Uses Cases for
{Prefix, Origin} Validation

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Goals

- Systematically enumerate the situations or scenarios for {prefix, origin} validation

- But do not make a final recommendation on any RPKI interpretation at this point

- We have included some comments on plausible RPKI recommendations. However, it is fully acknowledged that these recommended RPKI interpretations can be overridden by ISP's local policy.

Taxonomy

Update prefix: Prefix seen in an update

ROA prefix: Prefix contained in a ROA

Covering Prefix: ROA prefix is a covering prefix for an update prefix if the ROA prefix in an exact match or a less specific when compared to the update prefix

No relevant ROA: It means that there is no ROA that has a covering prefix for the update prefix.

No other relevant ROA: It means that there is no other ROA (besides any that is(are) already cited) that has a covering prefix for the update prefix

Use Cases

1. Covering ROA Prefix, Maxlength Satisfied, and AS Match

2. Covering ROA Prefix, Maxlength Exceeded, and AS Match

3. Covering ROA Prefix, Maxlength Satisfied, and AS Mismatch

4. Covering ROA Prefix, Maxlength Exceeded, and AS Mismatch

5. Covering ROA Prefix Not Found

6. Covering ROA Prefix Not Found but ROAs Exist for a Covering Set of More Specifics

7. Update has an AS Set as Origin and ROAs Exist for a Covering Set of More Specifics

Feedback request: Any other {Prefix, Orgin} validation use cases that should be included?

Use Case 5

Covering ROA Prefix Not Found

Update has {240.1.1.0/24, Origin = AS65551}
No relevant ROA
Recommended RPKI prefix-origin validation
interpretation: TBC

Comment: In this case there is no relevant ROA that has a covering prefix for the update prefix. It could be a case of prefix or subprefix hijack situation, but this announcement does not contradict any existing ROA. During partial deployment, there would be some legitimate prefix-origin announcements for which ROAs may not have been issued yet. Recommended RPKI validation interpretation could be: Announced prefix-origin pair has 'no ROA'.

Use Case 6

Covering ROA Prefix Not Found but ROAs Exist
for a Covering Set of More Specifics

ROA: {10.1.0.0/18, maxlength = 20, AS64496}

ROA: {10.1.64.0/18, maxlength = 20, AS64496}

ROA: {10.1.128.0/18, maxlength = 20, AS64496}

ROA: {10.1.192.0/18, maxlength = 20, AS64496}

Update has {10.1.0.0/16, Origin = AS64496}

No other relevant ROA

Recommended RPKI prefix-origin validation

interpretation: TBC

Note: Algorithm is unlikely to look for ROAs for such more specifics.

Probably this case should also be regarded as partial deployment
('no ROA')?