

Numbering IPv6 Router Interfaces

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Proposals

- RFC 4291 (status quo)
 - /64
- Also deployed
 - /112
 - /126
 - /127
 - /128
 - unnumbered

Benefits of The Status Quo

- Some features depend on uniformity
 - RFC 2462 (Duplicate Address Detection)
- Host detection more difficult
 - Arguable
- The remaining 64 bits is a big enough address space for every sub-network in the world

Problems with the Status Quo

- Behavior of some point-to-point interface implementations
- Neighbor Discovery DoS Attack
 - Arguably a vendor problem, vendors need to fix. Interim solutions may be necessary, but that does not preclude working towards the Right Thing. See Igor's allocation vs. configuration plan.

Problems with the Status Quo

- Consumes more address space than really needed
 - Waste not, want not
 - But IPv6 addresses more plentiful than engineer/tech brain cells, optimize for people not machines
 - Whatever you do, don't allocate (as opposed to interface subnet mask) on anything other than a nybble boundary. CIDR and VLSM are good for computers but bad for people.

/112 Prefix Length

- Popular non-standard size
 - <http://huque.com/~shuque/doc/penn-ipv6-plan.html>
- Always suppresses RA/autoconfig
- One size fits all
 - Point to point links
 - More than 2 routers on ethernet
 - Vrrp
 - Server segments

/112 Prefix Length

- Aligns on “:” boundary
- All of your loopbacks and internal links can be numbered out of the same /64
 - Simplified control plane acl's
- Good balance between efficiency and flexibility
 - /112 is 16,384 times less efficient than /126 but 281,474,976,710,656 times more efficient than /64

Proposed Solutions

- /127 and smaller mitigates all security issues described above
 - draft-kohno-ipv6-prefixlen-p2p
- Unnumbered may become more viable with implementation of draft-atlas-icmp-unnumbered
- Allocate /64 and use /64 for point-to-point as soon as vendors fix security issues, until then configure first /127 out of allocated /64 on each interface

Discussion

