



nic.br
Brazilian Network
Information Center



egi.br
Brazilian Internet
Steering Committee



registro.br cert.br cetic.br ceptro.br ceweb.br ix.br

nic.br cgi.br

ix.br

AOPF AONOG 2022
Luando, AO | 12/08/2022

Peering in Brazil - IX.br

ix.br nic.br cgi.br

INTERNET GOVERNANCE

MODEL IN BRAZIL

egi.br The Brazilian Internet Steering Committee

Multistakeholder model

Created in 1995 and modified in 2003



CGI.br members and former members
(only the current members have right to vote) ➔

GENERAL ASSEMBLY

7 members elected by the General Assembly ➔

**ADMINISTRATIVE
COUNCIL**

**AUDIT
COMMITTEE**

ADMINISTRATION
.....
LEGAL
.....
COMUNICATION
.....
ADVISORIES:
CGI.br and PRESIDENT

**EXECUTIVE
BOARD**

1 2 3 4 5

registro.br

Domain Registration
IP Assignment

cert.br

Security and
Incident Response

cetic.br

Studies and Surveys
About ICT use

ceptro.br

Internet Engineering
and New Projects

ceweb.br

Web Technologies

ix.br

Traffic Exchange

W3C
Brasil

Web Standards

- 1 Chief Executive Officer
- 2 Administrative and Financial Director
- 3 IT and Services Director
- 4 Director of Special Projects and Development
- 5 Consulting Director for CGI.br activities

THE ROLE OF THE BRAZILIAN NETWORK INFORMATION CENTER – NIC.br



() New Federal Decree: constitution and structure of CGI.br.*

- The Brazilian Network Information Center is a non-profit civil entity that implements, since December 2005, the decisions and projects designed by the Brazilian Internet Steering Committee

FACTS AND FIGURES ABOUT BRAZIL

Population: 210 million (5th largest)
85% living in urban area
5,570 municipalities
5th largest territory in the world

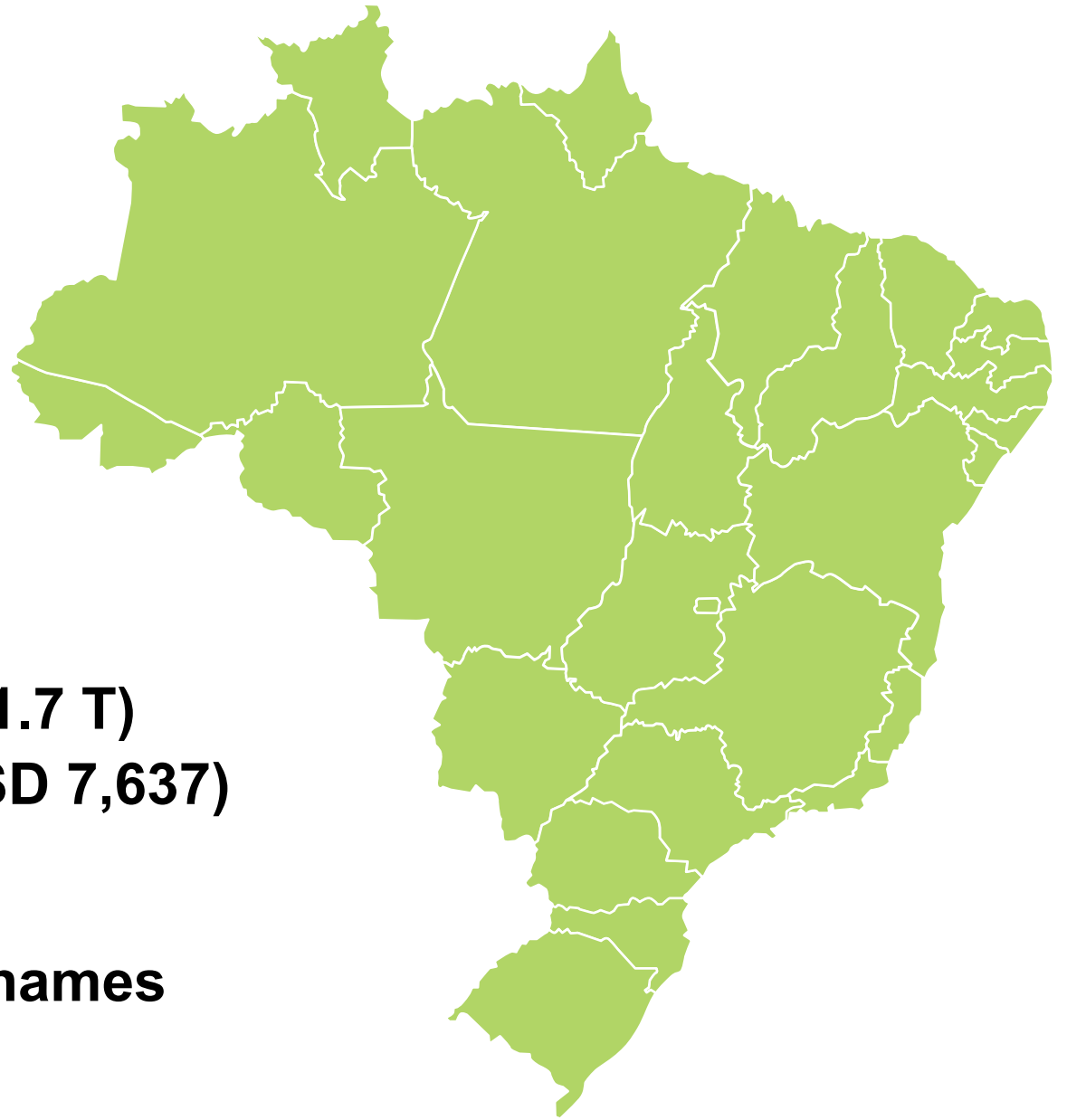
Source: IBGE 2019

GDP: BRL 6.8 Trillion (~USD 1.7 T)
GDP/Capita: BRL 30,548 (~USD 7,637)

Source: IBGE 2018

6th largest ccTLD: 5 million domain names
148 million Internet users

Source: CGI.br, ICT Households Survey 2021; Registro.br Nov/2022



DEMOGRAPHIC DENSITY



Densidade demográfica

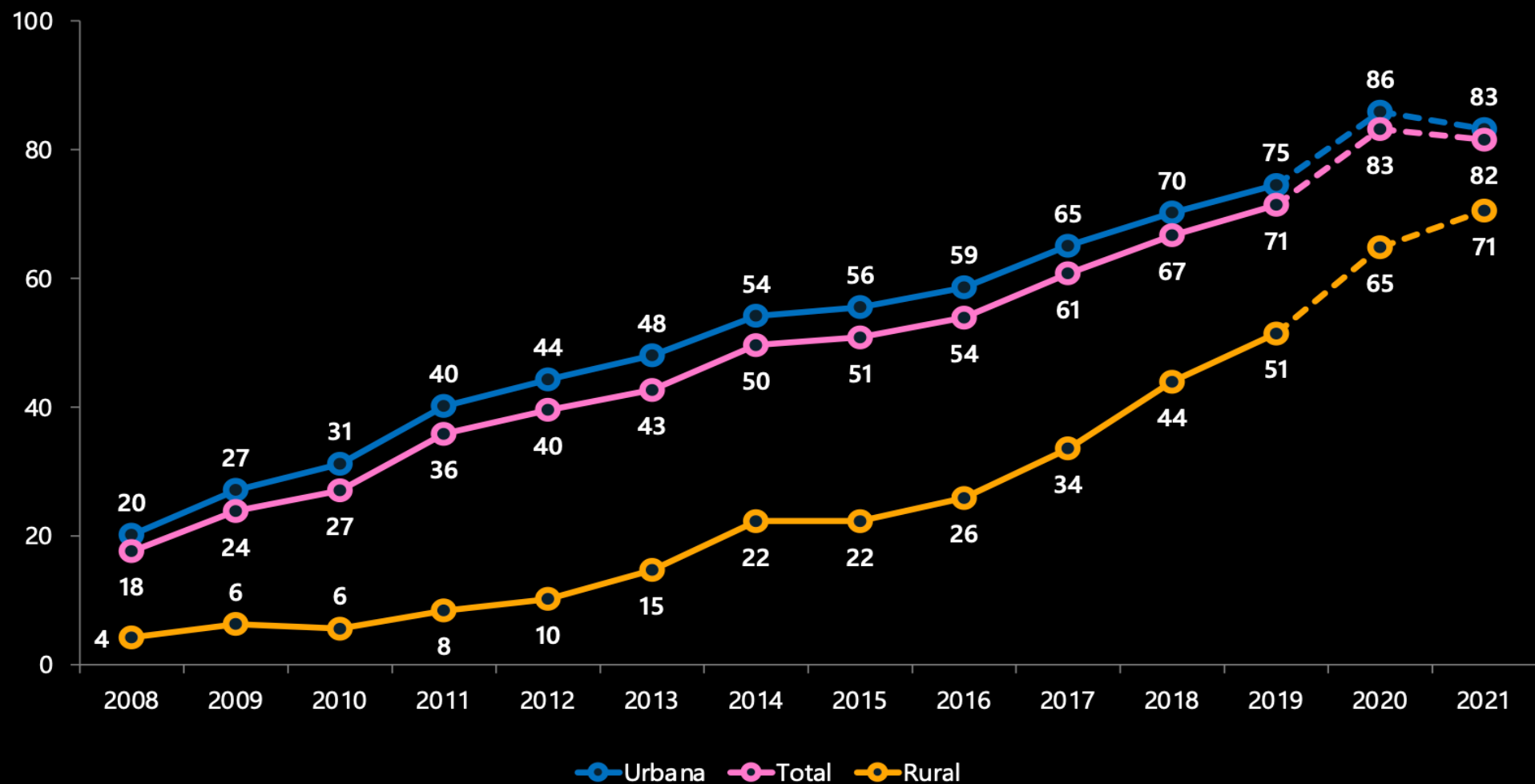
2010



Fonte: IBGE, Censo Demográfico 1940/2000; e Sinopse do Censo Demográfico 2010. In: IBGE. Sidra: sistema IBGE de recuperação automática. Rio de Janeiro, 2011. Disponível em: <<http://www.sidra.ibge.gov.br/bda/tabela/listabl.asp?z=cd&to=3&ti=P&tc=1298>>. Acesso em: mar. 2012.

DOMICÍLIOS COM ACESSO À INTERNET, POR ÁREA (2008-2021)

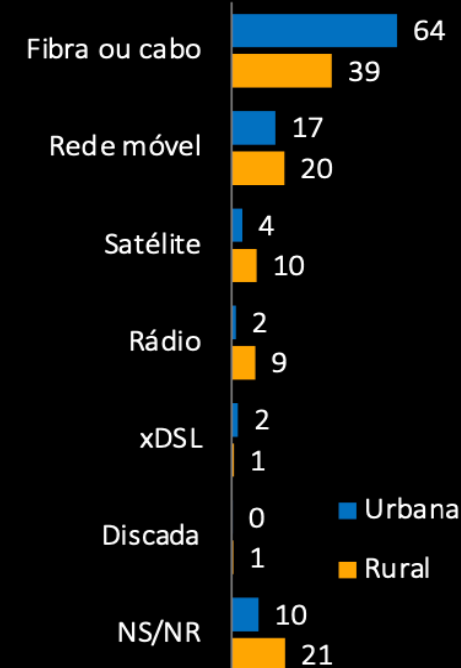
Total de domicílios (%)



Aumento significativo entre domicílios de área **rural** (+20 pp) e **urbana** (+8 pp) (2019-2021)

Tipo de conexão

Domicílios com acesso à Internet (%)



A4 DOMICÍLIOS COM ACESSO À INTERNET, POR REGIÃO

Total de domicílios (%)

Região	2019	2021	Var. (pp)
Sudeste	75	84	+9
Nordeste	65	77	+12
Sul	73	83	+10
Norte	72	79	+7
Centro-Oeste	70	83	+13
Total	71	82	+9

Tipo da conexão principal, por região

Domicílios com acesso à Internet (%)



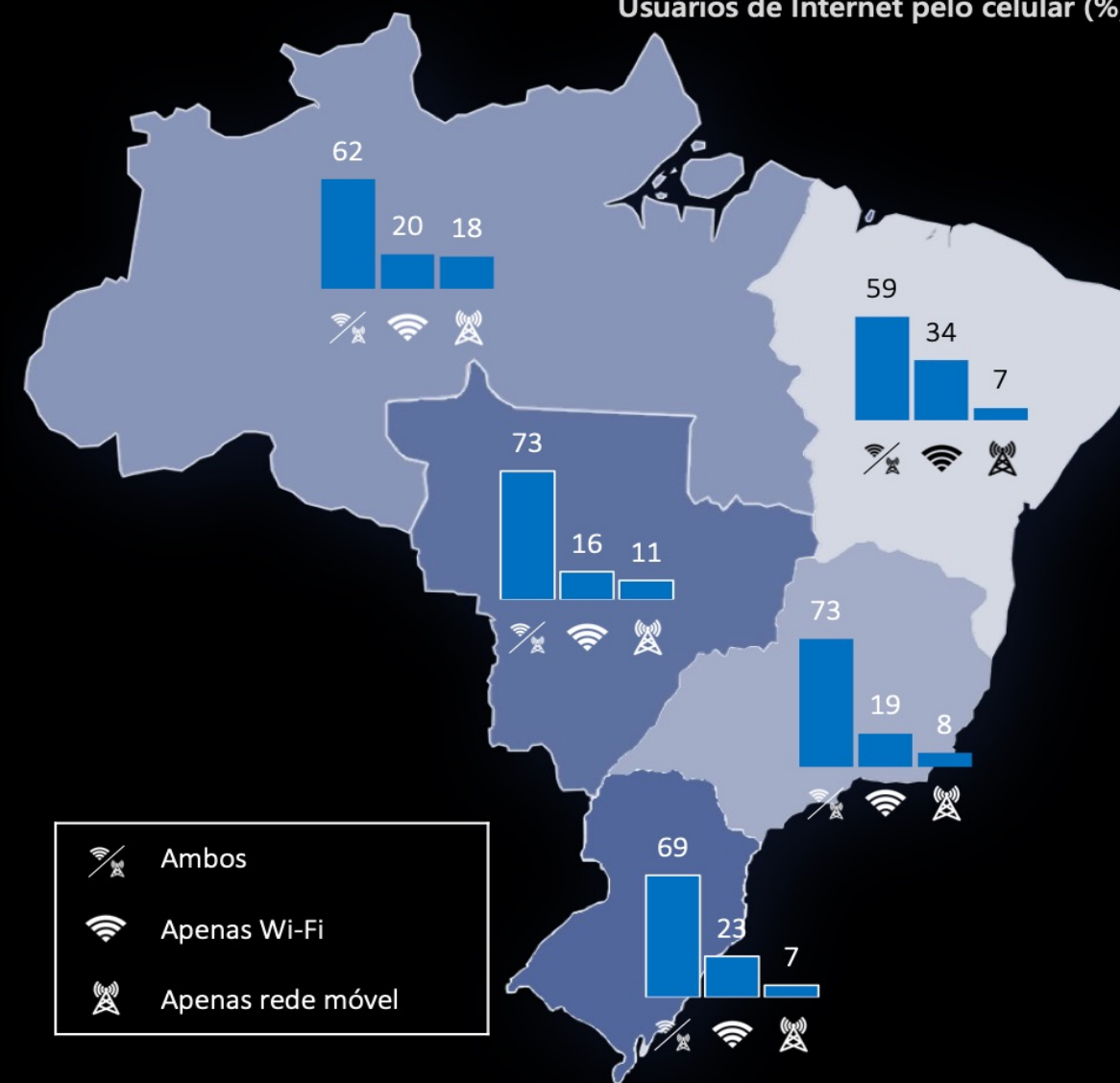
Total da população (%)

Região	2019	2021	Var. (pp)
Sudeste	75	81	+6*
Nordeste	71	78	+7
Sul	75	83	+8
Norte	74	83	+9
Centro-Oeste	76	83	+7*
Total	74	81	+7

* Dentro da margem de erro.

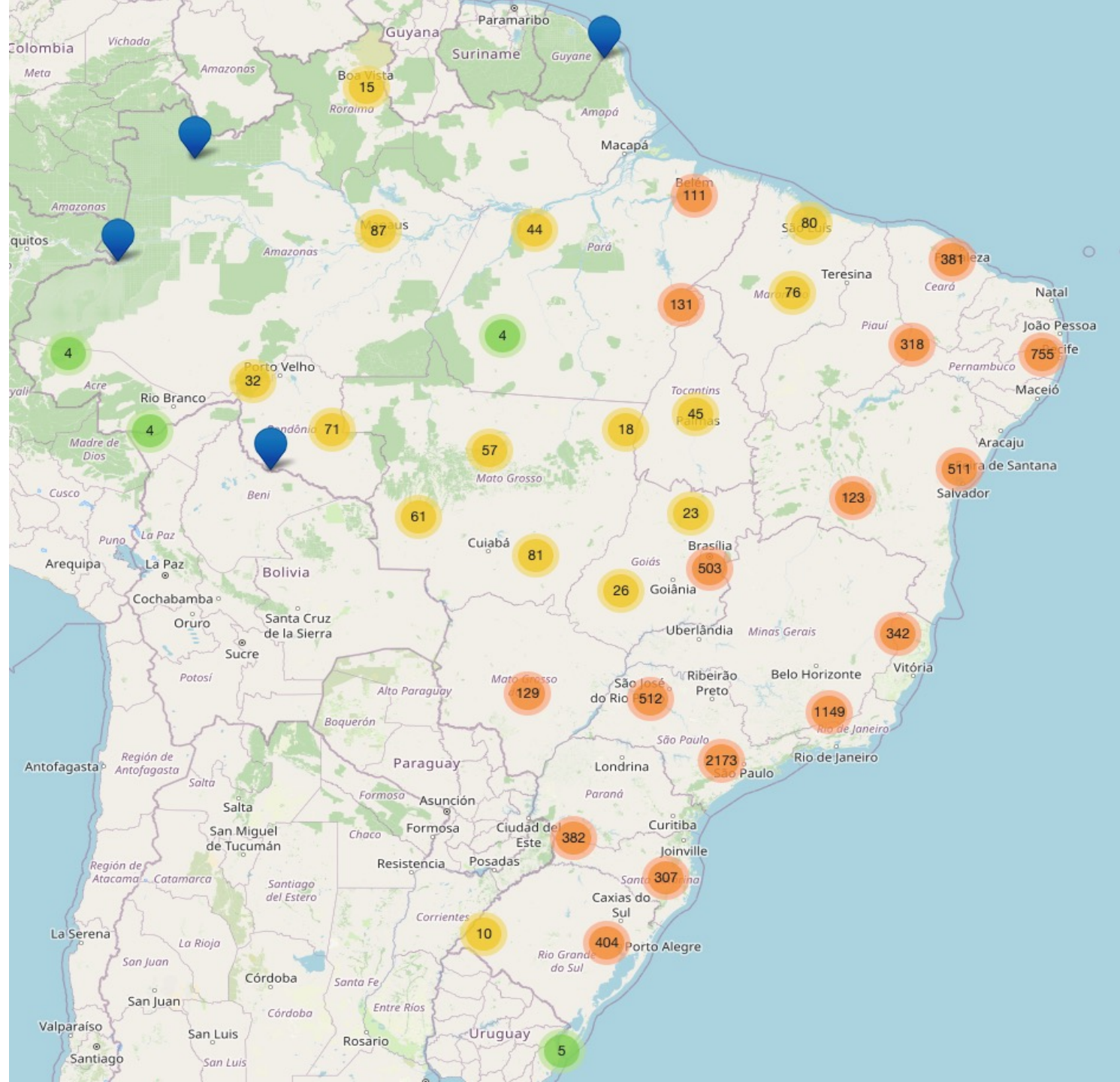
Tipo de conexão pelo celular

Usuários de Internet pelo celular (%)



DEMOGRAPHIC DENSITY OF ASNs

08/11/2022
8,978 ASNs



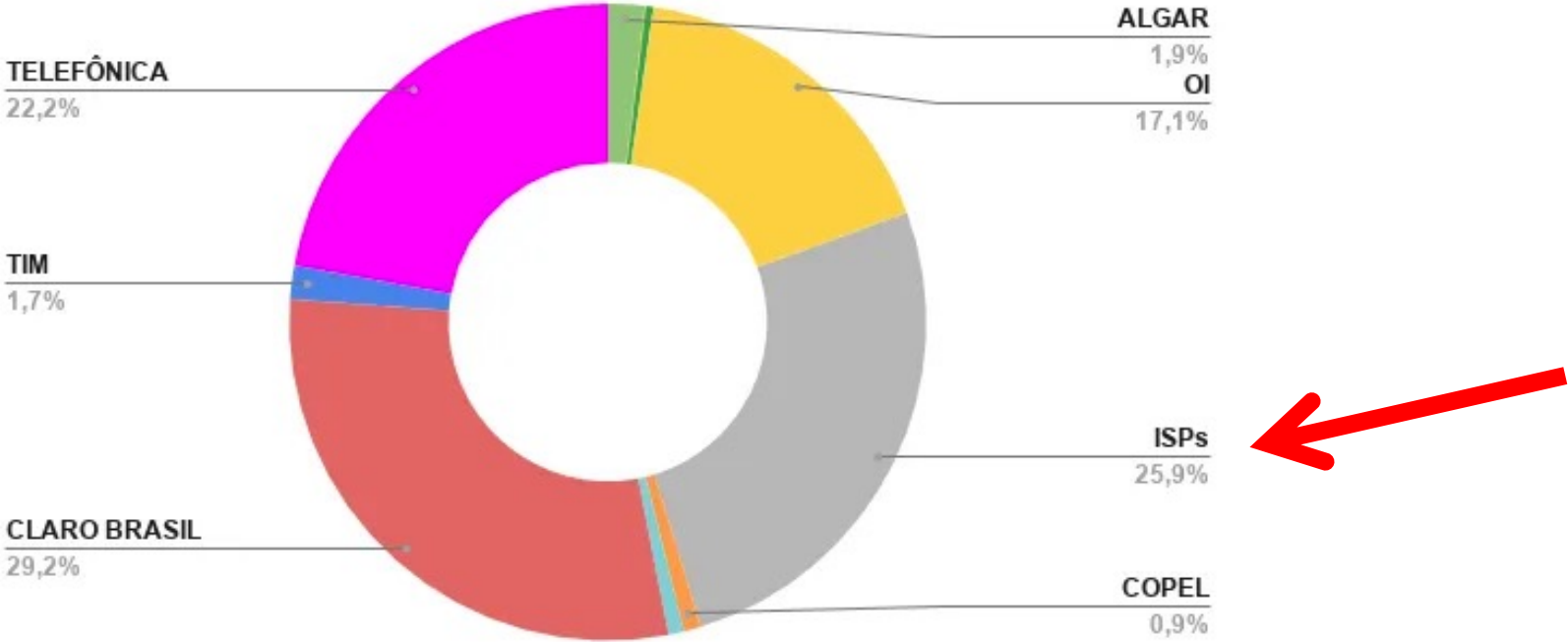
Distances in Brazil

35 IXPs in operation
NOT INTERCONNECTED



Internet Service Providers

Market share - set/19



Source: <https://teletime.com.br/31/10/2019/provedores-regionais-ultrapassam-2-milhoes-de-novos-acessos-em-2019/>

Small and Medium ISPs

- Can start getting 60 – 70% of residential users Internet traffic or 50 – 70% of business users from IX.br São Paulo
- When they grow, start requesting caches (GGC, FNA, OCA, ...)
- They can buy IP transit offered by telecom companies in IX.br (using a private VLAN)
- The number of these companies is not really well known, going from 12,000 to 18,000
- 17,658 companies are authorized by Anatel (Regulator) to provide Fixed Broadband service
- The cost to obtain the authorization had been reduced, for something like USD 130.00
- The cost of fiber optics infrastructure to bring Internet access to the users had also been reduced
- There are several ISPs Associations

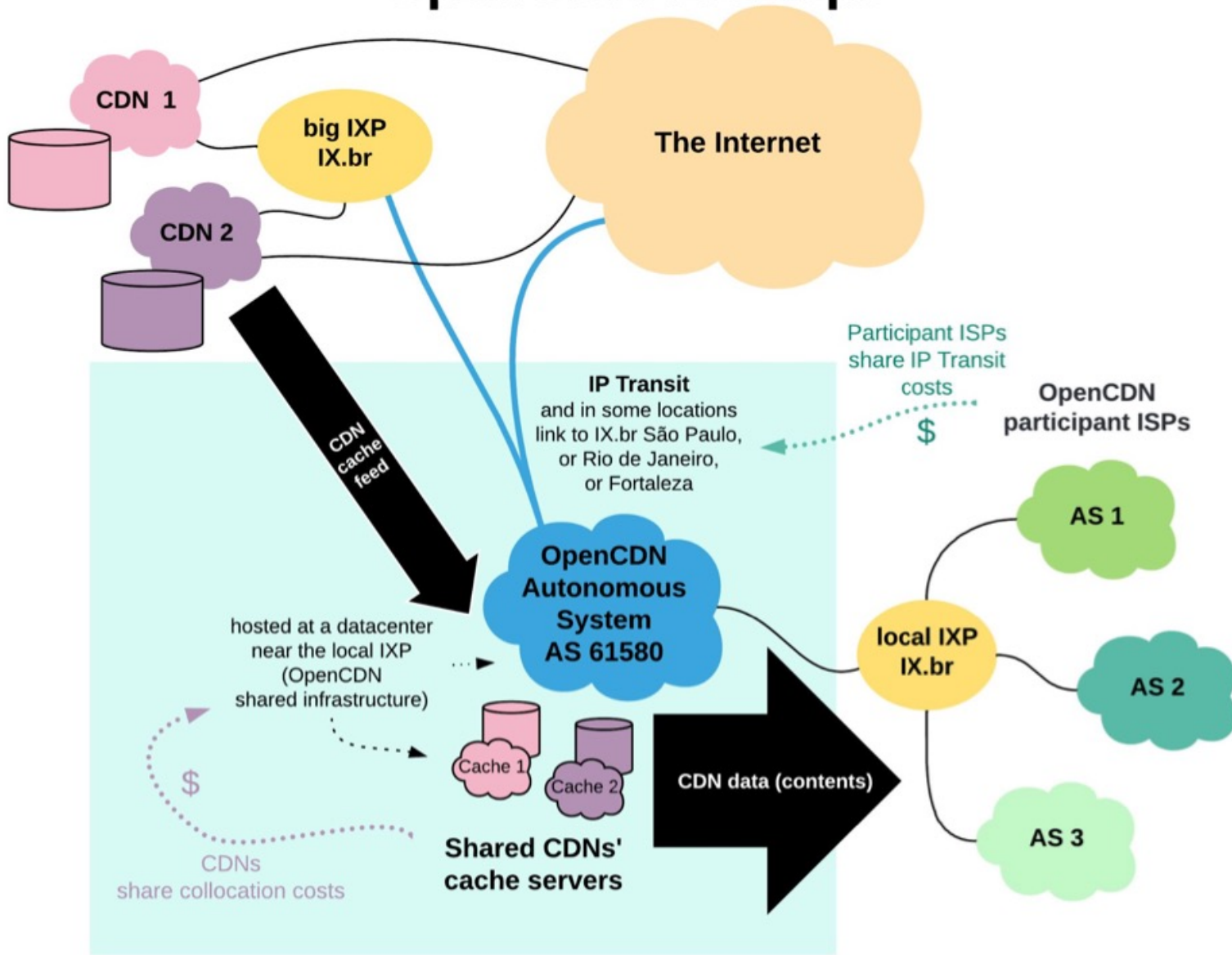


REDETELESUL



São Paulo/SP	Rio de Janeiro/RJ	Fortaleza/CE	Porto Alegre/RS	Curitiba/PR	Salvador/BA	Manaus/AM	Brasilia/DF	Recife/PE	João Pessoa/PB
Google	Google	Google			OpenCDN	OpenCDN	**		
Netflix	Netflix	Netflix	Netflix		OpenCDN	OpenCDN	OpenCDN		
Facebook	Facebook	Facebook							
Akamai	Akamai	Akamai	Akamai	Akamai	OpenCDN	**	Akamai		
Microsoft	Microsoft								
<u>Globo.com</u>	<u>Globo.com</u>	<u>Globo.com</u>	<u>Globo.com</u>	<u>Globo.com</u>	OpenCDN	OpenCDN	<u>Globo.com</u>	<u>Globo.com</u>	
Amazon	Amazon								
Azion	Azion	Azion			OpenCDN	**			
CacheFly									
CDNetworks									
CentralServer									
Cloudflare	Cloudflare	Cloudflare	Cloudflare	Cloudflare	Cloudflare	**	**		
Edgecast	Edgecast	Edgecast							
Fastly	Fastly	Fastly		Fastly					
GoCache	GoCache	GoCache		GoCache			GoCache		
RiotGames									
SingularCDN	SingularCDN	SingularCDN	SingularCDN			SingularCDN		SingularCDN	SingularCDN
Softlayer									
Twitch	Twitch	Twitch	Twitch				Twitch		
Twitter									
UPX	UPX	UPX			UPX		UPX		
Yahoo	Yahoo	Yahoo							
Edgeuno	Edgeuno	Edgeuno	Edgeuno	Edgeuno	Edgeuno		Edgeuno		
Alibaba_Cloud_CDN_	Alibaba_Cloud_CDN_								
CDNetworks									
CDN77									
28	18	15	7	6	3	1	6	2	1

OpenCDN concept



IX.br | NIC.br main goal: Increase Internet quality around Brazil

- Lower latency
- Lower cost (we don't have control over this)
- Increase ASNs connectivity
- Reduce dependency on big IXPs
- Promote or create demand for new data centres in unexplored areas
- Have Internet contents close to the users

Thanks !

<https://www.ix.br>

<https://www.opencdn.nic.br>

December 8th, 2022

nic.br egi.br

www.nic.br | www.cgi.br

History of the presence of CDNs/Content Providers on IX.br São Paulo

ASN	CDN	Activation year	Traffic peak IX-SP	# Participants IX-SP	PeeringDB – CDN Capacity – 2022
10310	Yahoo!	2006			80G
15169	Google	2008	4.65Gbps	43	2.5T
28604	Globo.com	2010	26Gbps	110	800G
2906	Netflix	2011	42Gbps	248	2.4T
16509	Amazon	2012	-----	-----	1.2T
32934	Facebook	2012	-----	-----	3.2T
8075	Microsoft	2013	147Gbps	392	400G
15133	Edgecast	2014	408Gbps	503	600G
13335	Cloudflare	2014	-----	-----	700G
20940	Akamai	2015	1Tbps	757	2.5T
54113	Fastly	2015	-----	-----	900G
52580	Azion	2017	2.69Tbps	1469	300G
46489	Twitch	2017	-----	-----	1.2T
33438	StackPath	2018	4.2Tbps	1729	600G
396986	ByteDance	2021	13Tbps	2291	300G
714	Apple	2022	15Tbps	2310	200G