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Internet-Draft	Cox Communications	
Intended status: Informational	V. Kuarsingh	
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	November 11, 2010	

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IANA Reserved IPv4 Prefix for Shared Transition Space
draft-weil-shared-transition-space-request-01

Abstract

This document requests a reserved IANA IPv4 address allocation as Shared Transition Space to support the deployment of IPv4 address sharing technologies post IPv4 exhaustion.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.
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This Internet-Draft will expire on May 15, 2011.

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1. Introduction

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Many operators are currently implimenting their IPv6 transition plans. During the transition, continued support for heritage IPv4 only devices will be required. While most operators are well aware of the limitations of NAT444 [I-D.shirasaki-nat444] (Yamagata, I., Shirasaki, Y., Nakagawa, A., Yamaguchi, J., and H. Ashida, “NAT444,” July 2010.) (see [I-D.donley-nat444-impacts] (Donley, C., Howard, L., Kuarsingh, V., Chandrasekaran, A., and V. Ganti, “Assessing the Impact of NAT444 on Network Applications,” October 2010.)), it is the transition mechnism that has the least customer impact for many carriers.
To deal with some of the NAT444 limitations, it becomes necessary for a provider to utilize address space in the NAT444 infrastructure that will not conflict with it's customer space.
This document requests that IANA reserve a portion of the remaining unallocated space as Shared Transition Space for the enablement of a clean transition strategy in provider networks.

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2. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 (, “,” .) [RFC2119].

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3. Motivation

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The Internet community is rapidly consuming the remaining supply of unallocated IPv4 addresses. During the transition period to IPv6, it is imperative that Service Providers maintain IPv4 service for devices and networks that are currently incapable of upgrading to IPv6.

In order to provide IPv4 service to customers and/or devices once the IPv4 address space is exhausted, Service Providers must multiplex several subscribers behind a single IPv4 address using one of several techniques including NAT444 . Providers need sufficient non-[RFC1918] (Rekhter, Y., Moskowitz, R., Karrenberg, D., Groot, G., and E. Lear, “Address Allocation for Private Internets,” February 1996.) address space to deploy such technologies and avoid overlap with customer use of private address space.

Many CPE router devices used to provide residential or small-medium business services have been optimized for IPv4 operation, and typically require replacement in order to fully support the transition to IPv6 (either natively or via one of many transition technologies). In addition, various consumer devices including IP-enabled televisions, gaming consoles, medical and family monitoring devices, etc. are IPv4-only, and cannot be upgraded. While these will eventually be replaced with dual-stack or IPv6 capable devices, this transition will take many years. As these are typically consumer-owned devices, service providers do not have control over the speed of their replacement cycle. However, consumers have an expectation that they will continue to receive IPv4 service, and that such devices will continue to have IPv4 Internet connectivity after the IPv4 pool is exhausted, even if the customer contracts for new service with a new provider.

Until such customers replace their Home Gateways and all IPv4-only CPE devices with IPv6-capable devices, Service Providers will be required to continue to offer IPv4 services through the use of an IPv4 address sharing technology such as NAT444 [I-D.shirasaki-nat444] (Yamagata, I., Shirasaki, Y., Nakagawa, A., Yamaguchi, J., and H. Ashida, “NAT444,” July 2010.). The challenges associated with these deployments are identified in [I-D.shirasaki-nat444-isp-shared-addr] (Shirasaki, Y., Miyakawa, S., Nakagawa, A., Yamaguchi, J., and H. Ashida, “NAT444 addressing models,” July 2010.), [I-D.donley-nat444-impacts] (Donley, C., Howard, L., Kuarsingh, V., Chandrasekaran, A., and V. Ganti, “Assessing the Impact of NAT444 on Network Applications,”

October 2010.), and [I-D.ietf-intarea-shared-addressing-issues] (Ford, M., Boucadair, M., Durand, A., Levis, P., and P. Roberts, “Issues with IP Address Sharing,” October 2010.).
Addressing solutions for dealing with the depletion of the IPv4 public address space and the lack of available private addresses within large providers are presented in [I-D.azinger-additional-private-ipv4-space-issues] (Azinger, M. and L. Vegoda, “Additional Private IPv4 Space Issues,” April 2010.) as well as [I-D.shirasaki-nat444-isp-shared-addr] (Shirasaki, Y., Miyakawa, S., Nakagawa, A., Yamaguchi, J., and H. Ashida, “NAT444 addressing models,” July 2010.). For infrastructure providers whose customers are already using [RFC1918] (Rekhter, Y., Moskowitz, R., Karrenberg, D., Groot, G., and E. Lear, “Address Allocation for Private Internets,” February 1996.) space, the preferred method for addressing the problems presented in both documents is to direct IANA to reserve address space from its unassigned IPv4 address pool for Shared Transition Space.

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4. Shared Transition Space

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This document proposes the assignment of the equivalent of a /10 as Shared Transition Space. This block could be composed of one contiguous assignment, or several discontiguous assignments. Shared Transition Space is IPv4 address space reserved for Infrastructure provider use with the purpose of facilitating IPv6 transition and IPv4 coexistence deployment. The requested block SHOULD NOT be utilized for any purpose other than IPv4 to IPv6 transition infrastructure. Network equipment manufacturers MUST NOT use the assigned block in default or example device configurations.
Because Shared Transition addresses have no meaning outside of the Infrastructure Provider, routing information about shared transition space networks MUST NOT be propagated on interdomain links, and packets with shared transition source or destination addresses SHOULD NOT be forwarded across such links. Internet service providers SHOULD filter out routing information about shared transition space networks on ingress links.

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5. Problems using Future Use Space

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[I-D.fuller-240space] (Fuller, V., “Reclassifying 240/4 as usable unicast address space,” March 2008.) and [I-D.wilson-class-e] (Wilson, P., Michaelson, G., and G. Huston, “Redesignation of 240/4 from "Future Use" to "Private Use",” September 2008.) suggest that 240.0.0.0/4 space could be used as Shared Transition Space. However, as discussed in [I-D.azinger-additional-private-ipv4-space-issues] (Azinger, M. and L.

Vegoda, “Additional Private IPv4 Space Issues,” April 2010.), some existing network equipment does not support addresses in the 240.0.0.0/4 range. In particular, [CISCO] (Cisco Systems, “TCP/IP Overview,” .) states that "no addresses are allowed with the highest-order bits set to 1111". It is likely that many home routers will not support this range, either. In order to use this range, equipment vendors would need to update software code for existing routers and end users would need to upgrade their home devices. As many older home routers do not support automatic updates, it is unlikely that enough end users would upgrade to make the 240.0.0.0/4 range viable for Shared Transition Space use.

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6. Security Considerations

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This memo does not define any protocol, and raises no security issues. Any addresses allocated as Shared Transition Space would not be routable on the Internet.

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7. IANA Considerations

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IANA is asked to reserve an IPv4 /10 from its remaining pool of unallocated IPv4 addresses for use as Shared Transition Space.

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8. Informative References

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[CISCO]	Cisco Systems, “TCP/IP Overview.”
[I-D.azinger-additional-private-ipv4-space-issues]	Azinger, M. and L. Vegoda, “Additional Private IPv4 Space Issues,” draft-azinger-additional-private-ipv4-space-issues-04 (work in progress), April 2010 (TXT).
[I-D.donley-nat444-impacts]	Donley, C., Howard, L., Kuarsingh, V., Chandrasekaran, A., and V. Ganti, “Assessing the Impact of NAT444 on Network Applications,” draft-donley-nat444-impacts-01 (work in progress), October 2010 (TXT).
[I-D.fuller-240space]	Fuller, V., “Reclassifying 240/4 as usable unicast address space,” draft-fuller-240space-02 (work in progress), March 2008 (TXT).
	Ford, M., Boucadair, M., Durand, A., Levis, P., and P. Roberts, “Issues with IP Address

[I-D.ietf-intarea-shared-addressing-issues]	Sharing," draft-ietf-intarea-shared-addressing-issues-02 (work in progress), October 2010 (TXT).
[I-D.shirasaki-nat444]	Yamagata, I., Shirasaki, Y., Nakagawa, A., Yamaguchi, J., and H. Ashida, "NAT444," draft-shirasaki-nat444-02 (work in progress), July 2010 (TXT).
[I-D.shirasaki-nat444-isp-shared-addr]	Shirasaki, Y., Miyakawa, S., Nakagawa, A., Yamaguchi, J., and H. Ashida, "NAT444 addressing models," draft-shirasaki-nat444-isp-shared-addr-04 (work in progress), July 2010 (TXT).
[I-D.wilson-class-e]	Wilson, P., Michaelson, G., and G. Huston, "Redesignation of 240/4 from "Future Use" to "Private Use"," draft-wilson-class-e-02 (work in progress), September 2008 (TXT).
[RFC1918]	Rekhter, Y., Moskowitz, R., Karrenberg, D., Groot, G., and E. Lear, "Address Allocation for Private Internets," BCP 5, RFC 1918, February 1996 (TXT).
[RFC2119]	"."

Appendix A. Acknowledgements

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Thanks to the following people (in alphabetical order) for their guidance and feedback:

John Brzozowski

Isaiah Connell

Greg Davies

Kirk Erichsen

Wes George

Tony Hain

Philip Matthews

John Pomeroy

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