

Measuring Routing Policies

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Valley-free, prefer-customer, then prefer peer

- Rule of thumb for ISP routing policies
- Valley-free: don't advertise routes learned from one provider to another, don't advertise routes learned from one peer to another
- Prefer customer, then prefer peer; provider route used as last resort
- Applications: AS-relationships, modeling/simulation work all assume that this heuristic is globally used
- Our goal: Measure how often this heuristic actually holds in practice

Methodology

- Start with Routeviews/dRIPE datasets, identify peering ASes that provide full tables
- Infer AS relationships for these ASes using multiple AS-relationship inference algorithms
 - GAO
 - CAIDA's AS rank algorithm
- Find customer cone C_X of each AS X : Prefixes that can be reached from X using customer links
- Find peer cone R_X of each AS X : Prefixes that can be reached from X using peering links

Methodology contd.

- Identify anomalies for Routeviews/RIPE peer AS X
 - A prefix p in C_X that is reached via a peer or a provider
 - A prefix p' in R_X that is reached via a provider link
- “Conservative” approach: Report anomalies only if seen with each AS relationship algorithm
- We are focusing on the “prefer customer, then prefer peer” part of the heuristic

Traceroute

- Use traceroute to verify anomalies discovered in BGP data
- We have Ark monitors in a few (~15) ASes that provide routing feeds to Routeviews/RIPE
- Some ASes provide public traceroute servers; we have code that automates querying these servers and parsing results (~20 ASes)
- Do we see the same next hop towards anomalous prefixes in BGP and traceroute?

Digging into the data (after we collect it)

- Can we figure out what causes BGP anomalies?
 - Selective prefix announcement by customers
 - Local routing policy by providers that overrides the rule-of-thumb heuristic
- How different are BGP and traceroute? Why?
 - Different policies in different parts of the network
 - Do both BGP and traceroute use the same type of neighbor (peer/provider) towards anomalous prefixes?

Abrupt Ending..

- This is very much work in progress
- Feedback and comments welcome!