

Proposal 090

IPv6 thinking for an IPv6 world

Why do we need this?

- Common misconception that all ISPs should fit in a /32 leads to:
 - Squeezing networks to make everything fit instead of expanding allocations.
 - Odd aggregation boundaries facilitating administrative errors.

How does this help?

- Nibble Aligned Allocations – no odd aggregation boundaries
- Nibble Aligned hierarchy – no odd aggregation boundaries
- ISPs can choose any minimum allocation unit up to /48 for end sites
- Ability to assign more than /48 per end-site with justification

Flexibility in Allocation

- Define serving site to fit your topology
 - POP?
 - Aggregation Router
 - Colocation Facility
 - Etc.
- This actually allows reserving vast amounts of room for growth through the 25% minimum free and nibble-boundary round-ups.

How does this help (cont)

- 5-year planning horizon -- Better Aggregation
- Consistent sized divisions -- Make every PoP like your largest PoP
 - Simplifies subdividing
 - Reduces fragmentation
 - Consistent expectations across network

Simplified Expansion

- Allows for asymmetric growth
 - 75% utilization overall
 - 90% utilization at any single site
- Oversized subsequent allocations
 - Enough to contain present+future use.
 - Optionally vacate original allocation through attrition and eventually return -- near ideal aggregation

What's the downside?

- Increased IPv6 prefix consumption
 - Without this policy, in 50 years, IPv6 will still have roughly 99.9975% free.
 - This policy will reduce that to approximately 99.54% if adopted in every RIR.
- Safety Valve: If this policy unexpectedly consumes more than a few /12s in region, 7/8ths of total address space still reserved.

Why % instead of HD

- While ISPs are well versed in HD in this region, it is confusing to end-users. This policy affects both ISPs and end-users.
- For medium-large networks it works out very close to the same with the included round-ups.
- Smaller networks are actually penalized by HD ratio.

Summary

- Better Aggregation
- Better Network Structure
- Fewer Outages (no bit-math required)
- Bigger Prefixes
- Still plenty of free space for way more than 50 years.

Questions

- Thanks for your time
- Please Approve this Policy Change