On Higher Levels of Address Aggregation

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A long time ago...

• We changed to classless addressing (CIDR).
• We started aggregating and advertising prefixes.
• We talked about aggregating entire continents and regions but nothing happened.
What’s changed?

• We’ve been leaking more-specifics for traffic engineering.
  • It would be good if we could clean these up, especially at a distance.

• We have a new (ok, now pretty old), undocumented idea for how to think about aggregation.

• We talked about proxy aggregation, what about unilateral remote aggregation?
Traditional aggregation
New concept: abstraction naming boundary
New concept: abstraction action boundary (Noel Chiappa)
What if …?

ISP A

ISP B

P.1, P.2, P.3, ....

P

P

P.1, P.2, P.3, ....
What if … ?

• Traffic routes around ISP B
• ISP B is still providing reachability to ISP A
• If aggregation happens on ingress, ISP B avoids carrying more-specifics internally
• If aggregation happens on egress, ISP B can still do traffic engineering

• This seems like it might be acceptable in some cases
• Can we apply this to organizational, continental, and regional aggregation?
Regional aggregation

• IANA has assigned large prefixes to RIRs.
  • 2a10:0000::/12 assigned to RIPE NCC

• These are fine candidates for remote aggregation.
  • Abstracts out
    • Traffic engineering more-specifics
    • RIR specific organizations

• Where is the abstraction action boundary?
  • Too close breaks traffic engineering
  • Too far is wasteful
  • Field input would be welcome
Continental aggregation

• In general, inter-continental links are rare relative to intra-continental links.
• We very much want to traffic engineer the inter-continental links.
• We want the abstraction action boundary to be just past the inter-continental links.
• This does require the RIRs to do continental addressing.
RPKI issues

• Aggregates using the origin ASN are fragile
  • At best are ‘unknown’
  • At works become ‘invalid’
• Form an atomic aggregate and originate locally
• Please file a ROA
Summary

• Seeking field experience with unilateral remote aggregation
  • Where could this be applied to organizational, continental, and regional aggregation?
  • Where should the abstraction action boundary be?
  • What happens when this is enabled?