

# IPv6 Addressing Format



- IPv6 uses a 128 bit address compared to IPv4's 32 bit address
- The address is written as X:X:X:X:X:X:X:X
- Each 'X' is a 16 bit hexadecimal field (hex values are 0-9,A-F)
- Eg. 2001:0DB8:0000:0001:0000:0000:0000:0001

# IPv6 Address Part Naming



- IPv4 addresses are 32 bits long, written as x.x.x.x
- Each segment is 8 bits so they are known as 'octets'
- IPv6 addresses 128 bits long, written as X:X:X:X:X:X:X:X
- Each segment is 16 bits but there isn't an official name for them ('hexadectet' is too hard to pronounce)
- They are sometimes called 'hextets', 'pieces' or 'quartets'

# Address Shortening



- The IPv6 address is very long. There are a couple of ways we can shorten it to make things more convenient
- Address shortening is a standard convention and supported by all vendor's devices
- Leading zeros in each field can be removed
- 2001:0DB8:0000:0001:0000:0000:0000:0001 can be written as 2001:DB8:0:1:0:0:0:1

# Address Shortening



- Successive all zero fields can be shortened to '::'
- 2001:0DB8:0000:0001:0000:0000:0000:0001 can be written as 2001:DB8:0:1:0:0:0:1 (leading zeros removed)
- And 2001:DB8:0:1:0:0:0:1 can be written as 2001:DB8:0:1::1

# Address Shortening



- Successive all zero fields can be shortened only once in an address to avoid confusion
- 2001:0:0:1:0:0:0:B can be shortened to
- 2001::1:0:0:0:B or
- 2001:0:0:1::B
- It can't be shortened to 2001::1::B