



International Telecommunication Union



IPv6 Benchmarking

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FCCN

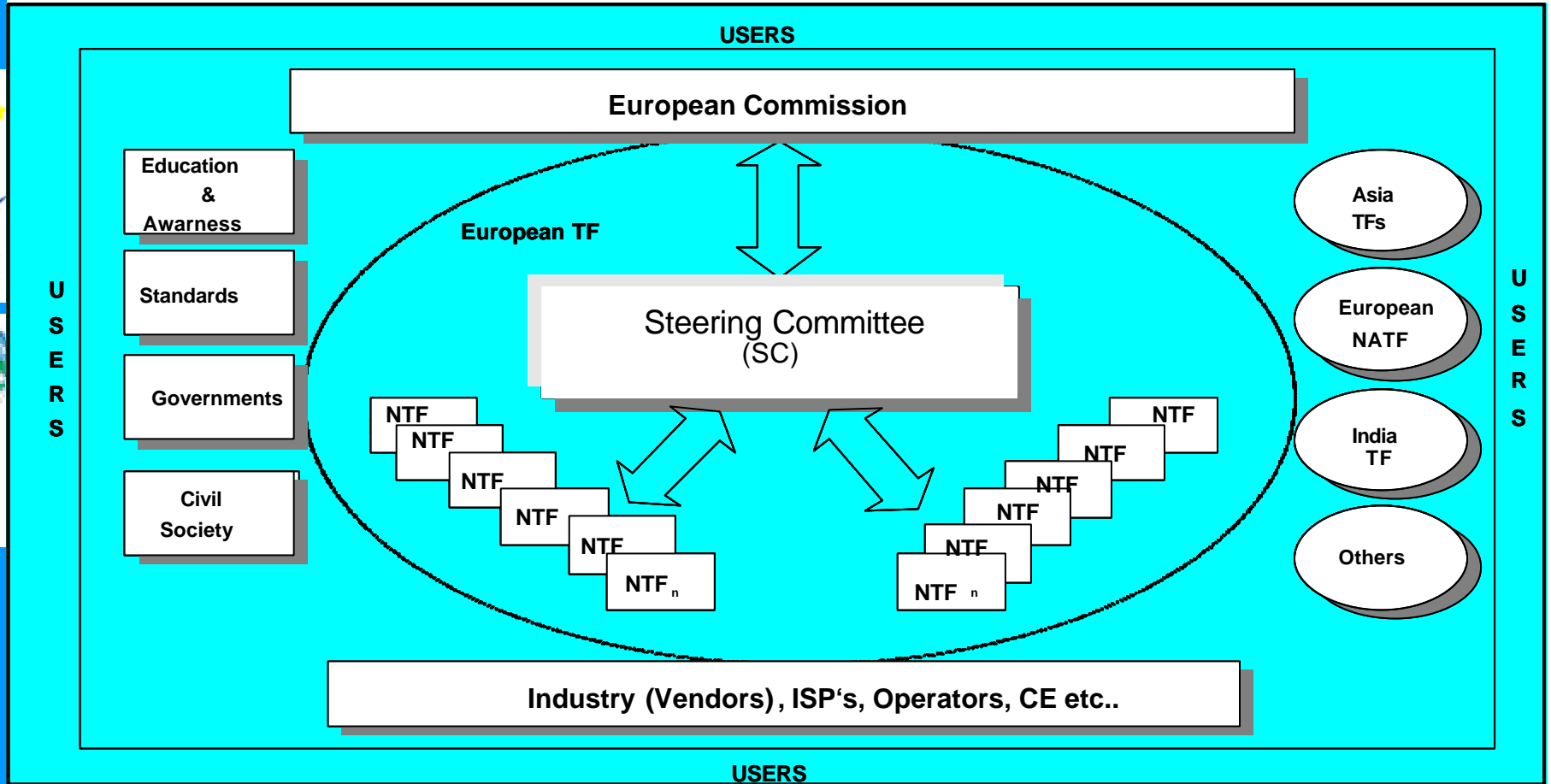
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I. Background

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All Inclusive Approach

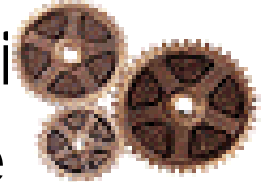


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Evaluate and Workout Local Reality

- Identify specific problems (questionnaire)
 - draw and implement a plan to solve them
- Setup a strategic group with representatives of the key players - *inclusive market approach*
- Leverage existing initiatives and expose to the market - *demonstrate that is up and running!*
- Evaluate progress against the roadmap - *benchmarking*





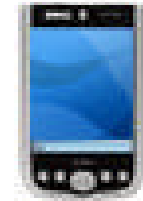
II. The Benchmarking Process

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Topics Covered



- o Connectivity
- o Basic Services
- o Applications
- o Infrastructure/Hardware
- o Training
- o NTF Membership
- o Available IPv6 Internet Services



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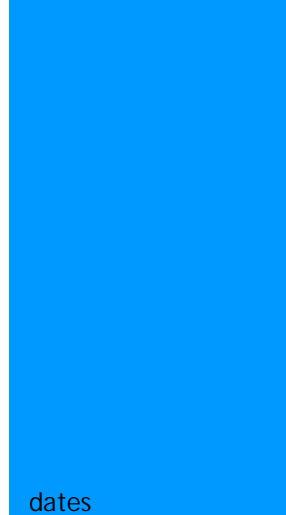
Why these Metrics...



- o Connectivity
 - Address Allocations by RIRs
 - ASNs seen on Global Routing Table
 - IPv6 @ Internet eXchanges
- o Services
 - DNS, structural Internet service
 - Availability via IPv6
- o Infrastructure/Hardware
 - Find and help solve «missing links»



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Why These Metrics...

- o Applications
 - ...are the final purpose of any technology
- o Training
 - Awareness Factor
 - IPv6-capable professionals needed
- o NTF Membership
 - Know more about the critical mass involved in promoting IPv6



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Status Gathering – How to?

- Focus on Numbers & on «Feelings about IPv6» Evolution
- Automatic Scripts
 - Collected data in Nov' 2004
 - Collected data in Apr' 2005
- Input from NTFs
 - Generic Questionnaire
 - Forward input from each nTF member
 - Weak cooperation, so far



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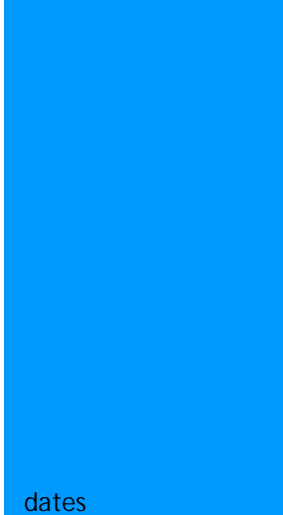
NTFs are currently a difficulty...

- We need MORE of them!
- Only 14 were recognized
- Missing NTFs in:

- Greece
- Ireland
- Czech Republic
- Baltic Countries
- Norway
- ...and unfortunately more...



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dates

III. Benchmarking Results

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Portuguese Questionnaire (1)

Question	Mobile	ISPs	Cable	Fixed
Is transition to IPv6 depending on Technical aspects	Yes, it represents more than half of the problem			Yes (!)
Stable standards (MIP and UMTS)	Still a problem	Yes (!)	Still a problem	
DNS functionality - Still a problem?	Concerns on configuration and interoperability with IPv4			
Network Access	Each tech needs to be certified			
	Lack/cost		Lack/cost	
Security (IPSec, Firewalls, NATs)	IPSec helps; Lack of Firewalls			
		NAT bad	NAT good	NAT good
Interoperability constraints	No (!)	Yes (!)	No (!)	Yes (!)
Impact on Network architecture	Yes	Yes (!)	Yes	Yes (!)

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Portuguese Questionnaire (2)

Question	Mobile	ISPs	Cable	Fixed
IPv6 Appl. (Lack of) IPv6 helps new Applications?	Yes			
	P-2-p	Yes	Yes (!)	Yes (!)
Equipment, including CPE	Reduced offer			Lack of compatib
Transition Date	2010	2010	2015	2010
Is IPv6 Important for your activity?	Will be (!)	Will be	Will be (!)	Will be
You have IPv6 Address for what?	Yes (1) Testing	Yes (1) Start service	No	Yes Testing
Clear advantages beyond addr. space	Yes/no - No conclusion			
There are market or economic barriers to implement IPv6?	Yes, transition costs: new equipment, net management			
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Results of the IPv6 Questionnaire @ Portugal

o Main Conclusions

- Lack of knowledge and perception towards IPv6 in a few players
- Very few benefits seen along with technical and market barriers

o What to do?

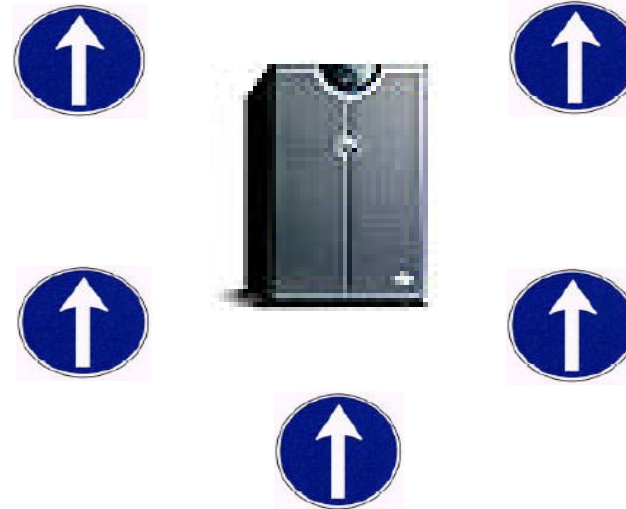
- Raise awareness & more training
- Organise public events targeting key market players
- Focus on the advantages of a timely and planned transition
- Show the IPv6 added value for their business



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Automatic Data Collection



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Data collected, Nov2004 - Apr2005



<i>Nov'2004</i>	<i>Apr'2005</i>	<i>Metric</i>
~310	~8523	# IPv6 Addresses Allocated (EU 25 countries), in /32s
376/642	457/N/A	# IPv6 RIPE Allocations/Global Allocations
~48,28%	N/A	% of IPv6 space allocated to EU countries/Global
45	51	# of IPv6 Allocations for European Internet eXchanges
8108	9324	# of inet6num objects registered on the RIPE DB
24	92	# of route6 objects registered on the RIPE DB
485	457	# of ASNs
654	492/13	# of Routes
19	19	# Native IPv6 EU Research Networks
8	8	# Native IPv6 Research Network (EUMED, etc...)
3	3	# Tunneled IPv6 EU Research Networks
1	1	# Tunneled IPv6 Research Network (EUMED, etc...)
3	3	# of Research Networks not doing IPv6
9	10	# of European ccTLDs glued on the root zone
40	42	# of ccTLDs glued on the root zone (global)
1,3	1,9	Average European IPv6 authoritative servers glued to the root

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Observed Evolution ...

- o Allocation By RIRs: several larger than /32s. That increased the global amount of space allocated
- o Most of the Internet eXchanges already have IPv6 allocations
- o «IPv6 objects» are growing in the RIPE database
- o 6BONE (TEST) routes are fading out!
- o European NRENs' status is fine and very encouraging for industry.



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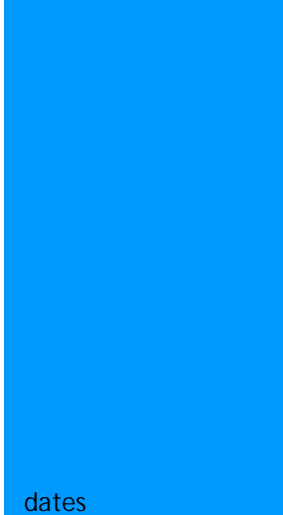


And DNS...

root-servers
.org

- o Still few European ccTLDs connected through v6 nameservers to the root zone
- o Global evolution seems to have stopped
- o Trend of glueing to the root zone is doing it with 1-2 servers
- o Some nameservers are serving several ccTLDs (which is OK, but...)





dates

Thank You!

Questions ???

<http://www.european-ipv6-tf.org>

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