NETWORKS
THAT
KNOW
AUTOMATION

EBOOK

AUTOMATION

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Preface

Over the years and across industries, it has been proven that increased automation leads to greater efficiency, enhanced productivity and a more agile way of doing business. The same is true for IT: as budgets dwindle, or become stretched to cover a greater range of responsibilities, the need for automation becomes more pronounced.

Increased automation means that IT organizations can spend more time working smarter, not harder – repurposing their expertise into initiatives that directly impact business success rather than spending time reactively and manually provisioning and operating IT assets. Automation also means that the potential for human error can be minimized or eradicated. It means more productive uptime and less damaging downtime.

In many ways, the rest of the IT technology stack is far ahead of the network when it comes to automation. The problem with this is that if one link in the chain is not automated – the network, for example – it can detract from the benefits of automation in other areas of the data center or cloud.

In fact, automation is one of the primary reasons we are currently seeing such interest in the industry around software-defined networking (SDN). It brings the promise of automating the network in line with the rest of the IT stack.

However, while some proprietary network architectures may very well provide good levels of automation capability, they can also lock the buyer into expensive or inflexible vendor upgrades and maintenance regimes. Or it might even lead to ripping and replacing the existing infrastructure altogether. It's automation, but not as you wanted it.

Section 1
KNOW THE LAY OF THE LAND

Every business has a mandate to do more with less. So it's no wonder that IT leaders, strategists, engineers and administrators are increasingly turning to automation tools to ensure that the enterprise can continue to innovate on flat, or even shrinking, budgets.

As more organizations are ramping up cloud capabilities in their data centers to deliver apps and support the business faster and cheaper, it's natural that different forms of automation are brought to the fore to tackle the risk, velocity and resource queries.

But there's a problem lurking in the background – one that poses issues for corporations in the months and years ahead. Gartner, in its "Automation Key to Managing Your Data Centers and Clouds" webinar, describes it as "opportunistic" buying. Which is to say that many enterprises are not always mindful of the bigger picture when investing in automation technologies – especially when it comes to promoting integration, collaboration and self-servicing. In short, a problem solved today becomes an albatross around the neck tomorrow.

Part of the issue is the sheer size and urgency of the task facing back office IT functions as they attempt to keep up with the huge growth of storage and compute power at the organization's disposal. In tandem, they're also under pressure from internal business units that are looking for new revenue streams by getting apps and services to market more quickly.

"While 22% of organizations have not needed to overhaul their network infrastructure to accommodate a cloud platform, 73% have needed to make changes since not all the architecture is under their domain."

A commissioned study conducted by Forrester Consulting on behalf of Juniper Networks, Hybrid Cloud Places New Demands On The Network, April 2014

The chief protagonists in the equation – network engineers and application experts – are there to pick up the pieces and have somewhat different, and often conflicting, priorities vying for attention.

On the one hand, service and application developers are preoccupied with aligning innovations to revenue and integrating tools with the larger ecosystem. On the other hand, engineering personnel are focused on reducing risk, optimizing network management, troubleshooting and reducing configuration changes, as well as responding to network events and conditions. They're also looking to control application performance as they traverse multiple devices (switches, routers, firewalls) and deal with multiple programming languages.

Each team needs to perform these complex tasks while limiting the time and cost of human intervention. Automation is seen as the answer, and you can take your pick of individual tools and portfolios. From SDN, to scripts, to cloud orchestration – the choices are bewildering.

But the tool is only part of the answer. What you really need is a simple, flexible and agile network architecture that solves some of the most difficult problems in the data center today.

Section 2

KNOW YOUR VULNERABILITIES

"Network security when connecting to cloud services has the biggest impact on creating a hybrid cloud, followed by network bandwidth, network performance and network reliability. Once these fundamental features are implemented, the focus turns to network automation/ programmability and network virtualization."

A commissioned study conducted by Forrester Consulting on behalf of Juniper Networks , Hybrid Cloud Places New Demands On The Network, April 2014

The convergence of technology, the pace of product development and the need to respond to growing trends like Big Data are all placing pressure on existing IT infrastructures. Everyone is looking to serve their internal and external stakeholders more quickly and providing improved access to new services – while at the same time struggling to maintain consistency of service, meet new compliance requirements and suppress the need for capital investment.

Although many enterprises and their IT departments are well versed in OpEx-first strategies, the historic investment in outdated legacy systems is holding back their ability to improve automation across the stack. One only needs to look at the many network operating systems that rely on tedious and error prone manual provisioning practices. Finding misconfigurations with such limited technology is like finding a needle in a haystack for network administrators, and precious time is wasted patching vulnerabilities that can easily take days or weeks to identify.

What these teams need is zero-touch provisioning and significantly reduced manual intervention. What they are getting, however, are proprietary programming languages, non-standard protocols, non-structured data and restricted or blocked access to new, open source tools.

As we alluded to earlier...

it's automation, but not as you wanted it.

Section 3

KNOW YOUR OPPORTUNITIES

"By 2015, 75% of larger enterprises will have more than four diverse automation technologies within their IT management portfolio, up from less than 20% in 2013."

Gartner Webinar, Automation Key to Managing Your Data Centers and Clouds, Ronni Colville, February 5, 2014

So, if closed, multi-layered, complex network architectures are out the window – what replaces them? For network agility that matches your compute and storage capability – promoting more automation and greater business efficiency – today's forward-thinking enterprise has its sights firmly fixed on openness.

Openness means best-in-class technologies without proprietary lock-in. Openness means networks that are software-defined, not limited by hardware. Openness means less money and fewer resources expended for the same or better results. Openness allows you to easily integrate new protocols and even do it yourself – without the vendor expense.

Network automation is critical to making the most of the cloud. But to do so, the enterprise needs to acknowledge that openness and automation are inextricably linked. Open networks, whether physical underlay or virtual overlay, don't just reduce investment in new technologies, they also extend the use and value of the network, and the cloud overall, in the long run. And all of this means, of course, that you can put the fears of "rip and replace" to rest and focus on building a data center and cloud architecture that is nimble and ready for the future.

With cleaner, more simplified architectures – using common, multi-use building blocks, fewer components and layers, and embracing new technologies like SDN – engineers, administrators and users have all the benefits of class-leading interoperability without the disruption of wholesale infrastructure changes.

With open source automation and configuration tools, you become the coder and modify it to suit your own needs – controlling your physical and virtual environments as you want. It means you can set the rules for new automation at different layers – maintaining control over policy, scripts and tools. It also means you can automate multiple tasks simultaneously, such as detecting incidents, collecting diagnostic data, simplifying incident escalation and performing inventory management.

Open sources tools are not just limited to orchestration and management either – many SDN solutions are also following an open strategy. This increased availability of open source components allows you to truly build a custom, best in class solution that suits your unique requirements.

Coupled with this, smart network technologies and tools are now available that provide new levels of automation based on data analytics and intelligence. Tools that can more efficiently automate the configuration and provisioning of the network, so that you always have your data and apps in the right place, at the right time. Tools that help you reduce downtime, lower operational costs and free up more time for dealing with strategic planning, fluctuating network growth, escalation procedures and end-of-life network analysis.

With actionable network intelligence, you could be saving valuable man hours and solving issues before they arise in the first place.
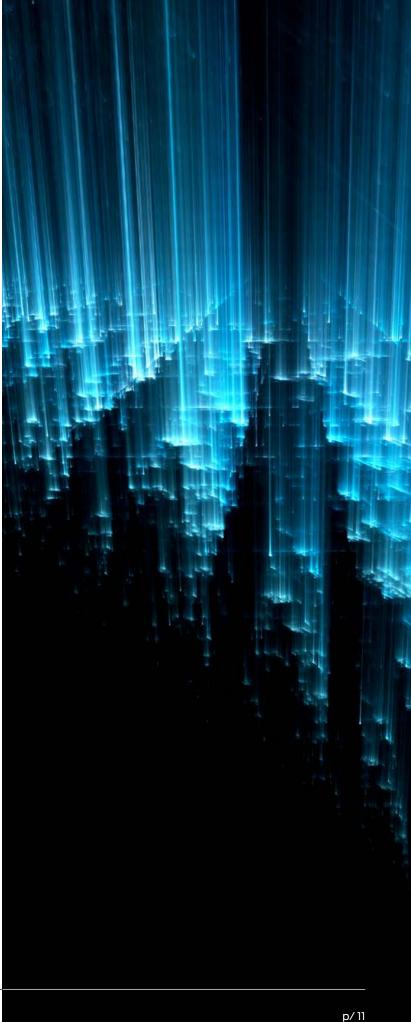
Section 4

KNOW YOUR CHECKLIST

What are the key attributes of a truly automated network?

Your checklist:

- Built on an open network architecture with standard protocols

- Enables the use of self-service portals and management interfaces

- Able to rapidly deploy network-based services at scale

- Ratchets services up and down with optimum elasticity

- Incorporates SDN technologies and principles

- Leverages programmable hardware that adapts to changes in the infrastructure or applications

- Supports server configuration changes faster than traditional, manual provisioning processes

- Visualizes and controls the whole network via a single pane of glass

- Unified, self service interface with centralized control for all scheduling needs

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