



Table Of Contents

1. Will Networking Become Push-Button Tedium? - Ethan Banks
2. Tech Blogs: How To
3. Sponsor: Cisco Wired For Wireless
4. Tech Blogs: Opinion
5. Packet Pushers Live In New York City
6. The Lulz
7. IT News
8. New Products & Industry Takes
9. Tech Tip: IOS Shell

Will Networking Become Push-Button Tedium?

By Ethan Banks

In this series, I am responding to a Packet Pushers listener, Robert, who sent detailed questions about how I feel about network engineering's future. To express all of my current opinions, I broke Robert's email up into several parts. I responded to each with my loosely held opinion and a contrarian view.

The four parts are as follows. Please enjoy part 4 today--the conclusion.

1. Is the network important?
2. Is network engineering dying? Am I an idiot for choosing this career?
3. Is deep networking knowledge still valuable?

4. Will networking become push-button tedium?

If career is on your mind and you are a premium Ignition member, you should also read [Greg's four-part PDF series entitled "Enterprise IT Career Advice."](#)

Part 4 - Will Networking Become Push-Button Tedium?

Q: I'm wondering at this point if the concepts I find most interesting in the IT world will be dead soon - i.e. connecting devices together.

Loosely Held Opinion

In my opinion, connecting devices together will never become uninteresting. Like you, once I understood the basics of packet-switched networking, I was hooked. As a young person, I was interested in shortwave radio for the same reason. Communication across great distances is endlessly fascinating to me, whatever the means.

Modern networking has increased in complexity due largely to security and scale requirements. Multi-tenancy, service chaining, and hyperscale data centers have launched a multitude of open source projects, startups, IETF drafts, and vendor product launches. The rapid evolution in networking technology in the past ten years is somewhat astonishing compared to the relative "frozen in time" vibe of the previous twenty.

I can't imagine networking as dead. Fractured? Horribly. Unevenly distributed? Absolutely. Proprietary? Increasingly. But dead? Not now, and not ever. Networks are the water in which applications swim.

Contrarian View

If the industry were to standardize the way in which devices are connected together, then my view is that networks could be constructed like interlocking Lego bricks. Each brick would be a module well understood and severely constrained by a generally accepted "correct" way of constructing a module.

In this approach, each module would have predictable characteristics and, therefore, be able to interconnect predictably. Imagine a campus module, Internet edge module, data center module, WAN module, cloud module, and so on.

With severe constraints and the resultant predictability, automation could run riot. That is, automation solutions struggle to be effective today because each network they need to act on is a special snowflake. But with standardization, automation would triumph.

In this view--a simplified, standardized network design--connecting devices together would lose some of its magic. Interesting in an abstract way, but rote and perhaps even tedious.

Q: With all of your IT experience, do you really envision connecting networks together a part of operations that goes unneeded because it's push-button?

Loosely Held Opinion

For some definition of “networks,” push-button operation is already happening. SD-WAN is an example of this, where policy is created centrally, and the specific plumbing, routing configuration, and tunnel creation happens automatically.

The SD-WAN ecosystem also offers selected integrations with third parties. For example, Packet Pushers recently interviewed Silver Peak and Zscaler. Their partnership allows Silver Peak administrators to build a policy that routes specific flows to Zscaler for cloud-based security inspection. The configuration is drag-and-drop. Tunnel instantiation between Silver Peak appliances and Zscaler data centers is fully automated.

Intent-based networking, despite being an emergent technology, is real enough to be viewed as push-button network operations. Apstra is the leader here, although the sorts of networks upon which Apstra can act is limited at this time.

Overlay networks created on demand by orchestration tools driven by policy such as Cisco ACI, VMware NSX, Kubernetes, and OpenStack are yet another example of push-button operations.

Contrarian View

“Push button” conjures images of dark magic, where all-knowing software creates a network without the operator having to know too much about networking. The reality is more complex.

Automation and orchestration tools are abstraction layers that hide complexity, but do not eliminate it. Network design requires a knowledgeable human that understands which buttons to push and in what order. In addition, that human will know what to do when the magic buttons don't produce the desired results.

In other words, fancy tools might make provisioning easier, but will never be robotic replacements for people. One could argue that tooling increases the complexity of network operations, as they are another thread that could unravel--time savers and error-reducers when they work, but deeply troublesome when they do not.

In this context, no amount of buttons are likely to replace network engineers entirely. Specialist knowledge will still be required to comprehend and resolve difficult connectivity problems.

Conclusion

I hope you found some value in my views on where network engineering is headed, and what that might mean for your career. This isn't an easy topic to address. I've done

my best to reflect just how complex the issues are in the hopes you find something to latch onto. Technology is fluid. Times are changing.

Tech Blogs: How To

The value of measurements: Network Latency - The Forwarding Plane

<https://www.forwardingplane.net/2019/04/the-value-of-measurements-network-latency/>

Nick Buraglio chats up the value of historical trend data, this time using open source tool [smokeping](#) to track latency. - Ethan

Dragon what? - The IT Rebel

<https://blog.theitrebel.com/2019/04/25/dragon-what/>

Scott L analyzes the impact of the recently revealed WPA3 Dragonblood security vulnerabilities. He's somewhat underwhelmed. - Ethan

How Common Are Data Center Meltdowns? - ipSpace.net

<https://blog.ipspace.net/2019/04/how-common-are-data-center-meltdowns.html>

Ivan Pepelnjak is gathering data on data center outages, especially those tied to L2 bridging meltdowns. Please send him your feedback in the comments or via e-mail. I assume you can do so anonymously to protect the guilty innocent. - Ethan

Extending NAPALM's capabilities in the Salt environment - Mircea Ulinic

<https://mirceaulinic.net/2019-04-24-extending-napalm-salt/>

Mircea discusses Salt Execution Modules when, for example, you need more capability than NAPALM gives you when using Salt for network automation. "These features in the latest Salt release provide low level interaction with the network device, by exposing you directly the available API (if any, otherwise you can use screen scraping via the Netmiko library). Using these, you can very easily extend Salt's capabilities for your own needs, but writing a small Execution Module." Know little about Salt for network automation? Try [this podcast episode](#) with Mircea. - Ethan

Sponsor: Cisco

Wired For Wireless: Reinventing Access

Wi-Fi 6 and 5G promise to deliver more capacity and speed. How do they differ? Do you need both?

Listen to “Wired for Wireless” for answers.

In this [highly informative video](#) you’ll hear from leading industry analysts, influencers, and suppliers about the complementary nature of these wireless standards. Cisco customers from diverse industries will share their insights and lessons learned. Cisco experts will showcase new products that deliver the end-to-end infrastructure necessary to effectively deploy Wi-Fi 6.

The recorded event is available on-demand and available at your convenience.



Tech Blogs: Opinion

Commentary: We're stuck with 40 years old technology - ipSpace.net

<https://blog.ipSPACE.net/2019/04/commentary-were-stuck-with-40-years-old.html>

If you wonder why some of us are cynical about new networking technologies, it's because they are usually just prettied-up old ones when you peer closely. As an industry, we wallpaper over potholes to fix them, and then wonder why we keep falling

into potholes. Ivan comments on this stuck state, and posits that routing (whether at L2 or L3) is the way we get to stable networks. - Ethan

About that Easy Button ... - Rule 11 Reader

<https://rule11.tech/about-that-easy-button/>

Russ White makes an argument for disaggregation, suggesting that controlling each element is perhaps better for your business than committing to a vertically integrated network stack (the “easy button”). That is, maybe it’s smarter to separate networking hardware and software. Russ concludes, “This is as much about mindset as anything else; the easy button is an abstraction. Abstractions are abstracting something. Don’t just watch the vendor presentation and gawk; dig in and understand.” - Ethan

Vulnerability Management vendors and Vulnerability Remediation problems - Alexander Leonov

<https://avleonov.com/2019/04/29/vulnerability-management-vendors-and-vulnerability-remediation-problems/>

Detecting vulnerabilities is nice. Fixing them is the needful thing, though. What’s the best way to get that done? Alexander Leonov walks through the state of vulnerability management. It’s a grim assessment. - Ethan

Planting Perennials Next to Potholes - Brave New Geek

<https://bravenewgeek.com/planting-perennials-next-to-potholes/>

Tyler Treat addresses companies who put lipstick on a pig, when maybe we should be replacing the pig. He’s coming at it from a dev perspective, but I saw parallels in IT ops. - Ethan

Why We Have Crappy Rural Broadband - POTs and PANs by CCG Consulting

<https://potsandpansbyccg.com/2019/04/22/why-we-have-crappy-rural-broadband/>

The “we” here refers to the US market. Other parts of the world might have it better. I’ve worked for small state government doing both municipal and state-wide fiber projects, and fought constantly with the telco to get anything done. I’ve lived in a small town where the only meaningful broadband was from the cable provider, as the copper was barely usable for DSL. I’ve worked for a CLEC where we didn’t exactly compete with the ILEC. We were the ILEC’s customer because we had no other choice, and eventually collapsed under the weight of the recurring infrastructure leasing costs. Everything in this article rang true to me. Capitalism and de-regulation are great--until they aren’t. - Ethan

“Please stop outsourcing what should be your core competencies.” - Tyler Treat on Twitter

https://twitter.com/tyler_treat/status/1121439134176940032

https://www.theregister.co.uk/2019/04/23/hertz_accenture_lawsuit/

Hertz is suing Accenture--a sad tale of all-around incompetency. Tyler Treat tweets up a storm on why companies shouldn't outsource IT projects. An interesting perspective on an unfortunate lawsuit. - Ethan

Packet Pushers Live In New York City

Join Gluware and the Packet Pushers [live and in person](#) on May 14th in Times Square, NYC!

In this free half-day mini-conference you'll hear from Merck and other guests about how they're automating their networks with Gluware technology, attend a live Packet Pushers podcast recording, and get the nitty-gritty on getting automation off the whiteboard and into production.

Join us after the tech talks for a complimentary reception to mingle with the Packet Pushers, your IT peers, and our Gluware hosts.

Event start: 1:00 pm

Reception: 5:00 - 7:00 pm

Location: Executive Conference Center, 7th Floor, 1601 Broadway at 48th Street, NYC

[Register now](#) for this exclusive live event. Tickets are free, but they're also limited, so don't wait.

gluware Intent '19 > **PACKET PUSHERS**

Learn how to accelerate enterprise network automation

Tuesday, May 14 2019
1-5pm
Cocktail Reception
5-7pm
Limited seating, reserve your space now

Executive Conference Center
1601 Broadway 7th Floor
New York, NY 10019

[Register Now](#)

The Lulz

MY BOSS ARRIVED AT WORK IN A BRAND-NEW LAMBORGHINI. I SAID, "WOW, THAT'S AN AMAZING CAR!"



HE REPLIED, "IF YOU WORK HARD, PUT ALL YOUR HOURS IN, AND STRIVE FOR EXCELLENCE, I'LL GET ANOTHER ONE NEXT YEAR."

IT News

Time for a new adventure - Ned In The Cloud

<https://nedinthecloud.com/2019/04/28/time-for-a-new-adventure/>

Ned Bellavance is an outstanding IT resource to the community, and he's working for himself now. "I am available for webinars, speaking engagements, writing content, podcasting, and more! If you're interested, please reach out ... Reach me ned-at-nedinthecloud.com, through Twitter, or LinkedIn." Ned is the host of the [Day Two Cloud podcast](#) on the Packet Pushers network. It's very good. You should [subscribe](#). (Of course I'd say that. 😊) - Ethan

Sinister secret backdoor found in networking gear perfect for government espionage: The Chinese are – oh no, wait, it's Cisco again - The Register

https://www.theregister.co.uk/2019/05/02/cisco_vul...

The Register is having some fun at the expense of Bloomberg, Cisco, and the United States government with this story. It reports on a Cisco vulnerability in Nexus 9000 ACI fabric switches due to a hardcoded, default SSH keypair that could give a remote attacker full root access to the device. Cisco has released a patch, but the The Register is playing up on a recent Bloomberg story about the presence of the Telnet service on Huawei gear, which Bloomberg positioned as a sneaky backdoor. But if unauthorized remote access is enough to boot Huawei, shouldn't the same apply to other vendors, asks EI Reg? Also, you [should go patch](#) any Nexus 9K ACI fabric switches you might have.

- Drew

50,000 companies exposed to hacks of 'business critical' SAP systems: researchers

<https://www.reuters.com/article/us-sap-security/50...>

Speaking of patching, security researchers have released exploit code that they claim can affect SAP software. SAP says it has previously released fixes for the vulnerabilities being exploited, but other security researchers say a vast number of SAP customers haven't properly employed the fixes. - Drew

Jack Dorsey Is Gwyneth Paltrow for Silicon Valley - NY Times

<https://www.nytimes.com/2019/05/02/fashion/jack-dorsey-influencer.html>

Is he a CEO or a lifestyle guru? The New York Times examines Twitter founder Jack Dorsey's influence on the lifestyles of a particular class of young male techies who crave peak optimization and will employ salt juice, near-infrared saunas, and Faraday tents recommended by Dorsey to get it. Is it just me, or is real life becoming harder to distinguish from parody? - Drew

New Products & Industry Takes

Expereo expands mobile connectivity at a global level, adding services such as 5G connectivity - Expereo

<https://www.expereo.com/expereo-expands-mobile-connectivity-at-a-global-level/>

Expereo, which offers managed network and Internet connectivity, including SD-WAN, says it now supports 5G as a connectivity option to give SD-WAN and mobile connectivity customers more choice. I thought this release might be a little premature given that 5G isn't widely available. A few Internet searches let me to [this link](#) that tracks global 5G deployments. In North America, significant 5G penetration isn't expected until 2020, but there are pockets of 5G in other parts of the world, such as Seoul, South Korea. - Drew

Aryaka Raises \$50M to Accelerate Global Managed SD-WAN Expansion - Aryaka

<https://www.aryaka.com/press/aryaka-raises-50-million-series-f-funding-goldman-sachs/>

Investor appetite for SD-WAN has yet to be sated. Earlier this month, CloudGenix landed \$65 million in new investment. This time it's Aryaka's turn, as the managed SD-WAN provider took in \$50 million in a series F round, with new investor Goldman Sachs Private Capital Investing joining the party. Aryaka, which has now raised \$184 million to date, will use the money to "...scale business operations, grow revenues and hire exceptional talent..." I wonder if these investors on board for the long haul of building a sustainable company, because I doubt many acqui-exits are left. - Drew

What is 768K Day, and Will It Cause Internet Outages? - ThousandEyes Blog

<https://blog.thousandeyes.com/what-is-768k-day/>

As full Internet routing tables swell to 768K routes, will the Internet take a hit? Possibly older equipment with limited TCAM to hold routes would feel the pain. I doubt "768K

day” will be too impactful, though. Routing table growth is a well-known issue, and big-iron routers have been able to handle a million or more entries for a while now. I expect isolated incidents with limited impact. But if we feel the pain, ThousandEyes (a long-time sponsor of Packet Pushers) will be tracking it. - Ethan

CompTIA Cloud Essentials Certification - CompTIA Certification Blog

<https://certification.comptia.org/certifications/cloud-essentials>

CompTIA has a new cloudy cert. “Cloud Essentials validates the primary understanding of cloud language, principles and rationale that make up the cloud computing landscape.” Good for general purpose cloud knowledge. If you’re an IT pro, I’d put my energy into AWS or Azure specific certs, though. My gut says that specialized cloud knowledge might serve your career goals better. If you really want a vendor-independent cloud cert, then maybe consider [CompTIA’s Cloud+](#), and not Cloud Essentials. - Ethan

Apstra Unveils Multidomain Unified Group-Based Policy and Enterprise Cloudification in Newest Product Release - Apstra

<https://www.apstra.com/press/apstra-unveils-multidomain-unified-group-based-policy-and-enterprise-cloudification-in-newest-product-release/>

Apstra sells a vendor-agnostic intent-based network automation tool, and have released AOS 3.0. New shiniest include, “Group-Based Policy, enterprise cloudification features, advanced VMware vSphere connection, and major Intent-Based Analytics enhancements.” Apstra has sponsored Packet Pushers in the past, so [have a read or a listen](#) if you’re interested in understanding what they do. - Ethan

The Dangers of Hardware Vendor Lock-in - Apstra Blog

<https://blog.apstra.com/the-dangers-of-hardware-vendor-lock-in>

Despite a dose of hyperbole, this post nicely articulates the issues of marrying your business to proprietary vendor networking technology. What the article doesn’t do is explain the trade-offs if you adopt a fully open posture instead. There’s no one right answer to the lock-in vs. open dilemma, but it is worth thinking about. Apstra, of course, is meant to help you overcome some of the challenges of going open. - Ethan

Stateless Unveils Networking Industry's First Software-Defined Interconnect Platform - Stateless Press Releases

<https://www.bestateless.com/hubfs/Stateless%20Luxon%20Product%20Announcement.pdf>

Stateless has released SD-IX service Luxon, a software defined platform to deliver L3 connectivity at interconnection points such as colocation and cloud MSP data centers. Stateless points out that the traditional NFV approach doesn't work well at large sites due to hardware requirements. The Luxon platform is a traditional NFV alternative, as thousands of tenants can be consolidated onto the same cluster. Therefore, operators lower overhead and monetize IX services better with Luxon. Luxon features a microservices architecture that is multi-tenant and fully automated, offers a data-rich API, and can evolve into new use cases over time. - Ethan

Tech Tip: IOS Shell

We asked for Tech Tips to share and you responded. That is, Ray Lucas responded. Thanks Ray! He writes:

"I was very excited to recently discover "IOS Shell" in IOS/IOS-XE.

This feature brings a bunch of Unix shell type functionality, similar to that available in NX-OS. While the documentation describes fancy things like creating functions, loops, conditional statements etc., I only care about the basics like multiple pipe / "|" support, and additional commands like grep, sort, tail, wc, etc.

Turns out it's been available since 2011 or so. How did I not know about this?

You can turn it on temporarily with "terminal shell trace" at the enable prompt or permanently with "shell processing full" in configuration mode ."

For details see:

https://www.cisco.com/c/en/us/td/docs/ios/netmgmt/configuration/guide/Convert/IOS_Shell/nm_ios_shell.html

and

https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/ios_shl/command/ios-shell-cr-book/ios-shell-cr-a1.html

If you have a tech tip to share that will fit in a newsletter format (a link, a script, a pointer to a favorite tool, and so on), let me know at drew@packetpushers.net.

The End Bit

Sponsorship and Advertising - Send an email to humaninfrastructure@packetpushers.net for more information. You could reach more than 6,000 subscribers.

Human Infrastructure is weekly newsletter with view, perspectives, and opinions. It is edited and published by Greg Ferro and Drew Conry-Murray from PacketPushers.net. If you'd like to contribute, email Drew at drew.conrymurray@packetpushers.net.

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

Copyright © 2019 Packet Pushers Interactive LLC, All rights reserved BUT feel free to share this email with ALL YOUR FRIENDS. They would love it, right? Just don't change it. Send it because it's beautiful.

[Unsubscribe From This List](#) | 95 Hidden Lane, Northfield, NH 03276