



**RIPE NCC**

RIPE NETWORK COORDINATION CENTRE

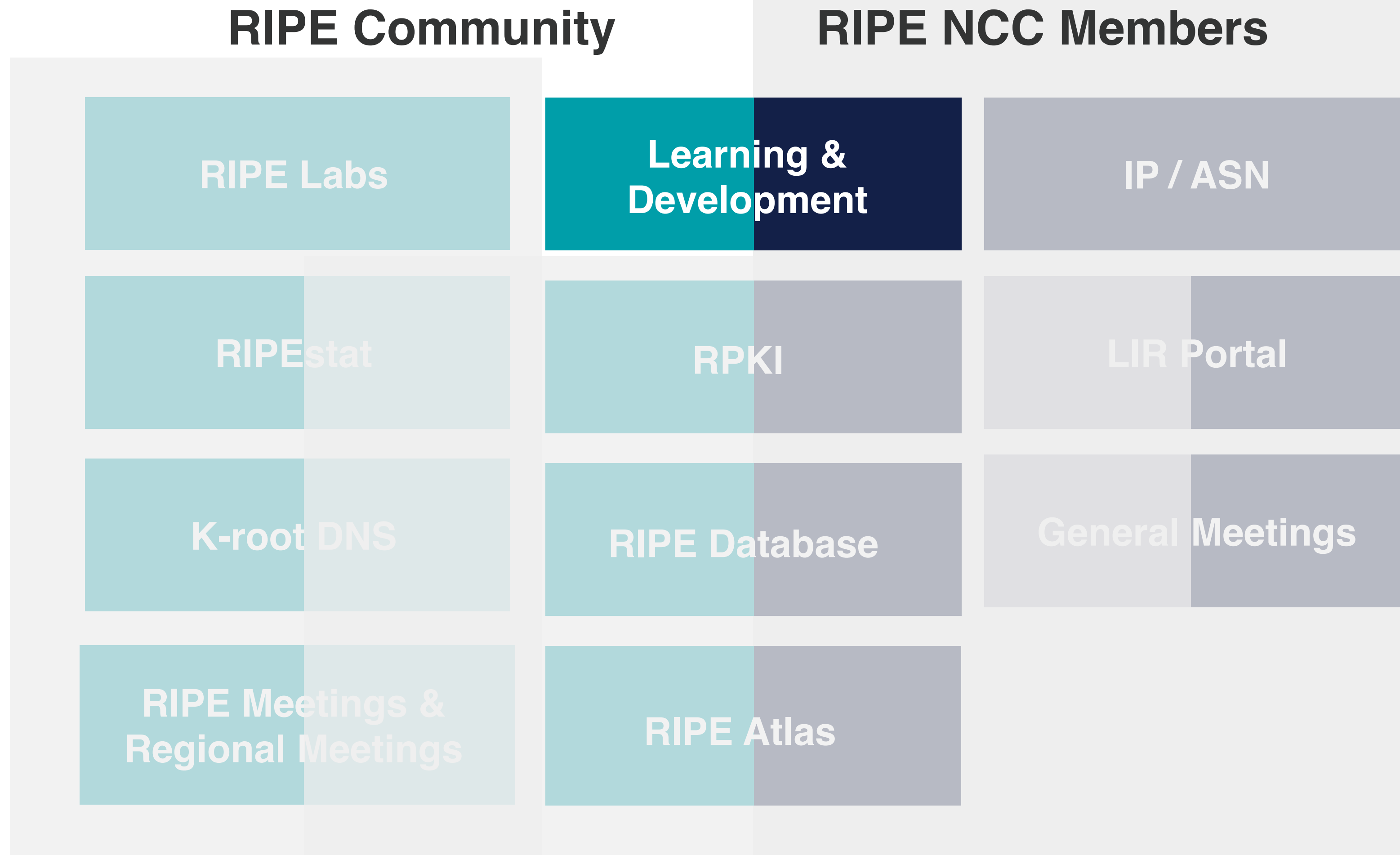
# RIPE NCC Academy

Learning Beyond Boundaries

**RIPE 87**

**RIPE NCC Learning & Development**

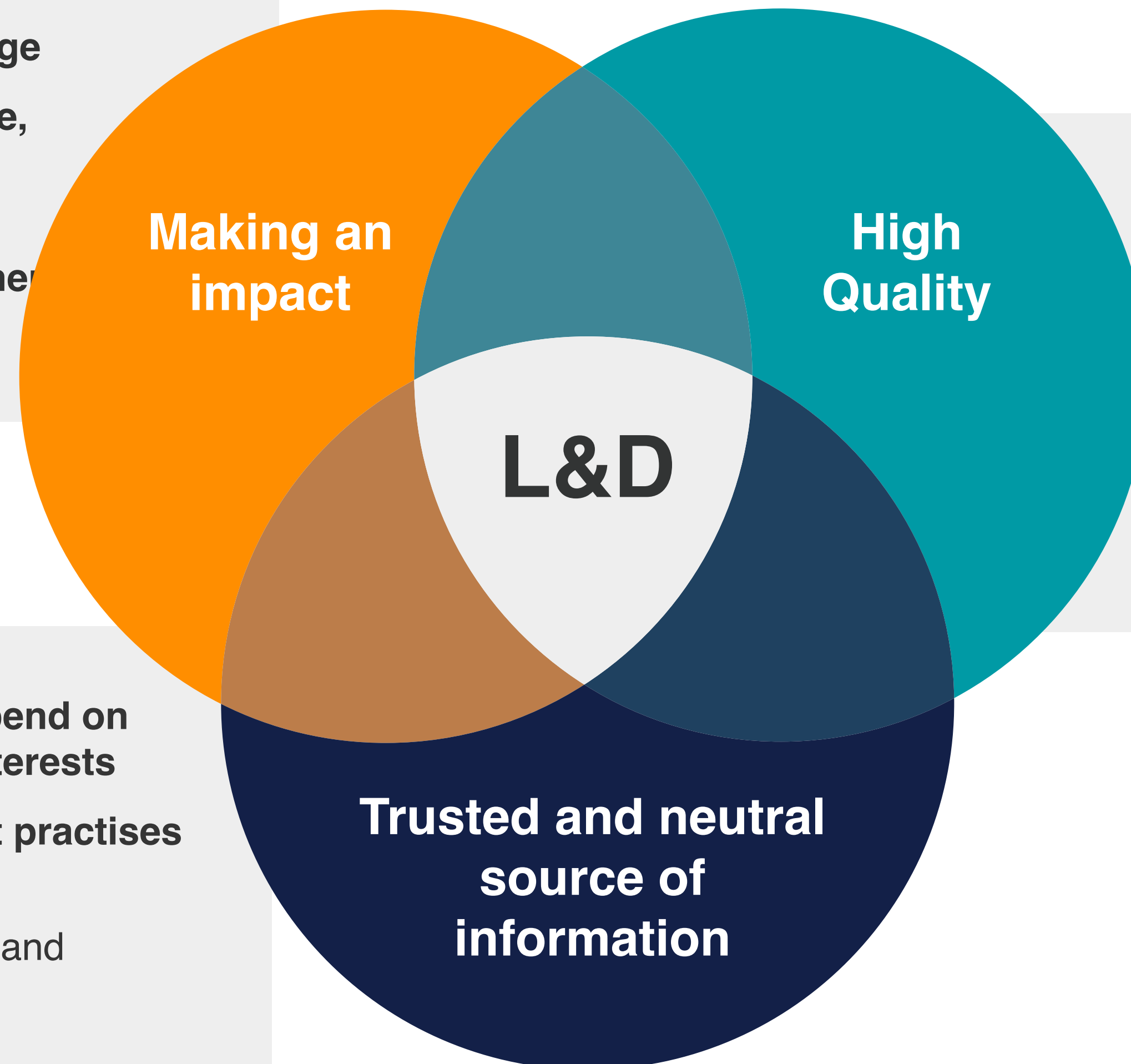
# RIPE NCC Services



# RIPE NCC's Learning & Development (L&D)



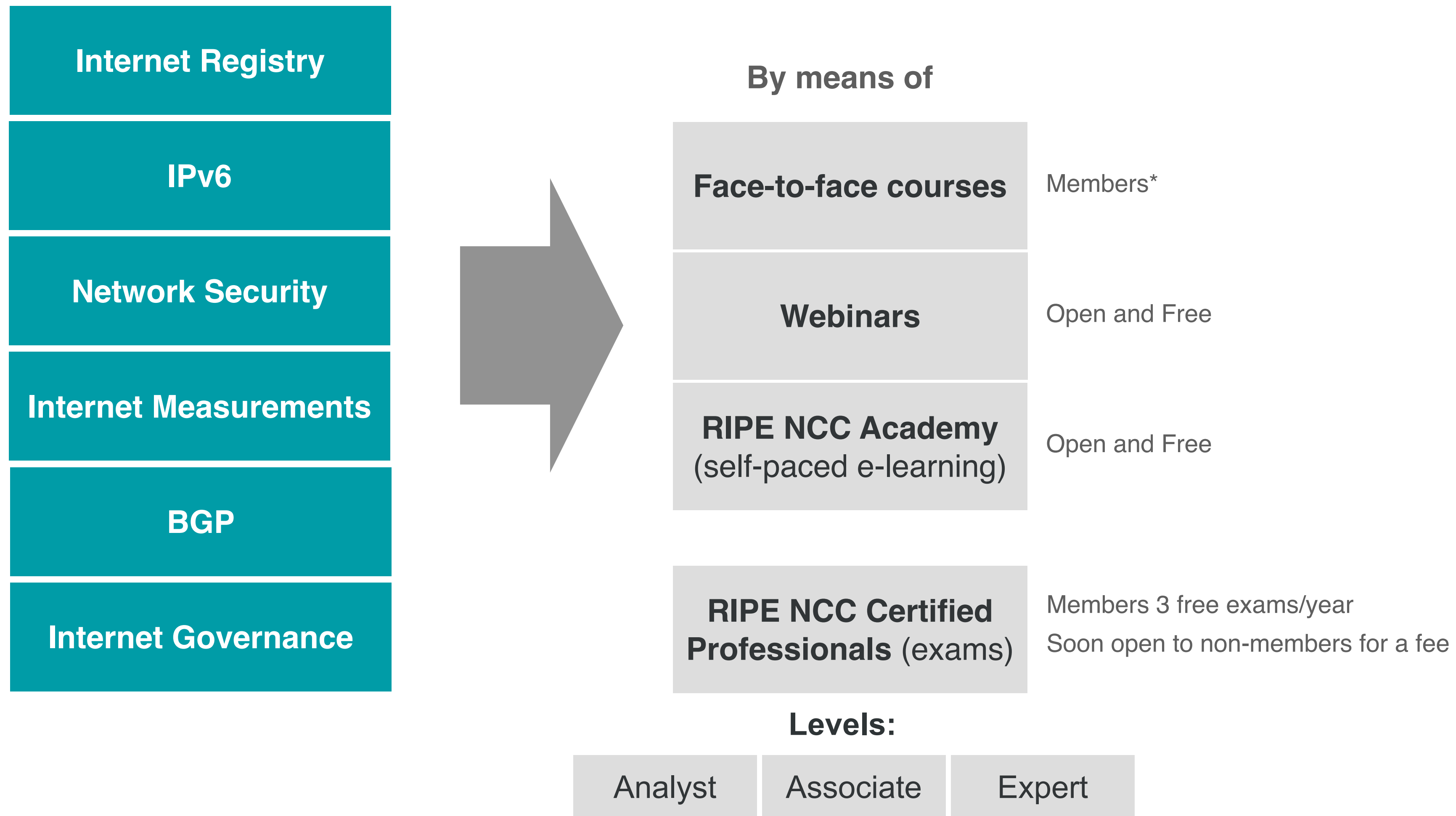
- Instruct in **best practices**
- Provide **practical knowledge**
- Contribute to a more **secure, stable, resilient** and **innovative** Internet
- Help with **career development**



- **Relevant** and **up-to-date** content tailored to **learners' needs**
- Involvement of **subject matter experts** in development
- **Sound pedagogical** methodologies
- **Engaging, interactive** and **accessible** learning experiences

- Information **does not depend on economic or political interests**
- Focusing on **best current practises** and **standards**
- Using **open source** tools and materials

# L&D Offers Learning Experiences about..



# RIPE NCC Academy



- Launched in 2014
- Over a 100 self-paced modules
- 20-30 minutes per module
- Interactive, mix of text, videos, questions, hands on (lab) activities

The screenshot displays the RIPE NCC Academy website interface. At the top, there is a navigation bar with the RIPE NCC Academy logo and a user status indicator: "You are not logged in. (Log in)". Below the navigation bar is a hero section with the heading "Learn online with the RIPE NCC!" and a sub-heading "Study at your own pace online with the RIPE NCC Academy e-learning courses." Below this, there are two buttons: "Enrol in a Course" and "Get Certified".

The main content area is titled "Browse courses" and features a grid of five course cards. Each card includes an icon, a title, a brief description, and a badge indicating the exam it prepares for:

- Internet Governance**: Learn how the Internet is governed and how you can be part of the process! This course will prepare you to participate in Internet governance processes and events and help bring to life your vision of what the Internet should be.
- BGP Security**: BGP is vulnerable. Analyse the threats to BGP and learn about the recommended security measures to protect your network against accidental and malicious misconfigurations. Gets you ready for the BGP Security - Associate exam.
- IPv6 Security**: Keep your IPv6 network secure. Learn to design a high-level strategy to protect your IPv6 infrastructure against common threats. Gets you ready for the IPv6 Security Expert exam.
- IPv6 Fundamentals**: Get started with IPv6. You will learn how IPv6 addresses work, how to subnet, best practices and IPv6-related RFCs among other topics. Gets you ready for the IPv6 Fundamentals - Analyst exam.
- RIPE Database**: Learn how the RIPE Database works. Practise querying, creating and updating objects. Understand database best-practices and more. Gets you ready for the RIPE Database Associate exam.

<https://academy.ripe.net>

# RIPE NCC Academy



- Launched in 2014
- Over a 100 self-paced modules
- 20-30 minutes per module
- Interactive, mix of text, videos, questions, hands on (lab) activities

The screenshot shows the RIPE NCC Academy interface. At the top, there is a navigation bar with the RIPE NCC Academy logo and the name. Below this, the current module is identified as 'Module 3.1 - Basic IPv6 Header'. The main content area is titled 'Section 2 of 4' and 'IPv6 Extension Headers'. A paragraph explains that in IPv6, optional addressing and routing information is encoded in separate headers placed between the IPv6 header and the upper-layer PDU. These are called 'Extension Headers' and can be chained together. A diagram below the text illustrates two packet structures. The first structure shows an 'IPv6 header' (Next Header: TCP) followed by a 'TCP Header' and 'Data'. The second structure shows an 'IPv6 header' (Next Header: Routing) followed by a 'Routing header' (Next Header: TCP), then a 'TCP Header' and 'Data'. The bottom of the page shows navigation links for 'Module 2.3 - IPv6 Address Types and Scopes' and 'Activity 3.a - Basic Headers'.

<https://academy.ripe.net>

# RIPE NCC Academy



- Launched in 2014
- Over a 100 self-paced modules
- 20-30 minutes per module
- Interactive, mix of text, videos, questions, hands on (lab) activities

The screenshot displays the RIPE NCC Academy interface. On the left is a dark sidebar with navigation options: Dashboard (Access to the servers' consoles), Network diagram (How are the machines connected), Admin console (Control the VM itself), and Legal (Copyright, Privacy, Terms and...). The main area is divided into three terminal windows for Host A, Host B, and Host C, and a section for Available tools.

**Host A** terminal shows:

```
reconnect pop out
root@hostA:~# ali
alias alive2map.sh alive6
root@hostA:~# alive6 eth0
Alive: 2001:db8:f1:1:1 [ICMP echo-reply]
Alive: 2001:db8:f1:216:3eff:feee:c [ICMP echo-reply]
Alive: 2001:db8:f1:216:3eff:feee:b [ICMP echo-reply]

Scanned 1 address and found 3 systems alive
root@hostA:~# ping6 2001:db8:f1:216:3eff:feee:b
PING 2001:db8:f1:216:3eff:feee:b(2001:db8:f1:216:3eff:feee:b) 56 data byte
s
64 bytes from 2001:db8:f1:216:3eff:feee:b: icmp_seq=1 ttl=64 time=0.092 ms
64 bytes from 2001:db8:f1:216:3eff:feee:b: icmp_seq=2 ttl=64 time=0.204 ms
64 bytes from 2001:db8:f1:216:3eff:feee:b: icmp_seq=3 ttl=64 time=0.160 ms
^
```

**Host B** terminal shows a Scapy welcome message and a Python script:

```
reconnect pop out
aSPY//YASa
apyyyyCY/////////YCa
sY/////////YSpsc scpCY//Pp
ayp ayyyyyySCP//Pp sy//C
AYASAYYYYYYYYY//Ps cY//S
pCCCCY//p cSSps y//Y
SPPPP//a pP//AC//Y
A//A cyP//C
p//Ac sC//a
P//YCpc A//A

t
scccccp//pSP//p p//Y
sY/////////y caa S//P
cayCyayP//Ya pY/Ya
sY/PsY//YcC aC//Yp
sc sccaCY//PCyapaayCP//YsS
spCPY/////////YPSps
ccaacs
using IPython 8.12.0
>>> a = IPv6(src="2001:db8:f1:216:3eff:feee:b",
...:
...: dst="2001:db8:f1:216:3eff:feee:a")
>>> b = ICMPv6NS(tgt="2001:db8:f1:216:3eff:feee:a")
>>> c = ICMPv6ND0ptSrcLLAddr(lladdr="00:16:3e:ee:00:0c")
>>>
```

**Host C** terminal shows a Termshark interface with a packet capture table:

```
termshark v2.4.0 | eth0
Filter:
No Time - Source - Dest - Proto Length Info -
5 5.2463 fe80::216:3e 2001:db8:f ICM 86 Neighbor Solicitation for 2001
6 5.2464 2001:db8:f:1 fe80::216: ICM 78 Neighbor Advertisement 2001:db
7 10.367 fe80::216:3e fe80::216: ICM 86 Neighbor Solicitation for fe80
8 10.367 fe80::216:3e fe80::216: ICM 78 Neighbor Advertisement fe80::2
9 15.487 fe80::216:3e fe80::216: ICM 86 Neighbor Solicitation for fe80
10 15.487 fe80::216:3e fe80::216: ICM 78 Neighbor Advertisement fe80::2
```

**Available tools** list:

- Scapy
- THC-IPv6
- SI6 IPv6 Toolkit
- Termshark

**Hints** list:

- Feel free to **resize terminal windows** by dragging (does not work in Safari)
- To scroll inside the tmux, use **Ctrl-B** and **PageUp/PageDown** (**Fn + Up/Down** on Mac)
- To open new tmux window, use **Ctrl-B c**

<https://academy.ripe.net>

# Webinars



SHARE - JAD EL CHAM - RIPE NCC (PRESENTER)

## Extension Headers Properties

1	Flexible (use is optional)
2	Only appear once (except Destination options)
3	Fixed (types and order)
4	Processed only at endpoints (except Hop-by-Hop and Routing)

12

VIDEO (1)  
Jad El Cham - Ri...

ATTENDEES (12)

- Hosts (2)
  - Jad El Cham - RIPE NCC (Host)
  - Ondřej Caletka - RIPE NCC | Guest
- Presenters (1)
  - Jad El Cham - RIPE NCC (Presenter) | Guest
- Participants (9)

DOWNLOAD ME! - FILES SESSION 1

- 1. Basic IPv6 Protocol Security.pdf

USEFUL LINKS - SESSION 1

- 1. Provide Feedback
- 2. Download Scapy
- 3. The Hacker's Choice

CHAT

Everyone

Jad El Cham - RIPE NCC (Host): We should be we shall be starting shortly

Christian: all good

Andreas Lattka: Yes, all is fine

espen: all good

MORE VIDEOS

Q & A

No Questions Available

- 1 - 2 hour online live sessions

<https://learning.ripe.net>





# RIPE NCC Certified Professionals



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





# Tell us how we can help you!

*Takes about 3 minutes*



[ripe-ncc.typeform.com/academia](https://ripe-ncc.typeform.com/academia)