6ta Clase 19/4/2022

75.43 Introducción a los Sistemas Distribuidos
73.33 Redes y Teleprocesamientos I
TA048 Redes

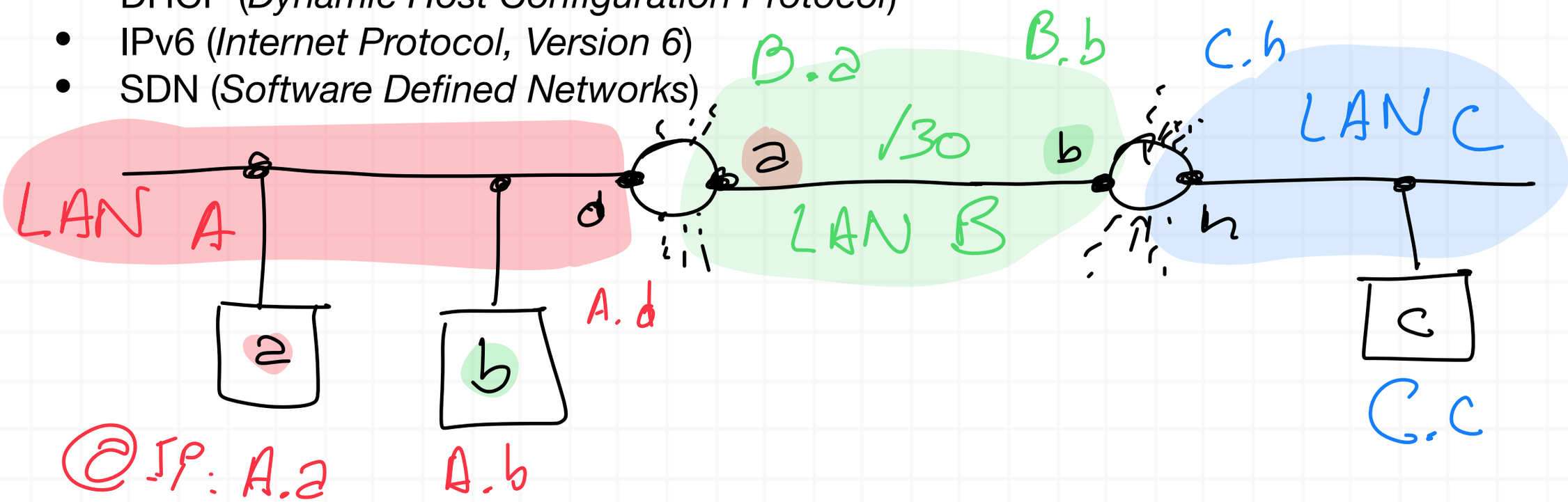
Tema: Capa de Red (II)

*D*esde *4.3.3 IPv4 Addressing* hasta el final del capítulo de *Computer Networking : A Top-Down Approach. James Kurose and Keith Ross. Publisher: Pearson Edition: 7th, 2016.*

Dr. Ing. J. Ignacio Alvarez-Hamelin

Clase de hoy

- Enrutamiento sin clases: Subredes
- DHCP (*Dynamic Host Configuration Protocol*)
- IPv6 (*Internet Protocol, Version 6*)
- SDN (*Software Defined Networks*)



A.a & máscara → Red(A.a) = LAN A

157.92.58.2 & /16 → 157.92.0.0 Alejado de UBA

& /26 → 157.92.58.0 en UBA

255.255.255.1100 0000 → /26

255.255.255.1111 1100 → /30

00 00 0000
01
10
11 11 1111

Conf. Mínima

Capa de red

- @IP
- máscara
  - → @red
  - → @host
  - → @broadcast
- tabla de rutas (Default Gateway)

DHCP

Nombre

- DNS primario, secundario, ...
- dominio
- nombre del host

cnet.fi.upv.es

host: cnet

dominio: fi.upv.es

Fragm. [MTU (maximum transfert unit)

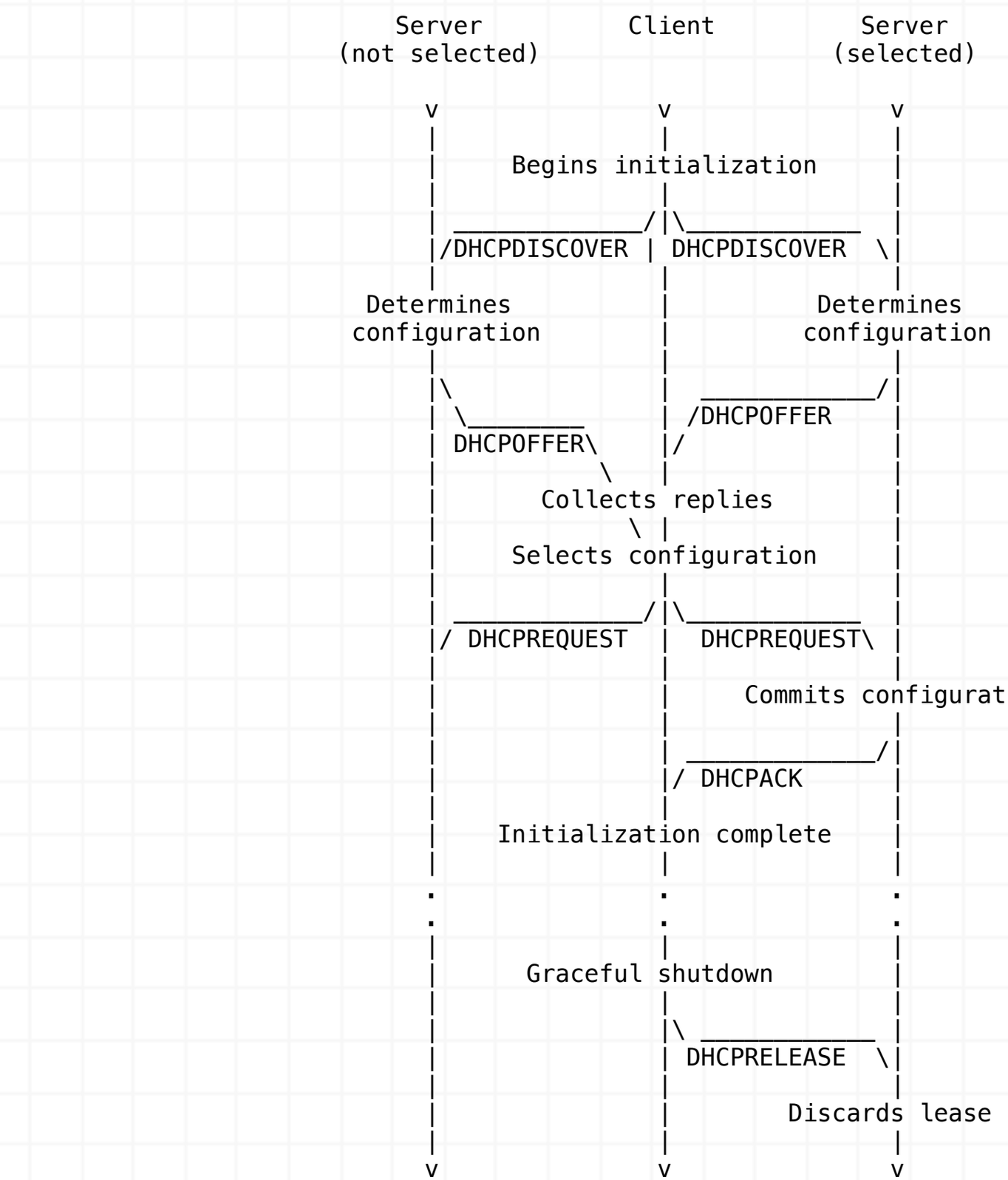
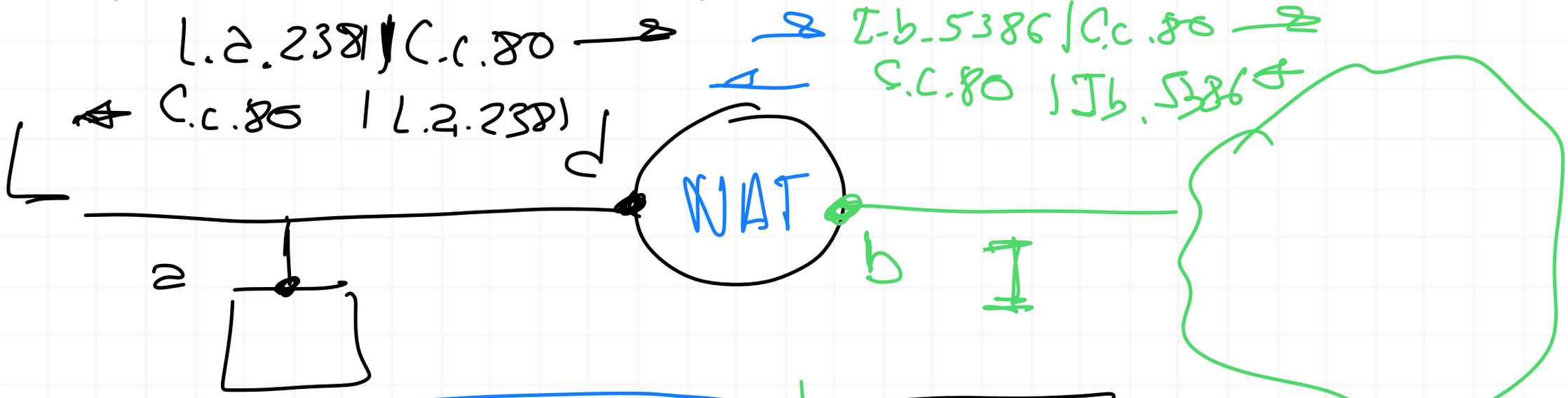


Figure 3: Timeline diagram of messages exchanged between DHCP client and servers when allocating a new network address

NAT (*Network Address Translation*), una **middlebox**



Origen		Origen		Destino	
IP	Port	IP	Port	IP	Port
1.2	2381	I.b	5386	C.c	80

IPv6 (*Internet Protocol, Version 6*)

¡motivación principal!

- Falta de direcciones

- Encabezados modulares

- Fragmentación prohibido en *routers* (sólo los extremos pueden hacerlo)

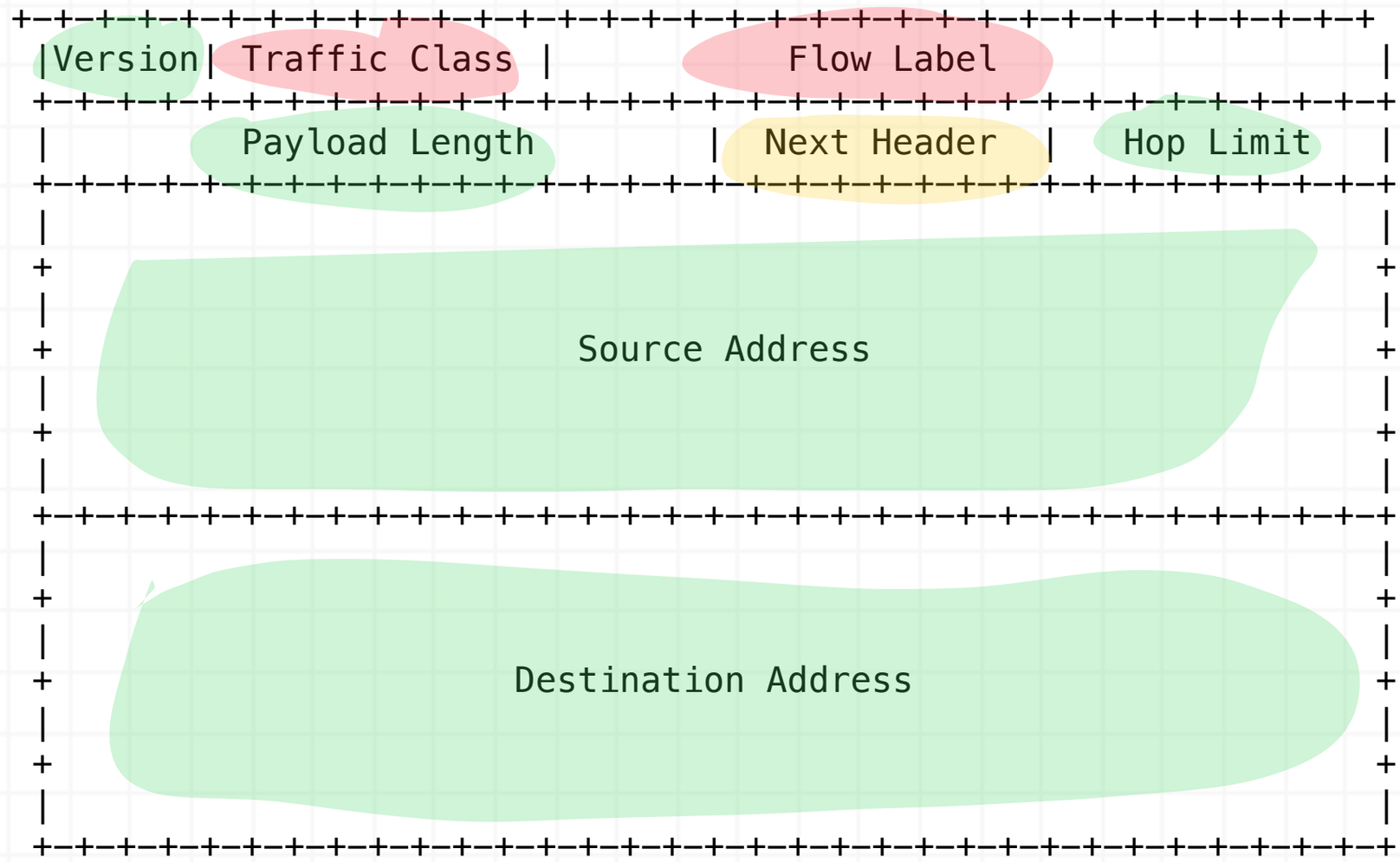
- Auto-configuración?

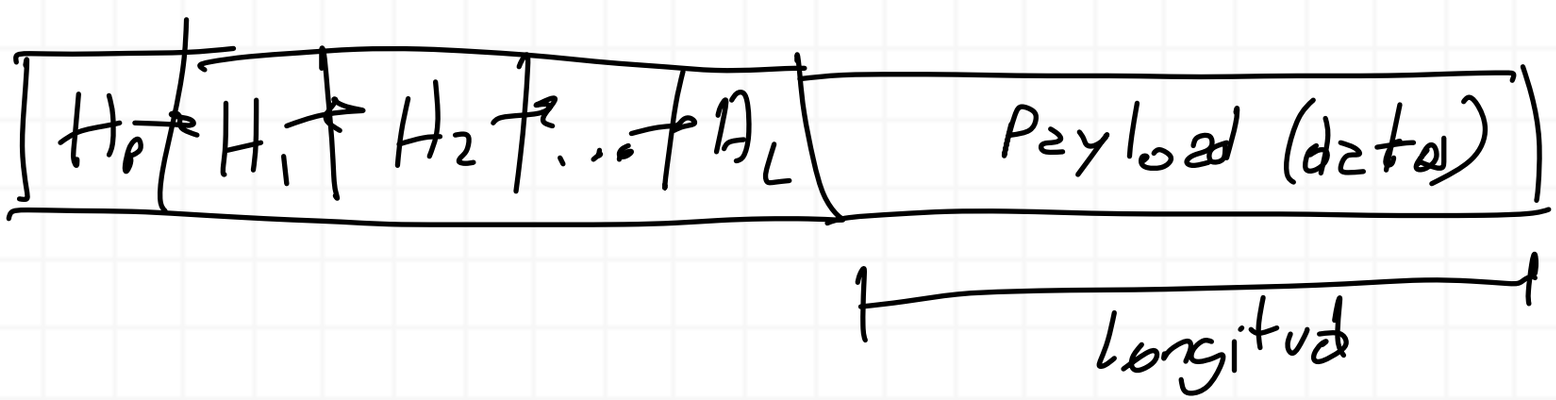
- Tratamiento diferenciado de flujos

- Sin checksum

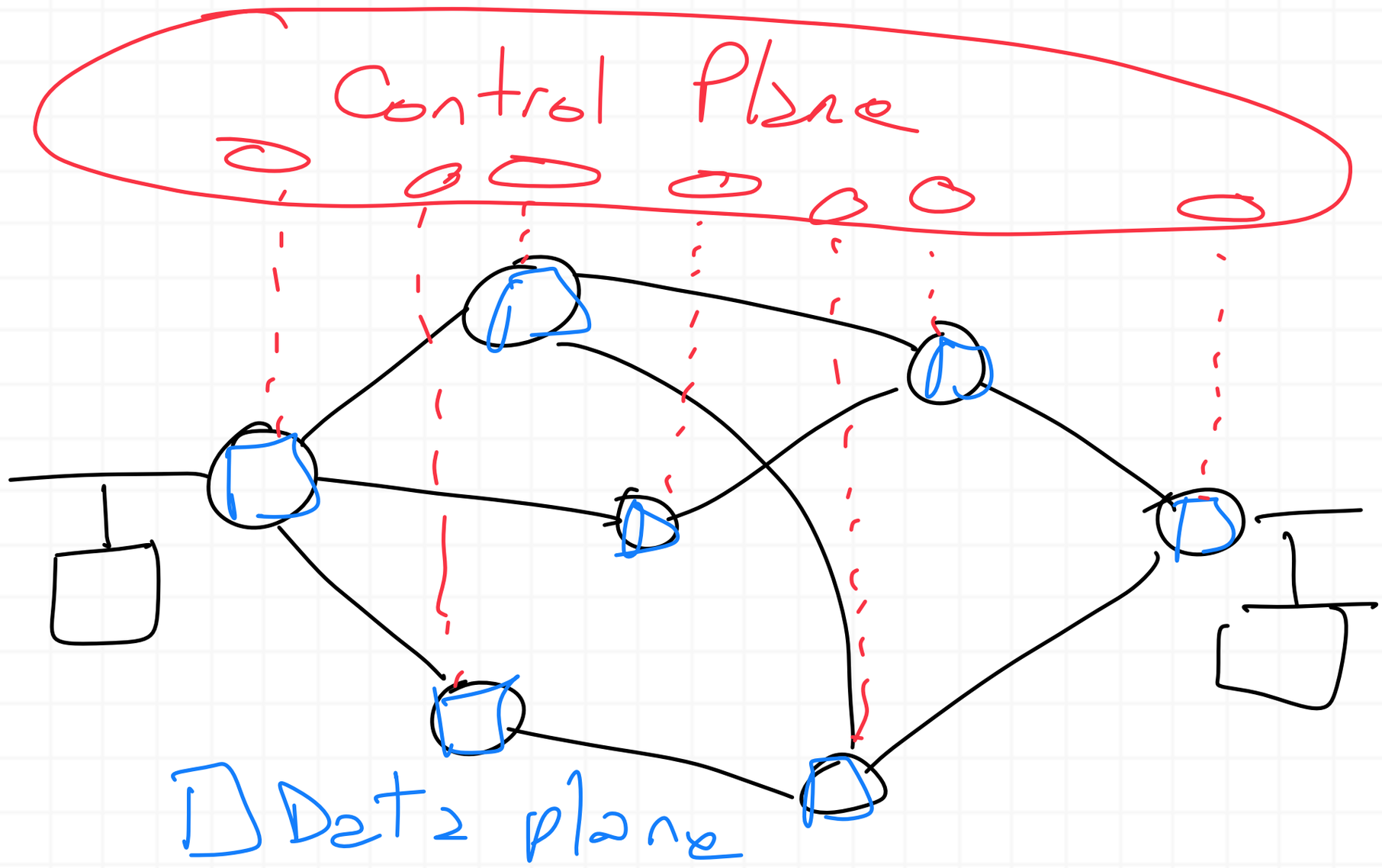
Ver aquí la realidad sobre IPv6

3. IPv6 Header Format





SDN (*Software Defined Networks*)



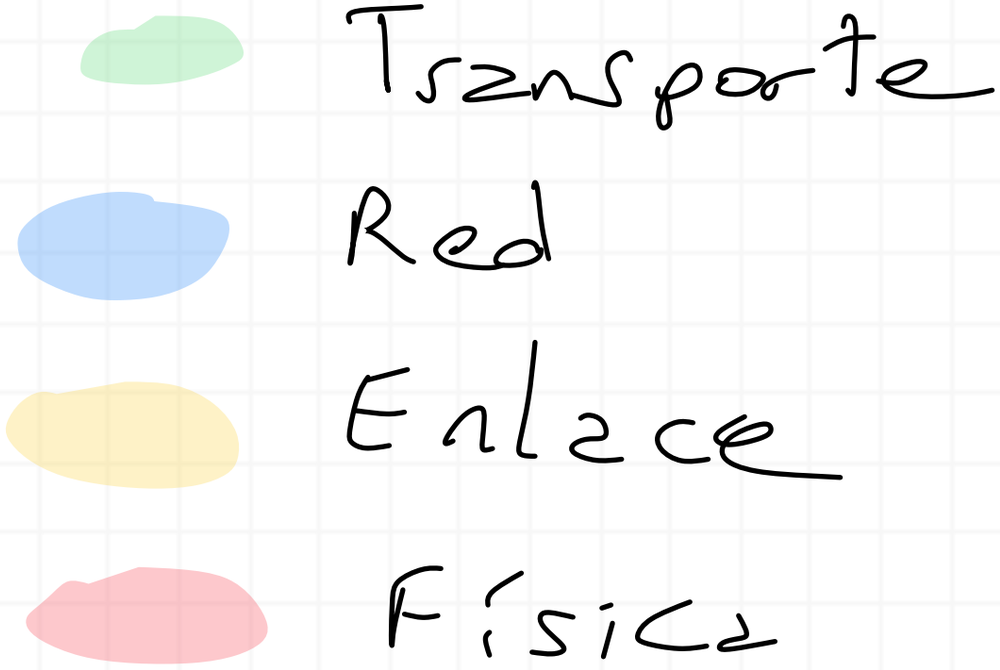
Ingress Port	Ether source	Ether dst	Ether type	VLAN id	VLAN pri-or-ity	IP src	IP dst	IP proto	IP ToS bits	TCP/ UDP src port	TCP/ UDP dst port

Table 2: Fields from packets used to match against flow entries.

Extraída de: https://opennetworking.org/wp-content/uploads/2013/04/openflow-spec-v1.0.0.pdf

TCAM (Ternary Contente Addressable Memory)

"Content-Addressable Memory (CAM) Circuits and Architectures: A Tutorial and Survey"



Middle boxes

- NAT (Network Address Translation)
- Firewalls
- DPI (Deep Packet Inspection)
- IDS (Intrusion Detection System)

Lectura para la próxima clase:
Capítulo 5, desde el inicio hasta el apartado ***5.3 Intra-AS Routing in the Internet: OSPF*** inclusive.