

IPv6 – Opportunities and Challenges for Comms Council UK members

About Comms Council UK

Comms Council UK is a membership-led organisation that both represents and supports telecommunications companies that provide services to both business and residential customers in the UK. We keep Britain talking in its various guises by providing or reselling voice services over data networks (VoIP) as well as other “over the top” applications including instant messaging and video.

The membership is a mixture of network operators, service providers, resellers, suppliers and consultants involved in a sector that is diversifying rapidly. Comms Council UK (formerly known as ITSPA) represents its members at a policy level, builds coalitions to collaborate on industry initiatives and provides a platform to help members prepare for change, learn about new trends and develop new business relationships.

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Introduction

IPv4 addresses are a finite resource (approx. 3.7 billion useable) and have all but been depleted. On the 3rd February 2011 the Internet Assigned Numbers Authority (IANA) allocated the last remaining block of IPv4 addresses to Regional Internet Registries (RIRs) such as RIPE, who allocated the last addresses in their available pool in November 2019. Since then, the allocation of IPv4 addresses from the RIRs to service providers has been highly restricted and can take months and even years as it relies on address space being returned and reallocated on a “first come, first served” basis.

A healthy secondary market in the sale and leasing of IPv4 addresses has evolved due to these shortages and increasing demand. RIPE have nearly 100 “Recognised IPv4 Transfer Brokers” at the time of writing, and an average price of \$20 per IP address is only set to rise as demand from major cloud and broadband providers continues.

IPv6 was created to solve the Internet address shortage problem by expanding the available address space with an astounding 340 undecillion addresses available – far more IP addresses than there are grains of sand on the whole of Earth.

However, there’s a catch. Whilst IPv4 and IPv6 can operate together, they are distinctly individual addressing schemes which need to be explicitly configured. Internet Service Providers (ISPs), telecoms

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operators, cloud hosting providers, and anyone reliant on IPv4 must explicitly configure IPv6 on their infrastructure.

Adoption of IPv6

When this document was first published in [WHEN?], IPv6 adoption was still quite patchy in the UK. 96% of the world's internet traffic was still reliant on IPv4, and no major UK ISP had, at that time, committed to deploying IPv6 to end users.

Fast forward to the present, and things are looking considerably better. Whilst there are a number of ways to measure IPv6 adoption in the UK, stats from Google, Facebook and Content Delivery Network (CDN) Akamai published in December 2020 by the UK IPv6 Council put adoption at between 33% and 36%. All major cloud hosting providers support IPv6, as do major broadband ISPs such as BT and Sky. However, there's still work to do to get the adoption closer to 100% - which is why it's important to ensure your services are IPv6 "ready".

What do I need to do?

Although the SIP protocol was designed to support IPv6 from day one, as was the media transmission protocol RTP, issues can occur when both protocols are required to be supported simultaneously (dual stack).

Broadly speaking, IPv6 support depends on:

- Capabilities of platforms, software and equipment at the ITSP
- Capabilities of the ITSP's access networks (e.g. upstream ISPs, Internet Exchange Points (IXPs))
- Capabilities of the customers' access networks (e.g. broadband, Wi-Fi hotspots, and mobile data networks)

Capabilities of the equipment (CPE) used by the customer (e.g. router, handset, mobile device)

Whilst the majority of SBC, proxy and handset vendors support IPv6 in their products, such support and availability of dual stack support may vary from model to model and version to version. Popular open source software such as Asterisk, FreeSWITCH, OpenSIPS and Kamailio have all supported IPv6 for a number of years.

A small note about Network Address Translation (NAT)

The exhaustion of IPv4 addresses has forced some ISPs, especially mobile operators, to implement "Carrier Grade NAT" (CGN), which is a giant centralised NAT at the ISP that runs thousands of sessions. This is problematic for VoIP especially when combined with Customer Premises Equipment (CPE) doing NAT to give "double NAT". As IPv6 does not suffer from this exhaustion, VoIP equipment can easily have public IP addresses and in turn alleviates the requirement for NAT.

Recommendations

- Ensure that core services, including business processes, are IPv6-compatible and test with IPv6-aware CPE.
- Consider changes and compatibility issues of IPv6 to business processes including databases and provisioning.
- Adopt IPv6 sooner rather than later, as some ITSPs have already.

- Request native IPv6 support and connectivity from ISPs, interconnects, partners and suppliers.

Further Information

- [UK IPV6 Council](#)
- [RIPE IPv6 Info Centre](#)

[Google IPv6 Statistics](#)

IPv6 Tests, such as: [Test your IPv6. \(test-ipv6.com\)](#)