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6to4 DHCP Relay Router Option
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[Abstract](#)

Provides a DHCP 6to4 Relay Router option.

[Status of this Memo](#)

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[1. Introduction](#)

Using 6to4 [\[RFC3056\]](#) currently requires manual configuration of the relay router or the use of a anycast relay router [\[RFC3068\]](#). The latter has a number of well known issues (add reference).

This document attempts to address some of those issues by providing a method for clients to discover the address of a 6to4 relay router. It is expected that the 6to4 relay router will be managed and that it will be topologically close to the client thereby reducing some of the issues with using public anycast relay routers.

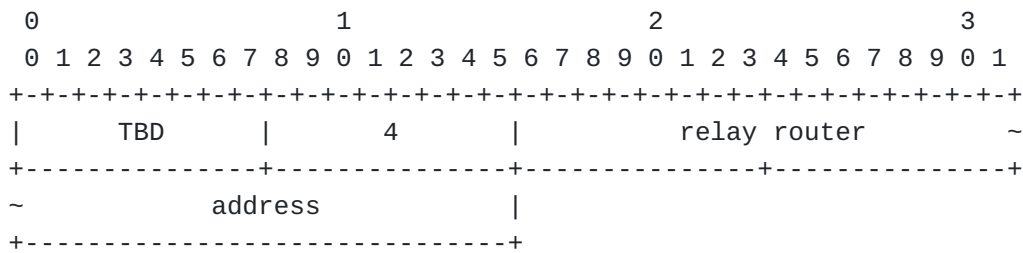
Additionally not all IPv4 address allocated to clients are suitable for use with 6to4. Whether they be [\[RFC1918\]](#) address, or other addresses behind a NAT, or are behind a firewall which blocks 6to4 encapsulted traffic. This document provides a method for the DHCP server operator to signal that the address being returned is not suitable for use with 6to4.

[1.1. Reserved Words](#)

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 [\[RFC2119\]](#).

[2. 6to4 Relay Router Option](#)

The 6to4 DHCP Relay Router Option (6to4RR0) has code TBD and consists of a single IPv4 address specifing the IPv4 address of the 6to4 relay router. Setting the relay router address to 0.0.0.0 indicates that 6to4 will not work for returned lease address.



The presence of a 6to4RR0 option in the reply MUST NOT be used as a indication that the client should use 6to4. It is only a instruction to the client of how it should do 6to4 if it is otherwise configured to use 6to4.

3. CPE Equipment

CPE equipment SHOULD be configured to request the 6to4RR0 option if 6to4 has been enabled. If 0.0.0.0 is returned in response to the 6to4RR0 option the CPE SHOULD disable 6to4 and withdraw any advertised 6to4 prefixes.

The 6to4RR0 SHOULD be requested even if a 6to4 relay router has been manually configured. This is done so that the CPE can see if 6to4 needs to be disabled if it is moved between networks. Returned values other than 0.0.0.0 MAY be ignored.

CPE equipment MAY have a configuration knob to disable requesting the 6to4RR0. This knob MUST default to OFF.

4. Comparision of 6to4RR0 vs 192.88.99.1

Provides a way to distribute load independent of the routing table.

Using a unicast address rather than a anycast address allows for reliable reassembly of the IPv4 encapsulating packet.

Provides a way to supply 6to4 decapsulation service which is unlikely to leak to unexpected clients.

5. Comparision of 6to4 and 6to4RR0 to 6rd

6rd [\[RFC5969\]](#) works well as a replacement for 6to4 when the ISP controls the CPE equipment and is willing to deploy 6rd border routers. 6rd does not work so well as a replacement if any these conditions are not met for logistical reasons and may require parallel deployment with 6to4 until the CPE equipment is updated.

6rd requires active participation of the ISP. 6to4 does not.

6rd does not provide a signal to tell the CPE/host not to use 6to4.

The 6to4RR0 can often be deployed without requiring additional vendor support with existing equipment.

6to4RR0 should not be seen as a reason to not support 6rd in CPE/hosts.

6to4RR0 and 6rd have different deployment senarios.

6. Deployment Senarios

6.1. Enterprise Deployment

To prevent accidental 6to4 tunnels a enterprise would set 6to4RR0 to 0.0.0.0. This is intended to turn off mobile clients that have accidentally left 6to4 enabled when connecting to the enterprises network.

6.2. ISP Deployment

ISPs, with a IPv6 connection to the public Internet, would set 6to4RR0 to point to 6to4 relay routers run by the ISP. This will provide their customers with a managed 6to4 routers which are topologically close to the client. If the ISP does not have IPv6 connectivity it SHOULD NOT set the 6to4RR0 option unless it knows the addresses it it returning will not work with 6to4.

If the ISP is returning a IPv4 addresses which will be subject to network address translation, regardless of whether they have IPv6 connectivity or not, it SHOULD set the returned 6to4RR0 option to 0.0.0.0. This is intended to stop clients using IPv4 addresses which will not work with 6to4.

7. IANA Considerations

IANA is requested to allocate a DHCP option code point.

8. Security Considerations

A rogue DHCP server advertising this option can cause 6to4 traffic to be redirected anywhere in the world.

Setting the returned address to 0.0.0.0 can be used to deny 6to4 service when it would otherwise work.

9. References

9.1. Normative References

[RFC1918]	Rekhter, Y., Moskowitz, B., Karrenberg, D., de Groot, G. J. and E. Lear, " Address Allocation for Private Internets ", BCP 5, RFC 1918, February 1996.
[RFC2119]	Bradner, S., " Key words for use in RFCs to Indicate Requirement Levels ", BCP 14, RFC 2119, March 1997.
[RFC3056]	Carpenter, B. and K. Moore, " Connection of IPv6 Domains via IPv4 Clouds ", RFC 3056, February 2001.
[RFC3068]	Huitema, C., " An Anycast Prefix for 6to4 Relay Routers ", RFC 3068, June 2001.

9.2. Informative References

[RFC5969]	Townsley, W. and O. Troan, " IPv6 Rapid Deployment on IPv4 Infrastructures (6rd) -- Protocol Specification ", RFC 5969, August 2010.
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