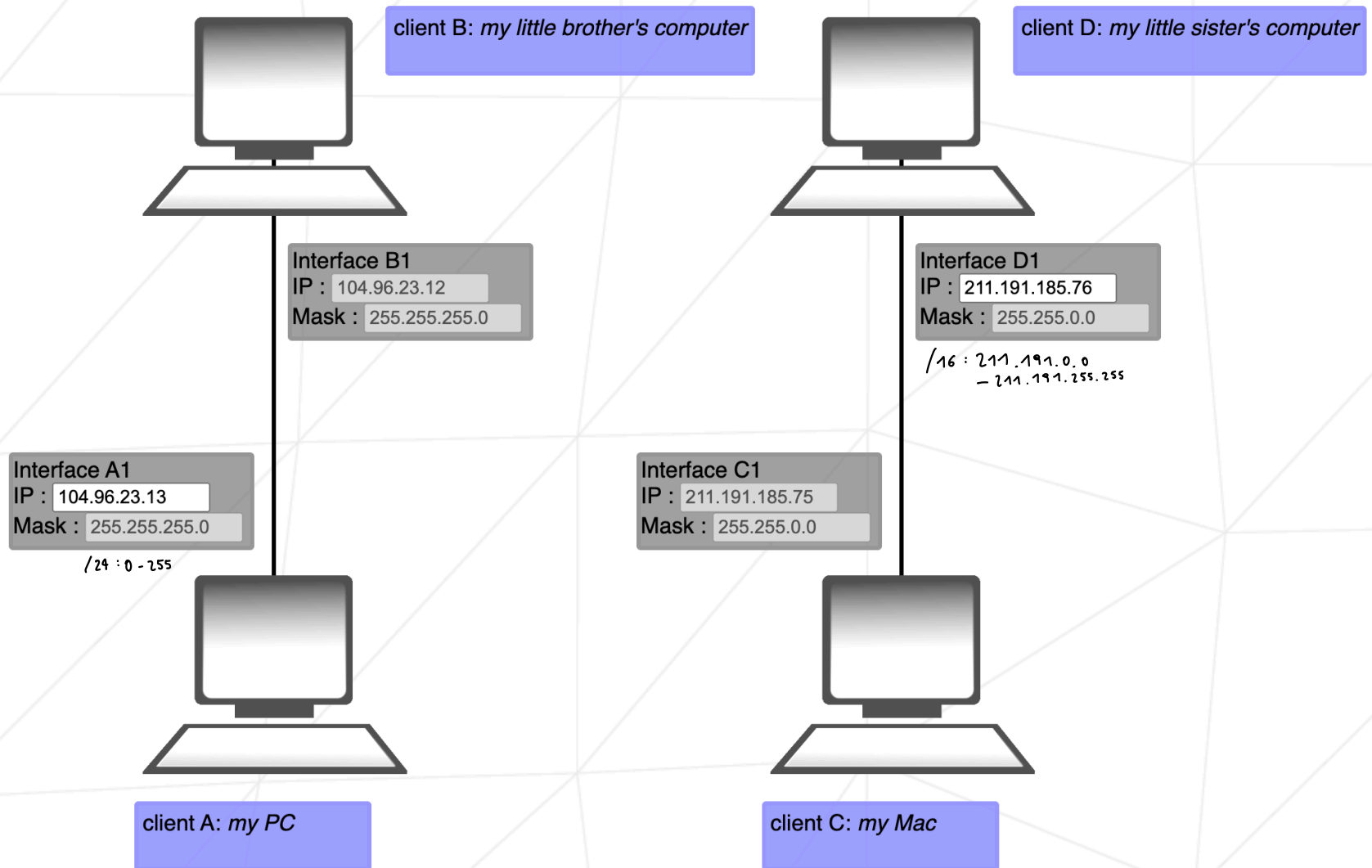# Level 1 :

Goal 1 : *my PC* need to communicate with *my little brother's computer* - Status : OK - Congratulations !!

Goal 2 : *my Mac* need to communicate with *my little sister's computer* - Status : OK - Congratulations !!

Check again | Get my config | Next level

client B: *my little brother's computer*

client D: *my little sister's computer*

Interface B1
IP : 104.96.23.12
Mask : 255.255.255.0

Interface D1
IP : 211.191.185.76
Mask : 255.255.0.0

/16 : 211.191.0.0
– 211.191.255.255

Interface A1
IP : 104.96.23.13
Mask : 255.255.255.0

/24 : 0 - 255

Interface C1
IP : 211.191.185.75
Mask : 255.255.0.0

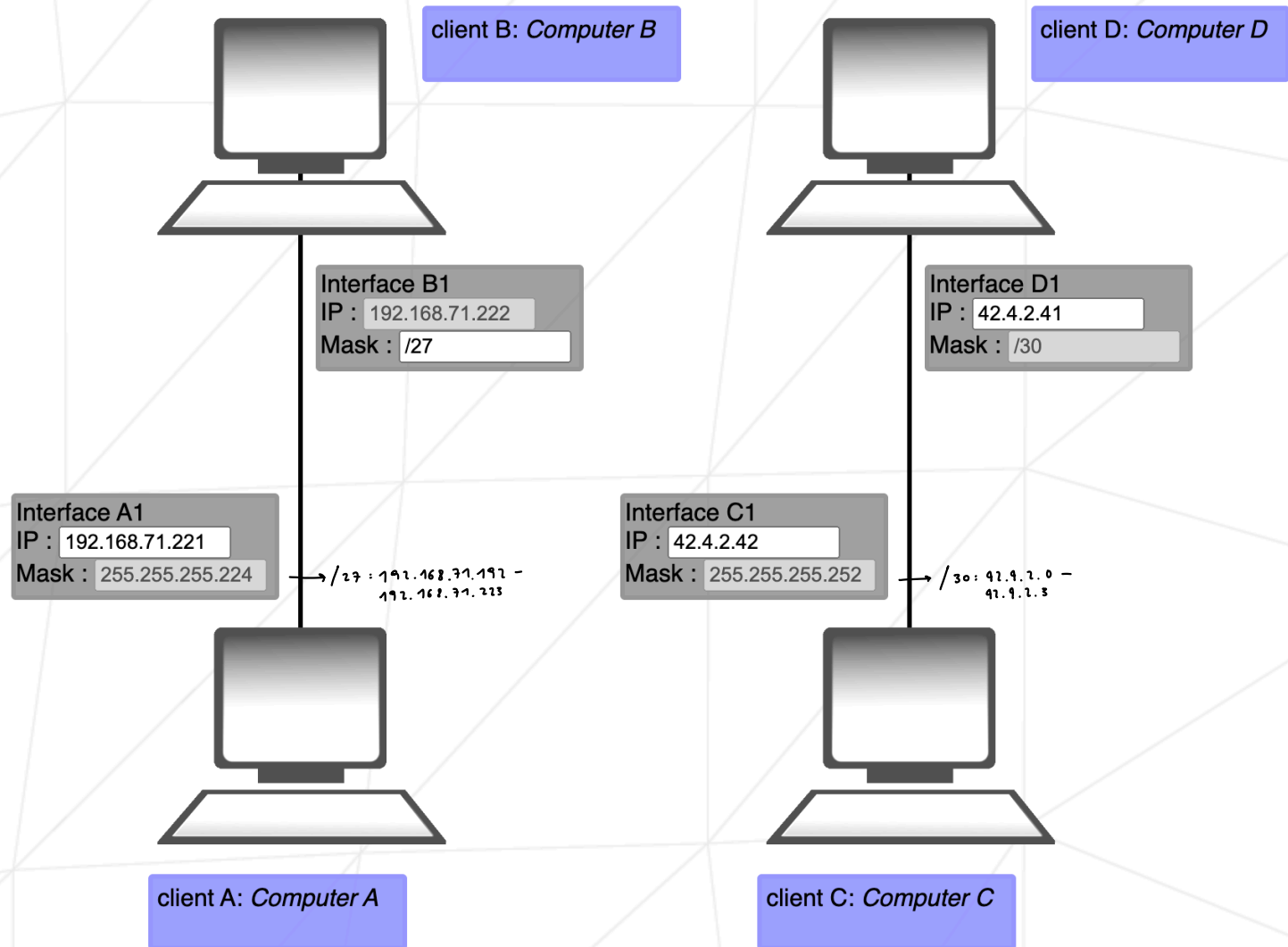client A: *my PC*

client C: *my Mac*

Level 2 :

Goal 1 : *Computer B* need to communicate with *Computer A* - Status : OK - Congratulations !!
Goal 1 : *Computer D* need to communicate with *Computer C* - Status : OK - Congratulations !!

Check again | Get my config | Next level

client B: *Computer B*

client D: *Computer D*

Interface B1
IP : 192.168.71.222
Mask : /27

Interface D1
IP : 42.4.2.41
Mask : /30

Interface A1
IP : 192.168.71.221
Mask : 255.255.255.224

/27 : 192.168.71.192 –
192.168.71.223

Interface C1
IP : 42.4.2.42
Mask : 255.255.255.252

/30 : 42.4.2.0 –
42.4.2.3

client A: *Computer A*

client C: *Computer C*

Level 3 :
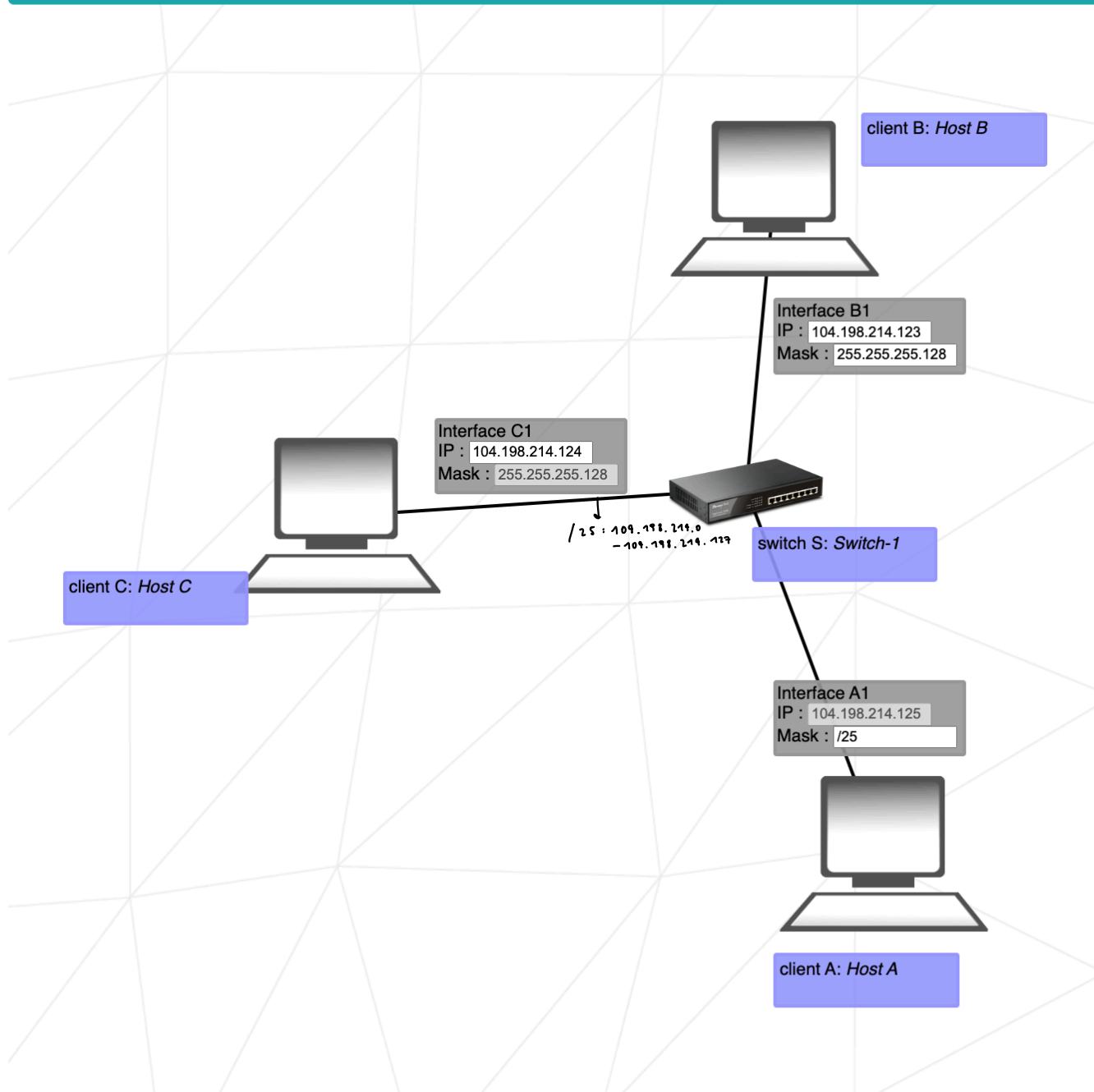Goal 1 : *Host A* need to communicate with *Host B* - Status : OK - Congratulations !!
Goal 2 : *Host A* need to communicate with *Host C* - Status : OK - Congratulations !!
Goal 3 : *Host B* need to communicate with *Host C* - Status : OK - Congratulations !!
Check again   Get my config   Next level

client B: *Host B*

Interface B1
IP : 104.198.214.123
Mask : 255.255.255.128

Interface C1
IP : 104.198.214.124
Mask : 255.255.255.128

/25 : 109.198.219.0
— 109.198.219.127

switch S: *Switch-1*

client C: *Host C*

Interface A1
IP : 104.198.214.125
Mask : /25

client A: *Host A*

Level 4 :

Goal 1 : *A nice host* need to communicate with *Another host* - Status : OK - Congratulations !!
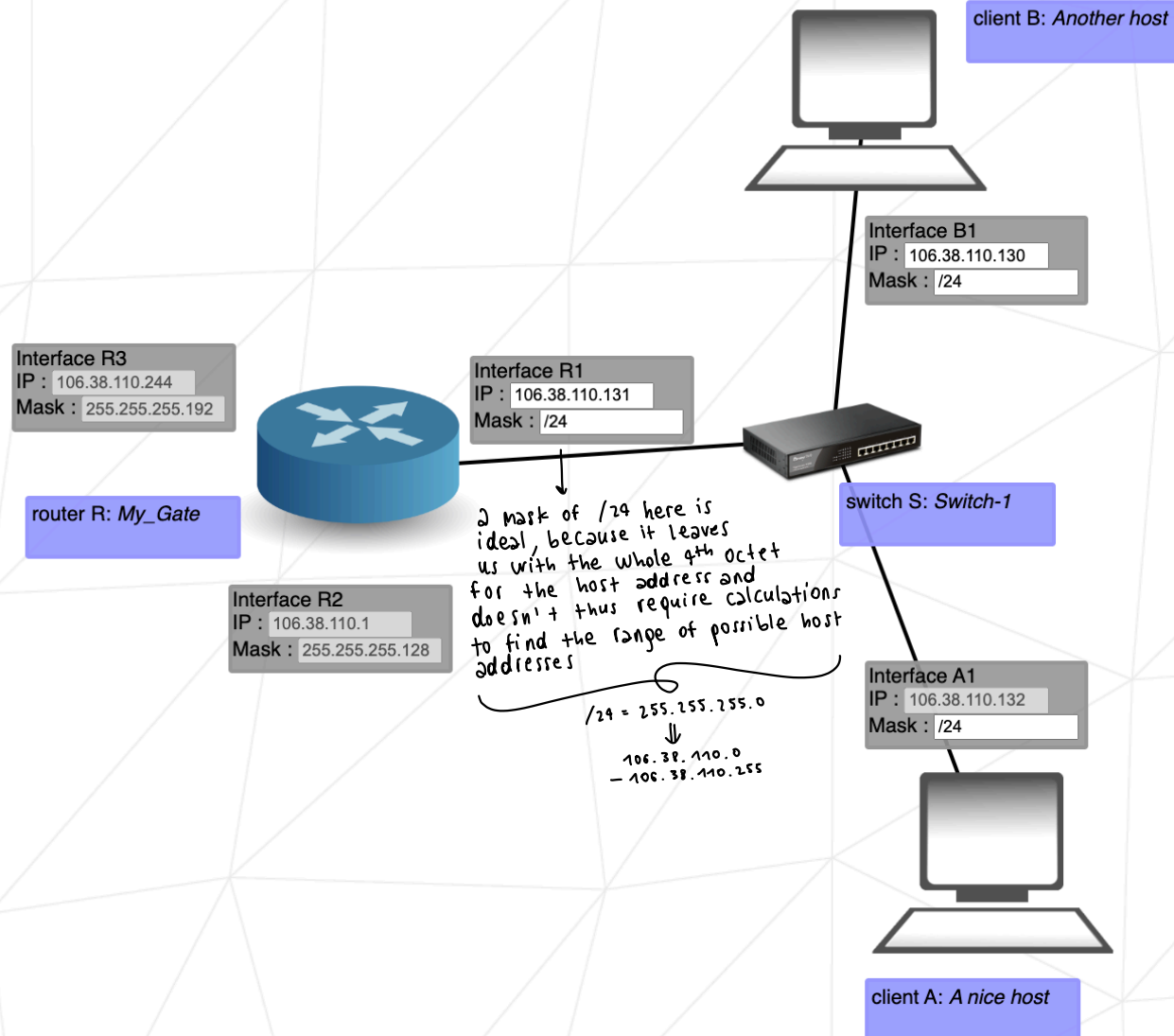Goal 2 : *A nice host* need to communicate with *My_Gate* - Status : OK - Congratulations !!
Goal 3 : *Another host* need to communicate with *My_Gate* - Status : OK - Congratulations !!

[Check again] [Get my config] [Next level]

client B: *Another host*

Interface B1
IP : 106.38.110.130
Mask : /24

Interface R3
IP : 106.38.110.244
Mask : 255.255.255.192

Interface R1
IP : 106.38.110.131
Mask : /24

switch S: *Switch-1*

router R: *My_Gate*

Interface R2
IP : 106.38.110.1
Mask : 255.255.255.128

a mask of /24 here is
ideal, because it leaves
us with the whole 4th octet
for the host address and
doesn't thus require calculations
to find the range of possible host
addresses

/24 = 255.255.255.0
⇓
106.38.110.0
— 106.38.110.255

Interface A1
IP : 106.38.110.132
Mask : /24

client A: *A nice host*

Level 5 :

Goal 1 : *Machine A* need to communicate with *The Mighty Router* - Status : OK - Congratulations !!
Goal 2 : *Machine B* need to communicate with *The Mighty Router* - Status : OK - Congratulations !!
Goal 3 : *Machine A* need to communicate with *Machine B* - Status : OK - Congratulations !!

Check again   Get my config   Next level

client B: *Machine B*
Routes :
default   =>   164.172.31.254

Interface B1
IP : 164.172.31.253
Mask : /18

Interface R2
IP : 164.172.31.254
Mask : 255.255.192.0

router R: *The Mighty Router*

/18 : 164.172.0.0
    - 169.172.63.255

Interface R1
IP : 85.203.106.126
Mask : 255.255.255.128

/25 : 85.203.106.0
    - 85.203.106.127

Interface A1
IP : 85.203.106.125
Mask : /25

client A: *Machine A*
Routes :
default   =>   85.203.106.126
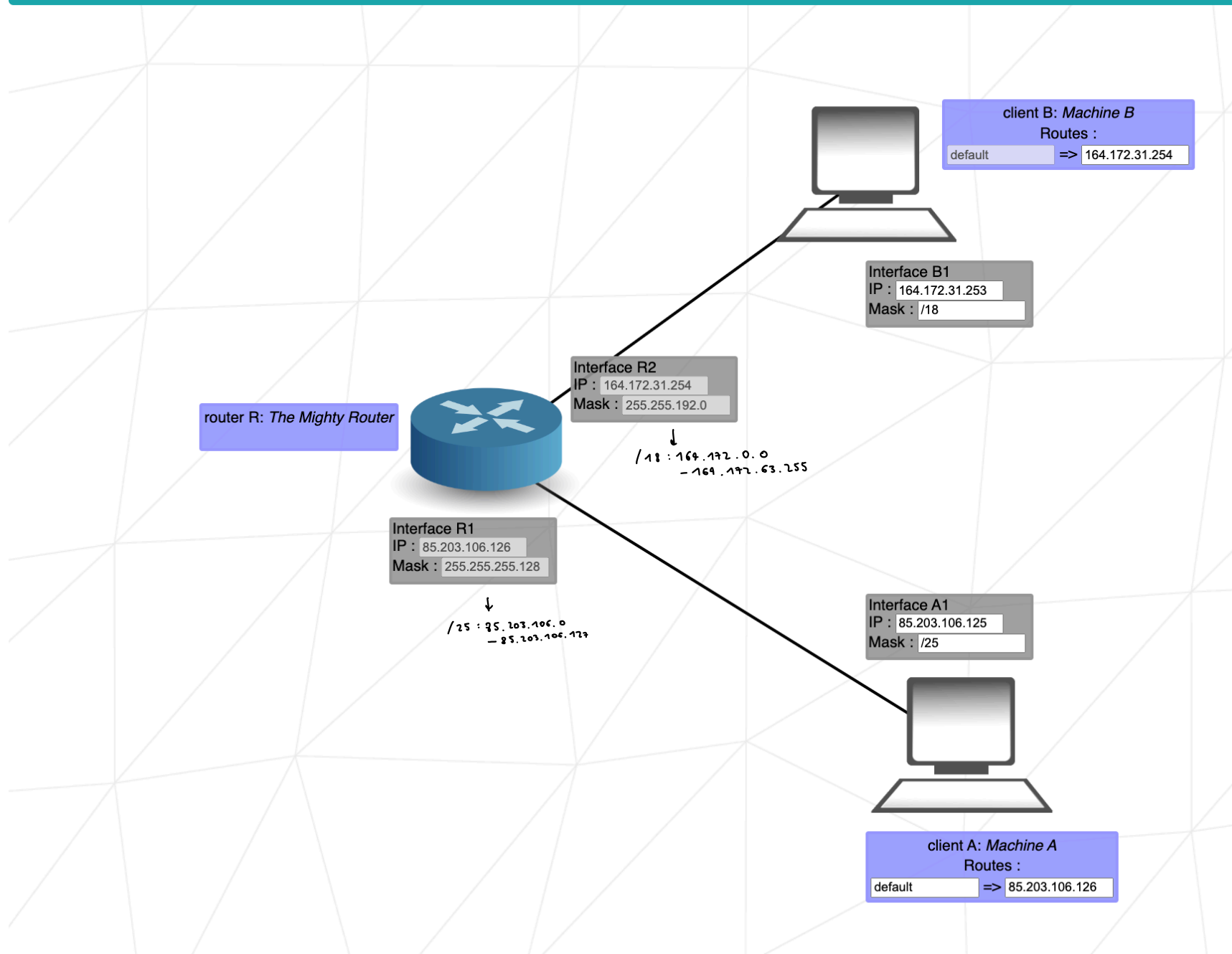
Level 6 :

Goal 1 : Interface *A1* need to communicate with interface *Somewhere on the Net* - Status : OK - Congratulations !!

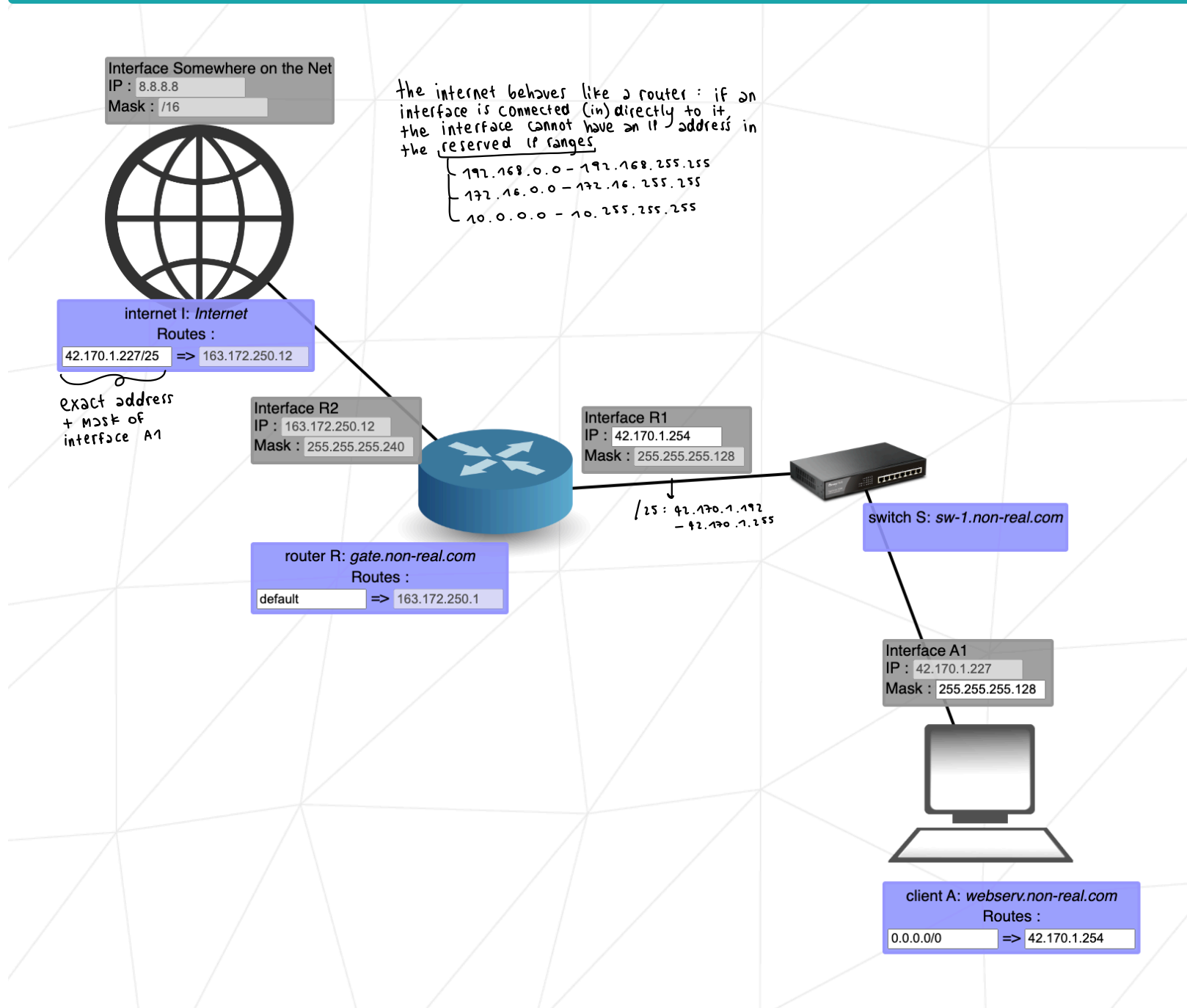Check again | Get my config | Next level

Interface Somewhere on the Net
IP : 8.8.8.8
Mask : /16

the internet behaves like a router : if an interface is connected (in) directly to it, the interface cannot have an IP address in the reserved IP ranges

192.168.0.0 - 192.168.255.255
172.16.0.0 - 172.16.255.255
10.0.0.0 - 10.255.255.255

internet I: *Internet*
Routes :
42.170.1.227/25 => 163.172.250.12

exact address + mask of interface A1

Interface R2
IP : 163.172.250.12
Mask : 255.255.255.240

Interface R1
IP : 42.170.1.254
Mask : 255.255.255.128

/25 : 42.170.1.192 - 42.170.1.255

switch S: *sw-1.non-real.com*

router R: *gate.non-real.com*
Routes :
default => 163.172.250.1

Interface A1
IP : 42.170.1.227
Mask : 255.255.255.128

client A: *webserv.non-real.com*
Routes :
0.0.0.0/0 => 42.170.1.254

Level 7 :

Goal 1 : *dev.non-real.net* need to communicate with *accounting.non-real.net* - Status : OK - Congratulations !!

Check again   Get my config   Next level

the range of IP addresses of a network
must not overlap the range of IP addresses
of a separate network
networks are separated by routers

Interface A1
IP : 94.198.14.2
Mask : /26

Interface R11
IP : 94.198.14.1
Mask : 255.255.255.192

router R1: *tech.non-real.net*
Routes :

| 0.0.0.0/0 | => | 94.198.14.253 |

network A1 - R1

Interface R12
IP : 94.198.14.254
Mask : /26

a mask of /26 (64 hosts)
or higher is convenient to
split the last bytes of
the address into 4 or more
address ranges

client A: *dev.non-real.net*
Routes :

| 0.0.0.0/0 | => | 94.198.14.1 |

network R1 - R2

Interface R21
IP : 94.198.14.253
Mask : /26

Interface C1
IP : 94.198.14.67
Mask : /26

Interface R22
IP : 94.198.14.66
Mask : /26

network R2 - C

client C: *accounting.non-real.net*
Routes :

| 0.0.0.0/0 | => | 94.198.14.66 |

router R2: *adm.non-real.net*
Routes :

| 0.0.0.0/0 | => | 94.198.14.254 |

Level 8 :
Goal 1 : *office.non-real.com* need to communicate with *home.non-real.com* - Status : OK - Congratulations !!
Goal 2 : *office.non-real.com* need to communicate with *Internet* - Status : OK - Congratulations !!
Goal 3 : *home.non-real.com* need to communicate with *Internet* - Status : OK - Congratulations !!

[Check again] [Get my config] [Next level]

router R1: *gate.non-real.com*
Routes :
| default | => | 133.160.36.61 |
| 0.0.0.0/0 | => | 163.194.250.1 |

Interface R12
IP : 163.194.250.12
Mask : 255.255.255.240

Interface R13
IP : 133.160.36.62
Mask : /28

internet I: *Internet*
Routes :
| 133.160.36.0/26 | => | 163.194.250.12 |

133.160.36.48
- 133.160.36.63

Interface R21
IP : 133.160.36.61
Mask : /28

Interface R23
IP : 133.160.36.1
Mask : /28

Interface R22
IP : 133.160.36.17
Mask : /28

133.160.36.0
- 133.160.36.15

133.160.36.16
- 133.160.36.31

router R2: *transit.my-isp.org*
Routes :
| default | => | 133.160.36.62 |

Interface D1
IP : 133.160.36.2
Mask : 255.255.255.240

Interface C1
IP : 133.160.36.18
Mask : /28

client D: *home.non-real.com*
Routes :
| default | => | 133.160.36.1 |

client C: *office.non-real.com*
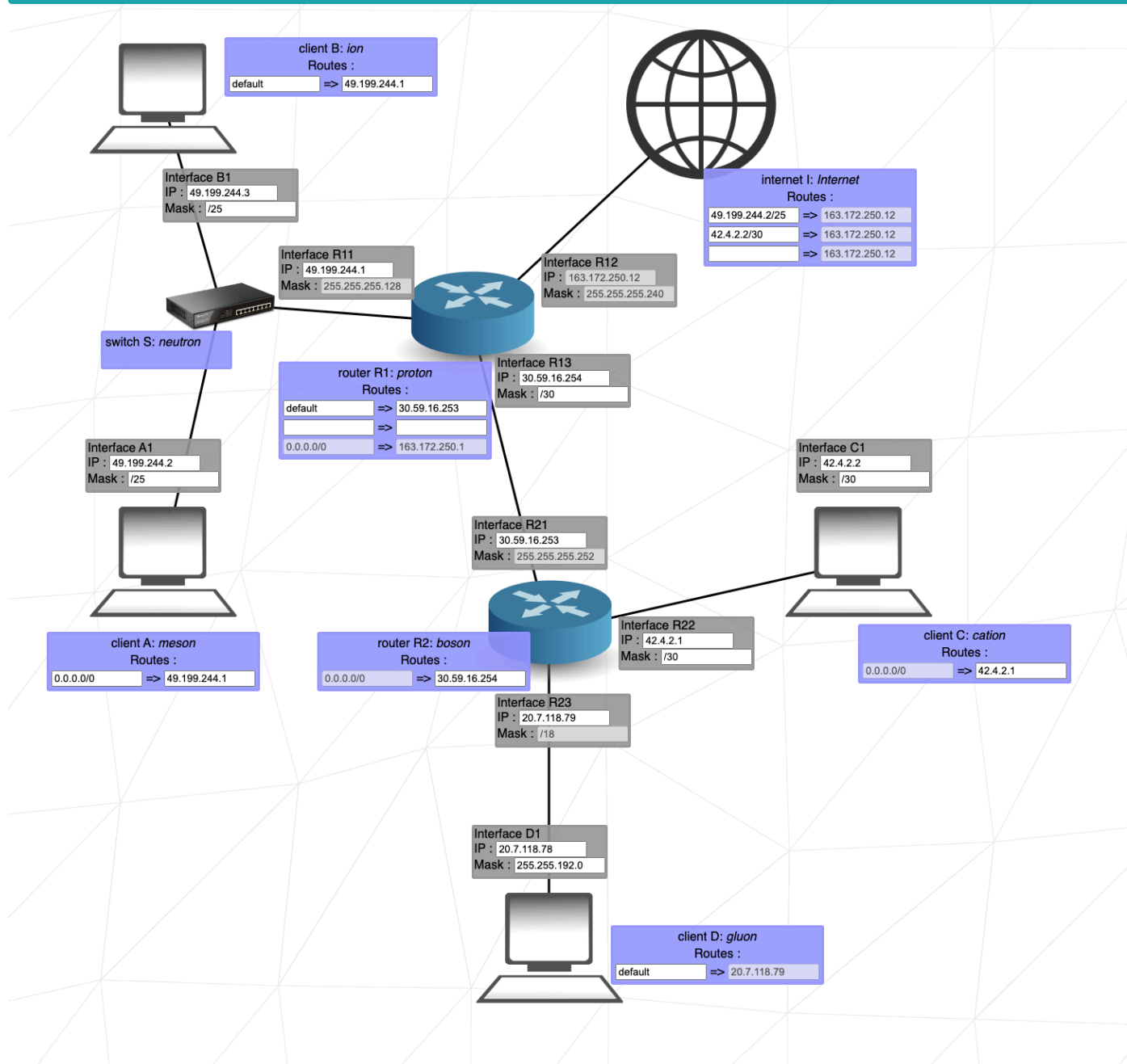Routes :
| 0.0.0.0/0 | => | 133.160.36.17 |

Level 9 :

Goal 1 : *meson* need to communicate with *ion* - Status : OK - Congratulations !!
Goal 2 : *cation* need to communicate with *gluon* - Status : OK - Congratulations !!
Goal 3 : *meson* need to communicate with *Internet* - Status : OK - Congratulations !!
Goal 4 : *meson* need to communicate with *gluon* - Status : OK - Congratulations !!
Goal 5 : *ion* need to communicate with *cation* - Status : OK - Congratulations !!
Goal 6 : *cation* need to communicate with *Internet* - Status : OK - Congratulations !!

[Check again] [Get my config] [Next level]

client B: *ion*
Routes :
default => 49.199.244.1

Interface B1
IP : 49.199.244.3
Mask : /25

internet I: *Internet*
Routes :
49.199.244.2/25 => 163.172.250.12
42.4.2.2/30 => 163.172.250.12
=> 163.172.250.12

Interface R11
IP : 49.199.244.1
Mask : 255.255.255.128

Interface R12
IP : 163.172.250.12
Mask : 255.255.255.240

switch S: *neutron*

router R1: *proton*
Routes :
default => 30.59.16.253
=>
0.0.0.0/0 => 163.172.250.1

Interface R13
IP : 30.59.16.254
Mask : /30

Interface A1
IP : 49.199.244.2
Mask : /25

Interface C1
IP : 42.4.2.2
Mask : /30

Interface R21
IP : 30.59.16.253
Mask : 255.255.255.252

client A: *meson*
Routes :
0.0.0.0/0 => 49.199.244.1

router R2: *boson*
Routes :
0.0.0.0/0 => 30.59.16.254

Interface R22
IP : 42.4.2.1
Mask : /30

client C: *cation*
Routes :
0.0.0.0/0 => 42.4.2.1

Interface R23
IP : 20.7.118.79
Mask : /18

Interface D1
IP : 20.7.118.78
Mask : 255.255.192.0

client D: *gluon*
Routes :
default => 20.7.118.79

Level 10 :
Goal 1 : *Host one* need to communicate with *Host two* - Status : OK - Congratulations !!
Goal 2 : *Host three* need to communicate with *Host four* - Status : OK - Congratulations !!
Goal 3 : *Host one* need to communicate with *Internet* - Status : OK - Congratulations !!
Goal 4 : *Host one* need to communicate with *Host four* - Status : OK - Congratulations !!
Goal 5 : *Host two* need to communicate with *Host three* - Status : OK - Congratulations !!
Goal 6 : *Host three* need to communicate with *Internet* - Status : OK - Congratulations !!
Goal 7 : *Host four* need to communicate with *Internet* - Status : OK - Congratulations !!

Check again   Get my config   Complete !

client H2: *Host two*
Routes :
default   =>   140.19.106.1

Interface H21
IP : 140.19.106.3
Mask : /25

internet I: *Internet*
Routes :
140.19.106.0/24   =>   163.172.250.12

/24 because
we need the
full range
(0-255)

140.19.106.0
- 140.19.106.127

Interface R12
IP : 163.172.250.12
Mask : 255.255.255.240

Interface R11
IP : 140.19.106.1
Mask : 255.255.255.128

switch S1: *Switch one*

router R1: *Router one*
Routes :
default   =>   140.19.106.253
140.19.106.128/26   =>   140.19.106.253
0.0.0.0/0   =>   163.172.250.1

Interface R13
IP : 140.19.106.254
Mask : /30

140.19.106.252
- 140.19.106.255

Interface H11
IP : 140.19.106.2
Mask : /25

Interface R21
IP : 140.19.106.253
Mask : 255.255.255.252

Interface R23
IP : 140.19.106.129
Mask : /26

Interface R22
IP : 140.19.106.193
Mask : /30

client H1: *Host one*
Routes :
0.0.0.0/0   =>   140.19.106.1

140.19.106.128
- 140.19.106.191

router R2: *Router two*
Routes :
0.0.0.0/0   =>   140.19.106.254

140.19.106.192
- 140.19.106.195

this is only IP address
range still not assigned

Interface H41
IP : 140.19.106.131
Mask : 255.255.255.192

Interface H31
IP : 140.19.106.194
Mask : /30

any mask that will let
us take 2 IP addresses
from that (?) range works

client H4: *Host four*
Routes :
default   =>   140.19.106.129

client H3: *Host three*
Routes :
0.0.0.0/0   =>   140.19.106.193