Redes de Computadores

Grado en Ingeniería Informática en Tecnologías de la Información

Curso 2022-2023

Práctica 4: División de la red

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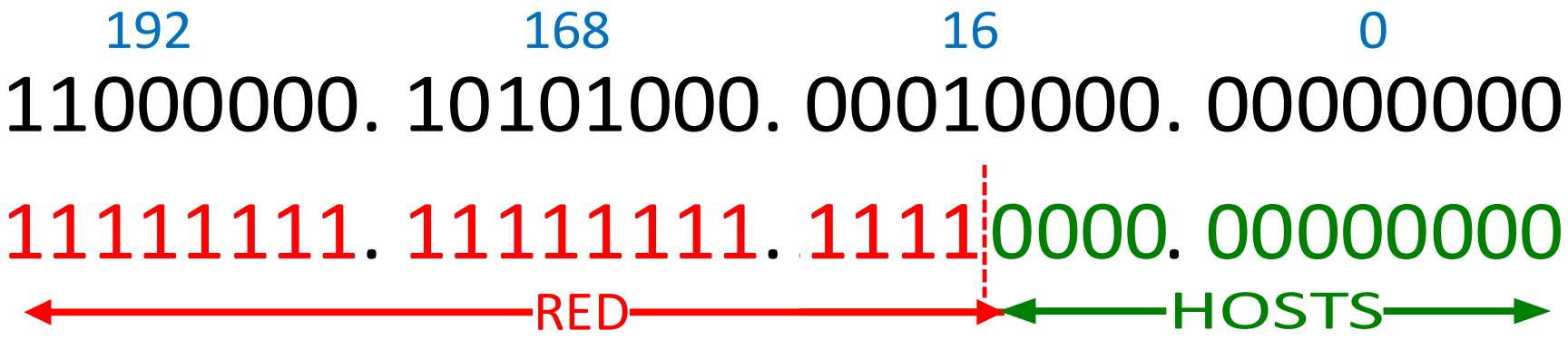
División de redes

Partimos de la red 192.168.16.0/20



Nos piden:

- Una subred con espacio para 300 hosts*
- Una subred con espacio para 120 hosts*
- Una subred con espacio para 30 hosts*

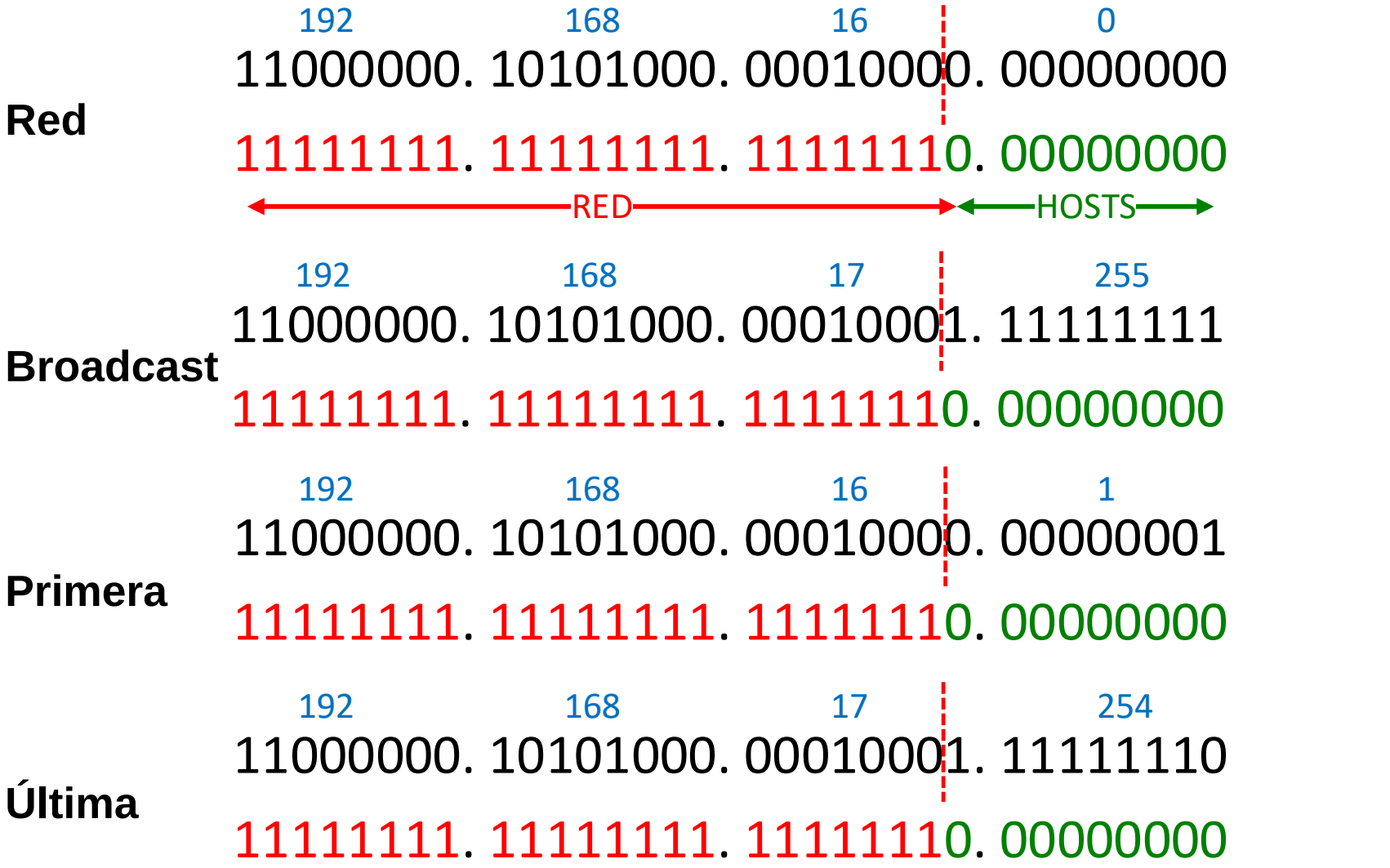
*incluido el Gateway. Es un host de capa 3 más…

División de redes

Empezamos la división por la subred más grande

/31 → 255.255.255.254 → 11111111.11111111.11111111.11111110 → 2^1 = 2 Hosts
/30 → 255.255.255.252 → 11111111.11111111.11111111.11111100 → 2^2 = 4 Hosts
/29 → 255.255.255.248 → 11111111.11111111.11111111.11111000 → 2^3 = 8 Hosts
/28 → 255.255.255.240 → 11111111.11111111.11111111.11110000 → 2^4 = 16 Hosts
/27 → 255.255.255.224 → 11111111.11111111.11111111.11100000 → 2^5 = 32 Hosts
/26 → 255.255.255.192 → 11111111.11111111.11111111.11000000 → 2^6 = 64 Hosts
/25 → 255.255.255.128 → 11111111.11111111.11111111.10000000 → 2^7 = 128 Hosts
/24 → 255.255.255.0 → 11111111.11111111.11111111.00000000 → 2^8 = 256 Hosts
/23 → 255.255.254.0 → 11111111.11111111.11111110.00000000 → 2^9 = 512 Hosts
/22 → 255.255.252.0 → 11111111.11111111.11111100.00000000 → 2^{10} = 1024 Hosts
/21 → 255.255.248.0 → 11111111.11111111.11111000.00000000 → 2^{11} = 2048 Hosts
/20 → 255.255.240.0 → 11111111.11111111.11110000.00000000 → 2^{12} = 4096 Hosts
/19 → 255.255.224.0 → 11111111.11111111.11100000.00000000 → 2^{13} = 8192 Hosts
/18 → 255.255.192.0 → 11111111.11111111.11000000.00000000 → 2^{14} = 16384 Hosts
/17 → 255.255.128.0 → 11111111.11111111.10000000.00000000 → 2^{15} = 32768 Hosts

División de redes



División de redes

Acabamos la red anterior en esta dirección…

192	168	17	255
11000000.	10101000.	00010001.	11111111
11111111.	11111111.	11111110.	00000000

… seguimos dividiendo a partir de la siguiente:

192	168	18	0
11000000.	10101000.	00010010.	00000000

División de redes

Siguiente subred más grande → 120 equipos

/31 → 255.255.255.254 → 11111111.11111111.11111111.11111110 → 2^1 = 2 Hosts
/30 → 255.255.255.252 → 11111111.11111111.11111111.11111100 → 2^2 = 4 Hosts
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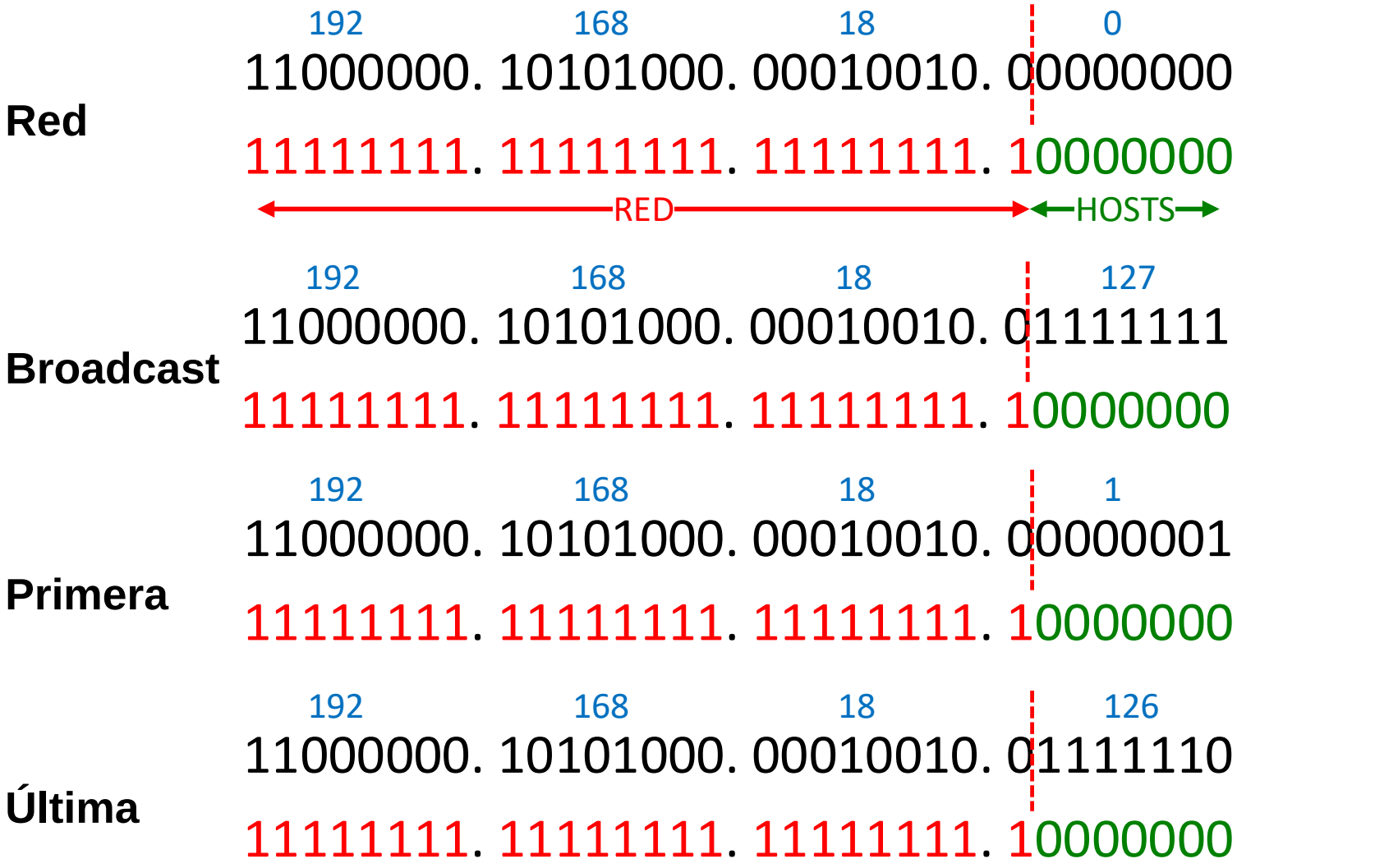
División de redes



División de redes

Acabamos la red anterior en esta dirección…

192	168	18	127
11000000.	10101000.	00010010.	01111111
11111111.	11111111.	11111111.	10000000

… seguimos dividiendo a partir de la siguiente:

192	168	18	128
11000000.	10101000.	00010010.	10000000

División de redes

Subred restante → 30 equipos

/31 → 255.255.255.254 → 11111111.11111111.11111111.11111110 → 2^1 = 2 Hosts
/30 → 255.255.255.252 → 11111111.11111111.11111111.11111100 → 2^2 = 4 Hosts
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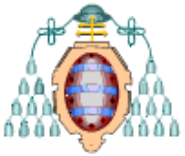

División de redes

¿Y si para la última nos requiriesen espacio para 32 hosts?

/31 → 255.255.255.254 → 11111111.11111111.11111111.11111110 → 2^1 = 2 Hosts
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/17 → 255.255.128.0 → 11111111.11111111.10000000.00000000 → 2^{15} = 32768 Hosts

División de redes

Red

192 168 18 128

11000000. 10101000. 00010010. 10000000

11111111. 11111111. 11111111. 11100000

RED HOSTS

Broadcast

192 168 18 159

11000000. 10101000. 00010010. 10011111

11111111. 11111111. 11111111. 11100000

Primera

192 168 18 129

11000000. 10101000. 00010010. 10000001

11111111. 11111111. 11111111. 11100000

Última

192 168 18 158

11000000. 10101000. 00010010. 10011110

11111111. 11111111. 11111111. 11100000