

# Draft Policy ARIN-2025-1

## Clarify ISP and LIR Definitions and References to Address Ambiguity in NRPM Text

Leif Sawyer

Elizabeth Goodson





# Problem Statement

Current Text (5 March 2026)

Section 2.4 of the NRPM defines an LIR but does not explicitly define an ISP. An ISP is defined in the context of an LIR, but the explicit definition is otherwise assumed.

Through implication and in common business practice, all ISPs are LIRs, but not all LIRs are ISPs.

This proposal adds clarity by creating an explicit definition for ISP reframing and aligning with the term LIR, and replaces ISP with LIR throughout the NRPM as appropriate.

# Policy Statement



Update the Table of Contents, replacing ISP with LIR as follows:

4.2. Allocations to **LIRs**

4.2.2. Initial Allocation to **LIRs**

4.2.3.4.2. Downstream **LIRs**

4.2.4. **LIR** Additional Requests

6.5.4. Reassignments from **LIRs/ISPs**

# Policy Statement (cont.)



## Section 2:

Rewrite the LIR definition to provide clarity and relationship to ISP

### 2.4. Local Internet Registry (LIR)

A Local Internet Registry (LIR) is an IR that is a member of an RIR, receives allocations of internet numbers from that RIR, for allocation to its customers, end-users, and infrastructure, at a local level. LIRs include Internet Service Providers (ISPs) whose customers are primarily end users and possibly other ISPs. Historically in the ARIN service region "ISP" was used as an equivalent, albeit incomplete, term.

# Policy Statement (cont.)



Replace ISP with LIR:

## 2.15. Provider Assignment Unit (IPv6)

When applied to IPv6 policies, the term “provider assignment unit” shall mean the prefix of the smallest block a given LIR assigns to end sites (recommended /48).

*\* 2025-6 Draft Proposal would change “Assignment” to “Allocation” here as well as Table of Contents.*

# Policy Statement (cont.)



Add new definition for ISP:

## 2.18 Internet Service Provider (ISP)

An Internet Service Provider (ISP) is a type of organization that provides Internet services to other organizations, its customers, and/or individuals other than its employees. Internet services include, but are not limited to, connectivity services, web services, colocation, dedicated servers, virtual private servers, and virtual private networks.

# Policy Statement (cont.)



Section 3:

Replace only the first instance of ISP with LIR

## 3.6.3. Organizations Covered by this Policy

This policy applies to every Organization that has Internet number resources issued by ARIN (or one of its predecessor registries) or a reallocation from an upstream **LIR**. This includes but is not limited to upstream ISPs and their downstream ISP customers (as defined by NRPM 2.5 and 2.6), but not reassignments made to their downstream end user customers.

# Policy Statement (cont.)



Section 4:

Replace ISP with LIR: in the following sections:

4.2. Allocations to **LIRs** (Requirements for Requesting Initial Address Space)

4.2.1.1. Purpose

ARIN allocates blocks of IP addresses to **LIRs** for the purpose of reassigning and reallocating that space to their customers.

# Policy Statement (cont.)



## 4.2.1.5. Minimum Allocation

In general, ARIN allocates /24 and larger IP address prefixes to LIRs. If allocations smaller than /24 are needed, LIRs should request address space from their upstream provider.

## 4.2.2. Initial Allocation to LIRs

All LIR organizations without any IPv4 addresses from ARIN automatically qualify for an initial allocation of a /24. LIRs providing a 24-month utilization plan for the request size specified may receive up to a /22. LIRs holding reallocations and/or reassignments must show the efficient utilization of their resources consistent with the requirements in sections 4.2.3 and 4.2.4.

# Policy Statement (cont.)



## 4.2.3.1. Efficient Utilization

**LIRs** are required to apply a utilization efficiency criterion in providing address space to their customers. To this end, **LIRs** should have documented justification available for each reassignment and reallocation. ARIN may request this justification at any time. If justification is not provided, future receipt of allocations may be impacted.

# Policy Statement (cont.)



## 4.2.3.2. VLSM

To increase utilization efficiency of IPv4 address space, **LIRs** reassigning IP address space to their customers should require their customers to use variable length subnet mask (VLSM) and classless technologies (CIDR) within their networks. **LIRs** should issue blocks smaller than /24 wherever feasible.

# Policy Statement (cont.)



## 4.2.3.3. Contiguous Blocks

IP addresses are allocated to **LIRs** in contiguous blocks, which should remain intact. Fragmentation of blocks is discouraged. To avoid fragmentation, **LIRs** are encouraged to require their customers to return address space if they change **LIRs**.

Therefore, if a customer moves to another service provider or otherwise terminates a contract with an **LIR**, it is recommended that the customer return the network addresses to the **LIR** and renumber into the new provider's address space. The original **LIR** should allow sufficient time for the renumbering process to be completed before requiring the address space to be returned.

# Policy Statement (cont.)



## 4.2.3.4. Downstream Customer Adherence

**LIRs** must require their downstream customers to adhere to the following criteria:

### 4.2.3.4.1. Utilization

A downstream customer requesting address space from an upstream **LIR** must document a plan to the allocating **LIR** for their utilization to conform to Section 4.3.3. Reassignment and reallocation information for prior allocations must show that each customer meets the 80% utilization criteria and must be available via SWIP / a distributed service which meets the standards set forth in section 3.2 prior to issuing them additional space.

# Policy Statement (cont.)



## 4.2.3.4.2. Downstream LIRs

Customers must follow ARIN policy for LIRs.

## 4.2.3.6. Reassignments to Multihomed Downstream Customers

If a downstream customer has a requirement to multihome, that requirement alone will serve as justification for a /24 allocation. Downstream customers must provide contact information for all of their upstream providers to the LIR from whom they are requesting a /24, and utilize a border routing protocol between the customer and the ISP. Customers may receive a /24 from only one of their upstream providers under this policy without providing additional justification. LIRs may demonstrate they have made an assignment to a downstream customer under this policy by supplying ARIN with the information they collected from the customer, as described above, or by identifying the AS number of the customer.

# Policy Statement (cont.)



## 4.2.3.7. Registration

**LIRs** are required to demonstrate efficient use of IP address space allocations by providing appropriate documentation, including but not limited to assignment histories, showing their efficient use.

## 4.2.3.8. Reassignments for Third Party Internet Access (TPIA) over Cable

IP addresses reassigned by an **LIR** to an incumbent cable operator for use with Third Party Internet Access (TPIA) will be counted as fully used once they are assigned to equipment by the underlying cable carrier provided they meet the following requirements:

# Policy Statement (cont.)



## 4.2.4. LIR Additional Requests

### 4.2.4.1. Utilization Percentage (80%)

LIRs must have efficiently utilized all allocations, in aggregate, to at least 80% and at least 50% of every allocation in order to receive additional space. This includes all space reassigned or reallocated to their customers.

### 4.2.4.3. Request Size

LIRs may request up to a 24-month supply of IPv4 addresses.

# Policy Statement (cont.)



## Section 6:

Update terminology section to reference how ISP and LIR are used

### 6.5.1. Terminology

a. The terms ISP and LIR were previously used interchangeably in this section. Unless otherwise noted, the term ISP is treated as a subset of LIR.

# Policy Statement (cont.)



Replace ISP with LIR in the following sections:

## 6.5.2.1 Size

a. All allocations shall be made on nibble boundaries.

b. In no case shall an **LIR** receive smaller than a /32 unless they specifically request a /36 or /40. In order to be eligible for a /40, an **LIR** must meet the following requirements:

- \* Hold IPv4 direct allocations totaling a /24 or less (to include zero)
- \* Hold IPv4 reassignments/reallocations totaling a /22 or less (to include zero)

# Policy Statement (cont.)



In no case shall an **LIR** receive more than a /16 initial allocation.

g. An LIR that requests a smaller /36 or /40 allocation is entitled to expand the allocation to any nibble aligned size up to /32 at any time without renumbering or additional justification. /40 allocations shall be automatically upgraded to /36 if at any time said LIR's IPv4 direct allocations exceed a /24. Expansions up to and including a /32 are not considered subsequent allocations, however any expansions beyond /32 are considered subsequent allocations and must conform to section 6.5.3. Partial returns of any IPv6 allocation that results in less than a /36 of holding are not permitted regardless of the **LIR**'s current or former IPv4 address holdings.

# Policy Statement (cont.)



## 6.5.2.2. Qualifications

An organization qualifies for an allocation under this policy if they meet any of the following criteria:

- a. Have a previously justified ~~ISP~~ IPv4 allocation from ARIN or one of its predecessor registries or can qualify for an IPv4 allocation under current criteria.

# Policy Statement (cont.)



## 6.5.4. Reassignments from LIRs/~~ISPs~~

## 6.5.5. Registration

**LIRs** are required to demonstrate efficient use of IP address space allocations by providing appropriate documentation, including but not limited to reassignment and reallocation histories, showing their efficient use.

# Policy Statement (cont.)



## 6.5.5.4. Registration Requested by Recipient

If the downstream recipient of a static assignment of /64 or more addresses requests publishing of that assignment in ARIN's registration database, the **LIR** shall register that assignment as described in section 6.5.5.1.

## 6.5.8.1. Initial Assignment Criteria

f. By providing a reasonable technical justification indicating why IPv6 addresses from an ~~ISP or other~~ LIR are unsuitable.

# History

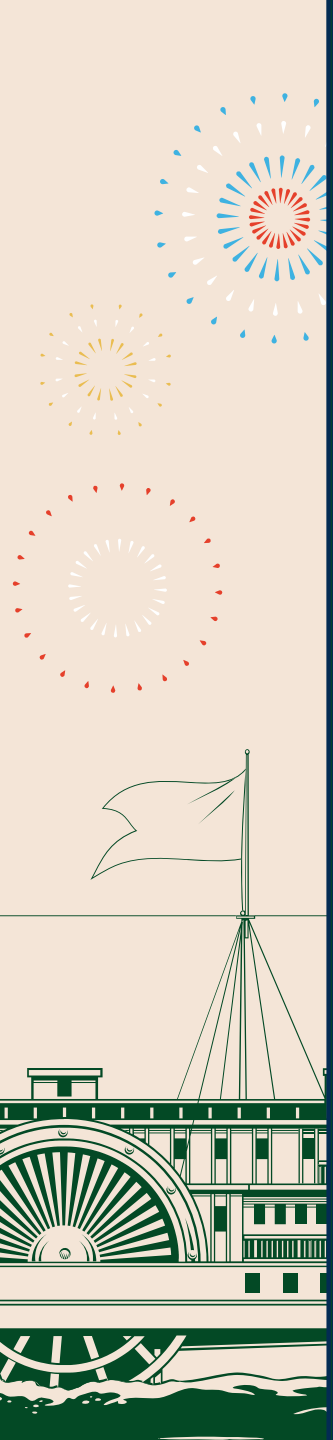
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| Action       | Date              |
|--------------|-------------------|
| Proposal     | 8 January 2025    |
| Draft Policy | 29 January 2025   |
| Revised      | 19 March 2025     |
| Revised      | 27 March 2025     |
| Revised      | 12 September 2025 |
| Revised      | 5 March 2026      |

# Policy Impact



- This policy would change the term ISP to LIR across the majority of the Number Resource Policy Manual (NRPM) except in very certain circumstances.
- This would align ARIN's policy language to that used in other Regional Internet Registries (RIRs), potentially making it easier for those who operate in multiple RIRs to compare the policies.
- These changes would require ARIN to make significant changes to internal documentation, training materials, and other related external documentation.
- This Draft Policy does not appear to impact the NRPM substantively; however, it has yet to have a Staff & Legal review.





# Community Feedback



- Community feedback during ARIN 55 indicated a desire to migrate from the original draft policy language of using “LIR/ISP” in a conjoined manner.
- Public Policy Mailing List (PPML) feedback leaned slightly toward using LIR
- ARIN 56 community feedback also leaned more toward using LIR as a single term
- Feedback from PPML after the latest draft was positive with some minor editorial text changes

# Questions for the Community



**Do you support this policy as written?**

# Draft Policy ARIN-2025-3

## Change Section 9 Out Of Region Use Minimum Criteria

Gerry George

Matthew Wilder





# Problem Statement

Current Text (25 March 2025)

Section 9 of the NRPM, Out of Region Use, requires organizations to use at least a /22 in the ARIN region before they can justify out of region use. This harms smaller organizations that have less than a /22 in region but do require some out of region use.

# Policy Statement



Modify the following text in Section 9:

FROM:

IPv4: At least a **/22** used in region.

TO:

IPv4: At least a **/24** used in region.

# Policy Statement (cont.)



## RESULT:

Out of region use of ARIN registered resources are valid justification for additional number resources, provided that the applicant has a real and substantial connection with the ARIN region which applicant must prove (*as described below*) and is using the same type of resources (*with a delegation lineage back to an ARIN allocation or assignment*) within the ARIN service region as follows:

- **IPv4:** At least a /24 used in region
- **IPv6:** At least a /44 used in region
- **ASN:** At least one ASN present on one or more peering sessions and/or routers within the region

# History

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| Action       | Date             |
|--------------|------------------|
| Proposal     | 13 February 2025 |
| Draft Policy | 25 March 2025    |
|              |                  |
|              |                  |



# Staff and Legal Review (23 February 2026)



## **Staff Understanding:**

NRPM Section 9, Out of Region Use, for IPv4 addresses requires that to justify out-of-region use, an organization must utilize at least a /22 within the ARIN region before additional resources may be approved for use outside the region.

Section 9 applies to IPv4 address requests in conjunction with section 4 "IPv4", section 8.3 "Transfers Between Specified Recipients Within the ARIN Region", and section 8.4 "Inter-RIR Transfers to Specified Recipients".

This section does not apply to section 4.4 or 4.10 space, these sections have their own restrictions.



# Staff and Legal Review (cont.)



Draft Policy 2025-3 proposes reducing the in-region IPv4 utilization threshold from a /22 (or equivalent) to a single /24.

Under this change, an organization would need to demonstrate use of only one /24 within the ARIN region to justify receiving additional ARIN-issued IPv4 resources for use outside the ARIN region.

Neither the current policy text nor this draft policy establishes any maximum on the amount of IPv4 space that may be justified to be used outside the ARIN region, so long as at least a single /24 is utilized within the ARIN region, meaning a single in-region /24 could, in practice, unlock requests for substantially larger blocks for deployment entirely outside the ARIN region.

This draft policy does not modify the current [Section 9](#) threshold for Autonomous System Number and IPv6 usage.



# Staff and Legal Review (cont.)



In conjunction with [section 4.1.8](#) "ARIN Waitlist", an organization could request an initial /22 from the IPv4 waitlist with the intent to use a portion outside the ARIN region, provided they demonstrate efficient projected usage of one /24 within the ARIN region, and three /24s outside the ARIN region.



# Staff and Legal Review (cont.)



Staff anticipates this draft policy would significantly increase the volume of IPv4 waitlist requests. Because the policy requirements for an organization to justify an initial /24 are generally straightforward to meet, it is expected that more organizations may request a /24 primarily to qualify for additional ARIN-issued IPv4 addresses for out-of-region use. It is expected that this would result in more ARIN IPv4 space being used out of region.



# Staff and Legal Review (cont.)



**Implementable as Written?:** Yes

**Impact on ARIN Registry Operations and Services:** Anticipate increase to staff ticket workload

**Legal Review:** No material legal issue

**Implementation Timeframe Estimate:** 3 months

**Implementation Requirements:**

- Staff Training
- Updates to public documentation
- Updates to internal procedures and guidelines

**Proposal/Draft Policy Text Assessed:** 25 March 2025

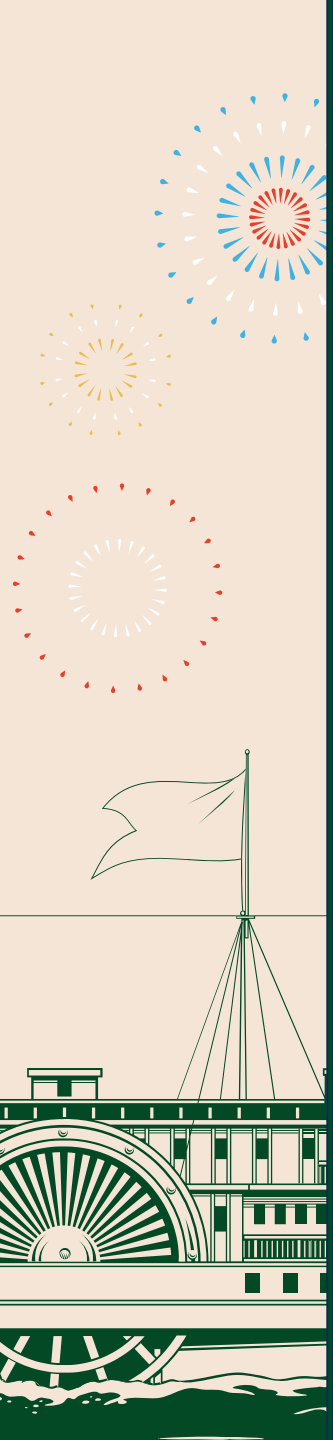
# Policy Impact



Because the policy requirements for an organization to justify an initial /24 are generally straightforward to meet, it is expected that:

- more organizations may request a /24 primarily to qualify for additional ARIN-issued IPv4 addresses for out-of-region use.
- more ARIN IPv4 space may be used out of region.

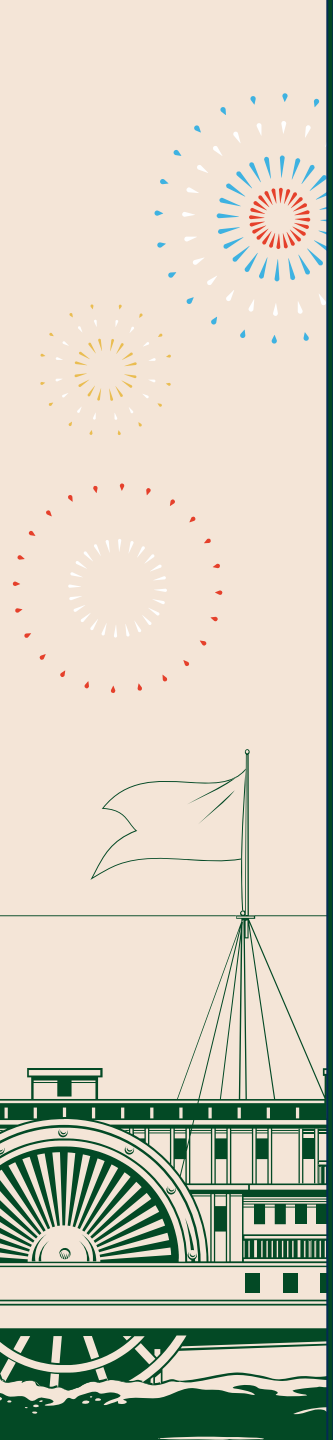
This change in policy would significantly increase the volume of IPv4 Waiting List requests and could lead to an increase to staff ticket workload.



# Community Feedback



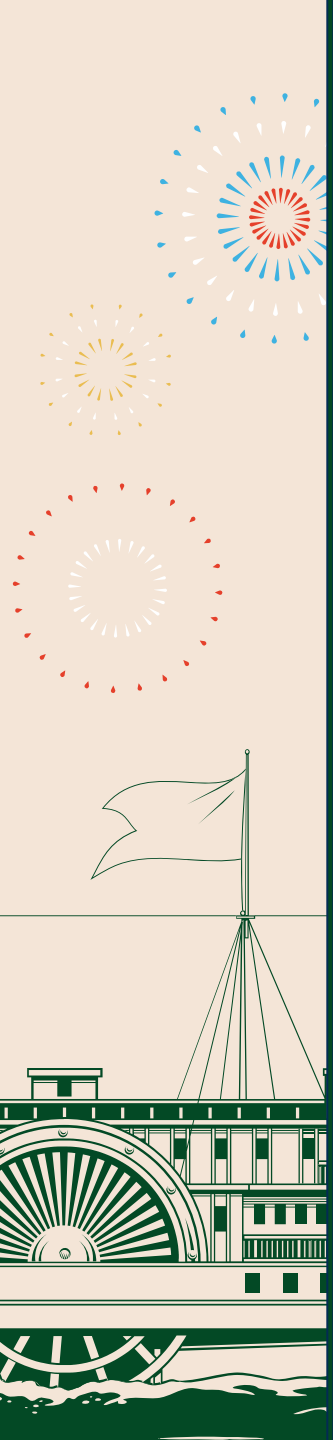
- Possible abuse of the reduced requirement in order to obtain ARIN resources, particularly for blocks larger than the minimum (/24) for out-of-region use
- May unfavorably impact companies having more growth out of region and drive them to other RIRs and away from ARIN
- "Real and substantial connection" requirement in Section 9 may or may not be sufficient to prohibit or reduce the potential for abuse



# Community Feedback



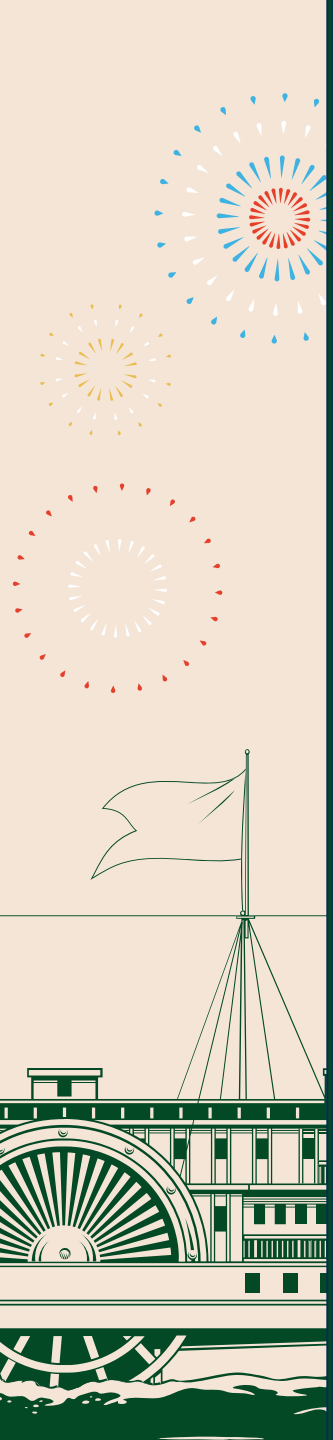
- Using more addresses/prefixes in-region than out-of-region seems like sufficient evidence of "real and substantial connection with the ARIN region" and is far better than arbitrary length-based rules.
- The concept of restricting out-of-region use to less than or equal to in-region use does open a can of worms; For most organizations it's a far more restrictive policy than the active one, while the proposed policy is slightly less restrictive.



# Community Feedback



- This restriction would force organizations with multiple large ARIN blocks used out-of-region to do some severe restructuring, and would most likely involve them having to join the other RIRs and transfer the space there.
- I like that the proposed policy has a very "light touch" and just addresses the issue of the discrimination against very small organizations under current policy without changing policy for everyone else.



# Questions for the Community



Are you in support of the policy?

Are there any additional issues which should be considered at this time?

Should the AC continue working on the policy as written?

# Draft Policy ARIN-2025-6

Fix Formula in 6.5.2.1c

William Herrin

Gus Reese





# Problem Statement

Current Text (3 September 2025)

Sections [6.5.2.1](#) explains the initial IPv6 ISP/LIR allocation in a way that is difficult to follow and the formula in section (c) does not match the remainder of the text.

# Policy Statement



In 6.5.2.1c, replace:

“This calculation can be summarized as  $\lfloor N \rfloor$  where  $N = P - (X + Y)$  and  $P$  is the organization’s Provider Allocation Unit,  $X$  is a multiple of 4 greater than  $\frac{4}{3} * \text{-serving sites}$  and  $Y$  is a multiple of 4 greater than  $\frac{4}{3} * \text{end sites served by largest serving site}$ .”

with:

“This calculation can be summarized as  $\lfloor N \rfloor$  where  $N = P - (X + Y)$  and  $P$  is the organization’s Provider **Allocation** Unit,  $X$  is a multiple of 4 greater than  $\frac{4}{3} * \log_2(\text{-serving sites})$  and  $Y$  is a multiple of 4 greater than  $\frac{4}{3} * \log_2(\text{end sites served by largest serving site})$ .”

In 2.15 and 2.16, replace “provider **assignment** unit” with “provider **allocation** unit.”

# History

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| Action       | Date             |
|--------------|------------------|
| Proposal     | 19 May 2025      |
| Draft Policy | 1 July 2025      |
| Revised      | 3 September 2025 |
|              |                  |



# Staff and Legal Review (16 March 2026)



## **Staff Understanding:**

NRPM section “6.5.2.1. Size” describes requirements for the size of IPv6 allocations to ISPs/LIRs. Sub-section “c” defines how to calculate the largest allocation justified by the requestor. Accompanying the text description is a mathematical formula that intends to summarize the calculation as  $\frac{P}{N}$  where  $N = P - (X + Y)$  and  $P$  is the organization’s Provider Allocation Unit  $X$  is a multiple of 4 greater than  $\frac{4}{3}$  serving sites and  $Y$  is a multiple of 4 greater than  $\frac{4}{3}$  end sites served by largest serving site.”



# Staff and Legal Review (cont.)



This draft policy indicates the formula does not match the text, and intends to correct it with, "This calculation can be summarized as  $P/N$  where  $N = P - (X + Y)$  and  $P$  is the organization's Provider Allocation Unit,  $X$  is a multiple of 4 greater than  $\frac{4}{3} * \log_2(\text{serving sites})$  and  $Y$  is a multiple of 4 greater than  $\frac{4}{3} * \log_2(\text{end sites served by largest serving site})$ ."



# Staff and Legal Review (cont.)



ARIN staff currently implements NRPM 6.5.2.1.c based on the policy text rather than the summarized formula. The summarized formula is overly complex for many typical IPv6 requestors, while the policy text is more readily understood by customers and more consistently applied by ARIN staff.



# Staff and Legal Review (cont.)



In practice, staff evaluates initial allocation size by reviewing the number of serving sites in the ARIN region and the number of end sites served by the largest serving site and then applying the 75% utilization standard consistent with current implementation. This approach is also reflected in the training materials ARIN provides to assist organizations in calculating IPv6 address requirements. In addition, the applicable policy parameters are built into the workflow for IPv6 ISP address requests.

Removal of the summarized formula from the NRPM would have no impact on ARIN operations and would simplify the policy language for IPv6 requestors. Staff would continue to implement NRPM 6.5.2.1.c consistent with current practice.



# Staff and Legal Review (cont.)



NRPM section “6.5.2.1. Size” includes the text “Provider Allocation Unit”, while sections 2.15 and 2.16 reference the term, “Provider Assignment Unit “. This draft policy intends to update the text in sections 2.15 and 2.16 to “Provider Allocation Unit”. Modifying “Assignment” to “Allocation” aligns with the deprecation of Direct Assignment’s that occurred during ARIN’s fee harmonization. Staff agrees the terms should match between section 2 and section 6. Staff considers subnetted Direct Allocations, Reallocations, and Reassignments to be “Provider Assignment Units”. This modification aligns with staff’s current implementation.



# Staff and Legal Review (cont.)



**Implementable as Written?:** Yes

**Impact on ARIN Registry Operations and Services:** None

**Legal Review:** No material legal issue

**Implementation Timeframe Estimate:** 3 Months

**Implementation Requirements:**

- Staff Training
- Updates to public documentation

**Proposal/Draft Policy Text Assessed:** 3 September 2025

# Excerpt: ARIN IPv6 instructions to ISPs



## ISP Block Size: Per Site

Use the table below to determine the block size for your largest site (based on customer count):

| <b>/48 to Each Customer</b>                 | <b>Per-Site Block Size</b> |
|---|----------------------------|
| 1 to 12 customer at largest site            | /44                        |
| 13 to 192 customers at largest site         | /40                        |
| 193 to 3,072 customers at largest site      | /36                        |
| 3,073 to 49,152 customers at largest site   | /32                        |
| 49,153 to 786,432 customers at largest site | /28                        |

# The Formula



Can the formula paragraph actually be removed from the policy manual without changing the policy or impacting the implementation?



# Community Feedback



"Rewriting the section, or re-visiting the allocation strategy entirely, is definitely worthwhile future work. But fixing the gross error should be the first thing we do."

"Perfectly fine with adopting it as written [but] I want the policies to be readable and comprehensible to someone coming to them new."

"Just get rid of [the formula]. This math is not helping anybody."

"I'm a scientist. I like formulas. I use formulas to help me understand what text and policy means."



# Community Feedback



"As the author of the original policy in question, I agree this fix is a valid correction to the formula"

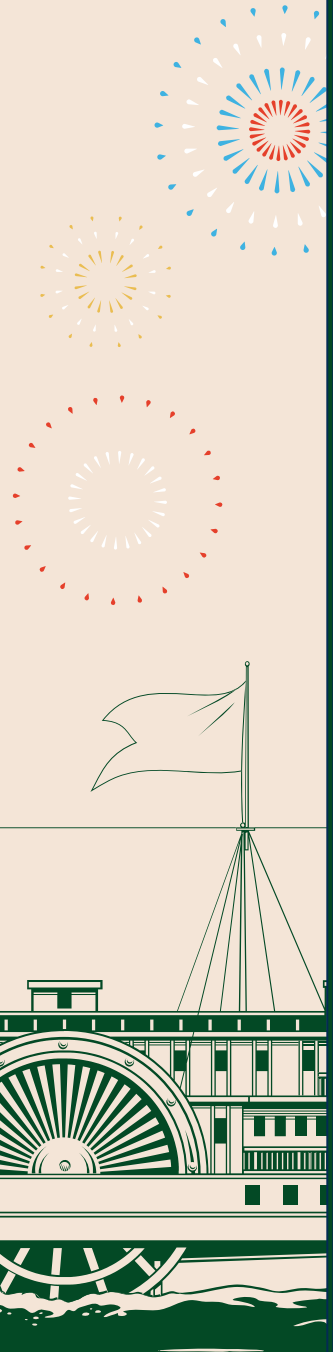
"Assuming /48 as the PAU is not true to the policy. The policy was intended to encourage LIR/ISPs to implement /48 PAUs by limiting the size of allocations to providers that issued smaller end site allocations."

"It's not default... it's minimum. If they issue /48s by default to business customers and /60s to residential, for example, the policy calls for a PAU of /60."

# Policy Impact



- Improved consistency in the Number Resource Policy Manual.
- No change to how addresses are allocated.





**Next: Open Mic/Comments**

**Then: Poll – do you support Draft Policy  
ARIN-2025-6 as written?**

# Open Mic/Comments



After open mic: poll – do you support Draft Policy ARIN-2025-6 as written?

# Poll: Do you support Draft Policy ARIN-2025-6 as written?



In 6.5.2.1c, replace:

“This calculation can be summarized as  $/N$  where  $N = P - (X + Y)$  and  $P$  is the organization’s Provider **Allocation** Unit,  $X$  is a multiple of 4 greater than  $4/3 * \text{serving sites}$  and  $Y$  is a multiple of 4 greater than  $4/3 * \text{end sites served by largest serving site}$ .”

with:

“This calculation can be summarized as  $/N$  where  $N = P - (X + Y)$  and  $P$  is the organization’s Provider **Allocation** Unit,  $X$  is a multiple of 4 greater than  $4/3 * \log_2(\text{serving sites})$  and  $Y$  is a multiple of 4 greater than  $4/3 * \log_2(\text{end sites served by largest serving site})$ .”

In 2.15 and 2.16, replace “provider **assignment** unit” with “provider **allocation** unit.”

# Draft Policy ARIN-2025-7

Make Policy in 6.5.8.2 Match the Examples

Lily Botsyoe  
Leif Sawyer





# Problem Statement

Current Text (4 February 2026)

6.5.8.2 states “An organization qualifies for an assignment on the next larger nibble boundary when their sites exceed 75% of the /48s available in a prefix.” and then follows with “For example: More than 1 but less than or equal to 12 sites justified, receives a /44 assignment;” implying that a single site should only receive a /48. However, 1 /48 exceeds 75% of the /48s available in a /48 (1), so per the rule an organization with a single site should receive a /44, which differs from the example.

# Policy Statement



Change the sentence “**The** initial assignment **size** will be determined by the number of sites justified below.”

To: “**Larger** initial assignment **sizes** will be determined by the number of sites justified below.”

# Policy Statement (cont.)



Resulting with:

Organizations that meet at least one of the initial assignment criteria above are eligible to receive an initial assignment of /48. **Larger** initial assignment **sizes** will be determined by the number of sites justified below; an organization qualifies for an assignment on the next larger nibble boundary when their sites exceed 75% of the /48s available in a prefix. For example:

- More than 1 but less than or equal to 12 sites justified, receives a /44 assignment;
- More than 12 but less than or equal to 192 sites justified, receives a /40 assignment;
- More than 192 but less than or equal to 3,072 sites justified, receives a /36 assignment;
- More than 3,072 but less than or equal to 49,152 sites justified, receives a /32 assignment; etc...

# History

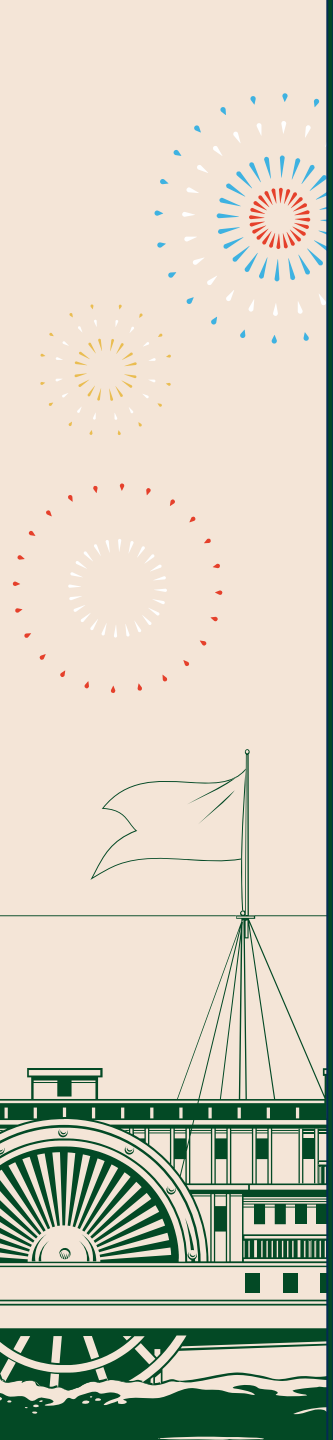
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| Action       | Date            |
|--------------|-----------------|
| Proposal     | 19 May 2025     |
| Draft Policy | 1 July 2025     |
| Revised      | 4 February 2026 |
|              |                 |

# Policy Impact



- Clearly defines that assignments larger than a /48 (such as /44 or /40) are only triggered once an organization justifies more than one site.
- Removes a loophole where the "75% rule" accidentally qualified single-site organizations for a /44, forcing the policy to align with the intended /48 baseline.





# Community Feedback



There has been no community feedback on the Public Policy Mailing List since the Draft Policy was revised and published in February 2025.

Previous feedback before the change seemed to indicate general positive feedback if the policy structure was reworked to state that a single-site organization receives a /48, and then the 75% formula applies to multisite organizations rather than framing the /48 as an exception.

# Questions for the Community



**Do you support as written?**

**Are any additional changes needed before moving this policy to Recommended status?**

# Draft Policy ARIN-2025-8

## Reserve 4.10 Space for In-Region Use

Kaitlyn Pellak

E. Marie Brierley





# Problem Statement

Current Text (14 July 2025)

ARIN 4.10 allocations, reserved to facilitate IPv6 deployment, currently have no restrictions for out-of-region use beyond the general restrictions laid out in Section 9. As the use of these allocations outside of the ARIN region seems to be contrary to the intentions for use of this space - and ARIN staff has interpreted the policy as such - the prohibition of this practice should be codified in policy.

# Policy Statement



Change the second sentence in NRPM [Section 4.10](#) from:

“This IPv4 allocation will be set aside and dedicated to facilitate IPv6 deployment.”

to:

“This IPv4 allocation will be set aside and dedicated to facilitate IPv6 deployment **within the ARIN service area**”

# History

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| Action          | Date             |
|-----------------|------------------|
| Proposal        | 14 July 2025     |
| Draft Policy    | 25 August 2025   |
| Staff and Legal | 12 November 2025 |



# Staff and Legal Review (12 November 2025)



## **Staff Understanding:**

The current implementation of [Section 4.10](#) (Dedicated IPv4 Allocations to Facilitate IPv6 Deployment) requires that IPv4 addresses be used within the ARIN region. Draft Policy ARIN-2025-8: Reserve [4.10](#) Space for In-Region Use codifies the current practices applied by ARIN staff when processing requests under [Section 4.10](#). This policy does not alter existing review practices; it formally documents the longstanding approach ARIN staff has used and will continue to apply.



# Staff and Legal Review (cont.)



**Implementable as Written?:** Yes

**Impact on ARIN Registry Operations and Services:** None

**Legal Review:** No material legal issue

**Implementation Timeframe Estimate:** 3 months

**Implementation Requirements:**

- Staff Training
- Updates to public documentation
- Updates to internal procedures and guidelines

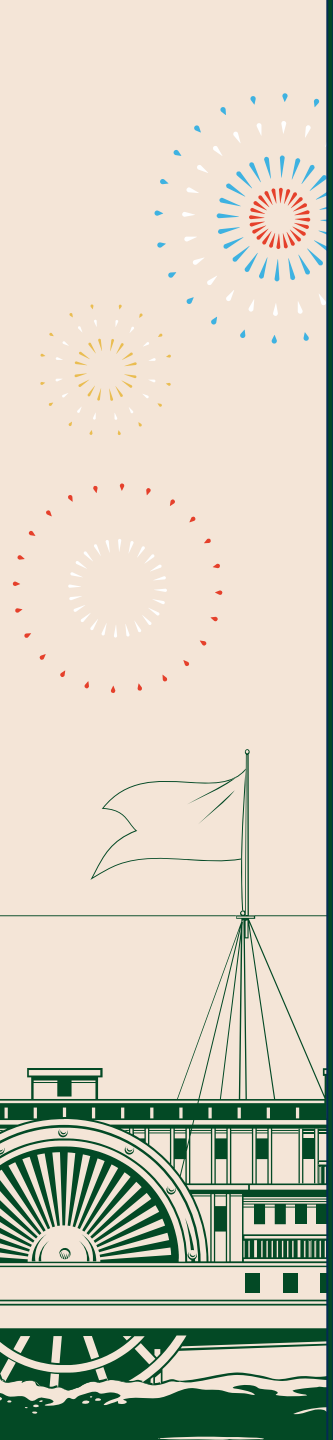
**Proposal/Draft Policy Text Assessed:** 14 July 2025

# Policy Impact



As reiterated by the Staff and Legal Review, the intention of this policy is to codify in the Number Resource Policy Manual the actual implementation of 4.10 space by ARIN staff.

"4.10 space is already presumed to be only for use within the ARIN service region, this policy is intended to clarify that usage with the community and prevent unnecessary confusion for members who apply to receive 4.10 space."





# Community Feedback



- Feedback at community meetings has been positive. At ARIN 56, the consensus was that this was a good policy and community members supported it as written.
  - "Support as written...it's implicitly there; the community expected it. Staff are implementing it that way."
- Two more members came to the microphone to voice their support as well.



# Community Feedback Continued



- Four community members on the Public Policy Mailing List (PPML) suggested that the current policy proposal language is too vague. The crux of this issue was that the ambiguity could prevent certain uses of IPv6 space that was facilitated with a 4.10 allocation:
  - "Someone with an ARIN IPv6 allocation they are using globally...should also be able to use their 4.10 allocation to provide NAT64 for their [global] IPv6 allocation."
- One member on the PPML indicated the change felt unnecessarily protective, with an additional member speaking up in agreement.

# Questions for the Community



Should the language in the policy be updated to be more specific?

Should the language in the policy specify ARIN service area "only"?

If not, do you support the current language and moving the policy forward to Recommended Draft status?

# Draft Policy ARIN-2026-1

## Taking IP To Other Planets (TIPTOP)

Alison Wood  
Brian Jones





# Problem Statement

Current Text (3 March 2026)

Organizations conducting space exploration missions are deploying IP-based networking infrastructure beyond Earth orbit, including on the Moon and in other deep-space environments. These networks currently utilize address space allocated independently from multiple RIRs, including ARIN.

As international missions expand and networks operated by multiple agencies interconnect to share communications infrastructure and provide operational redundancy, the use of unrelated terrestrial address allocations introduces routing scalability concerns. Existing allocations are not aligned with the topology of outer space communications networks, which may require the advertisement of numerous disaggregated prefixes when networks interconnect.



## Problem Statement (cont.)

Outer space communications infrastructure is expected to develop around natural clusters near celestial bodies, with limited communication links between those regions. Addressing structures that reflect these topological boundaries could improve route aggregation and long-term routing scalability.

For the purposes of this policy, outer space includes the Moon and regions beyond Earth orbit, but excludes low Earth orbit (LEO) and geostationary Earth orbit (GEO).

# Policy Statement



ARIN may allocate IPv4 and IPv6 address space to organizations operating IP networking infrastructure in outer space, including beyond Earth orbit and on the Moon. Allocations are intended to support interagency connectivity, operational redundancy, and scalable routing in emerging space networks.

Addressing structures should be organized hierarchically to reflect major celestial regions—such as the Moon, Earth–Moon Lagrange points, asteroid belt, and other planetary systems—enabling route aggregation where feasible. Participation in aggregation is voluntary, and organizations may advertise more specific prefixes when necessary.

This policy applies to government, research, and commercial space operators, and encourages coordination among agencies to facilitate efficient address usage and scalable routing for outer space networks.

# Policy Statement (cont.)



## Definitions (Add to NRPM Section 2)

2.xx Extra-Terrestrial Network (ETN) An ETN is defined as any IP-based networking infrastructure operating physically beyond the Geostationary Earth Orbit (GEO) arc, including but not limited to Lunar, Martian, or deep-space deployments.

# Policy Statement (cont.)



## IPv4 Policy (Add to NRPM Section 4)

**4.11 IPv4 Allocations for Extra-Terrestrial Networks** ARIN shall maintain a dedicated pool or specific registration guidelines for organizations operating ETNs to ensure routing scalability.

**4.11.1 Eligibility:** Applicants must demonstrate a direct operational requirement for networking infrastructure located beyond Earth's orbit. Eligible entities include government agencies, research institutions, and commercial operators.

**4.11.2 Topological Hierarchy:** To prevent global routing table exhaustion, allocations for ETNs should be issued from contiguous blocks where possible, designated by "Celestial Regions" (e.g., Luna, Mars, Lagrange Points).

**4.11.3 Utilization Requirements:** Standard utilization requirements (Section 4.2.4) apply, but ARIN may grant exceptions for high-latency "cold storage" nodes or orbital relay constellations where traditional "active host" pings are impractical for verification.

# Policy Statement (cont.)



## IPv6 Policy (Add to NRPM Section 6)

**6.12 IPv6 Allocations for Extra-Terrestrial Networks** Due to the vast distances and high-latency nature of deep-space communications, IPv6 is the preferred protocol for ETN deployments.

**6.12.1 Minimum Allocation:** The minimum allocation size for an ETN operator shall be a /48, or a size sufficient to allow for hierarchical subnetting per celestial body.

**6.12.2 Planetary Aggregation:** Organizations are encouraged to aggregate all prefixes within a specific gravity well or orbital system to a single aggregate route for advertisement back to Terrestrial Ground Stations (TGS).

**6.12.3 Sparse Allocation:** ARIN will employ sparse allocation techniques within the ETN block to allow for the future growth of lunar and planetary colonies without fragmenting the space.

# Policy Statement (cont.)



## Comments:

This is being proposed jointly with the IETF TIPTOP working group.

Please see <https://datatracker.ietf.org/doc/draft-li-tiptop-address-space/> and <https://datatracker.ietf.org/doc/draft-many-tiptop-ip-architecture/> for more details.

# History

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| Action       | Date          |
|--------------|---------------|
| Proposal     | 3 March 2026  |
| Draft Policy | 24 March 2026 |
|              |               |
|              |               |



# Staff and Legal Review



Staff Understanding: The Draft Policy seeks to establish provisions within the NRPM for the allocation of address space to organizations operating IP networking infrastructure beyond Earth orbit (Extraterrestrial Networks, or ETNs). The Draft Policy introduces definitions, eligibility criteria, and allocation practices intended to support routing scalability through hierarchical addressing aligned with celestial regions.



# Staff and Legal Review (cont.)



Specifically, the Draft Policy calls for:

- A. Establishment of a dedicated allocation pool or registration guidelines within ARIN for address space used by networks operating in outer space.
- B. Introduction of new definitions and eligibility criteria for Extraterrestrial Networks (ETNs) within the NRPM.
- C. Development of allocation practices intended to facilitate routing aggregation for deep-space networking environments, including hierarchical addressing aligned with celestial regions.



# Staff and Legal Review (cont.)



Per discussion on ARIN-PPML, the Draft Policy appears primarily motivated by concerns regarding current operational practices among space agencies deploying deep-space networking infrastructure. In particular, the Draft Policy seeks to address current use of address space from existing allocations without coordination for long-term routing aggregation across shared deep-space communications infrastructure and to establish a coordinated addressing framework intended to improve routing scalability in such environments.



# Staff and Legal Review (cont.)



The Draft Policy amends the NRPM directly and therefore falls within the procedural scope of ARIN's Policy Development Process (PDP). However, it raises several considerations related to clarity, implementability, and alignment with ARIN's role in the Internet number resource system.



# Staff and Legal Review (cont.)



The Draft Policy seeks to improve routing aggregation through coordinated allocation practices for ETNs from dedicated, contiguous address blocks reserved for deep-space use. Without such address space, networks built using ad hoc IPv4 and IPv6 allocations would not support meaningful aggregation. Accordingly, the availability and source of dedicated address space are prerequisites for achieving the Draft Policy's stated objectives and should be clearly specified as an underlying assumption of the policy.



# Staff and Legal Review (cont.)



The IETF could direct IANA to allocate dedicated address space for this purpose, including coordination with the RIR system for appropriate allocation and registry services for the relevant operational community (including, for example, interim administration by an existing RIR of registry and policy development functions until such time as the establishment of a distinct Internet number registry organization by that community).



# Staff and Legal Review (cont.)



While ARIN served a “rest of world” role at the time of its formation (i.e., requests not handled specifically by RIPE NCC or APNIC were handled by ARIN), it is not clear that the ARIN Board would consider ARIN serving as the “default” registry for this purpose, even on an interim basis, to fall within the scope of ARIN’s current mission. If the Board were to determine that providing such services is compatible with ARIN’s mission (e.g., until such time as there is a deep-space Internet Number Registry organization), then ARIN could provide such services pursuant to policy recommended by the community and adopted by the Board. Such a determination would likely depend on both community sentiment and explicit acknowledgment by the other RIRs that such a role is acceptable.



# Staff and Legal Review (cont.)



The Draft Policy, as written, presumes that these prerequisite conditions have already been satisfied, and these conditions should be clearly stated in the policy to provide a shared understanding of the circumstances under which the policy could be adopted: (a) that the IETF has determined that a dedicated address block is required; (b) that IANA has allocated appropriate IPv6 and/or IPv4 address space for this purpose and coordinated with the RIRs to provide operational registry services for that space; (c) that the ARIN Board of Trustees has determined that providing such services is consistent with ARIN's mission; and (d) that the other RIRs have concurred with ARIN serving in this capacity.



# Staff and Legal Review (cont.)



Due to the complexity of this Draft Policy, active discussions, and necessary confirmations described above, a comprehensive staff review will be necessary once this Draft Policy is further developed.



# Staff and Legal Review (cont.)



**Implementable as Written?:** No

**Impact on ARIN Registry Operations and Services:** n/a

**Legal Review:** At this preliminary stage, Legal has identified several areas for further consideration, including potential jurisdictional questions, coordination with other RIRs, and the source of IP resources. Additional clarity in definitions and alignment with the service region model will also be important. These observations are based on the Draft Policy in its current form, and a more comprehensive legal analysis may be provided if and when the Draft Policy is further developed.

**Implementation Timeframe Estimate:** n/a

**Implementation Requirements:** n/a

# Policy Impact



## **Minimal impact to current terrestrial allocations**

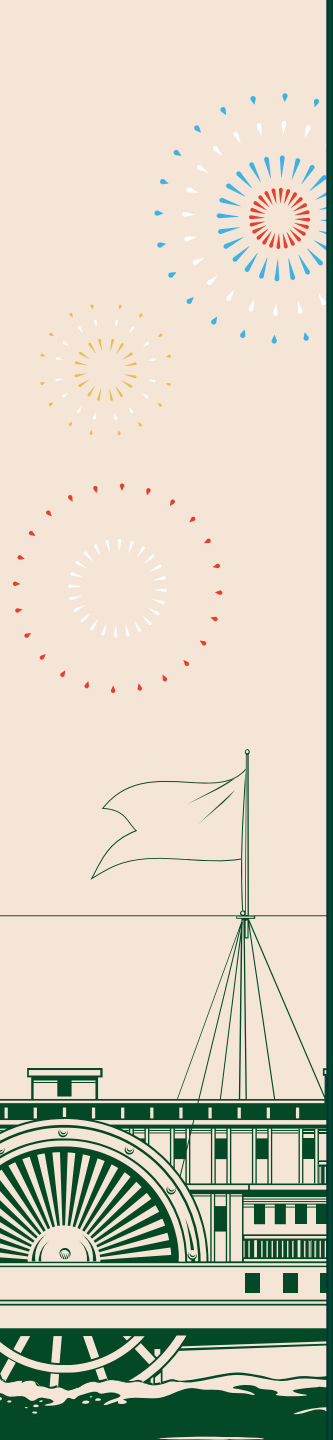
- The policy does not change existing IPv4 or IPv6 allocation practices on Earth.

## **Establishes a framework for extraterrestrial networking**

- Introduces a policy basis for allocating IP resources for non-terrestrial use cases (e.g., lunar, deep space missions).
- Prevents ad hoc or inconsistent addressing practices across agencies and regions.

## **Improves aggregation and routing scalability**

- Encourages topology-aligned addressing rather than agency-by-agency allocations from different RIRs.
- Reduces risk of future routing table sprawl as interplanetary networks interconnect.



# Policy Impact



## Promotes inter-RIR coordination

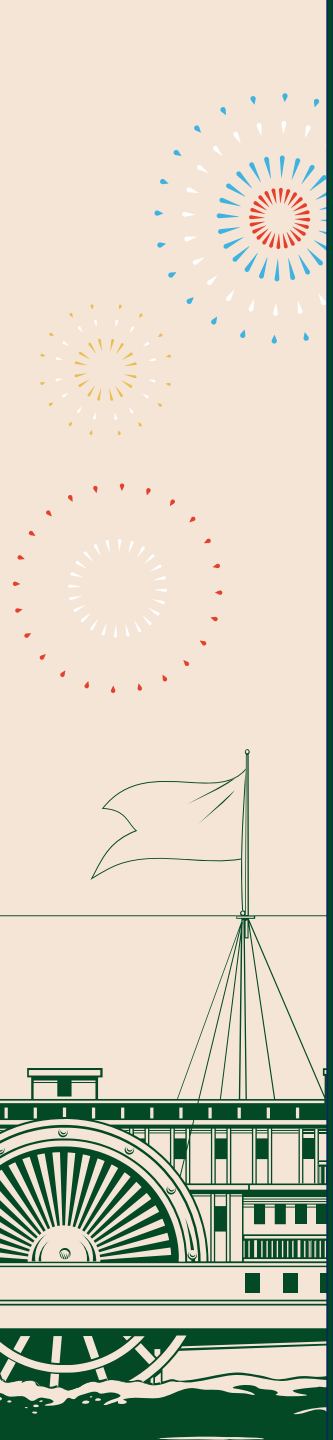
- Space missions can be multinational.
- TIPTOP implicitly pushes toward harmonization across RIRs, which could lead to future global policy coordination.

## Limited immediate utilization

- Near-term demand is small and specialized (space agencies, contractors).
- No sudden depletion pressure on IPv4 or IPv6 pools.

## Precedent-setting

- This is would be the first formal recognition of off-Earth use cases in RIR policy.





# Community Feedback



- **Ad hoc allocations:** Agencies are currently selecting IP space for deep-space missions in an inconsistent manner, limiting aggregation and routing optimization.
- **Need for guidance:** A formal framework would provide structure for deep-space allocations while allowing flexibility in network design.
- **Aggregation & topology:** Provider-based allocations support aggregation, but shared topologies introduce complexity and uncertainty.
- **Low risk, potential benefit:** Dedicated deep-space addressing could improve aggregation even if topology assumptions evolve over time.



# Community Feedback



## **Scope and coordination concerns:**

- Some feedback suggests this may be better suited as a global policy (NRO NC) rather than ARIN acting independently.
- Others support ARIN proceeding via the bottom-up process, with inter-RIR coordination occurring.
- Authority considerations: Address allocations remain within the existing RIR/ASO framework, not external bodies.
- Establishing policy now could prevent fragmentation and support future multinational space networking.

# Questions for the Community



Would aligning address allocations with celestial topology improve routing scalability for interconnecting space-based networks?

Do you see a risk of increased global routing table entries if extra-terrestrial networks continue using disaggregated terrestrial allocations?

What concerns would you want addressed before advancing this further in the Policy Development Process?

Are there any other risks that should be discussed?