



RIPE NCC

RIPE NETWORK COORDINATION CENTRE

RIPE Database Basics

Webinar

RIPE NCC Learning & Development



**This webinar is
being recorded**

Take the poll!

What do you know about the **RIPE Database**?

 2 min.





The RIPE Database

Purpose of the Database

RIPE Database Objects

Contact Objects

Network Objects

Query the RIPE Database

Available interfaces

Default query results

Using flags and options

Inverse Lookups

Full Text Search

Create and update objects

Maintainer Objects

Authentication Mechanisms

Best practices

Updating objects



The RIPE Database

Purpose and Objects



RIPE Database

- Public Internet resource and routing registry database
 - Registry of **WHO** holds IPs and ASNs
 - Keep **contact information**
 - For troubleshooting, notifying of outages
 - Publishing **routing policies**
 - Provisioning **reverse DNS**





Try it out!

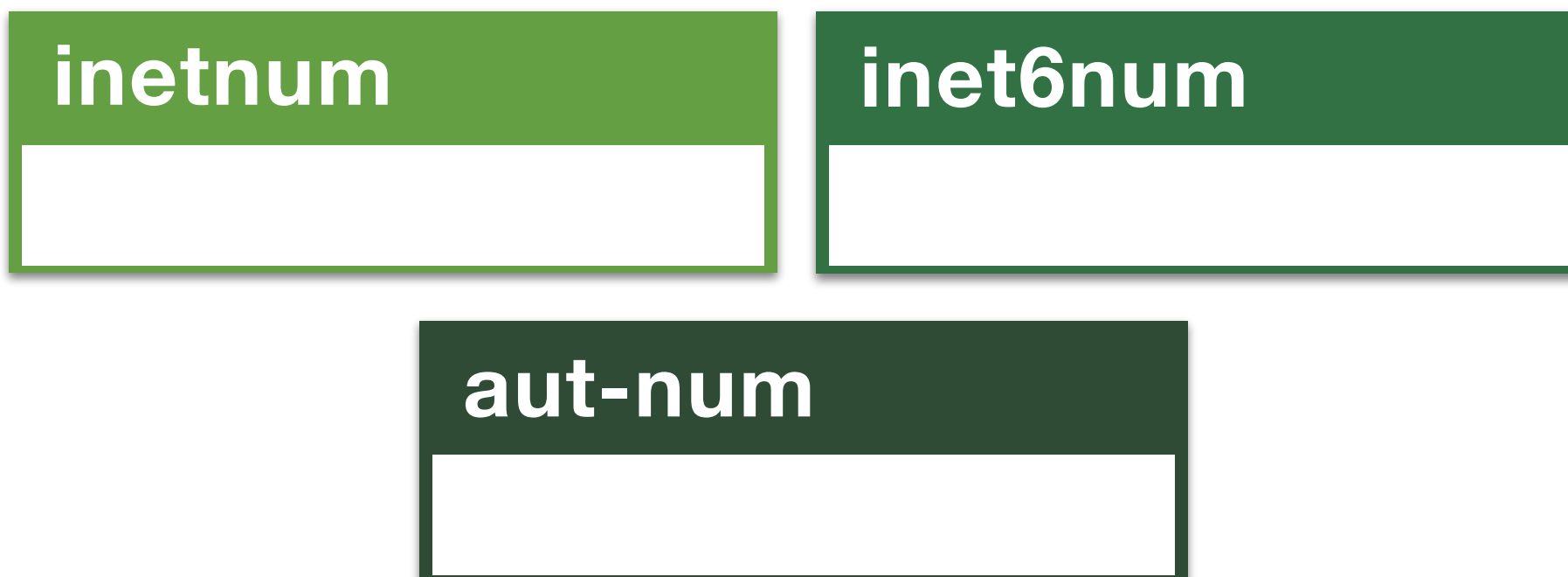
Go to apps.db.ripe.net

Search for **193.0.24.10**

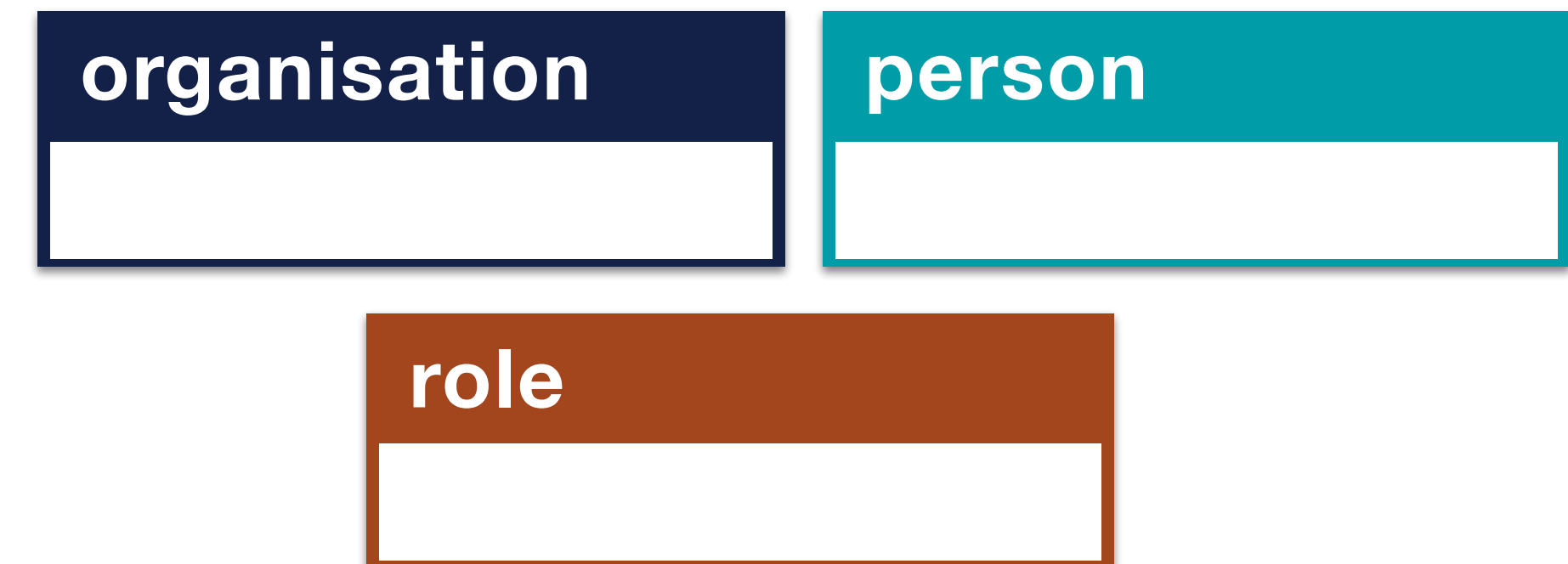
What did you find in the RIPE Database?



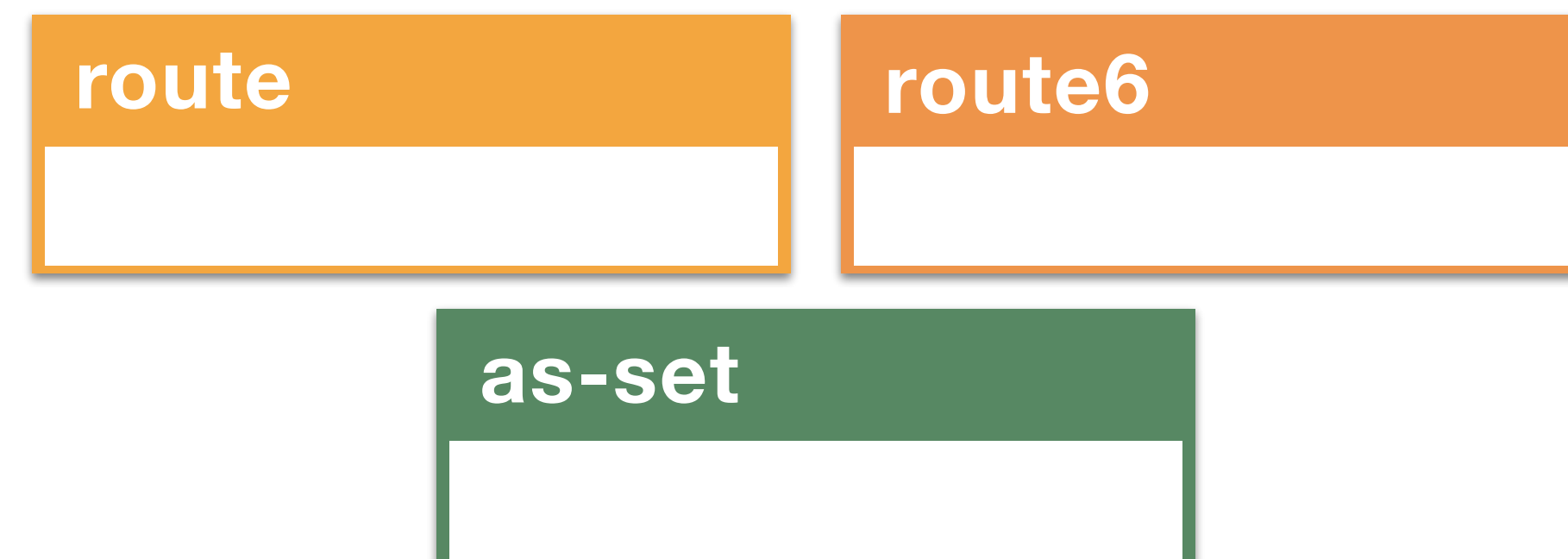
IPs and ASNs



Contact Information



Routing



Reverse DNS



Object Protection



Demo

Let's do a quick search
in the RIPE Database...



Anatomy of an Object



Attributes

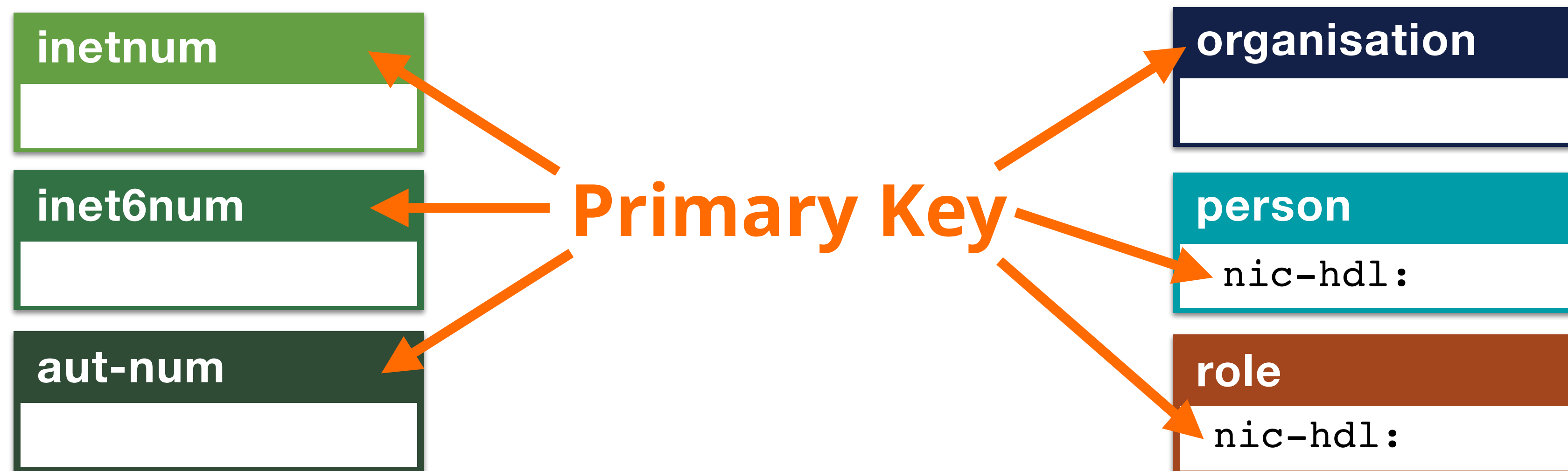
person:	Jean Blue
address:	Long Street 123
address:	76543 Big City
e-mail:	j.blue@example.com
nic-hdl:	JB0123-RIPE
mnt-by:	SECURITY-MNT
created:	(date & time)
last-modified:	(date & time)
source:	RIPE

Values



Primary Key

- Every object has one Primary Key
- It makes the object unique
 - Different from other objects of the same type



Lookup Keys

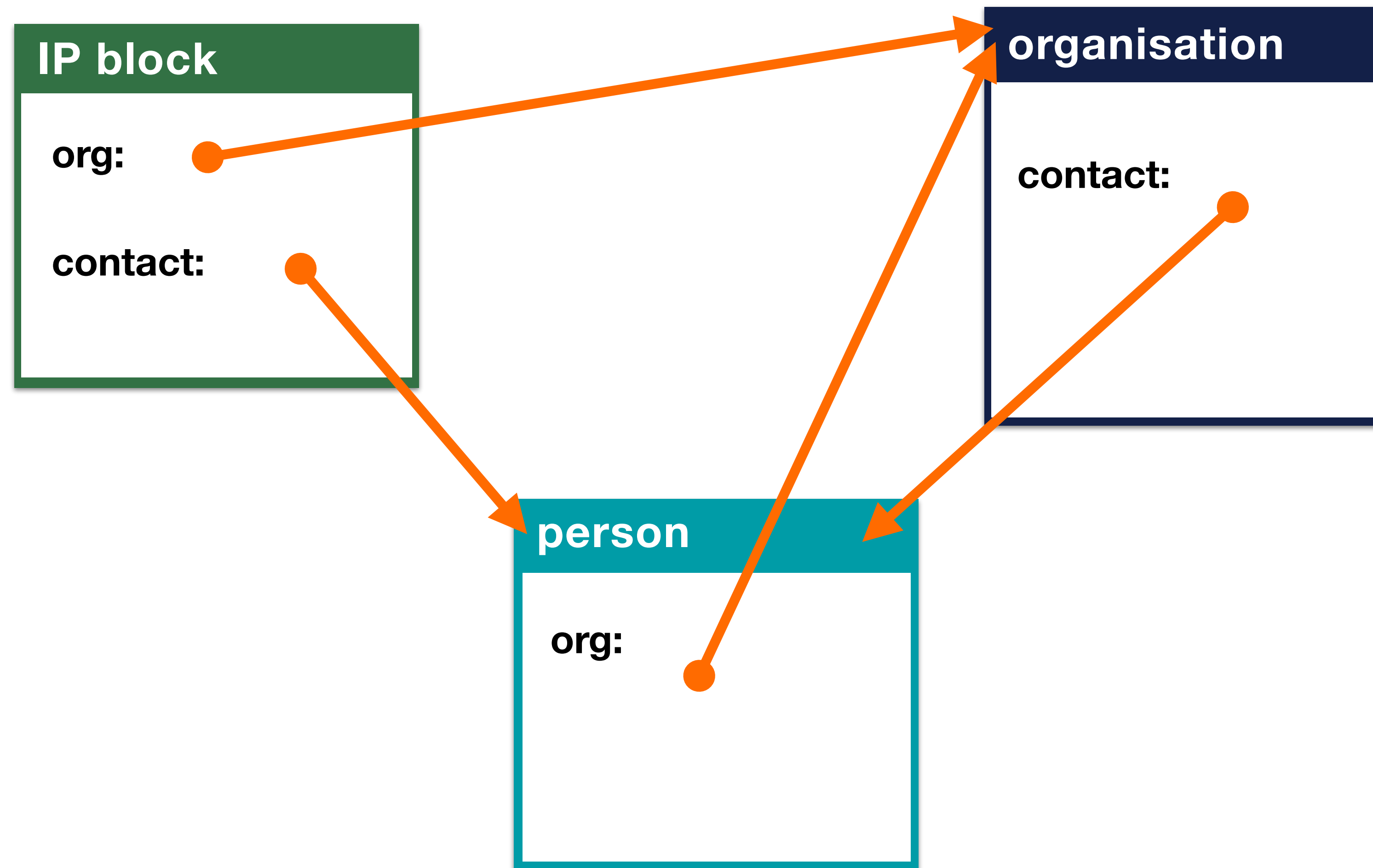


person:	Jean Blue
address:	Long Street 123
address:	76543 Big City
e-mail:	j.blue@example.com
nic-hdl:	JB0123-RIPE
mnt-by:	SECURITY-MNT
created:	(date & time)
last-modified:	(date & time)
source:	RIPE





Objects are Linked to Each Other





Questions



Take the poll!

What do you do when you have **Internet problems**?

 2 min.





Contact Objects

How contact data is registered



organisation object

Has data about a company, institution or any other kind of organisation that has IP addresses and AS Numbers.



organisation

This is how you
can contact ORG
and who is
responsible



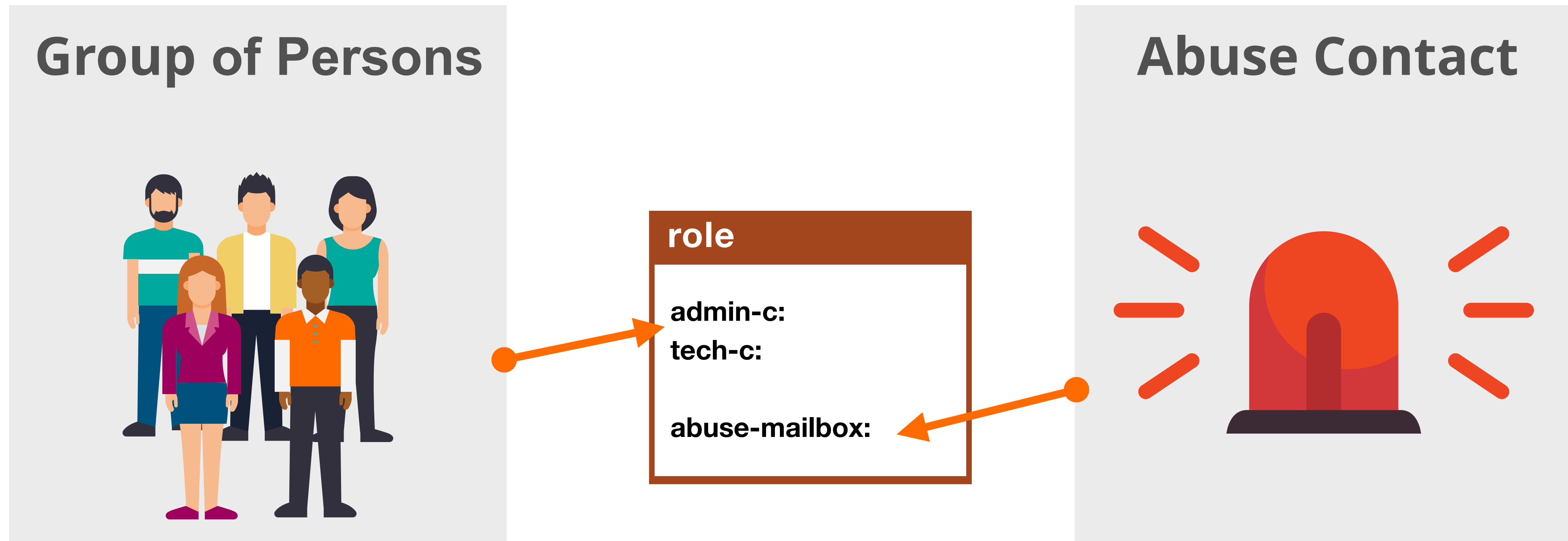
person object

Has data that can be used to contact a real person.



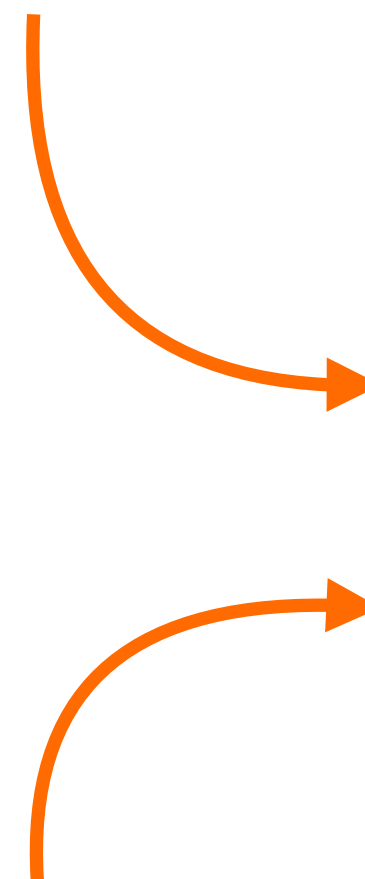
person
This is how you can contact me

role object



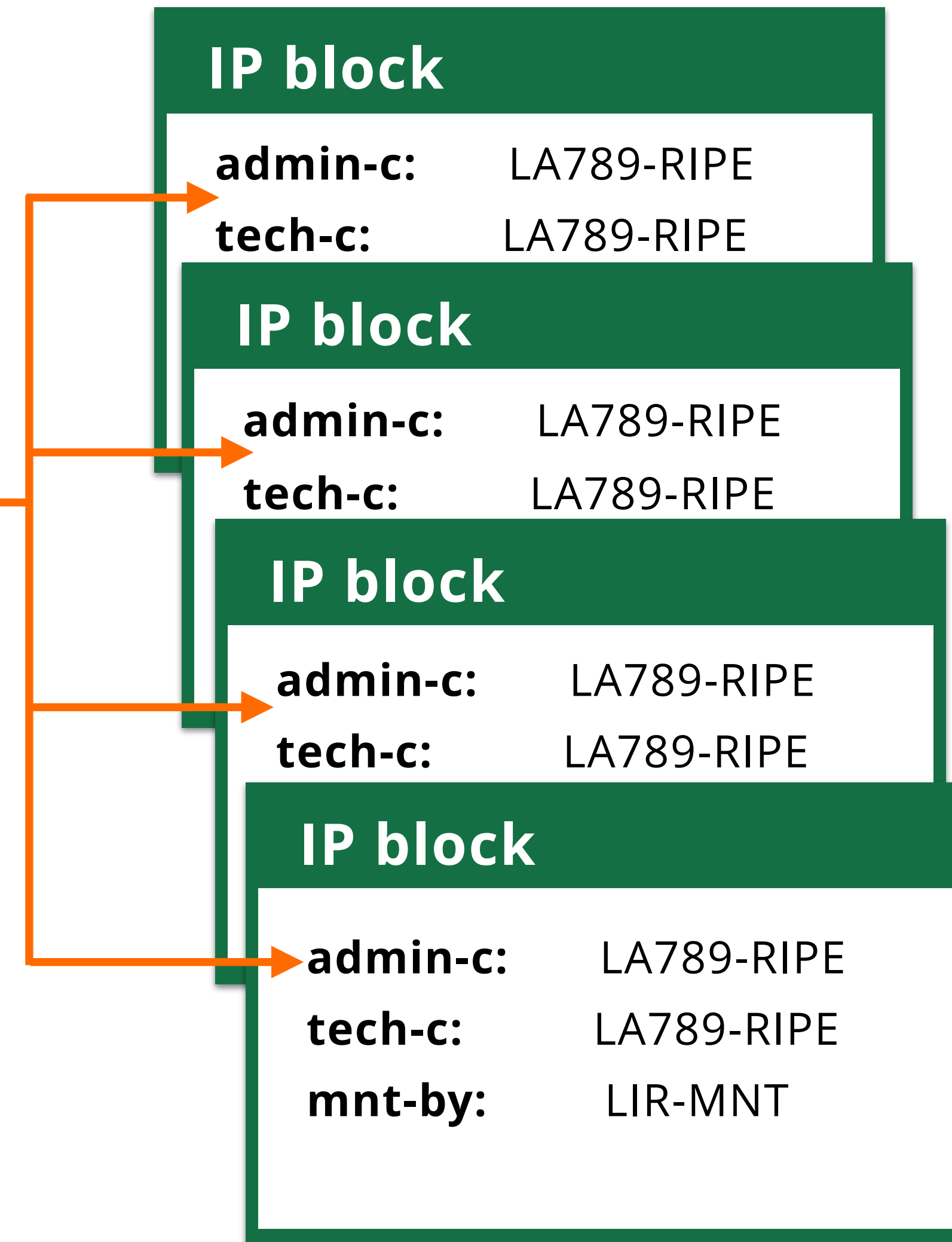


person: Jean Blue
nic-hdl: JB123-RIPE
address: Long Street 5
phone: +31 20 555 0101
email: jean@example.net
mnt-by: LIR-MNT



role: LIR Admin
nic-hdl: LA789-RIPE
admin-c: JB123-RIPE
tech-c: JB123-RIPE
admin-c: BW531-RIPE
tech-c: BW531-RIPE
mnt-by: LIR-MNT

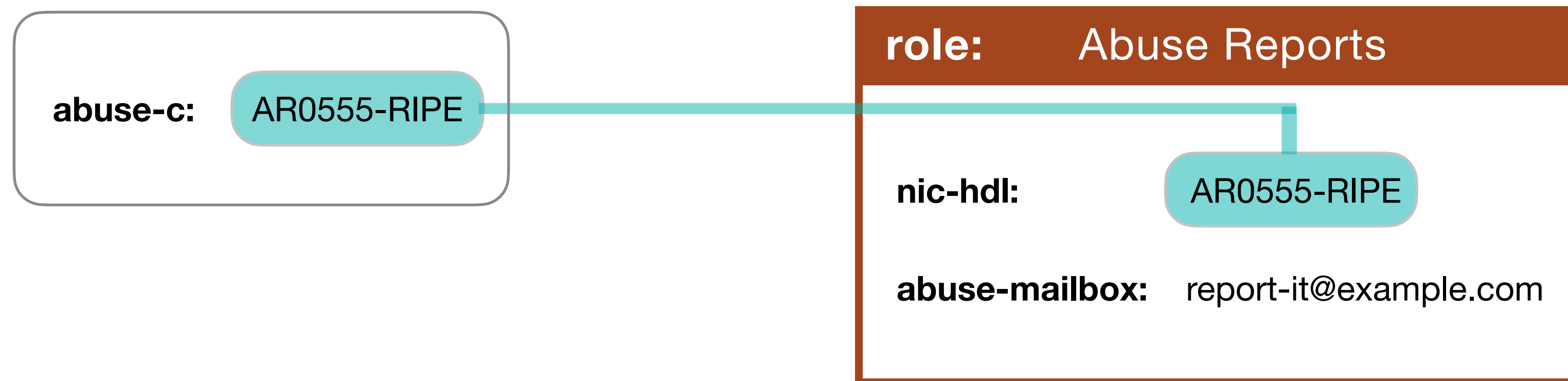
person: Betty White
nic-hdl: BW531-RIPE
address: Long Street 5
phone: +31 20 555 0101
email: betty@example.net
mnt-by: LIR-MNT





role object: Abuse Contact

- The **role** object contains the “abuse-mailbox:”
- Objects reference the **role** in “abuse-c:”
- RIPE Database shows the abuse contact in WHOIS query results



Demo

Let's search for a **role** in the RIPE Database...





Network objects

How networks are registered



Network objects

IPv4 = inetnum

inetnum: 192.30.0.0 - 192.30.3.255

netname: NL-NETWORK-20170101
country: NL
org: ORG-EE2-RIPE
admin-c: DV789-RIPE
tech-c: JS123-RIPE
status: ALLOCATED PA
mnt-by: RIPE-NCC-HM-MNT
mnt-by: DEFAULT-LIR-MNT
source: RIPE

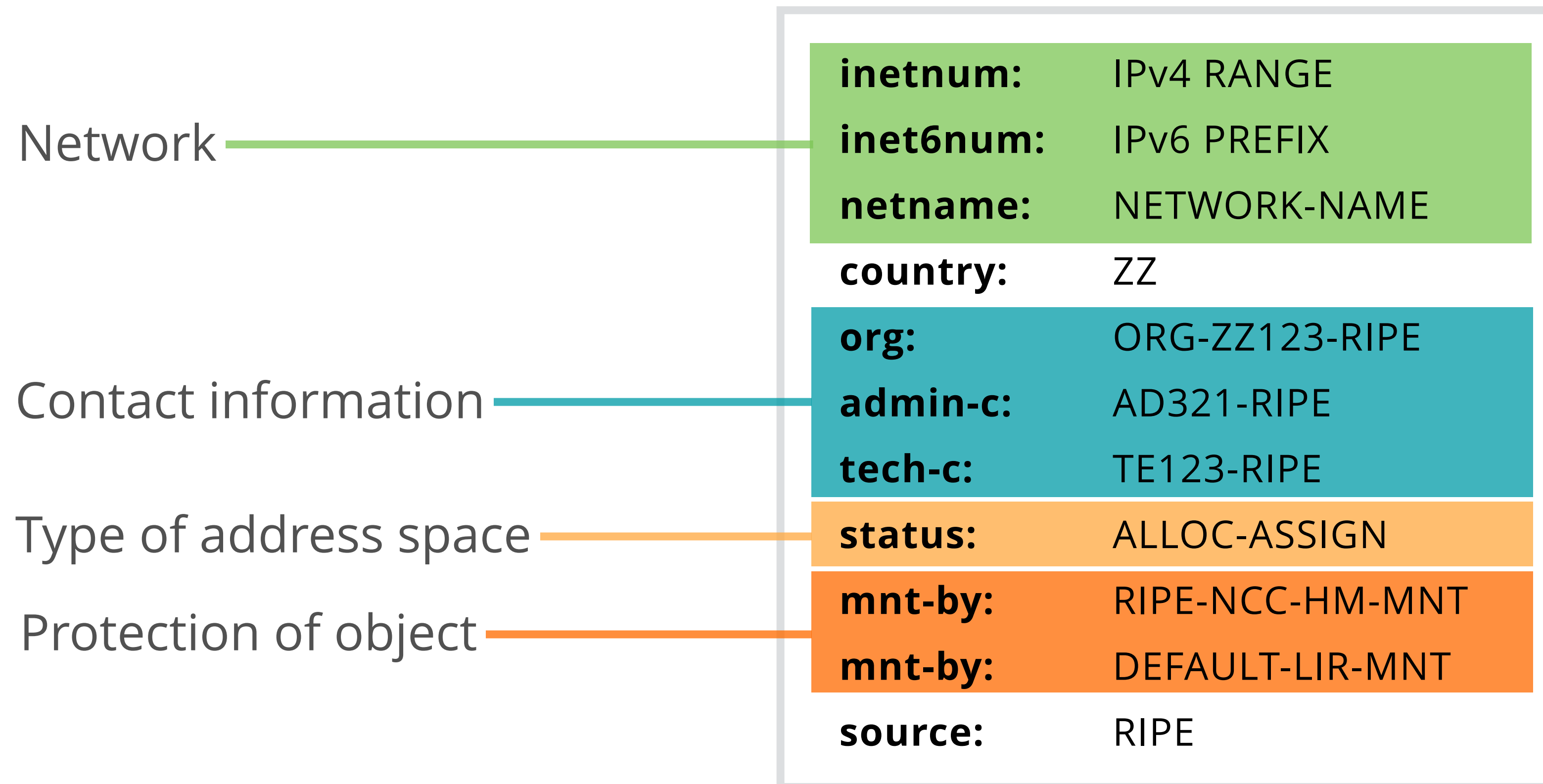
IPv6 = inet6num

inet6num: 2001:db8::/32

netname: NL-NETWORK-20170101
country: NL
org: ORG-EE2-RIPE
admin-c: DV789-RIPE
tech-c: JS123-RIPE
status: ALLOCATED-BY-RIR
mnt-by: RIPE-NCC-HM-MNT
mnt-by: DEFAULT-LIR-MNT
source: RIPE

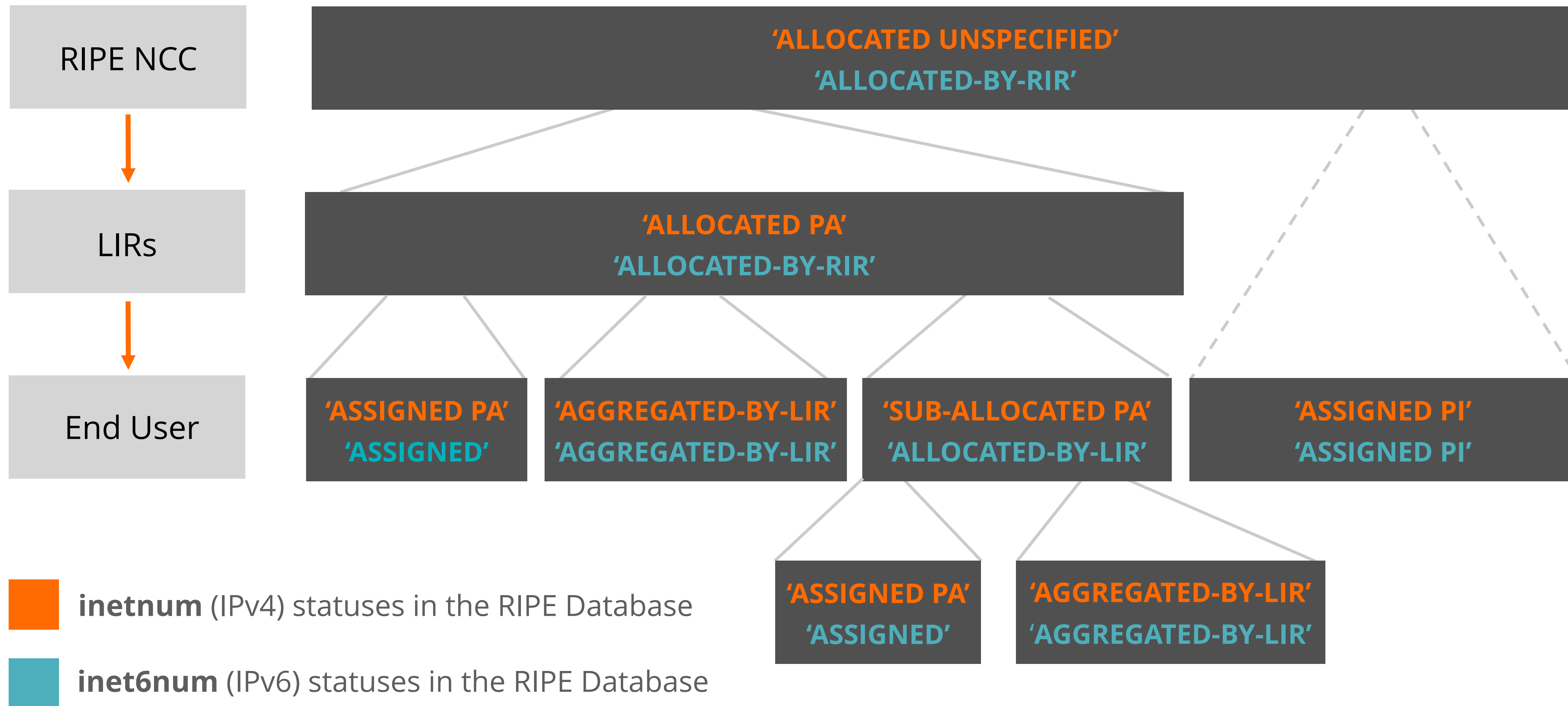


Same object structure for IPv4 and IPv6





Object Status Hierarchy





Questions





Querying

Default results, flags and options



Querying the RIPE Database

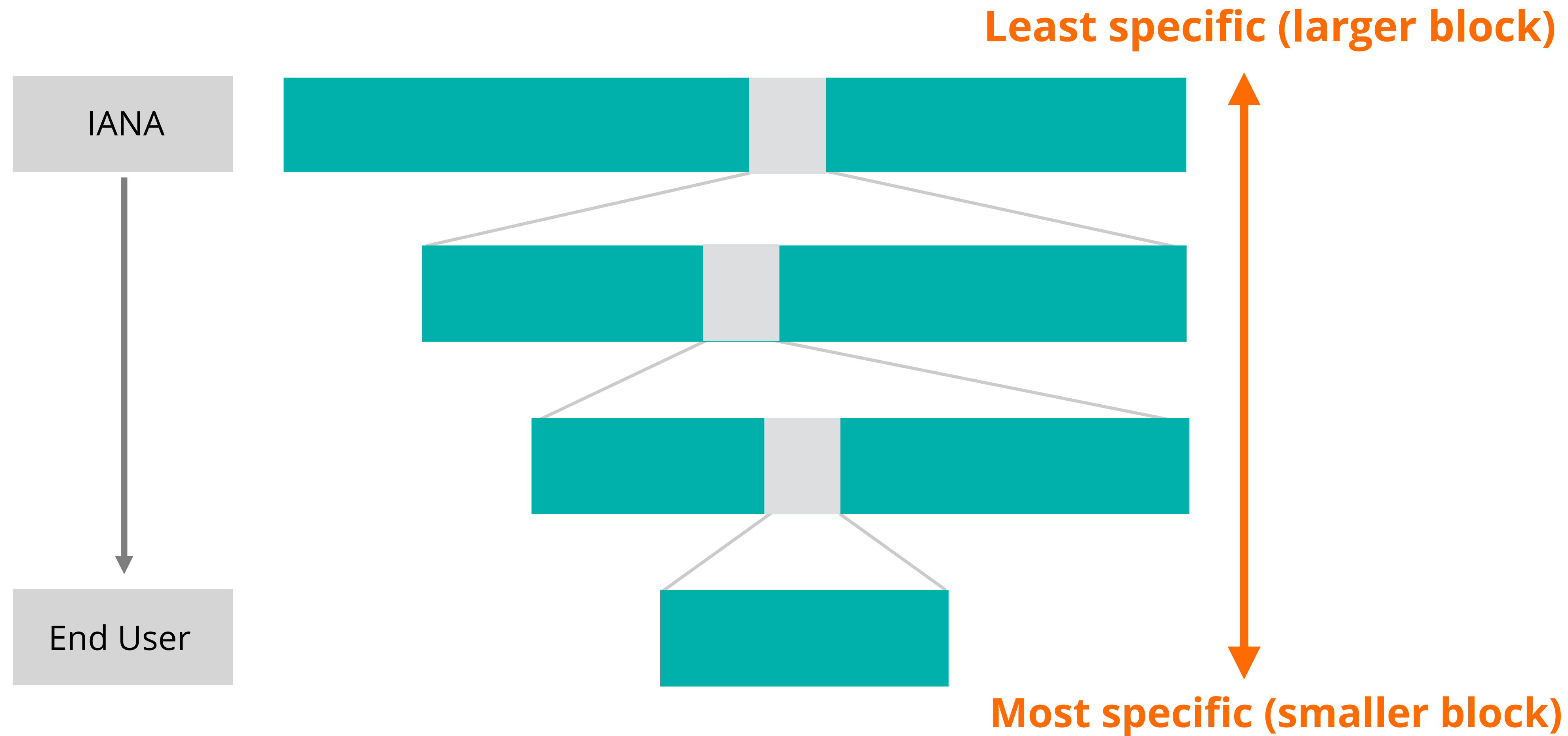
- Web interface
- Command line
- Full Text Search
- RESTful API
- RIPEstat





Default Query Results

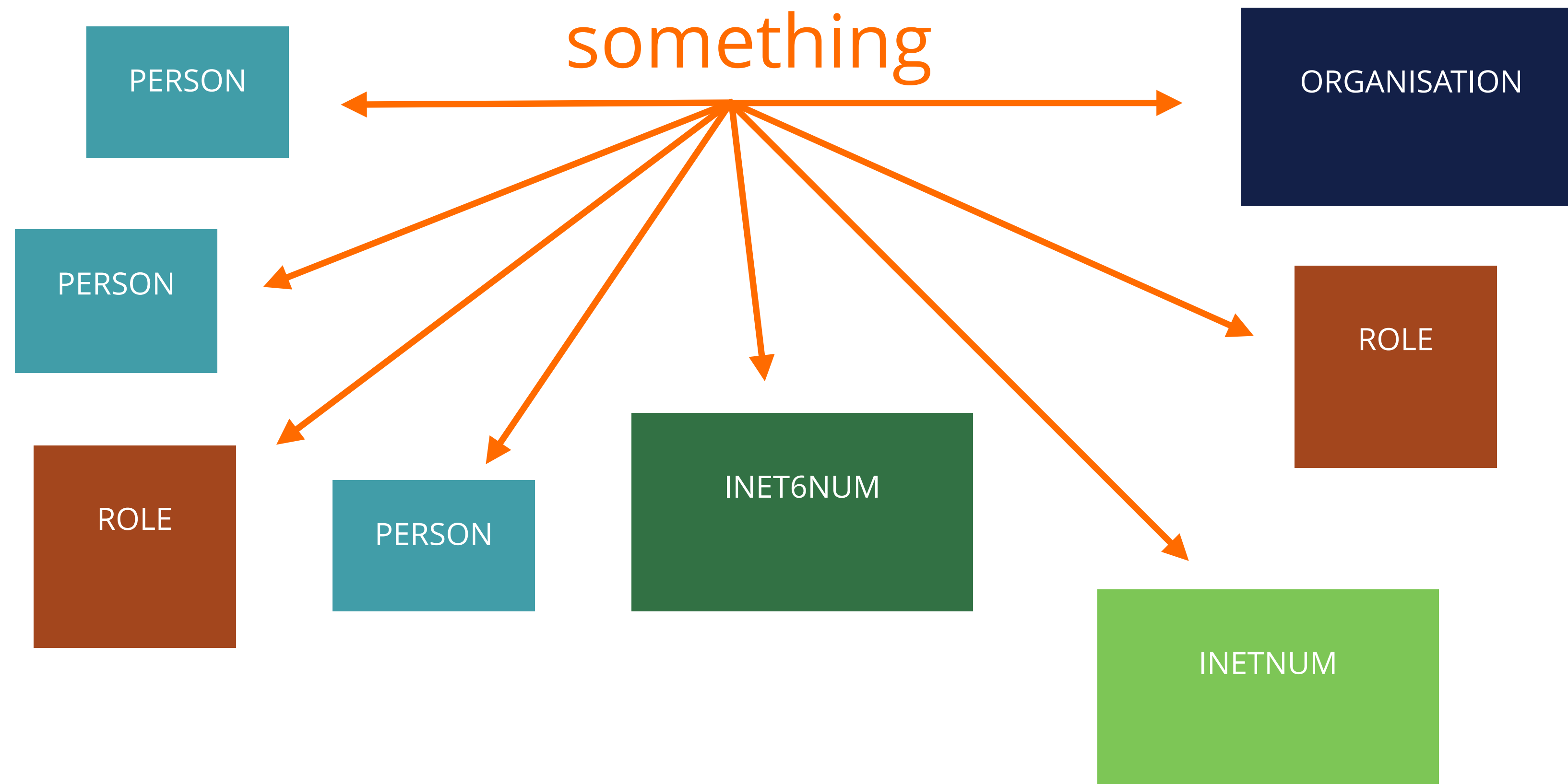
When you query for an **IP address** or **prefix**...





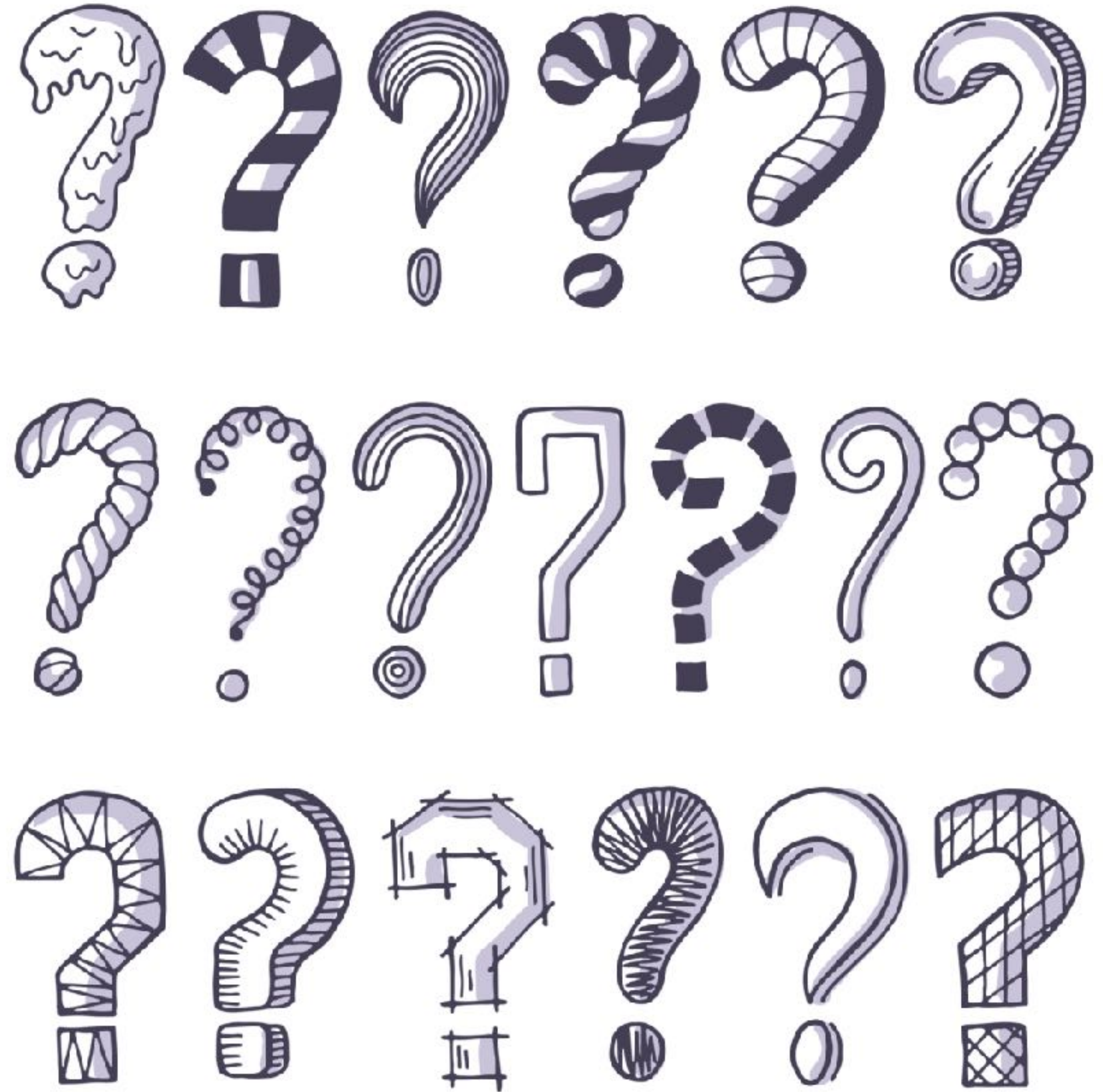
Default Query Results

When you query for simple **text**...



Take the poll!

How can you make **better queries** in the RIPE Database?





Making Better Queries

- Reduce the amount of objects returned
- Use options and flags to optimise the results.
- Avoid getting blocked!





Filtered Query Results

- All email addresses **are filtered**
- Show them with **-B** flag in query
 - Or turn on “Show full object details”
- “auth:” attribute values are always filtered

person:	Jean Blue
nic-hdl:	JB123-RIPE
address:	Long Street 5
phone:	+31 20 555 0101
mnt-by:	LIR-MNT
source:	RIPE # Filtered

mntner:	LIR-MNT
admin-c:	JB123-RIPE
auth:	SSO # Filtered
auth:	SSO # Filtered
auth:	PGP-KEY-54321
mnt-by:	LIR-MNT
source:	RIPE # Filtered



Results Without Related Objects

Search term:

Search 

inetnum: 193.0.24.0 - 193.0.30.255

admin-c: BRD-RIPE

tech-c: OPS4-RIPE

route: 193.0.24.0/21

origin: AS2121



Results With Related Objects

Search term:

193.0.24.1



Search

inetnum: 193.0.24.0 - 193.0.30.255

admin-c: BRD-RIPE

tech-c: OPS4-RIPE

role: RIPE NCC Operations

admin-c:

admin-c:

tech-c:

tech-c:

tech-c:

tech-c:

nic-hdl: OPS4-RIPE

person: Brian Riddle

address: Stationsplein 11

address: 1012 AB Amsterdam

phone: +31 20 535 4444

e-mail: brian@ripe.net

nic-hdl: BRD-RIPE

route: 193.0.24.0/21

origin: AS2121

Selecting Object Types



<input type="checkbox"/>	as-block	<input type="checkbox"/>	inet-rtr	<input type="checkbox"/>	poem
<input type="checkbox"/>	as-set	<input type="checkbox"/>	irt	<input type="checkbox"/>	poetic-form
<input type="checkbox"/>	aut-num	<input type="checkbox"/>	key-cert	<input type="checkbox"/>	role
<input type="checkbox"/>	domain	<input type="checkbox"/>	mntner	<input type="checkbox"/>	route
<input type="checkbox"/>	filter-set	<input type="checkbox"/>	organisation	<input type="checkbox"/>	route6
<input checked="" type="checkbox"/>	inet6num	<input type="checkbox"/>	peering-set	<input type="checkbox"/>	route-set
<input checked="" type="checkbox"/>	inetnum	<input type="checkbox"/>	person	<input type="checkbox"/>	rtr-set

- Choose the types of objects you want to see
- This results in fewer objects to process
- Using a flag: **-T {object type}**
 - i.e. -T inetnum 192.168.0.0/21

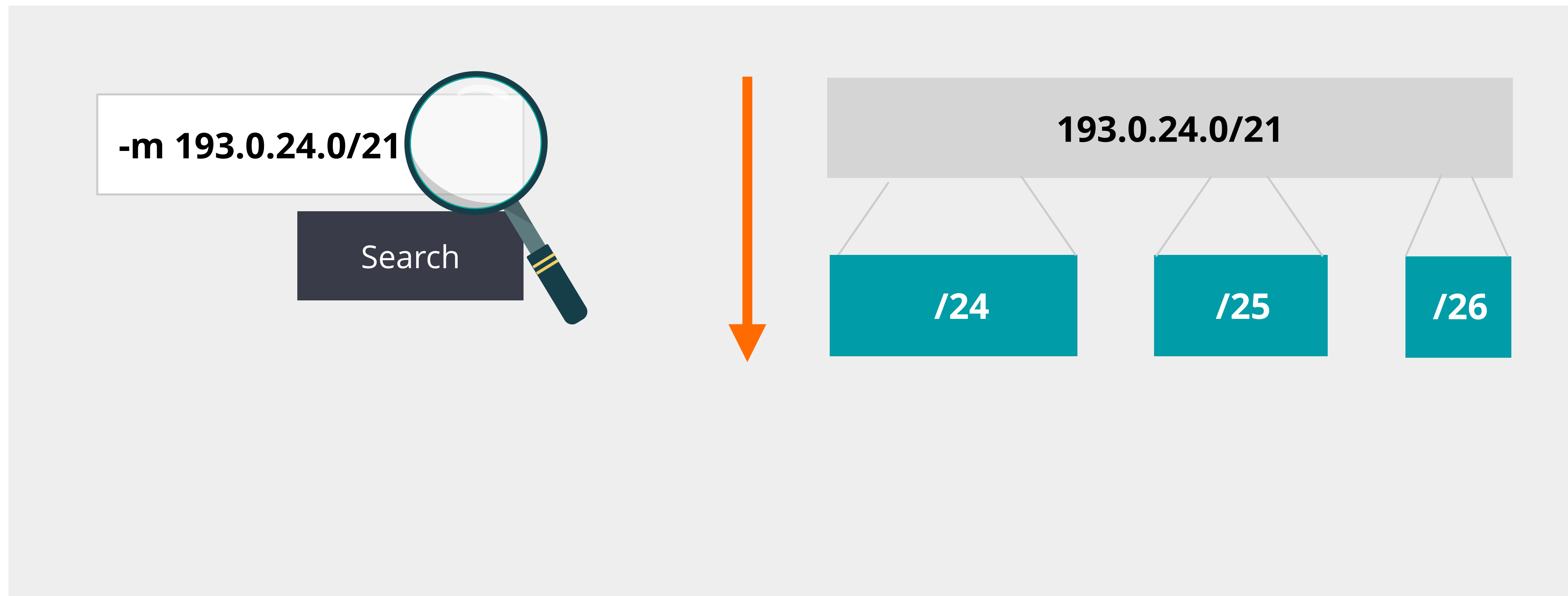


Navigating the Hierarchy

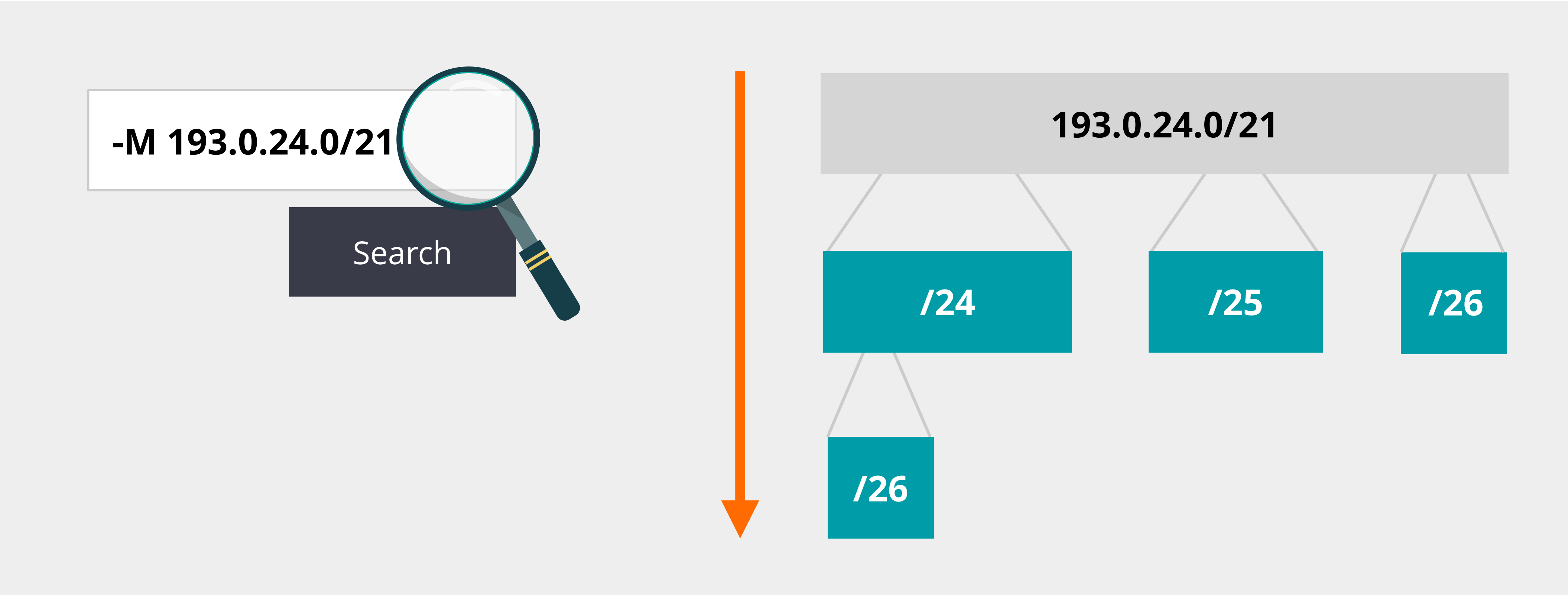
- Using flags, you can find what is under or above an inet(6)num object
 - Under = More Specific
 - Above = Less Specific
- The flags: -m, -M, -l, -L
- Also found in the “Hierarchy Flags” tab



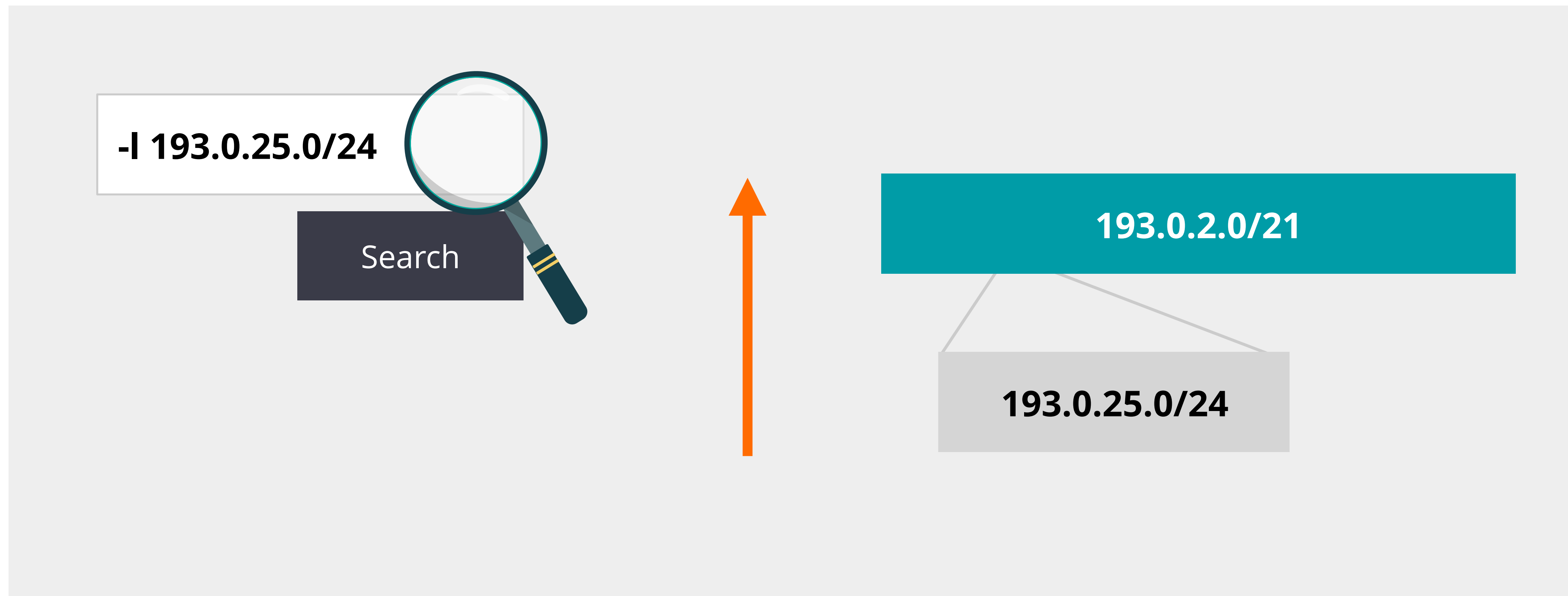
More Specific inetnums: -m



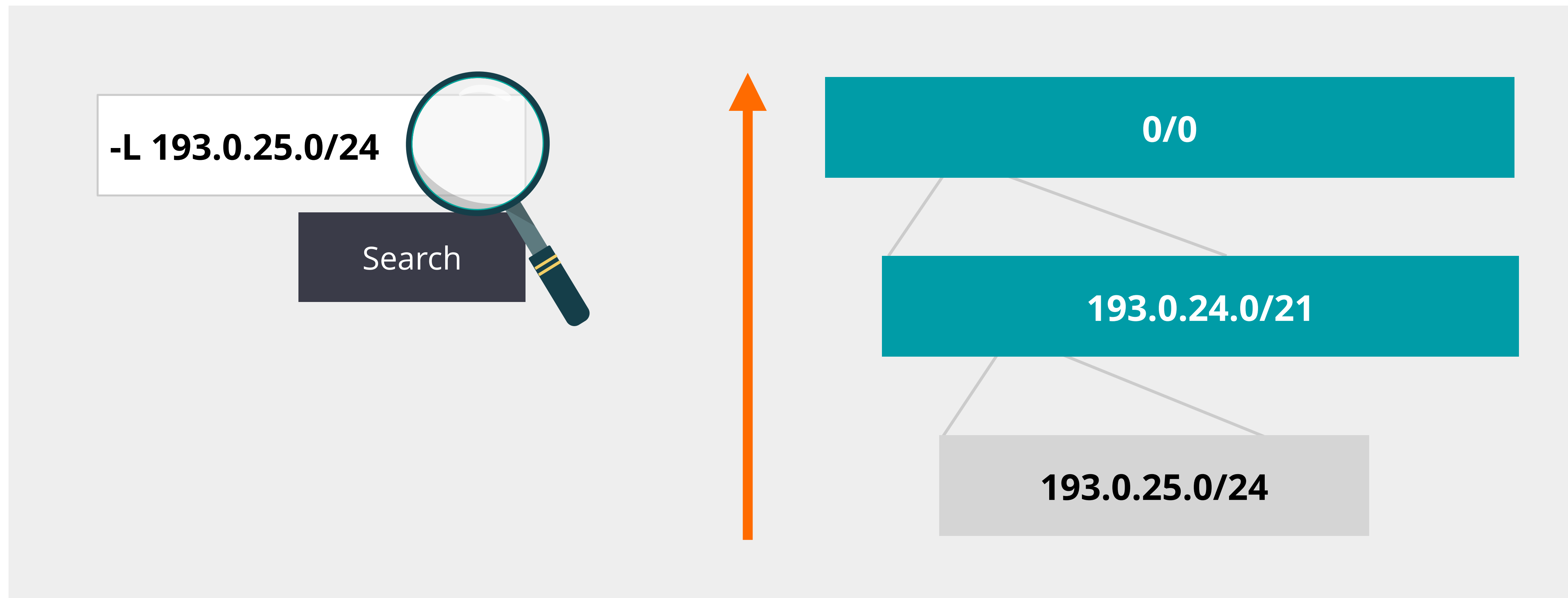
More Specific inetnums: -M



Less Specific inetnums: -l



Less Specific inetnums: -L





Let's practice! (1)

Which **flag** would give you this object as a result?

person:	Jean Blue
nic-hdl:	JB123-RIPE
address:	Long Street 5
phone:	+31 20 555 0101
e-mail:	j.blue@example.net
mnt-by:	LIR-MNT
source:	RIPE



Let's practice! (2)

Which **flag** would give you these objects as a result?

193.0.24.0/21

/24

/26



Let's practice! (3)

Which **flag** would give you this object as a result?

```
route6: 2001:db8::/32
```

```
origin: AS65530
```



Questions





**We will continue in
5 minutes!**

Welcome back!



Take the poll!

Are you enjoying the
RIPE NCC webinar?





Inverse Lookups

Searching for references

Take the poll!

What is an **“inverse lookup”**?

 2 min.





Inverse Lookup



Finding all other objects in which your object is **referenced**.

Inverse Lookup: admin-c



inet6num: 2001:db8::/32

org: ORG-BB2-RIPE
admin-c: BW280-RIPE
tech-c: JB1-RIPE
mnt-by: RIPE-NCC-HM-MNT
mnt-by: DEFAULT-LIR-MNT

aut-num: AS64551

org: ORG-BB2-RIPE
admin-c: **JB1-RIPE** ←
tech-c: TT789-RIPE
mnt-by: RIPE-NCC-END-MNT
mnt-by: DEFAULT-LIR-MNT

mntner: DEFAULT-LIR-MNT

admin-c: **JB1-RIPE** ←
tech-c: TT789-RIPE
mnt-by: DEFAULT-LIR-MNT

role: Tech Team

nic-hdl: TT789-RIPE
admin-c: **JB1-RIPE** ←
tech-c: KH404-RIPE
mnt-by: DEFAULT-LIR-MNT

-i admin-c JB1-RIPE

person: Jean Blue

address: Big Street 45
phone: +31 20 345 6854
e-mail: jean.blue@example.net
nic-hdl: JB1-RIPE
mnt-by: BLUE-MNT

Inverse Lookup: person



inet6num: 2001:db8::/32
org: ORG-BB2-RIPE
admin-c: BW280-RIPE
tech-c: JB1-RIPE ←
mnt-by: RIPE-NCC-HM-MNT
mnt-by: DEFAULT-LIR-MNT

aut-num: AS64551
org: ORG-BB2-RIPE
admin-c: JB1-RIPE ←
tech-c: TT789-RIPE
mnt-by: RIPE-NCC-END-MNT
mnt-by: DEFAULT-LIR-MNT

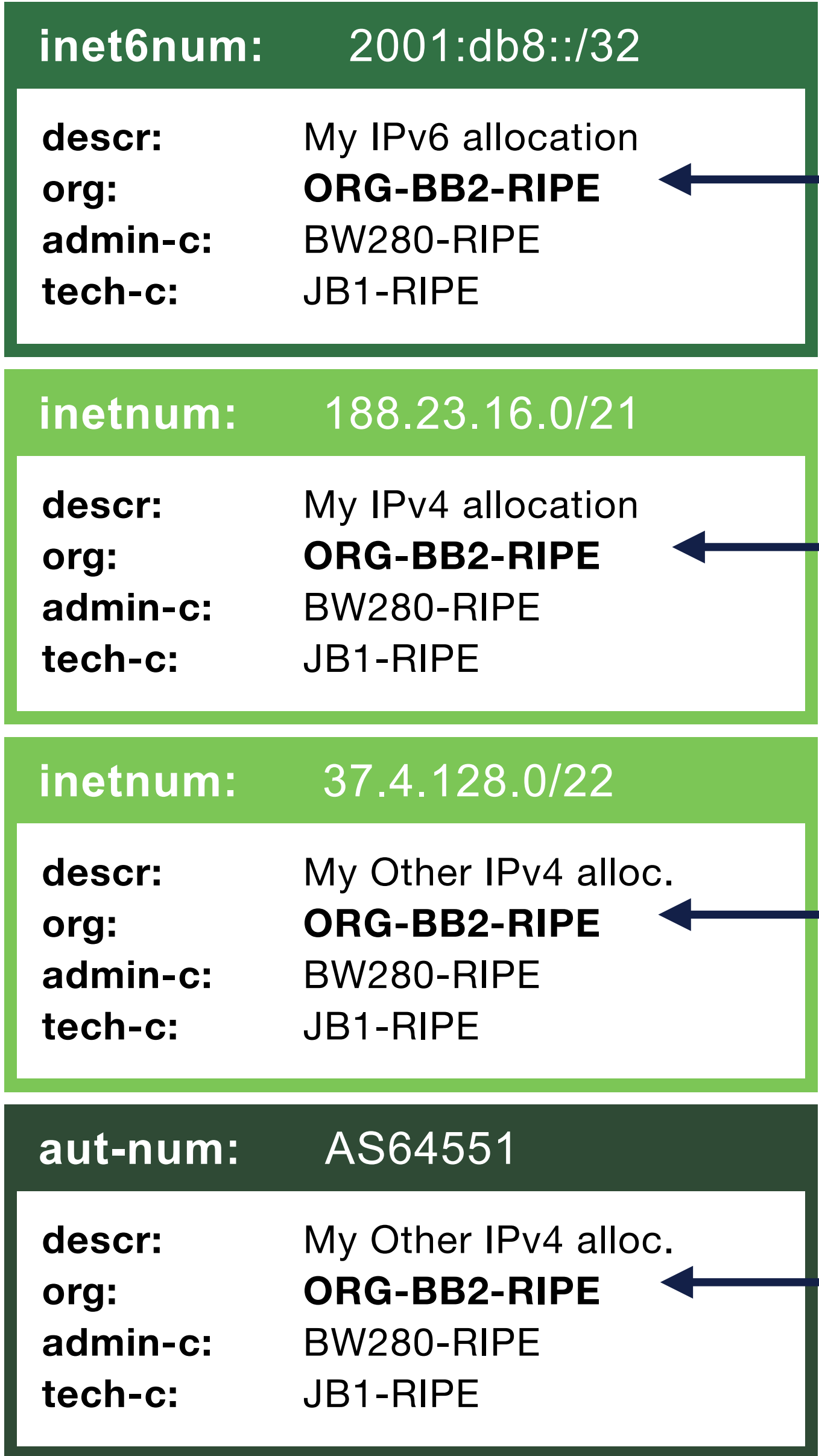
mntner: DEFAULT-LIR-MNT
admin-c: JB1-RIPE ←
tech-c: TT789-RIPE
mnt-by: DEFAULT-LIR-MNT

role: Tech Team
nic-hdl: TT789-RIPE
admin-c: JB1-RIPE ←
tech-c: KH404-RIPE
mnt-by: DEFAULT-LIR-MNT

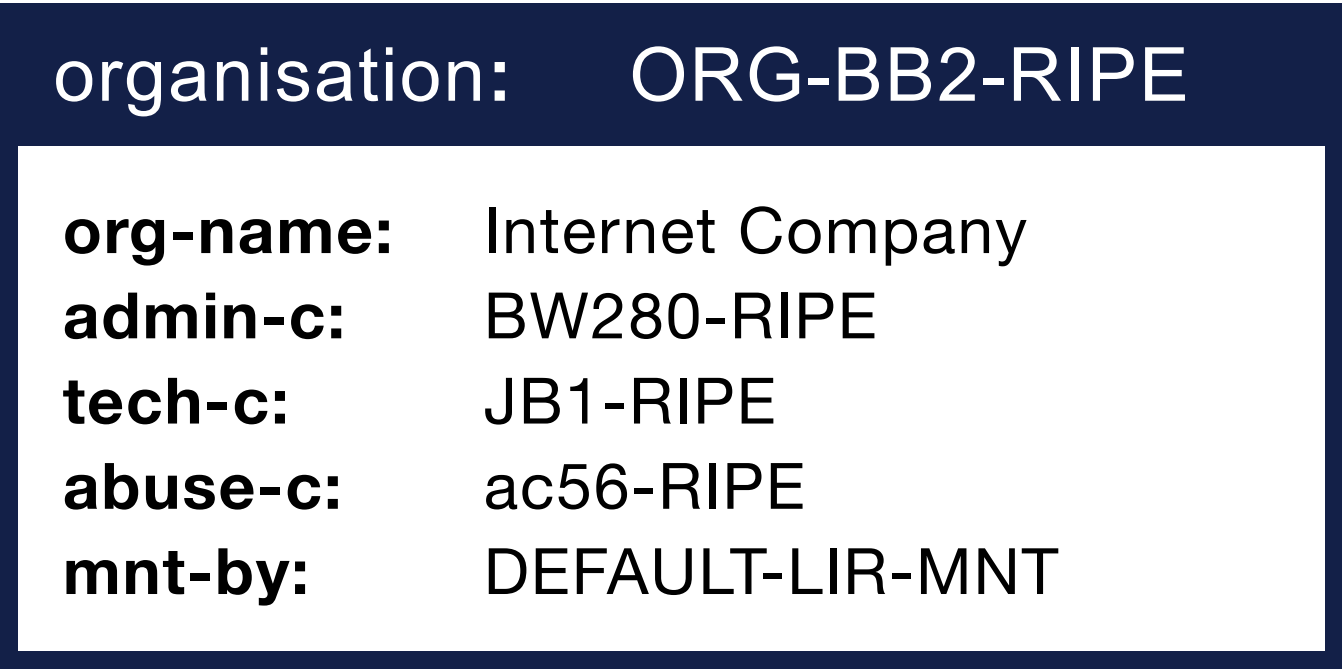
-i person JB1-RIPE

person: Jean Blue
address: Big Street 45
phone: +31 20 345 6854
e-mail: jean.blue@example.net
nic-hdl: JB1-RIPE
mnt-by: BLUE-MNT

Inverse Lookup: organisation



-i org ORG-BB2-RIPE



Inverse Lookup: mnt-by



```
inet6num: 2001:db8::/32
org: ORG-BB2-RIPE
admin-c: BW280-RIPE
tech-c: JB1-RIPE
mnt-by: RIPE-NCC-HM-MNT
mnt-lower: ANOTHER-MNT
```

```
aut-num: AS64551
org: ORG-BB2-RIPE
admin-c: JB1-RIPE
tech-c: TT789-RIPE
mnt-by: RIPE-NCC-END-MNT
mnt-by: ANOTHER-MNT
```

```
person: Jean Blue
nic-hdl: JB1-RIPE
phone: +31 20 543 9640
mnt-by: ANOTHER-MNT
```

```
role: Other Group
nic-hdl: OG10-RIPE
admin-c: JB1-RIPE
tech-c: SZ72-RIPE
mnt-by: ANOTHER-MNT
```

-i mnt-by ANOTHER-MNT

```
mntner: ANOTHER-MNT
admin-c: JB1-RIPE
auth: PGPKEY
auth: SSO
upd-to: jean.blue@example.net
mnt-by: ANOTHER-MNT
```




Full Text Search

Looking for text everywhere



RIPE Database Text Search

This service allows searches over the full text of the RIPE Database object data.

The search is done on object text without regard for any relationships. Multiple search terms should be separated with a space.

+ [Advanced Search](#)

By submitting this form you explicitly express your agreement with the [RIPE Database Terms and Conditions](#)

Search



Search results

This is the RIPE Database full text search service.
The RIPE Database is subject to [Terms and Conditions](#).

Number of results - all object types	15
key-cert	6
person	3
domain	2
mntner	2
inet6num	1
inetnum	1

« 1 2 »

domain: 201.156.178.IN-ADDR.ARPA
descr=BLUELIGHT , mnt-by=RO-BLUELIGHT

domain: 200.156.178.IN-ADDR.ARPA
descr=BLUELIGHT , mnt-by=RO-BLUELIGHT

inet6num: 2a01:4f8:201:31ea::/64
netname=BLUE-LIGHT



Search term

+ Basic Search

All
 Any
 Exact Match

Search only within the following objects:

- as-block
- as-set
- aut-num
- domain
- filter-set
- inet-rtr
- inet6num
- inetnum**
- irt
- key-cert
- mntner
- organisation
- peering-set
- person
- poem
- poetic-form
- role
- route
- route-set
- route6
- rtr-set

Search within the following fields: ?

- admin-c
- changed
- country
- created
- descr
- geoloc
- inetnum
- language
- last-modified
- mnt-by
- mnt-domains
- mnt-irt
- mnt-lower
- mnt-routes
- netname
- notify
- org
- remarks
- source
- sponsoring-org
- status
- tech-c

By submitting this form you explicitly express your agreement with the [RIPE Database Terms and Conditions](#)

Search

Advanced search

Take the poll!

How would **you** use
the **Full Text Search**?

 2 min.





Questions





Creating Objects

How to put data in the RIPE Database

Demo

Let's create a **role** object.

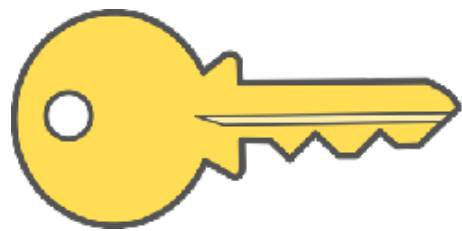




Maintainers: Protecting Objects

person:	Jean Blue
address:	My Street 9876
address:	Office 123
phone:	+31 20 876 5432
e-mail:	jean@example.net
nic-hdl:	JB123-RIPE
<u>mnt-by:</u>	<u>LIR-MNT</u>

mntner:	LIR-MNT
admin-c:	JB123-RIPE
notify:	noc@example.org
upd-to:	noc@example.org
auth:	MD5-PW \$1\$crypto-stuff
auth:	SSO email@domain.com
auth:	PGP-KEY-<key ID>
<u>mnt-by:</u>	<u>LIR-MNT</u>



* Will be deprecated in 2025



Authentication

- RIPE NCC Access (Single Sign-On)
- Password (MD5-PW) (**will be deprecated in 2025**)
- Private key/public key (PGP and x509)





auth: SSO

```
mntner: NCCTS-MNT

admin-c: JB123-RIPE
upd-to: noc@example.org
auth: SSO email@domain.com
mnt-by: NCCTS-MNT
```

Maintainer with SSO

Sign in using your RIPE NCC
Access account

Your email address*

Your password*

SIGN IN

[Forgot password?](#) [Create an account](#)

Sign in to Access

Create object!

Create "person" object

Please enter the maintainers you would like to use as mnt-by

NCCTS-MNT ★ ✕

person
Specifies the full name of a contact, e.g. John Smith.

address
Specifies the full postal address of a contact.

phone
Phone number with country code, e.g. +44 161 715 1234.



auth: MD5-PW

```
mntner: NCCTS-MNT  
  
admin-c: JB123-RIPE  
upd-to: noc@example.org  
  
auth: MD5-PW $1$crypto-stuff  
  
mnt-by: NCCTS-MNT
```

Maintainer with MD5

Password authentication

Select a maintainer to authenticate the update operation.

NCCTS-MNT

Provide the password for the selected maintainer [Forgotten MNTNER password?](#)

Also authorise my RIPE NCC Access account for this maintainer. [Learn more.](#)

Submit

Provide password

Create object!

Create "person" object

Please enter the maintainers you would like to use as mnt-by

NCCTS-MNT ★ ✕

person
Specifies the full name of a contact, e.g. John Smith.

address
Specifies the full postal address of a contact.

phone
Phone number with country code, e.g. +44 161 715 1234.

* Will be deprecated in 2025



auth: PGPKEY

```
mntner: SPIDERMAN-MNT  
  
admin-c: JB123-RIPE  
upd-to: noc@example.org  
auth: PGP-KEY-<key ID>  
mnt-by: LIR-MNT
```

Maintainer with PGPKEY

key-cert: PGP-KEY-<keyID>

```
method: PGP  
owner: Some Body <somebody@domain.email>  
fingerpr: B8C7 456D 66DD 4A26 D976 9987 79D2 7CC1  
certif: -----BEGIN PGP PUBLIC KEY BLOCK-----  
certif: Version: PGP Desktop 10.1.1 (Build 10)  
certif:  
certif: mQENBE800ZIBCAC07Dj4BJ1NwWpiCOzA  
certif: aGpzuMVJB0QO6HzGvC9t8F4uBJdderTtCd  
certif: wWe2foVxMgF2upPpGmpfq6TxuEekM/5XB  
certif: jfETr4J77VsSW9Q581HyRDdVaAT9wdL8jZa  
certif: bxQbO3XZrROjmf5PPq+5/XNv7tQs1AtglEu
```

key-cert object holds the public key

- X509 certificate authentication works the same way

auth: PGPKEY



New message

To: **auto-dbm@ripe.net**

Subject: **New object creation**

person: Peter Parker
address: Some Long Street 123
phone: +99876543210
nic-hdl: PP999-RIPE
mnt-by: SPIDERMAN-MNT
source: RIPE

- - - BEGIN PGP SIGNATURE - - -
Version: PGP Desktop 10.1.1 (Build 10)

mQGIBDuWQtARBACA88T3KzHTmirNtTQ3zo7l6KhZIZCJ9+i5yJaDIaPTGmT7/LuO
VXaM011iLqjIzRb+EZbV48979UcYNHu7HpBiaRX9wLXVxb2OQANGME5mkhDtFsNP
tA0k0SaEzXUBH4l2k8UuMT8Ph779q/kvO2S5kno7WLnOsHYXKvyGIn2QDwCght3g

Send A 🗑️ 😊 🖼️

Create object!

```
person: Peter Parker
address: Some Long Street 123
phone: +99876543210
nic-hdl: PP999-RIPE
mnt-by: SPIDERMAN-MNT
created: 2019-04-03T11:44:58Z
last-modified: 2019-04-03T11:44:58Z
source: RIPE
```

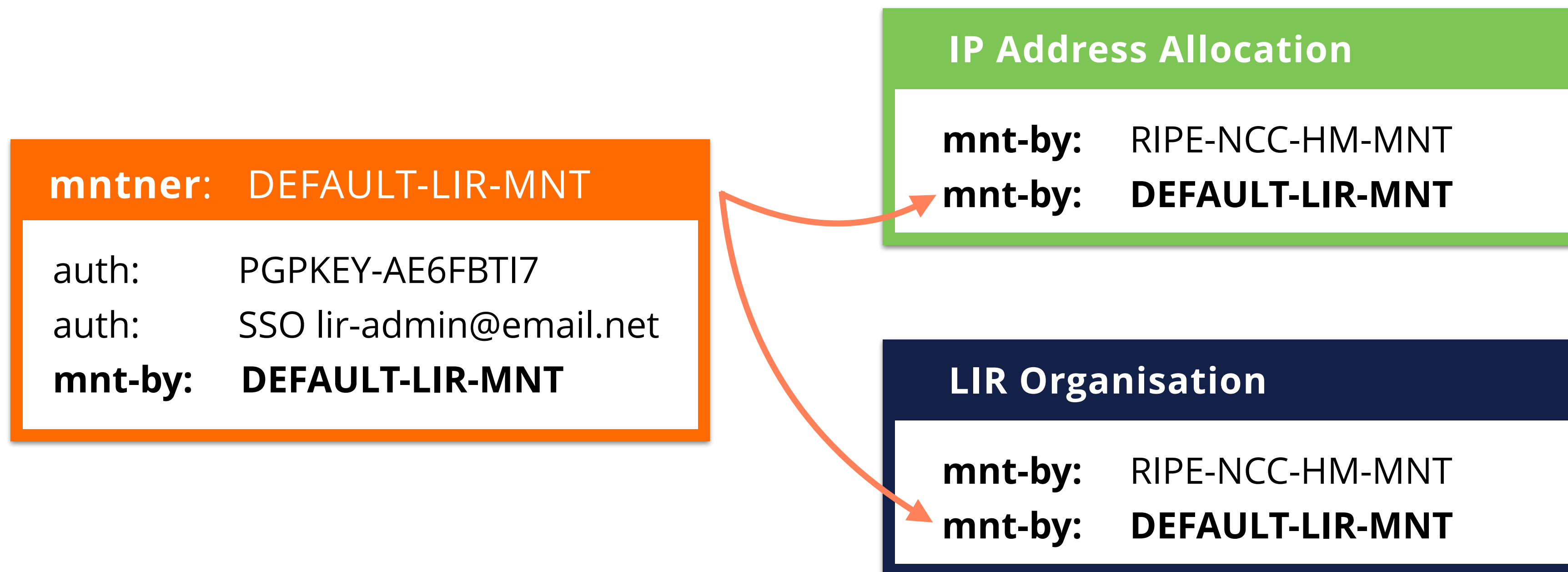
Send update in email

Signed with private key



Default Maintainer for LIRs

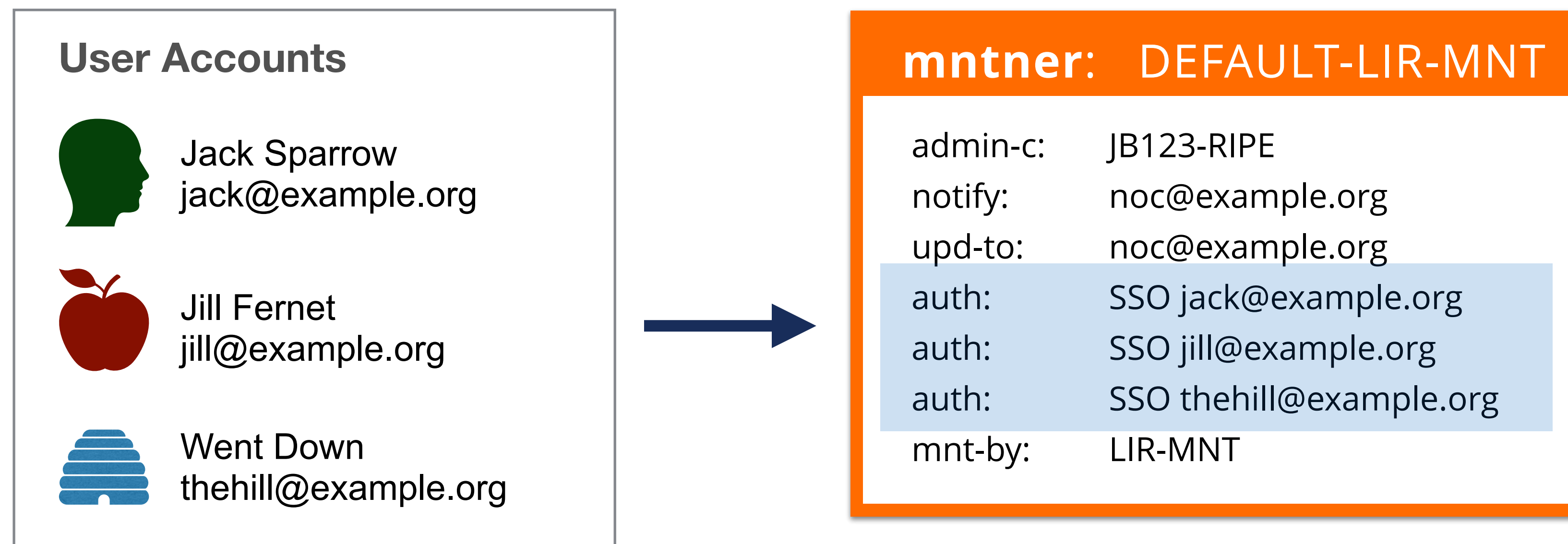
- Allows partial control over your allocations, ASNs and ORG
- Can be selected in the LIR Account Details
- Automatically reflected in the RIPE Database





Synch With LIR Portal

- Default LIR Maintainer can be synchronised with LIR Portal
- Users added as SSO to the maintainer
- Previous “auth:” lines are removed





Take the poll!

Which maintainer would **you** use to protect **your own person object**?





Personal vs Shared

LIR objects, shared maintainer

```
mntner: DEFAULT-LIR-MNT  
  
auth: PGPKEY-423789  
auth: SSO johndoe@email.net  
auth: SSO clara@network.com
```

```
IP Address Allocation  
  
mnt-by: RIPE-NCC-HM-MNT  
mnt-by: DEFAULT-LIR-MNT
```

```
LIR Organisation  
  
mnt-by: RIPE-NCC-HM-MNT  
mnt-by: DEFAULT-LIR-MNT
```

Your person, your maintainer

```
mntner: PERSONAL-MNT  
  
auth: SSO johndoe@email.net
```

```
Person  
  
mnt-by: PERSONAL-MNT
```



Multiple Maintainers

mntner: ONE-MNT

admin-c: LA789-RIPE
tech-c: LA789-RIPE
mnt-by: ONE-MNT
auth: SSO email@domain.com
auth: X509-AE6FBT17

mntner: TWO-MNT

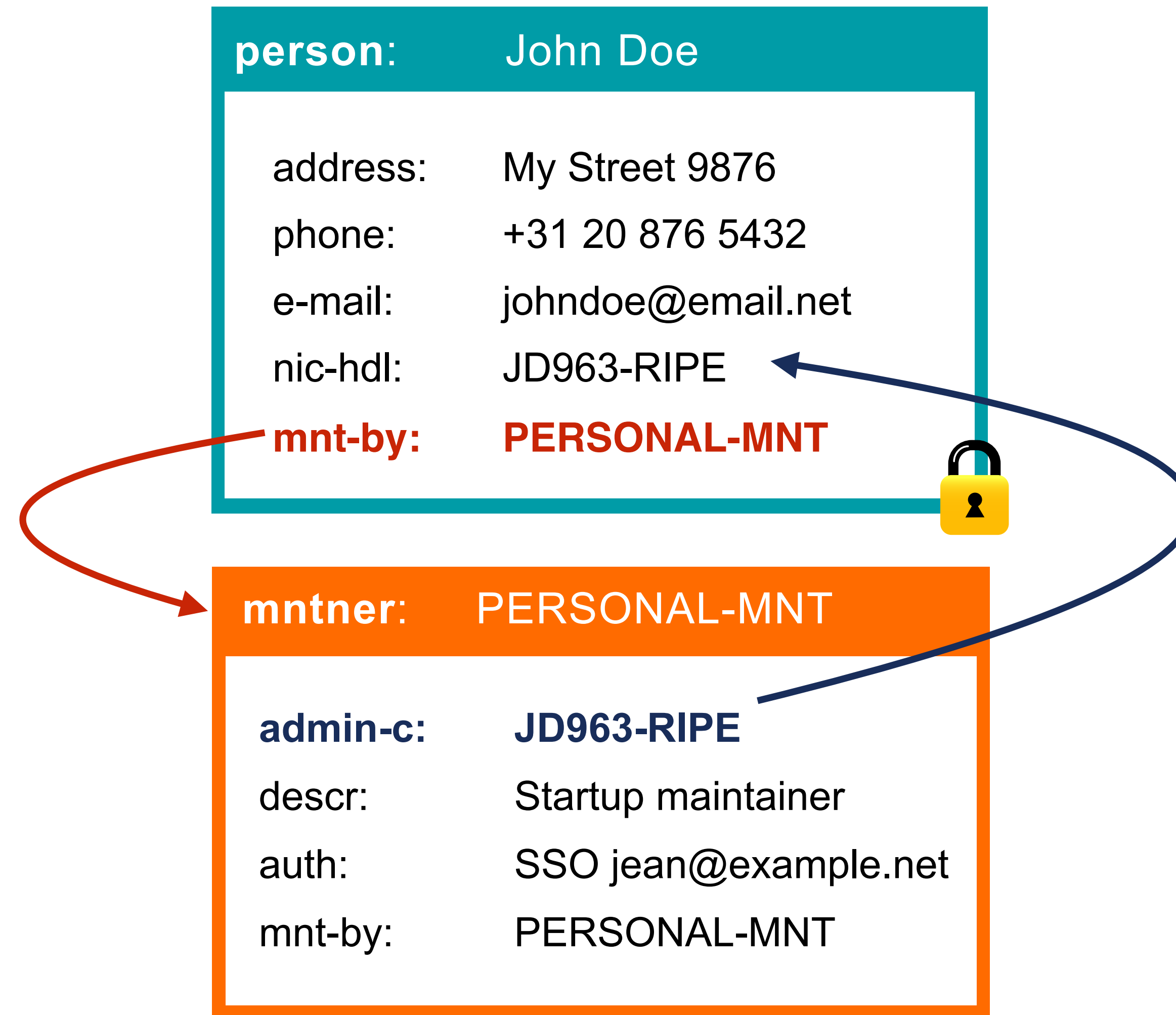
admin-c: XY456-RIPE
tech-c: XY456-RIPE
mnt-by: TWO-MNT
auth: SSO other@domain.com

person: Jean Blue

address: My Street 9876
phone: +31 20 876 5432
e-mail: jean@example.net
nic-hdl: JB123-RIPE
mnt-by: ONE-MNT
mnt-by: TWO-MNT



Maintainer and Person



Demo

Let's create
a **person /maintainer** pair...





Questions





Updating Objects

The easy way



Take the poll!

In which cases would you **update** an existing object?



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Access account

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Search for the object

Search results

[PERMA](#) [XML](#) [JSON](#)

This is the RIPE Database search service. The objects are in RPSL format.
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Responsible organisation: [Reseaux IP Europeens Network Coordination Centre \(RIPE NCC\)](#)
Abuse contact info: abuse@ripe.net

```
inetnum:      193.0.24.0 - 193.0.30.255
netname:      LARGE-NETWORK
country:      NL
admin-c:      BRD-RIPE
tech-c:       GAV
status:       ASSIGNED PA
mnt-by:       RIPE-NCC-MNT
created:      2020-03-26T14:07:53Z
last-modified: 2020-03-26T14:07:53Z
source:       RIPE
```

Update object

RIPEstat [↗](#)

Click here!

Update object



Modify "inetnum" object

Edit in text area

Please enter the maintainers you would like to use as mnt-by

RIPE-NCC-MNT ★

inetnum
193.0.24.0 - 193.0.30.255

netname
LARGE-NETWORK

country
NL

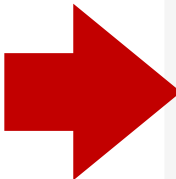
admin-c
BRD-RIPE

tech-c
GAV

status
ASSIGNED PA

source
RIPE

Some attributes **cannot** be updated



This one **can** be updated!



By submitting this form you explicitly express your agreement with the [RIPE Database Terms and Conditions](#)

Delete this object

Cancel

Submit

Submit the changes



Your object has been successfully modified

inetnum "193.0.24.0 - 193.0.30.255"

inetnum:	193.0.24.0 - 193.0.30.255
netname:	LARGE-NETWORK
country:	NL
admin-c:	BRD-RIPE
- tech-c:	GAV
+ tech-c:	OPS-RIPE
status:	ASSIGNED PA
mnt-by:	RIPE-NCC-MNT
created:	2020-03-26T14:07:53Z
- last-modified:	2020-03-26T14:07:53Z
+ last-modified:	2020-03-26T14:16:28Z
source:	RIPE

Modify

Back to Create object





Questions



We want your feedback!



What did you think about this webinar? Take our survey at:

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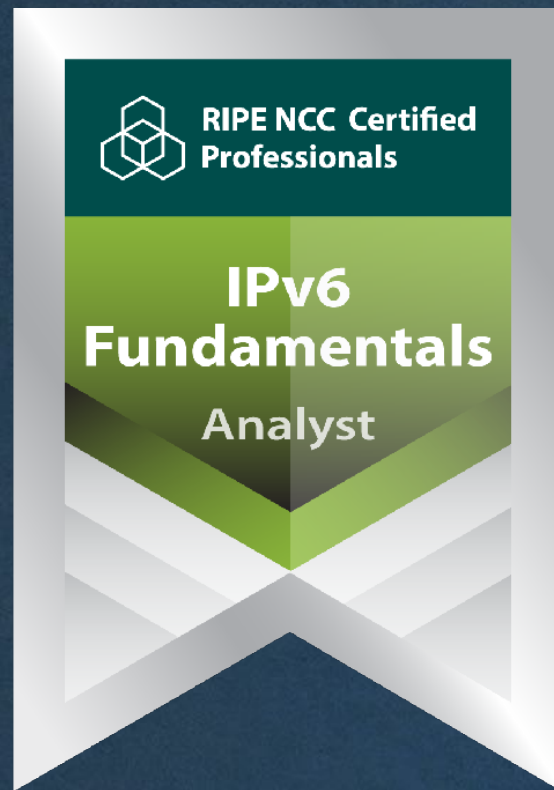


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Lõpp	Amaia	Loppu	Slutt	Крај	Kraj	
Kraj	Sfârșit	النهاية	Конец	Koniec	Fund	
Fine	Fin	Einde	Fí	Крај	Beigas	Τέλος
Fim	Slut				Pabaiga	



What's Next in Internet Registry

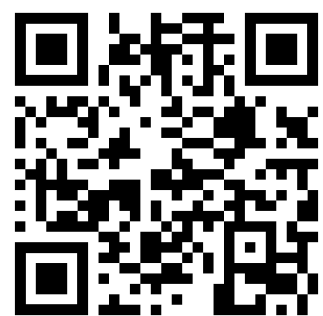


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