

IPv6 Work@ IETF

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Based on input from Bob Hinden, Ole Trøan and Fred Baker

RIPE77, Amsterdam, Oct 2018

Why Shall You Care?

- Think that IETF is disconnected from reality?
- Unhappy with the protocol design?
- Do not see your use case being addressed?

Come and change it.

How to Get Involved?

You don't have to fly to Bangkok

Most work is done in mailing lists

Remote participation in IETF meeting

The Goals of This Talk

- Provide a short summary of current activities
- Solicit operational input/feedback on drafts
 - [IETF103](#) in Bangkok, Nov 3rd - 9th
- Get more operators involved

Document Lifecycle (Simplified)

Individual draft



WG adoption



WG Last Call



IETF Last Call



RFC

Flavours of RFCs (Simplified)

Standards

Informational

Experimental

Best Current
Practices

IPv6-Related IETF Working Groups

IPv6 Maintenance (6man)

IPv6 Operations (v6ops)

IPv6 over the TSCH mode of IEEE 802.15.4e (6tisch)

IPv6 over Low Power Wide-Area Networks (lpwan)

Sunsetting IPv4 (sunset4) - Concluded WG

IPv6 Maintenance Working Group

IPv6 Maintenance (6man) WG Overview

Chairs: [Bob Hinden](#) / [Ole Trøan](#)

Documents: <https://datatracker.ietf.org/wg/6man/documents/>

Mailing list: ipv6@ietf.org Click [here](#) to subscribe

Mailing list archive: <https://www.ietf.org/mailman/listinfo/ipv6>

- responsible for the maintenance, upkeep, and advancement of the IPv6 protocol specifications
- addresses protocol limitations/issues discovered during deployment and operation.

IPv6 only flag

<https://datatracker.ietf.org/doc/draft-ietf-6man-ipv6only-flag/>

WG Status: in WG Last Call since Sep 2018

Summary: a new RA flag to signal to hosts that this link is "IPv6 only" (so hosts can disable IPv4 processing on the interface);

Open Questions:

- implications of the signal;
- Other ways to achieve the same goal;

Segment Routing for IPv6

<https://datatracker.ietf.org/doc/draft-ietf-6man-segment-routing-header/>

WG Status:

- WG Last Call since March 2018.
- Most of the open issues resolved

Summary: The base specification of the IPv6 Segment Routing header (all other SR-related work is done in SPRING WG)

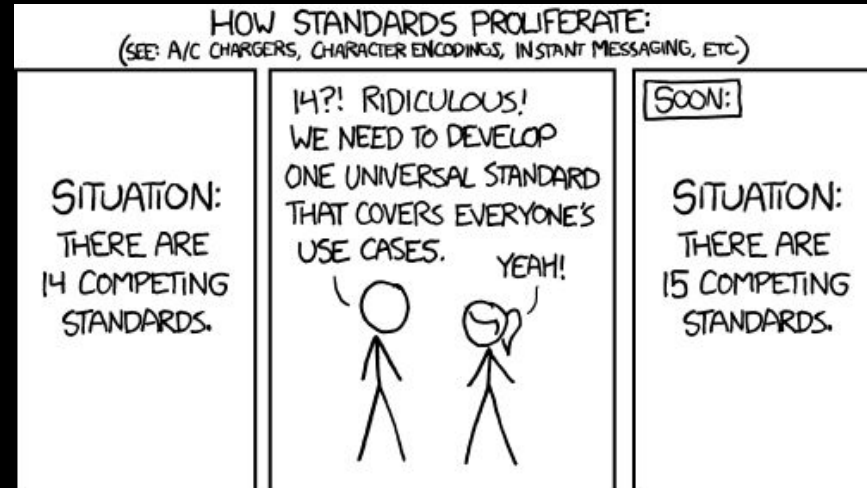
Discovering NAT64 Prefix in Router Advertisement

<https://datatracker.ietf.org/doc/draft-pref64folks-6man-ra-pref64/>

Summary: an RA Option to specify /96 NAT64 prefix(es)

Why?

- Simple, Atomic, Reliable way to configure Pref64



<https://xkcd.com/927/>

Feedback Needed: Do we need non-/96 prefixes?

IPv6 Address Architecture (RFC4291-bis)

- Not a topic for Bangkok
- Multiple drafts on the most controversial topic:
/64 boundaries
- No consensus

JFYI

Path MTU Discovery: A New Hope

Some discussion planned in Bangkok.

- Is it possible to improve on PMTUD at the network layer, or should we just give up and punt to the transport layer?
- Can network layer give some hints to transport?
- Can MTU be discovered in one RTT?
- Can we come up with something deployable?

PMTUD Idea #1: Packet Truncation

<https://datatracker.ietf.org/doc/draft-leddy-6man-truncate/>

Summary:

- Packets eligible for truncation have "Truncation Eligible" Option
- Instead of dropping packet:
 - truncate the packet
 - update "Truncated Packet" option
 - Destination node sends ICMP back

PMTUD Idea #2: MTU Recording by Routers

<https://datatracker.ietf.org/doc/draft-hinden-6man-mtu-option/>

Summary:

- new Hop-by-Hop Option to record the minimum PMTU
- Routers on the path update the MTU value in the Option
- Destination node can send the minimum reported PMTU value back to the Source Node.

IPv6 Operations Working Group

IPv6 Operations WG Overview

Chairs: Fred Baker/Ron Bonica

Documents: <https://datatracker.ietf.org/wg/v6ops/documents/>

Mailing list: v6ops@ietf.org (Click [here](#) to subscribe)

Archive: <https://mailarchive.ietf.org/arch/browse/v6ops/>

Develops guidelines for the deployment and operation of new and existing IPv6 networks. (incl. IPv6-Only)

Indefensible Neighbor Discovery

<https://datatracker.ietf.org/doc/draft-jaeggli-v6ops-indefensible-nd/>

Summary:

Neighbor Discovery resource exhaustion mitigations approaches

- Using LLAs
- /127 for p2p
- Firewalling (no incoming traffic for unknown addresses)
- ..and some references to previous work

Even More V6Ops Drafts...

(presented by J. Palet Martinez)

v6ops drafts (1)

- Requirements for IPv6 Customer Edge Routers to Support IPv4 Connectivity as-a-Service
 - RFC7084 was Basic Requirements for IPv6 Customer Edge Routers
 - Support only for 6RD and DS-LITE
 - This new document include support for 464XLAT, DS-Lite, Iw4o6, MAP T/E
 - Same CE for different ISPs, cheaper, same configuration steps, and you can buy in the retail
 - <https://datatracker.ietf.org/doc/draft-ietf-v6ops-transition-ipv4aas/>
 - This is already in AD/IESG review, so will become and RFC soon (hopefully)
- NAT64/464XLAT Deployment Guidelines in Operator and Enterprise Networks
 - How you do that without messing up your network (cellular or broadband)
 - <https://datatracker.ietf.org/doc/draft-ietf-v6ops-nat64-deployment/>
- IPv6-Ready DNS/DNSSEC Infrastructure
 - This document defines the timing for implementing a worldwide IPv6-Ready DNS and DNSSEC infrastructure, in order to facilitate the global IPv6-only deployment
 - Merge of 2 previous documents (draft-palet-sunset4-ipv6-ready-dns and draft-byrne-v6ops-dnssecaaaa-00)
 - <https://datatracker.ietf.org/doc/draft-bp-v6ops-ipv6-ready-dns-dnssec/>

v6ops drafts (2)

- IPv6 Point-to-point links

- This document describes different alternatives for configuring IPv6 point-to-point links, considering the prefix size, numbering choices and prefix pool to be used
- <https://datatracker.ietf.org/doc/draft-palet-v6ops-p2p-links/>

- Pros and Cons of IPv6 Transition Technologies for IPv4aaS

- This document describes different alternatives for configuring IPv6 point-to-point links, considering the prefix size, numbering choices and prefix pool to be used
- <https://datatracker.ietf.org/doc/draft-lmhp-v6ops-transition-comparison/>

- IPv6 Address Assignment to End-Sites

- -bis version of RFC6177 with some clarifications
- <https://datatracker.ietf.org/doc/draft-palet-v6ops-rfc6177-bis/>

v6ops drafts (3)

- Network-side Happy Eyeballs based on accurate IPv6 measurement
 - “Happy Eyeballs” protocol for Networks to help measurements and (new) failure detection/reporting
 - New version coming, merged with my older document (draft-palet-v6ops-he-reporting)
 - <https://datatracker.ietf.org/doc/draft-v6ops-xie-network-happyeyeballs/>
- IPv6-only Terminology Definition
 - <https://www.ietf.org/archive/id/draft-palet-v6ops-ipv6-only-03.txt>

*And Now for Something Completely
Different*

Discovering Provisioning Domains

<https://datatracker.ietf.org/doc/draft-ietf-intarea-provisioning-domains/>

- Provisioning Domain (PvD): a configuration context/A set of network configuration information
- PvD is identified by FQDN
- PvD IDs are advertised in RAs so hosts can discover them

Examples:

- a host with multiple interfaces;
- A host with the same interface connected to multiple networks

Interested?

Intrigued?

Fascinated?

Confused?

