



RIPE NCC
RIPE NETWORK COORDINATION CENTRE

RIPE Database

Training Course

Training Services | RIPE NCC | October 2015

Schedule



09:00 - 09:30	Coffee, Tea
11:00 - 11:15	Break
13:00 - 14:00	Lunch
15:30 - 15:45	Break
17:30	End

Introduction



- **Name**
- **Number on the list**
- **Experience**
 - LIR
 - RIPE Database
 - RIPEstat
- **Goals**

Overview



- **The RIPE Database Basics**
 - Exercise 1: Using the “New Organisation Startup Form”
- **Role Objects**
 - Exercise 2: Create a role Object
- **Querying the RIPE Database**
- **Inverse Lookups**
 - Exercise 3: Finding the Correct Contact Information
- **Database Protection Mechanisms**
 - Exercise 4: Finding the Addresses of an LIR
- **Hierarchical Authorisation**
 - Exercise 5: Hierarchical Authorisation
- **Reverse Delegation**
 - Exercise 6: Setting Up Reverse Delegation
- **Tools: LIR Portal, RIPEstat**



RIPE Database Basics

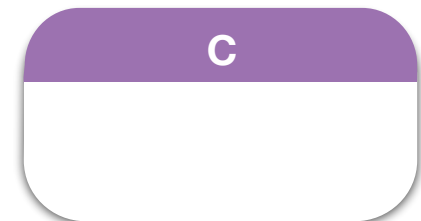
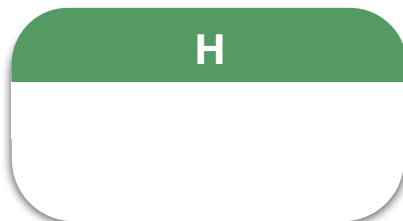
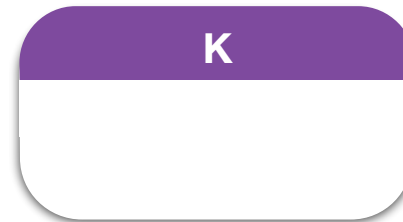
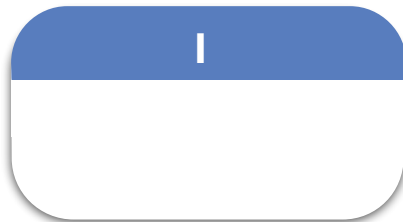
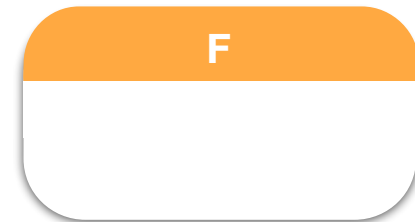
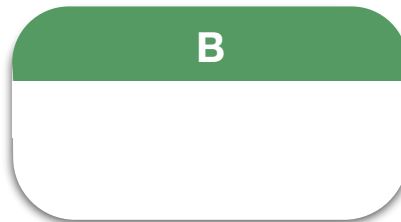
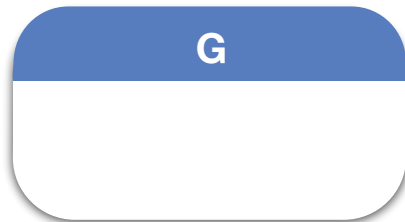
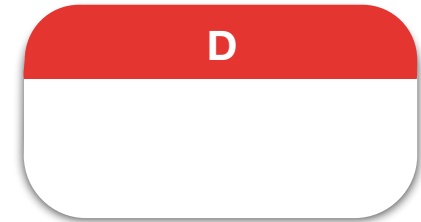
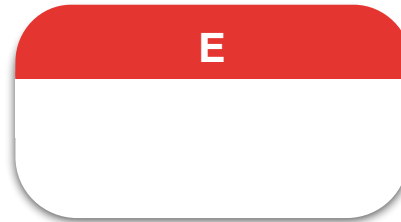
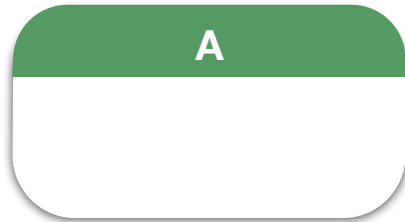
Section 1



Registration

- Ensures uniqueness of all Internet resources
- Provides contact information

Objects in the Database

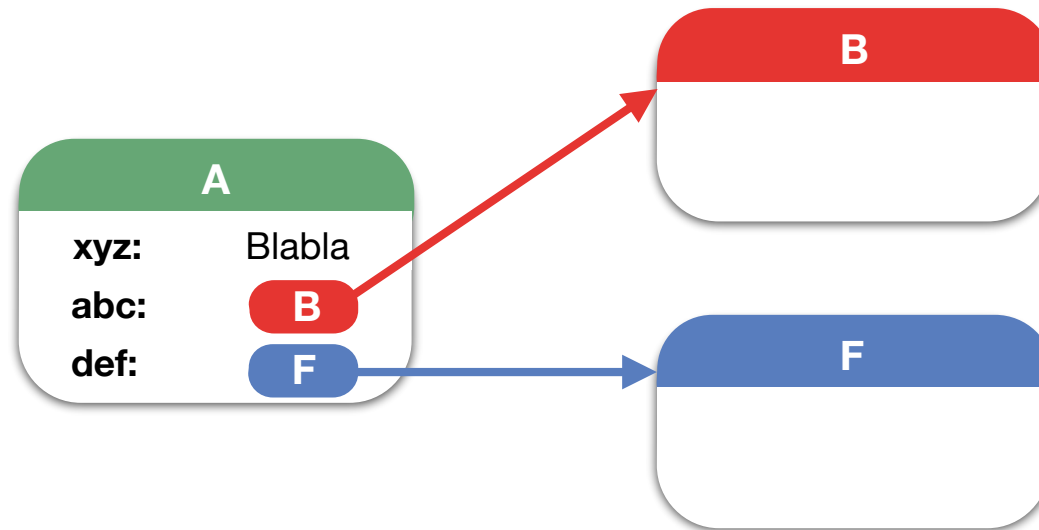


Notice:



- **Objects have a name**
 - “primary key”
- **Colour**
 - “type of object”

Objects in the Database

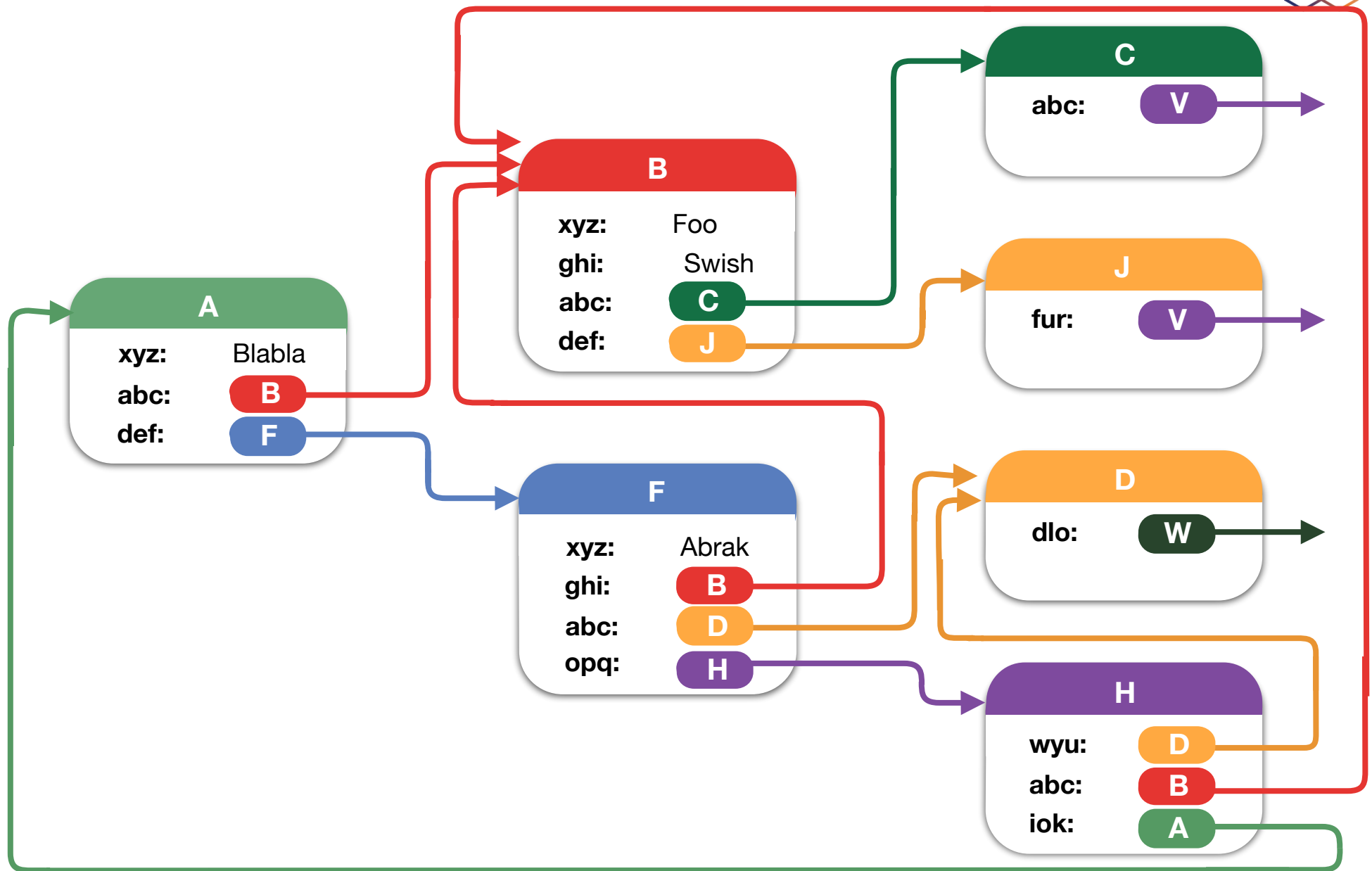


Objects in the Database



- Objects have several lines
- All look like this `yyyyyy: xxxxxxx`
- Two types of lines
 - `yyyyyy: blablabla` (fill out with free text)
 - `zzzzzz: B` (fill out with name of another object)

Objects in the Database



Objects in the Database



A

xyz:	Blabla
abc:	B
def:	F

B

xyz:	Foo
ghi:	Swish
abc:	C
def:	J

F

xyz:	Abrak
ghi:	B
abc:	D
opq:	H

C

abc:	V
------	----------

J

fur:	V
------	----------

D

dlo:	W
------	----------

H

wyu:	D
abc:	B
iok:	A



Questions

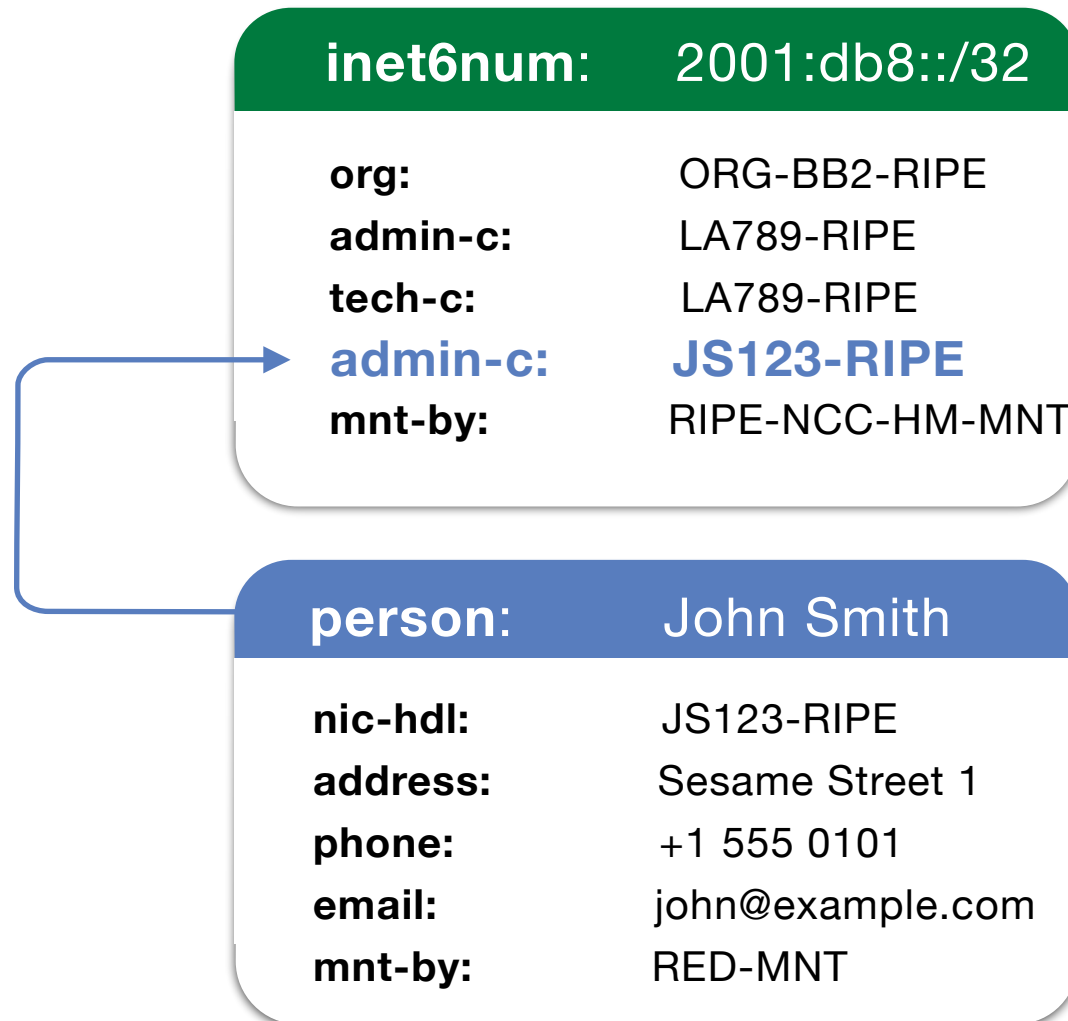


RIPE Database Objects



- **inetnum** = IPv4 address range
- **inet6num** = IPv6 address range
- **aut-num** = single AS number
- **route, route6** = address range announced by an AS number
- **domain** = reverse domain range
- **organisation** = info on who holds the set of resources
- **person** = contact info for other objects
- **role** = group of persons
- **maintainer** = protects all other objects

Person object: contact info

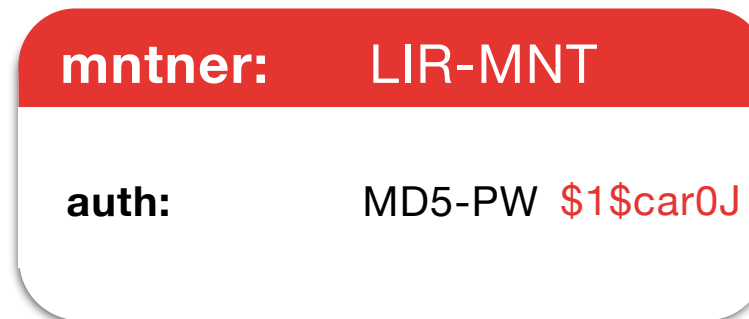


mntner Object: Protection



Password: tiger72

Hashed Password: \$1\$car0J

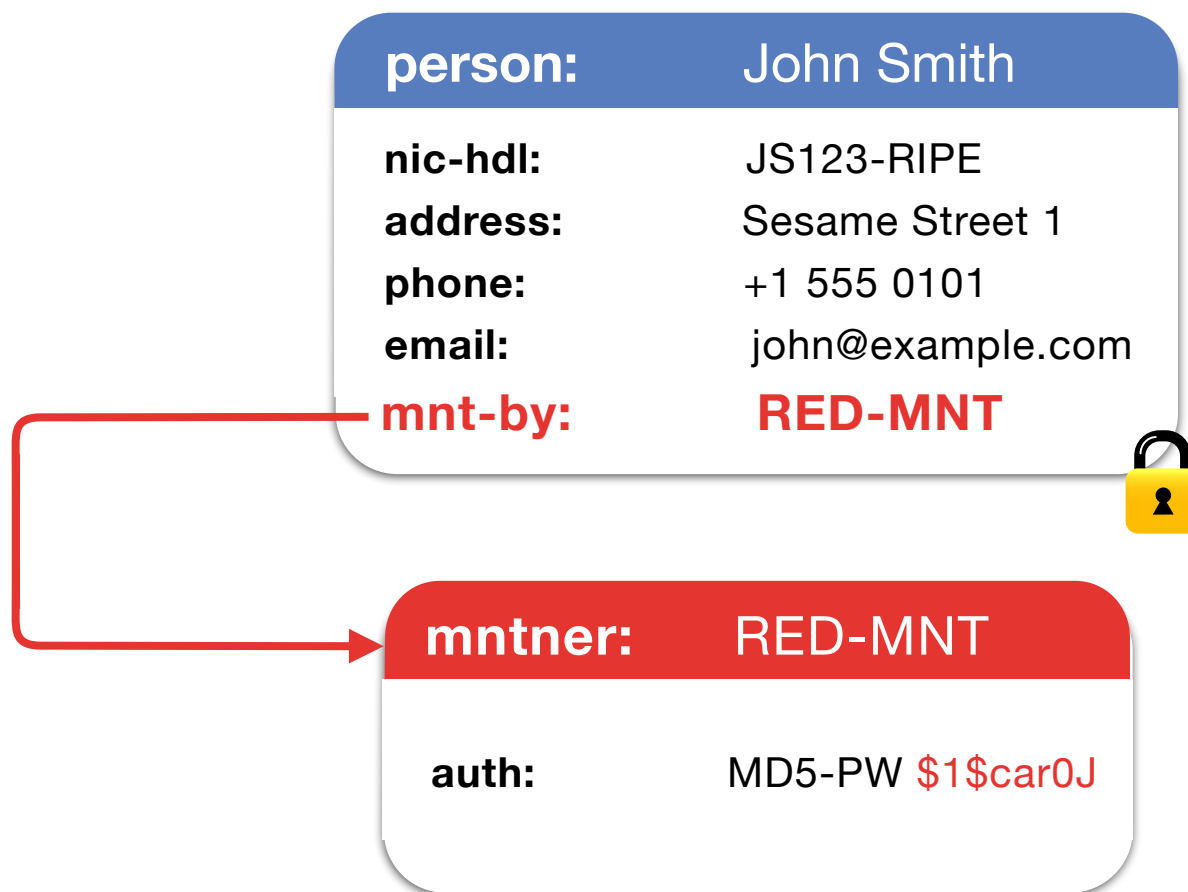


mntner Object in the RIPE DB



```
mntner:      EXM-MNT
descr:       Maintainer
admin-c:     JE2702-RIPE
auth:        MD5-PW # Filtered
mnt-by:      EXM-MNT
remarks:     Accepted the RIPE Database Terms and Conditions
created:     2013-07-30T09:28:24Z
last-modified: 2013-07-30T09:28:24Z
source:      RIPE # Filtered
```

Protecting an Object



Updating an Object



person:	John Smith
nic-hdl:	JS123-RIPE
address:	Sesame Street 1
phone:	+1 555 0101
email:	john@example.com
remarks:	extra remark
mnt-by:	RED-MNT



mntner:	RED-MNT
auth:	MD5-PW \$1\$car0J

Add passwords

Session passwords

0 stored password(s)



tiger72



Updating the RIPE Database



- Webupdates

RIPE Database <<

Query >

Update v

Create an object

Update an object

Syncupdates

New Organisation Startup

Abuse Contact >

Passwords >

Available Credentials

Session Passwords

0 stored password(s) ?

Add password Add

Update or delete object

Search for the object you want to modify or delete:

Object type: ?

select a type

Source Database: ?

- ☒ RIPE Database
- ☐ TEST Database

Operation:

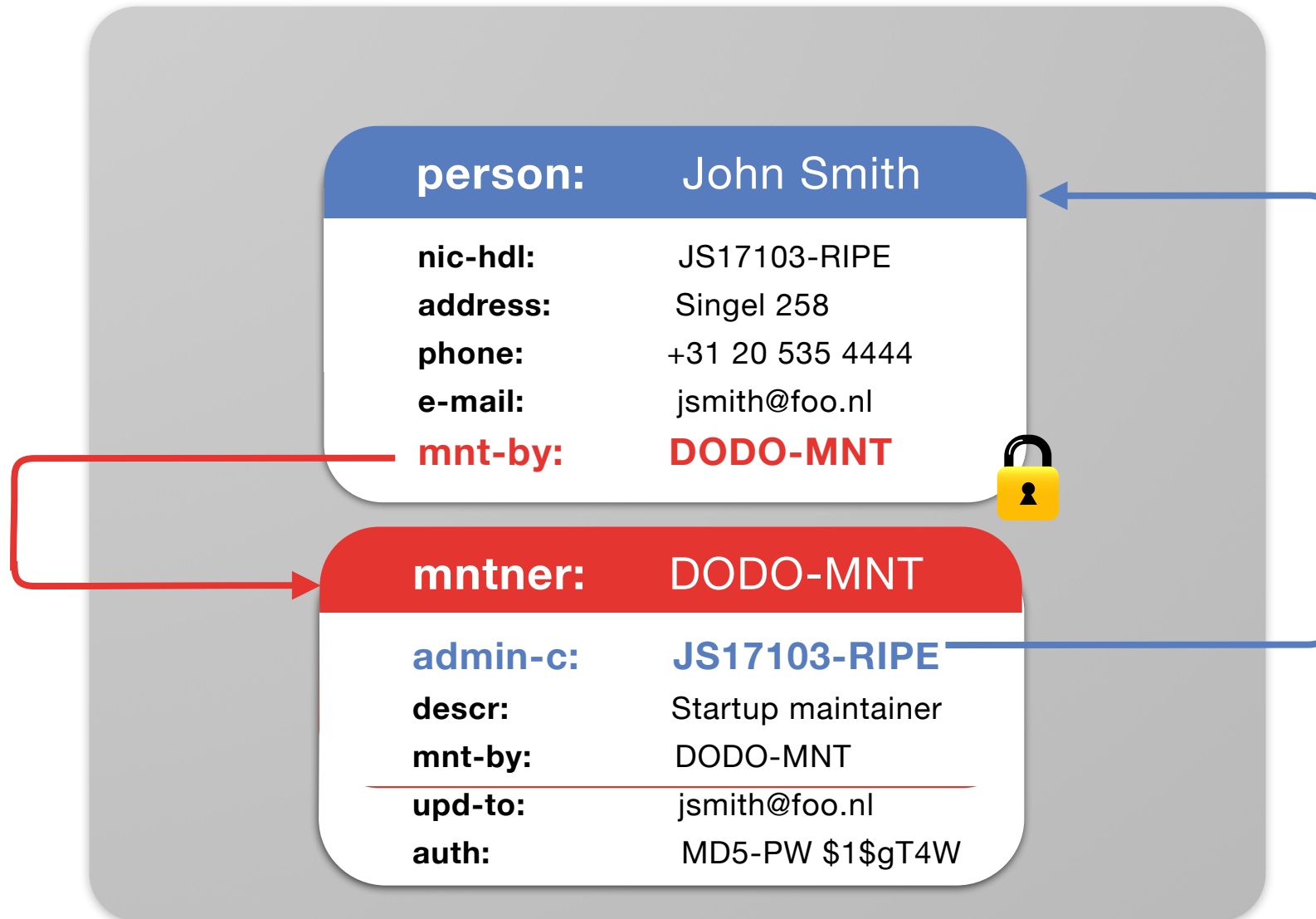
- ☒ modify object by individual fields
- ☐ modify object in single text area
- ☐ delete object

Search

New Organisation Startup Tool



- Creation of first person **object** - mntner **object** pair



DB New Organisation Startup Form



RIPE Database	«
Query	>
Update	▼
Create an object	
Update an object	
Syncupdates	
New Organisation Startup	
Abuse Contact	>
Passwords	>

New Organisation Startup Form

This form enables a new organisation to create the first person and maintainer objects in the RIPE Database for this organisation.

Person and maintainer objects that are not referenced by any operational data for 90 consecutive days will be subject to deletion by the automated Database clean up process. It is therefore recommended not to create these objects until you are ready to reference them.

* Mandatory Information.

Source: *	
RIPE Database	
Person Object	
Person: *	
<input type="text"/>	
NIC hdl:	
<input type="text"/>	
The NIC hdl has a fixed format. If you are not sure what to enter, leave it blank and it will be generated for you. This NIC hdl cannot be changed after creation. For further details about NIC hdl see RIPE Database User Manual-Getting Started .	
Address: *	
<input type="text"/>	
Phone: *	
<input type="text"/>	
Email: *	
<input type="text"/>	
Maintainer Object	
Maintainer name: *	
<input type="text"/>	
Password: *	
<input type="text"/>	
Password (again): *	
<input type="text"/>	
Accept Terms and Conditions	
<input type="checkbox"/> I accept the RIPE Database Terms and Conditions .	
Create	

DB Startup Form - Filled Out



RIPE Database	«
Query	>
Update	▼
Create an object	
Update an object	
Syncupdates	
New Organisation Startup	
Abuse Contact	>
Passwords	>

New Organisation Startup Form

This form enables a new organisation to create the first **person** and **maintainer** objects in the RIPE Database for this organisation.

Person and **maintainer** objects that are not referenced by any operational data for 90 consecutive days will be subject to deletion by the automated Database clean up process. It is therefore recommended not to create these objects until you are ready to reference them.

* Mandatory Information.

Source: *	
RIPE Database	
Person Object	
Person: *	
John Smith	
NIC hdl:	
auto-1	
The NIC hdl has a fixed format. If you are not sure what to enter, leave it blank and it will be generated for you. This NIC hdl cannot be changed after creation. For further details about NIC hdl see RIPE Database User Manual-Getting Started .	
Address: *	
Singel 258 1016AB Amsterdam The Netherlands	
Phone: *	
+31653534444	
Email: *	
jsmith@foo.nl	
Maintainer Object	
Maintainer name: *	
DODO-MNT	
Password: *	

Password (again): *	

Accept Terms and Conditions	
<input checked="" type="checkbox"/> I accept the RIPE Database Terms and Conditions .	
Create	

DB Startup Tool: Results



New Organisation Startup Form

Succeeded! Where to go from here...

We have created two RIPE Database objects for you, please make a note of the primary keys (shown in bold letters) for these two objects for future reference:

person nic-hdl: JS17103-RIPE

person: **John Smith**
address: Singel 258 1016AB Amsterdam The Netherlands
phone: +31653534444
e-mail: jsmith@foo.nl
nic-hdl: JS17103-RIPE
mnt-by: DODO-MNT
changed: jsmith@foo.nl 20150713
created: 2015-07-13T12:34:17Z
last-modified: 2015-07-13T12:34:17Z
source: RIPE

maintainer name: DODO-MNT

mntner: DODO-MNT
descr: Startup maintainer
admin-c: JS17103-RIPE
upd-to: jsmith@foo.nl
auth: MD5-PW \$1\$oGTcJfIB\$wBf96uu9Vb9KMCcCjWv3Y.
mnt-by: DODO-MNT
referral-by: DODO-MNT
changed: jsmith@foo.nl
source: RIPE

Creating Additional Objects?



- **Webupdates!**

Creating Objects



RIPE Database <<

Query >

Update v

Create an object

Update an object

Syncupdates

New Organisation Startup

Abuse Contact >

Passwords >

Available Credentials

Session Passwords

0 stored password(s) ?

Add password

Add

Create object

Object type: ?

select a type

Source Database: ?

- ☒ RIPE Database
☐ TEST Database

Operation:

- ☒ Create object by individual fields
☐ Create object in single text area

Create

If your organisation does not have a mntner object yet, you need to use the [New Organisation Startup](#) form.

Webupdates: Using Individual Fields



RIPE Database <<

Query >

Update v

Create an object

Update an object

Syncupdates

New Organisation Startup

Abuse Contact >

Passwords >

Available Credentials

Session Passwords

0 stored password(s) ?

..... Add

Create a new person object

person

James Example v + trash ?

address

Singel 258, 1016AB Amsterdam v + trash ?

phone

+31 20 535 4444 v + trash ?

nic-hdl

auto-1 v + trash ?

mnt-by

EXAMPLE-MNT v + trash ?

source

RIPE v + trash ?

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Cancel Submit

Webupdates: Using Individual Fields



RIPE Database

«

Query

>

Update

▼

Create an object

Update an object

Syncupdates

New Organisation Startup

Abuse Contact

>

Passwords

>

Available Credentials

Session Passwords

0 stored password(s) ?

.....

Add

Create a new person object

The mandatory attributes in a template are shown in upper case for convenience. The final submission to the database is case insensitive. Any optional attributes not required must be removed. Blank values (except for remarks) will cause errors.

PERSON: James Example
ADDRESS: Singel 258, 1016AB Amsterdam
PHONE: +31 20 535 4444
e-mail: jexample.foo.nl
NIC-HDL: auto-1
MNT-BY: EXAMPLE-MNT
SOURCE: RIPE

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Cancel

Create



New Organisation Startup Form

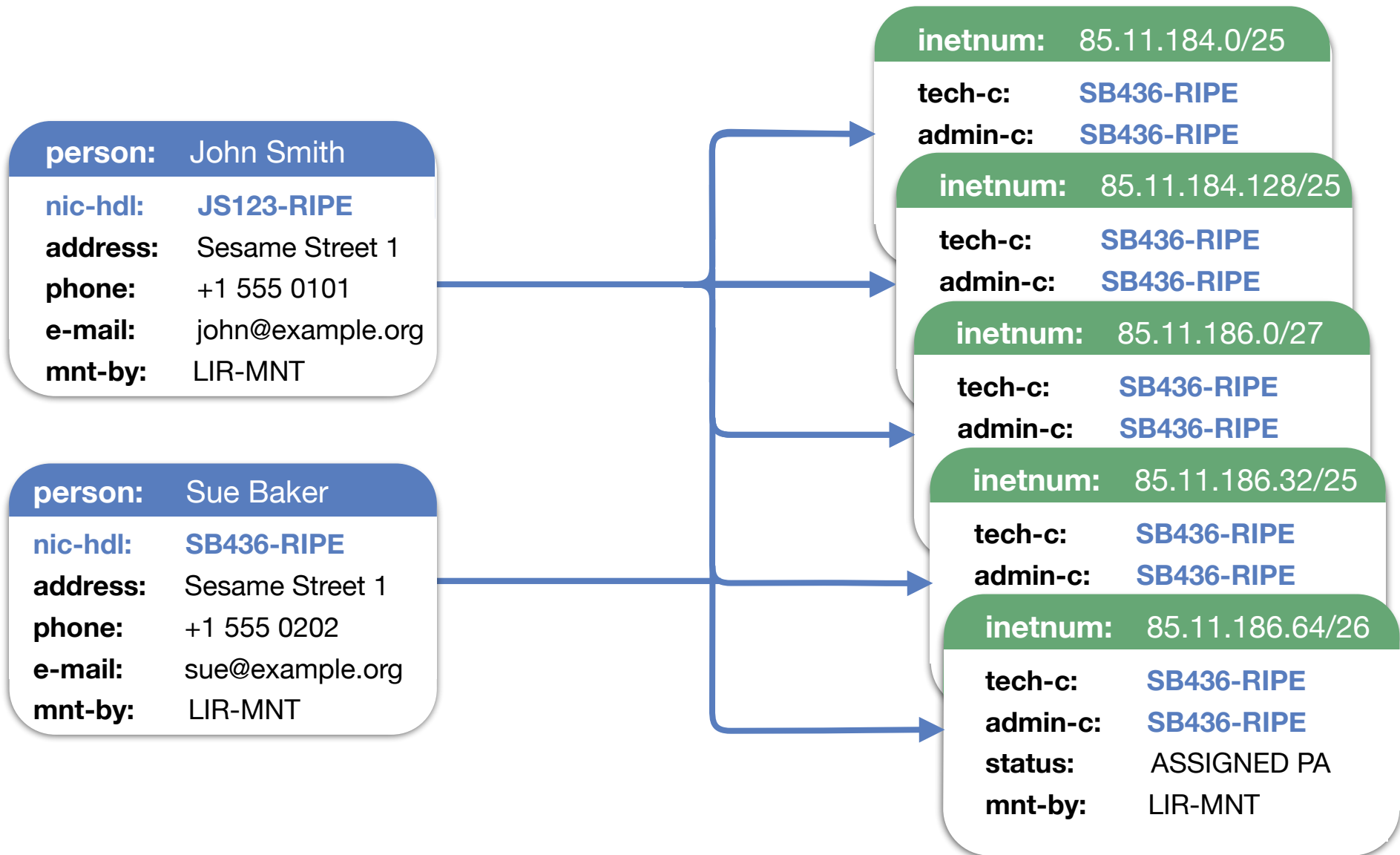
Exercise 1



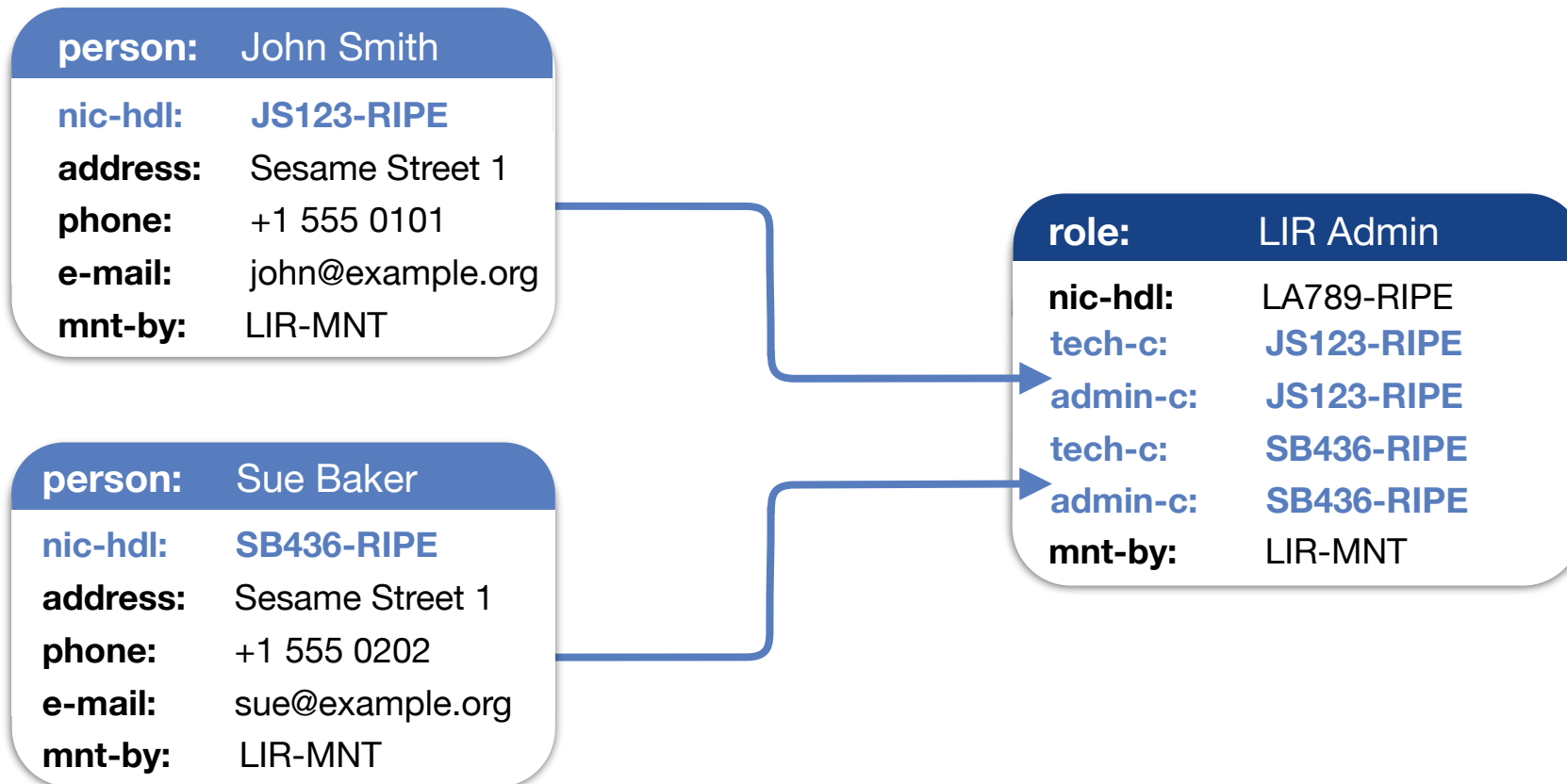
Role Objects

Section 2

Not Using a role Object

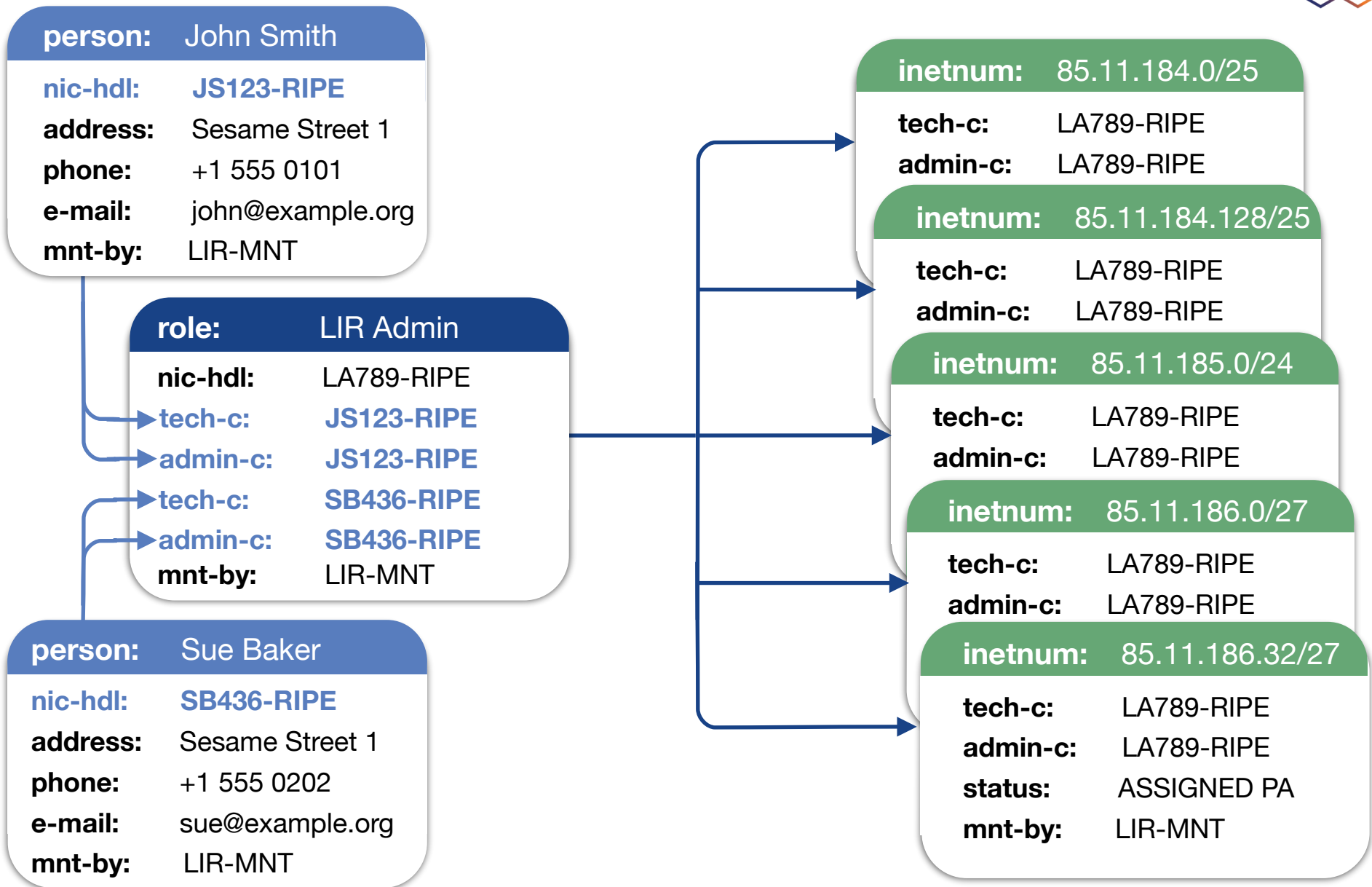


role Objects





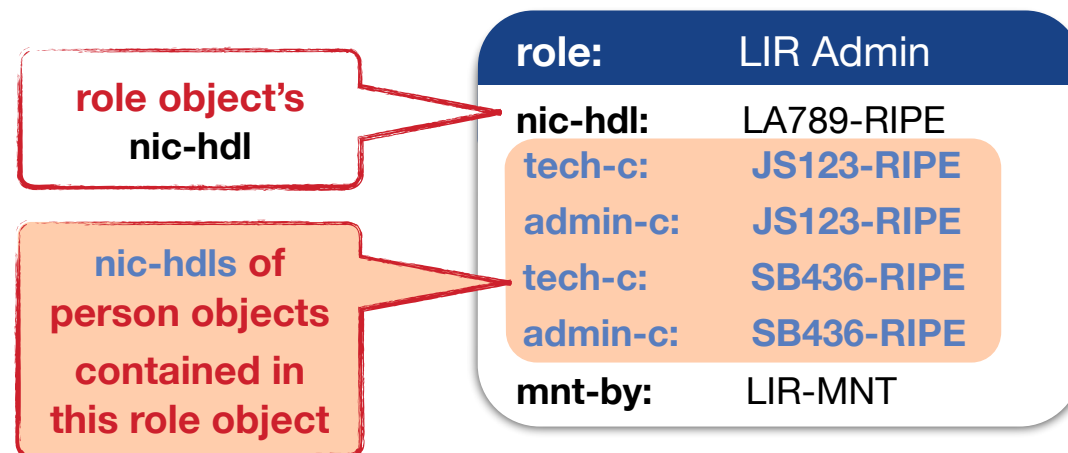
Using a role Object



role Objects



- **role** objects can group **person** objects together





Create a role Object

Exercise 2



Querying the RIPE Database

Section 3

Querying the RIPE Database



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

RIPE Database	«
Query	▼
Query the RIPE Database	
Full Text Search	
Geolocation Finder	
Update	>
Abuse Contact	>
Passwords	>

RIPE Database Query

☐ Show full object details ?
☐ Do not retrieve related objects ?

You can search up to 5 terms at once in the search box above, separating them with a semicolon.

Sources

Types

Hierarchy Flags

Inverse lookup

☒ RIPE Database ?
☐ TEST Database ?
☐ Global Resource Service (GRS) ?

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Search

Query Web Interface



RIPE Database Query

- ☐ Show full object details ?
- ☐ Do not retrieve related objects ?

You can search up to 5 terms at once in the search box above, separating them with a semicolon.

Sources

Types

Hierarchy Flags

Inverse lookup

- ☒ RIPE Database ?
- ☐ TEST Database ?
- ☐ Global Resource Service (GRS) ?

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Search

Query Result



Abuse contact info: abuse@ripe.net


Update Delete RIPEstat

inetnum: 193.0.24.0 - 193.0.30.255
netname: RIPENCC-MEETING-PUBLIC
descr: Reseaux IP Europeens Network Coordination Centre (RIPE NCC)
remarks: RIPE NCC Training Services & RIPE Meetings
remarks: This space is used as public space during RIPE meetings
country: NL
admin-c: JDR-RIPE
admin-c: BRD-RIPE
tech-c: OPS4-RIPE
status: ASSIGNED PA
mnt-by: RIPE-NCC-MNT
mnt-routes: RIPE-NCC-MNT
mnt-domains: RIPE-NCC-MNT
created: 2013-10-09T14:42:14Z
last-modified: 2013-10-09T14:42:14Z
source: RIPE # Filtered

Query While Showing All Details



RIPE Database Query

- 
- ☒ Show full object details ?
 - ☐ Do not retrieve related objects ?

You can search up to 5 terms at once in the search box above, separating them with a semicolon.

Sources Types Hierarchy Flags Inverse lookup

- ☒ RIPE Database ?
- ☐ TEST Database ?
- ☐ Global Resource Service (GRS) ?

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Search

Query Result



Abuse contact info: abuse@ripe.net


Update Delete RipeStat

inetnum: 193.0.24.0 - 193.0.30.255
netname: RIPENCC-MEETING-PUBLIC
descr: Reseaux IP Europeens Network Coordination Centre (RIPE NCC)
remarks: RIPE NCC Training Services & RIPE Meetings
remarks: This space is used as public space during RIPE meetings
country: NL
admin-c: JDR-RIPE
admin-c: BRD-RIPE
tech-c: OPS4-RIPE
status: ASSIGNED PA
mnt-by: RIPE-NCC-MNT
mnt-routes: RIPE-NCC-MNT
mnt-domains: RIPE-NCC-MNT
created: 2013-10-09T14:42:14Z
last-modified: 2013-10-09T14:42:14Z
source: **RIPE**
changed: mvantol@ripe.net 20131009

Avoid Being Blocked



RIPE Database Query



193.0.24.0/24

☒ Show full object details ?
☒ Do not retrieve related objects ?

You can search up to 5 terms at once in the search box above, separating them with a semicolon.

Sources Types Hierarchy Flags Inverse lookup

☒ RIPE Database ?
☐ TEST Database ?
☐ Global Resource Service (GRS) ?

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Search

Alternatively:

- -no-personal
- -r

Object Templates



- To get the empty template for any object type, query with the 't' flag

RIPE Database Query

☐ Show full object details ?
☐ Do not retrieve related objects ?

You can search up to 5 terms at once in the search box above, separating them with a semicolon.

Sources

Types

Hierarchy Flags

Inverse lookup

☒ RIPE Database ?
☐ TEST Database ?
☐ Global Resource Service (GRS) ?

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Search

person Object Template

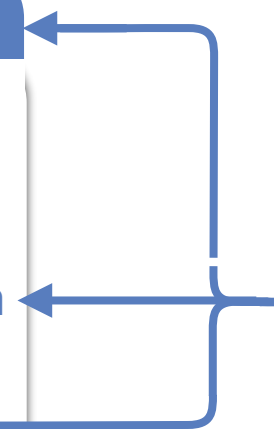


person:	[mandatory]	[single]	[lookup key]
address:	[mandatory]	[multiple]	[]
phone:	[mandatory]	[multiple]	[]
fax-no:	[optional]	[multiple]	[]
e-mail:	[optional]	[multiple]	[lookup key]
org:	[optional]	[multiple]	[inverse key]
nic-hdl:	[mandatory]	[single]	[primary/lookup key]
remarks:	[optional]	[multiple]	[]
notify:	[optional]	[multiple]	[inverse key]
abuse-mailbox:	[optional]	[multiple]	[inverse key]
mnt-by:	[mandatory]	[multiple]	[inverse key]
changed:	[optional]	[multiple]	[]
created:	[generated]	[single]	[]
last-modified:	[generated]	[single]	[]
source:	[mandatory]	[single]	[]

Lookup Keys



<i>person:</i>	<i>John Smith</i>	
address:	Sesame Street 1	
phone:	+1 555 0101	
fax:	+1 556 8989	
email:	john@example.com	
remarks:	extra remark	
nic-hdl:	JS123-RIPE	
mnt-by:	RED-MNT	
source:	RIPE	



Full Text Search



RIPE Database

«

Query

▼

Query the RIPE Database

Full Text Search

Geolocation Finder

Update

>

Abuse Contact

>

Passwords

>

Results per object type

Click to filter results

key-cert (6)

mntner (5)

domain (4)

person (4)

inetnum (2)

inet6num (1)

role (1)

route (1)

organisation (1)

all (25)

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.

bluelight

+ Advanced Search

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Search

Search results

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

[1] 2 3

domain: 210.149.82.in-addr.arpa
descr=Reverse delegation for Bluelight 2nd/24

domain: 205.149.82.in-addr.arpa
descr=Reverse delegation for Bluelight 2nd/24

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

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

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

Querying with Flags

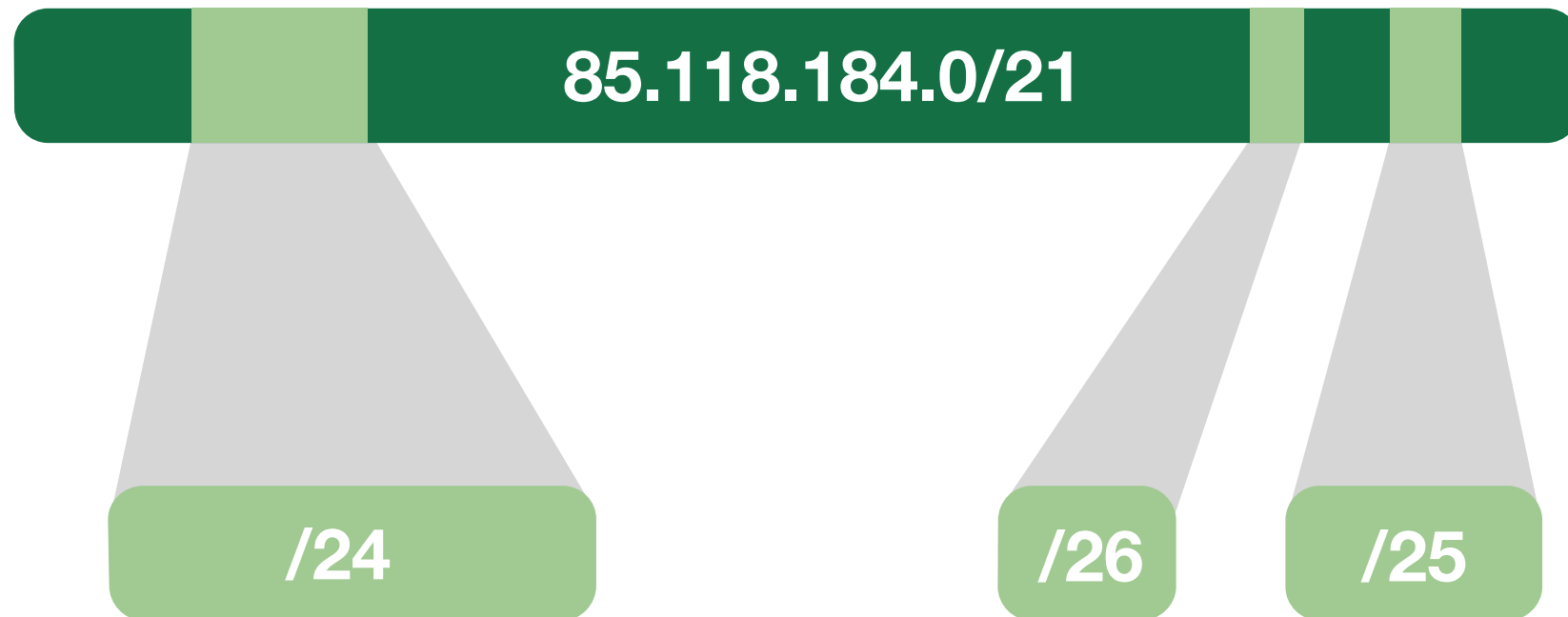


- **For finding additional information**
 - Insert flag in front of the query:
 - -m
 - Or check appropriate box in “Hierarchy Flags” tab

More Specific inetnums



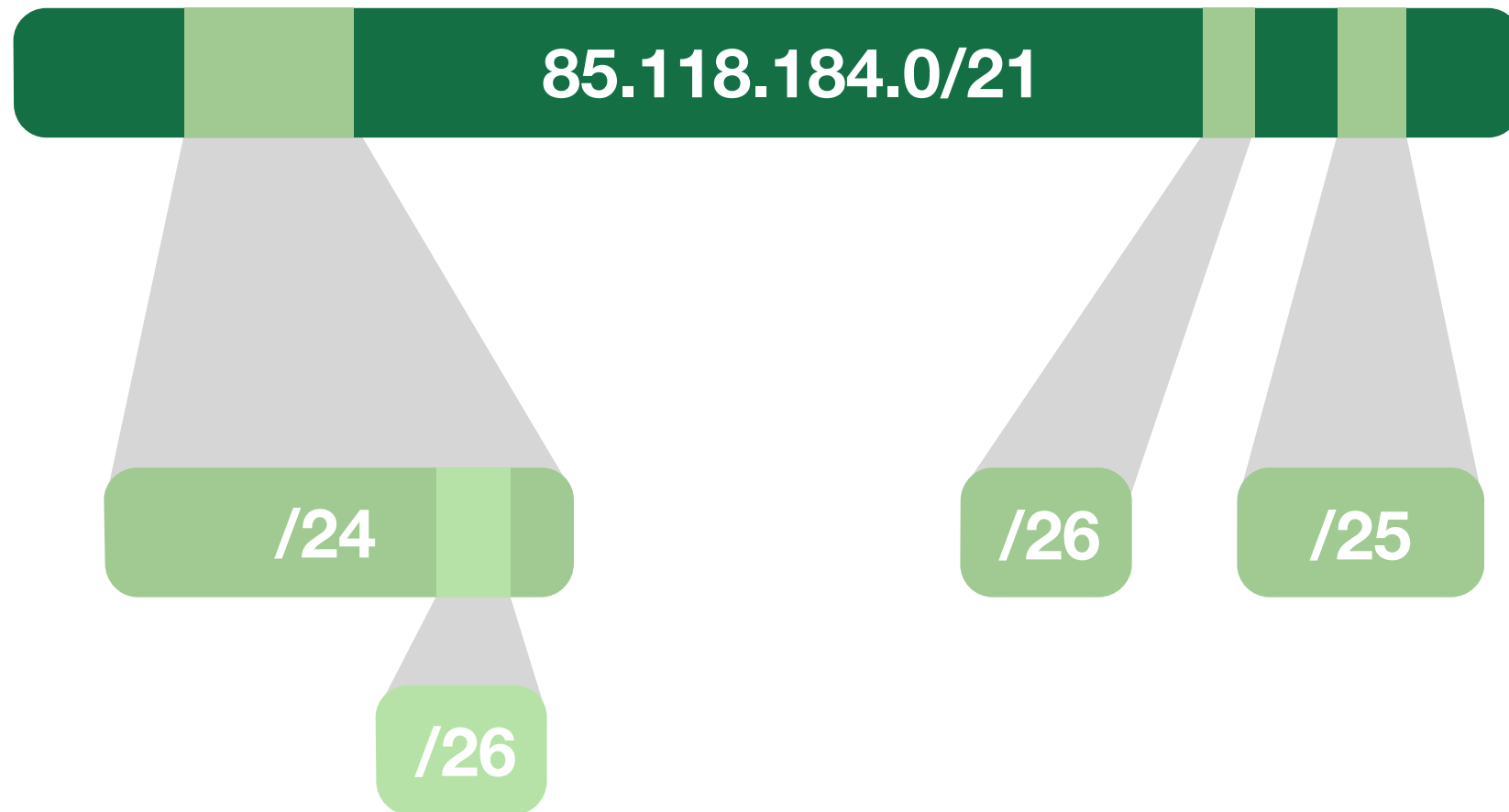
-m 85.118.184.0/21



More Specific inetnums: -M



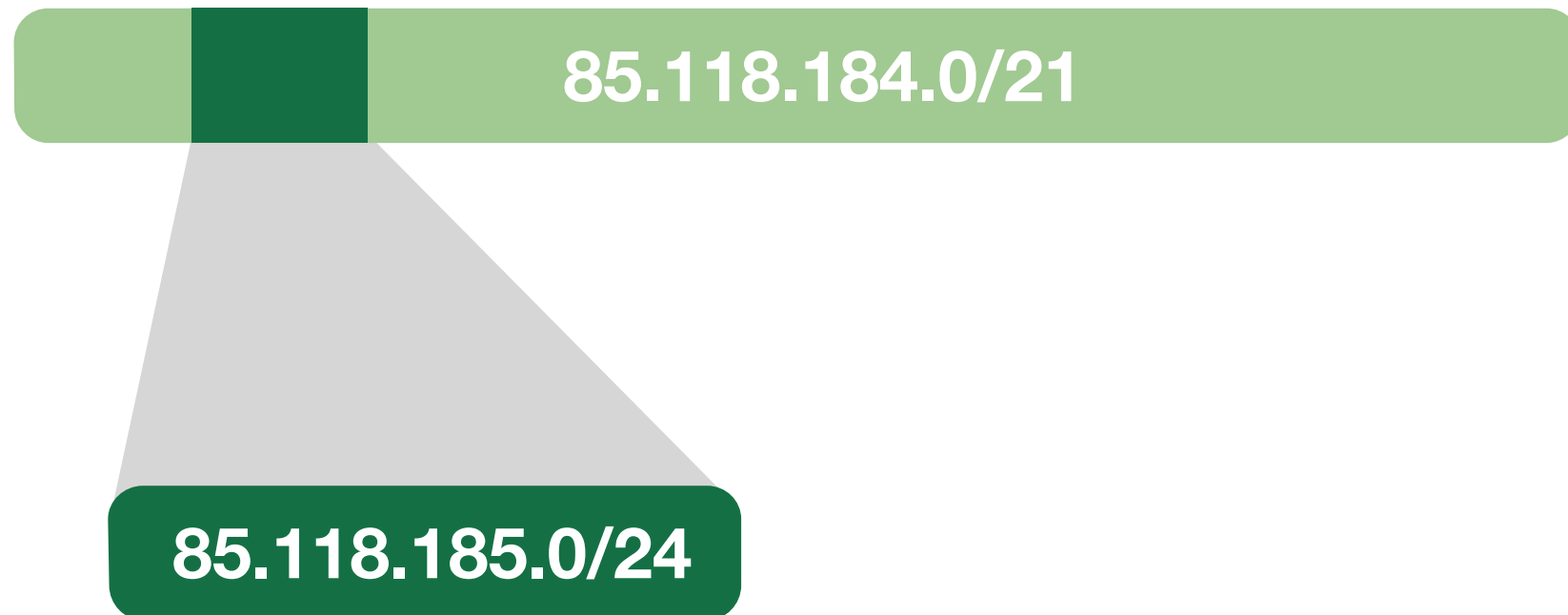
-M 85.118.184.0/21



Less Specific intetnums: -l



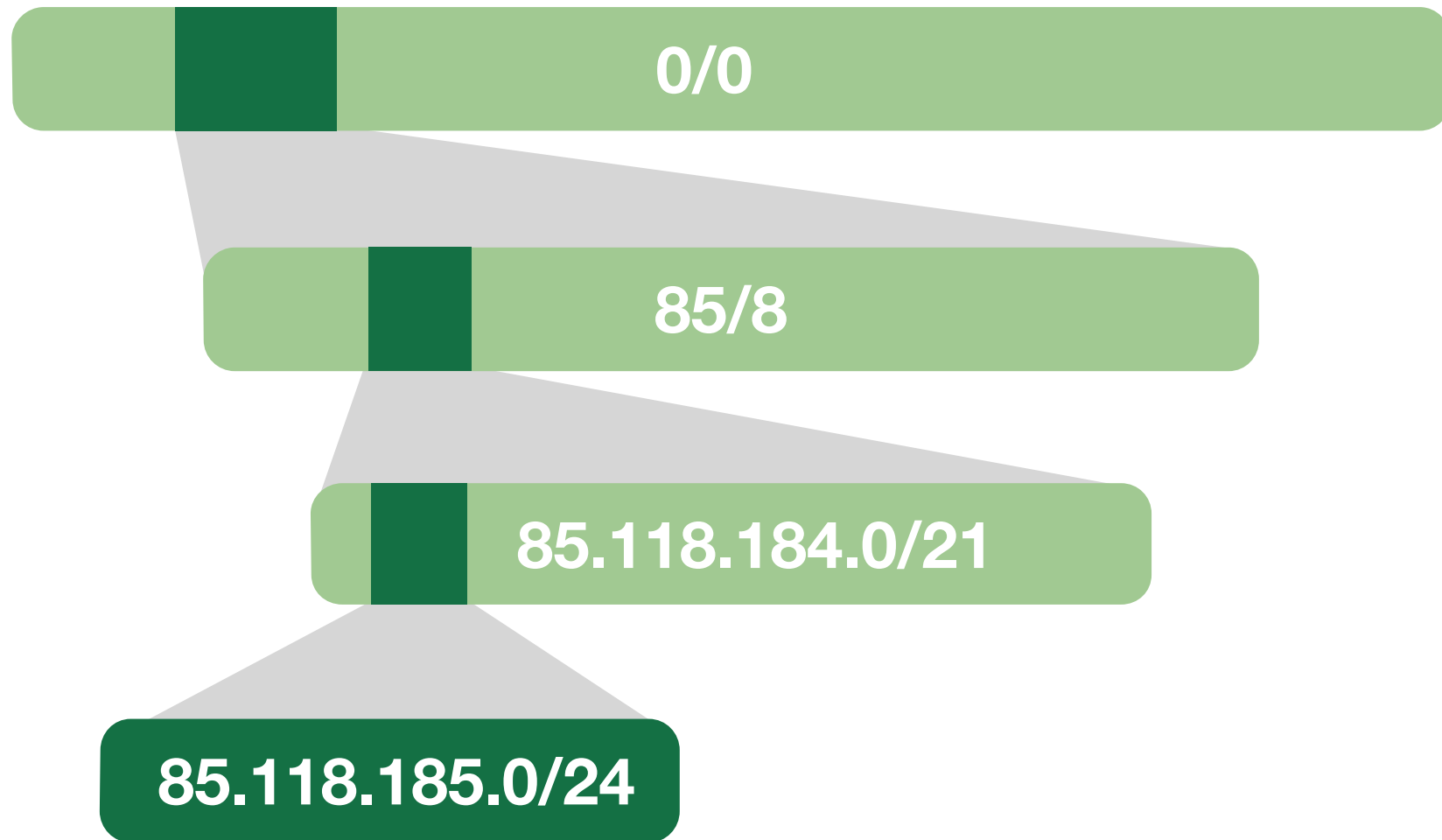
-l 85.118.185.0/24



Less Specific inetnums: -L



-L 85.118.184.0/24

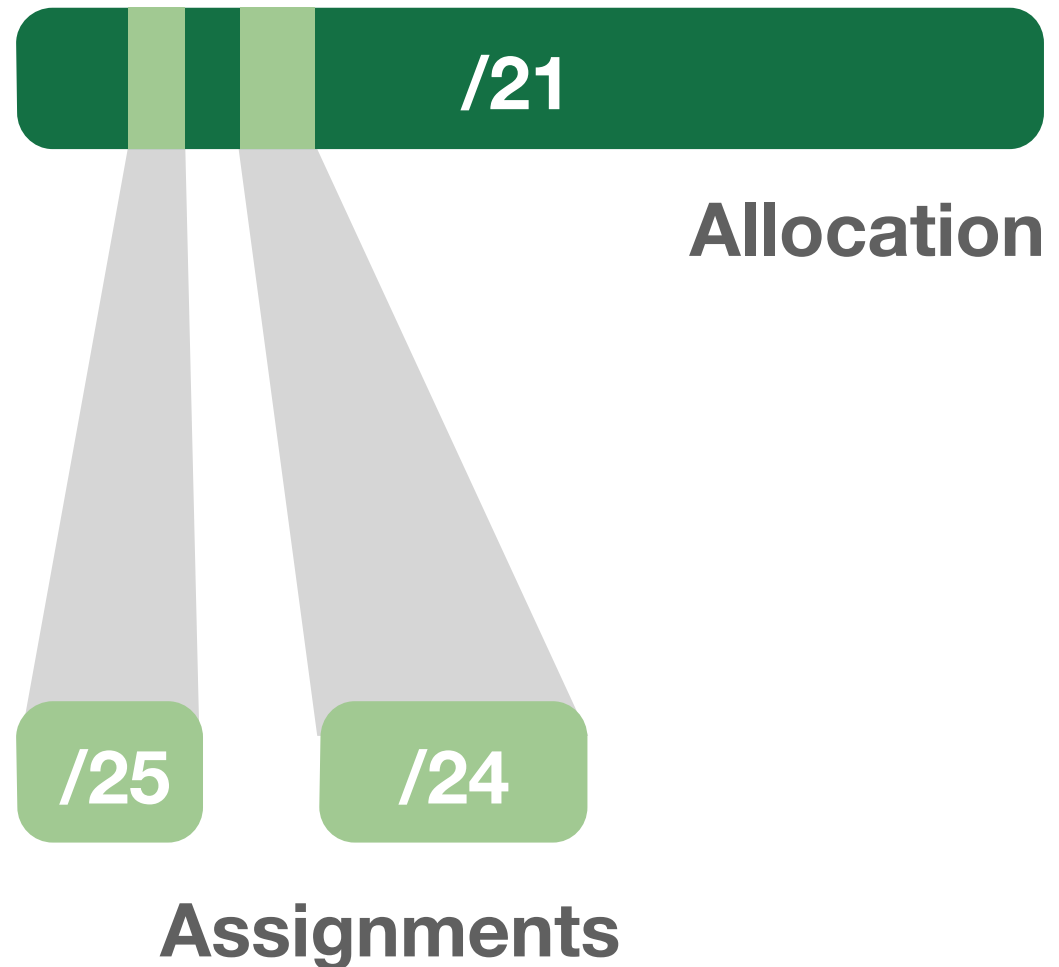


LIR's Allocations and Assignments



inetnum:	85.11.184.0/21
netname:	NL-EXAMPLE
descr:	LIR's Name
status:	ALLOCATED PA
org:	ORG-BB2-RIPE
mnt-by:	RIPE-NCC-HM-MNT
mnt-lower:	LIR-MNT
mnt-domains:	LIR-MNT
admin-c:	LA789-RIPE
tech-c:	LA789-RIPE

inetnum:	85.11.186.0/25
descr:	My Assignment
status:	ASSIGNED PA
mnt-by:	LIR-MNT
admin-c:	LA789-RIPE
tech-c:	LA789-RIPE



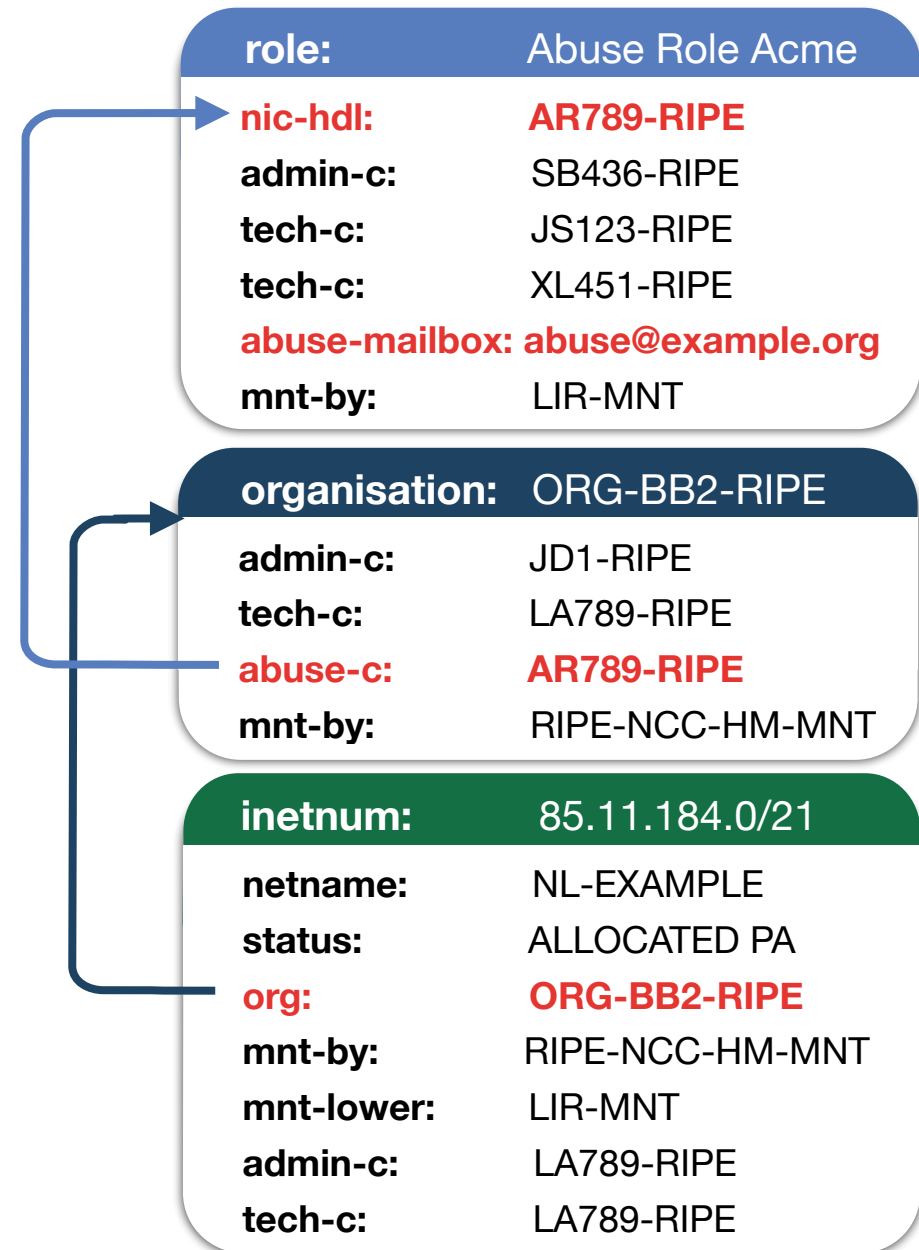
Add Abuse Contact for Your Allocation



Create “Abuse Role object”
with “abuse mailbox”

Point the abuse-c in the org
object to the “Abuse Role
object”

The allocation points to your
organisation object





Inverse Lookups

Section 4

Inverse Lookup



- **Finding all objects in which your object is referenced**

Inverse Lookup



RIPE Database Query

☒ Show full object details ?
☒ Do not retrieve related objects ?

You can search up to 5 terms at once in the search box above, separating them with a semicolon.

Sources

Types

Hierarchy Flags

Inverse lookup

?

☐ abuse-mailbox

☐ admin-c

☐ auth

☐ author

☐ fingerpr

☐ form

☐ irt-nfy

☐ local-as

☐ mbrs-by-ref

☐ member-of

☐ mnt-by

☐ mnt-domains

☐ mnt-irt

☐ mnt-lower

☐ mnt-nfy

☐ mnt-ref

☐ mnt-routes

☐ notify

☐ nserver

☐ org

☐ origin

☐ person

☐ ping-hdl

☐ ref-nfy

☐ tech-c

☐ upd-to

☐ zone-c

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Search

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Search

☐ abuse-mailbox ☐ admin-c ☐ auth ☐ author ☐ fingerpr ☐ form ☐ irt-nfy ☐ local-as ☐ mbrs-by-ref

Inverse Lookup



RIPE Database Query

☒ Show full object details ?
☒ Do not retrieve related objects ?

You can search up to 5 terms at once in the search box above, separating them with a semicolon.

SourcesTypesHierarchy FlagsInverse lookup

?

☐ abuse-mailbox
☒ admin-c
☐ auth
☐ author
☐ fingerpr
☐ form
☐ irt-nfy
☐ local-as
☐ mbrs-by-ref

☐ member-of
☐ mnt-by
☐ mnt-domains
☐ mnt-irt
☐ mnt-lower
☐ mnt-nfy
☐ mnt-ref
☐ mnt-routes
☐ notify

☐ nserver
☐ org
☐ origin
☐ person
☐ ping-hdl
☐ ref-nfy
☐ tech-c
☐ upd-to
☐ zone-c

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

Search

Inverse Lookup: admin-c



inet6num: 2001:db8::/32

descr: my IPv6 range
mnt-by: RIPE-NCC-HM-MNT
org: ORG-BB2-RIPE
admin-c: JE777-RIPE
tech-c: JD1-RIPE

aut-num: AS64551

descr: my AS number
mnt-by: RIPE-NCC-HM-MNT
org: ORG-BB2-RIPE
admin-c: JD1-RIPE
tech-c: LA789-RIPE

mntner: LIR-MNT

admin-c: JD1-RIPE
tech-c: LA789-RIPE
mnt-by: LIR-MNT

role: Bluelight Staff

nic-hdl: BLS77-RIPE
admin-c: JD1-RIPE
address: Sesame Street 1
e-mail: staff@example.org

-i admin-c JD1-RIPE

person: John Davies

nic-hdl: JD1-RIPE
address: Sesame Street 1
phone: +1 555 0101
e-mail: john@example.org
mnt-by: LIR-MNT

Inverse Lookup: person



inet6num:	2001:db8::/32
descr:	my IPv6 range
mnt-by:	RIPE-NCC-HM-MNT
org:	ORG-BB2-RIPE
admin-c:	JE777-RIPE
tech-c:	JD1-RIPE

aut-num:	AS64551
descr:	my AS number
mnt-by:	RIPE-NCC-HM-MNT
org:	ORG-BB2-RIPE
tech-c:	JD1-RIPE
tech-c:	LA789-RIPE

mntner:	LIR-MNT
admin-c:	JD1-RIPE
tech-c:	LA789-RIPE
mnt-by:	LIR-MNT

role:	Bluelight Staff
nic-hdl:	BLS77-RIPE
admin-c:	JD1-RIPE
address:	Sesame Street 1
e-mail:	staff@example.org

-i person JD1-RIPE

person:	John Davies
nic-hdl:	JD1-RIPE
address:	Sesame Street 1
phone:	+1 555 0101
e-mail:	john@example.org
mnt-by:	LIR-MNT

Inverse Lookup: person



RIPE Database Query

☒ Show full object details ?
☒ Do not retrieve related objects ?

You can search up to 5 terms at once in the search box above, separating them with a semicolon.

Sources

Types

Hierarchy Flags

Inverse lookup

?

☐ abuse-mailbox

☐ admin-c

☐ auth

☐ author

☐ fingerpr

☐ form

☐ irt-nfy

☐ local-as

☐ mbrs-by-ref

☐ member-of

☐ mnt-by

☐ mnt-domains

☐ mnt-irt

☐ mnt-lower

☐ mnt-nfy

☐ mnt-ref

☐ mnt-routes

☐ notify

☐ nserver

☐ org

☐ origin

☒ person

☐ ping-hdl

☐ ref-nfy

☐ tech-c

☐ upd-to

☐ zone-c

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

Search

Inverse Lookup: organisation



inet6num: 2001:db8::/32
descr: My IPv6 range
org: **ORG-BB2-RIPE**
admin-c: JE777-RIPE
tech-c: JD1-RIPE

inetnum: 85.23.16.0/21
descr: My v4 allocation
org: **ORG-BB2-RIPE**
admin-c: JE777-RIPE
tech-c: JD1-RIPE

inetnum: 85.111.185.0/21
descr: Other v4 allocation
org: **ORG-BB2-RIPE**
admin-c: JE777-RIPE
tech-c: JD1-RIPE

aut-num: AS64551
descr: my AS number
org: **ORG-BB2-RIPE**
admin-c: JE777-RIPE
tech-c: JD1-RIPE

-i org ORG-BB2-RIPE

organisation: **ORG-BB2-RIPE**
admin-c: JD1-RIPE
tech-c: LA789-RIPE
abuse-c: **AR789-RIPE**
mnt-by: LIR-MNT

Inverse Lookup : mnt-by



inet6num: 2001:db8::/32

descr: my IPv6 range
mnt-by: RIPE-NCC-HM-MNT
mnt-lower: LIR-MNT
admin-c: JE777-RIPE
tech-c: JD1-RIPE

aut-num: AS64551

descr: my AS number
mnt-by: RIPE-NCC-END-MNT
mnt-by: LIR-MNT
org: ORG-BB2-RIPE
tech-c: LA789-RIPE

person: John Davies

nic-hdl: JD1-RIPE
e-mail: john@example.org
mnt-by: LIR-MNT

role: Bluelight Staff

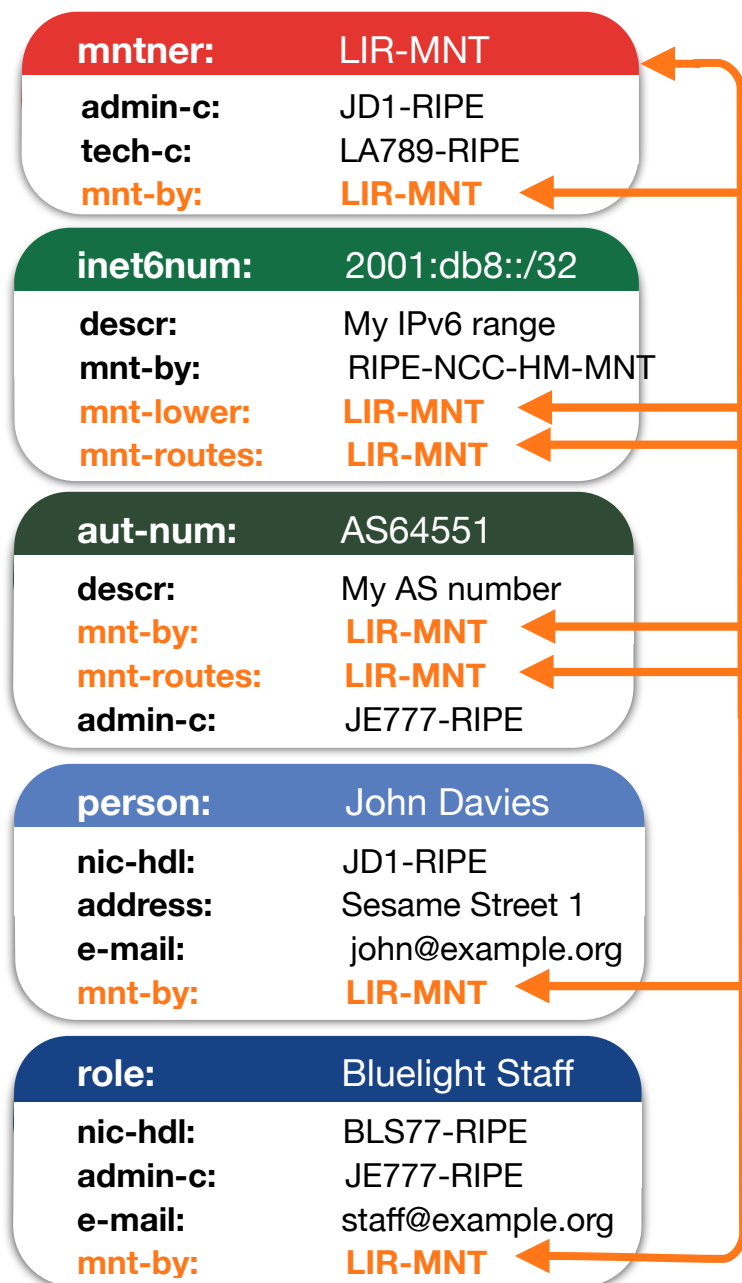
nic-hdl: BLS77-RIPE
admin-c: JD1-RIPE
mnt-by: LIR-MNT
e-mail: staff@example.org

-i mnt-by LIR-MNT

mntner: LIR-MNT

admin-c: JD1-RIPE
mnt-by: LIR-MNT

Find All References of a mntner



Free Text Search

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.

LIR-MNT

[Advanced Search](#)

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



Find the Correct Contact Info

Exercise 3



Database Protection Mechanisms

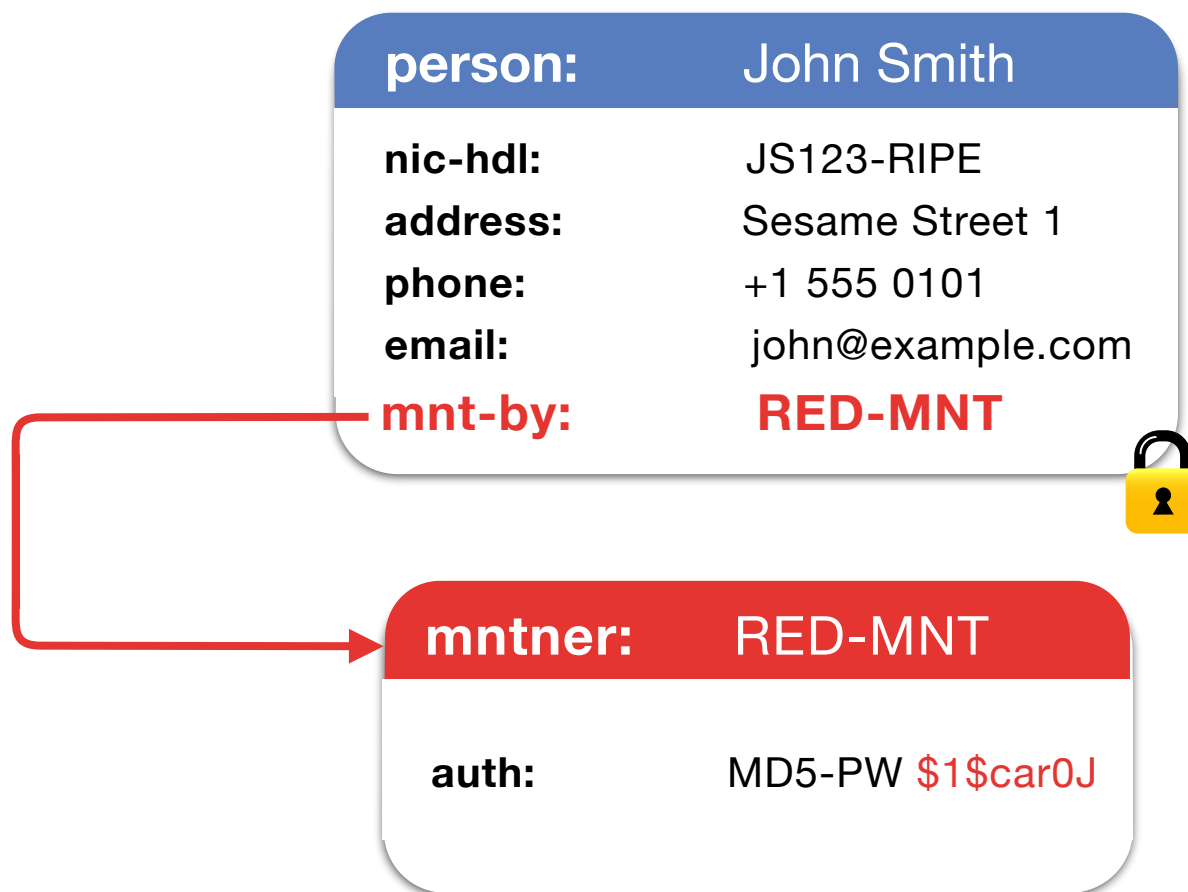
Section 5

Creating a mntner Object



- 1. Choose “mntner” in “create object” menu of Webupdates**
- 2. Choose password**
 - tiger72
- 3. Click on (icon) in the auth line to encrypt it**
- 4. The hashed password is included in the auth line**
 - auth: MD5-PW \$1\$WDe5uDBH\$M25JnQIM55Wd/Vjib/Unl01\$o93UxR
- 5. Create the mntner object in Webupdates**
 - RED-MNT

Protecting an Object



PGP Authentication



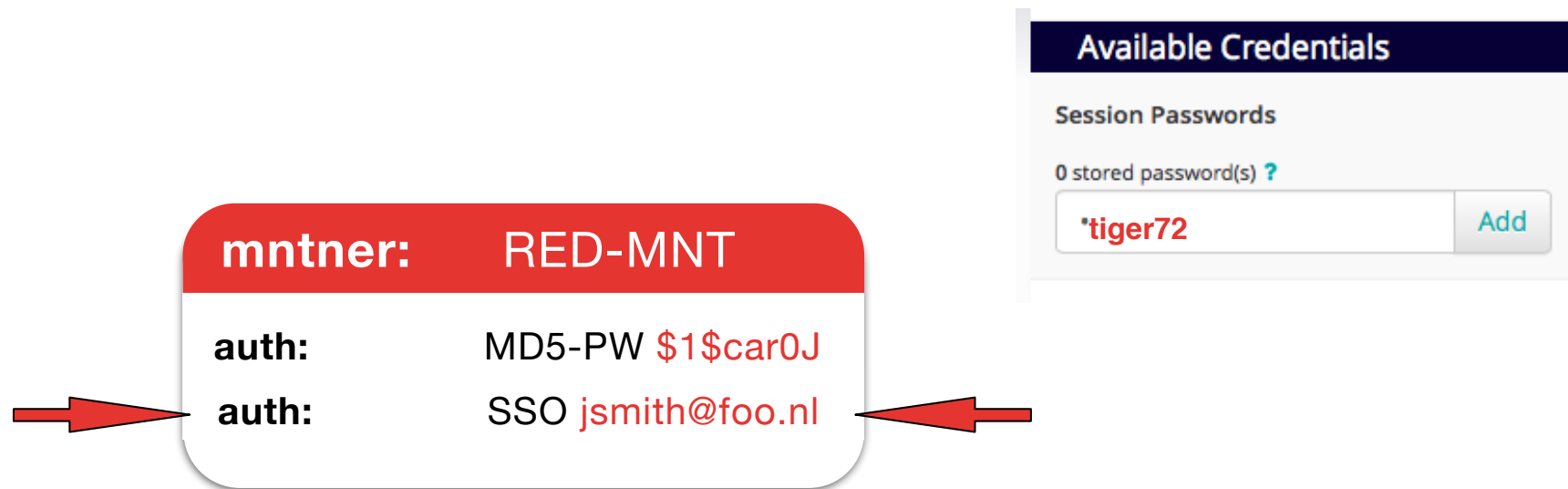
- **Private key / Public key**
 - PGPKEY-<id>
 - key-cert object



SSO Authentication - Setting It Up



- Create a RIPE NCC access account
- Add 'SSO email@address' to any mntner object(s)



SSO Authentication - Updating Objects



- Log in to your RIPE NCC access account
- You can update any objects that are protected by a mntner having your SSO in the “auth:” line
- No extra password needed

The screenshot shows the RIPE NCC website interface. At the top right, the user's SSO email address, **jsmith@foo.nl**, is displayed next to a profile icon and is circled in red. Below the header, a navigation bar contains links: Manage IPs and ASNs, Analyse, Participate, Get Support, Publications, and About Us. The main content area is titled "RIPE Database Query" and features a search form with a "Search term" input field. Below the input field are two checkboxes: "Show full object details ?" and "Do not retrieve related objects ?". A note states: "You can search up to 5 terms at once in the search box above, separating them with a semicolon." The search results are displayed in a table with columns: Sources, Types, Hierarchy Flags, and Inverse lookup. The "Sources" column shows three options: "RIPE Database ?" (selected), "TEST Database ?", and "Global Resource Service (GRS) ?". At the bottom of the form, there is a link to "RIPE Database Terms and Conditions" and a "Search" button. The footer indicates "RIPE Database Software Version 1.80".

Protection



mntner:	LIR-MNT
admin-c:	LA789-RIPE
tech-c:	LA789-RIPE
mnt-by:	LIR-MNT

inetnum:	85.11.184.0/21
descr:	My Assignment
status:	ASSIGNED PA
mnt-by:	LIR-MNT
admin-c:	LA789-RIPE
tech-c:	LA789-RIPE



person:	John Smith
nic-hdl:	JD1-RIPE
mnt-by:	LIR-MNT
address:	Sesame Street 1
phone:	+1 555 0101
e-mail:	john@example.org



aut-num:	AS64551
descr:	my AS number
mnt-by:	RIPE-NCC-END-MNT
mnt-by:	LIR-MNT
admin-c:	JE777-RIPE
tech-c:	JD1-RIPE



Multiple Protection



mntner: ONE-MNT	
admin-c:	LA789-RIPE
tech-c:	LA789-RIPE
mnt-by:	ONE-MNT
auth:	MD5-PW \$1\$gT4W
auth:	PGPKEY-AE6FBT17

mntner: TWO-MNT	
admin-c:	XY456-RIPE
tech-c:	XY455-RIPE
mnt-by:	TWO-MNT
auth:	MD5-PW \$76\$ytE7

person: John Smith	
nic-hdl:	JS123-RIPE
address:	Sesame Street 1
phone:	+1 555 0101
e-mail:	john@example.org
mnt-by:	ONE-MNT
mnt-by:	TWO-MNT





Forgot Your mntner's Password?

- Go to <https://apps.db.ripe.net/change-auth/>
- Automated process
 - Recovery link sent to “upd-to:” email address
- Manual process
 - Send statement & registration papers to us
 - We will send you an email with the recovery link
 - We will add your Access account to the maintainer

Forgotten MNTNER password

Please enter your MNTNER name:

Reset Old mntner Passwords



- Pre Nov 2011
- With MD5-PW
- Email sent to you with link to reset
- Didn't get it?
 - use standard mntner reset



Finding the Address of an LIR

Section 6



Hierarchical Authorisation

Exercise 4

Hierarchical Authorisation



- **Giving someone else some rights to create new objects for you**
- **But not too many rights; you don't want them to be able to delete or edit your objects**
 - mnt-lower - create inetnum objects
 - mnt-routes - create route objects
 - mnt-domains - create (reverse) domain objects

mnt-lower Explained



- To allow someone to create more specific **inetnum** objects in your range
- Without allowing them to delete or modify your original **inetnum**

mntner in mnt-by Has Two Functions

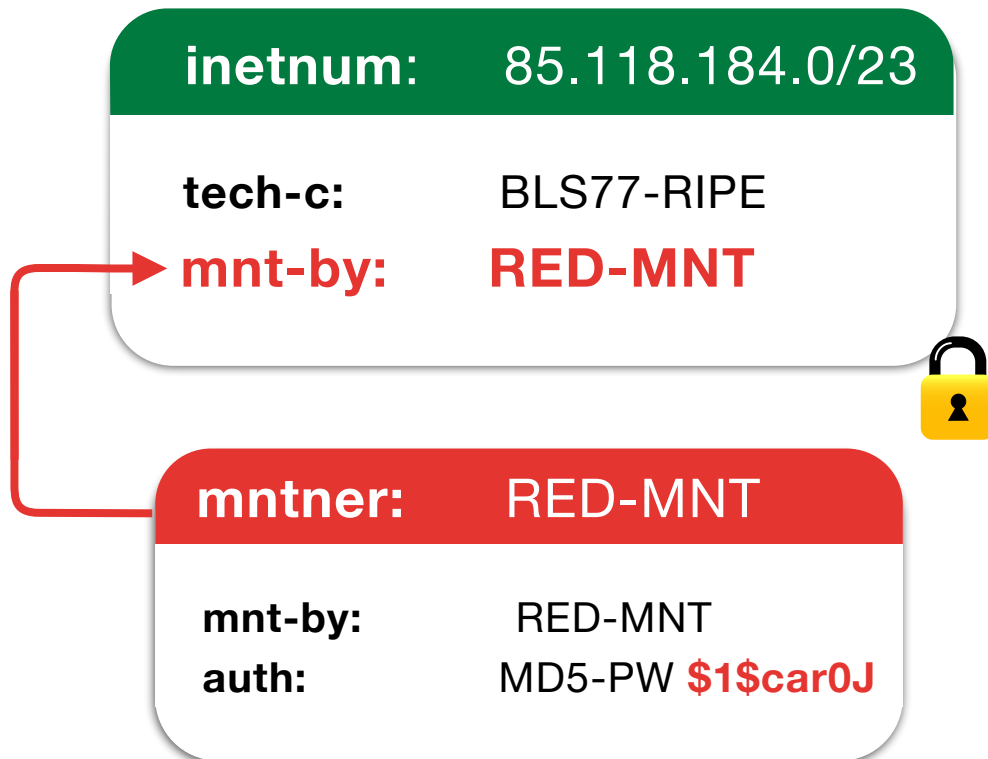


1. Protects the object
2. Guards the address range

inetnum: 85.118.184.0/23

mnt-by: RED-MNT

1st Function: Protects the Object



Add passwords

Session passwords

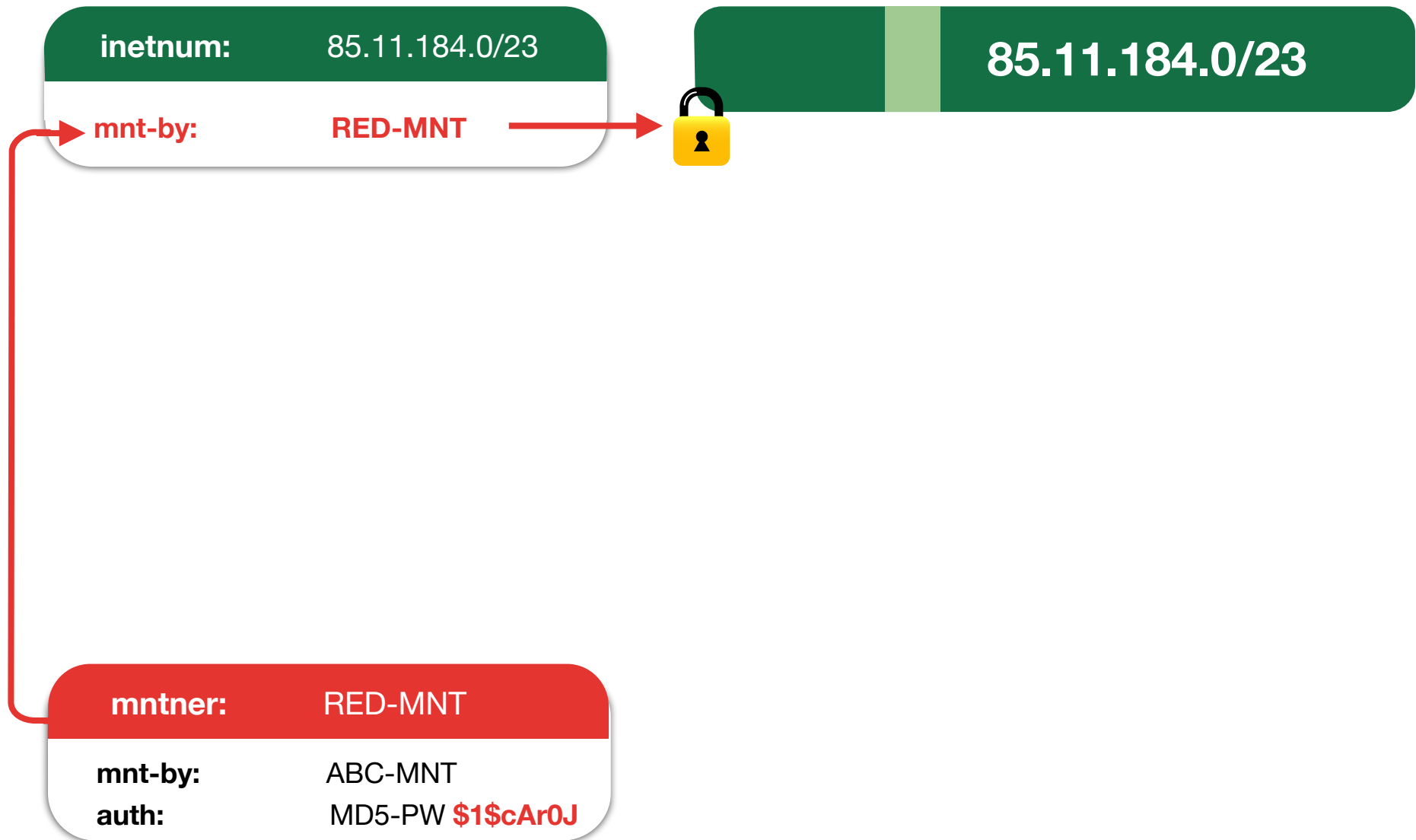
0 stored password(s)



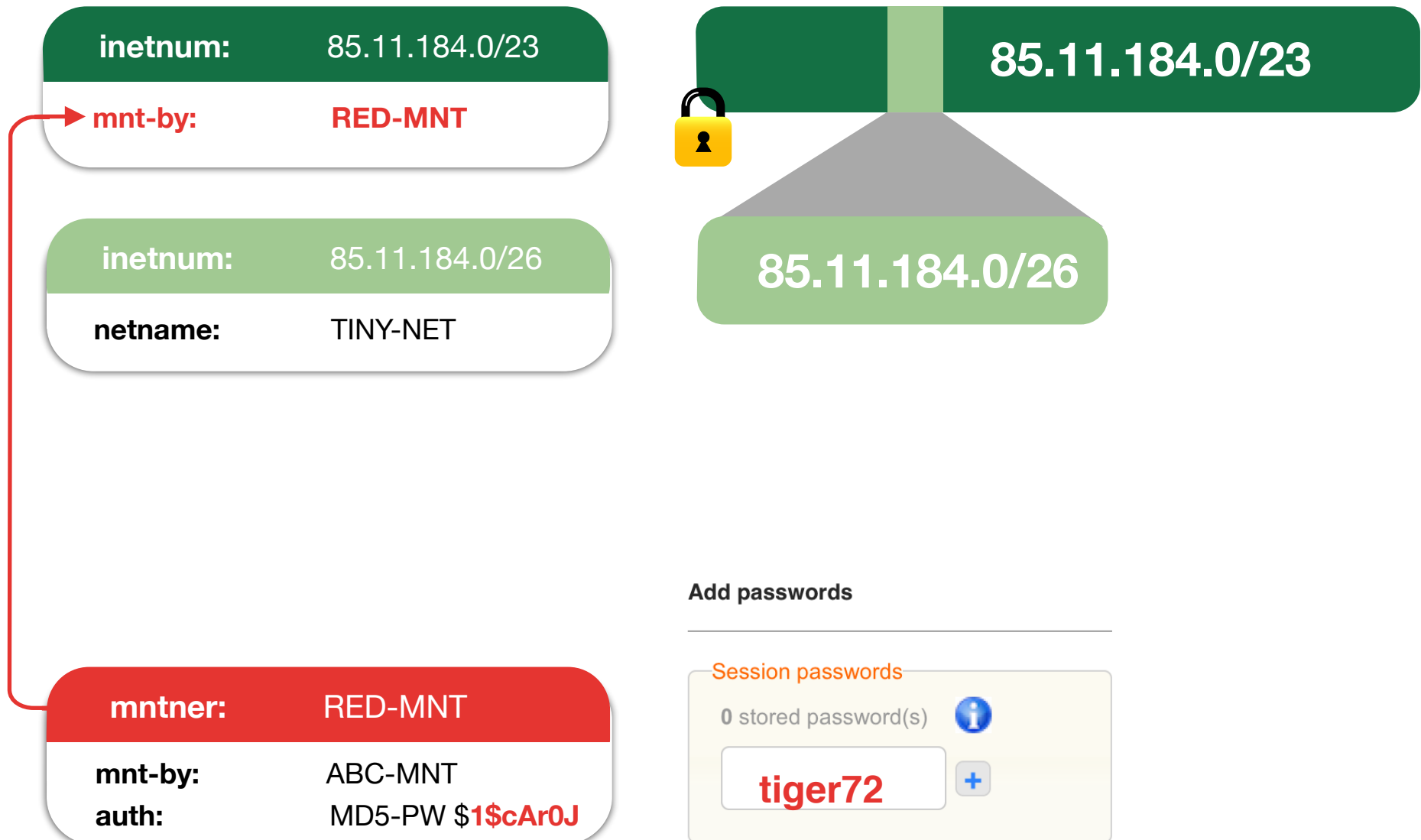
tiger72



2nd Function: Protects the Address Range



How Do I Create a More Specific inetnum



Password



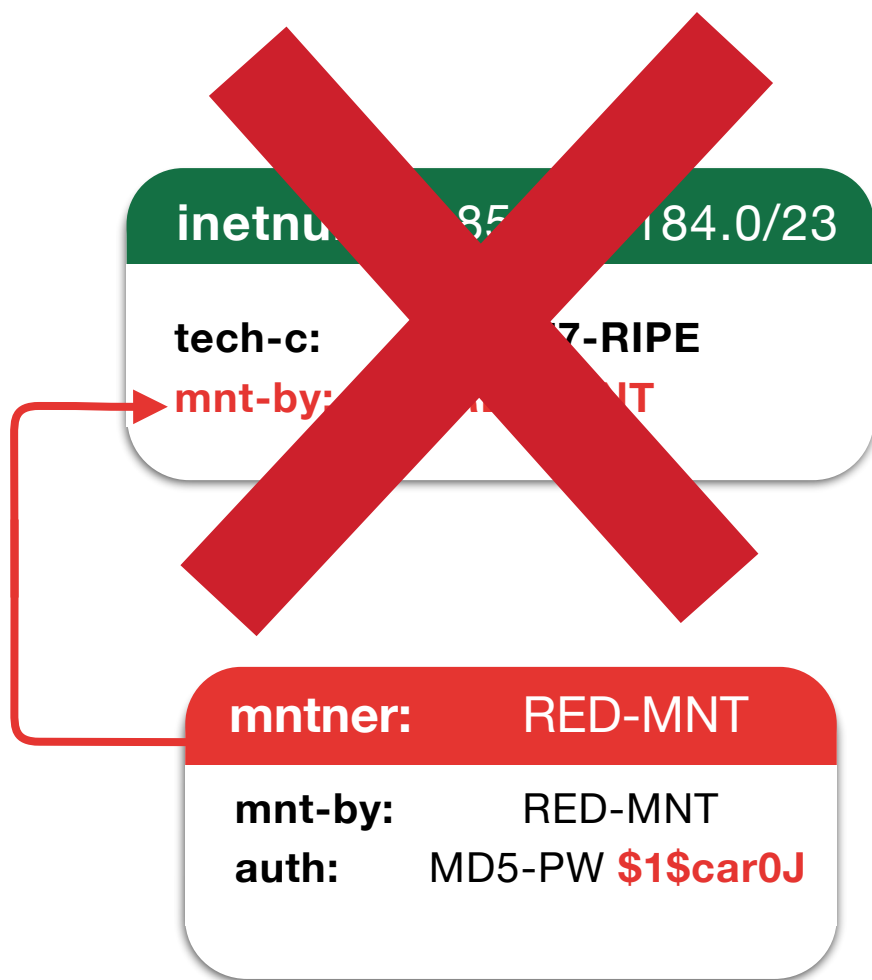
- Would you tell them the password?



Danger!



- original object can be deleted!



Add passwords

Session passwords

0 stored password(s)



tiger72



Solution: Add mnt-lower



- Split the two functions of the maintainer in mnt-by adding a mnt-lower line to the object

The Two Functions Are Split



1. mntner in **mnt-by** only protects the object
2. mntner in **mnt-lower** guards the address range



The mntner-s



mntner: RED-MNT

mnt-by: RED-MNT

auth: MD5-PW **\$1\$car0J**

Password: tiger72

Hashed Password: \$1\$car0J

mntner: GOLD-MNT

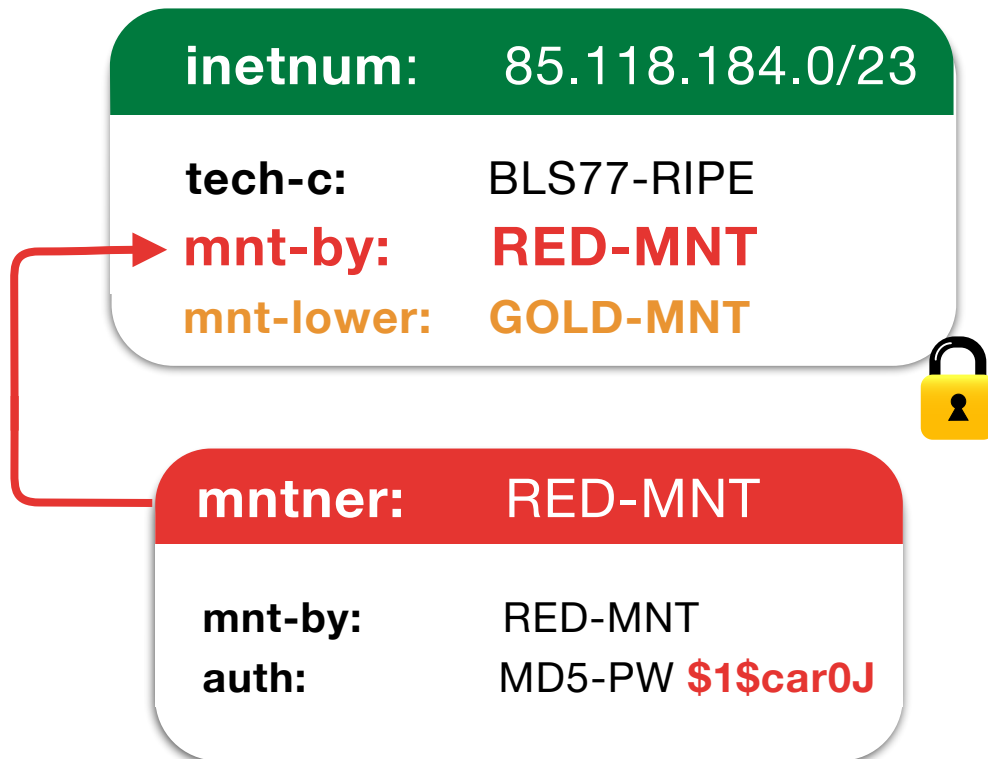
mnt-by: GOLD-MNT

auth: MD5-PW **\$1\$koW4**

Password: kitty89

Hashed Password: \$1\$koW4

1st Function: Protects the Object



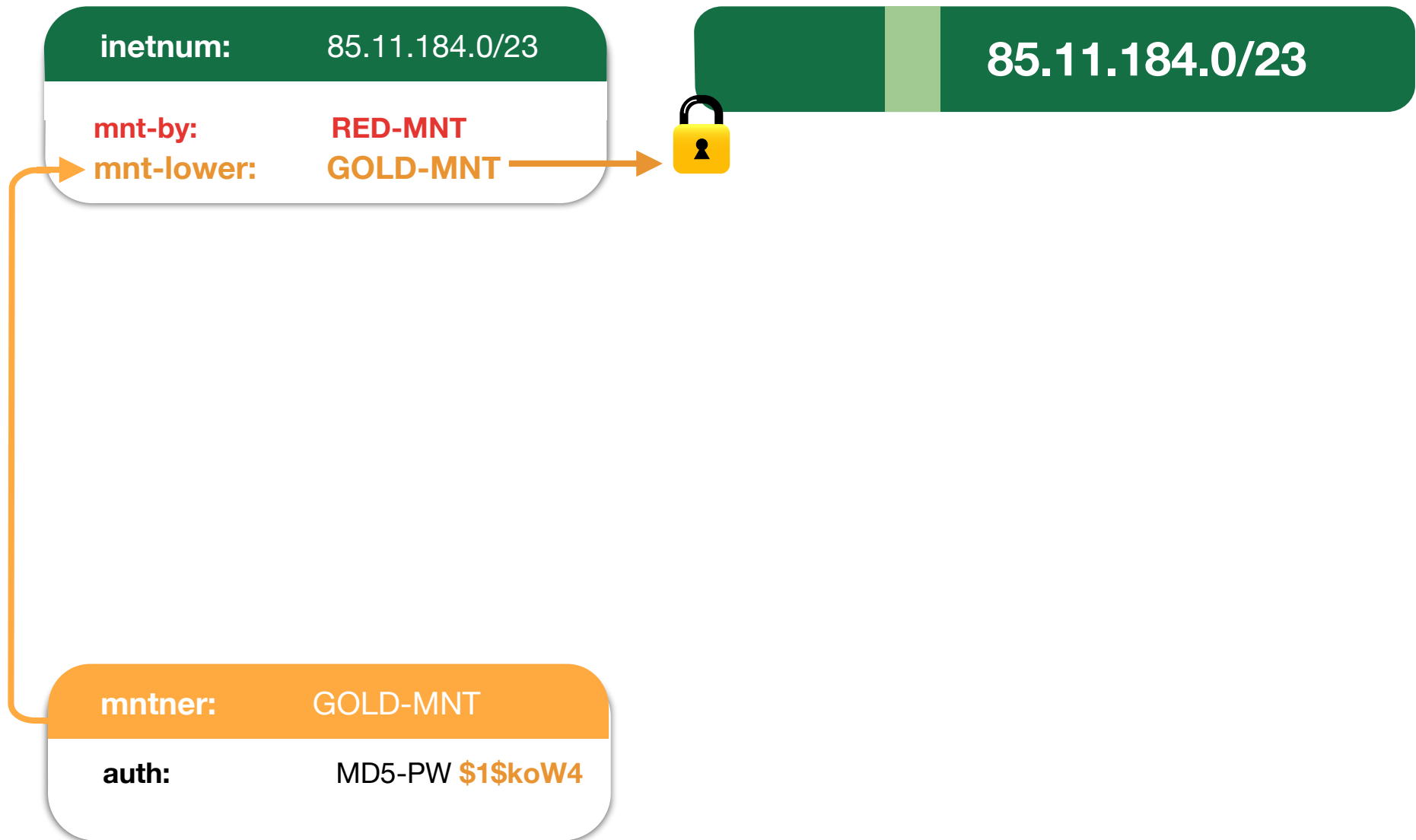
Add passwords

Session passwords

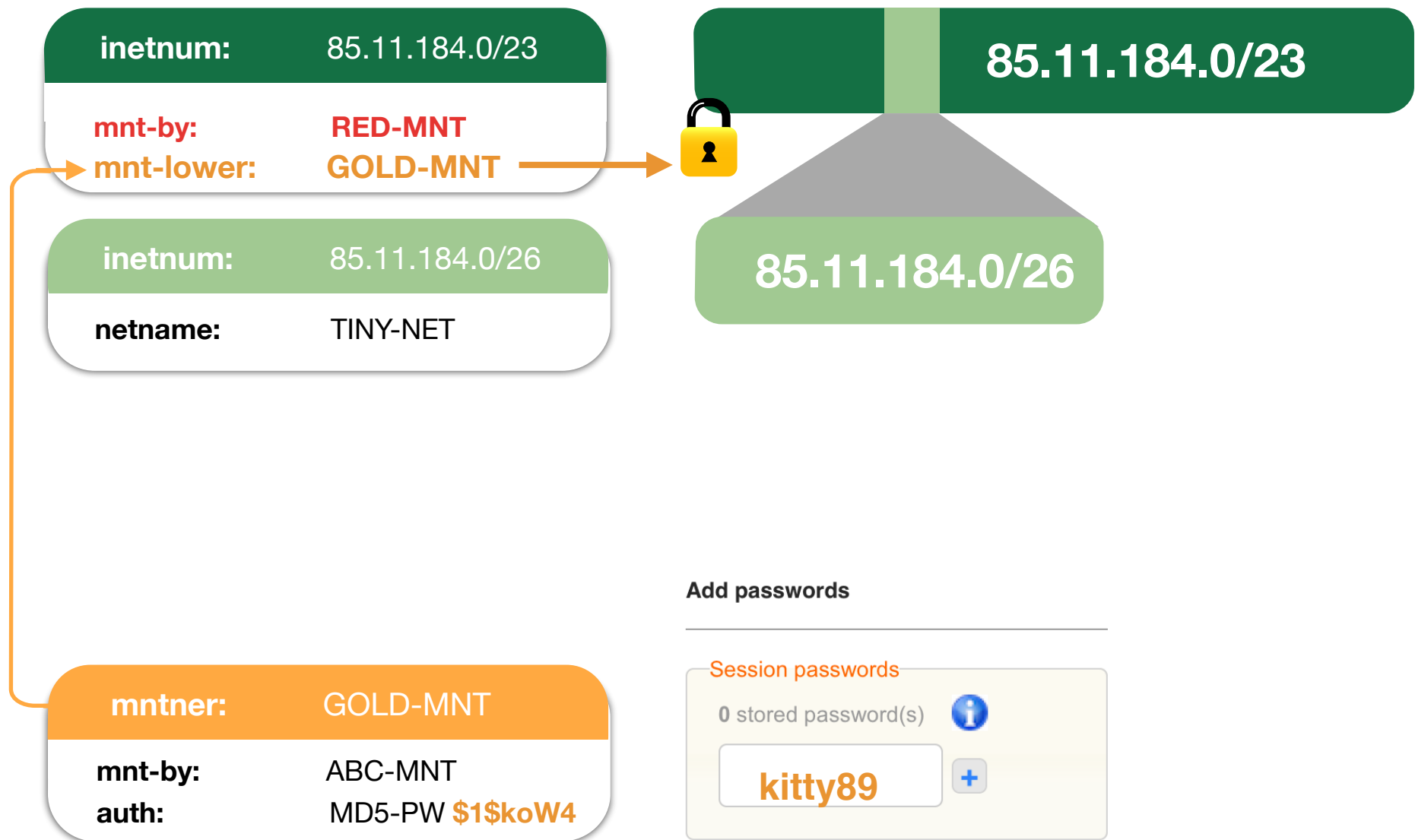
0 stored password(s) ?

tiger72 +

2nd Function: Guards the Address Range



How Do I Create a More Specific inetnum?



mntner in mnt-lower



- **Authenticates only the creation of new more specific objects**
- **Has no authority to edit the objects it created**

But...Who Can Edit an Object?



- Depends on which maintainer you put in the **mnt-by** of the new object when you create it

inetnum:	85.118.184.0/26
netname:	tinynet
mnt-by:	LILA-MNT

Question



- If you...
 - know the password of **RED-MNT**
 - and don't know the password of **GOLD-MNT**
- ...can you create a more specific object?

```
inetnum: 85.118.184.0/23
mnt-by: RED-MNT
mnt-lower: GOLD-MNT
```

- **NO!**

Finally: The Complete Solution



inetnum: 85.118.184.0/23

mnt-by: RED-MNT

mnt-lower: GOLD-MNT

mnt-lower: RED-MNT

- Who can update this object?

tiger72

- Who can create more specific inetnums now?

kitty89

tiger72

Multiple mnt-by and / or mnt-lower Lines



inetnum:	85.118.184.0/23
mnt-by:	RED-MNT
mnt-by:	GREEN-MNT
mnt-lower:	GOLD-MNT
mnt-lower:	BLUE-MNT

- Who can update this object?

tiger72

spot18

- Who can create more specific inetnums now?

kitty89

mitzy9

Hierarchical Authorisation



- Route and Domain objects

inetnum: 85.118.184.0/21

descr: My Allocation

status: ALLOCATED PA

mnt-by: RIPE-NCC-HM-MNT

mnt-lower: LIR-MNT

mnt-routes: LIR-MNT

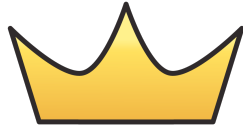
mnt-domains: LIR-MNT

org: ORG-BB2-RIPE

admin-c: LA789-RIPE

tech-c: LA789-RIPE

LIR Can Delete All Object in Their Range!



inetnum: 85.11.184.0/21

descr: LIR's Allocation

status: ALLOCATED PA

mnt-by: RIPE-NCC-HM-MNT

mnt-lower: LIR-MNT

mnt-routes: LIR-MNT

mnt-domains: LIR-MNT

org: ORG-BB2-RIPE

85.11.184.0/21

inetnum: 85.11.184.0/25

netname: TINY-NET

mnt-by: LILA-MNT

domain: 184.11.85.in-addr.arpa

mnt-by: STRANGE-MNT

mnt-by: END-USER-MNT

nserver: ns1.example.com

nserver: ns2.example.com

route: 85.11.184.0/21

origin: AS2

tech-c: LA789-RIPE

admin-c: JD1-RIPE

mnt-by: SOME-MNT

Want to create an inetnum or inet6num?



1. Every **inetnum** has a larger **inetnum** above it
2. Make sure that the mnt-lower (or mnt-by) in that larger **inetnum** is a mntner whose password you know. You have to supply it as the second password during the creation of the new inetnum.



Hierarchical Authorisation

Exercise 5



Routing Policy Objects

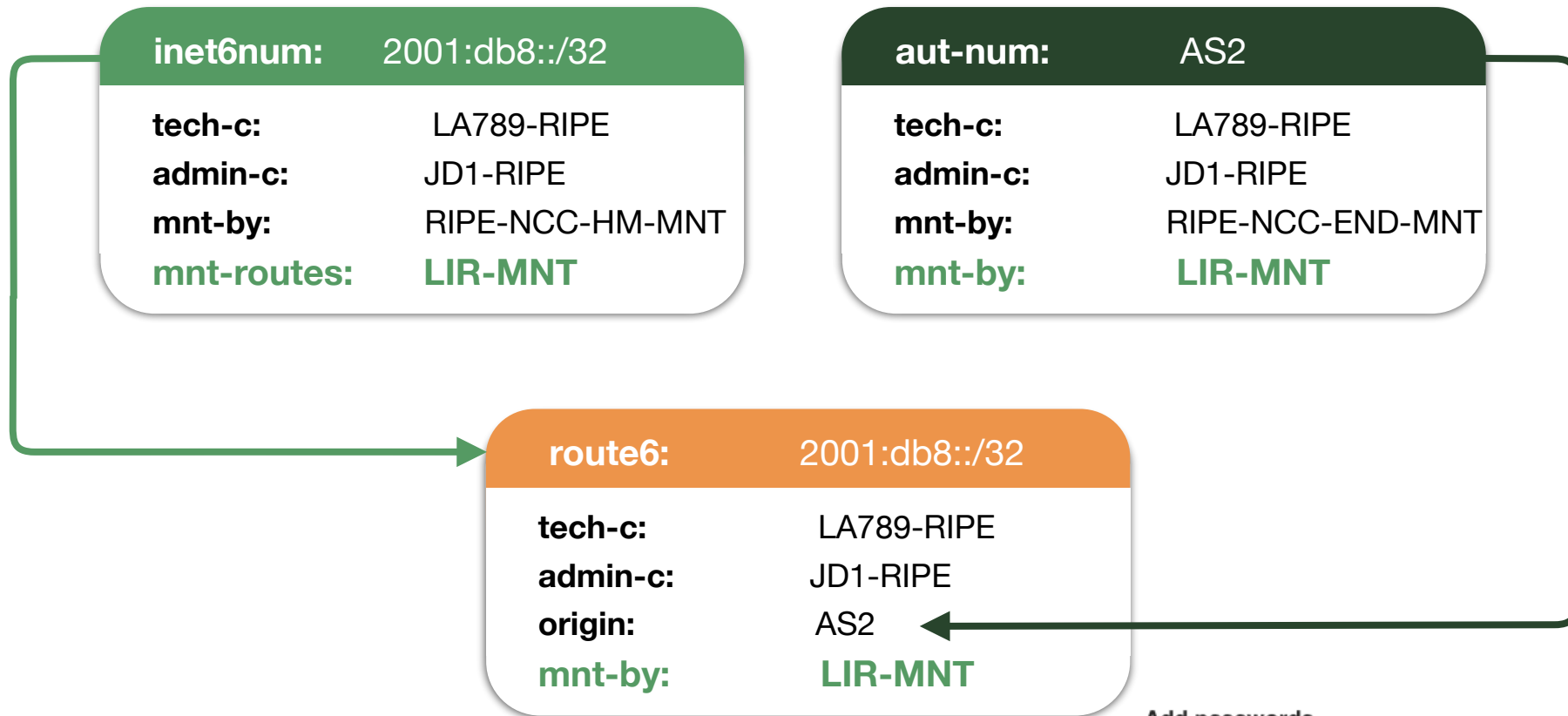
Section 7

Which Ones Do You Create?



- **inetnum** - IPv4 address range RIPE NCC LIR
- **inet6num** - IPv6 address range RIPE NCC LIR
- **aut-num** RIPE NCC LIR
 - Registration record of an AS Number
 - Contains the routing policy
- **route** LIR
 - IPv4 prefix announced by an AS
- **route6** LIR
 - IPv6 prefix announced by an AS

route and route6 Object (1st Scenario)



Add passwords

Session passwords

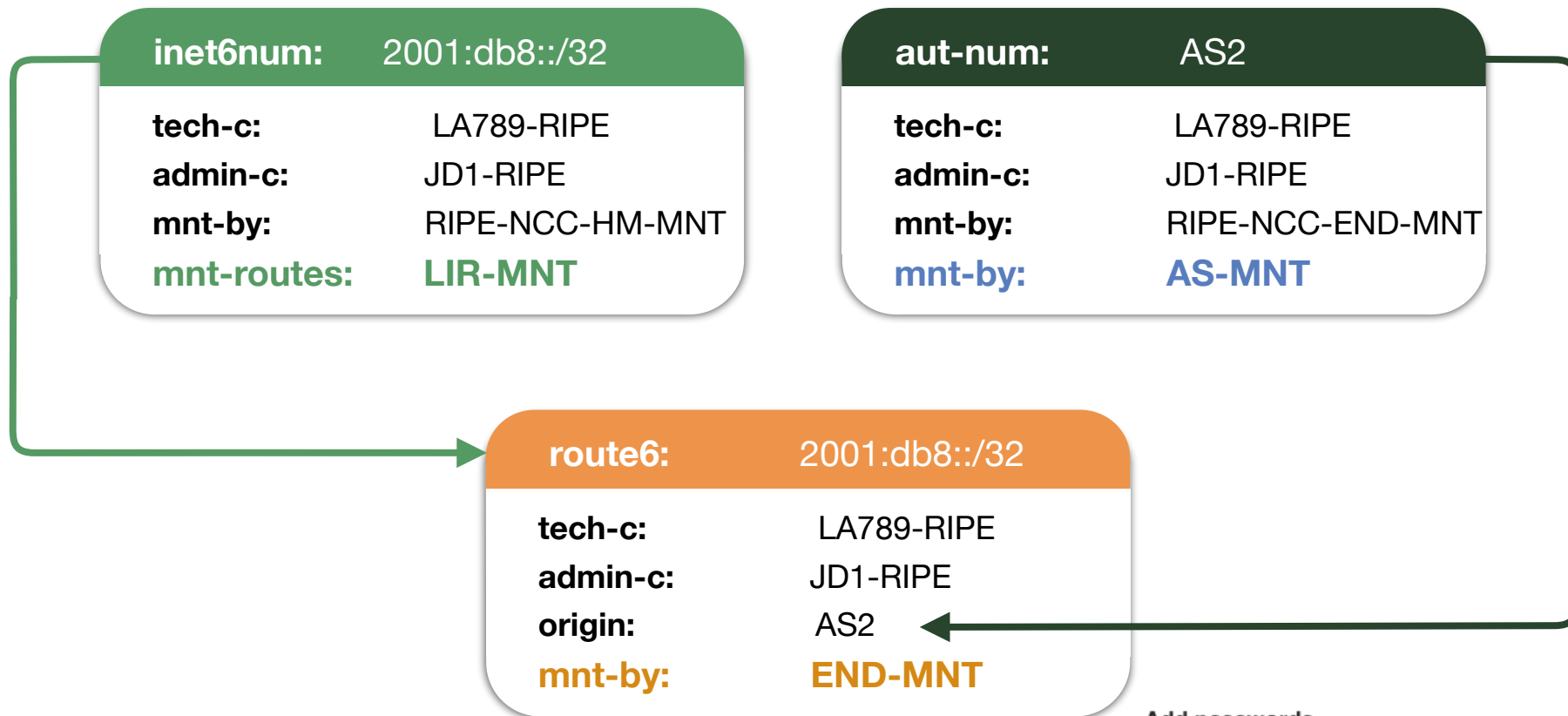
0 stored password(s)



12lir



route and route6 Object (2nd Scenario)



Add passwords

Session passwords

0 stored password(s)



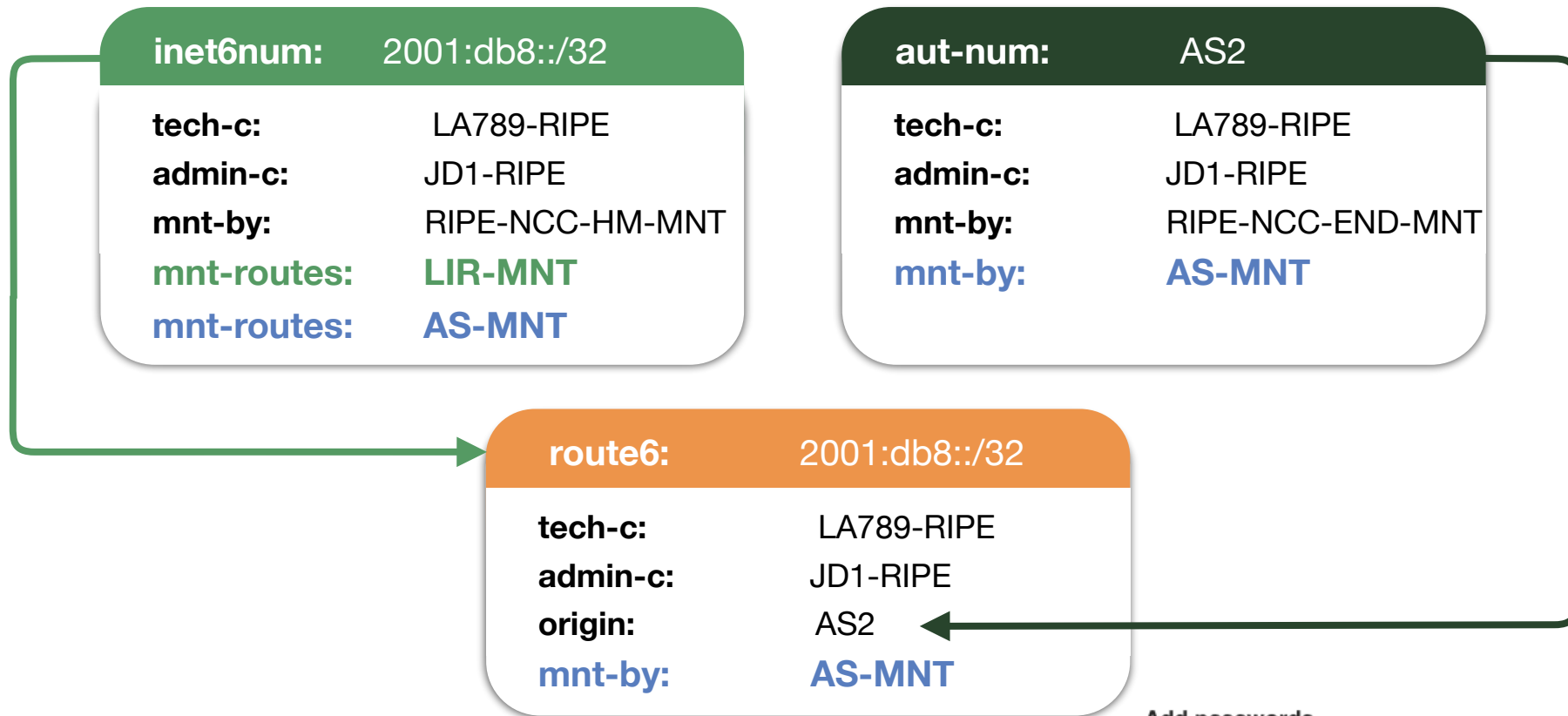
12lir

as999

end72



route and route6 Object (3rd Scenario)



Add passwords

Session passwords

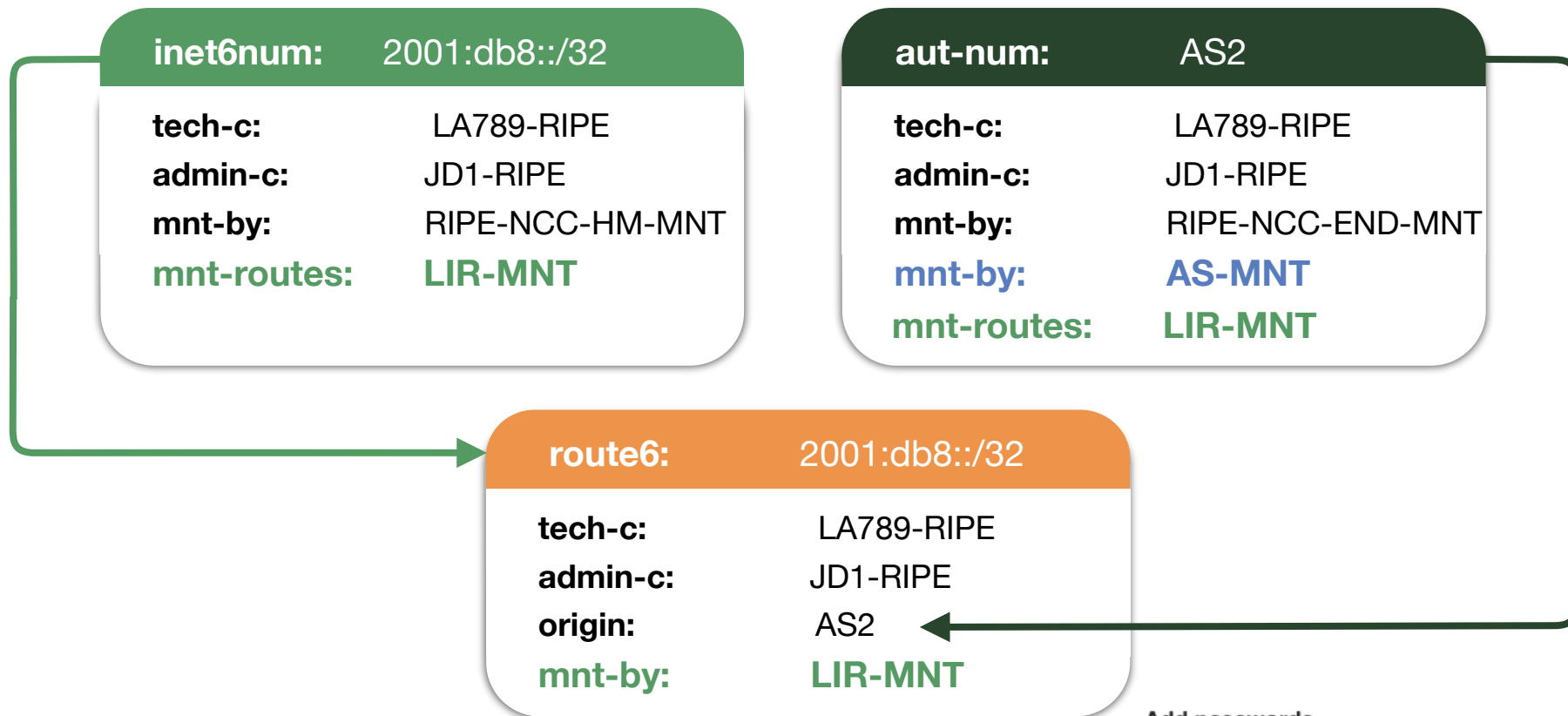
0 stored password(s)



as999



route and route6 Object (4th Scenario)



Add passwords

Session passwords

0 stored password(s)



12lir



inet6num in Real Life



inet6num: 2001:db8::/32

org: ORG-BB2-RIPE
admin-c: LA789-RIPE
tech-c: LA789-RIPE
mnt-by: RIPE-NCC-HM-MNT
mnt-lower: LIR-MNT
mnt-routes: LIR-MNT
mnt-domains: LIR-MNT

Registering routes - New Approach



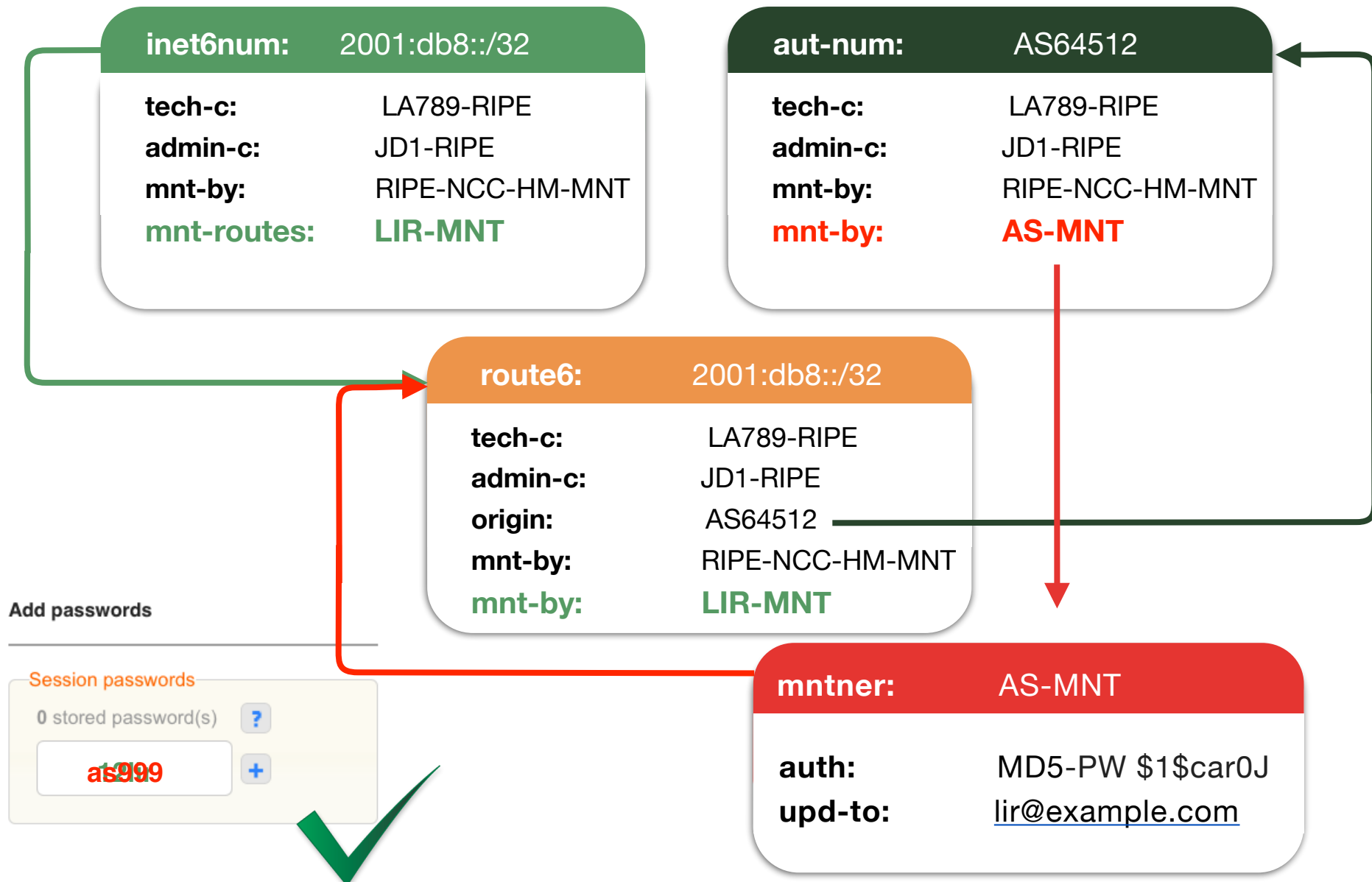
- **Creating route object**
 - Sharing passwords
 - Adding other users' maintainers to your objects
- **New approach**
 - For any missing authorisation, object is queued and notification is sent to the maintainer

mntner: LIR-MNT

auth: MD5-PW \$1\$car0J

upd-to: lir@example.com

Registering routes - New Approach





Reverse Delegation

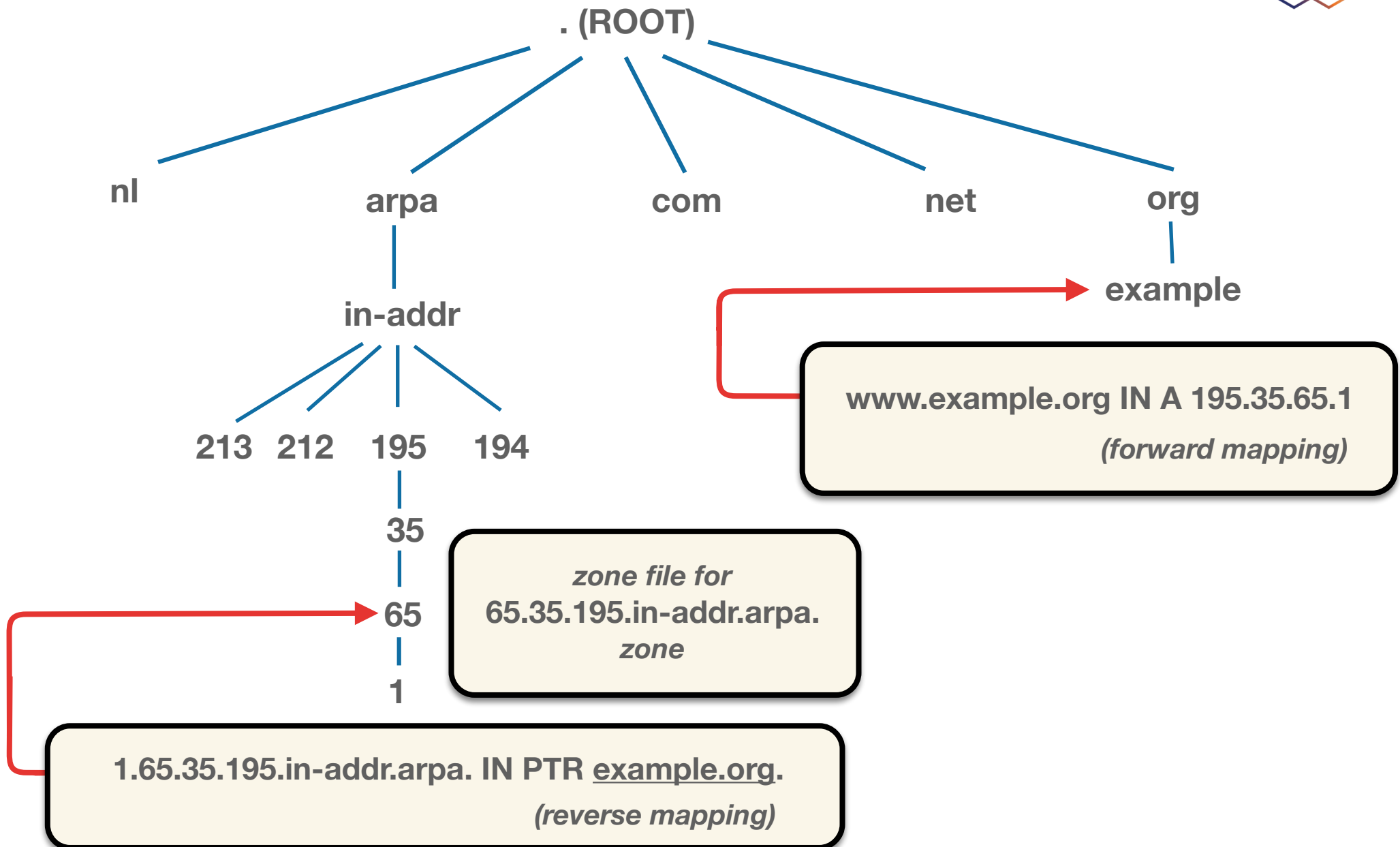
Section 8

What is Reverse Delegation?



- Mapping of IP addresses to domain names

in-addr.arpa Domain (IPv4)



Reverse DNS for a /24 Domain (IPv4)



- domain object:

195. 4. 0. 1

in-addr.arpa.

- PTR record:

1.0.4.195.in-addr.arpa. IN PTR [you.example.org.](#)

Reverse DNS (IPv6)



- domain object:

2001:0db8:003e:ef11:0000:0000:c100:004d

.ip6.arpa.

- PTR record:

d.4.0.0.0.1.c.0.0.0.0.0.0.0.1.1.f.e.e.3.0.0.8.b.d.

0.1.0.0.2.ip6.arpa. IN PTR yourname.domain.tld.

d.4.0.0.0.1.c.0.0.0.0.0.0.0.1.1.f.e.e.3.0.0.8.b.d.0.1.0.0.2.ip6.arpa. IN PTR yourname.domain.tld.

Reverse Delegation Basics



- **IPv4**
 - in-addr.arpa
 - /24 or /16 sizes only
- **IPv6**
 - ip6.arpa
 - Sizes: multiples of 4 bits (/32, /36, /48)

Setting up Reverse Delegation: Preparation



- **Modify the covering inetnum or inet6num**
 - add "mnt-domains: your_mntner"
 - for allocations: use LIR Portal Object Editor
 - for other objects: use Webupdates
- **Chop up your address range into chunks suitable for reverse delegation**
 - /24 or /16 chunks for IPv4or
 - multiples of 4 bit chunks (/32, /36, /48, etc.) for IPv6

Setting up Reverse Delegation: Setup



- **Configure your DNS servers**
 - at least two name servers in different subnets
 - create a zone file on each
 - for /16 (v4) and /32 (v6) you can use ns.ripe.net as secondary server
- **Delegation checker**
 - <http://dnscheck.ripe.net>
- **RIPEstat widget**

Setting up Reverse Delegation: domain Object



- **create a domain object for each of your chunks of**
 - /24 or /16 (for IPv4)
 - /32 or /36 or /*“any multiple of 4”* (for IPv6)
- **Specify name servers:**
 - nserver: your_1st_nameserver
 - nserver: your_2nd_nameserver
- **Multiple objects:**
 - 192.4.0.0/22 = 192.4.0-3.0/24

Setting up Reverse Delegation: domain Object



domain: 0.4.192.in-addr.arpa

domain: 1.4.192.in-addr.arpa

domain: 2.4.192.in-addr.arpa

domain: 3.4.192.in-addr.arpa

mnt-by: LIR-MNT
mnt-by: END-USR-MNT
nserver: ns1.example.com
nserver: ns2.example.com

Creation



- **domain object creation = request for reverse delegation**
 - asking RIPE NCC to enter NS records pointing to your name servers in RIPE NCC's /8 parent zone
- **Robot checks before successful creation**
 - authentication check
 - RIPE Database syntax check
 - zone delegation check (20 points max!)



Reverse Delegation

Exercise 6



Tools

LIR Portal, RIPEstat

Section 9

LIR Portal



- LIR's confidential communication channel and interface to the RIPE NCC
- Get an admin account from the RIPE NCC to use it
- Request forms, Object editors

Editing an Allocation or Organisation Object



- IP allocations and LIR's org object can only be edited in the LIR Portal, not via Webupdates
- You can only edit some of the lines, not all the lines

Object Editors

1. Select Object(s)

193.0.24.0 - 193.0.31.255

2. Select attribute to edit

admin-c

3. Select attribute value(s)

Write the new value here

JDR-RIPE
BRD-RIPE
TS7729-RIPE

4. Add/remove attributes to/from selected object(s)

Add Remove

inetnum	193.0.24.0 - 193.0.31.255
netname	NL-RIPENCC-TS-19930901
org	ORG-Bb2-RIPE
descr	Reseaux IP Europeens Network Coordination Centre (RIPE NCC)
remarks	RIPE NCC Training Services & RIPE Meetings Used for RIPE Meetings and demonstration purposes self-published-feed: https://meetings.ripe.net/geol/google.csv
country	NL
admin-c	JDR-RIPE BRD-RIPE TS7729-RIPE
tech-c	OPS4-RIPE
status	ALLOCATED PA
mnt-by	RIPE-NCC-HM-MNT
mnt-lower	RIPE-NCC-MNT MNT-NCCTS

RIPEstat: <http://stat.ripe.net>



- One interface for all IP resources related data
 - Registry data, routing, reverse DNS, active measurements, 3rd party data (blacklist, geolocation)
- Query: IP address, AS, domain name

Search RIPEstat

Search

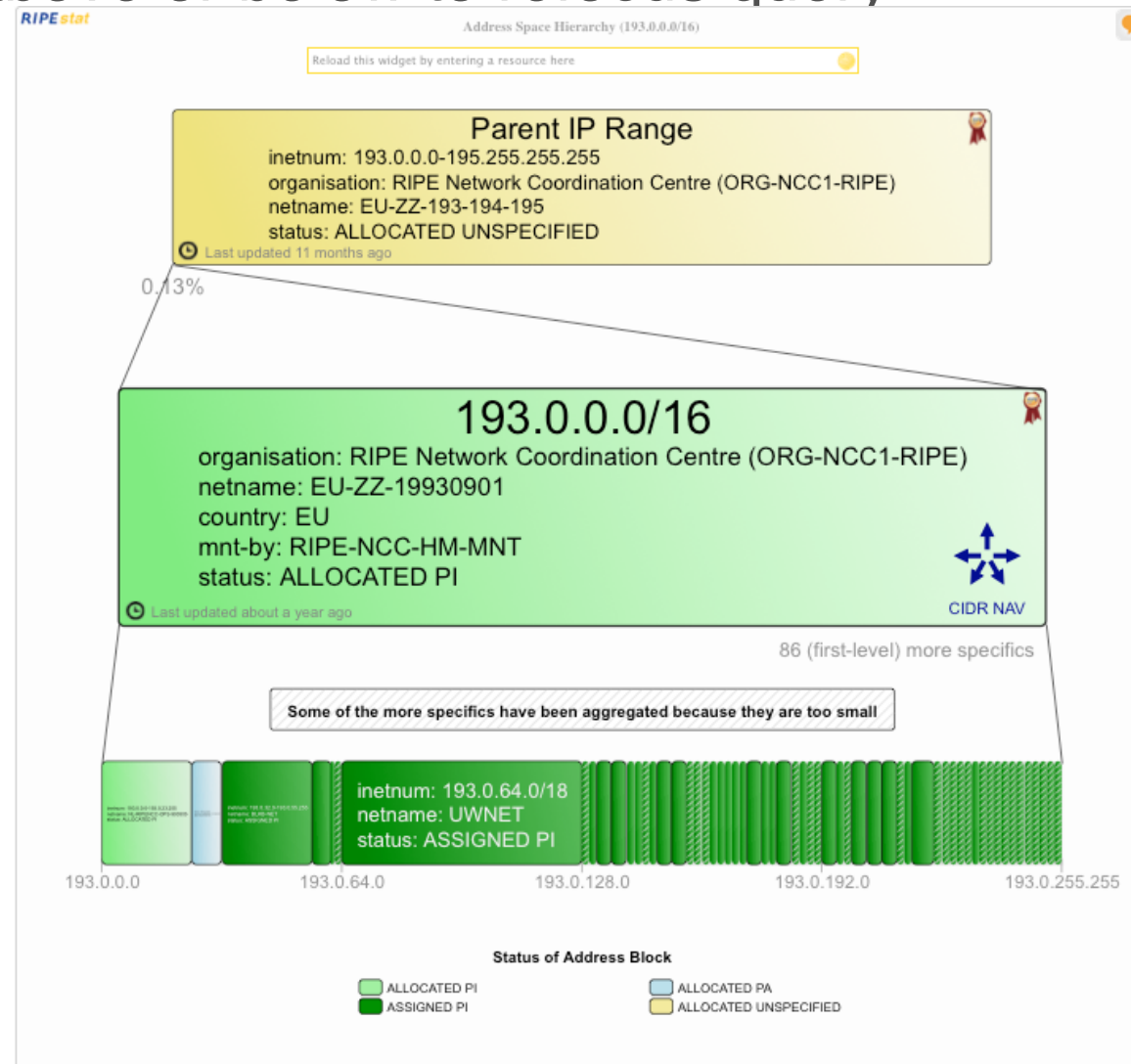
Your network: [AS33333](#), [2001:67c:2e8::/48](#)

e.g.: [IPv4 prefix/range](#), [IPv6](#), [ASN](#)

Address Space Hierarchy Widget



- click above or below to refocus query




Registry Browser Widget



- click on another object to refocus query

Registry Browser (109.110.192.0/19)

Reload this widget by entering a resource here 

🕒 2011-08-04 16:00:28Z to 2012-12-17 14:02:27Z
Last changed on 2011-08-04 at 16:00:28Z

inetnum: 109.110.192.0/19 [Show more](#)

descr ASTER Sp. z.o.o.
netname PL-ACC-20091113
country PL
org ORG-ACCL1-RIPE
status ALLOCATED PA
mnt-by RIPE-NCC-HM-MNT

↑

route: 109.110.192.0/19 [route] [Show more](#)

route: 109.110.192.0/19 [route] [Show more](#)

↓

organisation: ORG-ACCL1-RIPE [Show more](#)
[org]

role: ACC TEAM [admin-c, tech-c] [Show more](#)

mntner: RIPE-NCC-HM-MNT [mnt-by] [Show more](#)

mntner: PL-ASTER-ZG-MNT [Show more](#)
[mnt-lower, mnt-routes]

mntner: ACC-MNT [mnt-lower, mnt-routes] [Show more](#)

Registry Browser Widget



RIPEstat

Registry Browser (mntner:ACC-MNT)

Reload this widget by entering a resource here

2013-02-12 15:12:09 UTC to 2013-03-11 13:39:23 UTC
Last updated on 2013-02-12 at 15:12:09 UTC.
mntner: ACC-MNT
descr Aster Sp. z o.o. AS Maintainer
mnt-by ACC-MNT

7 × aut-num, 400 × domain^{truncated}, 3 × inet6num, 22 × inetnum, 5 × mntner, 6 × organisation, 5 × person, 1 × role, 3 × route

aut-num: AS31079
aut-num: AS35342
aut-num: AS49785
domain: 0.178.31.in-addr.arpa
domain: 0.179.31.in-addr.arpa
domain: 0.187.31.in-addr.arpa
domain: 0.222.85.in-addr.arpa
domain: 0.5.0.4.1.0.0.2.ip6.arpa
domain: 0.73.178.in-addr.arpa


role: ACC TEAM [admin-c, tech-c]
mntner: ACC-MNT [mnt-by]

Showing results for ACC-MNT as of 2013-03-11 13:39:23 UTC

Travel Back in Time: For RIPE NCC Members



Registry Browser (AS3333)

Reload this widget by entering a resource here 

2012-04-17 10:12:15 UTC to 2013-03-13 13:04:15 UTC

2012-04-17 10:12:15 UTC to 2013-03-13 13:04:15 UTC
2012-04-17 09:55:11 UTC to 2012-04-17 10:12:14 UTC
2012-03-12 08:40:16 UTC to 2012-04-17 09:55:10 UTC
2011-03-29 14:57:26 UTC to 2012-03-12 08:40:15 UTC
2011-02-15 10:48:34 UTC to 2011-03-29 14:57:25 UTC
2011-02-15 10:30:34 UTC to 2011-02-15 10:48:33 UTC
2011-02-02 14:06:10 UTC to 2011-02-15 10:30:33 UTC
2009-01-28 17:46:03 UTC to 2011-02-02 14:06:09 UTC
2009-01-28 17:27:21 UTC to 2009-01-28 17:46:02 UTC
2009-01-28 11:14:33 UTC to 2009-01-28 17:27:20 UTC
2009-01-27 15:44:05 UTC to 2009-01-28 11:14:32 UTC
2008-12-19 18:38:35 UTC to 2009-01-27 15:44:04 UTC
2008-12-19 16:51:45 UTC to 2008-12-19 18:38:34 UTC
2008-11-19 16:31:45 UTC to 2008-12-19 16:51:44 UTC
2007-08-24 15:04:21 UTC to 2008-11-19 16:31:44 UTC
2007-07-10 10:24:28 UTC to 2007-08-24 15:04:20 UTC
2006-10-24 12:47:11 UTC to 2007-07-10 10:24:27 UTC
2006-10-24 12:44:28 UTC to 2006-10-24 12:47:10 UTC
2006-10-24 08:21:03 UTC to 2006-10-24 12:44:27 UTC
2006-05-03 10:29:36 UTC to 2006-10-24 08:21:02 UTC

route: 193.0.0.0/21 [origin] [Show more](#)

route: 193.0.10.0/23 [origin] [Show more](#)

route: 193.0.12.0/23 [origin] [Show more](#)

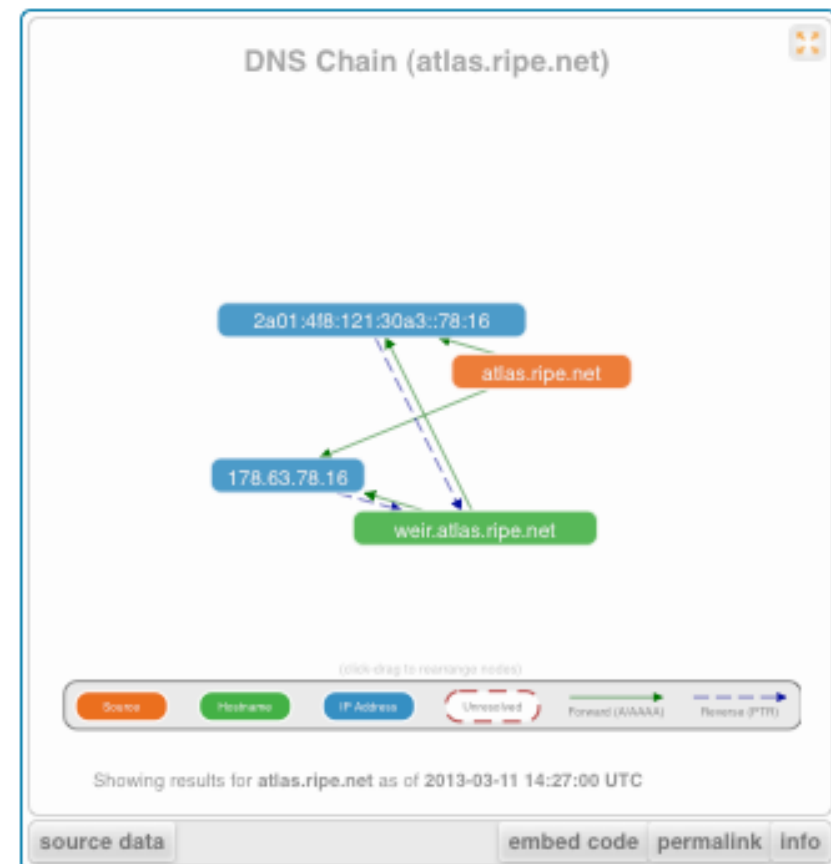
organisation: ORG-NIEN [org]

person: Jochem de Ruig

Reverse DNS and DNS



- For IP prefixes: reverse DNS whois registration
- For hostnames: resolves A and AAAA records
- DNS chain for both
 - hostnames & IP addresses





Questions



RIPE NCC Academy



RIPE
NCC ACADEMY

<http://academy.ripe.net>



twitter

@TrainingRIPENCC



<https://www.ripe.net/training/db/feedback>



The End! Край Y Diwedd
النهاية Соңы 𐌿𐌽𐌿𐌸 Fí Finis
Ende Finvezh Liðugt Кінець
Konec Kraj Ěnn Fund پایان
Lõpp Beigas Vége Son Крај
An Críoch 𐤒𐤍𐤔𐤁
Fine Endir Sfârșit Fin Τέλος
Einde Канец Slut Slutt
დასასრული Pabaiga
Fim Amaia Loppu Tmiem Koniec