultimately, a rootkit can route that data to a hacker "to plunder accounts or gain access to a corporate network," Olds says.

Beyond software-based rootkits there are hardware-based rootkits, says Hadnagy. "These, like software rootkits, give the attacker full admin access to a machine, compromising everything on it and even at times the network it's connected to," he says. For users, O'Gorman says a rootkit "destroys all trust with the computer. You can't know what is private, what is not. All integrity is gone."

#### ► HOW YOU'LL KNOW

There are several ways a rootkit can find its way into a computer. A downloaded program file a user believes to be legitimate, for example, may have a rootkit embedded within it. Menting says rootkits generally enter a system through existing vulnerabilities and are loaded by malware, which can infect computers via downloads, email attachments disguised as genuine communication or documents, websites with unpatched vulnerabilities, USB thumb drives, or mobile devices.

To the average user, abnormal computer behavior is the best indicator a rootkit might be present; warning signs include files spontaneously disappearing or appearing, a sluggish Internet connection, and slow-loading programs. Such behavior can indicate other programs are running in the background. Menting advises checking the Task Manager to detect which applications or processes are running and using significant memory. "For the non-tech user, it may be difficult to understand," she says. "But users should familiarize themselves with how their Task Manager looks when it's running on a clean system so that when it actually is infected, the user can spot some differences when looking at the tasks."



Unfortunately, "the likelihood of being hacked or unwittingly downloading malware on a computer is extremely high."

**Michela Menting**

senior analyst, ABI Research

That said, detecting a rootkit is still generally difficult. This is due to how adept they are at installing themselves and hiding their presence in a way that is "virtually undetectable by your system software," Olds says. "In this case, the only way to find the rootkit is to boot the system using a CD/DVD or thumb drive that has special diagnostic routines designed to find and remove rootkits." Hadnagy says if a system's OS is compromised, it can't be "trusted to find flaws in itself." In this event, it may be necessary to boot a self-contained OS running from a CD/DVD or USB drive and run malware detection and removal software from a "clean" environment.

#### ► WHAT TO DO

For typical users, arguably the worst news concerning rootkits is that getting rid of one can be beyond their scope. Olds says, in fact, most users should probably seek an expert's help if they suspect a rootkit infection. Though some security programs can detect and remove specific rootkits, Menting says, "there are so many variants that it can be impossible to detect and remove them all." Often, she says, getting rid of a rootkit "requires a radical solution."

If a user suspects a rootkit, he should first disconnect the system from the Internet to cut off possible remote access and prevent data from leaking, Menting says. Next, remove data from the infected computer and scan it for malware on another device. (Menting notes that if the data contains unknown [or zero-day] malware, this step may not guarantee the

malware is eradicated.) Finally, "the computer should be purged—wipe the hard drive and reinstall everything," she says. O'Gorman, in fact, says starting over is the only real solution, because "really, you can't trust cleanup methods, as you are never really sure if they worked."

#### ► HOW TO PROTECT YOURSELF

The first defense against rootkits (and malware in general) is keeping the operating system and all software—especially security software—up-to-date and fully patched. Completely relying on antivirus software is a mistake, however. As O'Gorman says, there's always a lag between the time a new threat pops up and the point at which antivirus software can detect it. "The best way to avoid issues is to not engage in risky activities," he says. "Run trustworthy, current software that's kept patched. Don't go to shady sites with out-of-date browsers and plugins. Don't run software that doesn't come from trustworthy sources."

Unfortunately, "the likelihood of being hacked or unwittingly downloading malware on a computer is extremely high," Menting says. "Especially in the network-connected environment of a company—even if you take all precautions necessary—someone else may not have and you get a virus from them internally."

Menting suggests using different passwords for all logins, encrypting sensitive and confidential data, staying constantly on the lookout for odd system behaviors, and securing mobile devices, particularly if they are connected to a company network or business computer. ●



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