IPv6 Address Assignment to End-Sites

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RFC6177 is foggy

- Many ISPs have not gotten the message
  - IPv6 addressing is about subnets, not hosts
- We moved away from /48
  - from RFC3177 to RFC6177
- Some RIRs still suggest /48, others /56
  - In any case, it is an ISP decision
- Let's make sure folks get it right this time:
  - A site needs to have many subnets
  - A single /64 is never recommended

Global IPv6 Survey

- Running for 2 years
- 1.559 ISPs, in 105 countries
  - /48 in 23% (more advanced in terms of IPv6 deployment)
  - /56 in 35%
  - /64 in 33%
- Inappropriate interpretation of RFC6177

Updated Recommendations

1. /128 is extremely discouraged
2. CIDR: No hard-coded boundaries
3. One-size-fit-all is not necessary or appropriate
4. Still need to ensure that end-sites get a sufficiently big number of subnets

   – A single /64 subnet is not a normal choice
   – Neither should be a small number of subnets

- End-sites should always be able to obtain a reasonable number of /64 subnets for their actual and planned usage, and over time ranges specified in many years, probably decades

On /48 Assignments

- Per-address cost (from RIR) should not be an issue
- HNCP needs sub-assigning to downstream routers
  - /56 may be too short
- Use of ULAs internally (/48), matching the ISP prefix
- If multiple links are present, DNS is simpler with same prefix size from each link
- Business may need more than a single /48
  - Address assignment policies allow it
- Single /64 per host/interface (RFC7934)
- /48 is not wasteful in many situations

IPv6 Lifetime

- A /3 contains: 35.184.372.088.832 /48

- 50% utilization: 17.592.186.044.416 /48

- 32 billons population: 34.359.738.368 humans

- Average life expectation: 100 years

- Let's give each human: 1 /48   -> 51.200 years

  4 /48   -> 12.800 years

- Let's use all the space: 8 /3 (x 8)

- Let's give each human: 1 /48   -> 409.600 years

  4 /48   -> 102.400 years

Summary

- Exact prefix choice is an operational issue
  - See RIPE-690

- Strongly discourage a single /64

- Strongly suggest considering a /48
  - Alternatively, reserve a /48, assign the first /56
  - Will avoid renumbering, the remaining /48 can then be assigned when needed

- Encourage alignment of cellular networks
  - They are alternatives to broadband

Next steps

- Become a WG item ?

- New inputs ?