

On Higher Levels of Address Aggregation

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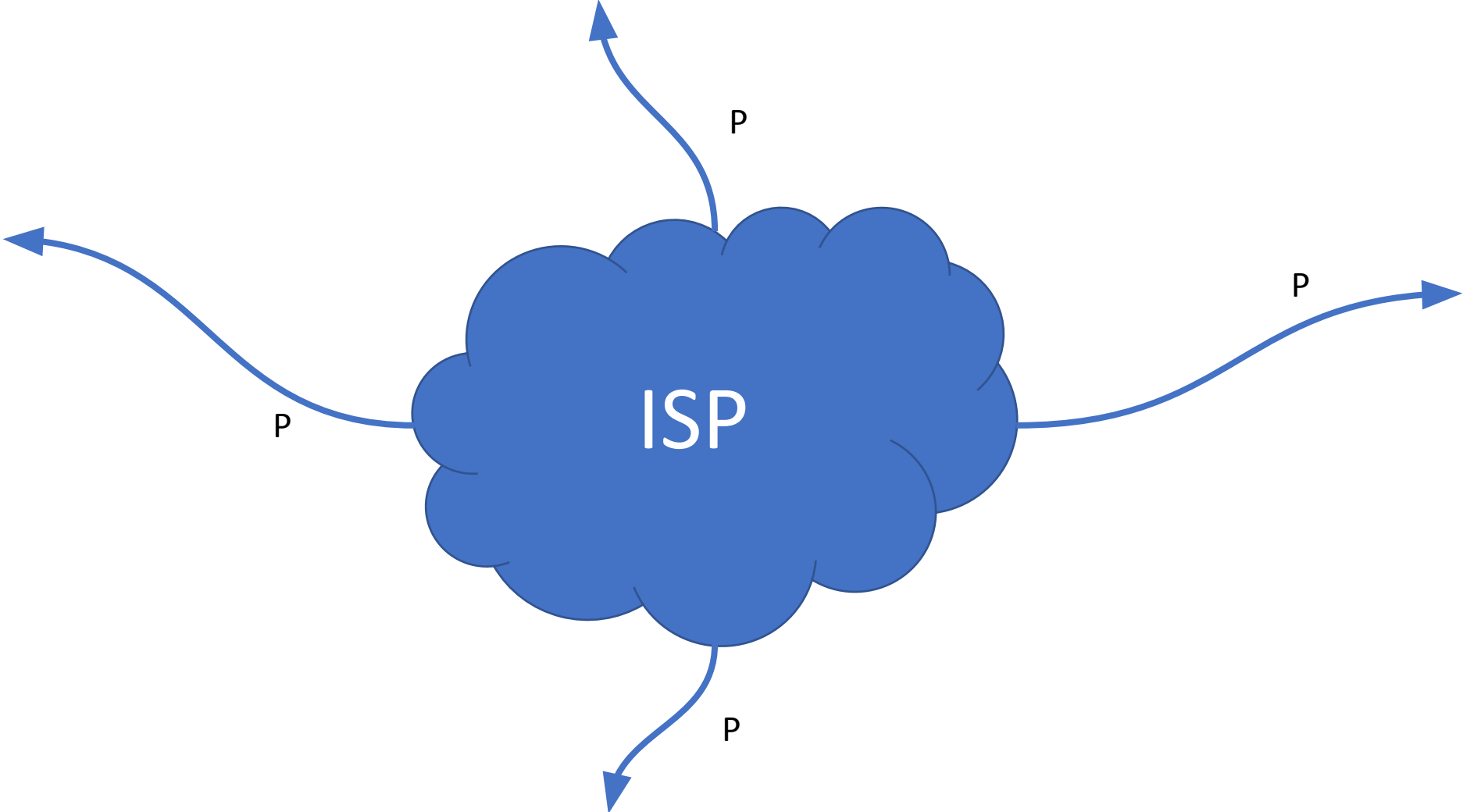
A long time ago...

- We changed to classless addressing (CIDR).
- We started aggregating and advertising prefixes.
- We talked about aggregating entire continents and regions but nothing happened.

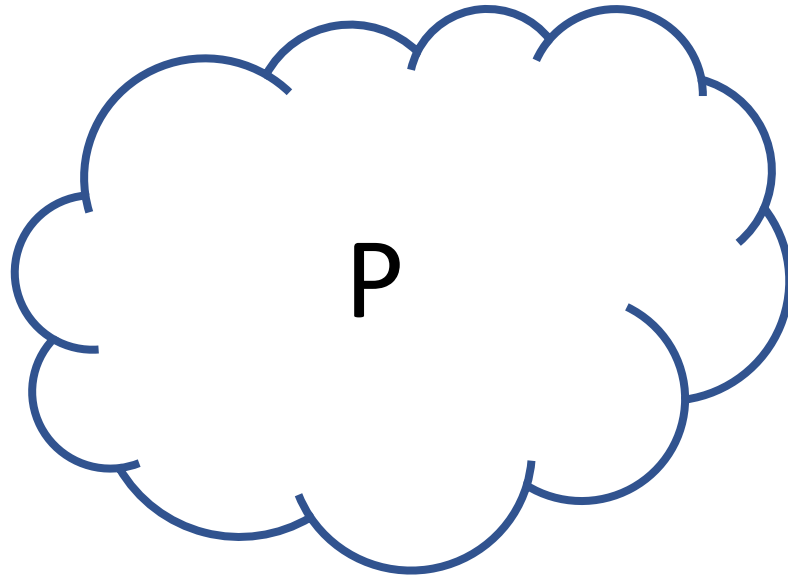
What's changed?

- 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?

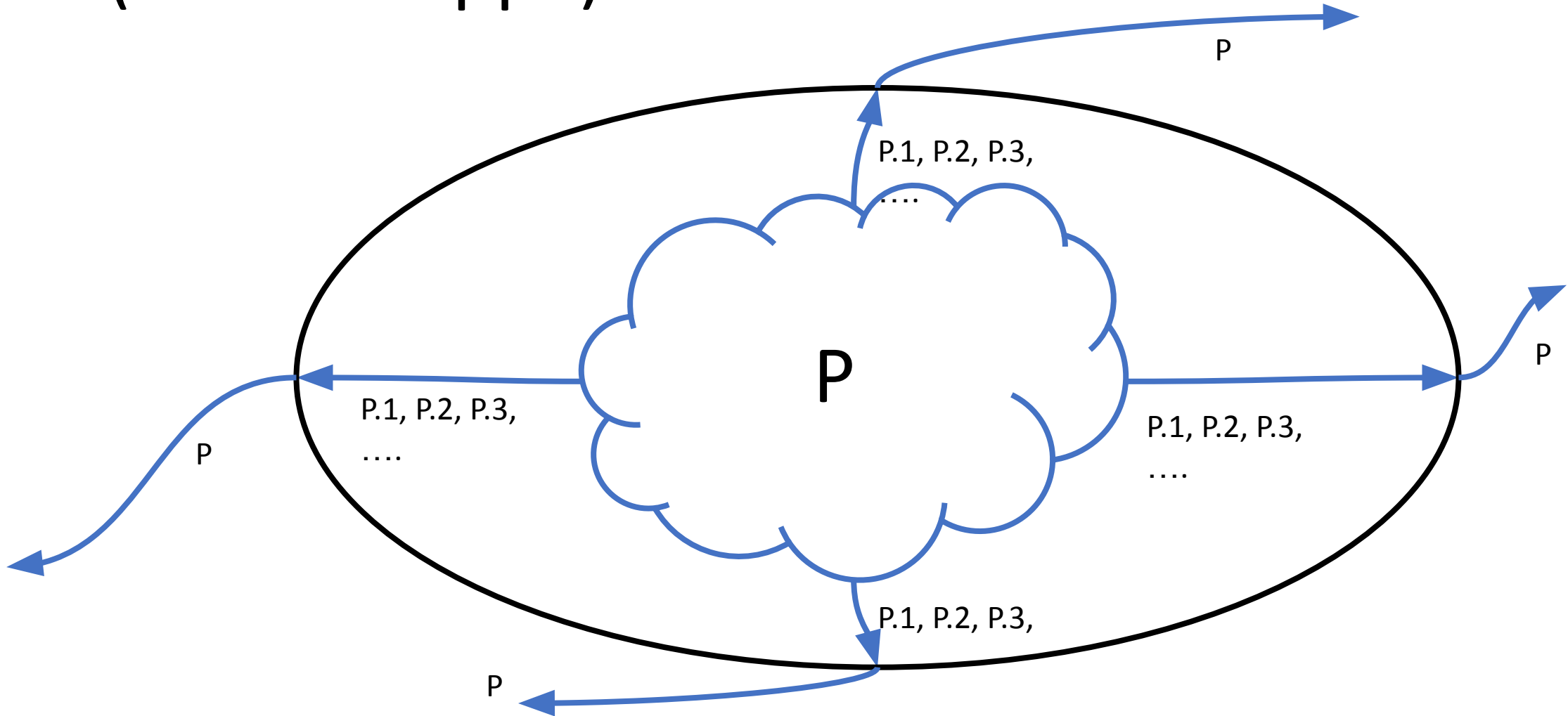
Traditional aggregation



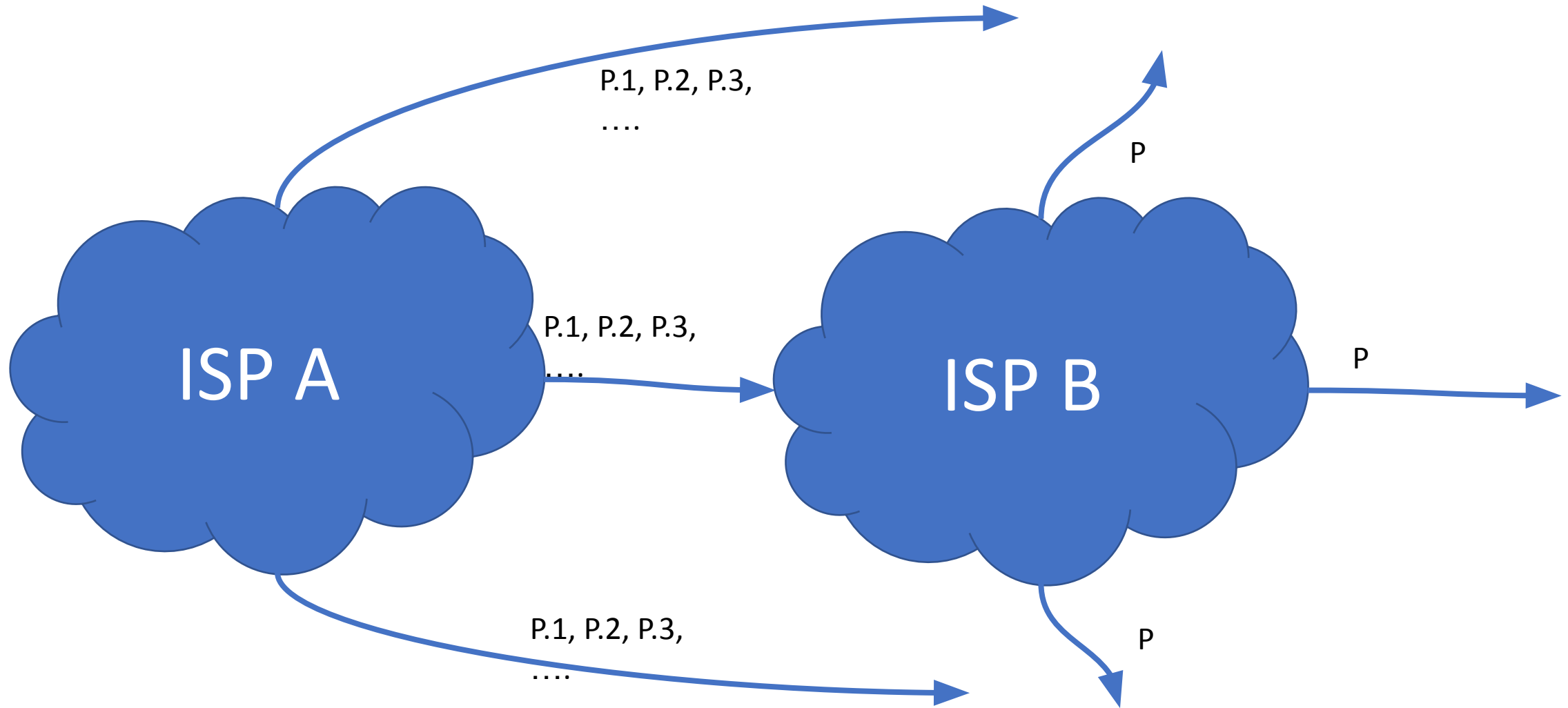
New concept: abstraction naming boundary



New concept: abstraction action boundary (Noel Chiappa)



What if ...?



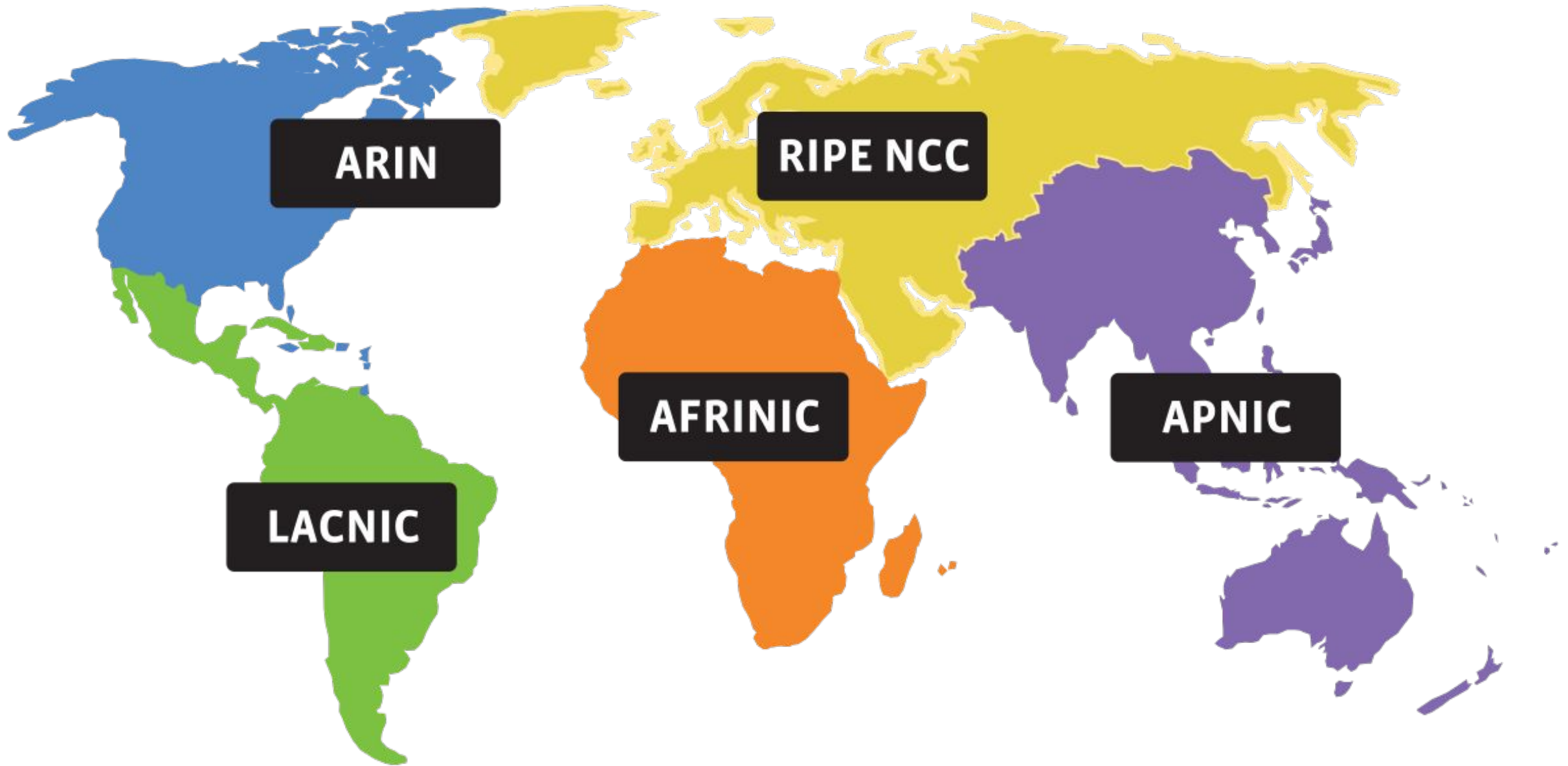
What if ... ?

- 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



ARIN

RIPE NCC

AFRINIC

APNIC

LACNIC



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 worst 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?