APPLICATION CENTRIC INFRASTRUCTURE EDITION

Unleashing IT

VOLUME 5 / ISSUE 1

TAKING FLIGHT WITH SDN

How Bowling Green State University is improving the educational experience for staff and students.

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THE REVOLUTION IS HAPPENING

It's not easy to revolutionize longstanding technology norms. It takes vision, knowhow, determination, and most of all, industry acceptance.

This edition of *Unleashing IT* showcases the groundswell of momentum surrounding Cisco® Application Centric Infrastructure (Cisco ACI™), which fundamentally transforms the way technology is delivered in support of business priorities. In the following pages, our customers and technology partners discuss their adoption of the year-old architecture and the steps they have taken to simplify, automate, and secure their data centers.

Technology leaders like F5 Networks and Citrix are pushing the benefits of Cisco ACI to the network's upper layers (page 8). Software innovators including Apprenda, CliQr, DataTorrent, and Vnomic are utilizing Cisco ACI to bolster the integration, security, and manageability of their applications (page 5). And forward-thinking organizations like Bowling Green State University (page 10), KPIT (page 12), Siam City Cement PCL (page 14), Alpha Technologies (page 16), and Pulsant (page 18) are already taking advantage of the breakthrough software-defined networking architecture.

To learn more about Cisco ACI—and foundational pillars such as the Intel® Xeon® processor-based Cisco Unified Computing System™ (Cisco UCS®) and Cisco Nexus® switches—visit the resource center at UnleashingIT.com.

Sincerely,

Inbar Lasser-Raab
Vice President
Cisco Systems, Inc.

STRATEGIES & SOLUTIONS

EXPERIENCES

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CISCO ACI AT THE ONE-YEAR MARK

Cisco senior vice president Soni Jiandani and other industry insiders discuss the swift and broad adoption of a breakthrough software-defined networking architecture.

It's been just over a year since Cisco® Application Centric Infrastructure (Cisco ACI™) and associated products—including the Application Policy Infrastructure Controller (APIC) and Cisco Nexus® 9000 switches—began shipping. If customer and partner adoption are any indication, the breakthrough software-defined networking (SDN) architecture is being very well received.

"ACI is outpacing other SDN platforms by more than two to one in terms of adoption," says Soni Jiandani, senior vice president of the Insieme business unit at Cisco. "We recently announced our one-thousandth ACI customer—Danske Bank, the largest financial institution in Denmark—and hundreds of organizations are already in production and realizing exceptional results."

She points to Symantec as a prime example. Cisco ACI has helped the global leader in security reduce application development time by 87 percent while boosting the efficiency of its network operations staff by 79 percent.

"We did the planning, design, and execution for this whole software-defined ACI approach in four and a half months," says Sheila Jordan, senior vice president and CIO of Symantec. "That kind of speed is unheard of when implementing a leapfrogging technology." [1]

All told, Symantec projects a whopping $145 million in business benefits over a five-year span as a direct result of deploying Cisco ACI—representing an ROI of 441 percent.

"We don't look at deploying ACI as a network refresh, but as a way of changing how our data centers operate," says Vince Spina, vice president of IT, global network infrastructure, and data center services at Symantec. "We need to move at the speed of business and be an enabler, not an impediment. ACI helps us focus on delivering the applications the business needs rather than the plumbing supporting the applications." [2]

OPEN ARCHITECTURE, EXPANDING ECOSYSTEM

A growing number of technology leaders—including Apprenda, Citrix, CliQr, DataTorrent, F5 Networks, Intel®, Microsoft, Puppet Labs, SAP, Vnomic, and others—have integrated with Cisco ACI to bolster the development, control, and security of their solutions.

"Over 45 prominent technology providers have adopted ACI, providing integration, automation, and policy control up and down the stack," says Jiandani. "This growing ecosystem of partners is helping push the benefits of ACI well beyond the networking layer."

Cisco ACI is an open architecture that allows any application—whether virtual, bare metal, or container—to be deployed at scale in heterogeneous environments through the use of application programming interfaces (APIs), she explains. It also accommodates a variety of firewalls, load balancers, hypervisors, cloud management tools, and L4-L7 appliances.

Enterprise Management Associates (EMA) calls Cisco ACI a "surprisingly open technology."[3]

"Cisco ACI is far more open than the industry gives it credit for," the analyst firm contends. "EMA recommends that enterprises looking for open programmable solutions assess ACI to determine whether it meets their requirements. Its approach to providing an open and programmable network may contrast sharply with the approaches adopted by advocates of bare-metal switching and open source network software, but Cisco is offering a degree of openness that was previously unheard of in Cisco networks."

"We want to enable maximum choice," Jiandani says, "while also providing simplicity through automation and programmability."

CONTINUED MOMENTUM, FOCUS ON ANALYTICS

According to Jiandani, Cisco will continue to advance the architecture's capabilities in the coming months, with a distinct focus on data analytics.

"We want to double down on infrastructure analytics to deliver the insights that no one else can," she says. "ACI will soon be able to analyze and act on relevant data in motion."

That means dynamic data centers that can automatically discover and recommend policies in real time. And it means greater application mobility throughout virtual, bare metal, container, and multi-cloud environments.

"Integration, automation, security, and control are necessary in today's application-centric world," says Jiandani. "ACI will continue to deliver on all of these fronts through ongoing innovations."

[1] http://images.forbes.com/forbesinsights/StudyPDFs/Cisco-IT_as_a_Strategic_Business_Resource-REPORT.pdf

[2] http://www.cisco.com/c/dam/en/us/solutions/data-center-virtualization/application-centric-infrastructure/benefits-aci.pdf

[3] http://www.cisco.com/c/dam/en/us/solutions/collateral/data-center-virtualization/application-centric-infrastructure/ema-enable-agility.pdf

CISCO ACI BY THE NUMBERS

See how much time and money Symantec is saving through the use of Cisco ACI. To get the IDC Business Value Snapshot, visit the resource center at UnleashingIT.com.

SOFTWARE LEADERS EMBRACING INFRASTRUCTURE AUTOMATION

Application experts from Apprenda, CliQr, DataTorrent, and Vnomic explain why they have integrated their solutions with Cisco Application Centric Infrastructure.

Building applications is one thing. Deploying them in data centers or the cloud is another.

"Let's be honest, it's a lot of work to put an application into production," says Farid Jiandani, product manager at Cisco. "Applications have a series of dependencies that need to be mapped across a wide variety of environments. "These dependencies range from security rules and service level agreements to performance and compliance. And they need to be correlated to networking constructs such as subnet groups, firewalls, access control lists, load balancers, and other L4 through L7 policies."

There needs to be an easier way to deploy applications across heterogeneous environments, he surmises, regardless of the hypervisors and cloud management software being utilized.

"Software abstraction can help translate application dependencies into a logical policy model," says Jiandani. "But then it needs to be translated into infrastructure jargon that tells the underlying systems how to behave."

That's why software leaders like Apprenda, CliQr, DataTorrent, and Vnomic are taking advantage of Cisco® Application Centric Infrastructure (Cisco ACI™)—combining application logic with policy control to automate the configuration of the infrastructure. Here's how.

APPRENDA: IMPROVING APPLICATION SECURITY AND COMPLIANCE IN THE CLOUD

Apprenda provides a Platform-as-a-Service (PaaS) software layer for large enterprises developing their own custom applications. Because its customers operate in highly regulated industries such as financial services and healthcare, security and compliance are of great concern.

"We've always been able to isolate compute, memory, and storage, but our customers wanted more," says Rakesh Malhotra, senior vice president of product management and engineering at Apprenda. "They would ask us about network isolation, and quite frankly, we never had a good answer."

Until now. Apprenda recently integrated its enterprise PaaS with Cisco ACI, delivering the isolation—and resulting security and compliance—its customers were seeking.

"With ACI, the applications are decoupled from the infrastructure," says Malhotra. "So our customers can utilize a shared, standardized infrastructure that offers full isolation instead of managing many silos of dedicated hardware."

Everyone benefits, he adds. Application development teams can work faster and are no longer confined to the limitations and rigidity of the infrastructure. And infrastructure teams can focus on higher value tasks like security, capacity, and efficiency instead of continually spinning up new virtual machines, firewalls, and load balancers.

"The best thing is speed and flexibility don't come at the expense of security, compliance, or control. It's quite the opposite. Standardization and automation dramatically improve those things," says Malhotra. "Customers are the best barometer, and they are very, very excited about our ACI integration."

CLIQR: AUTOMATING APPLICATION DEPLOYMENT ACROSS MULTIPLE CLOUDS

CliQr offers a single platform to model, deploy, and manage applications in hybrid—often multi-cloud—environments. Its CloudCenter Platform has been integrated with Cisco ACI to automate and optimize the end-to-end provisioning of infrastructure as part of the application deployment process.

"Deploying applications in the cloud takes far too long, it's far too manual, and it can be very difficult to align heterogeneous environments like OpenStack and VMware," says Jeremy Oakey, vice president of strategic alliances at CliQr. "Our platform simplifies the process by creating application profiles, and with ACI, we can use those profiles to automate the configuration of the cloud infrastructure."

The programmability and automation of Cisco ACI is "extremely deep," he adds, which is in stark contrast to other software-defined networking (SDN) architectures that are more "flat" and still demand networking expertise and manual provisioning.

"We share the same vision with Cisco surrounding abstraction, automation, and policy control," says Oakey. "ACI is a disruptive technology, but our customers are keenly interested in putting it into production."

DATATORRENT: UNIFYING THE MANAGEMENT OF BIG DATA APPLICATIONS

DataTorrent is a leader in real-time big data analytics, offering the world's first open source, enterprise-grade platform for stream and batch processing on Hadoop. That platform, DataTorrent RTS, is now integrated with Cisco ACI.

"Big data applications operate in a distributed compute environment, and they need to connect to multiple sources of data to generate business insight," says Charu Madan, director of business development at DataTorrent. "As access requirements evolve, the process of securely configuring these connections becomes tedious, manual, and repetitive. That's not only time consuming, but unsustainable with the dynamic nature of applications and real-time data."

The combination of DataTorrent RTS and Cisco ACI provides a unified view of a big data application, its data sources, and the underlying network. And it enables the creation of policies that follow the application and data sources even after changes have been made.

"We are leveraging ACI because it makes our product better," says Madan. "The integration of the two allows big data applications to be developed and deployed faster, with better security and a single point of management."

VNOMIC: EASING THE DEPLOYMENT OF SAP HANA APPLICATIONS

Vnomic provides an "application-centric, policy-driven, software-defined everything" platform, improving the development and governance of complex applications such as SAP S/4HANA. The Vnomic Declarative Application Delivery and Governance Platform has been integrated with Cisco ACI, automating the configuration and deployment of network fabrics in support of those large-scale applications.

"ACI makes the network a semi-magical thing," says Derek Palma, president and CTO of Vnomic. "We define the application semantics and push them to the network with ACI, and it immediately produces a sophisticated fabric that can deliver everything the application needs—regardless of whether it is in a physical or virtual environment."

Palma says Cisco ACI is more elegant than other SDN architectures that require additional infrastructure translation, where interfaces, protocols, routers, subnets, and shared resources need to be explicitly manipulated.

"With ACI, we never have to worry about the particulars of the networking layer—only semantics and connectivity," Palma says. "The ACI constructs are robust, simple, and semantically pure. And we got it up and running in about a week."

Vnomic customers can now build large, complex application landscapes extremely fast, with servers, storage, network, hypervisors, and firewalls automatically provisioned. What used to take months can be performed in hours.

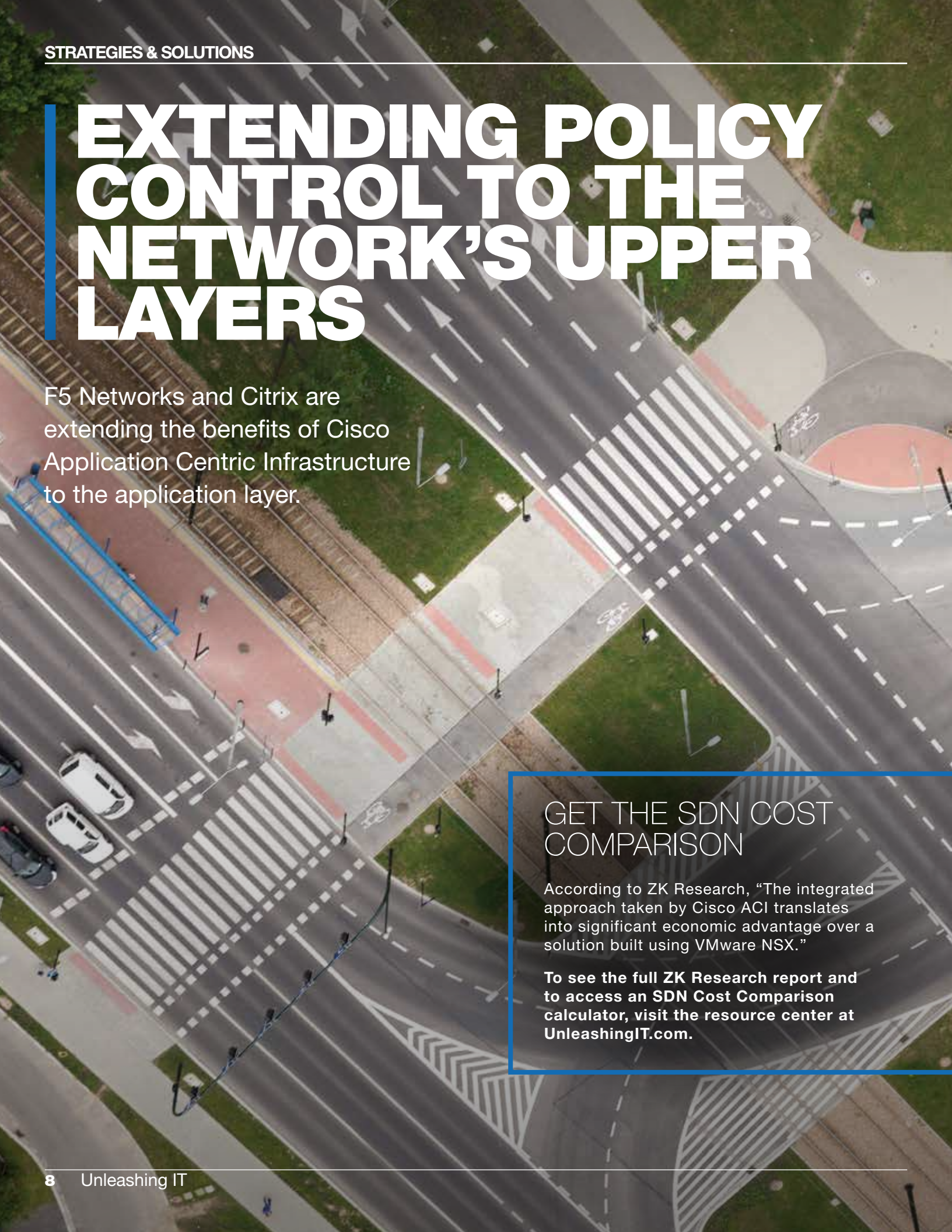
"These are very, very complex network environments, and they are being automated for the first time," says Palma. "It's like a new kind of factory where you can define what you want, push a button, and it just happens."

GET THE FORRESTER STUDY

Forrester calculated the potential ROI and typical payback period for Cisco ACI deployments. See the results and get the Forrester Total Economic Impact™ study at the UnleashingIT.com resource center.

EXTENDING POLICY CONTROL TO THE NETWORK'S UPPER LAYERS

F5 Networks and Citrix are extending the benefits of Cisco Application Centric Infrastructure to the application layer.



GET THE SDN COST COMPARISON

According to ZK Research, "The integrated approach taken by Cisco ACI translates into significant economic advantage over a solution built using VMware NSX."

To see the full ZK Research report and to access an SDN Cost Comparison calculator, visit the resource center at UnleashingIT.com.

Security breaches don't always occur at the perimeter of a network. Session hijacking, SQL injection, and other data attacks frequently take place in the application layer.

"Hackers are frauding the application itself, going straight through the firewall," says Nathan Pearce, principal technologist for programmable networks at F5 Networks. "And it looks like normal TCP traffic."

The point is this: security and policy control cannot be limited to the core networking layers (L2-L3). They must be extended to the upper layers of the network (L4-L7) where application services are delivered.

That's why technology leaders like F5 and Citrix have adopted Cisco® Application Centric Infrastructure (Cisco ACI™), extending the benefits of software-defined automation and policy control to L4-L7.

REDUCING COMPLEXITY, INCREASING SPEED

Applications are more distributed than ever before, and they are constantly being augmented. While server and storage virtualization has helped facilitate the dynamic nature of modern applications—and the business functions they serve—the network has remained largely static and rigid.

"It can't take weeks to configure the network when applications are changing on a daily basis," says Raj Gulani, director of product management at Citrix. "The network must maintain pace, up and down the stack."

Switches, routers, firewalls, load balancers, and DNS services all require command lines—for each application. And all applications must be manually synchronized across a multitude of physical and virtual environments.

"Today's applications have too many touchpoints, and defining every bit of network plumbing takes too long," Pearce says. "We needed to get away from single command lines for each and every device, which is time consuming, prone to human error, and takes applications offline when changes need to be made."

The answer? Network abstraction, where configuration and deployment are based on the application itself and not the network devices. And where a single policy for each application can be extended anywhere the application is stored and accessed.

"ACI defines the policy for connectivity—switching, routing, load balancing, firewalls—but you still need to extend that policy to the application services that ensure high performance, availability, and security," says Pearce.

A FULLY AUTOMATED NETWORK

F5 has integrated the Cisco Application Policy Infrastructure Controller (APIC) with its Software Defined Application Services, directly incorporating F5 application solutions into the Cisco ACI automation framework. Using F5 application services templates, known as iApps, application policies can be developed once and easily replicated without recreating every single command line.

"There's really no point in addressing L2 and L3 without addressing L4 through L7, and vice versa," says Pearce. "Organizations need full-stack integration and automation, and that's what we've done with ACI and F5 application solutions. It's a higher level of abstraction; like a menu without having to know all of the ingredients or how to cook the dish."

The Citrix NetScaler Device Package for Cisco ACI has also been integrated with the APIC, enabling the orchestration of Citrix network fabrics. The integration provides software-defined policy control from L2-L7 that can be managed directly through the APIC, delivering end-to-end health monitoring and telemetry.

"We've effectively automated the network," says Gulani. "We have work to do to educate others on how to take advantage of this new technology, but I have no doubt that it will become more mainstream."

With L2-L7 integration, customers can automate network configurations and connectivity as well as higher level application services surrounding TCP/HTTP optimization, data security, and performance monitoring. They can react faster to application changes, fluctuating demand, and potential attacks. And they can improve their compliance posture while reducing the possibility of human errors and downtime.

"Customers want to see that this is real, and we are happy to show them," says Gulani. "That's when they realize the true value and power of this integration, and its ability to spawn innovation and differentiation."

BUILDING A DATA CENTER AROUND AN APPLICATION ARCHITECTURE

With a software-defined network as the hub of a new data center, Bowling Green State University is streamlining application delivery to better serve students and staff.

The IT department at Bowling Green State University (BGSU) couldn't do it all. New application and service requests, software updates and patches, and infrastructure maintenance all demanded time and attention—which was in finite supply.

Of course, each new application or service added to the snowball effect. More to maintain, less time to fulfill the ongoing stream of requests from the university's staff.

"Department leaders are always finding new applications that they want to employ for teaching purposes, and they want them fast," says Matt Haschak, director of IT security and infrastructure at BGSU. "We were trying to do it all, but it was unsustainable."

New requests could not come at the expense of hardware and software maintenance. And IT administration could not come at the expense of the university's mission to continually improve educational experiences inside and outside the classroom.

Something had to give.

NEW COLOCATION STRATEGY

The data center at BGSU is smack dab in the middle of campus, on the third floor of a building constructed in 1931. The location presents a number of challenges, such as getting new equipment into the room. At one point, the university had to cut a hole in the roof and lower new hardware in.

BGSU recently decided to establish a new data center at a colocation facility. Doing so would free up valuable space on campus for new student services, and also dramatically reduce the time and effort required for infrastructure maintenance.

But hardware caretaking was only half the problem. BGSU wanted to find a better, faster way to accommodate requests for new applications and IT services.

"We started looking at SDN [software-defined networking], and we had three requirements," says Haschak. "We wanted an architecture that would allow us to be more efficient, that would be more flexible and open, and offer better, more consistent security."

His research led him to the combination of Cisco® Application Centric Infrastructure (Cisco ACI™), Cisco Nexus® switches, and the Intel® Xeon® processor-based Cisco Unified Computing System™ (Cisco UCS®).

"We did a bunch of homework and looked at other SDN solutions, but they weren't as mature as ACI," says Haschak. "And once the decision was made, ACI became the focal point of the entire colocation build out. We are building everything around it."

ABOVE Big thinker: Matt Haschak, director of IT security and infrastructure, on the BGSU campus

MORE CONSISTENCY, BETTER SECURITY

Haschak cut his teeth as a security analyst, and he brings a security-minded focus to every infrastructure project and decision. While Cisco ACI was chosen for its ability to simplify and accelerate application delivery, it was the security aspects of the architecture that got his juices flowing.

"ACI is a policy-based architecture," Haschak explains. "Once you define those policies, they follow the application no matter where it is stored or accessed. If you do it right the first time, everything else becomes faster, easier, more consistent, and more secure moving forward."

Cisco ACI forced Haschak and his team to better understand the connections and communications between BGSU's technology systems, and establish policies surrounding application security, load balancing, user access, and the like.

"It takes some time up front, but it will pay huge dividends for us," he says. "A lot of security breaches happen on old systems that are somewhat forgotten and just sitting there. With ACI, we can see everything in a single pane of glass, we know what is connected to what, and we know the security policies are being enforced."

When BGSU's applications are ported to the new colocation data center in spring of 2016, the university's IT staff will be largely freed from the burden of infrastructure maintenance. And they will have a powerful SDN architecture that streamlines application delivery and support.

"We will be able to accommodate more one-off requests, and we will have more time to consider new things and new ways of serving our students and staff," says Haschak.

He cites a new test and development environment for university researchers as an example. In the past, that sort of environment would have been very difficult and time consuming to deploy, segment from the university's core systems, and secure. With Cisco ACI policy templates, it will be fast and effortless.

"Our new architecture is allowing us to evolve," Haschak says, "as an IT staff and as a university."

GET THE SDN COST COMPARISON

Curious about the cost differences between Cisco ACI and VMware NSX? Access the SDN Cost Comparison calculator at the UnleashingIT.com resource center.

THE BIRTH OF A "SMART ENTERPRISE"

How global technology firm KPIT is transforming its operations, from employee recruiting and collaboration to customer engagement and support.

One of the fastest growing IT consulting and product engineering firms in the world, KPIT helps its customers run their business more efficiently and develop products that deliver sustainable competitive advantage. In doing so, the India-based company "co-creates transformational value."

But recently, KPIT has been undergoing a transformation of its own.

"We look at ourselves as a highly agile company, and every function supporting the business needs to be agile," says Mandar Marulkar, vice president and chief information officer at KPIT. "With this goal in mind, we have been working to increase our operational agility."

KPIT partners with more than 200 global corporations in the automotive and transportation, manufacturing, and energy and utilities industries. Much of its work surrounds the development of custom applications that help its customers become more productive, integrated, and innovative.

Because speed of application delivery is a key differentiator for KPIT and, in turn, its customers, the company implemented a private cloud five years ago to allow its developers to provision their own compute resources. However, all other infrastructure services—including network, security, and storage—would often take four weeks to deploy after application requirements were fully understood.

"We wanted to give the power to our application developers to provision all infrastructure components, on demand and in a cost-effective manner," explains Marulkar. "They should be able to decide service, performance, and security levels, and then have the infrastructure automatically configured. They shouldn't have to worry about technical configurations, and they shouldn't have to wait."

DIGITAL TRANSFORMATION

Known internally as "Smart Enterprise," KPIT's digital transformation initiative aims to advance the company's business processes using social engagement, mobility, predictive analytics, and container technologies. But before those goals can be attained, the company needed to modernize its infrastructure and application environment.

KPIT is doing so with a combination of Cisco® Application Centric Infrastructure (Cisco ACI™), Cisco Nexus® switches, the Intel® Xeon® processor-based Cisco Unified Computing System™ (Cisco UCS®), and Cisco UCS Director. A policy-based automation architecture, Cisco ACI simplifies and accelerates application delivery.

"ACI provides essential automation," Marulkar explains, "which helps speed up infrastructure provisioning, reduce human errors, and ensure compliance and uniformity of all applications. In essence, it allows us to work faster and deliver better solutions and services."

Cisco ACI also integrates with KPIT's preexisting network infrastructure and comes pre-loaded with application templates and rules, easing the implementation process.

"The openness and integration of ACI was very crucial because we didn't want to create isolated technology islands in our data center," says Marulkar. "And with an intuitive interface, ACI has been easy to learn, manage, and monitor."

THE NEXT LEVEL

According to Marulkar, KPIT can now respond quickly and efficiently to new application requests and business requirements—for both internal and external customers. It can build multitenant environments that simultaneously cater to the needs of multiple customers while delivering consistent security and performance. And it can offer better, more competitive service-level agreements to the marketplace.

"Cisco ACI has helped us take our business offerings to the next level," says Marulkar. "That means we can pursue more business opportunities, capture additional revenue, and increase customer satisfaction."

KPIT can also advance its "Smart Enterprise" ambitions. The new infrastructure and application architecture will provide the foundation for a variety of new digital platforms. And they will help transform the company's operations, from employee recruiting and collaboration to customer engagement and support.

Smart indeed.

GET THE FULL CASE STUDY

Cisco ACI reduces costs, automates IT tasks, and accelerates application deployments. To learn more about KPIT's use of Cisco ACI, get the full case study at the UnleashingIT.com resource center.

TRANSFORMING BUSINESS

With an application-centric data center, KPIT is advancing its "Smart Enterprise" initiative with a variety of new technologies.

"All of our internal processes and customer-facing applications are being transformed," says Mandar Marulkar, vice president and chief information officer at KPIT. "We want to improve how we engage with customers, the speed with which we deliver products and services, how we innovate, and the resiliency and reliability of our operations."

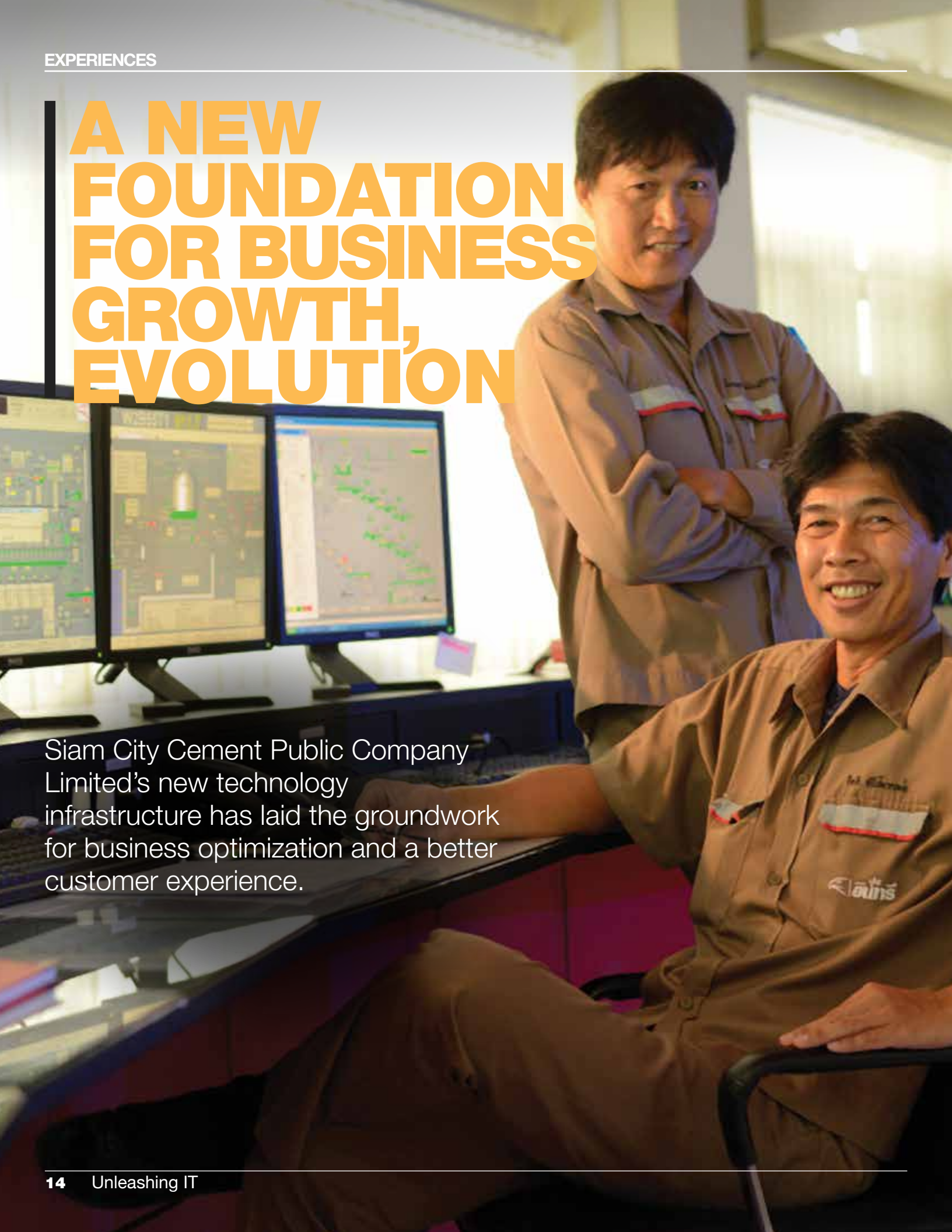
The integration of mobile, video, and cloud technologies is key to the transformation. KPIT is utilizing a combination of Cisco Connected Mobile Experiences (CMX), VBrick streaming video, Cisco Intercloud Fabric™ (ICF) solutions, and Cisco Identity Services Engine (ISE).

"We want to provide secure access to all applications and data through mobile devices," Marulkar explains.

With the new technologies in place, KPIT plans to enhance employee recruiting, training, and collaboration. It will expand customer engagement and digital marketing practices. And it will use advanced analytics to attain new insights surrounding operational performance and customer trends.

"This is just the first phase of our Smart Enterprise initiative," says Marulkar. "We will continue to transform the customer experience, enhance our operational processes, and pursue new digital business models."

A NEW FOUNDATION FOR BUSINESS GROWTH, EVOLUTION



Siam City Cement Public Company Limited's new technology infrastructure has laid the groundwork for business optimization and a better customer experience.

The directive from Siam City Cement Public Company Limited (or INSEE) leaders was clear: Go digital, become more agile, and use the latest technologies to grow and evolve in the Asia Pacific region.

"Even though we are a cement provider in a commoditized industry, we believe technology can help us be a leader in this market," says Hans Keril Ante, head of IT, security, and compliance for Siam City Cement PCL, one of the largest cement producers in Thailand. "So we reconsidered everything."

That meant rethinking the core infrastructure, cloud utilization, and endpoint devices, and it included a dedicated pursuit of big data analytics and the Internet of Things (IoT). All in an effort to boost operational efficiency, enhance the customer experience, and create differentiation in a mature market.

NEW DATA CENTER BUILT FROM SCRATCH

Based in Bangkok, Siam City Cement PCL has three primary manufacturing plants and 98 smaller mixing plants spread throughout Thailand. A brand new, world-class data center that connects them all recently went live.

"We built it from scratch using the best technology we could find," explains Ante, the infrastructure lead for the digital transformation project.

The combination of Intel® Xeon® processor-based Cisco Unified Computing System™ (Cisco UCS®), Cisco Nexus® switches, and Cisco® Application Centric Infrastructure (Cisco ACI™) are at the heart of the new data center. A policy-based automation architecture, Cisco ACI simplifies and accelerates application delivery.

"It's so easy to interconnect and provision things," says Ante. "We connected and configured the new data center in only two weeks. And we can provision new services quickly. Not just servers and switches, but entire services. If we want to deploy a new web service or connect to a new cloud service, we can do it very fast."

Network configurations, firewalls, and security elements are automatically replicated using Cisco ACI policies and service profiles. Ante says his team was able to replicate 30 servers and switches in less than three hours. This speed was a critical factor in stress testing the new environment and preparing SAP HANA for production deployment.

"We got SAP HANA up and running faster than expected, and we've seen a 100 percent performance improvement compared to our old SAP installation," Ante says. "Because it's so much faster, we can conduct better analytics and run more complicated reports."

MORE EFFICIENCY, BETTER CUSTOMER EXPERIENCE

Some 80 percent of Siam City Cement PCL's orders are placed online through customer and supplier portals that generate a

Hans Keril Ante, head of IT, security, and compliance

wealth of data. And new sources of data will soon be brought online as part of the company's IoT strategy. With better integration and visibility of that data, Ante and his team are planning to conduct advanced analytics that lead to business optimization.

"We want to become more operationally efficient," says Ante. "With our new infrastructure and SAP HANA, we can see the performance of our plants and the performance of our business. And we can see everything with one dashboard."

Siam City Cement PCL also has the flexibility and agility company leaders requested, and will use them to continuously enhance the way it serves its customers.

"We don't know what new apps will come that can improve the customer experience or our competitive advantage," says Ante. "But we know we can implement anything, and we can do it quickly."

Company leaders can be more creative as they explore opportunities to grow and evolve, he adds. Regardless of which paths they choose, Siam City Cement PCL's future will be built on its new technology foundation.

"The combination of UCS, Nexus, and ACI was a no brainer," says Ante. "If we didn't adopt them, we would be stuck in the past."

GET THE FORRESTER STUDY

Forrester calculated the potential ROI and typical payback period for Cisco ACI deployments. See the results and get the Forrester Total Economic Impact™ study at the UnleashingIT.com resource center.

COMPETING WITH PUBLIC CLOUD TITANS

Why large-scale cloud providers should be concerned about West Virginia's Alpha Technologies.

The West Virginia economy has been decimated in recent decades. As the once-fruitful coal mines fade into obscurity, so too have the career prospects for countless area professionals.

"The local economy needs an influx," says Doug Tate, founder and president of Alpha Technologies, a West Virginia cloud, communications, and hosting provider. "I want to create 300 to 600 high-paying jobs that will help."

To do so, Tate needs to grow his business. Alpha currently supports hundreds of customers, but it aims to serve thousands. And it has lofty ambitions of competing with the world's largest cloud providers.

"We want to play in the same sandbox as the big boys," Tate says, "on local, regional, and national levels."

Alpha is now in a position to do so, he claims, because of its recent adoption of Cisco® Application Centric Infrastructure (Cisco ACI™), a breakthrough software-defined networking architecture, and the Intel® Xeon® processor-based Cisco Unified Computing System™.

"ACI is a game changer," Tate says. "It allows us to compete at a higher level."

SECURITY, COMPLIANCE FOR GOVERNMENT CUSTOMERS

Alpha's proximity to Washington, D.C., makes it an ideal provider for government contracts and projects. But as with all public sector activities, data security is of utmost importance.

"Traffic needs to be completely isolated," says Jack Belcher, COO for Alpha. "In the past, we had to manually provision everything—network, virtual machines, security. It was time consuming, complex, and came with the possibility of human error. But ACI is secure by default."

In a traditional data center, every system can communicate with others unless segmentation policies are meticulously defined, creating a dubious security posture. Cisco ACI is the opposite. Server, storage, and networking systems cannot interact with each other natively unless those links are deliberately established.

"There is less complexity but more depth with ACI," Belcher explains. "So security is simultaneously simpler, better, and more manageable on a granular level."

That has allowed Alpha to bolster its PCI, HIPAA, and SSAE16 compliance capabilities, and pursue ISO27001 and FedRAMP certifications.

"When you get certified by these standards bodies, it opens up a ton of new business opportunities," Tate says, while adding the company's size, geography, and status as a service-disabled, veteran-owned company also play in Alpha's favor. "Our whole pitch is around security and data protection."

In the past, it took a week to get a new customer up and running on Alpha's cloud. Using Cisco ACI, the same work can be accomplished in less than an hour—with full data isolation, better security, and demonstrable compliance with a number of industry standards.

The extra time will be spent attracting new business, enhancing customer support, and creating new jobs for the local population. While Alpha generated roughly $13 million in 2015 revenue, Tate estimates the company can "easily" net upwards of $200 million in 2016.

"We are bidding on multi-million and multi-billion dollar contracts that nobody else can touch, and it's largely based on our security and compliance capabilities," Tate says. "This stuff sells itself."

BETTER GOVERNMENT: ONLINE VS. WAITING IN LINE

How NIC is making government services more accessible for citizens.

Interacting with state and local government agencies isn't always easy. It often involves traveling to an understaffed office, filling out paperwork, waiting in line, and hoping for the desired answers or outcome.

NIC is working to improve these interactions by making them more accessible for citizens and businesses. The eGovernment pioneer has delivered roughly 9500 services in more than 30 states, making it easier for people to obtain hunting and fishing permits, register vehicles, pay for parking tickets, purchase business licenses, and comply with court and corrections mandates. All online, without waiting in line.

But as with all public sector activities, citizen privacy is of utmost importance.

"We essentially act as a fully managed private cloud for a number of states," says Jeff Shaw, vice president of IT at NIC. "But each agency is independent and has its own data that can't be intermingled with others, even within the same state."

GET STARTED

A variety of solution and service bundles with fixed pricing are available to speed up Cisco ACI deployments. To learn more about Cisco ACI starter kits, visit the resource center at UnleashingIT.com.

With data isolation and protection being critical to its success, NIC would meticulously and manually provision everything—servers, network, security—to deploy each new service or onboard a new agency. The process took 30 to 45 days on average.

FASTER PROVISIONING, BETTER SECURITY

NIC has adopted Cisco® Application Centric Infrastructure (Cisco ACI™) to increase the speed and efficiency of service delivery. The software-defined networking architecture automates infrastructure provisioning, greatly accelerating application development, testing, and deployment.

"ACI handles all of the tedious, manual infrastructure tasks for us, so we can deploy new services faster," says Shaw. "What used to take a month or more now takes hours."

NIC recently hosted a technology conference, he adds, in part to showcase its new development capabilities. In the span of three and a half days, conference leaders and attendees created 583 discrete application environments.

"I never thought it would be possible to spin up that many environments in that short of a timeframe," says Shaw. "It has taken us 23 years to deploy 9500 services. With ACI, I think we can increase our output by 500 to 1000 services annually."

And all of them will have better data isolation and security. Cisco ACI decouples security and segmentation from the underlying network topology, providing automation and policy control down to the individual tenant, application, or workload.

"Government agencies want to move to the cloud," says Shaw. "With ACI, we can get them there more efficiently and securely than ever before."

BUSINESS UNLIMITED

For Pulsant and its customers, the combination of Cisco Application Centric Infrastructure and F5 Device Package delivers integration and automation across multiple environments.

Choice and integration. That is what Pulsant's customers are demanding. And it is exactly what the U.K.-based cloud, colocation, and managed services provider is delivering.

"Our customers are increasingly utilizing a hybrid combination of technologies and services, from on-premises and colocation data centers to managed and public clouds," says Matt Lovell, CTO for Pulsant. "But they don't want a collection of point solutions. They want end-to-end management, security, and analytics across all of these environments."

With hardware, software, standards, and everything in between being different, data becomes the pivot point, he explains. And policy control surrounding that data is the only way to ensure consistency—of governance, security, and compliance—no matter where the workloads reside.

A POWERFUL COMBINATION

Pulsant is utilizing the latest software-defined networking (SDN) technologies to integrate its colocation and cloud offerings and provide a higher level of service to its customers.

"We're moving up the enterprise food chain by becoming more data and application centric," Lovell says. "There are a lot of cloud providers, but not many can offer management down to each device or a single pane of glass across all enterprise applications."

Cisco® Application Centric Infrastructure (Cisco ACI™) and the F5 Device Package for Cisco Application Policy Infrastructure Controller (APIC) have been key to Pulsant's evolution in this arena, providing integration and automation from the core network to the application layer.

"The network is critical for how applications, services, and data are handled," Lovell explains. "The combination of Cisco ACI and F5 Device Package provides visibility and policy control across L2 to L7 fabrics, and removes the boundaries between physical and virtual workloads."

SIMPLICITY + AUTOMATION = SPEED

Pulsant's new architecture provides intelligence and abstraction that simplify and automate complex tasks. That means much faster development and provisioning for Pulsant and its customers.

"It's all about simplicity," says Martin Lipka, head of connectivity architecture at Pulsant. "If the racks are set up and the cables are laid, I can configure a new data center in 10 minutes, and I can teach someone else to do it just as quickly."

In the past, it would take Pulsant weeks to patch together different systems and services, handling security, protocols, and compliance on a case-by-case basis. Today, it takes days or even hours.

"Architecting a complex core network is difficult and time consuming, but the next-gen controllers do most of the heavy lifting," says Lipka. "The APIC takes high-level instructions, breaks them down into little pieces, and delivers them to the ACI Fabric. It's all automated."

Pulsant isn't just providing systems and service integration, but also end-to-end visibility, health monitoring, policy control, and security. A new self-service portal will soon give Pulsant's customers greater access to and control of their data—across multiple physical and virtual environments—for advanced analytics, reporting, and decision making.

"This is one of the most exciting times to be a networking specialist," Lipka says. "We are in the midst of a revolution, and ACI is a revolutionary technology. After two days of testing, we could tell it would change and improve the way we run our business and serve our customers."

"Business unlimited," says Lovell. "That's our vision, and we are delivering on the vision by creating new ecosystems of value for our customers—all backed by an integrated platform with consistent security, management, and policy control."

CISCO ACI BY THE NUMBERS

See how much time and money can be saved through the use of Cisco ACI.

To get the IDC Business Value Snapshot, visit the resource center at UnleashingIT.com.

Faster data center. Full stop.

Slow is neither an option nor an excuse today. That's why Intercloud, ACI, and data centers powered by Cisco UCS get you and your business ready for cloud at the speed of right now. See how.

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