

ETHEREALMIND

Human Infrastructure Magazine

A Newsletter on a Life in Networking

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Issue Number 16

09/21/2015

End of summer slowdown starts about now.

Thought For The Week:

How many calories will I burn by telling someone they are stupid ?

Thoughts: **War of Virtual Switches - IOvisor vs OVS**

vs vSwitch

Where is the edge of the network in 2015 ? Once a physical port on the switch now the network is inside every device. For 3G/4G or WiFi network its the handheld device/tablet. For IOT devices, its the VPN/Overlay connection to the application servers. Virtual appliances are part of the network while being virtually connected to the physical networks.

New security methods on the desktop from companies like Bromium are using micro-hypervisors as security containers. Where is the network connection here? Is it the network driver or the operating system or the micro visor itself ?

It can be confusing. The network edge is now defined by software in some type of operating system and most often, Linux. The emergence of OpenStack and KVM, especially in the carrier market, is changing what expect from the server hypervisor. The paucity of networking has left a large space of

The Data Centre

In the data centre, hypervisors mean that tens of VMs share a single pair of **physical** 10GbE ports and use virtual switches in the hypervisor as the network edge. In an overlay network, the edge is the point of encapsulation whether an IOT device, VPN, server or network appliance.

In the past, the company that controlled the edge of the network would also control the core. Back in the 80's & 90's, Cisco grew its business by dominating sales in the edge, and then moved into the carrier and enterprise.

Virtual Switches

There are two widely used virtual switches for hypervisors today - **VMware and Open vSwitch**.

The VMware vSwitch is proprietary, closed, limited to VMware products (and licensing) and only available in the data centre today (strong hints that NSX is expanding into WAN). This is a popular choice for many enterprise

companies since the networking has to be integrated with their existing VMware technology and their dominant market position.

Open Source Networking

For products based on open source (ie. not Windows or VMware), people have chosen to either configure the existing Linux network driver (using VLANs, IPtables or BR0) or use Open vSwitch.

Open vSwitch was designed to implement OpenFlow. Many vendors regard OpenFlow as evil incarnated and find it difficult to change how they think about packet forwarding to become flow operations. However, OVS has their code in the Linux kernel and this means it is part of most Linux distributions.

Enter IOvisor.org

[Plumgrid](#) has developed packet-oriented virtual switch for their SDN overlay network which uses the [Berkeley Packet Filter](#) that is part of the Linux kernel for many years.

In the last few weeks, they have formed a consortium in the Linux Foundation call [IOvisor.org](#). I recorded a podcast this week to get more information and came away thinking that we have a third option:

1. IOvisor is "linux like" and well behaved member of Linux community. I'm told that Open vSwitch is not well integrated with the Linux kernel and somewhat disliked by kernel developers.
2. IOvisor is to networking as the C programming language is to Assembler or high level languages.
3. IOvisor project has support from the big daddies in networking - [Cisco and Huawei](#)
4. IOvisor will OpenFlow compatible virtual switches to be built using it. And vendors can choose to implement other networking devices that use IOvisor to get directly to the Linux kernel.
5. IOvisor doesn't support DPDK yet but Intel is a project member and there is some hope that it can be done.

Will IOvisor Replace OVS ?

This is a complex question. I understand that NFV virtual appliances might adopt IOvisor as a better way to connect to the network. Why ?

1. IOvisor has a different approach to networking - its not just about path management, but also about packet munging which makes it more suitable for network appliances such as load balancers and firewalls. (I am not convinced that appliances will use IOvisor while projects like [Snabb](#) exist and far superior for appliance platforms)
2. I could be easily convinced that Cisco and Huawei are looking to displace VMware NSX in OpenStack. NSX has a substantial commitment to Open vSwitch and through its funding of developers, continues to take OVS in a particular direction that neither Cisco or Huawei would value.
3. For Docker, and containers more generally, IOvisor might be better suited for networking stack. Today, Kubernetes et al configures BR0 and configuring a vSwitch built on IOvisor/BPF may be a superior choice. I mean, it can't be any worse than Project Calico.
4. OVS had first mover advantage. Can IOvisor get the developer support ? The existing list of project supporters is impressive but Cisco/Huawei supports hundreds of open source projects to a larger/lesser/non-existent degree.

But, really, its too early to tell. First, OVS has had several years to build up momentum. Second, VMware NSX has plenty of money and motivation to keep building OVS - hiring developers, building partnerships and motivating them to use it. The goal is ensure that OpenStack doesn't get away from VMware. VMware's overlord, EMC, is fanatical about maintaining control of their customers and ensuring that there are limited opportunities to leave.

As always, its good times in networking. I will be watching for more. When the podcast comes out, it is definitely worth listening to hear the story behind it.



Interop® Las Vegas
Connecting the IT Community

Breaking News: Interop Summit

We have just received confirmation that Packet Pushers is partnering with Interop Las Vegas 2016. Here is the description:

This Summit uncovers the technology that you cannot buy or deploy but seems likely to impact networking in the next five to ten years. We carefully uncover pre-standard technology, unknown startups, emerging ideas and the next big thing.

Networking is a vast landscape. WAN, Campus, Wireless, Data Centre and DWDM technologies connect globally/locally, wired/wireless and physical/virtual. Some technologies and products are beginning to merge such as Wired/Wireless Campus. DWDM could disrupt the Data Centre Interconnect by offering low-cost Ethernet at 40 and 100Gigabit. And SDN is beginning to control WAN, Wireless. What about NFV in the Enterprise? Or the next ten years of Ethernet standards?

Not everything is short term or quarterly. This Summit is for attendees who value the ability to peer into the future and evaluate what might impact their ten year strategic plan

If you are tired of attending vendor conferences where everything is a cheer squad for sales, then check your training budget and start planning to join the Packet Pushers at [Interop Las Vegas](#) in May 2-6, 2016.



Word of the Week: Cenossillicaphobia

Cenossillicaphobia is the fear of an empty beer glass.

I'm not sure whether to seek counselling or just use it as an excuse.



OBJECTS: Jins Blue Light Glasses

These glasses filter out light in the blue spectrum. Blue light regulates the circadian rhythm. It is high frequency and short wavelength (460 nm), which gives it the highest energy of all visible light. It is most commonly found in sunlight and is necessary for energizing us and keeping us awake as well as regulating our circadian rhythm.

The problem arises, however, when blue light comes from artificial sources in great quantities at the wrong time. Under these circumstances, blue light can throw off the body's circadian rhythm and cause eye strain.

I use an application on my Mac called [Flux](#) which cuts the blue levels after sunset. My perception is that this really works. I would like to try these (but I

have prescription glasses and can't them in England - sigh.)

I want them.

[JINS](#)

Sponsor: Talari - 5 Reasons To Consider an SD-WAN

Unshackle your organization from the limitations of a traditional WAN and move to a more flexible, agile software defined WAN that's suited to today's world.

Five things that a Talari SD-WAN does for you:

1. Offers more network choices.

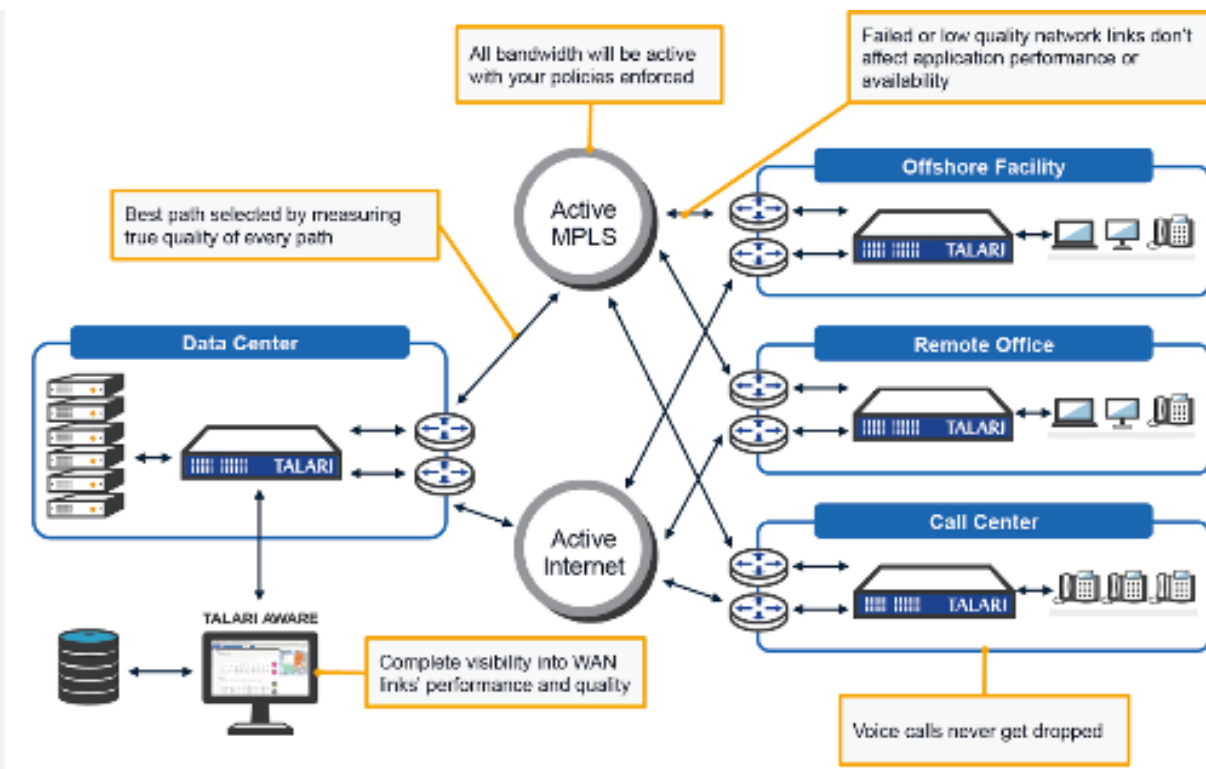
Businesses need the flexibility to use whatever LAN links best fit their needs, based on bandwidth, availability and cost. With SD-WAN, you are no longer limited to MPLS and dedicated circuits. Be free to embrace broadband Internet without compromising reliability.

2. Works with any WAN architecture.

Choose the WAN architecture that works best for you, whether it is an on-premises network, a virtual network or cloud or a combination.

3. Frees IT to say “yes” to new apps.

Users expect a flawless experience, whether it's a phone call, a videoconference, updating the sales forecast or crunching data. A Talari SD-WAN not only increases network capacity but also ensures the quality of application delivery so users are happy and IT has the bandwidth to accommodate applications expansion.



4. Keeps you covered when network chaos breaks out.

No matter how well you plan, outages happen. With a Talari SD-WAN, it doesn't matter if a single link experiences problems because application traffic keeps flowing across the other paths in the WAN. Workers stay productive and you aren't operating in crisis mode to fix the problem.

5. Empowers IT to say “no” to escalating network costs.

Businesses are tired of the “MPLS treadmill” – buying more expensive MPLS to meet bandwidth needs while back-up links sit idle. With a comprehensive SD-WAN, you can use the backup WAN links full time. Or choose the most cost-effective bandwidth available without sacrificing reliability.

Talari offers businesses a better way to WAN by bringing real-time, packet-level intelligence to the network, creating a THINKING SD-WAN that increases capacity, improves reliability and lowers costs. Talari is the SD-WAN technology innovator and market share leader with a proven solution used by customers around the world. Learn more at www.talari.com.



Things on My Mind: **Future of Networking Podcast Series**

Ethan has made an outstanding success of the "Design & Build" series of podcasts that he has been producing on the [Packet Pushers Weekly Show](#) and there are many more to come.

Not to be outdone, I have started a series of podcasts called the "Future of Networking". The concept is to discuss the long-term future of technology and business. I'm hoping to engage with those people who have a major role in networking. I will interview them candidly and get them to talk about the way that they see our industry headed.

This week, I published the very first show in this series with Professor Douglas Comer. Many engineers will have read his textbooks during their degrees or when learning about networking. He was there when the Internet was designed, he worked at Cisco for 6 years in research & design.

[Packet Pushers Weekly how 255 - Future of Networking with Douglas Comer](#)

Research: **Papers & Thinking**

A collection of links to research papers, white papers and other content that made me think deeply about technology.

Internet Society - South Africa

Some interesting presentations on DNSSEC from the IETF / Internet Society ION 2015 conference in Capetown, South Africa.

[LINK](#)

Evolution of Ethernet Speeds: What's New and What's Next

Presentation from UK NOF 23 by Greg Hankins shows the future of Ethernet. [LINK](#)

In particular note that political lobbying organisations that now control the future of Ethernet. For 2.5G/5G it's a pissing match between Cisco/NBaseT & Broadcom/MGBase-T. And don't forget the Ethernet Alliance, MEF and the many others. The **IEEE must be a disaster area** for so many lobby groups to form around it.

The [25/50/100G alliance](#) has passed it work into the IEEE and we expect a standard sometime in mid-2016 but really, it could be years before the final standard is ratified based on history. We expect nothing better from them.

Juniper Northstar Controller

This PDF is a product data sheet for the carrier orchestration platform for MPLS networks. Based on the PCEP protocol for MPLS network discovery and control, its an SDN platform for telcos. This is worth a quick read to see how different carrier/telco networks will become compared to Enterprise.

NorthStar Controller is able to discover the topology of the network dynamically by peering via IGP (ISIS-TE, OSPF-TE) and listening to BGP-LS updates, while the discovery of optical network topology and optical virtual paths can be done via REST API calls using notion of Abstract topology as defined in standards into the optical plane. Modification of existing paths or provisioning new paths can be achieved through PCEP standard.

[LINK](#)

A Successor to HTTP ?

Neocities is adding a distributed web protocol to its platform to build a Federated data platform. It made me think more carefully about how websites are built.

I strongly believe IPFS is the replacement to HTTP (and many other things), and now's the time to start trying it out. Replacing HTTP sounds crazy. It is crazy! But HTTP is broken, and the craziest thing we could possibly do is continue to use it forever. We need to apply state-of-the-art computer science to the distribution problem, and design a better protocol for the web.

[LINK](#)

Ubuntu Wiki - Fan Networking - Container IP Addressing

A IP schema for use when designing containers networks. Because current containers networking relies on warehouse-scale NAT mapping.

Containers enable tremendously dense virtualisation -- it is easy to run hundreds or even thousands of containers on a single host machine. Whether for whole machine containers (LXD) or process containers (Docker), it is easiest for these containers to be managed as separate networking entities, which means they need their own IP addresses. The proliferation of containers thus creates demand for additional network address space. Typically, the number of extra addresses needed is roughly constant across each container host.

Note that you won't have to maintain IP addressing of containers manually as is done with servers or VMs today. Orchestration platforms like Kubernetes will take of allocation and naming.

[LINK](#)

Open Optics MSA

This consortium is another lobby group for Ethernet looking building an open standard for the optical connectors. The current generations of connectors are often encumbered with licensing fees and this cost is passed to you.

Its also interesting reading on the how MSA/Optics are designed.

The OpenOptics initiative creates a solid foundation for scalable next generation data center optics for 100G, 400G, and beyond. It begins by defining a 1550nm QSFP28 optical transceiver for 100G data center networks on single mode fiber (SMF) infrastructure.

[LINK](#)

State of the Web Browser 5 Conference

Video Presentations from the conference. I believe that the web browser will be vital for network engineers to understand so that security, QoS and network operations can be tuned for the browser-based applications. Lets face it, we know roughly how applications work to understand what sort of impact they have on the network.

[LINK](#)

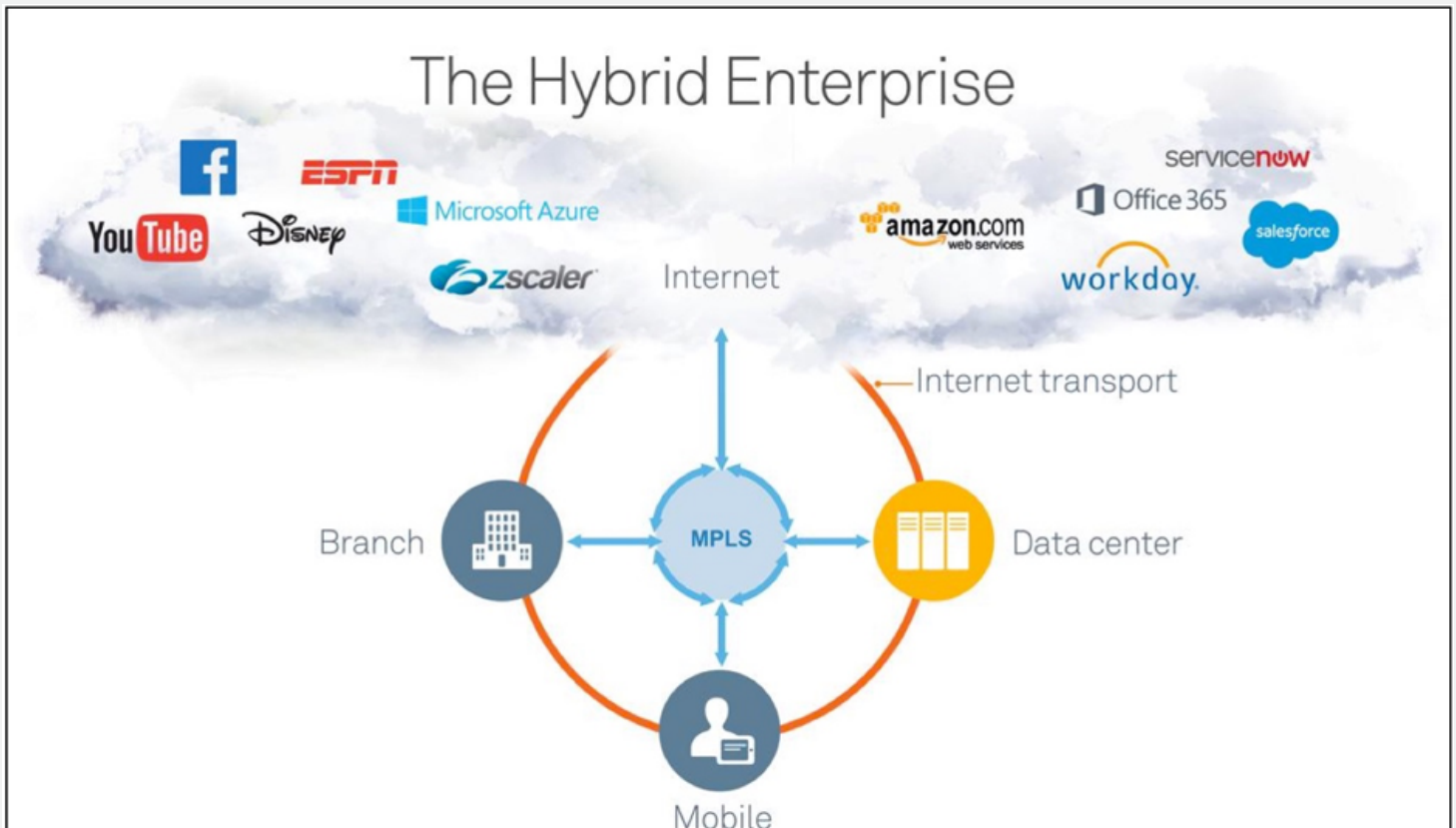


Sponsor: The Future of WAN Optimisation & Application Performance

WAN Optimization was developed to solve a very specific problem: How do you mitigate the impact of bandwidth and latency on application performance over wide-area networks? Vendors developed a number of technologies to address these challenges and a majority of large enterprises have employed these solutions to keep their day-to-day business critical application running.

But today's hybrid enterprise is dynamic, complex, and requires more than traditional WAN optimization to effectively and securely deliver mission-

critical applications.



Business and application requirements continuously change, so IT needs to be highly agile when reconfiguring networks to accommodate these modifications. SD-WAN solutions help automate and manage time-consuming bits and pieces at the edge. But what companies need is a comprehensive solution that enables business-defined (not network-confined) application delivery across end-to-end hybrid architectures.

That's where Riverbed, the pioneer and longtime leader in the WAN optimization space, comes into play.

Check out the [PacketPushers Podcast Show 254, Riverbed: Beyond WAN Optimization](#) which discusses how network engineers can conquer the complexities of today's hybrid WANs, the latest innovations from Riverbed and why the company is leading the emerging SD-WAN market.



Sites to See: Internets Of Interest

A collection of content that is worth reading or knowing about. Or something.

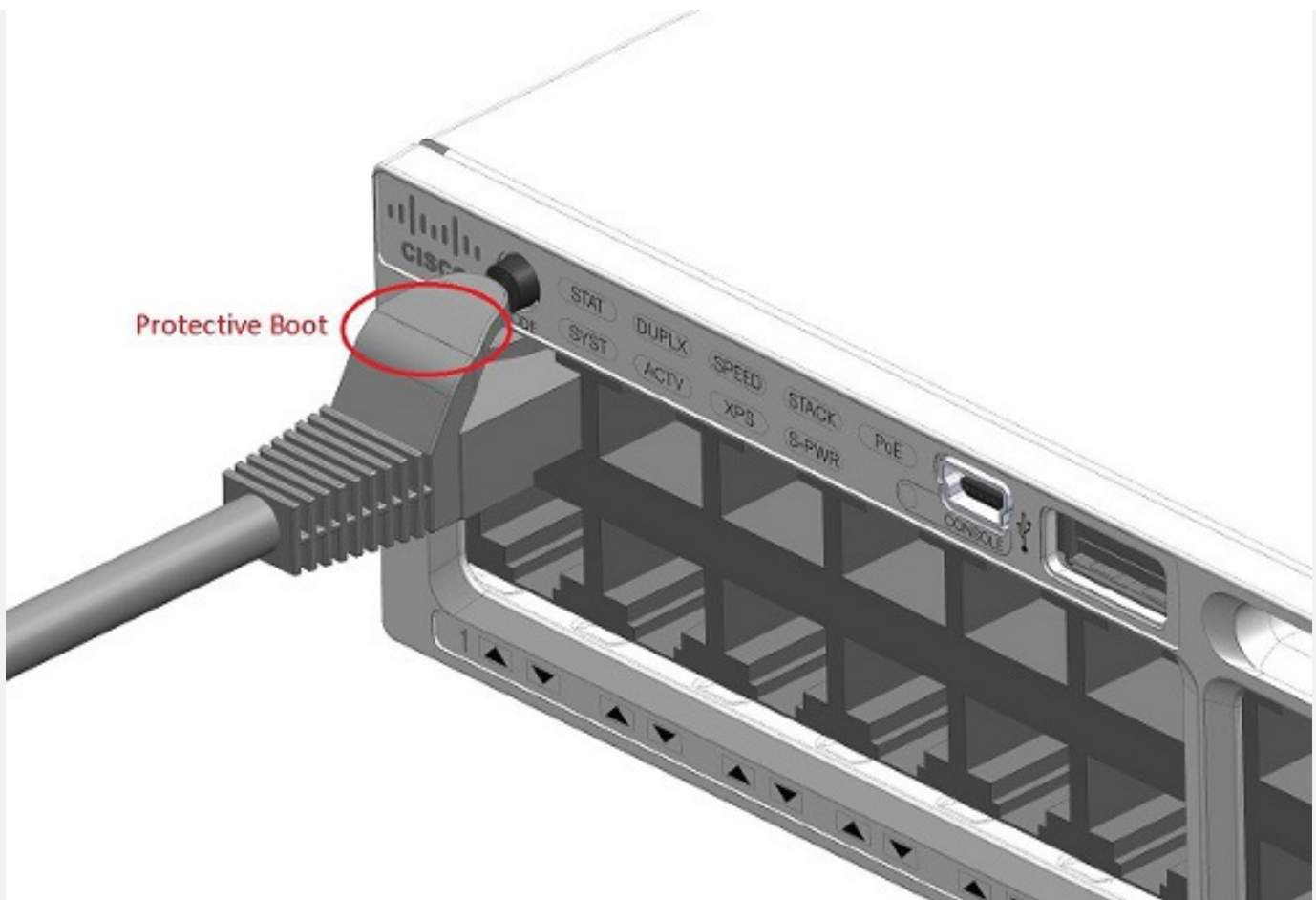
Cisco Field Notice: FN - 63697

Protective Boot on Certain Network Cables Might Push the Mode Button and Cause an Unexpected Reset on the 48-Port Models of Cisco Catalyst 3650 and 3850 Series Switches.

Two year old Field Notice and you might have seen it already. The reset button is placed directly over Ethernet port and inserting cable with a snag-free cover will factory default the switch.

"It's not my fault"

[LINK](#)



How Soundcloud ended up with microservices.

A wonderful spit in the eye of the technology purists:

"I am sorry to disappoint my fellow techies, but the reason we migrated to microservices had to do much more with productivity than pure technical matters. I'll explain."

[LINK](#)

Survey of the SSL Implementation of the Most Popular Web Sites

Trustworthy Internet Movement - SSL Pulse. A website that scans and updates information about SSL configuration on the Internet. Useful data for supporting your design decisions.

[Link](#)

Automating in a Brownfield Environment

Got some interesting ideas from this deck. Particularly the sections that talks about how to approach automation.

Some places don't have rock-star ninjas running everything. Some places are afraid of change. Some places think automation means taking our jobs. This talk, is about those places and how we move forward.

[LINK](#)

Cisco Mantl sort of explained as IOE

Cisco calls its IOE strategy "Fog Computing" which makes me think it doesn't know what to do and using a vague non-committal approach. However, this article is quite well written and explains a use case for Cisco Mantl micro services stack and InterCloud.

And yeah, micro services is a going to be a deal in the future. Worth thinking about.

[LINK](#)

MonitoringScape

A massive collection of monitoring tools for all sorts of reason.

We now have a choice of over 100 monitoring tools that provide excellent visibility to every nook and cranny of our IT stack. The modern monitoring landscape has something for everyone: on-prem installations, SaaS applications, open-source tools and high-priced enterprise monitoring suites. However, with so many tools to choose from, the monitoring landscape can be difficult to navigate.

[LINK](#)



Q&A

People send me questions. I do my best to answer them.

Q. I have heard you mention that private cloud is cheaper than public, do you have any data on that?

A. Nothing I can publish (client confidentiality) but I've built both types of clouds and it's much cheaper to build and operate a private cloud **if you do it right**. Scaling down the complexity of a public cloud to smaller private clouds is simple, reliable and often uses open source software to cut costs.

People say that building at scale cuts costs per unit but what I've seen is that building small scale cuts even more cost because there is less waste. You only build and use what you need instead of getting forced into the AWS mode of operation. Do you really want to be forced to use IAM ?

Q. Next market to crash - Wan Optimization, Proxy, or Fibre Channel, and why?

A. Network management. SDN will transform the way we monitor, analyse, configure and operate our networks. Network management software is long overdue for improvement and SDN replaces SNMP as a way to get data.

All the others will start to shrink in the years ahead. WanOP is becoming a feature of SD-WAN instead of a product. FibreChannel is already shrinking, look at the share price of QLogic. Proxy servers can't work as encryption becomes widely used in the public networks and a lot of revenue/sales will simply disappear. Corporate IT will still use them

Q. What is your take on off shoring?

A. It goes in and out of fashion. It doesn't work when the service being off-shored is constantly changing - and that's why IT outsourcing & Off shoring is dying out. I've seen companies implement automation to replace outsourcing of tasks

Q. You can't be a consultant anymore, you work for one company and only

support them, best industry to get in and why?

A. I just don't know the answer to this one. It depends on you, where you are in life, and what your goals are. If you want to own big houses and fast cars, then you need a career that pays well. If you choose modest lifestyle, you have more choices about what sort of work, where and what you want to get paid.

High paying jobs have a big personal cost in time, travel, emotional hygiene and mental health. Moderate paying jobs

Q. You provide more technical details than just about anyone, but I still always want to know the how to any what.

A. At some point you have to do the work yourself. We can give you some pointers and summarise the information but the only way to really know a product is to read the manuals, speak to sales rep, and so on.

And that is a feature - the desire to know stuff should grow your skills and experience. A big reason for writing this newsletter is to share what I'm reading and learning about. If you have something to share, then email it in to humaninfrastructure@packetpushers.net - would be pleased to share it with everyone else.



Recent Articles

The last five articles published on EtherealMind and Packet Pushers blogs

EtherealMind.com Latest

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

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

IETF RFC 8374 BGPsec Design Choices and Summary of Supporting

Discussions - [Link](#)

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

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

PacketPushers.net - The Last Five

Network Break 182: BGP Hijacked For Cryptocurrency Heist; Juniper, Big Switch Unveil New Products - [Link](#)

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

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

Datanauts 131: Masters And Mentorship - [Link](#)

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

Fun Stuff

Marital Aid: Bin Night Bot

"Send a twitter @reply to [@binnightbot](#) which day of the week your bins are scheduled to be collected, and every week you'll get a handy reminder to put them out.

That's all it does. Because I always forget and my wife gets mad at me.

Scale Model of Solar System.

In the desert, 7 miles wide using a marble as "Earth". Inspirational.



Beautiful video about building a true scale model of the solar system in the desert.

Kuvva

"Kuvva for Mac streams beautiful wallpapers right to your desktop, presenting you breathtaking images every day of the week."

I'm not a huge fan of the wallpapers because who looks at your desktop, its always covered with apps. But if you do, this might be your thing.

[LINK](#)

SpaceX - Crew Interior & Drone Name

These videos of the interior of the SpaceX Dragon spacecraft feel like a science fiction movie.





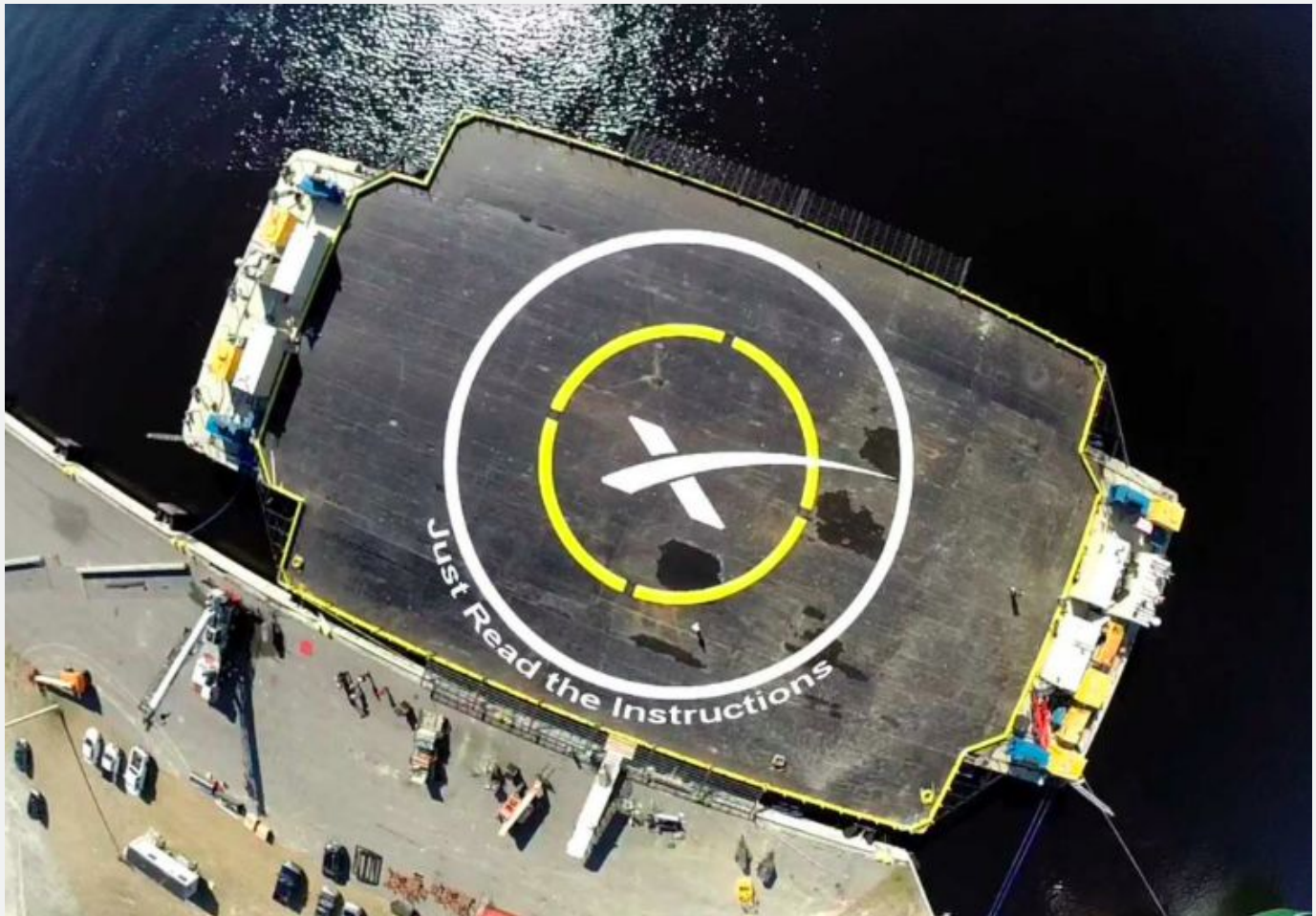
Step inside Crew Dragon, SpaceX's next-generation spacecraft designed to carry humans to the International Space Station and other destinations:
www.spacex.com/crew-dragon



This one was a bit cheesy, but the design is splendid.

Little known fact. The drone ship that reusable launch vehicle will land on is called "Just Read The Instructions"

Why ? Because look at this photo:



Still Here ? : Virtual Toolbox

Last weekend I started working on collecting all of the best places for content. I call it a "Virtual Toolbox".

The plan is to create a series of pages over time and get community input. At the bottom of each page is a form where you can submit your suggestions for the page. Early days and I will work on it over time.

Check it out - [Virtual Toolbox](#)

Use the forms or [email me](#) with content and suggestions.

The End Bit

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Human Infrastructure is bi-weekly newsletter with view, perspectives & opinions. It is edited and published by Greg Ferro from [EtherealMind.com](#) and [PacketPushers.net](#).

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

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