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Abstract:

The aim of this document is to inform about the first results (for 2Q 2013) of the IPv6 Readiness Benchmarking results in public administrations across Europe.

Keywords:

IPv6,Governments, benchmarking, monitoring

Revision History

The following table describes the main changes done in this document since its creation.

Revision	Date	Description	Author (Organization)
V1.0	15/09/2013	Document creation	Jiří Průša (CZ.NIC)
	24/09/2013	Finalization	Uwe Kaiser (Fraunhofer)
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Disclaimer

Executive Summary

Europe needs to be a competitive player in information technologies, and in IP networking this means introducing IPv6, in the private sector as well as in eGovernment services. Continuous monitoring of the level of IPv6 rollout progress of each state is therefore a must-have. That's why, in line with the **Digital Agenda for Europe** and its **Action Nr. 89,** we started to monitor and regularly record the IPv6 readiness of governmental institutions and their public appearances.

This way we can find out whether IPv6 was introduced or not, relating to web-services, DNS, and e-mail servers support. The problem lies in finding comparable metrics. Especially in the globalised world of internet we have to distinguish between national and international URLs. Even though some websites seem national since they are in national language and they are used by citizens of certain state we can't forget that they might be international e.g. Facebook, Google.

There is no other European-wide research that would compare just governments' websites although there is one research alike that is provided by the "IPv6 Observatory"[1]. The difference from the following one is in comparing international URL with national. The other difference between IPv6 Observatory and our research is that GEN6 focuses on government websites and services instead of on the most visited web-pages from each country.

The reason why this monitoring is unique is that it is the only one that is based on collecting comparable URLs of EU member states and some non-EU countries e.g. Turkey. Designated catalogue of governmental institutions of public appearance was prepared based on the common methodology (Deliverable D5.41 - IPv6 Readiness Monitoring Methodology) in order to monitor the progress of transition to IPv6. Based on this selection of addresses, IPv6 readiness will be measured and published every 3 months, starting in April 2013 until the end of the GEN6 (Government enabled with IPv6) project as supported by the European Commission. This benchmark will compare different areas of public administration starting with heads of state and ending with municipalities.

Technical checks in benchmarking will focus on the availability of web services, DNS and mail servers with respect to their availability via IPv6.

[1] http://www.ipv6observatory.eu

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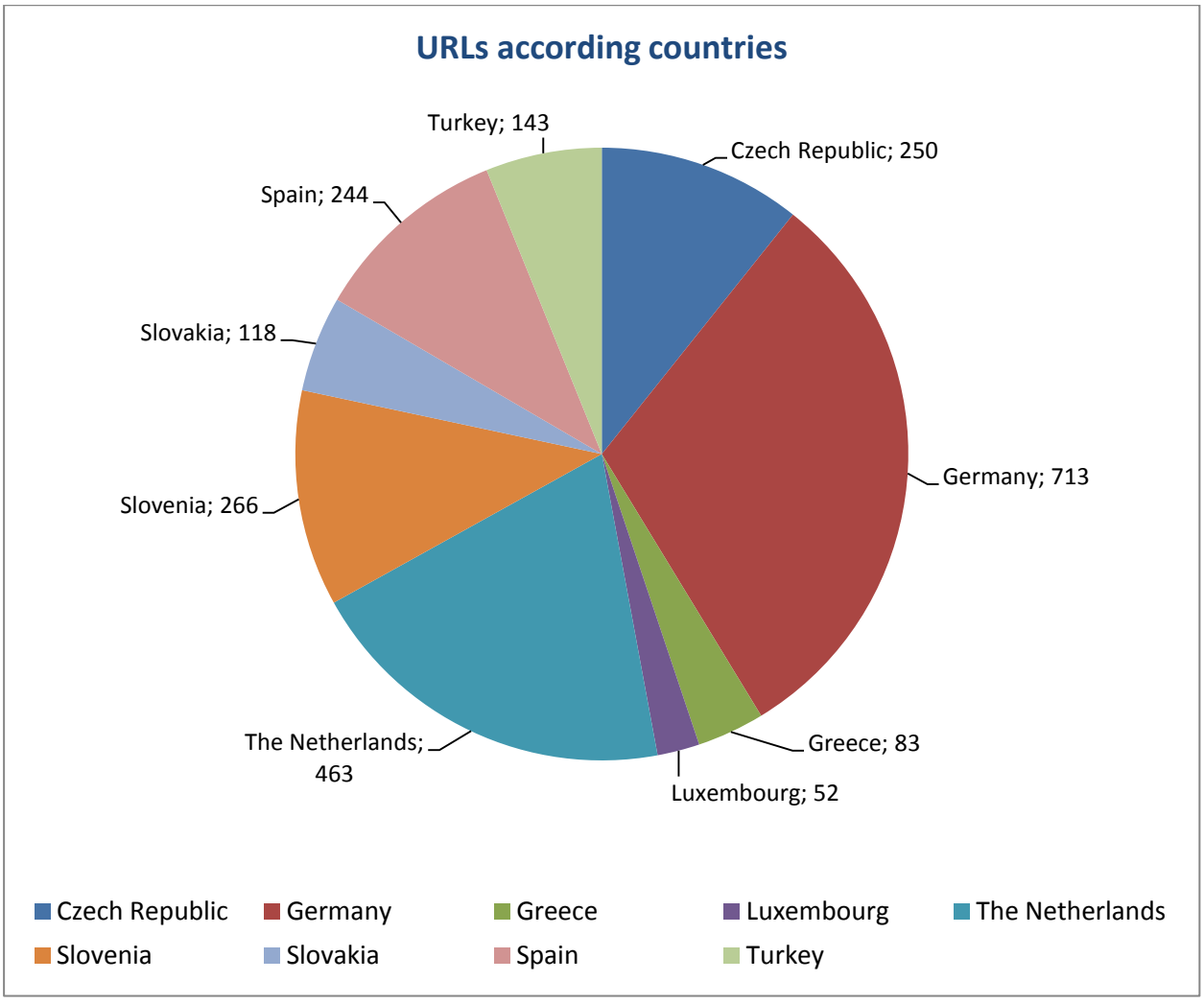
1. THE SCOPE

Based on the common methodology defined in "D5.41 IPv6 Readiness Monitoring Methodology", all partners participating in GEN6 project were asked to collect URLs in their country. During 4Q/2012 – 1Q/2013, the following countries provided a set of URLs of the most important public organisations in their countries: the Czech Republic, Germany, Greece, Luxembourg, the Netherlands, Slovenia, Spain and Turkey. Due to close cooperation, CZ.NIC also provided data for Slovakia, which is not involved in the GEN6 project.

In total, 2 332 URLs were collected for the purpose of an IPv6 readiness analysis. These URLs are sorted not only according to country, but also according to three levels of public administration: central government organisations, regional representatives and local self-government bodies.

The largest URLs sample (713) was provided by Germany, followed by the Netherlands (463) and Slovenia (266). Information about the structure of URLs according to country is presented in the chart.



From the public administration's point of view, the largest set of URLs is represented by the local level, that means cities and villages (1 863), followed by the national level (347) and the regional level (122). Due to the various constitutional environments in each country, no regional level is represented in case of Luxembourg and Slovenia (especially due to their country size). In case of Turkey, the regional level is formally established, but in fact, there are no regional offices and no websites at the regional level.

By analysing the provided URLs from each country, there is no significant difference in the amount of URLs at the national level (between 31 to 55), but they is a large difference in the amount of URLs at the local level – from 12 in Luxembourg to 666 in Germany. In this case, the difference can be easily explained if we look at the size of these countries and the number of cities/villages. At the national level, it's necessary to mention the case of the Netherlands, where several central-government institutions (ministries) share one URL. This should have a significant influence on the results on the national level.

2. IPv6 Benchmarking Results

All collected URLs were automatically analysed on 15 July 2013 by a script provided by ULAKBIM that was modified by CZ.NIC. The list of URLs according to countries and IPv6 readiness results is available at https://devpub.labs.nic.cz/ipv6-smt-new/country/.

For presenting benchmarking results in a more user-friendly way, the following overviews and charts have been created for all three levels of public administration as well as progress from the first measurement from March 2013 (D5.42: IPv6 Readiness Monitoring Results: 1Q 2013). The differences are noted as "*+/- x pp*" where *pp* stands for *percentage points*.

2.1. General overview (all levels)

Country	Web servers		DNS servers		E-mail servers	
	Fully supported	Partially supported*	Fully supported	Partially supported	Fully supported	Partially supported
Czech Republic	28% (+ 4 pp)	1% (+ 1 pp)	21% (+ 1 pp)	29%	5% (+2 pp)	6% (+ 1 pp)
Germany	6% (- 2 pp)	0%	14% (+ 1 pp)	25% (+ 2 pp)	1%	4% (+ 3 pp)
Greece	0% (- 1 pp)	1% (+ 1 pp)	2% (+ 1 pp)	4% (+ 3 pp)	5% (+ 3 pp)	0%
Luxembourg	0%	0%	19% (+13 pp)	4% (-11 pp)	0%	2%
The Netherlands	4%	0%	25% (- 1 pp)	7% (+ 1 pp)	3% (+1 pp)	6%
Slovenia	3%	0%	9% (+ 1 pp)	13% (+ 1 pp)	5%	0%
Slovakia	18% (+ 1 pp)	1%	4% (+ 1 pp)	6% (+ 1 pp)	0%	0%
Spain	1% (- 1 pp)	0%	3% (+ 1 pp)	11%	2%	1%
Turkey	1%	0%	1%	1%	0% (- 1 pp)	0%

2.2. National level

Country	Web servers		DNS servers		E-mail servers	
	Fully supported	Partially supported*	Fully supported	Partially supported	Fully supported	Partially supported
Czech Republic	48%	3%	29% (+ 3 pp)	35% (+ 4 pp)	19% (+ 6 pp)	19% (- 7 pp)
Germany	0%	0%	16%	23%	0%	0%
Greece	0% (- 3 pp)	3% (+ 3 pp)	0%	3%	3%	0%
Luxembourg	0%	0%	8% (+ 3 pp)	5%	0%	3%
The Netherlands	42%	0%	39% (- 3 pp)	15% (+ 3 pp)	3%	0%
Slovenia	5%	2%	5%	13%	0%	0%
Slovakia	0%	0%	5%	3%	0%	0%
Spain	5% (- 5 pp)	0%	5% (+ 2 pp)	33% (- 3 pp)	0%	5%
Turkey	4%	0%	2%	6%	0%	0%

** has IPv6 address, but request is not successful*

2.3. Local level

Country	Web servers		DNS servers		E-mail servers	
	Fully supported	Partially supported*	Fully supported	Partially supported	Fully supported	Partially supported
Czech Republic	25% (+ 3 pp)	1% (+ 1 pp)	20%	27% (+ 1 pp)	2% (+ 1 pp)	3% (- 1 pp)
Germany	6% (- 2 pp)	0%	14%	25% (+ 3 pp)	1%	4% (+ 3 pp)
Greece	0%	0%	6% (+ 3 pp)	6% (+ 6 pp)	8% (+ 5 pp)	0%
Luxembourg	0%	0%	58% (+ 50 pp)	0% (- 42 pp)	0%	0%
The Netherlands	1%	0%	24%	7%	3% (+ 1 pp)	7%
Slovenia	3% (+ 1 pp)	0%	9%	13% (+ 1 pp)	6%	0%
Slovakia	28% (- 2 pp)	1%	4% (- 2 pp)	7% (- 1 pp)	0%	0%
Spain	0%	0%	3%	3%	2%	1%
Turkey	0%	0%	0%	0%	0% (- 1 pp)	0%

** has IPv6 address, but request is not successful*

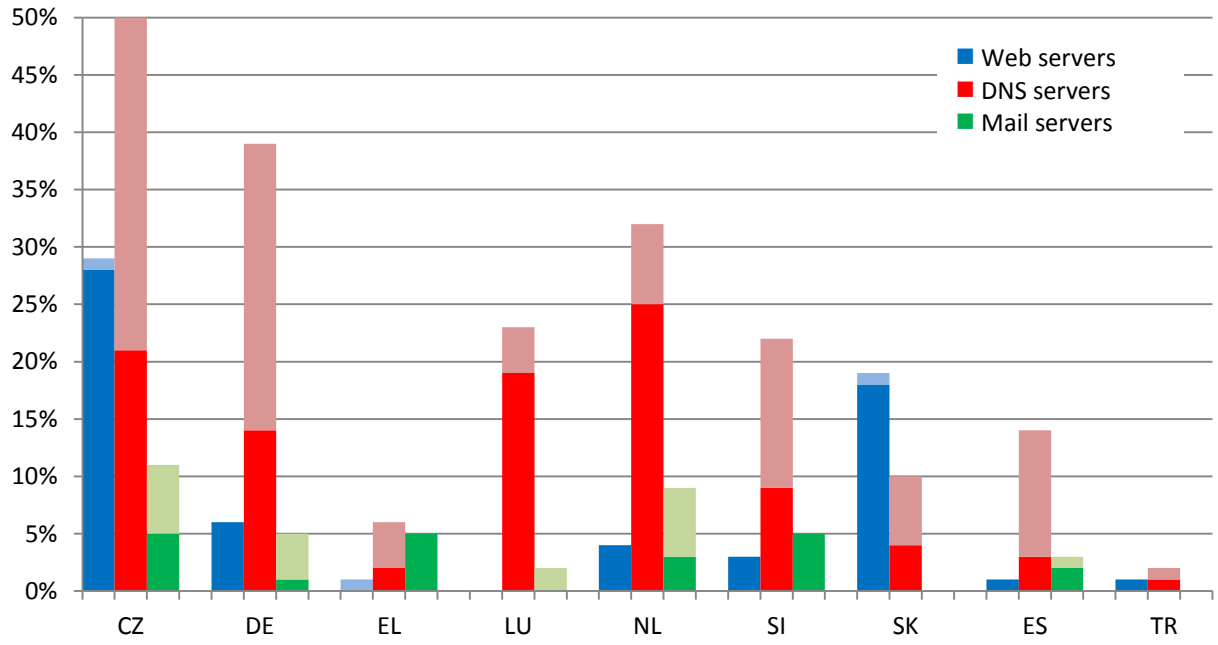
2.4. Regional level

Country	Web servers		DNS servers		E-mail servers	
	Fully supported	Partially supported*	Fully supported	Partially supported	Fully supported	Partially supported
Czech Republic	15% (+ 7 pp)	0%	15%	54% (+ 8 pp)	15%	8%
Germany	13%	0%	6%	31%	6%	0%
Greece	0%	0%	0%	0%	0%	0%
The Netherlands	0%	0%	25%	8%	0%	0%
Slovakia	13%	0%	0%	13%	0%	0%
Spain	0% (- 2 pp)	2% (+2 pp)	0%	18% (+ 5 pp)	3% (- 2 pp)	0%

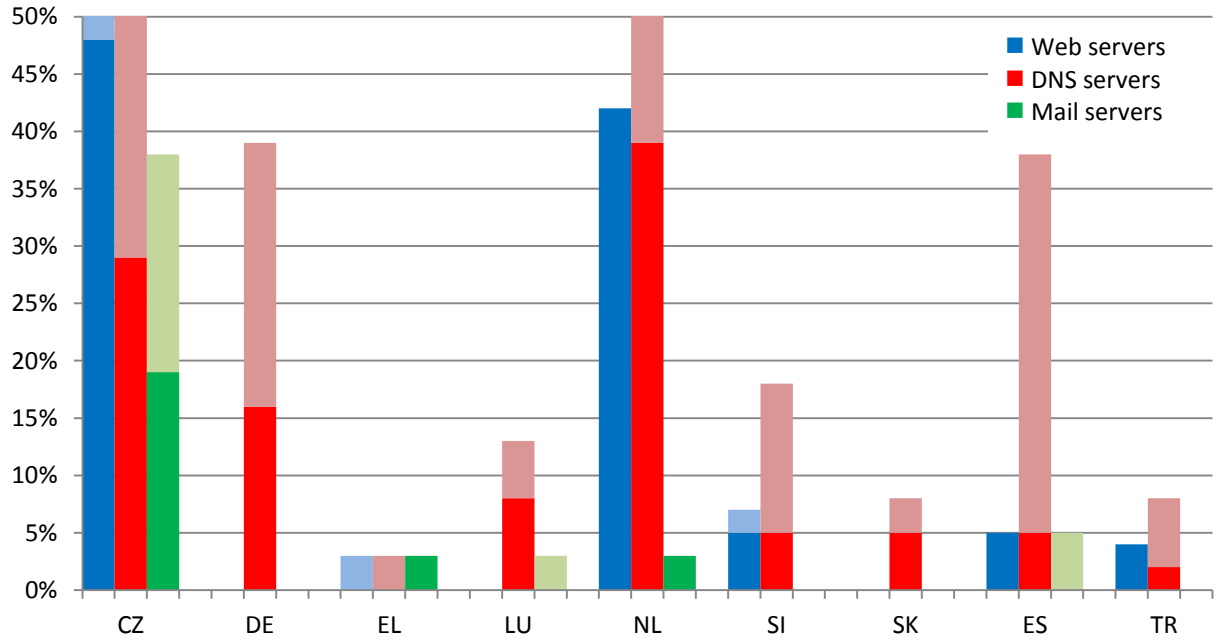
** has IPv6 address, but request is not successful*

2.5. Charts

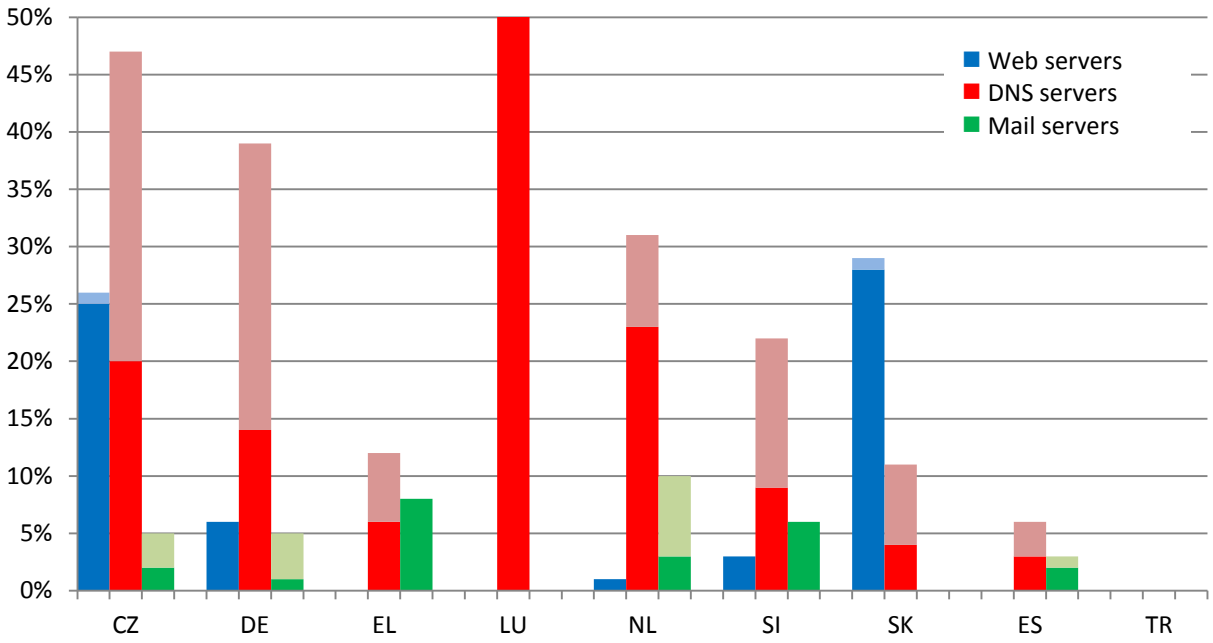
General overview (all levels)



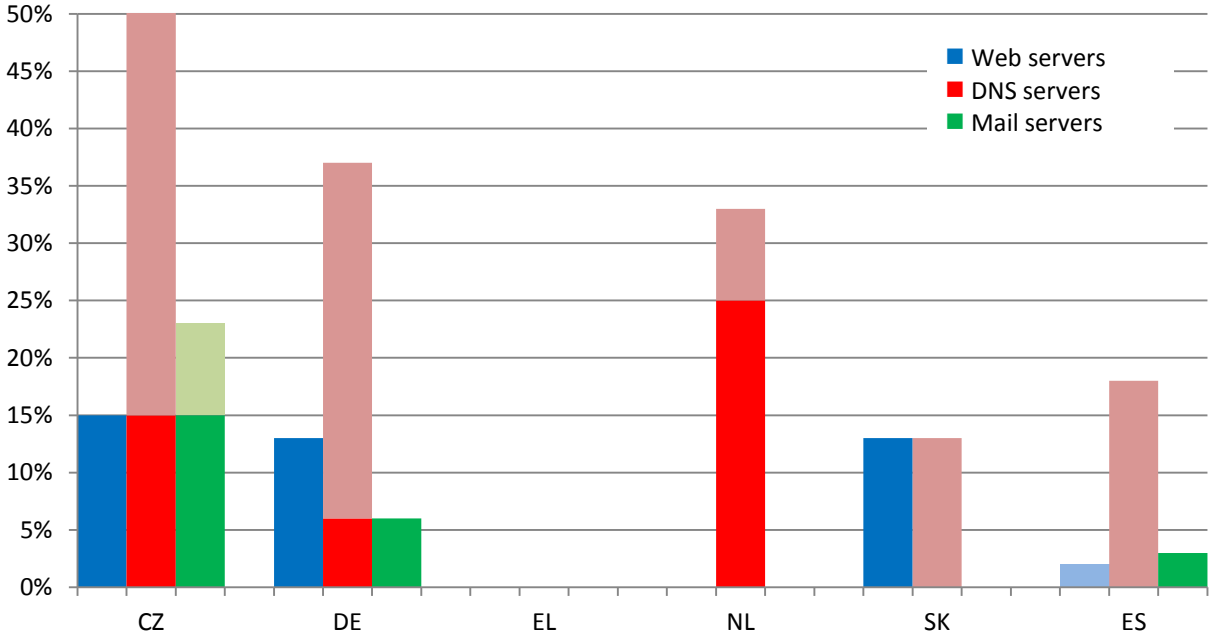
National level



Local level



Regional level



3. CONCLUSIONS

According to the IPv6 Observatory research analysing the 500 most visited websites in individual EU countries, the support of IPv6 implementation reaches 7.1 %, though the situation in each country is rather different. The above-mentioned research shows that e.g. while in the Czech Republic the IPv6 is supported by 13.4 % of the most-visited websites, in Lithuania it is only 4.3 %.

Based on the objectives of the **Digital Agenda for Europe** and especially its **Action Nr. 89**, the GEN6 project made an analysis aimed at IPv6 support at individual public administration bodies at all levels – national, regional and municipal. The data came from eight EU member countries (the Czech Republic, Germany, Greece, Luxembourg, the Netherlands, Slovakia, Slovenia, and Spain) and from Turkey.

Although the research shows the average IPv6 support in public administration is approx. 7 %, i.e. similar to the most visited websites according to the IPv6 Observatory, the analysis unveils that in many states the IPv6 support at public administration bodies is higher than the national average shown by the IPv6 Observatory research. The **leading countries** are especially the **Czech Republic** and **Slovakia**, while the countries with very low public administration support of IPv6 are Luxembourg and Spain. The data also shows big **differences among the levels** themselves. Generally it can be concluded that there is higher support by organisations at the national (central) level and lower at the local government subjects, i.e. cities and municipalities. The example of the Czech Republic and Slovakia shows that with the help of appropriate tools including EU-financed projects it is possible to motivate even those entities, whom Europeans often come in contact with while using many electronic services.

Looking at services, the highest support is traditionally with the DNS servers that have also seen the highest growth (especially in Luxembourg). There has also been a significant growth of support with the e-mail servers. However, compared to the 1Q 2013, there has also been a slight decrease of support with the web servers, or the loss of IPv6 connectivity respectively (especially in Spain). The servers thus have an AAAA records, but the IPv6 request is not successful.

4. REFERENCES

[1] IPv6 Readiness Monitoring Methodology; Deliverable D5.41
http://www.gen6.eu/docs/deliverables/GEN6_PU_D5_41.zip

[2] IPv6 Observatory
http://www.ipv6observatory.eu/

[3] A Digital agenda for Europe; COM(2010)245
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0245:FIN:EN:PDF

[4] The European eGovernment Action Plan 2011-2015; COM(2010)743
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0743:FIN:EN:PDF