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IPv6-only Terminology Definition
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Abstract

This document clarify the terminology regarding the usage of expressions such as "IPv6-only", in order to avoid confusions when using them in IETF and other documents, in reference to what is the actual functionalities being used (not the actual protocol support).

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[1.](#) Introduction

Due to the nature of the Internet and the different types of users, part of a network, providers, flows, etc., there is no a single and easy way to categorically say something such as "IPv6-only".

The goal of this document is to depict this situation and agree in a common language to be used for IETF and other documents, in order to facilitate ourselves and future readers, the correct understanding of what we are talking about.

Note that all the references in this document are regarding the actual usage of IPv4/IPv6, not the support of those. For example, a device or access network may support both IPv4 and IPv6, however actually is only using (forwarding at layer-2), IPv6.

[2.](#) Context

The transition from IPv4 to IPv6 is not something that can be done, in the large majority of the cases, overnight and in a single step. Consequently, in general, we MUST NOT talk about a whole network having a "single and uniform" status regarding IPv6, at least not in the early deployment stages.

Even if it is possible, it is not frequent to deploy new IPv6 networks which have no IPv4 connectivity at all, because at the current phase of the universal goal of the IPv6 deployment, almost every network still need to provide some kind of access to IPv4 sites. It is not feasible for most of the operators de tell their customers "I can provide you IPv6 service, but you will not be able to access all Internet because some of the contents or applications still don't support it, so you will miss every content that it is IPv4-only".

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So what often happens is that some networks may have IPv6-only support for specific purposes. For example, a DOCSIS provider may have decided that is worth the effort to get rid of IPv4 for the management network of the cable-modems. Or a network that provides connectivity only to IoT devices, may be IPv6-only.

However, despite the IETF and vendor efforts to get rid-off IPv4 as soon as possible in every network or part of it, there are many devices, in both corporate and end-user networks (smartTV, IP cameras, security devices, etc.), which are IPv4-only and it is not feasible (vendors may even be out of the market, or devices have no easy way to be updated with new firmware, or the vendor have more interest in selling a new model, etc.), the "end-networks" in general, need to keep supporting IPv4.

It is true that this IPv4 support maybe done by using tools, or sets of them, developed by IETF as part of the transition mechanisms efforts. So, we could talk today about a situation where we can have "most parts" of operator (or even enterprises/organizations) networks being IPv6-only, however have some kind of "IPv4" support, which in general we are calling "IPv4-as-a-service", which means typically that IPv4 is transported using the IPv6 layer-3 infrastructure as an IPv4 layer-2 one (for example by means of encapsulation or translation).

Let's describe the situation in the cellular networks. Because the nature of the applications in those networks, it is easier to have more control on how the developers work, and for example, mandate IPv6 support in order to allow the apps to be installed in the smartphones, as actually has been done by Apple. What that means is that it is theoretically possible to have an IPv6-only access network for a complete cellular operator network. It may be even possible that the core and other parts of the operator network are IPv6-only if all the management of those is done by means of IPv6. However, as soon as any application in the smartphone requires access to IPv4-only end sites (example web servers), there must be some kind of IPv4 support in that network, for example PLAT (NAT64/DNS64) and consequently, some IPv4 addresses, which allow the IPv4-only traffic flow to end-sites by means of the upstream providers/peers.

Now, if those smartphones in an IPv6-only cellular network provide tethering (sharing of a smartphone Internet connection with other devices), they may also need to "transport" IPv4 (those devices may be IPv4-only), in a seamless way, over the IPv6-only network.

We can extrapolate the example above to, instead of smartphones to LTE routers, or CEs with any wired technology (FTTH, xDSL, Cable, etc.). At the end, no matter which is the access technology, we

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can't talk, in general, in the customer LANs, about IPv6-only, because today is very common that we must provide still some sort of IPv4 support ("IPv4-as-a-service").

Consequently, if we want to be precise and avoid confusing others, we MUST NOT use the terminology "IPv6-only" in a generic way, and we need to define what part of the network we are referring to.

From that perspective, we define the "IPv6-only" status depending on if there is actual layer-2 forwarding of IPv4.

3. IPv6-only

IPv6-only MUST be used only if, a complete network, end-to-end, is actually not forwarding IPv4 at layer-2, which will mean that no-IPv4 addresses are configured, neither used for management, neither the network is providing transition/translation support, neither there is IPv4 transit/peering.

4. IPv6-only host/router

IPv6-only host/router MUST be used only if the host or router that we are referring to, isn't actually forwarding IPv4 at layer-2.

5. IPv6-only WAN/access

IPv6-only WAN or access MUST be used only if the WAN or access network that we are referring to, isn't actually forwarding IPv4 at layer-2.

6. IPv6-only LAN

IPv6-only LAN (or LANs) MUST be used only if the LAN(s) that we are referring to, isn't actually forwarding IPv4 at layer-2.

7. IPv6-only core

IPv6-only core MUST be used only if the core network that we are referring to, isn't actually forwarding IPv4 at layer-2.

8. Other cases

Similar other cases or parts of the network MUST be considered as IPv6-only if there is no actual forwarding of IPv4 at layer-2 over them and in that case, after "IPv6-only" MUST be some word/short text pointing to the specific case or part of the network.

9. Security Considerations

This document does not have any specific security considerations.

10. IANA Considerations

This document does not have any IANA considerations.

11. Acknowledgements

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