# RIPE NCC

# Tutorial

## Tbilisi Regional Meating | May 2015

Training Services
RIPE NCC

# Content

- **RIPE  and RIPE NCC**

- **Policy Development Process**

- **Distributing IP Addresses**

- **The RIPE Database**

- **RIPE NCC Tools**

- **Transfers**

# RIPE AND RIPE NCC

## Section 1

## (Internet Registry System)

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# Regional Internet Registries
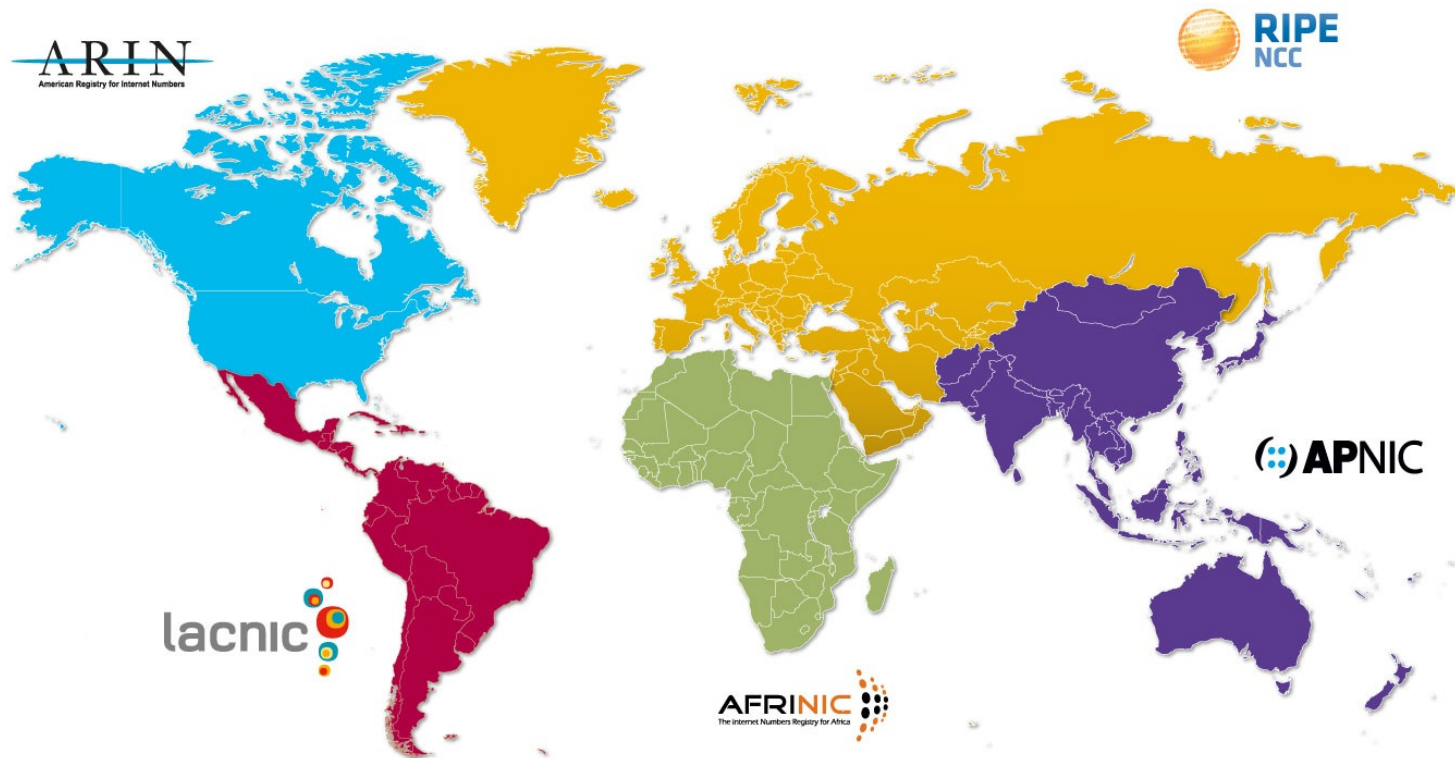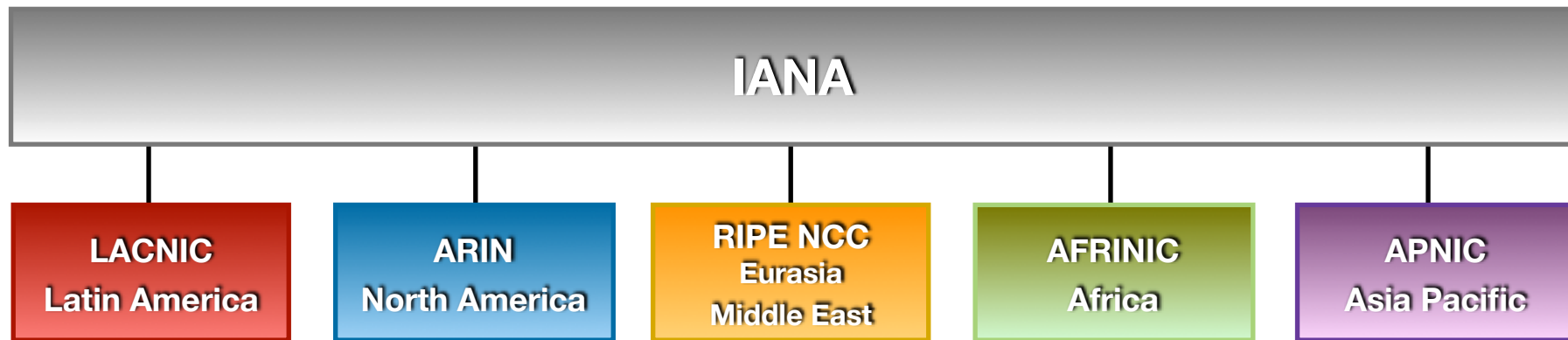
- **Five RIRs worldwide**

  - Not-for-profit organisations

  - Funded by membership fees

  - Policies decided by regional communities

  - Neutral, Impartial, Open, Transparent

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**IANA**

| LACNIC Latin America | ARIN North America | RIPE NCC Eurasia Middle East | AFRINIC Africa | APNIC Asia Pacific |

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- Began operating in 1992

- Not-for-profit membership organisation

- 11,000+ members (Local Internet Registries)

- Neutral, Impartial, Open, Transparent

- Provides administrative support to RIPE

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- Started in 1989

- Discussion forum open to all parties interested

- Not a legal entity and no formal membership

- Develops policies

- Work done in Working Groups

- Activities are performed on a voluntary basis

- Decisions formed by consensus

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- 2000+ subscribed to Address Policy Mailing list

- 609 Attendees at RIPE 69, November 2014

- Includes business, government, regulators, law enforcement agencies, civil society, academia, private citizens

- Meets twice a year at the RIPE meetings

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# Policy Development Process

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# Policy Development Process
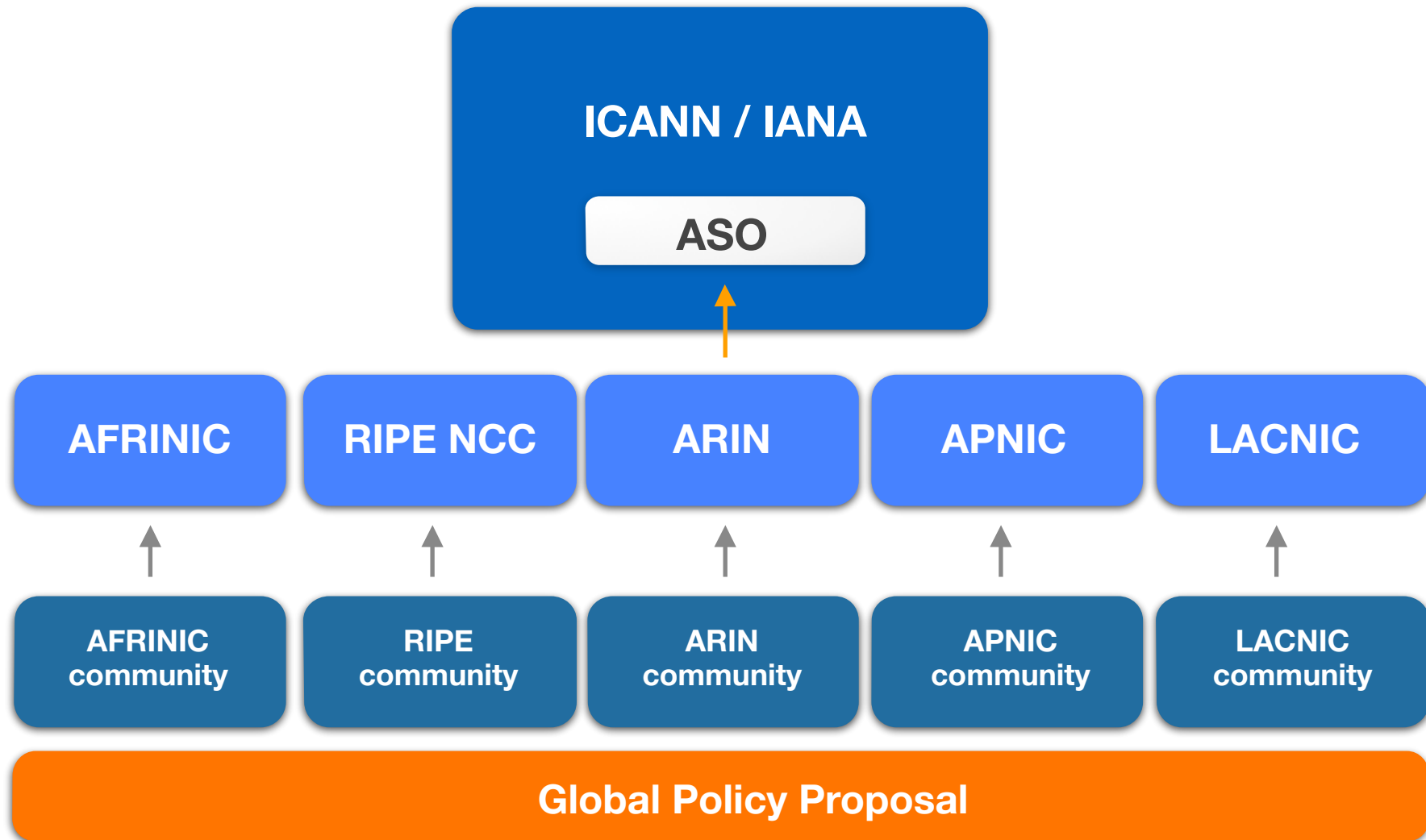
- **Open**
  - Anyone can participate
  - On mailing lists and at meetings

- **Transparent**
  - List discussions archived publicly
  - Meetings transcribed

- **Developed bottom-up**
  - **YOU** make the policies
  - The RIPE NCC implements them

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# Who Does What ?

- **The RIPE community**

  - Creates proposals
  - Discusses proposals
  - Seeks consensus

- **Working Group (WG) chairs**

  - Accept proposals
  - Chair the discussions
  - Decide if consensus has been reached

# Who Does What ?

- **The RIPE NCC**

  - Acts as the secretariat to support the process

  - Publishes the documents

  - Implements the proposals

# Participating in the PDP

- Sign up for the **Policy Development Process Announcements** mailing list

- Join in discussions about policy proposals

- Stay up-to-date with new policies

- Propose a new policy

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- Members may discuss the operations and activities of the RIPE NCC

- Also exercise their voting rights on:
    - Charging Scheme, Resolutions
    - Executive Board membership
    - Financial Report

- Allows members to provide input to, and feedback on, the RIPE NCC's Activity Plan and Budget
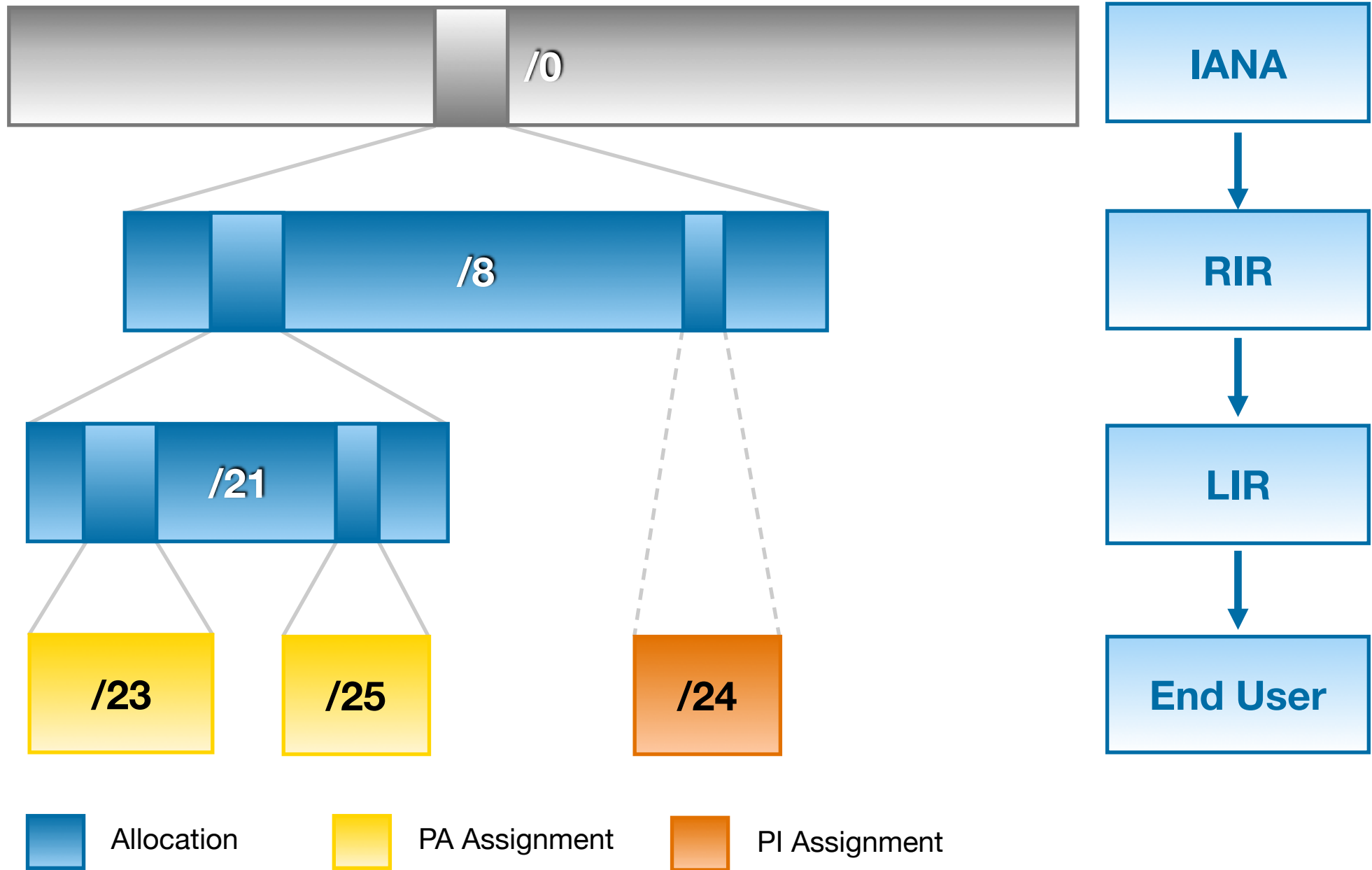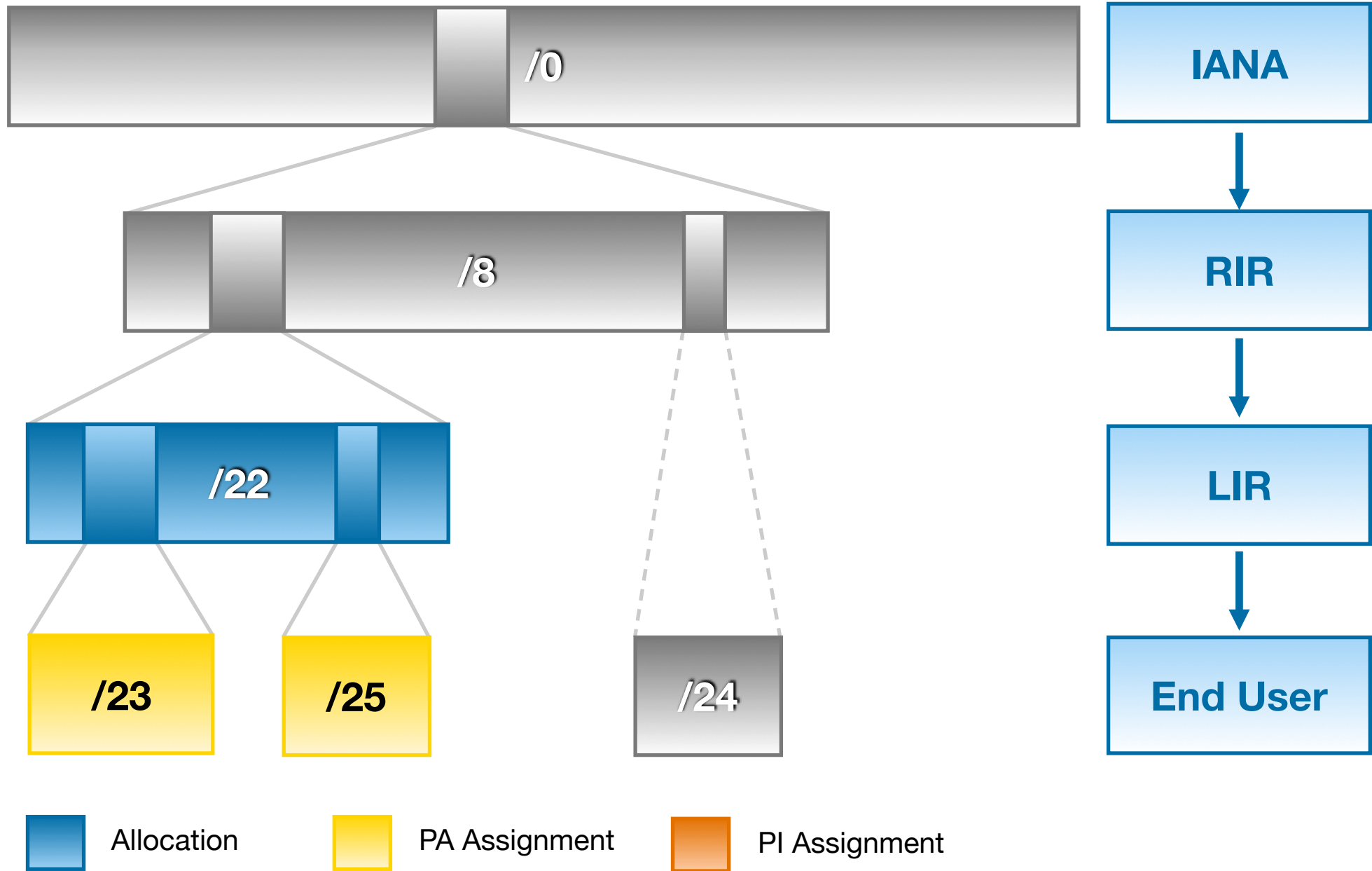
# Distributing IP Addresses

## Section 3

Allocation
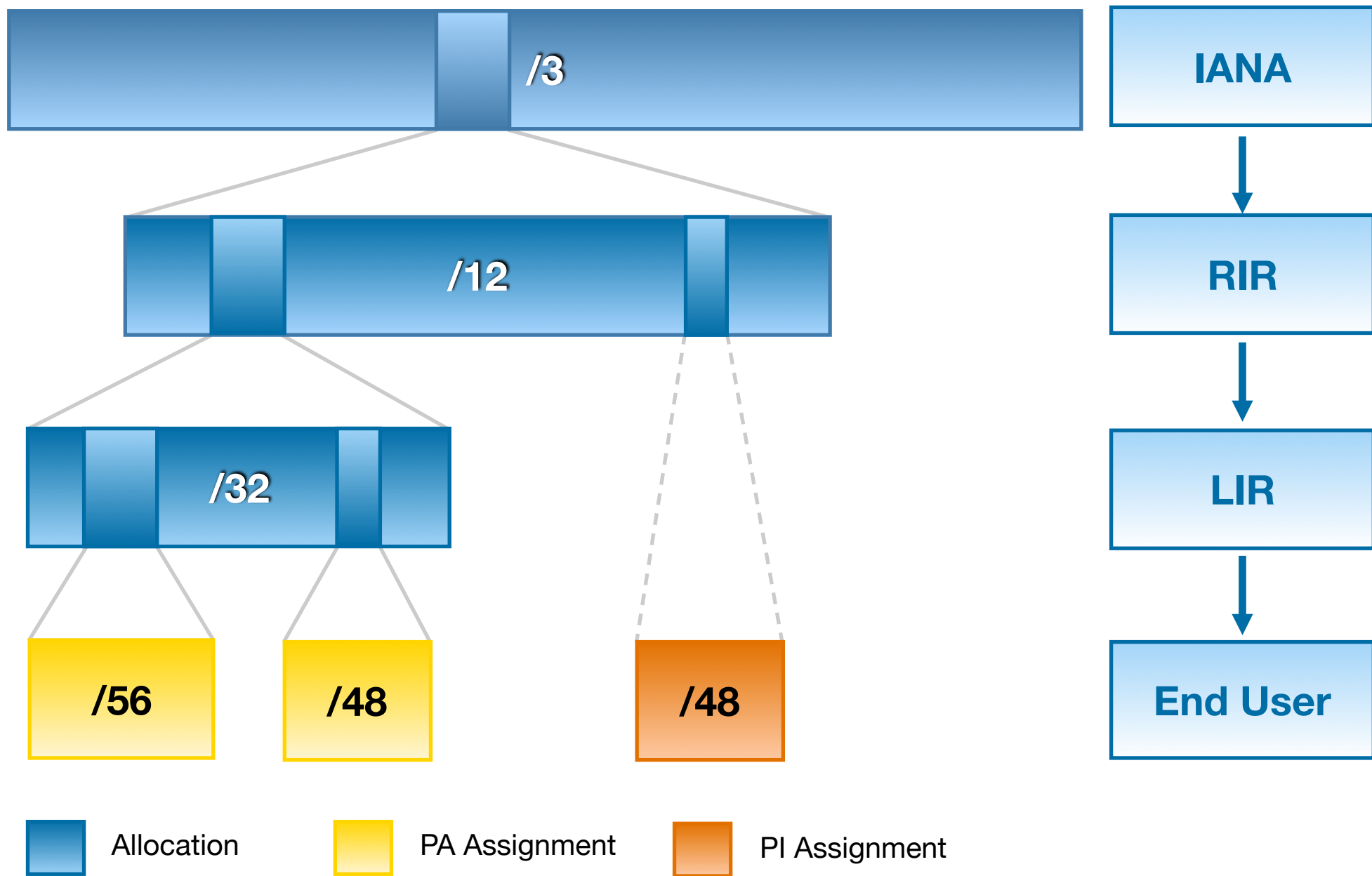PA Assignment
PI Assignment

# IPv4 Address Distribution - Current

# IPv6 Address Distribution

# Terminology

- **Allocation**

  - **Block of IP addresses reserved for future use**

- **Assignment**

  - **A chunk of addresses from an allocation that is used:**

    - in your own infrastructure

    - in an End User network

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# Types of Address Space

- **Provider Aggregatable (PA)**

    - Assignments made from member's allocation

    - Allocated to LIR / Assigned by LIR

    - Address space remains with LIR

    - Customer has to renumber when changing ISP

- **Provider Independent (PI)**

    - Assignment made directly by the RIPE NCC

    - Assigned to End User

    - End User takes the address space with them

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# The RIPE Database

**Section 4**

- **Public Internet resource and routing registry database**

  - Resources (IP addresses, AS Numbers)

  - Contact information for resources

  - Reverse DNS delegations

  - Routing policy

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# RIPE Database Objects

- **Resources**
  - inetnum, inet6num, aut-num

- **Routing**
  - route, route6

- **Reverse DNS**
  - domain

- **Security**
  - mntner

- **Contact**
  - organisation, person, role

- **Web interface**

- **Command line**

- **Full Text Search**

- **Restful API (XML/JSON)**

## RIPE Database Query

Search term

☐ 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) ❓

By submitting this form you explicitly express your agreement with the RIPE Database Terms and Conditions

Search

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- **Privacy sensitive data is protected**

  - person/role objects

- **Maximum number of queries per day**

  - When exceeding, you get blocked

- **Use "--no-personal" flag to limit the query**
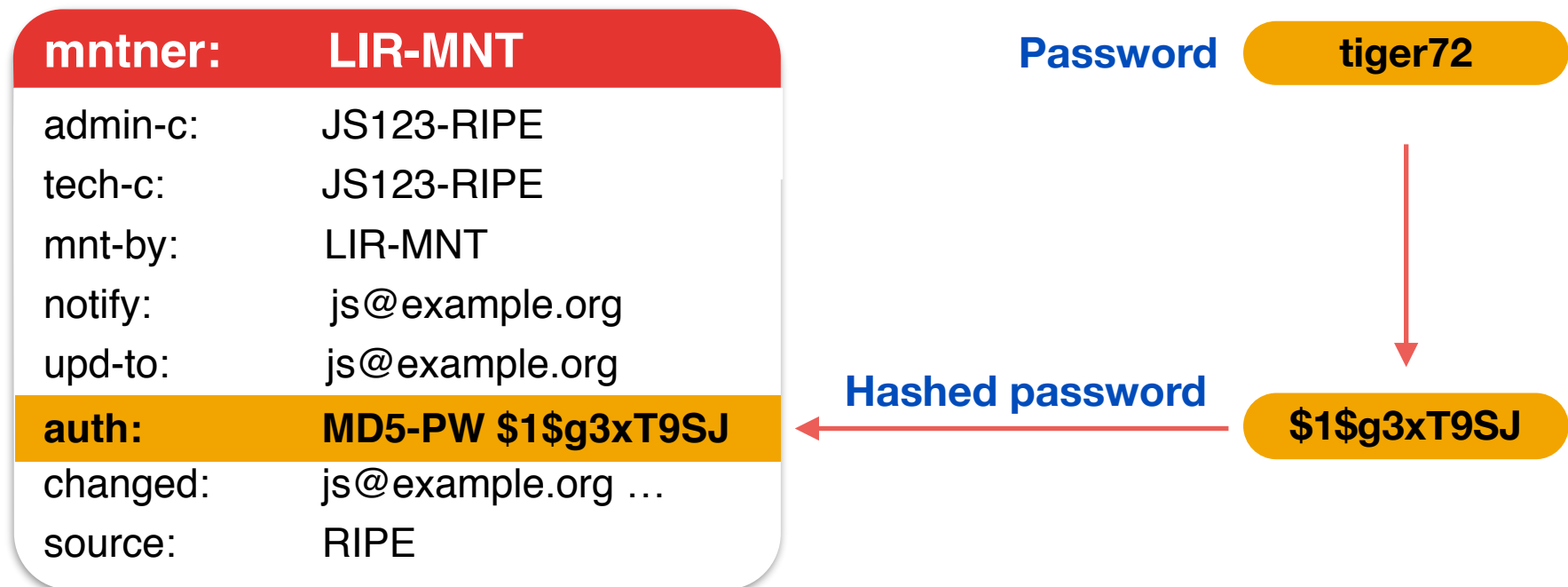
- **Request to be whitelisted**

# Querying the
# RIPE Database

## Demonstration

# The Maintainer - mntner

| mntner: | LIR-MNT |
|---|---|
| admin-c: | JS123-RIPE |
| tech-c: | JS123-RIPE |
| mnt-by: | LIR-MNT |
| notify: | js@example.org |
| upd-to: | js@example.org |
| **auth:** | **MD5-PW $1$g3xT9SJ** |
| changed: | js@example.org … |
| source: | RIPE |

**Password**  tiger72

**Hashed password**  $1$g3xT9SJ

- **Password (MD5-PW)**

- **Private key/public key**

  - PGPKEY-<id> and key-cert object

  - X.509-<id> and key-cert object

- **RIPE NCC Access (Single Sign-On)**

# Protection

| mntner: | LIR-MNT |
|---------|---------|
| admin-c: | JS123-RIPE |
| tech-c: | JS123-RIPE |
| mnt-by: | LIR-MNT |
| notify: | js@example.org |
| upd-to: | js@example.org |
| auth: | MD5-PW $1$g3xT9SJ |

| person: | John Smith |
|---------|-----------|
| address: | My Street 9876 |
| address: | Office 123 |
| e-mail: | js@example.org |
| phone: | +31 20 876 5432 |
| nic-hdl: | JS123-RIPE |
| mnt-by: | LIR-MNT |

## Available Credentials

**Session Passwords**

0 stored password(s) ?
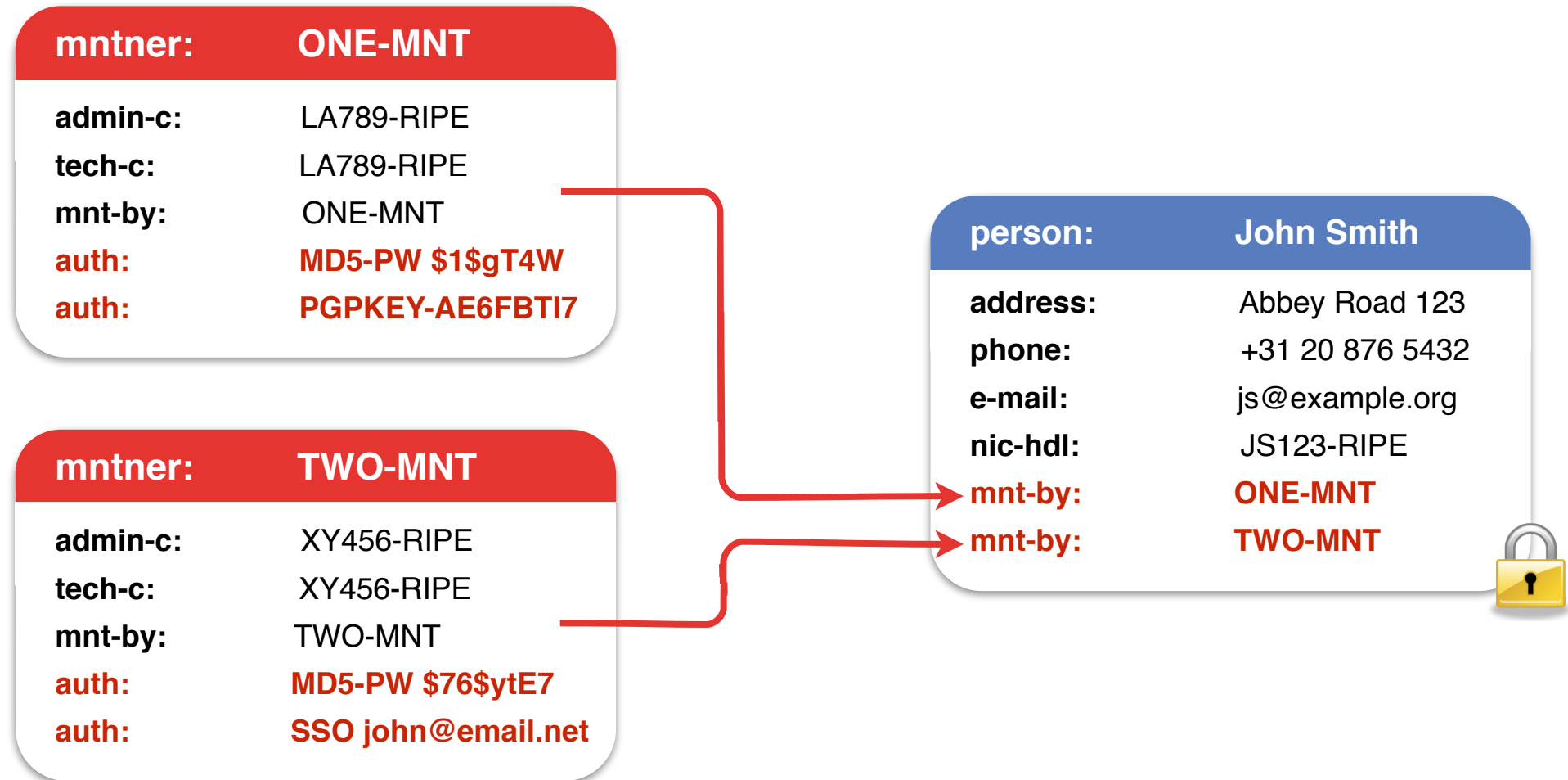
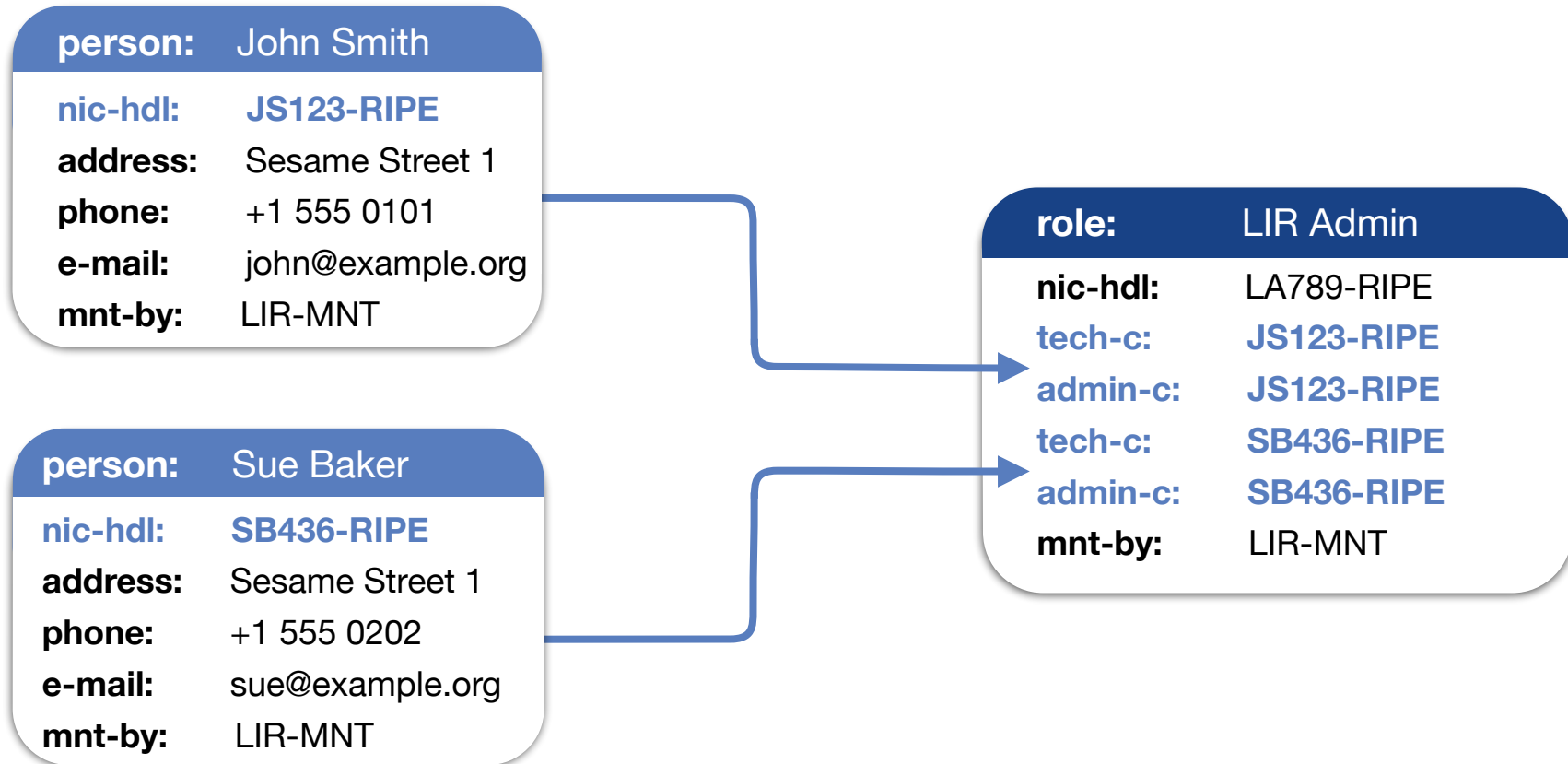tiger72          Add

Reset passwords 🗑

**mntner:** LIR-MNT

**admin-c:** JS123-RIPE
**tech-c:** JS123-RIPE
**mnt-by:** LIR-MNT

**inetnum:** 85.11.184.0/21

**descr:** My Assignment
**admin-c:** LA789-RIPE
**tech-c:** LA789-RIPE
**status:** ASSIGNED PA
**mnt-by:** LIR-MNT

**person:** John Smith

**address:** Abbey Road 123
**phone:** +31 20 876 5432
**e-mail:** js@example.org
**nic-hdl:** JS123-RIPE
**mnt-by:** LIR-MNT

**aut-num:** AS65432

**descr:** My AS Number
**admin-c:** LA789-RIPE
**tech-c:** LA789-RIPE
**mnt-by:** RIPE-NCC-END-MNT
**mnt-by:** LIR-MNT

# Multiple Protection

| mntner: | ONE-MNT |
|---|---|
| admin-c: | LA789-RIPE |
| tech-c: | LA789-RIPE |
| mnt-by: | ONE-MNT |
| auth: | MD5-PW $1$gT4W |
| auth: | PGPKEY-AE6FBTI7 |

| mntner: | TWO-MNT |
|---|---|
| admin-c: | XY456-RIPE |
| tech-c: | XY456-RIPE |
| mnt-by: | TWO-MNT |
| auth: | MD5-PW $76$ytE7 |
| auth: | SSO john@email.net |

| person: | John Smith |
|---|---|
| address: | Abbey Road 123 |
| phone: | +31 20 876 5432 |
| e-mail: | js@example.org |
| nic-hdl: | JS123-RIPE |
| mnt-by: | ONE-MNT |
| mnt-by: | TWO-MNT |

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# The role Object

**person:**   John Smith

**nic-hdl:**   **JS123-RIPE**
**address:**   Sesame Street 1
**phone:**   +1 555 0101
**e-mail:**   john@example.org
**mnt-by:**   LIR-MNT

**role:**   LIR Admin

**nic-hdl:**   LA789-RIPE
**tech-c:**   **JS123-RIPE**
**admin-c:**   **JS123-RIPE**
**tech-c:**   **SB436-RIPE**
**admin-c:**   **SB436-RIPE**
**mnt-by:**   LIR-MNT

**person:**   Sue Baker

**nic-hdl:**   **SB436-RIPE**
**address:**   Sesame Street 1
**phone:**   +1 555 0202
**e-mail:**   sue@example.org
**mnt-by:**   LIR-MNT

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# Updating the
# RIPE Database

## Demonstration

# RIPE NCC Tools

**Section 5**

- RIPE NCC Access is our single sign-on system.

- Personalised functionality on RIPE website

- No need to be an LIR to have an account

**http://access.ripe.net**

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- The LIR Portal lets you manage your registry

- View all allocated/assigned resources

- Provides access to IP management tools and RIPE NCC services

**http://lirportal.ripe.net**

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# RIPE NCC Services

RIPE NCC Access → LIR Portal

And more…

# IPv6 Analyser

Legend | ALLOCATED-BY-RIR | ALLOCATED-BY-LIR | AGGREGATED-BY-LIR | ASSIGNMENT

2a01:9e00::/32 - ALLOCATED_BY_RIR - UK-FAELIX-20110201 | ↻ Reload data | ⚡ Create new objects

| 2a01:9e00::/32 | 2a01:9e00:4000::/34 | 1 Assignments of /48 | |
| | 2a01:9e00:7fff::/48 | 5 Assignments of /64 |
| | 2a01:9e00:ac00::/38 | 1 Assignments of /56 | |
| | 2a01:9e00:a217::/48 | 1 Assignments of /64 | |
| | 2a01:9e00:2ee3:c800::/53 | 5 Assignments of /64 | |
| | 2a01:9e00::/64 | 4 Assignments of /128 | |

## More specific inet6nums

Filter on range...

| inet6num | Status | Date | Size | AsgSize | Netname | |
|---|---|---|---|---|---|---|
| 2a01:9e00:4000::/34 | ALLOCATED_BY_LIR | 03-02-2011 | /34 | | UK-FAELIX-CUSTOMER | ⚙ |
| 2a01:9e00:ac00::/38 | ALLOCATED_BY_LIR | 04-02-2011 | /38 | | UK-FAELIX-TUNNEL | ⚙ |
| 2a01:9e00:a217::/48 | ALLOCATED_BY_LIR | 03-02-2011 | /48 | | UK-FAELIX-FAELIX | ⚙ |
| 2a01:9e00:7fff::/48 | ALLOCATED_BY_LIR | 23-06-2012 | /48 | | UK-FAELIX-CROSSCONNECT | ⚙ |

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**Allocations (42)**

| Range | % |
|---|---|
| 62.142.0.0 - 62.142.255.255 | 82.8% |
| 62.248.128.0 - 62.248.255.255 | 0.8% |
| 80.186.0.0 - 80.186.255.255 | 100% |
| 81.197.0.0 - 81.197.255.255 | 100% |
| 80.81.160.0 - 80.81.191.255 | 57.4% |
| 82.103.192.0 - 82.103.255.255 | 1.6% |
| 82.118.192.0 - 82.118.223.255 | 93.4% |
| 83.245.128.0 - 83.245.255.255 | 0% |
| 84.230.0.0 - 84.231.255.255 | 50% |
| 85.76.0.0 - 85.79.255.255 | 75% |
| 85.156.0.0 - 85.156.255.255 | 100% |
| 88.112.0.0 - 88.115.255.255 | 100% |
| 91.152.0.0 - 91.159.255.255 | 100% |
| 193.64.0.0 - 193.66.255.255 | 36.3% |
| 193.94.0.0 - 193.94.255.255 | 19.5% |
| 193.184.0.0 - 193.185.255.255 | 92.4% |
| 193.199.0.0 - 193.199.255.255 | 18.7% |
| 193.229.0.0 - 193.229.255.255 | 34% |
| 194.86.0.0 - 194.86.255.255 | 68.5% |
| 194.136.0.0 - 194.136.255.255 | 40.5% |
| 194.157.0.0 - 194.157.255.255 | 25.7% |
| 194.188.0.0 - 194.188.255.255 | 58.2% |
| 194.211.0.0 - 194.211.255.255 | 73.8% |
| 194.240.0.0 - 194.241.255.255 | 66.1% |

## Grand Totals

| | Total Addresses | Infra | Used | Free |
|---|---|---|---|---|
| | 3,088,384 | 7.0% | 69.6% | 30.4% |
| | In 42 Allocations | 215,323 Addresses | 2,149,128 Addresses | 939,256 Addresses |

## Free Space

*Want to assign a free block? Select the desired prefix size in the drop-down below for a suggestion.*

Size  /23

Using a conservative algorithm the best suggestion is 62.142.34.0/23, this prefix matches one of your free blocks exactly in size.  ✕

## Notifications

*You currently have no notifications.*

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# RIPEstat

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

- **Registry data, routing, reverse DNS, measurements & 3rd-party data**

- **Main interface: web-based widgets**

  - also available as: CLI, data API & mobile

  - personalised via RIPE NCC Access

## http://stat.ripe.net

# LIR Portal

**Demonstration**

# Being an LIR contact

# Exercise: Being an LIR Contact

(A) Check which resources are certified

(B) Correct invalid assignments in the RIPE Database

(C) Compare your assignment records with the RIPE Database

(D) Ask the RIPE NCC to update any outdated information you can't update yourself

(E) Add your person object to the LIR role object

(F) Get a RIPE NCC Access account or

(G) Request resources if needed

(H) Check the LIR information and what resources you have

(I) Create a person object in the RIPE Database

(J) Update the LIR contact list in the LIR PortalGet the LIR maintainer password

(K) Correct any outdated LIR information in the LIR Portal

# Transfers

**Section 6**

- **Submit the IPv4 Allocation Request form**

  - Use the same mntner, person and role objects from the IPv6 allocation

- **Each LIR can get one /22 block**

  - = 1024 IPv4 addresses

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- PA allocations between RIPE NCC members

- Due to merger or acquisition

- From legacy space

- PI assignments between end users

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# IPv4 Allocation Transfers

- **Only between RIPE NCC members**

- **No minimum allocation size**

- **Evaluated by the RIPE NCC**

  - Cannot transfer same block again within 24 months

- **Transfers can be permanent or temporary**

# IPv4 PI Assignment Transfers

- **No minimum/maximum block size**

- **Offering & Receiving parties must have a sponsoring LIR before transfer takes place**

- **Evaluated by the RIPE NCC**

  - Cannot transfer again same block or parts of the transferred block within 24 months

- **Transfers can be permanent or temporary**

- **Documentation and objects from new user are required**

- **IPv4 Listing Service**

  - Accessible from LIR Portal account

- **Brokers**

  - Listed on RIPE NCC website

  - **NOT** endorsed by RIPE NCC

  - Signed an agreement to conform to RIPE Policies

- **Send an email to lir-help@ripe.net**

- **Include the following information & documents:**

  - IPv4 blocks(s) being transferred

  - company names and contact details

  - company registration papers

  - IPv4 Transfer Agreement

  - For PI transfers, sponsoring LIR agreement is needed too

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**Graduate to the next level!**

**http://academy.ripe.net**

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**The End!**

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Finvezh

Кінець

Konec

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