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# **Block Chain Technology— The Enterprise Awaits**

*By Pete Harris*

## **Four Simple Steps to Transform Legacy Datacenters, Part 1: Sit Together**

*By Hans Ashlock*

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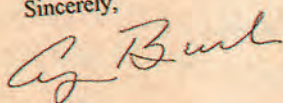
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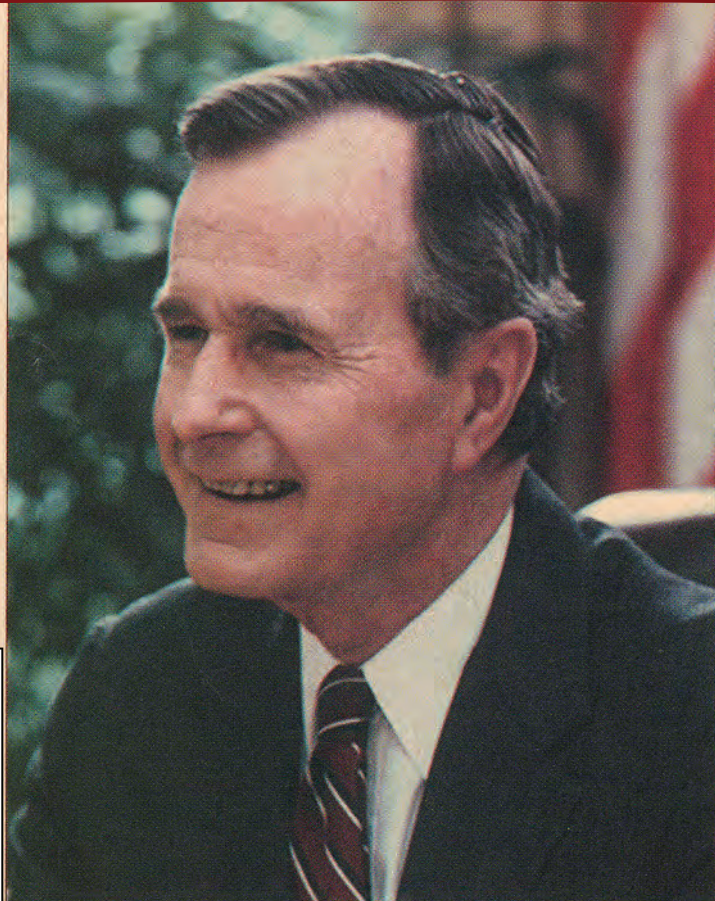
Thank you for inviting me to participate in the tenth anniversary celebration of NaSPA, The Association for Corporate Computing Technical Professionals, on May 6, 1996. I accept with pleasure and look forward to being with you and your industry colleagues in Orlando.

With my very best wishes,

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Mr. Scott Sherer



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## Message from the President

Well, the clocks have been turned back, holiday cookies are in the oven and Christmas carols are playing in the stores. Before we move away from the November holiday season, I want to express “Thanksgiving” for two valuable NaSPA corporate sponsors at **Auerbach Publishers** and **Cisco Press**. Without these folks, many of the best parts of this magazine would not be possible. As a case in point, in this issue you can feast on holiday delicacies like our cover story from noted author and expert Pete Harris. Pete walks us through the challenges that come with *Block Chain Technology* in an insightful article entitled *The IT Enterprise Awaits*. Changing your cloud provider? Find insightful tips in *Does Changing Your Cloud Provider Mean You’ve Failed?* by Penny Collen. Want to learn the basics of routing? Check out Part 1 of a two part series, *Network Routing Protocols and Methods* by Sean Wilkins. If you like these and our other articles why not visit the web sites of Auerbach and Cisco Press and find more. NaSPA members still get a 15% discount! Just click on their web site banners on [naspa.com](http://naspa.com) or in this magazine.

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In summary, look for more big changes here at NaSPA very soon. In the next 60 days we will have a brand new user interface on our already great Job Site for both employers and job seekers. We are in the early planning stages of NaSTEC 2016 set for Fall 2016, just in time for NaSPA’s 30th birthday. Are you interested in speaking, displaying or advertising at NaSTEC? It’s not too late to begin reaching out. Contact me directly at [president@naspa.com](mailto:president@naspa.com).

Perhaps the biggest change this year will be the introduction of NaSPA corporate memberships. That’s right, for the first time corporations engaged in Information Technology pursuits will be able to join NaSPA as corporate members and enjoy a whole suite of great benefits to help them recruit, advertise, network, write, speak and meaningfully engage NaSPA members. More details coming soon.

In the meantime have a wonderful Christmas and New Years holiday!

Leo A. Wrobel, President

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# Does Changing Your Cloud Provider Mean You've Failed?

By: Penny Collen, Financial Solutions Architect, Cloud Cruiser, Inc.

The cloud market, both public and private, is still changing. While there are definite industry leaders, (AWS, Microsoft, IBM, Google, and Salesforce), there are a multitude of providers in the marketplace today, each with unique services available. The way people interact with technology is evolving at an unprecedented pace. Other than agreeing the cloud market will experience massive growth globally, predicting what that market will look like, or what new features will dominate in five years is difficult.

One attractive aspect of public cloud is that it allows companies the ability to provision services without long-term commitment. But this perspective runs against the norms familiar to most CIO's. Unlike traditional IT where capital expenditures drive decisions favoring existing vendors, the cloud encourages companies to shop for the best resource provider for each workload. Provisioning decisions now involve capacity needs driven by seasonality or cyclical, not maximum service levels required over years. Things like spot markets where you can trade capacity a cup at a time were unheard of in the past. Flexibility makes cloud attractive and, by default, encourages companies to change vendors to find the best fit. Therefore, a certain amount of churn in your provisioning strategy should not be seen as an indication of failure.

Here are some factors contributing to companies changing providers:

## 1. Changes in available cloud providers

The cloud market, like any emerging market, is undergoing constant change. There are a number of new entrants in the mix, each with unique pricing plans and service offerings. There have been a number of CSP's that have been absorbed by others and a few who have gone out of business. The market is still consolidating as technology evolves. Mobile apps, the Internet of Things, and Big Data have all descended on or you could say risen to the cloud.

## 2. Cost savings

Many companies embraced the cloud based on early stories of cost savings. In many cases, savings were difficult to prove. Often there was not a good understanding of the cost of the internal infrastructures being replaced. This did not mean savings were not present but the companies were unable to provide compelling evidence of savings.

It was also hard to buy "like" services. Standard offerings from cloud providers often offered more features and functionality than an individual company currently provided. CSP's most likely had more service coverage, more highly skilled technicians, more back-up and recovery options, more security, and more frequent software upgrades. If the costs of these features were considered when evaluating cost savings, the CSP would often show greater savings.

## 3. Shadow IT

In many cases, the CIO was thrust into managing cloud services inherited from contracts negotiated by another department. These one-off selections may have been highly successful in terms of the organization who made the sourcing decision. However, once identified, those shadow arrangements needed to be assessed in terms of the corporation's overall cloud strategy. Sometimes better alternatives were found. Sometimes it was determined the better choice was to integrate the workload back into existing applications.

## 4. Economies of scale

Using a public cloud allowed companies to embark on trials of new technologies and processes without making long-term financial commitments. Some companies deployed smaller workloads as a proof of concept. As the workloads gained critical mass, it became cost effective to invest in internal resources, both hardware and personnel. Hence, a move away from the public provider.

## 5. Spread of SaaS

Software as a Service offerings in the public cloud add agility to meet changing market needs. The days of long application development cycles have been left behind in

favor of ready-to-use applications. Entities with internally developed applications deployed on company-owned infrastructure or using IaaS or PaaS in the cloud have chosen to move work to providers offering full SaaS solutions.

## 6. Complexity of Hybrid deployments

IT organizations have learned to create complex architectures which blend public and private cloud resources, exploiting the best features of each. Some have used public providers for processing power while maintaining all data stores internally for security reasons. Others have made extensive use of public storage options, especially for DR, but continue to process data on internal resources. Successful combinations like these have encouraged IT organizations to explore more complex options, and have contributed to changes in where and how workloads were provisioned.

Early cloud usage was dominated by a desire to reduce operating costs. Today companies have learned more about evaluating workload placement strategies considering scalability, agility, and flexibility in addition to costs to determine which workloads were best suited to a public provider environment, as well as which providers were the best match. Astute cost management practices recognized the true cost of moving workloads from one vendor to another. Many times, the longer term benefits to move to a new provider outweighed the cost to reposition the work. Change does not equate to failure; it equates to learning how the cloud infrastructure works and learning to exploit this emerging technology to its greatest advantage.

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## ABOUT THE AUTHOR

*Penny Collen is the Financial Solutions Architect for software provider, Cloud Cruiser, Inc, where she enables organizations to successfully migrate to hybrid cloud environments. This includes providing a foundation for optimizing cloud investments, enhancing IT services for the business and developing activity-based cost models for hybrid IT. Ms. Collen is an industry expert and thought-leader on the management of IT with special emphasis on financials.*



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# Four Simple Steps to Transform Legacy Datacenters, Part 1: Sit Together

By Hans Ashlock, QualiSystems Technical Marketing Manager

IT organizations that want to embrace agility and DevOps practices across their business face a common challenge: How can they employ modern, cloud-based, and automated solutions while at the same time maintain and evolve critical legacy applications and processes? This situation, which research firm Gartner has termed “bimodal IT,” can be a tough balancing act. IT organizations need a plan for transforming legacy IT systems into modern software-defined data centers.

There are many steps that go into making such a transformation possible. We will look at four of them in this series, starting with the creation of a culture of renewed collaboration and free-flowing information. Instituting DevOps innovation is a good way to break down the traditional organizational silos between DevTest and Operations and ultimately help to remake legacy facilities.

## The Importance of Sitting Together: Planting the Seeds of DevOps

It may seem like a small and mundane change, but even something as simple as having DevTest and Operations teams sit together in an office setting can be the start of an important cultural shift. Members of these groups may have had limited direct contact in the past due to the presence of waterfall methodologies optimized for infrequent release schedules.

There has always been a certain tension at the heart of the traditional, pre-DevOps approach to IT processes. Developers and testers had often been evaluated on their ability to innovate, deliver new capabilities, and release software quickly – that is, to create change. Their counterparts in operations were typically judged on their ability to provide a stable and secure system.

The co-existence of these two opposing concepts, change and stability, has historically created clashing incentives that often slowed down the deployment and maintenance of applications and services, which in turn ultimately slowed the entire organization.

DevOps, quite simply, is an approach to delivering software that unifies the Dev and Ops silos; it attempts to resolve the conflict between the opposing forces of change and stability. Specifically, DevOps is the application of insights related to lean manufacturing practices that emphasize collaboration, bottom-up thinking, and a holistic approach to product delivery. Under DevOps, all the typical silos (Dev, Test, Networking, Storage, IT, Operations, Security, etc.) are placed on the same team by uniting them around common business goals. Practically speaking, this often means having them make the entire application lifecycle their common overarching concern.

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The essence of DevOps is this collaborative mindset, instead of any particular technical toolset, and the seeds can be planted by taking a simple “sit together” approach to office organization.

## Dividing Deeper: The Steps toward Building a DevOps Culture

Many enterprises and startups are eager to pursue DevOps. A CA survey of 1,400 IT and line-of-business executives found that 88 percent had adopted or planned to adopt DevOps.

An important initial step to making DevOps plans into reality is to figure out where the application lifecycle is breaking down or where there is waste in the delivery cycle. Typical sources of waste or causes of breakdown can include manual software configuration tasks, dev/test teams waiting for provisioning of infrastructure environments, development of design documents, inefficient utilization and sharing of common physical resources (servers, equipment, etc.), or dependency on individuals with exclusive ownership of key mindshare.

By identifying these sources of breakdown and waste, it becomes very clear what approach the DevOps implementation should take within a given organization.

Another necessary step is to identify the legacy applications and services that will not be able to transition from more traditional/waterfall management approaches to more agile DevOps in a timely manner. As mentioned, the challenge for companies wanting to pursue agility and DevOps practices is the reality of their ingrained legacy applications and processes. The idea of BiModal IT claims that there are simply some applications, services, or departments that are so historically ingrained in traditional approaches that a sudden and forced "transplant" into a DevOps approach would have too many negative business ramifications.

However, the "sit-together" approach can still provide a helpful first step as it can serve to start the transformation of the cultures that inhabit the more traditional approaches to IT and product management.

There also needs to be an agreed-upon system in place for evaluating the progress of DevOps. Metrics could include change fail rates, deployment frequency, lead times and mean time to recovery. Ideally, DevOps and de-siloing will improve an organization's ability to shorten

the release cycle, reduce failures and rollbacks during deployment and enhance defect detection, but there has to be a way of knowing if it is actually succeeding on these counts.

Building a productive culture – one that can handle the bimodal IT challenge and improve everyone's responsiveness to changing operational requirements – requires alignment between middle management and organizational leadership, in addition to just devtest and operations. Everyone must buy into DevOps for it to succeed in making the business more agile.

Beyond this initial acceptance of DevOps principles, employees must also have access to resources such as training, which can help them acquire the cross-functional skills that are central to DevOps. We will look more at these types of technical challenges and requirements in Part 2, in which we will discuss the importance of building infrastructure-as-a-service clouds that everyone can use.

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### ABOUT THE AUTHOR

*"Hans Ashlock joined QualiSystems in 2013 and heads Quali's worldwide technical marketing. Hans has over 15 years of software engineering, product management, marketing and sales experience in automation software solutions addressing, cloud, networking, telcom, data center, federal, and semiconductor industries. Before Quali – Hans was a founding member of a global engineering services company, developing products and services for enabling adoption of automation technologies. Though he only holds one patent, he's just glad he didn't have to pay for it. An engineer at heart, Hans is passionate about the transformation to software defined everything and its impact on business and technology. Connect with him on LinkedIn, Twitter, and SlideShare."*



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# Top 3 Factors Driving the Rise in Data Breaches

By Bill Carey

The drumbeat of high-profile hacking incidents in the news continues. Just in the past year, more than 200 million records have been stolen in data breaches that occurred at Premera Blue Cross, Anthem, Sony and Home Depot. The pilfered data included bank account information, Social Security numbers, email addresses, credit card numbers and other personal information.

There appears to be no end in sight to the hacking epidemic, and large and small businesses as well as consumers are scrambling to find new ways to protect themselves. So what's behind the rise in data breaches? Here are three top drivers:

1. There's more information to steal. When asked why he robbed banks, legendary bandit Willie Sutton allegedly replied, "Because that's where the money is." A similar dynamic is driving the rise in data breaches. These days, companies rely more heavily on technology than ever before to conduct business. They store valuable data in the cloud, including customer account and financial information and other personal data in greater numbers. That's why hackers are working overtime to gain access to this valuable data, which they can sell or use.

2. Technology automates hacking. There are many different hacking methods, but specialized hacking software now makes it easier for cybercriminals to target multiple businesses and individuals, playing the percentages to gain access to data. Websites are scanned and assessed for vulnerabilities. Hackers conduct password attacks, gaining access via brute force (guessing passwords until they crack the code), dictionary attacks (programs that try various word combinations at scale) and keylogging (software that tracks user input).

3. People are lax about security. Hacking is often a crime of opportunity. In the wake of news-making hacking incidents, investigations have found evidence of incredibly lax handling of log-in credentials or poor security practices by vendors that leave companies vulnerable to data breaches. But while hacking attacks on government agencies and large corporations generate the most media coverage, small businesses may be at an even greater risk since they have more valuable data than individuals but are typically less secure than large firms.

There's not much business owners and individuals can do about the first two data breach drivers, short of going back to the pre-Internet, pre-mobile technology era. But you can

greatly reduce your vulnerability to hackers by following some commonsense practices and considering technology solutions that can strengthen security. Here are some tips that can help:

- Make sure your software is up to date. Your operating system and antivirus provider will notify you when it's time to update your system or renew your protection. It's a good idea to act on that right away since the update may contain patches for new threats. The less current your security

software and operating system are, the more vulnerable you are to a data breach.

- Teach employees to reduce risks. If you manage employees, make sure they understand how to protect themselves online. A best practices program administered at orientation is a good idea, as well as periodic updates to ensure that employees understand how hackers target companies and can recognize the signs of a data breach.

- Put formal security policies in place. Once employees understand how to reduce risks, employers should hold them accountable with a policy that requires the use of strong passwords (a combination of upper and lowercase

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**Just in the past year, more than 200 million records have been stolen in data breaches that occurred at Premera Blue Cross, Anthem, Sony and Home Depot.**

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letters plus numbers and symbols) for each site and mandates a password change every 60 to 90 days. Since many employees use personal devices at work, it's a good idea to have guidelines for safe personal device usage.

There's no indication that the massive hacking problem confronting individuals and companies will end anytime soon. There's too much incentive (in the form of profits) for hackers to cease their criminal activity, and there's no magic-bullet technology solution on the horizon to make websites and devices safer.

Passwords will continue to be the first line of defense against hacking, so the best thing you can do right now to decrease your vulnerability is to commit to using strong passwords and changing them regularly. That can be a challenge since it's tough to remember so many different, complex passwords—one for every secure site you visit. But whether you choose to use a password management software solution or go it alone, your response to the rise in data breaches will determine how likely you are to fall prey to hackers.

## ABOUT THE AUTHOR

Bill Carey is Vice President of Marketing & Business Development at Siber Systems Inc., which offers the top-rated RoboForm Password Manager solution. Find out more about RoboForm at <http://www.roboform.com>.

## H.I.G. Growth Partners Announces Investment in Centerfield Media Holdings, a Leading Digital Media Advertising Technology Company

**BOSTON – November 05, 2015** – H.I.G. Growth Partners (“H.I.G.”), the dedicated growth capital investment affiliate of H.I.G. Capital, has announced a growth recapitalization of Centerfield Media Holdings, LLC (“Centerfield” or the “Company”) in partnership with the Company’s co-founders Jason Cohen and Brett Cravatt.

Centerfield is a digital advertising technology company that is focused on real time biddable media enabling the targeting and acquisition of high performing, high life time value customers for its clients across numerous industries. The Company leverages a proprietary and purpose-built end-to-end technology platform to automatically optimize each part of the customer acquisition, education and conversion process. This platform technology empowers Centerfield to identify and acquire customers across a variety of digital platforms, including search, display and others, at scale for its end clients.

Jason Cohen, Co-Founder and Co-CEO of the Company stated, “H.I.G.’s investment will support our on-going investment in world-class technology and product offerings helping us to continue to deliver unparalleled results for our customers.”

Nik Shah, Managing Director at H.I.G. Growth, commented, “Centerfield has built multiple truly unique and highly differentiated advertising technology solutions which are delivering significant value to its customers across a wide variety of verticals. We are very excited to partner with Jason, Brett and the rest of the Centerfield team as they expand the Company’s product and service offering in existing and new industry verticals.”

Brett Cravatt, Co-Founder and Co-CEO of the Company said, “Given their extensive digital media and ad technology investment experience, H.I.G. is an excellent partner for Centerfield as we enter our next phase of rapid growth.”

H.I.G. has previously invested in numerous digital media and advertising technology companies including Batanga, Boostability, Classmates, Escalate Media/Womenforum, Go2mobi, Grupo NZN, Intelius, REVshare, SpotXchange, Telescope and Triad Retail Media.

## About Centerfield

Centerfield develops intelligent digital advertising technology focused on real time biddable media which enables targeting and acquisition of high performing, high life time value customers for its clients across numerous industries. The Company’s sophisticated marketing technology platform leverages Big Data and optimizes each part of the customer acquisition process from initial view through offline sale in real time for the highest possible return on advertising spend. For more information, please refer to the Centerfield website <http://www.centerfield.com/>.

## About H.I.G. Growth Partners

H.I.G. Growth Partners is the dedicated growth capital investment affiliate of H.I.G. Capital, a leading global private equity investment firm with \$19 billion of equity capital under management.\* We seek to make both majority and minority investments in strong, growth oriented businesses located throughout North America, South America and Europe. We will invest \$5 million to \$30 million in equity in a given company and target investments in profitable growth oriented businesses with between \$10 million and \$100 million in revenues. We consider investments across all industries, but focus on certain high-growth sectors where H.I.G. has extensive in-house expertise such as technology, healthcare, internet and media, consumer products and technology-enabled financial and business services. Growth Partners strives to work closely with our management teams to serve as an experienced resource, providing broad-based strategic, operational, recruiting and financial management services from a vast in-house team and a substantial network of third-party relationships. For more information, please refer to the H.I.G. website at [www.HIGgrowth.com](http://www.HIGgrowth.com). <http://www.welotec-solu>



### WinterGreen Impact Market Share Trends

The trend is your friend

The WinterGreen Impact Market Share Trend is a plot of the market share performance for a given sector, quarterly back to 2006. The Impact Market Share provides a context for data driven analysis of market segments. How a given market has changed in the past few years is displayed graphically for the participants by quarter. Worldwide and regional analyses are available. Graphically layout permits fast visual interpretation of:

- Who are the market leaders?
- What has changed in this market segment?
- Who are the up and coming companies?

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# Network Routing Protocols and Methods, Part 1

By: Sean Wilkins

In this two-part series, Sean Wilkins, co-author of *CCNA Routing and Switching 200-120 Network Simulator*, discusses current network routing protocols and methods for implementing them. This article covers the types of static versus dynamic routing protocols and the differences between them.

## Overview

Once an engineer has a basic understanding of how packet forwarding/routing works, the next step is to move on to the method of configuring routing. (If you're still not sure how packet forwarding/routing works, take a look at my article "Basic Layer 3 Routing Concepts.")

This article discusses the main categories of routing configuration and goes over the different types of dynamic routing protocols that are available and commonly used.

## Choosing How to Configure Network Routing

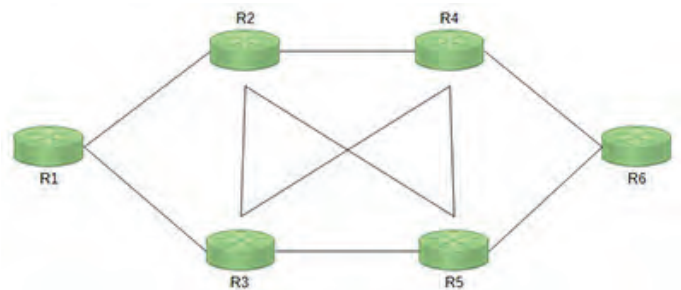
There are two primary ways of configuring routing: statically and dynamically. Static routing is typically used on very small networks, where the number of routes to be configured is just as small. However, static routing is sometimes used in larger networks as a small piece of an overall dynamically controlled routing infrastructure. In such cases, static routes typically configure default routes, or direct traffic out of the network to another network controlled by another party.

Dynamic routing is built to deal with network changes automatically as the topology changes within the network, and are typically used on all other network types not previously mentioned.

Let's visualize this with the topology shown in Figure 1. This example shows a number of different paths that a message can take when leaving R1 and destined for R6. For example, it could go R1 > R2 > R4 > R6, or it could go R1 > R3 > R4 > R6. When configuring static routing, typically the engineer has a single path in mind to reach the destination. So, to configure a route from R1 to R6 using the path through R2 and R4, a static route would

need to exist on R1, R2, and R4 for the forward trip (R1 > R6), and another route would need to exist on R6, R4, and R2 for the reverse trip (from R6 back to R1). Keep in mind that this route is for a single reachable destination.

Figure 1 Base Topology



To provide reachability to every destination that potentially exists in the network, the engineer would need to calculate the best paths for each destination initially, and then individually configure each route along each best path. Obviously, this process can quickly become very time-consuming. And what happens if a failure exists along the calculated best path?

These reasons indicate why dynamic routing protocols are used on larger networks, and static routing is left for very small networks or other specific use cases. Dynamic routing protocols avoid the manual configuration problem; they also are built to handle many complex topologies, as well as dealing with network outages—without the need for additional administrative attention.

## Types of Dynamic Routing

After selecting the dynamic routing method, the engineer must make some additional decisions involving the types of dynamic routing protocols. At the highest level are two main categories of dynamic routing protocol: exterior gateway protocols (EGPs) and interior gateway protocols (IGPs). EGPs connect multiple network domains; they're called exterior because the protocol is exterior to the network domains. (A domain in this case is a specific organization or service provider network.) IGPs handle the routing inside these network domains; these protocols are the most common, as each company with a network handles its own network domain.

Modern networks use only a single EGP: the Border Gateway Protocol (BGP). As you might expect, a number of different IGPs are available, depending on the requirements of each network. Four IGPs are the most popular:

- Open Shortest Path First (OSPF)
- Enhanced Interior Gateway Routing Protocol (EIGRP)
- Intermediate System to Intermediate System (IS-IS)
- Routing Information Protocol (RIP)

These EGP and IGP protocols are split into three different types of routing protocol: distance vector, link-state, and path vector. There are a number of important differences between these types. The next three sections discuss each type of routing protocol in detail.

## Distance Vector Protocols

A few main attributes are associated with traditional distance vector routing protocols:

- The router's view of the network is only discovered from the known routes of its neighbors ("routing by rumor").
- The router sends a complete version of its routing table to its neighbors at regular intervals.
- They take a long time to converge after a failure because the update is only sent at regular intervals.
- Compared with link-state protocols, distance vector protocols have a higher risk of causing routing loops.
- The only modern routing protocol that is traditionally distance vector is RIP. It advertises a complete copy of its routing table every 30 seconds via all enabled interfaces.

Once a router receives an update from a neighbor, it places the update into the routing table (assuming that there are no conflicts). If something happens and the route becomes unreachable, the route remains in the routing table for at least 180 seconds (default invalid timer) before being marked as unreachable. This technique slows down the convergence of a failed route and delays traffic from being routed along an alternate path.

RIP comes in three versions: RIP version 1, RIP version 2, and RIPng. Their operations are very similar; however, there are a few differences: RIP version 1 broadcasts updates, whereas RIP version 2 multicasts updates. This design prevents non-RIP devices from processing extra packets every 30 seconds. RIP version 2 also supports subnetted (classless) networks, while RIP version 1 only supports classful networks. RIPng works similarly to RIP version 2, but for IPv6 addresses.

EIGRP is technically a distance vector protocol in that its view is based on its neighbors' views alone, but it has some features that make it act like a link-state protocol. This is why EIGRP is usually discussed as being a hybrid protocol, using attributes from both traditional distance vector as well as link-state protocols. Crossover features include the use of neighborships and triggered partial updates, to name two.

Loop management for distance vector routing protocols uses two different methods: poison reverse and split horizon. Poison reverse is used every time a new route is learned from a neighbor; when this happens, the router automatically sends a route advertisement back out the learned interface with an infinite metric. This action prevents the neighbor from using that route to the newly learned destination.

Split horizon is also used when a router advertises routes out its interfaces. With split horizon, if a route was learned on interface 1, it will not advertise that same route back out interface 1.

## Link-State Protocols

Link-state protocols provide each of the routers in a network with a network-wide view, giving each router the ability to calculate the best path through the network. All modern link-state routing protocols use Dijkstra's shortest path algorithm.

Link-state protocols work by establishing neighborships with connected routers and exchanging a copy of the known network (not just the routing table contents) to these neighbors. All updates that are received are immediately relayed to all other connected neighbors.

Both OSPF and IS-IS are link-state protocols, and both use Dijkstra's algorithm for best-path mapping. However, their configurations are quite different, and the selection of one versus the other is based mainly on the requirements of a specific network. OSPF is more commonly deployed in enterprises, and IS-IS is more popular in service provider networks.

## Path Vector Protocols

The only path vector protocol in use today is BGP. When BGP is configured, it will have a copy of all reachable autonomous systems (BGP's term for network domains, discussed earlier) and the path to reach them. This information gives the protocol a clear view of which networks it can reach and the advertised path to each.

A BGP router also uses a number of different path attributes to determine which path it will end up using

to reach a specific destination. Since BGP is an EGP and is used to route between routing domains, often multiple paths are available to reach a destination. By using a combination of these path attributes, a router selects the route it uses.

## Summary

Whether to use a static or dynamic method of routing is frequently determined by the size of the network; if the network is very small (a few nodes), a static routing solution could work. However, even if the network is small, a dynamic routing method can be used without a lot of configuration, and it will continue to work as the network grows.

The type of dynamic routing protocol to use largely depends on the vendor of the networking equipment in use. OSPF and EIGRP are two of the most popular routing protocols used on enterprise networks. Of these two, EIGRP is typically considered easier to configure, but until recently it has been Cisco proprietary, and therefore typically not supported on other vendors' equipment.

If you're deploying only Cisco equipment, the selection is a bit more dependent on the training of your staff and which protocol they best understand and prefer.

Part 2 of this series will walk through how a network converges for a distance vector network versus a link-state network, along with covering a few common additional dynamic routing protocol features.

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## ABOUT THE AUTHOR

Sean Wilkins is an accomplished networking consultant for SR-W Consulting (<http://www.sr-wconsulting.com>) and has been in the field of IT since the mid 1990s, working with companies like Cisco, Lucent, Verizon and AT&T as well as several other private companies. Sean currently holds certifications with Cisco (CCNP/CCDP), Microsoft (MCSE) and CompTIA (A+ and Network+). He also has a Masters of Science in Information Technology with a focus in Network Architecture and Design, a Masters of Science in Organizational Management, a Masters Certificate in Network Security, a Bachelors of Science in Computer Networking, and Associates of Applied Science in Computer Information Systems. In addition to working as a consultant, Sean spends a lot of his time as a technical writer and editor for various companies.



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# SNEAK PREVIEW OF JOB POSTINGS

## Members! Here is Your Special "Sneak Preview" of Upcoming New Jobs, posting soon on the NaSPA Job Site

*The following is a sample of the awesome jobs posted by employers in just the last 30 days on the NaSPA Job Site. NaSPA sincerely appreciates all the people who think of NaSPA first when they are looking for the ideal Information Technology candidate. They find the best people, and help NaSPA at the same time. These jobs have not hit our site yet so now you can have a "sneak preview" ahead of other applicants by Site right now and see what else is new!*

**Job Name** SENIOR SYSTEMS ANALYSTS BS+5  
**Position Title** SENIOR SYSTEMS ANALYSTS  
**Location(s)** Irving, Irving, TX but EXTENSIVE TRAVEL on assignment to various unanticipated client sites within the USA, United States

**Description**  
 SENIOR SYSTEMS ANALYSTS to design, develop, test, and implement business software applications; Troubleshoot issues with implementation and rollout in live business environment; Train and provide technical advice to project staff. Require: Bachelor's deg. (or foreign equiv.) in Computer Science, Engineering, Computer Information Systems, Business Administration, or a related field; five year of progressive job related experience (any title); Experience to include use of one of the following skill sets: 1. Peoplesoft HCM, PeopleTools, PeopleCode, Oracle, SQR, Bi Publisher, Integration Broker; 2. SAP Project Systems, SAP PPM, SAP MRS; 3. Peoplesoft FSCM, PeopleTools, SQL, SQR, Integration Broker, Application Workflow Engine. Travel/relocation to various unanticipated locations within U.S. possible. Resume: MOURI Tech LLC, 1303 W. Walnut Hill Lane, Suite #285, Irving, TX 75038 or email jobs@mouritech.com.

**Job Name** Senior Systems Analysts MS+1  
**Position Title** SENIOR SYSTEMS ANALYSTS  
**Location(s)** Irving, Irving, TX but EXTENSIVE TRAVEL on assignment to various unanticipated client sites within the USA, United States

**Description**  
 SENIOR SYSTEMS ANALYSTS to design, develop, deploy, & coordinate business software applications; Troubleshoot issues with implementation and rollout in live business environment; Train and provide technical advice to project staff; Research emerging technologies. Require: Master's deg. (or foreign equiv.) in Computer Science, Engineering, Computer Information Systems, Business Administration, or a related field; one year of job related experience (any title); Experience to include use of one of the following skill sets: 1. SAP Project Systems (PS) module and its integration with other modules, ABAP, Java; 2. SAP OpenText: VIM, Archiving, xECM; SAP ABAP Workflow; 3. SAP CRM, Obj Oriented ABAP, Java. Travel/relocation to various unanticipated locations within U.S. possible. Resume: MOURI Tech LLC, 1303 W. Walnut Hill Lane, Suite #285, Irving, TX 75038 or email jobs@mouritech.com.

**Job Name** SAP  
**Position Title** Sr. SAP SOFTWARE ENGINEER  
**Location(s)** Connecticut, United States  
**Description**

Perform techno-functional lead role performing scalable ERP SAP ERP App analysis, design, customization implementation & deployment. Perform Project Planning, Gap Analysis, & Business Mapping for SAP R3 implementations for various modules such as FI/CO, BW, SD, SCM, Enterprise Portal. Coordinate with Project Managers, Business Users & Programmers. Perform requirement

gathering & document with latest tools such as Rational, Use case & UML. Prepare work flows. Configure SAP modules & customize to the business needs. Design database architecture & ensure performance. Perform Enterprise Application Integration (EAI) of legacy systems with Web intensive ERP Apps. Design & integrate with CRM apps. Set migration/conversion strategies & Change Management & plan system software upgrades. Resolve Go Live/Cut over issues. Perform programming & code walk through. Work in: SAP R3, ABAP4, UML, Rational, UML, EAI, CRM, EDI, NetWeaver, Internet Technologies, RDBMS on UNIX & Windows. Will work in Rocky Hill, CT and/or various client sites throughout the U.S. Reqs: M.S. Com Sci, Eng or related field & 2 yrs exp performing techno-functional lead role on scalable SAP ERP customizations, implementations & deployment working in SAP R/3, ABAP4, UML, EAI, CRM, EDI, Internet technologies, RDBMS, Unix. In alternative will accept B.S. Com Sci, Eng or related field & 5 yrs exp. Must be willing to travel and/or relocate. Employer accepts any suitable combination of education, training and experience. Employer: Infowave Systems Inc, Work Schedule: 9 AM to 5 PM.Mon-Fri. Salary: \$91,062/yr. Send resume to: Recruitment and Employment Office, Infowave Systems Inc, Attn: Job Ref #: INF50144, P.O. Box 56625, Atlanta, GA 30343

**Job Name** NTT00001  
**Position Title** Software Engineers  
**Location(s)** Plano, Texas, United States  
**Description**

NTT DATA, Inc. seeks Software Engineers (4 vacancies) to design & devel. programs (web/reporting/batch updates) & enhancements, functional specs., sys. & integration testing, analysis of bus. reqs., tech. design efforts & making recommendations for proc./perform. improvements. Reqs: Bach. or foreign equiv. in CS, IS, Math, (Electrical, Electronics, Mechanical) Engineering or related + 5 yrs. progressive, post-bacc. exp. in developing & customizing complex, web-based business software apps. (server or app. side); exp. must incl. full life cycle devel. w/ Java & related technologies along w/ relational databases such as Oracle & Sybase w/in global delivery model. Will also accept Masters or foreign equiv. in one of above-enumerated fields or related + 3 yrs. exp. as described above. Must be fully qualified for offered position @ time of hire; will not train. M-F, 9am-5pm; 40 hrs/wk. Sal: \$115,794/yr. Immediate eligibility for full, comprehensive benefits pkg. Position based @ company HQ in Plano, TX; must be willing to physically relocate (w/ employer reimbursement) to unanticipated job/client sites throughout US for short- & long-term assignments. Send resume to: Recruitment & Employment Office, NTT DATA, Inc., Attn: Job Ref #: NTT00001, PO Box 56625, Atlanta, GA 30343.

**Job Name** Program Coordinator 1  
**Position Title** Program Coordinator 1  
**Location(s)** Ames, Iowa, United States  
**Description**

The Dean of Students Office at Iowa State University is seeking applicants for a Program Coordinator I for Tutoring Services, to serve as a member of the Academic Success Center team under the supervision of the Director. The Program Coordinator will provide leadership and is responsible for planning all aspects of program development, delivery, and assessment of Tutoring Services. Additional duties include database administration relating to development, functionality, processing, and records, as well as reporting; program development and supervision of the tutoring services program; communication and outreach to the campus; and assessment and evaluation of the program. This position will also be responsible for guiding and leading graduate students in the supervision, orientation, and training of undergraduate peer tutors.

The successful candidate will demonstrate knowledge of academically at-risk college students and possess strong organizational skills, excellent written and oral communication skills, and have a willingness to work in a student-centered learning environment.

**Job Name**                    **Manager**  
**Position Title**           **Manager**  
**Location(s)**                **Rosemont, Illinois, United States**  
**Description**  
 Capgemini Financial Services USA, Inc. (Rosemont, IL) seeks Manager w/ master's in comp science or eng'g + 2 yrs/exp in comp softw dvlpmnt (alternatively, bach + 5 yrs/exp) to schedule, monitor & oversee the analysis, dsgn, dvlpmnt, testng & implmnt of customzhd biz systems softw apps for mult. projects. Maintain client relationships & meet regularly w/ Sr. Mgmt. Manage the dvlpmnt & delivery of systems softw using Pega PRPC; Pega Project & Test Management Framework in the insur & financial services domain; Oracle & WebSphere; and JavaScript, HTML, XML & SOAP. Large % of time may be spent prfrmg consulting srvc's at client sites in various geogr. locations. Must have completed prjcts involving: 1) architecture & implementation of BPM softw solutions using Pega PRPC; 2) Pega Project & Test Management Framework in the insur & financial servcs domain; 3) Oracle & WebSphere; 4) JavaScript, HTML, XML & SOAP. Must be willing to travel or relocate on a short/long term basis to projects at various unanticipated locations throughout the U.S. Salary \$105,433. Standard company benefits apply. Mon-Fri: 8am-5pm. To apply: send resumes to Recruitment & Employment Office, CAPGEMINI FINANCIAL SERVICES USA INC. Attn: Job Ref #: CAP06541, P.O. Box 56625, Atlanta, GA 30343

**Job Name**                    **Nine Chapters/ ZHU**  
**Position Title**            **Quantitative Researcher**  
**Location(s)**                **Short Hills, New Jersey, United States**  
**Description**  
 Employer: Nine Chapters Capital Management LLC seeks Title: Quantitative Researcher (1 position available) Job Duties: Apply: econometrics and/or stochastic modeling; solid understanding of financial markets; statistical models; regression analysis; and time series analysis to discover trading opportunities; Perform portfolio construction and rebalancing using convex optimization techniques; Manage, analyze and visualize large scale financial data using SQL and other database tools. Experience with scripting languages (Python/Perl/Matlab); Research Conduct original research in quantitative fields applying mathematical and financial concepts; Conduct original research on risk management strategies and empirical studies; Perform quantitative research on financial modeling and hedging to enhance risk management; Source research ideas from senior management, financial journals and other venues; Perform complex mathematical analysis of stochastic models; Conduct quantitative analysis on the robustness of each component of the research platform; Development: Develop quantitative and mathematical systems for gathering and organizing data and information as well as development of prototypes and models to demonstrate and test various mathematical and financial theories and principles, and to simulate various processes as they relate to the financial markets; Use mathematical and scientific training to measure risk, identify market opportunities, as well as design and develop massive parallel computing architectures, electronic trading tools, and advanced algorithms; Implement trading models by using object oriented programming language; Write performance attribution and risk analysis tools; and Work on other quantitative programing projects as part of the effort to build up research and trading platform. Work Schedule: Full time, 40 hours/wk Mon-Fri, 9 am to 5 pm. Salary: \$152,000.00/year Job Location: 51 JFK Parkway, Suite 280, Short Hills, NJ 07078; no travel required. Education and Experience: Ph.D. in Finance, Computer and Information Science, Mathematics or a Related Field and 2 years of experience in job offered or 2 years of experience as a Research Associate or any other job title performing all listed job duties. Applicants with any suitable combination of education, training or experience are acceptable. Please send resumes by mail to: Recruitment and Employment Office, NINE CHAPTERS CAPITAL MANAGEMENT LLC, Attn: Job Ref#NIN42493, P.O. Box 56625, Atlanta, GA 30343

**Job Name**                    **ETL Developer**  
**Position Title**            **ETL Developer**  
**Location(s)**                **Overland Park, Kansas, United States**  
**Description**  
 ETL Developer req'd to design, dvlp, test, migrate & implm., extract, transf. & load (ETL) solutions for enterprise systems using Datastage and Oracle Data Integrator, Oracle SQL, PL/SQL, Java, Informix, Toad, SQL Developer, SVN. Req'd: Adv knowledge of Star/Snowflake schemas and Physical/Logical data modeling, DataStage Components/Designer/Director, Infosphere Information Server Mgr. Wrk closely w/ other dvlprs, architects and biz analysts in ETL program post prod. support. Req: MS degree or equiv in CS, Engg, Biz, Finance, IT/IS or rlted. field +3 yrs exp. in ETL dvlpmnt & testing, or in lieu, a BS degree or equiv in one of the same fields, or rlted field., + 5 yrs of progressive exp. in ETL dvlpmnt & testing. Mail resume and cover letter ATTN: HR-ED-JOB to: JMA Info. Tech. Inc., 10551 Barkley Street #400 Overland Park KS 66212

**Job Name**                    **IBM Systems Analyst**  
**Position Title**            **IBM Systems Analyst**  
**Location(s)**                **Duluth, Georgia, United States**  
**Description**  
 INDU LLC D/B/A INTIGROW has 2 IBM Systems Analyst positions available in Duluth, GA. (M-F 9am-5pm 40 hrs/wk) Duties: Prep tech reports & studies for sys upgrades & customized prgrms. Design, customize, & configure prgrms to meet client needs. Create feasibility report for implmntn of sys changes. Draft report recommend new techs into existing computer or network sys. Analyze cost & time reqd for upgrades. Address compatibility issues w/ current sys. Communicate & manage groups of people; Conduct workshops to gather bus reqs & understand client needs. Dev, document, & revise internal manuals & procedures. Implement training manual to assist in mentoring/training new tech staff - not limited to existing but also future technology changes/upgrades w/ IBM tools while continuing to design & test procedures. Create client training manuals. Create procedures for quality control standards. Conduct training for key client users & other IT support team members. Dev & conduct training sessions for clients & other IT personnel; Monitor certs for staff - upgrade whenever needed. Serve as the IT contact & resource person for client. Provide leadership & supervision to other App Engnr's & IT resources to deliver app/project deliverables, & work guidance to client. Utilize expertise of other team members & leverage other resources across the organization. Provide tech leadership to other IT team members & possess IT project mngmt skills. Consult w/ client mngmt to ensure agreement on system principles. Recommend sys mods or upgrades. Explain & resolve complex tech issues. Serve as liaison b/n IT staff & client mngmt. Implement, maintain, & apply IBM OS Sys (TSM, TIM, TAM, or AIX) & hardware platforms. Analyze reqs from consumers for new or changed reqs. Work w/ IT vendors & recommend imprvmnts; Attend seminars & workshops by vendors & IT peers. Provide tech support & troubleshoot reported problems from clients. Maintain & administer network & related envrmnts; Perform routing audits of systems & s/w - Work in a methodical fashion to create clear accurate docs & implement designs in a diverse team envrmnt. Travel/ relocate to various unanticipated locations to interact with clients and train users for different short and long term projects. Req: Master's degree/equiv in Comp Sci, S/W Engg, or related plus 24 months of exp as a Computer S/W Professional. Our company will also accept a Bachelor's degree/equiv in Comp Sci, S/W Engg, or related plus 5 years of exp as a Computer S/W Pro. Salary: \$100,422/yr (Standard Benefits incl: PTO, technical certification assistance, health/dental & vision insurance, & travel assistance) Submit resumes to: Recruitment and Employment Office, INDU LLC D/B/A INTIGROW, Attn: Job Ref#: IND23389, P.O. Box 56625, Atlanta, GA 30343.

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**Job Name** Computer Systems Analyst V  
**Position Title** Computer Systems Analyst V  
**Location(s)** College Station, Texas, United States

**Description**  
Cognizant Technology Solutions U.S. Corporation, Computer Systems Analyst V, pos located in College Station, TX. Analyze business and other data processing problems to implement and/ or improve software systems for assigned projects. Duties may include: expand or modify system to meet technical and business specifications; test, maintain, and monitor programs/ systems; support the installation/implementation of computer programs and systems; contribute to the development of documents; contribute to enhancement of system design procedures, test procedures, and quality standards; support the creation of solutions to system challenges, such as malfunctions and system/ program problems; contribute to the review and analysis performance indicators to ascertain, develop, and implement improvements/ solutions; coordinate and link systems to implement solutions across an organization. May oversee/guide/mentor other professionals (depending on project or level of responsibility, may supervise 0-25 IT professionals). To perf duties, must have experience with one of the following technologies: .NET, Java, Network Development or Network Administration, Data Warehousing, Software Testing, SAP, Customer Relationship Management (CRM) software applications, and/or Mainframe Development. May survey and observe users or perform the job to determine what information is processed and how it is processed. May support multiple projects of varied complexities. Engage in substantial long-term and/or short-term travel and/or relocation to unanticipated client locations throughout the U.S. to join established, operating onsite project teams with close, frequent supervision by a manager, 1,000+ Multiple full time positions available/ levels of responsibility available. 40 hrs/week M-F 9:00am - 5:30pm Reqs: Bachelor's degree or equivalent in Computer Science, Sciences, Engineering, Math or Business plus 60 months of experience in the job offered. Job duties require substantial long-term and/or short-term travel and/or relocation to unanticipated client locations throughout the U.S. for position based/reporting to College Station, TX. Certain travel and/ or relocation expenses, and/or possible location-based pay, depending on assignment, paid by employer. Must have experience with one of the following technologies: .NET, Java, Network Development or Network Administration, Data Warehousing, Software Testing, SAP, Customer Relationship Management (CRM) software applications, and/ or Mainframe Development. \$91,624/yr. Std. employee benefits. Any suitable combination of education, training, or experience is acceptable. Submit resume to Recruitment and Employment Office, Cognizant Technology Solutions US Corporation, Attn: Job Ref#: COG00008, P.O. Box 56625, Atlanta, GA 30343

**Job Name** Engineer Software Developer 3  
**Position Title** Engineer Software Developer 3  
**Location(s)** San Diego, California, United States

**Description**  
Claims Services Group is seeking an Engineer Software Developer 3 in San Diego, CA to design, develop, & implement enterprise applications that create a comprehensive insurance solution. Perform system analysis, design, development and implementation of enterprise software and scalable solutions in a high transaction environment. Will ensure good programming practices are followed. Collaborate with product stakeholders, teams in other offices. Will participate in tool selection, design decisions, & estimate domain knowledge & customer workflows. Will design & develop algorithms & implement complicated workflow solutions. M-F 8am-5pm. Salary: \$92,768. Requirements: MS in CS & 3 months of development exp. Knowledge of development of software apps; C++, Java, JSP/Servlets; JDBC, Swing, & Applets. Knowledge of ORM Concepts (such as OracleTop Link), agile methodology, EasyMock, test/QA, Mobile App Development for iPhone, iOS Development using xCode & Objective C. Experience w/ JIRA, AccuRev, Linux, Eclipse IDE, SOAP UI, HTML, CSS, JavaScript, jQuery, JavaScript Libraries. Good understanding of Web Framework (such

as Click Framework), Velocity, & unit testing using junit. Understanding of Web Services using SOAP; SQL, XML, SQLite, Oracle, & design patterns. Apply by mailing resumes to: Recruitment and Employment Office, Claims Services Group, Attn: Job Ref# CLA19672, P.O. Box 56625, Atlanta, GA 30343.

**Job Name** Programmer Analyst  
**Position Title** Programmer Analyst  
**Location(s)** Sterling, Virginia, United States

**Description**  
**Programmer Analyst, Sterling, VA: Programming in Esq, Java DB2, Oracle.** Implement ETL strategies for loading Staging schema & dimensional data structures. Conduct RDBMS development, data warehousing & data modeling. Bachelors Degree in Computer Science, IT, Computer Applics, Compu. Info. Sys., Engg. field, Math, Science, or foreign equiv. plus at least 5 years IT work exp. A combo of multiple degrees, diplomas, certifi., and/or work exp., as being equiv. to 4-year Bachelors Degree is accepted. Full time, 8am-5pm, Mon-Fri. The wage offered is \$108,430 per year. Send resumes to: Recruitment and Employment Office, UNIFIED SYSTEMS, INC., Attn.: Job Ref #: UNI16687, P.O. Box 56625, Atlanta, GA 30343.

**Job Name** Software Engineer  
**Position Title** Software Engineer  
**Location(s)** Sterling, Virginia, United States

**Description**  
Software Engineer, Sterling, VA: Design and develop software applications Java, J2EE, JSP, APIs, STRUTS, SAP ABAP/Basis and NetWeaver, with relevant modules. The minimum requirements for this position are a Master's Degree in Computer Information Systems, Computer Science, or Computer Applications or Engineering, or a foreign equivalent. Full time, 8am-5pm, Mon-Fri. The wage offered is \$91,000 per year. Proof of permanent U.S. work authorization is required. Send resumes to: Recruitment and Employment Office, UNIFIED SYSTEMS, INC., Attn.: Job Ref #: UNI16427, P.O. Box 56625, Atlanta, GA 30343.

**Job Name** Systems Engineer  
**Position Title** Systems Engineer  
**Location(s)** Newport Beach, California, United States

**Description**  
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# Protecting Medical Record Data

By: Lauren Sporck, Associate at OPSWAT

After a slew of data breaches in 2014, the FBI warned the healthcare industry that cyber-criminals would be directing more attention their way in 2015 [1]. The healthcare industry, valued at \$3 trillion, has become an increasingly valuable target for cyber thieves and, in some cases, a much easier target to attack due to their often less than adequate investment in cyber security. What is it about the healthcare industry that has captured the cyber criminals' interest in the last few years [2]?

## Overview of Data Breaches in 2014

At the end of each year, the Identity Theft Resource Center (ITRC) produces a data breach report showing the total number of data breaches and records stolen for each industry [3]. The data is taken from credible sources, including the Attorney General's website, and includes data breaches that occurred in the year of the report or breaches that were made public in the year of the report. 2014 was a big year for data breaches in general, with a total of 761 breaches, amounting in 83,176,279 exposed records. The following industries were included in the report:

- **Credit/Financial (5.5%)**
- **Business (32.7%)**
- **Education (7.6%)**
- **Government/Military (11.8%)**
- **Healthcare (42.3%)**

Of the industries represented, the healthcare industry had the highest number of total breaches in 2014: 322 out of a total of 761 breaches.

In terms of the total amount of records stolen or compromised by breaches in 2014, the business sector had the highest at 65,896,115, followed by the healthcare industry at 8,255,247 records [4]. It might be surprising that the banking industry only had 1,185,492 records stolen, especially when considering how frequently credit card fraud makes the news. It's not often that you hear about someone who had their medical record stolen.

Unfortunately, stolen medical record data is not usually reported in a timely manner; often taking years before someone discovers that the data has been compromised. Unlike stolen medical records, stolen credit card information is usually reported rather quickly, due to banks' monitoring for suspicious account activity.

## Comparing Medical Records to Credit Card Data

In order to understand why the healthcare industry is such a big target for cyber-criminals, you have to understand the value of a stolen medical record. Personal banking information is still valuable to the average cyber thief, but it doesn't have nearly as high of a payout as that of a medical record. Reuters placed a value on stolen medical information that is 10 times more than that of credit card data [5]. According to data collected from monitoring exchanges on the black market, the director of threat intelligence at PhishLabs estimates the value of stolen medical information to be around \$10 per record, and that is on the low end of black market prices (see reference 7 below). Some sources claim that they can be sold for as much as \$60 to \$70 per record.

In the ITRC report mentioned above, of 322 reported breaches for the healthcare industry, 289 breaches resulted in confirmed quantities for the number of records stolen. The average amount of records stolen per known breach was around 28,564. If each medical record is assumed to be worth a minimum of \$10, then the average payout for cyber-criminals from each breach would be at least \$285,640, and that is considered to be a conservative estimate. If a record were assumed to be worth around \$60-\$70, then the average payout would be over \$1.7 million per breach [6]. Credit card data, on the other hand is worth around \$1 per record, so cyber-criminals would have to steal at least 10 times as many banking records to realize similar profits.

Medical records sell at a high price because they contain personal data such as names, addresses, social security numbers, birth dates, billing information, among other information. This information is used by cyber-criminals to create fake IDs that can be used to buy drugs that can be resold later, or to file false insurance claims using patient data [7].

## Industry Spending on Cyber Security

Hospitals are often easier targets for cyber-crime because they lack the proper cyber security defenses [8]. Healthcare spending for cyber security is known to be low, compared to other regulated industries. In a 2012 report released by the Ponemon Institute, the healthcare industry listed a lack of funds as one of the main obstacles preventing them from taking the proper steps toward better data security practices [9]. ABI Research recently reported estimates that worldwide healthcare spending on cyber security will be around \$10 billion by 2020 [10]. This only amounts to about 10% of the amount spent on cyber security by the critical infrastructure industry. By comparison, the financial industry is expected to spend \$9.5 billion in 2015 alone [11].

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**ABI Research recently reported estimates that worldwide healthcare spending on cyber security will be around \$10 billion by 2020.**

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We know how much cyber-criminals stand to gain from a healthcare industry data breach, but how much do these data breaches cost the companies who are affected?

With the average cost of a data breach for a company in the healthcare industry around \$2 million over a two-year period [12], the case for investing in additional cyber security defenses becomes clearer.

### The Problem with BYOD

One of the biggest concerns facing the healthcare industry is the increased adoption of BYOD by medical professionals. According to a recent report, 88% of healthcare organizations said they permitted employees and other medical staff to use personal devices for work purposes [13]. More than half of those same organizations claimed they did not have visibility to the security status of those BYOD devices. If organizations are not certain of the security of a device, how can they effectively protect any patient data contained therein?



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Although many healthcare organizations allow medical staff to use personal devices for work purposes, their IT departments do not adequately support that use [14]. There seems to be some sort of disconnect between the Electronic Medical Record (EMR) tools that are chosen by the IT department and the willingness of medical professionals to use those tools. In a study recently released by Spyglass Consulting, 70% of physicians interviewed claimed that their IT department wasn't making adequate progress towards supporting mobile computing and communication requirements [15].

This statistic is alarming as 96% of those same physicians claim to be using their personal smartphone for clinical communication purposes. Inefficient support of physician's mobile devices results in communication issues, which in turn leads to higher costs created by communication delays.

The healthcare industry clearly needs to find a way to integrate BYOD trends without compromising the security of devices.

## Solutions for Preventing Future Breaches

With healthcare industry data breaches predicted to increase in 2015, organizations must take the proper precautions to avoid hefty fines resulting from HIPAA violations.

## Multi-scanning Technology

As a requirement for HIPAA, installing an antivirus product is an important layer of protection. By choosing multi-scanning, organizations reduce the risk that that malware will enter their network; what one antivirus engine doesn't detect another often will. Document sanitization capabilities are also useful, allowing users to prevent infections by advanced threats or zero-day attacks by converting potentially dangerous file types to remove embedded malware.

## Protection of Endpoints

If devices connecting to a hospital's internal network cannot be confirmed as secure, how can organization expect to avoid a possible data breach? Proper host checking and monitoring of endpoint security status is imperative as more physicians adopt BYOD practices. This endpoint visibility challenge is unique and difficult to address while still maintaining the spirit of BYOD policies. Some MDM (Mobile Device Management) products have addressed this using techniques like containerization, but the issue is largely unaddressed for desktops and laptops.

## Improved Email Security

A phishing attack is believed to be the cause of the recent Anthem breach, where stolen employee credentials were used to gain access to a secure network. In order to avoid this type of attack, the healthcare industry must invest in the proper email security software.

Industry-wide spending on cyber security remains low, despite the fact that healthcare is the largest target for cyber-criminals. If organizations in the healthcare sector want to reduce their risk of cyber-attack, they have to re-evaluate their views on security. Too often, investment in cyber security occurs after a breach has already taken place and patient data has already been compromised. If organizations find the right security tools they can protect patient data while addressing organization-wide communication issues, saving the valuable time of medical staff and avoiding the potential loss of millions in data-breach recovery costs.

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\*Naspa was unable to gain access to the cite link on number 10.

## **New Study Finds Benefits of Transferring C-band Spectrum from Satellite to Terrestrial Wireless Grossly Exaggerated**

**Research Reveals Flawed Analysis misinforming world delegations at ITU World Radiocommunication Conference**

**Geneva, 5 November 2015** – As national administrations from across the world prepare to make critical decisions this month regarding global communications spectrum allocations, a newly-released report shows that studies suggesting enormous benefits of satellite spectrum for terrestrial wireless contain major flaws in logic, calculation and methodology.

The findings of a study done by economic consultants VVA show that in highlighting the benefits of the so-called “C-band” for mobile terrestrial, cost-benefit studies done for the mobile terrestrial sector completely ignore major negative impacts on satellite communications’ user groups throughout the world. The findings come just before the question of the C-band will be considered during the International Telecommunication Union (ITU) World Radiocommunication Conference (WRC), being held in Geneva through November 2015.

Terrestrial mobile stakeholders commissioned studies from Frontier Economics and Plum to highlight the positive economic impact of the C-band for their sector. A closer look at their methodology by VVA shows that these studies ignore the cost of disruption or loss of services for sectors that rely on them today, noting that for some applications, mobile terrestrial cannot provide any replacement. Furthermore they use incomparable benchmarks; follow an incorrect approach to calculations; overlook alternative bands and technologies; rely on unproven technical concepts and use a multiplier effect of their errors in order to exaggerate the economic benefits.

Monica Pesce, Managing Director of VVA commented, “Any economic analysis must take full and proper consideration of the costs of and benefits for existing players and users and new players and users. The studies we have looked at are selective in their approach, drawing on the most favourable elements necessary to conclude a significant, positive economic benefit for the terrestrial mobile sector, even if in reality, they may be far lower when properly balanced against satellite user interests.”

In a joint statement, Aarti Holla and David Hartshorn, Secretary Generals of ESOA and GVF, non-profit associations representing the international satellite communications sector noted that “Millions of people throughout the world depend on satellite services delivered via the C-band, and it is imperative that the decisions to be made at WRC are based on the most accurate information currently available. The C-band is used to support a wide range of services, including emergency communications, peacekeeping, distance learning, live broadcasting, tele-medicine, e-government and other vital applications. Taking away and re-allocating the spectrum required to support those services based on inaccurate terrestrial wireless analyses would have a severe impact on consumers, enterprises and governments throughout the world.”

## **Background - Informing the Global Debate - VVA Study Findings**

Research conducted by VVA, a Brussels-based consultancy, which discovered that claims made recently by Plum and Frontier Economics are based on key methodological flaws, including:

- The impact on existing C-band users and the stakeholders they serve is ignored;
- Economic benefits are overestimated by using auctions on 2.6 GHz - a band with different characteristics - as a benchmark for spectrum value rather 3.5 GHz auction values;
- Country specific factors, obtained by using an inaccurate calculation approach, further inflate spectrum value for many countries used as case studies. Wrong quantifications are then extrapolated for considered regions. These two errors generate a multiplier effect that leads to further overestimating calculated benefits;
- Efficiency gains deriving from the usage of alternative methods to provide capacity are expressed qualitatively but are not quantified. Alternative options to C-band for spectrum usage are ignored.

**For More Information About This Issue [www.satellite-spectrum-initiative.com](http://www.satellite-spectrum-initiative.com)**

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**GVF** is an independent, non-partisan and non-profit organization with 200+ members from every major region of the world. The broad-based membership represents every sector of the satellite industry, including fixed and mobile satellite operators, satellite network operators, teleports, satellite earth station manufacturers, system integrators, value added and enhanced service providers, telecom carriers, consultants, law firms, and users.

**ESOA** is a Brussels-based trade association whose membership brings together all European, Middle-East and African satellite operators and supporting members including service providers, manufacturers and launch service providers. Set up in 2002, the association’s mission is to provide a unified voice and a platform for collaboration for satellite operators to ensure the continued success of the sector and to broaden the opportunities for policymakers to leverage satellite services to fulfill their objectives.

**VVA BRUSSELS** is the European economic consultancy with an international team within VVA Group. VVA was founded in 1992 by two Professors from Bocconi University, which works across a variety of fields, from business consulting and market research to transfer pricing to economic and market studies on EU policy. ([www.vva.it/en](http://www.vva.it/en))

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## New Gefen Matrix Provides 4K Ultra HD Switching and HDCP 2.2 Compatibility

CHATSORTH, CA – Gefen has just announced its next generation matrix switcher: the [4K Ultra HD 8x8 Matrix for HDMI w/ HDCP 2.2](#) (EXT-UHD-88). This matrix 2 to any combination of eight displays, along with support for the new HDCP 2.2 content protection protocol.

Resolutions up to 4K Cinema-DCI (4096x2160 at 24 or 30 Hz 4:4:4) and 4K Ultra HD (3860x2160 at 60 Hz, 4:2:0 or 30Hz 4:4:4) are supported. Compliance with the latest HDCP 2.2 protocol as well as legacy HDCP 1.4 ensures compatibility with a vast array of premium content and sources.

The new matrix has been designed for use with the Gefen Syner-G™ software. Discovery and Show Me features automatically detect all installed units on a Local Area Network and easily configure their IP settings.

This product also features an intuitive web-served interface. In addition to basic end-user controls such as routing sources to displays, this powerful interface possesses the ability to upload, download and save EDID information from any connected display to the internal memory. These EDIDs can then be made available to any of the connected sources, virtually eliminating compatibility issues among different sources and displays.

In addition to the web interface, other control options include front-panel buttons, IR remote, RS-232, Telnet and UDP.

With an MSRP of \$3999, this new matrix provides best-in-class features and performance typically found on larger matrix systems at a competitive price.

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# Protests or Profiteering: The Hack Remains in Same

By Stephen Coty, Chief Security Evangelist,  
Alert Logic

Hactivism has been around since the Cult of the Dead Cow in the 80s; only the names have changed. Where we once heard about Chaos Computer Club and the Legion of Doom, we now have high-profile examples like Anonymous, Anti-Sec, and Lul-Sec. This is not a comparison: 35 years ago it was mostly demonstrations and denials of service. Now, attacks are exponentially more intrusive and destructive.

With this escalation in damages comes a new name. Cyber Terrorism is a term that the media has been using quite frequently. There have been countless articles on Cyber Caliphate, Cyber Berkut, and Cyber Freedom fighters that are fighting for the rights of freedom and free information around the world. Is changing "hactivism" to "terrorism" the media's way of upping the ante on hacking? What is the difference between hactivism and cyber terrorism? They both seek out the same targets. They have a singular purpose, in its simplest definition—to cause damage to an entity, organization or group. So what sets these two categories of hackers apart? Is the answer in their motivation? Is one viewed as "good," while the other "bad"? Or is it simply in the eye of the beholder?

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**Hactivism has been around since the Cult of the Dead Cow in the 80s; only the names have changed.**

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## ANONYMOUS

Anonymous is a loose association of activist networks that has an informal centralized leadership structure. Beginning in 2003, on the bulletin board 4Chan, anonymous began to recruit and train young people interested in hacking for a cause. Throughout the years, they have run cyber attacks, mostly DDOS (Distributed Denial of Service), against the Financial, Healthcare, Education, Religious Organizations, Oil, Gas and Energy industries. They have also earned a spot on that distinguished list of attackers who have targeted SONY in the past. Anonymous has really changed the nature of protesting, and in 2013 Time Magazine called them one of the top 100 influential people in the world. Supporters have called the group "freedom fighters" and even compared them to a digital Robin Hood. Others consider them cyber terrorists. In the public's eye, it depends on their motivation, following and targets. The bottom line: This could either be a case of malicious activity masked by political motivation, or pure malicious activity.

## CYBER BERKUT

Cyber Berkut, a modern group of hackers, claims its name from the special police force "Berkut," formed in the early 1990s. The pro-Russian group made a name for itself by conducting DDOS attacks against the Ukrainian government and western corporate websites conducting business in the region. The group has also been known to penetrate companies and retrieve sensitive data; they would post on public-facing paste sites or their non-English website that includes a section called "BerkutLeaks." Cyber Berkut was most recently credited for hacking attacks against the Chancellor of the German Government, NATO, Polish websites as well as the Ukrainian Ministry of Defence. The group has been compared to Anonymous based on its methods of protest and political targets. Viewed as passionate about its targets, Cyber Berkut has a clear agenda that it aims to accomplish. However, the group's ideology in no way diminishes the amount of intended damage that might be inflicted on potential victims.



## CYBER CALIPHATE

Cyber Caliphate, a hacker group claiming association with terrorist group ISIS, has attacked many different government and private industry entities in the name of the freedom-fighting group. Caliphate is responsible for multiple website defacements and data breaches. The group has hacked various websites and social media accounts, including those of military spouses, US military command, Malaysia Airlines, Newsweek and more. Cyber Caliphate has proven itself efficient and hungry for media attention. This raises the question: Does Cyber Caliphate believe in its stated cause, or is this just opportunistic hacking under the guise of a cause for media attention? What if the group is just looking for fame and fortune? What if the group is not a group at all, but the work of one or two people collaborating with different contributors for specific targets?

## MOTIVE DOES NOT MATTER

Is this cyber terrorism, hacktivism, or just another set of hackers trying to get famous by jumping on the media's hot topic of the month? We can wax poetic about standing up for a cause, but the fact remains that attacks are attacks, whether they are motivated by politics, fortune, or fame. And the key to fighting back is Threat Intelligence. Threat Intelligence gathering is key to keeping up with the actions of these groups and their potential targets. Staying ahead of future attacks requires a proper investment in intelligence groups who have the proper tools, people and processes to deliver up-to-date intelligence. Information sharing among intelligence groups from different industries and countries will help expedite the reverse engineering of malicious code and assist in the building of signature content and correlation logic that is deployed to our security technologies. So once attacks are deployed globally, defenses have been created and detection logic has been integrated.

## ABOUT THE AUTHOR

Stephen Coty is the Chief Security Evangelist for Alert Logic. For more information please visit <https://www.alertlogic.com>.

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# Block Chain Technology: *The IT Enterprise Awaits*

By Pete Harris, Principal, Lighthouse Partners

*Consider this: 100 startups are developing block chain applications, and around \$1 Billion has been invested in them to date. Marc Andreessen – who invented the web browser and is now one of the investors – has called block chain a “core innovation,” and the mainstream business media is covering it almost daily – piquing the interest among the C-suite of major corporations. The next step: enterprise adoption. Probably.*

While most in the startup community believe it is a given that block chain technology will become embedded in the IT infrastructure of Fortune 1000 companies – and for sure the promise is tangible – a few challenges need to be overcome before that becomes a probable scenario.

Now, before I get into the promise and challenges, here is a very quick overview of block chain technology and why it is considered unique:

- Block chain technology is implemented as a software and data layer that runs on a physical distributed network, using internet protocols.
- Block chain is the technology platform the underpins the bitcoin crypto currency. It was first described in the 2008 white paper that introduced bitcoin, authored by the mysterious Satoshi Nakamoto. Also, just for the record, Satoshi used two words – i.e. block chain – to describe his invention, though many now refer to it as the singular, blockchain. Clearly, I'm with Satoshi on this.
- As well as supporting bitcoin, block chains have also been implemented to run other crypto currencies, and to potentially support a wide range of applications that are not currencies at all. So bitcoin is a reference implementation of a block chain, but because it was the first such implementation, it is often referred to as 'the' block chain.

- Block chains are a type of database that has some rather unique properties.
- Block chains rely on cryptography – including public and private encryption keys – to secure them and to ensure that any attempt to tamper with them can be detected.
- A block chain is a time ordered list of immutable records – once a record is written to it, it cannot be deleted or changed (without being detected).
- A block chain is distributed and shared, so that the same data set is stored on multiple network nodes, and hence it is very secure.
- The consistency of data sets across nodes is managed by what is called a consensus protocol, and these can differ depending on the implementation of the technology.
- Bitcoin's consensus mechanism uses a 'Proof of Work' approach where certain network nodes perform complex mathematical operations to ensure the integrity of new data blocks that are added.
- Bitcoin's Proof of Work ensures overall block chain integrity even when one or more rogue nodes might be working to undermine it. The end result is that bitcoins can be safely sent (and be proven to have been sent) from one person to another, even if the individuals do not know one another. And this means that no central authority or hub is needed to manage bitcoin transactions between individuals/nodes on the network. They are pure peer-to-peer operations, sometimes referred to as decentralized.
- Proof of Work requires increasingly powerful computer technology, and relatedly increasing amounts of electrical power, in order to perform it. The nodes that perform this Proof of Work function are actually rewarded for their efforts in bitcoin, and so the process is popularly referred to as 'mining'.
- As well as Proof of Work, other consensus approaches have been developed, especially for block chains that are implemented with known security in place, i.e. where it is known that there are no rogue nodes. These alternative

consensus mechanisms are often faster and have higher throughput than bitcoin's Proof of Work.

Building business applications – and not just crypto currencies – on block chain technologies is now being investigated for pretty much every vertical, because the block chain approach offers to improve the performance of some processes, make them more transparent to regulators, more resistant to cyber criminals and generally simplify what's needed to implement them. Simplification means reduced time to market and reduced operational costs.

Little wonder, then, that corporations as diverse as the Nasdaq stock exchange, the banking giant UBS, the credit card issuer Visa, healthcare tech provider Philips, and the Government of Honduras (which has a problem of government corruption when it comes to managing land title records) are all exploring block chain-based applications.

While block chain technology in all its guises has much going for it, actually implementing it in live production within enterprise environments will require marrying it with practical know how of deploying scalable, reliable and secure systems that conform to agreed service level agreements – the kind of skills that are second nature to the major IT vendor community.

Which is where there is some reason to pause. Because despite the innovative pressure and the increasing corporate interest, the major IT vendors that would commonly partner with enterprises to implement their core infrastructure seemingly have little to offer when it comes to block chain expertise.

That's a view I formed after conducting a simple survey\* of 100 big IT vendors, reviewing each of their websites for information on block chains. As detailed in the resulting report – Searching in Vain for The Block Chain - Just 23 had anything at all to say about it, and that number dropped to 15 when management consultants and IT analysts were not counted.

In my view, unless the major global IT vendor community becomes educated in block chain technology – along with its technology benefits and business potential – there is real threat that the roll out of this innovation will be slowed.

Looking back at the history of IT adoption, while startups have generally been the early stage innovators of some new development, it is only when much larger established IT vendors have become involved have the new technologies really taken off. I am thinking of innovations including big data processing, cloud computing, mobile services, open source ... and even the internet itself.

This state of affairs is hardly surprising. Major corporations that operate on a global scale require equally global and trusted IT partners when it comes to deploying technology on which their business depends. For example, in the case of cloud computing, corporations concerned with cyber security and compliance with data regulations required the comfort that comes with working with a capable, experienced and financially stable IT vendor that they established a relationship with.

Following this thinking, for block chain technology to be adopted by mainstream corporations and implemented in core infrastructure and systems, the solutions need to be offered by the major global IT vendors.

Given the potential opportunity of re-architecting the business processes of major corporations worldwide using block chain approaches, and of offering services with much lower costs, there is a real imperative for the big IT vendors to get up to speed on the technology.

Looking forward to 2016, I believe that a number of these large vendors will rapidly educate themselves on block chain, begin to offer advice to their customers, and explore partnerships with (and perhaps acquisitions of) players in the startup community that are already up to speed, leading to them offering block-chain based products and services.

Peering out a few years, I expect that among the major IT players, there will be both leaders and laggards, the latter being most likely those vendors with incumbent technologies and revenue streams, and real vested interests in slowing down the path of innovation. And for some of the leaders, it could well be a bet-the-company decision to go the block chain route. For sure, though, block chain adoption will succeed or fail based on what these IT heavyweights choose to do, and how well they execute. File under 'History repeats itself'.

- Download Lighthouse Partners' research survey "Searching in vain for The Block Chain" at [www.lighthouse-partners.com/resources.html](http://www.lighthouse-partners.com/resources.html).

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## ABOUT THE AUTHOR

*Pete Harris is Principal of Lighthouse Partners, a business and technology consulting firm advising on positioning of innovative enterprise technologies, with specific focuses on go-to-market and growth strategies involving partnerships, thought leadership creation and events. Lighthouse was established in 2000 and is based in Austin, TX.*

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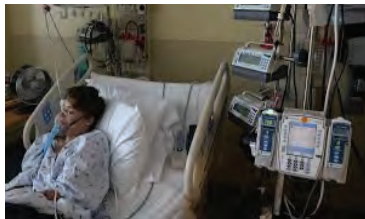
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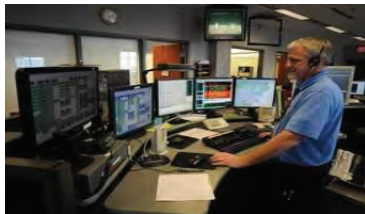
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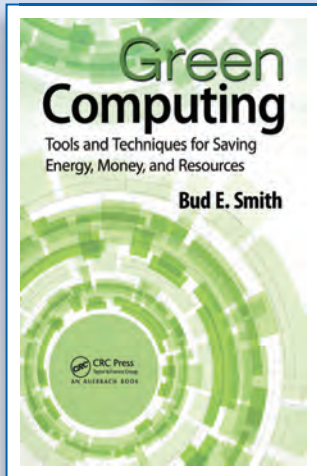
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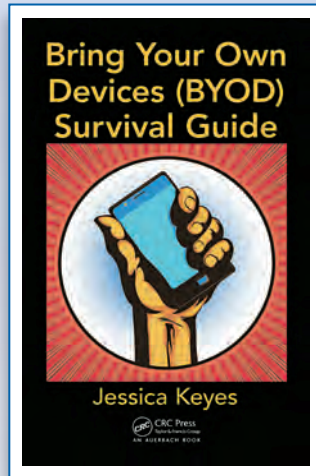
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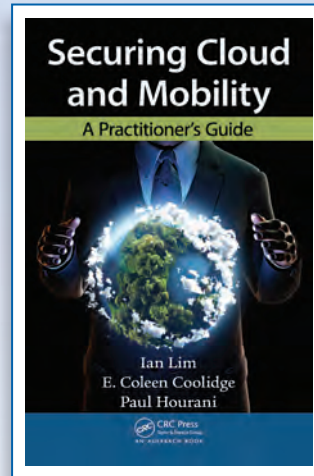
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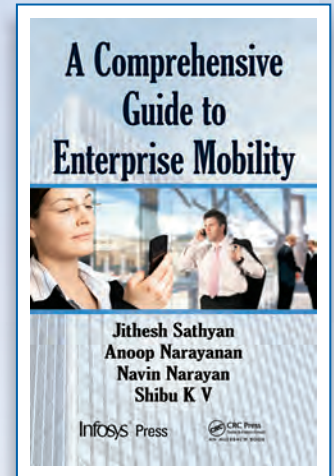
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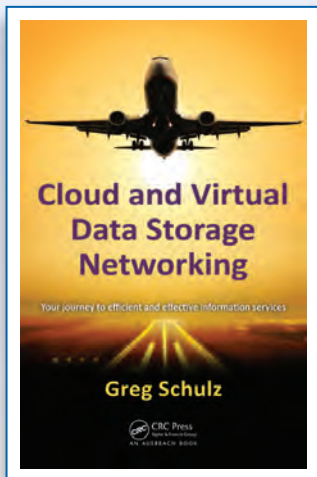
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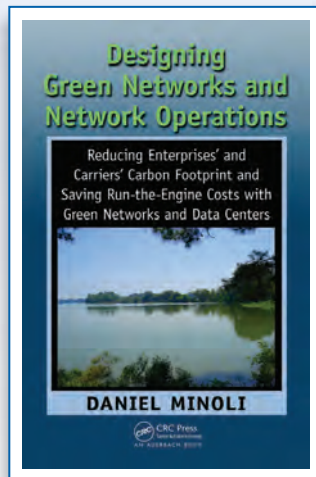
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