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AT-LARGE ADVISORY COMMITTEE
ALAC Statement on the Name Collision IPv6 Research Study

Preamble

On 20 October 2025, the Public Comment proceeding opened for the Name Collision IPv6 Research Study. An At-Large workspace was created in preparation for this Public Comment submission. The At-Large Consolidated Policy Working Group reviewed the Name Collision IPv6 Research Study and decided it would be in the interest of end users to develop and submit an ALAC Public Comment Statement.

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Ratification Record

On 20 October 2025, the Public Comment proceeding opened for the Name Collision IPv6 Research Study. On 26 November 2025, the Consolidated Policy Working Group (CPWG) discussed the comments for an ALAC statement. The CPWG decided it would be in the interest of end users to develop and submit an ALAC statement for this Public Comment proceeding. Aftab Siddiqui, Alfredo Calderon, Claire Craig, Denise Hochbaum, Gloria Frimpomaah Amofah-Adjekum, Greg Shatan, Natalie Tercova, Nefertiti Marquez, Pari Esfandiari, and Satish Babu volunteered to draft the initial ALAC statement for CPWG consideration and ALAC endorsement.

On 10 December 2025, Pari Esfandiari shared the draft statement with the CPWG as the penholder for review and input. On 12 December 2025, the At-Large Public Comment Statement was finalized. The ALAC Chair, Jonathan Zuck, requested that the Public Comment Statement be ratified by the ALAC before submission to the ICANN Public Comment feature.

On 19 December 2025, staff confirmed the online vote resulted in the ALAC endorsing the statement with 14 out of 15 votes in favor. 0 votes against, and 0 abstentions. Please note 93% of ALAC members participated in the poll. The ALAC members who participated in the poll are (alphabetical order by first name): Adebunmi Akinbo, Aftab Siddiqui, Aziz Hilali, Claire Craig, Eunice Alejandra Perez Coello, Emilia Zalewska-Czajczynska, Hannah Frank, Jonathan Zuck, Judith Hellerstein, Justine Chew, Natalie Tercova, Pari Esfandiari, Raihanath Gbadamassi, Satish Babu. You may view the results here:

The ALAC has been asked to vote on the "ALAC Statement on the Name Collision IPv6 Research Study." Do you agree with this Statement?			
Total Voters:15			
Choice 🗳️	View Raw Votes 🔍	Votes	Percentage 🗳️
Yes		14	100.00%
No		0	0.00%
Abstain		0	0.00%

Executive Summary

The ALAC supports the development of an IPv6-based Controlled Interruption mechanism but cannot endorse the use of **::ffff:127.0.53.53** due to significant technical, operational, and standards-related concerns. As IPv6 adoption grows, relying on a mapped-loopback address risks inconsistent behavior and reduced error transparency for users, especially in IPv6-only environments. ALAC recommends further testing, exploration of standards-aligned alternatives, and strong user-focused guidance before any IPv6 CI approach is adopted.

ALAC and At-Large Community Comments

The ALAC and At-Large community welcome the opportunity to comment on the Name Collision IPv6 Research Study. ALAC supports the development of an IPv6-based Controlled Interruption (CI) mechanism but **cannot endorse the adoption of ::ffff:127.0.53.53** at this time due to unresolved concerns regarding standards compliance, technical behavior, operational predictability, user safety, and the growing importance of IPv6-only environments. Any final solution must ensure consistency, clarity, and global usability.

1- Summary of ALAC Concerns

- **User Safety and Error Transparency**

ALAC is concerned that an IPv6 CI mechanism adopted without full validation may cause **new confusion and diagnostic failures**. Inconsistent behavior across resolvers, devices, or networks could leave users facing unexplained errors with no indication of a Name Collision. With IPv6 usage now exceeding 40%, the absence of a reliable IPv6 CI signal leaves IPv6-only environments **unprotected**, undermining CI's purpose. Any solution must ensure **clear, predictable, and interpretable** behavior for all user groups.

- **Technical and Operational Risks**

Using `::ffff:127.0.53.53` as an IPv6 CI address raises several documented risks:

- **Standards Deviation (RFC 4291):** IPv4-mapped IPv6 addresses are not intended for AAAA records and may behave inconsistently.
- **Loopback Conflicts (RFC 1122):** Embedding a loopback value can cause systems to connect to themselves.
- **Resolver / Client Issues:** Some libraries treat mapped addresses as special, creating unpredictable fallback behavior.
- **Dual-Stack & IPv6-Only Impact:** Mapped addresses may disrupt source/destination selection; IPv6-only networks may fail silently.
- **Caching Anomalies:** AAAA loopback-mapped entries may cause persistent misrouting.
- **CDN & Middleware Disruptions:** Non-routable addresses may confuse routing, load balancers, and inspection systems.
- These concerns are supported by RFCs 4291, 1122, 8200, 8499, and findings from ICANN's CI IPv6 research.

- **Global Diversity and Uneven IPv6 Maturity**

Many regions still operate with incomplete IPv6 deployments, diverse hardware, inconsistent ISP IPv6 support, and limited technical capacity. A CI mechanism relying on non-standard behavior risks **disproportionate disruption** in these environments. A globally reliable solution must be **simple, standards-aligned, and broadly interoperable**.

- **Communication Burden and User Impact**

Even with a technically correct mechanism, CI will only work if supported by **clear, multilingual, non-technical guidance**, standardized error messaging, and capacity-building materials. Without this, CI warnings risk being misunderstood or ignored, especially in low-resource settings.

- **Need for Broader Testing and Evidence**

ALAC encourages ICANN to expand testing across diverse resolvers, operating systems, mobile stacks, dual-stack and IPv6-only contexts, varied regional networks, and accessibility use cases. ICANN should also work with the IETF to explore securing a **dedicated IPv6 block** for CI or loopback-like signaling, avoiding mapped or ambiguous formats that may require later reversal.

Public comments reflect wide caution, including concerns that mapped IPv6 use “**must be corrected**” and calls for ICANN to “**engage the IETF**” on a standards-aligned solution.

2. Assessment of Alternatives

Several **standards-aligned** IPv6 options exist—such as ULA-based addresses (e.g., `fd:53::1` or `fd53:5353:5353::1`)—that avoid mapped address semantics, loopback conflicts,

and resolver ambiguity. These alternatives offer:

- consistent interpretation across resolvers and systems,
- clear alignment with IPv6 addressing standards (RFC 4291, RFC 8200),
- reduced operational, security, and diagnostic risks.

However, ALAC does not endorse any specific alternative at this stage but emphasizes that any chosen solution must deliver clear, predictable, and consistent behaviour across all user groups.

Further investigation, controlled testing, and community consultation are required to determine which approach provides the safest, most predictable, and most user-transparent CI behavior.

3. ALAC Recommendations

- **Defer Adoption of ::ffff:127.0.53.53**
Given the user impact associated with the technical, operational, security, and standards concerns outlined above, ALAC does not support adopting this address at this time.
- **Conduct Broader, Global Testing**
ICANN should expand its test matrix, assess performance in IPv6-only and diverse environments, and publish results for community review.
- **Investigate Standards-Aligned Alternatives**
Alternatives that avoid mapped and loopback semantics should be evaluated, though not adopted prematurely.
- **Prioritize Error Transparency**
Any IPv6 CI mechanism must generate consistent, easily understood error behavior and allow users to identify Name Collision issues quickly.
- **Provide Multilingual, Accessible Guidance**
Clear instructional materials must accompany any deployment.
- **Establish a Periodic Review**
As IPv6 standards and behaviors evolve, CI mechanisms should be reassessed regularly.

4. Summary

The ALAC supports establishing an IPv6-based Controlled Interruption mechanism but advises **significant caution**. The proposed mapped-loopback address (::ffff:127.0.53.53) presents significant risks, including non-standard protocol behavior, ambiguous interpretation by clients, operational inconsistencies across networks and resolvers, and notable security concerns. With IPv6 adoption rising and IPv6-only environments expanding, these issues warrant deeper study, broader testing, and continued collaboration with the technical community and the IETF. Any final CI mechanism must be standards-aligned, predictable, transparent, and safe for users across the global Internet.

5. References

RFC 4291 • RFC 4038 • RFC 8200 • RFC 4033 • RFC 4034 • RFC 4035 •
RFC 1034 • RFC 1035 • RFC 8499 • RFC 1122 • RFC 1812 •
ICANN Public Comment • ICANN Controlled Interruption IPv6 Study (Summary & Reports 1–2)