BGP YANG Model
draft-ietf-idr-bgp-model-16

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Status (-16)

• Name change
  – YANG Model for Border Gateway Protocol (BGP-4)
Status (-16)

• Addition of two new modules
  – iana-bgp-notification
    • Better operational state
    • Includes NOTIFICATION message, Error Codes, and Error subcodes
  – iana-bgp-community-types
    • Definitions for BGP communities

• One sub-module
  – ietf-bgp-capabilities
Status (-16)

• **AS_PATH**
  – See proposal in appendix
  – Need to come up with RegEx
  – Discussion on following slides

• **IPv6 extended communities (RFC 5701)**

• **More counters**
  – neighbor counters

• **add-path was missing at global AFI/SAFI level**
Status (-16)

• Moved ttl security under transport
• Prefix limit feature rationalization
  – From threshold exceeded and teardown
  – To threshold exceeded, option to teardown or log
Status (-16)

• Moved out of the model
  – TCP-AO
  – MD5

They are in the TCP YANG Model

• Secure sessions
  – BGP identifies key chain for TCP-AO/MD5
AS_PATH Problem Statement

• Different ways of rendering received AS_PATH
  – Left to right
  – Leftmost is neighbor AS; prepended AS
  – No consistent way to render white spaces between AS numbers

• AS_PATH regex used in BGP policy
  – Character based tokens
  – Integer based tokens

• Why not POSIX?
  – Integer based tokens are a problem
  – grep is not the solution
  – YANG by default does not use POSIX

• Segment Types are ignored
AS_PATH Regex

• Need to standardize the format of AS_PATH
• Inspiration from - Routing Policy Specification Language (RFC 2622)
AS_PATH Regex Examples

- 64496
  - Matches the AS_PATH that contains at least one instance of 64496, regardless of its position.
- ^64496$
  - Matches the AS_PATH that is exactly one AS long, and that AS is 64496.
- ^64496$
  - Matches the AS_PATH where the left-most (neighbor) AS is 64496.
- 64496$
  - Matches the AS_PATH where the right-most (origin) AS is 64496.
- [64496 64500]
  - Matches the AS_PATH where at least one of the ASes is either 64496 or 64500.
- [^64496 64500]
  - Matches the AS_PATH where neither 64496 nor 64500 are present in the AS_PATH.
- [64496-64511]
  - Matches the AS_PATH where at least one AS number is in the range 64496..64511, inclusive. This matches the documentation AS numbers in [RFC5398].
- 64496 64500
  - Matches the AS_PATH where 64496 is present and immediately followed by 64500.
- 64496 | 64500
  - Matches the AS_PATH where 64496 or 64500 occur in the AS_PATH.
- ^64496 .{2} ( 64500 | [64505-64511] )
  - Matches the AS_PATH where the left-most (neighbor) AS is 64496, is followed immediately by any two ASes and either 64500 or an AS in the range 64505..64511.
Community Regex

• Like AS_PATH, need to standardize format of community regex.
• Many implementations have restrictions on what they can do.
• Solution: Restricted profile for POSIX.2 Extended Regular Expressions.
  – This would widely cover most implementations.
  – POSIX.2 extended regex is a well-known standard.
Community Regex (2)

Exclusions:

• Character class expressions (Section 9.3.5)
• Collating symbols (Section 9.3.5)
• Equivalence classes (Section 9.3.5)
• Back-reference expressions (Section 9.3.6)
Issues

• Tracked here
  – https://github.com/mjethanandani/ietf-bgp-yang/issues

• Major issue
  – Need AS_PATH regex expression ABNF (Issue #293)
  – Move key item to the top of list neighbors (Issue #340)

• Minor issue
  – Punctuation cleanup (Issue #68)

Everything else is an enhancement (to be tackled in a –bis or a new draft)
Next Steps

• 97% 99% there
  – Believe we are dealing with last set of issues
  – v17 will hopefully be the last WG version

• Chair ask
  – Identify shepherd (co-authors are also chairs)
  – YANG Doctor reviews. Have had 2 already
  – OpsDir review??
  – RtgDir review. Early review done.