

IPv6 Transition Works in Turkey and Experiences of ICTA

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MENOG 7

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OUTLINE

- **Transition to IPv6 in the World**
- **Transition to IPv6 in Turkey: a short history**
- **Design of National IPv6 Infrastructure and Transition to IPv6 Protocol Project**
 - **Project Overview**
 - **The Project's Objectives**
 - **The Project's Outputs**
- **ICTA's deployment experience**
 - **Milestones**
 - **Lessons learned**
 - **Challenges**
- **Conclusion**

Transition to IPv6

- Increasing Internet usage -> increasing demand for IP addresses
- BUT; IPv4 address blocks left unallocated in IANA= 5 %
- Many initiatives at national and international levels;
 - USA:2005 ->“Memorandum For the Chief Information Officers”
2008 ->“Planning Guide/Roadmap Toward IPv6 Adoption within the US Gov.”
 - Germany: 2009 -> “National IPv6 Action Plan”
 - Others: Australia, India, Singapore, China, Japan, Korea, etc.
 - EU: 2008 ->“Action Plan for the Deployment of IPv6 in Europe”
 - ITU: 2008 -> WTSA, Res. 64, “IP address allocation and encouraging the deployment of IPv6”
 - OECD: 2008-> “The Seoul Declaration for the Future of the Internet Economy”



IPv6 in Turkey: a short history

- **2003:** TUBİTAK ULAKBİM (*Turkish Academic Network & Information Center*) started performing researches on IPv6 and ULAKNET (*National Academic Network*) connected to GEANT (*pan-European data network dedicated to the research and education community*) through IPv6.
- **2007:** ICTA (Turkish Information and Communication Technologies Authority) and ULAKBİM signed a protocol to make research on IPv6 based technologies
- **2007:** IPv6 Forum Turkey was established (became a member of IPv6 Forum International in 2010)
- **2009:** “Design of National IPv6 Infrastructure and Transition to IPv6 Protocol Project” was started (to be completed in 2011)
- **2009:** E-Transformation Turkey Executive Board’s Decision No.27 was published. It gives ICTA the missions of raising awareness, preparing a road map and to develop measures and policy proposals regarding the transition to IPv6 with collaboration of all related stakeholders.

Current Status

- # of ISPs with allocated IPv6 prefixes = 17 (total # of ISPs = 110)
- Total # of allocated IPv6 prefixes for Turkey = 26
- Total # of visible prefixes for Turkey = 3

LG	Prefix	tld	NetName	Owner	AS	S	Allocated	First seen	Seen by	Last seen (*)
LG	2001:930::/32	TR	TR-KOCNET-20021004	KocNET	8386	A	2002-10-04	2009-06-22 18:17:32	100%	2010-09-29 13:17:45
LG	2001:a98::/32	TR	TR-ULAKBIM-20030114	Ulakbim	8517	A	2003-01-14	2003-05-30 16:13:22	100%	2010-09-29 13:17:45
LG	2001:1b68::/32	TR	TR-ESERTELEKOM-20040...	Eser Telekom		A	2004-05-07		0%	never
LG	2a00:de8::/32	TR	TR-TR-NET-20081107	TR.NET Orta Dogu Yazilim ...		A	2008-11-07		0%	never
LG	2a00:1880::/32	TR	TR-RTNET-20091215	Vodafone Turkey IPv6 Allo...		A	2009-12-15		0%	never
LG	2a00:1d30::/32	TR	TR-TTNET-20100312	TTNet A.S.		A	2010-03-12		0%	never
LG	2a00:1d58::/32	TR	TR-TURKSAT-UYDU-KABL...	Turksat Uydu Haberlesme v...		A	2010-03-15		0%	never
LG	2a00:1f90::/32	TR	TR-ISNET-20100422	Is Net A.S.		A	2010-04-22		0%	never
LG	2a01:188::/32	TR	TR-SUPERONLINE-20060...	Superonline International...	6822	A	2006-08-07		0%	never
LG	2a01:358::/32	TR	TR-TELEKOM-20070516	Turk Telekom	9121	A	2007-05-16	2008-04-25 16:17:29	100%	2010-09-29 13:17:46
LG	2a01:718::/32	TR	TR-BNET-20071228	Borusan Telekom ve Iletis...		A	2007-12-28		0%	never
LG	2a01:720::/32	TR	TR-ADANET-20071231	ADA-NET Internet ve Ileti...		A	2007-12-31		0%	never
LG	2a01:730::/32	TR	TR-TELETEK-20080108	Teletek Telekomunikasyon ...		A	2008-01-08		0%	never
LG	2a01:748::/32	TR	TR-METEKSAN-20080114	Meteksan Net Iletisim Hiz...		A	2008-01-14		0%	never
LG	2a01:790::/32	TR	TR-RADORE-20080123	Radore Hosting		A	2008-01-23		0%	never
LG	2a02:50::/32	TR	TR-IHLASNET-20080215	Ihlas Net		A	2008-02-15		0%	never
LG	2a02:e0::/32	TR	TR-BILISIMTELEKOM-20...	Tellcom Iletisim Hizmetle...		A	2008-02-27	2010-05-12 19:32:41	0%	2010-09-27 01:02:47
LG	2a02:178::/32	TR	TR-DEMIRBANK-2008031...	HSBC INTERNET VE TELEKOMU...		A	2008-03-17		0%	never
LG	2a02:268::/32	TR	TR-GARANTITEK-200804...	Garanti Technology		A	2008-04-09		0%	never
LG	2a02:480::/32	TR	TR-DORUK-NET-2008060...	DORUK-NET		A	2008-06-06		0%	never
LG	2a02:4e0::/32	TR	TR-TURKCELL-20080618	Turkcell Iletisim Hizmetl...		A	2008-06-18		0%	never
LG	2a02:f80::/32	TR	TR-MAYANET-20090602	Maya Iletisim Ticaret Lim...		A	2009-06-02		0%	never
LG	2a02:ff0::/32	TR	TR-SATKO-20090615	TurkNet Iletisim Hizmetle...		A	2009-06-15		0%	never
LG	2a02:2010::/32	TR	TR-ARIA-20100625	Avea Iletisim Hizmetleri ...		A	2010-06-25		0%	never
LG	2a02:2020::/32	TR	TR-CIZGI-20100628	Cizgi Bilgisayar Sistemle...		A	2010-06-28		0%	never
LG	2a02:2460::/32	TR	TR-OGERTELECOM-20100...	Oger Telecom Yonetim Hizm...		A	2010-09-20		0%	never
LG	3ffe:82d0::/28	TR	OXYGEN/TR		15897	C	2001-12-04		0%	2005-04-15 23:02:17

(Ref: www.sixxs.net/tools/grh/dfp/all/?country=tr , 29.09.2010)

“Design of National IPv6 Infrastructure and Transition to IPv6 Protocol Project”



Project Overview:

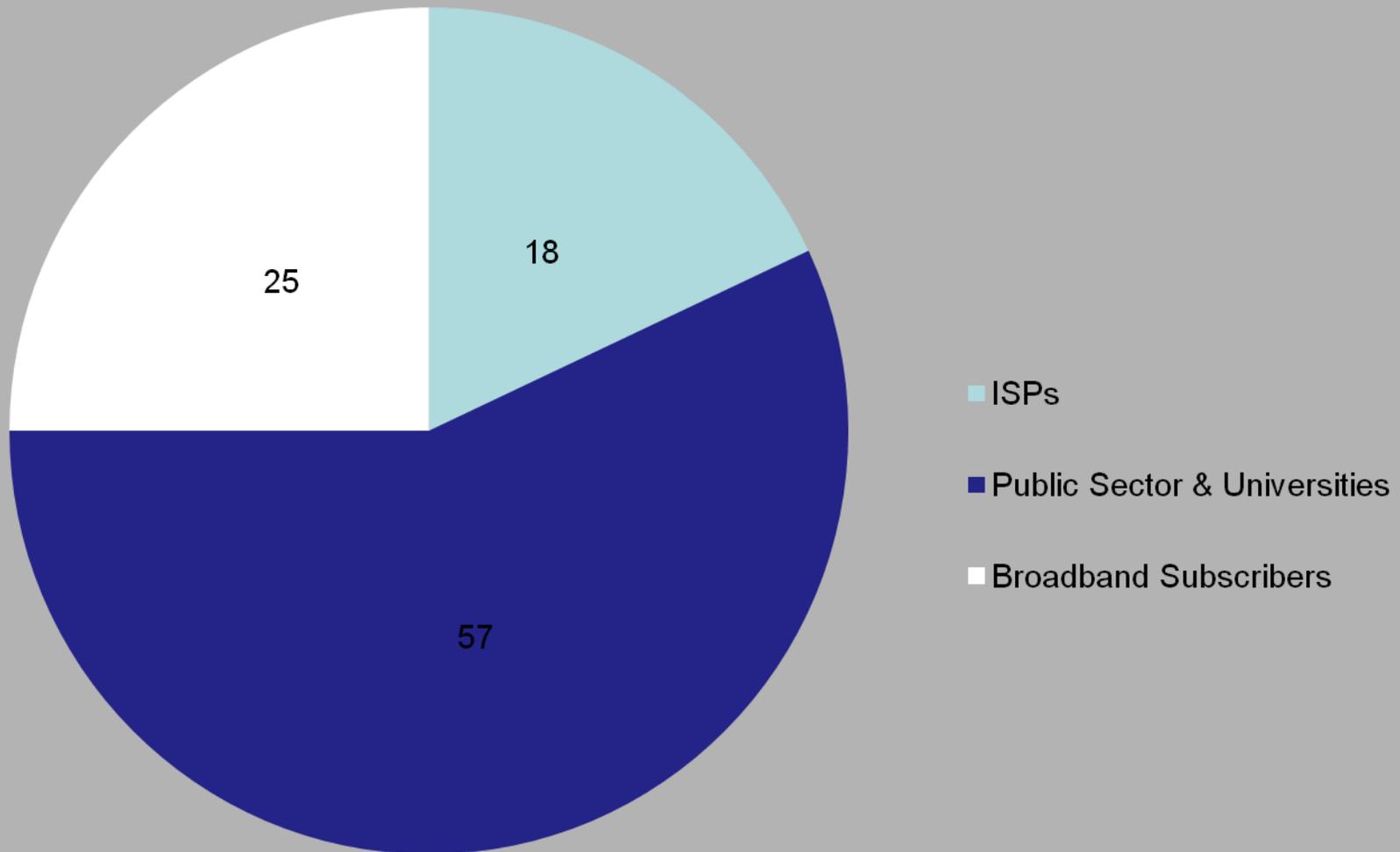
- As an R&D project funded by TUBITAK (The Scientific & Technological Research Council of Turkey)
- Total budget = 500.000 €
- # of researchers involved > 30
- Period of the project = 2 years (Feb 2009-Feb 2011)
- Supported by ICTA as the customer
- Carried out under the coordination of ULAKBİM with the participation of Gazi University & Çanakkale 18 Mart University

Project Objectives:

- To draw a road map for the IPv6 transition process for Turkey
- To research security problems that could be faced during & after transition period
- To test applicability of advanced IPv6 services
- To gain & increase IPv6 know-how at national level
- To raise awareness about IPv6

“Design of National IPv6 Infrastructure and Transition to IPv6 Protocol Project”

IPv6 Transition Cost in Turkey for Years 2011-2016 =
515.417.000 €



- Cost analysis for IPv6 transition in Turkey is done

ICTA's deployment experience

- **2006:** ICTA started to require IPv6 compatibility in its IT hardware and software procurements.
- **2009:** IT personnel took a training about IPv6 operation, IPv6 transition mechanisms, security issues, etc
- **February 2010:** ICTA decided to make its IT infrastructure IPv6-enabled and transition works were started under the consultancy of ULAKBIM.
- **The aims:**
 - To avoid risks that may arise as a result of unplanned implementation of IPv6
 - To gain experience on IPv6 operation in a timely manner
 - To lead by example and to share first-hand experiences with other public sector institutions
 - To trigger our ISP for starting to offer IPv6 services and to make it ready, both technically and administratively, for IPv6 service requests coming from other customers

ICTA's deployment experience

Milestones (in 2010):

Step 0 Meet with the management, discuss the requirements, explain risks

- IPv6 deployment is not just a simple upgrade of an infrastructure, it should be regarded as a project (get approval of top management)
- Hardware/Software upgrade may be needed
- Extra time is needed for IT staff, so their job schedule should be arranged
- Deployment may cause service interruptions
- Inventory analysis is required to define the roadmap of transition

ICTA's deployment experience

Milestones (in 2010):

Step 1, February: IPv6 address and IPv6 connection request was sent to the ISP

- Turkish ISPs do not offer any commercial IPv6 connection service yet
- They claim “we do not have a single customer IPv6 address/connection request”, so we wanted to see what happens if someone requests IPv6 address
- We wanted to brake chicken and egg problem (no offer because of no request/ no request because of no offer)

ICTA's deployment experience

Milestones (in 2010):

Step 2 March:

- **Inventory analysis: IPv6 compatibility status of web, dns and e-mail services in the DMZ region and network & security components was reported**
 - **The result: Only IPS (Intrusion Prevention System) device was incompliant**
- **What to enable IPv6?**
 - **Decision: first services, then user computers**
- **Which services are to be offered IPv6-enabled and how?**
 - **Decision: web (face is first), dns and e-mail services (first in test environment, then in production)**
- **Analysis of transition mechanism: Which method would be the most convenient one for ICTA?**
 - **Decision: “dual-stack”**

ICTA's deployment experience

Step 3 April: IPv6 address block was assigned to ICTA and works to provide IPv6 connection service were started by ISP (bc ICTA was the first customer asking IPv6 service)

Step 4 June: Official procurement procedure for IPS device was started (still goes on)

- Should we wait for IPS to make connection ?-> Decision: NO
- By pass IPS to make tests on a separate Test LAN

Step 5 August: IPv6 connection service is ready to be offered to ICTA

- Connection is given on a separate link to minimize the service interruption
- Connection is made, first IPv6 ping
- IPv6 DNS service is provided by ULAKBIM

ICTA's deployment experience

Step 6 September: IPv6 address planning, Enabling L3 switches & routers IPv6

Step 7 October: Enabling firewall IPv6

What is next?

- Tests are to be completed in 4 months
- All services available for public access are to be IPv6-enabled by August 2012 latest

ICTA's deployment experience

Lessons learned so far:

- It is good that we started IPv6 works now because we have time
 - to upgrade incompliant equipment
 - to take necessary trainings
 - to test IPv6-enabled services
- It is good that we have been looking for IPv6 compatibility requirement in IT procurements since 2006; in that way costs will be minimized
- Lack of skill shortage in IPv6 would be a great obstacle unless ULAKBIM weren't our consultant

ICTA's deployment experience

Challenges:

- **Being the first customer requesting IPv6 service**
- **Reluctance of IT staff**
- **Complexity of public procurement procedures**

Conclusion

- **Everyone has a part to play in IPv6 transition**
- **What can governments do?**
 - **Awareness raising**
 - **Public procurement requirements**
 - **Investments in test beds**
 - **Preparing road maps**
 - **Leading by example**

THANK YOU

IPv6 Conference, 12-13 Jan 2011

Ankara, Rixos Grand Hotel

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