Analysis of paths selection modes for Add-Paths

draft-vvds-add-paths-analysis-00

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Goal

- `draft-ietf-idr-add-paths-01.txt`
- Defines how to advertise multiple paths to same NLRI over a BGP session
- Doesn’t tell which paths to select for advertisement
  - Multiple applications which lead to different selection modes
  - (maybe) No interop issues when different path selection modes are applied by speakers in an AS
Goal

• Informational draft
  • List the modes in one draft
  • Evaluate them (what it gives, what it costs)
  • Track potential interop issues
Add-path applications

• Fast Convergence
• Load Balancing
• Med Oscillation reduction
• Churn reduction (eBGP)
Evaluation

- Control plane charge
  - (#paths, not bytes)
- Control plane stress
  - Complexity of running a decision process
- Ability to avoid MED oscillations
- Path optimality
  - Ability to let one router pick the path it would have picked, had it known all the paths available at the borders
- Backup path Availability and Optimality
Modes

- All paths
- N paths (max)
- AS-Wide best paths
- Neighbor-AS group best paths
- Best Loc Pref / Second best Loc Pref paths
- Decisive step - l
- (put your favorite mode here)
Path optimality

• KO for N bests and Group best

• N Best should be good at making it with a reasonable value of N

• Ensured by all the others
Backup path optimality

- All paths: Yes
- N best: No but should be good at making it
- AS Wide best, Group Best: backup is optimal (when provided)
- Best/Second LP: Yes
- Decisive step - 1: Yes
RIB Charge

- N Bests mode gives you a bound on RIB charge
- In theory, others don’t (~All Paths)
- Decisive step - 1 < Best/Second LP
MED oscillations avoidance

• All but N-Best
Control plane stress

- Extremely implementation dependent
- How Adj-RIB-IN is maintained and optimized for add-paths
Control plane stress

- All paths: Easy
- Best/Second LP: Easy
- Decisive step - 1: too implementation dependent to be relevant
- N best: Depends on N
- Group Best: Hard
Tool

- Analysis can be performed
- Required Data gathering is painful
Next

• if there’s interest
  • new modes, maybe
  • modes to be ruled out, maybe
  • more details on each mode
  • consider that there’s no Ingress-Egress encap
  • interop issues (hope not)
  • -01 and wg doc?