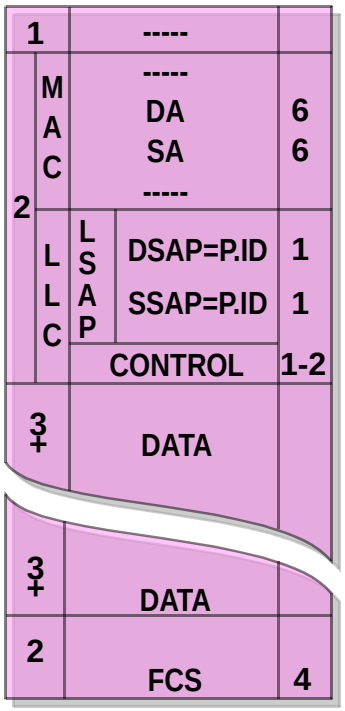
LAN FRAME FORMATS

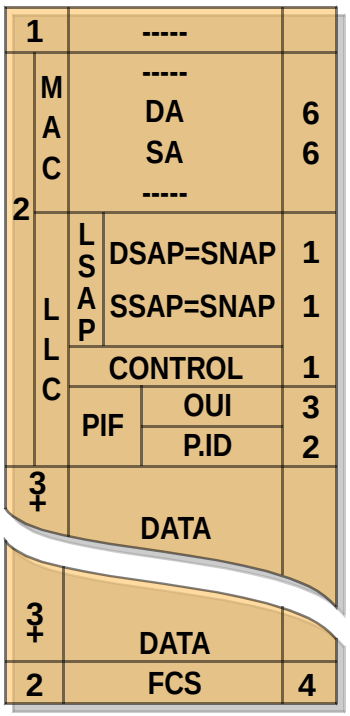
IEEE 802.2 - LLC (Logical link Control)



DSAP field (1byte)	SSAP field (1byte)
X X X X X X U I (LSB)	X X X X X X U C (LSB)
I = Group/Individual SAP 1 = Group SAP 0 = Individual SAP	C = Response/Command 1 = Response 0 = Command
U = Universal (IEEE 802)/User defined SAP 1 = Universal SAP 0 = User SAP	
X = Six bits used to define SAP codes	

LAN FRAME FORMATS

SNAP



- SNAP "opens" the frame for five additional bytes,
- the PIF = Protocol Information Field.

- PIF has two fields:

  - OUI - Organizationally Unique Identifier – 3 bytes

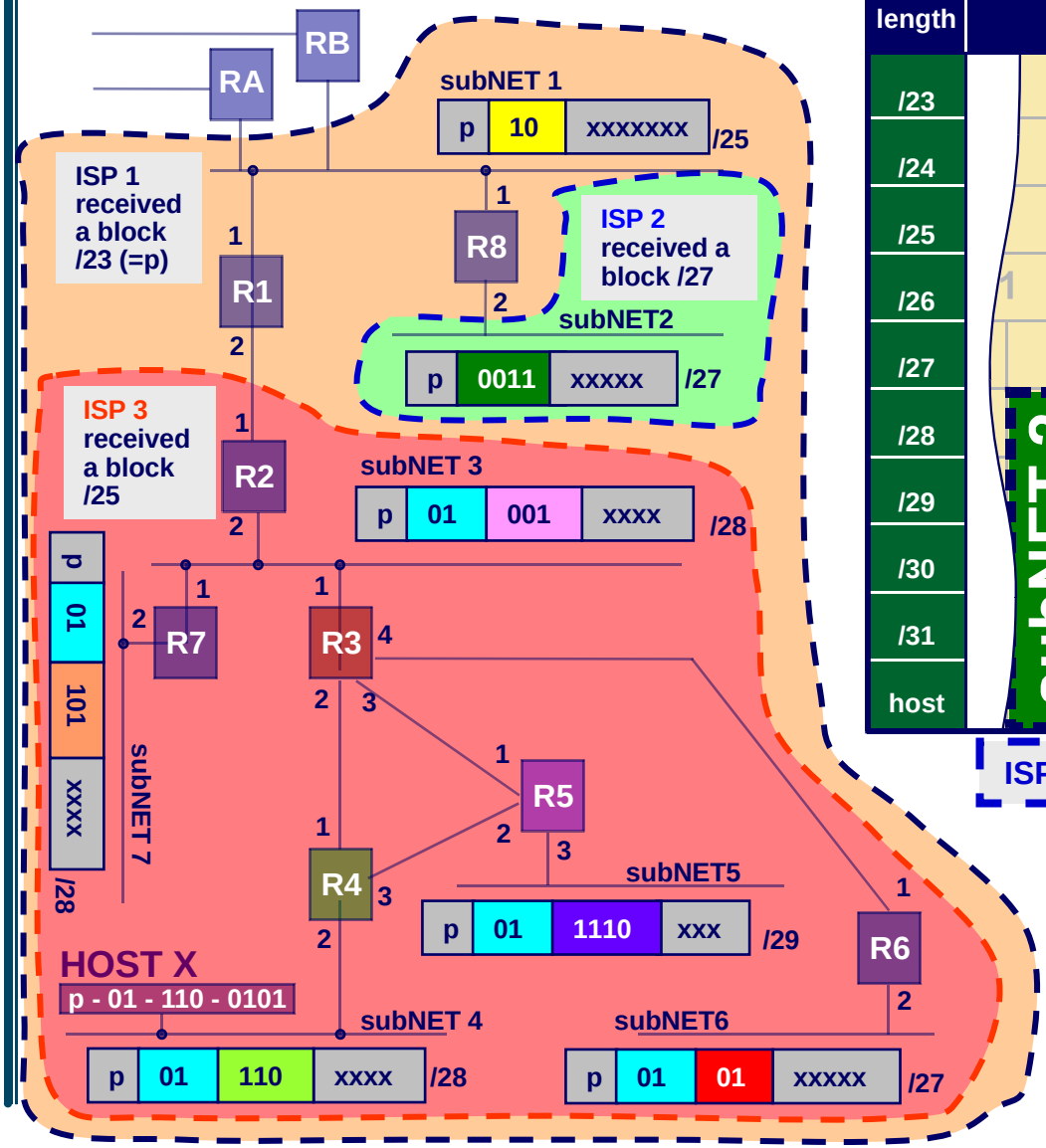
    - globally administrated by IEEE 802.2

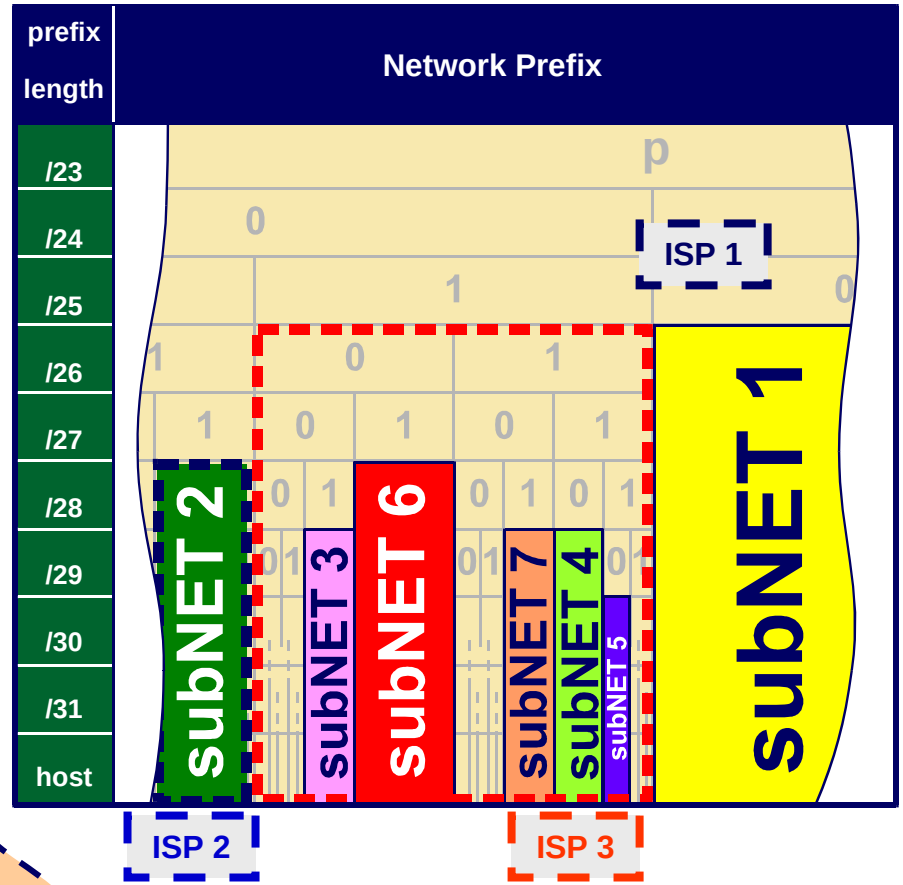
    - OUI 00-00-00 is reserved for use in "special" cases. (administrated by IETF - International Engineering Task Force)

  - P.ID - Protocol Identifier – 2 bytes

    - locally administrated by each organization having an OUI.

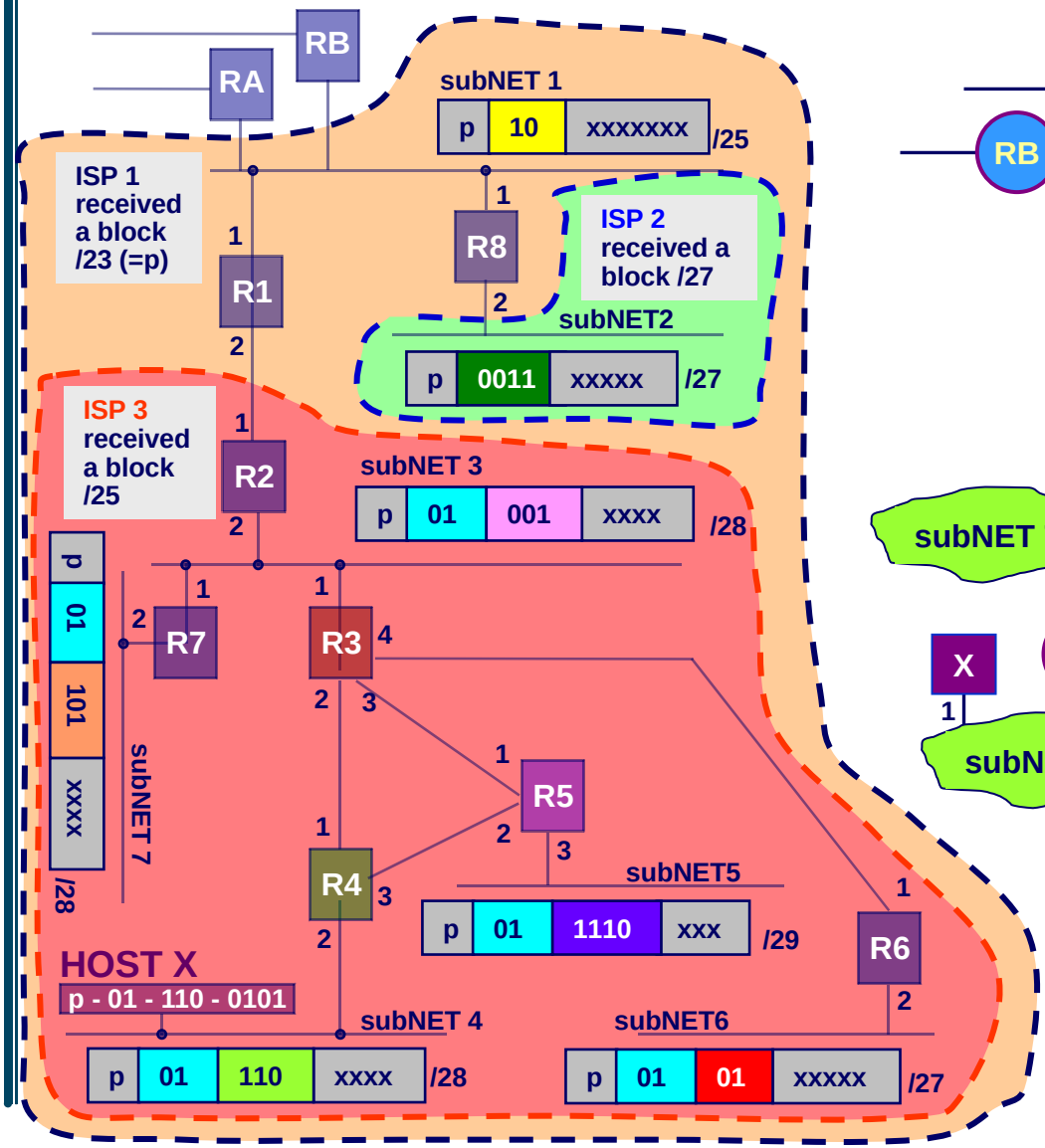
Routing Tables - Example: Class-less (CIDR) Environment

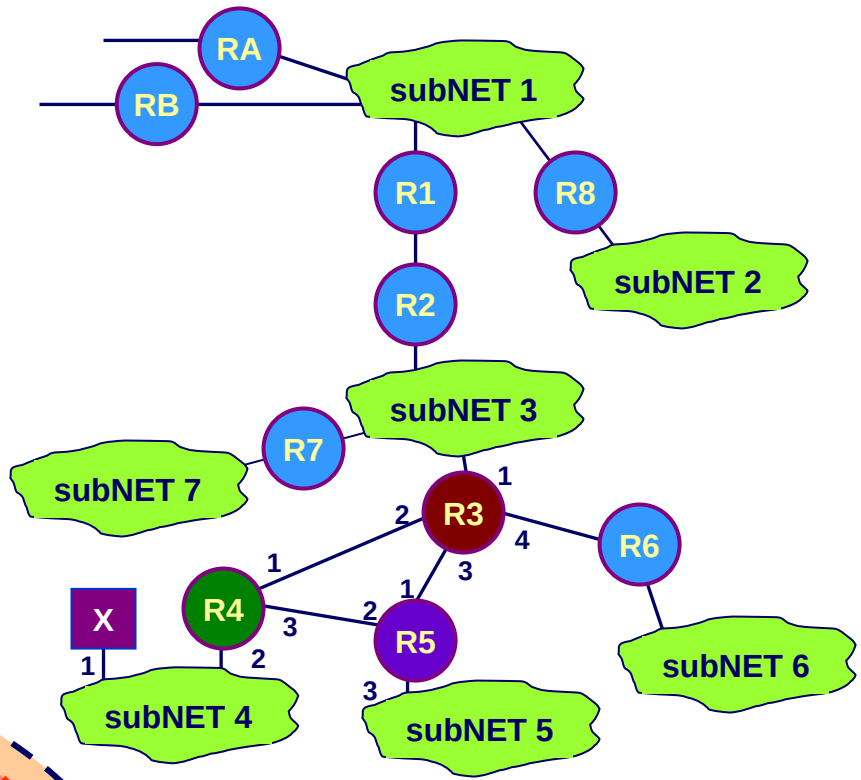




Routing Tables

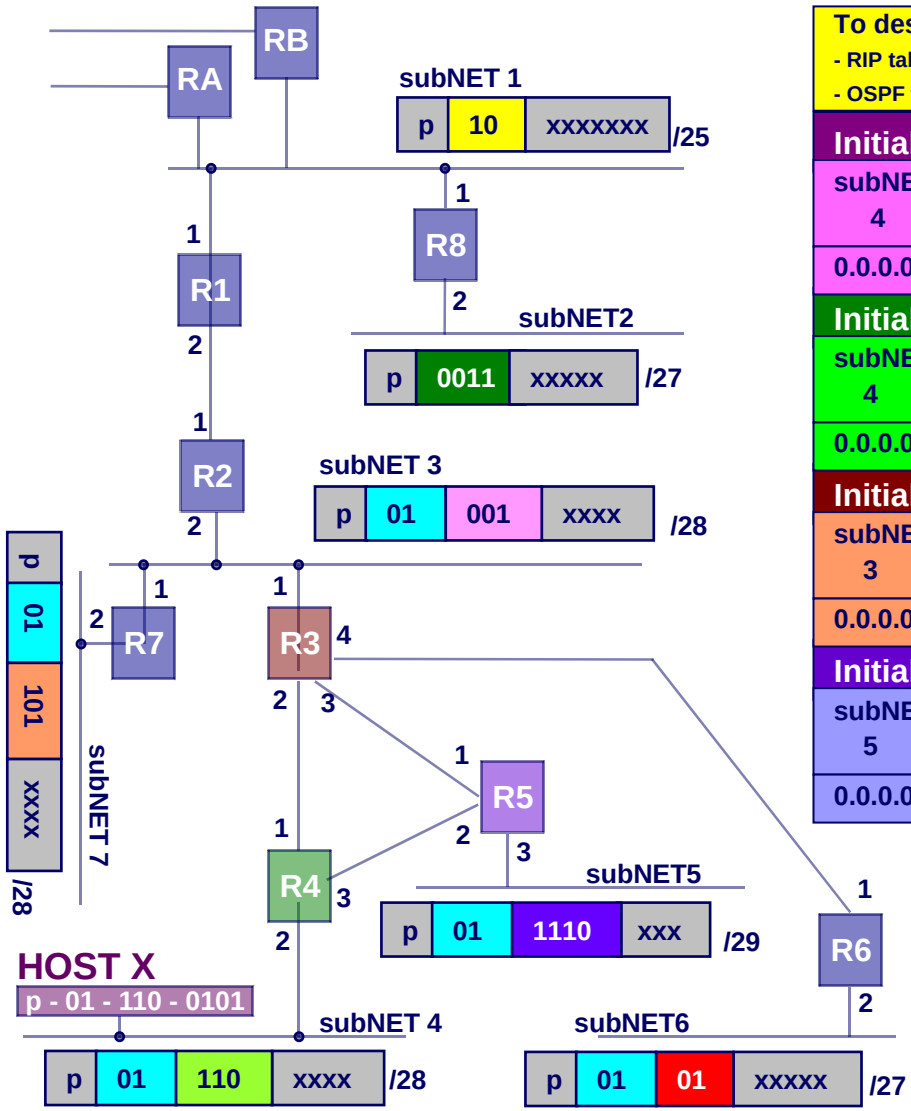
- Example: Class-less (CIDR) Environment





Routing Tables

- Example: Class-less (CIDR) Environment



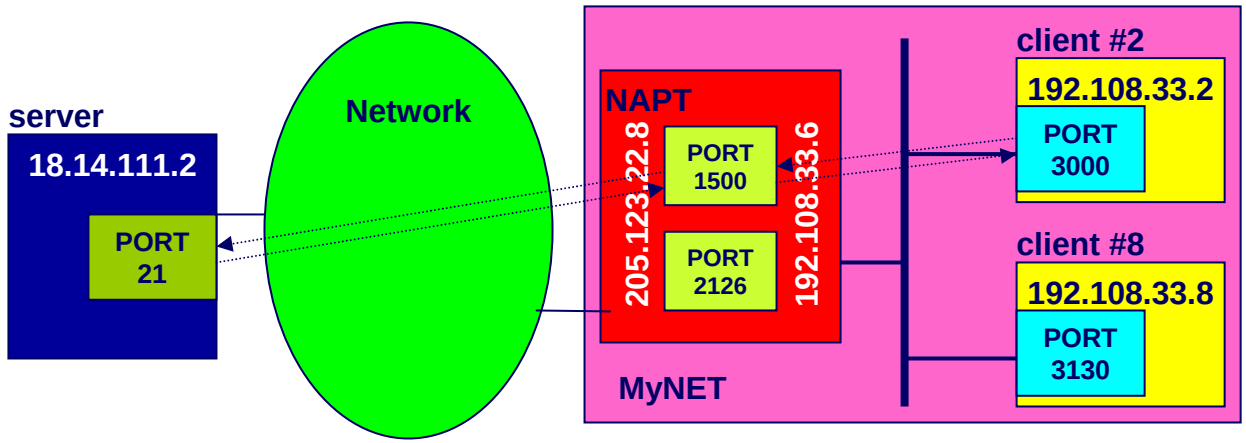
To destination - RIP tables do not include mask length - OSPF tables do include mask length	Deliver to router	Port	Nr. of hops
Initial table in Host X			
subNET 4 p 01 110 xxxx	-	X.1	0
0.0.0.0 (default)	R4	X.1	1
Initial table in R4			
subNET 4 p 01 110 xxxx	-	R4.2	0
0.0.0.0 (default)	R3	R4.1	1
Initial table in R3			
subNET 3 p 01 001 xxxx	-	R3.1	0
0.0.0.0 (default)	R2	R3.1	1
Initial table in R5			
subNET 5 p 01 1110 xxx	-	R5.3	0
0.0.0.0 (default)	R3	R5.1	1

Initial routing tables

LAYER 4 SWITCHING
NETWORK ADDRESS PORT TRANSLATION

Application #1
Net address translating

- NAPT allows the use of one single globally administrated IP address for multiple simultaneously active users
- NAPT allows changing of this unique address without having to modify every individual user's IP address (CIDR environment)
- NAPT identifies incoming packets based on their Layer 4 DESTINATION port



	Layer 4 PORT		Layer 3 ADDRESS		Layer 2 ADDRESS	
	dest.	source	dest.	source	dest.	source
client #2 to NAPT	21	3000	18.14.111.2 (blue)	192.108.33.2 (yellow)	NAPT (red)	client #2 (yellow)
NAPT to server	21	1500	18.14.111.2 (blue)	205.123.22.8 (red)	...	...
server to NAPT	1500	21	205.123.22.8 (red)	18.14.111.2 (blue)	...	...
NAPT to client #2	3000	21	192.108.33.2 (yellow)	18.14.111.2 (blue)	client #2 (yellow)	NAPT (red)