Introduction to IPv6

1. Address sizes
   - IPv4 - 32 bits long = 4 octets (8 bits)
   - IPv6 - 128 bits long = 32 nibbles (4 bits) = 8 hextets (16 bits)
     - split into two portions - Network portion, Interface identifier
     - both portions are 64 bit long (usually)
     - subnet masks aren't commonly used
     - leading 0s can be eliminated
       - we can remove sets of 0s after the transformation and replace them with '::' (double colon)

2001:0DB8:0002:008D:0000:0000:00A5:52F5 =>

=> 2001:DB8:2:8D:0:0:A5:52F5 => 2001:DB8:2:8D::A5:52F5

     - only one double colon can be used and it's typically placed between network and host portion

2. Number of addresses
   - the host portion is 64 bit long so only for a single network there are 2^{64} addresses
   - when we combine it with the network portion - $2^{64} \cdot 2^{64}$

Ethernet and switching

1. Ethernet
   - two types : Wireless Ethernet, wired Ethernet (we use Ethernet cable to make the connection)
   - switches are typically used to connect all the devices in a network together