

Put this router (router 1) in the topology and propose an IP configuration for the three networks using the address range 192.168.1.0/24:

- machines, router and server IP addresses
- subnetworks addresses/masks
- broadcast addresses
- 3 subnetworks: $2^2 \rightarrow 2 \text{ bits} \rightarrow /24 + 2 = /26$

Classical IP addressing with /26 mask to define three subnets:

Network Address	Usable Host Range	Broadcast Address:
192.168.1.0	192.168.1.1 - 192.168.1.62	192.168.1.63
192.168.1.64	192.168.1.65 - 192.168.1.126	192.168.1.127
192.168.1.128	192.168.1.129 - 192.168.1.190	192.168.1.191

1. Build the router 1 routing table (no next hop in this case, only port/interface number)

Destination	Interface/port
192.168.1.1/26	Port 2
192.168.1.2/26	Port 2
192.168.1.3/26	Port 2
192.168.1.65/26	Port 1
192.168.1.66/26	Port 1
192.168.1.7/26	Port 1
192.168.1.129/26	Port 3

2. No we cannot define 5 subnets with the mask /26 => we need /27 to define 5 subnets:

Network Address	Usable Host Range	Broadcast Address:
192.168.1.0	192.168.1.1 - 192.168.1.30	192.168.1.31
192.168.1.32	192.168.1.33 - 192.168.1.62	192.168.1.63
192.168.1.64	192.168.1.65 - 192.168.1.94	192.168.1.95
192.168.1.96	192.168.1.97 - 192.168.1.126	192.168.1.127
192.168.1.128	192.168.1.129 - 192.168.1.158	192.168.1.159

2. Yes, we can assign IP addresses to the new machines in the extended rooms 1 and 2 (10 and 20 machines) using the same subnets defined previously /27: subnets can contain up to 30 machines ($2^5 - 2$)
3. No, we cannot assign IP addresses to 50 machines on using our current subnet configuration with /27, because a subnet can contain only 30 machines.
4. Solution: VLSM