

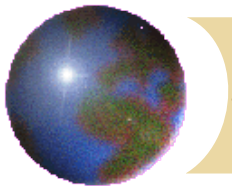
# *IETF Activities Update*

**Cathy Aronson**

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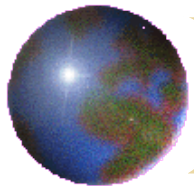
**ARIN XXX**



## *Note*

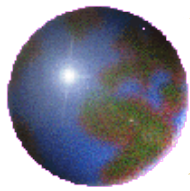
This presentation is not an official IETF report

- ❑ 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*

- ✦ World IPv6 Launch
- ✦ IETF website was attacked the Friday before IETF and all the attach traffic was IPv6
- ✦ New working group IPv4 Sunsetting

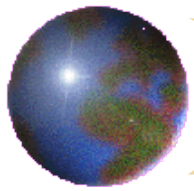


# *Some Things Haven't Changed*

## Reviews of IPng Proposals

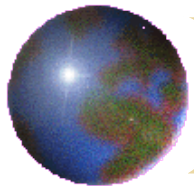
summarized against protocol requirements

	catnip	sipp	tuba	IPng
complete spec	no	yes	mostly	mostly
simplicity	no	no	no	mostly
scale	yes	yes	yes	yes
topological flex	yes	yes	yes	yes
performance	mixed	mixed	mixed	yes
robust service	mixed	mixed	yes	yes
transition	mixed	no	mixed	yes
media indepdnt	yes	yes	yes	yes
datagram	yes	yes	yes	yes
config. ease	unknown	mixed	mixed	mostly
security	unknown	mixed	mixed	yes
unique names	mixed	mixed	mixed	mixed
access to stds	yes	yes	mixed	yes
multicast	unknown	yes	mixed	yes
extensibility	unknown	mixed	mixed	yes
service classes	unknown	yes	yes	yes
mobility	unknown	mixed	yes	mixed
control proto	unknown	yes	mixed	yes
tunneling	unknown	yes	mixed	yes



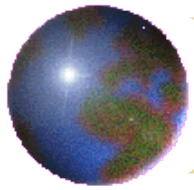
# *IPv6 Maintenance -6man*

- ✦ Several docs advancing to the IESG. Many drafts to fix various problems with IPv6. Router Solicitation problems, etc.
- ✦ Packet Loss Resiliency for router solicitations – trying to figure out the correct behavior if you don't get an RA
- ✦ Representing IPv6 Zone Identifiers in Uniform Resource Identifiers
- ✦ IPv4 address imbedded in IPv6 Mcast
- ✦ "I am all for documenting that bad ideas are indeed bad ideas" Lorenzo



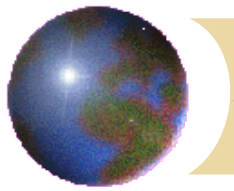
# *Technical Plenary*

- ⊕ Technical discussion of Software Defined Networks (SDN)
- ⊕ “Transmogrifier Gun”



# *Transport Area*

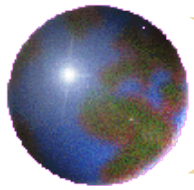
- ✦ Controlled Delay (CoDel) presentation by Van Jacobson
  - ✦ Deals with Bufferbloat using packet sojourn time through the queue
  - ✦ ACM Article is here <http://queue.acm.org/detail.cfm?id=2209336>
  - ✦ More on Bufferbloat is here <http://www.bufferbloat.net/>
  - ✦ Major performance problem of existing networks.
- ✦ Competing proposal is DCTCP
  - ✦ <http://www.stanford.edu/~alizade/Site/DCTCP.html>
- ✦ Also LEDBAT
  - ✦ <http://datatracker.ietf.org/wg/ledbat/charter/>



# *WORLD IPv6 Launch Lunch*

- ✦ 2000 Websites went to IPv6
- ✦ Sustained impact on traffic levels
- ✦ Truly a global event
- ✦ Comcast
  - ✦ 2% provisioned native dual stack
  - ✦ 100% increase since May
  - ✦ V6 on 50% of the network
  - ✦ Most traffic YouTube, Netflix, iTunes
  - ✦ Measuring v4 and v6 parity – comparing experience





# *WORLD IPv6 Launch Cont.*

## ✦ Google

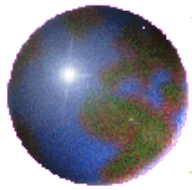
- ✦ IPv6 SMTP support
- ✦ IPv6 adoption up 150% over the past year
- ✦ AAAA filtering used by some to turn off v6

## ✦ Time Warner

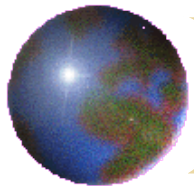
- ✦ Huge deployment to get to the 1% actual traffic

## ✦ Akamai

- ✦ 53 countries and 600 locations using v6
- ✦ [www.akamai.com/ipv6](http://www.akamai.com/ipv6)

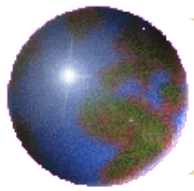


- ✦ Internet Disruptions in North Africa
  - ▣ Interesting talk about the Internet in Egypt and Libya
  - ▣ Egypt has 51 ASNs and Libya has 3 so for example it was easier to turn off the Internet in Libya during the uprising.
- ✦ Delay Tolerant Network Research Group
  - ▣ Interplanetary Internet
  - ▣ lots of interesting work on different high delay networks.



# *V6 Operations*

- ✦ Several good documents on transitioning to IPv6. Enterprises, Content and Application Service Providers.
  - ✦ Design Guidelines for IPv6 Networks
  - ✦ IPv6 Guidance for Internet Content and Application Service Providers
  - ✦ Service Provider WiFi Services over Residential Architectures
  - ✦ Enterprise Incremental IPv6
  - ✦ A Reference Framework for DC Migration to IPv6"transition" for data centers.



# *V6 Operations - Continued*

## ✚ Semantic IPv6 Prefix

- ✚ Embed semantics into prefix

- ✚ Can't stop folks from doing this even if it is a bad idea.

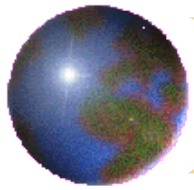
## ✚ Operational experience with NAT 64

- ✚ Tmobile

## ✚ Quotes from v6 Operations

- ✚ "it's an example of how a pig can fly if there's enough economics behind it"

- ✚ "you're going to lose a lot of information and you're probably going to screw yourself"



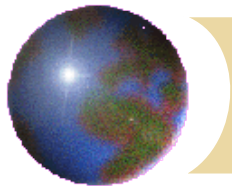
# *V6 Operations - Continued*

## ✦ 464XLAT

- ✦ Limited IPv4 connectivity over a v6 only network

- ✦ There is a class of applications that don't work.. stuff with IPv4 literals like skype.

## ✦ BCP: IPv6 over ATM interworking Function



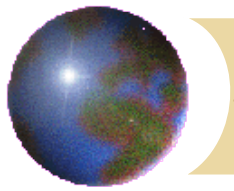
# *Internet Area*

## ✦ NAT Reveal Analysis

- ✦ The engineering problem is that if there are bad guys and good guys behind CGN and there are attacks they all get cut off

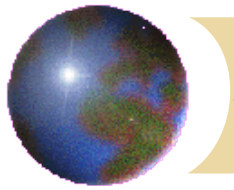
## ✦ IEEE Registration Authority Committee (RAC)

- ✦ Manages MAC addresses.
- ✦ Proposal oddly like IPv4 A, B and C addresses
- ✦ Don't want to run out of MAC addresses
- ✦ How to re-use addresses that are assigned dynamically.



# *Dynamic Host Configuration*

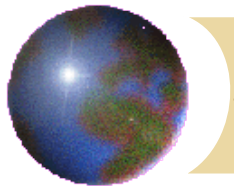
- ✦ A lot of work being done in DHCP to accommodate various v4 and v6 issues. Several drafts are there to accommodate issues that software needs solved. Also drafts of other problems that need to be solved.
- ✦ DHCPv4 and DHCPv6 Options for Access Network Query Protocol Servers
- ✦ DHCP Options for Port Set Assignment
- ✦ DHCPv6 Option Guidelines
- ✦ Port Restricted IP Address Assignment
- ✦ DHCPv6 Options for Mapping Address and Port
- ✦ Guidelines for Creating new DHCPv6 Options



# *Dynamic Host Configuration*

- ✦ MAP Provisioning over DHCPv6
- ✦ DHCPv4 and DHCPv6 Access-network Identifier Options
- ✦ DHCPv6 Class Based Prefix
- ✦ Client Hardware Address Option in DHCPv6
- ✦ DHCPv4 over v6 tunnel..
- ✦ Mitigating Aggregation Traffic of DHCP Discover Messages
- ✦ Prefix pool Option for DHCPv6 Relay Agents on Provider Edge Routers
- ✦ Radius Option for DHCPv6 Relay Agents on Broadband Access Server
- ✦ Multiple Stateful DHCPv6 Options Issues

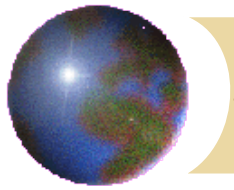




# *DNS Operations (DNSOP)*

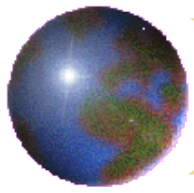
## ⊕ Omniscient AS112 Servers

- ⊠ in-addr.arpa servers get a lot of junk
- ⊠ AS112 is a distributed sink to answer the queries. Authoritative replies. Anycasted. Stops queries because replies are cached
- ⊠ Proposal to make these authoritative for "." or ".arpa"?



# *V6 RENUM*

"One man's rogue is another man's renumbering event" how to prepare a renumbering event - timers etc. RFC4192



# *HOMENET – your Mother's net?*

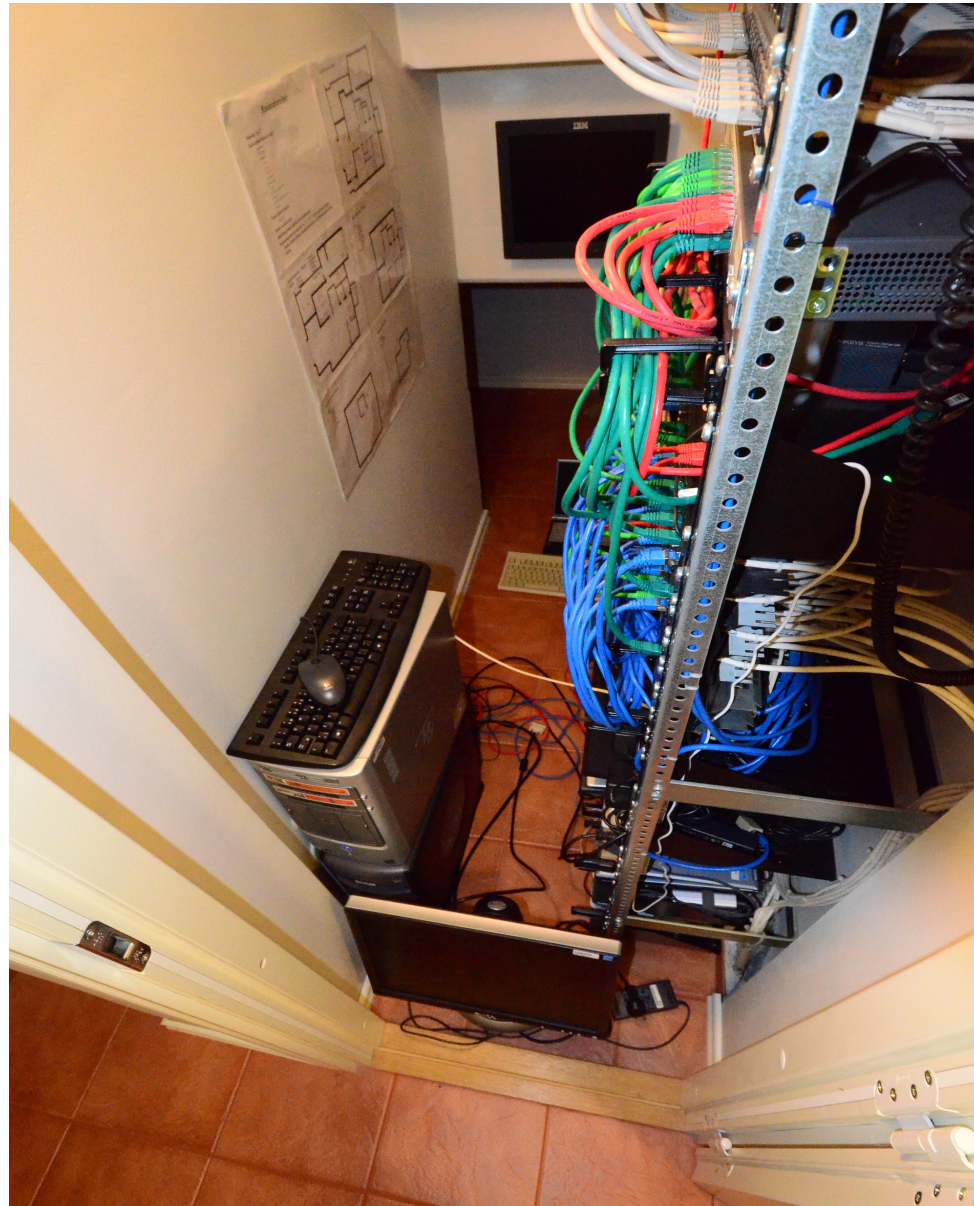
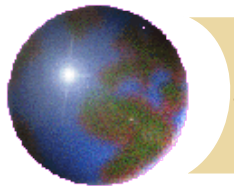


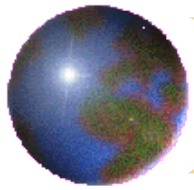
Photo by

Jari Arkko



# *HOMENET*

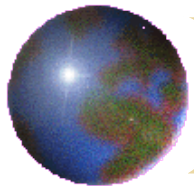
- ✦ AKA "Arbitrarily Complex Home Networks Because We're Geeks WG"
- ✦ "what if I take my router to my neighbor's house because there's a party and they need a router?" "what prefix will the router get?"
- ✦ Prefix Assignment in the home with OSPFv3



# *IPv4 Sunsetting WG*

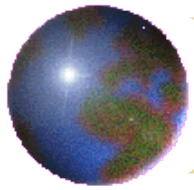
## ☉ Purpose of the group

- ☒ Central place to discuss IPv4 specific IETF work, ensure it's justified before proceeding.
- ☒ what is the minimum work that IETF needs to finish so that standards work on IPv4 work is "done"
- ☒ A WG to consider how to turn IPv4 OFF. NOT IPv6 Deployment Deniers Anonymous
- ☒ Does not harm or delay deployment of IPv6
- ☒ "I like sunsets. Sunsets are pretty. Sometimes I like sunsets to last longer" Lee Howard



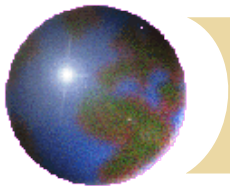
# IPv4 Sunsetting

- ✦ IPv6 Support within IETF work
  - ▣ future IPv4 work limited to solving documented operational problems indentified by multiple organizations
  - ▣ IPv6 is not optional
- ✦ Gap Analysis – what's missing for turning off v4?
- ✦ "if you don't have v4 you don't have a v4 problem"



# *Ops & Mgmt Area*

- ✚ FLOW OAM document
  - ✚ improve traditional tools such as ping and traceroute to work in large scale data centers where there is lots of multipath and ECMP
  - ✚ trace packets need to go through the same processing as the actual application flow that is being traced
- ✚ "The problem is you're trying to write a MIB. You should be writing a virtual MIB then the problem would be solved" Kireeti



# 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>

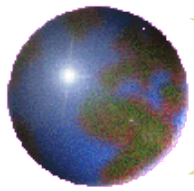
- ⊕ Upcoming BOFs Wiki:

- ⊞ <http://tools.ietf.org/bof/trac/wiki>

- ⊕ Also IETF drafts now available as ebooks

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





# Questions?



Geek meditation session.