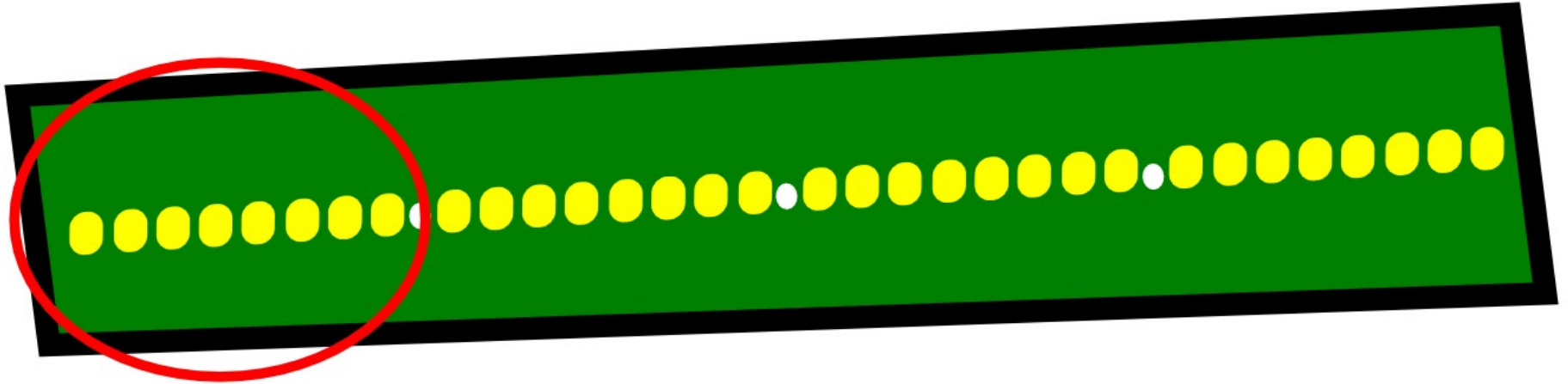


# IP Networking

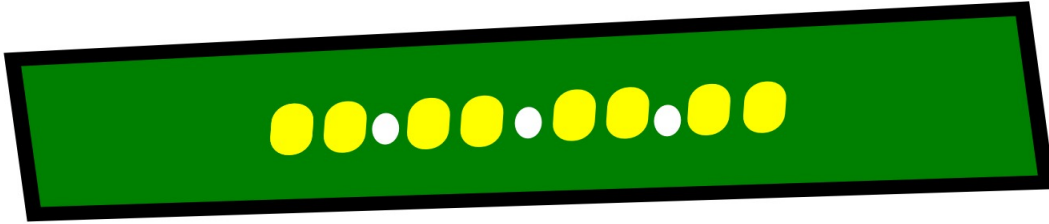
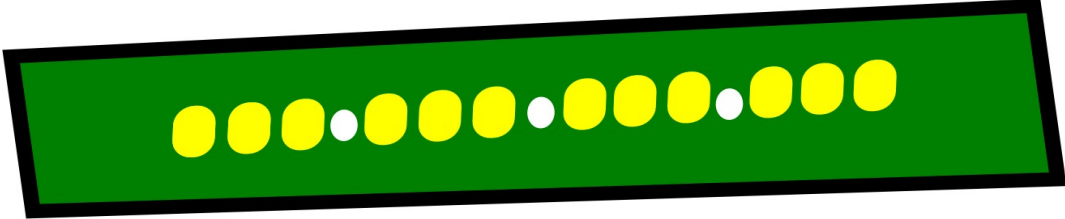
فروردین ۱۳۹۱

جلسه ۲۲۷ لاگ اصفهان

تهیه کننده: صدیقه احمدی



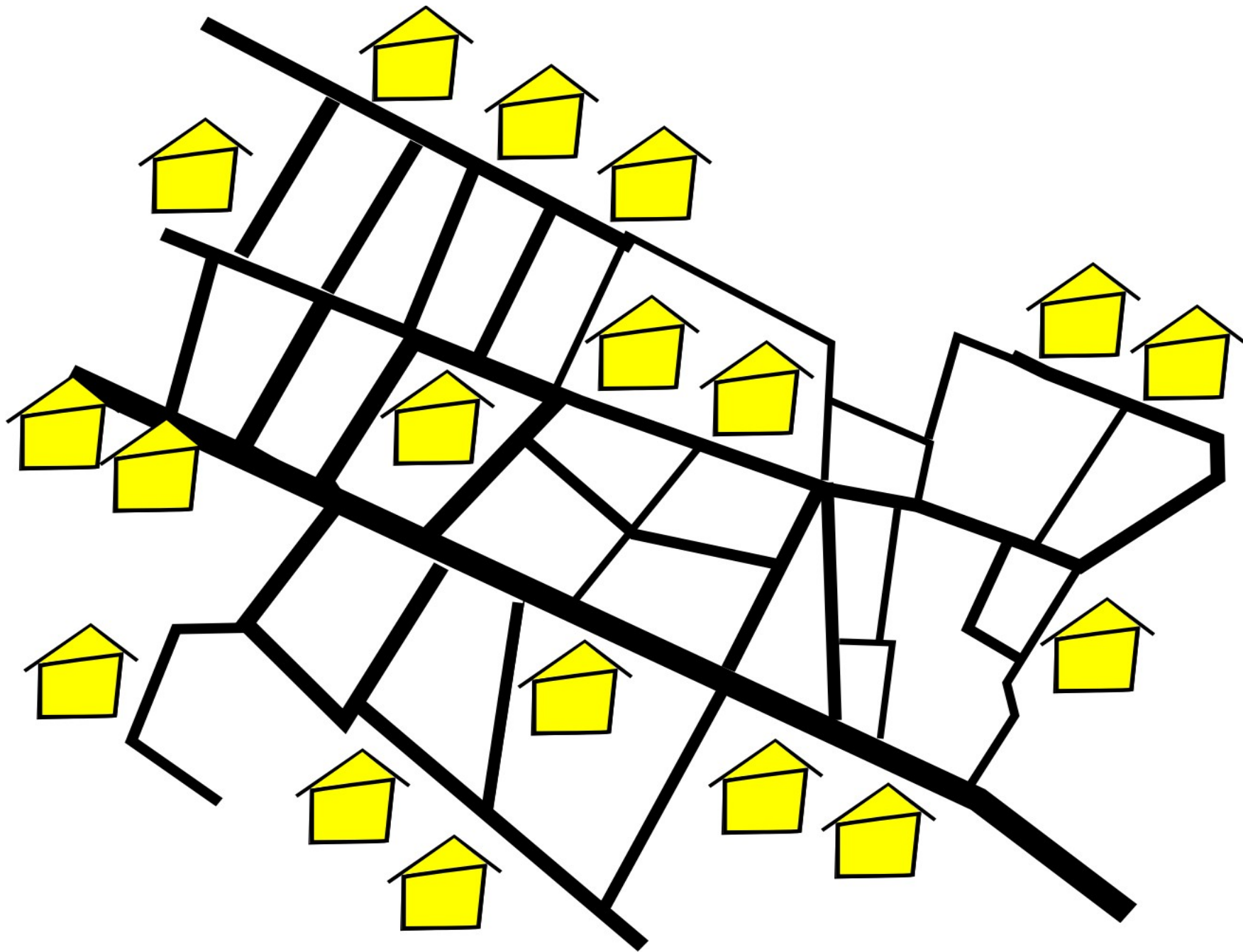
octet

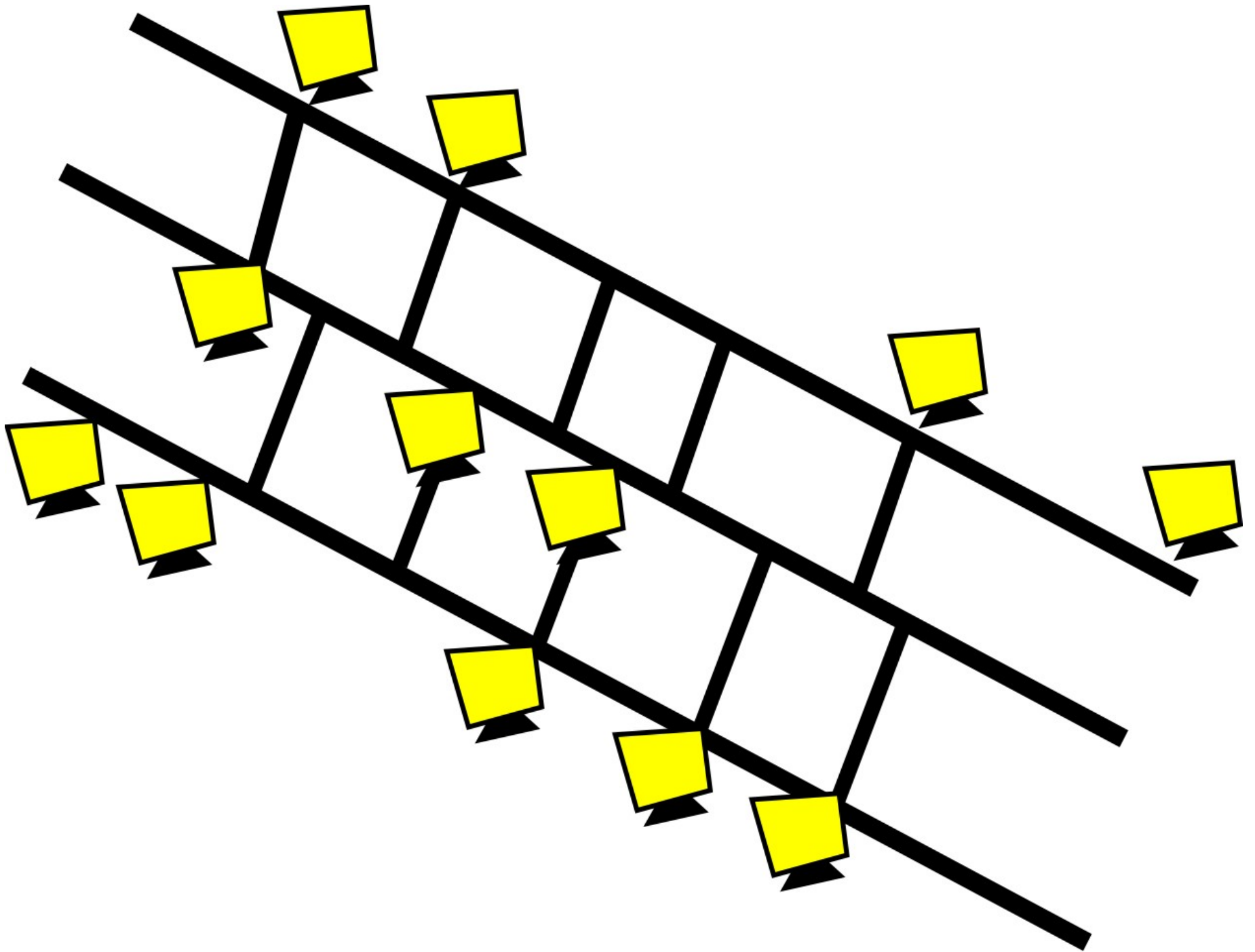


11000000.10101000.00001010.00000001

C0.A8.A.01

192.168.10.1





1 bit => 2 عدد

3 bit =>  $2*2*2=8$  عدد

32 bit =>  $2^{32} = 4\ 294\ 967\ 296$

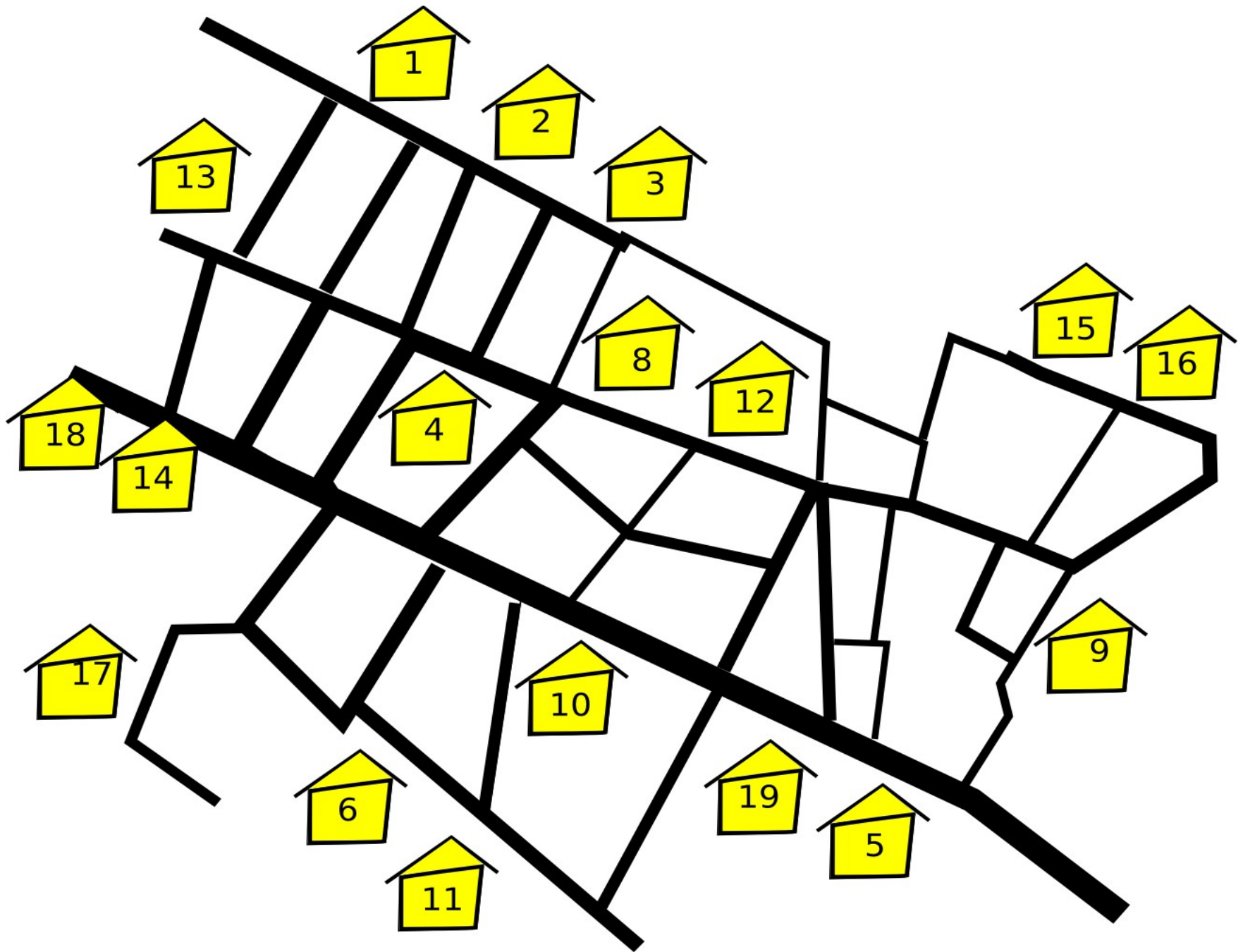
00000000.00000000.00000000.00000000

.

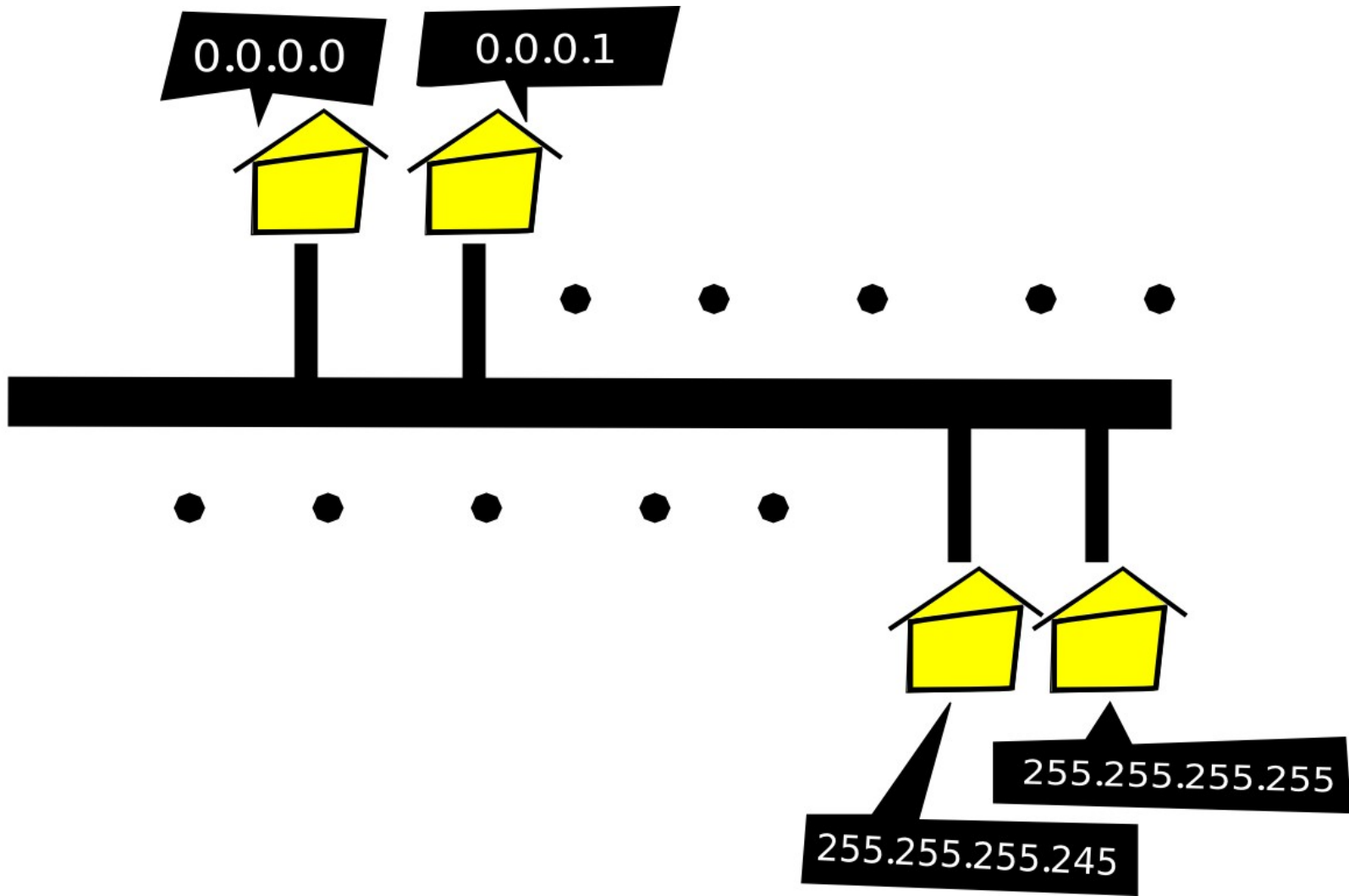
.

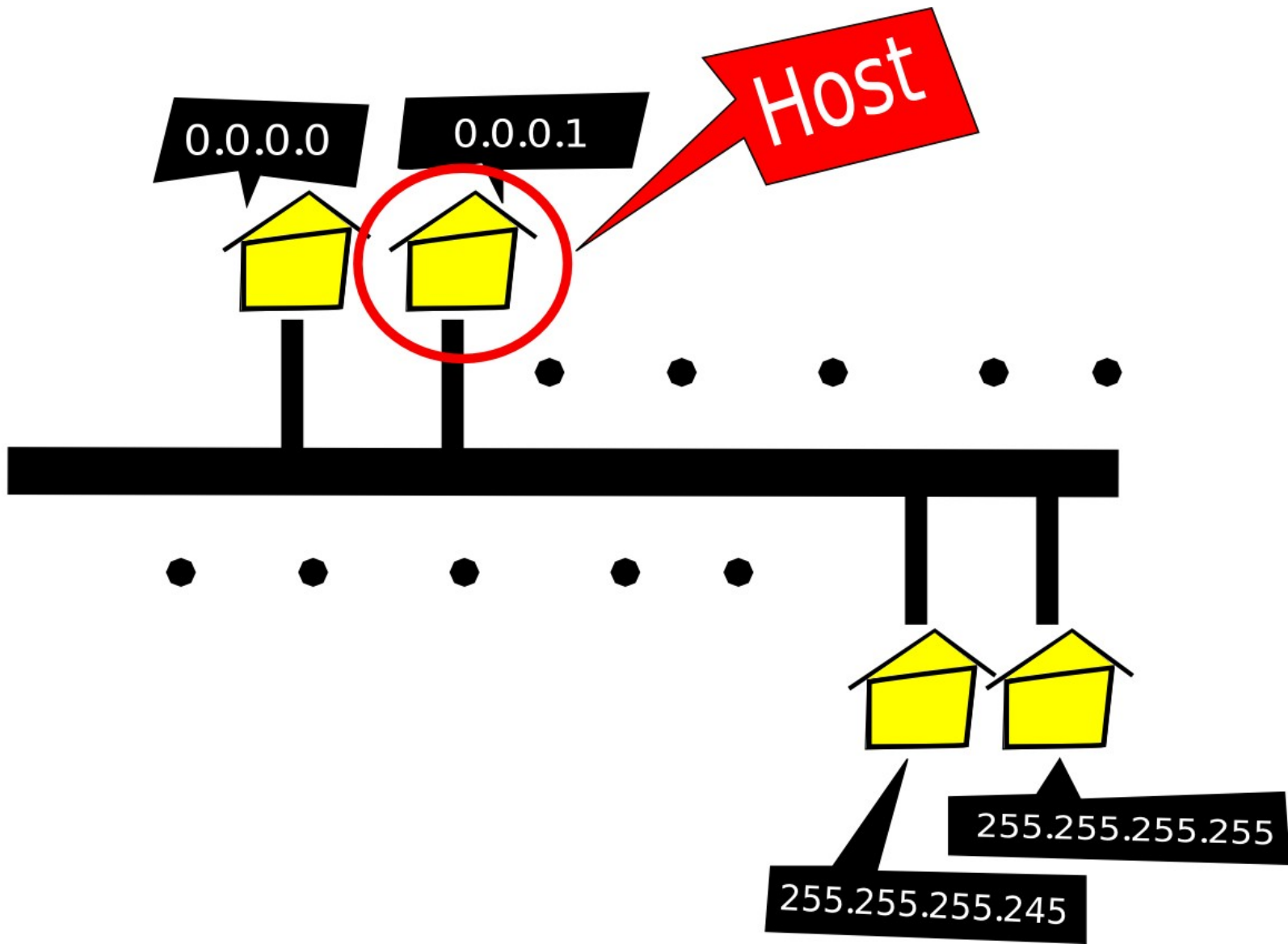
.

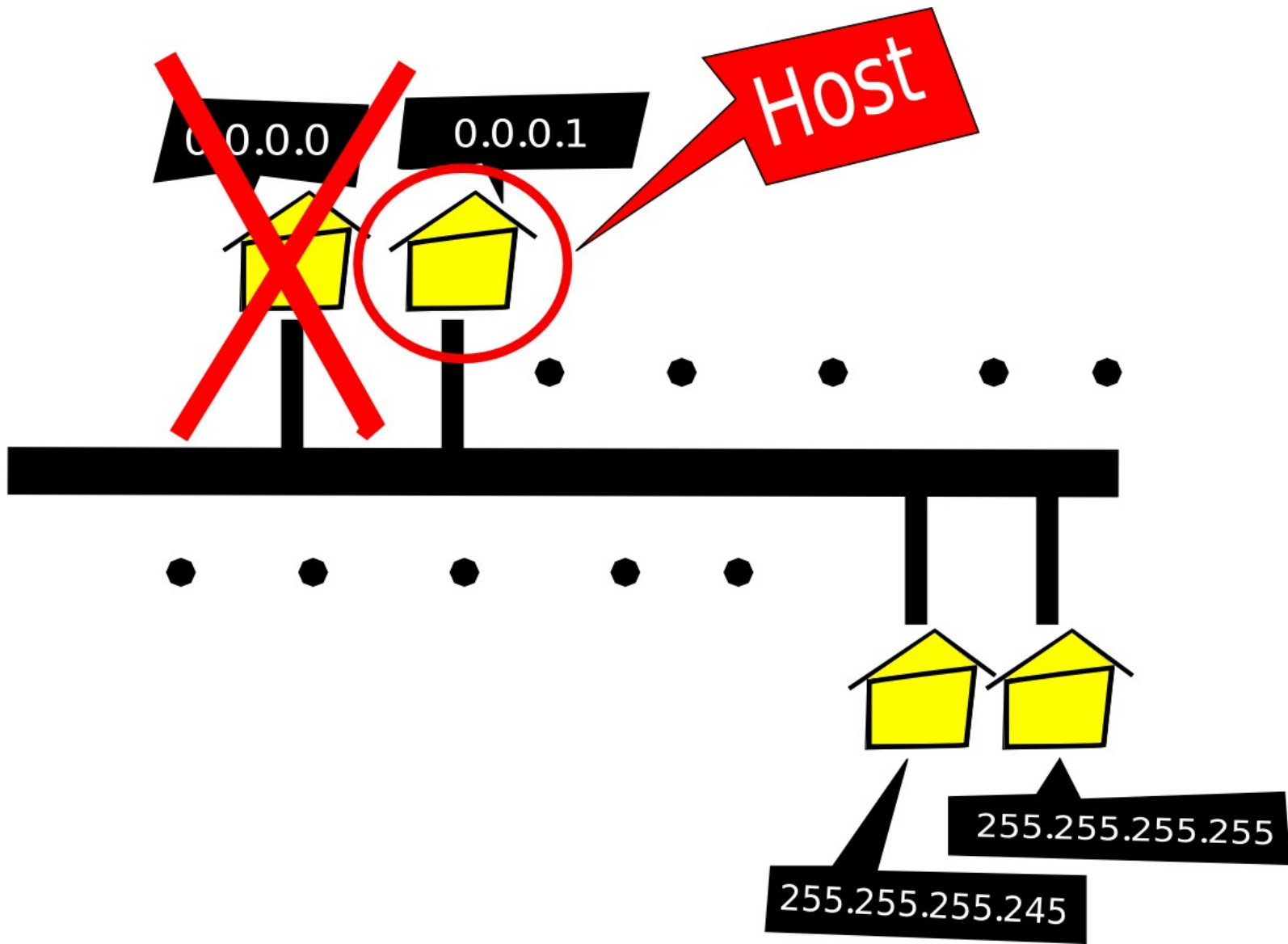
11111111.11111111.11111111.11111111

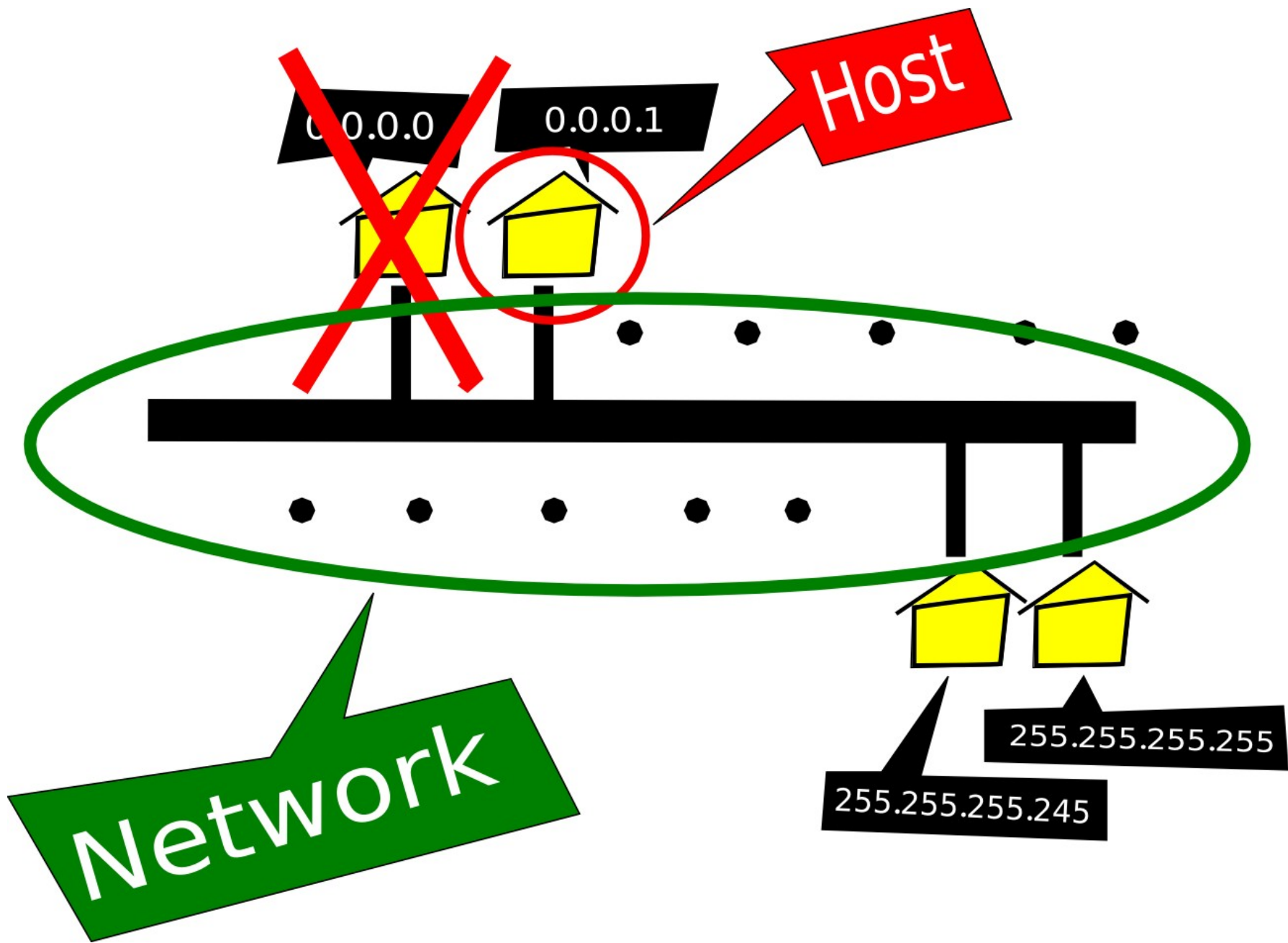


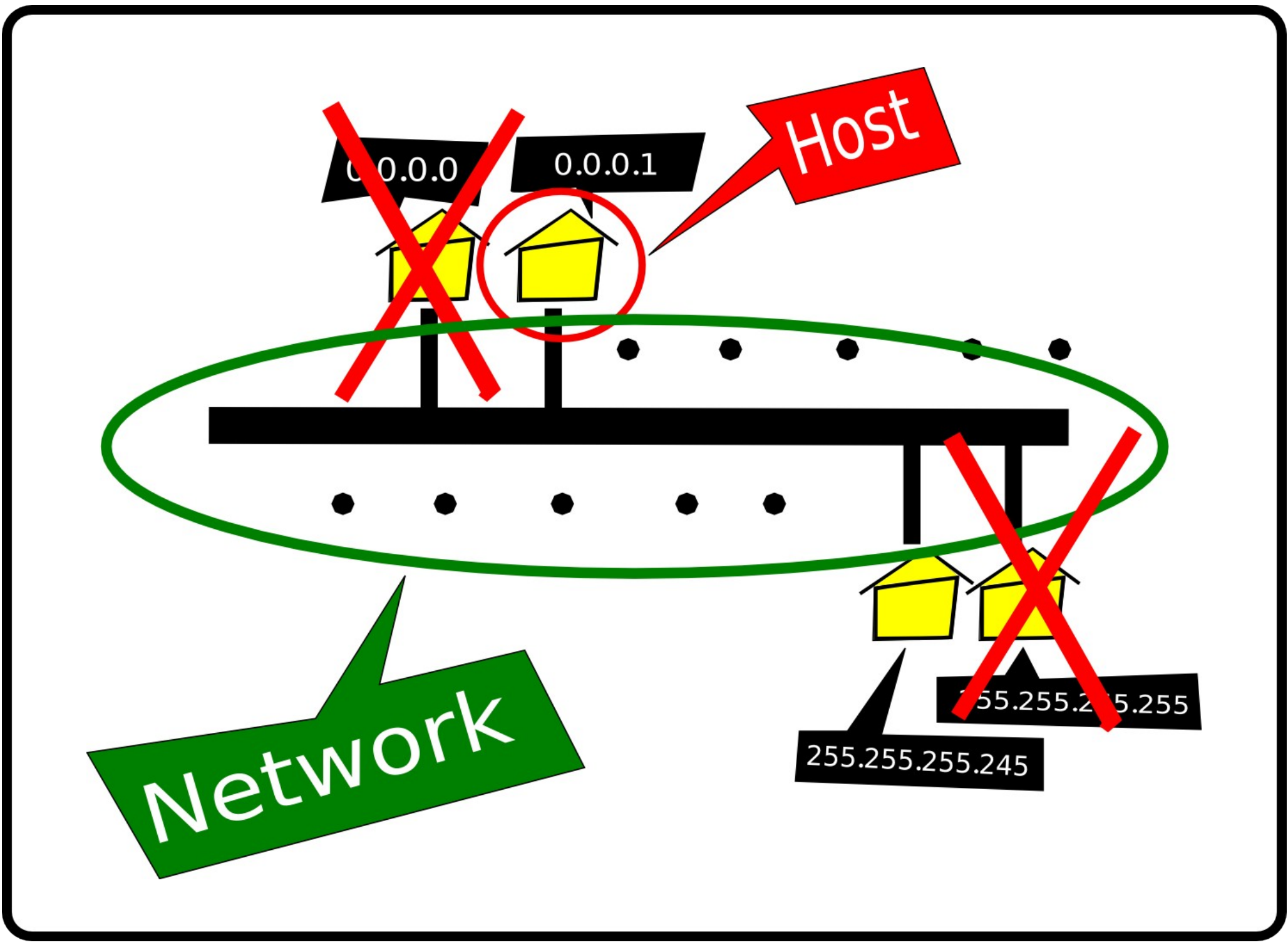












0.0.0.0

0.0.0.1

Host

Network

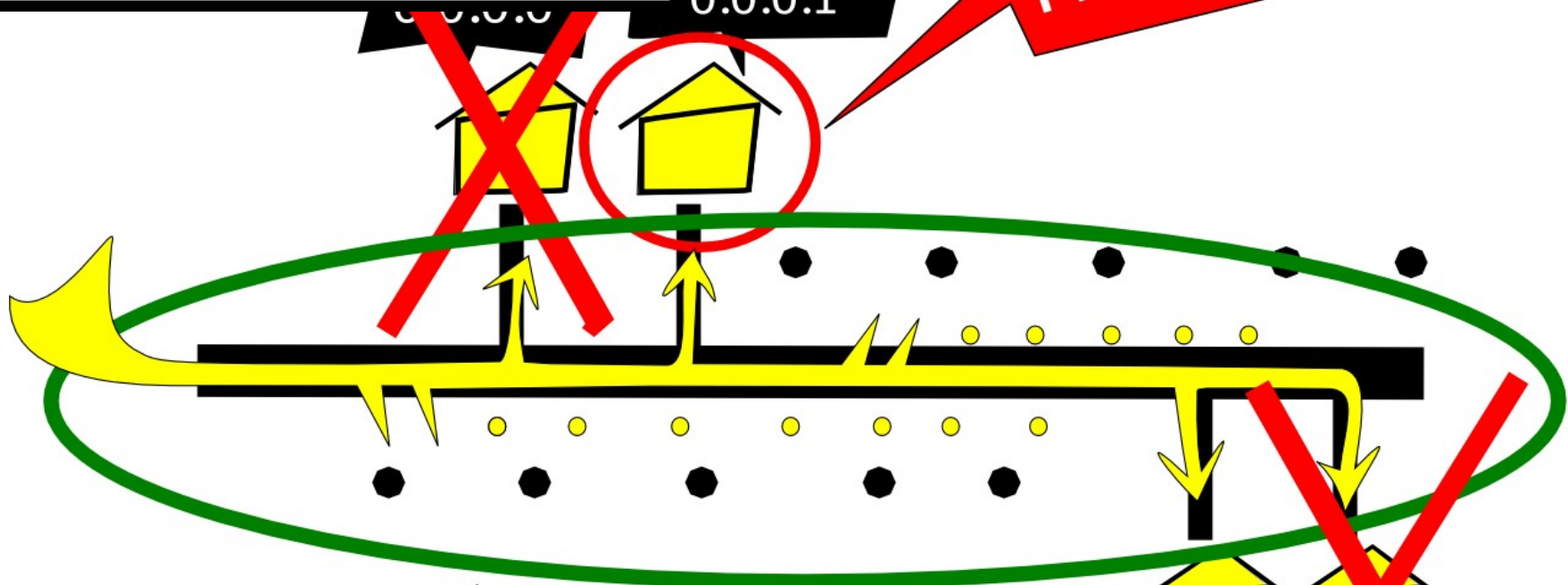
255.255.255.255

255.255.255.245

خیابان 0.0.0.0 پلاک 0.0.0.1

0.0.0.1

Host

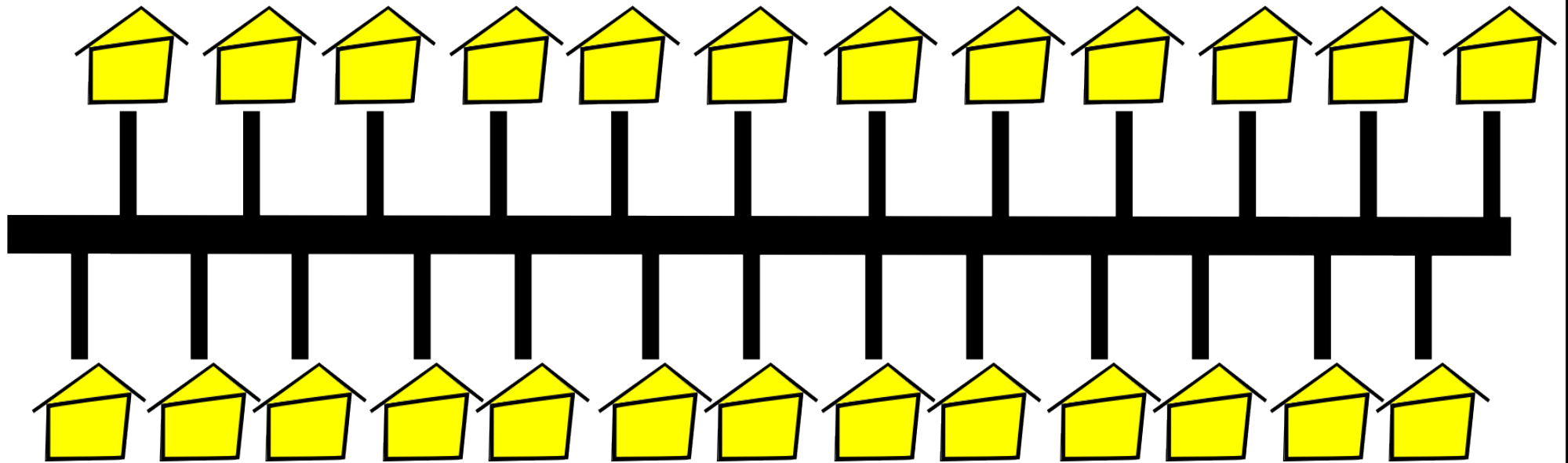


55.255.255.255

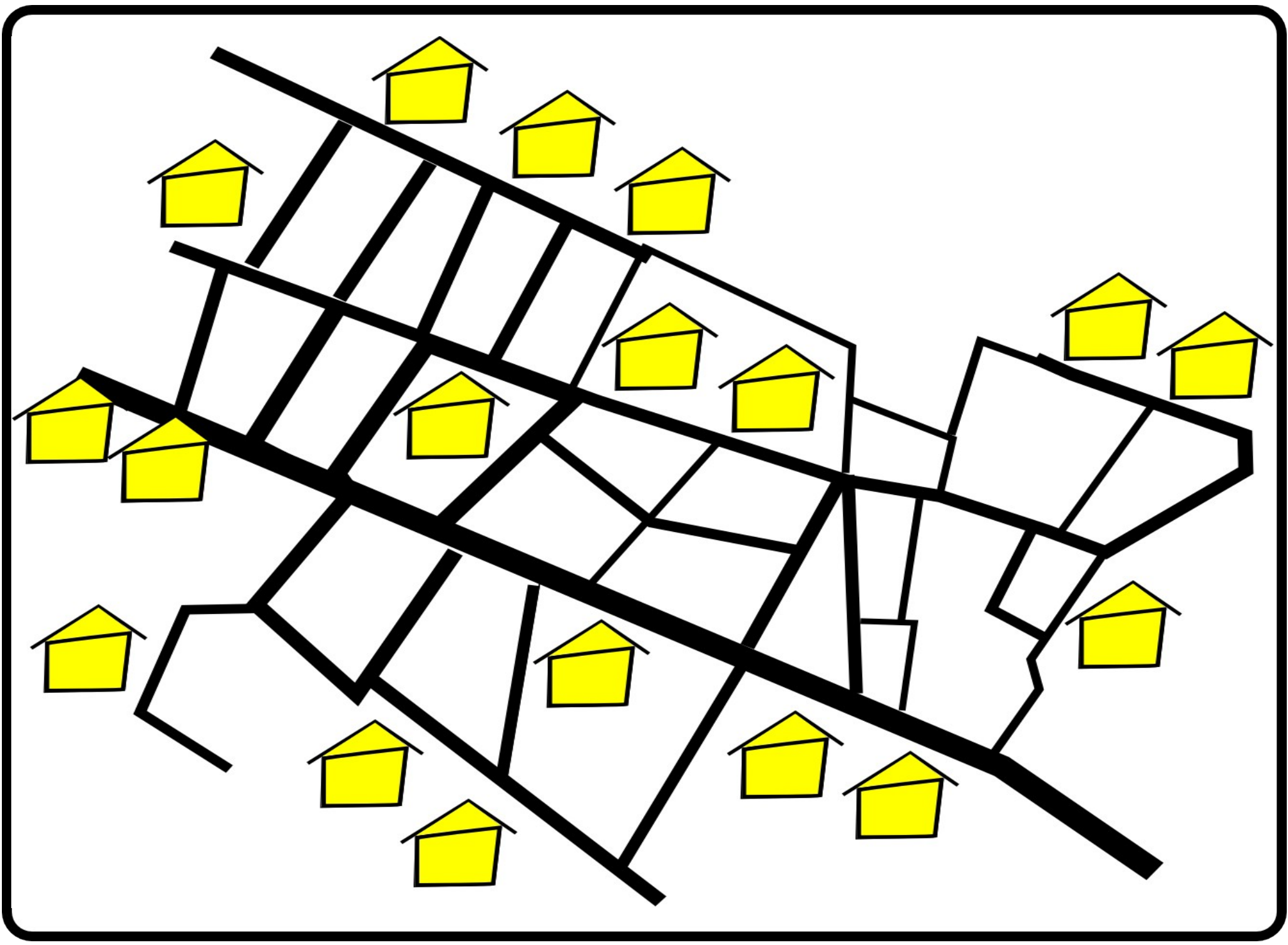
255.255.255.255

valid and invalid

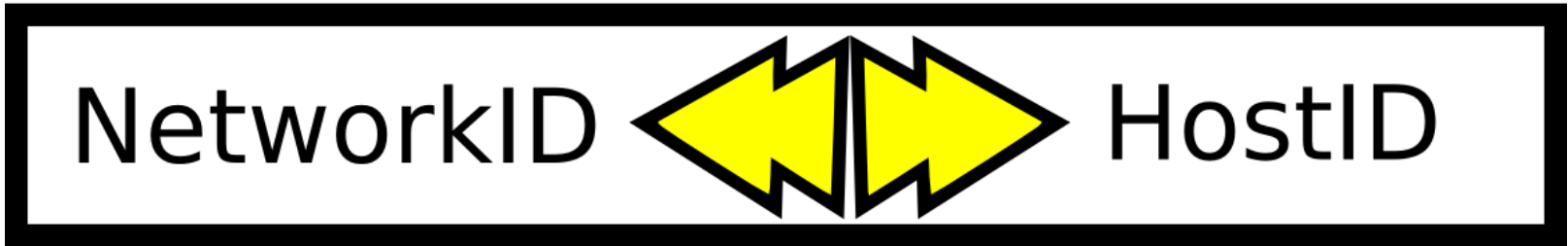
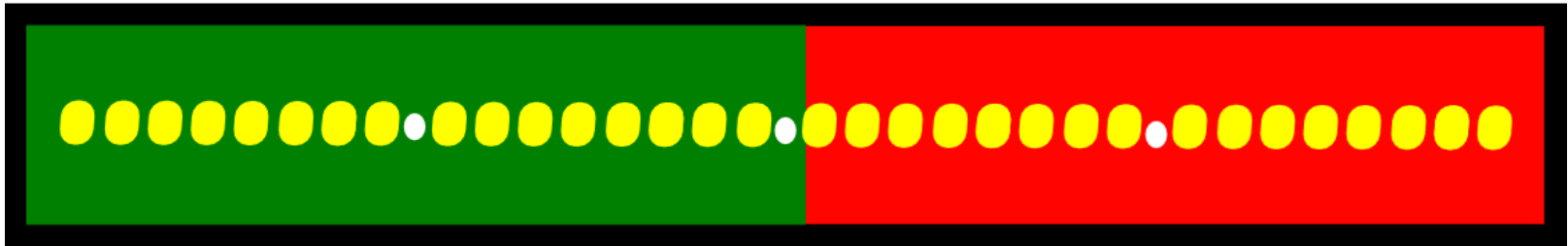
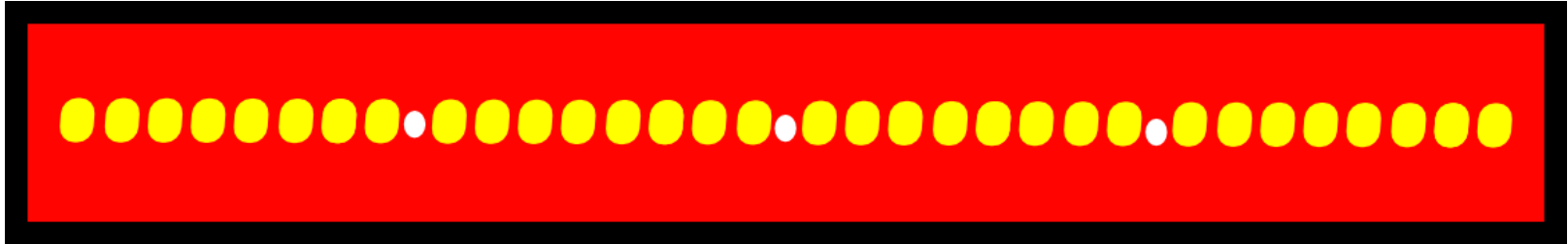
Network











**Classfull**

**Classless**

# Classfull

**A**

0-126

127 Local Loopback

N

H

H

H

**B**

128-191

N

N

H

H

**C**

192-223

N

N

N

H

**D**

224-239

Special

**E**

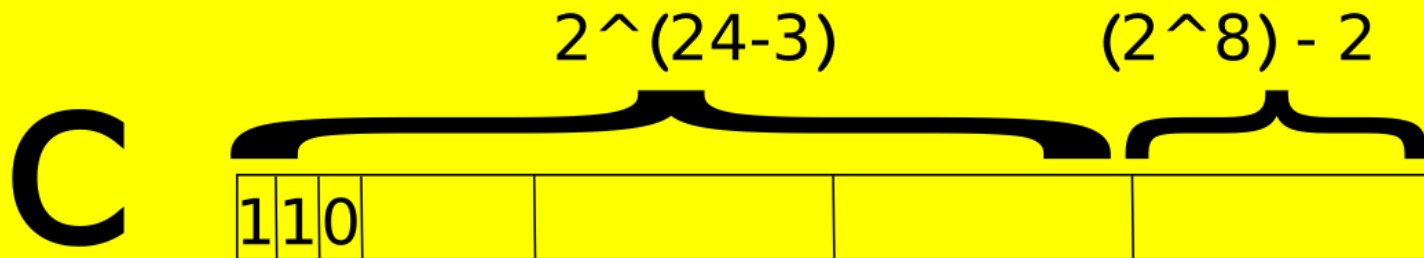
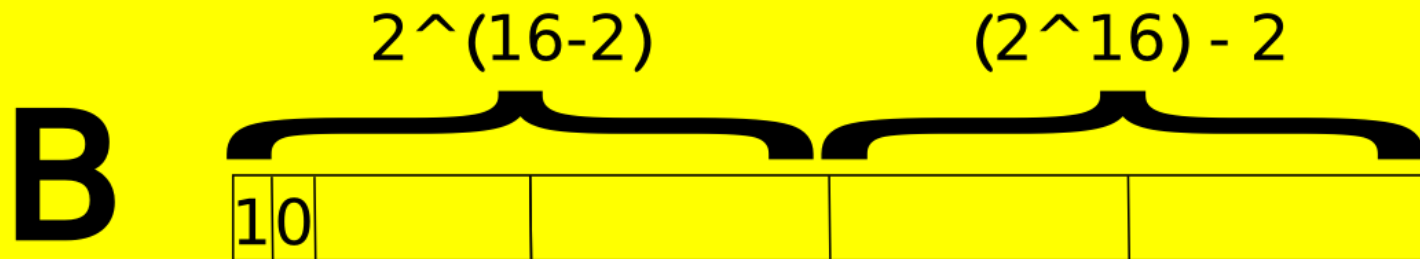
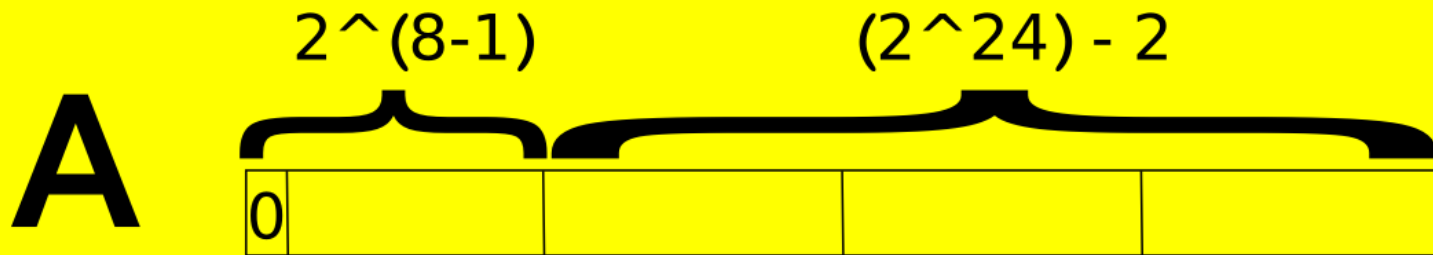
multicasting

240+

research

Special

# Classfull

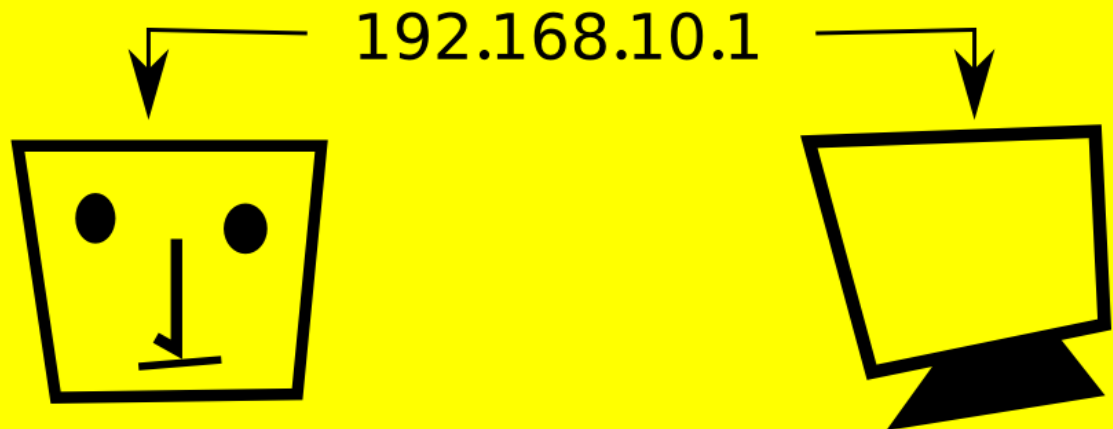


## Public and private

10.0.0.0 – 10.255.255.255      A 16777216 ip 1 network

172.16.0.0 – 172.31.255.255      B 1048576 ip 16 network  
169,254,255,254 – 169,154,0,1      apipa

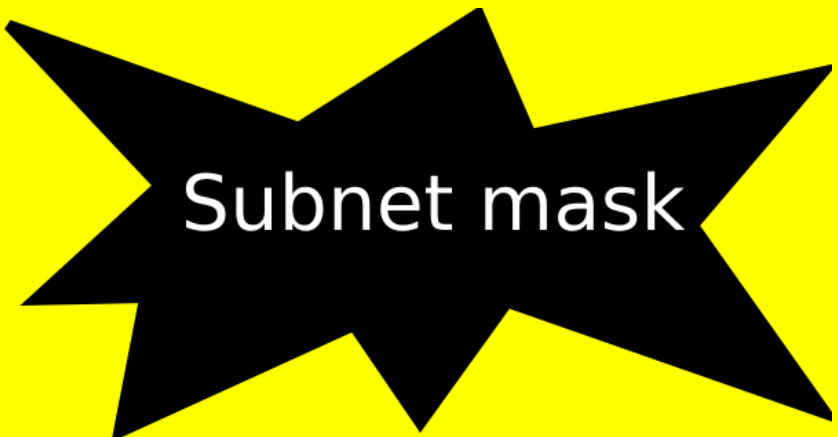
192.168.0.0 – 192.168.255.255      C 65536 ip 256 network



192.168.10.1

11000000.00010000.00001010.00000001

$0 < 192 < 217 \Rightarrow A$



NetID 192.0.0.0

Broadcast 192.255.255.255

192.168.10.1



A 255.0.0.0

B 255.255.0.0

C 255.255.255.0

Host 255.255.255.255

11000000.00010000.00001010.00000001

subnet mask

11111111.00000000.00000000.00000000

&

---

11000000.00000000.00000000.00000000

# Classless

classfull

216.3.128.0 class C

$2^8 - 2 = 254$  host

classless

~~A 255.0.0.0~~

subnetting

~~B 255.255.0.0~~

~~C 255.255.255.255~~

supernetting



# Classless Subnetmask

classfull

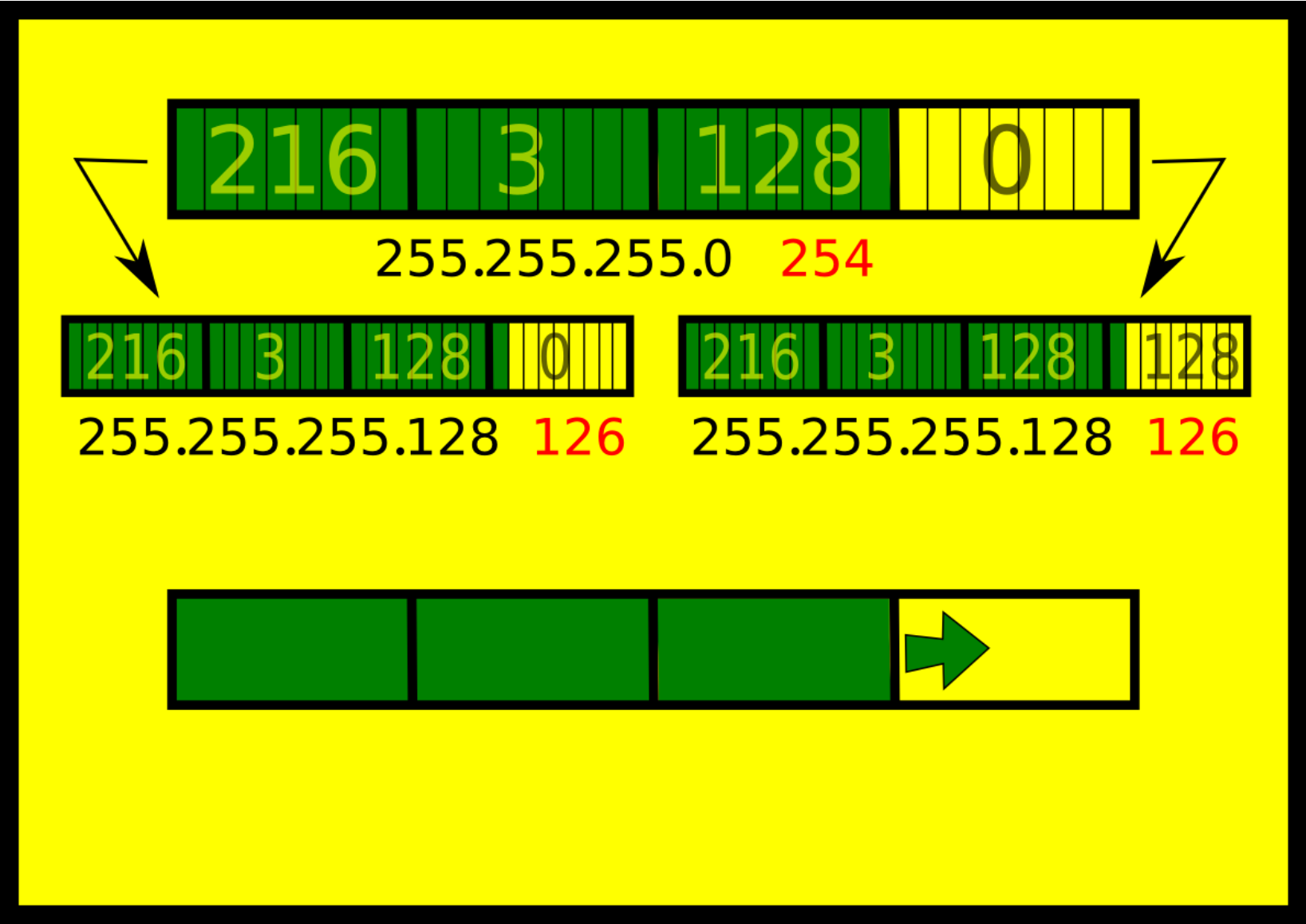
Subnet Mask (SNM)

Network Mask

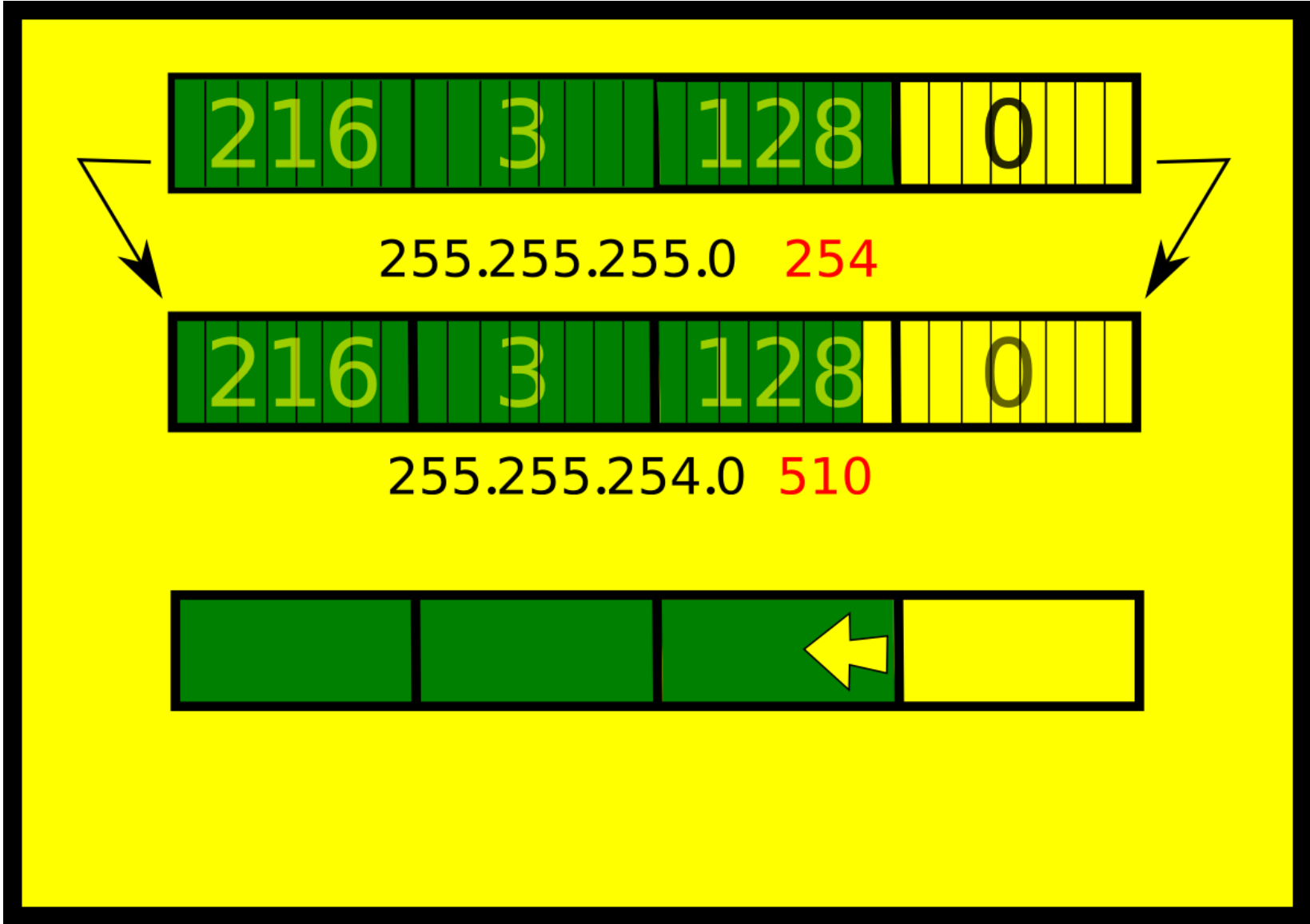
classless

Subnet Mask / Subnet ID

# Classless subnetting



# Classless supernetting





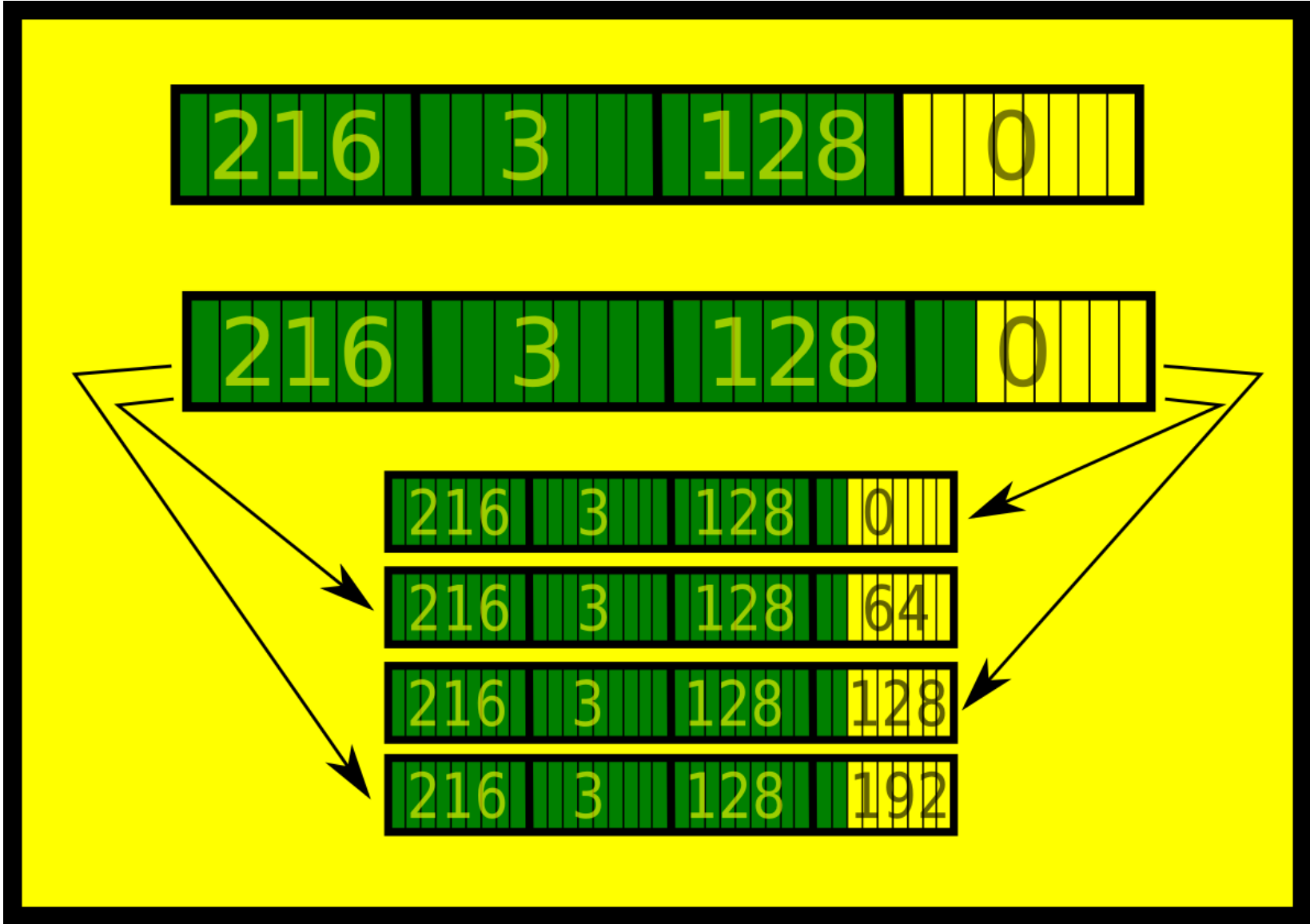
255.255.255.0

Subnet ID



255.255.255.192

# Classless CIDR



# Classless VLSM



62 54



62 13

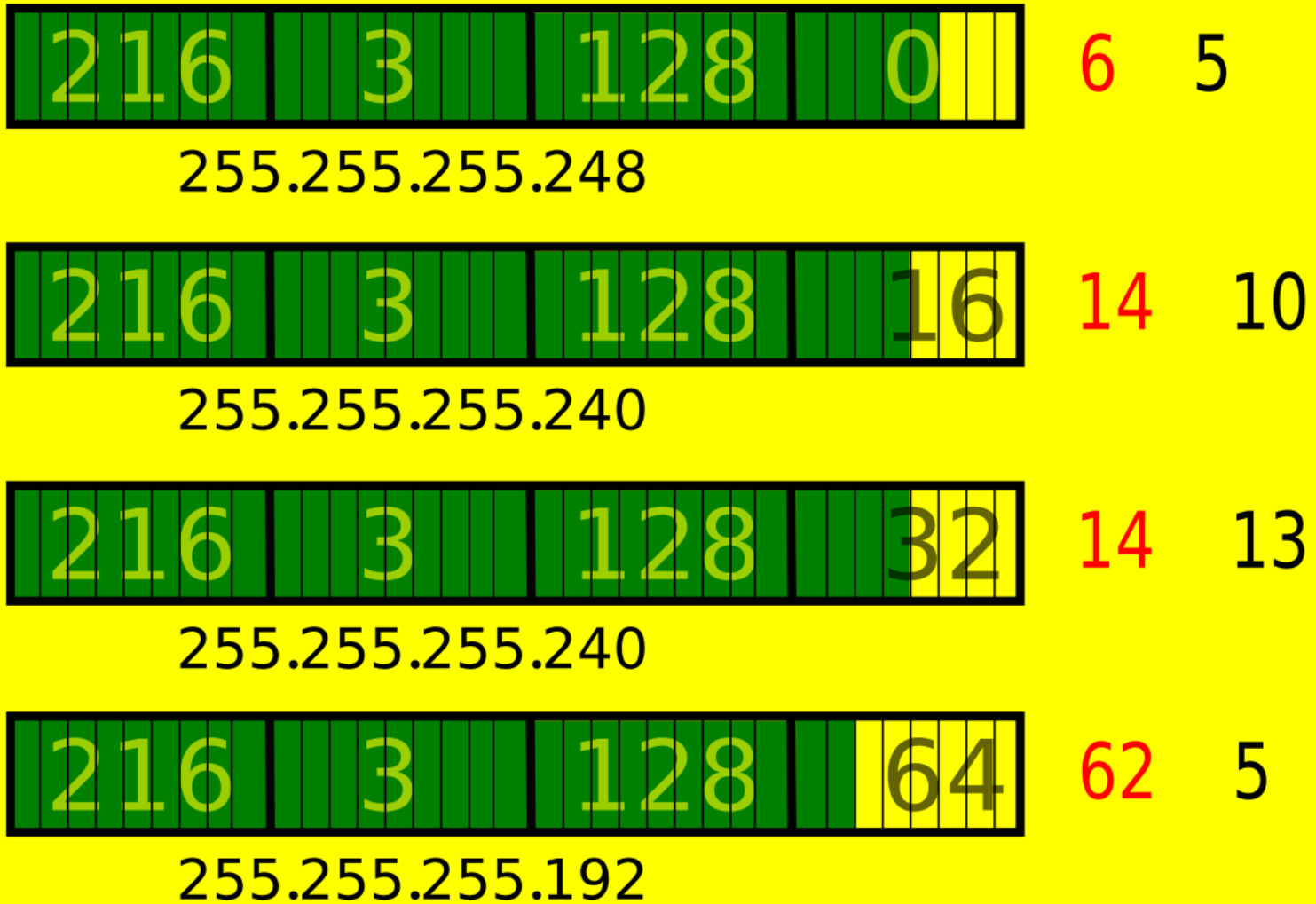


62 10



62 5

# Classless VLSM



# Subnetting chart

	/	Netmask	Block Size	Subnets			Hosts					
				Class A	Class B	Class C	Class A	Class B	Class C			
	8	255.0.0.0	256	1			16777214					
	9	255.128.0.0	128	2			8388606					
	10	255.192.0.0	64	4			4194302					
	11	255.224.0.0	32	8			2097150					
	12	255.240.0.0	16	16			1048574					
	13	255.248.0.0	8	32			524286					
Class C Network	Class B Network	Class A Network	21	255.255.248.0	8	8192	32		2046	2046		
			22	255.255.252.0	4	16384	64		1022	1022		
			23	255.255.254.0	2	32768	128		510	510		
				24	255.255.255.0	256	65536	256	1	254	254	254
				25	255.255.255.128	128	131072	512	2	126	126	126
				26	255.255.255.192	64	262144	1024	4	62	62	62
				27	255.255.255.224	32	524288	2048	8	30	30	30
				28	255.255.255.240	16	1048576	4096	16	14	14	14
				29	255.255.255.248	8	2097152	8192	32	6	6	6
				30	255.255.255.252	4	4194304	16384	64	2	2	2

Default Route 0.0.0.0  
single 255.255.255.255



**classfull** Flsm  
(A,B,C,D) Fixed Length Subnet masks

**classless** {  
(subneting, superneting) CIDR  
Classless Inter-Domain Routing

VLS M  
Variable Length Subnet Masking

# Config

Network Legacy

Network Manager

wcid

# Config Network Legacy

ifupdown

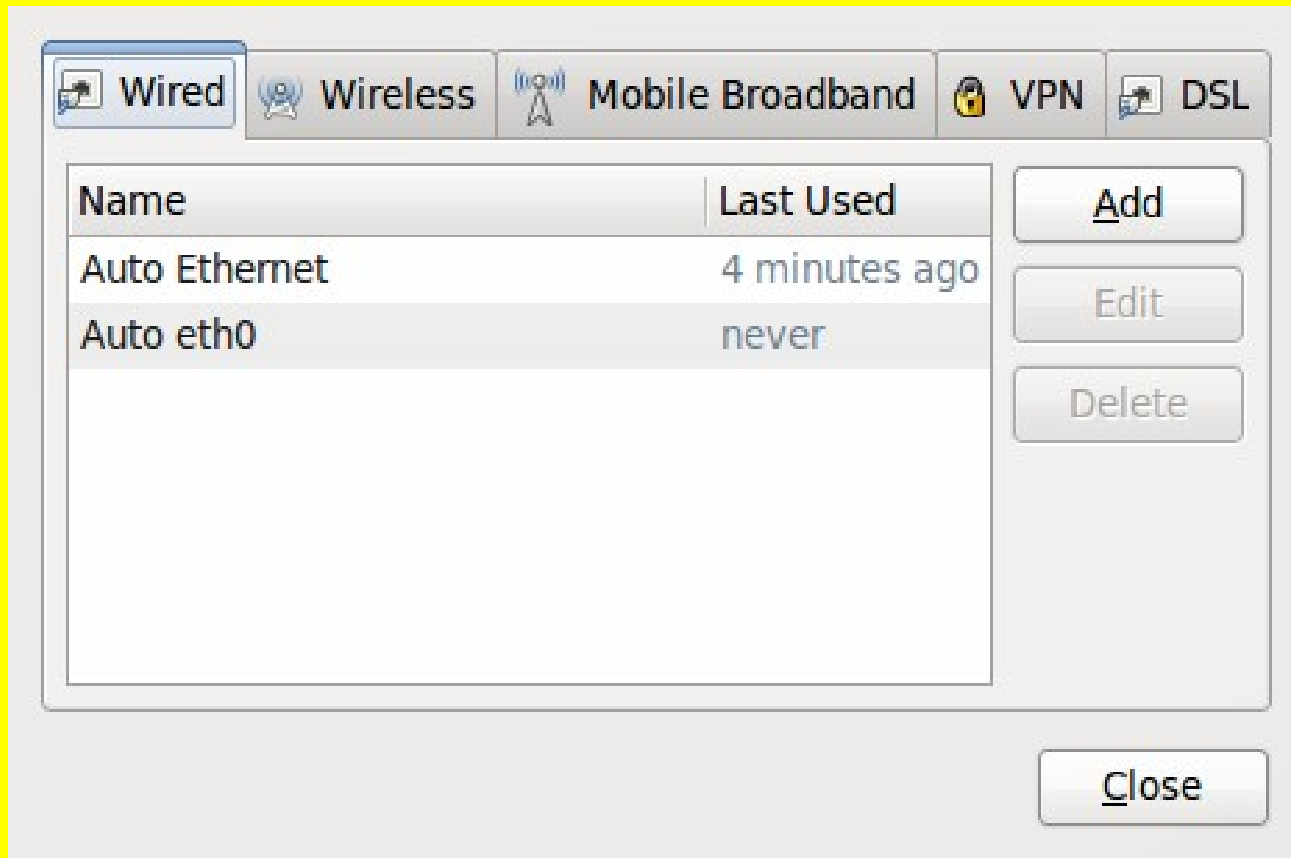
debian

`/etc/network/interfaces`

redhat

`/etc/sysconfig/network-scripts/ifcfg-<interface>`

# Config Network Manager

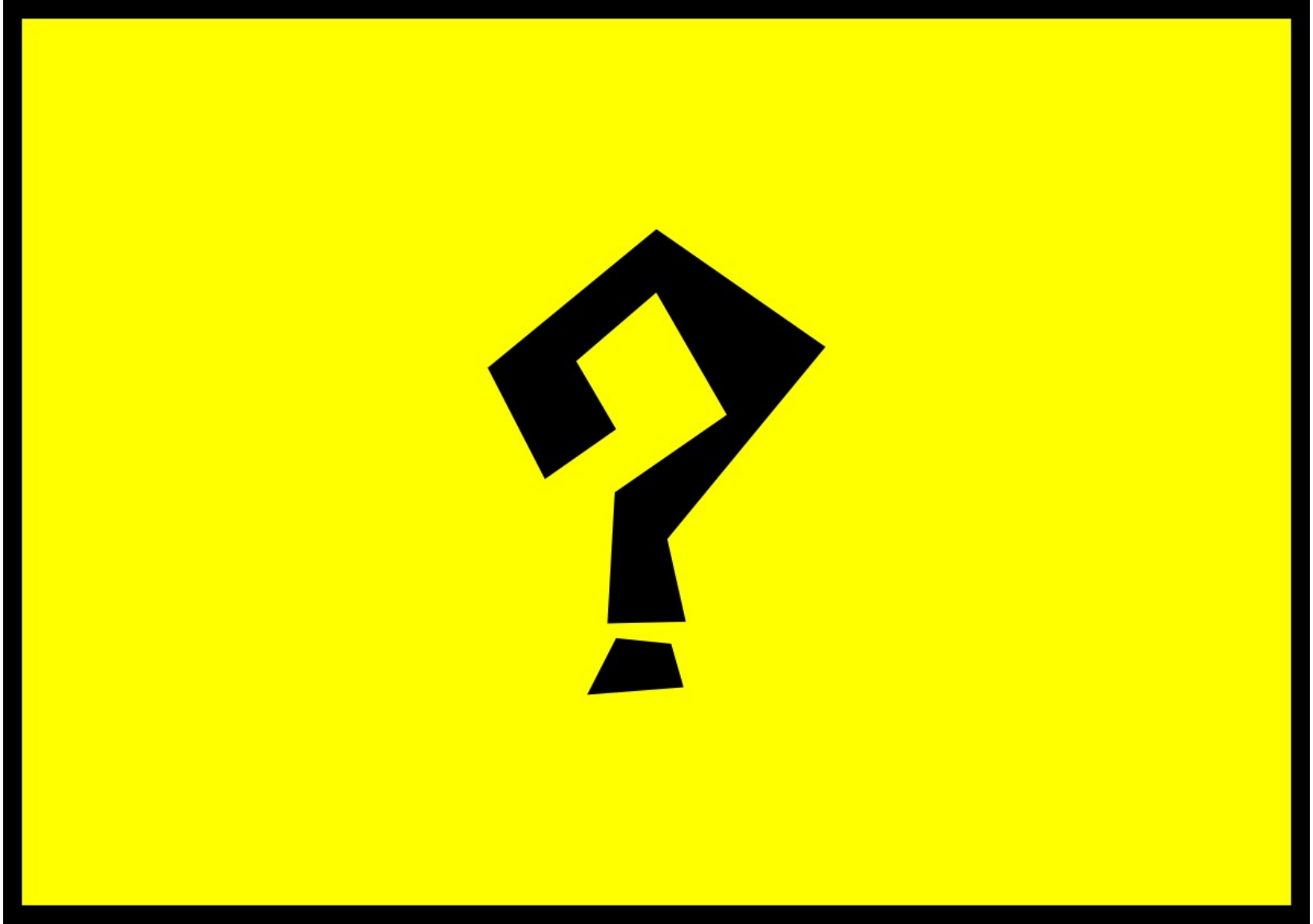


`/etc/NetworkManager/system-connections`

# ifconfig

```
eth0    Link encap:Ethernet  HWaddr 00:21:9b:dc:92:e3
        inet addr:31.57.8.165  Bcast:31.57.8.165  Mask:255.255.255.255
        inet6 addr: fe80::221:9bff:fedc:92e3/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:97954 errors:0 dropped:0 overruns:0 frame:0
        TX packets:111199 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:62633561 (62.6 MB)  TX bytes:17962820 (17.9 MB)
        Interrupt:17

lo      Link encap:Local Loopback
        inet addr:127.0.0.1  Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
        UP LOOPBACK RUNNING  MTU:16436  Metric:1
        RX packets:50038 errors:0 dropped:0 overruns:0 frame:0
        TX packets:50038 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:0
        RX bytes:7426580 (7.4 MB)  TX bytes:7426580 (7.4 MB)
```



# منابع

wikipedia.org

cisco.com

ralphb.net

blog.shafagh.com (سیسکو به پارسی)

Downloads>Routing

lpic (بهراد اسلامی فر) اسلاید

Topic109: Networking Fundamentals

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