THIS WEEK: Why people keep quiet about private clouds, the ins and outs of working for yourself, routing resources, CCIE tips, and our endangered downtime spaces.

Another week of Life in IT.

Issue Number 25

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The "Enterprise IT is slowing down its spending but no one knows why!" Edition

Thought For The Week:

You are probably overweight because buggy vendor software means endless free pizza at 10pm while panic-fixing a network switch.

1. Successful Private Clouds Aren’t Spoken About In Public

by Greg Ferro

You don’t hear much about successful private clouds because they aren’t done in public. I have two takeaways from this:

1. People talk a lot about public cloud because it's good business, not necessarily because it's good technology. [1]
2. Private clouds are being successfully deployed in vast numbers, but no one is talking about them. This is also good business and probably because it's good technology.

Being Public

Some companies choose to speak openly about their public cloud participation for a variety of reasons, including...

1. **Recruiting.** Cloud computing of any type needs people that have a variety of skills, but mostly it's about attitude, flexibility, and excellence, and recruiters are bad at identifying these traits. Chatting to people at conferences is a cheaper hiring strategy than paying recruiters.
2. **Marketing.** Speaking at conferences using your company brand name usually costs a lot of money. The poster child of public cloud, Amazon AWS, gets vast amounts of free marketing that could well be measured in the hundreds of millions.
3. **Open Source Participation.** Get other companies to start using your software and wait for the free software contributions to roll in to your platform.
4. **Open Source Exposure.** Encouraging other developers to start using your open source project can build a pool of resources for using, developing and supporting your platform. You can save money on recruiting (see above) and get more contributions (see above).
5. **Ego.** Some people like to think that what they do matters and they should receive public recognition for it. Only a very few actually deserve it.

6. **Competitive Advantage.** Strategic business advantage can be gained by showing competitors how your IT makes you more competitive.
7. **Startup Crash Landing.** Working in startups has few guarantees. The most likely outcome is that your next job is just around the corner, and public speaking is a fine addition to your resume.

These are all solid reasons for for being open and speaking about your IT success. In particular, using public cloud platforms means that your chances of systemic differentiation are removed. [2]

Being Private

Most companies do not talk about their private cloud participation for many reasons, including...

1. **Competitive Advantage.** Many companies invest in IT to achieve competitive advantage. Highlighting your advantage will negate the investment.
2. **Cost.** It costs serious money in lost time, travel and supervision to release resources for travel. [3]
3. **Measurable Gain.** The returns on public speaking are largely intangible & immeasurable. Why waste effort?
4. **Legal.** Some industries are highly regulated and the legal department discourages public discussion.
5. **IT Security**. Open discussion of your internal architecture provides reconnaissance information to an attacker [4].
6. **Brand Protection.** Employees speaking on behalf of company are at risk of damaging the brand, or creating public outcry with a careless or misunderstood comment. People who have families to care for (compared to most public cloud consumers) have real fears of failure that will cause serious damage to their personal lives.

There are also lesser reasons for rejecting public engagement. While often these are retrograde, they are nonetheless real:

1. **Inflexibility.** It's never been done before.
2. **No Perceived Value.** Measuring the internal cost vs. the perceived value is difficult for companies who have never engaged openly.
3. **Fear Of Failure**. Why take a risk?

4. **Why Bother?** We have insufficient resources. [5]
5. **Fear Of Speaking.** Mature, established companies have no experience in the mechanics of speaking.

Private Clouds Are, Well, Private

The majority of companies using public cloud have limited financial resources. They don't make a profit, and cash burn/cash flow is a critical issue, so the ability to achieve **any form** of exposure is a good thing. And as mentioned, there's a chance of feathering a soft landing for yourself when your startup crashes (as most of them do).

The technology press has been massively skewed towards public cloud rather than private simply because there is material to be used: public presentations, public figures who are accessible for interviews/coffee. Private cloud owners simply don't engage in public debate. I mean, why bother?

In the real world, a private cloud is far more flexible and practical for the most companies. It is the only cloud solution that will support your legacy software AND support the implementation of next-generation cloud technologies.

Cloud Is The Answer

I'm concerned that there is widespread market bias leading (a Confirmation Bias most likely) that strongly supports public cloud as the only solution. The disruption isn't caused by public cloud, it's caused by technologies that public cloud must use. Without them, public cloud isn't viable.

Public cloud providers have been the first companies to embrace DevOps/Automation/Orchestration Portals/APIs/REST/JSON and so on because that is the best way to run an IT infrastructure.

Enterprise IT will be slower to embrace these since they are not technology-only companies, and they must sustain heirloom technologies while transitioning to cloud in their private data centers.

Back to my two points:

1. Public clouds aren’t the best solution just because people talk about them.
2. Private clouds are being successfully deployed in vast numbers and no one is talking about them.

The EtherealMind View

One feature of the public cloud is that sheer number of resources available to help with adoption: practical, useful resources that talk about the good, bad & ugly help to get the job done. This information removes very costly processes like pre-sale proof-of-concept, time spent in meetings, and more.

On the other hand, public cloud is hard and requires a full replacement of all your existing IT to embrace.

You don’t hear much about private cloud because it's private. No egos, no resume boosting, no travel, and some minor security reasons.

Private clouds exist, are successful, and are going through exactly the same growing pains as public clouds, but you hear less about them because they are private.

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1. Most cloud technology is better than existing technology because most existing IT technology is obsolete by at least a decade. ↩
2. Once everyone is using the same technology, there is no advantage between competitors. (computing/storage/networking are unlikely to be fungible resources like electricity in the next 50 years). ↩
3. Not everyone wants to work nights and weekends. Not everyone thinks that speaking at a conference is a fun activity. ↩
4. Security through obscurity isn’t best practice but when attackers have your source code, it doesn't matter. ↩
5. Startups have far more human resources than a typical enterprise IT team. Enterprise IT must cope with far more complexity than a typical

Internet startup - more platforms, more operating systems, diverse applications, and little access to high-quality people and support. ↩

2. So You Want To Work For Yourself

by Ethan Banks

Working for myself has been a goal of mine for many years. I almost pulled it off back in 2000 or so, but the pressure of young kids and a mortgage held me back at that time.

In 2015, I finally took the plunge. I left a network architecture position at a company that had been suffering from severe cash flow issue, and opted to work for myself as co-founder of Packet Pushers alongside the inestimable Mr. Ferro.

A dream come true, right? Wow. Working for myself. No more commute. No more fabric covered cubicle, and a welcome reduction in secondhand flatulence. Yes. Those things are true enough.

But I have to say that working for myself has proven to be far more challenging than I expected. It's not the actual work - the work is fine. It's all of the other stuff that you don't suspect when electing to be self-employed. If you're contemplating working for yourself, consider some of what I've learned.

1. You are a one-person wrecking crew.

You are responsible for everything. Sales. Accounting. Billing. Taxes. Time tracking. Providing quotes. Planning projects. Delivering projects. Managing customer expectations. Managing staff (if you have any). Paying contractors. Handling customer reactions to your work, both positive and negative.

Maintaining your schedule. And so on.

The administrative burden of doing what must be done to make a business work is a big deal, and it increases with the number of jobs you're doing and the number of people involved.

2. You might think that if you work for yourself, you can set your own hours and have as much vacation as you feel like.

And I suppose that's true. You have all the time off you want, as there's no one to tell you "no." But generally speaking, if you're not working, you're not getting paid. Therefore, you might feel like taking time off, but you might feel like working on a billable project even more. Getting paid is pretty important, and you feel the pressure of that when you're not working.

3. Self-employment tax in the US is much higher than what you're used to paying.

If you've been making something under six figures and can take a lot of deductions, your effective tax rate is likely to be low. In addition, your employer pays a significant amount of your federal tax burden.

When you start working for yourself, you can still take deductions. However, you are the employer now, and the entirety of the tax burden shifts to you.

Expect to send 30% of your gross income to the IRS in the form of quarterly estimated tax payments. You might get a bit of a refund come tax time, but I find that 30% is a wise baseline. "You mean if I make $10,000, I keep $7,000?" Exactly.

4. The Affordable Care Act makes it easy to get health insurance, but it's not cheap unless you qualify for subsidies.

In the US, the ACA created marketplaces that make it easy enough to shop for health care plans for you and your family. However, the rates are high. Typical bronze care packages are around $600 - $850 a month with high deductibles for a family of four. Silver and gold care packages are easily between $1,000 and $1,500 (or more) a month. If you have sufficiently low income, you will qualify for a subsidized rate, but don't count on that. If you make any sort of a reasonable living, you'll be paying 100% of the premium.

On the plus side, your health care premiums are tax deductible, which reduces the net cost to you.

In addition, you need to discuss with your healthcare provider which ACA plans they accept. Don't assume any plan in your local marketplace will do. Very possibly, your local hospital isn't part of the contract for a given plan. Ask a lot of questions both of your doctor and the insurance company before deciding which plan makes the most sense.

5. You don't have 40 hours a week available to bill.

For the newly self-employed person, you might assume that you've got a budget of 40 hours a week that you can bill. Many independent contractors work on an hourly basis, so this seems like a good place to start.

40 hours a week times 50 working weeks a year, and there's 2,000 hours you could be billing. And then you set a rate accordingly. If I charge $100 an hour times 2,000 hours, that's $200K gross. After taxes, that's around $140K. Hey, that's a pretty good living!

Not really. Unless you have a steady gig with one or two big customers where you know you can count on billing 40 hours a week, you just won't. Some weeks will boom. You'll have more work than you can handle. Other weeks will be quiet -- nothing coming in, and nothing coming up.

In addition, you don't really even want to have 40 hours of billable time a week. You want more like 25. You need the remaining time in your week to do administrative tasks, answer e-mail, research, train yourself, return phone calls,

work on certifications, attend local business events, and have a day off every now and then.

This has a huge bearing on what you need to charge per hour to make the numbers work. If you assume an average of 25 hours a week times 50 weeks a year, you're now down to 1250 hours annually.

If you still want that $200K gross income, you need to charge $160 an hour to get it. In metro areas like Boston or NYC, no problem. You can easily charge $200 - $250 an hour as a high-powered network engineering hotshot with a pocketful of certs and some decent references. But if you're in a more rural area, there is greater price sensitivity.

I'm not suggesting that working for yourself is a bad thing. Nor am I suggesting that it's too hard. I'm reasonably happy doing what I'm doing.

However, if you are thinking seriously about going it alone, go in with your eyes open. Having worked for myself for almost a year now, there's something to be said for working for someone else -- it's not as bad as all that.

Sponsor: Interop

Interop is the leading independent IT conference, and the Packet Pushers are putting together a two-day "Future of Networking Summit" for Interop Las Vegas 2016.

The goal of this summit is to identify current and emerging technologies that will affect the networking industry over the next 5 to 10 years.

Experts, practitioners, and of course the Packet Pushers themselves will talk about the changing state of network operations, advances in network hardware and silicon, open networking, SD-WAN, containers and more.

Besides the Future of Networking Summit, Interop is assembling a full slate of independent, top-notch content on security, virtualization, IT leadership, SDN,

and more.

Make your plans now to join us at Interop Las Vegas, May 2nd through the 6th, at Mandalay Bay. Use the code **PPUSHERS** when you register and get 25% off 5-Day, 3-Day, and 2-Day conference passes.

3. Improve Your Routing Chops With Free Tools

by Russ White

Okay, so you already know routing. But you can always learn more, right? Here's three good--and free--resources for extending your routing knowledge.

First are free tools to build local labs on a laptop or desktop. Cisco VIRL is one choice, but VirtualBox is a free option you can use instead. Matt Oswalt's blog "Keeping it Classless" has a good tutorial about building a routing lab in VirtualBox using Ansible and Vagrant. It's a solid introduction to this set of tools.

Another option is GNS3, which has a number of tutorials, both free and paid, on different technologies using their tool. If you watch my new set of IS-IS videos (being published soon on Cisco Press), the labs there are in GNS3.

Segment routing is a very interesting topic in the routing space right now. Don't know what that is? Then you should head over to the segment routing page and read through the tutorial. It's a useful introduction to the topic.

Finally, peering can be somewhat mysterious, as most people don't work at a

large service provider. And yet, it's an important topic because understanding peering will help you understand and manage your service provider relationship, as well as give you a better grasp of the larger Internet world.

This paper, distributed under the GNU FDL, is a solid explanation of peering costs and benefits.

That's it for this time. More free resources for learning are just another Human Infrastructure issue away.

4. CCIE: Two Paths To Certification

by Roger Perkins

If you're considering becoming a CCIE, but you haven't taken a single Cisco exam in your life, how should you do it? The traditional route is to take the well-trod path of CCNA, CCNP, CCIE Written, and then the lab.

However, after completing the journey to one CCIE in R&S last last year, my take on the whole subject has changed.

I am considering CCIE Wireless this year. I could do CCNA, CCNP, CCIE Written and then lab— or I could just take the written test and book the lab. I think the latter option is the much better choice and I will tell you why.

If you want to pass the lab, you have to learn the technologies anyway, so although going through the CCNA/NP path will give you a good depth of knowledge, it will also go over a lot of information that's not featured in the lab at all.

So if you want to get yourself a CCNA or CCNP and stop there, then go for it— you will learn a lot and get an industry-recognized certification that you can put on your CV.

If you want to go for the CCIE, skip straight to the written exam and get your lab booked.

Then learn everything you need to know and don't stop.

It took me nearly four years, on and off, to pass my first CCIE. I plan on doing the second one in under a year! I'll update my progress on my personal blog.

5. Our Downtime Spaces Are Becoming Endangered

by Drew Conry-Murray

The technology industry, and especially Silicon Valley, is a cult of productivity. Within this cult, your status and value are directly tied to the hours you log at work.

The masterful titans of corporate tech have managed to convince enterprise and startup cultures that a 60- or 70-hour work week isn't explotation. Rather, with a deft bit of Orwellian judo, they've made constant work not just normal, but a marker of one's virtue.

You see it in people's social media posts, which are laced with humble-brags about 12-hour days, weekends sacrificed to projects, and cries for "moar caffeine" to help us stay upright on the treadmill.

In fact, even as I write this, an anxious voice at the back of my mind warns me not to say anything bad about relentless productivity. People might think I'm lazy, or a slacker, or not sufficiently committed.

And that's how pernicious this culture has become—that a critique of it feels like thought-crime.

Endangered Spaces

Part of the issue with the demand for relentless productivity is that the natural barriers between “work” and everywhere else have eroded. Work is no longer a place you go to; it’s a mobile and omnipresent obligation that accompanies you regardless of location.

Consider the home. Home used to be a place where you could leave the office behind. You could rest, play, see your family, or otherwise get on with your life. But with the Internet, laptops, and mobile devices, the office can be in your living room, bedroom, or basement.

Even the kitchen is no longer excluded; the startup Soylent aims to disrupt the inefficiencies of food preparation and consumption with a meal-replacement drink that lets you tank up and get right back to work.

But what does it say about our culture when the act of preparing nourishing meals distracts too much from our productivity, so we should just drink fart-sludge?

Airplanes used to be an opportunity to legitimately fall off the map for a handful of hours. Maybe you could read a novel, or stare out the window and let your mind wander. But with onboard WiFi you have no excuse for not checking email, monitoring Slack, massaging documents and spreadsheets, and otherwise moving that Sysiphean stone up the hill.

Perhaps the last refuge of downtime is the driver’s seat in a car. You might have to take the occasional phone call, but otherwise your drive time can be spent how you like: listening to the radio, chatting with a passenger, or maybe even in contemplative silence.

But if and when driverless cars emerge, the commute will go the way of the airplane voyage: just another mobile workplace where you’ll be expected to be present and productive.

The impact of these shrinking downtime habitats are clear: rising rates of stress, anxiety, burnout, and even suicide.

I understand that people take pride in their work. So do I. And I work hard. The people in this industry work hard. We do it not just because it's what's expected of us, but because we're professionals who want to meet the high expectations of the people who employ us and the communities we serve.

But we're not worker drones or robots or software programs whose efficiency and productivity can be infinitely maximized.

The cult of productivity needs to be rebalanced. At the very least, it needs to be recognized for what it is: not a badge of honor or a marker of virtue, but an act of exploitation by organizations seeking to maximize profits by squeezing employees as long and hard as they can.

I should note that my own employers recognize the notion of work/life balance, and don't just pay it lip service. If something needs to get done, they trust that I'll put in the hours to make it happen. But if 5:30 or 6:00 pm rolls around and there are things that can wait until tomorrow, I can step away from my laptop and not look at it again until the next morning.

Technology has enabled relentless productivity, but culture perpetuates and normalizes it. It's time to reclaim our vanishing downtime habitats; we need room to graze, amble, and disconnect. We'll be the better for it.

Sponsor: Aruba Atmosphere Conference

Atmosphere, the largest mobility conference on earth, takes place March 6th through the 11th at the Cosmopolitan of Las Vegas. It features keynote speakers–including HPE CEO Meg Whitman–breakout sessions, and technology demos (along with a few receptions and parties!)

And the Packet Pushers will be on site to record several podcasts with Aruba subject matter experts and chat with fellow conference attendees. Maybe you?

If you're going to be at Atmosphere, we'd like to meet you, shake your hand, and hear about the IT projects you're working on.

During the conference, keep your eye on the @packetpushers Twitter account, and we'll let you know where we'll be and when. Register now, and keep an ear out for the podcasts from Aruba Atmosphere that we'll publish in the Weekly Show and Priority Queue feeds.

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.

Linkedin's Project Falco: Decoupling Switching Hardware and Software

The LinkedIn engineering team blogs about why it built its own operating system and switch:

"Three years ago we had a serious latency problem with applications inside our data centers. We were not scaling our network infrastructure to meet the demands of our applications – high speed, high availability and fast deployments. We knew we needed greater control of features at the network layer, but we hit a roadblock on figuring out how."

We've heard this before from Facebook, Amazon, and Google: the commercial networking products aren't good enough for the Web-scale providers. Instead of working around the problem (like we do) they went and built their own product. Once again proving that network vendors aren't nearly as good as their marketing says they are.

LINK

Spotify: SDN Internet Router

These Spotify blog posts talk about using $10K whitebox Ethernet switches instead of $1M branded routers for Internet connections.

"Switches are extremely fast and cheap equipment that you can find in any datacenter. Compared to routers they consume very little power, they are way smaller and the price per port is an order of magnitude cheaper. However, the hardware is limited and can't hold all the possible routes in the world.

However:

- *At Spotify we already have transit providers and they know how to reach everybody.*
- *We connect to eyeball networks.*
- *We divide users per region. I.e. users in NY might go to the datacenter in Ashburn, users in Germany to the IXP in Frankfurt, Stockholm users to the IXP in Stockholm, etc.*

So why do we need to hold the entire routing table in our devices? Wouldn't it be smart to try to figure which routes we need and use our transit in case we don't know how to reach a particular user?"

Summary: If you take time to design the network, you can save millions in CapEx and reduce OpEx as well (but you will need to have humans to develop the software).

LINK - Part 1
LINK - Part 2

ESnet: Router/Switch Buffer Size Issues

This ESnet blog post on buffering in switches concludes that buffers in switches are pointless.

"The general rule of thumb is that you need 50ms of line-rate output queue buffer, so for for a 10G switch, there should be around 60MB of buffer. This is particularly important if you have a 10G host sending to a 1G host across the WAN. But there are a number of switch design issues that make it hard to quantify exactly how much buffering is actually required."

Some network vendors like to talk up their buffers, probably because it's one of the few features that are different from any other product. QoS is pointless and buffer management in Ethernet switches is doubly so.

LINK

This channel has our nerdiest shows on data networking technologies and products.

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

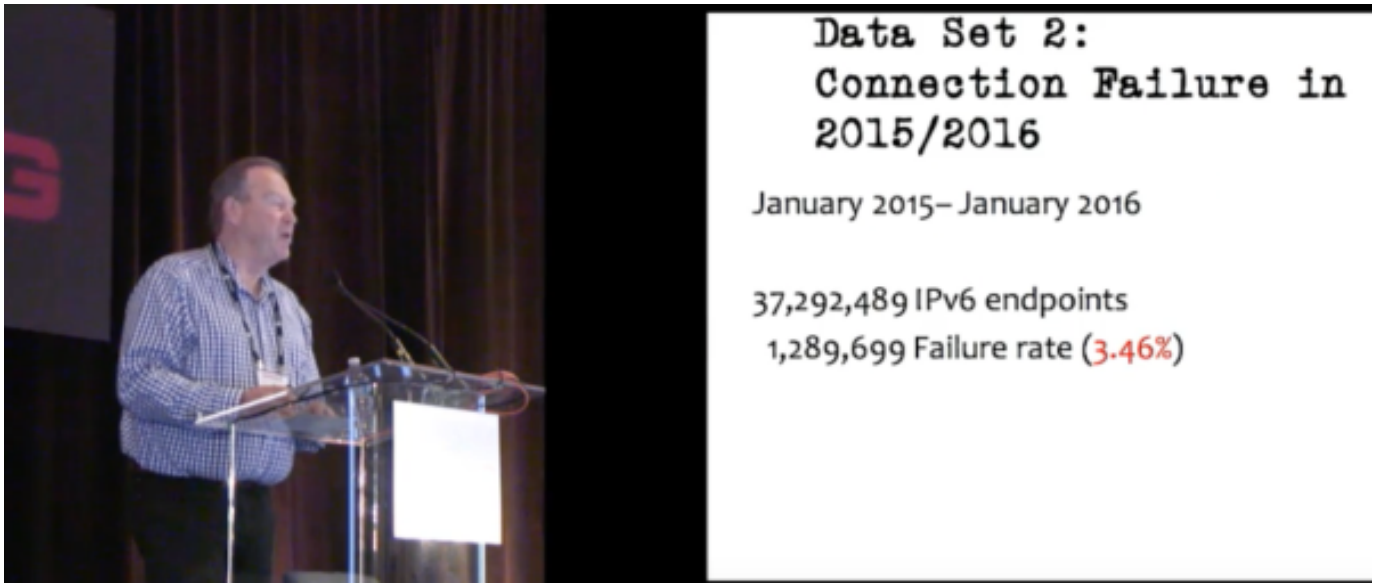
Research Papers

Research and technology papers that provide deep insight or expertise.

Geoff Huston: IPv6 Really Faster? - NANOG Talk

Geoff presents the results of a year's round testing on IPv6 endpoints and finds that connection failure rates > 3%. Which is crap.

LINK



Internet Failures – An Emergent Sea of Complex Systems and Critical Design Errors?

This research paper by Jon Crowcroft from 2009 uses complexity theory to consider whether the Internet is a complex system and subject to emergent failures because of critical design errors.

"Complex systems researchers have looked to the Internet as a possible source of interesting emergent behaviour. Indeed, some high profile failures, and some low level phenomena, might easily be construed as evidence of a complex system. In this paper, I look at the local and global consequences of the Internet design, and show that few, if any, of these problems are actually consequences of emergent properties in the pure technical sense. However, there are lessons for network architecture from these problems. The influence of local decisions on global behaviour of the network is a source of some of the difficulties that protocol designers must cope with, but it is also a source of great wealth and innovation, and as such should be regarded in a positive light."

LINK

Product News

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

Zabbix 3.0

Zabbix is an enterprise-class tool popular with lots of people.

In 2016, I believe that open source network management tools are still competitive with commercial products. SDN is changing the way devices will be managed in a few years, and OpenConfig looks promising to replace SNMP. This looks like a nice upgrade.

LINK

Cumulus Networks Moves To Perpetual Licensing Model

Cumulus tried to differentiate its sales with a year-by-year license model. This always struck me as a PITA since:

1) I would have to build automation to maintain licenses
2) I would have to raise purchase orders every bloody year
3) Convince IT managers that the 5-year cost evens out

Note: I can't find anything about this on the Cumulus website. It looks like all the sales information is secret, so only a cabal of partners are allowed access. We don't want customers to know what they are buying. Get the feeling that Cumulus has hired a few too many Cisco sales grunts ?

LINK

Cisco VIRL For Rent On Packet.com

I prefer using GNS3 for lab/study work. But for commercial/corporate testing this looks like a good option if you can't get access to a large number of VMs. Here's pricing for Packet's Bare Metal offerings.

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, or just entertain us.

Bet you can't take your eyes off this.

Photographer Ari Fararooy used digital animation to bring to life photos he took at Burning Man in 2014 and 2015. The results are rather hypnotic. Ari writes "My photographs illustrate my surreal experiences at the festival, often using my imagination to alter reality."

PACKET PUSHERS

Link Propagation Newsletter

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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.

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