

Problema 3

Dirección IP: 150.26.193.66/21 ➡

red (21)																								host (11)											
1	0	0	1	0	1	1	0	.	0	0	0	1	1	0	1	0	.	1	1	0	0	0	.	0	0	1	.	0	1	0	0	0	0	1	0

a) Máscara de red: 255.255.248.0 ➡

1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	1	.	1	1	1	1	1	.	0	0	0	.	0	0	0	0	0	0	0	0
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b) Dirección de red: 150.26.192.0 ➡

1	0	0	1	0	1	1	0	.	0	0	0	1	1	0	1	0	.	1	1	0	0	0	.	0	0	0	.	0	0	0	0	0	0	0	0
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c) Dir. de difusión: 150.26.199.255 ➡

1	0	0	1	0	1	1	0	.	0	0	0	1	1	0	1	0	.	1	1	0	0	0	.	1	1	1	.	1	1	1	1	1	1	1	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

d) Número máximo de hosts: $2^{11}-2=2046$

e) Rango de direcciones útiles: 150.26.192.1 – 150.26.199.254

Problema 4

Dirección IP: 150.26.193.66/26 ➡

red (26)			host (6)
10010110	.00011010	.11000001	.01000010

a) Máscara de red: 255.255.255.192 ➡

11111111	.11111111	.11111111	.11000000
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b) Dirección de red: 150.26.193.64 ➡

10010110	.00011010	.11000001	.01000000
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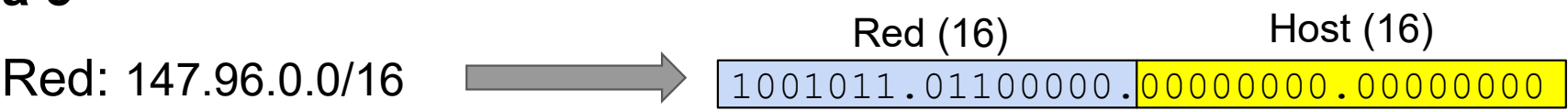
c) Dir. de difusión: 150.26.193.127 ➡

10010110	.00011010	.11000001	.01111111
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d) Número máximo de direcciones disponibles: $2^6-2=62$

e) Rango de direcciones útiles: 150.26.193.65 – 150.26.193.126

Problema 5



a) Dividir en 8 (=2³) subredes

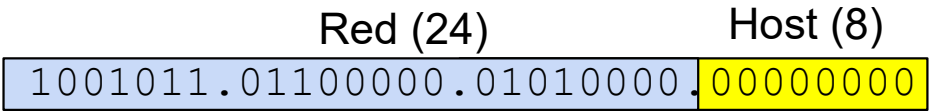
Nueva máscara (16+3) = /19 ⇒ 255.255.224.0

b) Subredes:

Red (16)	Subred (3)	Host (13)	Dir. subred	Dir. de difusión	Rango de direcciones
1001011.01100000.	000	00000.000000000	147.96.0.0	147.96.31.255	147.96.0.1 – 147.96.31.254
1001011.01100000.	001	00000.000000000	147.96.32.0	147.96.63.255	147.96.32.1 – 147.96.63.254
1001011.01100000.	010	00000.000000000	147.96.64.0	147.96.95.255	147.96.64.1 – 147.96.95.254
1001011.01100000.	011	00000.000000000	147.96.96.0	147.96.127.255	147.96.96.1 – 147.96.127.254
1001011.01100000.	100	00000.000000000	147.96.128.0	147.96.159.255	147.96.128.1 – 147.96.159.254
1001011.01100000.	101	00000.000000000	147.96.160.0	147.96.191.255	147.96.160.1 – 147.96.191.254
1001011.01100000.	110	00000.000000000	147.96.192.0	147.96.223.255	147.96.192.1 – 147.96.223.254
1001011.01100000.	111	00000.000000000	147.96.224.0	147.96.255.255	147.96.224.1 – 147.96.255.254

Problema 6

Red: 147.96.80.0/24



Dividir en subredes de 20 hosts \Rightarrow necesitamos subredes de $2^5 = 32$ direcciones

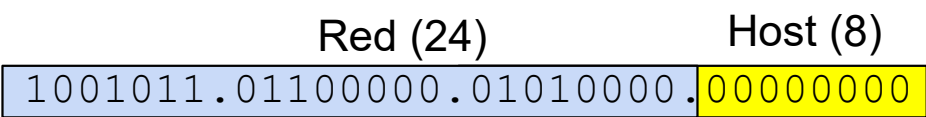
- a) Nuevo hostid = 5 bits \Rightarrow Nueva máscara (32-5) = /27 \Rightarrow 255.255.255.224
- b) N° máximo de hosts por subred: $2^5-2=30$
- c) N° máximo de subredes: $27-24=3 \Rightarrow 2^3=8$ subredes
- d) Subredes:

Red (24)	Subred (3)	Host (5)
1001011.01100000.01010000	000	00000
1001011.01100000.01010000	001	00000
1001011.01100000.01010000	010	00000
1001011.01100000.01010000	011	00000
1001011.01100000.01010000	100	00000
1001011.01100000.01010000	101	00000
1001011.01100000.01010000	110	00000
1001011.01100000.01010000	111	00000

Dir. subred	Dir. difusión	Rango de direcciones
147.96.80.0	147.96.80.31	147.96.80.1 – 147.96.80.30
147.96.80.32	147.96.80.63	147.96.80.33 – 147.96.80.62
147.96.80.64	147.96.80.95	147.96.80.65 – 147.96.80.94
147.96.80.96	147.96.80.127	147.96.80.97 – 147.96.80.126
147.96.80.128	147.96.80.159	147.96.80.129 – 147.96.80.158
147.96.80.160	147.96.80.191	147.96.80.161 – 147.96.80.190
147.96.80.192	147.96.80.223	147.96.80.193 – 147.96.80.222
147.96.80.224	147.96.80.255	147.96.80.225 – 147.96.80.254

Problema 7

Red: 147.96.80.0/24



- 1 subred de 126 máquinas $\Rightarrow 2^7$ direcciones (hostid = 7 bits) \Rightarrow Máscara (32-7) = /25_{Host (7)}
 - Subred: 147.96.80.0/25 \longrightarrow 1001011.01100000.01010000.00000000
- 1 subred de 62 máquinas $\Rightarrow 2^6$ direcciones (hostid = 6 bits) \Rightarrow Máscara (32-6) = /26_{Host (6)}
 - Subred: 147.96.80.128/26 \longrightarrow 1001011.01100000.01010000.10000000
- 1 subred de 30 máquinas $\Rightarrow 2^5$ direcciones (hostid = 5 bits) \Rightarrow Máscara (32-5) = /27_{Host (5)}
 - Subred: 147.96.80.192/27 \longrightarrow 1001011.01100000.01010000.11000000
- 2 subredes de 14 máquinas $\Rightarrow 2^4$ direcciones (hostid = 4 bits) \Rightarrow Máscara (32-4) = /28_{Host (4)}
 - Subred: 147.96.80.224/28 \longrightarrow 1001011.01100000.01010000.11100000
 - Subred: 147.96.80.240/28 \longrightarrow 1001011.01100000.01010000.11110000

Problema 7 (cont.)

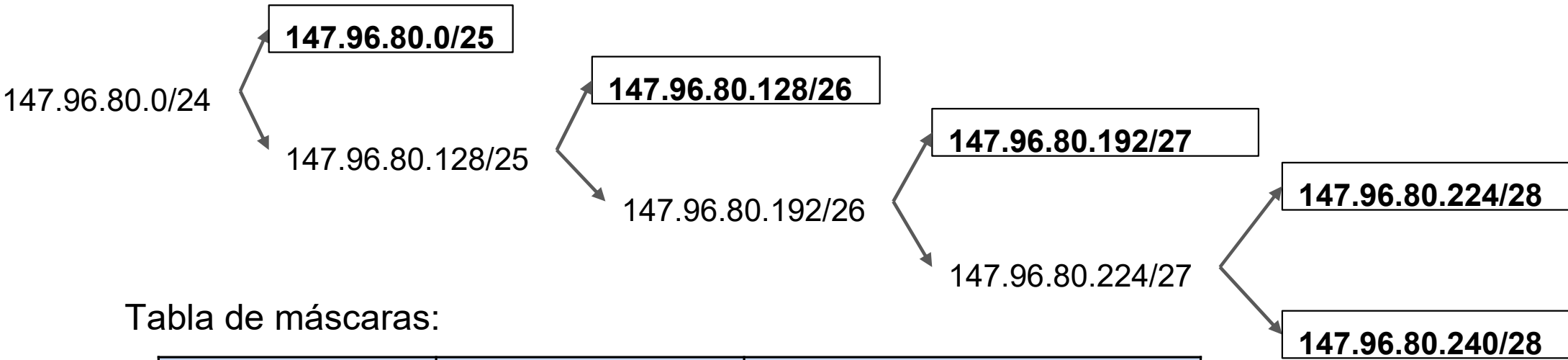


Tabla de máscaras:

Dir. de red	Difusión	Máscara
147.96.80.0	147.96.80.127	255.255.255.128
147.96.80.128	147.96.80.191	255.255.255.192
147.96.80.192	147.96.80.223	255.255.255.224
147.96.80.224	147.96.80.239	255.255.255.240
147.96.80.240	147.96.80.255	255.255.255.240

Problema 8

Red: 128.24.0.0/16

a) Subred de primer nivel:

8 ($=2^3$) subredes de la red 128.24.0.0/16

Nueva máscara ($16+3$) = /19 \Rightarrow 255.255.224.0

Subredes:

128.24.xxx00000.00000000

Red	Dirección de Red
0	128.24.0.0/19
1	128.24.32.0/19
2	128.24.64.0/19
3	128.24.96.0/19
4	128.24.128.0/19
5	128.24.160.0/19
6	128.24.192.0/19
7	128.24.224.0/19

b) Subred 3: 128.24.96.0/19

Rango IPs: 128.24.96.1 – 128.24.127.254

Dir. de difusión: 128.24.127.255

Problema 8 (cont.)

c) **Subred 6:** 16 ($=2^4$) subredes de la red 128.24.192.0/19

Nueva máscara ($19+4$) = /23 \Rightarrow 255.255.254.0

Subredes: 128.24.110xxxx0.00000000

d) **Subred 6-3:** 128.24.198.0/23

Rango IPs: 128.24.198.1 – 128.24.199.254

Dir. de difusión: 128.24.199.255

Red	Dirección de Red
6-0	128.24.192.0/23
6-1	128.24.194.0/23
6-2	128.24.196.0/23
6-3	128.24.198.0/23
6-4	128.24.200.0/23
⋮	⋮
6-14	128.24.220.0/23
6-15	128.24.222.0/23

e) **Subred 6-14:** 8 ($=2^3$) subredes de la red 128.24.220.0/23

Nueva máscara ($23+3$) = /26 \Rightarrow 255.255.255.192

Subredes: 128.24.1101110x.xx000000

Red	Dirección de Red
6-14-0	128.24.220.0/26
6-14-1	128.24.220.64/26
6-14-2	128.24.220.128/26
6-14-3	128.24.220.192/26
6-14-4	128.24.221.0/26
6-14-5	128.24.221.64/26
6-14-6	128.24.221.128/26
6-14-7	128.24.221.192/26

f) **Subred 6-14-2:** 128.24.220.128/26

Rango IPs: 128.24.220.129 – 128.24.220.190

Dir. de difusión: 128.24.220.191