



Nmecs

Since our nmecs are 113435 and 114184, the list of numbers to be used in the IP addresses is the following:

- $X_1 \rightarrow 1$
- $X_2 \rightarrow 3$
- $X_3 \rightarrow 4$
- $X_4 \rightarrow 3$
- $X_5 \rightarrow 5$
- $X_6 \rightarrow 1$
- $X_7 \rightarrow 4$
- $X_8 \rightarrow 1$
- $X_9 \rightarrow 8$
- $X_0 \rightarrow 4$



Private IPv4 Assignment

Private IPv4 assignment								
	Department	Network Address	Mask	Broadcast Address	Available Addresses	Used Addresses	Gateway #1 Address	Gateway #2 Address
NewNet ISP	NewNetCenter	-	-	-	-	-	-	-
	NewNetLT	-	-	-	-	-	-	-
Amazing	Offices	10.54.76.0	23	10.54.77.255	10.54.76.1 → 10.54.77.254	-	10.54.78.1	10.54.78.5
	WiFi	10.54.72.0	22	10.54.75.255	10.54.72.1 → 10.54.75.254	-	10.54.78.1	10.54.78.5
	Factory	10.54.64.0	21	10.54.71.255	10.54.64.1 → 10.54.71.254	-	10.54.78.1	10.54.78.5
	Interconnection Amazing - ESW#1	10.54.78.0	30	10.54.78.3	10.54.78.1 → 10.54.78.2	-	-	-
	Interconnection Amazing - ESW#2	10.54.78.4	30	10.54.78.7	10.54.78.5 → 10.54.78.6	-	-	-
	GR8	Office	10.114.36.0	24	10.114.36.255	10.114.36.1 → 10.114.36.254	-	-
		WiFi	10.114.37.0	24	10.114.37.255	10.114.37.1 → 10.114.37.254	-	-

Justification

NewNet ISP

NewNet won't have any private IPv4 addresses assigned to it, since it is an ISP and it will only provide internet access to the other companies.

Amazing

Starting off with the base address, this will be $10.0X_5X_0.64.0/20$, or $10.54.64.0/20$ when replacing with the nmea separation.

The Amazing Factory will take most of the addresses, so when dividing the network, it will have the addresses from $10.54.64.0/21$ to $10.54.71.255/21$ and will result on having $10.54.72.0/21$ to divide for the rest of the company. After the factory, WiFi is the one taking the most addresses so after dividing the resultant, it will be taking from $10.54.72.0/22$ to $10.54.75.255/22$ and resulting on $10.54.76.0/22$ to be divided once again for the offices. When doing so, they will be taking the addresses from $10.54.76.0/23$ to $10.54.77.255/23$ and leaving $10.54.78.0/23$ for the switches.

Since we want /30 sub-networks for the switches, and can still populate from $10.54.78.0$ to $10.54.79.255$, we will be using $10.54.78.0/30$ for AmazingL3SW1 and $10.54.78.4/30$ for AmazingL3SW2 resulting in 2 gateways for the Amazing network.

All this explained more visually in the following image.

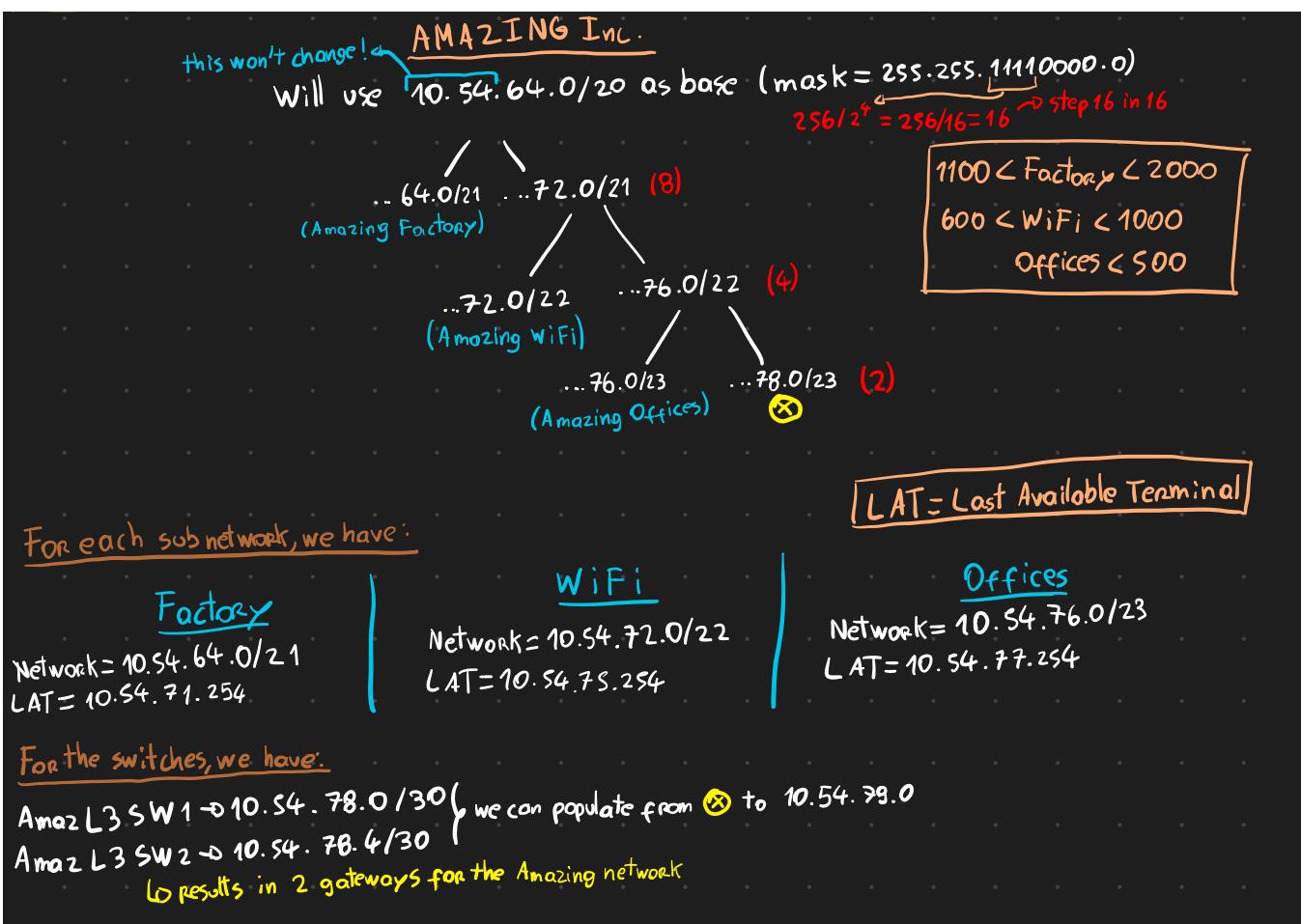


Figure 1: Private IPv4 assignment for Amazing

GR8

GR8 will only have 2 networks, one for the office and one for the WiFi. The base address for this company will be $10.114.X_8X_7.0X_46.0/23$ or $10.114.36.0/23$ when replacing the nmecc numbers.

The office will be taking $10.114.36.0/24$ and the WiFi will be taking $10.114.37.0/24$.

This company will have no gateways.

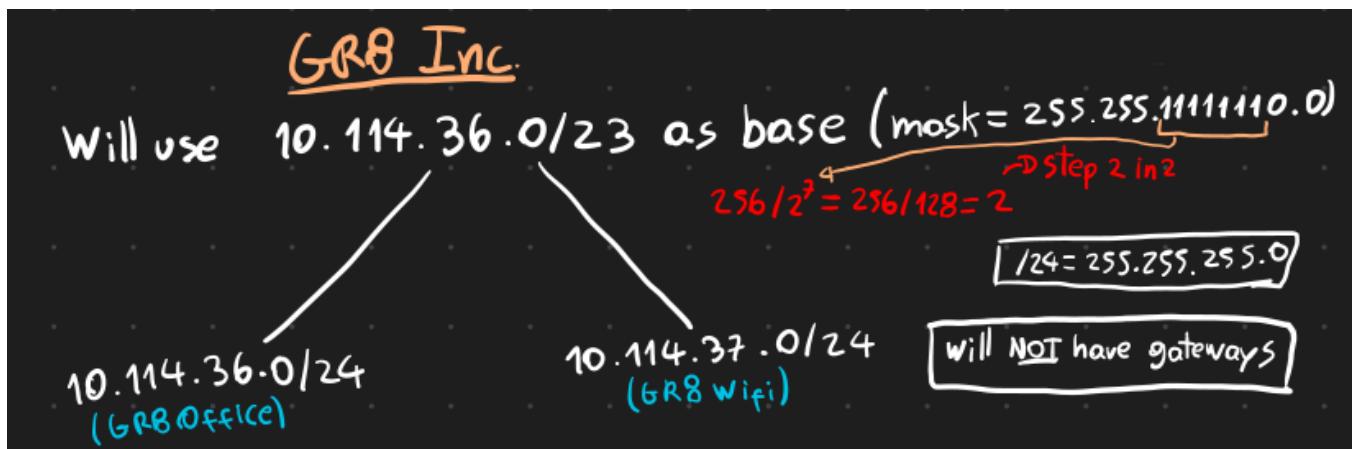


Figure 2: Private IPv4 assignment for GR8



Public IPv4 Assignment

Public IPv4 assignment								
	Department	Network Address	Mask	Broadcast Address	Available Addresses	Used Addresses	Gateway #1 Address	Gateway #2 Address
NewNet ISP	NewNetCenter	201.134.15.128	26	201.134.15.191	201.134.15.129 → 201.134.15.190	–	201.135.15.128	–
	NewNetIT	201.134.15.96	27	201.134.15.127	201.134.15.97 → 201.134.15.126	–	201.135.15.96	–
Amazing	Offices	201.134.15.192	26	201.134.15.255	201.134.15.193 → 201.134.15.254	–	201.135.15.192	–
	WiFi	–	–	–	–	–	–	–
	Factory	–	–	–	–	–	–	–
	NAT/PAT	201.134.15.32	27	201.134.15.61	201.134.15.33 → 201.134.15.60	–	201.135.15.32	–
GR8	Office	201.134.15.64	27	201.134.15.95	201.134.15.65 → 201.134.15.94	–	201.135.15.64	–
	WiFi	–	–	–	–	–	–	–
	NAT/PAT	201.134.15.16	28	201.134.15.31	201.134.15.17 → 201.134.15.30	–	201.135.15.16	–
Interconnection	NewNet - Amazing	201.134.15.8	30	201.134.15.11	201.134.15.9 → 201.134.15.10	–	201.135.15.8	–
	NewNet - GR8	201.134.15.12	30	201.134.15.15	201.134.15.13 → 201.134.15.14	–	201.135.15.12	–

Justification

The base public address for this assignment will be $20X_1.1X_2X_0.0X_6X_5.0/24$ or 201.134.15.0/24 when replacing the nmecc numbers. This means we will have a total of 256 addresses to use.

Since we only have one ISP, we will need to divide the same network for all the companies in order to meet all the following requirements:

- 60 addresses for Amazing Offices
- 50 addresses for NewNet Center
- 16 addresses for NewNet IT
- 22 addresses for GR8 Office
- 20 addresses for Amazing NAT/PAT
- 9 addresses for GR8 NAT/PAT

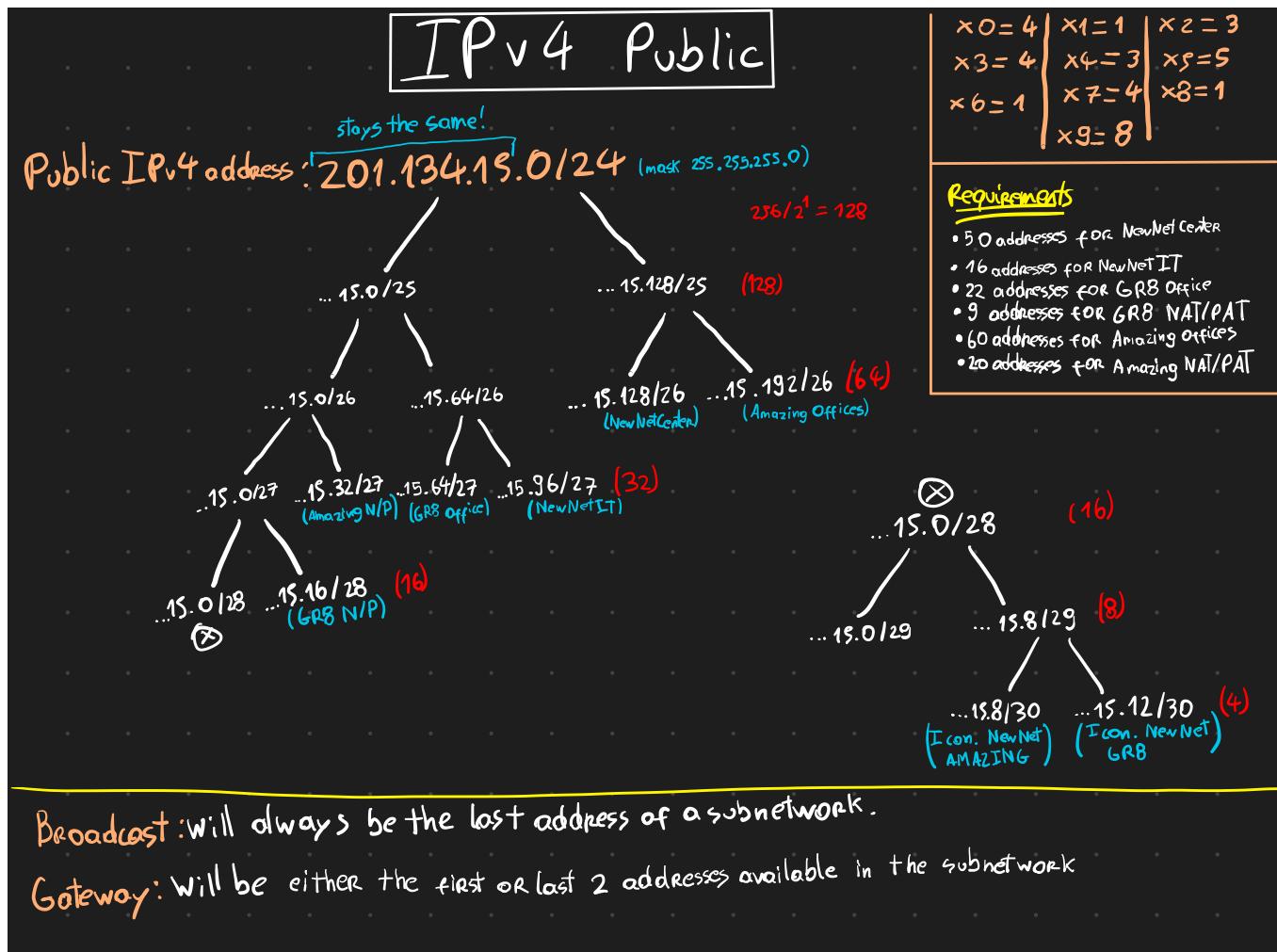


Figure 3: Public IPv4 assignment



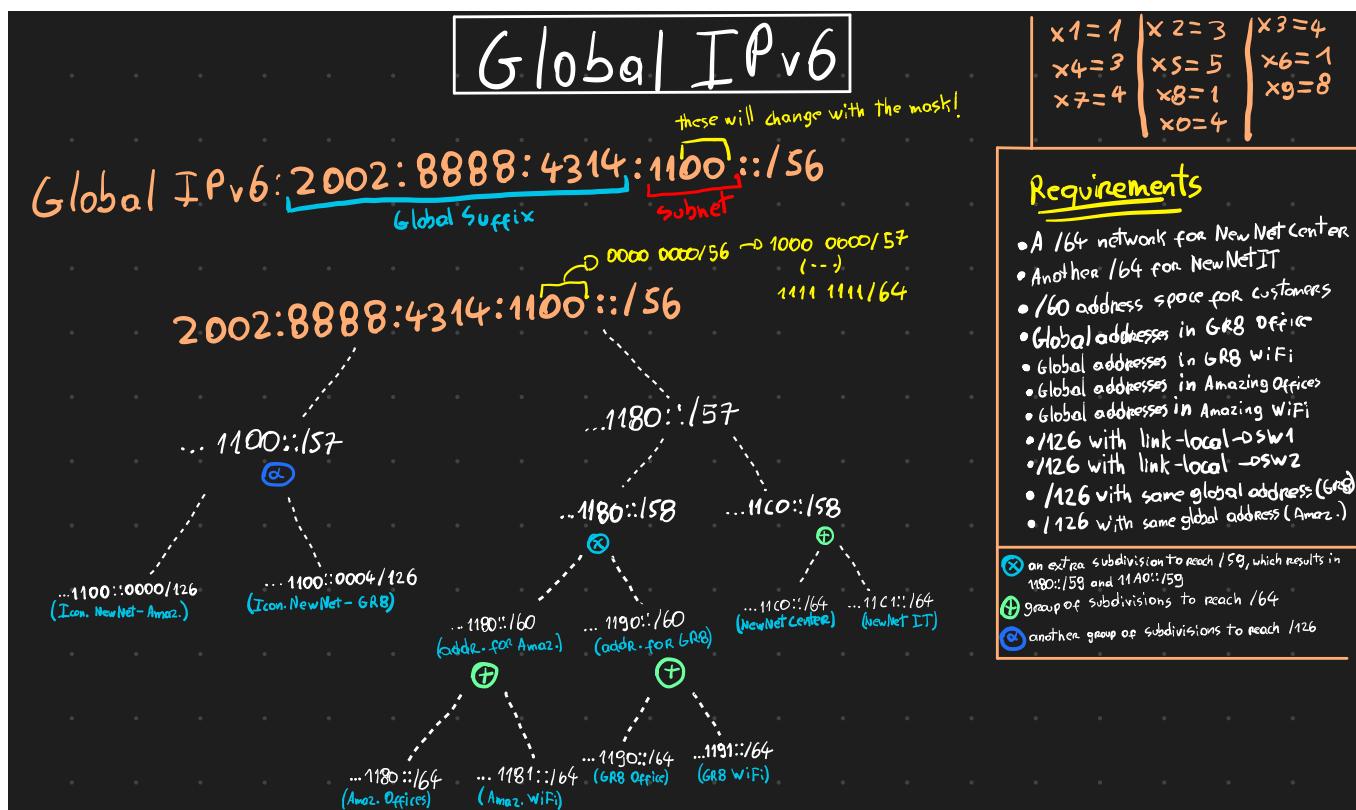
Global IPv6 Assignment

Global IPv6 assignment							
	Department	Network Address	Mask	Available Addresses	Used Addresses	Gateway #1 Address	Gateway #2 Address
NewNet ISP	NewNetCenter	G:11C0::	64	G:11C0::0003 → G:11C0:FFFF:FFFF	-	G:11C0::0001	G:11C0::0002
	NewNetIT	G:11C1::	64	G:11C1::0003 → G:11C1:FFFF:FFFF	-	G:11C1::0001	G:11C1::0002
Amazing	Offices	G:1180::	64	G:1180::0003 → G:1180:FFFF:FFFF	-	G:1180::0001	G:1180::0002
	WiFi	G:1181::	64	G:1181::0003 → G:1181:FFFF:FFFF	-	G:1181::0001	G:1181::0002
	Factory	-	-	-	-	-	-
	Interconnection Amazing - ESW#1	FE80::1	10	-	-	-	-
	Interconnection Amazing - ESW#2	FE80::2	10	-	-	-	-
GR8	Office	G:1190::	64	G:1190::0003 → G:1190:FFFF:FFFF	-	G:1190::0001	G:1190::0002
	WiFi	G:1191::	64	G:1191::0003 → G:1191:FFFF:FFFF	-	G:1191::0001	G:1191::0002
Interconnection	NewNet - Amazing	G:1100::0002	126	G:1100::0003	-	G:1100::0001	G:1100::0002
	NewNet - GR8	G:1100::0004	126	G:1100::0007	-	G:1100::0005	G:1100::0006

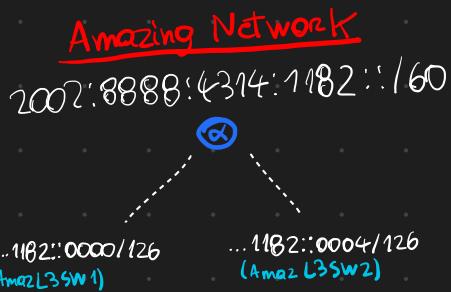
Global prefix: G = 2002:8888:4314

Justification

Our global IPv6 prefix will be 2002:8888:4314:1100::/56. From there, we will divide it into all the subnets we need as explained in the following image.



We still need to obtain the link-local for the switches on the Amazing network. These can be obtained by grabbing the Amazing network's global IPv6, and creating subnetworks for each switch.



After this, each switch will generate a link-local (fe80::/10), with a size of 64 bits. The last 48 bits will be filled via the EUI-64 method.

Figure 4: Global IPv6 assignment