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Abstract:
 The aim of this document is to inform about the 3rd results (for 4Q 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)
v0.1	13/01/2014	Document creation	Jiří Průša (CZ.NIC)
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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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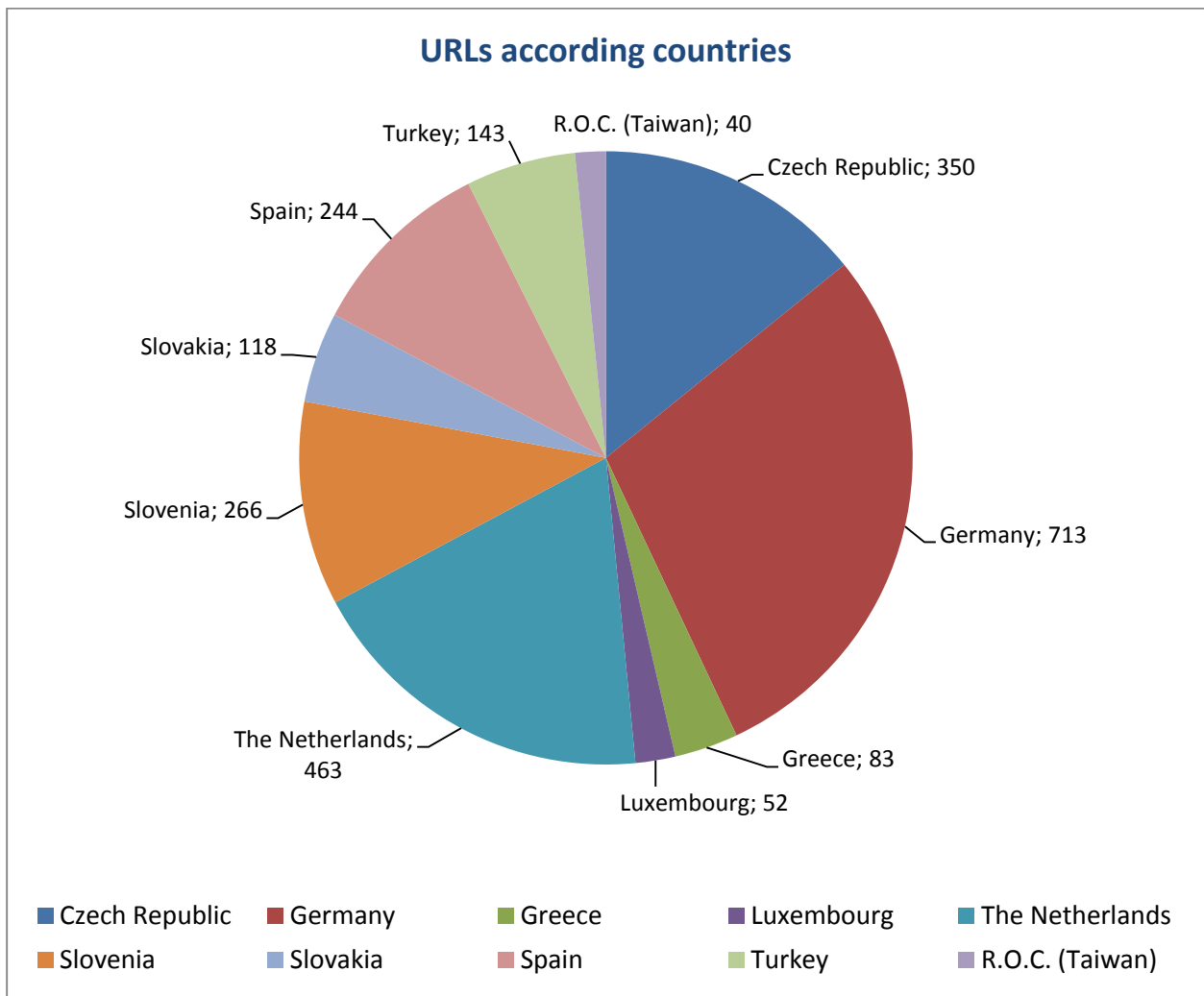
1. THE SCOPE

Based on the common methodology defined in “D5.41 IPv6 Readiness Monitoring Methodology”, all partners participating in 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 GEN6 project. In 4Q 2013, the Republic of China (Taiwan) joined the GEN6 benchmarking on a voluntary basis. Based on a request from the Ministry of Industry and Trade (MoIT) in the Czech Republic, the study expanded also to the private sector, especially the TOP100 companies in the Czech Republic according to their turnover. Results from the companies’ analysis are compared separately for the Czech Republic only.

In total, 2 472 URLs² 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), the Czech Republic (350) and Slovenia (266). Information about the structure of URLs according to country is presented in the following chart.

² Including the R.O.C. (Taiwan) and the TOP100 companies in the Czech Republic



From the public administration's point of view, the largest set of URLs is represented by the local level, that means cities and villages (1 868), followed by the national level (382) 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.

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 31 December 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 for illustrating progress made from the third measurement from September 2013 (D5.43: IPv6 Readiness Monitoring Results: 2Q 2013).

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	29% (+ 1 pp)	3% (+ 2 pp)	19% (- 2 pp)	32% (+3 pp)	5%	6%
Germany	6%	0%	14%	27% (+ 2 pp)	2% (+ 1 pp)	4%
Greece	0%	1%	4% (+ 2 pp)	1% (+ 3 pp)	5%	0%
Luxembourg	0%	0%	19%	4%	0%	2%
The Netherlands	5% (+ 1 pp)	0%	27% (+ 2 pp)	7%	5% (+ 2 pp)	4% (- 2 pp)
Slovenia	3%	0%	9%	13%	5%	0%
Slovakia	18%	1%	5% (+ 1 pp)	7% (+ 1 pp)	0%	1% (+ 1 pp)
Spain	1%	0%	3%	13% (- 2 pp)	3% (+ 1 pp)	2% (- 1 pp)
Turkey	1%	1% (+ 1 pp)	1%	2% (+ 1 pp)	0%	1% (+ 1 pp)
R.O.C. (Taiwan)	63%	25%	30%	28%	23%	13%

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% (+ 4 pp)	10% (+ 7 pp)	32% (+ 3 pp)	39% (+ 4 pp)	23% (+ 4 pp)	23% (+ 4 pp)
Germany	0%	0%	16%	23%	0%	0%
Greece	0%	3%	0%	3%	3%	0%
Luxembourg	0%	0%	8%	5%	0%	3%
The Netherlands	42%	0%	42% (+ 3 pp)	15%	3%	0%
Slovenia	5%	2%	9%	11%	0%	0%
Slovakia	0%	0%	5%	3% (- 10 pp)	0%	0%
Spain	5%	0%	5%	36% (+ 3 pp)	0%	5%
Turkey	4%	2% (+ 2 pp)	2%	6%	0%	2% (+ 2 pp)
R. O. C. (Taiwan)	57%	29%	23%	35%	20%	11%

* 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	26% (+ 1 pp)	2% (+ 1 pp)	18% (- 2 pp)	30% (+ 3 pp)	2%	3%
Germany	6%	0%	14%	26% (+ 1 pp)	2% (+ 1 pp)	4%
Greece	0%	0%	8% (+ 2 pp)	0% (- 6 pp)	8%	0%
Luxembourg	0%	0%	58%	0%	0%	0%
The Netherlands	1%	0%	26% (+ 2 pp)	6% (- 1 pp)	5% (+ 2 pp)	5% (- 2 pp)
Slovenia	3%	0%	10% (+ 1 pp)	13%	6%	0%
Slovakia	28%	1%	6% (+2 pp)	8% (+ 1 pp)	0%	1% (+ 1 pp)
Spain	0%	0%	3%	4% (+ 1 pp)	3% (+ 1 pp)	1%
Turkey	0%	0%	1% (+ 1 pp)	1% (+ 1 pp)	0%	0%
R. O. C. (Taiwan)	100%	0%	80%	0%	40%	20%

* 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% (- 7pp)	54%	8% (- 7 pp)	15% (+ 7 pp)
Germany	13%	0%	0% (- 6 pp)	38% (+ 7 pp)	6%	0%
Greece	0%	0%	0%	0%	0%	0%
The Netherlands	8% (+ 8 pp)	0%	25%	8%	0%	0%
Slovakia	13%	0%	0%	13%	0%	0%
Spain	0%	2%	0%	20% (+ 2 pp)	5% (+ 2 pp)	0%

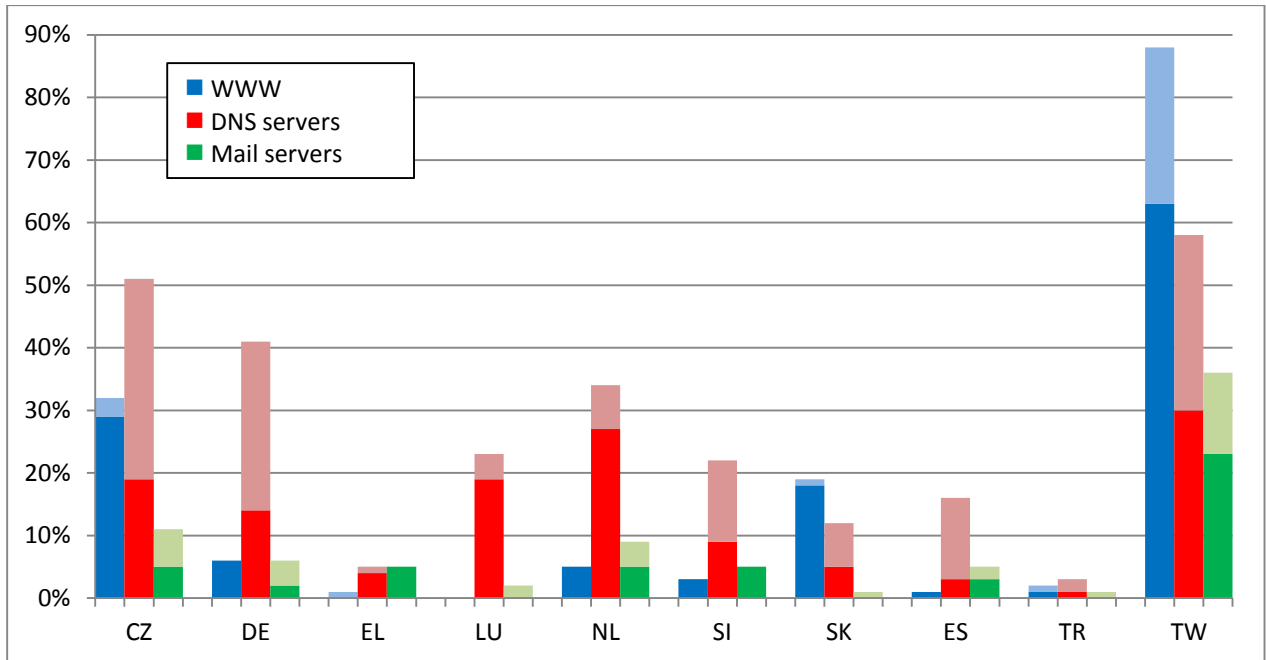
* has IPv6 address, but request is not successful

2.5. Most important companies (TOP100)

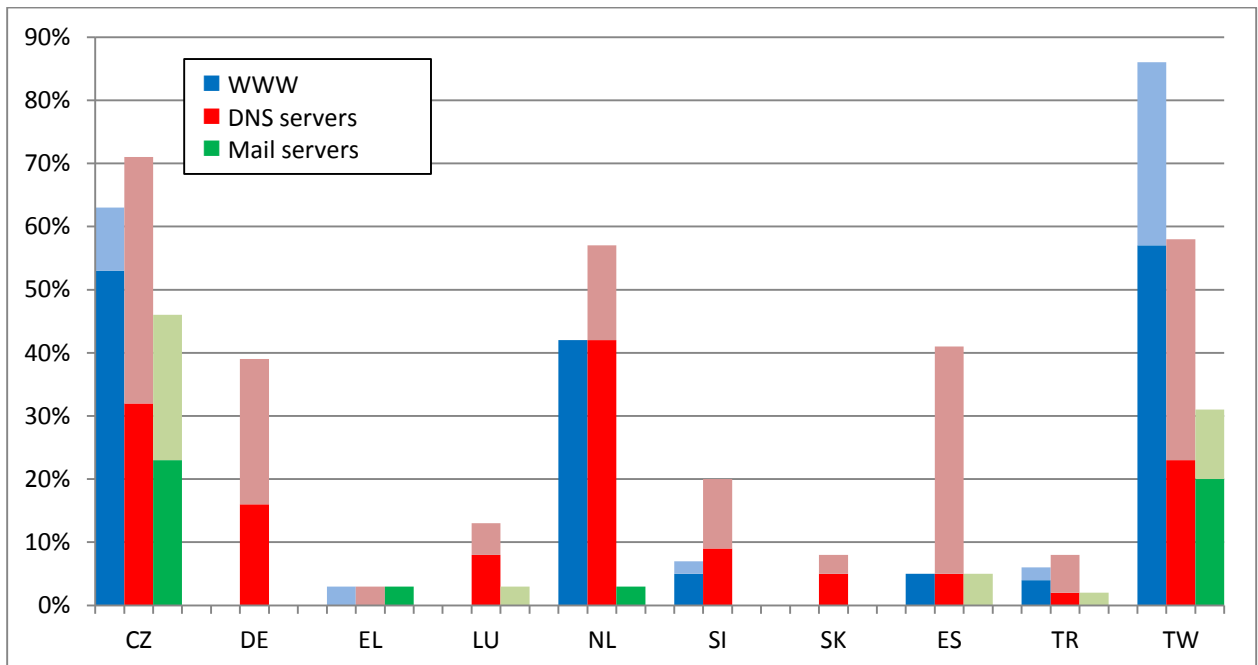
Country	Web servers		DNS servers		E-mail servers	
	Fully supported	Partially supported*	Fully supported	Partially supported	Fully supported	Partially supported
Czech Republic	5%	0%	19%	24%	3%	2%

2.6. Charts

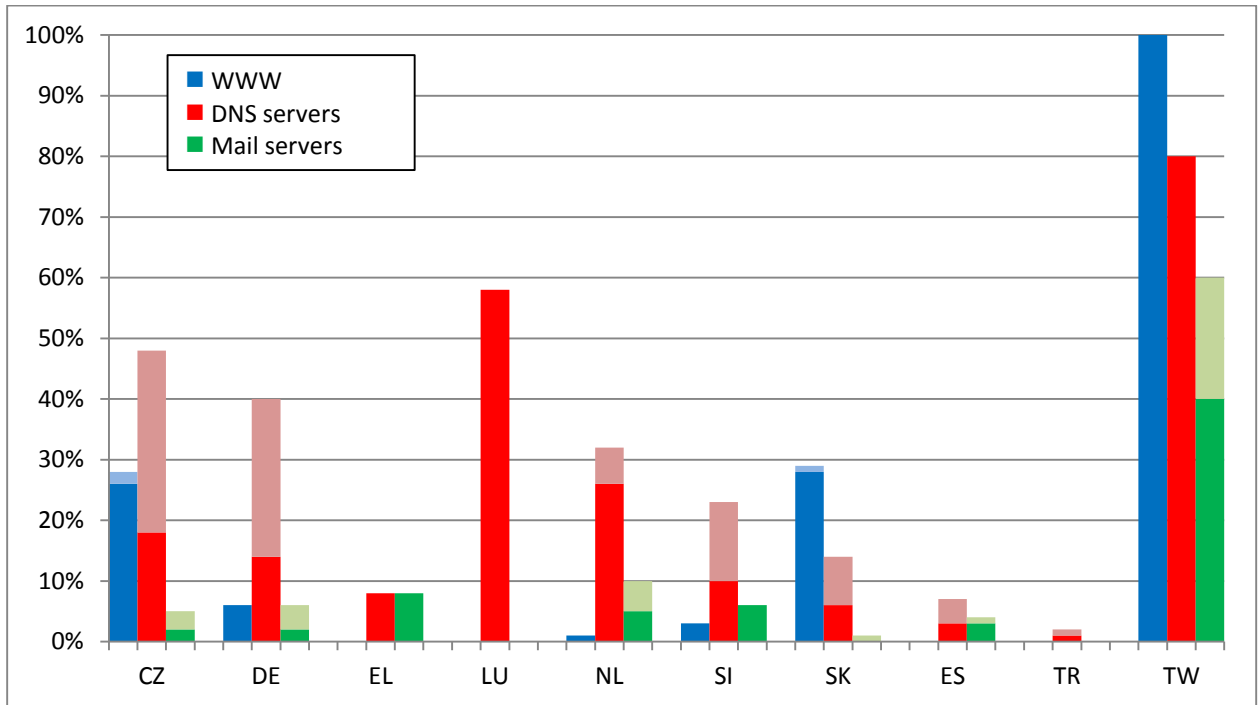
General overview (all levels)



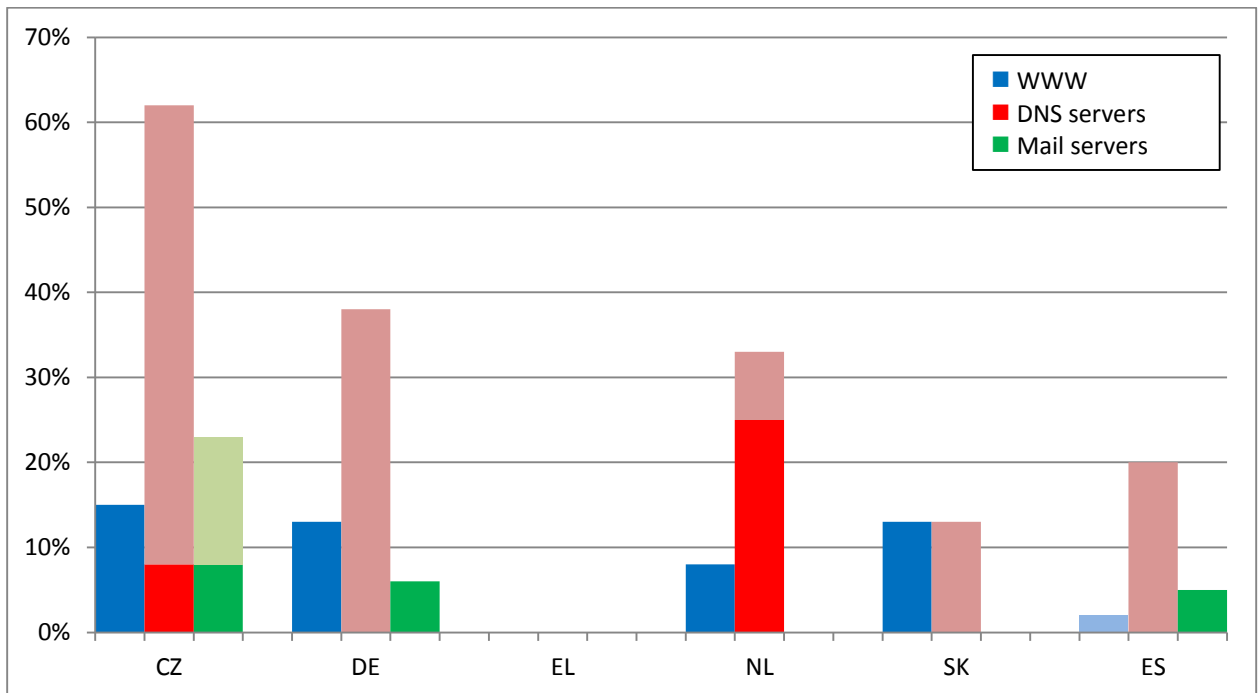
National level



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 eight EU member countries (the Czech Republic, Germany, Greece, Luxembourg, the Netherlands, Slovakia, Slovenia, and Spain) and from Turkey. In 4Q 2013, the Republic of China (Taiwan) joined the GEN6 benchmarking on a voluntary basis. Based on a the request from the Ministry of Industry and Trade (MoIT) in the Czech Republic, the study expanded also to the private sector, especially the TOP100 companies in the Czech Republic. These new data enable to compare the situation in public administration in Europe with one Asian country and with the state of play in the business sector.

Comparing the situation at the end of 2013 with the first measurement made in March 2013, there is a **tangible progress made in IPv6 deployment**. In case of web servers, we recorded full IPv6 on 19 new web servers, out of which 14 in the Czech Republic. A deeper analysis of the benchmarking results and national IPv6 policies shows a tremendous impact of the Government Resolution, which is possible to demonstrate on figures at central government organisations that are directly affected by the government resolution. In this respect, we can expect further progress in 2014 thanks to the adoption a new government resolution on 18 December 2013. In the Czech Republic, we can also see a huge IPv6 support by public administration, which is several times higher than in the business sector, which is usually a leader in implementing new technologies.

In case of **Germany**, there is a significant increase of IPv6 support on DNS servers: 45 institutions (increased by 7 pp) implement IPv6 support on at least one name server.

Looking at services, it is pleasant to see a **still growing IPv6 support on mail servers** (70 MX records on all servers at the end of 2013 comparing with 41 in March 2013), as they represent one of the weak points of IPv6 deployment in public administration.

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>
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<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0743:FIN:EN:PDF>