IPv6 Deployment Survey

Based on responses from the global Regional Internet Registry (RIR) community during June 2012

- Maarten Botterman
  maarten@gnksconsult.com
Setting the scene

- The Internet has become a fundamental infrastructure, worldwide, for economic and social activity, and its usage continues to grow exponentially:
  - More users
  - New applications (e.g., mobile, Internet of Things etc.)

- The transition from IPv4 to IPv6 is the only sustainable option in the long run.
- A smooth transition requires understanding the challenges and a timely start.
Global IPv6 Deployment Monitoring Survey

• Aim is to establish the best possible comprehensive view of present IPv6 penetration and future plans of IPv6 deployment
• Best way to establish this is to ask the Internet providers and users, basically: the RIR communities around the world
• ARIN carried out such a survey with its members in March 2008, a starting point for the currently proposed survey
• RIPE NCC and APNIC carried out this same survey in 2009. In 2010, 2011 and 2012, all RIRs participated to the survey making it truly global:
  – Survey was prepared and carried out by GNKS in close collaboration with RIPE AFRINIC, APNIC, ARIN, LACNIC and RIPE NCC
  – Survey was kept short and focused on essentials. Changes to the survey were kept to a minimum and are taken into account in the analysis
  – Privacy is guaranteed
• Every year, the last question is whether the survey should take place again next year. In 2009, 2010, 2011 and 2012 more than 90% of the respondents said “yes”
Summary report on 2012 results

1 – respondents’ profile
2 – experience and assumptions
3 - planning
Section 1 – Respondents’ profile

• 1443 people responded to the survey. This is 13% less than in 2011. When considering the difference in responses between 2012 and 2011, the following differences are noticable:
  – Less ISPs amongst the respondents (39% in 2012 and 53% in 2011)
  – Relatively many respondents from the top 3 countries
  – Other factors (e.g. regions, size, profit status, remain comparable)
Q1 - Response to questionnaire

- 1443 respondents from 105 countries/economies
  - 15 countries > 29 respondents = 953
  - 22 countries 7 < x < 30 respondents = 306
  - 29 countries 3 < x < 8 respondents = 110
  - 16 countries with 2 or 3 respondents = 36
  - 38 countries with 1 respondent = 38

- Top 10 respondent countries 2011

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Germany</td>
<td>341</td>
</tr>
<tr>
<td>2.</td>
<td>USA</td>
<td>306</td>
</tr>
<tr>
<td>3.</td>
<td>Taiwan</td>
<td>104</td>
</tr>
<tr>
<td>4.</td>
<td>Netherlands</td>
<td>37</td>
</tr>
<tr>
<td>5.</td>
<td>Switzerland*</td>
<td>35</td>
</tr>
<tr>
<td>6.</td>
<td>United Kingdom</td>
<td>35</td>
</tr>
<tr>
<td>7.</td>
<td>Australia</td>
<td>33</td>
</tr>
<tr>
<td>8.</td>
<td>Canada*</td>
<td>32</td>
</tr>
<tr>
<td>9.</td>
<td>Russia</td>
<td>30</td>
</tr>
<tr>
<td>10.</td>
<td>France</td>
<td>27</td>
</tr>
</tbody>
</table>

* New in Top 10

source: GNKS 2012
Q2 - Respondent categories

n=1443

*less ISPs as compared to 2011 (53%), further similar to 2011

source: GNKS 2012
Q3 – Are you a mobile network operator?

88% mobile network operator
12% other

n=1443

*new question in 2012 hence no comparable data

source: GNKS 2012
Q4 – Financial status

*slightly more non profit respondents (29% vs. 24% in 2011)

n=1443

source: GNKS 2012
Q5 – To which RIR?

Q6 - Has your organization signed a Registration Services Agreement with your RIR?

<table>
<thead>
<tr>
<th>Year</th>
<th>40% says “Yes”</th>
<th>25% “No”</th>
<th>35% does not know.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>40% says “Yes”.</td>
<td>25% “No”.</td>
<td>35% does not know.</td>
</tr>
<tr>
<td>2011</td>
<td>54% says “Yes”.</td>
<td>16% “No”.</td>
<td>29% does not know.</td>
</tr>
</tbody>
</table>

Source: GNKS 2012
Q7 – How large is your customer base?

ISP only - *No significant changes as compared to 2011

source: GNKS 2012
Q10 – Size of your organization

- Small (50 employees or less): 45%
- Medium (51 up to 250 employees): 18%
- Large (251 up to 2,500 employees): 17%
- Very Large (more than 2,500 employees): 20%

n=1399

*No significant changes as compared to 2011

source: GNKS 2012
Section 2 – experience and assumptions

• More ISPs have customers using IPv6 connectivity (65% vs. 56% in 2011)
• More IPv6 presence, experience with IPv6, and more uptake, gradually
• From those that interconnect with IXs, 50% peer with all IXs, and 29% at least with one
• Of all respondents, 15% plan to or use LSN ... of those, 80% uses LSN next to using IPv6 (and not instead of)
Q8 - What percentage of your customer base uses IPv6 connectivity?

- More than 2%
- 1.0% - 2.0%
- 0.5% - 1.0%
- 0% - 0.5%
- 0

n=531

source: GNKS 2012
Q9 - Do you consider promoting IPv6 uptake to your customers?

n=531

source: GNKS 2012
Q11 - Does your organization have, or consider having an IPv6 allocation and/or assignment?

n=1399

*“consider” was not a separate option in survey 2010 but combined in “Yes”*  
source: GNKS 2012
Q12 - Why doesn’t your organization consider having an IPv6 allocation/assignment?

- Cannot afford the expense
- Haven’t gotten around to it yet
- Communications service provider doesn’t support IPv6.
- ISP doesn’t support IPv6
- Lack of configuration management tools for IPv6
- Our infrastructure doesn’t support it
- Could not convince business decision makers
- Don’t see the business need now

n=145

source: GNKS 2012
Q13 - What you expect to be the biggest hurdle(s) to your organization if you were to deploy IPv6?

Please note these are responses from the 10% indicated to not consider having an IPv6 allocation.
Q14 - What motivated your organization to consider having an IPv6 allocation/assignment?

- Want to be “ahead of the game” and expect to meet future needs: 66%, 64%, 75%
- To make sure IPv6 is supported in our products: 46%, 49%, 56%
- Want to benefit from IPv6 as soon as possible: 43%, 46%, 51%
- Availability of IPv4 address space: 34%, 38%, 50%
- Customer demand: 21%, 22%, 25%
- Other: 5%, 4%, 7%

Source: GNKS 2012

n=1299
Q17 - What are likely to be the biggest hurdle(s) when deploying IPv6?

- Vendor support
- Availability of (knowledgeable) staff
- Costs (required financial investment/time of staff)
- Business case to non-technical business decision makers
- Information security
- Other
- Don't know

Source: GNKS 2012

n=1025
Q18 - What are the biggest problems with IPv6 in production?

- Lack of user demand
- Technical problems
- No experience, yet
- Budget issues: convincing non-technical business responsible people
- Budget issues: no access to investment money due to scarcity of resources
- Other

n=1017

Source: GNKS 2012
Q16 - Does your organization have an IPv6 presence?

- Yes, both within internal networks and on the Internet: 48.5%, 43%, 42%
- Yes, only on the Internet: 19.5%, 11%, 14%
- Yes, only within internal networks: 8.5%, 19%, 8%
- No: 23.4%, 27%, 36%

n=1045  
source: GNKS 2012
Q19 - your organization’s IPv6 setup

- Dual-stack (i.e. IPv4 and IPv6 on the same hardware): 95%
- Separate infrastructure for IPv4 and IPv6: 12%
- Only IPv6: 3%

n=978

Source: GNKS 2012
Q20 - nature of your organization’s IPv6 production services

- **Native IPv6**:
  - 2010: 75%
  - 2011: 78%
  - 2012: 76%

- **Tunneled IPv6** (excluding automatic tunneling):
  - 2010: 17%
  - 2011: 15%
  - 2012: 14%

- **Address Translation (like NAT)**:
  - 2010: 0%
  - 2011: 0%
  - 2012: 0%

- **Automatic tunneling**:
  - 2010: 0%
  - 2011: 0%
  - 2012: 0%

Source: GNKS 2012

n=919
Q21 - If your organization has IPv6 in production, how does the amount of IPv6 traffic compare to your IPv4 traffic?

- 2012: 68% IPv6 is insignificant, 28% IPv6 traffic is non-negligible but less than IPv4 traffic, 1% IPv6 traffic is same as IPv4 traffic, 1% IPv6 traffic is greater than IPv4 traffic
- 2011: 78% IPv6 is insignificant, 18% IPv6 traffic is non-negligible but less than IPv4 traffic, 1% IPv6 traffic is same as IPv4 traffic, 1% IPv6 traffic is greater than IPv4 traffic
- 2010: 81% IPv6 is insignificant, 16% IPv6 traffic is non-negligible but less than IPv4 traffic, 1% IPv6 traffic is same as IPv4 traffic, 1% IPv6 traffic is greater than IPv4 traffic

n=919

source: GNKS 2012
Q24 - If your organization is connected to one or several Internet Exchanges (IXs), do you:

- peer in IPv6 in all the IXs you are connected to: 50%
- peer in IPv6 in some of the IXs you are connected to: 29%
- not peer in IPv6: 21%

These answers are given by the 55% of the 1104 respondents, who indicated to connect to IXs.

n=552

source: GNKS 2012
Q25 - On Large Scale NAT (LSN aka CGN (Carrier Grade NAT)):

- We use LSN: 85%
- We plan to use LSN: 9%
- We do not plan to use LSN: 6%

- Along with IPv6: 79%
- Instead of IPv6: 21%

n=969
• preparedness for IPv6 among ISPs has continued to grow. Preparedness means here that ISPs are implementing IPv6 capability, planning for the deployment, and preparing for the increasing demand that they expect to come from their customers soon.
• deployment has improved since July 2011
Q23 - Which best describes your organization’s IPv6 implementation (plans)?

Source: GNKS 2012
We thank all respondents for their contributions!

91% of the respondents to the question “Would you be interested to participate again to this survey in a years’ time” said:

“Yes”

For more information: maarten@gnksconsult.com