IPv4 ADDRESS BLOCK ALLOCATION POLICIES

3.1. Introduction

For the purpose of section 3, all references to IP addresses shall refer to version 4 of this protocol.

In this chapter we will describe how an Internet Registry (for future reference, this concept encompasses Internet Service Providers and National Internet Registries) can obtain IP address allocation and how the allocated space must be administered.

IP address space is allocated to Internet Registries (IR) using a slow−start model. Allocations are based on justifiable need, not only on the grounds of client preference.

Due to the fact that the number of IP addresses is limited, many factors must be considered for the delegation of IP address space.

As mentioned earlier, LACNIC's allocations to IRs are based on RFC 2050's slow−start concept. The idea is to allocate IP address space to Internet Registries in the same proportion as they will assign the IP addresses among their users.

The size of an allocation to a particular IR is based on the rate with which it has previously assigned IP address space among their clients. The aim is to avoid the existence of large blocks that are not assigned to end users.

Due to technical restrictions and the possibility of overcharging the routing tables, certain policies must be implemented in order to ensure that the preservation and routeability objectives are fulfilled.

This chapter mentions prefix sizes and block sizes. Standard notation implies that larger prefixes reference blocks of smaller size. For example, when it is said that certain policy applies to blocks with a prefix greater than /20, this means that blocks smaller than 16 class C networks are being discussed.

3.2 Aspects to Consider in relation to IP Address Administration

This section describes a number of aspects on which relationships must be based, both between Internet Registries and their clients as well as between Internet Registries and LACNIC.

3.2.1 IP Addresses are Delegated

LACNIC shall allocate Internet resources within a delegation plan. This resource delegation plan shall be valid for one year. This delegation is renewable, and shall be subject to the conditions established at the time of renewal.

3.2.2 Slow−Start Policy

IP address blocks are allocated to IRs using a procedure called slow−start based on RFC 2050.

Internet Service Providers applying for IP address blocks for the first time shall receive a minimal amount based on immediate requirement, with the exceptions established in item 3.3.4 − "Immediate Allocations".

Thereafter, allocated blocks may be increased based on the verification of block usage according to information provided to LACNIC. Thus, LACNIC shall be responsible for determining initial and subsequent allocations. Additional IP address allocations shall enable the IRs to operate for at least three months without requiring further allocations.

Initial allocations shall not be based on any current or future routing restrictions, but on actual and demonstrated use of IP addresses.

Likewise, the number of addresses projected by the applicant is useful for planning future requirements.

3.2.3 Allocated Blocks

In order to ensure an efficient implementation and use of classless technologies (CIDR), LACNIC shall allocate IP address blocks based on the limits supported by this technology. To facilitate an efficient deployment of the CIDR, Internet Service Providers (ISPs) and End Users are encouraged to initially request IP address space from their upstream providers. The upstream provider shall maintain control of the allocated blocks upon termination of their clients' contract.

3.2.4 Avoid Block Fragmentation

IP addresses under CIDR technology are allocated to IRs in blocks. It is recommended that the publication of these blocks on the routing tables remain intact. More specifically, ISPs shall treat IP address reallocations to their clients as loans for the duration of the connectivity. Upon termination of the Internet connectivity contract, e.g., if a customer moves to another ISP, the client shall have to return the IP addresses currently in use and renumber them with the new IP addresses of the new provider.

New requests for addresses shall be conditioned to the finalization of this task. The IR shall allow sufficient time for the renumbering process to be completed before these IP addresses are reused with another client.

3.2.5 Documentation

Internet Registries shall use the group of IP addressed they have been allocated in an efficient manner. To this end, IRs shall document the justification for each IP address reallocation. At the request of LACNIC, the corresponding IR shall make this information available. LACNIC shall not make complementary allocations to those Internet Registries that do not have the use of the blocks already allocated properly documented. In these cases, current allocations may also be reviewed.

According to what is established in RFC 2050, the documentation LACNIC may require includes:

- Engineering plans.
- Subnetting and aggregation plan.
- Description of network topology.
- Description of network routing plans.
- Receipts documenting investments (equipment).
- Other relevant documents.

3.2.6 Use of Classless Technology (CIDR)

Due to the requirement to increase the usage efficiency of IP address space, all assignments are made under the assumption that the organizations use variable length subnet masks (VLSMs) and classless technology within their networks. Any request for address space based on the use of classless technology shall require a detailed justification. The use of classfull technologies is generally unacceptable due to the limited availability of free IP addresses space.

3.2.7 Static Addressing

Due to restrictions on the availability of IP addresses, LACNIC shall in no way endorse the use of static IP address assignments (e.g., one address per customer) for dial−up users. It is understood that the use of static addressing may simplify some administrative aspects. However, the current rate of consumption of IP addresses does not allow the assignment of static addresses for administrative reasons. Because of this, organizations that are considering the use of static IP address assignment are expected to investigate and implement dynamic assignment technologies.

3.2.8 Web Hosting

The development of the http 1.1 protocol has eliminated the need of assigning an IP address for each web domain in case of multiple websites on the same server. LACNIC promotes the development of web page hosting based on name usage, as opposed to IP addresses.

Therefore, this last case shall not be accepted as justification for address usage. LACNIC shall consider exceptions where applications require the use of web hosting based on IP addresses, which must be duly described and justified.

3.2.9 Non−Guaranteed Routeability

Portable (provider−independent) addresses issued by LACNIC or other Regional Registries are not guaranteed to be globally routable.

These problems shall be solved by those possessing the addresses involved together with their connectivity provider or providers.

LACNIC shall, in those cases deemed necessary, provide the corresponding guidance.

3.2.10 Validity of IP Address Allocation

IP address allocations are valid as long as the objectives of exclusivity, conservation, routeability, and information continue to be met. LACNIC may invalidate any IP address allocation if it is determined that the requirements for address space no longer exist or any of the objectives stated in this document have ceased to be satisfied.

There are a number of practices that might be considered grounds for losing the allocations received. These are:

- Not using the allocated address space during a period of one month following registration.
- Not updating the reverse resolution of the allocated addresses.
- Not updating the reallocation information on LACNIC's Whois database.
- Not satisfying contractual obligations towards LACNIC.
- Not responding to a request for information made by LACNIC within a period of two weeks.
- Not applying correctly LACNIC's policies on suballocations and administration of resources received from LACNIC.

In the event of IP address space invalidation, reasonable effort shall be made by LACNIC to inform the community that the addresses have been returned and are once again available IP address blocks.

3.2.11 Submission of Application Templates

IRs request address space from LACNIC through Address Application Templates for IRs or End Users. Any application deemed as lacking information or insufficiently detailed shall be returned to the applicant for its completion.

3.2.12 Suballocation Supervision

3.2.12.1 Suballocation Window

ISPs may suballocate to their clients blocks smaller than /20, i.e., blocks with prefixes greater than /20, following the policy defined by LACNIC in this document. In some cases, suballocations shall be consulted with LACNIC or with the corresponding NIR in order to ensure optimization of the IP address space and the correct application of LACNIC policies.

LACNIC defines every prefix greater than /23 as an allocation window. Thus, all suballocations of prefixes less than or equal to /23 (larger blocks) shall be consulted with LACNIC or with the corresponding NIR. In these cases, communication between the ISPs and LACNIC or the corresponding NIR shall include the same information and justifications established in this document for end users.

3.2.12.2 NIR Suballocation

NIRs are exempt from complying with item 3.2.12.1. Instead, they shall be subject to more severe audit programs according to the content of the contracts between LACNIC and said NIRs.

These audits shall be carried out at least once a year and, if necessary, with greater frequency.

3.2.12.3 Submission of Reallocation Information

Allocations are based on the requirement of three months of Internet Registries, in addition to other information considered relevant by LACNIC such as that described in item 3.2.5 − "Documentation". Thus, initial allocations may be relatively small. The justification for requiring new allocations must be based on the information transmitted by the corresponding Internet Registry to LACNIC's WHOIS database.

Reallocation information shall be sent to LACNIC within a period of seven days following the allocation, so that the WHOIS database may be updated in due time.

Transmission of reallocation information is also necessary for the following reasons:

- To ensure that an IR has exhausted, or is about to exhaust, its address space allocation, thereby justifying the allocation of new additional space.
- To provide the Internet community with information as to which organization is using the IP address space and to provide a point of contact in case of operational, security, or other problems.
- To assist in the study of IP address allocation within the region.

3.2.13 Security and Confidentiality

LACNIC shall maintain systems and practices that ensure and protect the confidentiality of all information entrusted to LACNIC in the documentation submitted to justify allocation or assignment of IP addresses.

3.2.14 Equal Processing of All Applications

LACNIC shall process every application strictly in the order they are received, regardless of geographical factors, demographic factors, language, etc. Under no circumstance shall LACNIC grant special treatment or make exceptions to the norm established for application processing. To this end, LACNIC shall use an application numbering system that will allow their proper administration.

3.2.15 Micro Allocations

LACNIC shall micro allocate blocks with prefixes greater than the standard (smaller blocks) in special cases listed in Section 3.3 − "Initial IP Address Space Allocation Policies".

3.3 Initial IP Address Space Allocation Policies

LACNIC shall allocate IP addresses to organizations covered by the following cases:

- Allocation to multi−homed Internet Service Providers.
- Allocation to Internet Service Providers that are not multi−homed.
- Micro allocations.
- Immediate allocations to Internet Service Providers.
- End user assignment.

The following sections contain a detailed description of the policies LACNIC shall apply for initial IP address allocation in each of these cases.

Due to the fact that the number of IP addresses available on the Internet is limited, many factors must be considered for determining IP address space allocation. Therefore, IP address space is allocated to ISPs following a slow−start model. Allocations are based on justifiable need, not on prediction of number of clients, market research, etc.

3.3.1 Initial Allocation to Multi−Homed Internet Service Providers

LACNIC shall apply a policy whereby a multi−homed ISP that has efficiently used a /22 block is allocated a /20 block.

An ISP is multi−homed if it receives full−time connectivity from more than one Provider and has one or more routing prefixes publicized by at least two of its connectivity providers.

In order to receive an initial allocation of address blocks from LACNIC, Internet Service Providers shall meet the following requirements:

1. Be multi−homed organizations that have efficiently used a minimum /22 block (adjoining or non−adjoining). To justify future allocations, the organization must provide LACNIC the appropriate documentation, including allocation history. Organizations that have the minimal allocation requested and are planning to become multi−homed within a period of one month may also present applications; in this case, copies of the validating contracts or documents shall also be required.

2. Provide reallocation information by prefixes with lengths less than or equal to /29 (i.e., blocks greater than or equal to /29) on LACINIC's WHOIS.

3. Provide documentation justifying the initial address space. (Complete the IP Address Application Template for ISPs.) This must include detailed information showing how /20 shall be used within the following three and six−month periods.

4. Agree to renumber /22 block within a period of 12 months and return the space to its original provider. This point is essential for obtaining the requested /20 block. The allocated /20 block must be used to renumber the original /22 block.

5. If the applicant's current IP address space is portable (provider−independent), applicant shall have a record of the inverse resolution of all allocated IP address space and therefore the previous item shall not apply.

3.3.2 Initial Allocation to Internet Service Providers that Are Not Multi−Homed

Those organizations seeking an initial allocation from LACNIC that do not meet the requirements of item 3.3.1 shall comply with the following policies:

1. Have efficiently used the entirety of a /21 block previously allocated by their upstream provider. There is no reason why the allocation of this /21 block must be adjoining address spaces.

2. Provide documentation justifying the initial address space (Complete the IP Address Application Template for ISPs). This must include detailed information showing how /20 shall be used within the following three and six−month periods.

3. Provide reallocation information by prefixes with lengths less than or equal to /29 on LACNIC's WHOIS.

4. Agree to renumber /21 block within a period of 12 months and return the space to its original provider. This point is essential for obtaining the requested /20 block. The allocated /20 block must be used to renumber the original /21 block.

5. If the applicant's current IP address space is portable (provider−independent), applicant shall have a record of the inverse resolution of all allocated IP address space and therefore the previous item shall not apply.

3.3.3 Micro Allocations

Micro allocation is the name given to those allocations that imply blocks smaller than /20 but always greater than or equal to /24.

LACNIC can make this type of allocation in case of projects and infrastructure for key or critical networks such as IXP (Internet Exchange Point), NAP (Network Access Point), RIR, ccTLD, among others.

In the case of IXPs or NAPs, in order to be able to apply for this type of allocation, organizations shall meet the following requirements:

1. Duly document the following aspects:

1.1 Prove by means of their bylaws their capacity of IXP or NAP. They shall have at least three members and an open policy in relation to the association of new members.
1.2 Submit a company structure organizational diagram.
1.3 Document the numbering plan to be implemented.

2. Provide a usage plan for the following three and six months.

The rest of the applications shall be studied based on the analysis of the documentation justifying the critical and/or key aspects of the project.

Organizations receiving micro allocations can not suballocate these addresses.

3.3.4 Immediate Allocations

According to the specifications of RFC2050, LACNIC applies a slow−start policy for IP address allocation. According to sections 3.3.1 and 3.3.2, the initial allocation for an IR is a /20 block.

Despite this, LACNIC acknowledges that there may exist circumstances under which there is justifiable need for an initial allocation where infrastructure and service investment levels would demand minimal allocation.

LACNIC shall be able to make this type of allocation to those organizations that meet the following requirements:

1. The organization is currently multi−homed or will be multi−homed in the near future (contracts or letters of intention signed with their carriers).

2. Submit a detailed description of network topology.

3. Submit a portfolio with a detailed description of the services the organization will offer.

4. Submit a detailed plan of deployment of IP address space usage for 3, 6, and 12 months.

5. Submit a copy of receipts or purchase orders for the equipment that will support the previously described services.

6. Submit a copy of receipts for services offered to customers.

It should be noted that this type of allocation shall be handled as exceptions and are not covered by the response times guaranteed for normal IP address application processes. For these allocations LACNIC may, at any time, request additional information to help justify a minimal allocation.

3.3.5 Policies for IP Address Assignation to End Users

LACNIC shall assign IP address blocks to end users requiring IP address space for internal use, for the functioning of their networks, but not for sub−delegation outside their organization.

Generally end users receive IP address space from their upstream providers, not directly from LACNIC. Provider−independent (portable) addresses obtained directly from LACNIC or other Regional Registries are not guaranteed to be globally routable. For this reason, end users should contact their Internet Service Providers to ensure their connectivity within the network.

End users not connected to an ISP and/or not planning to be connected to Internet are advised to use private IP addresses. The description of these addresses may be found in RFC 1918.

When assigning IP addresses to end users, LACNIC follows the guidelines of the assignment policies and procedures established in RFC 2050. These guidelines and policies were developed to satisfy the needs of the growing Internet community in relation to preserving the limited IP address space and allowing the continuity and existence of Internet routing technologies. The minimum IP address block allocated by LACNIC is /20. Should the need for IP address space be lower than /20, end users should contact their corresponding Internet Service Providers.

LACNIC shall assign IP addresses to end users that are efficiently using a /21 block; each one of these organizations shall be assigned a /20 block.

In order to receive an initial assignment from LACNIC, multi−homed end users shall:

1. Provide detailed information showing how the /20 shall be used within the following six and twelve−month periods, as shown in the following example.

Prefix	**Subnet Mask**	**Size**	**Current**	**6 Months**	**12 Months**	**Description**
200.10.193.0	255.255.255.192	64	28	34	50	Purchases
200.10.193.64	255.255.255.224	32	10	12	25	Customers
200.10.193.96	255.255.255.224	32	8	13	27	North Office
200.10.193.128	255.255.255.128	128	57	100	114	Corporate
200.10.194.0	255.255.255.0	256	132	170	210	Sales
200.10.195.0	255.255.254.0	512	317	350	380	Assembly
		1024	552	679	806	Totals

Table 1.− Report for IP address space assignment

2. Agree to renumber /21 block within a period of 12 months and return the space to its original provider. This point is essential for obtaining the requested /20 block. The allocated /20 block must be used to renumber the previously assigned /21 block.

3. Submit subnetting plans for a period not shorter than one year, including subnet masks and host numbers on each subnet. Use of VLSM is required.

4. Detailed description of network topology.

5. Detailed description of network routing plans, including the routing protocols to be used as well as any existing restrictions.

3.4 Additional IP Address Space Allocation Policies

The object of these guidelines is to assist Internet Registries in the process of applying for additional IP address space. The most important factor in the evaluation of additional address space applications is the revision of the current IP address space of the Registries presenting an application, as well as that of their clients. In order to receive the additional space requested, a Registry shall have used at least 80% of its previous allocations. This includes space reallocated to its clients. Therefore, it is important that IRs demand that their customers follow the efficient usage practices described in these policies.

The following are the steps that must be carried out for the allocation of new IP address blocks:

1. The first step of the process is to verify the usage of at least 80% of previous allocations. This usage percentage shall be based solely on those networks publicized with IP addresses connected to the Internet. For IRs that have allocated IP addresses to their clients, the available method to prove this usage is through the records kept in LACNIC's WHOIS database. Until the usage of at least 80% of the previously allocated block is verified the application shall not continue to be considered. Use of 80% of previously allocated addresses also covers those addresses dedicated to internal use and dial−up clients of the company.

   The application process for additional space shall continue once the usage of at least 80% of the previously assigned space has been verified.

2. Organizations shall prove they are using LACNIC policies in reallocating space to their clients, particularly in relation to:

   - Issuing prefix lengths greater than /24, wherever possible.
   - Verifying that block reallocations within the allocation window were previously sent to LACNIC for their approval.

3. Organizations shall demand that their clients adhere to the following criteria:

   - The information on reallocations smaller than /29 must be available through WHOIS and they must comply with the 80% space usage requirement before assigning additional space to their clients.
   - LACNIC policies for the Internet community are generally communicated to and followed by their clients.
   - Web host clients must report use of IP addresses in a manner similar to that shown in the above report.

4. When reviewing applications for additional IP addresses, LACNIC shall also review whether the space designated for its return was actually returned in due time as described in this document.

5. Keep the registry of inverse resolution of administered IP address space updated. The inverse resolution registry shall also agree with the 80% usage.

6. For allocating additional blocks, LACNIC shall verify that the organization presenting the application is in compliance with contractual obligations.

7. The final step is to determine the appropriate allocation. In order to determine the size of the allocation, detailed information must be provided showing how the address space shall be used within the following three, six and twelve−month periods. Allocation policy is based on the efficient usage of space within a time frame of three−months.

Usage rate is a key factor that must be justified. Usage rate is the percentage of addresses that the organization will utilize within a specified period of time. The rate established according to RFC 2050 and adopted by LACNIC is:

25% of immediate usage rate.
50% of one−year usage rate.

A larger usage rate may be required based on individual requirements. Should the organization presenting the application fail to comply with these parameters, addresses shall be withdrawn and a reasonable period shall be negotiated for their renumbering.