



RIPE NCC
RIPE NETWORK COORDINATION CENTRE

LIRs: Managing IP Addresses and AS Numbers

Webinar (2 hours)

RIPE NCC Learning & Development

A close-up photograph of a professional condenser microphone mounted on a boom arm. The microphone has a silver mesh grille and a black body. The boom arm is black and extends from the left side of the frame. The background is blurred, showing a computer monitor and other studio equipment. A white banner with orange text is overlaid at the bottom of the image.

This session is being recorded

Agenda



LIRs and the Internet Ecosystem

1. The Internet Registry System
2. RIPE & RIPE NCC
3. How to improve the Internet
4. LIR Portal
5. The RIPE Database

LIRs: Manage your IP Addresses and AS Numbers

1. Which Internet number resources does the RIPE NCC distribute?
2. How to get Internet numbers resources from the RIPE NCC
3. How to transfer them to/from another LIR
4. Using the Internet number resources
5. Tips and tricks

Take the poll!

Which Internet number resources has your LIR already received from the RIPE NCC?

Please choose all correct answers.

 2 min.

B1





**Which Internet number
resources does the RIPE NCC
distribute?**

Section 1 of 5

There is a Distribution Hierarchy:



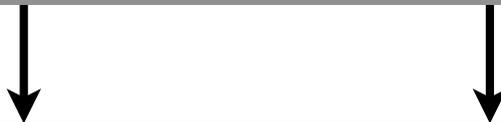
IANA:

The Internet Assigned Numbers Authority



RIR:

Regional Internet Registry (RIR): the RIPE NCC



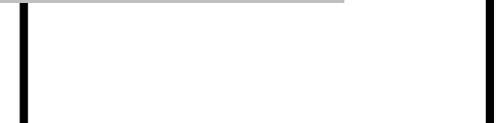
LIR:

Local Internet Registries



ISP:

Internet Service Providers



Users:





Behind the scenes:

IANA:

Global Internet Numbers Pools



RIR:

Reserved for future use: **Allocations**



LIR:

Reserved for future use: **Allocations**



Behind the scenes:

IANA:

Global Internet Numbers Pools



RIR:

Reserved for future use: **Allocations**



LIR:

Reserved for future use: **Allocations**



Users:

Assignments



Behind the scenes:

IANA:



RIR:



LIR:



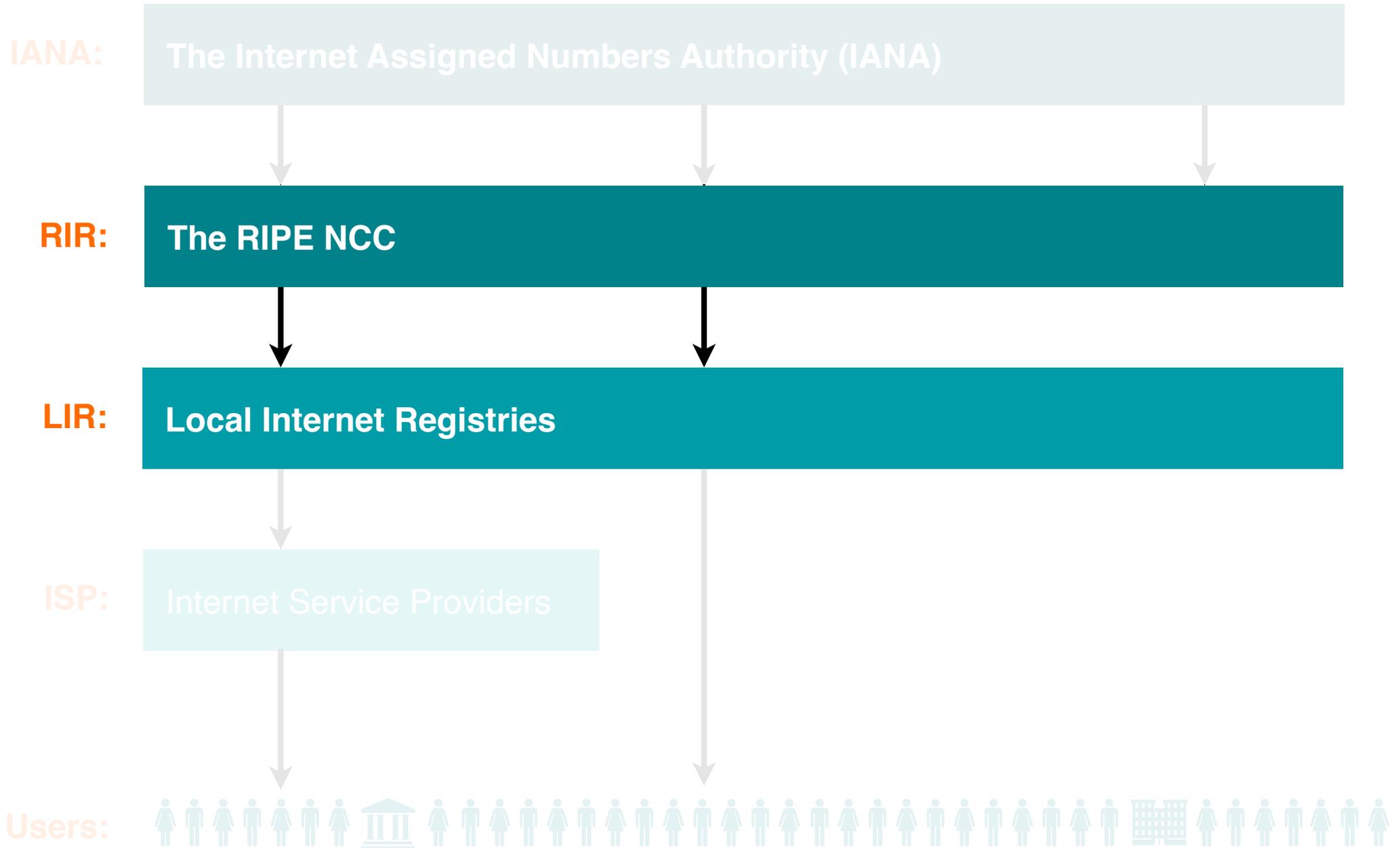
ISP:



Users:



Who gets IP address **allocations**?





.... Assignments?

IANA:

The Internet Assigned Numbers Authority (IANA)



RIR:

The RIPE NCC



LIR:

Local Internet Registries



ISP:

Internet Service Providers



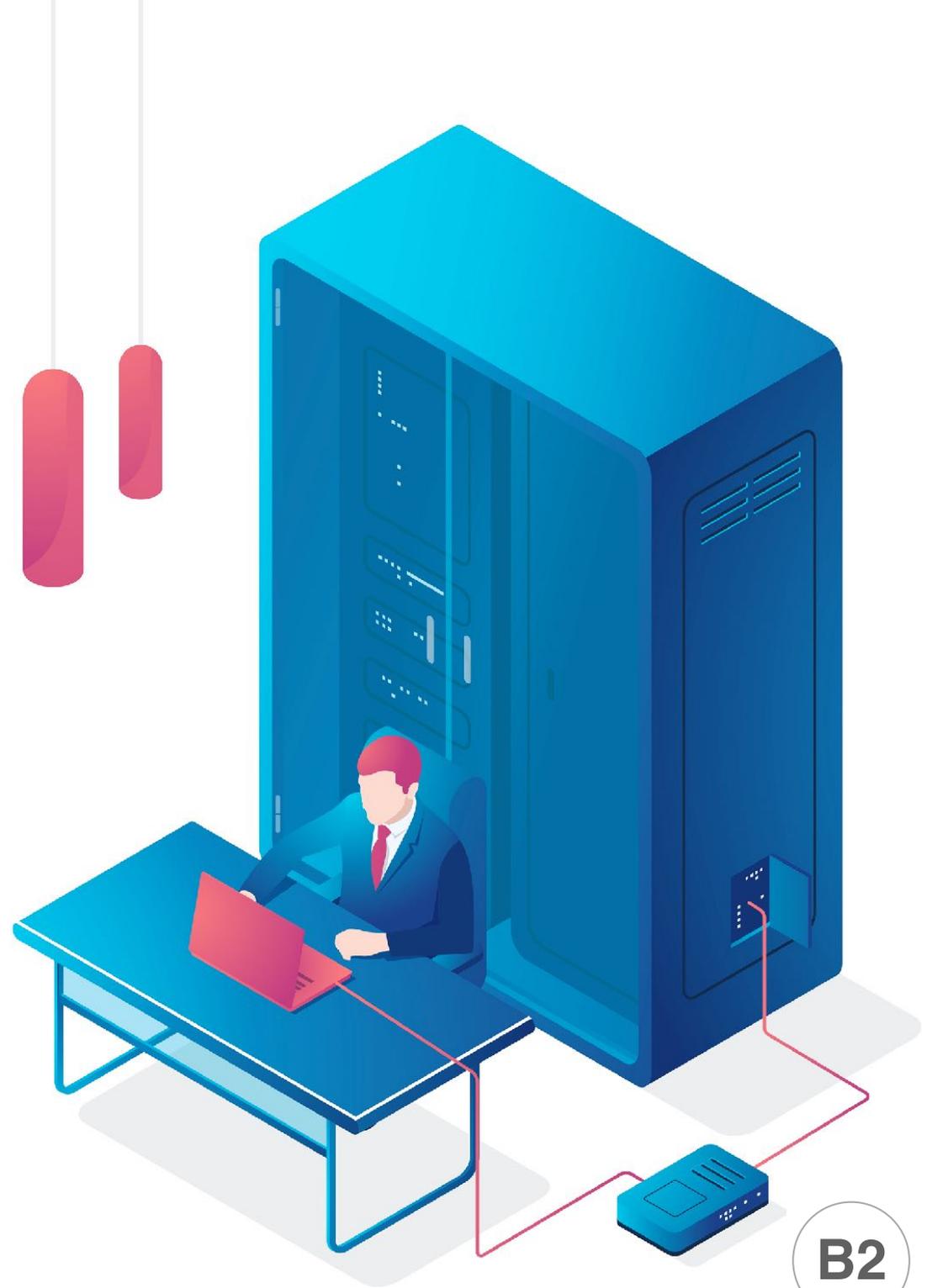
Users:



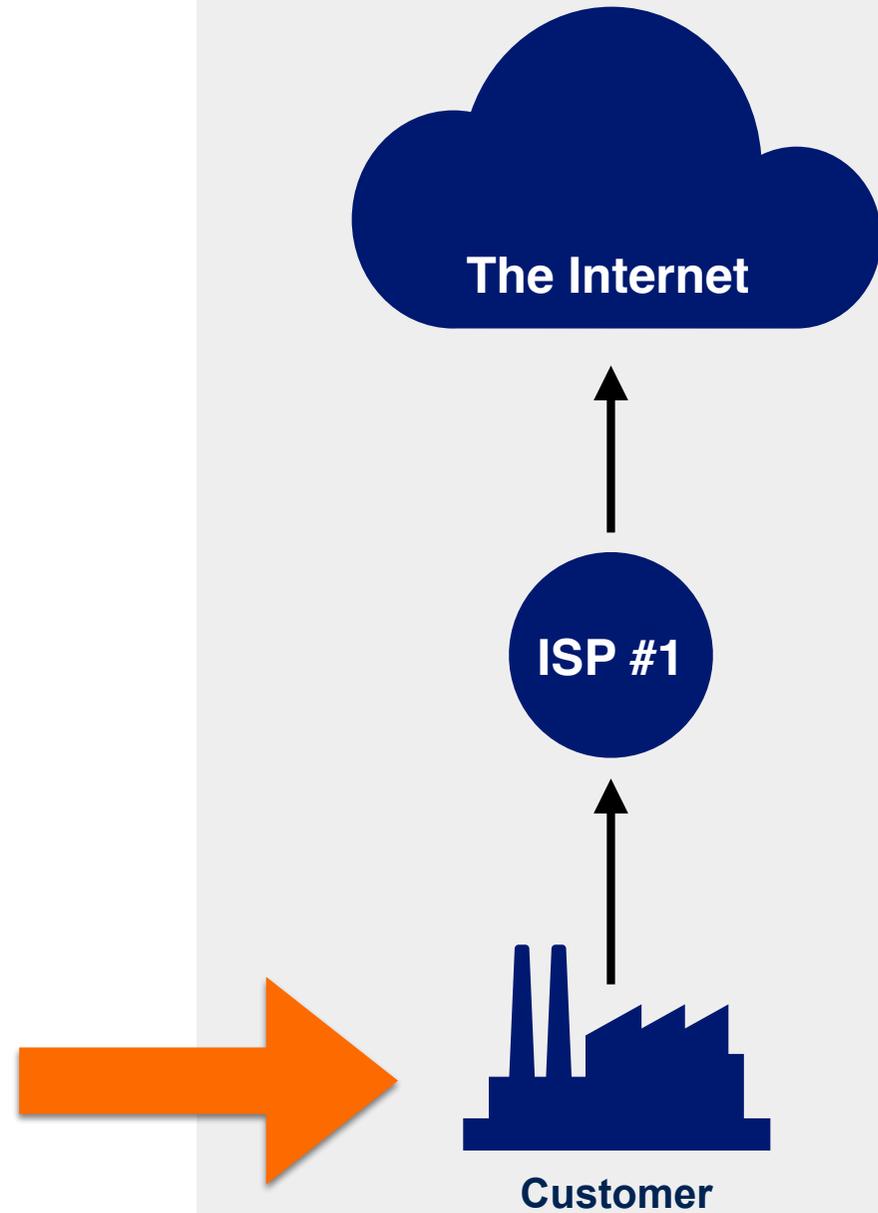
Take the poll!

What should an LIR use for their own infrastructure?

Please select the correct answer.

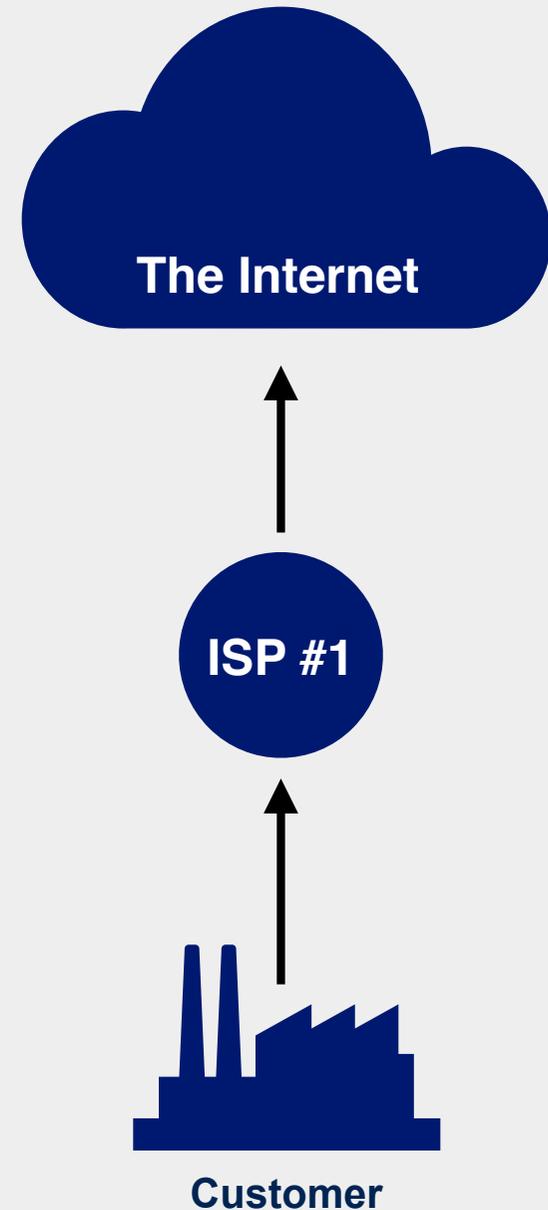


**What does
a customer get?**



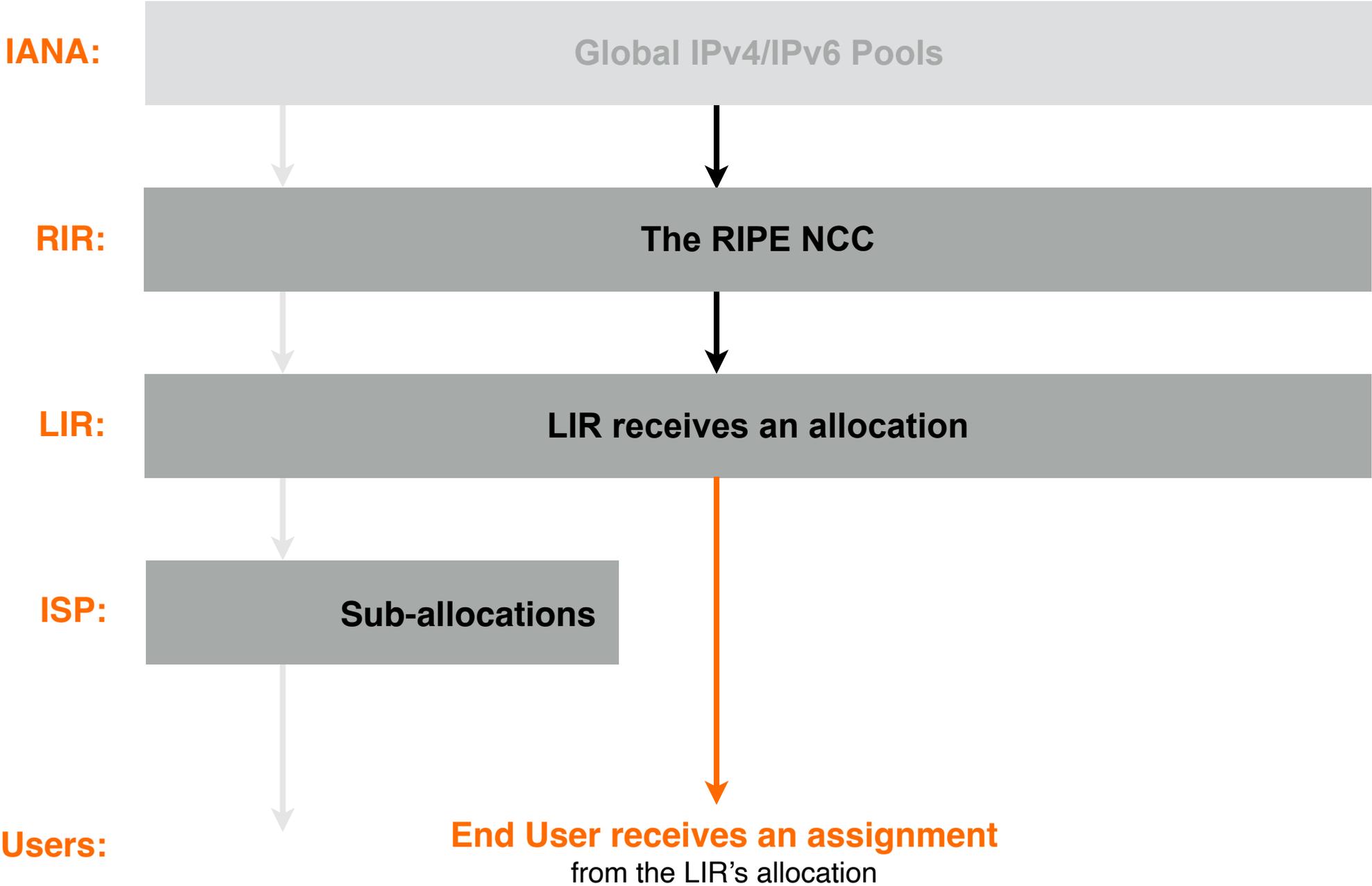
What should a customer do if they need a public IP?

1. Find an ISP which provides public IPs
2. Ask the ISP for a public IP
3. Use it 👍





Behind the scenes...

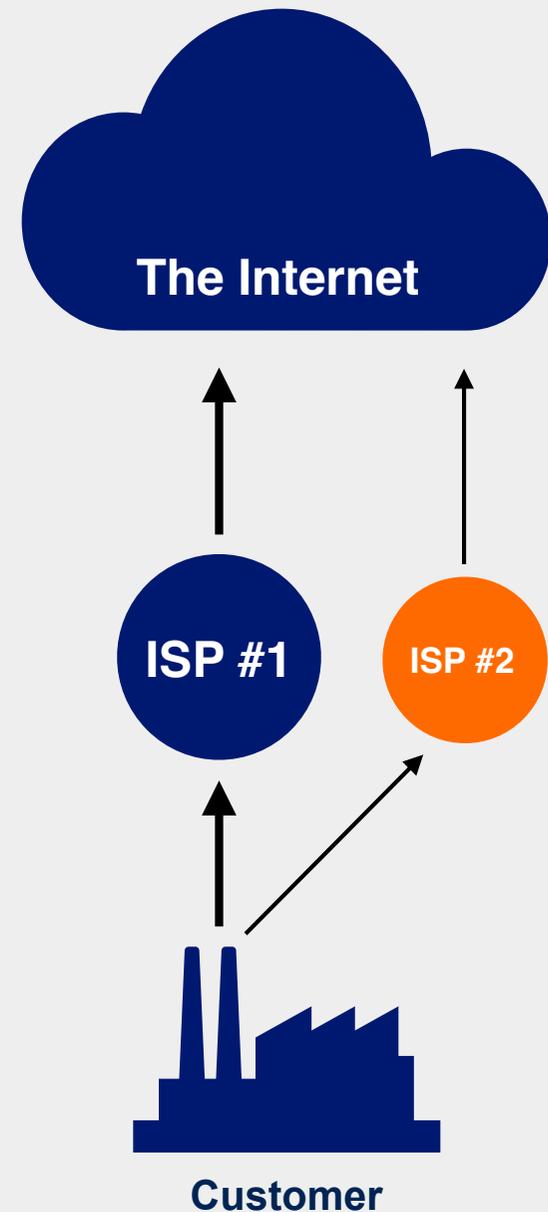


Take the poll!

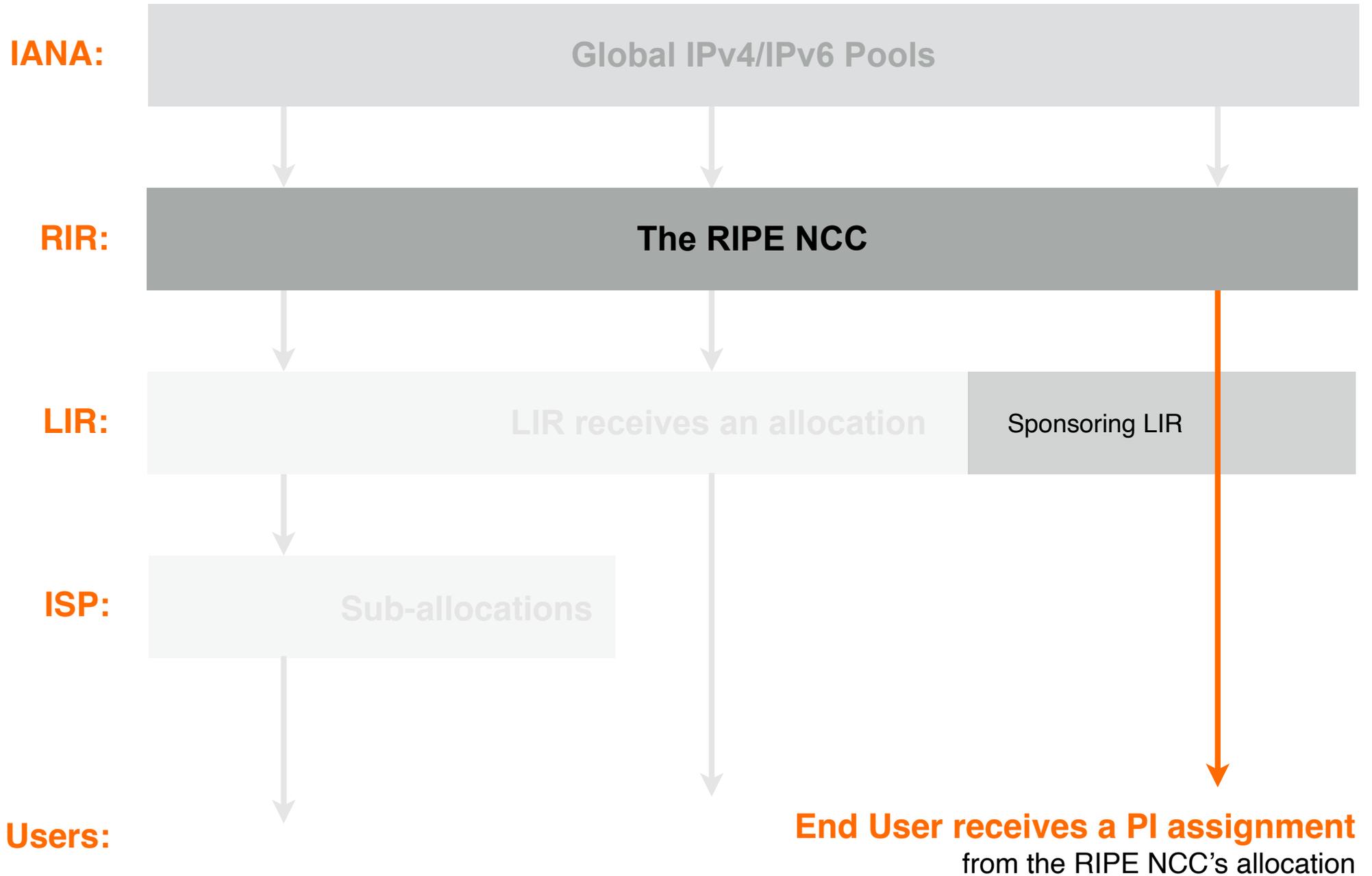
A company is connected to two ISPs for redundancy but requires to be highly available on **ONE** public IP address.

Which IP addresses should the company use?

Please choose all correct answers.



Where does PI space come from?





ASNs: 16-bit and 32-bit

IANA:

IANA holds the whole range → 0—65535 & 65536—4294967295

RIR:

The RIPE NCC receives subranges

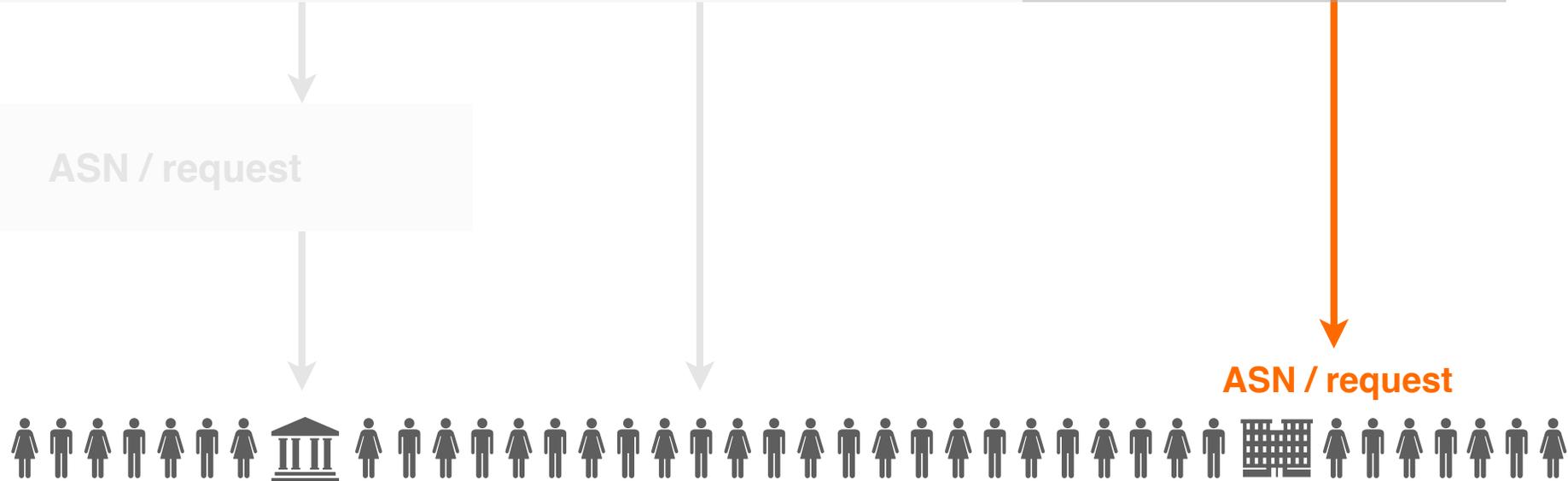
LIR:

LIRs receive an ASN / request Sponsoring LIR

ISP:

ASN / request

Users:





Questions

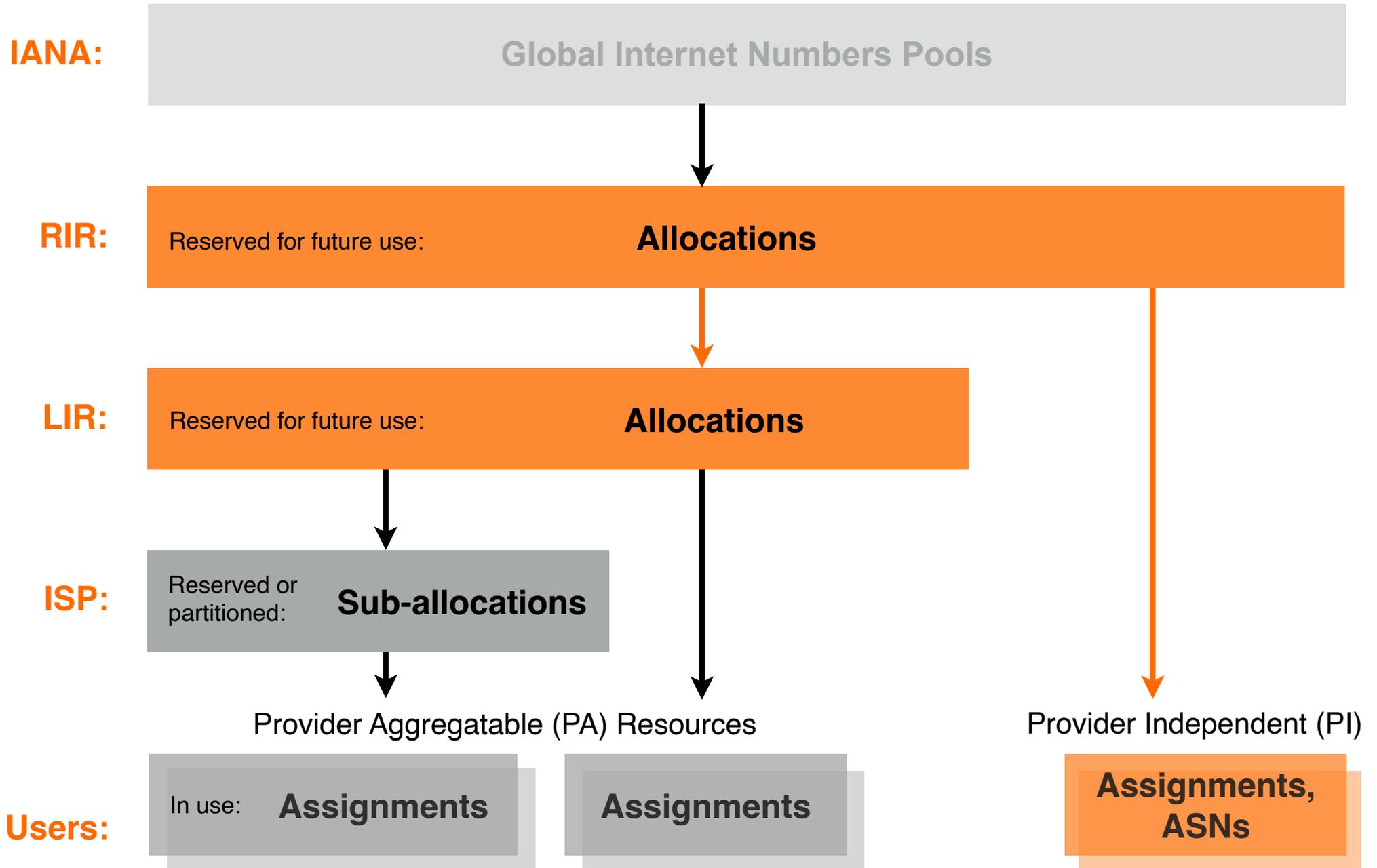




How to get Internet number resources from the RIPE NCC

Section 2 of 5

The RIPE NCC allocates / assigns:



The RIPE NCC allocates / assigns:



To LIR: **Provider Aggregatable (PA):**

1. IPv4 allocations
2. IPv6 allocations

To End Users: **Provider Independent (PI):**

4. IPv4 assignments
5. IPv6 assignments
6. ASNs

The RIPE NCC allocates / assigns:



To LIR: **Provider Aggregatable (PA):**

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4. IPv4 assignments
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Take the poll!

How many IPv4 addresses can an LIR receive today from the RIPE NCC?

Please select the correct answer.

 2 min.



B4



IPv4 Distribution Timeline

Original policy: **Everybody receives as many addresses as they can justify**



IPv4 Distribution Timeline

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2011: **IANA allocates the RIPE NCC the last block: 185/8**



IPv4 Distribution Timeline

Original policy: Everybody receives as many addresses as they can justify

2011: IANA allocates the RIPE NCC the last block: 185/8

2012: **LIRs start receiving allocations from the last new block: 185/8**

New policy: **No more than a single /22 for each new LIR**



IPv4 Distribution Timeline

Original policy: Everybody receives as many addresses as they can justify
2011: IANA allocates the RIPE NCC the last block: 185/8
2012: LIRs start receiving allocations from the last new block: 185/8
New policy: No more than a single /22 for each new LIR

2018: **LIRs start receiving /22 allocations from the recycled space**

Soon continuous /22 are gone; LIRs start receiving /22 allocation equivalents in multiple smaller prefixes (/23—/24)



IPv4 Distribution Timeline

- Original policy: Everybody receives as many addresses as they can justify
- 2011: IANA allocates the RIPE NCC the last block: 185/8
- 2012: LIRs start receiving allocations from the last new block: 185/8
New policy: No more than a single /22 for each new LIR
- 2018: LIRs start receiving /22 allocations from the recycled space

- November 2019: An equivalent of /22 can no longer be allocated
New policy: **No more than a single /24 for each new LIR.**
The waiting list is introduced

Our Reality: The Waiting List



1. Submit the IPv4 allocation request form at the LIR Portal
2. Wait

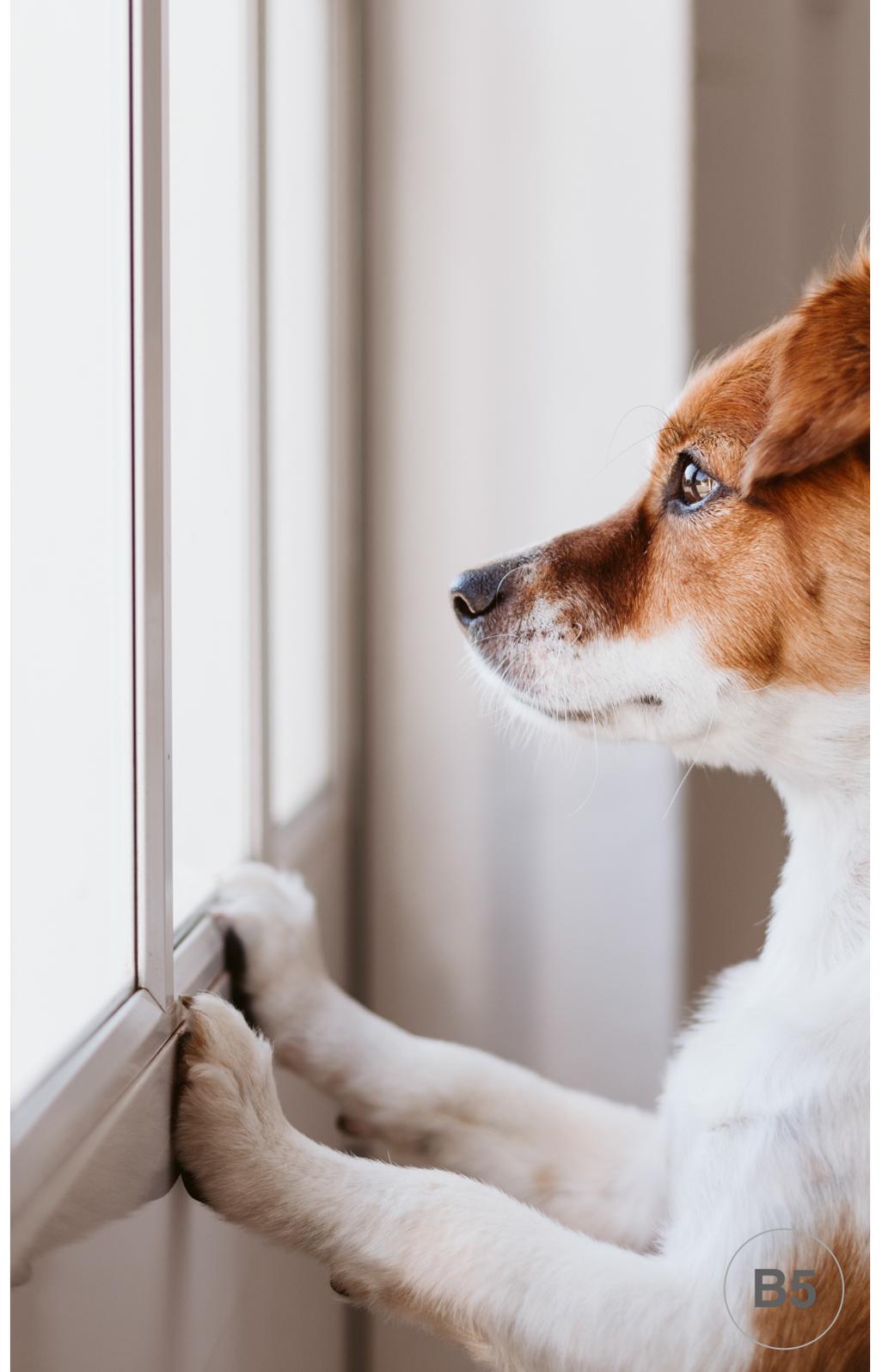


Take the poll!

How long do you have to wait
for your IPv4 allocation?

Please choose the closest estimate.

 2 min.



B5



Our Reality: Limitations

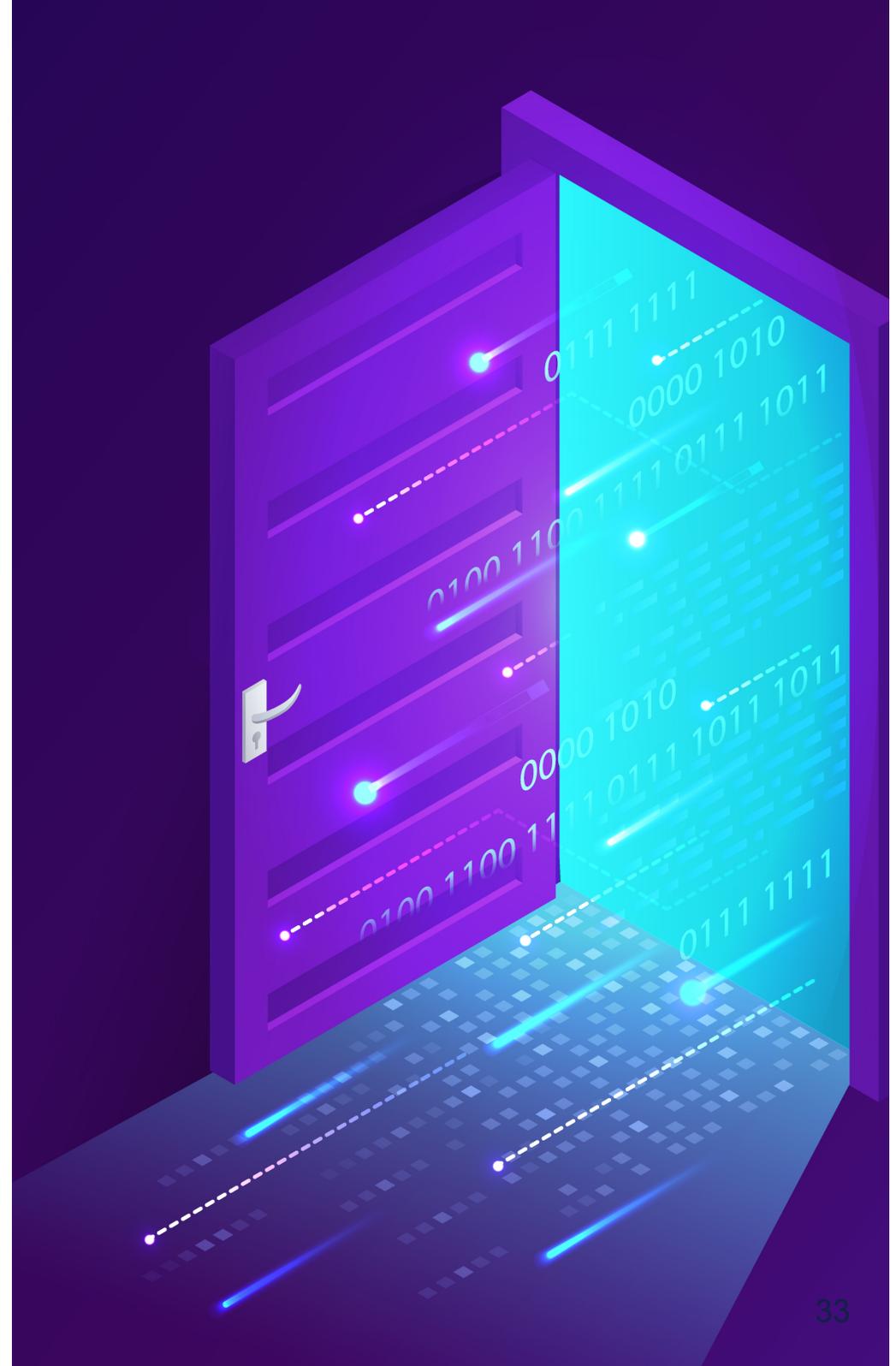
- The waiting list is first-come-first-served
- Each LIR receives only **one /24** block (256 IPv4 addresses)
- IPv4 allocation cannot be transferred for 24 months after receiving it

The IPv4 waiting list right now:

<https://www.ripe.net/manage-ips-and-asns/ipv4/ipv4-waiting-list>

Let's use IPv6!

- All LIRs can receive as many IPv6 addresses as they can justify
- There are no limitations on the transfer
- There is no waiting list!



The RIPE NCC allocates / assigns:



To LIR: **Provider Aggregatable (PA):**

1. IPv4 allocations
2. IPv6 allocations

To End Users: **Provider Independent (PI):**

4. IPv4 assignments
5. IPv6 assignments
6. ASNs

How to request IPv6 addresses..



1. Submit the **IPv6 allocation request form** in the LIR Portal:

- Have a plan for making assignments within two years
- Minimum block: /32 (16 millions /56 IPv6 subnets)
- Maximum block without justification: /29 (134 million /56 IPv6 subnets)
- But sky's the limit if the LIR can justify the business need!

2. Get it approved!



Behind the scenes:

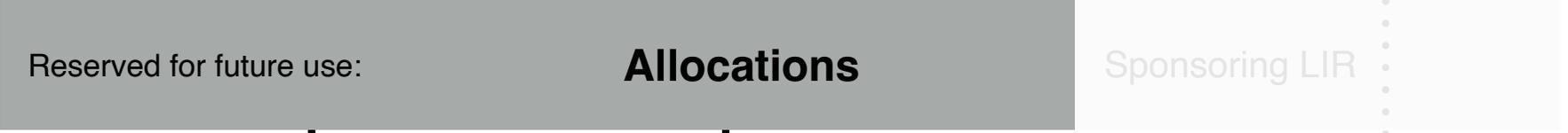
IANA:



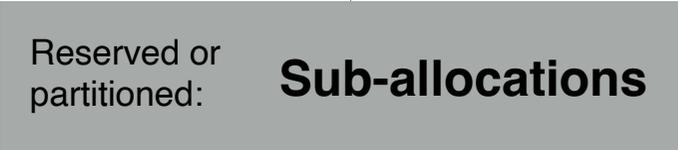
RIR:



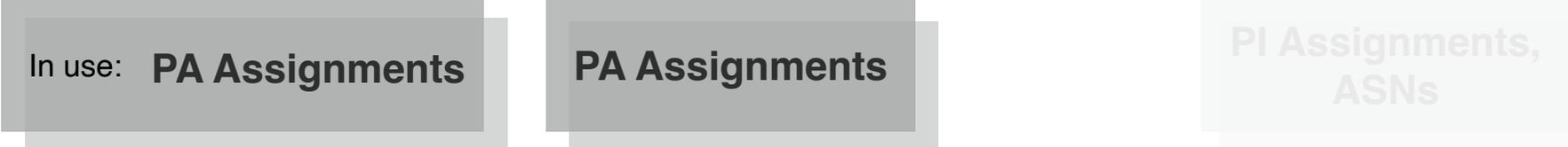
LIR:



ISP:



Users:



The RIPE NCC allocates / assigns:



To LIR: Provider Aggregatable (PA):

1. IPv4 allocations
2. IPv6 allocations

To End Users: Provider Independent (PI):

4. IPv4 assignments
5. IPv6 assignments
6. ASNs



PI is assigned per User / Network

IANA:



RIR:



LIR:



ISP:



Users:



4. IPv4 PI Assignments



Get it transferred from another resource holder.

5. IPv6 PI Assignments



**A sponsoring LIR requests it on behalf of
the End User**

(min. assignment size: /48)

How to request PI resources:

[https://www.ripe.net/manage-ips-and-asns/resource-management/
number-resources/independent-resources](https://www.ripe.net/manage-ips-and-asns/resource-management/number-resources/independent-resources)

6. ASNs



A sponsoring LIR requests it on behalf of the End User

(the Network must be multi-homed and have a
unique routing policy for each AS)

ASN Assignment Criteria:

<https://www.ripe.net/publications/docs/ripe-679#AssignmentCriteria>

How to request ASN:

<https://www.ripe.net/manage-ips-and-asns/as-numbers/request-an-as-number>

Get Started

1. How to request a resource from the RIPE NCC
2. Where to find the resources **already allocated** to the LIR
3. .. resources the LIR is **sponsoring**

Demo



Questions



Activity:

RIPE-745 defines the SSA.

<https://www.ripe.net/publications/docs/ripe-745>

Which article says when the RIPE NCC can close an LIR?

Please choose the correct answer.

 5 min.



PAGE NOT FOUND!

GO HOME

B6

**Let's take a
5 minute
break!**



WELCOME

WE ARE

OPEN

PLEASE COME IN





Questions



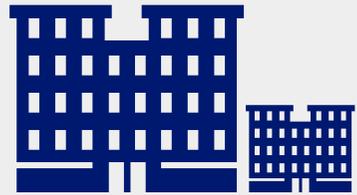


How to transfer Internet number resources to/from another LIR

Section 3 of 5



The General Procedure



The current
resource holder

1. Check if the transfer is possible
2. Sign the transfer agreement
3. The current resource holder starts the transfer



The receiving
party

Take the poll!

In the RIPE NCC region, there is a restriction prohibiting transfers within 24 months since the last transfer/allocation.

For which resources does this apply?

Please select all correct answers.

 2 min.



LOCKDOWN

B7

Let's practise



Demo

RIPE Resource Transfer Policies:

<https://www.ripe.net/publications/docs/ripe-682>

 5 min.

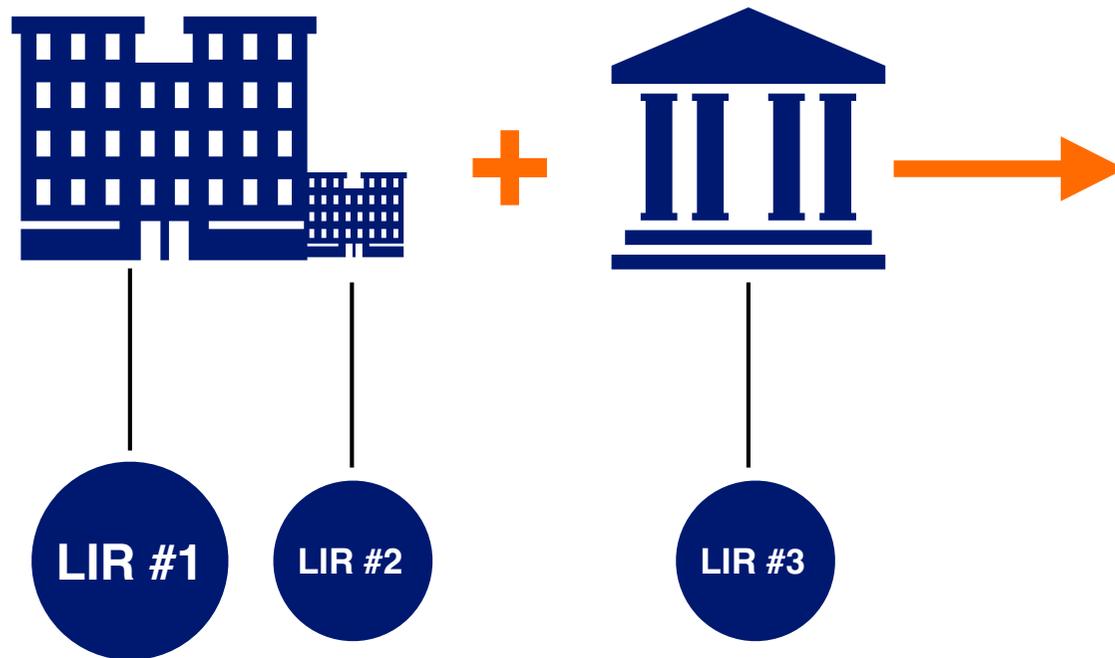
Activity & Poll

Demo

Transfers that happened in the past:

<https://www.ripe.net/manage-ips-and-asns/resource-transfers-and-mergers/transfer-statistics>

Company Mergers/Acquisitions



1. Check the policy if the transfer is possible
2. Transfer the resources to one of the LIRs
3. Close LIRs that you do not need anymore

How to start a merger/acquisition:

<https://www.ripe.net/manage-ips-and-asns/resource-transfers-and-mergers/mergers-and-acquisitions>

Transfers can be temporary!



- The resource holder can temporary transfer:
 - Allocations / sub-allocations
 - PI assignments & ASNs
- The temporary transfer must have an expiration date
- The restrictions for transfers do not apply upon return



Can **PI resources** be transferred?



- The End User name changes → notify the RIPE NCC
- The sponsoring LIR changes → notify the RIPE NCC
- The sponsoring LIR closes → within 20 working days find a new one
- Transfer PI resources to another company/person → submit the transfer request

The RIPE Policy to check:

<https://www.ripe.net/publications/docs/ripe-757>

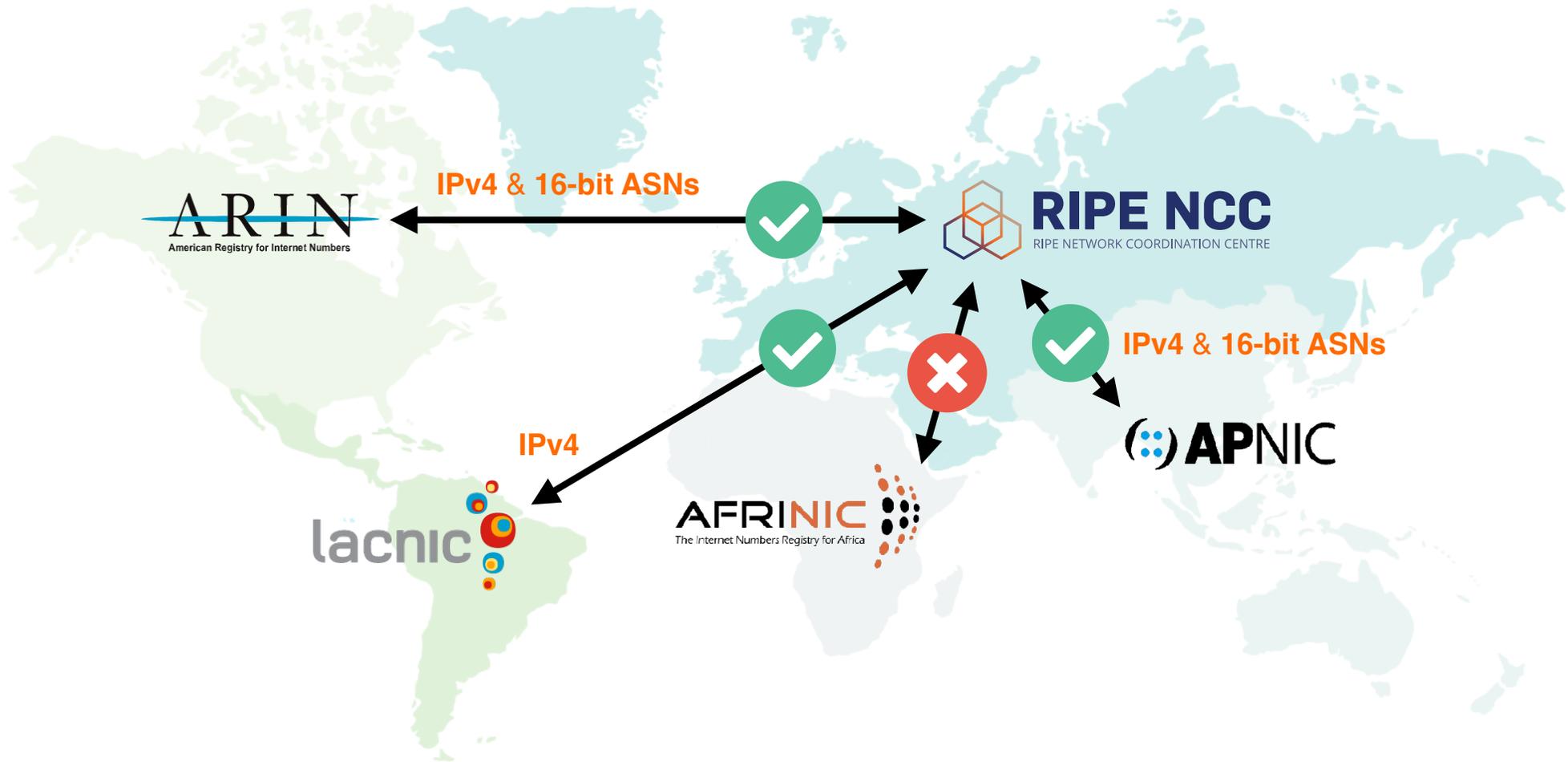


Transfers with other RIRs





Transfers with other RIRs



Inter-RIR transfers procedure:

<https://www.ripe.net/manage-ips-and-asns/resource-transfers-and-mergers/mergers-and-acquisitions>

To start inter-RIR transfer send request to: inter-rir@ripe.net



Questions





Using the Internet number resources

Section 4 of 5

Take the poll!

What can an LIR do with an IP allocation?

Please choose all correct answers.

 2 min.



B9



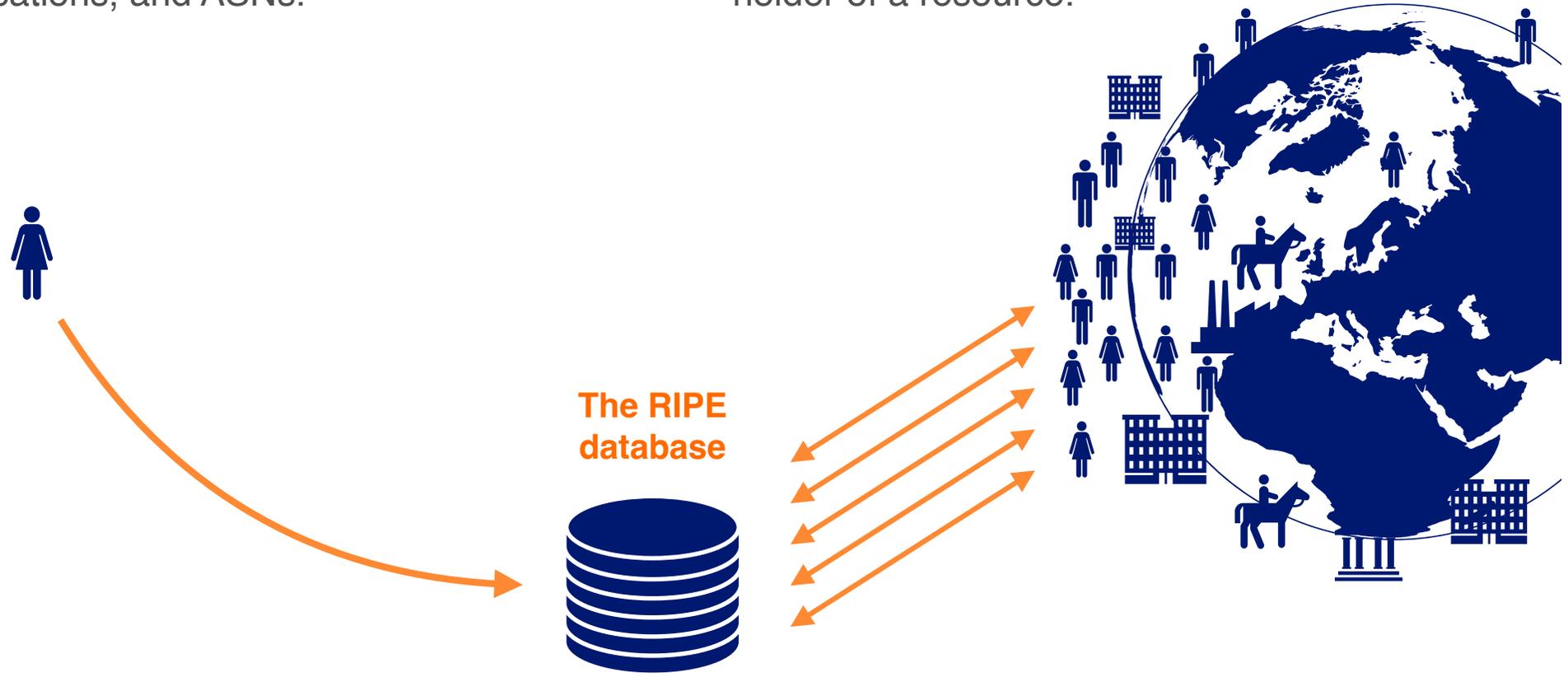
Must be registered in the RIPE Database!

Step 1

The legitimate holder registers all assignments, (sub)-allocations, and ASNs.

Step 2

Other Internet users or ISPs can query who is the legitimate holder of a resource.





Who registers what?

IANA:

Global Internet Numbers Pools

RIR:

The RIPE NCC's Allocations and Ranges

LIR:

LIR's Allocations // **by the RIPE NCC**

ISP:

Sub-allocations // **by LIR**

Users:

PA Assignments // **by LIR or ISP**

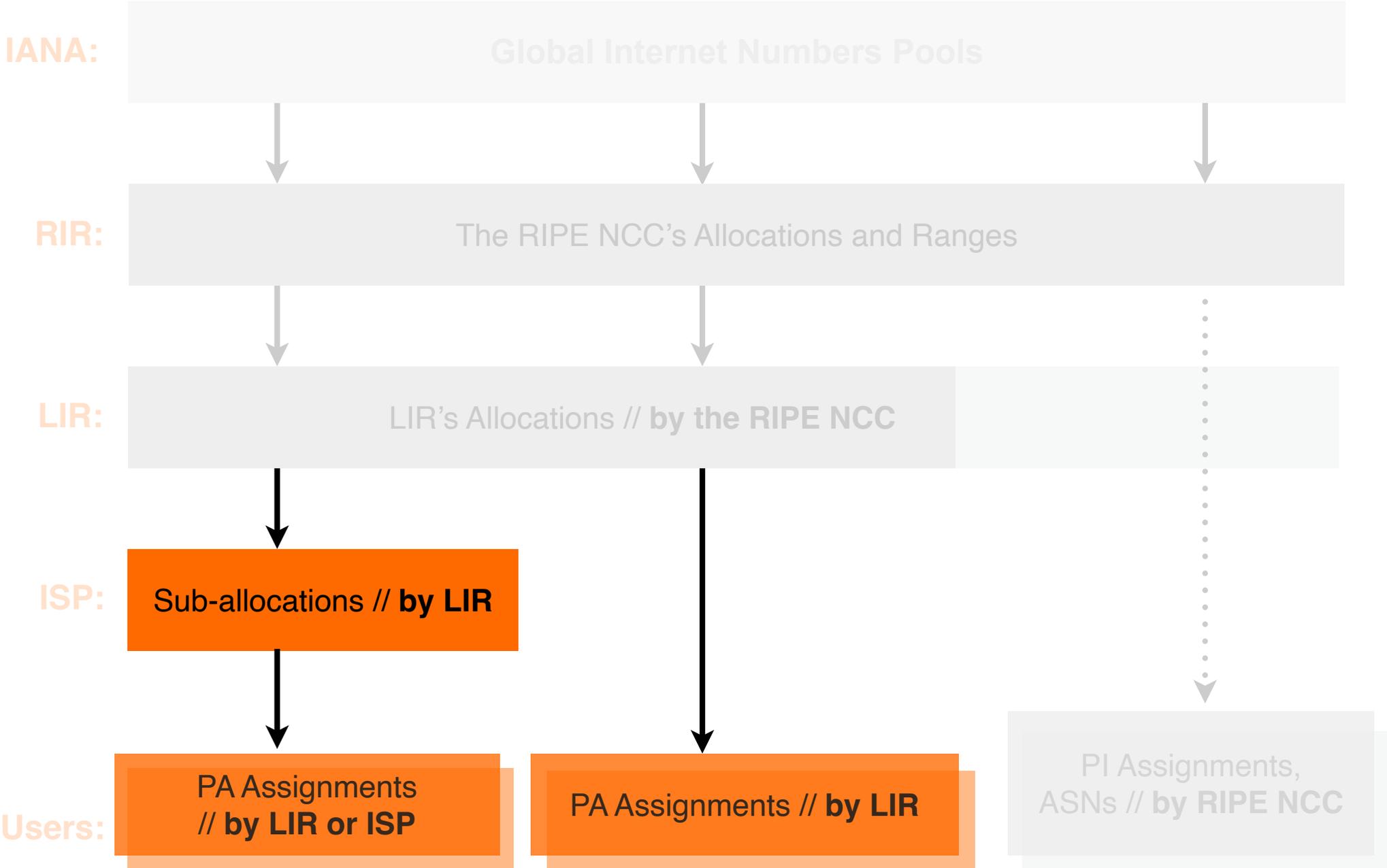
PA Assignments // **by LIR**

PI Assignments, ASNs // **by RIPE NCC**





An LIR registers:





Registering an assignment

The screenshot shows the RIPE NCC web interface. The browser address bar displays the URL: `apps.db.ripe.net/db-web-ui/myresources/overview?type=inet6num&sponsored=false&ipanalyserRedirect=false`. The user is logged in as Nathalie Jones. The main navigation menu includes: Manage IPs and ASNs, Analyse, Participate, Get Support, Publications, and About Us. The current page is 'My Resources' for 'Reseaux IP Europeens Network C...'. The 'IPv6' tab is selected, showing a resource '2001:67c:64::/48' with tags 'ASSIGNED PI', 'RIPE-MEETING-NFT', 'IRR', and 'RDNS'. A 'Create assignment' button is located next to the resource. The footer contains social media icons and links: Home, Sitemap, Contact Us, Service Announcements, Privacy Statement, Legal, Cookies, Copyright Statement, and Terms of Service. A 'Report a Bug' button is also present.

It's in the LIR portal!

Demo



Questions





Tips and Tricks

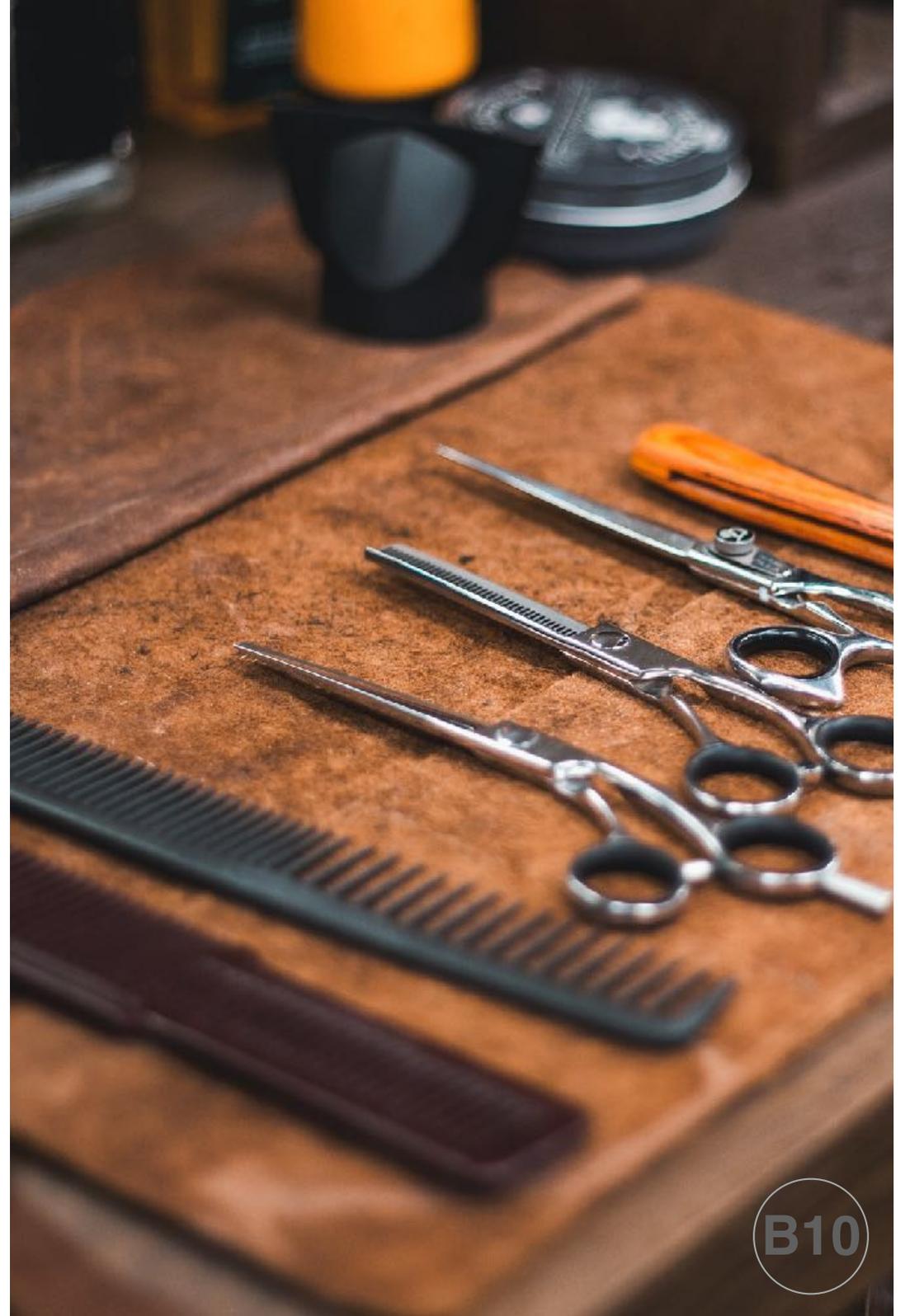
Section 5 of 5

Take the poll!

What is an ARC?

Please select the correct answer.

 2 min.

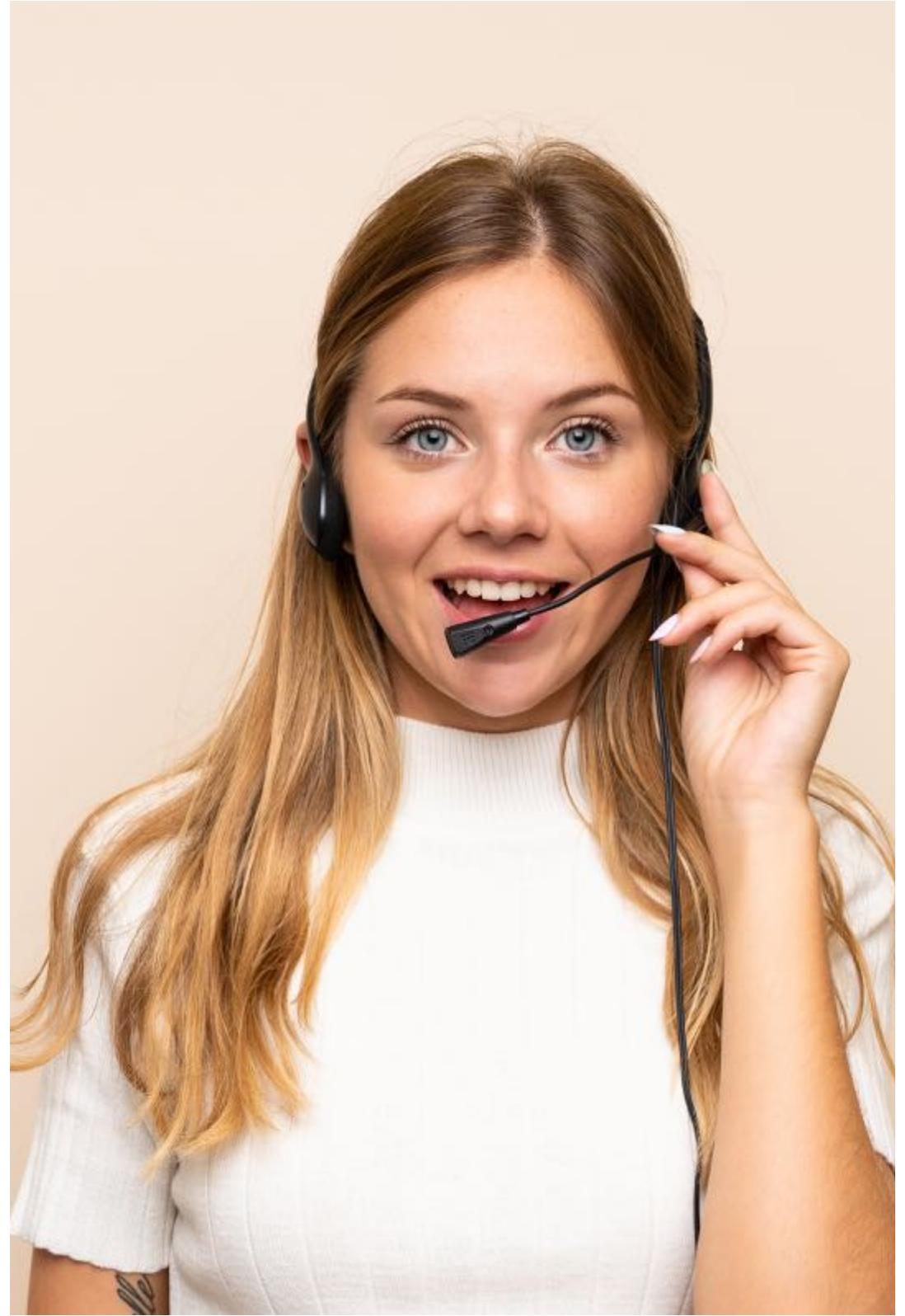


B10

It is an Assisted Registry Check!

Once in a while, we will reach you to ask how things are and:

1. Remind you that some important information in the LIR portal must be **up-to-date**: legal name, VAT, address, and phone number...
2. Check the allocated resource consistency.





Lost Maintainer Password

- **Automated recovery:** the link sent to “**upd-to:**” email address

The screenshot shows the RIPE NCC web interface. At the top, there is a navigation bar with links: Manage IPs and ASNs >, Analyse >, Participate >, Get Support >, Publications >, and About Us. Below the navigation bar, there is a breadcrumb trail: Home > ... > Webupdates. On the right side, it says 'You are editing' followed by a dropdown menu showing 'Reseaux IP Europeens Network C...'. On the left side, there is a sidebar with links: My Account >, Resources >, and RIPE Database >. The main content area is titled 'Forgot maintainer password'. Below the title, there is a form with the label 'Please enter your MNTNER name:'. The form has a text input field and two buttons: 'Search' and 'Cancel'.

- **Manual recovery:**
 1. Send statement and registration papers to the RIPE NCC
 2. After verification, we will send you an email with the recovery link
 3. We will add your **RIPE NCC Access account** to the maintainer

To start the password recovery:

<https://apps.db.ripe.net/change-auth/>



- One-stop-shop for viewing all IP-resource related data from the RIPE NCC

The screenshot displays the RIPEstat interface for AS3333. The page is organized into several sections:

- RIS Visibility:** AS3333 has HIGH visibility.
- Announced Prefixes:** AS3333 has 7 prefixes.
- Geolocation:** Loading...
- AS Routing Stats:** AS3333, RIPE-NCC-AS - Reseaux IP Europeens Network Coordination Centre (RIPE NCC). Includes IPv4 and IPv6 statistics: IPv4 (Visibility: 31028.7, Prefixes: 0, IPs: 4608) and IPv6 (Visibility: 3239.326, Prefixes: 1, 48s: 1).
- Abuse Contact:** abuse@ripe.net
- RIR:** Registration of AS3333 by RIPE NCC.
- Blacklist Status:** ASAS3333 NOT found in RECENT blacklists.
- RPKI Validation:** RPKI is VALID for AS3333.
- Maxmind Geo Map:** Map showing ASAS3333 location with IPv4 and IPv6 indicators.
- AS Neighbours:** 42 left, 2 right, 661 unique, 618 uncertain. Includes a table of neighboring ASNs.
- IANA:** 3154-3353 is ASSIGNED to RIPE NCC.
- WHOIS:** WHOIS information found for ASAS3333.

ASN	Holder	Type	v4	v6
1103	SURFNET-NL - SURFnet bv	left	112510	4867
1257	SWIPNET - TELE2	left	299515	17968
1273	CW - Vodafone Group PLC	left	166585	1079
12859	NL-BIT-BIT BV	left	5969	1137
12874	FASTWEB - Fastweb SpA	left	0	1

- Registry data, routing, reverse DNS, measurements, and third-party data
- Via web-site widgets, CLI, data API or mobile

RIPEstat:

<https://stat.ripe.net>



RIPE Atlas: Active Measurements

- Next generation Internet measurement network

Gives a bigger picture about the Internet traffic

- Currently **10,000+ active probes** worldwide

Hardware or software

- User Defined Measurements available for LIRs

ping, traceroute, DNS, SSL

- Set up IPv6 reachability test



RIPE Atlas:

<https://atlas.ripe.net>



RIPE Labs

- A place to showcase new and interesting Internet-related developments

The screenshot shows the RIPE Labs website interface. At the top, there's a navigation menu with links like 'RIPE Labs', 'COVID-19', 'RIPE Atlas', 'Tools', 'Security', 'RIPE Database', 'Data Repository', 'Network Operator Groups (NOG)', 'History of Networking', 'Sustainability', and 'About'. Below the navigation is a 'Contact us!' button and a 'See your ideas on RIPE Labs' button. A 'Your IP address is:' section shows '2001:67c:2e8:9::c100:14e6'. A 'TagCloud' section lists various tags like 'allocation', 'api', 'ases', 'atlas', 'audio', 'belarus', 'bgp', 'cdn', 'certification', 'community', 'communityprojectsfund', 'country', 'country', 'cpe', 'data', 'database', 'datarepository', 'diversity', 'dns', 'dnsmoon', 'dnssec'. The main content area features a 'Statistics' section with three cards: '23,599 Number of LIRs', '16,016 LIRs with IPv6', and '1,047,296 IPv4 addresses transferred'. Below that is an 'Articles' section with two featured articles: 'Our First Glance at the Uganda Internet Shutdown' by Vesna Manojlovic (14 Jan 2021) and 'IETF Hackathon Online - Finding New Ways to Collaborate' by Charles Eckel (06 Jan 2021). Each article has a small image, a title, author, date, and engagement metrics (comments, likes, dislikes).

- **Anyone** can:

- Present research
- Showcase prototype tools
- Share operational experience
- Exchange ideas

RIPE Labs:

<https://labs.ripe.net>



Questions



What's Next



LIRs and the Internet Ecosystem

1. The Internet Registry System
2. RIPE & RIPE NCC
3. How to improve the Internet
4. LIR Portal
5. The RIPE Database

LIRs: Manage your IP Addresses and AS Numbers

1. Which Internet number resources does the RIPE NCC distribute?
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We want your feedback!

What did you think about this session?

Take our survey at:

<https://www.ripe.net/support/training/feedback/lir2/>





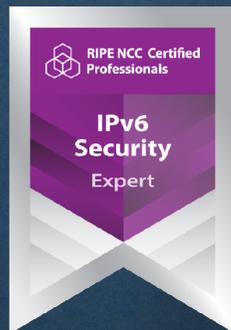
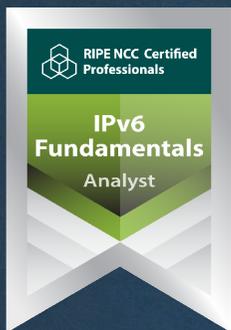
RIPE NCC
Academy

Learn something new today!
academy.ripe.net





RIPE NCC Certified Professionals



<https://getcertified.ripe.net/>



Ēnn Соңы An Críoch Y Diwedd
Vége Endir ڤايان
Son დასასრული Finvezh ڤերջ Ende Koniec
Lõpp Amaia 𐤀𐤍𐤁𐤀 Tmiem Кінецъ Finis
Sfârșit Loppu 𐤀𐤍𐤁𐤀 Kraaj
Kraj Конецъ Liđugt Fund
Fine Fin النهاية Konec Tέλος
Einde Fí Край Pabaiga
Slut Beigas
Fim

