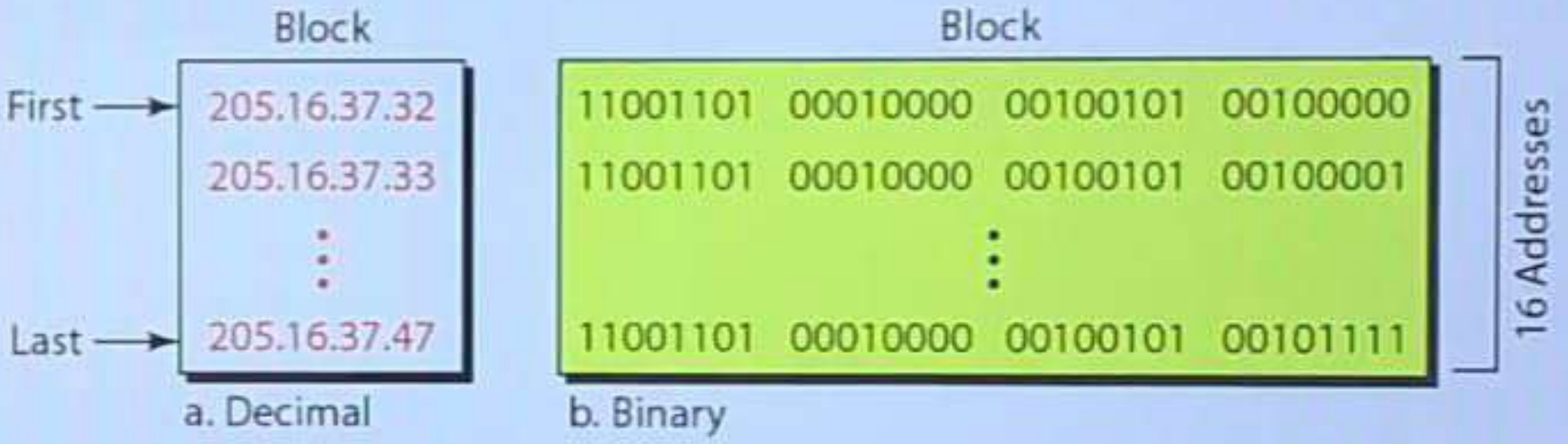
IPV4 Classless Addressing

Classless addressing was designed and implemented to overcome address depletion and give more organizations access to the Internet. Here in classless addressing there are no classes, but the addresses are still granted in blocks.



A block of 16 address combinations (consider last 4 bits) granted to a small organization.

IPV4 Classless Addressing

- In IPv4 addressing, a block of addresses can be defined as x.y.z.w /n in which x.y.z.w defines one of the addresses and the /n defines the mask.
- The first address in the block can be found by setting the rightmost 32 – n bits to 0s.
- The last address in the block can be found by setting the rightmost 32 – n bits to 1s.
- So the number possible addresses = 2^{32-n}

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Example:

- For the address 205.16.37.39/28, find the first and the last addresses in the block. Also find number of addresses in block.
- Binary representation of the given **address and mask** are

  11001101 00010000 00100101 00100111 **(address)**

  11111111 11111111 11111111 11110000 **(mask)**
- Now to get the **first address** in the block we set 32–28=4 rightmost bits to set to 0, so we get

  11001101 00010000 00100101 00100000

  i.e. 205.16.37.32

- Now to get the **last address** in the block we set 32–28=4 rightmost bits to set to 1, so we get

  11001101 00010000 00100101 00101111

  i.e. 205.16.37.47

- So the number addresses = $2^{32-n} = 2^{32-28} = 16$