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Abstract:

The aim of this document is to inform about the 5th results (for 2Q 2014) 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)
V0.1	11/07/2014	Document creation	Jiří Průša (CZ.NIC)
V0.2	14/7/2014	Review	Uwe Kaiser (FOKUS)
V0.3	15/7/2014	Review	Arjen Holtzer (TNO)
V1.0	28/7/2014	Final Version	Jiří Průša (CZ.NIC)

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 3months, 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.

Currently, the benchmarking study is based on an **in-depth analysis of 2 407 public administration websites** in **9 EU member states** and one **associated country** (Turkey). Based on the recommendations from the February review in Ljubljana, during 2014 the benchmarking has **expanded to Estonia** and thus currently involves 2 non-project countries.

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

In order to present data and GEN6 projects results in a user-friendly way, government benchmarking was included into a CZ.NIC statistical portal and are available in the Czech and English languages as well as at http://stats.nic.cz/stats/gen6/ and http://stats.nic.cz/stats/gen6_by_levels/. These statistics allow all users to generate their own charts, use it as embedded components in their websites as well as get open-data from GEN6 government benchmarking. During the 3Q 2014, this statistical portal will be further developed based on the end-users feedback.

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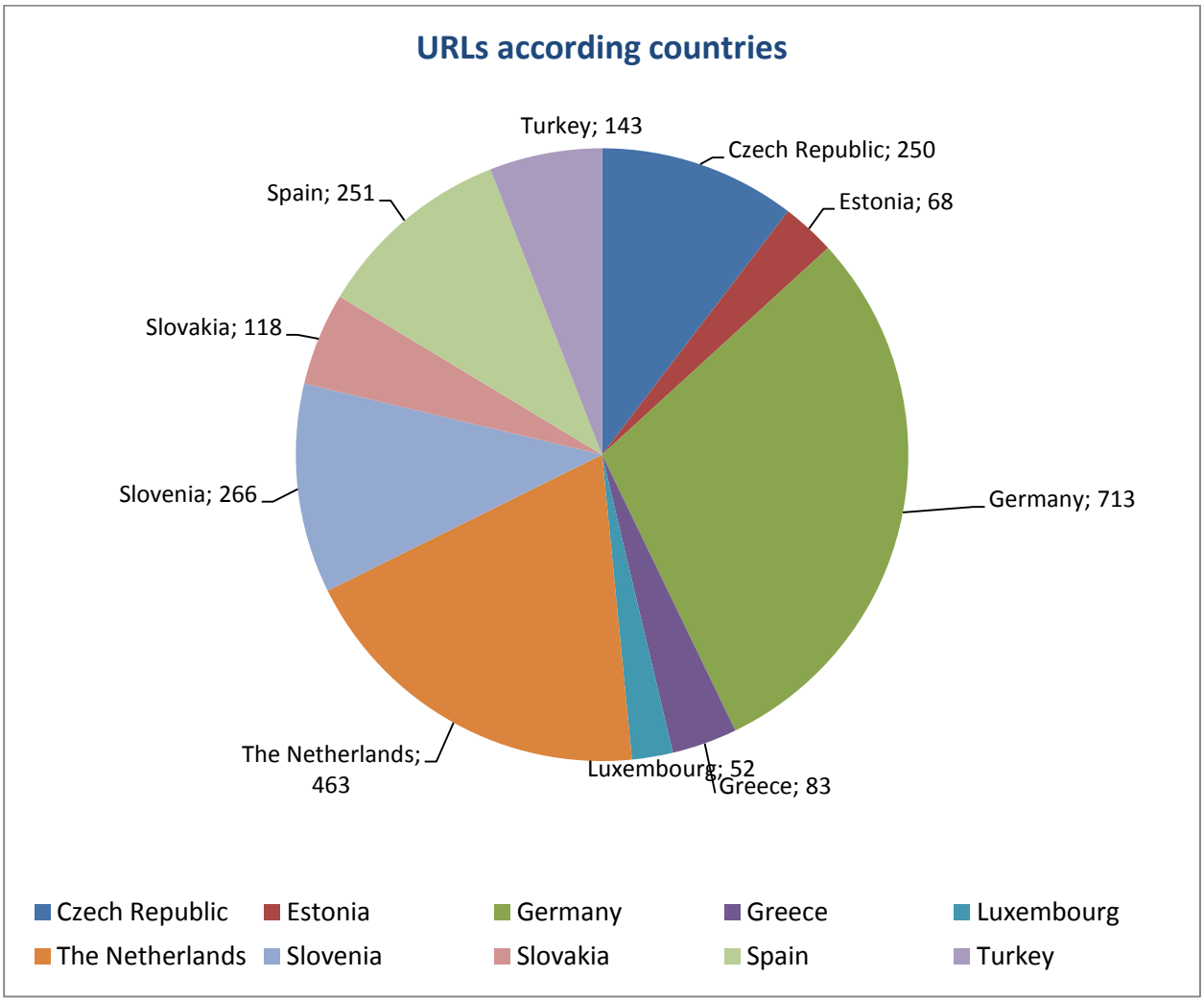
1. THE SCOPE

Based on the common methodology defined in "D5.41 IPv6 Readiness Monitoring Methodology", all partners participating in the 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 GEN6project. During 2014, the benchmarking has expanded to Estonia, another non-project country. Thus, the benchmarking currently involves 10 countries, including two that are not member of the GEN6 project.

In total, 2 407 URLs were collected for the purpose of an IPv6 readiness analysis. These URLs were 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), Slovenia (266) and the Czech Republic (250). Information about the structure of URLs according to country is presented in the following 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 (1 870), followed by the national level (400) and the regional level (137). 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.

The analysis of the provided URLs from each country shows there is no significant difference in the amount of URLs at the national level (between 31 to 55), but there 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 30 June 2014** 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/. In order to present data and GEN6 projects results in a user-friendly way, government benchmarking was included into a CZ.NIC statistical portal and are available in the Czech and English languages as well as at http://stats.nic.cz/stats/gen6/ and http://stats.nic.cz/stats/gen6_by_levels/. These statistics allow all users to generate their own charts, use it as embedded components in their websites as well as get open-data from GEN6 government benchmarking.

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 for illustrating progress made from the measurement from March 2014 (D5.45: IPv6 Readiness Monitoring Results: 1Q 2014).

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	34% (+ 1 pp)	1%	32% (+ 3 pp)	37% (+ 4 pp)	6% (+ 3 pp)	8% (- 1 pp)
Estonia	0%	0%	19% (+ 1 pp)	49%	1%	0%
Germany	6%	0%	14%	30% (+ 3 pp)	2%	4%
Greece	1% (+ 1 pp)	0% (- 1 pp)	2% (- 3 pp)	5% (+ 4 pp)	6%(+ 1 pp)	0%
Luxembourg	0%	2% (+ 2 pp)	17% (+ 2 pp)	6% (+ 2 pp)	2%	0%
The Netherlands	5%	1%	25%	13%	5%	5%
Slovenia	4% (+ 1 pp)	0%	9% (+ 1 pp)	15% (- 2 pp)	4%	0%
Slovakia	18%	1%	5% (+ 1 pp)	4% (- 1 pp)	0%	1%
Spain	2%	1%	3%	10%	2%	2%
Turkey	1% (+ 1 pp)	1%	1%	2% (+ 1 pp)	0%	1%

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	52% (+ 3 pp)	10% (+ 4 pp)	48% (+ 6 pp)	32% (+ 7 pp)	19% (+ 3 pp)	16% (+ 7 pp)
Estonia	0%	0%	22% (+ 2 pp)	65%	0%	0%
Germany	0%	0%	16%	23%	0%	0%
Greece	3% (+ 3 pp)	0% (- 3 pp)	0%	6% (+ 3 pp)	6% (+ 3 pp)	0%
Luxembourg	0%	0%	8%	5%	3%	0%
The Netherlands	45%	3%	39%	21%	3%	0%
Slovenia	5%	2%	5% (+ 1 pp)	16%	0%	0%
Slovakia	0%	0%	5% (+ 2 pp)	3% (- 2 pp)	0%	0%
Spain	9%	2%	4%	28%	0%	4%
Turkey	4%	2%	2%	6%	0%	2%

** 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	33% (+2 pp)	0%	31% (+ 3 pp)	35% (- 2pp)	4% (- 3 pp)	7%
Estonia	0%	0%	43%	43%	14%	0%
Germany	7% (+ 1 pp)	0%	14%	31% (+ 4 pp)	2%	4%
Greece	0%	0%	6% (- 5 pp)	6% (+ 6 pp)	8%	0%
Luxembourg	0%	8%	50% (- 8 pp)	8% (+ 8 pp)	0%	0%
The Netherlands	2%	0%	23%	12%	6%	5%
Slovenia	3%	0%	10% (+ 1 pp)	15% (- 2 pp)	5%	0%
Slovakia	28%	1%	6%	4%	0%	1%
Spain	0%	0%	3%	3%	2%	1%
Turkey	0% (- 1 pp)	0%	0% (- 1 pp)	1% (+ 1 pp)	0%	0%

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

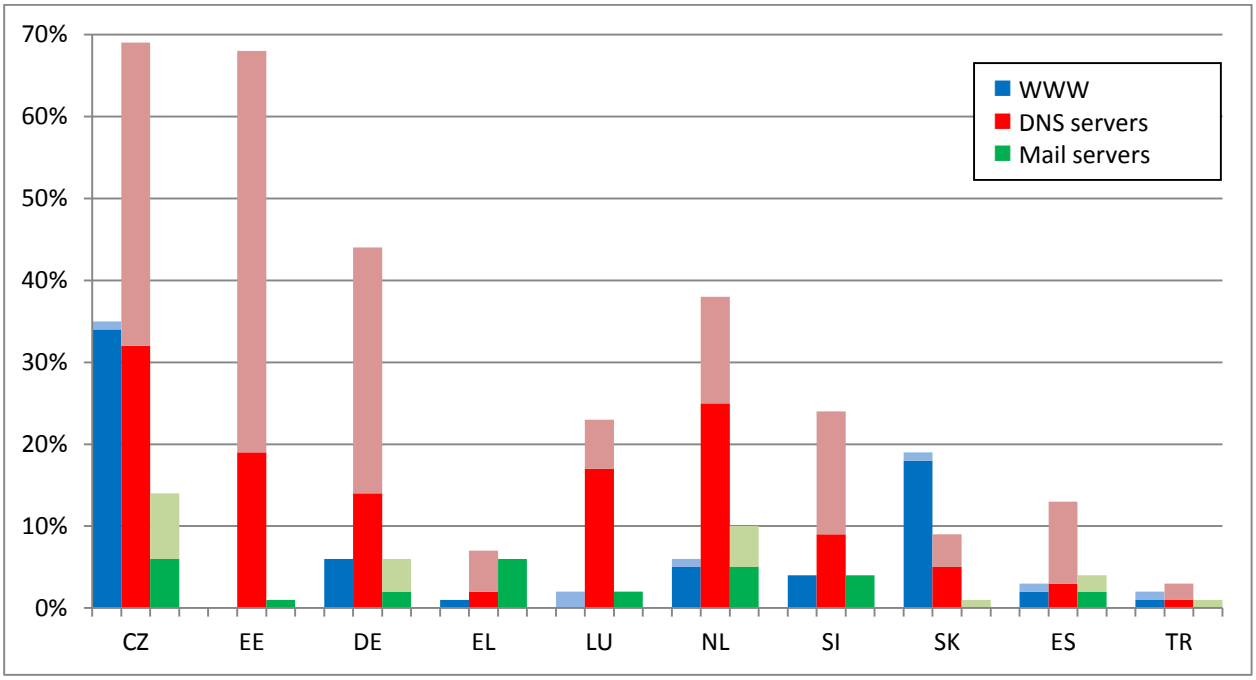
2.4. Regional level

Country	Web servers		DNS servers		E-mail servers	
	Fully supported	Partially supported*	Fully supported	Partially supported	Fully supported	Partially supported
Czech Republic	15%	0%	8%	69% (+ 23 pp)	8%	15%
Estonia	0%	0%	0%	0%	0%	0%
Germany	13%	0%	6%	31%	6%	0%
Greece	0%	0%	0%	0%	0%	0%
The Netherlands	8%	8%	25%	25%	8%	0%
Slovakia	13%	0%	0%	13%	0%	0%
Spain	0%	2%	0%	15%	5%	0%

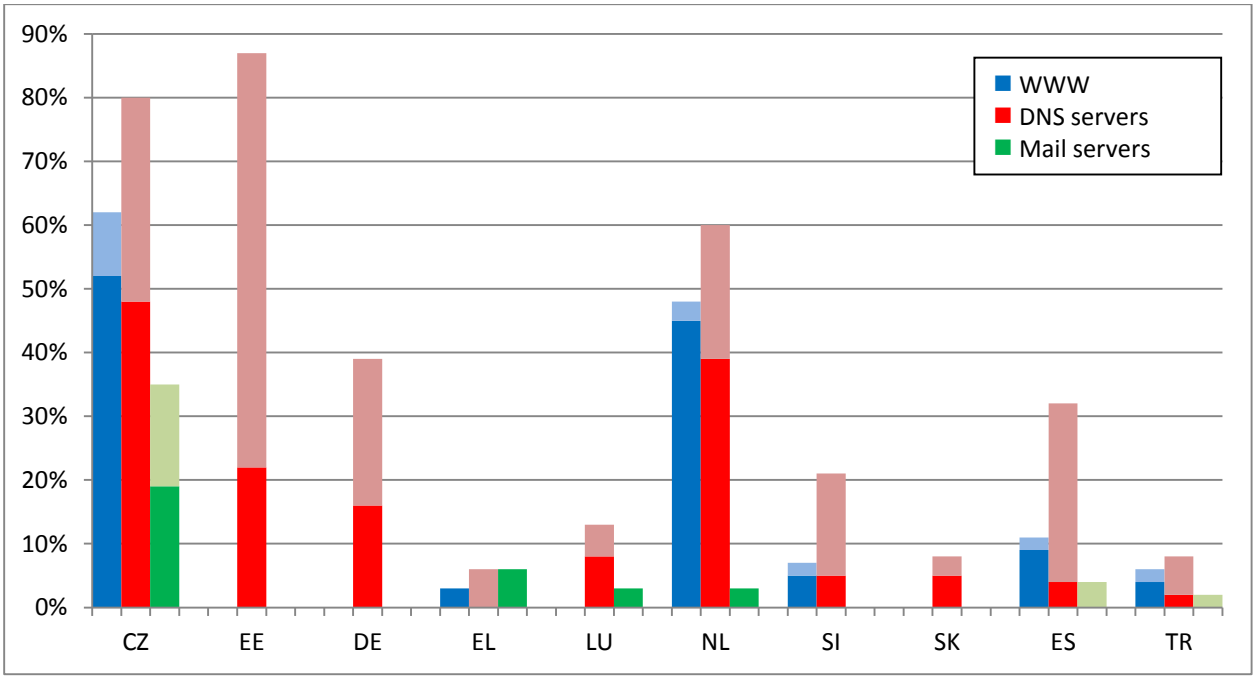
** has IPv6 address, but request is not successful*

2.5. Charts

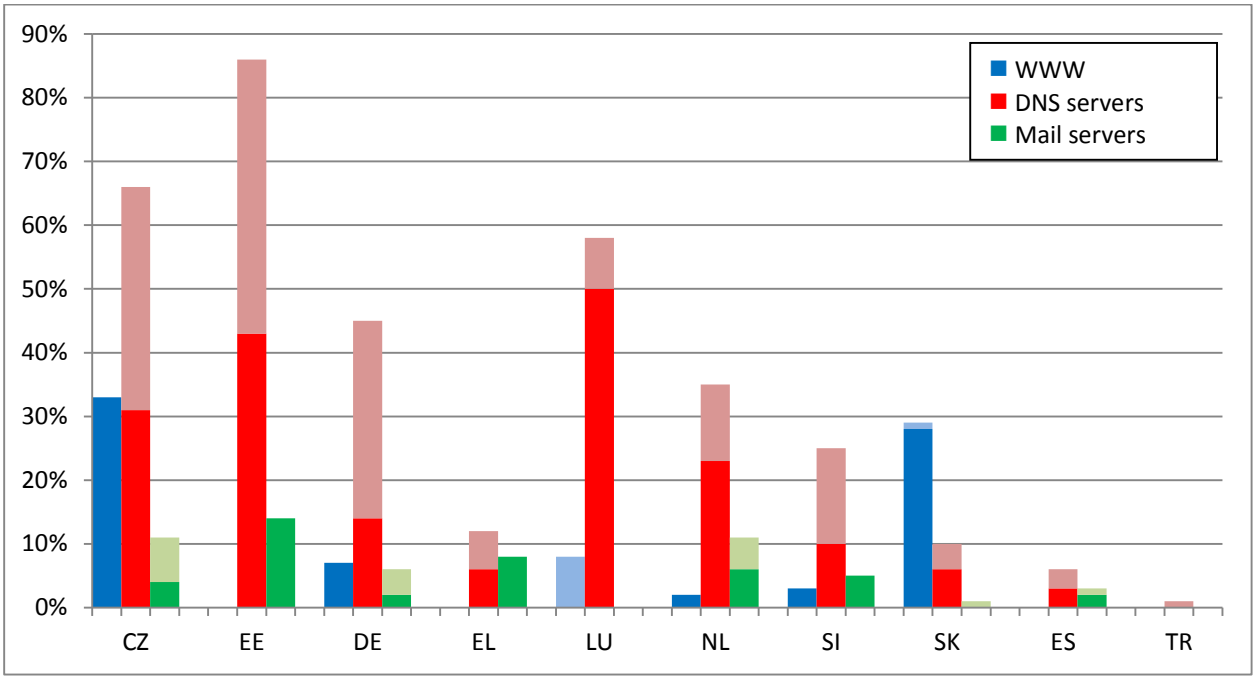
General overview (all levels)



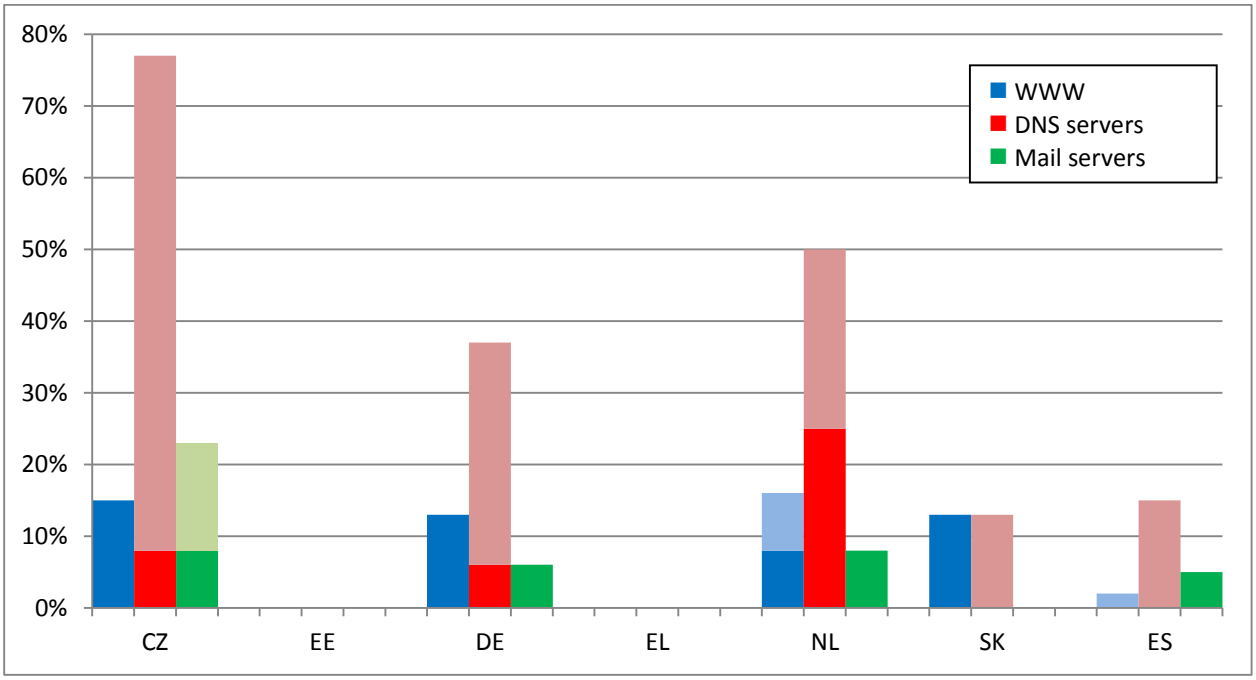
National level



Local level



Regional level



3. CONCLUSIONS

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 nine EU member countries (the Czech Republic, Estonia, Germany, Greece, Luxembourg, the Netherlands, Slovakia, Slovenia, and Spain) and from Turkey.

Compared to the situation in 1Q 2014, we can see general progress in the deployment especially in the Czech Republic and Luxembourg. In case of the Czech Republic, the continuing growth is directly linked with policy measures (especially the December Government Resolution aimed at the obligation of the IPv6 transition) based on the results and within the GEN6 project and the dissemination activities of CZ.NIC.

There was a change at DNES and mail servers noted in some countries, however in most cases it was due to making one name/mail server accessible via IPv4 only, while others (often three) remaining servers support both IPv4 and IPv6, so there is no access restriction for users who have IPv6 network only.

The comparison of individual countries also shows the important role of domain name registrars (often acting as web hosting companies) in IPv6 transition and national registries. It is demonstrated especially at the general overview (all levels), where Slovakia (whose national domain name registry launched IPv6 support quite lately) is the only country with lower IPv6 support at name servers than web servers. The opposite is true in Estonia, whose national registry in cooperation with the registrars strongly supports the IPv6 and therefore the support is very high there. However, there are markedly absent public administration efforts that would lead to IPv6 support also at webservers (and mail servers).

Looking at services, it is pleasant to see a **continuing growth of IPv6 support.** Compared to 1Q 2014, there was recorded an increase by 7 web servers fully supporting IPv6 and additionally 1 with partial support. In case of name servers, there was an increase of 12 institutions with IPv6 on all name servers and 33 on at least one name server. Last but not least, IPv6 deployment increased also at mail servers – 8 new institutions with IPv6 in all MX records and 2 with at least one MX record.

The above mentioned figures clearly demonstrate the **positive impact of dissemination measures in the GEN6 project** and the need to involve policies aspects in the project activities. Compared to pilot projects – dissemination and policies represent cost-effective measures with big impact. In this regard, it will be more than useful to continue with these measures also in 2014 – the last year of the project – and to focus also on countries not involved in the GEN6 project.

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

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