Relay Services

IPv6 Transmission Mechanisms

IPv4 and IPv6 networks are not directly interoperable, which means that a transition mechanism is needed in order to permit hosts on an IPv4 network to communicate with hosts on an IPv6 network, and vice versa. The links below are links to videos developed by RIPE NCC will help you understand some of these techniques.

6in4

6in4 is a tunneling technique. You can manually set up a 6in4 tunnel. Watch this video to learn more.

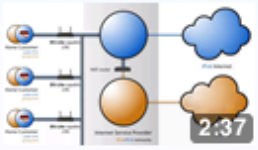
6RD

6RD is a tunneling technique in which the IPv4 and IPv6 addresses come from the Internet Service Provider (ISP). Some ISPs offering DSL or cable services are implementing 6RD to connect their customers over IPv6.

NAT64

NAT64 is a transition mechanism based on Network Address Translation (NAT) that makes it possible for IPv6-only hosts to talk to IPv4-only servers. NAT64 can be useful for mobile providers.

DS-Lite



DS-Lite allows an ISP to give access to IPv4-only services for customers that have only native IPv6. This mechanism could be useful for DSL or cable providers.

Additional Materials

There are several relay services that are of interest to ISPs because they can set up tunnel relay servers to either provide better service to a mixed v4/v6 Internet, or to enable full reachability regardless of the end-user's version of IP. The following pages deal with the main automatic tunnel/relay technologies:

- Cisco 6to4 Relay Service
- FreeBSD Teredo Relay
- Juniper 6to4 Relay Service
- Linux or BSD 6to4 Relays
- ISPs currently announcing a 6to4 prefix
- Miredo
- Transitioning___6to4
- Transitioning___NAT64
- Transitioning___NAT-PT
- Transitioning___Teredo

There is also useful information about these technologies on these pages:

- Operational transition information
- Planning IPv6 Deployment
- Transparent Internet Access

The following conversation from the NANOG list explains how effective placement of 6to4 relays in content-provider networks can greatly reduce the likelihood of latency issues in a mixed v4/v6 Internet.

> 2) If Teredo relays are deployed close to the service (ie. content,
> etc.) then performance is almost equivalent to IPv4. 6to4 relies on
> relays being close to both the client and the server, which requires
> end users' ISPs to build at least *some* IPv6 infrastructure, maintain
> transit, etc. When you consider that this infrastructure and transit
> is quite likely to be over long tunnels to weird parts of the world,
> this is a bad thing. Putting relays close to the content helps for the
> reverse path (ie. content -> client), however the forward path (client
> -> content) is likely to perform poorly.

Not quite correct. 6to4 does not require transiting a relay if the target
is another 6to4 site. What this means is that a clueful content provider
will put up a 6to4 router alongside whatever native service they provide,
then populate the dns with both the native and 6to4 address. A properly
implemented client will do the longest prefix match against that set, so a
6to4 client will go directly to the content provider's 6to4 router, while
a native client will take the direct path. The only time an anycast relay
needs to be used is when the server is native-only and the client is 6to4-only.

And here is a brief Q&A that makes it clear that installing proper relays gives you greater visibility of your IPv6 traffic.

On Thu, 30 Oct 2008, David W. Hankins wrote:

> I don't know how to ask this question without sounding mean, but did
> the graph spike out of zero, or did you start collecting two months ago?

It spiked out of zero as we put up our 6to4 and teredo relays approx two months ago.
I don't know where the traffic was before, probably at other peoples 6to4 relays.

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