

Network Subnetting

Cheat Sheet

Group Size	128	64	32	16	8	4	2	1
Subnet	128	192	224	240	248	252	254	255
CIDR (40)	/25	/26	/27	/28	/29	/30	/31	/32
3rd octet	/17	/18	/19	/20	/21	/22	/23	/24
2nd octet	/9	/10	/11	/12	/13	/14	/15	/16
1st octet	/1	/2	/3	/4	/5	/6	/7	/8

1. Use CIDR/Mask to find group size above
2. Starting from 0, or the corresponding subnet value above, or one to its left, increase or decrease by the group size, until you pass the corresponding octet value in the target IP
 1. Next Network ID cannot contain 256, instead increment the preceding octet by 1 and reset to 0
 2. If this is the 1st octet, Next Network is N/A, and Broadcast IP = 255.255.255.255
3. Number before target IP = Network ID
4. First Host = Network ID + 1
5. Number after target IP = Next Network ID
6. Broadcast = Next Network - 1
7. Last Host = Next Network - 2
8. #IP Addresses = Group size, or $2^{(32-\text{CIDR})}$ for 3rd/4th octet

Network ID	
First Host IP	
Last Host IP	
Broadcast IP	
Next Network ID	
No. IP Addresses	
CIDR/Subnet Mask	

- Each subnet bit doubles the available subnets
- Each host bit doubles the available host addresses

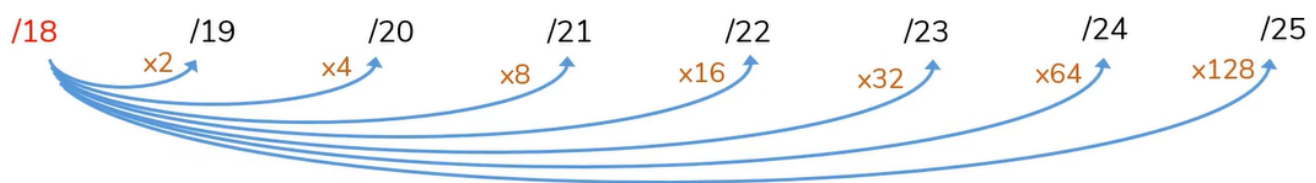
FLSM Questions

2^1	2
2^2	4

2^3	8
2^4	16
2^5	32
2^6	64
2^7	128
2^8	256
2^9	512

Starting with /18, what size sub-network would you need to create 100 sub-networks? /25

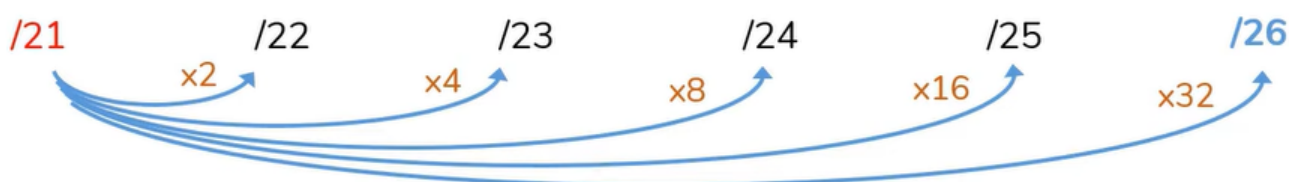
- Or, $128 = 2^7$ /18 + 7 = /25



Starting with /21, how many sub-networks could you create that could contain 50 IP addresses? 32

- Or, /26 - /20 = $2^5 = 32$

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CIDR	/25	/26	/27	/28	/29	/30	/31	/32



How to Read a Subnetting Question

You will generally be given 2, and your job will be to solve the 3rd.

- A starting network size
- Number of Sub-Networks
- Size of Sub-Network

Variable Length Subnet Masks (VLSM)

<https://www.youtube.com/watch?v=amKyfbg5G2Q>

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