

# Recent IRR changes


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# Internet Routing Registry (IRR)

- To publish your own routing intentions
  - route/route6
    - Specify the origin AS for an IP prefix
  - as-set
    - Specify a list of ASes to be advertised
- To construct route filters based on the registered objects
- APNIC IRR and RADB are popular IRR in AP region
  - Some NIRs are also operating its IRR such as JPIRR by JPNIC

# IRR as-set

- Publishing your advertisement in advance
- Important technical information exchanged when peering with peers and upstreams



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### Internet Initiative Japan

Organization	<a href="#">Internet Initiative Japan Inc.</a>
Also Known As	IIJ
Long Name	
Company Website	<a href="http://www.ij.ad.jp/en/">http://www.ij.ad.jp/en/</a>
ASN	2497
IRR as-set/route-set ?	JPIRR::AS-IIJ JPIRR::AS-IIJ6
Route Server URL	

SANOG41/INNOG7

```
as-set:      AS-IIJ
descr:      ASes routed by IIJ
members:    AS-IIJ-T1, AS2497,
            :
mnt-by:      MAINT-AS2497
source:      JPIRR
```

# APNIC IRR and Hierarchical as-set

- prop-151: Restricting non-hierarchical as-set
  - Reached consensus at APNIC 55 (2023)
- To fix the Name Collision Issue
  - AS-AMAZON, AS-TWITTER and so on...

```
as-set:      AS-AMAZON
descr:      Amazon ASNs
members:    AS-AMAZON-NA, AS-AMAZON-AP,
            AS-AMAZON-EU
admin-c:    AC6-ORG-ARIN
tech-c:     AC6-ORG-ARIN
:
mnt-by:     MAINT-AS16509
source:     RADB
```

```
as-set:      AS-AMAZON
tech-c:     DUMY-RIPE
admin-c:    DUMY-RIPE
:
mnt-by:     KATERINA-MNT
source:     RIPE
```

# Hierarchical as-set (RFC2622)

- Non-hierarchical as-set example
  - AS-APNIC (This is not an APNIC's as-set)
  - AS-4608 (APNIC's as-set, not in Hierarchical naming scheme)
- Hierarchical as-set example
  - AS17494:AS-CUSTOMERS
- **The notation is <AS#>:AS-<as-set name>**
  - Only that AS number's maintainer can create the object
  - Resolving Name Collision Issues

# Safe Transition Plan

- Step 1: Create a new Hierarchical as-set
  - Register a new as-set with Hierarchical naming scheme
    - Let's say it's AS2497:AS-IIJ
  - This has the same members as the existing as-set (AS-IIJ)
- Step 2: Make the old as-set a reference to the new one
  - Modify the member of the existing as-set as AS2497:AS-IIJ
  - Thereafter, only AS2497:AS-IIJ needs to be updated
- Step 3: Notify peers
  - Update the peeringdb information
  - Ask peers and upstreams to use to the new as-set
- Step 4: Delete the old as-set
  - Delete the old non-hierarchical as-set after this transition completes

## Our Current AS-SET (Non-hierarchical as-set)

```
as-set:      AS-IIJ
descr:      ASes routed by IIJ
members:    AS-IIJ-T1, AS2497,
           :
mnt-by:     MAINT-AS2497
source:     JPIRR
```



## New AS-SET (Hierarchical as-set)

```
as-set:      AS2497:AS-IIJ
descr:      ASes routed by IIJ
members:    AS2497:AS-IIJ-T1,
           AS2497,
           :
mnt-by:     MAINT-AS2497
source:     JPIRR
```

## For backward compatibility (Non-hierarchical) To be deleted after migration

```
as-set:      AS-IIJ
descr:      Please refer AS2497:AS-IIJ
members:    AS2497:AS-IIJ
mnt-by:     MAINT-AS2497
source:     JPIRR
```

# RADB and RPKI

- RADB migrated to IRRDv4 on November 13th, 2023
  - New features related to RPKI have been implemented
- route/route6 objects falling under RPKI Invalid
  - RPKI **Invalid** objects will no longer be visible in a query
  - Objects that have not\_found or valid RPKI will not be effected
  - Any new objects that are **Invalid** will be rejected and any modification of an existing **Invalid** object will be rejected as well



# ROA and RPKI ROV Invalid

- A route object registration that is inconsistent with the corresponding ROA will be rejected by RADB

★ ROA  
prefix: 1.1.1.0/24  
as: 13335

route: 1.1.1.0/24  
origin: AS13335  
source: RADB

→ Registrable

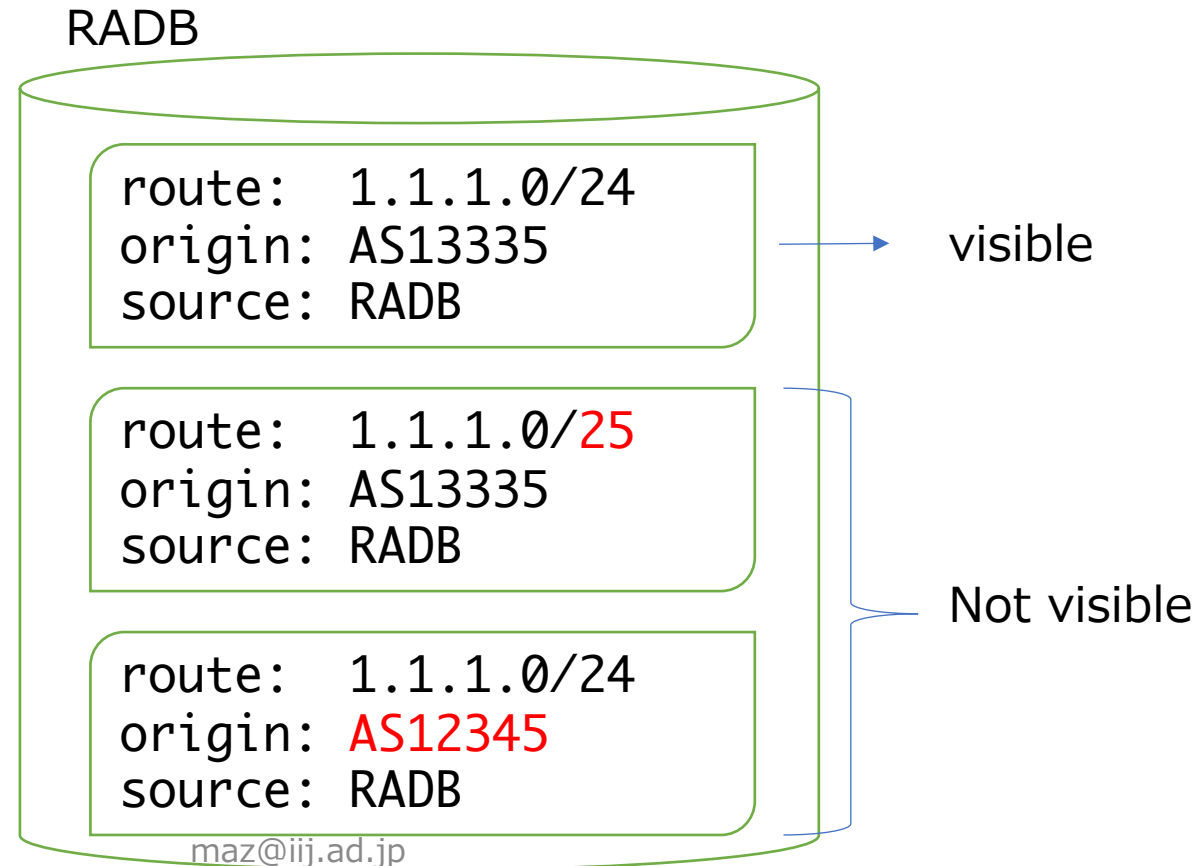
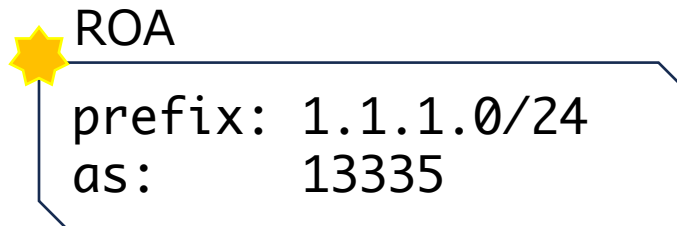
route: 1.1.1.0/25  
origin: AS13335  
source: RADB

route: 1.1.1.0/24  
origin: AS12345  
source: RADB

To be rejected

# ROA and RPKI ROV Invalid

- RPKI **Invalid** objects will no longer be visible in a query



# Creating a minimal ROA

- Assume we have the following ROA and route object

★ ROA

```
prefix: 2001:db8::/32
as:     64512
```

```
route: 2001:db8::/32
origin: AS64512
source: RADB
```

- If for some reason I want to create a route object with a sub prefix (/34), how should I modify/issue ROA?

## idea 1: max-length

★ ROA

```
prefix: 2001:db8::/32
as:     64512
max-length:34
```

## idea 2: additional ROA

★ ROA

```
prefix: 2001:db8::/32
as:     64512
```

★ ROA

```
prefix: 2001:db8::/34
as:     64512
```

# Summary

- APNIC account holders are only permitted to create hierarchical as-sets at APNIC IRR
- For transition, Safe Transition Plan (P.6) is available
- RADB is rejecting RPKI ROA Invalid
  - This protects you because no one can register a route object that is inconsistent with the ROA!
- Keep your ROA minimal as possible to protect your network