



**ORGANIZACION DE LOS ESTADOS AMERICANOS  
ORGANIZATION OF AMERICAN STATES**

**Comisión Interamericana de Telecomunicaciones  
Inter-American Telecommunication Commission**

---

**XIV MEETING OF PERMANENT CONSULTATIVE  
COMMITTEE I: TELECOMMUNICATIONS  
May 5 to 8, 2009  
Cusco, Peru**

**OEA/Ser.L/XVII.4.1  
CCP.I-TEL/doc. 1629/09  
27 April 2009  
Original: English**

**IP ADDRESSES ALLOCATION IN LACNIC REGION  
IPv4 STATUS AND TRANSITION TO IPv6**

**(Item of the agenda 3.2.1)**

**(Document submitted by LACNIC)**

Since 2003, LACNIC has been very active in the region in promoting the adoption of IPv6 through many different activities: disseminating information, providing training, funding initiatives, creating the Latin-American and Caribbean IPv6 Task Force, founding and organizing the Latin-American and Caribbean IPv6 Forum and maintaining the IPv6 Portal among other endeavors.

Recently the International Telecommunication Union (ITU) has submitted to all the member states a questionnaire about IPv4 and IPv6 allocations and some information about the transition to IPv6. Some of the information that is required in this questionnaire is generated and maintained by the RIRs (Regional Internet Registries) and is public and available in the RIR's websites.

In accordance with LACNIC objectives in supporting the IPv6 deployment in the region and consequent with providing all the information necessary to all stakeholders, LACNIC has prepared the following data in order to help the governments to provide accurate responses to ITU.

Only some of the points included in the form are able to be responded almost automatically from the data provided by LACNIC. However we provide also some comments in some of the other questions in order to contribute to the clarification of those points.

**1) What is the number (absolute number, for example 10'000) of IPv4 addresses currently available and used in your country?**

The five Regional Internet Registries publish daily updated reports on IPv4 address delegations by economy. Because of the very large numbers possible in some cases, we have also included a column to show the number of addresses using the standard Internet technical equivalent of a total number of /8s ("slash 8s", which represent  $2^{24}$  IP addresses, or what was known historically as a "Class A"). For ease of access, we provide the following table for member states and the TSB to use:

In the questionnaire is requested to mention the number of IPv4 and IPv6 addresses currently "used". There is no way to answer that question. It is possible however to identify the number of IP addresses that are being announced on the Internet at certain moment. There are many reasons that justify that a set of IP addresses could be announced in some moment and not in others, but it doesn't mean that all of these addresses are used and on the other hand, there could be addresses that are used in public networks (i.e. inter banks networks, state networks, pulse to talk networks) but not on the internet and so, they are not announced on the Internet, but used. We have included anyway the number of addresses announced on the Internet at the moment of preparing the table. While they don't indicate, as explained, the number of addresses used, it is the closest concept and it would be the one we can measure with some level of confidence.

Country	ISO 3166 Country Code	Absolute number of addresses allocated	Number of addresses allocated in /8s	Number addresses being used/routed
Argentina	AR	7.395.072	0,4408	6.568.112
Aruba	AW	18.432	0,0011	17.952
Belize	BZ	49.664	0,0030	37.078
Bolivia	BO	431.360	0,0257	335.377
Brazil	BR	29.754.880	1,7735	26.925.586
Chile	CL	4.731.136	0,2820	3.934.257
Colombia	CO	4.257.536	0,2538	3.797.523
Costa Rica	CR	1.504.256	0,0897	1.363.149
Cuba	CU	105.472	0,0063	104.690
Dominican Republic	DO	405.248	0,0242	398.291
Ecuador	EC	803.072	0,0479	689.376
El Salvador	SV	406.528	0,0242	389.064
French Guiana *	GF	2.048	0,0001	0
Guatemala	GT	489.472	0,0292	356.013
Guyana	GY	16.384	0,0010	16.242
Haiti	HT	57.344	0,0034	36.910
Honduras	HN	94.464	0,0056	76.001
Netherlands Antilles	AN	211.968	0,0126	207.534
Nicaragua	NI	166.144	0,0099	128.849
Mexico	MX	21.503.232	1,2817	17.951.789
Panama	PA	1.130.240	0,0674	1.121.054
Paraguay	PY	141.568	0,0084	130.862
Peru	PE	1.715.968	0,1023	1.693.660
Suriname	SR	44.032	0,0026	20.300
Trinidad and Tobago	TT	307.968	0,0184	301.822
Uruguay	UY	663.808	0,0396	595.256

Venezuela	VE	3.693.056	0,2201	3.306.454
-----------	----	-----------	--------	-----------

\* - Due to some technical reasons it was not possible to verify the information regarding French Guiana.

**2) What is the number (absolute number, for example 10'000) of IPv6 addresses currently available and used in your country?**

The same comments and clarifications made in the previous question, also apply to this one.

Because of the very large numbers possible in some cases, we have also included a column to show the number of addresses using the standard Internet technical equivalent of a total number of /48s ("slash 48s", which represent  $2^{96}$  IP addresses, which is the standard address block assigned to an end site). For ease of access, we provide the following table for member states and the TSB to use.

Country	ISO 3166 Country Code	Absolute number of addresses allocated in /48s	Number of addresses being used/routed in /48s
Argentina	AR	2.490.369	1.310.720
Aruba	AW	0	0
Belize	BZ	0	0
Bolivia	BO	196.608	0
Brazil	BR	2.359.300	262.144
Chile	CL	720.897	327.680
Colombia	CO	589.825	0
Costa Rica	CR	393.216	262.144
Cuba	CU	262.144	131.072
Dominican Republic	DO	196.608	0
Ecuador	EC	262.146	131.072
El Salvador	SV	65.536	65.536
French Guiana	GF	0	0
Guatemala	GT	262.144	65.536
Guyana	GY	0	0
Haiti	HT	65.536	0
Honduras	HN	0	0
Netherlands Antilles	AN	196.611	65.536
Mexico	MX	851.970	524.288
Nicaragua	NI	131.072	0
Panama	PA	196.608	65.536
Paraguay	PY	65.536	0
Peru	PE	458.752	0
Suriname	SR	0	0
Trinidad and Tobago	TT	131.072	65.536
Uruguay	UY	1.245.188	196.608
Venezuela	VE	917.504	131.072

**3) What is the number (absolute number, for example 100) of organizations in your country that**

**currently have been allocated an IPv4 addresses block from one of the Regional Internet Registries (RIRs)?**

In the table below, it is expressed the number of organizations that currently have been allocated IPv4 blocks from LACNIC and/or from the NIRs. This is the number of organizations with direct allocations. Those organizations can later sub-allocate addresses to other organizations. It is the case of ISPs that allocates public addresses to smaller ISPs or to some of their customers. When the sub-allocations are blocks of 8 IPv4 addresses or more, the ISP has to record the sub-allocation in LACNIC's system. This information is checked every time that the ISP comes back to LACNIC for requesting more addresses. Small sub-allocations are not registered in order to protect the privacy of users.

Therefore, the number of organizations that really hold IP addresses is bigger than the number shown in the table. Since the small allocations are not registered and there are many Internet operators in the region that usually allocate a small number of IP addresses to most of their customers, it is impossible to know what is the number of organizations that hold IP addresses in each country. However, it doesn't seem to be a relevant indicator.

Country	ISO 3166 Country Code	# of organizations with direct allocation
Argentina	AR	181
Aruba	AW	2
Belize	BZ	4
Bolivia	BO	18
Brazil	BR	476
Chile	CL	192
Colombia	CO	85
Costa Rica	CR	15
Cuba	CU	12
Dominican Republic	DO	15
Ecuador	EC	122
El Salvador	SV	13
French Guiana	GF	1
Guatemala	GT	21
Guyana	GY	1
Haiti	HT	6
Honduras	HN	16
Netherlands Antilles	AN	15
Mexico	MX	476
Nicaragua	NI	12
Panama	PA	27
Paraguay	PY	12
Peru	PE	34
Suriname	SR	2
Trinidad and Tobago	TT	11
Uruguay	UY	13
Venezuela	VE	53

**4) What is the number (absolute number, for example 100) of organizations in your country that currently have been allocated an IPv6 addresses block from one of the Regional Internet**

## Registries (RIRs)?

Country	ISO 3166 Country Code	# of organizations
Argentina	AR	17
Aruba	AW	0
Belize	BZ	0
Bolivia	BO	3
Brazil	BR	35
Chile	CL	12
Colombia	CO	10
Costa Rica	CR	3
Cuba	CU	4
Dominican Republic	DO	3
Ecuador	EC	6
El Salvador	SV	1
French Guiana	GF	0
Guatemala	GT	4
Guyana	GY	0
Haiti	HT	1
Honduras	HN	0
Netherlands Antilles	AN	5
Mexico	MX	14
Nicaragua	NI	2
Panama	PA	3
Paraguay	PY	1
Peru	PE	7
Suriname	SR	0
Trinidad and Tobago	TT	2
Uruguay	UY	5
Venezuela	VE	13

**5) What would you expect your requirements to be in terms of the number (absolute number, for example 10'000) of IPv4 addresses in your country in the future?**

This question and the next one are very difficult to answer, because the number of addresses needed doesn't depend only of the growing of the Internet in a given country. It may be possible with some certainty to predict how the Internet penetration will evolve but it is much more difficult to predict what kind of new services will be provided, how new equipments will use IP addresses and what will be the changes in the operators infrastructure.

**6) What would you expect your requirements to be in terms of the number (absolute number, for example 10'000) of IPv6 addresses in your country in the future?**

Same comments than in the previous question.

**7) What, if any, facilities are present in your country, to encourage IPv6 deployment?**

It is not clear in this context what is referred as “facilities”.

**8) What would you expect requirements to be in your country in terms of equipment necessary for the transition from IPv4 to IPv6?**

The RIRs suggest that as the transition from IPv4 to IPv6 will take up to 20 years to complete, there will be a long period where there will be both IPv4-only and IPv4/IPv6 networks. Timelines for the migration to IPv6 will vary significantly depending on the strategy networks in each country find most appropriate for their circumstances. Therefore, there will be a continuous scale of requirements, from networks that do not need to make any equipment changes now, to networks choosing to make those changes now, to networks that can simply buy IPv6-compatible equipment as part of the natural replacement cycle.

**9) What would you expect the cost to be of that equipment?**

As noted above, this will be a very difficult question for member states to answer, as it depends on the strategy or combination of strategies best suited for the networks in their country.

**10) Do you consider that you have adequate information on IP address allocation and registration policies and mechanisms?**

All RIRs provide free and unfettered access to all IP address allocation and registration policies from their websites. Documents are also often available in multiple languages. The RIRs have a long and consistent history of engaging governments to help them understand how IP address management systems work and how stakeholders can participate in the open and transparent policy making processes that develop the allocation policies. LACNIC invites governments to visit its website at: [www.lacnic.net](http://www.lacnic.net).

**11) If you answered “no” to question 10 above, indicate what additional information would be useful for you:**

Given the transparency of the RIR system and the RIRs’ engagement with member states through not only the RIR system, but also through other forums such as the ITU, the IGF, eLAC and CITEL, LACNIC is very confident that any government who has a genuine interest in IP address distribution has ample opportunity to find any information it needs on allocation, registration and associated IP addressing issues.

**12) What are, to the best of your knowledge, the real or perceived barriers to IPv6 uptake, (for example, institutional barriers, cost of equipment, cost of training, current allocation policy, etc)?**

-----

**13) What specific information would you expect to find on the ITU web site that will be created pursuant to WTSA Resolution 64?**

-----

**If you have any additional comments, please write them in below, or in an additional page.**

Information sources:

**LACNIC Stats file:**

<ftp://ftp.lacnic.net/pub/stats/lacnic/delegated-lacnic-latest>

The “LACNIC Stats file” is a text file containing a list of allocations and assignments made by LACNIC indicating the country code of the organization receiving it. Published on daily basis.

**LACNIC SIARI:**

<http://lacnic.net/en/siari.html>

Internet Resources Analysis Interactive System by LACNIC. SIARI is a tool based on the use of data warehousing techniques that allow the interactive analysis of LACNIC Registration System information

**IPv4 Routing Information**

<http://bgp.potaroo.net/index-ale.html>

IPv4 routing reports containing information about routes for IPv4 addresses block organized by RIR, by economy and region.