



---

# Vocus RPKI Implementation

Phil Mawson

29<sup>th</sup> February 2024

VOCUS

# Design Decision

Multivendor (Cisco, Juniper, Arista, Nokia)

International (Australia, NZ, US & Asia)

Security Concerns

Centralised Management & Monitoring

What validator software to use

	IOS	XR	JUNOS
SSH	NO	YES	NO
TLS	NO	NO	NO
TCP	YES	YES	YES
TCP-MD5	NO	NO	NO
TCP-A0	NO	NO	NO
IPsec	NO	NO	NO

## Validator Software

NLNet Labs Routinator – Very community focussed

*Join their RPKI Discord Server*

Fort

OctoRPKI

open-rpki (with StarRTR)

4826 & 9443 Routers



rtr

Location 1: Sydney



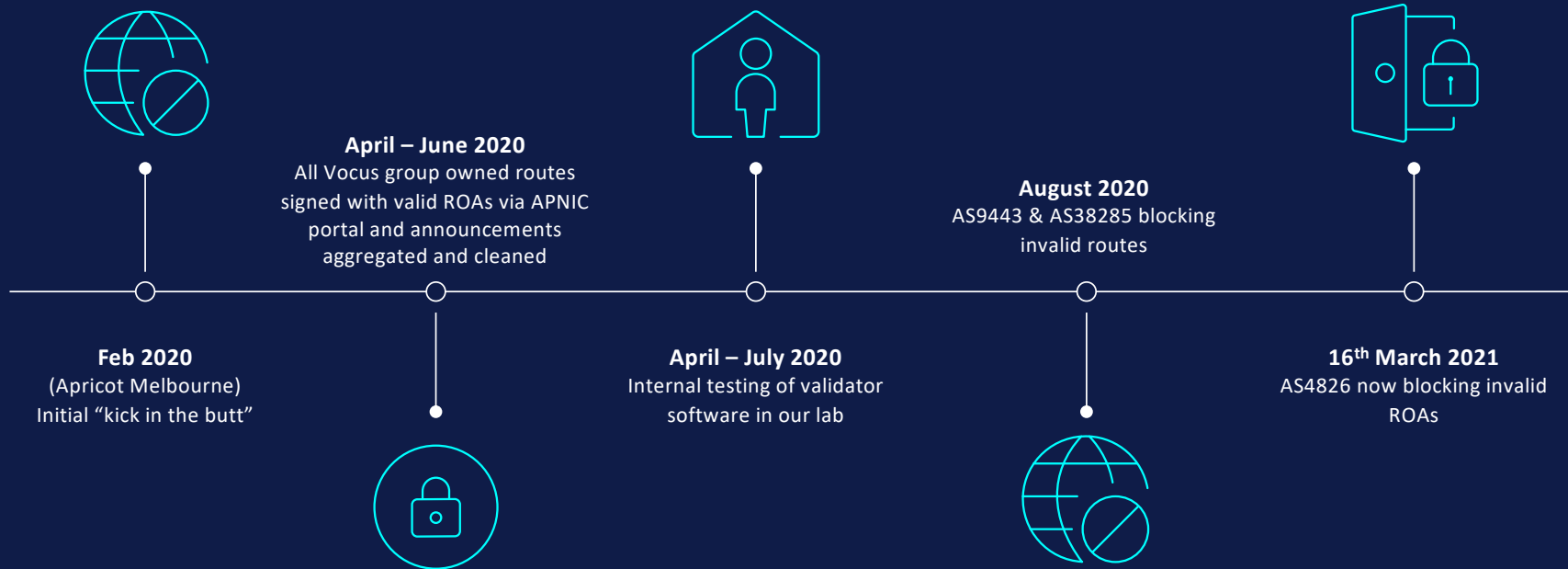
Location 2: Melbourne



rsync/rrdp



# Timeline



## Aggregation of routes and IRR Clean up

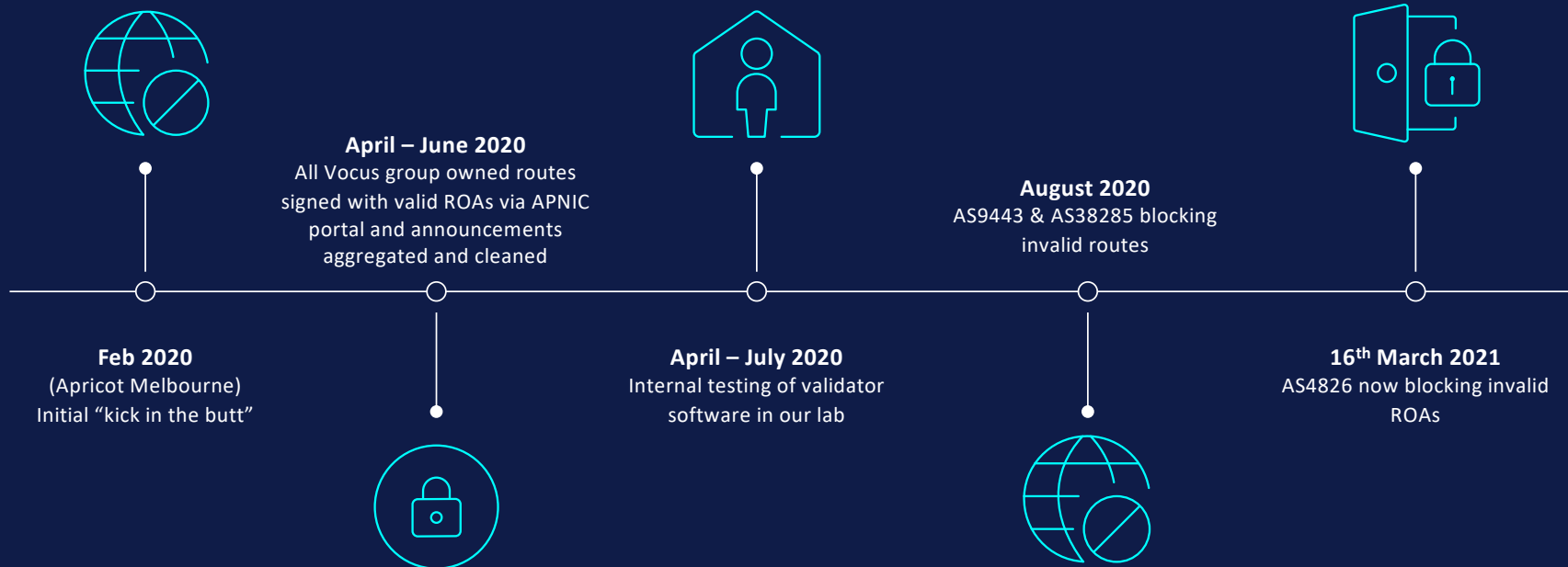
AS9443 routes were aggregated as highly as possible, we remove approx. 60% of the announced routes into global table.

Any Vocus Owned route now have their WHOIS object via APNIC and removed from many third party data sources (RADb, REACH, NNT, Level3). Single source of truth

As of end of 2023, Vocus has exited RADb for all, including proxy.



# Timeline



## Lessons Learnt

OpenSource software can be EOL'd very quickly

- RIPE Dropped their validator support end of 2020
- Louis left Cloudflare, leaving GoRTR un-maintained. This was later forked to StayRTR

Java Sucks (Who didn't know this already)

- RIPE Validator UI was built on Java, often would crash and require process restart

Clean your IRRs

- APNIC make it very easy to create those objects in their portal.
- Trust a RIR over RADb



## Limitations Learnt

### Cisco

- Unable to set source address for validation session  
Bug CSCvg37740 and resolved in 6.7.1
- If session to validator server lost, cache may not be re-built locally  
Bug CSCvp82287 and resolved in a number of versions
- Stale sessions - waiting for Cisco to ack

### Juniper

- Only support clear text (no SSH unlike Cisco)  
Not resolution for this yet, is a feature request

## Stale Sessions Learnt

### Cisco & Stale Sessions

```
RP/0/RSP0/CPU0:bdr02-per02#show bgp rpki table  
154.197.42.0/24 max 24  
Mon Jan 29 03:10:55.423 UTC
```

```
RPKI ROA entry for 154.197.42.0/24-24  
Origin-AS: 49981 from syd02  
Origin-AS: 49981 from mel02  
Origin-AS: 49981 from syd01  
Origin-AS: 58460 from mel01
```

# Stale Sessions Learnt

## Cisco & Stale Sessions

```
RP/0/RSP0/CPU0:bdr02-per02#show bgp rpki server sum
```

```
Mon Jan 29 03:18:55.423 UTC
```

Hostname/Address	Transport	State	Time	ROAs (IPv4/IPv6)
mel01	TCP:8323	ESTAB	2w2d	416835/99458
mel02	TCP:8323	ESTAB	2w2d	416906/99734
syd01	TCP:8323	ESTAB	2w4d	416835/99458
syd02	TCP:8323	ESTAB	15w6d	412726/98331

# Monitoring



**BGP Alerter** APP 15:35

**rpki**

The route 202.43.86.0/24 announced by AS4826 is not RPKI valid. Valid ROAs: 202.43.86.0/24|AS45947|maxLength:24. Top 3 most used AS paths: [3356,4826], [8220,4826],[8758,6830,3257,4826].



**BGP Alerter** APP 15:57

**visibility**

The prefix 202.43.86.0/24 (CUSTOMER) has been withdrawn. It is no longer visible from 40 peers

## Internal Issue monitoring

vMX receiving our routes monitoring for invalids.

BGP Alerter

Thresholds on Routinator for number of clients via Grafana

# Updated Looking Glass in 2022 – lg.vocus.network

The screenshot displays the VOCUS Looking Glass interface. At the top, there are navigation tabs: "BGP Route" (selected), "Query Type", "111.220.0.0/16" (Target), "Global", and "Routing Table". Below this, two panels are shown for "Perth" and "Sydney", each with a green checkmark and a dropdown arrow. Each panel contains a table with the following columns: Prefix, RPKI State, AS Path, Next Hop, Weight, Local Preference, and MED. The data for both locations is as follows:

Prefix	RPKI State	AS Path	Next Hop	Weight	Local Preference	MED
111.220.0.0/16	✓	9443	114.31.206.78 (Perth) / 114.31.192.8 (Sydney)	170	400	0

Below each table is a pagination control showing "Page 1 of 1" and a "Show 5" dropdown menu. At the bottom of the interface, there is a footer with links for Help, Terms, Vocus, PeeringDB, Peering Policy, RPKI Information, and BGP Communities, along with a moon icon for dark mode.



The image features a dark blue background with several overlapping, wavy, semi-transparent shapes in shades of blue and teal. These shapes have a fine, grid-like texture. In the center, the text 'V:CUS' is displayed in a white, sans-serif font. The colon in the logo is replaced by a cluster of seven small white dots arranged in a 2-3 pattern.

V:CUS

V:CUS