Update on the Why and How of IPv6 Deployment
About the RIPE NCC

- Main task: Managing Internet Numeric Resources (ASNs and IPs) in our region
- Maintain the RIPE database, and in general work for the good of the Internet
- Independent, not-for-profit, bottom-up membership organisation
Why IPv6?

IPv6 Is Happening Right Now!

IPv4 Address Exhaustion

Number of Connected Devices

IPv6 Development
How: Things to take into account (1)

• Happening at **different speeds:**
  - Fixed vs. mobile
  - Region / Country
  - Type of network / business
  - Vendors (HW & SW)

• **Different ways of measuring**
  - Addresses & BGP
  - DNS & Availability of the services
  - IPv6 traffic on networks, IXPs or CDNs
  - IPv6 capable clients
How: Things to take into account (2)

- Monitor values in time
- Compare with IPv4
- Correlation with specific events
How: Globally (1)

- Overall growth is pretty high

[Graph showing IPv6 adoption over time]

http://www.google.com/ipv6/

http://stats.labs.apnic.net/ipv6

http://v6asns.ripe.net
How: Globally (2)

- But if we see it by region/country…

www.google.com/ipv6/
http://stats.labs.apnic.net/ipv6
How: Europe (1)

- We have big differences between countries

- Belgium
  - IPv6 Adoption: 46.56%
  - Latency / impact: 10ms / 0.01%

- Greece
  - IPv6 Adoption: 26.61%
  - Latency / impact: -40ms / -0.01%

- Switzerland
  - IPv6 Adoption: 26.25%
  - Latency / impact: 10ms / 0%

- Germany
  - IPv6 Adoption: 26.01%
  - Latency / impact: 10ms / -0.01%

- Portugal
  - IPv6 Adoption: 18.87%
  - Latency / impact: 0ms / -0.01%

- Romania
  - IPv6 Adoption: 6.4%
  - Latency / impact: -20ms / 0%

www.google.com/ipv6/
How: Europe (2)

- There is a linear constant growth

http://stats.labs.apnic.net/ipv6
How: Europe (3)

- RIPE NCC LIR’s: IPv6 resources
How: Europe (4)

- RIPE NCC LIR’s: IPv6 + BGP
How: Europe (5)

- RIPE NCC LIR's: IPv6 + No BGP
How: Europe (6)

- RIPE NCC LIR’s: No IPv6

Removing IPv6 Requirement for Receiving Space from the Final /8
IPv6 RIPEness

• Rating system to measure early signs of IPv6 deployment
  • 1 star if LIR has an IPv6 allocation
  • 3 more stars possible if
    - Prefix is announced (visible in RIS)
    - Prefix is registered in routing registry (route6 object)
    - Reverse DNS is set up

http://ipv6ripeness.ripe.net
IPv6 RIPEness “5th Star”

• Measuring actual IPv6 deployment

- **Content networks**: Percentage of IPv6-enabled Alexa 1M listed sites in that network, weighted by Alexa ranking

- **Access networks**: Percentage of IPv6-enabled users from APNIC ads-measurements

- Threshold for “5th star” has been doubled every year

<table>
<thead>
<tr>
<th>Threshold</th>
<th>5th star LIRs</th>
</tr>
</thead>
<tbody>
<tr>
<td>4%</td>
<td>7.8%</td>
</tr>
<tr>
<td>8%</td>
<td>6.8%</td>
</tr>
<tr>
<td>16%</td>
<td>5.6%</td>
</tr>
<tr>
<td>50%</td>
<td>3.2%</td>
</tr>
</tbody>
</table>

Current status at various thresholds
How: Eastern Europe & Romania (1)

<table>
<thead>
<tr>
<th>Country</th>
<th>IPv6 Capable</th>
<th>IPv6 Preferred</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic, Eastern Europe, Europe</td>
<td>9.41%</td>
<td>8.41%</td>
<td>999,918</td>
</tr>
<tr>
<td>Romania, Eastern Europe, Europe</td>
<td>6.48%</td>
<td>6.23%</td>
<td>5,307,641</td>
</tr>
<tr>
<td>Hungary, Eastern Europe, Europe</td>
<td>4.72%</td>
<td>4.59%</td>
<td>1,316,546</td>
</tr>
<tr>
<td>Poland, Eastern Europe, Europe</td>
<td>2.06%</td>
<td>2.00%</td>
<td>4,002,904</td>
</tr>
<tr>
<td>Russian Federation, Eastern Europe, Europe</td>
<td>1.84%</td>
<td>1.79%</td>
<td>8,088,570</td>
</tr>
<tr>
<td>Bulgaria, Eastern Europe, Europe</td>
<td>0.73%</td>
<td>0.72%</td>
<td>5,621,249</td>
</tr>
<tr>
<td>Republic of Moldova, Eastern Europe, Europe</td>
<td>0.35%</td>
<td>0.33%</td>
<td>1,402,741</td>
</tr>
<tr>
<td>Slovakia, Eastern Europe, Europe</td>
<td>0.28%</td>
<td>0.23%</td>
<td>274,729</td>
</tr>
<tr>
<td>Ukraine, Eastern Europe, Europe</td>
<td>0.21%</td>
<td>0.20%</td>
<td>7,943,345</td>
</tr>
<tr>
<td>Belarus, Eastern Europe, Europe</td>
<td>0.00%</td>
<td>0.00%</td>
<td>1,645,598</td>
</tr>
</tbody>
</table>

http://stats.labs.apnic.net/ipv6
How: Eastern Europe & Romania (2)

- If we look into RIPE NCC statistics

![Chart showing IPv6 adoption by country in Eastern Europe and Romania](chart.png)
How: Romania (1)

- RIPE NCC LIR - Romania
How: Romania (2)

- RIPE NCC LIR - Romania: IPv6 + BGP
How: Romania (3)

- RIPE NCC LIR - Romania: IPv6 + No BGP
How: Romania (3)

- RIPE NCC LIR - Romania: No IPv6
What about YOU? (1)

Source: AKAMAI
What about YOU? (2)

United Kingdom

Sky Broadband

Source: AKAMAI

Mar-2016
What about YOU? (3)
Summary

- IPv6 Adoption happening all around the world
- Different speeds
- You have to decide what to do about it
- Important IPv6 -> Urgent IPv6
References (1)

- APNIC IPv6 Stats: [http://stats.labs.apnic.net/ipv6](http://stats.labs.apnic.net/ipv6)
- RIPEness: [http://ipv6ripeness.ripe.net](http://ipv6ripeness.ripe.net)
- RIPE NCC - IPv6 Enabled Networks: [http://v6asns.ripe.net](http://v6asns.ripe.net)
- RIPE NCC Statistics: [https://labs.ripe.net/statistics/?tags=ipv6](https://labs.ripe.net/statistics/?tags=ipv6)
References (2)


Questions

avives@ripe.net
@TrainingRIPENCC
RIPE NCC Academy

- Virtual Learning Environment
- Follow online courses
- Certify your expertise

https://academy.ripe.net

Login with RIPE NCC Access account

access.ripe.net