IETF Tourist
I attend so you don't have to or maybe so you'll want to

CATHY ARONSON
ARIN 37, JAMAICA

About This Presentation

This presentation is not an official IETF report

- There is no official IETF Liaison to ARIN or any RIR
- 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 have an interesting please share it!
- Opinions expressed are solely my own and I include thoughts that I typed while at the meeting.

Highlights

Footware Styles of the IETF

Highlights

- Not sure if it's a highlight but Scott Bradner is soon retiring from his roles at IETF.
- As Jari (IETF Chair) said at the plenary.
- We'll just say what the press says about Scott.

Mother of consensus

Engineering the internet is too big a task for one outfit

Mar 5th 2016 | From the print edition

The wizard of the web

Highlights

- Traveled to Iwate and gave a talk at Iwate Prefectural University
  - Thanks to ARIN for sponsoring me and giving me stickers, etc. to give to the students.
- A new idea.. If there is something you want me to cover or an issue you think IETF should solve please let me know.
  - I will do my best to report on these at the next presentation to the community
- Added some new content – not at IETF but still interesting..

Highlights

- A comment from attendee list, "Internet Engineering Travel Forum"
- Big discussions about IETF meeting venues. IETF 100 is in Singapore and that generated MUCH discussion because of their anti-gay laws.
  - New working group to define what criteria IETF will use (and process) to pick meeting venues
  - Super interesting article about such laws
    - https://76crimes.com/76-countries-where-homosexuality-is-illegal/

Highlights – Yang Models All the Rage

- YANG is a data modeling language used to model configuration and state data manipulated by the Network Configuration Protocol (NETCONF), NETCONF remote procedure calls, and NETCONF notifications.

- Everything these days is a yang model. Fun.

Not at IETF but still interesting

- This explains IANA and the transition that will help us explain all of this to our relatives.
  - http://techcrunch.com/2016/04/07/the-internet-is-made-with-carrots-not-sticks

To Squat or not to Squat

- To Squat or not to Squat? My crash course in ISPs adding to RFC 1918 space with un-routed IPv4 address blocks.
  - Right before Yokohama I was asked the question whether it was better to use 22.0.0.0/8 or 30.0.0.0/8 as additional RFC1918 space
  - I was puzzled. Were folks really doing this?
  - Had the world gone mad?
- Why not to do this?
  - The block doesn't belong to you
  - If block becomes globally routable you have to re-address everything very quickly
  - With IPv4 addresses worth money this is more likely to happen

Not at IETF but maybe soon?

- 2-byte and 4-byte ASNs
- There has been a lot of discussion about them on the PPML of late.
- The same mechanism for communities doesn't exist for both. But there are extended BGP communities
  - https://datatracker.ietf.org/doc/rfc5668/
  - How to configure from cisco
    - http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bgp/configuration/15-1sg/irg-4byte-asn.html
  - Also there are enough 2-byte ASNs at ARIN for 5 years is that long enough?

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

- IPv6 performs better than v4 between the US mobile LTE and Facebook.
- Big Data in .nl. They talked about their infrastructure but the most interesting part is the shoes. Yup shoes!
  - Shoes are the most counterfeit item
  - 40% of all US border seizures
  - Using the DNS legitimately for criminal purposes.

IEPG

- Joao Damas
  - Impact of DNS over TCP from the resolver's point of view.
    - Biggest impact is keeping the state.
    - The benefit is connection reuse
    - Also helps prevent spoofing
- Also a talk about how a router really works. This is work trying to inject real-world info into the IETF

IEPG

- BGP 2015 -http://iepg.org/2016-04-03-ietf95/2016-04-03-routing-2015.pdf
  - Geoff Huston
  - More and more routes even though we're out of addresses
  - Up until 2010 all the addresses showing up in the routing table were assigned in the last 12 months. Now older addresses are showing up.
  - Routes and ASNs are added like clock work at constant rates.
  - 28,000 IPv6 routes, 6000 prefixes added per year

IEPG

- Stuff seen at Ns.ICANN.org http://iepg.org/2016-04-03-ietf95/iepg-buenos-small.pdf
  - Still see traffic to domains long gone..
    - TPC.INT
    - IP6.INT 59% of all queries
  - This one is there but challenged.
    - .UG (Uganda)
      - Fastest moving because it's on the equator
      - Land locked but has it's own navy
      - 34 million people and ¼ Internet on mobile phones
      - 5500 domains
      - 2.0M queries per day
      - 62% generate NXDOMAIN

IEPG

- Legacy transfers and RPKI up/down
  - http://iepg.org/2016-04-03-ietf95/160403.iepg-transfer.pdf
  - Slides have interesting commentary on ARIN policy process
  - Experiences of transferring IP address blocks to RIPE
  - Wanted to transfer ASNs but wasn't able to because no policy for inter-RIR transfers
  - Problems with reverse DNS
  - Description of the RPKI set up and problems.

IEPG – Other talks

- EDNS Compliance A Year On
  - http://iepg.org/2016-04-03-ietf95/marka.pdf
- Quest for missing key tags
  - http://iepg.org/2016-04-03-ietf95/keytags.pdf
- IDN query trends seen at JP and Root
  - http://iepg.org/2016-04-03-ietf95/201604-idn.pdf
- Continuous Data-driven Analysis of Root Stability (CDAR)
  - http://iepg.org/2016-04-03-ietf95/cdar-iepg.pdf

Sunset v4 – What is it?

- In order to fully transition the Internet to IPv6, individual applications, hosts, and networks that have enabled IPv6 must also be able to operate fully in the absence of IPv4. The Working Group will point out specific areas of concern, provide recommendations, and standardize protocols that facilitate the graceful "sunsetting" of the IPv4 Internet in areas where IPv6 has been deployed. This includes the act of shutting down IPv4 itself, as well as the ability of IPv6-only portions of the Internet to continue to connect with portions of the Internet that remain IPv4-only.

- charter-ietf-sunset4-02

Sunset v4

- My all time favorite draft.. IPv4 Declared Historic
  - draft-howard-sunset4-v4historic-00
  - Should the IETF declare IPv4 historic?
  - LOTS of discussion.
  - Geoff pointed out to me that RFC 162 (Netbugger 3) is not historic and neither is Gopher
  - Could send the wrong signal to the world.
    - The IETF is nuts someone needs to take over
- Then how do we decide when to do this?
  - One suggestion was when there was no more IPv4 on the network
  - If you have thoughts on this talk to Lee Howard or me
  - "we should not give folks the perception that the IETF has lost touch with reality"

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 Operations

- Temporal and Spatial Classification of Active IPv6 Addresses, Dave Plonka, IMC October 2015
  - Super interesting paper. He is looking at how you find where the active addresses are in the huge v6 networks.
- IP/ICMP Translation Algorithm (rfc6145bis)
  - This is referenced by a lot of documents but needs a clean up of NAT for v4 and v6

V6 Operations

- Unique IPv6 Prefix Per Host
  - v6 support for community wifi
  - draft-jjmb-v6ops-unique-ipv6-prefix-per-host
  - This is versus a unique address within a shared prefix
  - Comcast is rolling this out.
  - A model for how to do IPv6 on wifi
  - Unique prefix per user equipment address additional protection and efficiency to IPv6 ND and RD processing.
  - Must also provide an IPv6 only experience
- Host Address Availability Recommendations
  - Vint's draft
  - WGLC has expired and there is broad support
  - Discussion of subdividing a /64

V6 Operations

- Update on v6 Deployment at Facebook
  - Migration for internal traffic 95% complete
  - Issues
    - Java still has issues
    - Performance, routing code in Linux stack
    - Old rack switches had problems with ND
    - Performance and functional issues with NIC offloads
- Identifier Locator Addressing with IPv6
  - draft-herbert-nvo3-ila
  - Let's you address more than physical hosts
  - Perhaps use an address per task

V6 Operations

- Design Choices for IPv6 Networks
  - Routing focused design choices
  - Enterprises in scope
  - What's important to this group?
    - It recommends getting PI space
    - PA space is hard when changing providers
    - Also talks about ULA and Link-Local as well as whether to put v4 and v6 on the same interface
    - I am not sure if it's a good idea for an RFC to recommend PI space.

V6 Operations

- IPv6 deployment in LAC: successful and not so successful stories
  - Study with LACNIC and Banco CAF
  - Why is v6 adoption not happening
  - Survey and face to face interviews
  - The have a formula ICAv6
  - Only countries with IPv6 are
    - Bolivia, Ecuador, Peru, and Brazil
    - Some others have plans but no deployments
    - Even these countries have little or no v6 to end users

V6 Operations

- IPv6 Extension Headers in the Real World
    - Continuing work
    - Perhaps ready for WGLC
- Operational Impacts of IPv6 Packets with Extension Headers
    - It was suggested to document they are dropped and then move on

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.

6 Man

- IPv6 Segment Routing Header (SRH) draft-previdi-6man-segment-routing-header
  - Segment Routing (SR) allows a node to steer a packet through a controlled set of instructions, called segments, by prepending a SR header to the packet. Could be topological or service based
- Recommendation on Stable IPv6 Interface Identifiers draft-ietf-6man-default-iids
  - This is continuing work on addressing interfaces, security addresses, local addresses, etc.
- Spoken at the microphone, "I realized I need to check something before I opened my mouth so I don't say something wrong"

6 Man

- IPv6 Specifications to Internet Standard, draft-ietf-6man-rfc2460bis , draft-ietf-6man-rfc4291bis , draft-ietf-6man-rfc1981bis
  - Trying to take what we know now and update the IPv6 specification

- Hop by hop header handling, draft-ietf-6man-hbh-header-handling

6 Man

- Extensions for Multi-MTU Subnets, draft-van-beijnum-multi-mtu
  - The age old problem of packet size and MTU. This specifies a per-neighbor maximum packet sizes so that nodes on a multipoint subnet may use the maximum mutually supported packet size without being limited by the smaller maximum sizes on the same subnet.
- Communicating Prefix Cost to Mobile Nodes, draft-mccann-dmm-prefixcost
  - Interesting draft about the "cost" of maintaining IP prefixes for distances on the mobile network. This is about initial access not jitter or latency. As you connect then move farther away the more network resources you use and performance goes down.

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

- They chose Babel as the routing protocol. It's "Mandatory to implement as experimental"
- "The Internet is moving towards the compuserv of things"

HOMENET

- Host Route based Wifi roaming
  - "I wrote this draft but I am not the biggest proponent of it"
  - multiple APs have the same SSID and PW and one of them goes out of range and they both have a different /64 and you get a new address. It breaks TCP and UDP.
- "It looks like a flying pig solution… you can't make pigs fly but sometimes you have to. "

HOMENET

- Babel profile for Homenet
  - draft-chroboczek-homenet-babel-profile
  - This is a hodge podge of configuration stuff for Homenet
  - Since Babel can be implement with almost any parameter and metric choice this tries to specify things that Homenet is going to need.
  - I really feel that this protocol isn't ready
- Architecture draft draft-lemon-homenet-naming-architecture-00
  - Re: management The keys that your devices have in the home are important and need to find a way to keep them when the equipment is swapped.
- "if my host is named banana.homenet on my homenet and yours is banana.homenet on your homenet and I take my host to your homenet how do I secure it? "

HOMENET

- Drafts on Naming Architecture and Service Discovery
  - draft-ietf-homenet-hybrid-proxy-zeroconf-02
  - draft-ietf-homenet-front-end-naming-delegation-04
    - Outsourcing Home network authoritative DNS putting DNS on CPE that connects to ISP?
  - draft-ietf-homenet-naming-architecture-dhc-options-02

Babel BoF

- "It may take a day to write a routing protocol but a lifetime to debug it. "
- Pronounced sometimes babble but mostly bay-bel. Not sure why.
- The Babel [routing protocol](#) is a [distance-vector routing protocol](#) for [Internet Protocol](#) [packet-switched networks](#) that is designed to be robust and efficient on both wireless mesh networks and wired networks.
- It is the protocol chosen for homenet

Babel BoF

- There are multiple implementations of Babel and some developers talked about how easy it is to code

- Since there aren't standard metrics you could get implementations with widely varying ideas about metrics

- I personally find it hard to believe that this is a very robust protocol and we're going to start putting it in peoples' homes.

- Definitely something to follow.

Human Rights on the Internet RG

- The Human Rights Protocol Considerations Research Group 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.

Net of Rights

- It is too-often assumed that there is no link between protocols (the standards which underpin the way the internet functions) and human rights, but this is simply not the case, as the film argues.
- To protect human rights online, it will be necessary to explore and map the link between rights and protocol, ensuring the survival of a decentralized and collaborative internet, in which freedom of expression through unimpeded connectivity remains a central principle, and a guiding force.

Net of Rights

- 'Net of Rights', a short film which explores the link between internet protocols and human rights online.

- Please find the film Net of Rights here: https://hrpc.io/wp-content/uploads/videos/netofrights.io.mp4

- and the teaser here: https://hrpc.io/wp-content/uploads/videos/netofrights.io_teaser.mp4

- get involved in the work at hrpc at: https://www.irtf.org/mailman/listinfo/hrpc

Human Rights

- Really good presentation (remote presenter) by Ramsey Nasser, http://nas.sr
- He feels that because everything to do with computers is in ASCII or American English that really doesn't facilitate human rights. It disenfranchises a lot of the world. He feels it's a constant reminder to non-English speakers that the Internet is "not made for you"
- He tried to write a programming language in Arabic. Some things just don't work because it's a non-ASCII language.
- Human readable = American English
- "we make our tools and our tools make us"

Human Rights

- INTERNET MULTISTAKEHOLDER PROCESSES AND TECHNO-POLICY STANDARDS
  - http://www.jthtl.org/content/articles/V11I1/JTHTLv11i1_MulliganDoty.PDF
  - I haven't finished reading it but so far it's interesting.

IANAplan

- IANA transition working group
- Most of the work for the IETF has been done.
- The group just talked about IPR
  - Protocol parameter registries are in the public domain
  - IETF trust owns trade marks
  - Licenses them back to IANA

Intelligent Transportation Systems

- There is not yet a charter for this group as it was a BoF.
- The group is looking at future smart transportation where cars are networked together and "talk" to each other.
  - Folks within the car could be networked
  - Cars can negotiate with each other
    - Can I follow you? Yes but I speed so you may not want to

Intelligent Transportation Systems

- Some drafts
  - ITS use-cases C-ACC and Platooning
    - draft-petrescu-its-cacc-sdo-04
    - Cooperative Adaptive Cruise Control
- ITS V2V problem statement
  - draft-petrescu-its-problem-00
- My thought at the time, "I don't think I want this stuff in my car"

IETF Trends and Observations

- draft-arkko-ietf-trends-and-observations-00
  - Some thoughts about the non-technical aspects of IETF.
  - Talks about meeting locations, remote participation, the old guard, etc.
  - I think it needs participation from a wider group than those who wrote it.

ARCing BoF

- Alternative Resolution Contexts for Internet Naming
  - There is now an active discussion of the namespace associated with the DNS relates to other namespaces used on the Internet.
  - Others.. Multicast DNS, TOR (.ONION)
  - Drafts about this
    - https://tools.ietf.org/html/draft-hardie-resolution-contexts-00
    - draft-trammell-inip-pins
    - draft-lewis-domain-names

SUPA - Overview

- Simplified Use of Policy Abstractions (SUPA)
- SUPA: High Level Goal
- "thus, a common way for expressing and describing policies that is uniform and consistent regardless of the nature of the networking environment is likely to facilitate the overall service delivery procedure and operation."
- "The SUPA (Simplified Use of Policy Abstractions) working group defines a data model, to be used to represent high-level, possibly network-wide policies, which can be input to a network management function (within a controller, an orchestrator, or a network element)"

- SUPA: "consuming large amount of distilled beverages" In Swedish

SUPA - Highlights

- Not going to talk too much about SUPA but some topics talked about were
  - An explanation of the scope of the policy-based management framework and how it relates to existing work of the IETF.
  - If the working group considers it necessary, a generic information model composed of policy concepts and vocabulary.
  - A set of YANG data models consisting of a base policy model for representing policy management

SUPA

- Purpose and Focus of SUPA
  - https://www.ietf.org/proceedings/94/slides/slides-94-supa-6.pdf
- SUPA Value Proposition
- https://datatracker.ietf.org/doc/draft-klyus-supa-proposition/
- https://www.ietf.org/proceedings/94/slides/slides-94-supa-1.pdf

Traffic Engineering Architecture and Signaling (teas) – What is it?

- The Traffic Engineering Architecture and Signaling (TEAS) Working Group is responsible for defining MPLS and GMPLS traffic engineering architecture, standardizing the RSVP-TE signaling protocol, and identifying required related control-protocol functions, i.e., routing and path computation element functions.

- Traffic Engineering (TE) is the term used to refer to techniques that enable operators to control how specific traffic flows are treated within their networks. TE is applied to packet networks via MPLS TE tunnels and LSPs. The MPLS-TE control plane was generalized to additionally support non-packet technologies via GMPLS. RSVP-TE is the signaling protocol used for both MPLS-TE and GMPLS.

Teas Topics

- YANG Data Model for TE Topologies
- RSVP Extensions For Re-optimization of Loosely Routed Point-to-Multipoint Traffic Engineering Label Switched Paths (LSPs)
- RSVP-TE Extensions for Collecting SRLG Information
- Information Model for Abstraction and Control of TE Networks (ACTN)
- RSVP-TE Extensions For Associated Co-routed Bidirectional Label Switched Paths (LSPs)
- The Use Cases for Using PCE as the Central Controller(PCECC) of LSPs

STIR – Secure Telephony Identity

- The STIR working group will specify Internet-based mechanisms that allow verification of the calling party's authorization to use a particular telephone number for an incoming call. Since it has become fairly easy to present an incorrect source telephone number, a growing set of problems have emerged over the last decade.

STIR – Secure Telephony Identity

- Stopped into this one then went to GROW.
- A couple of drafts to look at if you're interested
- draft-ietf-stir-rfc4474bis
- draft-ietf-stir-certificates

GROW – What is it?

- The purpose of the GROW is to consider the operational problems associated with the IPv4 and IPv6 global routing systems, including but not limited to routing table growth, the effects of the interactions between interior and exterior routing protocols, and the effect of address allocation policies and practices on the global routing system. Finally, where appropriate, the GROW documents the operational aspects of measurement, policy, security, and VPN infrastructures.

- charter-ietf-grow-03

GROW

- draft-mauch-bgp-reject
  - This is a draft to clean up a bad default behavior
  - Basically it specifies that BGP should not come up and advertise or accept anything without specific policy to let it advertise. This prevents route leaks when bringing up a box.
- draft-ymbk-grow-blackholing
  - Black hole BGP community

Diversity

- I am becoming increasingly interested in diversity ..
- Went to a meeting about getting more Africans involved in the IETF.
- Already do this some
  - Fellowships
  - Remote hubs
  - Seminars in remote locations (what is IETF)
- Most participants from Africa are operators not a lot of hardware/software vendors in Africa

SIDR – What is it?

- The purpose of the SIDR working group is to reduce vulnerabilities in the inter-domain routing system. The two vulnerabilities that will be addressed are:
  - Is an Autonomous System (AS) authorized to originate an IP prefix
  - Is the AS-Path represented in the route the same as the path through which the NLRI traveled
  - The SIDR working group will take practical deployability into consideration.
- charter-ietf-sidr-04

SIDR

- Adverse Actions by a CA
  - draft-kent-sidr-adverse-actions-01
  - "we're looking for feedback from more than just Andre"
- Mis-operation or malicious operation of CA
  - draft-fu-sidr-unexpected-scenarios-00
- Router Keying
  - Router Keying for BGPsec
  - draft-ietf-sidr-rtr-keying-10
  - How to get router keys into the RPKI to sign BGPsec
  - Generate external an upload to router or generate key internally and it never leaves the router. keeps private key localized. makes it hard to switch routers/cards

SIDR

- Presented by Andy Newton on behalf of all 5 RIRs
  - TA Applicability Statement 1510-1530 RPKI Multiple "All Resources" Trust Anchors Applicability Statement draft-rir-rpki-allres-ta-app-statement-00 https://tools.ietf.org/html/draft-rir-rpki-allres-ta-app-statement-00

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/
- Men there are lists for you too.. All the meeting lists are mostly men. Have at it ☺

Questions?

©Daydream Imagery LLC