



RIPE NCC

RIPE NETWORK COORDINATION CENTRE

IPv6 in the RIPE Database

1-Hour Webinar

RIPE NCC Learning & Development



**This session is
being recorded**

Overview



**IPv6 Address
Distribution**

IPv6 Objects

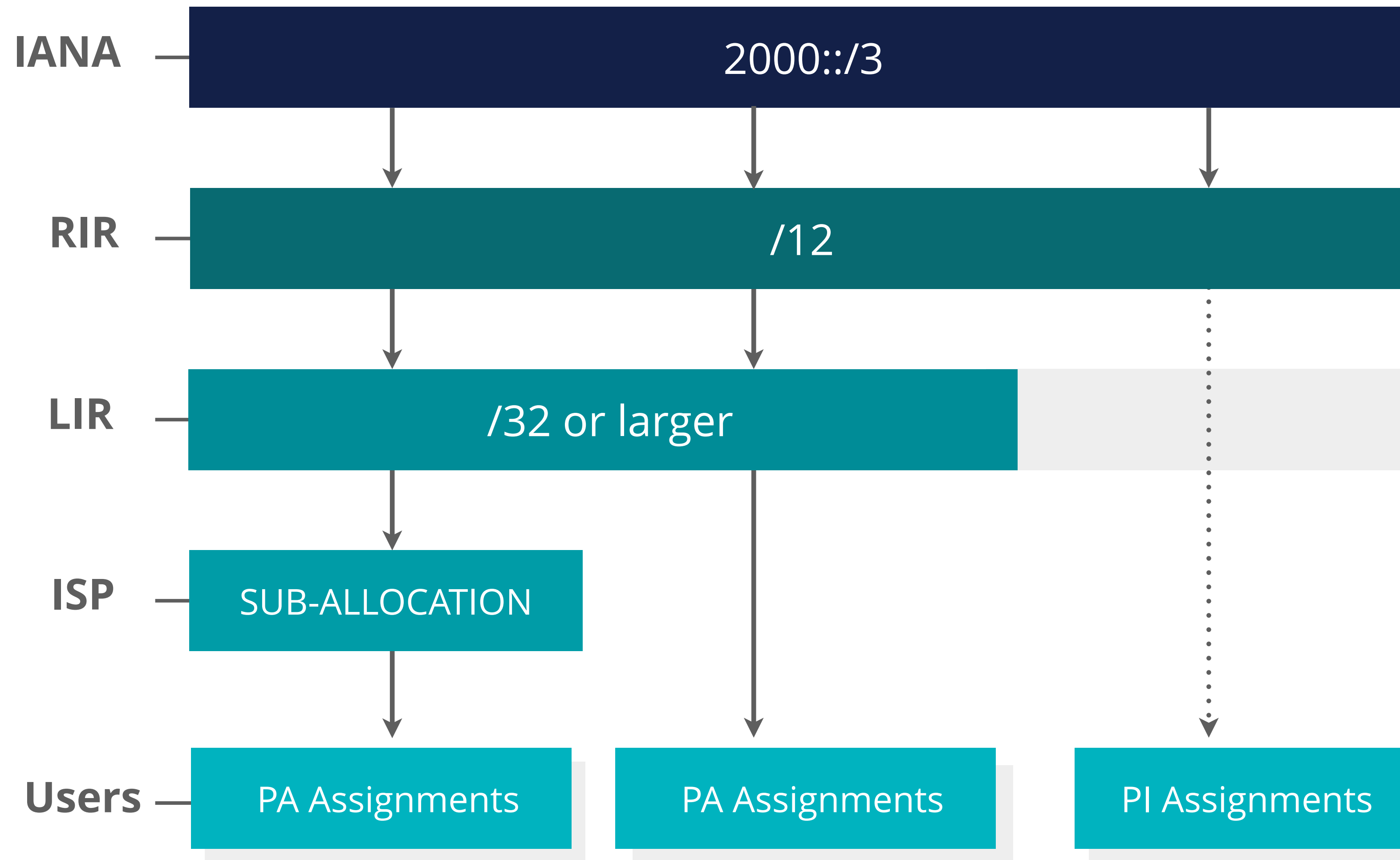
**route6 and
domain Objects**



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?



Take the poll!

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

 1 min.



RIPE Database Objects



IPs and ASNs

inetnum

inet6num

aut-num

Reverse DNS

domain

Routing

route

route6

as-set

Object Protection

mntner

Contact Information

organisation

person

role

Comparison IPv4 and IPv6 status



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

ALLOCATED-BY-RIR



IANA
2000::/3

RIPE NCC
ALLOCATED-BY-RIR

LIR
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

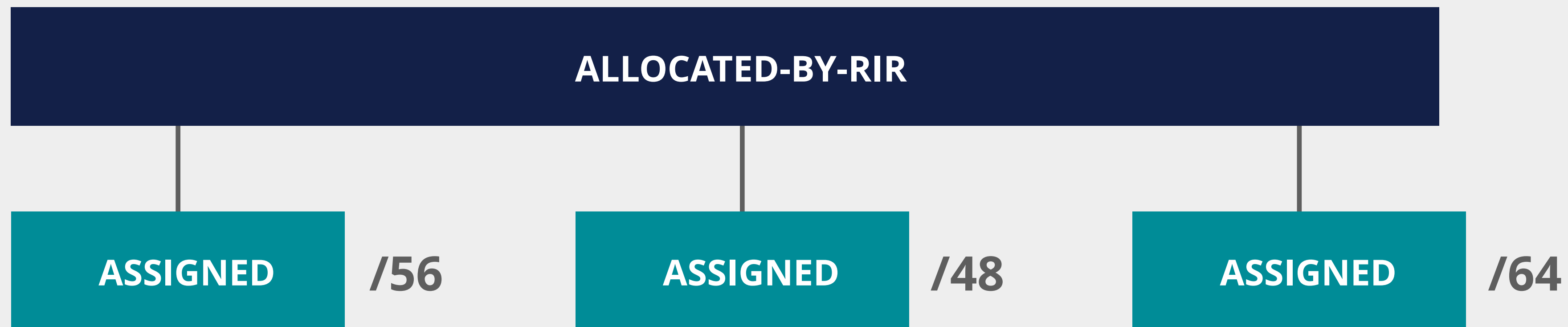
inet6num:	2001:db8::/32	IPv6 prefix allocated to the LIR
netname:	NL-LAIKABV-20150531	
country:	NL	
org:	ORG-LBV1-RIPE	Organisation object of the LIR
admin-c:	ADM321-RIPE	
tech-c:	NOC123-RIPE	
status:	ALLOCATED-BY-RIR	Represents an allocation
mnt-by:	RIPE-NCC-HM-MNT	
mnt-by:	DEFAULT-LIR-MNT	LIR partially maintains this object
mnt-lower:	BRIGHTLIFE-MNT	
mnt-routes:	BRIGHTLIFE-MNT	
created:	2015-05-31T08:23:35Z	
last-modified:	2015-05-31T08:23:35Z	
source:	RIPE	

Take the poll!

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



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

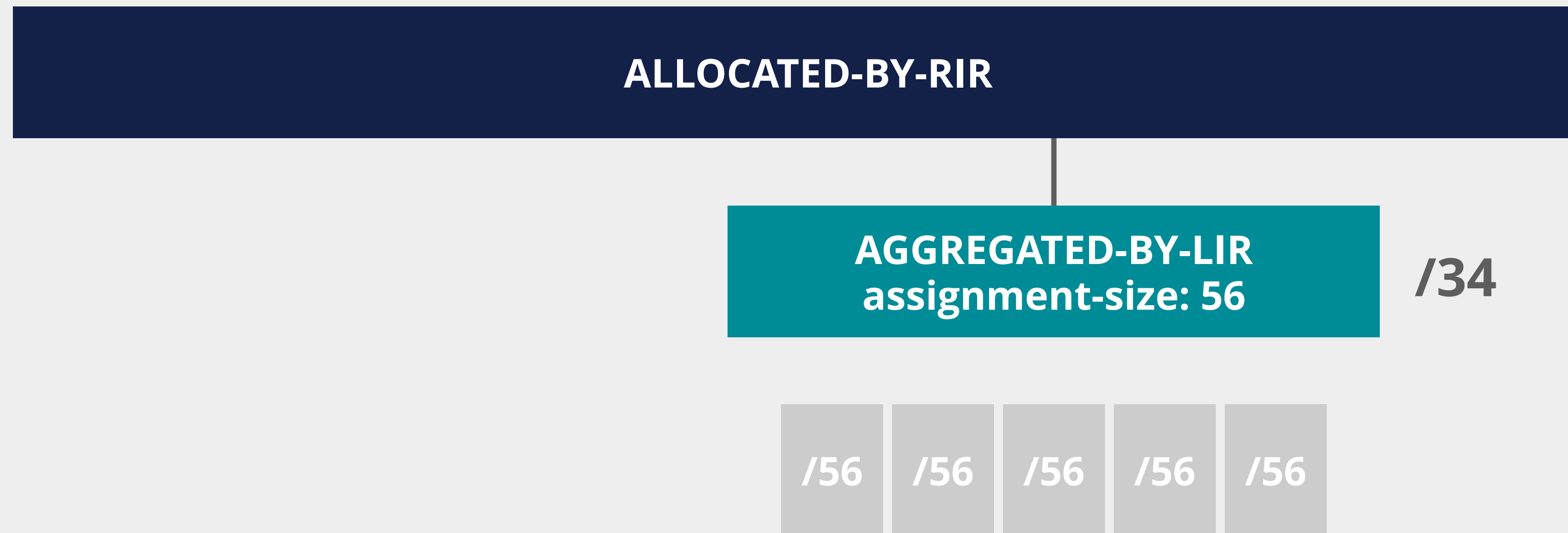
Take the poll!

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

Is this correct?



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!

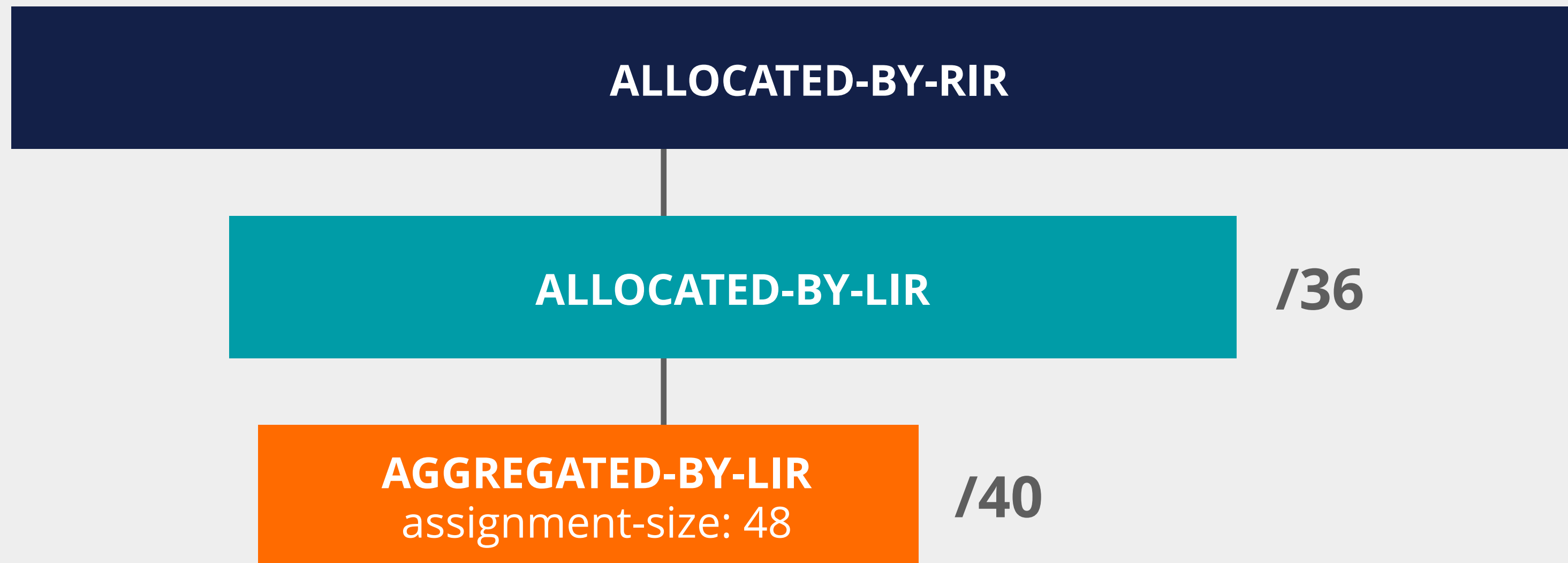
You want to register an **inet6num** object for a large customer that is an ISP. They will register assignments to their customers.

You want to use **'AGGREGATED-BY-LIR'**.

Is this correct?



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

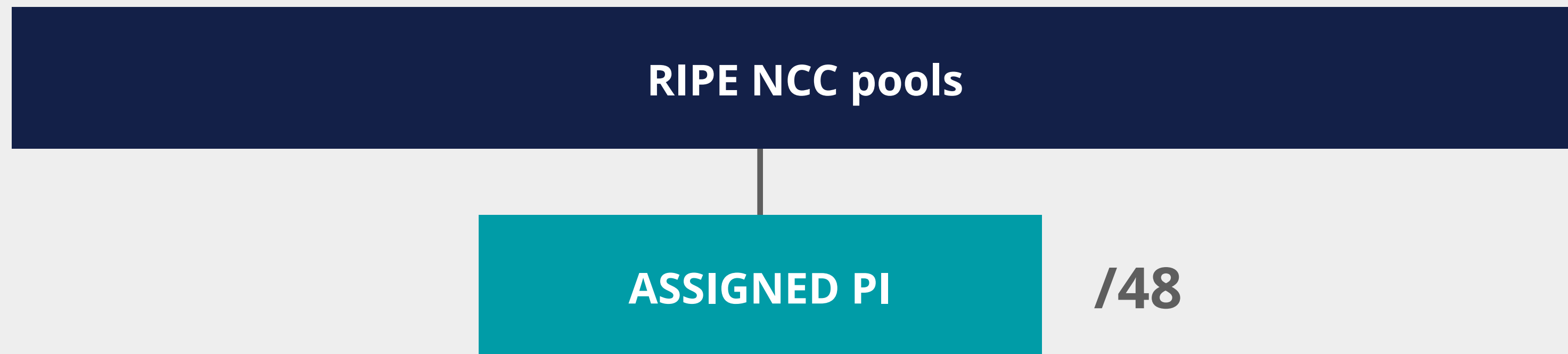
Take the poll!

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

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



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'**?



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

Requesting Reverse Delegation



- 1 2001:db8:3e:ef11::c100:4d
- 2 2001:0db8:003e:ef11:0000:0000:c100:004d

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

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

Reverse DNS in IPv6



1

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

2

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

Reverse DNS in IPv6



1

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

2

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

3

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. PTR your.domain.tld.

Take the poll!

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





Questions



We want your feedback!

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

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





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