Route Management Guide to manage your routes and (RPKI) ROA





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1 Introduction

This document provides detailed instructions regarding using the Routes Management feature in MyAPNIC to create route objects and ROAs.

The next section of this document is explaining how to activate the RPKI engine, which is required for <u>Resource Certification</u>, followed by Route Management.

2 Activating RPKI engine

RPKI engine needs to be activated in order to certify the resources under a particular account. The RPKI page is accessible as following :

- 1) Login to MyAPNIC
- 2) Go to: Resources \rightarrow Resource Certification (see image below)

Resources

Internet Resources

Summary View all of your resource holdings. IPv4 View your IPv4 resource holdings. IPv6 View your IPv6 resource holdings. AS Numbers View your ASN resource holdings.

Whois Updates

 Whois Updates

 Add, update, and delete individual Whois objects.

 Bulk Whois Updates

 Add, update, and delete multiple Whois objects.

 Contact Details Update

 Update contact details of the internet resources associated with your account.

 Maintainers

 View your registered maintainers, and register new maintainers.

 IRTs

 View your registered IRT objects, and register new IRT objects.

Reverse DNS Delegations

Add Reverse Delegations Add new reverse delegations. Reverse Delegation Summary View and manage reverse delegations

Resource certification RPKI Set up your RPKI engine, and manage your Route Origin Authorization (ROA)

Set up your RPKI engine, and manage your Route Origin Authorization (ROA) objects.

Route management Routes Add, update, delete and view routes. Create Route Origin Authorisation (ROA) for routes.

2.1 Permissions required for Resource Certification

All users should have <u>Two-Factor-Authentication</u> enabled in MyAPNIC to use the Resource Certification feature

- Corporate Contacts by default have "update" privilege.
- Other contacts by default only have "view" privilege

The Corporate Contact can manage user privileges from the Manage Contact menu in MyAPNIC.



Edit Permissions for Jane Roe

Resources	View	Update
Resource certification		
ASN, IPv4, IPv6 and AW		
Resource tickets		
Whois database	View	Update
Private objects		
Domain objects		
Membership administration	View	Update
Membership details (address, phone)		
View billing history, balance and invoice		
Admin tickets		
Voting	View	Update
Vote		
Account maintainer permissions	Use	
MAINT-AU-APNICTRAINING		
Update		

2.2 RPKI Engine activation (enabling resource certification)

To start using the Resource Certification feature, click on the Certification menu under Resources. Select if you want to operate in the MyAPNIC RPKI portal or if you want to host your own certificate authority.

			том	MYAPNIC-T	EST-AP	LOGOUT
My APNIC	2					
	Home Events	Resources Voting	Admin My Profile	Contact	Tools	

Home / Resources / RPKI

RPKI

Enable Resource Certification

Currently, you have not enabled resource certification for your registry.

- I want to operate in the MyAPNIC RPKI portal.
- I want to host my own certification authority and run an RPKI engine myself.

Next

After selecting the first option, you will be taken to the terms and conditions. Please read carefully, and if you agree to the conditions please accept by clicking the following button at the bottom of the page.



With that your RPKI engine will be activated. This is required to request/receive your Resource Certificate from APNIC and create your ROA (Route Origin Authorization) objects in MyAPNIC. Once this service is activated, it is available to all MyAPNIC users from that account with the Resource Certification privilege. Home / Resources / RPKI

RPKI

Activating engine, please wait...

2.3 Hosting your own Certificate Authority

Home / Resources / RPKI

RPKI

Enable Resource Certification

Currently, you have not enabled resource certification for your registry.

○ I want to operate in the MyAPNIC RPKI portal.

• I want to host my own certification authority and run an RPKI engine myself.



Select the second option and click "Next".

Home / Resources / RPKI

RPKI

Enable Provisioning Protocol to my own Engine

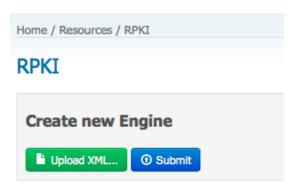
Currently, you have not enabled resource certification for your registry.

Terms and Conditions of APNIC Certification Authority

Introduction	
	Certificates, Certificate Revocation Lists (CRLs), and RPKI-signed objects in the tory (" Repository "). The Repository is available to anyone under these Terms
Article 1 - Def	finitions
In the Terms and Co meanings assigned	onditions, unless the context requires otherwise, the following terms have the to them below:
APNIC - APNIC Pty	/ Ltd ACN 081 528 010 (a company incorporated under the laws of Australia), the

Read the terms and conditions and click on "I accept. Enable provisioning protocol to my own Certification Authority".

Click on "Upload XML" and attach your identity.xml file.



Home / Resources / RPKI
RPKI
Selected file: identity.xml (text/xml, 1185 bytes)
Create new Engine

After you attach your identity.xml file, click on "Submit".

Home / Resources / RPKI			
RPKI			
Uploading XML file plea	se wait		
Create new Engine	e		
Home / Resources / RPKI			
RPKI			
My Engine			
Description	Actions		
A918C2870001	O Upload new XML	O Download parent XML	

Click on "Download parent XML" to download the XML file which is needed to configure the parent of your RPKI engine.

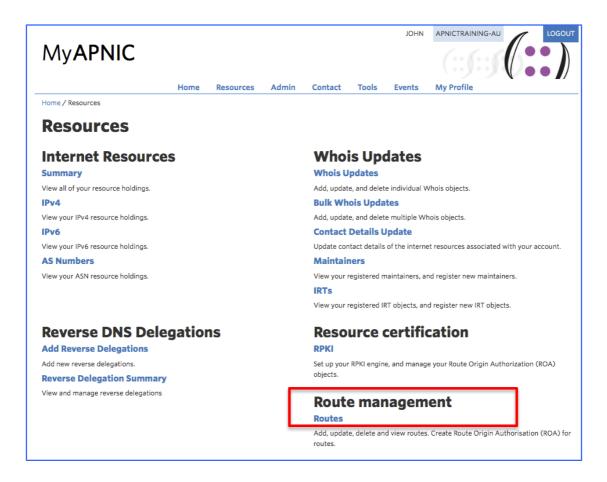
Should your RPKI engines business PKI (BPKI) certificate change in the future, you need to upload your new identity XML file by clicking on "Upload new XML".

3 Route and ROA management

The route management tool is an interactive feature in MyAPNIC where users can manage routes and ROAs at once.

To access the Route/ROA management feature:

- 3) Login to MyAPNIC
- 4) Go to: Resources \rightarrow Route Management (see image below)



3.1 How MyAPNIC routes and WHOIS route objects are different

Through this tool, users can create/manage MyAPNIC routes, which are mentioned as "routes" throughout this document. These 'routes' act as a template for creating actual routes in whois database, which are mentioned as "route objects" in this document.

Routes and route objects can exist separately; that is a route in MyAPNIC can exist without an actual route object in whois database, and route objects in whois database can exist without a route entry in MyAPNIC.

3.2 Synchronizing MyAPNIC routes and WHOIS route objects

Users can decide to import routes in the whois database through Route Management tool. This will ensure a route entry in MyAPNIC is created for every route object associated to that account. (routes with accounts IP prefixes and ASNs). Once a route entry is created in MyAPNIC, users can manage whois route objects through the tools interface.

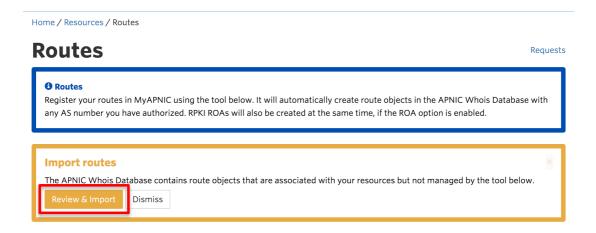
When a user creates/updates/deletes a route through this tool, the tool will attempt to create a whois route object as soon as possible. If you are updating multiple objects at the same time, the tool may show "pending" status against the routes which are not yet synchronized.

3.3 Conflicts between MyAPNIC routes and WHOIS route objects

Route management tool is not the only way that a whois route object can be managed. If a whois route object is changed, the MyAPNIC route entry will not change. It will indicate that there is conflict. This ensures that user is made aware of changes done outside the Route Management tool. The user can then take action to resolve the conflict. Either accept the changes, or revert the route object back to MyAPNIC route template.

4 Import routes

When a user opens or refreshes the Route management page, the tool checks for any route objects in the APNIC whois database which are not managed by the route management tool in MyAPNIC. If any such route objects exist, the user can select and import them and start managing them through the tool.



If user clicks on "Review & Import", following screen will appear.

Im	port routes from Whois		×
Sele Sho	following route objects associated w ct routes to be imported: w 10 • entries lect all Deselect all	ith your resources were fo	ound in the APNIC Whois Database. Search:
	Route prefix	Origin AS	Most specific announcement
Ο	2001:df0:a::/48	AS45192	48
0	2001:df0:a::/56	AS17821	56
	2001:df2:ee00::/48	AS131107	48
	2001:df2:ee01::/48	AS45192	48
0	202.125.96.0/24	A\$131107	24
Ο	202.125.97.0/24	AS45192	24
Ο	2406:6400:1::/48	AS17821	48
Ο	2406:6400:2::/48	AS17821	48
	2406:6400:3::/48	AS17821	48
	2406:6400:4::/48	AS17821	48
Sho	wing 1 to 10 of 20 entries 4 rows sel	ected	Previous 1 2 Next
			Cancel Import

From this page, the user can view and select route objects to be managed by the tool.

When the user finishes selecting, and clicks on "Import" the following message will appear on the screen to confirm that the import task is being handled in the back ground.



To see more details about the task, the user can either click on the above message while its being displayed, or click on the "Requests" link at the top of Route Management page. By clicking either of the links, user can see following detailed information about the task.

Route task requests Show 10 entries Search:											
ID ↓≣	Created	11	User	11	Туре	11	Route	11	Status	J1	Actions
2203	2016-08-24T07:13:37.000+0000		EL_8332_pubudu1		Create route		2406:6400:4::/48		\odot	Г	View
2201	2016-08-24T07:13:37.000+0000		EL_8332_pubudu1		Create route		2406:6400:3::/48		\odot		View
2199	2016-08-24T07:13:37.000+0000		EL_8332_pubudu1		Create route		2001:df2:ee00::/48		\odot		View
2197	2016-08-24T07:13:37.000+0000		EL_8332_pubudu1		Create route		2001:df2:ee01::/48		\odot		View

		/ Route task reques		details					
Rout	e task	details							
		ID		2203					
		Created		2016-08-24T07:1	3:37.000+00	00			
		User		EL_8332_pubudu	1				
		Туре		Create route					
		Route		2406:6400:4::/4	3				
		Status		Success					
		Status message		Route creation co	mpleted suc	cessfully.			
ask Rep									
-	entries							Search:	
D I	Task type	lî.	Reference	ļţ.	Status	11	Status message		Actions
21817	Create Whoi	s object	2406:6400:4:	:/48AS17821	0		Object already exists.		View Whois object
	of 1 entries							(Previous 1 Nex

By clicking on the "View" button a particular request on the Route task request window, the tool will show any changes that were done in the APNIC whois database regarding this request. In the case of importing, the route object will not be changed, hence the message "Object already exists" is displayed. Once the routes are imported, any further changes to the route object will change the route object in the APNIC whois database.

See section 3, Edit routes for more information about making changes to an existing route.

5 Create Routes

To create a new route object, please select the 'create route object'

IP Prefixes AS Numbers						
Create route I elete selecte	ed					
Show 10 • entries					Search:	
			1.0			
Route	11	Origin AS	11	ROA status	Act	ions
Route	ļΞ	Origin AS	UI No data available in		Act	ions

The following template shows the minimum information that a user needs to input to create a route.

Create route	×
Prefix	2406:6400::/32
Origin AS	A\$135541
Most specific announcement	/36
🔂 ROA	□ You are not permitted access to RPKI. Click here to enable two-factor authentication, which will allow you access to RPKI.
Options	Define Whois route attributes
	Notify additional contacts
	Cancel Next

Prefix	The IPv4 or IPv6 prefix in CIDR notation
Origin AS	The AS Number which is used to announce the IP prefix
Most Specific	By default, this will be prefilled by the IP prefixes size.
Announcement	However, the user can chose to announce more specific IP
	prefixes if he wishes to. If a more specific announcement is
	chosen, the tool will create all the route objects from the
	least specific announcement, up to the most specific
	announcement, including any prefixes in between.
ROA	See <u>ROA option</u>
Define whos is	See <u>'Whois Route Attributes' option</u>
route attributes	
Notify Additional	See Notify Additional Contacts
Contacts	

5.1 Using ROA option

If the member who logs into MyAPNIC has : - RPKI update permission -AND-Two Easter Authentisation angled

- Two Factor Authentication enabled

The ROA option will be ticked by default. If proceeded, with the option, matching ROAs will be created for the prefix and also for most specific announcement. Option can be un-ticked if the user does not require ROAs to be created.

If the member who logs into MyAPNIC has : - RPKI update permission revoked -OR-- Two Factor Authentication disabled

The ROA option will be un-ticked by default. User cannot tick this option. If the user wants to create ROAs, he can click "here" to go to the Two Factor Authentication configuration page.

Create route	×
Prefix	2001:df0:a::/48
Origin AS	A\$135541
Most specific announcement	/48
() ROA	You are not permitted access to RPKI. Click here to enable two-factor authentication, which will allow you access to RPKI.
Options	Define Whois route attributes
	Notify additional contacts
	Cance! Next

5.2 'Whois Route Attributes' option

Create route			×
Prefix	2001:df0:a::/48		
Origin AS	AS135541		
Most specific announcement	/48		
🕄 ROA	 You are not perm you access to RPP 	itted access to RPKI. Click here to enable two-factor KI.	authentication, which will allow
Options	Define Whois rou	ite attributes	
	Notify additional	contacts	
Whois attribut	es		
Mandatory Whois re	oute attributes not def	ined here will be automatically pre-filled by MyAPN	IC.
	descr -	Add field	
	descr holes		
	country member-of inject		Cancel Next
	aggr-mtd aggr-bndry	II ROA status	Actions
	export-comps components	No data available in table	
of O entries	remarks notify mnt-lower mnt-routes mnt-by changed source		Pr

User can add number of attributes through this option, from the drop down menu, one by one.

To see a detailed explanation about all these attributes please visit the following URL.

https://www.apnic.net/apnic-info/whois_search/using-whois/guide/route

If this option is not selected, a route will be created with the mandatory attributes filled with information from your.

Route object template for 'route' (IPv4 routes)

route:	[mandatory]	[single]	[primary/look-up key]
descr:	[mandatory]	[multiple]	[]
origin:	[mandatory]	[single]	[primary/inverse key]
holes:	[optional]	[multiple]	[]
country:	[optional]	[single]	[]
member-of:	[optional]	[multiple]	[]
inject:	[optional]	[multiple]	[]
aggr-mtd:	[optional]	[single]	[]
aggr-bndry:	[optional]	[single]	[]
export-comps:	[optional]	[single]	[]
components:	[optional]	[single]	[]
remarks:	[optional]	[multiple]	[]
notify:	[optional]	[multiple]	[inverse key]
mnt-lower:	[optional]	[multiple]	[inverse key]
<pre>mnt-routes:</pre>	[optional]	[multiple]	[inverse key]
mnt-by:	[mandatory]	[multiple]	[inverse key]
changed:	[mandatory]	[multiple]	[]
source:	[mandatory]	[single]	[]

Route object template for 'route6' (IPv6 routes)

5.3 'Notify additional contacts' option

By default, if a route is created, automatic notifications will be send to ASN custodian. Notifications will be send to APNIC account contacts. If the ASN is from a different RIR, 'whois' database contacts associated to that ASN will be notified.

If neither of the above contacts were found, APNIC helpdesk will be notified.

With the Notify 'Notify additional contacts', the user is able to send route creation notices to any other party that he wishes to inform. Multiple e-mail contacts can be included by separating them with commas or spaces.

Create route	×
Prefix	2001:df0:a::/48
Origin AS	A\$135541
Most specific announcement	/48
() ROA	□ You are not permitted access to RPKI. Click here to enable two-factor authentication, which will allow you access to RPKI.
Options	Define Whois route attributes
	Notify additional contacts
Whois attribute	es
Mandatory Whois ro	oute attributes not defined here will be automatically pre-filled by MyAPNIC.
	descr
Notify addition	al contacts
Emails	john@apnic.net, jane@apnic.net jane@yahoo.com
	Cancel Next

5.4 Sub-route selection

Once all the information is filled, and when user clicks "NEXT", the Confirmation window appears, where further adjustments can be made.

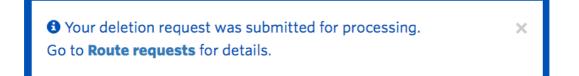
Confi	rm route creation				
	ROA	Disabled			
	Prefix	2001:df0:a::/48			
	Origin AS	AS135541			
	Most specific announcement	/50			
Select	the sub-routes to be enabled:				
Show	10 - entries		Search:		
Selec	t all Deselect all				
R	oute			Ţ	101
2	001:df0:a:4000::/50				
0 20	001:df0:a:8000::/49				
☑ 20	001:df0:a:8000::/50				
2	001:df0:a::/48				
0 2	001:df0:a::/49				
2	001:df0:a::/50				
2	001:df0:a:c000::/50				
Showin	g 1 to 7 of 7 entries 5 rows selected		F	Previous 1 Next	t
Whois	attributes				
	country	AU			
			Cancel	Go back Submit	
			Curreer	SUBAR	

The confirmation screen above shows all the routes that are going to be created. The mandatory attributes the user entered are displayed at the top of the screen. It is followed by a list of routes that will be created. List will have more than one route if the '*most specific announcement*' is higher than '*prefix size*'. All routes in the list would be selected by default. The user has the option to unselect any route if required.

Select all	Ticks all the sub-routes in the list
Deselect all	Un-tick all the sub-routes in the list
Show 'X'	Determines the number of sub-routes to be displayed per page.
entries	Options are 10, 25, 50 and 100
Previous	Goes to the previous page of the list if the number of sub-
	routes does not fit in to a new page

Next	Goes to the next page of the list if the number of sub-routes
	does not fit in to a new page
Cancel	Aborts the route creation
Go back	Goes to the previous page where route attributes can be
	updated
Submit	All selected sub-routes will be created. Route objects will be
	injected to the whois database. If ROA option is enabled,
	matching ROAs will be created

Once thee '*Submit*' button is clicked, the tool will start processing the route creation. A dialog box appearing as below will indicate this.



This dialog box will disappear automatically once the routes are created in MyAPNIC. As shown in the dialog box, to see details click the '*Route requests*' link shown below.

					1 JOHN	APNICTRAINING-AU	LOGOUT
My APNIC						(::)::)	
	Home I	Resources	Admin Con	tact Tools	Events	My Profile	
lome / Resources / Routes							
Routes							Requests
Routes Register your routes in MyAPNI belong to other members or are	-		natically create the r	equired Whois ro	ute objects and	RPKI ROAs, including for AS	Ns that
		5					
IP Prefixes AS Numbers Create route Delete selecte	_	_					
IP Prefixes AS Numbers	_					Search:	
IP Prefixes AS Numbers Create route Delete selecte Show 10 • entries	_			Jî ROA statu	S	Search:	
IP Prefixes AS Numbers Create route Delete selecte Show 10 • entries Select all Deselect all	4			Jî ROA statu Ø	5		

5.5 Route Requests – Action log

The 'Route requests' link (<u>please 1.1.4 Confirm and Submit</u>) will take the user to a log of all activities associated the Route Management page. Action log will look similar to the below screen.

10 Nov	- entries							Search:		
D ↓₹	Created	11	User	J1	Туре	11	Route	1 Status	١t	Actions
401	2016-07-02T08:56:26.000+0000		EL_8332_pubudu1		Create route		2001:df0:a::/48	\odot		View
399	2016-07-02T08:45:52.000+0000		EL_8332_pubudu1		Delete route		2001:df0:a::/48	\odot		View
397	2016-07-02T08:45:30.000+0000		EL_8332_pubudu1		Create route		2001:df0:a::/48	\odot		View
369	2016-06-29T05:46:15.000+0000		PubuduJ		Delete route		103.27.72.0/22	\odot		View
367	2016-06-29T05:44:48.000+0000		PubuduJ		Create route		103.27.72.0/22	8		View
365	2016-06-29T05:24:39.000+0000		PubuduJ		Delete route		61.45.248.0/24	\odot		View
363	2016-06-29T05:24:39.000+0000		PubuduJ		Delete route		61.45.248.0/24	\odot		View
345	2016-06-29T00:22:26.000+0000		gkgk		Modify route		61.45.248.0/24	\odot		View
343	2016-06-29T00:21:15.000+0000		gkgk		Create route		61.45.248.0/24	\odot		View
341	2016-06-29T00:19:53.000+0000		gkgk		Delete route		61.45.248.0/24	\odot		View

ID	Action log ID
Created	Date and time stamp of the submission
User	MyAPNIC user ID
Туре	Type of action requests. Create Route, Modify Route or Delete
	Route
Route	The IP prefix which will be announced. Sub-route prefixes can be
	viewed by clicking ' <i>View</i> '
Status	Green tick mark indicates all sub-routes are created successfully.
	Red cross icon indicates that at least one sub-route creation has
	failed.
View	Shows more details about a specific action item

5.6 Route Task Details

The screen below shows how route task details will appear if the '**view**' button is clicked in the route requests page (see 1.1.6 <u>Route Requests</u>)

Route	e task det	alis			
	ID	1401			
	Created	2016-07-021	08:56:26.000+0000		
	User	EL_8332_pu	budu1		
	Туре	Create route			
	Route	2001:df0:a::/	48		
	Status	In progress			
	Status me	essage			
Task Repo	onses				
	entries Task type	It Reference II	Status 🥼	Search: Status message	: Actions
Show 10 -	entries	It Reference It 2001:DF0:A:8000::/50A5135541 1000000000000000000000000000000000000			Actions
Show 10 -	entries Task type				Actions
Show 10 • ID ↓ 18387	entries Task type Create Whois object	2001:DF0:A:8000::/50AS13554	Ø Ø	Status message Route (2001:DF0:A:4000::/50)	Actions View Whois ob
ID I IB I 18387 18385	entries Task type Create Whois object Create ROA	2001:DF0:A:8000::/50AS13554 2001:DF0:A:4000::/50	Ø Ø	Status message Route (2001:DF0:A:4000::/50)	Actions View Whois ob View Whois ob
ID I ID IF 18387 I 18385 I	entries Task type Create Whois object Create ROA Create Whois object	2001:DF0:A:8000::/50A5135541 2001:DF0:A:4000::/50 2001:DF0:A:4000::/50A513554		Status message Route (2001:DF0:A:4000::/50) added to RPKI. Route (2001:DF0:A::/50) added t	Actions View Whois ob View Whois ob
ID I IB387 I 18385 I 18383 I	entries Task type Create Whois object Create ROA Create ROA	2001:DF0:A:8000::/50A513554 2001:DF0:A:4000::/50 2001:DF0:A:4000::/50A513554 2001:DF0:A::/50	0 0 0 0 0	Status message Route (2001:DF0:A:4000::/50) added to RPKI. Route (2001:DF0:A::/50) added t	Actions View Whois ob View Whois ob View Whois ob View Whois ob

If the task selected is either "Create Route" or "Edit Route", the user can view the actual whois route object by clicking the "*View Whois Object*" button in the above screen.

6 Edit Routes

The routes created through MyAPNIC or through other methods such as e-mail updates can be modified through this interface.

					I JOHN	APNICTRAINING-AU	LOGOUT
Μy ΑΡΝΙϹ						(::] ::] :	
	Home R	esources	Admin Contac	t Tools	Events	My Profile	_
ome / Resources / Routes							
Routes							Requests
Routes Pogister your routes in MyAPNI	Cusing the tool below	. It will automa	atically create the requ	ired Whois rou	te objects and	RPKI ROAs, including for A	ASNs that
belong to other members or are			areany create the requ				
IP Prefixes AS Numbers	managed in other reg						
belong to other members or are	managed in other reg						
IP Prefixes AS Numbers	managed in other reg					Search:	
IP Prefixes AS Numbers Create route Delete selecte	managed in other reg					Search:	
belong to other members or are IP Prefixes AS Numbers Create route Delete selecte Show 10 entries	managed in other reg	jions.				Search:	
belong to other members or are IP Prefixes AS Numbers Create route Delete selecte Show 10 • entries Select all Deselect all	managed in other reg	jions.					

Clicking on the edit button in front of a route entry can modify the specific route.

Edit route			×
Prefix	2001:df0:a::/48		
Origin AS	A\$135541		
Most specific	/50		
announcement ROA	✓ Enabled		
Sub-routes	es	Search:	
Route	11	Managed	Actions
2001:df0:a:4000::/50)	Enabled	Update whois 🕑
2001:df0:a:8000::/49		Disabled	Update whois 🕑
2001:df0:a:8000::/50)	Enabled	Update whois 🕑
2001:df0:a::/48		Enabled	Update whois 🕑
2001:df0:a::/49		Disabled	Update whois 🕑
2001:df0:a::/50		Enabled	Update whois 🕑
2001:df0:a:c000::/50)	Enabled	Update whois 🕑
Showing 1 to 7 of 7 ent	ries	Prev	vious 1 Next
		Can	cel Submit

Most Specific	User can change this attribute. By changing this, the number of
Announcement	sub-route entries will automatically change.
ROA	User can toggle between ROA enable and ROA disable. User
	need to have permission to enable ROA (See : <u>User Permission</u>)
Enable/Disable	If Managed set to 'Enabled', it means there is a whois route
	object existing.
	If Managed set to 'Disabled', it means whois route object does
	not exist.
	By toggling between the two states, the user can create and
	delete whois route objects.
	If the user disables a sub-route for which ROA is enabled, ROA
	will automatically get deleted as well.
Submit	Changes will be processed, and whois route objects will be
	updated accordingly.
Update Whois	This button will open whois update page for that particular
	whois route object.

7 User permission

To be able to create ROAs together with routes, user require:

- 1) Resource Certification permission enabled AND-
- 2) Two Factor Authentication enabled (2FA)
 - a. Timebased One Time Passwords (TOTP) OR
 - b. Digital Certificates

To learn more about:

Resources Certification: <u>www.apnic.net/ROA</u> Two Factore Authentication: <u>www.apnic.net/2FA</u>

By default, **Corporate Contacts** have **Resource Certification** permission **Enabled**. Technical Contacts and Billing (Admin) Contacts do not have access by default. The Corporate Contact can grant them access through MyAPNIC.

None of the contacts have 2FA enabled. Therefore, all contact persons must selected one of the above 2FA methods and configure it before they can create ROAs.

7.1 Checking user permission

Users can check what permissions are enabled for them by going to :

APNICTRAINING-AL í) IOHN **MyAPNIC Mv** Profile Home Resources Admin Contact Tools Events **My Profile** Password reset Memberships Account permissions TOTP Resources Whois Databas Voting Certification ASN, IPv4, Tickets **Private objects** ain objects Mombo Vote Pv6, AW Account View* Update View* Update* Update⁴ Update * APNICTRAINING-AU User must access MyAPNIC with a certificate or TOTP to exercise this permission

Home \rightarrow MyProfile \rightarrow Account Permission

To be able to create ROAs both "View" and "Update" permissions should be enabled.

8 FAQ

8.1 What is ROA and RPKI

Please visit APNIC website for more information. <u>www.apnic.net/ROA</u>

8.2 Why do I get "authorization failed"

It could be due to one or more of the following reasons.

- IP prefix not in the APNIC account. Route objects can be created by IP prefix custodians only. Please goto : Home → Resources → IPv4/IPv6 and check if the IP prefix is available.
- 2) The account maintainer has not been added to your MyAPNIC. You can request for the password if there are other users who already have the maintainer added. Please goto : Home → Resources → maintainers and check if the maintainer is registered.
- 3) Anther route object exists which is same or larger than the route object you are trying to create, and it has a different "mnt-lower" or "mnt-routes". In that case, please register that maintainer in your MyAPNIC and use it for more specific route announcements.

8.3 How does authorization work?

Whois objects are protected by maintainers. In the case of route objects, it's a little bit more complicated. To be consistent with the objects which already exist, there are different levels of checks which needs to be validated before a route can be injected into whois database.

If you are creating a route object (eg : 198.51.100.0/24 with AS64511), maintainer authorization will be checked in the following order.

- 1) Is there a route object with the same IP prefix ?
 - a. If yes : Goto 5
 - b. If No : Goto 2
- 2) Is there a route object with a less specific IP prefix ? (overlapping the route you want to create)
 - a. If yes : Goto 5b. If No : Goto 3
- 3) Is there an inetnum object with the same IP prefix ?
 - a. If yes : Goto 5
 - b. If No : Goto 4
- 4) Is there an inetnum object with a less specific IP prefix ? (overlapping the route you want to create)
 - a. If yes : Goto 5
 - b. If No : route creation fail error given
- 5) Is there a mnt-routes defined in the existing object

- a. If yes : Goto 8
- b. If No : Goto 6
- 6) Is there a mnt-lower defined in the existing object
 - a. If yes : Goto 8
 - b. If No : Goto 7
- 7) Is there a mntner defined in the existing object
 - a. If yes : Goto 8
 - b. If No : route creation fail error given
- 8) Does the mnt-routes/mnt-lower/mntner of the existing object match the mntner of the route you wish to create ?
 - a. If yes : Create Route
 - b. If No: route creation fail error given

If you still cannot find the reason why it fails, please contact APNIC helpdek. (helpdesk@apnic.net)

8.4 How do I enable Two factor authentication (2FA)

There are two options to enable 2FA. For more information about 2FA, please visit www.apnic.net/2FA

8.4.1 Time-based One Time Password (TOTP)

To configure, please see following guide: <u>www.apnic.net/2fa</u>

8.4.2 Digital Certificates

To configure, please see following guide: <u>https://www.apnic.net/manage-ip/myapnic/digital-certificates</u>