

IPv6.br

The Brazilian experience in IPv6 dissemination

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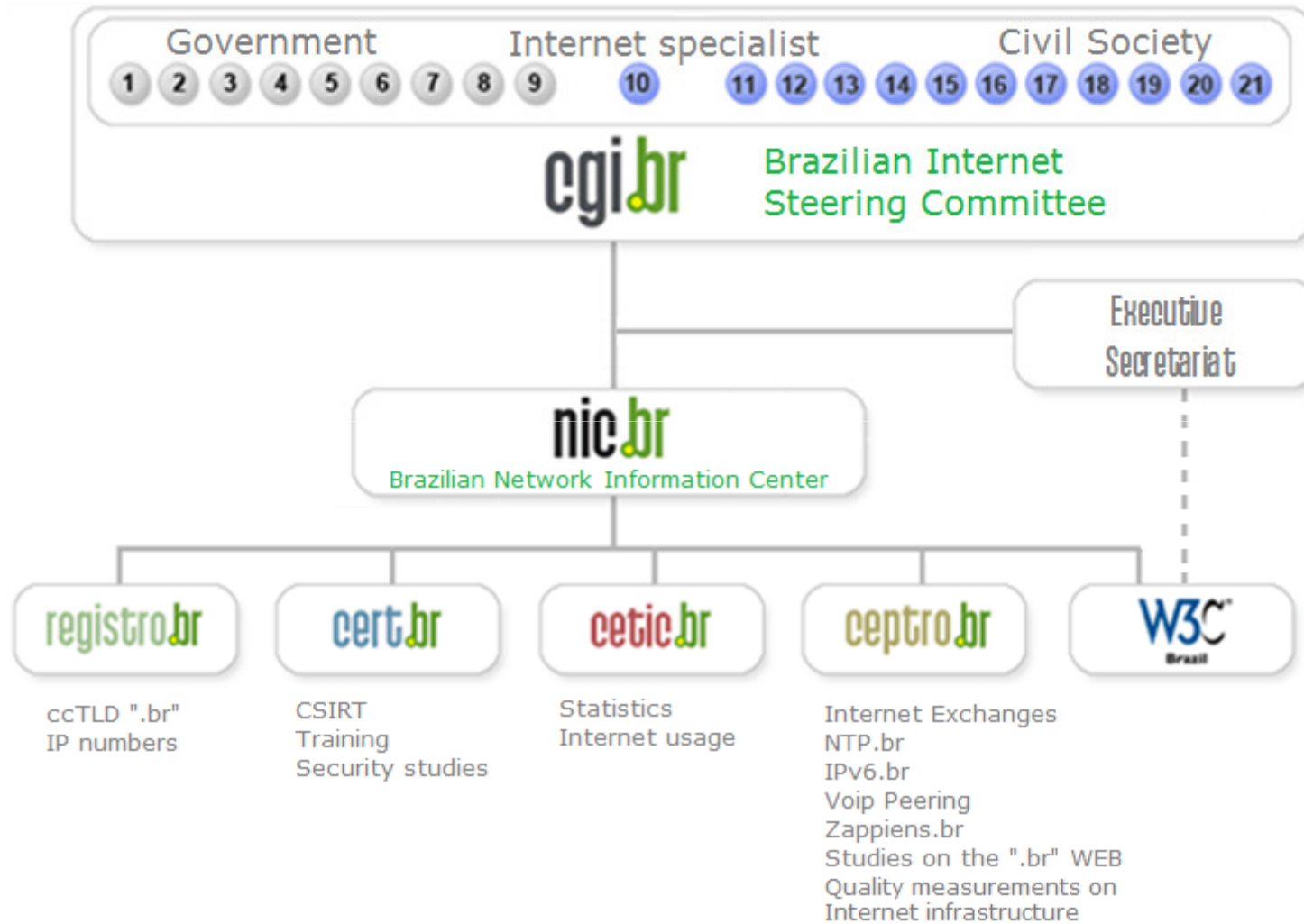
Brazilian Network Information Center – NIC.br

Internet Governance Forum
15-18 November 2009 – Sharm el Sheikh - Egypt

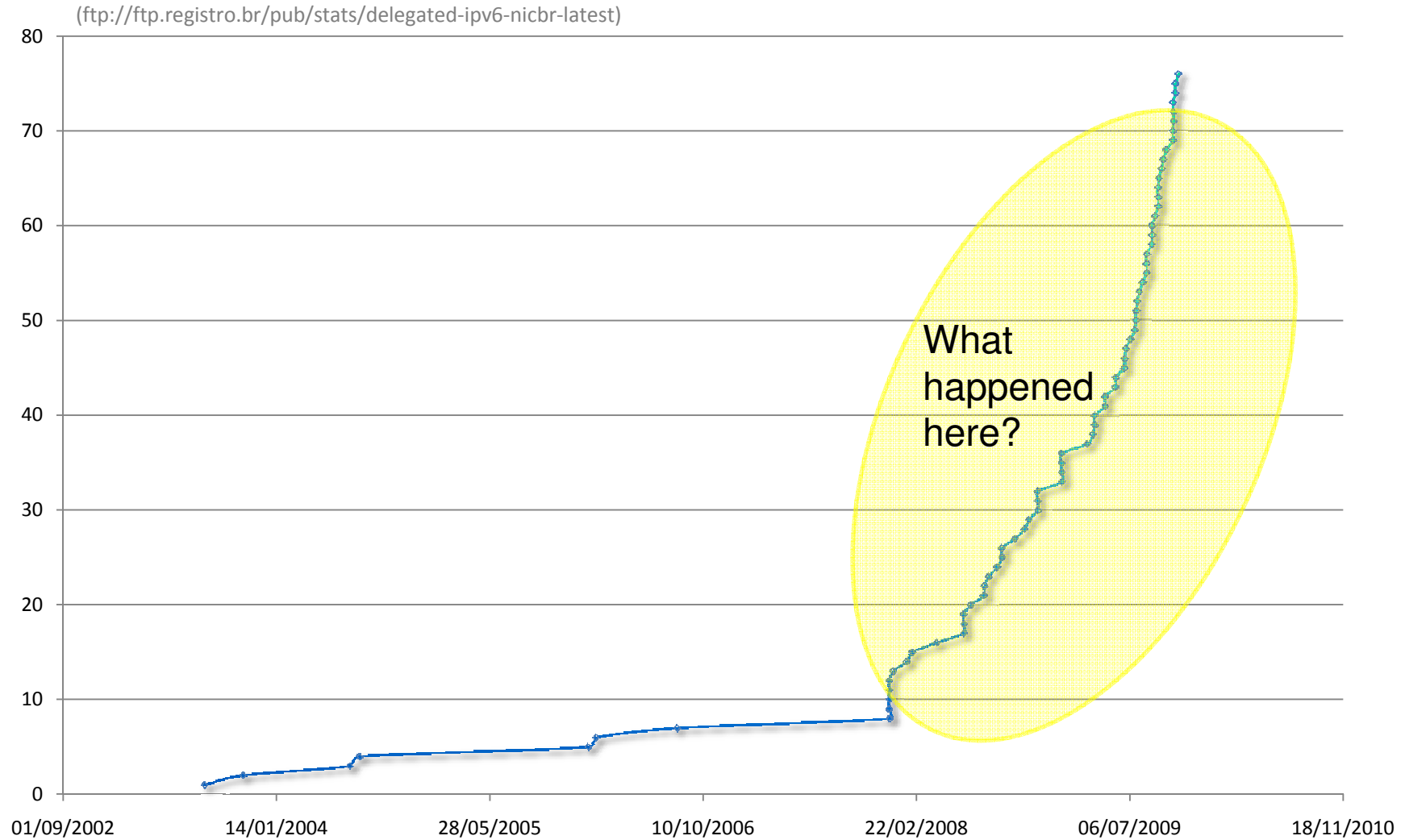
CGI.br and NIC.br

- The Brazilian Internet Steering Committee
 - Main Internet Governance organization in Brazil
 - Multistakeholder
 - Space of debate and coordination for the Internet initiatives
- Brazilian Network Information Center
 - Non-profit organization
 - Executive arm of the Internet Steering Committee
 - Manages “.br” ccTLD ← ~US\$ 17,00/domain/year
 - Functions as a National Internet Registry
 - Projects and services to improve Internet in Brazil

CGI.br and NIC.br



some results (ipv6 allocations)



some results (ISPs / government)



- ISPs started to create IPv6 test websites, or enable IPv6 in their websites:

www6.terra.com.br
www.acesse.com.br
www.onda.net.br
www.nipcable.com.br
(...)

- Governments start to ask for IPv6 as customers...



(e-ping is a document with interoperability standards for the Brazilian Federal government, and it recommends IPv6)

(<http://www.governoeletronico.gov.br/anexos/e-ping-versao-4-0-in-english>)



intraGov is a network to be used by São Paulo (state) government, and it will have IPv6 and IPv6 access to the Internet.

(<http://www.prodesp.sp.gov.br/NOTICIAS/noticia-45.htm>)

easier access to the addresses (0)

- Until 2007, LACNIC was responsible for IPv6 allocations
 - This means a challenge for Brazilian Providers:
 - A legal contract, in spanish, with a foreing organization.
 - December 2007: Registro.br starts to register IPv6 address, what had been already happing with v4 and AS numbers.
 - Policy: if you have already an IPv4 allocation, than you certainly justify at least a /32 IPv6.
 - Easier process led to a increase in registration.

awareness raising (1)

- Started at beginning of 2008
 - Awareness raising
 - Speeches at 26 events
 - Universities
 - IT meetings / events
 - (...)



FISL 9
17, 18 e 19 de Abril de 2008
Porto Alegre

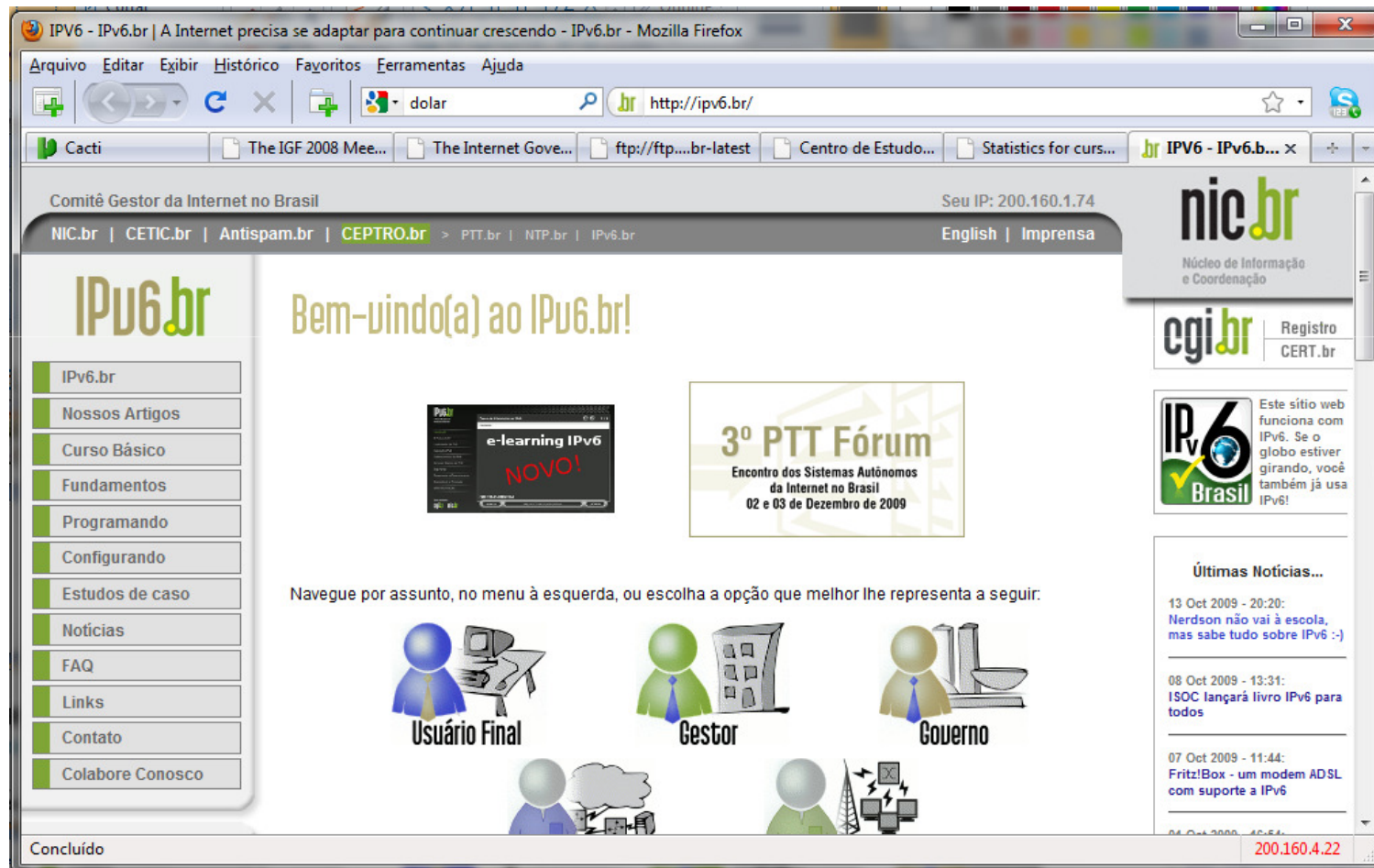


website (2)

- Awareness raising
- Information
- Started as a simple repository of pre-existent information (in Portuguese language)
- We noticed the need to write some articles / information → fill the gaps...
- Colaborative
- Creative Commons 2.5

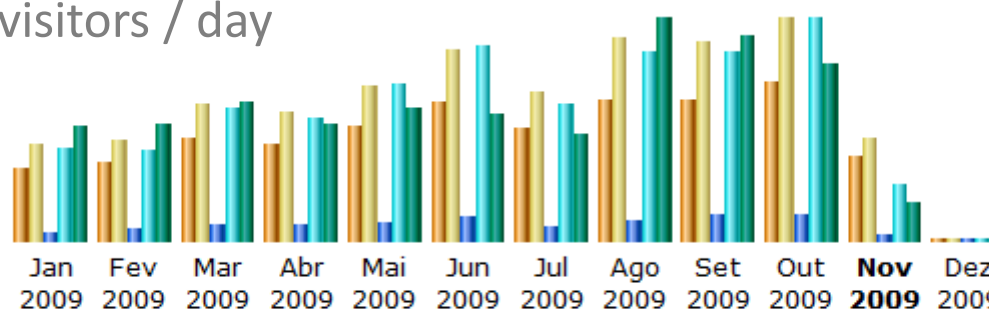
website (2)

http://ipv6.br



website (2)(stats)

300+ unique visitors / day




Mês	Visitantes únicos	Número de visitas	Páginas	Hits	Bytes
Jan 2009	3182	4312	17021	169310	5.97 GB
Fev 2009	3376	4420	19395	164643	6.11 GB
Mar 2009	4526	6027	29064	240253	7.29 GB
Abr 2009	4311	5725	27076	225196	6.16 GB
Mai 2009	5020	6735	33523	284783	6.92 GB
Jun 2009	6120	8350	41036	360037	6.63 GB
Jul 2009	4879	6584	26336	249677	5.64 GB
Ago 2009	6268	8888	38763	346930	11.55 GB
Set 2009	6251	8772	48015	346047	10.77 GB
Out 2009	7034	9751	46219	405567	9.19 GB
Nov 2009	3721	4450	13368	100961	2.01 GB
Dez 2009	0	0	0	0	0
Total	54688	74014	339816	2893404	78.23 GB

e-learning package (3)

- We had good feelings about 6diss (EU project) e-learning package
 - It was in English, but it already had Portuguese subtitles...
 - The language was a problem even with subtitles...
- We tried to get permission to translate it... But it was not possible...
- We decided to start our own project...
 - About six months later, we had it done (may/2009)
 - Professional look
 - Well written content
 - It became very popular in Brazil

e-learning package (3)


<http://ipv6.br/curso>



A Nova Geração do
Protocolo Internet

- Introdução
- O Protocolo IP
- Implantação do IPv6
- Cabeçalho IPv6
- Endereçamento do IPv6
- Serviços Básicos do IPv6
- Segurança
- Roteamento e Gerenciamento
- Coexistência e Transição
- Mais Informações

Uma iniciativa



Curso de Introdução ao IPv6
☰ ? 6 / 14

Cabeçalho IPv6

	Classe de Tráfego (Traffic Class)	Identificador de Fluxo (Flow Label)	
Versão (Version)	Tamanho dos Dados (Payload Length)	Próximo Cabeçalho (Next Header)	Limite de Encaminhamento (Hop Limit)

Endereço de Origem(Source Address)

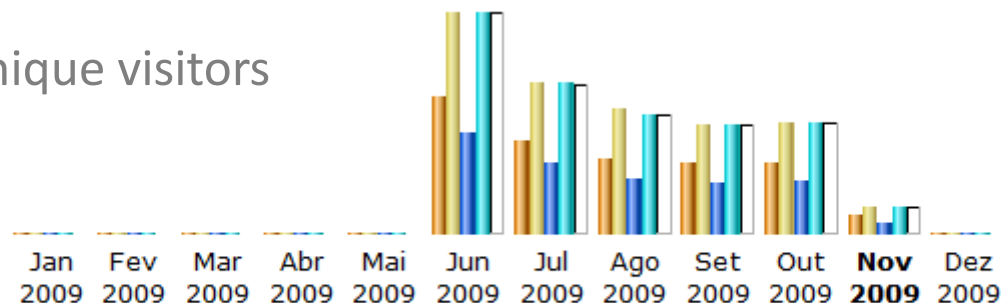
Endereço de Destino(Destination Address)

O campo Identificador de Fluxo foi acrescentado, adicionando um mecanismo extra de suporte a QoS ao IP. ➔

anterior
próximo

e-learning package (3) (stats)

~ 26000 unique visitors



Mês	Visitantes únicos	Número de visitas	Páginas	Hits	Bytes
Jan 2009	0	0	0	0	0
Fev 2009	0	0	0	0	0
Mar 2009	0	0	0	0	0
Abr 2009	0	0	0	0	0
Mai 2009	2	2	25	82	1.12 MB
Jun 2009	7670	12372	460873	987834	19.19 GB
Jul 2009	5155	8424	313305	678225	12.87 GB
Ago 2009	4158	6915	246591	530403	10.24 GB
Set 2009	3897	6151	225074	487946	9.55 GB
Out 2009	3965	6251	231612	502134	9.67 GB
Nov 2009	1065	1464	51325	110322	2.14 GB
Dez 2009	0	0	0	0	0
Total	25912	41579	1528805	3296946	63.66 GB

capacity building (4)

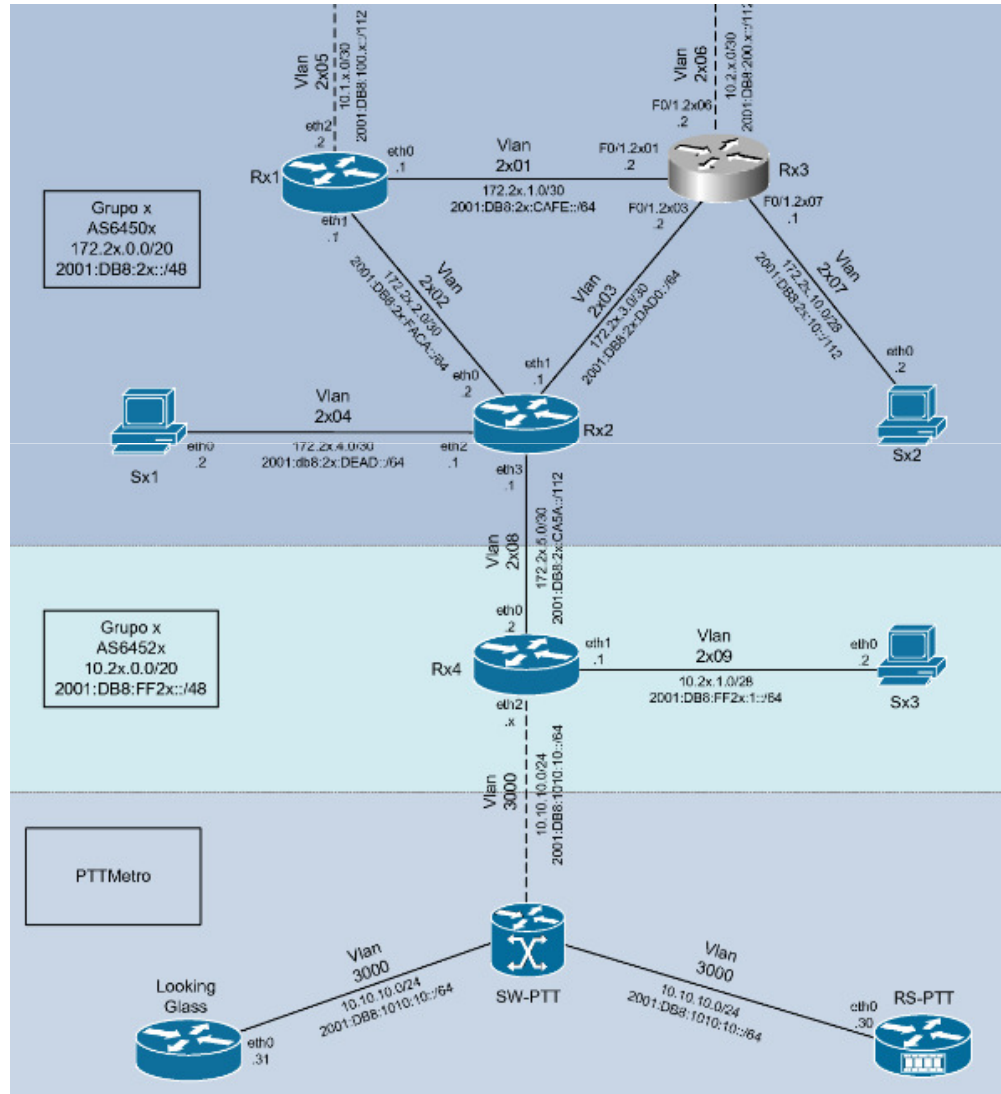
- We had to reach the Brazilian ISPs... How?
 - We had the feeling that capacity building was an important need
 - High costs...
 - We have prepared our own brochures inspired on 6diss/6deploy material, but completely rewritten
 - Creative Commons! Comercial use, derivative works, copy, distribution, all uses are allowed...
 - Laboratory: 6 CISCO + a lot of virtual machines with linux and quagga
 - Evolved to 8 Cisco + 8 Juniper routers, plus ~ 50 virtual machines, to teach 8 groups of 4 people each.

capacity building (4)

- 07 courses already
- Intensive / hands on / 4 days = 32h (theory + labs)
 - It became very common, in the next few weeks :
 - ...the ISPs ask for an IPv6 allocation
 - ...to ask for IPv6 peering in our IXPs
 - ...sometimes, to put a test IPv6 website to work



capacity building (4)



Theory

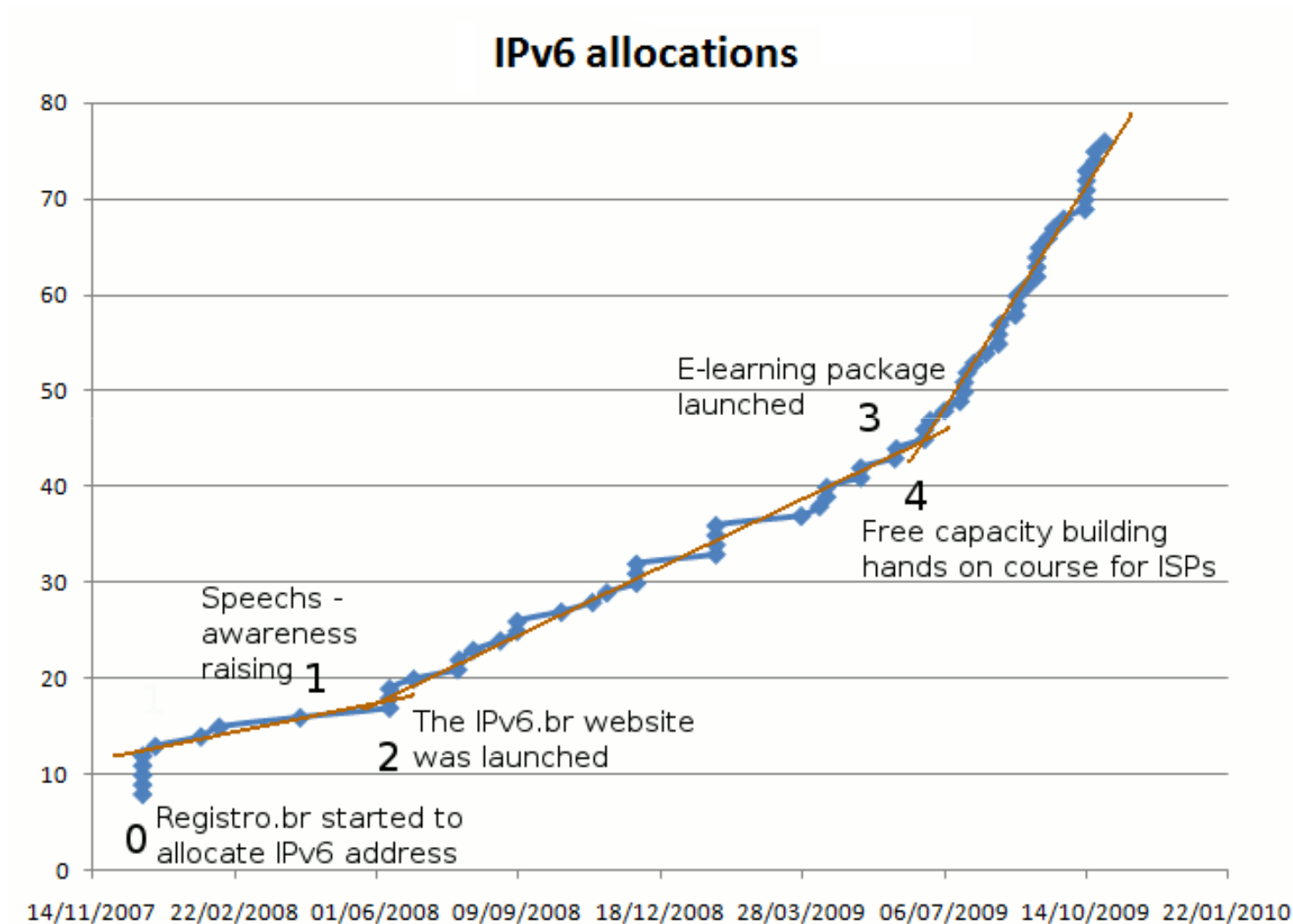
- introduction
- basic functionality
- routing
- management
- security
- planning

Labs

- basic
- tunneling
- firewall
- routing (ospf, bgp)
- dns

<http://ipv6.br/presencial>

back to the graph...



lessons learned

- Capacity building is really a need for our ISPs, we shall continue to work on it.
- Licensing under Creative Commons is a very good idea, preferably allowing all kinds of use of the material. It enables the dissemination of the idea, more than of the material itself.
- We started targeting small and medium ISPs... Some of the big ones followed and came to us asking for training... Some governments and universities did the same...
- IPv6 has to be demystified, more than taught, at least in a first moment... Hands on labs are a need.
- Virtualization is your friend... Don't have a lot of money? Try OpenVZ, Imunes, Netkit, etc.

problems not solved / next steps

- Some ISPs are asking for IPs first, and then planning... In some cases probably the default /32 will not suffice...
- The announcements in the global IPv6 table are not growing so fast as the allocations...
 - Sometimes it is a problem with lack of IPv6 enabled upstream providers...
 - We have been planning to give free IPv6 transit for PTT Metro São Paulo participants (our biggest IXP)... Probably the first test will happen this month.
- We need to train more trainers
- We need to cover some IPv6 aspects in more detail (other, specialized, capacity building courses?)
- The equipment in the network core isn't a problem... But where is the IPv6 equipment for the edges?? ADSL and cable modems? CPEs? VoIP phones? Etc?

THANK YOU

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<http://ipv6.br>

<http://ceptro.br/english>

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