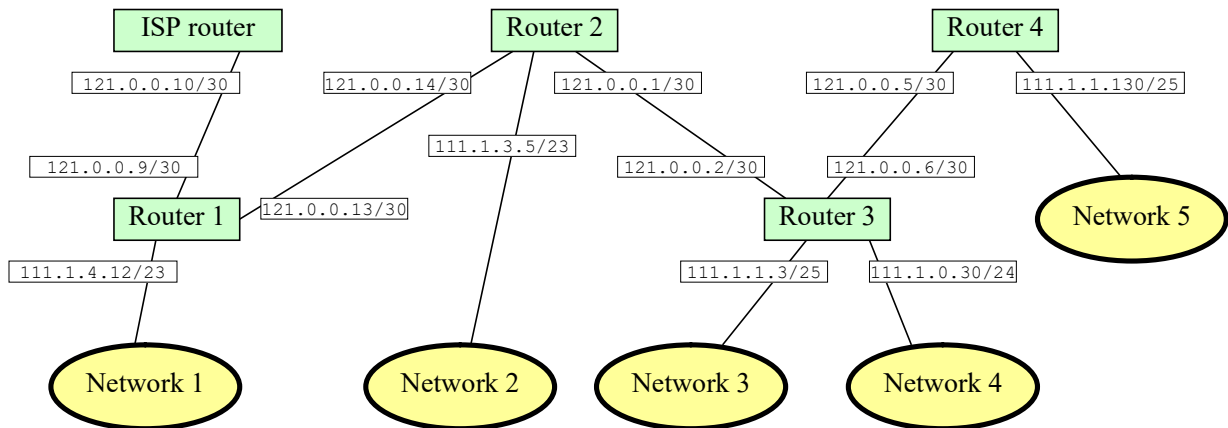


- Practical exercises (IPv4 networks dimensioning and static routing).

- Bearing in mind the required number of nodes each network must support, complete the following table using only addresses from the 193.7.160.0/20 IPv4 addresses block. Notice some addresses of the provided block are already in use and can't be overlapped.**

Network Name	Number of nodes to be supported (valid IPv4 node addresses)	Network address	Network prefix	Network broadcast address	First node address	Last node address
A	300					
B	800					
C	75					
D	120	193.7.168.128	25	193.7.168.255	193.7.168.129	193.7.168.254
E	80					
F	500	193.7.162.0	23	193.7.163.255	193.7.162.1	193.7.163.254
G	500					
H	1000					
I	100					

2. The image below represents some IPv4 networks interconnected by routers. The IPv4 addresses of each router in each connected network are represented on the image.



Assuming the **ISP router** ensures the internet connection (default route), fill the following static routing tables applying all possible simplifications.

Router 1	
Destination	Next-hop

Router 2	
Destination	Next-hop

Router 3	
Destination	Next-hop

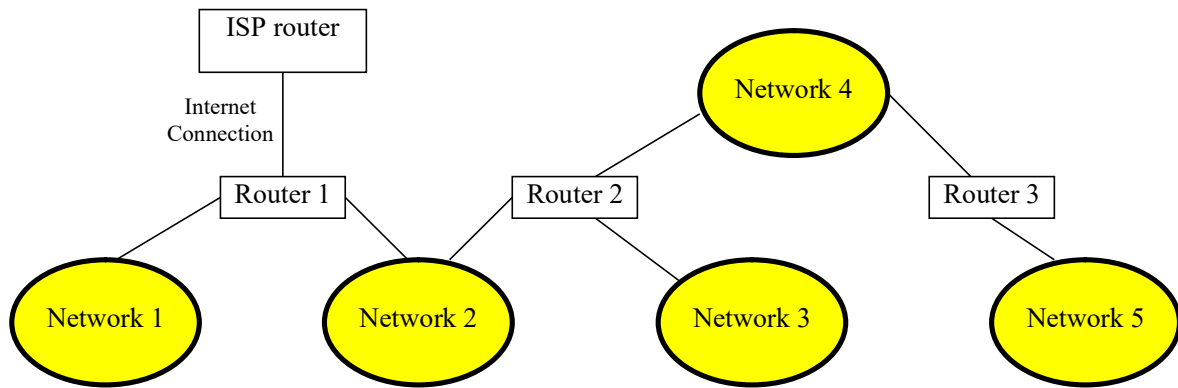
Router 4	
Destination	Next-hop

3. The table below represents a set of IPv4 networks to be used by an organisation. Fill the table meeting the following constraints:

- Each network must support up to the number of specified maximum nodes.
- For each network don't use more addresses than those required (as far as possible, don't waste addresses).
- Use only addresses from the **18.12.176.0/20** IPv4 addresses block.
- The **18.12.183.0/25** addresses block is already being used elsewhere in the organisation, therefore they can't be used here.

	Maximum nodes number	IPv4 network address	Network prefix	Network broadcast address
Network A	60			
Network B	240			
Network C	500			
Network D	2000			
Network E	30			
Network F	30			
Network G	1000			

4. The following image represents several IPv4 networks interconnected by routers.



Routers' addresses on each network							
	Internet Connection	Network 1	Network 2	Network 3	Network 4	Network 5	Network 6
Router 1	165.20.0.5/30	195.8.4.30/27	195.8.4.61/27	-	-	-	
Router 2	-	-	195.8.4.62/27	195.8.4.126/28	195.8.4.189/26	-	
Router 3	-	-	-	-	195.8.4.190/26	195.8.4.222/27	195.8.4.254/27

a) Define the static routing tables for routers one, two and three, without any simplification applied:

In each router there must be a line for each remote network (networks not directly attached to the router). Because an internet connection exists, each router must also have a default route.

Router 1 routing table	
Destination (IP/mask)	Next-hop (IP)

Router 2 routing table	
Destination (IP/mask)	Next-hop (IP)

Router 3 routing table	
Destination (IP/mask)	Next-hop (IP)

b) Apply all possible simplifications to the previously defined routing tables:

Router 1 routing table	
Destination (IP/mask)	Next-hop (IP)

Router 2 routing table	
Destination (IP/mask)	Next-hop (IP)

Router 3 routing table	
Destination (IP/mask)	Next-hop (IP)