Approaching the End of IPv4

...What will the afterlife hold?
Only 6,000 /22s to go...
The Process

• First come, first served - as usual
• Allocation based on prefix availability
  1. One /22 per LIR (±5000)
  2. Combine /23s and /24s to make one /22 (±1000)
  3. One /22 per LIR from the /16 set aside for unforeseen circumstances (ripe-708)
  4. Exhaustion of the IPv4 address pool
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Unforeseen Circumstances Policy

“A /16 will be held in reserve for some future uses, as yet unforeseen” (…) “In the event that this /16 remains unused at the time the remaining addresses covered by this policy have been distributed, it returns to the pool to be distributed”

- Currently a contiguous /16
- Will be replaced by /23s and /24s (totalling a /16) once PDP timelines do not allow for related policy change
IPv4 Dust

- The little bits that will be left over
- /25s, /26s and 27s (less than 6,000 IPs)
- Not really suitable for routing purposes
- We want to keep them reserved for the time being
Returned IPv4 Addresses

What if we try to keep things simple?
Proposal: Waiting List

• For LIRs that haven’t yet received a final /22
  - Applies to new and existing LIRs as per current policy
  - May receive a single /22 or the equivalent (prefix not larger than /24)

• No policy changes would be required

• Returned IPv4 blocks quarantined for six months before distribution
  - As per current practice, this allows for proper clean-up
Thoughts on Policy

Questions and recommendations
IPv4 Pool for Internet Exchange Points

• A /16 is held in reserve for IXPs (ripe-708)
• This might be gone in less than five years
• Is the IXP pool large enough?
IXP IPv4 Pool Utilisation

![Bar Chart showing IPv4 pool utilisation over time from Q4 2012 to Q3 2018. The chart indicates the total issued IPs and remaining IPs with blue and grey bars, respectively.](image-url)
IXP Pool and Assignment Size

• What about moving small blocks (/25, /26) to the IXP pool?
  - Diminished routability won’t affect peering LANs
  - Text should be added to the “recycling” section of ripe-708, stating that returned IPv4 blocks smaller than /24 will be added to the IXP pool

• “An IXP will receive one number resource (/24 to /22)” (ripe-708)
  - Does not allow assigning small blocks, which could be of use to IXPs
  - A policy change would be needed for this
What If We Used /24 Allocations for the Waiting List?

Model with /22 allocations

Model with /24 allocations
IPv4 Allocation Size to /24?

• /24 allocation size policy proposal discussed last year
  - Did not reach consensus

• Reduction in allocation size allows for wider distribution

• Shorter waiting time

• Would make the waiting list less attractive for speculators
Questions

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Discussion

• Replacing contiguous /16 for unforeseen circumstances to /23s and /24s totalling /16 - any opposition?

• Creation of a waiting list - any opposition?

• IXP pool size - is this large enough?

• Moving blocks under a /24 to the IXP pool and allowing for their assignment - worth it? And if so, any volunteers?

• /24 Allocation size - worth it? And if so, any volunteers?