IETF Report

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About This Presentation

This presentation is an official IETF report

- **This report covers TWO IETFs, IETF 100 and IETF 101**
- **This is not an in-depth IETF report lots of exercise for the reader**
- **I am not a DNSSEC expert and there is a LOT going on with DNSSEC and RPKI**
- I am officially the ARIN IETF Reporter for 2018
- This is all my opinion and my view and I am not covering everything just highlights
- You should know I like funny quotes
- I hope you enjoy it
- Your feedback is greatly appreciated
- If you were there and I missed something interesting please share!
- Opinions expressed are solely my own and I include thoughts that I typed while at the meeting.

Highlights

- **I was on the ANRP selection committee. Two of the papers may be of interest to this community (all were interesting but these mention ARIN)**
- A Look at Router Geolocation in Public and Commercial Databases https://www.caida.org/publications/papers/2017/look_at_router_geolocation/ "The worst city-level accuracy for all the databases is observed for ARIN addresses. "
- On IPv4 transfer markets: Analyzing reported transfers and inferring transfers in the wild https://www.caida.org/publications/papers/2017/ipv4_transfer_markets_wild/ipv4_transfer_markets_wild.pdf
- **Lots of experimentation on turning off IPv4 during the 6Man and V6 Ops sessions. Found bug in APs**

IEPG – What is it?

- The IEPG is an informal gathering that meets on the Sunday prior to IETF meetings. The intended theme of these meetings is essentially one of operational relevance in some form or fashion - although the chair will readily admit that he will run with an agenda of whatever is on offer at the time!
- The IEPG has a web page and a mailing list
  - iepg@iepg.org - the usual subscription protocols apply.

IEPG

- hass-iepg 101.pdf
  - **Sort of a survey of control plane security mechanisms and what to do about them.**
  - what is right from a security standpoint vs. what will actually work
  - MD5 is fairly simple but having to share keys in TLS is more difficult

IEPG

- Engineering authoritative DNS servers recommendations
  - **Authoritative nameservers should all have similar latency. Recommends big anycast**
  - Routing can matter more than locations
    - Choose a provider that is closer via BGP than geography
  - Detailed Anycast maps of catchments requires active measurements
    - **Adding more anycast sites just to have more can cause overloaded and underused sites.**

IEPG

- **IPv6 DoS Attack**
  - **Lots of open resolvers (400+ seen)**
    - **Used to amplify the attack**
    - **Need to have the same safeguards in v6 as v4**
  - People still using 6to4 to do their own DNS recursion
  - Articles about attack:
    - https://www.theregister.co.uk/2018/03/03/ipv6_ddos/
    - https://www.informationsecuritybuzz.com/news/first-native-ipv6-ddos-attack-strikes-organisations-face-yet-another-new-cyber-threat/

IEPG

- **Measuring Additional Truncated Response – ATR**
  - Geoff using Ad platform to do testing
    - 10,851,323 tests
    - Failure rate in receiving large responses – 4,064,356
    - **IPv6 fragmentation failure rate 38%**
    - Some infrastructure can't handle fragments at all and DNS is increasingly using fragmentation
  - ATR is basically a way to get the DNS to switch to TCP quicker
  - **Super interesting. I am always amazed that the Internet works at all.**

IEPG

- User to User measurement with RIPE Atlas
  - Usually Client to server gets measured, not client to client.
  - **So looking at traffic between users..**
    - **Does traffic go via an IXP?**
    - **Really great diagrams of this info from South Africa, US, Germany, UK**
- *Removing EDNS Workarounds (Extension mechanisms for DNS)*
  - *https://ednscomp.isc.org/ednscomp/*

IEPG

- The Curious Case of the Crippling DS Record – Public Safety Notice
  - Update on the KSK rollover failures.
  - This is an analysis of the protocol compliant but unexpected failure of the key rollover
  - http://iepg.org/2018-03-18-ietf101/roy-ds.pdf

IEPG

- Root KSK Roll Delay Update
  - Didn't roll the key as planned.
  - 6% were not ready for the KSK roll on 11 October 2017
  - Going to try again October 2018
- How to measure KSK roll readiness
  - Interesting paper and non-trivial problem.
  - Draft-huston-kskroll-sentinel

IEPG

- Wild ROArs
  - **Taking a look at how cc information for both prefix and declared origin AS actually looks**
  - Original intention was to look at possible cases where the cc for both prefix and declared origin_AS differ in ROA data
  - **Columbia has the most foreign ROAs.**
  - Some of the "strange" cases have been involved in security incidents.

IEPG

- **Impact of security vulnerabilities in timing protocols on DNS**
  - Why we should use "raw time" instead of actual time
  - A lot of things on the network can use "raw time" and should
  - DNSSEC cannot use "raw time" so NTP also needs to be fixed.
- **DDos and Collateral Damage Risks are TLDs over sharing DNS infrastructure?**
  - DDos is becoming bigger and cheaper
  - Services not under attack that were affected (Spotify, Netflix)
    - Happens when parts of the infrastructure are shared
  - ccTLDs have far less sharing than gTLDs
  - **9 TLDs using 1 AS only**
  - Some /24 have 360+ zones

Technical Plenary

- **The Technical Plenary in London was all about community networks**
- Leandro Navarro

  Quifi.net is a functional internet that's affordable and allows full engagement
  - Built by citizens
  - Open and cooperative
- 2nd talk – Steve Song
  - **" we care more about connecting refrigerators to the Internet than we do poor people"**
  - He argues that how spectrum is managed has to change. It's too expensive and favors the big guys
- Jon Brewer – The future is up in the sky
  - **An awesome talk about satellite and how it's helping community networks in remote places.**

DNS Operations – What is it?

- The DNS Operations Working Group will develop guidelines for the operation of DNS software and services and for the administration of DNS zones. These guidelines will provide technical information relating to the implementation of the DNS protocol by the operators and administrators of DNS zones.
- More at charter-ietf-dnsop-04

DNS Operations

- draft-jabley-dnsop-bootstrap-validator
  - KSK rollover is postponed until Oct 2018
  - Not sure we're any closer to knowing what's going on
  - **"provides guidance on how validators might determine an appropriate trust anchor for the root zone to use at start-up, or when other mechanisms intended to allow key rollover to be tolerated gracefully are not available. "**

DNS Operations

- **The DNS Camel**
  - An operational view to RFC 8324
    - DNS Privacy, Authorization, Special Uses, Encoding, Characters, Matching, and Root Structure: Time for Another Look?
  - **How many features can we add to this protocol before it breaks?**
    - **185 DNS RFCs**
    - **2781 pages**
  - **Bugs happen because no one reads all the RFCs**
  - **“The 3 in NSEC3 is the number of people who understand it”**

DNS Operations

- draft-ietf-dnsop-terminology-bis
  - Closing in on this new terminology doc. Needs reviewers
- draft-ietf-dnsop-rfc5011-security-considerations
  - Did not reach consensus and lots of questions still exist
  - “I see logarithms and I fall off my chair”

DNS Operations

- Geoff talked about KSK roll
  - key roll postponed because signal that came back on the early adoption the take up of the key was not universal and the folks not using it is non trivial
  - don't know if they'll go dark or if they'll have an alternative server? At what point should we proceed?
  - devise a query that will show? send a query label that reports back if the key is or is not in the key store.. calls it user-side management.

DNS Operations

- Other drafts
  - draft-ietf-dnsop-let-localhost-be-localhost-01
  - draft-bellis-dnsop-xpf-03
  - draft-fujiwara-dnsop-additional-answers-00
  - draft-mglt-dnsop-dnssec-validator-requirements-06
  - draft-huston-kskroll-sentinel-02), Huston

DC Routing BOF - ?

- Over the last year, there have been discussions in a number of routing area working groups about proposals aimed at routing within a data center. Because of their topologies (traditional and emerging), traffic patterns, need for fast restoration, and need for low human intervention, among other things, data centers are driving a set of routing solutions specific to them. The intent of this BOF is to discuss the special circumstances that surround routing in the data center and potential new solutions.
- The objective is not to select a single solution, but to determine whether there is interest and energy in the community to work on any of the proposals.

DC Routing BoF Summary

- Most of the work done in other groups.
- The idea is to reduce flooding and “link-state” behavior.
- Also aims to reduce churn.

DC Routing BoF

- **BGP-LS SPF: Shortest Path Routing Extensions for BGP Protocol**
  - All I can say is Yikes
  - Why BGP is better in a Data center but needs to be SPF?
- **RIFT: Routing in Fat Trees**
  - Distance-vector / Link-state hybrid

DC Routing BoF

- ISIS Routing for the Spine-Leaf Topology https://datatracker.ietf.org/doc/draft-shen-isis-spine-leaf-ext
- Openfabric: ISIS Support for Openfabric https://tools.ietf.org/html/draft-white-openfabric-04
- OSPF/ISIS Flooding reduction in MSDC https://tools.ietf.org/html/draft-xu-ospf-flooding-reduction-in-msdc-02
- https://tools.ietf.org/html/draft-xu-isis-flooding-reduction-in-msdc-02

DC Routing BoF

- Read-out: Cloud DC and Operator Requirements for DC Routing
  - This is the start of a list of requirements for this community
- Enterprise Requirements for DC Routing
  - Requirements for Enterprises. (brick and mortar type enterprises)

V6 Operations – What is it?

- The IPv6 Operations Working Group (v6ops) develops guidelines for the operation of a shared IPv4/IPv6 Internet and provides operational guidance on how to deploy IPv6 into existing IPv4-only networks, as well as into new network installations.
- The main focus of the v6ops WG is to look at the immediate deployment issues; more advanced stages of deployment and transition are a lower priority.
- http://datatracker.ietf.org/wg/v6ops/

V6 Ops

- **Mythic Beasts: an IPv6-Preferred Data Center**
  - **These guys do IPv6 only hosting. They translate with NAT64 and have an inbound proxy.**
  - **Spam is filtered on /64 boundary so if you have a /64 for the whole data center and one of your clients spams then everyone is filtered. So /64 per customer.**
- IPv6 Prefix delegation models
  - This draft is all about nodes assigning addresses to itself for all sorts of purposes and how it should behave when it does.

V6 Ops

- **Fragmentation is fragile**
  - **This all boils down to the MTU of Ethernet being 1500 bytes**
  - **Fragmentation causes lots of problems with load balancers, firewalls and other boxes.**

V6 Operations

- **Update from the Hackathon**
  - **VPNs won't work if they're configured not to work :-)**
  - **A lot of problems went away when software is updated**
  - **For more info ask Lee Howard**
- **IPv6 Only Terminology Definition**
  - **Apparently this is difficult**
  - **How should we define IPv6 only?**

V6 Operations

- **A good talk about V6-only deployment at cisco**
  - **Set up in building 23. Was dual stack but now v6-only**
  - **Management is over v6 too**
  - **EIGRP for v6**
  - **RFC4941 sec 3.6 is not implemented in Android..**
    - **Privacy Extensions for Stateless Address Autoconfiguration in IPv6 - Deployment Considerations**
  - **Storage does not use v6 yet**
  - **NAT64 and DNS64 set up**

V6 Ops

- **Transition Requirements for IPv6 Customer Edge Routers to support IPv4 as a service**
  - Specifically, this document extends the "Basic Requirements for IPv6 Customer Edge Routers" ([RFC7084]) in order to allow the provisioning of IPv6 transition services for the support of IPv4 as a Service (IPv4aaS) by means of new transition mechanisms, which where not available at the time [RFC7084] was published.

V6 Ops

- NAT64 Deployment Guidelines in Operator and Enterprise Networks
  - A detailed discussion of deploying NAT64
- IPv6 Point-to-Point Links
  - An overview of addressing point-to-point links. Prefix size, numbering choices, and prefix pool

HOMENET – What is it?

- The purpose of this working group is to focus on this evolution, in particular as it addresses the introduction of IPv6, by developing an architecture addressing this full scope of requirements:
  - prefix configuration for routers
  - managing routing
  - name resolution
  - service discovery
  - network security
- charter-ietf-homenet-03

HOMENET

- **Presentation on anima security bootstrapping remote security protocol for homenet?**
  - **Homenet is a non professionally managed/ unmanaged that's a big challenge**
  - **If there is a PKI for the home where would it reside? What if they get a new TV or device?**
  - **Other security issues**
    - **perimeter security**
    - **HNCP and BABEL security**
    - **trust model (how to establish trust)**
- WG charter says to write a security document and it isn't written. Ted Lemon volunteered so stay tuned
  - **I can't help but ponder why security is always left for last.**

HOMENET

- Naming Architecture and Service Discovery
  - Doc is reorganized
  - **Uses home.arpa for local names**
- Other drafts
  - draft-ietf-homenet-simple-naming-0x
  - draft-ietf-homenet-babel-profile-05 in IETF LC
  - draft-ietf-homenet-dot-14 (in editor's queue)
  - draft-ietf-homenet-front-end-naming-delegation-06
  - draft-ietf-homenet-naming-architecture-dhc-options-05

HOMENET

- Support for HNCP in IPv6 CE routers
  - different models for homenet - ISP more or less involved.
  - What do we want HOMENET to be?
  - Jordi is really trying to define things in all these groups.
  - **Do we believe we have to have guidelines how to define a homenet?**

IASA – What is it?

- **IETF Administrative Support Activity**
  - RFC 4071 provides the structure and guidance for the IASA, IAOC, and IAD. The IAOC structure is designed to ensure accountability and transparency.

IASA

- Overview of draft-haberman-iasa20dt-recs-01
  - Administrative tasks and arrangements we have today
  - addresses org and relationship with ISOC and how we set it up to get the job done
  - “you will never find so much money with so few strings anywhere else” (referencing the ISOC - IETF relationship)
  - **Need to decide whether to remain an activity of ISOC and being our own entity**

IPv6 Maintenance (6MAN) - ?

- The 6man working group is responsible for the maintenance, upkeep, and advancement of the IPv6 protocol specifications and addressing architecture. It is not chartered to develop major changes or additions to the IPv6 specifications. The working group will address protocol limitations/issues discovered during deployment and operation. It will also serve as a venue for discussing the proper location for working on IPv6-related issues within the IETF.

6MAN

- Still working on Node Requirements
  - Getting close to being done so send comments if you have them
- IPv6 Segment Routing Header
  - **There is now working code for this. I am always curious why there are drafts with extension headers when a lot of it gets filtered**

6Man

- **draft-gont-6man-address-usage-recommendations-04**
  - This document analyzes the security and privacy implications of IPv6 addresses based on a number of properties (such as address scope, stability, and usage type), and identifies gaps that currently prevent systems and applications from leveraging the increased flexibility and availability of IPv6 addresses.
  - **Basically we have a lot of addresses so why not use different addresses for different functions?**

6Man

- **No IPv4 experiment.. AGAIN**
- **Bug in Singapore.. RA misbehavior where you end up timing out your default route and not getting one back.**
- **On the dual stack network happy eyeballs makes it work**

6MAN

- Multi-Vendor Interoperability Testing Results Update
  - There is a video but it's just a Nokia advertisement
  - Twenty vendors participating
  - Testing Segment routing with an IPv6 Data plane
  - Hot staging happened March 5-16th at EANTC and more testing in April at MPLS + SDN + NFWORLD
- Testing of TI-LFA (Topology independent Loop-free alternate) implementations
  - **Test results using this form of segment routing**
  - Results here www.eantc.de/en/showcases/mpls_sdn_2018

6MAN

- Other items being worked
  - ICMPv6 errors for discarding packets due to processing limits
  - IPv6 Router Advertisement IPv4 Unavailable Flag
  - Unified Identifier in IPv6 Segment Routing Networks
  - Privacy Extensions for Stateless Address Autoconfiguration in IPv6
  - Recommendation on Temporary IPv6 Interface Identifiers
  - IPv6 Performance Measurement with Alternate Marking Method
  - IPv6 Node Requirements, draft-ietf-6man-rfc6434-bis
    - going to make it a BCP
  - draft-ietf-opsec-ipv6-eh-filtering

Operations Area – What is it?

- The primary technical areas covered by the Operations & Management (OPS) Area include: Network Management, AAA, and various operational issues facing the Internet such as DNS operations, IPv6 operations, operational security and Routing operations.
- Unlike most IETF areas, the Operations & Management area is logically divided into two separate functions: Network Management and Operations.
- The Network Management function covers Internet management and AAA, and the related protocols, including but not limited to NETCONF, SNMP, RADIUS, Diameter, and CAPWAP, and of data modeling and data modeling languages used in management such as SMI and YANG. Another important role of the Management function is to identify potential or actual management issues regarding IETF protocols and documents in all areas, and to work with the other areas to resolve those issues.
- The Operations function is largely responsible for soliciting operator feedback and input regarding IETF work. Another important role of the Operations function is to identify potential or actual operational issues regarding IETF protocols and documents in all areas, and to work with the other areas to resolve those issues.

Operations Area

- **Effect of Pervasive Monitoring on Operator draft-mm-wg-effect-encrypt**
  - **This is all about TLS and pervasive encryption effects on operations**
  - **Talked about this last report as well. Enterprises need to monitor within their network. They have regulations with respect to banking and they have to figure out how to do the monitoring necessary and prevent attacks.**

Operations Area

- Network slicing is a specific form of virtualization that allows multiple logical networks to run on top of a shared physical network infrastructure. The key benefit of the network slicing concept is that it provides an end-to-end virtual network encompassing not just networking but compute and storage functions too
  - Heterogeneous Network Slicing problem statement
  - Information Model for Network Slicing and NetSlicing work area
  - Network Slicing Use Cases: Network Customization and Differentiated Services
  - Interconnecting (or Stitching) Network Slice Subnetstiated Services

Ops Area WG

- Drafts in this WG
  - YANG Data Model for NAT
  - Manufacturer Usage Description Specification
  - Network Data Use Case for Wavelength Division Service

Routing Area WG

- The Routing Area working group (RTGWG) is chartered to provide a venue to discuss, evaluate, support and develop proposals for new work in the Routing Area and may work on specific small topics that do not fit with an existing working group.

Routing Area WG

- Enterprise Multihoming using Provider-Assigned Addresses
  - This is moving to last call.
  - **Tries to define a complete solution for multihoming with PA address space**
  - In this scenario the site has addressing from each provider and deciding the right source address is an issue. Packets can be dropped for a number of reasons.

Routing Area WG

- draft-dm-net2cloud-problem-statement-01
  - **This is all about data centers and issues with their hybrid networks**

Routing Area WG

- **BGP-based Mobile Routing for the Aeronautical Telecommunications Network**
  - **building a network for worldwide air traffic management**
  - **IPv6 to talk to airplanes**
  - **BGP overlay that's separate but may interconnect with the global BGP**
- Sub-network depends on where the plane is.
- draft-templin-atn-bgp

Routing Area WG

- Ingress Filtering for Asymmetric Routing
  - BCP 38 and BCP 84 both refer to ingress filtering of varying sorts.
  - BCP 38 can cause problems with multihoming
  - This presentation talks about using ingress filtering to assure asymmetric routes. (sort of like policy based paths.. I want X to go via B and not via C.

Routing Area WG

- Toward a Network Telemetry Framework
  - "Network telemetry has emerged as a mainstream technical term to refer to the newer technologies of data collection and consumption in the IDN (Intent-Driven Network) paradigm, distinguishing itself form the convention technologies for network OAM. "
    - So basically looking at what the IETF is doing and can be doing in this space.

Routing Area WG

- draft-ymbk-lsvr-lsoe
  - Link state over Ethernet
  - Just a discovery protocol
  - The question was asked how is this different than neighbor discovery in OSPF and no one was sure.

SIDR Operations – What is it?

- The global deployment of SIDR, consisting of RPKI, Origin Validation of BGP announcements, and BGPSEC, is underway, creating an Internet Routing System consisting of SIDR-aware and non-SIDR-aware networks. This deployment must be properly handled to avoid the division of the Internet into separate networks. Sidrops is responsible for encouraging deployment of the SIDR technologies while ensuring as secure of a global routing system, as possible, during the transition.

The SIDR Operations Working Group (sidrops) develops guidelines for the operation of SIDR-aware networks, and provides operational guidance on how to deploy and operate SIDR technologies in existing and new networks.

SIDR Ops

- Signaling Prefix Origin Validation Results from a Route Server to Peers
  - This is a way to ease clients into using the RPKI
  - Not popular with folks who run networks, long line at microphones
  - "RPKI-based prefix origin validation [RFC6480] can be a significant operational burden for BGP peers to implement and adopt. In order to boost acceptance and usage of prefix origin validation and ultimately increase the security of the Internet routing system, IXPs may provide RPKI-based prefix origin validation at the route server [RFC7947]."

SIDR Ops

- Status of RPKI deployment at IXPs
  - **some ix's are doing filtering of invalids.**
    - AMSIX - opt out filtering, 757 v4 peers, 614 v6 peers. Has one route server doing opt in filtering. 201 v4 peers, 160 v6 peers
    - Lyonix – 111 peers filtering
- ROAs with multiple prefixes RFC6482
  - Really we want one prefix per ROA

SIDR Ops

- Origin Validation Policy Considerations for Dropping Invalid Routes
  - **This is interesting can of worms when a ROA makes a more specific invalid.**
- **So this is a whole thought process on how to pick which routes to use when you have a combo of valid, invalid and not found prefixes that overlap in different ways. interesting thought process.**
- "gradual hardening of the stick"
- This even is compounded by multihoming

SIDR Ops

- **Discussion of RIRs not sharing information that seems to be out of nowhere. Complaining about non-communication of how each RIR has it's own root CA. The RIRs have presented and documented this.**
- **Seemed like group amnesia**

SIDR Ops

- **Status of BGP Origin Validation deployment of NREN in Colombia**
  - national research and education network in Columbia. trained folks, signatures for 1109 resources, 28713 prefixes
- RPKI signed object for TAL (Trust Anchor Locators)
  - Used for planned migration to a new key
  - Used when a TA wants to change locations where it's cert is found.

ILA BoF - ?

- ILA is a protocol to implement transparent network overlays without encapsulation. It addresses the need for network overlays in virtualization and mobility that are efficient, lightweight, performant, scalable, secure, provide seamless mobility, leverage and encourage use of IPv6, provide strong privacy, are interoperable with existing infrastructure, applicable to a variety of use cases, and have simplified control and management. While many solutions have been proposed, none seem to meet all these requirements.
- ILA is a type of identifier/locator split that partitions an IPv6 address into identity and location components. Unlike previously defined identifier-locator protocols (e.g. 8+8, ILNP), ILA is wholly contained within the network layer. It is not required to be used end to end and requires no changes to transport layer protocols or applications. ILA modifies destination addresses in flight, however, unlike in NAT, any modification is reversed before delivery. Since ILA does not use encapsulation, issues with in-network tunneling-- such as MTU and fragmentation, ECN and diffserv propagation, zero UDPv6 checksum handling in UDP encapsulations-- are not relevant.

ILA BoF

- Identifier Locator addressing
  - **This is basically LISP but without encapsulation. It is translation instead.**
  - Has all the same problems as LISP, you need mapping (identifier to locator)
  - IPv6 only
  - I am not sure that this will work.
- Identifier-locator Addressing for IPv6
  - draft-herbert-intarea-ila-00
    - an IPv6 address is split into a locator and an identifier component. The locator indicates the topological location in the network for a node, and the identifier indicates the node's identity which refers to the logical or virtual node in communications

INT Area Wg – What is it?

- The Internet Area Working Group (INTAREA WG) acts primarily as a forum for discussing far-ranging topics that affect the entire area. Such topics include, for instance, address space issues, basic IP layer functionality, and architectural questions. The group also serves as a forum to distribute information about ongoing activities in the area, create a shared understanding of the challenges and goals for the area, and to enable coordination.

  The Internet Area receives occasional proposals for the development and publication of RFCs that are not in scope of an existing working group and do not justify the formation of a new working group. The INTAREA WG has a secondary role to serve as the forum for developing such work items in the IETF. The working group milestones are updated as needed to reflect the current work items and their associated milestones.

INT Area

- **Approaches to Address the Availability of Information in Criminal Investigations Involving Large-Scale IP Address Sharing Technologies**
  - **NAT and law enforcement**
  - **The document considers the reasons why source port information is not routinely logged by Internet-facing servers and proposes some immediate-term actions that can be taken to help improve the situation.**

INT Area

- IP Tunnels in the Internet Architecture
  - This document focuses on tunnels that transit IP packets, i.e., in which an IP packet is the payload of another protocol, other than a typical link layer.
  - **“Tunnel” occurs in 1500 RFCs..**
  - The variety of tunnel mechanisms raises the question of the role of tunnels in the Internet architecture and the potential need for these mechanisms to have similar and predictable behavior. In particular, the ways in which packet size (i.e., Maximum Transmission Unit or MTU) mismatches and error signals (e.g., ICMP) are handled may benefit from a coordinated approach.

INT Area

- Discovering Provisioning Domain Names and Data
  - Hosts can access the network over different interfaces, tunnels, or next hop routers. This talks about provisioning domains and how hosts can figure out about the different domains

Int Area

- Drafts being discussed
  - Discovering Provisioning Domain Names and Data
  - Guidelines for packet timestamps
  - SOCKS v6
  - Architectural Considerations for Latency Critical Communications

OPSEC - ?

- The OPSEC WG will document operational issues and best current practices with regard to network security. In particular, the working group will clarify the rationale of supporting current operational practice, addressing gaps in currently understood best practices and clarifying liabilities inherent in security practices where they exist.

OPSEC

- Operational Security Considerations for IPv6 Networks
  - This document analyzes the operational security issues in several places of a network (enterprises, service providers and residential users) and proposes technical and procedural mitigations techniques.
  - This is a good document that talks about security in IPv6 networks.
  - **Getting ready for WGLC so take a look!**

OPSEC

- **An analysis of the applicability of blockchain to secure IP address allocation, delegation and bindings.**
  - **Looks like this is proposing using blockchain instead of RPKI..**
- Benchmark Methodology for Network Service Device Performance
  - Firewall performance and network security performance..
  - Next-gen firewall benchmarking
  - Very different than vendor claims

OPSEC

- **TLS1.3 Impact on Network-Based Security**
  - **This document talks about the issues with the need to look at traffic vs. the way TLS 1.3 makes it so you can't look at traffic.**
- Enhanced Feasible-Path Unicast Reverse Path Filtering
  - This is a way to help mitigate DDoS attacks when SAV – Source Address Validation ingress filtering is not workable. Multi homed sites, etc.

IRTF

- Vision for a QIRG: Quantum Internet Research Group
  - IRTF is looking at the "quantum Internet"
  - My notes from the meeting say, "not sure I get this at all"
  - Looking online I found, ""'Quantum internet' is a vague term," says physicist Thomas Jennewein of the University of Waterloo. "People, including myself, like to use it. However, there's no real definition of what it means.""
  - I'll keep an eye on this and see what it becomes.

IRTF

- Applied Network Research Prize talks
  - Performance Characterization of a Commercial Streaming Video Service
    - All about performance of video streaming.
    - Throughput is a bigger problem than latency
  - Vroom: Accelerating the Mobile Web with Server-Aided Dependency Resolution
    - So this is a look at load times for browsing on a phone
    - vroom uses http/2 push to push down info when the server replies

Human Rights Considerations

- The Human Rights Protocol Considerations Research Group in the IRTF is chartered to research whether standards and protocols can enable, strengthen or threaten human rights, as defined in the **Universal Declaration of Human Rights (UDHR)** and the **International Covenant on Civil and Political Rights (ICCPR)**, specifically, but not limited to the right to freedom of expression and the right to freedom of assembly.

Human Rights Considerations

- Human Rights and Civil Liberties in the Internet RFCs, 1969-1979 and On right to be forgotten - right not to know
  - Super interesting talk
- she did an analysis of networking from the early days until now
- ** this is a very cool analysis of the RFCs and human rights. It's interesting especially because she is not an IETFer
- http://people.tamu.edu/~braman/html/topicinternetdesign.html

Human Rights Considerations

- Discussion of draft-tenoever-hrpc-anonymity-01
  - “if we do nothing the Internet improves surveillance”
- Discussion of draft-tenoever-hrpc-unrequested-00
- Discussion of draft-tenoever-hrpc-guidelines-00
- Chainiac: end-to-end software supply chain security and transparency

Footwear styles of the IETF

Additional WG's

- 6TiSCH "IPv6 over the TSCH mode of IEEE 802.15.4e"
- SecDispatch – looks at new work in the security area
- Security Area Open Meeting
- Common Operations and Management on network Slices
- Constrained Restful Environments
- PANRG BoF

References

- Cool Feed of new documents and what they are
  - http://tools.ietf.org/group/tools/trac/wiki/AtomFeeds
  - It's pretty cool and has info about all new documents, liaisons etc.
- General WG Info:
  - http://datatracker.ietf.org/wg/ (Easiest to use)
- Internet Drafts:
  - http://tools.ietf.org/html
- IETF Daily Dose (quick tool to get an update):
  - http://tools.ietf.org/dailydose/
- Upcoming meeting agenda:
  - http://tools.ietf.org/agenda
- Upcoming BOFs Wiki:
  - http://tools.ietf.org/bof/trac/wiki
- Also IETF drafts now available as ebooks

Going to your first IETF?

- Watch the video
  - https://www.ietf.org/newcomers.html
- Are you a woman attending first IETF?
  - IETF Systers
  - https://www.ietf.org/mailman/listinfo/systers
- Woman involved in NOGs?
  - Net-grrls
  - https://www.facebook.com/groups/netgrrls/

Questions?

6TiSCH: "IPv6 over the TSCH mode of IEEE 802.15.4e"

- Described as Industrial IoT
- The Timeslotted Channel Hopping (TSCH)
- The Working Group will focus on enabling IPv6 over the TSCH mode of the IEEE802.15.4 standard. The extent of the problem space for the WG is one or more LLNs, possibly federated through a common backbone link
  via one or more LLN Border Routers (LBRs). The WG will rely on, and if necessary extend, existing mechanisms for authenticating LBRs.

6TiSCH

- openwsn.org - 6Tisch implementation
- Drafts being worked in this group
  - draft-ietf-6tisch-6top-protocol-10
  - draft-ietf-6tisch-minimal-security-05
  - draft-ietf-6tisch-terminology-10
  - draft-ietf-6tisch-6top-sfx-01
  - draft-chang-6tisch-msf-01
  - draft-duquennoy-6tisch-asf-01

SecDispatch – What is it?

- The Security Dispatch working group is chartered to consider proposals for new work in the SEC area an if the work is appropriate for the IETF and there is sufficient interest, identify, or help create, an appropriate venue for the work

SecDispatch

- Work being discussed
  - OSCCA Extensions For OpenPGP
    - new encryption algorithm
  - TLS Server Identity Pinning with Tickets
  - Randomness Improvements for Security Protocols
  - OCSP over
    - Online Certificate Status Protocol
    - really getting OCSP from the DNS ? really? yet another weird thing glued added to the DNS.. no.

Security Area Open Meeting

- Inter-domain DDoS mitigations: potentials, challenges, and solutions
  - holy grail is filtering closer to the source
  - no incentive to filter closer to source.
  - basically a middlebox that enforces a policy.
- "I can't see this working ever ever ever"

COMS BoF

- Common Operations and Management on network Slices
  - Not chartered yet
  - Network virtualization.
    - Different “slices” provide different services.

COMS BoF

- draft-arkko-arch-virtualization
  - A look at network virtualization and future IETF work that would support it.
- Other talks about what operators need. Basically end-to-end services with SLAs and predictability.

Constrained RESTful Environs ?

- The CoRE working group will define a framework for a limited class of applications: those that deal with the manipulation of simple resources on constrained networks. This includes applications to monitor simple sensors (e.g. temperature sensors, light switches, and power meters), to control actuators (e.g. light switches, heating controllers, and door locks), and to manage devices.

CORE

- Uniform Resource Names for Device Identifiers draft-ietf-core-dev-urn-01
  - A new namespace for hardware device identifiers.
  - A general representation of device identity can be useful in many applications, such as in sensor data streams and storage, or equipment inventories

CORE

- CoAP Simple Congestion Control/Advanced
  - Constrained Application Protocol needs to work so that it doesn't cause congestion.
  - This draft specifies a congestion mechanism called CoCoA
- Experimental results with 100+ clients and system congested showed that the more buffer the more queuing delay

PANRG BoF

- Path Aware Networking Research Group
- The scope of work within the proposed RG includes, but is not strictly limited to:
  - Communication and discovery of information about the properties of a path on local networks and in internetworks, exploration of trust and risk models associated with this information, and algorithms for path selection at endpoints based on this information.
  - Algorithms for making transport-layer scheduling decisions based on information about path properties.
  - Algorithms for reconciling path selection at endpoints with widely deployed
    routing protocols and network operations best practices

PANRG

- Service Aware Networking using Segment Routing
  - Another way to choose how to get where you're going.
  - Potential solution for Telcos with old equipment
  - How do I know what the client wants ?
  - How do I make the application network aware?
  - "faster swivel chair"

PANRG

- Path Awareness with Socket Intents
  - which path do you pick when there are multiple? We usually pick WIFI by default but is WIFI always better than others? LTE?
- Firewall and Service Tickets
  - Applications to signal the network for services it wants
  - you present a ticket to enter the network

PANRG

- Bad Ideas in Transport Signaling
  - Lots of experience with path awareness over the last decade
  - Very little experience getting path awareness deployed
  - In the process of writing down the lessons learned.
  - “we don’t need to describe every idea but we need to learn every lesson”
  - https://github.com/panrg/draft-dawkins-panrg-what-not-to-do