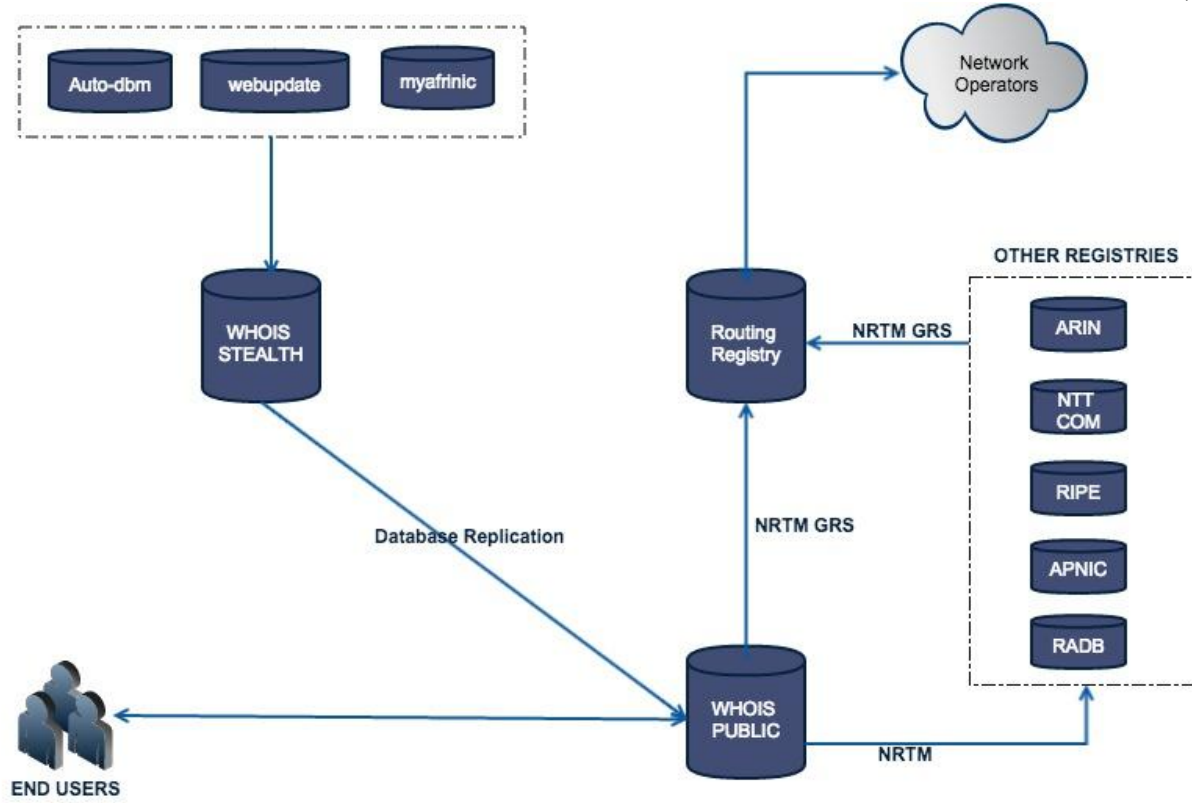


AFRINIC Internet Routing Registry

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CEO AFRINIC

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September 2018

AFRINIC Routing Registry Overview



Example IRR Objects (many details omitted)

```
route: 192.0.2.0/24  
origin: AS64496  
mnt-by: EXAMPLE1-MNT  
source: AFRINIC
```

```
route6: 2001:db8::/32  
origin: AS64496  
mnt-by: EXAMPLE1-MNT  
source: AFRINIC
```

```
inetnum: 192.0.2.0/24  
mnt-by: AFRINIC-HM-MNT  
mnt-lower: EXAMPLE1-MNT  
mnt-routes: EXAMPLE1-MNT  
source: AFRINIC
```

```
inet6num: 2001:db8::/32  
mnt-by: AFRINIC-HM-MNT  
mnt-lower: EXAMPLE1-MNT  
mnt-routes: EXAMPLE1-MNT  
source: AFRINIC
```

```
aut-num: AS64496  
mnt-by: AFRINIC-HM-MNT  
mnt-routes: EXAMPLE1-MNT  
import: ...  
export: ...  
source: AFRINIC
```

```
mntner: EXAMPLE1-MNT  
mnt-by: EXAMPLE1-MNT  
auth: MD5-PW $1$xxxxx  
source: AFRINIC
```

AFRINIC IRR Features



- **Open** to AFRINIC Resource members and Legacy Resource Holders in AFRINIC service region. The AFRINIC IRR is a **free** service
- AFRINIC IRR is **mirrored** by the other IRRs such as APNIC, RIPE NCC, NTTCOM, AMS-IX, Work Online(SA), Moscow IXP and RADB.
- **Stable** and **secure** source of routing information. **No downtime** recorded since the go-live of the AFRINIC IRR
- **Easy to Use:** AFRINIC IRR is a one-stop-shop as it is part of the AFRINIC WHOIS service.
- AFRINIC is the **single point of contact** for both Internet Resource Management and Routing Registry

Adoption of the AFRINIC IRR

AFRINIC encourages adoption of the IRR through:

1. BoFs at AFRINIC meetings and outreach at regional events
2. Tools to ease replication of existing Route(6) objects to AFRINIC IRR
3. During IRR tutorials and workshop:
 - Inform the community the AFRINIC IRR is ready and invite members to use it
 - Provide support to replicate existing route(6) objects on AFRINIC IRR
 - Encourage resource members to clean up the various registries to avoid inconsistencies using tools such as <http://irrexplorer.nlnog.net>

Adoption of the AFRINIC IRR

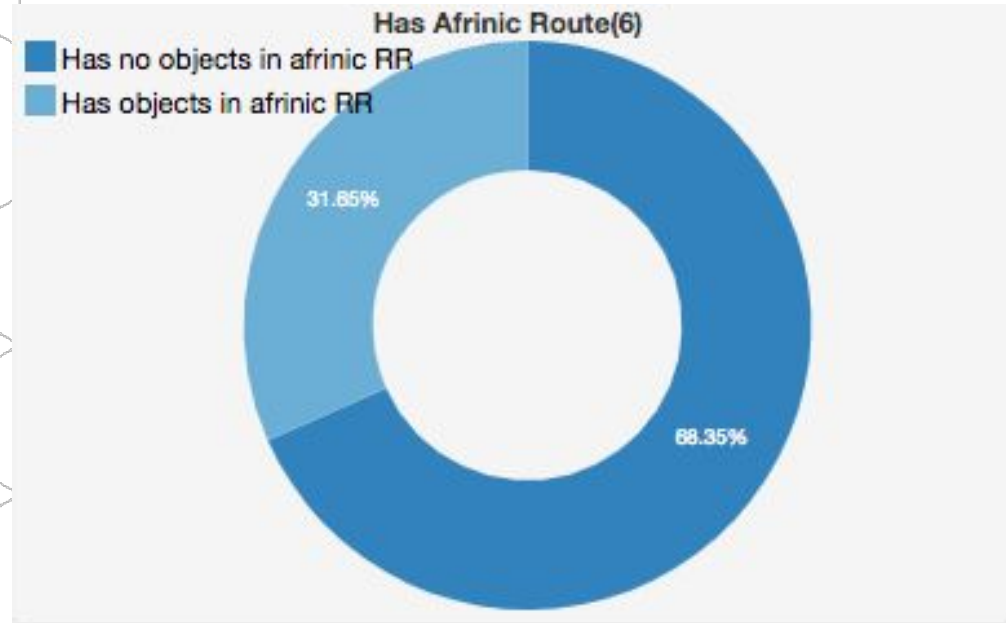
32% of AFRINIC members (338) adopted the IRR @20 Sept 2018

23% of AFRINIC members (277) adopted the IRR @Aug 2018

We target adoption by at least 50% of AFRINIC members in the next 12 months

Majority of AFRINIC members are still using RIPE NCC IRR (free service)

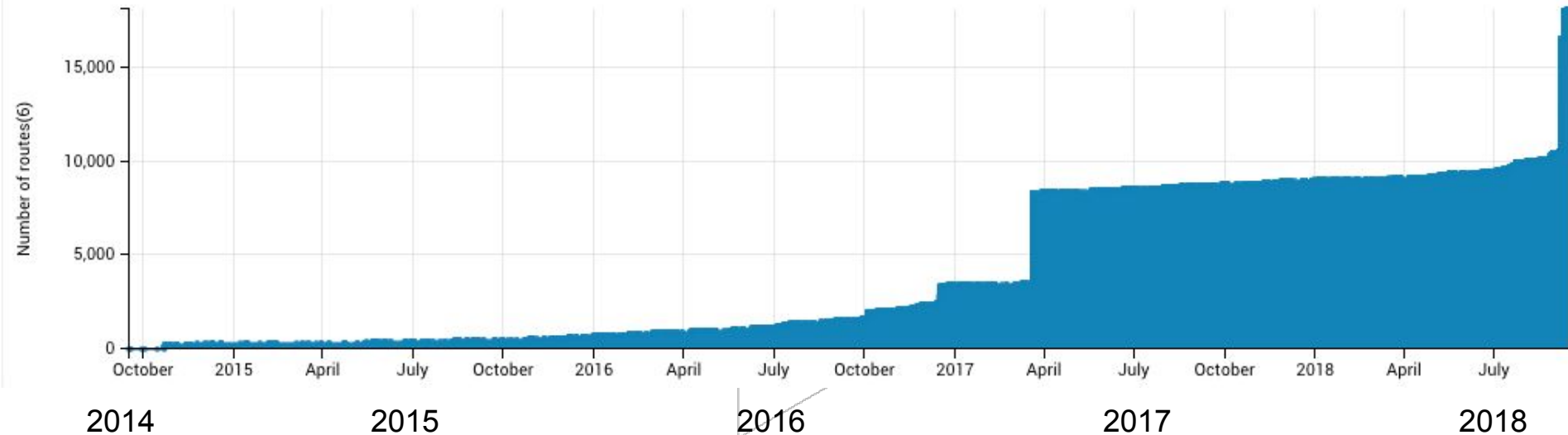
Some members use **paid** IRR services.



Adoption of the AFRINIC IRR

Route(6) objects creation over time show a slow adoption by AFRINIC resource holders. But after the NWI-5 changes were implemented at RIPE NCC, a sharp increase has been observed.

Route(6) cumulative chart



RIPE NCC Announcements

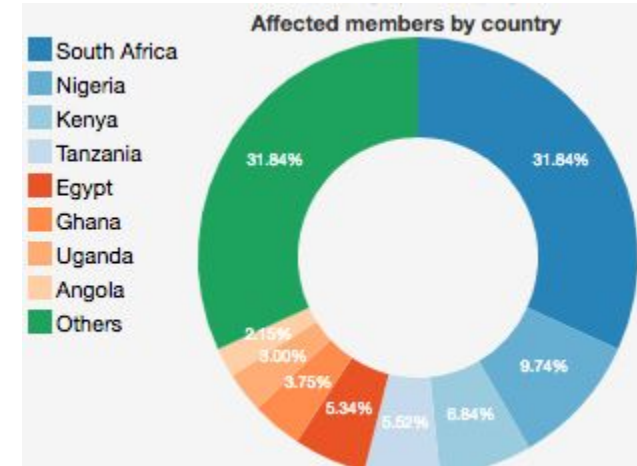
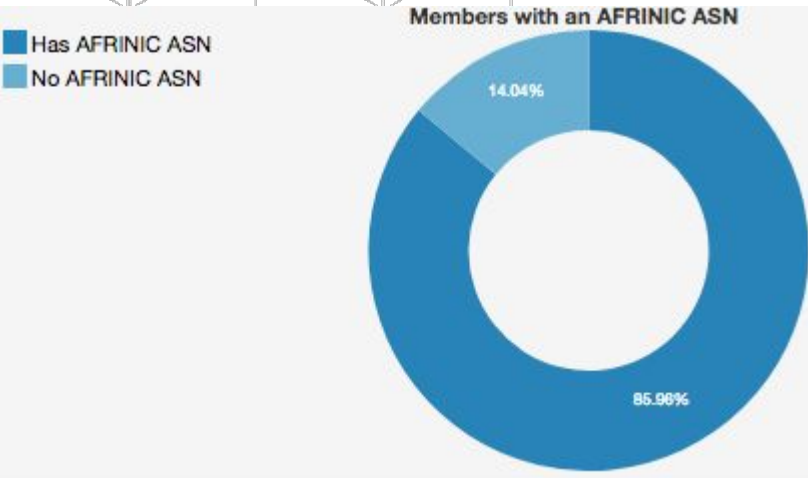
- Changes requested by RIPE NCC community
 - Creation of out-of-region ASN will not be allowed
 - Creation of route(6) objects for non RIPE managed resources will not be allowed
 - Existing route objects with out-of-region ASNs will have a new source “RIPE-NONAUTH”
 - RIPE-NCC-RPSL-MNT will be locked - There will be no maintainer object with public password available
 - Existing route(6) objects protected by RIPE-NCC-RPSL-MNT will not be allowed to be modified or deleted

In summary, RIPE NCC IRR will no longer support the creation of route(6) and aut-num objects that refer to out-of-region resources (Resources that were not delegated to the RIPE NCC by IANA)

Statistics: Total RIPE NCC Route(6) for AFRINIC prefixes

48,594 route objects for AFRINIC prefixes exist on RIPE NCC

Created by 1,068 AFRINIC Resource Holders



150(80 AFRINIC Resource Members & 70 Legacy Resource Holders) of 1,068 Resource holders do not hold an ASN from AFRINIC.

Impact of RIPE NCC changes

- Possible Issues for AFRINIC members
 - Operators can limit their queries to "source: RIPE" only, or they can filter the results locally based on this attribute. This allows operators to disregard out-of-region route(6) objects (as their authorisation is questionable) or treat them with a lower preference.
 - No longer able to create route(6) objects in the RIPE IRR DB
- Mitigation/solution
 - If you are an AFRINIC member, we highly recommend using the AFRINIC IRR to publish your routing policy

Recommendations

AFRINIC recommends that:

1. Members read through AFRINIC IRR docs published, to ensure ease of use of the AFRINIC IRR
2. Contact details kept up to date after staff movements.
3. Maintainer passwords are kept up to date
4. If you hold resources from AFRINIC, have your route object registered in the AFRINIC IRR
5. Replicate route objects from other IRRs to AFRINIC to avoid being filtered after housekeeping by the other IRRs
6. Inform AFRINIC in case your upstream provider does not accept routes from the AFRINIC IRR, but insists on you using some other IRR.

Recommendations

If you are an upstream provider in the AFRINIC service region:

1. Ensure your filters have been updated after the RIPE changes with source “RIPE-NONAUTH” to allow objects still on RIPE NCC’s IRR
2. Ensure your filters are updated with the AFRINIC IRR
3. Encourage adoption of AFRINIC IRR by your customers to ensure reliable routing information.

Current AFRINIC IRR Business Rules

- At this moment, the route(6) object creation are possible for the following scenario:
 - Both ASN and IPv4/IPv6 prefix(es) are issued to your organisation
 - Authentication for **IPv6/IPv6 and ASN in route(6) object is required**
 - IPv4/IPv6 is issued to one ORG and ASN to another ORG.
 - Both ASN and IPv4/IPv6 prefixes are registered in AFRINIC WHOIS
 - Dual Authentication of **IPv6/IPv6 & ASN holders is required**
 - **Dual Authentication** means the same object needs to be submitted to the database twice, with different passwords from the two organisations

Current AFRINIC IRR Business Rules

- **Out Of Region (OOR) ASN** (ASN not registered in AFRINIC WHOIS but registered as delegated in other RIRs whois db)
 - Currently Supported: OOR ASN Registered under member's org details in another RIR's whois db.

Manual Hostmaster intervention is required

Hostmasters create the route object after validation.

- Not supported: OOR ASN not delegated to member as per organisation details

New AFRINIC IRR Business Rules

- As from 27th Sept 2018, the route(6) object creation are possible as follows:
 - route(6) objects will no longer need to be authenticated by the ASN holder
 - They will still need to be authenticated by the IPv4 or IPv6 address holder
 - IPv4 or IPv6 must be from the AFRINIC service region
 - Only authentication required against IP prefix's maintainer
 - Regardless of where the ASN is domiciled or who is the holder of the ASN
 - No hostmaster intervention required for route(6) creation where the ASN is not issued by AFRINIC

Be heard, Be Engaged, Get Help!

The AFRINIC Database Working Group is an open mailing list available for knowledge sharing and for proposing new ideas/solutions

Feel free to contribute your ideas on this list.

Subscribe to our DBWG via <https://lists.afrinic.net/> then “dbwg”

See the IRR web page at <https://afrinic.net/en/services/afrinic-irr>, and the comprehensive guide linked from that page.

For any further help, contact irr@afrinic.net

Thank you for
your Attention

Questions?



[twitter.com/ afrinic](https://twitter.com/afrinic)



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[youtube.com/ afrinic](https://www.youtube.com/channel/UCafrinic) media



[www. afrinic .net](http://www.afrinic.net)

Introduction

- AFRINIC IRR
- How AFRINIC IRR functions
- Comparison between AFRINIC and RIPE NCC IRR
- RIPE NCC Announcement
- Analysis of impact on AFRINIC membership
- Communication to Membership
- Proposal for future IRR enhancements

AFRINIC IRR Roadmap June 2013 - June 2018

June 2013: Deployment of AFRINIC IRR

2013 to 2018:

Various AFRINIC initiatives to increase IRR adoption and member education on how to use the AFRINIC IRR (bootcamps, documentation on website, tutorials during outreach, assistance during face to face consultations, migration tool)

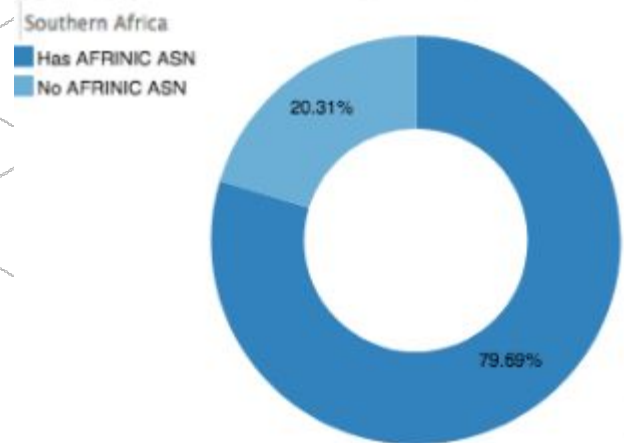
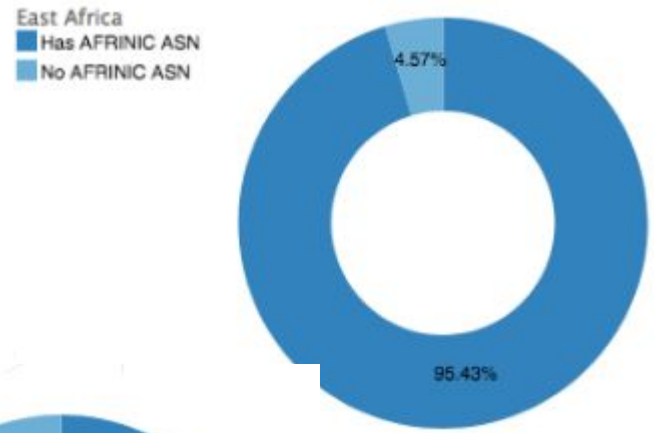
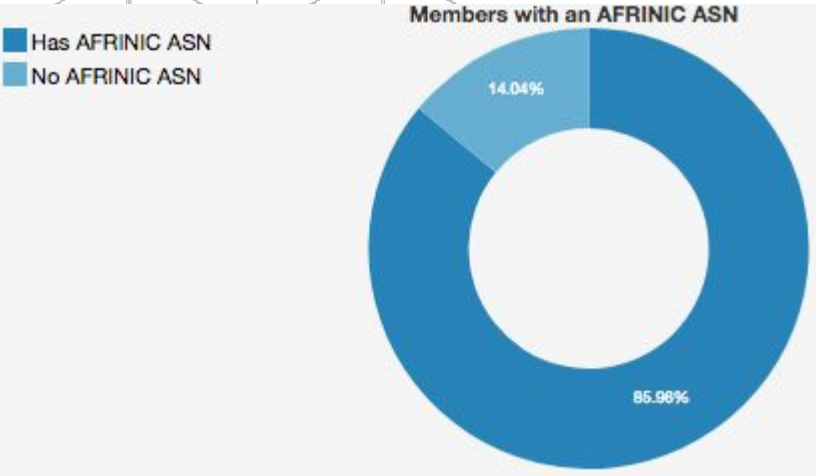
Enhancements to Business Rules in **May 2016**, to address some issues experienced by the AFRINIC membership

Aut-num authentication deprecation in **End of Sept 2018**.

AFRINIC IRR and RIPE IRR NCC similarities

- RPSL
- Same object attributes
- Authentication against maintainers
- Mirrored
- Use WHOIS web-client
- Use Email updates

Statistics



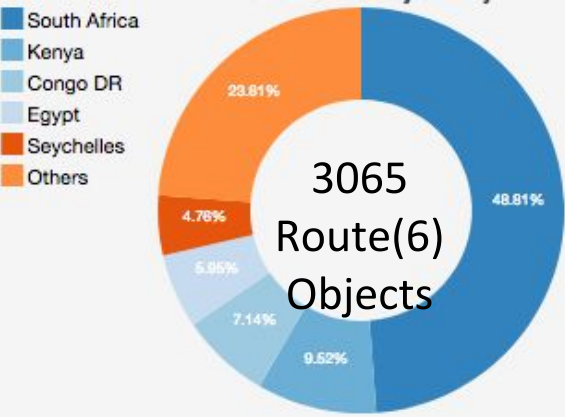
150(80 AFRINIC Resource Members & 70 Legacy Resource Holders) of 1,068 Resource holders do not hold an ASN from AFRINIC.

Statistics: Route(6) created in 2018 on RIPE NCC

3065 Route objects created by **84** AFRINIC Resource Holder

Of which **2456** Route objects(with OOR ASN) were created by **26** AFRINIC Resource Holders

Only **8** out of these **26** AFRINIC Resource Holders do not hold an ASN from AFRINIC



How to use the AFRINIC IRR

➤ Tools

- Whois web client – <https://whois.afrinic.net>
- Email client – mail to auto-dbm@afrinic.net

➤ Documentation

- <https://www.afrinic.net/en/services/afrinic-irr/1197-creating-route-object>
- <https://www.afrinic.net/en/services/afrinic-irr>

Communication to Membership

4th July 2018: General Announcement was sent by AFRINIC for the upcoming changes on RIPE NCC

Watch our Future communications:

1. Call for comments for changes on the AFRINIC IRR
2. Targeted Communication to affected Resource Members
3. Announcements for changes implemented

Proposed changes to the AFRINIC IRR

1. Increased technical community engagement to drive further IRR enhancements
2. Removal of the ASN authentication requirement for ROUTE(6) object creation. **Go live on 27th Sept 2018**
3. Removal the dual authentication functionality for ROUTE(6) creation, relates to ASN authentication in (1.) above. **Go live on 27th Sept 2018**
4. Publishing all the revamped IRR documentation and FAQs on AFRINIC website. **After new IRR rules go live on 27th Sept 2018**
5. Resuming bootcamps with the AFRINIC membership to facilitate their migration.

AFRINIC IRR Enhancement Roadmap

Short term

1. AFRINIC internal IRRWG to do impact analysis of changes that can be brought to IRR business rules to cater for the membership impacted (whose route objects in RIPE NCC now and cannot be migrated to AFRINIC IRR)
2. Call for comments from the AFRINIC Community
3. Incorporate feasible changes
4. Announcement to AFRINIC community/members

Medium Term

1. Look at IRR best practices (RPKI, integration in member portal)
2. Increased technical community engagement to drive further enhancements on the AFRINIC IRR
3. Publication of best practice blogs

Long Term

1. Look at IRR best practices (RPKI, integration in member portal)