IN THIS WEEK'S ISSUE: Network Automation: Tool Or Tripe?; A Possible End To Public Cloud. Please remember to enable the images; the magazine looks a lot better that way!

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(aka The Project Plan)

Issue Number 47

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The "ITIL Change Freeze" issue.

Thought For The Week:
Happy Holidays From The Packet Pushers!

1. Network Automation: Tool Or Tripe?

by Ethan Banks

While on a briefing with Brocade about their Workflow Composer Automation Suite, I wondered to myself who the sudden cornucopia of vendors' network automation products is actually for. The cynical side of me wonders whether network automation is a product meeting a market demand--or making one.

The answer, I believe, is both.

1. The market demands automation. More accurately, *one* market demands automation. That market is comprised of businesses with complex, churning networks that can't be configured as quickly as the business requires without automation.
2. Automation creates its own demand. Because most networks are not experiencing radical, constant churn, there's a disconnect between the automation craze and customers scratching their heads about what everyone seems so excited about.

No matter which side of the fence you fall on, I suspect that to most network engineers, automation instinctively feels like the right thing to be doing. Even if you don't have a serious business demand to automate network tasks, there's a voice in the back of your head telling you that you could save time and reduce errors if you automated certain tasks.

Let's step back from automation for a moment and consider new vendor features as a whole. Are all new technology features meant for every business? No. Many features are created for specific customers to solve specific problems. Perhaps you have those problems. Perhaps you don't.

The question isn't whether the features are interesting or useful. The question is whether they are needful. Yes, it's possible for you to evaluate new features you learn about in a class or that appear in Junos or NX-OS release notes, and then come up with use-cases. That's not the point. The point is whether these new features address

a specific problem your business has.

Often, the temptation is to put a new feature into production because you want to. However, beware of science experiments. “As simple as possible” is a mantra I’ve followed after inheriting pretzel knots of configuration complexity that served no business purpose. If you love your complex configurations, consider that data center networks of vast scale are usually quite simple. Scaling large becomes more difficult in the face of complex design.

A fair objection is the issue of career advancement. How will you move into whatever your dream role is if you aren’t improving your skills? Doesn’t career advancement necessitate twiddling the nerd knobs to demonstrate your packet-fu to potential employers?

Folks, there are ways to gain new skills without putting fiddly bits into production. As an interviewer, I’m 100% comfortable with a candidate who can talk me through their knowledge of a tool, whether that knowledge was gained in a lab or in production. Why? Because the term “production” is relative. What is production to you might seem like small potatoes to me. And what I am proud of in my production environment might seem like an adorable little lab exercise to someone else.

Therefore, keep production for those needful features that solve specific problems. Here are a few examples from my own experience, both positive and negative.

1. I used PVLANs to meet a specific business requirement to isolate customer gear from other customer gear living on my premises. Positive.
2. I used L3 access uplinks to isolate closet switch stacks from other closets, and push the bridging loop failure domain out to the edge. Positive.
3. I used storm control to limit the effect of a bridging loop on a core switching environment. Storm control is a difficult feature to

baseline correctly. Considering different design options might have addressed the problem more effectively. On the whole, negative in that specific circumstance.
4. I once managed a government network that connected many different agencies. My predecessor loved to experiment, and thus I inherited agencies connecting to the core via many different access methods. Experimenting in production is always a negative.

What then of network automation? I'm not here to tell you that automation is a tool you can safely ignore, because the hype is overblown, and this, too, shall pass. Rather, I believe that network automation is here to stay. That's because network automation has roles to play both small and large, and the toolbox is expanding steadily. You do not have to automate your entire network. Automation is not an all-or-nothing commitment. You can find small use cases for automation, as well as globally impactful ones.

Gaining competence with network automation is a useful skill to go after, as long as you remember to apply it in appropriate ways bound by a specific scope that meets a business need. Improving time to production and reducing the risk introduced by change are always valid business needs to consider.

developments in wide area networks, data center networking, network operations, and software-defined security.

Register for Interop ITX and attend other hands-on workshops like The Future of Data, Container Crash Course, Dark Reading Cyber Security Summit and the Open Source IT Summit. The event's Conference tracks focus on Security, DevOps, Cloud, Infrastructure, Data & Analytics – all the technologies you need for a successful Full Stack IT strategy. If you're looking to accelerate your career, there are also plenty of sessions on leadership and professional development. Plus, check out over 100 vendors at Interop ITX's Business Hall where you'll have an opportunity to meet with leading and emerging tech vendors.

Join us at Interop ITX this May. Use promo code: **PACKETPUSHERS** when you register, and you'll receive 20% off any pass.

We want to see you in Vegas, so visit interopitx.com and reserve your spot today.

2. A Possible End To Public Cloud

by Greg Ferro

Public Cloud is about centralization. But history tells us that every phase of centralization is followed by phases of distribution and expansion.

Network Enabled Perfection

It is the extreme realization of the data center over the last decade or so. The increase in network bandwidth has made it possible for Enterprise IT to move servers out of the branches and remote offices into a pair of locations. Computing at the edge of the network is taking advantage of this. Meanwhile, 'mobile' in the form of tablets, laptops, and smartphones has transformed the concepts of 'location' and 'network connection'.

We know that the network is far from perfect and that loss, latency, jitter and speed may impact the user experience. These network issues are not a problem right now because of the relative abundance of bandwidth today.

Machine Learning

A logic flow on how machine learning has low reliance on the cloud:

1. Devices get more capable through improvements in CPU, memory etc.

2. Machine Learning (ML) is developing rapidly and can analyze large data sets for decision making.
3. Sensors will be used to gather data to feed the ML systems.
4. It becomes rapidly impractical to transport large amounts of sensor data to ML farms in a centralized cloud.
5. Processing is done locally and summary data is sent to the ML Farm.
6. The ML Farm analyses data across a very large data set and gains further insights, information, and analysis.
7. This information is sent to the edge devices to improve their local decision making.

It doesn't matter if your device is a factory robot, pair of smart running shoes, or an autonomous truck. The result is the same.

Example: Voice control of devices is done this way. Companies have gathered and analyzed large data lakes of voice recordings to train voice response systems. The result is that part of your voice commands are processed locally on the phone's operating system.

Bit Production Or Transport

David Ward described this effect as 'bit transport' vs 'bit production'. Today it is cheaper to transport the bit over the network and process it in a central location than to process the bits at the network edge with some help from CDN caching.

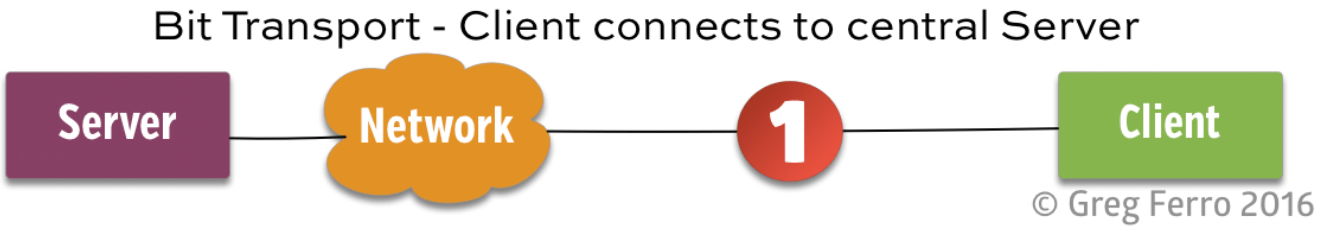
I think there are three possible ways of looking at this:

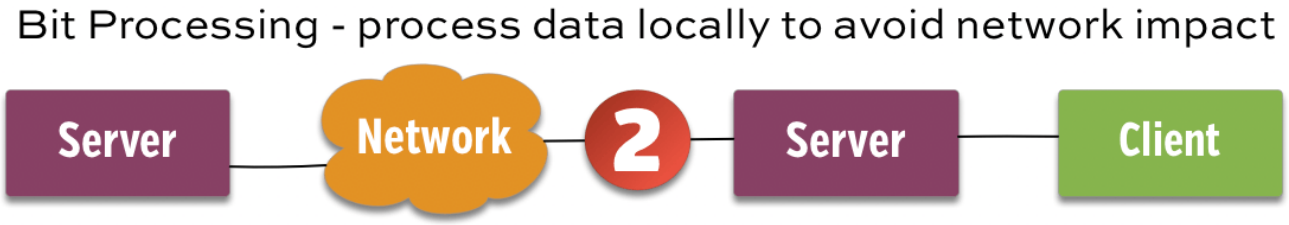
1. Centralized - Network bandwidth will increase exponentially and enable ever-increasing data mobility. (Unlikely due to cost and physical 'speed-of-light' issues.)

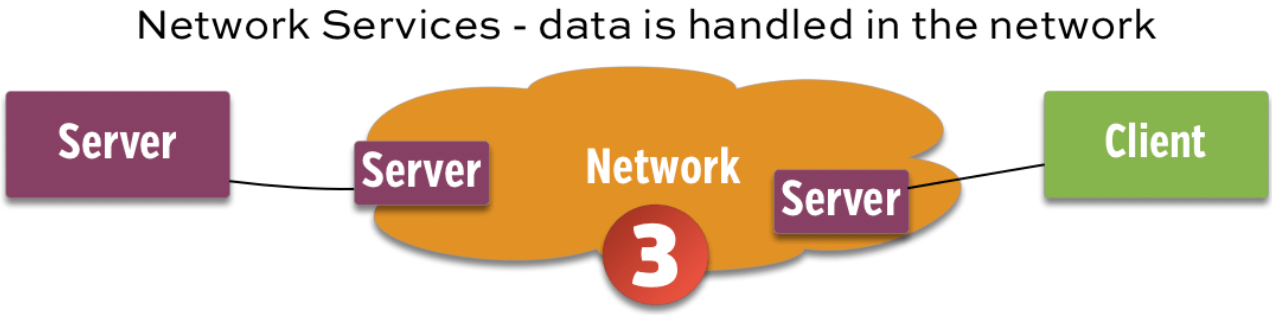
2. Edge Computing - Locate processing resources (a.k.a data centers) at the network edge close to the data source. For example, around 2005, we placed servers in remote locations so that data was close to the point of consumption for files and printing due to lack of bandwidth (and poor application design).

3. Network Computing - Move data processing into the network that is similar to content delivery networks. Your telco becomes a distributed computing provider with functions available on demand.

Bit Transport vs Production







The Long Term View

In my view, the most likely model will be Edge Computing, where many millions of data centers will be located in pockets, factories, and buildings to the data relevant to a system in the local area. Telcos are going to make substantial investments in Network Computing, especially in their 5G networks, hoping that they can add value for autonomous cars and intelligent city functions like lights, sewage, and traffic.

Cloud Computing will be a smaller but vital part of the future. In fact, this model already exists when you examine companies like Netflix, where less than 20% of their total IT is held in AWS. The rest is a global distributed CDN that does the heavy lifting at the edge of the network.

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Internets Of Interest

A collection of pre-loved links that might interest you. "Pre-loved" because I liked them enough to put into this newsletter. It's not *true* love.

By Greg Ferro & Drew Conry-Murray

Open Network Linux Expansion

BigSwitch Networks is expanding its Open Network Linux (ONL) network OS. Additions include support for ARM CPUs as well as the Mellanox Spectrum ASIC. It also can run on a host of new 1Gbps, 10Gbps, and 100Gbps switches from manufacturers including Dell and Accton.

> *"ONL has been part of the Open Compute Project (OCP) in an official capacity for nearly two years and we've watched as open hardware and software has gained mindshare with end users, technologists and even vendors..."*

Sure, Learn To Code. But First Learn Network Engineering

Russ White offers a full-throated defense of network engineering skills in this argument about networkers learning to code. But be sure to read beyond the headline: He doesn't say there's no value in coding. He also makes a pointed distinction between deep network engineering skills and simply stringing together a bunch of vendor

gear. One is not the other.

> *"Learn how the protocols really work, from theory to implementation, rather than how to configure them. Learn how devices switch packets, and why they work this way, rather than the available bandwidth on the latest gear. Learn how to design a network, rather than how to deploy vendor gear."*

Seriously, read the whole thing.

How VMware is Dealing with Docker Competition

Container Journal offers a brief analysis of how VMware is responding to the rise of containers, particularly Docker. Rather than try to fend off an incursion, VMware is embracing containers--literally--by building tools that make it easy for customers to host containers in the VMware hypervisor.

CCIE R&S written v5.1 thoughts

Network Introvert shares some generally positive impressions about the latest version of Cisco's Routing and Switching written exam. The test has been critiqued lately for poorly written questions and other problems. And of course, it wouldn't be a CCIE post without some tips on test prep.

"The topics that it hits are relevant for the most part, and I think that a lot of the input that Cisco received at Cisco Live this year was taken and has helped to create a better exam."

Introduction to StackStorm

Matt Oswalt, who blogs at KeepingItClassless.net, provides a detailed introduction to StackStorm, an open-source automation platform that's owned by Brocade. If you're looking into network automation, this post will be worth your time. Matt describes the key elements of the platform and provides code examples where relevant. Full disclosure: Matt works for StackStorm.

Recent Articles

The last five articles published on Packet Pushers

PacketPushers.net - The Last Five

Datanauts 65: Cloudy With A Chance Of Ops

Network Break 117: Cisco, Arista Notch Legal Wins; Intercloud Is Out

Show 319: Modern Networking – Where Are We Now? Part 1

PQ Show 103: Design & Build 11: DMVPN

Datanauts 64: Advancing Your IT Career

Watch This!

Where we collect some videos that make us reflect, think about our inner lives, or just entertain us.

This is a charming explanation of the serial comma and why it should be used. The instructor is Mary Norris, a copy editor at The New Yorker. She's made a whole series of short, clear grammar videos, which will come in handy if you want to be a know-it-all on Twitter.

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The End Bit

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We don't give away your email address or personal details because that would suck.