

IPv6.br

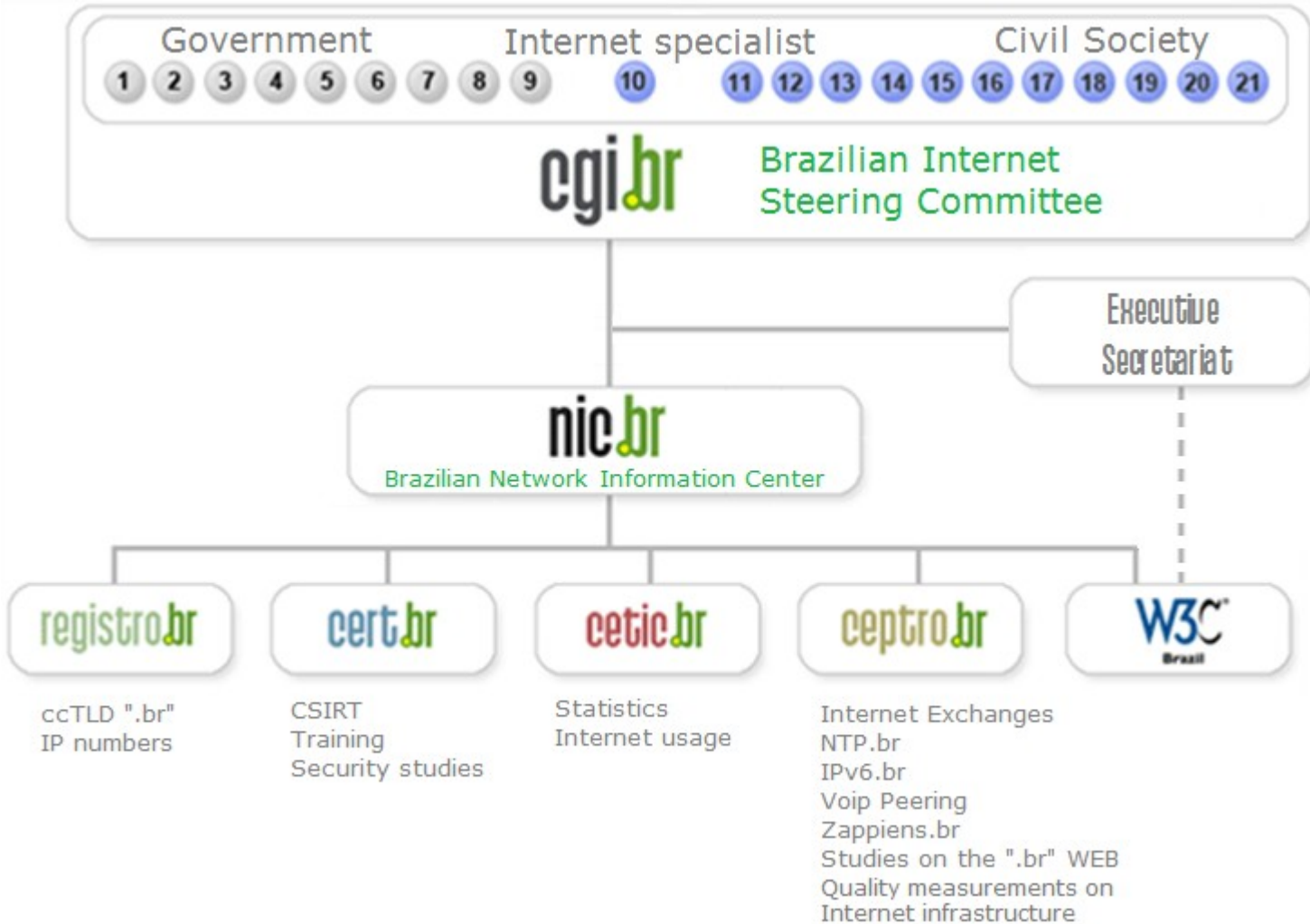
The Brazilian experience in IPv6 dissemination

Antonio M. Moreiras
moreiras@nic.br

Brazilian Network Information Center - NIC.br

IGF 2010

CGI.br and NIC.br



easier access to the addresses (1)

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

awareness raising (2)

- It started at the beginning of 2008
 - Awareness raising
 - Speeches at events
 - Universities
 - IT meetings / events
 - (...)



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



website (3)

- 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...
- Collaborative work
- Creative Commons 2.5 (Brazilian License)

website (3)

http://ipv6.br

Comitê Gestor da Internet no Brasil
Seu IP: 213.197.167.14

NIC.br | CETIC.br | Antispam.br | **CEPTRO.br** > PTT.br | NTP.br | IPv6.br
English | Imprensa

IPv6.br

- IPv6.br
- Nossos Artigos
- Curso Básico
- Trânsito IPv6 no PTT
- Fundamentos
- Programando
- Configurando
- Estudos de caso
- Notícias
- FAQ
- Links
- Contato
- Colabore Conosco

Busca

Bem-vindo(a) ao IPv6.br!

Navegue por assunto, no menu à esquerda, ou escolha a opção que melhor lhe representa a seguir:



Usuário Final



Gestor



Governo



Engenheiro



Provedor Internet

Artigos em destaque

- Videos sobre cases IPv6 fora do Brasil
- Entenda o esgotamento do IPv4
- Estatísticas sobre IPv6
- Habilitando IPv6 em Sistemas Operacionais
- Técnica de transição
- Migração para IPv6 de aplicações usuárias da interface de programação Sockets BSD
- RFCs relacionadas ao IPv6



Aprenda mais sobre IPv6

Nosso e-learning é uma ótima introdução ao protocolo, com aproximadamente 4h de duração. Se você não é técnico, mesmo assim será capaz de acompanhar os módulos 1 e 2!

Consulte também as apostilas de nosso **curso IPv6 básico**.



Núcleo de Informação e Coordenação



Registro
CERT.br



Este sítio web funciona com IPv6. Se o globo estiver girando, você também já usa IPv6!

Últimas Notícias...

10 Aug 2010 - 22:52:
Quadrinhos: Nerdson não vai a escola, mas sabe muito sobre IPv6!

06 Aug 2010 - 17:06:
Mais dois blocos IPv4 atribuídos para o APNIC.

05 Jul 2010 - 12:13:
Curso IPv6 transmitido ao vivo pela Internet: 5, 6 e 7 de Julho pelo sítio iptv.usp.br

23 Jun 2010 - 22:16:
Novo IOS 4 para iPhone traz suporte a IPv6

23 Jun 2010 - 17:37:
AmplitudeNet começa a implantar o IPv6

Mais...

e-learning package (4)

http://ipv6.br/curso

IPv6.br
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
cgi.br nic.br

Curso de Introdução ao IPv6
☰ ? 6 / 14

Cabeçalho IPv6

Versão
(Version)

Classe de Tráfego
(Traffic Class)

Identificador de Fluxo
(Flow Label)

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

capacity building (5)

- How do we reach the Brazilian ISPs?
 - We felt that capacity building was an important need, due to potential 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: 8 Cisco + 8 Juniper routers, plus ~ 60 virtual machines, to teach 8 groups of 4 people each.

capacity building (5)

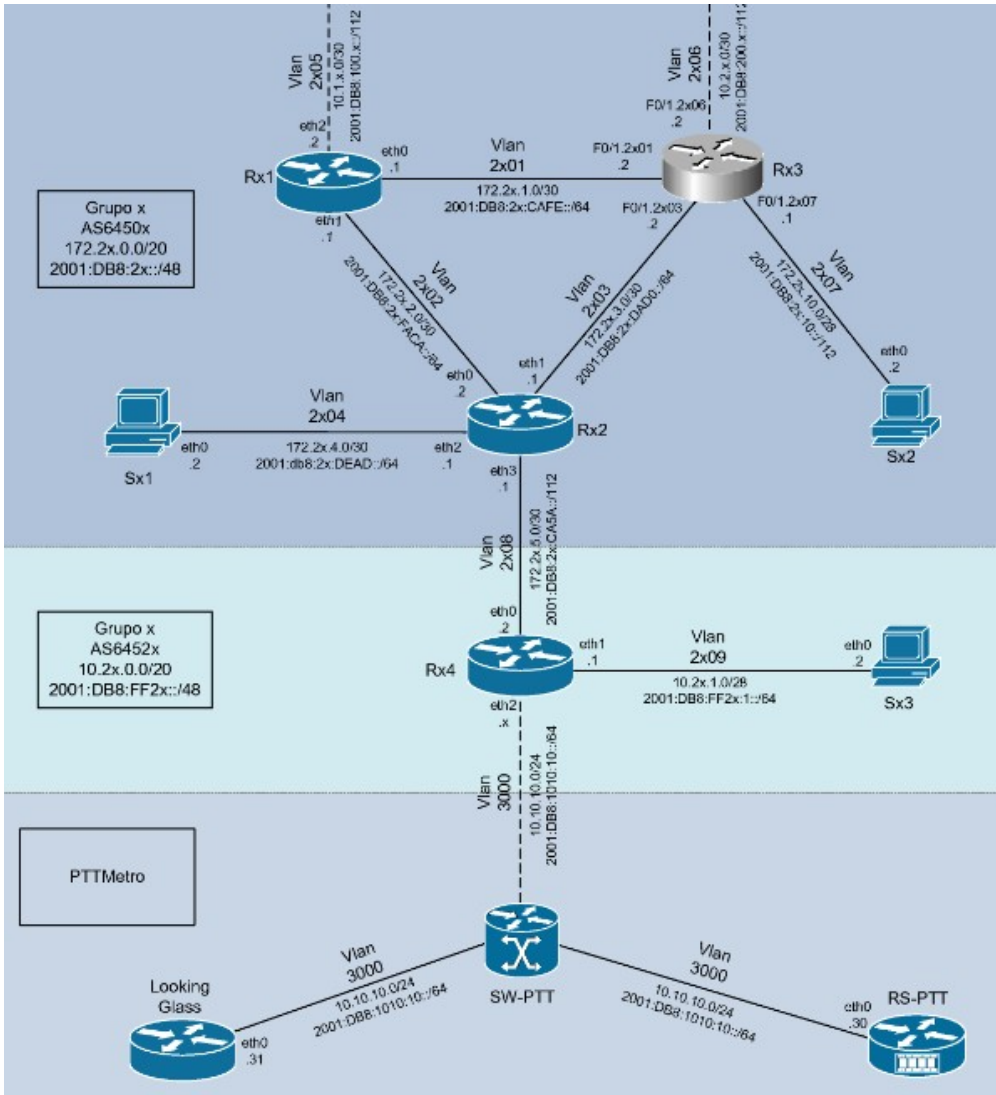
- 16 courses already
 - ~500 people, from more than 180 organizations (mainly ISPs or other Autonomous Systems) trained.
- Intensive / hands on / 5 days = 36h (theory + labs)
 - It became very common, in the next few weeks :
 - ...the ISPs ask for an IPv6 allocation
 - ...to ask for IPv6 peering in our IXPs
 - ...sometimes, to put a test IPv6 website to work



capacity building (5)

- The course is free for the ISPs staff
 - Funded by the “.br” domain names
- Course for Non-Brazilian ISPs
 - Scheduled for November, 2010 - São Paulo / Brazil
 - PTT Forum (Brazilian IXP Forum) / LACNOG + LACNIC
 - Also free + “becas” offered by ISOC

capacity building (4)



Theory

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

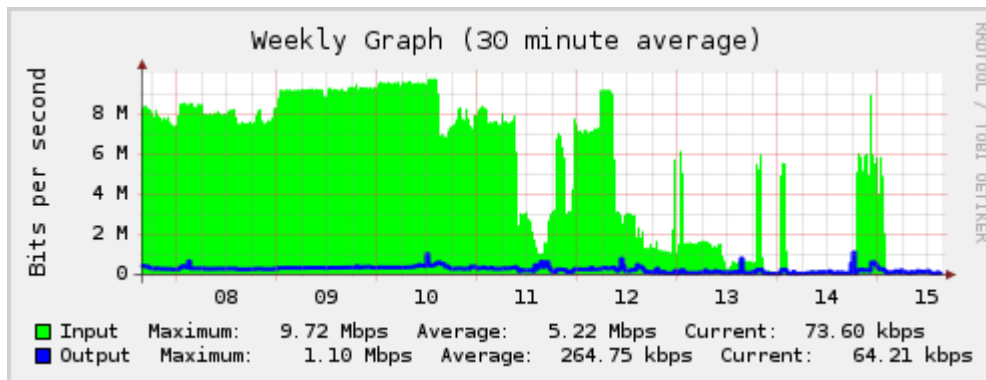
Labs

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

<http://ipv6.br/presencial>

IPv6 transit free of charge (6)

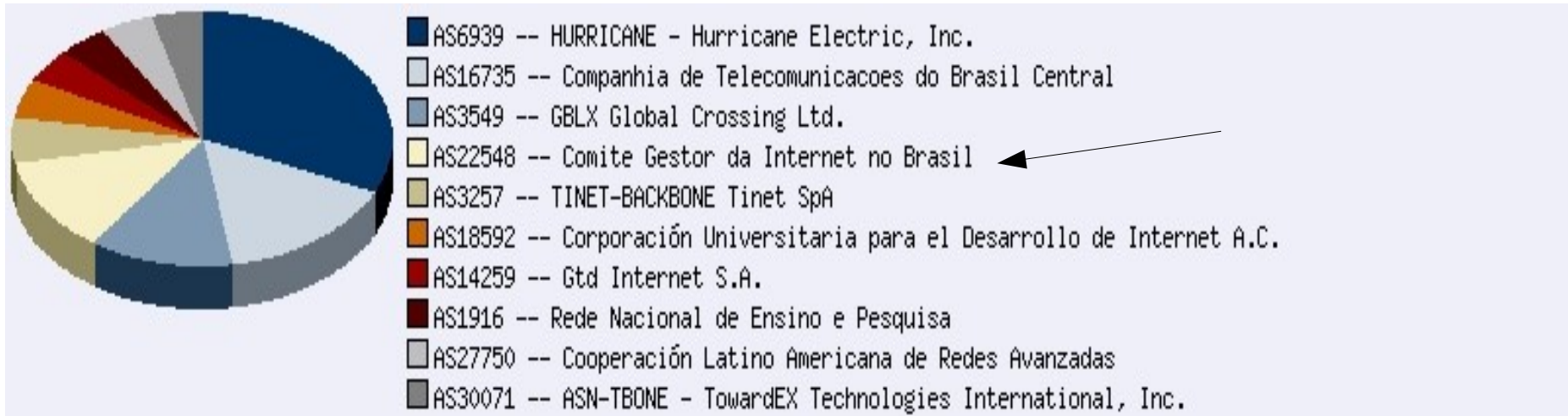
- Participants of Internet Exchange PTTMetro São Paulo.
- Experimental
- Limited time
- Limited and shared bandwidth
- Expected results:
 - Foster the ASes to use IPv6;
 - Lower the gap between Allocated and Routed IPv6 addresses



Trânsito IPv6 - PTTMetro - São Paulo	
ASN	NOME
8167	BRT
11706	Terra
14282	Persis
16397	Alog-SP
19182	TVA
22356	Durand
26592	Alog-RJ
28220	Cabo Telecom
28571	USP

IPv6 transit free of charge (6)

- 4th transit AS for LATAM – according to the BGP Weathermap
- 14 ASs

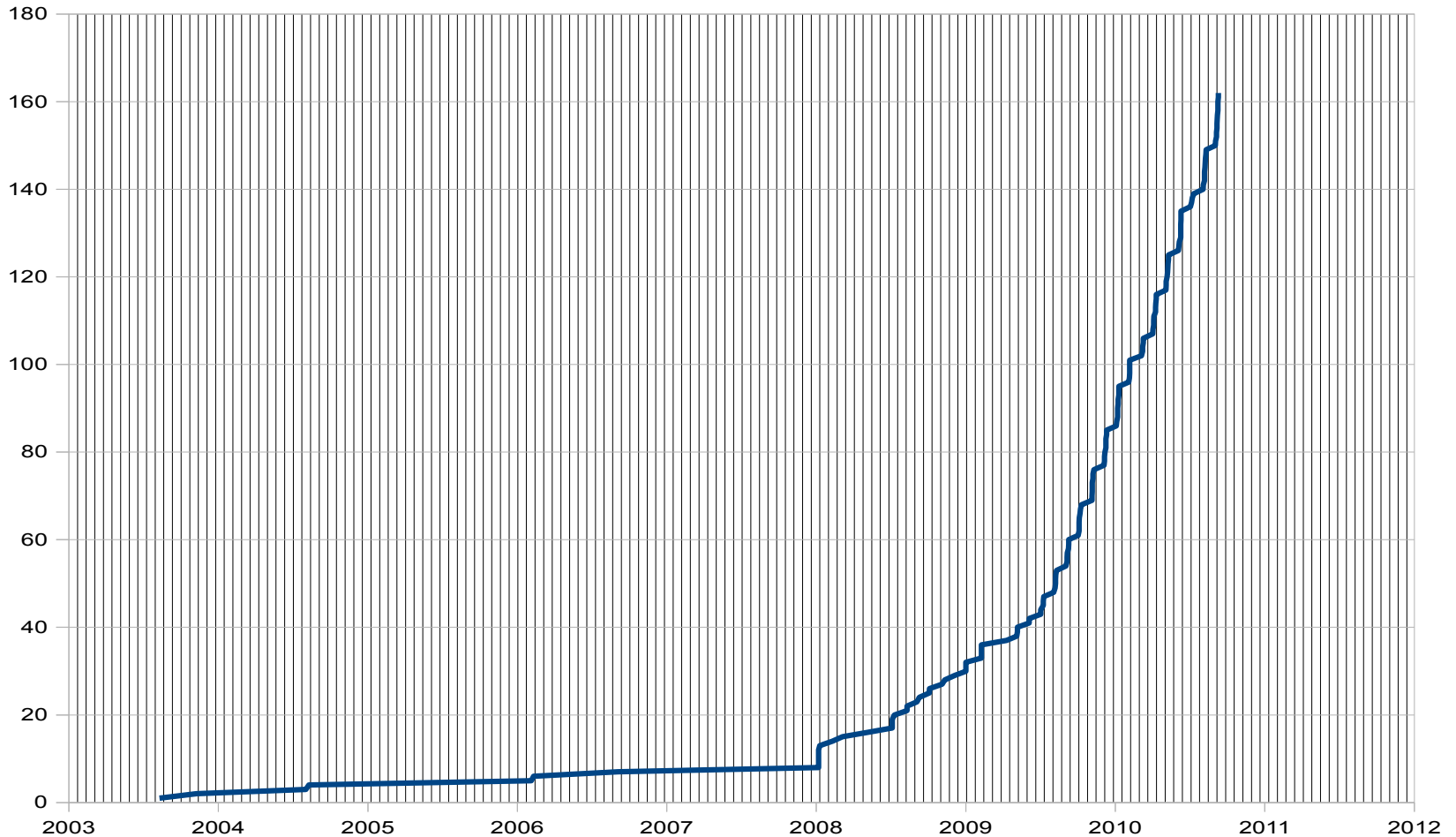


budget

- 1 engineer / 1 system analyst – full time
 - + coordination (part time)
 - + some help from IX PTT Metro team (on the courses and free transit)
- + ~ US\$ 100k / 2009 (labs, courses, e-learning)
- + ~ US\$ 100k / 2010
- Obs:
 - Participation of CISCO, JUNIPER and MICROSOFT with speeches at some of our courses
 - Some courses outside São Paulo can be supported by co-sponsors

some results (IPv6 allocations)

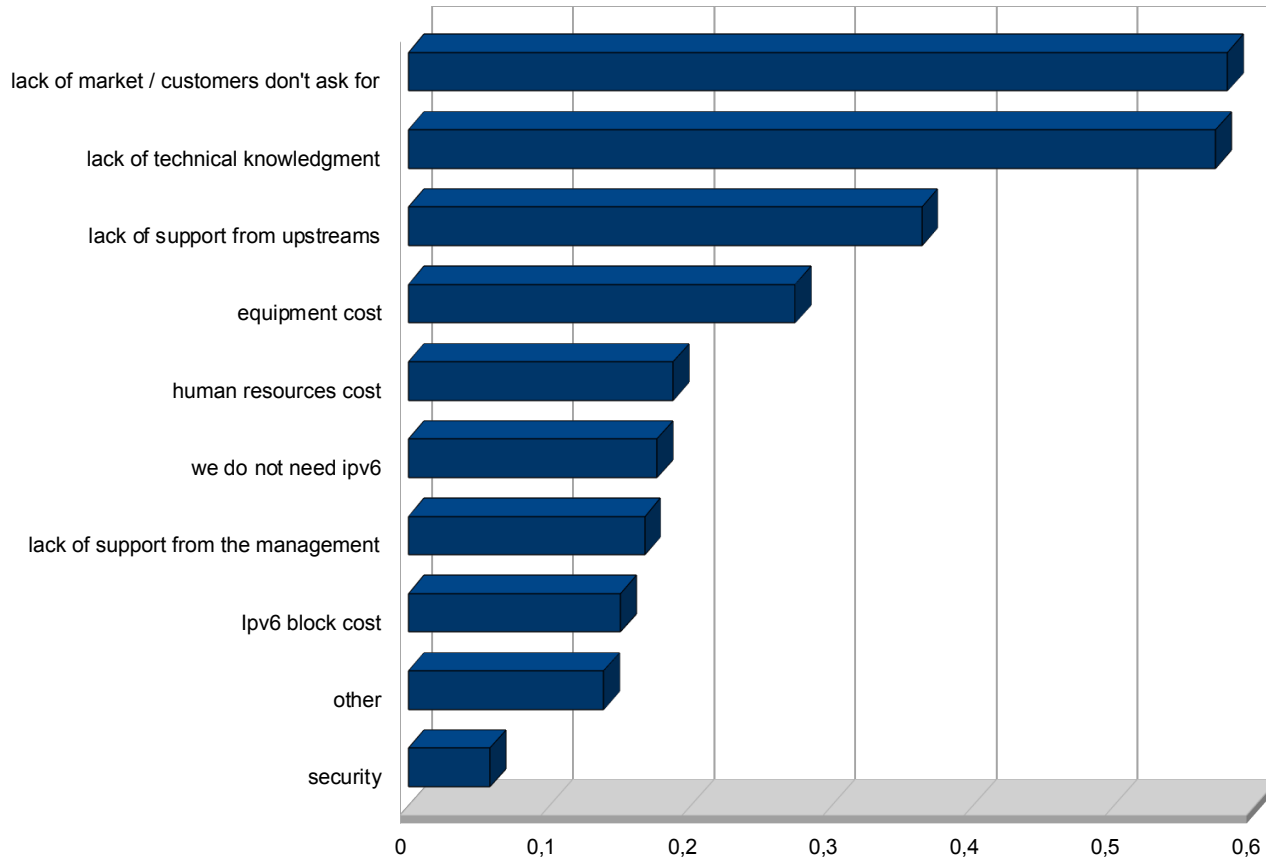
(ftp://ftp.registro.br/pub/s/tats/delegated-ipv6-nicbr-latest)



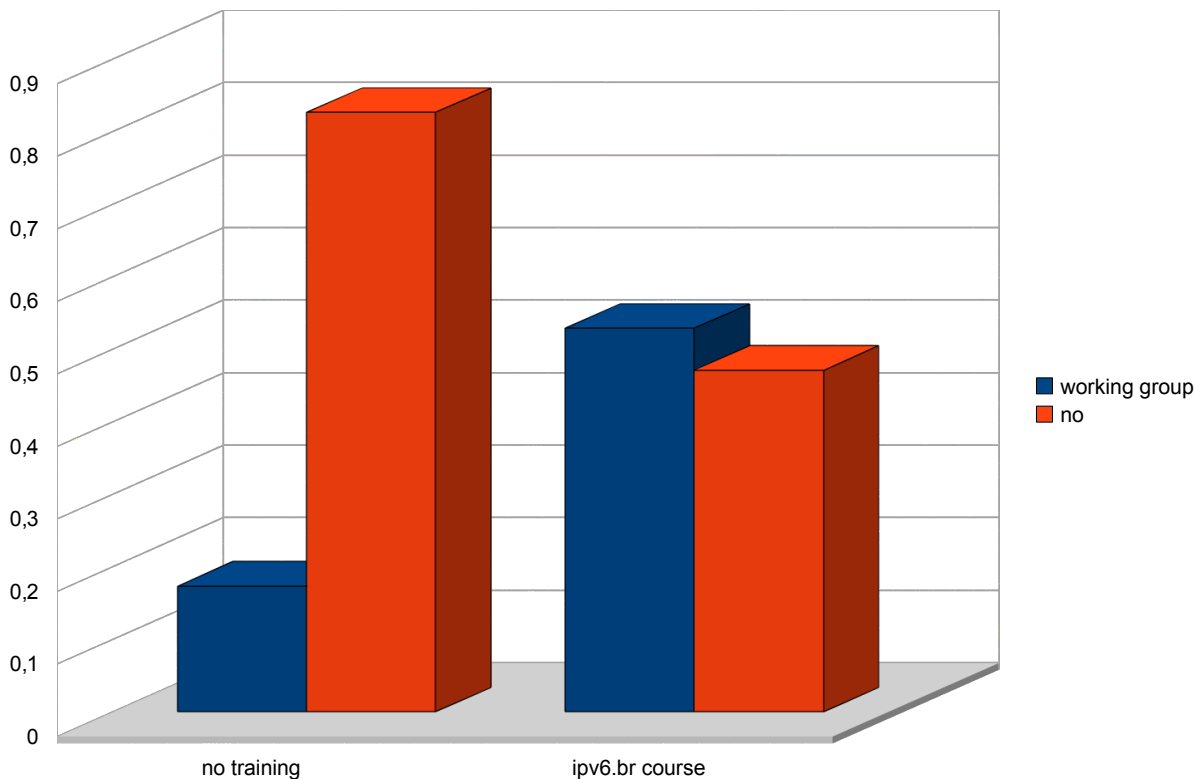
2010 survey

- In Brazil we have:
 - ~ 800 Autonomous Systems
 - ~ 1600 ISPs (estimated)
 - ~ 160 Autonomous Systems with IPv6 blocks (20%)
 - ~ 45 blocks in the BGP table (5%)
- In this survey:
 - 346 responses total (21% of 1600)
 - 258 ASs (32% of 800)

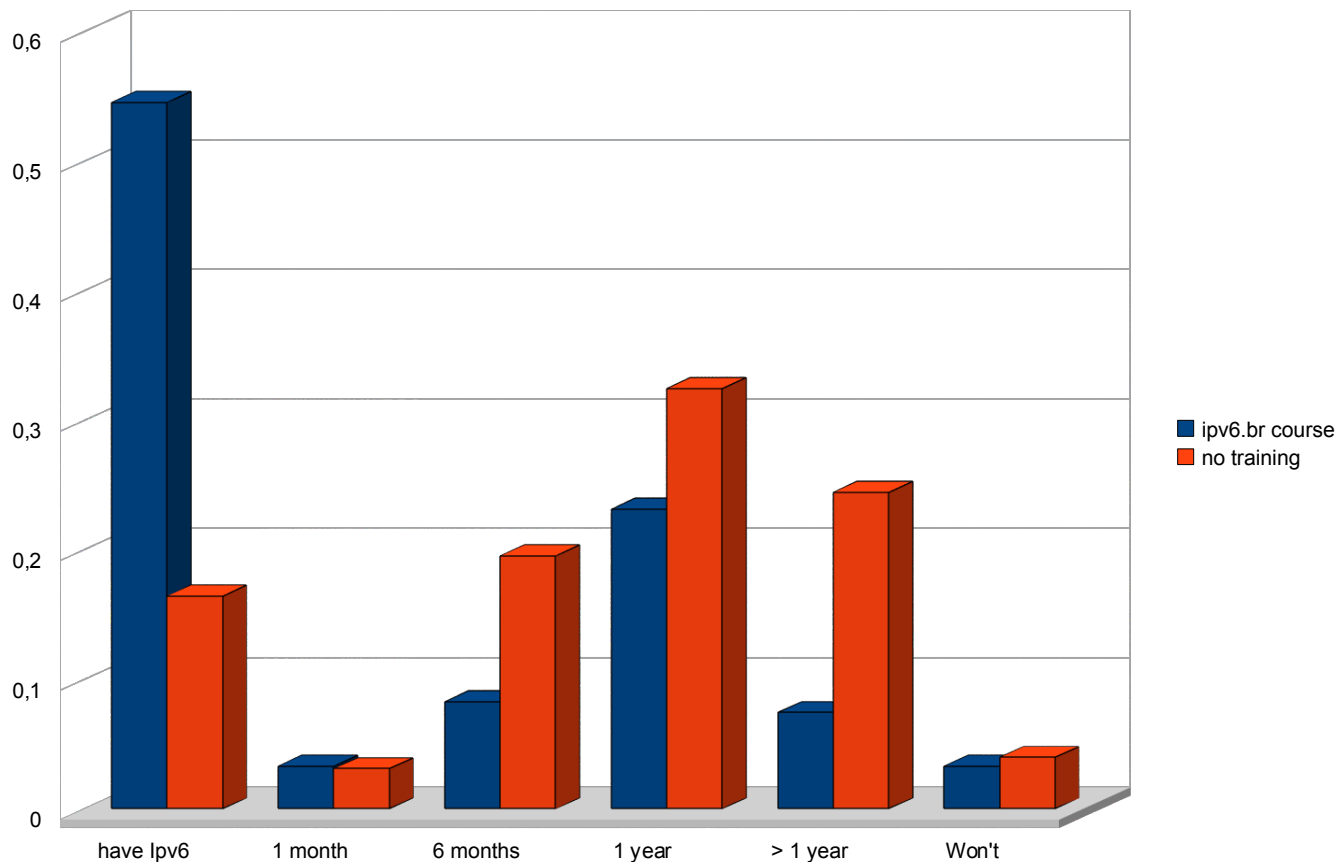
main difficulties



do you have a formal working group in your organization taking care of IPv6 deployment?



when do you intend to ask for the IPv6 address block?



THANK YOU

Antonio M. Moreiras
moreiras@nic.br

ipv6@nic.br

<http://ipv6.br>

<http://ceptro.br/english>

<http://nic.br/english>