IN THIS WEEK'S ISSUE: Private WANs On The Wane, IT Heroes Not Required, Getting Over Imposter Syndrome. Please remember to enable the images; the magazine looks a lot better that way!

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(aka The Project Plan)

Issue Number 31

05/12/2016

The "Still in the recovery phase from our Interop Las Vegas trip but brimming with ideas" issue.

Thought For The Week:

If a packet drops on the network and no one notices, did it really drop?

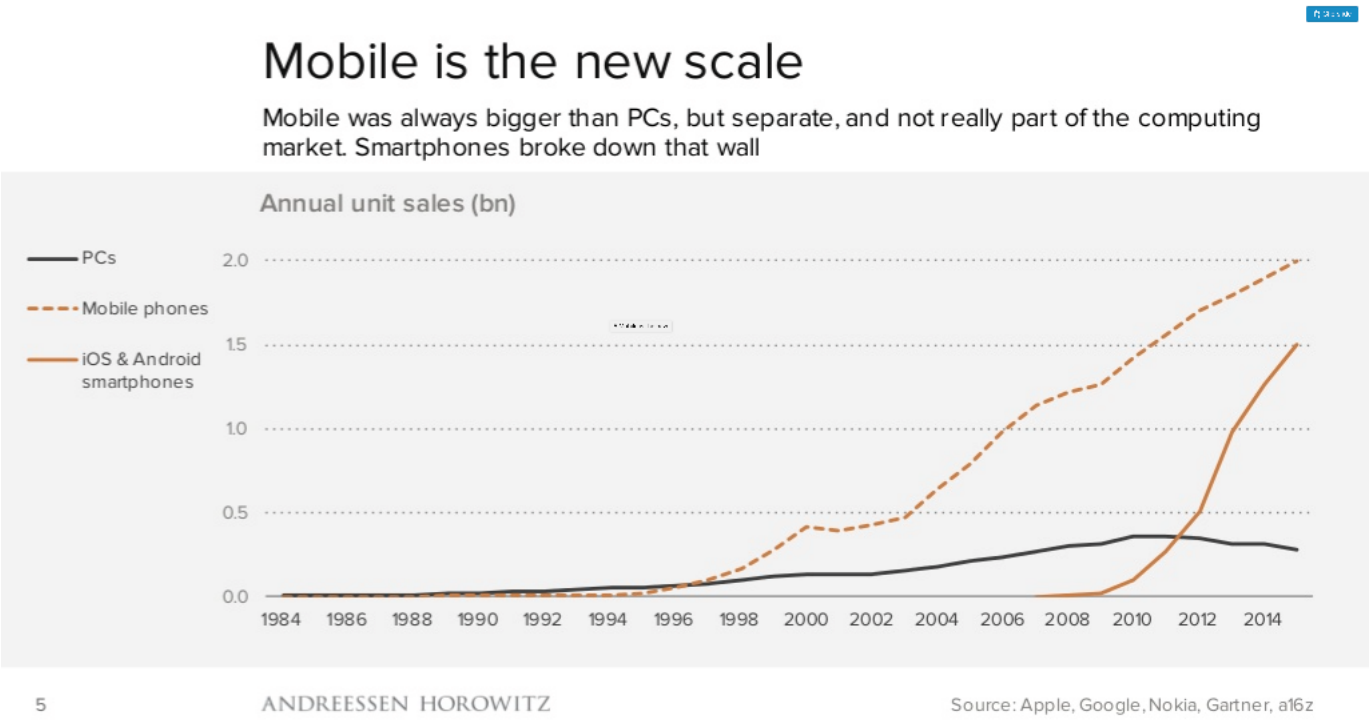
1. The End Of The Private WAN?

by Greg Ferro

Is it possible to predict the end of the private WAN? The answer to this question is tied directly to the growth of mobility and cloud applications.

Mobile Is Eating The Web

The scale of the smartphone is breathtaking in terms of market size and rapid cycling of handsets. [1.5 **billion smartphones were sold**] last year compared to less than 350 million PCs. When it comes to network design, the smartphone is much more important.



When it comes to designing public networks for the next two decades, service provider networks will be designed to support smartphones first and PCs

second.

Rapid Cycling/Replacement

Because smartphones are being replaced at short intervals (less than five years), carrier wireless networks have been upgraded on a regular basis. In the last decade, we have moved from 2G to 3G to 4G. The speed of this innovation is very rapid compared to Enteprise IT, which took more than two decades to adopt Ethernet and WiFi.

This rapid technology cycle is a virtuous loop. Carriers are able (and forced) to iterate rapidly and roll out new technology on a continuous basis. Compare this with Enterprise IT, which takes decades to adopt new technology and decades to upgrade.

What A Private WAN Should Do

A private WAN should deliver:

1. predictable application performance
2. security (not shared, not public)
3. lower complexity through predictability (response time, minimum bandwidth, etc.)
4. better reliability

A private WAN actually delivers:

1. uncertain application performance over shared backbones
2. unknown security through lack of guarantees, zero transparency, no audit or certification
3. restricted choice to manage complexity
4. compromised reliability/predictability because of slow repairs, poor support ,and poor visibility from service providers

Service providers run vast companies with multiple business units, confusing lines of ownership, and low accountability. When a problem occurs, the carrier is often unable to identify or rectify it.

Price Disparity & Performance

The cost of private and dedicated bandwidth is currently very high (as a rule of thumb, ten times more expensive that public bandwidth). That is, a 100Mbit Internet circuit is the same cost as 10Mbits of dedicated bandwidth.

A 100Mbit circuit, even with some degree of poor performance due to packet loss, jitter, and latency, will always perform better than a 10Mbit circuit.

While this price disparity continues, the Internet will remain a highly attractive option for corporate networks. A fundamental truth in networking is that Quality of Service (QoS) is always solved by a **Quantity of Service.**

Service Provider Focus - Reducing Costs

The total amount of Internet bandwidth is already many times larger than private WAN bandwidth. Private WAN continues because it makes vast profits, but the cost of sustaining MPLS backbones is also literally vast. Hardware, software, design, and operations are orders of magnitude larger than a single global routing table with a lot of routes using a less complicated protocol for forwarding.

Given these conditions, it makes sense to scale back spending on private WAN infrastructure. Internet use for the WAN is growing, demand is high, and customers are keen. Meanwhile, private WAN is becoming a second-class infrastructure.

Internet Transit Pricing (1998-2015)			
Source: http://DrPeering.net			
Year	Internet Transit Price		% decline
1998	$1,200.00	per Mbps	
1999	$800.00	per Mbps	33%
2000	$675.00	per Mbps	16%
2001	$400.00	per Mbps	41%
2002	$200.00	per Mbps	50%
2003	$120.00	per Mbps	40%
2004	$90.00	per Mbps	25%
2005	$75.00	per Mbps	17%
2006	$50.00	per Mbps	33%
2007	$25.00	per Mbps	50%
2008	$12.00	per Mbps	52%
2009	$9.00	per Mbps	25%
2010	$5.00	per Mbps	44%
2011	$3.25	per Mbps	35%
2012	$2.34	per Mbps	28%
2013	$1.57	per Mbps	33%
2014	$0.94	per Mbps	40%
2015	$0.63	per Mbps	33%

Private WAN Shrinking

Private WAN is already shrinking as public cloud platforms remove applications from the corporate network. As companies such as Salesforce have demonstrated the success of SaaS, new cloud applications for business are rapidly coming to market. Even networking vendors are turning to Internet-based cloud platforms to enable customers to configure, monitor, and operate networks.

Internet Is Everywhere

A fundamental limitation of the private WAN is that it's not where consumption happens any more. The static branch office with desktop computers is no longer a primary use case, and is more often regarded as a cost center. By contrast, Internet access is everywhere, and that's where consumption happens. Real, highly visible, and substantial value is extracted from mobile phones, tablets, or even laptops that use the Internet rather than the corporate WAN to access business applications.

What To Do?

Consider doing the following:

1. Plan to increase you usage of "Internet as a WAN" technology. SD-WAN products are a great start.
2. Don't sign up for new carrier contracts without an option for immediate cancellation without fee.
3. Start changing your security posture and policies to embrace "Internet First" for user connections, including their phones and tablets.

Sponsor: Nuage Networks

Why The Network Is Key To Delivering Cloud Services

Putting network agility at the center of their cloud services strategy lets service providers and large enterprises deliver new cloud services in minutes instead of weeks.

Most organizations understand that cloud services will help them move faster, cut costs, and deliver better services to end users. But they may not realize that their network is stopping them from fully achieving their goals.

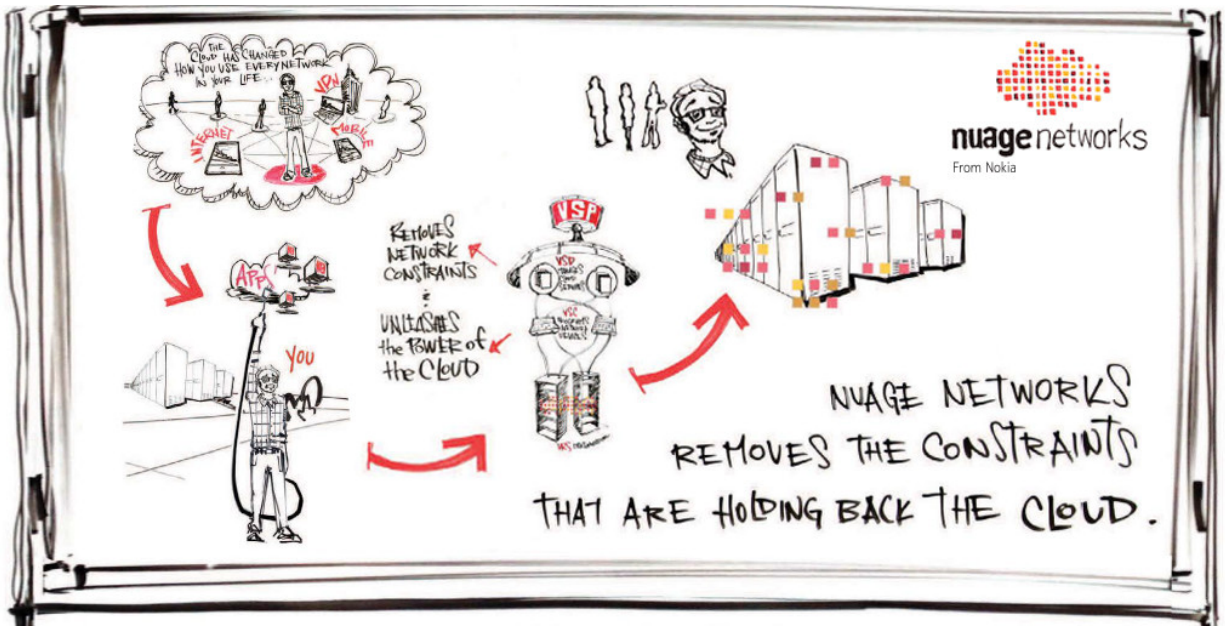
The problem is that the networks within and across data centers were not designed with cloud services in mind. Today's networks are rigid and constrained so they can't keep up with new demands. Organizations may have virtual compute platforms that let them turn up new applications in minutes, but configuring the network to support those new platforms can take weeks, or even months, to implement. The lack of flexibility in the network wipes away the speed and agility gained with virtual compute platforms.

3 Requirements To Free The Network

Organizations that want to realize the full benefits of cloud services need to look for solutions that overcome the limitations with today's rigid data center and WAN networks. These solutions should incorporate:

- Network automation for faster application deployment
- Policy-based Software Defined Networking (SDN) that abstracts the IP from IT
- Capabilities that eliminate network boundaries to enable a seamless environment across enterprise locations, WAN, and cloud data centers

With solutions that meet these requirements, the constraints on the network disappear. The network becomes as dynamic, automated, and virtualized as the server infrastructure. And end users have instant access to their applications anytime, anywhere.



Solutions to bring the network into the cloud services era are available today. And high-profile organizations are already realizing the benefits of these solutions. For more information, read the customer case studies, white papers, and brochures available at nuagenetworks.net/resource-center.

2. You Can't Do Everything Yourself

by Ethan Banks

Hello there, fellow control freak: the person who can’t seem to let other people do anything themselves, because you fear they’ll screw it up. Because they can’t do it as well as you.

Do I have your attention? Excellent, because we need to talk. You see, there’s a problem. And that problem is you. Not your talent or ability, but your insistence on doing everything yourself.

You've become an operational bottleneck, slowing down all of IT. Projects and change requests stack up at your desk because you have reached your scaling limit. You're overworked and stressed out from all the things you've taken on.

You don’t mean to be a bottleneck. You don’t want to be. But your workload has gotten out of control, and it gets a little worse each day, each week, and each month.

How did you get into this situation? Could it be that your ego is in the way? That you subconsciously thrive on being indispensable? Perhaps you enjoy martyrdom -- you get a perverse satisfaction from being the hero that goes out of his or her way when others can’t or won’t. Maybe you’re insecure, and feel you must hoard certain tasks to remain valuable.

I have been this person: The self-imagined hero. The martyr. The one who’ll do everything and more. Eager to please, taking on too much, and feeling secure because I was bringing value to the company.

Heck, I used to rack heavy equipment by myself, just to be that guy who’d take it all on his shoulders without bothering anyone else. Carefully balancing hardware that cost more than my car with one hand, I would lean into the rack, lining up the mounting brackets against the post holes. Magnetic screwdriver at

the ready, I'd gently guide the screw into the threaded hole with the other hand -- delicate work.

Get it wrong, and the screw would fall into the black abyss at the bottom of the rack, never to be seen again. Get it really wrong, and crossthread the screw. Or worse, jam something sharp into a fleshy thumb. If you look hard enough, you can find my blood smeared on the insides of a rack in a data center in Salem, New Hampshire.

No Heroes Required

While it might feel good to be the hero, the fact is that indispensable individuals are bad for IT operations. It took a coworker (and friend) to tell me it didn't have to be that way. He'd help me rack gear anytime I needed, and not simply because he was charitable, but because it was better for everyone if we worked together to maximize our efficiency. And he was right.

Since my days of racking gear solo, I've learned to think differently about working on a team.

1. I invest time in others. I will spend as much time with someone as they need to learn a task. I'll document, train, and mentor others, and then let go. True, in the beginning it will be faster to just do the task myself. But in the long run, the workload can be more evenly split, and more people on the team have technical knowledge.

2. I delegate when possible. If I don't have to do something myself, I don't. There's always plenty of other work to be done.

3. I trust others to do what is asked, and allow them to fail. The only way to stop being a bottleneck is to get out of the way. And that means someone else might not succeed at every task. That's how I learned. That's probably how you learned. And that's how they'll learn, too.

Some of this might seem risky, and you're right. Obviously, you need to coordinate with your management about this approach. But a wise manager will be thrilled that you're willing to spread your knowledge to others in the

company. When you're a bottleneck slowing things down, that's bad for IT. And that's bad for business.

My thanks to the authors of The Phoenix Project for Brent, the character who inspired this post.

Heroes not required, so leave the cape at home.

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.

3. Imposter Syndrome: How To Cope

by Drew Conry-Murray

At this year's Interop conference I ran into several speakers who confessed to varying degrees of anxiety or alarm about presenting to an audience of their peers. I was surprised because these were accomplished people with years of experience in their fields.

A common theme emerged from these conversations: Each person had doubts about their right to be the one at the podium. Who anointed them "experts"? Certainly not themselves. They were sure it was only a matter of time before they would be unmasked as frauds.

This anxiety has a name: imposter syndrome. It generally means harboring fears of inadequacy in a given realm despite demonstrable achievements.

The anxiety caused by this syndrome can be heightened by public acts, such as speaking at a technology conference.

And frankly, a tech audience can be tough—IT professionals revel in hoarding knowledge and facts, with bonus points for obscurity and complexity. So when you speak in public, you risk getting caught in a game of Stump the Chumps.

Coping Tips

As someone who has wrestled with my own share of anxiety about engaging with technologists as a speaker and writer, here's a few coping strategies I've learned.

First, shut up about your imposter syndrome. If you repeatedly tell people you

aren’t good enough and that you don’t deserve to be where you are, eventually they’ll believe you. A pinch of modesty is appropriate, but don’t overdo it—a little bit goes a long way.

Second, it’s OK that you’re not the smartest person in the room. Unless you’re walking around with a Nobel prize or a Fields Medal, you’re bound to run into someone who knows more than you, even within your areas of deepest expertise.

And that’s fine. You have your own experiences and your own perspective on which to draw. And frankly, you aren’t there to issue commandments on stone tablets like Moses from on high. You’re there to provoke thought, express an informed opinion, and spark conversation and debate.

Third, learn how to acknowledge and respond to criticism. People are going to criticize and correct you. It’s unavoidable—and it sucks. It’s embarrassing and it can make you feel stupid and bad about yourself.

I used to train in martial arts. I wasn’t particularly good at it, and I was constantly being critiqued. It was especially excruciating when the master who ran the school singled me out for correction.

But an older student told me something I’ve never forgotten: Correction from an expert who shares his or her time with you to help you improve is something to cherish, not shy away from. It’s a sign that they think you’re actually worth teaching.

This attitude applies to technology just as much as to the intricacies of joint locks and the finer points of kicking someone in the groin. If a person knows more than you and is willing to impart knowledge, take the opportunity to learn, and then bow politely and say “Thank you.”

Unfortunately there are people who correct or criticize because making you feel dumb makes them feel smart. If you sense that someone's criticism is motivated by malice, you’re well within your rights to suggest that they f**k off.

Imposter syndrome is real, and I’m willing to be it’s widespread. But don’t let it drive you away from the benefits of writing, speaking, and public engagement.

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

What we found when we simulated the backbone of the entire Internet

Lots of people think the Internet is some vast and unknowable technology magic. Recent increases in compute power and software algorithms mean you can make a complete model of the Internet backbone using the BGP routing table. That's what a startup called Improbable did.

From Improbable: *"The simulation allows you to create and delete ISPs, configure links between them, or load in data from the real world. It will calculate the best routes between any two nodes using BGP, with each node storing its own routing table and acting independently from all the others, just as in the real world.*"

Of course, this is what Internet monitoring companies are doing (but they have better data).

LINK

Change Control Boards Don’t Work

All of the dirty secrets about real flaws in ITIL processes are coming out as DevOps startups pour money into debunking the old ways. Everyone knows

that ITIL is the wrong thing, but now we have more evidence to prove it.

From The Register: *"One of the more wickedly astonishing findings from the current DevOps Report is that change review or advisory boards have little effect on a company's performance. In fact CABs – as they are called – tend to slow down IT's ability to release software quickly and regularly, negatively affecting organisational performance.*"

LINK

Why Every Great Network Engineer is also a Good Project Manager

Eyvonne Sharp writes on her blog ESharp about the "art" of being a network engineer.

From Eyvonne Sharp: *"Any time we undertake a sizable network project, we will need the cooperation of other teams. We will need to clearly explain the purpose of our project, enumerate the tasks that need to be completed, and assign owners and timelines to each task. Once tasks are created, followup is required. You'll need to know if your colleagues are on track, if they've run into issues, and how any delays will impact the project as a whole.*"

LINK

OCP Drives Telco Data Centers & The New IP

This article is basically a "pull piece" to get you to buy a research report for $3,500. But the message is clear that a large number of carriers are looking to Open Compute Project equipment for their NFV networking.

From Light Reading: *"Telecom equipment providers have traditionally supplied blade servers and rackmount servers for telecom data centers and a mix of*

carrier-grade servers and application-specific systems based on ATCA or proprietary platforms for telecom central office equipment. The latest COTS platforms for telecom applications are being built on designs influenced by OCP, Intel Rack Scale Architecture (RSA) and ATCA. The latest modular server and rack-mount appliance platforms have interconnects and chassis management based on ATCA but can deliver the same performance at significantly lower costs."

LINK

Here Comes Hyperloop One: Startup Raises $80 Million

Hyperloop One is a startup that proposes to shoot people and cargo from one city to another at up to 750 miles per hour through underground tunnels using magnetic levitation. Sounds problematic to me, but that didn't stop investors ponying up $80 million in a B round of funding for the startup. Also of note, former Cisco exec Rob Lloyd is the company's CEO.

LINK

The Weekly Show channel is our one-hour deep dive on networking technology.

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.

Viptela, Zenoss Team Up For Infrastructure Monitoring

SD-WAN startup Viptela is partnering with Zenoss, which makes IT monitoring technology, to integrate the two products to let IT managers monitor SD-WAN connections, routing policies, and health and performance metrics from within the Zenoss dashboard. SD-WAN products such as Viptela's closely measure network conditions on multiple links to help meet application performance requirements, so it makes sense to feed this kind of information into a broader monitoring platform.

As SD-WANs grow their market presence, I expect we'll see more integration between these products and third-party management and monitoring tools.

LINK

Huawei, Extreme Networks, Tap Cloud For Network Management

As smaller vendors such as Meraki (now owned by Cisco) have demonstrated the viability of using the cloud as a management platform for wireless and wired networking gear, other companies are embracing the idea.

Last week, both Huawei and Extreme Networks announced offerings that put a management layer in the cloud for switches, routers, APs and more. Huawei's Cloud Managed Network platform is available for managed service providers today, with general availability expected in 2017. Meanwhile Extreme's ExtremeCloud, which is available now, offers a line of wired switches and wireless access points, including APs that support 802.11ac Wave 2, that can be manged on premises or from the cloud.

LINK - Huawei (via eWeek)
LINK - Extreme Networks

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

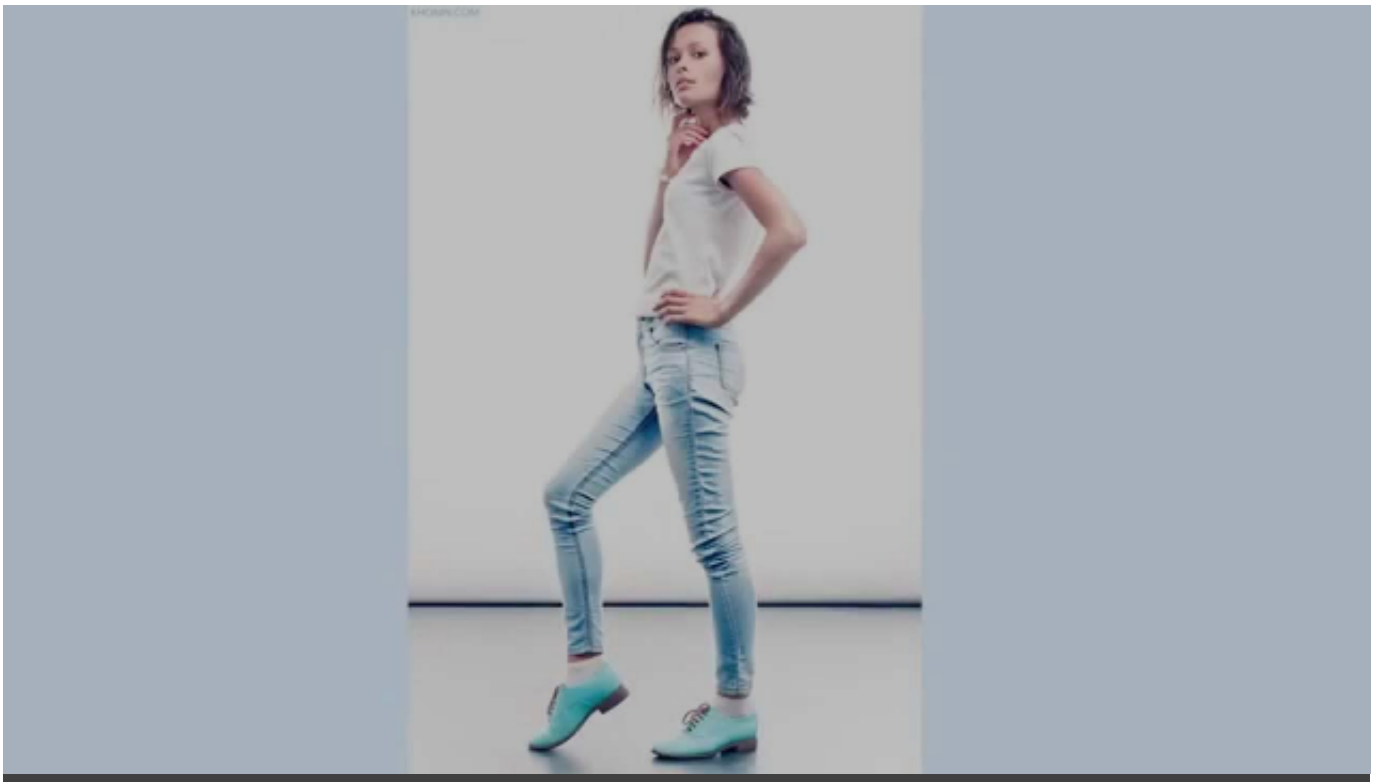
PQ 147: Connecting Security And GDPR Compliance (Sponsored)

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.



Modeling looks a lot like DevOps.

This is insane. These people don’t just play-fight: This is no-holds-barred, beat the living crap out of your opponent while wearing armour and wielding medieval weapons combat. A great watch.

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: Cable Management

How cleanly managed is the cabling in your switch closets and data centers?

A. Neat as a pin
B. Not perfect, but pretty good
C. Controlled chaos
D. Spaghetti monster nightmare

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, email Drew at drew.conrymurray@packetpushers.net.

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