

IP Addressing - Convert IP to Binary

When one says that computers and networking are all about zeros and ones or binary it's kind of true. Light is sent down fibre optics buried deep within the ground and oceans. The light is pulsed on and off, "on" being a 1 and "off" being a 0. The network systems converts the digital ones and zeros of the original signal.

1 bit = 0 or 1
byte / octet = 8 bits

Let's use the IP address 202.164.33.6 for an example, how does this translate into 32 zeros and ones you might ask. Each of the 4 numbers separated by a "dot" within the IP address represents 8 bits, therefore, 8 bits x 4 numbers = 32 bits. To determine your complete 32 bit address; process each number separately.

On a piece of paper jot down the following:

128 64 32 16 8 4 2 1

Does 128 go into 202? Yes. Remainder is 74 (202-128)

128 64 32 16 8 4 2 1

1

Does 64 go into 74? Yes. Remainder is 10 (74 - 64)

128 64 32 16 8 4 2 1

1 1

Does 32 go into 10? No. Remainder remains 10

128 64 32 16 8 4 2 1

1 1 0

Does 16 go into 10? No. Remainder remains 10

128 64 32 16 8 4 2 1

1 1 0 0

Does 8 go into 10? Yes. Remainder is 2 (10-8)

128 64 32 16 8 4 2 1

1 1 0 0 1

Does 4 go into 2? No. Remainder remains 2

128 64 32 16 8 4 2 1

1 1 0 0 1 0

Does 2 go into 2? Yes. Remainder is 0 (2-2)

128 64 32 16 8 4 2 1

IP Addressing - Convert IP to Binary

1 1 0 0 1 0 1

Does 1 go into 0? No. Remainder remains 0

128 64 32 16 8 4 2 1

1 1 0 0 1 0 1 0

There you have it, the decimal number 202 converted into the binary set of 11001010. If you process the remaining 3 numbers (164, 33, 6) you'll come up with the following 32 bit binary set for IP address 202.164.33.6

1 1 0 0 1 0 1 0 1 0 1 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 0 1 1 0