Negotiation-based Routing

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Two trends

1. Edge ISPs want more control
   - Not happy with default routing
   - Many valid paths go unused
   - Leading to multi-homing, overlays, RouteScience

2. The intermediate ISPs want more control
   - Senders unilaterally choose routes
   - Hard to traffic engineer
   - Has led to many hooks (MEDs, communities) in BGP

Need to tackle them together

The solutions:

1. Give more routing choices to edges
2. Get the intermediate and destination ISPs involved in route selection process
   - Negotiation with predictable outcome

- Solving just one of the two problems exacerbates the second

What is the ideal solution?

1. Distribute AS level topology
2. Advertise policy with edges
3. Each source computes policy conformant routes, and picks one or more it likes
4. For each route it wants to use, it gets it approved from all the ISPs in the route
   u Approval depends on the downstream ISP's traffic engineering goals
5. Use the approved routes

Summary

u Two somewhat conflicting trends

- Edge ISPs want more control
- Sources have too much control

u Routing should be viewed as an (online, predictable) negotiation between all the ISPs concerned

- Edges are free to use any valid path ……
- …… as long as the intermediate ISPs are fine with it