Route Filtering at the Edge AS15169
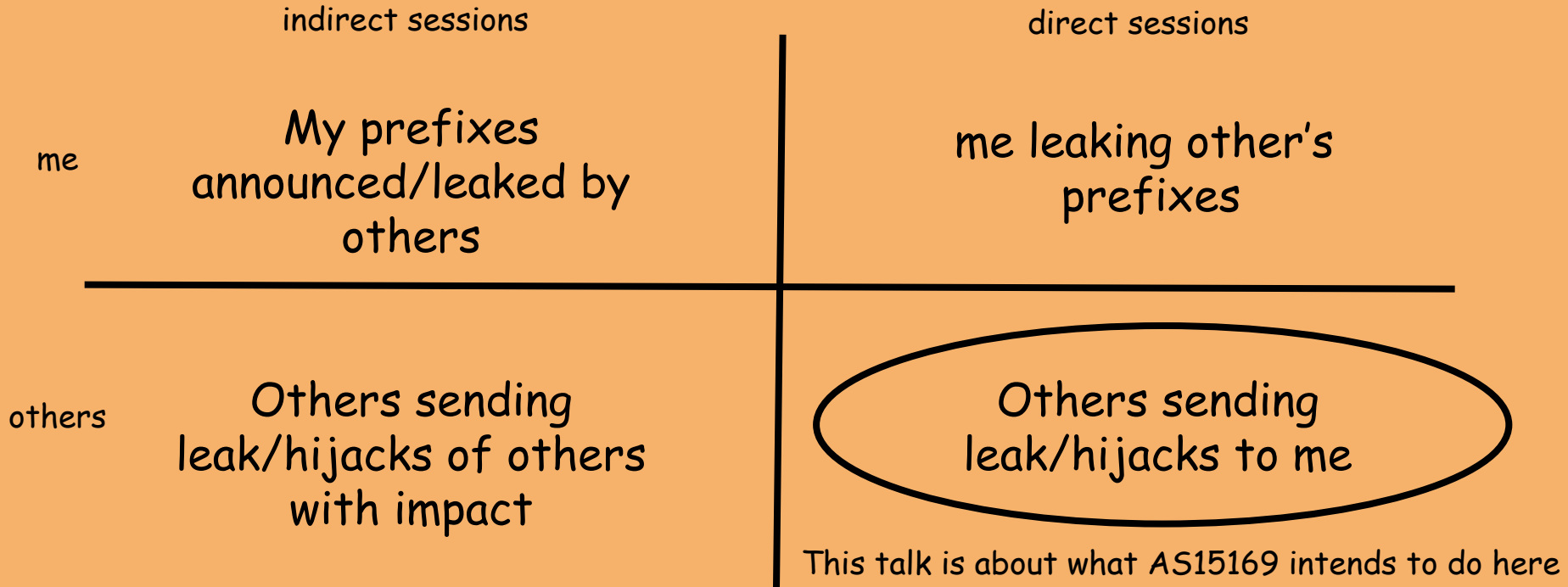
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AusNOG 2019

Background

Do I need to explain

why routing security matters?

The problems

	indirect sessions	direct sessions
me	My prefixes announced/leaked by others	me leaking other's prefixes
others	Others sending leak/hijacks of others with impact	Others sending leak/hijacks to me

This talk is about what AS15169 intends to do here

So in 2019

AS15169 will start to apply stricter

filters to BGP announcements

on all peering sessions

Route Intent Data Sources

IRR, RPKI, <internal TE>

- IRR data for what peers think they will be sending
- RPKI data where available to validate IRR data
- Internal TE sources to limit further if required

The Action Plan

1. Notify peers (howdy!)
2. Collect data regularly (daily?)
3. Parse and place into internal data service
4. Create per-ASN filter content
5. Apply changes to network device(s)
6. Mark today, drop tomorrow

User Interface & Notifications

- https://isp.google.com
- Roadmap:
  - Display current data for your ASN
  - 'update my filters because I updated my data' requests by peer(s)
- Feedback needed!

Data Collection

- IRR data is relatively easy to find:
  - ftp://ftp.radb.net/
- Other IRR databases:
  - RADB, RIPE, APNIC, ARIN and NTT and others
  - full list: see the ISP Portal
- Need another one? Let us know!
- AS-SET from PeeringDB record

Parse IRR data

- IRR data is generally formatted
    - Follow the AS (aut-num) -> AS-SET
    - 'Everyone' keeps theirs updated, right?
- What tooling exists for this today?
    - Irrtoolset - no
    - Bgpq3 - not usable (internal problems)
    - local IRRd - doesn't actually solve the problem of making the data available to the other tooling used
    - ISOC/MANRS is coordinating some data:
        - github.com/manrs-tools/…

Create per ASN filter

Vendor Neutral Formatting

- OpenConfig(OC)
  - Request from the internal (google) service owners
  - Output for configuration generation system in OC form
  - Internal tooling already knows OC
- Output: prefix-lists and and matching policies

Tentative Timeline

Research ⬅ You are here

Marking ⬅ End of Q3/2019

Depref invalids ⬅ Q4/2019 - Q1/2020

Drop invalids ⬅ TBA

FAQ (1)

Q: I do not have any IRR object. Would AS15169 accept my prefixes?

A: No. If you do not have any IRR object AS15169 won't accept any routing data from the BGP session(s) with your ASN.

FAQ (2)

Q: I modified some IRR objects. How long would take Google to process it?

A: We automatically process new data every day, so allow a period of 48hrs for our systems to update. If you encounter any problem or you have an emergency please contact the NOC.

FAQ (3)

Q: Where can I find more information and updates?

A:
- https://peering.google.com for general information
- https://isp.google.com for specific information about your network
- https://support.google.com/interconnect

Check Your Prefix Validity

- Google ISP Portal (coming soon!)
  - https://isp.google.com/bgp/
- IRR Explorer NLNOG
  - http://irrexplorer.nlnog.net/
- RIPE RIS Routing Consistency
  - https://stat.ripe.net/widget/as-routing-consistency

Want to Peer with AS15169?

- Check your PeeringDB record up to date.
- Check your IRR objects:
-     Maintainer, ASN, AS-SET, and Route/Route6
- Check our peering locations at https://www.peeringdb.com/asn/15169
- And then, only then go to https://peering.google.com/iwantpeering

What Else Are We Working On?

- Preventing ourselves from being the leaker:
  - Signing ROAs and cleaning up the data
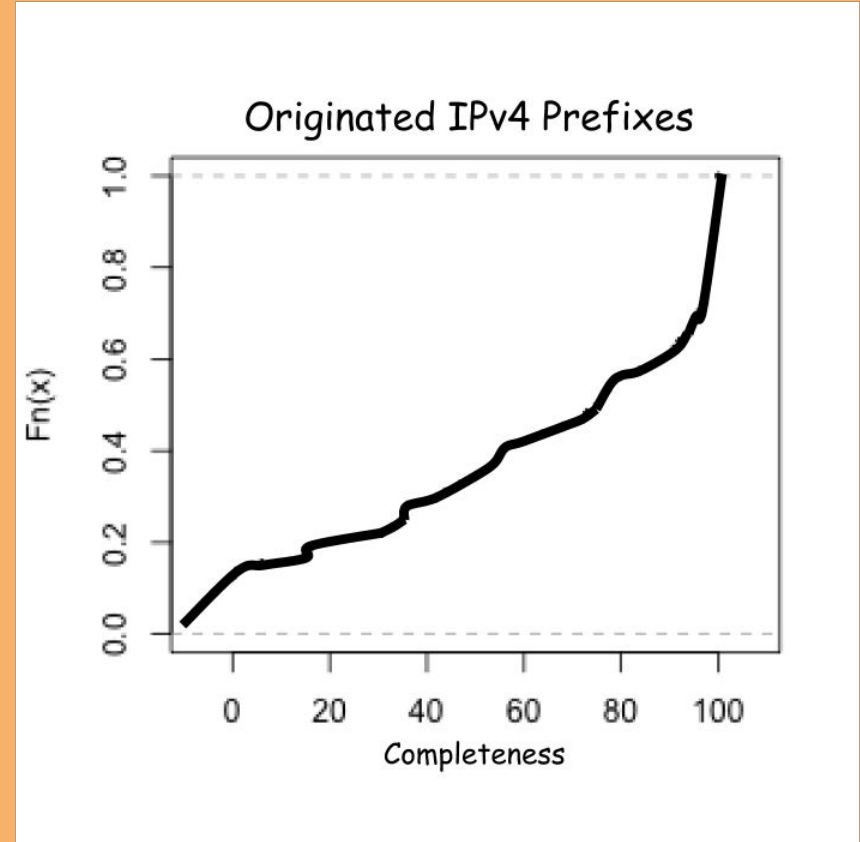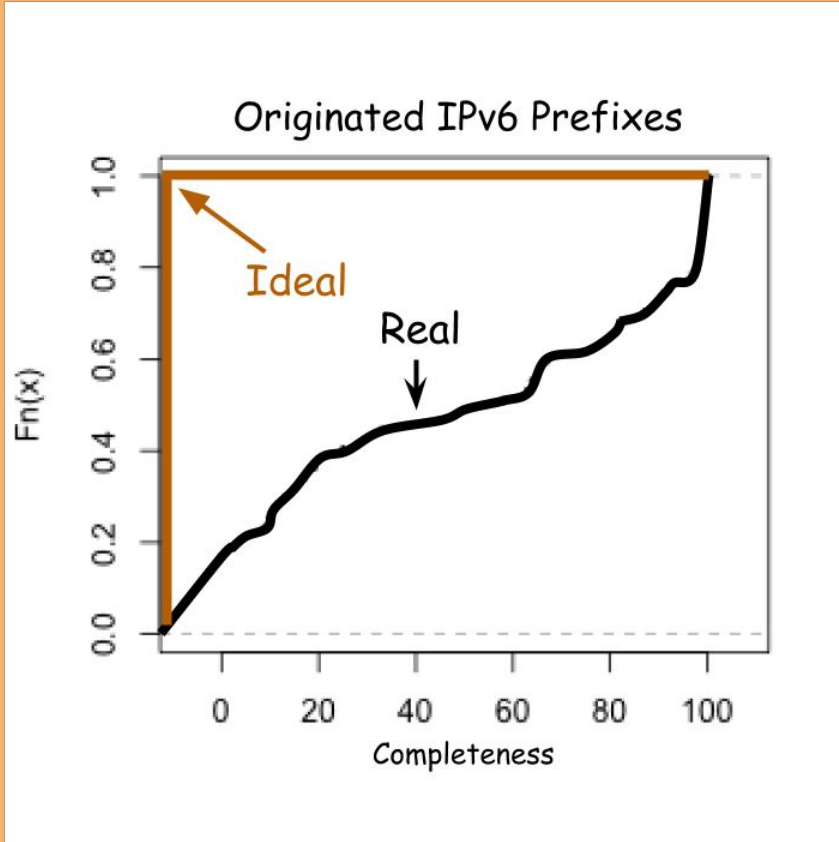 - Implementing this into our peering policy
- Participating in MANRS
  - https://www.manrs.org

Metrics

AS Completeness:

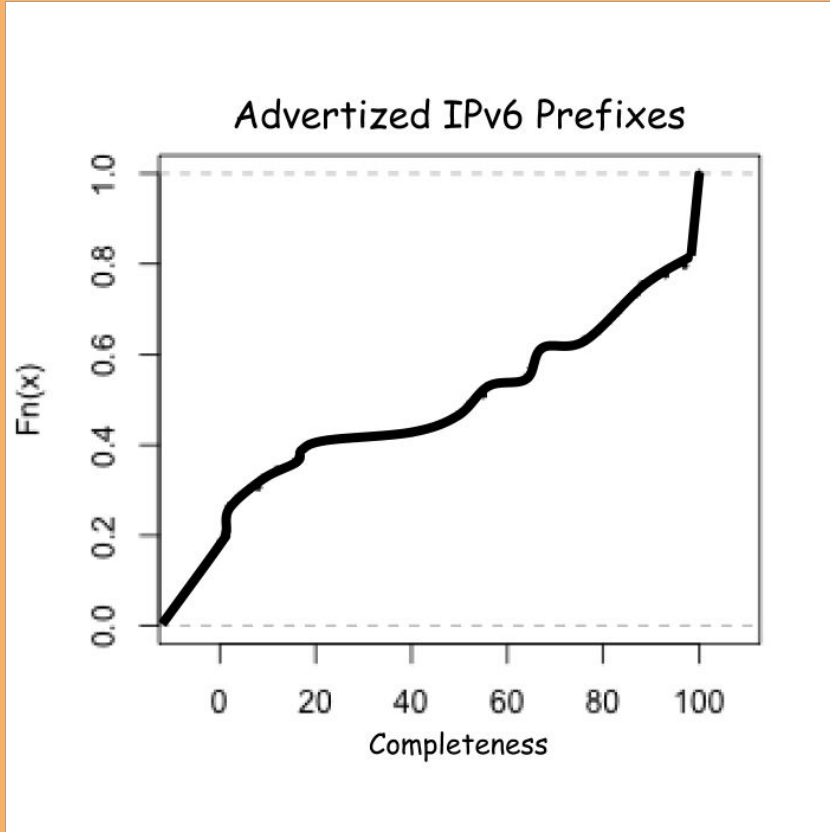# of valid$^{(*)}$ prefixes/# of all prefixes

(*) exists in IRR for the AS

How is Australia looking?

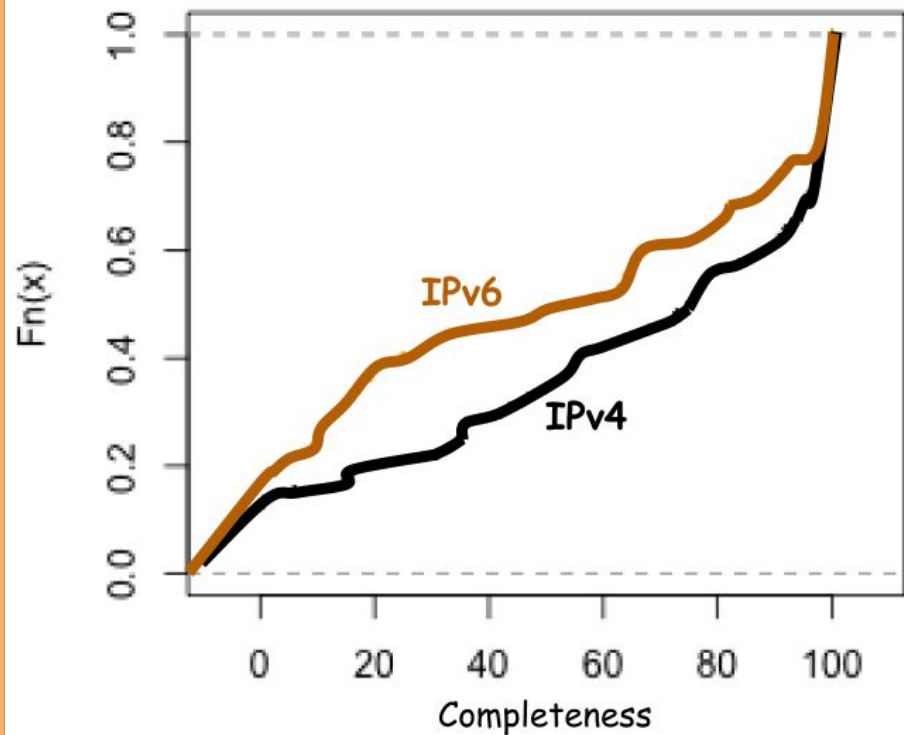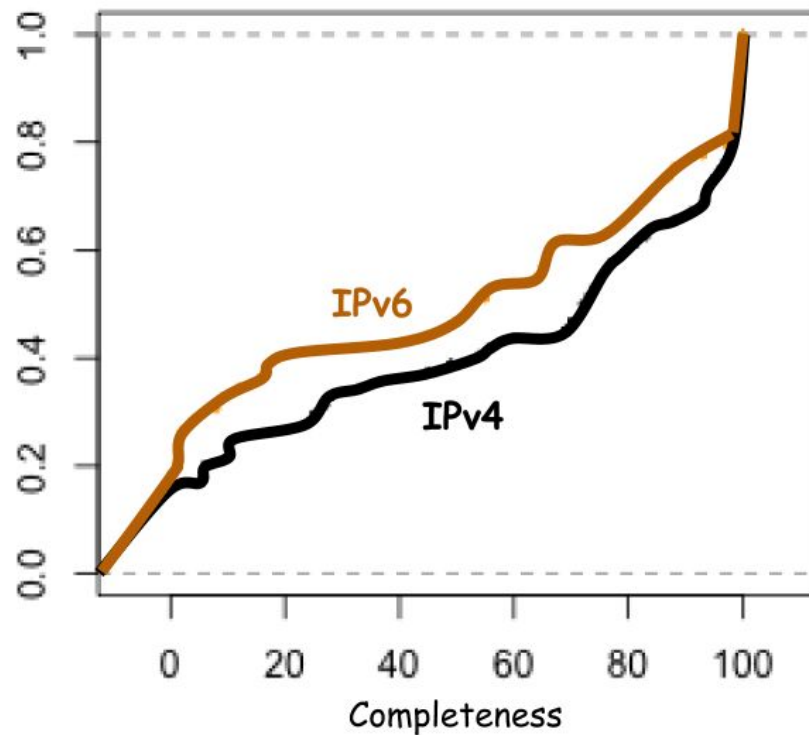# Cumulative Distribution Graph for Completeness

Cumulative Distribution Graph for Completeness

Originated Prefixes

Fn(x) vs Completeness

IPv6

IPv4

Advertized Prefixes

Fn(x) vs Completeness

IPv6

IPv4

Questions?