

Internet Protocol version 6 (IPv6) FAQ's

What is an IP address?

An IP address otherwise known as a binary number is the numerical label given to each device e.g. Computer, printer, smart phone or anything that connects to the internet. Originally designers defined IP addresses as a 32 bit number that is known as IP version 4. An IPv4 address is represented in a decimal notation which consists of four numbers ranging between 0 and 255 separated by a decimal. E.g. 172.16.254.1 Each number separated by a decimal represents a group of 8 bits or an Octet, there are four octets or four bytes currently in IPv4's and that is what makes up the complete 32bit number as the designers defined.

What is IPv6?

Internet Protocol version 6 or IPv6 as it can also be known as has been designed to succeed IPv4. There are 4,294,967,296 unique IPv4 addresses however we are running out of these because there are so many devices that require an IP address. The Internet Engineering Task Force (IETF) developed a permanent solution to the rapid exhaustion in 1995 called IP version 6. The one of the main differences is that the address size was increased from the 32bit to 128bits or 16 octets (rather than the previous 8 octets) this provides 340 undecillion different IP addresses. But what does this mean? Well the earth is about 4.5 billion years old. If we had been assigning IPv6 addresses at a rate of 1 billion per second since the earth was formed, we would now have used up less than one trillionth of address space.

Will IPv6 addresses look different to the IPv4's?

Yes, IPv6 addressing utilises 128Bits, where as IPv4 uses 32Bits. This means the format of the addressing will be different.

IPv6 addresses have two logical parts: a 64-bit network prefix and a 64-bit host address part. (The host address is often automatically generated from the interface MAC address. An IPv6 address is represented by 8 groups of 16-bit hexadecimal values separated by colons (:)) shown as follows:

A typical example of an IPv6 address is
2001:0db8:85a3:0000:0000:8a2e:0370:7334

Note: RFC 5952 recommends a canonical textual representation.

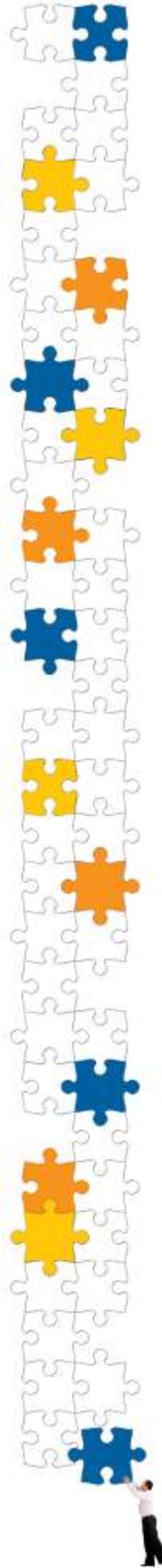
Domain Name Services, DNS, solves many problems related to IP address migration, whether IPv4 to IPv4 or IPv4 to IPv6. Changing the DNS to the new IP ranges is the same whether it is IPv4 or IPv6.

When is IPv6 available to end users?

IPv6 is available to end users now, on a trial basis.

Can you choose IPv6 or IPv4 (if IPv4 is still available) to run your internet service?

Yes. BtL can utilise 'Dual Stacking', which will allow for both the provisioning of IPv4 and IPv6 across our network.



When all the IPv4's are gone, will companies have to move all there IPv4 to IPv6?

Yes and no, there is no proven way to allow for the error-less translation of IPv4 to IPv6. If a company wishes to utilise IPv6 they will be required to get an IPv6 range. The company will be able to keep their existing IPv4 range and use both together utilising 'Dual Stacking'. Customers who have IPv4 will not be able to communicate with other areas on the web that are solely using IPv6. Therefore full conversion or utilisation of both schemes will be necessary to communicate fully on both internets.

What are the challenges in IPv4 to IPv6 transition?

Communication and continuity of business between new customers who can only buy IPv6 and older customers who have either not bought IPv6 or do not wish to convert. The internet will effectively be split in two, those who have IPv4 and those that have IPv6, potentially forming two internets which cannot inter-communicate effectively until everyone has migrated to IPv6.

Customers who already own IPv4 can purchase IPv6 allowing them to communicate with both 'Internets'. Although the challenge lies with newer companies who cannot purchase the IPv4 addresses anymore.

This need for IPv4 to communicate with the vast majority of users will likely see a type of 'black market' open up where providers charge high sums of money for few IPv4 addresses. We are already seeing IPv4 address hoarding, a good example of this is Microsoft buying up companies that have large amount of IPv4 address reserves.

How does IPv6 affect security?

Security is improved with IPv6, especially in areas such as VPNs, virtual private networks. The new IPsec security protocols, ESP (encapsulating security protocol) and AH (authentication header) are add-ons to IPv4. IPv6 builds-in and requires these protocols, which will mean that secure networks will be easier to build and deploy in an IPv6 world.

Transition to IPv6 has the potential to affect security in a number of ways. One of the main implications is that a new IPv6 security policy is required on firewalls. Failure to implement IPv6 properly can also be a security risk, since internal hosts will auto-configure by default and be liable to attack.

Will it affect any of my current hardware? i.e. routers

The effect on changing from using Ipv4 to Ipv6 will differ depending on how the user uses the internet, for home users there wont be a massive notable change however as larger websites start using Ipv6 the router they use or operating system will need to support how Ipv6's are routed. Your hardware needs to be Dual Stack compliant.

Will IPv6 effect windows and its different versions such as Vista, XP etc?

As long as your OS supports IPv6 addressing, then there will be no problems with that transition to IPv6.

If you have any further questions or would like to speak to someone at BtL, please call 0800 011 4088 or email sales@btlc.co.uk