RIPE NCC
RIPE NETWORK COORDINATION CENTRE

IPv6 in the RIPE Database

Webinar

February 2025

RIPE NCC Learning & Development


This session is
being recorded

Overview

IPv6 Address Distribution

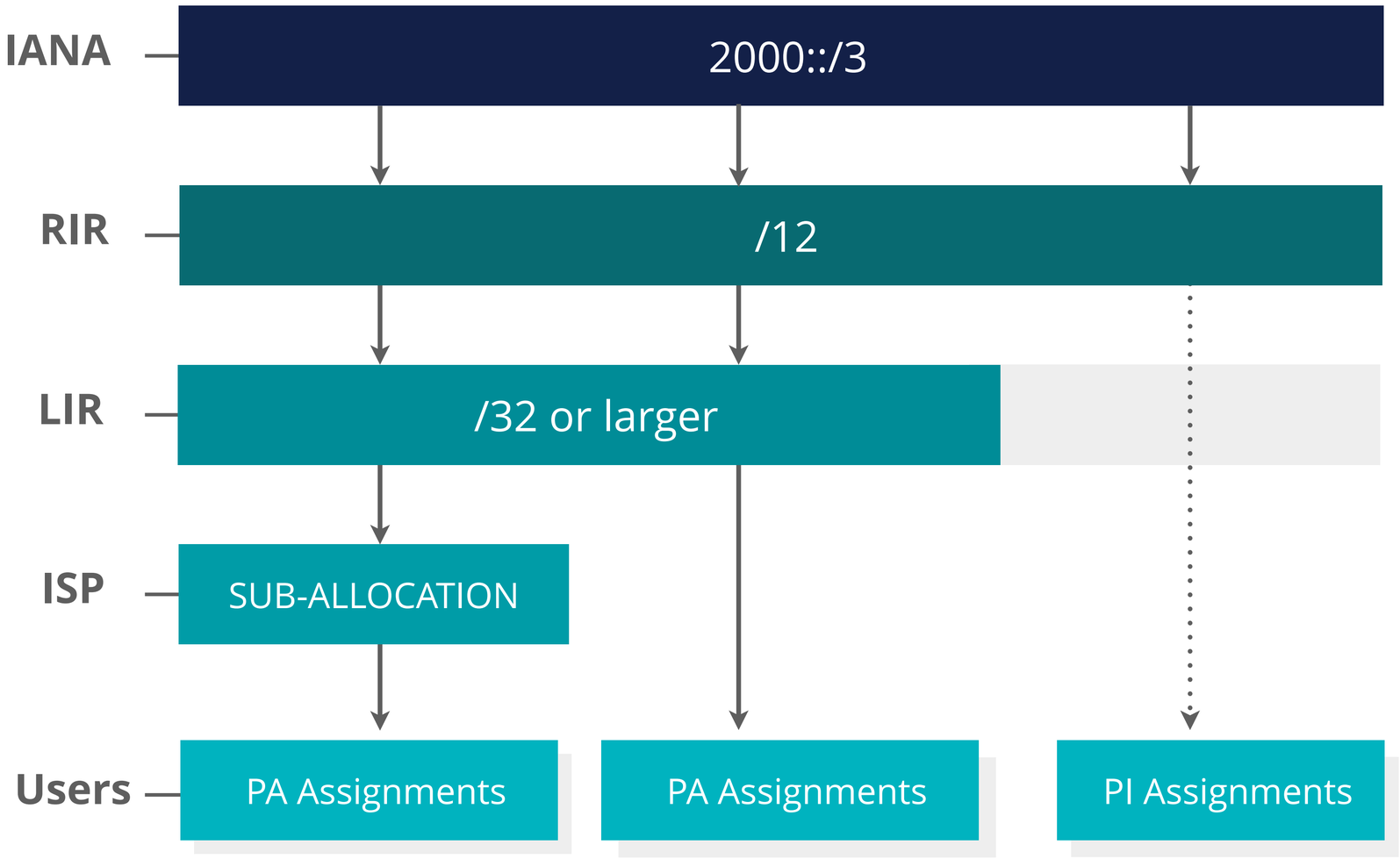
IPv6 Objects

route6 and domain Objects

IPv6 Address Distribution

From allocation to assignment

IPv6 Address Distribution



IPv6 Subnets

- **Minimum allocation size /32**
  - Up to /29, no extra documentation needed
  - 65,536 x /48s
  - 16,777,216 x /56s
  - 4 billion x /64s
- **Every subnet should be a /64**
- **Customer assignments (sites) should be "n" x /64**
  - *"How many /64s do they need?"*

Customer Assignments

- Give your customers **enough** address space
  - Consider future growth and new technologies

- Typical assignment **sizes** are:
  - Residential: /56 or /48
  - Business: /48

- **Every** assignment **must** be registered in the RIPE Database

Take the poll!

What is the **recommended size** of an IPv6 subnet?

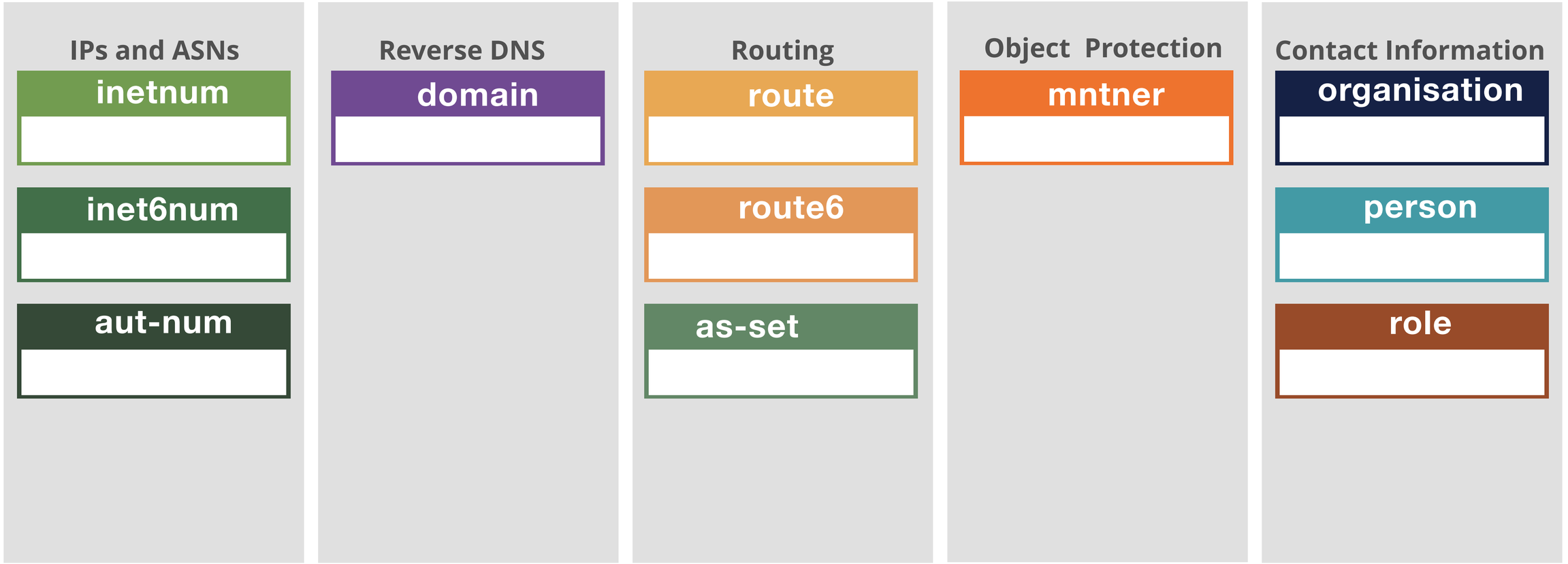
1 min.

Take the poll!

What size assignment would you give to a **home user**?

1 min.

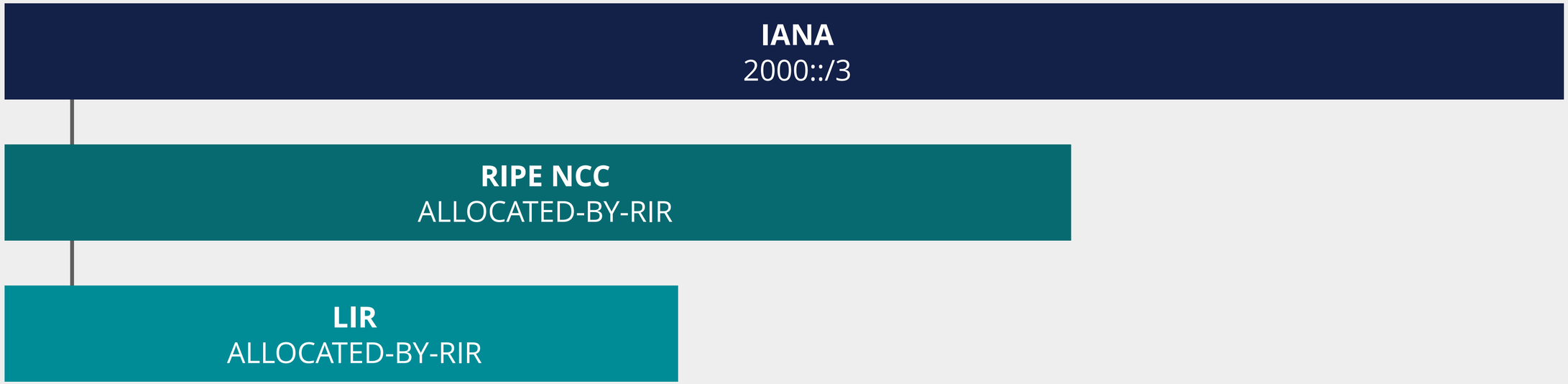
RIPE Database Objects



Comparison IPv4 and IPv6 status

IPv4		IPv6
ALLOCATED PA	Allocation	**ALLOCATED-BY-RIR**
ASSIGNED PA	Assignment	**ASSIGNED**
AGGREGATED-BY-LIR	Group of Assignments	**AGGREGATED-BY-LIR**
SUB-ALLOCATED PA	Sub-Allocation	**ALLOCATED-BY-LIR**
ASSIGNED PI	PI Assignment	**ASSIGNED PI**

ALLOCATED-BY-RIR



- Used by RIPE NCC to register allocations
- Minimum size is /32
- LIR is the “mnt-by:” of their own allocation

ALLOCATED-BY-RIR - Example object

inet6num:	**2001:db8::/32**
netname:	NL-LAIKABV-20150531
country:	NL
org:	**ORG-LBV1-RIPE**
admin-c:	ADM321-RIPE
tech-c:	NOC123-RIPE
status:	**ALLOCATED-BY-RIR**
mnt-by:	RIPE-NCC-HM-MNT
mnt-by:	**DEFAULT-LIR-MNT**
mnt-lower:	BRIGHTLIFE-MNT
mnt-routes:	BRIGHTLIFE-MNT
created:	2015-05-31T08:23:35Z
last-modified:	2015-05-31T08:23:35Z
source:	RIPE

IPv6 prefix allocated to the LIR

Organisation object of the LIR

Represents an allocation

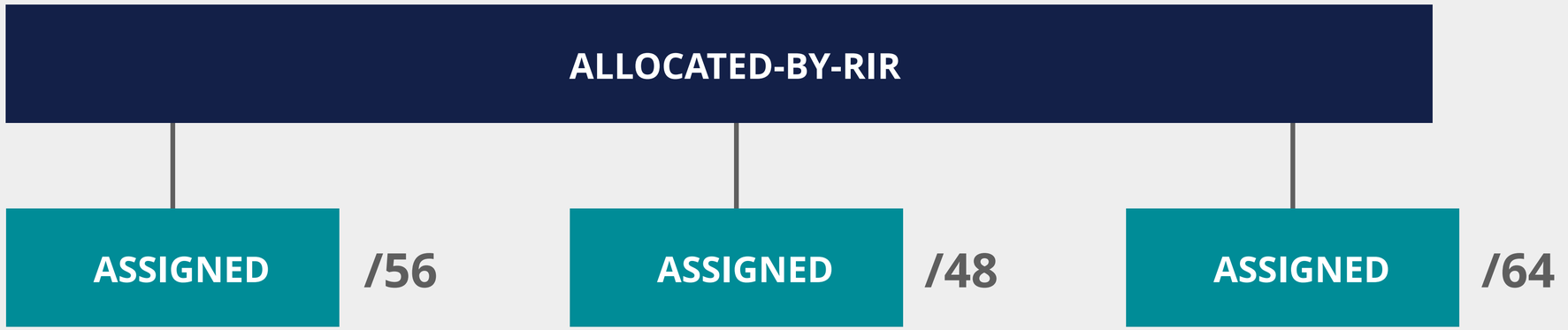
LIR partially maintains this object

Take the poll!

For whom would you register an **inet6num** with the status: **’ALLOCATED-BY-RIR’**?

1 min.

ASSIGNED



- Use ‘ASSIGNED’ for single assignments
- Minimum assignment size is a /64
- Document the justification for any assignment larger than /48

ASSIGNED - Example object

inet6num:	**2001:db8:1000::/48**
netname:	**LAIKA-NET**
country:	NL
admin-c:	ADM321-RIPE
tech-c:	NOC123-RIPE
status:	**ASSIGNED**
mnt-by:	BRIGHTLIFE-MNT
created:	2015-05-31T08:23:35Z
last-modified:	2015-05-31T08:23:35Z
source:	RIPE

IPv6 prefix assigned to network

Name of the network

Represents one assignment

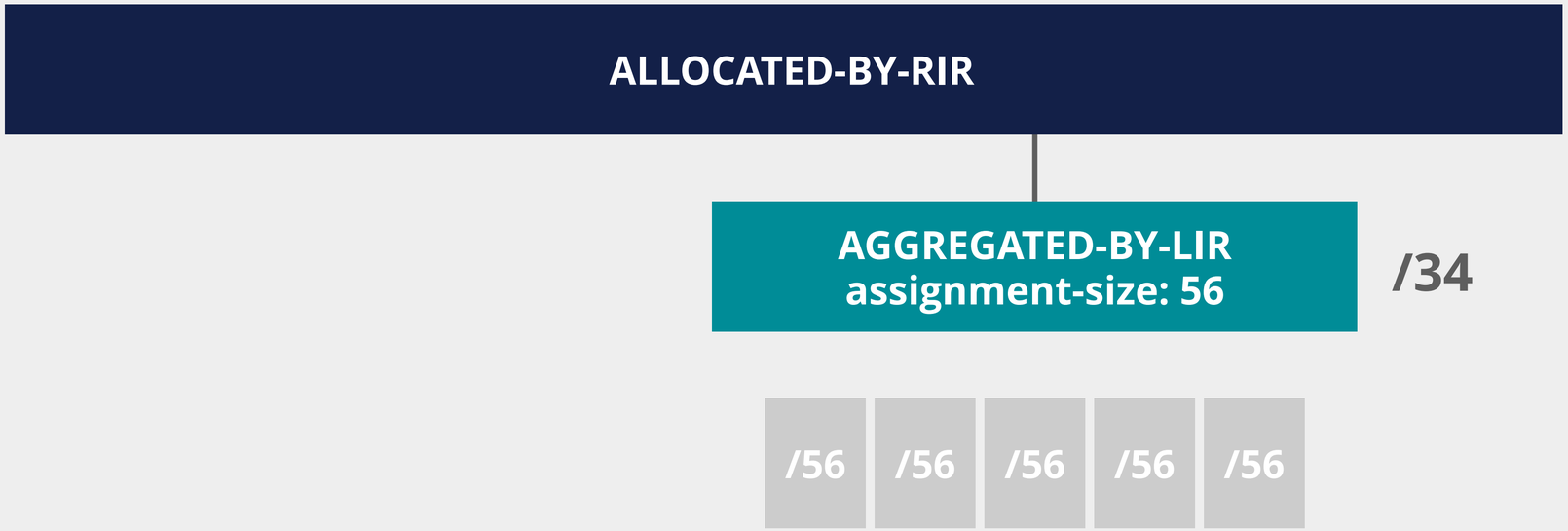
Take the poll!

You want to register one object with the status **‘ASSIGNED’** to represent ten different users.

Is this correct?

1 min.

AGGREGATED-BY-LIR



- Can be used to group customers
  - Broadband pool, for example
- “assignment-size:” = assignment size for every customer

AGGREGATED-BY-LIR - Example object

inet6num:	**2001:db8:1000::/36**
netname:	**Brightlife-Broadband-Pool**
country:	NL
admin-c:	ADM321-RIPE
tech-c:	NOC123-RIPE
status:	**AGGREGATED-BY-LIR**
assignment-size:	**48**
mnt-by:	BRIGHTLIFE-MNT
notify:	noc@example.net
created:	2015-05-31T08:23:35Z
last-modified:	2015-05-31T08:23:35Z
source:	RIPE

Block of IPv6 address space

Name for the block

Represents a group of assignments

Size of each assignment in block

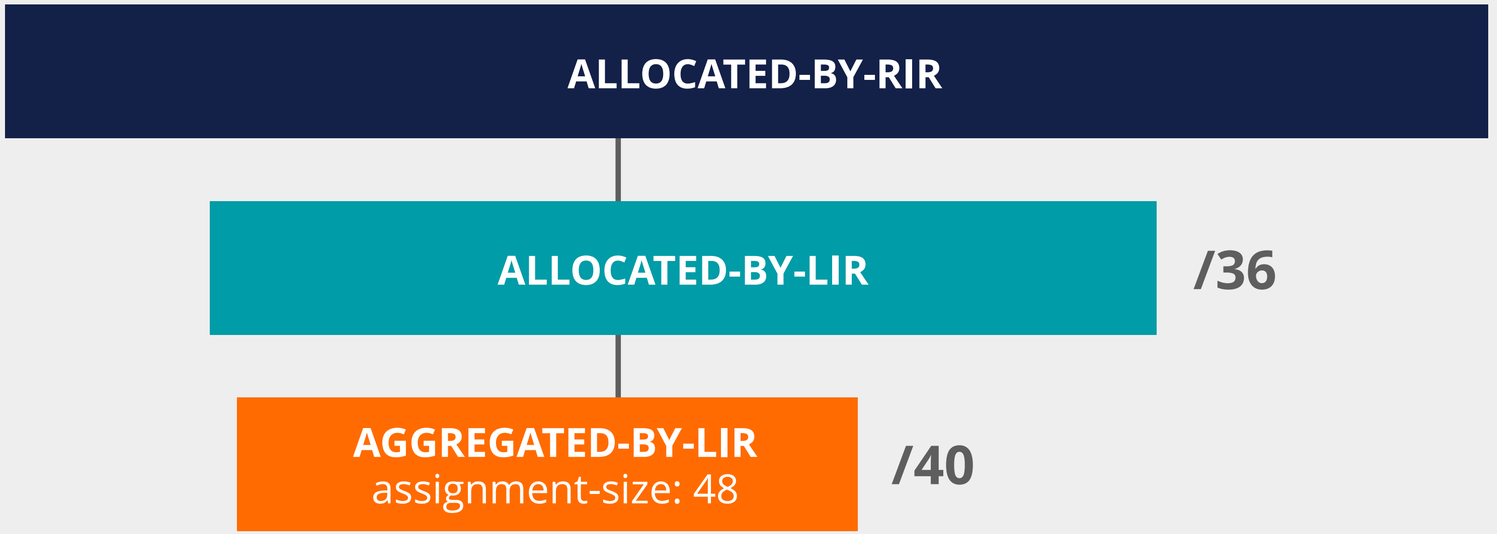
Take the poll!

You want to register an **inet6num** object for a large customer that is an ISP. They will register assignments to their customers.
You want to use **‘AGGREGATED-BY-LIR’**.

Is this correct?

1 min.

ALLOCATED-BY-LIR



- Partition of a larger address block
- Can be used for the LIR infrastructure
  - i.e., branch offices or departments
- Reserve a block for a large customer

ALLOCATED-BY-LIR - Example object

inet6num:	**2001:db8:50::/44**
netname:	**Big-Customer-Network**
country:	NL
admin-c:	ADM321-RIPE
tech-c:	NOC123-RIPE
status:	**ALLOCATED-BY-LIR**
mnt-by:	BRIGHTLIFE-MNT
mnt-lower:	**BIG-CUSTOMER-MNT**
notify:	noc@example.net
created:	2015-05-31T08:23:35Z
last-modified:	2015-05-31T08:23:35Z
source:	RIPE

Block of IPv6 address space

Name for the block

Represents a sub-allocation/partition

Can be delegated to someone else

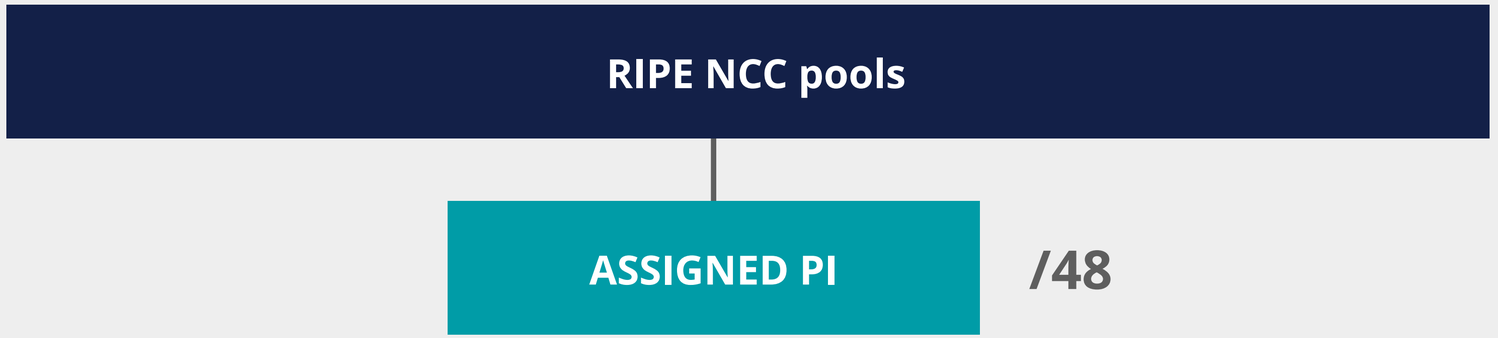
Take the poll!

You want to register an **inet6num** object with the status **‘ALLOCATED-BY-LIR’.**

Do you need to request an approval from the RIPE NCC?

1 min.

ASSIGNED PI



- Represents a PI assignment
- Only used by the RIPE NCC
- Minimum assignment size is a /48
- Address space comes directly from RIPE NCC pools

ASSIGNED PI - Example object

inet6num:	**2001:67c:2e8::/48**
netname:	**RIPE-NCC-NET**
org:	ORG-RIEN1-RIPE
country:	NL
admin-c:	JDR-RIPE
tech-c:	OPS4-RIPE
status:	**ASSIGNED PI**
mnt-by:	RIPE-NCC-END-MNT
mnt-by:	**MNT-ENDUSER**
mnt-routes:	**MNT-ENDUSER**
mnt-domains:	**MNT-ENDUSER**
created:	2015-05-31T08:23:35Z
last-modified:	2015-05-31T08:23:35Z
source:	RIPE

IPv6 prefix assigned to network

Name of the network

Represents a PI assignment

End User maintains the object and can create route6 and domain objects

Take the poll!

Can you register an **inet6num** object with status **'ASSIGNED PI'**?

1 min.

IPv6 in the Routing Registry

Register a route

route6: 2001:db8::/32
origin: AS65550

Register your routing policies

aut-num: AS65550
mp-import: afi ipv6.unicast from AS64496 accept ANY
mp-export: afi ipv6.unicast to AS64496 announce AS65550

Requesting Reverse Delegation

1. 2001:db8:3e:ef11::c100:4d
2. 2001:0db8:003e:ef11:0000:0000:c100:004d
3. 2001:0db8:003e:ef11:0000:0000:c100:004d
4. 8.b.d.0.1.0.0.2.ip6.arpa

Domain object example

domain:	**8.b.d.0.1.0.0.2.ip6.arpa**
descr:	RIPE-NCC Infrastructure
admin-c:	GII-RIPE
tech-c:	GII-RIPE
zone-c:	**GII-RIPE**
mnt-by:	RIPE-GII-MNT
nserver:	**pri.authdns.ripe.net**
nserver:	**sns-pb.isc.org**
created:	2011-01-21T13:52:29Z
last-modified:	2014-11-12T12:30:22Z
source:	RIPE

Reverse DNS zone

Contact for the DNS zone

Minimum of two name servers

Reverse DNS in IPv6

1 2001:0db8:003e:ef11:0000:0000:c100:004d

2 d.4.0.0.0.0.1.c.0.0.0.0.0.0.0.0.1.1.f.e.e.3.0.0.8.b.d.0.1.0.0.2.ip6.arpa

3 d.4.0.0.0.0.1.c.0.0.0.0.0.0.0.0.1.1.f.e.e.3.0.0.8.b.d.0.1.0.0.2.ip6.arpa. PTR your.domain.tld.

Take the poll!

What is the **smallest block size** for which you can request reverse delegation in IPv6?

1 min.

Questions

We want your feedback!

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

https://www.ripe.net/feedback/v6-rdb

RIPE NCC
Academy

Learn something new today!

academy.ripe.net

RIPE NCC Certified Professionals

https://getcertified.ripe.net/

Have more questions? Ask us!

academy@ripe.net

Ënn

Vége

Son

Lõpp

Kraj

Fine

Fim

Соңы

Endir

დასასრული

Amaia

Sfârşit

Fin

Slut

An Críoch

Finvezh

הסוף

Loppu

النهاية

Einde

پایان

վերջ

Tmiem

Slutt

Конец

Fí

Край

Ende

Кінець

Liðugt

Konec

Beigas

Y Diwedd

Koniec

Finis

Kpaj

Fund

Τέλος

Pabaiga

What’s Next in Internet Registry

Webinars

Attend another webinar live wherever you are.

- LIRs and the Internet Ecosystem (2 hrs)
- LIRs: Managing IP Addresses and ASNs (2 hrs)
- Internet Governance (1 hr)
- Policy Development Process (1 hr)
- Webinar for New LIRs (1 hr)

For more info click the link below

learning.ripe.net

Face-to-face

Meet us at a location near you for a training session delivered in person.

- LIR (8.5 hrs)
- RIPE Database (8.5 hrs)

E-learning

Learn at your own pace at our online Academy.

- Internet Governance (3 hrs)
- RIPE Database (16 hrs)

For more info click the link below

academy.ripe.net

Examinations

Learnt everything you needed? Get certified!

- RIPE Database Associate

For more info click the link below

getcertified.ripe.net

Copyright Statement

[...]

The RIPE NCC Materials may be used for **private purposes, for public non-commercial purpose, for research, for educational or demonstration purposes**, or if the materials in question specifically state that use of the material is permissible, and provided the RIPE NCC Materials are not modified and are properly identified as RIPE NCC documents. Unless authorised by the RIPE NCC in writing, any use of the RIPE NCC Materials for advertising or marketing purposes is strictly forbidden and may be prosecuted. The RIPE NCC should be notified of any such activities or suspicions thereof.

[...]

Find the full copyright statement here:
https://www.ripe.net/about-us/legal/copyright-statement