BGP Prefix Origin Validation
draft-pmohapat-sidr-pfx-validate-02

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Approach

- Inline prefix validation
- Event-based validation on cache updates
Prefix validation Logic

1. query key = <BGP destination, masklen>, data = origin AS
2. result = BGP_PFXV_STATE_NOT_FOUND
3. walk prefix validation table to look for the query key
4. for each matched “entry” node in prefix validation table,
5. prefix_exists = TRUE
6. walk all records with different maxLength values
7. for each “record” within range (query masklen <= maxLength)
8. if query origin AS == record origin AS
9. result = BGP_PFXV_STATE_VALID
10. return (result)
11. endif
12. endfor
13. endfor
14. if prefix_exists == TRUE,
15. result = BGP_PFXV_STATE_INVALID
16. endif
17. return (result)
Max_len fud for thought

Options when validating 10/24, AS A:

if ROA exists for 10/(min=8, max=16), AS A

• NOT_FOUND (draft currently says this)
• INVALID (will be covered in use cases presentation)
Bestpath selection

• Path’s validation states:

```c
typedef enum {
    BGP_PFXV_STATE_VALID = 0,
    BGP_PFXV_STATE_NOT_FOUND = 1,
    BGP_PFXV_STATE_INVALID = 2,
} bgp_pfxv_state_e;
```

• Bestpath comparison

1. INPUT: received path, current bestpath
2. if either received path or current bestpath is IBGP learnt, skip this comparison and goto the next decision step.
3. if received path’s validation state < current bestpath's validation state
4. prefer received path
5. elseif received path's validation state > current bestpath's validation state
6. prefer current bestpath
7. else /* they're equal */
8. proceed with rest of BGP decision process
Config and Policy overrides

1. Disable prefix validation globally
2. Disable prefix validation per EBGP peer
3. Disable prefix validation for a set of prefixes

When disabled, the "state" of such EBGP learnt routes will be set to “not-found”

1. Allow "invalid" routes for bestpath selection
2. Disallow "not-found" routes for bestpath selection
3. Set arbitrary communities based on "validity state" on neighbor outbound for debugging purposes
Implementations available

- Prototype in Cisco IOS-XR of RPKI data
  - cache-to-router protocol (draft-ymbk-rpki-rtr-protocol)
  - BGP prefix validation

- Testing in progress at multiple locations. Trying to get some real RPKI repository set up

- Early results:
  < 10usec of overhead for prefix validation per route

- Sample XR configuration:
  ```
  router bgp <as#>
  bgp rpki cache <cache name> <port#> refresh-time <time>
  bgp bestpath prefix-validation {disable | allow-invalid | disallow-not-found}
  ```
Changes from -01

- Geoff Huston added as an editor for the document
- Changes in the decision process section to clarify that only EBGP paths are subject to prefix validation and their validation states are compared. There is no comparison of validation state between EBGP and IBGP paths
- Changes to the policy control section to indicate that the default validation state for routes for which prefix validation is disabled by policy is “not found”
Document Status

- Feedback please!
  - To authors or SIDR mailing list
- WG adoption