Nmecs

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

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

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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	–	–	–	–	–	–	–
	NewNetIT	–	–	–	–	–	–	–
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 nmec 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.

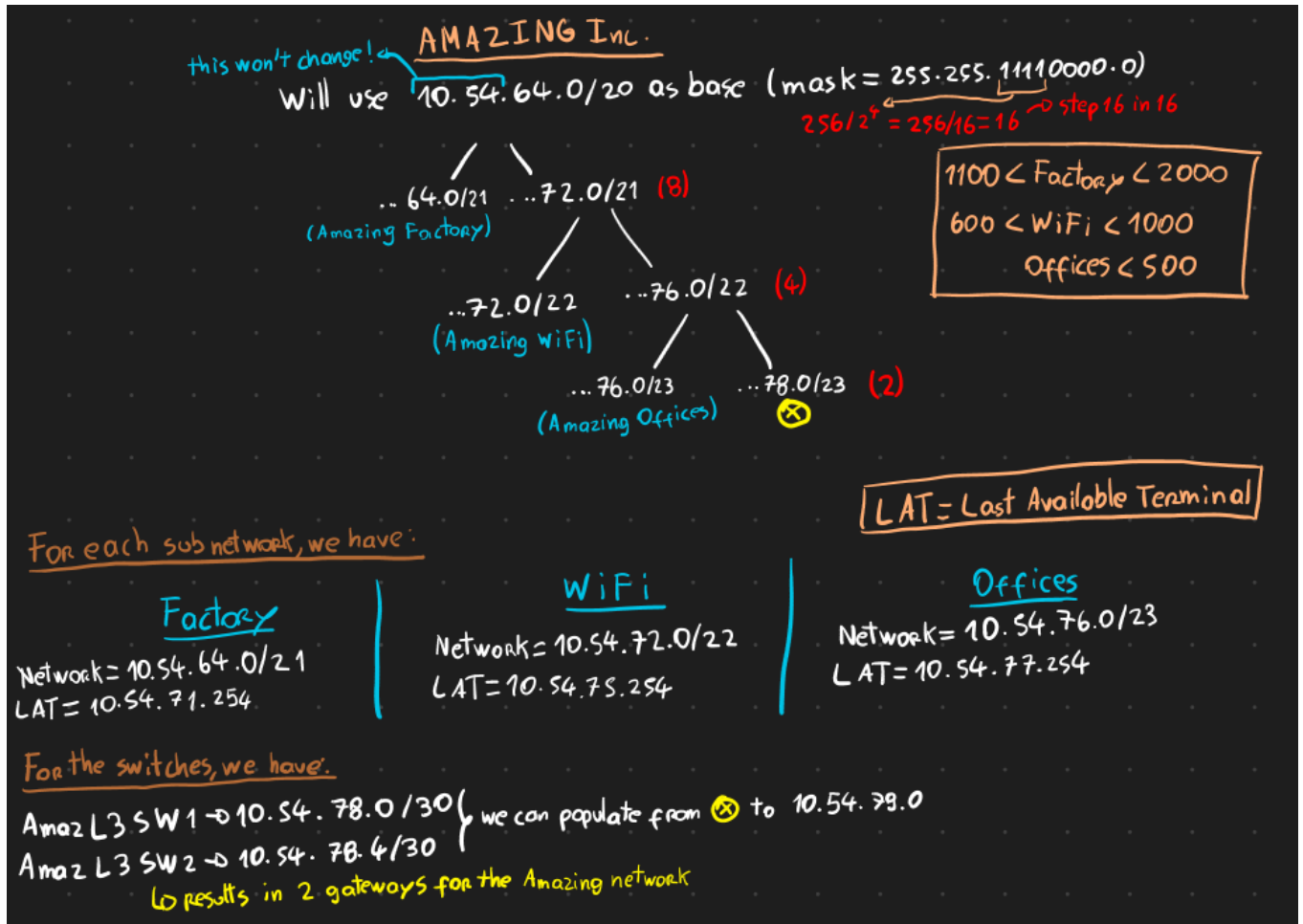All this explained more visually in the following image.

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 $10.1X_8X_7.0X_46.0/23$ or $10.114.36.0/23$ when replacing the nmec numbers.

The office will be taking $10.114.36.0/24$ and the WiFi will be taking $10.114.37.0/24$.
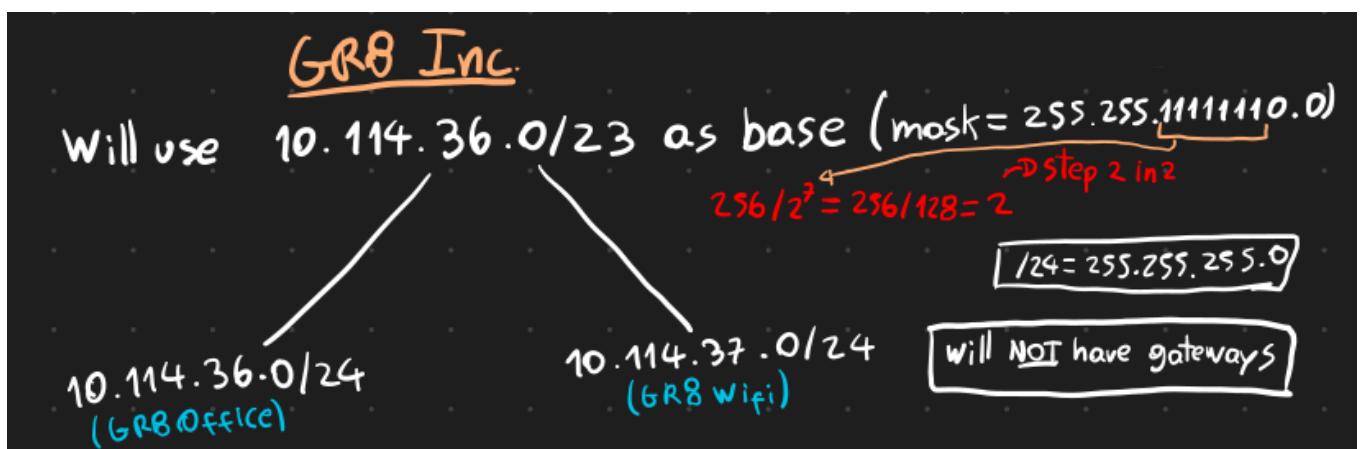
This company will have no gateways.

Figure 2: Private IPv4 assignment for GR8

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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 nmec 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

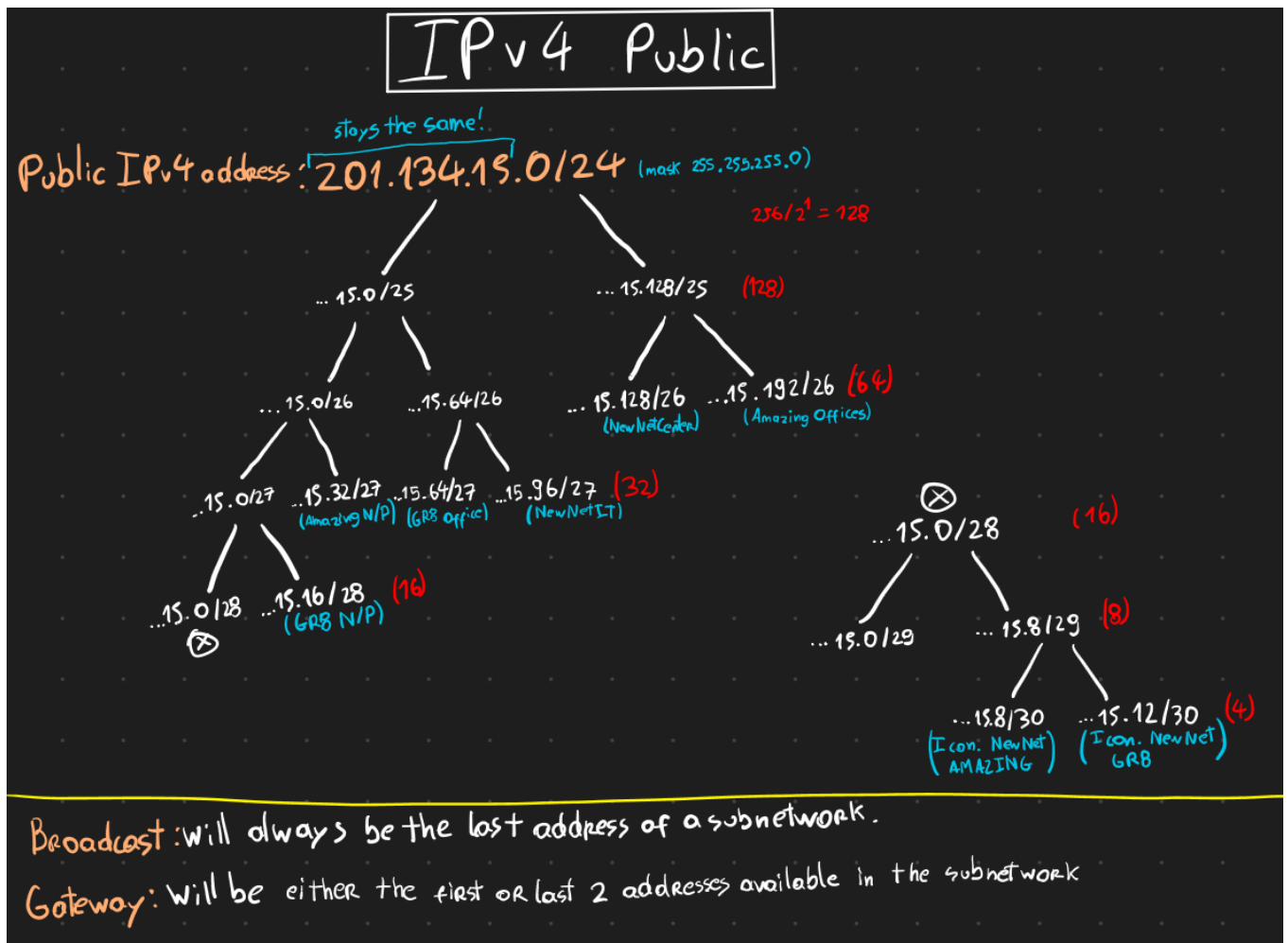- 20 addresses for Amazing NAT/PAT

- 9 addresses for GR8 NAT/PAT

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Figure 3: Public IPv4 assignment

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Global IPv6 Assignment

Global IPv6 assignment							
	Department	Network Address	Mask	Available Addresses	Used Addresses	Gateway #1 Address	Gateway #2 Address
NewNet ISP	NewNetCenter	2002:8888:4314:11C0::	64		–		
	NewNetIT	2002:8888:4314:11C1::	64		–		
Amazing	Offices	2002:8888:4314:1180::	64		–		
	WiFi	2002:8888:4314:1181::	64		–		
	Factory	–	–	–	–	–	–
	Interconnection Amazing - ESW#1	2002:8888:4314:1182::0000	126		–		
	Interconnection Amazing - ESW#2	2002:8888:4314:1182::0004	126		–		
GR8	Office	2002:8888:4314:1190::	64		–		
	WiFi	2002:8888:4314:1191::	64		–		
Interconnection	NewNet - Amazing	2002:8888:4314:1100::0000	126		–		
	NewNet - GR8	2002:8888:4314:1100::0004	126		–		

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