IETF Activities Update

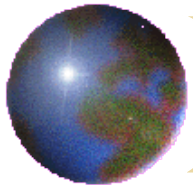
Cathy Aronson
cja@daydream.com

ARIN 34
San Francisco

Note

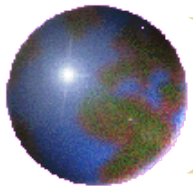
This presentation is not an official IETF report

- 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 item I missed please speak up



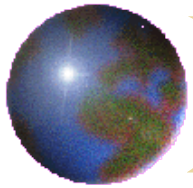
Highlights

- Watching Paint Dry?
  - Man gets paid to watch paint dry
  - http://www.dailymail.co.uk/news/article-408848/The-man-gets-paid-watch-paint-dry.html
  - For more than 30 years, assessing the drying time of industrial paint has been part of Mr Jackson's working life.
  - The highlight of his day is simply touching the paint to assess it's tackiness.



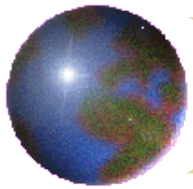
Highlights

- No good deed…
  - Nerds in Paradise T-shirts
  - IETF 15 was in Hawaii October 1989
  - IETF 91 was in Hawaii November 2014
  - Ole and Bob made Nerds in Paradise T-shirts like the ones in 1989
  - "Can I get the artwork so I can get one in a real color?"
  - "I want to return this (men's small and it was a guy) because it's too big"
  - No the distribution desk is not going to be open 24x7



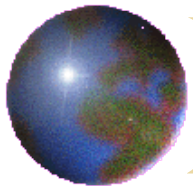
Highlights

- Internet addiction recognized in China
  - I mentioned in a previous IETF update
  - No single behavior pattern defines Internet addiction. These behaviors, when they have taken control of addicts' lives and become unmanageable, include: compulsive use of the Internet, a preoccupation with being online, lying or hiding the extent or nature of your online behavior, and an inability to control or curb your online behavior. If your Internet use pattern interferes with your life in any way shape or form, (e.g. does it impact your work, family life, relationships, school, etc.) you may have a problem.
  - Now there is Internet Addiction bootcamp



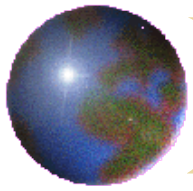
IEPG – What is it?

- 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.



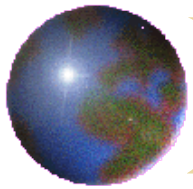
IEPG

- Preventing route hijacks. Presentation is here
  - http://www.iepg.org/2014-11-09-ietf91/bgp_hijack_golden_prefixes.pptx.pdf
- Geoff Huston on 512k route thing
  - AS 701 Route leak, Then issues continued for quite some time after
  - "In routing there is no God" But "it's miraculous"
  - "carefully crafted to make your router work like shit"
  - "obsessing about the size of the routing table is fun but not relevant"
  - http://www.potaroo.net/presentations/2014-11-08-routers-routing.pdf



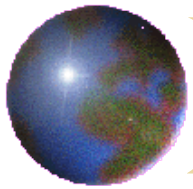
IEPG

- BGPDump2 a tool for full bgp route comparision
  - Public domain
  - Good for route comparison
  - Stats per peer
  - Longest match lookup
  - IPv5 and IPv6
- IETF Helpdesk
  - Lots of good input from NOG folks.
  - Getting the word out about IETF and how to participate
  - Maybe have a helpdesk at ARIN meetings?



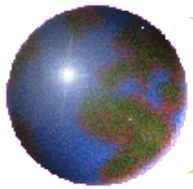
IEPG

- BGP scenario
  - Drop fragements but process ICMPv6 PTBs
- Fire an ICMPv6 PTB < 1280 provably one in each direction
  - Outcome
    - Packets get dropped despite TCP MD5 IPsec etc
    - Denial of service
  - Drafts with info to mitigate these attacks:
    - draft-gont-deprecate-atomfrag-gen
    - draft-gont-opsec-ipv6-eh-filtering



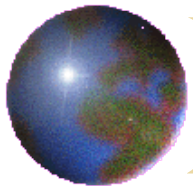
IEPG

- Extension Headers in the Real World v3
  - RIPE Atlas slides
    - More detailed graphs of drops
    - The longer the header size the more they are dropped
    - Half are dropped at the destination (shorter ones)
    - Longer ones are dropped in transit
  - Attacks using IPv6 EH's
    - Can an attacker trigger the use of EH's to get packets dropped?
      - Yes. If you send an ICMPv6 PTB packet with an MTU < 1280 then each packet has a fragment header (atomic fragments)
      - Very cool attack. So you send the one packet and then the server sends all packets with an EH and this causes a 10 minute DOS



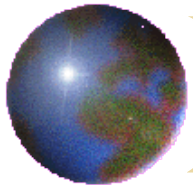
IEPG

- Use of ECDSA P-256 in DNSSEC
  - ECDNSA using 256 byte gives you the same as 3000 byte RSA encryption
  - One in five don't like ECDSA. The bad part is that if a resolver doesn't like the encryption it just ignores the fact that it's signed and returns an answer without saying a word.
  - The reality is that the 1500 byte packet size isn't going to change so maybe folks should support this encryption.



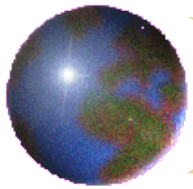
IEPG

- Experience with IPv6 Path Probing
  - looked at overhead of probing
  - SHIM6 was used for these tests.
  - Why use a protocol that no one is going to use to test?
- Operators and the IETF
  - https://tools.ietf.org/html/draft-opsawg-operators-ietf-00
  - Working to get more operators at the IETF and to ensure operational realities inform development of internet standards.



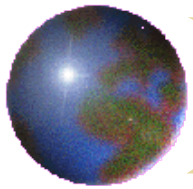
Human Rights Considerations

- Sometimes at IETF I go to a session just out of curiosity .. This is one of those sessions. Human Rights Considerations on the Internet? Really? I thought as I went to this room
- Group focuses on freedom of expression and freedom of association on the Internet
- https://tools.ietf.org/html/draft-doria-hrpc-proposal-01



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.

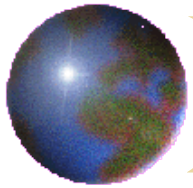


IPv6 Maintenance (6MAN)

- Efficient design team status report
  - measurements of impact of ND traffic.
  - problems with different ND functionality
  - operational techniques to reduce problems
  - consider hosts that sleep and wake up based on packets
  - sleep based on schedule
  - there is a list of issues.. RA are unreliable on wifi. Need to be send every 1800 seconds
  - inefficiencies of DAD

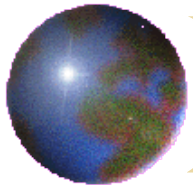
IPv6 Maintenance (6MAN)

- A survey of issues related to IPv6 Duplicate Address Detection
  - https://tools.ietf.org/html/draft-yourtchenko-6man-dad-issues-00
  - https://tools.ietf.org/html/draft-nordmark-6man-dad-approaches-00
  - "you can do DAD when you wake up"
  - "IETF asking how before should since 1984"
- Other drafts being worked on
  - IPv6 Segment Routing Header (SRH)
  - IPv6 Segment Routing Security Considerations
  - Source Address Dependent Route Information Option for Router Advertisements



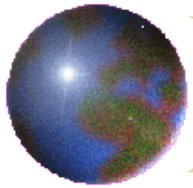
IPv6 Maintenance (6MAN)

- IPv6 Neighbor Discovery Optional Unicast RS/ RA Refresh
  - Periodic RAs are inefficient
  - Problems when phone goes to sleep. Every one has to know?
- Source Address Dependent Routing and Source Address Selection for IPv6 Hosts
  - Picking source address based on destination address
  - Not popular but there are implementations
  - Comcast has use cases.



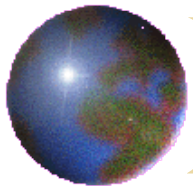
IPv6 Maintenance (6MAN)

- Some other drafts
  - Current issues with DNS Configuration Options for SLAAC
  - Transmission and Processing of IPv6 Options
    - RFC7045 for v6 options
    - clarifies default processing for IPv6 options
  - Improving Scalability of Switching Systems in Large Data Centers
  - Pv6 Flow Label Reflection



SUPA BoF - Overview

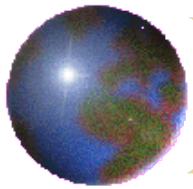
- Simplified Use of Policy Abstractions (SUPA)
- The purpose of the SUPA (Simplified Use of Policy Abstractions) working group is to develop a methodology by which management of network services can be done using standardized policy rules. The working group will focus in the first phase on inter-datacenter traffic management in the use case of a distributed data center, including the automated provisioning of site-to-site virtual private networks of various types.



SUPA BoF

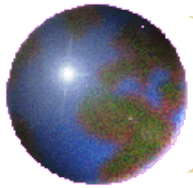
- Policy driven service management
  - policy data models run at the service level? service management but policy driven.
  - policy rule has meta data/logic for policy rule. Separates content of the rule from it's representation
  - So a rule may require a lot of CLI commands but it is more clear perhaps
- Distributed Data Center Use Case
  - inter data center connectivity and virtual Data center connectivity
  - Link based traffic optimization

- Architectural Considerations in smart object networking
  - A couple years ago, the IAB observed that:
    - Many non-IP-based smart object devices are being made and used
    - Various forums exist that defined profiles for non-IP-based devices
    - Belief among some of them that IP is too heavy weight
  - RFC 6574 (Smart Object Workshop Report)
  - This RFC 7452 is the result



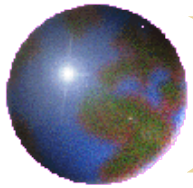
Technical Plenary

- There are many types of smart objects, so various answers might include:
  - It's very constrained in some way (cost, power, memory, bandwidth, etc.)
  - It interacts directly with physical world even when no user is around, and so potentially more dangerous
  - It's physically accessible by untrusted people and so may be more vulnerable
  - It's physically inaccessible by trusted people and has a long (5-40yr) life



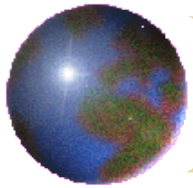
ISOC Briefing Panel

- How do we (humans) interact with other entities throughout the Internet and be known as us (ourselves)? and/or have some control and assert ourselves as us.
  - Need an Internet-wide identity
  - Maybe some are slow and secure (thinks that matter) and some faster and less secure.



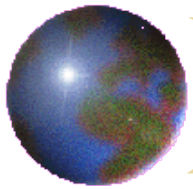
V6 Operations – What is it?

- 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/



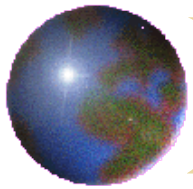
V6 Operations

- Deprecating 6to4 draft-ietf-v6ops-6to4-to-historic "no I won't give it to my mom, but I did turn it on once on my computer"
- SIIT-DC: Stateless IP/ICMP Translation for IPv6 Data Centre Environments
  - IPv6 only data center add an IPv4 clue on the edge.
- Considerations For Using Unique Local Addresses



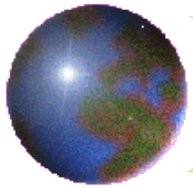
V6 Operations

- Considerations for Running Multiple IPv6 Prefixes
  - Lorenzo "do I have the wrong copy of the draft? Mine has no security considerations?" guy in room "version 2 has security considerations" Lorenzo "how did you find it?" guy in room "I googled it"
- Introducing IPv6 vulnerability test program in Japan draft-jpcert-ipv6vullnerability-check
  - coordination center that provides support for computer security centers. They want participation



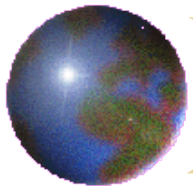
V6 Operations

- Other drafts
  - A Special Purpose TLD to resolve IPv4 Address Literal on DNS64/NAT64 environments draft-osamu-v6ops-ipv4-literal-in-url
  - Discovery of the IPv6 Prefix in 464XLAT draft-wang-v6ops-xlat-prefix-discovery
  - IPv6 Extension Headers in the Real World draft-gont-v6ops-ipv6-ehs-in-real-world
    - This was presented in IEPG
  - Design Choices for IPv6 Networks draft-ietf-v6ops-design-choices
    - design choices.. routing protocols, etc



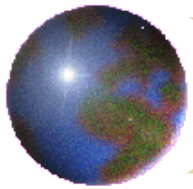
V6 Operations

- There are still problems with IPv6 only deployments. Some still need IPv4 to get going.
- Dallas - Talking about IPv4 as a service..
  - new project does the working group write experience documents for these transition technologies? It was suggested that the folks who write them should actually have experience.



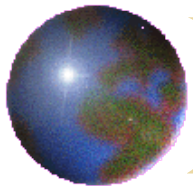
V6 Operations

- draft-ietf-v6ops-design-choices
  - an outline of design choices. Pros and cons of each.
  - arguments about what is an unnumbered interface.. does an unnumbered interface have a link local address? “administratively unnumbered interface” ”link local only” interface
  - what do we call an interface that is not link local only?
  - “I propose the term sheepskin”



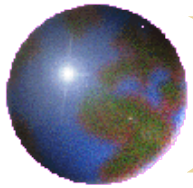
V6 Operations – Real Ops!!

- IPv6 deployment in a developing country, with MAP-T Trials
  - Super fun actually real world experience
  - Suprita LNU of Reliance JIO Infocomm Ltd
    - ISOC fellow and does a deployment across India.
  - 1024 addresses and India deployment.
  - 1.1% IPv6 connectivity
  - Enterprises are IPv6 ready
  - even if transport supports v6 there is a long way to go.
  - Looking at CG NAT. looking at MAP-T
  - lots of content is still v4 only



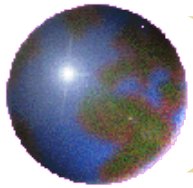
V6 Operations – Real Ops!!

- JPNE MAP-E deployment
  - Akira Nakagawa, JPNE
  - Japan Network Enabler - ISP
  - status of v6 in Japan
  - 5.5% deployment
  - Lots of fiber to the home.
  - several transition techs being used, MAP-E, DS-Lite, v6 + v4 tunnels
  - v4 over v6 home gateways available in Japan
  - users don’t care MAP-E, etc.. like air
  - now sunsetting v4



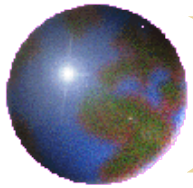
V6 Operations – Real Ops !!

- MAP-T and MAP-E deployment in CERNET and China Telecom
  - Xing Li, CERNET
  - MAP helps solve the IPv4 depletion problem.
  - Translation if you can, encapsulation you should
- draft-ipversion6-loopback-prefix
  - loopback prefix. can we have more loopback addresses in IPv6?
  - multiple servers on same host



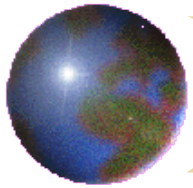
DNSPrivate exchange WG - ?

- The primary focus of this Working Group is to develop mechanisms that provide confidentiality between DNS Clients and Iterative Resolvers, but it may also later consider mechanisms that provide confidentiality between Iterative Resolvers and Authoritative Servers, or provide end-to-end confidentiality of DNS transactions. Some of the results of this working group may be experimental. The Working Group will also develop an evaluation document to provide methods for measuring the performance against pervasive monitoring; and how well the goal is met. The Working Group will also develop a document providing example assessments for common use cases.
- charter-ietf-dprive-01



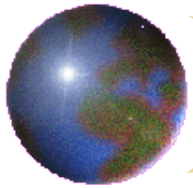
DNSPrivate exchange WG

- assumptions
  - recursive resolver is trusted
  - we don’t need it to be perfect
  - “perfect is the enemy of the good”
- draft-ietf-dprive-problem-statement
- AFNIC? registry for internet names in France
  - broad draft of dprive problem statement
- A draft on methods of evaluating DNS privacy
- list of terms that relate. Privacy terms.. system set up terms - different kinds of resolvers, RFC 7258



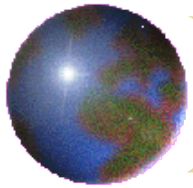
DNSPrivate exchange WG

- PRIVATE-DNS Phillip Hallam-Baker
  - rules for private DNS. 100% connectivity required.
- TLS for DNS: Initiation and Performance Considerations
  - minimize changes
  - reuse existing approaches
  - Running code. T-DNS (using TLS)
- draft-hoffman-dprive-dns-tls-{alpn,https,newport}



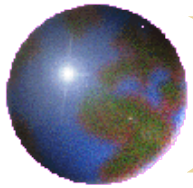
DNSPrivate exchange WG

- Evaluation of Privacy for DNS Private Exchange
  - Approach for doing evaluation of privacy mechanisms
  - Broke out attackers and look at pervasive attacker gathers and correlates all your data
- Private-DNS
  - Looks like he's doing DNS over again
  - Numerous consumers of DNS who could choose a resolver that offers this service and would have a better chance of someone not owning their traffic
  - Privacy for everybody



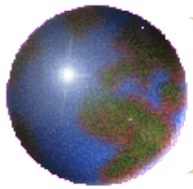
DNSPrivate exchange WG

- Other drafts and presentations
  - Why not progressing my stand-alone proposals
  - draft-hzhwm-dprive-start-tls-for-dns
  - draft-wijngaards-dnsop-confidentialdns
  - The way forward



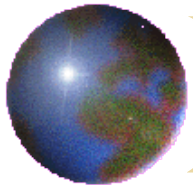
DNS Operations – What is it?

- 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



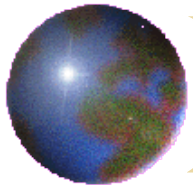
DNS Operations

- The .onion Special Use Domain
  - .onion – RFC 6761 special use domains
  - onion names label tor hidden services.
  - you resolve using a Tor protocol and connect to a Tor connection..
  - special is looks like DNS name but not used by the DNS.
  - so for .onion things should fail quickly. There is a hybrid state where .onion names have https certs.. This says it either has to be fully dns resolved or not. Needs to be registered in root or registered as special us by October 1



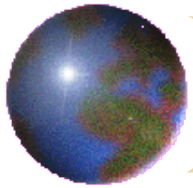
DNS Operations

- Reverse DNS in IPv6 for Internet Service Providers, Howard draft-howard-dnsop-ip6rdns
  - What's PTR for?
    - deploying IPv6 now cant populate PTRs
    - guidance for residential ISPs
    - what are we using residential user's PTRs for
      - Geolocation
      - ssh breaks if no PTR? - bad idea.
  - As I said in past presentation. Populating reverse DNS is very time consuming to say the least
  - The question is what breaks if we don't do PTR records for home users?



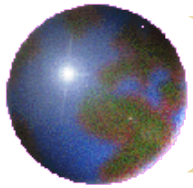
DNS Operations

- DNS Terminology
  - Still individual doc. New terms being suggested. Definitions are getting better. This might be a good doc for our community.
  - "I can still use belt and suspenders right?
  - "I am not sure I want to get in the way of you using a belt and suspenders"
- DNS Meta-Queries restricted
  - If someone asks you the time you're likely to tell them but if they ask you what's in your wallet you may not answer. So what if you get a query that you don't want to answer. This has options for what resolvers should do in this case. It lists what is currently done by some folks.



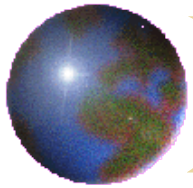
DNS Operations

- Sometimes I wonder about these people.. Quotes from DNS Operations
  - "some people beat their children" "you want children to know they're being beaten by protocol"
  - "We want people to operate brokenness to particular rules.. "
  - "one of the things that doesn't work in theory but does work in practice"
- Minimal Incremental Zone Transfer in DNS
  - ways to do more efficient zone transfers. Long lived TCP connections/compression/etc. Long lived could allow use of different ports.



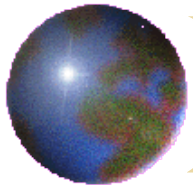
DNS Operations

- Additional Reserved TLDs
  - mail home and corp
  - operational issues with these. Well documented in several research papers.
- ALT Special Use Top Level Domain
  - Right now 40 or so requests for special use names in the pipeline. Put them under .alt?
  - .alt is a new special use domain. It should get you NXDOMAIN and so you can put your domain under .alt. and all of those are special use. a place to experiment.



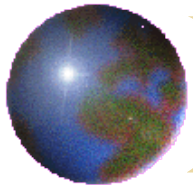
DNS Operations

- A Survey of the DNS cache service in China
  - Traffic analysis in China. Data about how things are working in the real world.



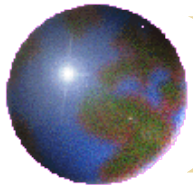
DNS Operations

- Other drafts.
  - DNS Cookies, with Data, Eastlake/Andrews
    - draft-eastlake-dnsext-cookies
    - Lightweight security using cookies.
  - QNAME minimization, next steps Bortzmeyer
    - Informational moving to experimental (maybe)
  - TCP Connection Close
    - draft-bellis-dnsop-connection-close (alternative to draft-ietf-dnsop-edns-tcp-keepalive)
  - DNS Transport over TCP, Dickinson
    - draft-dickinson-dnsop-5966-bis
    - TCP on same footing as UDP
    - want TCP to support privacy etc.



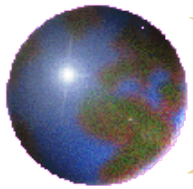
DNS Service Discovery - ?

- The focus of the WG is to develop a solution for extended, scalable DNS-SD. This work is likely to highlight problems and challenges with naming protocols, as some level of coexistence will be required between local zero configuration name services and those forming part of the global DNS. It is important that these issues are captured and documented for further analysis; solving those problems is however not within the scope of this WG.
- charter-ietf-dnssd-01



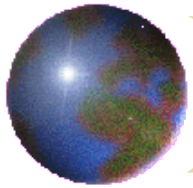
DNS Service Discovery

- DNS Long-Lived Queries
  - Using TCP to set up long lived queries
- Multicast DNS (mDNS) Threat Model and Security Consideration
  - lots of ways to attack the DNS with DNS-SD
- DNS name auto conf for homenet devices
  - name has device kind, vendor, etc
  - MD5 has to see it's unique
  - category names administered by IANA? Really?
  - why not bonjour?



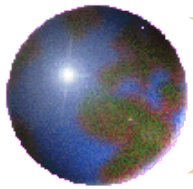
IRTF

- Applied networking prize winner
  - *** Sharon Goldberg *** for discussing threats when BGP RPKI authorities are faulty, misconfigured, compromised, or compelled to misbehave:
    - RPKI issues like bitcoin stealing ISP announced a /24 longer prefix in Canada "longest prefix hijack"
      - whitebox - does hijacks for you
      - no authentication for route origin announcements in BGP ***
      - RPKI should fix this by authenticating this
      - ROA - prefix/ASN valid
        - what happens if there are issues with the RPKI
        - RPKI authorities can delete ROAs and cause routes to become invalid



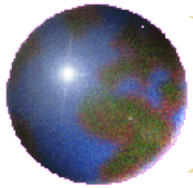
IRTF

- Applied networking prize winner
- Sharon's info would be interesting at an ARIN meeting. My thoughts, "Will this authority be allowed to take down routes? Law Enforcement? etc? Proposal includes new object ".dead" that shows permission"
- *** Misbah Uddin *** for developing matching and ranking for network search queries to make operational data available in real-time to management applications:
- *** Tobias Flach *** for the design of novel loss recovery mechanisms for TCP that minimize timeout-driven recovery: optimize ways to communicate and improve performance
  - how does TCP limit web access performance?
  - how do we fix it?



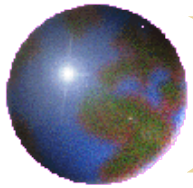
IRTF

- *** Aaron Gember-Jacobson *** for designing and evaluating an NFV control plane:
  - SDN functions to network functions or middle boxes. Stateful actions on the traffic. replace middle boxes with VMs that do the same functions without special boxes. Flexibly reroute traffic with SDN.



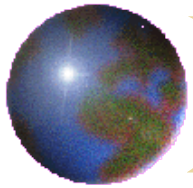
Dynamic Host Configuration - ?

- The DHC WG is responsible for defining DHCP protocol extensions. Definitions of new DHCP options that are delivered using standard mechanisms with documented semantics are not considered a protocol extension and thus are outside of scope for the DHC WG. Such options should be defined within their respective WGs and reviewed by DHCP experts in the Internet Area Directorate. However, if such options require protocol extensions or new semantics, the protocol extension work must be done in the DHC WG.
- charter-ietf-dhc-08



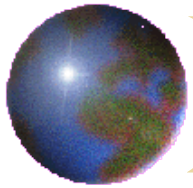
Dynamic Host Configuration

- aero - new routing and addressing system for IP internetworks. Tunnel virtual overlay over existing internetworks
  - End user devices as mobile
  - Aero servers are DHCPv6 servers
- DHCP Anonymity Profiles
  - An example is trash cans equipped with scanners that scan your wifi searches and use the info to track you. mac address with identity you can track folks. Either we fix it or we build database and include everyone. mac address randomization may be a solution



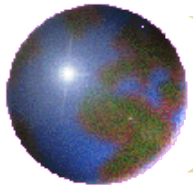
Dynamic Host Configuration

- Other drafts
  - DHCPv6 YANG Model
    - unified method to configure DHCPv6
  - DHCP YANG Model
    - yang model for v4
  - Secure DHCPv4
  - DHCPv6bis Discussion



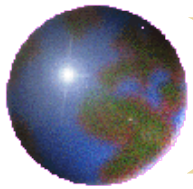
GROW – What is it?

- 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



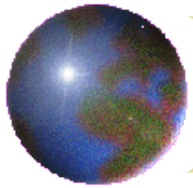
GROW

- IPv6 routing table is around 19,000 entries
- About 4000 new entries added per year
- De-aggregation growing at around 57% per year
- countries and large multinationals are de aggregating
- yikes new extended communities to make geographic routing
  - oy vey
- classification of route leaks
  - draft-sriram-route-leak-protection



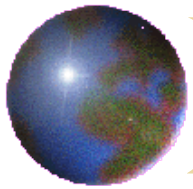
IANA Plan

- Elliot Lear presented
  - statement on how IETF uses IANA.ORG
  - proposed changes to the text.
  - outlines how IETF uses the IANA service .arpa
  - IAOC feels draft is too vague
  - Does IETF need to own IANA.ORG?
  - Randy wants transparency and portability in the system.



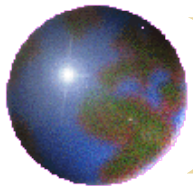
SDN - Overview

- Software Defined Networking
  - There is not currently a charter for this group
- Enables network applications to request and manipulate services provided by the network, and allow the network to provide feedback to the network applications.
- http://www.ietf.org/proceedings/82/slides/sdn-5.pdf
- Not constrained by a charter



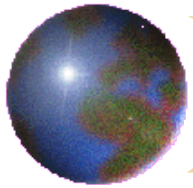
SDN

- An Over-The-Top SDN Architecture for Mobile Nodes and Home Routers
  - bring SDN end to end. so out to the end (your phone) change traffic flows to/from phones. control the source/path/etc. Overlay solution with a homogeneous view
- Inter-SDN in Seamless MPLS for Mobile Backhaul



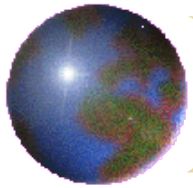
SDN

- Scalable Software-Defined Monitoring
  - scalability of monitoring can be imporved by using monitoring busses Split architecture principles for certain functions can help too. flexible data plane programming capabilities
- Network Configuration Web API for Bandwidth Reservation
  - SvDN service definied networking? In SvDN I want to receive 4k streaming from youtube. Then the service description is extracted to various conventional network configurations on network devices across the world



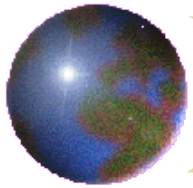
SDN

- Other drafts
  - SDN Controller Requirements
    - Public cloud and private cloud china mobile
  - Cooperating Layered Architecture for SDN
  - Seamless and Lossless VM/NFV Mobility for the Hyper-elastic Cloud
  - Applicability of Machine Learning to SDN
  - SDN RG: State of the Nation
- "Not constrained by a charter"



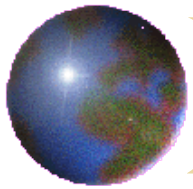
Sunset v4 – What is it?

- 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



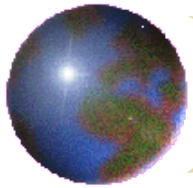
Sunset v4

- The entire session will be allocated to discussing three items with the goal of restarting forward progress in a WG that has been idle:
- draft-ietf-sunset4-gapanalysis
  - Almost ready to publish. need to get folks who have v6 only to review this document.
- draft-ietf-sunset4-noipv4
  - no ipv4 option for dhcpv6 is a focus. Need to add more use case steps into IPv4 sunsetting and how this would be used. the best option when there is no ipv4 upstream connectivity. what behavior is expected if ipv4 is turned off on CPE



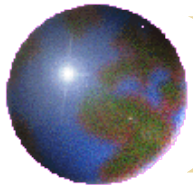
Sunset v4

- Future of the WG
  - Intent of draft discussion is to identify outstanding items necessary to complete the drafts - additional reviews, changes to respond to previous feedback
  - Intent of WG discussion is to identify future work (if any), gauge interest in whether the group should continue (do we have people to do the work we think needs to be done?)
  - Things necessary to turn of IPv4 in the network. Problems when a network is IPv6 only network.
  - Consensus that group should continue



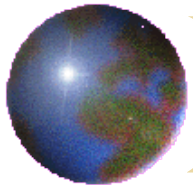
Plenary Dallas

- Imagining the internet great video.
  - http://www.elon.edu/e-web/imagining/event-coverage/ietf_2015/default.xhtml
  - Folks were interviewed regarding the Internet. They are making a video of this for the next IETF. Worth checking out
- Other interesting happening CODEMATCH
  - http://www.internetsociety.org/publications/ietf-journal-march-2014/programme-attracts-students-ietf
  - Aim is to attract computer science students to IETF
  - Get students to implement IETF standards.
  - One question is can someone implement a standard directly from the RFC?
- "there's cool shit at IETF" IETF Hackathon slide



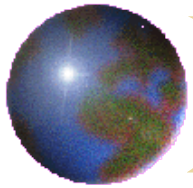
INTAREA – What is it?

- 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.



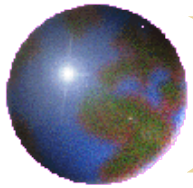
INTAREA

- IPv6 Path MTU Interactions With Link Adaptation
- GRE over IPv6
- Generic UDP Encapsulation
  - extension of GRE is hard so they created GUE.
  - Retained some of the simplicity. Allow more opportunities to extend the protocol.
  - so GRE like for IPv6
  - port 6080
  - needed network virtualization
- IP over Intentionally Partially Partitioned Links



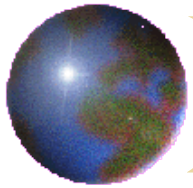
IPPM – What is it?

- The IP Performance Metrics (IPPM) Working Group develops and maintains standard metrics that can be applied to the quality, performance, and reliability of Internet data delivery services and applications running over transport layer protocols (e.g. TCP, UDP) over IP. Specifying network or lower layer OAM mechanisms is out of scope of the IPPM charter. It also develops and maintains protocols for the measurement of these metrics. These metrics are designed such that they can be used by network operators, end users, or independent testing groups. Metrics developed by the IPPM WG are intended to provide unbiased quantitative performance measurements and not a value judgement.



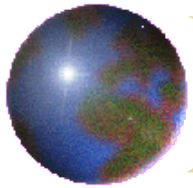
IPPM

- draft-ietf-ippm-model-based-metrics-04
  - Why model based metrics
    - Application wouldn't work end to end but would work segment by segment
    - no good understanding on how the network worked
    - "ISP cloud metric"
    - lameness of TCP masked other problems like bufferbloat
    - TCP performance is an equilibrium process
    - model based metric - testing with open loop TCP where you measure IP properties and loss statictics
    - Look at "and suddenly 1993 SLA metrics become clear"
    - Models are how fast can I transmit. Latency is important too. some gives you average performance but not necessarily the peak and peak is what folks complain about



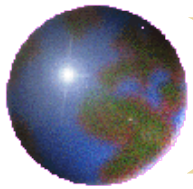
HOMENET – What is it?

- 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

- Homenet architecture is done! but we still don't know if one, one or two or more routing protocols?
- Multicast Routing - Pierre Pfister
  - draft-pfister-homenet-multicast-00
- Routing Protocol Selection Take Two
  - No, one or more than one
  - Ted Lemon wants a decision soon
  - It's insane to run IS-IS and OSPF in the home.. - Lorenzo
  - This discussion is crazy. I am not sure we'll ever decide even though we have to decide
- Prefix Assignment - Pierre Pfister
  - draft-ietf-homenet-prefix-assignment-0

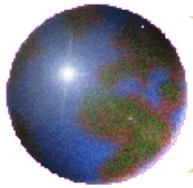


HOMENET

- DNS Name Auto-configuration
  - draft-jeong-homenet-device-name-autoconf-01
- HNCP Security and Trust Management
  - draft-barth-homenet-hncp-security-trust-01
- CER ID - Michael Kloberdans

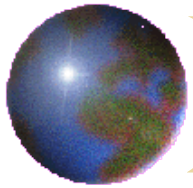
HOMENET

- .home - Stuart Cheshire
  - - draft-cheshire-homenet-dot-home-01
  - .home queries leaking to the root the number one
  - if the user does not have a domain name this is a way to bootstrap
  - draft suggests we determine why this is used
  - work out of the box without a globally unique domain name.
  - Lots are already using .home
  - www.icann.org/en/system/files/files/name-collision-02aut13-en.pdf
  - Icann is not delegating .home or .corp because it's being used
  - purpose is to gather more info about the uses and why
  - Audience question: what about other languages?
  - the document is to decide what should you do for .home.. maybe like .local??



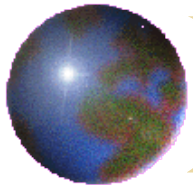
HOMENET

- Customer Edge Router Draft (CER)
  - If CER is edge than everything else is inside. JJB - this functionality is being asked for. Others.. there may be more than one edge router? Again in a homenet? really?
- Naming Architecture - unresolved issue with renumbering
- Working as a group on zero configuration within a home.
- Babel / IS-IS Comparison Draft Overview
  - Don't get me started about this ☺
  - Babel is small and does source routing and lossy links
  - Babel not an internet standard and only one implementation



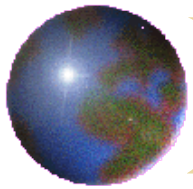
HOMENET

- Other notes/thoughts from HOMENET
  - How long are we willing to take to make a decision?
  - How big is a future homenet?
  - May want to add lossy link stuff to IS-IS because it may be quicker than making Babel an IETF standard.
  - This is going to go into $30 home routers right? if it doesn't fit in to ROM today it doesn't get there?
  - JJB is moving forward.. can't wait for homenet.



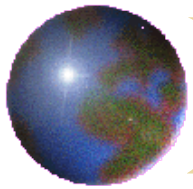
Netconf – What is it?

- The NETCONF protocol (RFC 6241) provides mechanisms to install, manipulate, and delete the configuration of network devices. NETCONF is based on the secure transport (SSH is mandatory to implement while TLS is an optional transport) and uses an XML-based data representation. The NETCONF protocol is data modeling language independent, but YANG (RFC 6020) is the recommended NETCONF modeling language, which introduces advanced language features for configuration management. Based on the implementation, deployment experience and interoperability testing, the WG aims to produce a NETCONF status report in a later stage. The result may be clarifications for RFC6241 and RFC6242 and addressing any reported errata.



Netconf

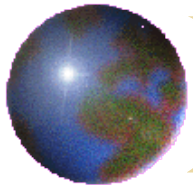
- Not going to talk too much about this group. Some docoments being worked are
  - RESTCONF Protocol
  - YANG Patch Media Type
  - YANG Module Library
  - RESTCONF Collection Resource
  - NETCONF Call Home
  - NETCONF Server Configuration Model
  - Zero Touch Provisioning for NETCONF Call Home (ZeroTouch)



Source Packet Routing in Networking - ?

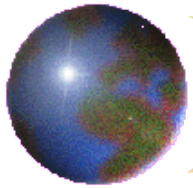
- The SPRING working group will define procedures that will allow a node to steer a packet along an explicit route using information attached to the packet and without the need for per-path state information to be held at transit nodes. Full explicit control (through loose or strict path specification) can be achieved in a network comprising only SPRING nodes, however SPRING must inter-operate through loose routing in existing networks and may find it advantageous to use loose routing for other network applications.

- charter-ietf-spring-01



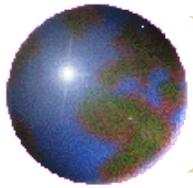
Source Packet Routing in Networking

- Done with real remote folks on the meetecho screen.
  - IETF-LAC Task Force- to increase participation
  - regional mailing list to discuss in local languages
  - ietf-lac@ladnog.org
  - This is very cool. True outreach.. ARIN should do this.
- IPv6 Segment Routing Update
  - draft-previdi-6man-segment-routing-header
  - draft-vyncke-6man-segment-routing-security
  - Seems like this is suspect but there are several implementations.



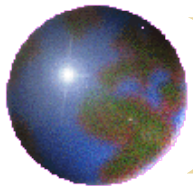
Source Packet Routing in Networking

- OpenFlow Interworking Requirements
  - draft-khc-spring-openflow-interworking-req
- BGP-Prefix Segment in large-scale data centers
  - segment routing in BGP only networks
  - Inter-domain mpls label rouitng? really?
  - why is this better than IGP?
  - I think it lets you pick egress router based on criteria
- Other drafts
  - Bidirectional Forwarding Detection (BFD) Directed Return Path
  - Entropy labels for source routed stacked tunnels



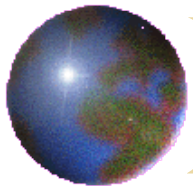
SIDR – What is it?

- 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



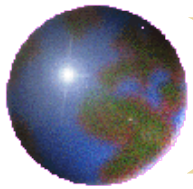
SIDR

- RPKI tools
  - Origin Validation Looking Glass
    - check validity of prefixes in routing table
    - www.labs.lacnic.net/rpkitools/looking_glass
    - Easily parsable output, alarm that will alert NOC
  - The RPKI Dashboard
    - SURFNET
      - 495838 Prefixes in routing table
      - 2.46% is valid
      - .52% invalid



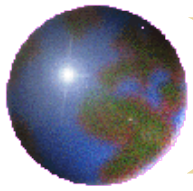
New Reference of Note

- There was a discussion recently about how sometimes draft names are not helpful. The example was draft-ymbk as not helpful. Turns out ymbk is a joke and is used to express the phrase "you must be kidding"
- In the process of this discussion this link was pointed out.
  - http://tools.ietf.org/group/tools/trac/wiki/AtomFeeds
  - It's pretty cool and has info about all new documents, liasons etc.



References

- 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
  - http://www.fenron.net/~fenner/ietf/ietf-ebooks



Questions?

What we say	What we mean
Horrible hack	Horrible hack that I didn't write
Temporary workaround	Horrible hack that I wrote
It's broken	There are bugs in your code
It has a few issues	There are bugs in my code
Obscure	Someone else's code doesn't have comments
Self-documenting	My code doesn't have comments
That's why it's an awesome language	It's my favorite language and it's really easy to do something in it.
You're thinking in the wrong mindset	It's my favorite language and it's really hard to do something in it.
I can read this Perl script	I wrote this Perl script
I can't read this Perl script	I didn't write this Perl script
Bad structure	Someone else's code is badly organized
Complex structure	My code is badly organized
Bug	The absence of a feature I like
Out of scope	The absence of a feature I don't like
Clean solution	It works and I understand it
We need to rewrite it	It works but I don't understand it
emacs is better than vi	It's too peaceful here, let's start a flame war
vi is better than emacs	It's too peaceful here, let's start a flame war
IMHO	You are wrong
Legacy code	It works, but no one knows how
^X^Cquit^\[ESC][ESC]^C	I don't know how to quit vi