

RIR COMPARATIVE POLICY OVERVIEW

December 2013

(Version 2013-4)

The goal of this document is to provide a comparative overview of policies across the Regional Internet Registry (RIR) system. It is not a policy statement by the RIRs, but serves as a reference for the Internet community. While this document was accurate on the date of publication (16 January 2014) it may be outdated by subsequent policy implementations. The official policy documents can be found at the respective websites of the RIRs. This is a public document that will be reviewed and revised quarterly through the coordinated efforts of the RIRs.

For more information, refer to the AFRINIC, APNIC, ARIN, LACNIC, and RIPE NCC websites.

TABLE OF CONTENTS

1. General.....	3
1.1 Goals of the RIR System	3
1.2 Membership	3
1.3 Allocation Terms and Conditions	4
1.3.1 Type of Custodianship	4
1.3.2 Transfer of Custodianship	4
1.3.3 Recovering Unused Resources	5
2. IPv4.....	6
2.1 Initial Allocation	6
2.2 Subsequent Allocations.....	7
2.3 Sub-Allocations.....	8
2.4 Assignments by RIRs (Independent/Portable)	9
2.4.1 General.....	9
2.4.2 Critical Infrastructure	10
2.4.3 Internet Exchange Points (IXPs)	11
2.5 Assignments by LIRs (Aggregatable/Non-Portable)	12
2.5.1 Assignment Window	12
2.5.2 Dynamic Addressing.....	12
2.5.3 Mobile Terminals	12
2.5.4 Web Hosting.....	13
2.5.5 Network Address Translation (NAT).....	13
2.5.6 RFC1918 Private Address Space	13
2.6. Use of Final Unallocated IPv4 Address Space.....	13
3. IPv6.....	16
3.1 Initial Allocation	16
3.2 Subsequent Allocations.....	18
3.3 Other Allocations	19
3.3.1 Micro-allocations for Internal Infrastructure	19
3.4 Assignments by RIRs (Independent/Portable)	20
3.4.1 Critical Infrastructure	20
3.4.2 Internet Exchange Points (IXPs)	21
3.4.3 End Users	22

3.5 Assignments by LIRs (Aggregatable/Non-Portable)	25
3.5.1 Dynamic Addressing	25
3.5.2 Mobile Terminals	25
3.5.3 Web Hosting	25
3.5.4 Network Address Translation (NAT)	25
4. Autonomous System Numbers (ASNs)	26
4.1 Allocations	26
4.2 Assignments	26
4.2.1 32-bit ASNs	27
5. Database - Registration	28
6. Reverse DNS	29
7. National Internet Registries (NIRs)	29
8. Policy Development	30
9. Internet Experiments	30
10. Documentation Prefix	30

1. GENERAL

1.1 GOALS OF THE RIR SYSTEM

RIR	Policy
AFRINIC APNIC ARIN LACNIC RIPE NCC	All allocations and assignments of Internet resources must be consistent with the goals of the Internet Registry system: aggregation, conservation and registration.

1.2 MEMBERSHIP

RIR	Category	Policy
AFRINIC	Qualification	Membership is open to organizations legally present in the AFRINIC region of service.
	Access to registration services	Registration service is accessible by members only. Registered resources are publicly available.
	Fee model	Not-for profit. Fee established to enable cost recovery of operations.
APNIC	Qualification	Only organizations that are located in the APNIC region or have networks located in the APNIC region may apply for resources.
	Access to registration services	Members have full access to all services. Non-member account holders may access resource assignment and allocation services.
	Fee model	Not-for-profit. Fee schedule established to enable cost recovery of operations.
ARIN	Qualification	Organizations that receive direct allocations automatically become members. Membership also open to organizations with direct assignments or ARIN issued Autonomous System Numbers.
	Access to registration services	Do not need to be a member to receive registration services.
	Fee model	Not-for-profit. Fee schedule established to enable cost recovery of operations.
LACNIC	Qualification	Membership is open to LACNIC region only, without conditions.
	Access to registration services	Organizations approved for IP addresses automatically become members. It is not necessary to become a member to obtain some services like ASN assignments. Only organizations based in LACNIC region may apply for resources.
	Fee model	Not-for-profit. Fee schedule established to enable cost recovery of operations.
RIPE NCC	Qualification	Membership is open without conditions.

RIR	Category	Policy
	Access to registration services	Members only. Direct Assignment Users who have a contract with the RIPE NCC can also access Registration Services.
	Fee model	Not-for-profit. Fee schedule established to enable cost recovery of operations.

1.3 ALLOCATION TERMS AND CONDITIONS

1.3.1 TYPE OF CUSTODIANSHIP

RIR	Policy
AFRINIC	Valid as long as original criteria remain satisfied.
APNIC	Allocates and assigns on a 'license' basis, to be of specific limited duration (normally 1 year). Licenses are renewable if: a) the original basis of the allocation or assignment remains valid and b) requirements have been met at time of renewal.
ARIN	Valid as long as organization remains in compliance with policy and registration fees are kept up to date.
LACNIC	Valid as long as original criteria remain satisfied and registration fees are kept up to date.
RIPE NCC	Valid as long as original criteria remain satisfied.

1.3.2 TRANSFER OF CUSTODIANSHIP

RIR	Policy
AFRINIC	Does not allow sale of addresses, but recognizes name changes and transfers of tangible assets associated with addresses. Requires submission of legal documents. Utilization is verified. May require new agreement.
APNIC	<p>APNIC recognizes resource transfers under the following conditions:</p> <ol style="list-style-type: none"> 1) Historical resources may be transferred to an APNIC Member account. Transfers are purely optional and do not need to meet any technical justifications. 2) APNIC recognizes transfers of IPv4 address blocks of /24 or greater between APNIC account holders. Recipients are required to justify their need for the resources. 3) Transfers of IPv4 address blocks greater than /24 are recognized between APNIC account holders and account holders in other regions, only where that region has a suitable Inter-RIR transfer policy. The APNIC account holder must meet the requirements of APNIC policy and the entity in the other region must meet the policy requirements and criteria in its own region. If the recipient is in the APNIC region, they are required to justify their need for the resources. 4) APNIC recognizes the transfer of any numeric resource resulting from mergers, acquisitions, and takeovers, where the effect of the new ownership is that an LIR changes its name. Supporting legal documentation is required, as is full disclosure of all address space held by all entities involved.
ARIN	<p>IPv4 number resources and ASNs within the ARIN region may be released to ARIN by the authorized resource holder, in whole or in part, for transfer to another specified organizational recipient. The recipient must demonstrate the need for up to a 24-month supply of IP address resources under current ARIN policies and sign an RSA.</p> <p>Inter-regional transfers of IPv4 number resources may take place only via RIRs who agree to the transfer and</p>

RIR	Policy
	<p>share reciprocal, compatible, needs-based policies.</p> <p>ARIN also recognizes name changes and transfers due to mergers, acquisitions and reorganizations. Requires documentation and demonstration of need.</p>
LACNIC	<p>Does not allow sale of addresses, but recognizes name changes and transfers of tangible assets associated with addresses. Requires submission of legal documents. Utilization is verified. May require new agreement.</p> <p>Once LACNIC or any of its NIRs becomes unable, for the first time, to cover an IPv4 block allocation or assignment because of lack of resources, LIRs and/or End Users within the LACNIC region will be allowed to transfer IPv4 blocks.</p>
RIPE NCC	<p>Member LIRs can transfer complete or partial blocks of IPv4 address space that were previously allocated to them by either the RIPE NCC or the IANA to another LIR. An LIR may only receive a transferred allocation after their need is evaluated and approved by the RIPE NCC according to the existing allocation policies. LIRs that receive a transfer from another LIR cannot re-allocate complete or partial blocks of the same address space to another LIR within 24 months of receiving the re-allocation.</p> <p>RIPE NCC also recognizes name changes and transfers of tangible assets associated with addresses. Requires submission of legal documents. Utilization is verified. May require new agreement.</p>

1.3.3 RECOVERING UNUSED RESOURCES

RIR	Policy	Comment
AFRINIC RIPE NCC	Valid as long as original criteria remain satisfied.	Do not actively recover unused resources, but if an organization closes, unused resources are returned to the public pool.
APNIC LACNIC	Valid as long as original criteria remain satisfied.	Has policy to actively recover 'unused' networks. If an organization ceases operation, unused resources are returned to the public pool.
ARIN	Organizations found by ARIN to be materially out of compliance with current ARIN policy shall be requested or required to return resources as needed to bring them into (or reasonably close to) compliance.	

2. IPv4

2.1 INITIAL ALLOCATION

RIR	Category	Policy
AFRINIC	Size	Slow start: /22 (can be exceeded when justified by requester).
	Eligibility	The requesting organization must show an existing efficient utilization of IP addresses from their upstream provider or an immediate need of IP addresses. Justification may be based on a combination of immediate need and existing usage.
	Period	1 year.
APNIC	Size	From Friday, 15 April 2011, new and existing APNIC account holders are eligible to receive a maximum /22 worth of address space from the remaining IPv4 address pool.
	Eligibility	a) Membership or pay non-member fee; b) have previously used or can demonstrate immediate need for /24; c) complied with policies in managing all previous address space; d) detailed plan for use of a /23 within a year;
	Period	1 year.
ARIN	Size	Slow start: /22 minimum for multihomed, otherwise /20 (can be exceeded when documented immediate need exceeds /20). /22 for Caribbean and North Atlantic Islands sector of the ARIN region.
	Eligibility	For a /22: efficient utilization of a /23 from upstream; intent to multihome; agree to renumber, or For a /21: efficient utilization of /22 from upstream; intent to multihome; agree to renumber, or For a /20: efficient utilization of /21 from upstream; intent to multihome; agree to renumber, or Efficient utilization of /20 from upstream (no renumbering required). For a /22 in the Caribbean and North Atlantic Islands sector: efficient utilization of a /22 from upstream (no renumbering required).
	Period	3 months.
LACNIC	Size	Slow start: /22, otherwise /21 (can be exceeded when documented immediate need exceeds /21).
	Eligibility	For a /22: current use or documented need of a /24; submit a detailed one-year utilization plan for a /23; agree to renumber out of the previously assigned block and return those IPv4 addresses to their ISPs no later than 12 months after the allocation of the /22; if the applicant does not already have an IPv6 block assigned by LACNIC, simultaneously request an IPv6 block in accordance with the corresponding applicable policy. or For a /21: Must provide information on assignments with prefixes equal to or shorter than /29 (more than 8 IPv4 addresses) on LACNIC's WHOIS database; must provide documentation that justifies the initial address space allocation (This must include detailed information showing how this resource will be used within a period of three, six

RIR	Category	Policy
		and twelve months); must agree to renumber out of the blocks obtained from their providers within a period no longer than 12 months and return the space to its original provider; if the applicant does not already have an IPv6 block assigned by LACNIC, simultaneously request an IPv6 block in accordance with the corresponding applicable policy. If the applicant is a multihomed ISP: Efficient utilization of at least 25% of the requested address space (contiguous or not). Else: Efficient utilization of at least a 50% of the requested address space (contiguous or not).
	Period	12 months.
RIPE NCC	Size	From Friday, 14 September 2012, new and existing RIPE NCC members are eligible to receive one /22 from the last /8.
	Eligibility	a) Membership; b) Demonstration of need; c) IPv6 allocation from an upstream LIR or the RIPE NCC
	Period	Up to 12 Months

2.2 SUBSEQUENT ALLOCATIONS

RIR	Category	Policy	Comment
AFRINIC	Size	Minimum /22, no maximum.	
	Eligibility	Demonstrate 80% efficient utilization of last allocated space or an immediate need that requires more IP addresses than are available in the most recent allocation.	
	Period	Up to 1 year.	
APNIC	Size	Minimum /24, up to a maximum /22 of the remaining available space after 15 April 2011.	
	Eligibility	Demonstrate 80% efficient utilization of all prior allocated space.	
	Period	Up to 1 year.	
ARIN	Size	Minimum /22 for multihomed, otherwise /20, no maximum.	
	Eligibility	Demonstrate efficient utilization of all previous allocations and at least 80% of the most recent allocation.	
	Period	3 months.	
LACNIC	Size	The policy for determining the size of additional allocations is based on the efficient utilization of space within a time	

RIR	Category	Policy	Comment
		frame of 12 months.	
	Eligibility	<p>Demonstrate 80% efficient utilization of all prior allocated space.</p> <p>The applicant must already have at least one IPv6 block assigned by LACNIC or, if not, must simultaneously request an initial IPv6 block in accordance with the corresponding applicable policy. If an applicant has already been assigned an IPv6 block, they shall submit to LACNIC a brief document describing their progress in the implementation of IPv6.</p>	
	Period	12 months.	
RIPE NCC	Size	/22	
	Eligibility	<p>a) Demonstrate approximately 80% efficient utilization of all prior allocated space;</p> <p>b) LIR has not received before a /22 from the last /8;</p> <p>c) IPv6 allocation from an upstream LIR or the RIPE NCC</p>	
	Period	Up to 12 Months	

2.3 SUB-ALLOCATIONS

RIR	Policy	Comment
AFRINIC	LIRs may sub-allocate addresses to other organizations, which further assign addresses to End Users. LIRs also assign addresses. Sub-allocations are subject to the 'Sub-Allocation Window' procedure.	
APNIC	LIRs may sub-allocate addresses to other organizations, which further assign addresses to end-users. LIRs also assign addresses. Sub-allocations are subject to the 'Assignment Window' procedure.	See section 2.5.1 'Assignment Window' below.
ARIN	ISPs may sub-allocate addresses to other organizations, which further assign addresses to End Users.	
LACNIC	RIR allocates and assigns IP blocks to organizations that can be ISPs, End Users or National Internet Registries, (NIRs - see section 7). NIRs allocate and assign IP blocks to organizations in their countries. ISPs may sub-allocate IP blocks to other ISPs or assign them to End Users.	

RIR	Policy	Comment
RIPE NCC	An LIR may sub-allocate up to a /20 (4096 addresses) to a downstream network operator every twelve months, who can then assign addresses to End Users. The minimum size of a sub-allocation is a /24.	

2.4 ASSIGNMENTS BY RIRS (INDEPENDENT/PORTABLE)

2.4.1 GENERAL

RIR	Category	Policy	Comment
AFRINIC	Size	/24 minimum, no maximum.	
	Eligibility	<ul style="list-style-type: none"> - Must be an AFRINIC member - Must EITHER show an existing utilization of /25 from their upstream/ISP, OR - Justify that at least 50% of the total 1 year requirement is needed immediately. 	
APNIC	Size	No minimum, no maximum.	In APNIC IPv4 policy there is no distinction between allocation or assignment. Both are designated as delegations.
	Eligibility	<p>Requesting organization needs to be multihomed or demonstrate a plan to multihome within one month.</p> <p>Delegations will be made according to the following criteria: 25% immediate utilization rate and 50% utilization rate within one year.</p>	
ARIN	Size	/24 minimum for multihomed, otherwise /20, no maximum.	Known as 'end-user' assignments.
	Eligibility	Assignments will be made according to the following criteria: 25% immediate utilization rate and 50% utilization rate within one year.	
LACNIC	Size	/24 minimum, no maximum.	Must agree to renumber out of all the blocks allocated by providers within a period of 3 months and return the space to its original provider; if the applicant does not already have an IPv6 block assigned by LACNIC, simultaneously request an IPv6 block in accordance with the corresponding applicable policy.
	Eligibility	<p>Multi-homed End Users may receive a minimum of /24 based on:</p> <p>25% immediate utilization rate of the requested block.</p> <p>50% utilization rate of the requested block within one year. Single-home End Users may apply, for at least a /20, based on previous assignments of /21 from upstream providers.</p>	
RIPE NCC	Size	No minimum, no maximum.	However additional IPv4 will be assigned with

RIR	Category	Policy	Comment
	Eligibility	<p>Assignments' immediate utilization should be at least 25% of the assigned space. After one year, this should be at least 50% of the space unless special circumstances are defined.</p> <p>Assignments may only be based on realistic expectations recorded in the documentation.</p>	<p>multihoming requirements in order to make the overall assignment size a multiple of /24. No more than 255 additional IPv4 address may be assigned.</p>

2.4.2 CRITICAL INFRASTRUCTURE

RIR	Category	Policy	Comment
AFRINIC	Definition	Public IXPs and root DNS service providers.	Portable space can be obtained by submitting a request directly to AFRINIC.
	Size	/24 minimum, more if justified.	
	Eligibility	No specific criteria defined.	
APNIC	Definition	Root DNS, ccTLD, gTLD, IANA, RIRs, NIRs.	
	Size	/24 minimum.	
	Eligibility	Delegations to critical infrastructure are available only to the actual operators of the network infrastructure performing such functions.	
ARIN	Definition	Public IXPs, Root DNS and ccTLD providers, IANA, RIRs.	
	Size	/24 minimum.	
	Eligibility	Assignments to critical infrastructure are available only to the actual operators of the network infrastructure performing such functions.	
LACNIC	Definition	Root DNS, ccTLD, gTLD, IANA, RIRs.	Requested via the 'micro-allocations' policy.
	Size	/24 minimum, /20 maximum.	
	Eligibility	Assignments to critical infrastructure are available only to the actual operators of the network infrastructure performing such functions. If the applicant does not already have an IPv6 block assigned by LACNIC, simultaneously request an IPv6 block in accordance with the corresponding applicable policy.	
RIPE NCC	Definition	Anycasting ccTLD, gTLD, ENUM.	The organizations applicable under this policy are TLD managers, as recorded in the IANA's Root Zone Database and ENUM
	Size	/24.	

RIR	Category	Policy	Comment
	Eligibility	The organization may receive up to four /24 prefixes per TLD and four /24 prefixes per ENUM. These prefixes must be used for the sole purpose of anycasting authoritative DNS servers for the stated TLD/ENUM, as described in BCP126/RFC4786 (http://www.ietf.org/rfc/rfc4786.txt)	administrators, as assigned by the ITU.

2.4.3 INTERNET EXCHANGE POINTS (IXPS)

RIR	Category	Policy	Comment
AFRINIC	Size	/24.	Portable space can be obtained by submitting a request directly to AFRINIC.
	Eligibility	- Minimum number of three peers connected - Open policy for anyone to connect/peer.	
APNIC	Size	/24 minimum assignment.	There is no restriction on routing prefixes assigned under this policy.
	Eligibility	Must be an IXP. The number of ISPs connected should be at least three and there must be a clear and open policy for others to join.	
ARIN	Size	/24 minimum assignment.	Requested via the 'micro-allocations' policy.
	Eligibility	Exchange point operators must provide justification for the allocation, including: connection policy, location, other participants (minimum of two total), ASN, and contact information.	
LACNIC	Size	/24 minimum, /20 maximum.	Requested via the 'micro-allocations' policy. Organizations receiving micro-assignments shall not sub-assign these IPv4 addresses.
	Eligibility	Exchange point operators must provide documentation showing that it is an IXP, list of participants, structure diagram and numbering plan. The organization shall have at least three members and an open policy for the association of new members. It must also provide a utilization plan for the following three and six months. If the applicant does not already have an IPv6 block assigned by LACNIC, simultaneously request an IPv6 block in accordance with the corresponding applicable policy.	
RIPE NCC	Size	No special policy.	Portable address space (Provider Independent (PI))

RIR	Category	Policy	Comment
	Eligibility	No special policy.	address space) can be requested for this purpose.

2.5 ASSIGNMENTS BY LIRS (AGGREGATABLE/NON-PORTABLE)

2.5.1 ASSIGNMENT WINDOW

RIR	Policy	Comment
AFRINIC ARIN	Not applicable.	Assignment practices are audited by RIR staff at time of request for additional resources.
APNIC LACNIC RIPE NCC	LIRs/ISPs need approval from the RIR when making assignments larger than their Assignment Window. This is the number of addresses an LIR/ISP can assign without prior approval. The RIR sets the assignment window according to the LIR's/ISP's level of experience with the policies.	APNIC does not have assignment windows on infrastructure. In RIPE region a new LIR's Assignment Window (AW) is automatically set to a /21 (2048 addresses) six months after receiving their first allocation.

2.5.2 DYNAMIC ADDRESSING

RIR	Policy
AFRINIC APNIC ARIN LACNIC RIPE NCC	In general, dynamic assignment of IP addresses is expected on transient connections such as analogue dialup.

2.5.3 MOBILE TERMINALS

RIR	Policy
AFRINIC APNIC ARIN LACNIC RIPE NCC	There is no special assignment policy with respect to mobile terminals.

2.5.4 WEB HOSTING

RIR	Policy
AFRINIC APNIC ARIN LACNIC RIPE NCC	Name based web hosting is strongly encouraged where feasible.

2.5.5 NETWORK ADDRESS TRANSLATION (NAT)

RIR	Policy
AFRINIC APNIC ARIN LACNIC RIPE NCC	The use of NAT is neither encouraged nor discussed during the request process.

2.5.6 RFC1918 PRIVATE ADDRESS SPACE

RIR	Policy
AFRINIC APNIC ARIN LACNIC RIPE NCC	For private networks that will never be connected to the Internet, the requestor is made aware of the IPv4 address space reserved for use in RFC1918.

2.6. USE OF FINAL UNALLOCATED IPV4 ADDRESS SPACE

RIR	Category	Policy
AFRINIC	Size	See below.
	Eligibility	<p>EXHAUSTION PHASE 1</p> <p>The maximum allocation size will change from /10 to /13.</p> <p>Allocations and assignments will be made from the final /8 until no more than a /11 of non-reserved space is available in the final /8. At this point the Exhaustion Phase 2 will begin.</p> <p>EXHAUSTION PHASE 2</p> <ul style="list-style-type: none">- The minimum allocation/assignment size will be /24, and the maximum will be /22 per allocation/assignment.- There is no explicit limit on the number of times an organization may request additional IPv4 address space during the Exhaustion Phase- The current allocation and assignment period of 12 months shall be changed to 8

RIR	Category	Policy
		months.
APNIC	Size	/24 minimum up to a maximum of /22 in total.
	Eligibility	<p>Since APNIC reached an equivalent of a /8 remaining in the APNIC pool on 14 April 2011:</p> <ol style="list-style-type: none"> 1. Each account holder (current and future) will be eligible to request and receive delegations up to a maximum of /22 from the remaining space, providing the account holder meets the criteria for receiving an initial or subsequent IPv4 delegation. 2. A /16 will be held in reserve for future uses, as yet unforeseen. If the reserved /16 remains unused by the time the rest of the remaining /8 worth of space has been allocated, the /16 will be returned to the APNIC pool for distribution under the policy described in the point above.
ARIN	Size	/28 minimum, /24 maximum.
	Eligibility	Policy takes effect upon receipt of ARIN's last /8 IPv4 allocation from IANA. Allocations and assignments are from a reserved /10 and must be justified by immediate IPv6 requirements.
LACNIC	Size	/22 for ISPs, /24 for Critical Infrastructure
	Eligibility	<p>LACNIC will create a reserve equivalent to a /12 block of IPv4 addresses, from which allocations and assignments will ONLY be done to NEW MEMBERS. IPv4 address requests classified as critical infrastructure according to the LACNIC policies in force may receive addresses, even if they have already been assigned IPv4 resources by LACNIC. LACNIC may only make IPv4 allocations or assignments greater than or equal to a /24 and smaller than or equal to /22, IPv4 address blocks larger than a /22 pending approval may only receive a /22. No further allocations or assignments will be possible after receiving resources under this policy, unless more resources are assigned from IANA. Blocks or sub-blocks received under this policy may not be transferred for a period of one year. If the applicant does not already have an IPv6 address block assigned by LACNIC, it must also request an IPv6 address block in accordance with the corresponding applicable policy. The reserve created under section 11.2 is independent from the reserve created under this policy.</p> <p>LACNIC will reserve an equivalent to another /12 block of IPv4 addresses for the purpose of achieving gradual exhaustion of IPv4 resources within the LACNIC region. LACNIC may only make IPv4 allocations or assignments greater than or equal to a /24 and smaller than or equal to /22 from this reserve pool. Organizations that receive IPv4 resources under the terms set forth in the following policy may receive additional IPv4 resources from LACNIC six months later. Blocks received under this policy may not be transferred as specified in paragraph 2.3.2.18 of the policy manual for a period of one year.</p> <p>Resources allocated by IANA to LACNIC after achieving the final /12 block for gradual exhaustion (section 11.2 of the Policy Manual), will only be allocated / assigned under the guidelines set forth on item 11.1 of the Policy Manual.</p>
RIPE NCC	Size	/22

RIR	Category	Policy
	Eligibility	<p>1. Allocations for LIRs from the last /8 On application for IPv4 resources LIRs will receive IPv4 addresses according to the following:</p> <ol style="list-style-type: none"> LIRs may only receive one allocation from this /8. The size of the allocation made under this policy will be exactly one /22. LIRs receive only one /22, even if their needs justify a larger allocation. LIRs may apply for and receive this allocation once they meet the criteria to receive IPv4 address space according to the allocation policy in effect in the RIPE NCC service region at the time of application. Allocations will only be made to LIRs if they have already received an IPv6 allocation from an upstream LIR or the RIPE NCC. <p>2. Assignments to Internet Exchange Point A /16 from the final /8 will be held in reserve for exclusive use by Internet Exchange Points. On application for IPv4 resources, an Internet Exchange Point (IXP) will receive one number resource (/24 to /22) according to the following:</p> <ul style="list-style-type: none"> - This space will be used to run an Internet Exchange Point peering LAN; other uses are forbidden. - Organizations receiving space under this policy must be Internet Exchange Points and must meet the definition as described in section two of the RIPE document "IPv6 Address Space for Internet Exchange Points". - IXPs holding other PI IPv4 space for their peering LAN (i.e. they are seeking a larger assignment), must return their old peering LAN resources back to this pool within 180 days of assignment. - New Internet Exchange points will be assigned a /24. Internet exchange points may return this /24 (or existing PI used as an IXP peering LAN) should they run out of space and receive a larger (/23, or /22 if utilization requires) assignment. - IP space returned by Internet Exchange Points will be added to the reserved pool maintained for Internet Exchange Point use. - Assignments will only be made to IXPs who have already applied for, or received an IPv6 assignment for their peering LAN <p>3. Unforeseen circumstance A /16 will be held in reserve for some future uses, as yet unforeseen. The Internet is a disruptive technology and we cannot predict what might happen. Therefore it is prudent to keep a /16 in reserve, just in case some future requirement makes a demand of it. In the event that this /16 remains unused at the time the remaining /8 covered by this policy has been distributed, it returns to the pool to be distributed as per clause 1.</p> <p>4. Post-depletion Address Recycling This section only applies to address space that is returned to the RIPE NCC and that will not be returned to the IANA but re-issued by the RIPE NCC itself.</p> <ol style="list-style-type: none"> Any address space that is returned to the RIPE NCC will be covered by the same rules as the address space intended in clause 1. Minimum allocation sizes for the relevant /8 blocks will be updated if necessary <p>5. Insufficient address space In case an allocation of a single /22 as per clause 1 can no longer be made, multiple allocations up to an equivalent of a /22 in address space will be made to fulfil a request.</p>

3. IPv6

3.1 INITIAL ALLOCATION

RIR	Category	Policy	Comment
AFRINIC	Size	/32.	
	Eligibility	<p>a) be an LIR;</p> <p>b) not be an end site;</p> <p>c) show a detailed plan to provide IPv6 connectivity to organizations in the AFRINIC region.</p> <p>d) show a reasonable plan for making /48 IPv6 assignments to end sites in the AFRINIC region within twelve months.</p>	
	Period	Up to one year.	
APNIC	Size	/32.	<p>Allocations consistent with the globally coordinated 'IPv6 Address Allocation and Assignment Policy' document. Organizations may qualify for an initial allocation greater than /32 by submitting documentation that reasonably justifies the request.</p> <p>Considers IPv4 deployment as one of the means of justifying a larger initial allocation.</p>
	Eligibility	<p>APNIC members with IPv4 resources managed by APNIC, but with no IPv6 resources automatically qualify for an appropriately sized IPv6 block.</p> <p>Organizations with no IPv4, or that wish to request more than a /32 should meet the following requirements: a) Be an LIR; b) not be an end site; c) plan to provide IPv6 connectivity to organizations to which it will make assignments; d) meet one of the following two criteria: i) have a plan for making at least 200 assignments to other organizations within two years, or ii) be an existing LIR with IPv4 allocations from an APNIC or an NIR, which will make IPv6 assignments or sub-allocations to other organizations and announce the allocation in the inter-domain routing system within two years. In addition, APNIC will make allocations to 'closed' networks if they meet all other criteria. APNIC can make allocation based on existing IPv4 network infrastructure.</p>	
	Period	For up to one year.	
ARIN	Size	/36, /32, /28, /24, /20, /16	The maximum allowable allocation shall be the

RIR	Category	Policy	Comment
	Eligibility	<p>Organizations must meet any of the following criteria:</p> <ol style="list-style-type: none"> 1. Already have an IPv4 ISP allocation from ARIN or one of its predecessor registries or can qualify for an IPv4 ISP allocation under current criteria. 2. Be multihomed for IPv6 or will immediately become multihomed for IPv6 using a valid assigned global AS number. 3. Provide a reasonable technical justification indicating why an allocation is necessary. 	<p>smallest nibble-boundary aligned block that can provide an equally sized nibble-boundary aligned block to each of the requesters serving sites large enough to satisfy the needs of the requesters largest single serving site using no more than 75% of the available addresses.</p>
	Period	For up to five years.	
LACNIC	Size	/32.	<p>As a special case, LACNIC has a policy for the “Second Allocation” where an Organization that holds only one IPv6 allocation can return it (within the first 6 months of getting it) in order to receive another shorter prefix allocation from LACNIC. For allocations larger than a /32, the Organization must address the considerations specified in section 4.5.1.3 of the Policy Manual.</p>
	Eligibility	<ol style="list-style-type: none"> 1. Hold an IPv4 allocation from LACNIC and announce the allocated block with the minimum possible level of disaggregation to the one that is publishing the IP blocks. <p>Or,</p> <ol style="list-style-type: none"> 2. a) Be a LIR or an ISP; b) Document a detailed plan for the services and IPv6 connectivity to be offered to other organizations; c) Announce the allocated block in the Internet inter-domain routing system, with the minimum possible level of disaggregation to the one that is publishing the IP blocks, within a period no longer than 12 months; d) Offer IPv6 services to clients or entities owned/related (including departments and/or sites) physically located within the region covered by LACNIC within a period not longer than 24 months than 24 months. 	
	Period	For up to one year.	
RIPE NCC	Size	/32 minimum, up to /29.	<p>Organizations that meet the initial allocation criteria are eligible to receive an initial allocation of /32. For allocations up to /29 no additional documentation is necessary.</p> <p>Considers IPv6 deployment as one of the means of justifying a larger than /29 initial allocation.</p>
	Eligibility	<ol style="list-style-type: none"> a) Be an LIR; b) have a plan for making sub-allocations to other organizations and/or End Site assignments within two years. 	

RIR	Category	Policy	Comment
	Period	For up to two years.	

3.2 SUBSEQUENT ALLOCATIONS

RIR	Category	Policy	Comment
AFRINIC	Size	Minimum size of next allocation will equal the first allocation size. More can be allocated but justification must be supplied.	Contiguous allocation provided if possible. RFC 3194 defines the HD-Ratio.
	Eligibility	ISP/LIR must satisfy the evaluation threshold of past address utilization in terms of the number of sites in units of /48 assignments. The HD-Ratio of 0.94 is used to determine the utilization thresholds that justify the allocation of additional addresses.	
	Period	Up to one year.	
APNIC	Size	Minimum size of next allocation will equal the first allocation size. More can be allocated but justification must be supplied.	Contiguous allocation provided if possible. RFC 3194 defines the HD-Ratio. Guidelines on what will be considered a valid technical requirement is available at: http://www.apnic.net/criteria/ipv6-guidelines
	Eligibility	ISP/LIR must satisfy the evaluation threshold of past address utilization in terms of the number of sites in units of /56 assignments. The HD-Ratio of 0.94 is used to determine the utilization thresholds that justify the allocation of additional addresses. Alternative criteria may be considered where an organization can demonstrate a valid reason for requiring a subsequent allocation.	
	Period	Up to two years.	
RIPE NCC	Size	Minimum size of next allocation will equal the first allocation size. More can be allocated but justification must be supplied.	Contiguous allocation provided if possible. RFC 3194 defines the HD-Ratio.
	Eligibility	ISP/LIR must satisfy the evaluation threshold of past address utilization in terms of the number of sites in units of /56 assignments. The HD-Ratio of 0.94 is used to determine the utilization thresholds that justify the allocation of additional addresses.	
	Period	Up to two years.	

RIR	Category	Policy	Comment
ARIN	Size	<p>Where possible ARIN will make subsequent allocations by expanding the existing allocation.</p> <p>If ARIN cannot expand one or more existing allocations, ARIN shall make a new allocation based on the initial allocation criteria above. The LIR is encouraged, but not required to renumber into the new allocation over time and return any allocations no longer in use.</p> <p>If an LIR has already reached a /12 or more, ARIN will allocate a single additional /12 rather than continue expanding nibble boundaries.</p>	<p>Subsequent allocations will also be considered for deployments that cannot be accommodated by, nor were accounted for, under the initial allocation. Justification for the subsequent subnet size will be based on the plan and technology provided with a /24 being the maximum allowed for a transition technology. Justification for transitional allocations will be reviewed every 3 years and reclaimed if they are no longer in use for transitional purposes. All such allocations for transitional technology will be made from a block designated for this purpose.</p>
	Eligibility	<p>Demonstrate at least 75% utilization of IPv6 allocations, or</p> <p>Demonstrate at least 90% utilization of any single serving site, or</p> <p>Have allocated more than 90% of total address space to serving sites.</p>	
	Period	Up to five years.	
LACNIC	Size	Minimum size of next allocation will equal the first allocation size. More can be allocated but justification must be supplied.	<p>Contiguous allocation provided if possible. RFC 3194 defines the HD-Ratio.</p>

3.3 OTHER ALLOCATIONS

3.3.1 MICRO-ALLOCATIONS FOR INTERNAL INFRASTRUCTURE

RIR	Category	Policy	Comment
AFRINIC APNIC LACNIC RIPE NCC	Size	No policy.	
	Eligibility	Not applicable.	
ARIN	Size	/48 minimum.	These allocations come from specific blocks reserved

RIR	Category	Policy	Comment
	Eligibility	Organizations that currently hold IPv6 allocations may apply for a micro-allocation for internal infrastructure. Applicant must provide technical justification indicating why a separate non-routed block is required. Justification must include why a sub-allocation of currently held IP space cannot be utilized.	only for this purpose.

3.4 ASSIGNMENTS BY RIRS (INDEPENDENT/PORTABLE)

3.4.1 CRITICAL INFRASTRUCTURE

RIR	Category	Policy	Comment
AFRINIC	Definition	Root DNS operators, IXPs, RIRs	Part of the 'Provider Independent (PI) Assignment for End-Sites' policy
	Size	/48 minimum.	
	Eligibility	Requestor to prove they operate a critical infrastructure network.	
APNIC	Definition	Root DNS, ccTLD, gTLD, IANA, RIRs, NIRs.	
	Size	/32 maximum.	
	Eligibility	APNIC members with IPv4 resources assigned under the IPv4 critical infrastructure policy, but with no IPv6 resources, automatically qualify for an IPv6 /48. Members that do not hold an IPv4 critical infrastructure assignment from APNIC, that have existing IPv6 resources, or that wish to request more than /48 should meet the following requirement: Assignments to critical infrastructure are available only to the actual operators of the network infrastructure performing such functions.	
ARIN	Definition	Root DNS, ccTLD, gTLD, IANA, RIRs.	
	Size	/48 minimum.	
	Eligibility	Assignments to critical infrastructure are available only to the actual operators of the network infrastructure performing such functions.	
LACNIC	Definition	NAPs, Root DNS, ccTLD, gTLD, IANA, RIRs,	

RIR	Category	Policy	Comment
		NIRs.	
	Size	/48 minimum, /32 maximum.	
	Eligibility	Micro allocation to critical Internet infrastructure operators only.	
RIPE NCC	Definition	Root DNS, Anycasting ccTLD, gTLD, ENUM.	For Anycasting assignments for ccTLD, gTLD and ENUM, the organizations are TLD managers, as recorded in the IANA's Root Zone Database and ENUM administrators, as assigned by the ITU.
	Size	For Root DNS minimum allocation size at time of request. It is up to four /48s per Anycasting ccTLD/gTLD and ENUM	
	Eligibility	<p>Root DNS:</p> <p>Assignments to critical infrastructure are available only to the actual network infrastructure performing such functions.</p> <p>Anycasting ccTLD, gTLD, ENUM:</p> <p>An organization may receive up to four /48 prefixes per TLD and four /48 prefixes per ENUM. These prefixes must be used for the sole purpose of anycasting authoritative DNS servers for the stated TLD/ENUM, as described in BCP126/RFC4786.</p>	

3.4.2 INTERNET EXCHANGE POINTS (IXPS)

RIR	Category	Policy	Comment
AFRINIC	Size	/48 minimum.	Part of the 'Provider Independent (PI) Assignment for End-Sites' policy
	Eligibility	<ul style="list-style-type: none"> - Minimum number of three peers connected - Open policy for anyone to connect/peer. 	
APNIC	Size	/48 minimum.	
	Eligibility	<p>APNIC members with IPv4 resources assigned under the IPv4 IXP policy, but with no IPv6 resources, automatically qualify for an IPv6 /48.</p> <p>Members that do not hold an IPv4 critical infrastructure assignment from APNIC, that have existing IPv6 resources, or that wish to request more than /48 should meet the following requirement: The IXP must have a clear and open policy for others to join and must have at least three members.</p>	

RIR	Category	Policy	Comment
LACNIC	Size	/48 minimum, /32 maximum.	
	Eligibility	The IXP must have a clear and open policy for others to join and must have at least three members. It must also provide documentation showing that it is an IXP, list of participants, structure diagram, numbering plan and a utilization plan for the following three and six months.	
ARIN	Size	/48 minimum.	
	Eligibility	Exchange point operators must provide justification for the allocation, including: connection policy, location, other participants (minimum of two total), ASN, and contact information.	
RIPE NCC	Size	/64 or /48.	
	Eligibility	The IXP must have a clear and open policy for others to join and must have at least three members.	

3.4.3 END USERS

RIR	Category	Policy	Comment
AFRINIC	Size	/48 minimum	
	Eligibility	a) Not be a LIR; b) Qualify for an IPv4 PI assignment from AFRINIC under the IPv4 policy currently In effect; c) Be or plan to be an AFRINIC Member of the category "EU-PI"; and d) Show a plan to use and announce the IPv6 PI address space within twelve (12) months after approval.	
APNIC	Size	/48 minimum.	These assignments come from a distinctly identified prefix.
	Eligibility	APNIC members with IPv4 resources assigned under the IPv4 multihoming policy, but with no IPv6 resources, automatically qualify for an IPv6 /48. Members that do not hold an IPv4 multihoming assignment from APNIC, that have existing IPv6 resources, or that wish to request more than /48 should meet the following requirement: a) An organization is currently multihomed or plans to be multihomed; b) Organizations are eligible for a Provider Independent delegation if they are able to demonstrate a valid reason that an assignment from their ISP, or LIR,	

RIR	Category	Policy	Comment
		is not suitable.	
ARIN	Size	/48 minimum.	The initial assignment size is determined by the number of sites. Nibble boundary assignments are available.
	Eligibility	<p>Meet one of the following requirements:</p> <ol style="list-style-type: none"> 1. have a previously justified IPv4 end-user assignment from ARIN or one of its predecessor registries 2. currently be IPv6 Multihomed or have a plan to immediately become IPv6 Multihomed using an assigned valid global AS number 3. have a network that will makes active use of a minimum of 2000 IPv6 addresses within 12 months 4. have a network that will make active use of a minimum of 200 /64 subnets within 12 months 5. provide a reasonable technical justification indicating why IPv6 addresses from an ISP or other LIR are unsuitable. <p>or,</p> <p>Be a Community Network that will immediately have at least 100 simultaneous users and a demonstrated plan to have at least 200 simultaneous users within one year.</p>	
LACNIC	Size	/48 minimum, /32 maximum	
	Eligibility	Automatic if requestor has IPv4 assignments. Else: 1) Not been an LIR, 2) In case of announcing the assignment on the Internet inter-domain routing system, the receiving organization shall announce the block maintaining de-aggregation to a minimum in accordance with the announcing organization's needs, 3) submit information showing address use plan for 3, 6 and 12 months, 4) submit network topology, routing and addressing plan.	
RIPE	Size	/48 minimum.	Assignments will be made from a separate

RIR	Category	Policy	Comment
NCC	Eligibility	Meet the requirements of the policies described in the document entitled "Contractual Requirements for Provider Independent Resources Holders in the RIPE NCC Service Region"	'designated block' to facilitate filtering practices

3.5 ASSIGNMENTS BY LIRS (AGGREGATABLE/NON-PORTABLE)

3.5.1 DYNAMIC ADDRESSING

RIR	Policy	Comment
AFRINIC APNIC ARIN LACNIC RIPE NCC	There is currently no specific policy related to dynamic addressing.	See RFC3177.

3.5.2 MOBILE TERMINALS

RIR	Policy
AFRINIC APNIC ARIN LACNIC RIPE NCC	There is no special assignment policy with respect to mobile terminals.

3.5.3 WEB HOSTING

RIR	Policy
AFRINIC APNIC ARIN LACNIC RIPE NCC	There is no recommendation for IPv6 assignments in support of web hosting at this time.

3.5.4 NETWORK ADDRESS TRANSLATION (NAT)

RIR	Policy
AFRINIC APNIC ARIN LACNIC RIPE NCC	The use of NAT is neither encouraged nor discussed during the request process.

4. AUTONOMOUS SYSTEM NUMBERS (ASNs)

4.1 ALLOCATIONS

RIR	Policy
APNIC	Blocks of ASNs are allocated to NIRs for further distribution to their members.
AFRINIC ARIN LACNIC RIPE NCC	Not applicable.

4.2 ASSIGNMENTS

RIR	Category	Policy
AFRINIC ARIN LACNIC RIPE NCC	Eligibility	Policies for ASN assignments are aligned with the guidelines contained in RFC1930. Verify that a network will have a unique routing policy or that it will be a multihomed site before assigning an ASN.
APNIC	Eligibility	<p>ASNs may be obtained directly from APNIC as a member or non-member account holder. The ASN obtained directly is portable. ASNs may also be obtained indirectly, through a LIR who 'sponsors' the request. In this event, the ASN is non-portable.</p> <p>Criteria need to be met in both cases, that is: An organization is eligible if it a) is multihomed; and b) has a single, defined routing policy that is different from its providers' routing policies. An organization will also be eligible if it can demonstrate that it will meet the above criteria upon receiving an ASN (or within a reasonably short time thereafter).</p>

4.2.1 32-BIT ASNS

RIR	Policy
AFRINIC ARIN RIPE NCC	<p>From 1 January 2007 the RIR will process applications that specifically request 32-bit only AS Numbers (AS numbers that cannot be represented with 16 bits) and assign such AS Numbers as requested by the applicant. In the absence of any specific request for a 32-bit only AS Number, the RIR will assign a 16-bit AS Number.</p> <p>From 1 January 2009 RIR will process applications that specifically request 16-bit AS Numbers and assign such AS Numbers as requested by the applicant. In the absence of any specific request for a 16-bit AS Number, the RIR will assign a 32-bit only AS Number.</p> <p>From 1 January 2010 the RIR will cease to make any distinction between 16-bit AS Numbers and 32-bit only AS Numbers, and will operate AS Number assignments from an undifferentiated 32-bit AS Number allocation pool.</p>
APNIC	<p>From 1 January 2010, APNIC ceased to make any distinction between two-byte only AS numbers and four-byte only AS numbers, and operates AS number assignments from an undifferentiated four-byte AS number pool.</p>
LACNIC	<p>From 1 January 2007 the RIR will process applications that specifically request 32-bit only AS Numbers (AS numbers that cannot be represented with 16 bits) and assign such AS Numbers as requested by the applicant. In the absence of any specific request for a 32-bit only AS Number, the RIR will assign a 16-bit AS Number.</p> <p>From 1 January 2009 RIR will process applications that specifically request 16-bit AS Numbers and assign such AS Numbers as requested by the applicant. In the absence of any specific request for a 16-bit AS Number, the RIR will assign a 32-bit only AS Number.</p> <p>From 1 January 2010, LACNIC shall allocate 32-bit AS numbers by default. 16-bit AS numbers shall be allocated, if available, in response to applications specifically requesting said resource and that duly justify the technical reasons why a 32-bit AS number would not be appropriate for its needs.</p>

5. DATABASE - REGISTRATION

RIR	Category	Policy	Comment
AFRINIC	Modification	LIRs are required to register all assignments and sub-allocations.	
	Entry	Can update all assignment and sub-allocation registrations (protection mechanism available). Org object cannot be created by a LIR.	
APNIC	Modification	LIRs required to register all assignments and sub-allocations. Registrations will be stored privately by APNIC unless the custodian wishes them to be made publicly available in the APNIC Whois Database.	Not required to register infrastructure assignments.
	Entry	Can update all assignment and sub-allocation registrations (protection mechanism available). Incident Response Team reference mandatory for all IP address and AS number objects in the APNIC Whois Database to assist in reporting network abuse.	
ARIN	Modification	Downstream reassignments and reallocations are reported, showing hierarchy and End User assignments. Reassignment information for residential customers need not contain the customer's name nor street address.	Not required to register infrastructure assignments.
	Entry	Can modify all parent data except "org name" and address range. Can modify all child data.	
LACNIC	Modification	Downstream reassignments and reallocations are reported, showing hierarchy and End User assignments.	Not required to register infrastructure assignments.
	Entry	Can modify all parent data except "org name" and address range. Can modify all child data. Users have to authenticate themselves in LACNIC web system.	
RIPE NCC	Modification	LIRs are required to register all assignments and sub-allocations.	
	Entry	Can update all assignment and sub-allocation registrations (protection mechanism available).	

6. REVERSE DNS

RIR	Policy	Comment
AFRINIC	Only make delegations on 8-bit boundaries (/16 or /24). Multiple delegations may be requested to cover CIDR prefixes for blocks bigger than a /24.	
APNIC	Provides reverse DNS based on domain objects in the APNIC database. If the delegation is /16 or larger then the authority for the reverse zone, it is delegated to the custodian of the address space.	Policy for “lame delegations” checking established and enforced.
ARIN	Provides reverse DNS for all allocations and assignments in the database with the following exception: For all /16 or larger blocks ARIN delegates reverse DNS authority to the registrant.	Policy for “lame delegations” checking established and enforced.
LACNIC	Provides reverse DNS for all parent blocks. Does not provide reverse DNS for reassignments on child blocks if the parent is /16 or greater.	Policy for “lame delegations” checking established and enforced
RIPE NCC	Provides reverse DNS delegation on request. Deploys DNSSEC on all the reverse zones.	RIPE NCC verifies RFC1912 compliance.

7. NATIONAL INTERNET REGISTRIES (NIRs)

RIR	Policy
AFRINIC ARIN RIPE NCC	Not applicable.
APNIC	NIRs operate in Korea, China, Japan, Taiwan, Indonesia, India and Vietnam. They are not ISPs. They allocate to their members within their economy following APNIC policies. Organizations within those NIR economies may go to either the relevant NIR or APNIC.
LACNIC	NIRs operate in Brazil and Mexico. They are not ISPs. They allocate to their members following LACNIC policies. NIRs are responsible for providing services within their country.

8. POLICY DEVELOPMENT

RIR	Policy
AFRINIC APNIC ARIN LACNIC RIPE NCC	The policy development process is consensus based, open to anyone to participate and is transparent in archiving all decisions and policies so that they are publicly accessible.

9. INTERNET EXPERIMENTS

RIR	Policy
AFRINIC APNIC	Allocations and assignments of Internet resources for Internet experiments are available. Such allocations or assignments are made for one year after which they must be returned. They are intended to support experimental Internet activities. Results of experiments must be made freely available to the public.
RIPE NCC	RIPE NCC uses a reserved pool of Internet resources for temporary assignment. The assignment time limits are up to six calendar months and for research purposes up to one calendar year. The results of Internet experiments must be made publicly available.
ARIN	ARIN will allocate Numbering Resources to entities requiring temporary Numbering Resources for a fixed period of time under the terms of recognized experimental activity.
LACNIC	LACNIC shall make experimental allocations with the aim of encouraging research and development within the region of Latin America and the Caribbean. The experimental allocation shall be for a period of one year, renewable for a period of the same duration, with no specified maximum. The results of the experiment must be published on a public website.

10. DOCUMENTATION PREFIX

RIR	Policy
APNIC	A documentation prefix is available to organizations wishing to use examples of Internet resources in educational materials, case studies and other documentation.
AFRINIC ARIN LACNIC RIPE NCC	No policy.