3 tips for managing your AS-SET

Telia Company

What *is* an AS-SET?

— BGP: AS_SET

  — Will show up in { } in your router

  — Never used

Chapter 2: The BGP Protocol 47

AS-PATHs are different, the aggregate and by the router have an AS-PATH attribute of "{100, 47} 200 15". The "{100, 47}" is encoded as an AS-SET, and the "200 15" is encoded as an AS-SEQUENCE. The

— IRR DB: AS-SET

  — e.g. RIPE DB

```
as-set:        AS544:AS-TELIA
descr:         Telia International Network
org:           ORG-SA28-RIPE
members:       AS-TELIANETSE
members:       AS-TELIANETSE-V6
members:       AS-TSF-CUSTOMERS
members:       AS-TELIANORWAY
members:       AS-ESTPAK
members:       AS-LTELECOM
admin-c:       TR889-RIPE
tech-c:        TR889-RIPE
mnt-by:        DATANET-NOC
mnt-by:        TELIANET-RR
mnt-by:        TELIANET-LIR
created:       2025-05-02T09:25:15Z
last-modified: 2025-05-02T09:25:15Z
```

AS-SET use-cases

1. Customers

- Announcements towards IP transit
- Most common use-case by far.

2. Peers / Peering-routes

- Useful for whom?
- Neat RPSL definitions, and so what?

3. IXP members

- Used to filter your BGP session to the route-server
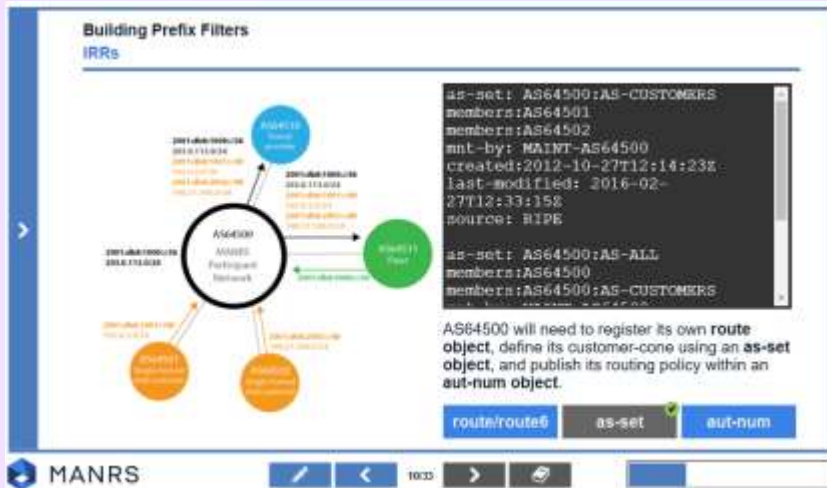
AS-SET use-cases

1. Customers

— Documents your upstream announcements
— Upstream providers will use this to create filters

— Most AS-SETs are this type!

2. Peers

— Documenting peering
— Used in RPSL documentation

— Does anyone *actually* use this for filtering??
— Cause for confusion

Harmful?

3. IXP members

— IXP
— Used to filter your BGP session to the route-server

3 tips for managing your AS-Set

1. Your AS-set purpose

2. What are you including?
   — Beware of the size!
   — Bigger is not better!

3. Who are including you?

3 tips for managing your AS-Set

1. **Understand your AS-set purpose**

2. What are you including?

3. Who are including you?

— What are you documenting here?
— Will this AS-set actually be used by anyone to generate filters?
  — If not, maybe you are just creating more confusion?

3 tips for managing your AS-Set

1. Understand your AS-set purpose

2. **What are you including?**

3. Who are including you?

— Beware of the size!

— Bigger is not better.

— Recursive references are powerful and dangerous.

— The bigger your AS-set, the more threat to routing security.

— Clean up regularly.

— A lean as-set improves routing security!

— This is your contribution to the routing security for everyone else.

3 tips for managing your AS-Set

1. Understand your AS-set purpose

2. What are you including?

3. **Who are including you?**

— This is where you get to police everyone else.

— Unfortunately no automatic approval available.

— If your ASN/AS-set is included in someone elses policy, then your routes will be accepted by their upstream.

— Every inclusion, is a potential BGP hijack/leak affecting your customers.

Further reading

— [DKNOG15: Prelude to a BGP hijack?](https://events.dknog.dk/event/32/contributions/297/)
— https://events.dknog.dk/event/32/contributions/297/

— [The Scourge of Excessive AS-SETs | Kentik Blog](https://www.kentik.com/blog/the-scourge-of-excessive-as-sets/)
— https://www.kentik.com/blog/the-scourge-of-excessive-as-sets/

— [Module 2: IRRs, RPKI, and PeeringDB – MANRS](https://manrs.org/resources/training/tutorials/irrs-rpki-peeringdb/)
— https://manrs.org/resources/training/tutorials/irrs-rpki-peeringdb/