

IN THIS WEEK'S ISSUE: Being A Comprehensivist, A Tale Of Two Layoffs, The Self-Improvement Imperative, and The Limits Of Analytics. Please remember to enable the images; the magazine looks a lot better that way!



PACKETPUSHERS

Human Infrastructure Magazine

A Newsletter About a Life in Networking

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Issue Number 32

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The "Maintaining the skills to pay the bills" issue.

Thought For The Week:
Don't believe everything your computer tells you.

1. Being A Comprehensivist

by Greg Ferro

Can you become a full-stack engineer? There is nothing stopping you. When I started learning IT in 1996, the only instruction came from co-workers and costly training courses. Today, it's all about the Internet.

Knowing A Lot

There's lots of industry chatter about "full-stack engineers:" people who know infrastructure and know how to code. They know enough about compute, storage, and networking to make good strategic decisions on the hardware. They have experience with operating systems, especially Linux, and know how to install/operate a server. They will have good skills in virtualization, most likely ESX, but also KVM/OpenStack, which is where the future is headed.

And they can write code; perhaps just enough to get stuff done, but maybe they can really cut code and look a lot like a programmer.

This sort of comprehensive skill set busts open tech silos because you know enough about all the "cylinders of excellence" to avoid them.

But how can you learn about all these disciplines?

Training

Training is good for learning a single thing. Today, I see training courses as a good first step for those lacking experience. Infrastructure isn't "taught" at universities, so training gives you practical skills for specific products from one vendor.

Training doesn't teach you how to shift from one product to another, though. Or how to cope with changing technology. Most training courses have very limited scope and rarely teach the right content--it's not possible in the "one week in a classroom with practical skills" training model.

Online Courses

There are several sites that offer online courses for a few hundred dollars a year. These sites shortcut the travel/classroom time.

Again, good stuff but it's not going to take you into the big time.

Learn Business

Learning the business isn't hard. You already know how to learn, you are smart and motivated. Compared to your average manager, you have all the advantages.

Put yourself in your managers' shoes, think about the pressures above them in the food chain. Then think about the pressures from below. How would you handle what they are doing?

Talk to people. Have a meeting with the purchasing team to talk about a project. Ask them questions about what they do and why they do it. Ask your manager the same things. Talk to everyone in different areas of the business and think about why they exist (people love talking about themselves).

Listen And Read

The Internet is a vast resource. It requires time, commitment, and focus to *use the Internet* wisely, but you won't find better resources. Watch Youtube videos. Listen to [podcasts](#). Use an RSS reader to follow hundreds of blogs.

Social Media

There's some risk for time wasting with social media, but spending time on [Twitter](#) to see what others are talking about will really open your eyes to a bigger world and challenge your thinking. You will probably learn that everyone has the same problems you do. And you can use the solutions that work for them (you are not a special snowflake).

Skill Up

Now that you are started on the path to comprehensive skills, it's time to start working on the next generation of products. Don't bother with gear you have

today--it's probably obsolete.

Buy a [cheap Intel NUC](#), install some Linux. Then read a book on OpenStack or the [OpenStack documentation](#) (awesome, BTW). Start thinking about how to build a trial of OpenStack.

Maybe you could commit to [learning Python](#). Again, with a book and some blogs you can get started in less than day. Plus, Python is free and runs on almost any computer or smartphone.

Now Where Are You?

If you do most of these things, you will have a wider perspective. You will be thinking about the business a bit, about the different types on infrastructure, and about coding. You have a basis for building a wide range of skills and knowledge.

That's all it takes: time and a little bit of money.

All About The Internet

When I started my learning twenty years ago, the only access to knowledge was training courses. Then the Internet made it possible to access product manuals instead of buying printed versions. Then blogs made it possible to read about other people's solutions. Then [podcasts let me hear stories](#) and changed my outlook on just about everything.

Finding ways to invest in your career will get results. It's all on the Internet.

Reference: This post was inspired by [this article](#).



Sponsor: AppViewX

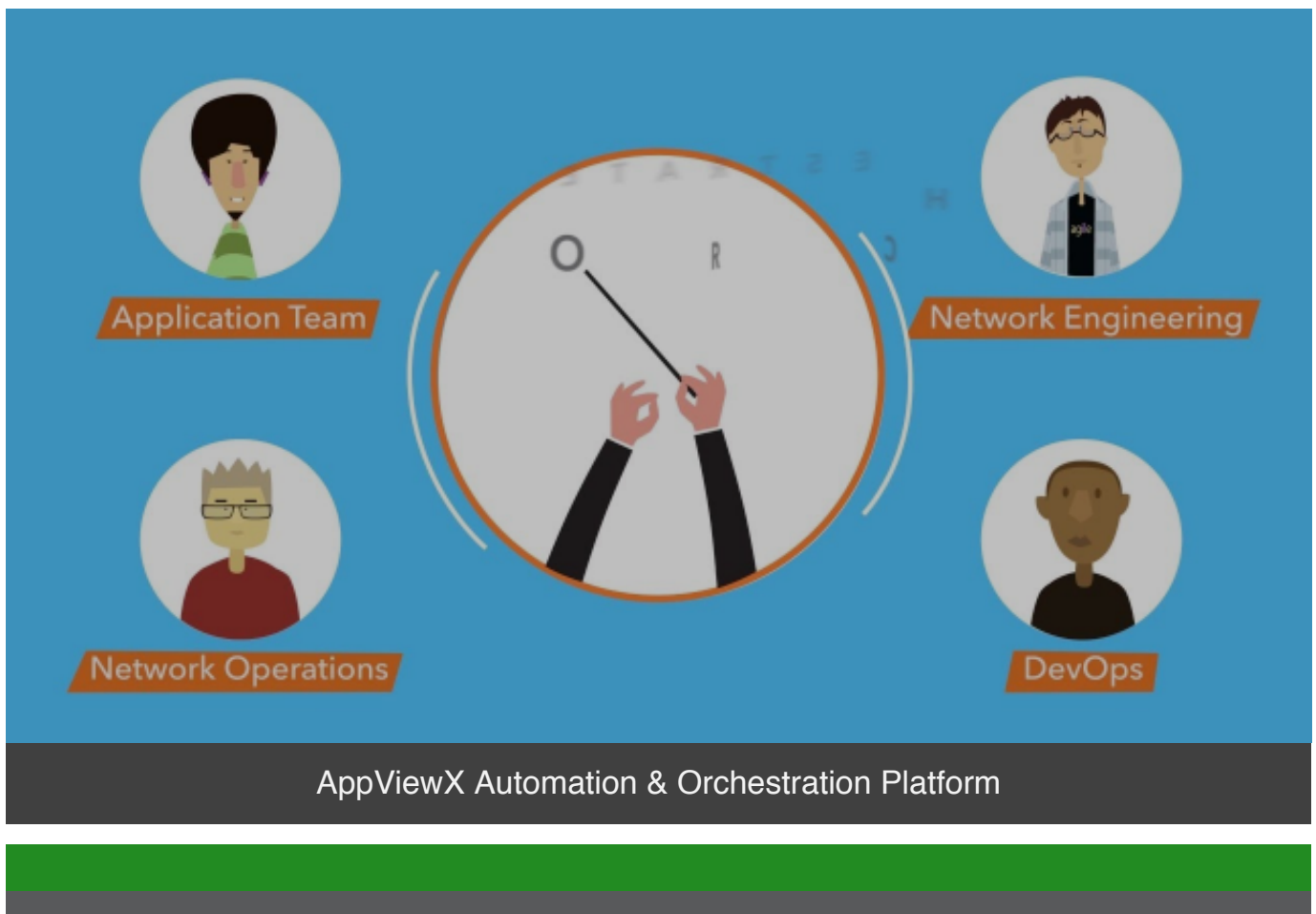
Automate and Orchestrate Your Network Infrastructure with AppViewX

Infrastructure and operations leaders have to manage complex environments for continuous application delivery. Orchestrating application services in traditional data centers, converged infrastructure, private cloud, and public cloud is different, complex, time-consuming, and cumbersome.

[AppViewX](#) offers a management, automation, and orchestration solution that discovers, models, deploys, and manages best-of-breed and open source application services in traditional data centers and converged infrastructure. With its range of products, ADC+, Cert+ and Security+ it offers multi-vendor support and state of the art management capabilities that maps to the evolving needs of Application Owners, Network Engineers and Network Operations. With its world-class app-centric orchestration platform, out of the box integration with ITSM and IPAM, AppViewX helps achieve application aware infrastructure and ensures responsiveness and availability for brownfield and greenfield data centers.

[AppViewX](#) has also been named a "Cool Vendor" in Enterprise Networking for 2016. According to the Gartner report, "Emerging technology vendors are now focusing on more pragmatic pain points such as improving network operations and reducing network life cycle costs, versus the 'gamechanging' software-defined networking (SDN)-based announcements that were rampant during the 2012 to 2015 time frame." AppViewX provides role-based, multivendor ADC management with orchestration and automation, helping enterprises simplify management of ADCs. It currently supports ADCs from F5 Networks, Cisco (ACE), Citrix, A10 Networks, Avi Networks and Radware.





2. A Tale Of Two Layoffs

by Rob Coote

Losing a job is never easy. The anxiety and emotional turmoil can lead you jump on the first opportunity that comes along, but that's not always the best thing for your career. Here's what I learned when I was laid off twice between April 2015 and February 2016.

The first layoff, from a local school division where I'd worked for seven and a half years, was totally unexpected. My wife and I had just had our second child, and she wasn't expected to return to work for a year.

I sent my resume everywhere, applying for any network/server/IT role I could find. The very first offer I received was from a small financial firm in July, and I accepted it almost out of desperation.

Six weeks later, I penned the first resignation letter I had written in the last 18 years. The job simply wasn't a good fit. I hadn't done enough homework on the company and I hadn't asked enough of, or the right kind of, questions during the interviews. I discovered very early after starting there that I was not going to enjoy the environment, and the infrastructure they were working with was not going to be interesting or challenging.

I signed on with an MSP in September. While I enjoyed the exposure to some larger environments and new vendors, I felt constant pressure to maximize billable time. Over the six months I was there I watched 3 staff members get walked out of the office. I spent a lot of time wondering if/when I would be next.

In February, my turn came. Management explained to me that (once again) due to the economy, customers were not moving ahead with IT projects and therefore the company simply didn't have enough work to go around.

With my wife returning to work in March, I decided to stay home with my two kids for a while. This was time for me to regroup and refocus on what I truly wanted to do next in my career.

The Gamble

A good friend of mine reached out with an opportunity at the MSP he worked for. I interviewed with some members of his team and was offered a position almost immediately.

At the same time I had been contacted by a recruiter with a unique opportunity at a professional sports and entertainment organization. I had a meeting with the VP of IT for the sports organization, and I knew immediately this was the job I wanted. It was a perfect fit, and about as close to a "dream job" as I could imagine.

However, there was no official offer on the table, and I didn't know if, or when, an offer might come. I could've played it safe and taken the job with the MSP, but I didn't want to put myself in a position to resign a job that wasn't a good fit again, especially when a friend was involved. I certainly wasn't going to collect a salary there while I waited to hear back from someone else.

I decided to gamble and decline the offer from the MSP.



For the next two months I waited. I had my final interview with the sports organization in mid-April, and one morning a few days later, I received the phone call I'd been waiting for.

They wanted me! I would be working for a major league sports franchise, in a brand new arena that would house state-of-the-art infrastructure in a new, modern data center, slated to open in September.

Emotions can play a big role when your finances and family are involved, especially when unemployed. This can make it easy to wind up in a place where you aren't going to be happy over the long term.

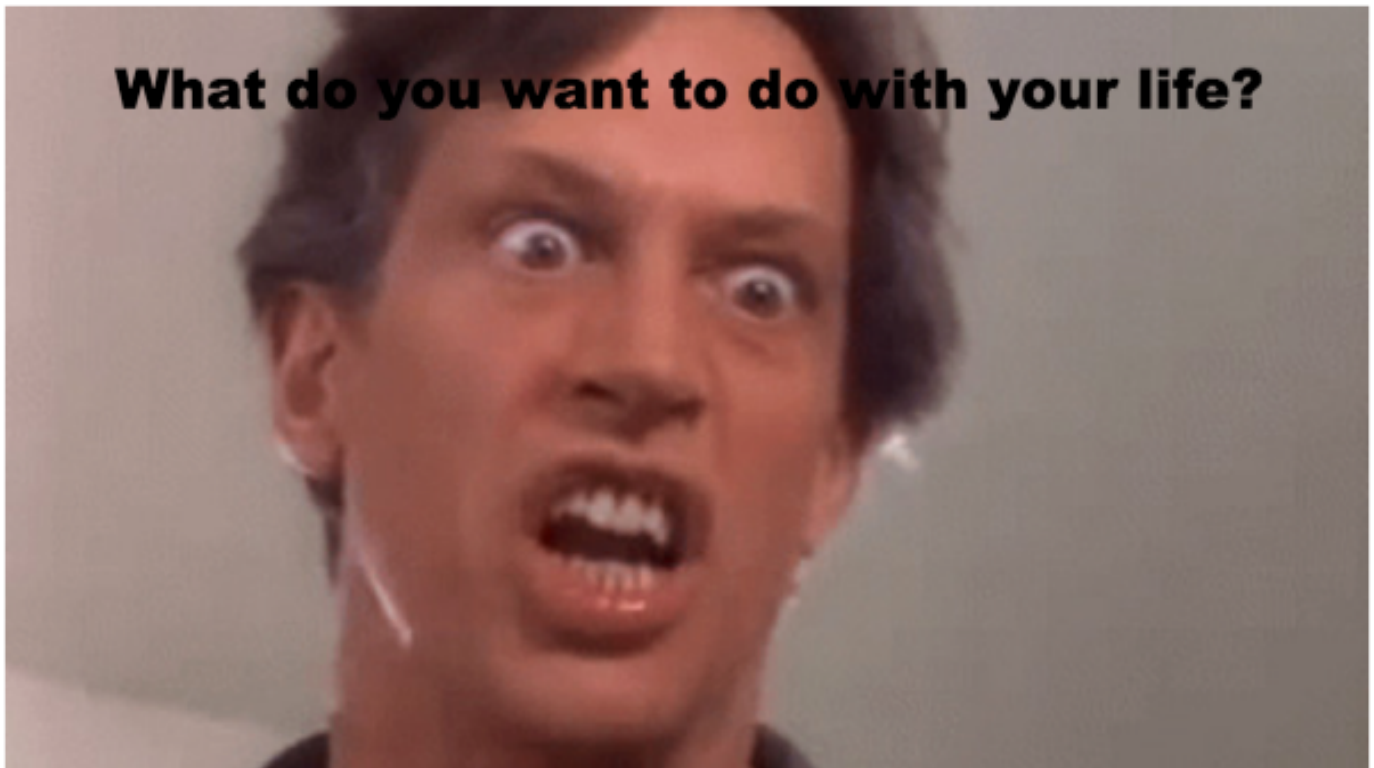
Focus instead on deciding exactly what you want to do and where and with whom you want to work, and dedicate yourself to that end. The gamble will almost certainly be worth it

3. Prioritizing Self Improvement

by Ethan Banks

Twisted Sister, one of the more cerebral bands of the 80's, asked poignantly "What do you want to do with your life?" If you're asking yourself that question about your IT career, it's a poignant question indeed.

IT career growth tends to come with skills growth. The more technical skills you master, the more value you bring to a business. The more valuable you are, the more employable you are. And if a lot of different business wish for that value you bring, you're in control of your career.



However, IT is not like some other professions, where a particular skillset may serve you well for 10, 20, or 30 years. You'll be lucky to have a particular IT skill remain useful for 5 years. Therefore, to remain keenly valuable, you must constantly dive into technology that you've never been trained for, that might involve risk, and that requires you to take ownership.

There's an attitude that comes with this concept of technology ownership. Once a business knows that you're a go-to person to help keep the business on the leading edge of the IT curve, they'll rely on you. And from a career perspective,

that's good. When the slowdowns come and layoffs happen, you'll be at the top of the list of "critical staff."

The downside of aggressively learning new technology is the stress that comes along with this self-imposed responsibility. It's easier to relax. It's easier to do what's needed, but no more. It's easier to share memes over chat and do a whole lot of nothing until the next ticket pops into your inbox. But that's not career growth. As soon as you give up and rely on your past skills, you're stagnating.

You want to be seen as the "Bringer Of New And Wonderful Things." Not the engineer who led that one Microsoft Exchange migration project 6 years ago and has been stuck managing that same mail system ever since. There is little business value in rote operations. Once technology has been figured out, it's simply a process. Anyone can follow a process.

You don't want to be just anyone, and so you need to be thinking about what's next. True value in a technology organization comes in providing a path to where infrastructure needs to go. That requires systems-level thinking. Business comprehension. An understanding of how your company consumes technology. And then an understanding of not only what new technology is emerging, but why it exists. What problems does this new technology solve? Is this new technology useful to this company? Why? Or why not?

Being able to answer those questions clearly to management will drive your career ahead. But all of this means that self-improvement must be a priority. Someone else can watch TV. You have other things to do.





[GNS3 Academy](#): Training for any network, any way you want.

The Network Break



PACKETPUSHERS

Where Too Much Networking Would *NEVER* Be Enough

[Network Break](#) is a weekly podcast that delivers news & analysis on the networking industry in a fun, fast-paced style.

4. Future-Crime And The Limits Of Analytics

by **Drew Conry-Murray**

Companies and governments are collecting vast sums of data about us, and analyzing those data to make decisions. In some cases, the repercussions of those decisions are slight—you get shown a spaghetti sauce ad instead of a cereal ad.

But sometimes the consequences are more serious. A low credit rating will affect the terms of home or car loan, or prevent you from getting a loan all together.

And what about software that measures the chances that you will commit a

crime?

I wasn't aware that kind of software exists, but a [story in Pro Publica](#) says at least 9 states use such a product to predict whether people who have been arrested will commit crimes in the future.

This software assigns risk scores that are presented to judges and other law enforcement personnel, who use the scores at various stages in legal proceedings, including setting bond amounts or the length of a jail sentence.

Those are serious repercussions based on a computer-generated score. But as the story in Pro Publica argues, the software isn't all that accurate. Here's a key quote from the site's analysis of risk assessment scores assigned in Broward County, Florida:

"...blacks are almost twice as likely as whites to be labeled a higher risk but not actually re-offend. It makes the opposite mistake among whites: They are much more likely than blacks to be labeled lower risk but go on to commit other crimes."

In other words, there's a bias in the software that has real-world effects, including length of jail time handed down by judges, what social services might be made available or denied to an arrestee, and whether people who are actually more likely to offend are put back on the street.

Around the same time of the Pro Publica story, Facebook became involved in a dustup over its news feed, which is supposed surface trending stories based on activity on the social media site.

But as a [post on Gizmodo revealed](#), Facebook contractors claim that humans decided to either suppress particular kinds of stories, or inject stories into the feed to make them look more popular.

While the mechanism is different—humans are manipulating results to change the outcome—the effect is similar to crime prediction ratings: you don't know if the output you're seeing is output you can rely on.

Don't Assume Infallibility

It's tempting to think that because computers aren't alive, they aren't subject to the implicit or explicit biases that all humans have. Computers are ruthless calculating machines with no stake in the outcome, and so the outcome can be trusted.

However, while computers may not have biases, the people who program them do. They also have programming flaws and blind spots, and imperfect information. They may assign the wrong weights to the wrong data points, or miss essential sources of information, or consciously tip a scale toward one result over another.

And that's a problem because everyday human users tend to assign properties of impartiality and infallibility to machines without accounting for the foibles of the machines' designers.

As more and more data are collected about us, and more and more algorithms and analytics tools applied to those data, more and more decisions about us are going to be made based on results that may or may not be trustworthy.

Judges, loan officers, marketing managers, and you and I have been trained to accept the output of our machines as valid. I think a little retraining may be in order.



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

Will Containers Replace Hypervisors? Almost Certainly!

Containers are the long-term future of the next generation of applications and I'm certain that hypervisors are less important and perhaps already a "mainframe" technology. I'm not the only person who thinks so, but this article nails all of the key reasons:

From the CloudScaling blog: *"Lost in all of this is a proper understanding of not only what a container is at the infrastructure layer, but also what it can be in the future with relatively trivial updates. Also lost is an understanding of the value of traditional hypervisors such as VMware ESX, which is rapidly fading. From my perspective the day of the VM is fading and it's only a question of how fast the change occurs."*

[LINK](#)

OCAML-TLS DEMO SERVER

This is a nice interactive demonstration of the TLS negotiation. Now that TLS is the dominant protocol on the Internet, you need tools to help you.

From Open Mirage: *"When connecting to a secure site (https://), your browser automatically initiates a secure connection using transport layer security (TLS). The sequence diagram below shows you the TLS handshake that just took place when your browser connected to this web server. We traced it using our OCaml-TLS implementation."*

[LINK](#)

Is TLS Fast Yet ?

HTTP over TLS is faster than unencrypted HTTP. That's a fact. Here's why:

From Is TLS Fast Yet.com: *"Data delivered over an unencrypted channel is*

insecure, untrustworthy, and trivially intercepted. We owe it to our users to protect the security, privacy, and integrity of their data — all data must be encrypted while in flight and at rest. Historically, concerns over performance have been the common excuse to avoid these obligations, but today that is a false dichotomy. Let's dispel some myths."

[LINK](#)

Augmented Traffic Control

This Facebook Github project produces a small app that manipulates Linux iptables and tc traffic control to create a quick and easy network traffic simulator. It would be very useful for automated testing in a CI/CD toolchain.

From Facebook: *"Augmented Traffic Control (aka ATC) is a project that allows developers to control the connection that a device has to the internet. Developers can use ATC to test their application across varying network conditions, easily emulating high speed, mobile, and even severely impaired networks."*

[LINK](#)

Storage People Are Finally Embracing iSCSI

For 95% of the market, iSCSI is an excellent storage networking protocol, but a lot of people are still spending big on FibreChannel equipment "because it works, we trust it and we know it".

From SolidFire: *"iSCSI is a standards-based method of communicating between computing equipment, such as hosts and servers, and storage equipment, like SolidFire. It was standardized between 2002 and 2004 and is supported by all major operating system suppliers and almost all storage vendors, including many NetApp offerings. This is not going to be an iSCSI*

tutorial, many of which are readily available on the web. (You can also catch my SNIA podcast on the evolution of iSCSI live on May 24 or the recording after the fact.) Instead, this blog post examines the three main reasons SolidFire decided on iSCSI as its storage transport of choice."

Finally.

[LINK](#)

CCDE – MY JOURNEY TO BECOMING SWEDEN'S 2ND CCDE

Daniel Dibswe passed his CCDE and this is his story.

From Lost In Transit: "On May the 17th I passed the CCDE practical in Madrid and became Sweden's 2nd CCDE, CCDE #20160011. This post describes my journey to passing the CCDE practical in my 1st attempt and the materials that I used to do so."

[LINK](#)

Wireless, Super-Fast Internet Access Is Coming to Your Home

This article from Technology Review examines the possible use of high-frequency spectrum and fancy antennas to get wireless broadband.

[LINK](#)

Why High-Skilled Freelancers Are Leaving

Corporate Life Behind

This article looks at the rise of multi-skilled freelancers. The term “full stack engineer” may be replaced by “**comprehensivist.**”

From Fast Company: *"Knowledge workers with polymathic competencies in multiple disciplines are still rare, but they're becoming more and more common. Take Hayes—a Berkeley geography grad with a design masters from Pratt. She is a data-visualization designer who regularly handles user interface, user experience, visual design, interaction design, and design research on behalf of clients. What once might've been a three- or four-person team is now simply Nicolette."*

[LINK](#)



Where Too Much Networking
Would **NEVER** Be Enough

[The Weekly Show channel](#) is our one-hour deep dive on networking technology.



Where Too Much Networking
Would **NEVER** Be Enough

[Priority Queue](#) tackles niche and nerdy tech topics and cutting-edge research projects.

Product News

We don't often get new products worth talking about, so that makes it nice to have something to say.

Cisco Nexus 6000 Is Finished/Kaput

An entire family of Nexus switches is getting the axe. I never understood why they even existed in the first place. Key drivers are the lack of adoption of 40G/100G in the Enterprise and the reasonable adoption of Nexus 9000 instead.

From Cisco: *"Cisco announces the end-of-sale and end-of-life dates for the Cisco Nexus 6000 Series Switches. The last day to order the affected product(s) is April 30, 2017."*

People tell me that NX5600 is a replacement.

[LINK](#)

Avaya Up For Sale?

Reuters is reporting that Avaya may be up for sale. This could be good or bad for Avaya. It's got lots of good networking technology but is struggling to get the message out because of limited resources. The debt burden could be crushing its ability to provide good information to customers.

[LINK](#)

Hundredfold Optical Fiber Capacity Increase

19 cores in single optical fiber? Hell yes! It might take a decade to arrive but this could address the weakness in 400GbE using 8 x 50GbE lanes (which needs 16 cores).

From Phys.org: "*Nippon Telegraph and Telephone Corporation and collaborating labs have demonstrated the world's highest density optical fiber using a deployable optical fiber diameter of less than 250 μm . This optical fiber contains 19 optical paths (cores) that can support six kinds of optical signals (modes), and it provides 114 (= 6 modes \times 19 cores) spatially multiplexed communication paths (channels) in one optical fiber.*"

[LINK](#)

Recent Articles

The last five articles published on [EtherealMind](#) and [Packet Pushers](#)

EtherealMind.com Latest

[Logical Razors Can Take on Corporate Babble](#)

[Canned Response to BGP Networking Questions – Reddit](#)

[IETF RFC 8374 BGPsec Design Choices and Summary of Supporting Discussions](#)

[Net Neutrality Hasn't Ended, We Don't Know When](#)

[Next Market Transition ? Cheaper Buying, Less Selling](#)

PacketPushers.net - The Last Five

[Network Break 182: BGP Hijacked For Cryptocurrency Heist; Juniper, Big](#)

[Switch Unveil New Products](#)

[Show 387: AWS Networking – A View From The Inside](#)

[PQ 147: Connecting Security And GDPR Compliance \(Sponsored\)](#)

[Datanauts 131: Masters And Mentorship](#)

[Network Break 181: Russia Accused Of Infrastructure Attacks; US Targets ZTE](#)

Watch This!

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



If you are digging a trench to lay fiber then you should be using a blown fiber system so that you can easily replace the fiber in the future. Watch this to see how it works inside the conduit.



VS



**BRAND
NAME**

GENERIC

What is the difference between brand name and generic products?



Link Propagation Newsletter

Our weekly newsletter delivering essential headlines, announcements, and useful news to your inbox

Can't get enough newsletters? Check out [Link Propagation](#), our newest publication. We send you a free weekly digest with tech news, interesting blogs, and industry announcements, all curated by the Packet Pushers. It's an easy way to keep up and stay informed. Subscribe at packetpushers.net/link-propagation.

Quick Survey: Certification Exams

How many times did it take you to pass your most recent certification exam?

- [A. First time, baby!](#)
- [B. Second try.](#)
- [C. Third time was the charm](#)
- [D. Still working at it--don't judge me!](#)

Did We Miss Something?

Got an link or an article to share? Email it to humaninfrastructure@packetpushers.net

The End Bit

Sponsorship and Advertising - Send an email to humaninfrastructure@packetpushers.net for more information. You could reach 5,013 people.

Human Infrastructure is bi-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 (and get paid for it), email Drew at drew.conrymurray@packetpushers.net.

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

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