Redes de Computadores – RECO

Introducción a Routers y protocolos ICMP y ARP

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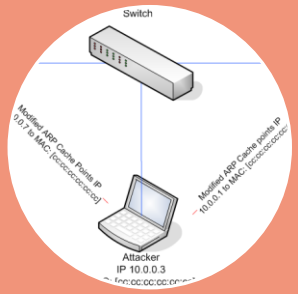
ESCUELA COLOMBIANA DE INGENIERÍA JULIO GARAVITO

AGENDA

Routers

Protocolo ICMP



Protocolo ARP

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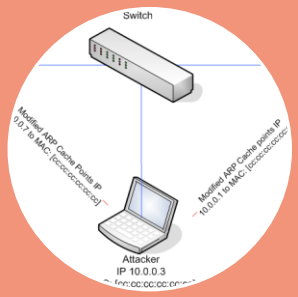
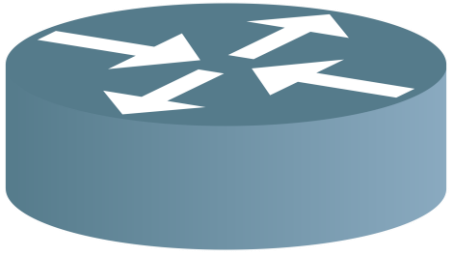


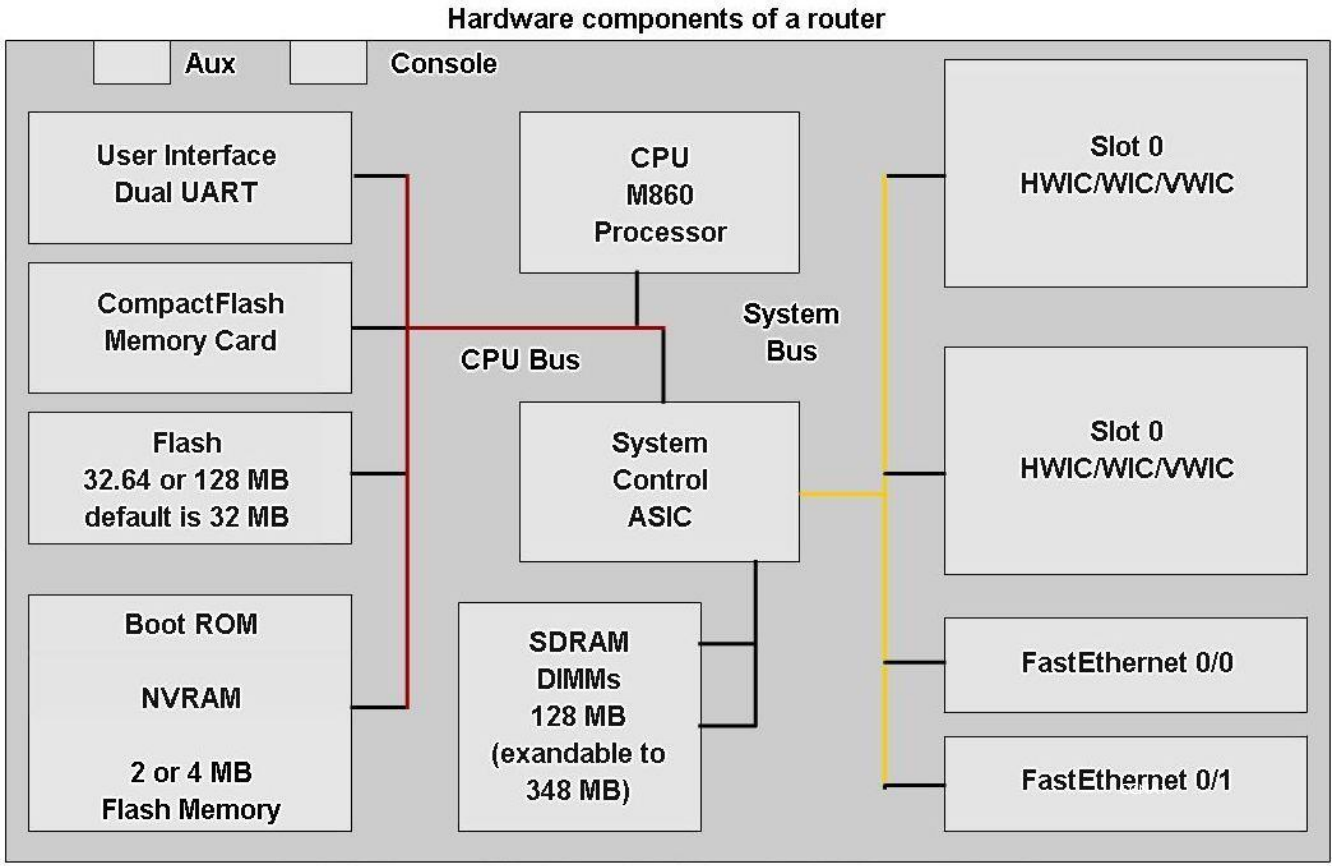
Protocolo ARP

ROUTERS

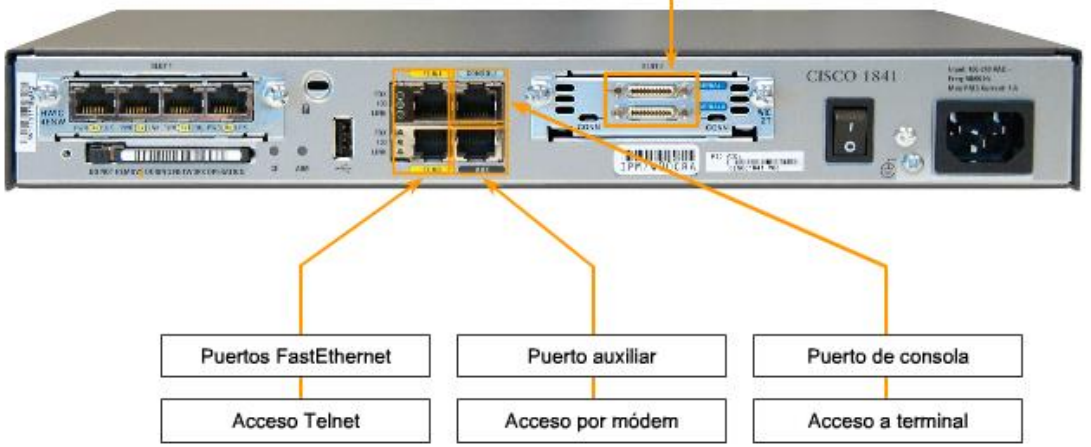
- Arranque del router
- Archivos de configuración
- Niveles de privilegios del IOS
- Comandos



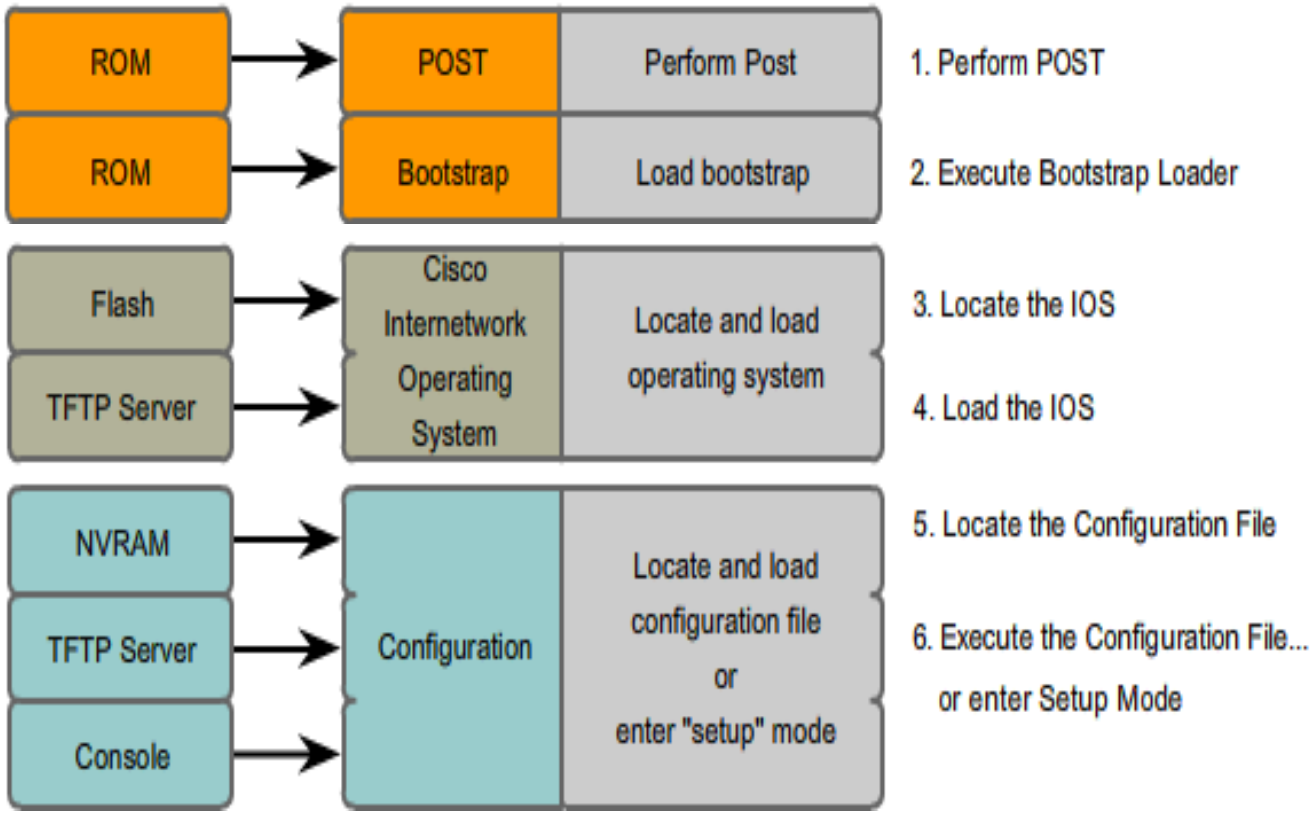
COMPONENTES DE UN ROUTER



COMPONENTES DE UN ROUTER

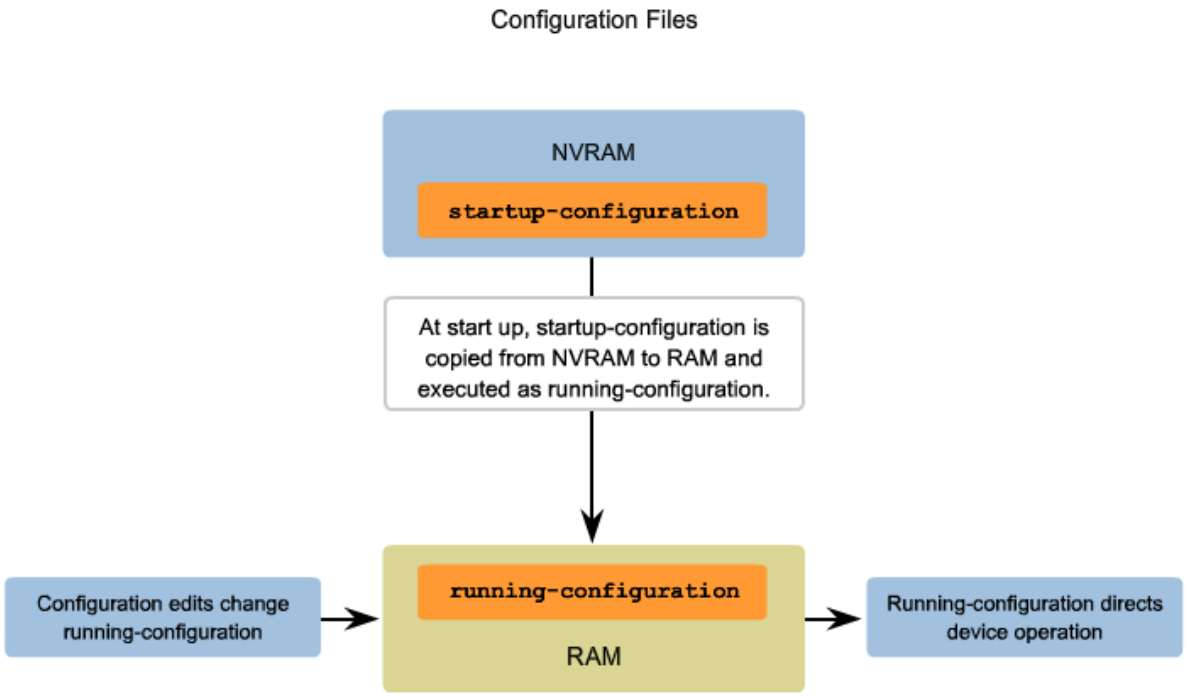


ARRANQUE DEL ROUTER



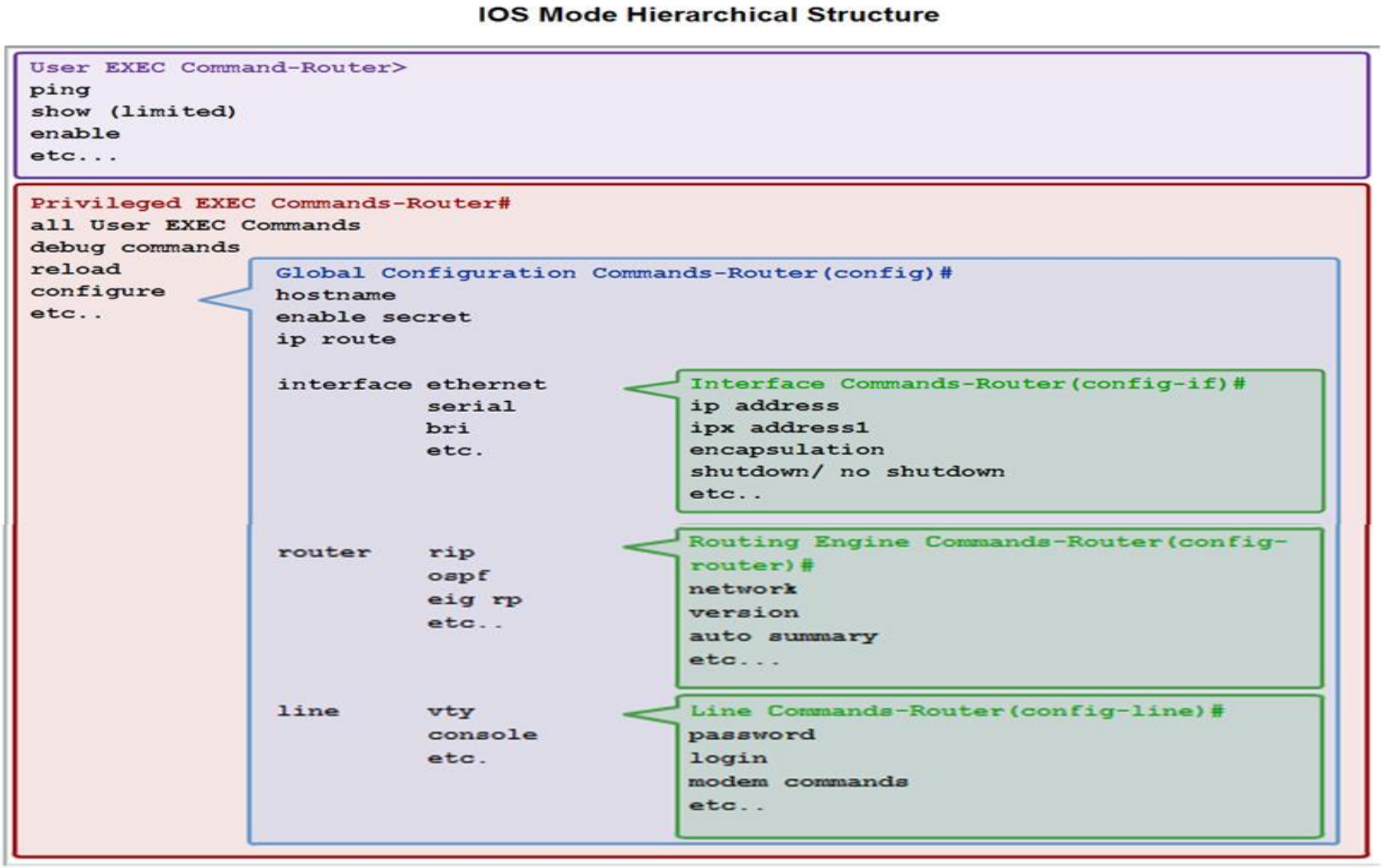
Fuente: CCNA2 Exploration

ARCHIVOS DE CONFIGURACIÓN



Fuente: CCNA2 Exploration

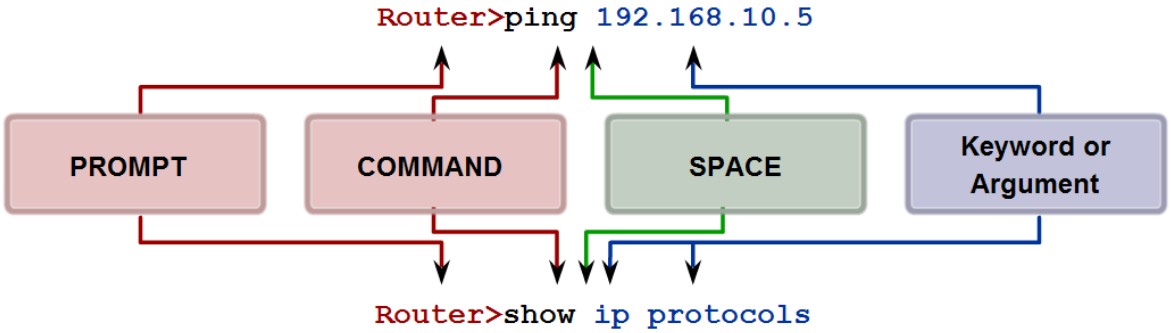
NIVELES DE PRIVILEGIOS DEL IOS



Fuente: CCNA2 Exploration

ESTRUCTURA DE LOS COMANDOS DEL IOS

Basic IOS Command Structure



Prompt commands are followed by a space and then the keyword or arguments.

Fuente: CCNA2 Exploration

CONFIGURACIÓN BÁSICA

- Nombre del router
- Banner (Aviso antes de ingresar al router)
- Passwords
- Configuración de las interfaces

Importante

- Verificar configuración y funcionamiento
- Grabar la configuración

COMANDOS BÁSICOS

Basic Router Configuration Command Syntax	
Naming the router	`Router(config)#hostname name`
Setting Passwords	`Router(config)#enable secret password`
	`Router(config)#line console 0`
	`Router(config-line)#password password`
	`Router(config-line)#login`
	`Router(config)#line vty 0 4`
	`Router(config-line)#password password`
	`Router(config-line)#login`
Configuring a message-of-the-day banner	`Router(config)#banner motd # message #`

Fuente: CCNA2 Exploration

COMANDOS BÁSICOS

Basic Router Configuration Command Syntax	
Configuring an interface	`Router(config)#interface type number`
	`Router(config-if)#ip address address mask`
	`Router(config-if)#description description`
	`Router(config-if)#no shutdown`
Saving changes on a router	`Router#copy running-config startup-config`
Examining the output of **show** commands	`Router#show running-config`
	`Router#show ip route`
	`Router#show ip interface brief`
	`Router#show interfaces`

Fuente: CCNA2 Exploration

COMANDOS BÁSICOS

- Borrar la configuración del router

  # Erase startup-config

  # Reload

- Buscar comandos disponibles en cualquier modo

  # ?

- No revisar configuración remota

  # no ip domain-lookup (no dns. En modo config)

- Grabar la configuración

  # copy running-config startup-config

- Sincronizar la línea de comandos y los mensajes del router

  # line console 0 | VTY 0 4

  # loggin synchronous (los mensajes de consola no estorben el comando)

OTROS COMANDOS

Comandos para revisar configuración

```
# show ip interface brief
# show controllers interface
# debug ip route
# Show running-config
# Show startup-config
# Show interface interface slot/puerto
# debug ip route
# undebug ip route | all
```

ALGUNAS PRECISIONES

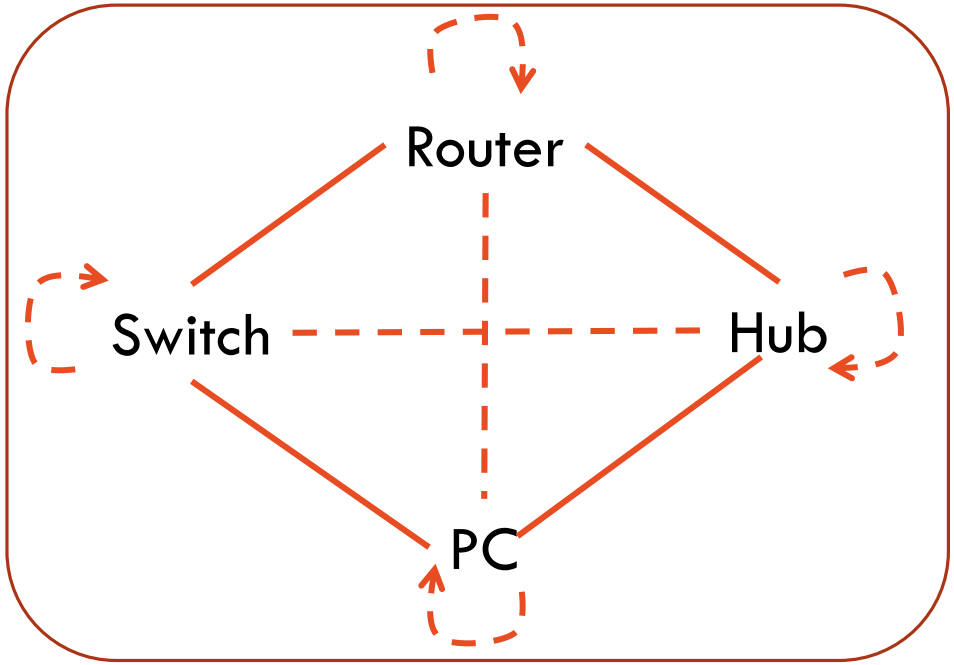
Conexiones Seriales

- Cable V.35

- Conexión router a la WAN

- Requiere sincronización
  - DTE – Data Terminal Equipment
  - DCE – Data Comunication Equipment

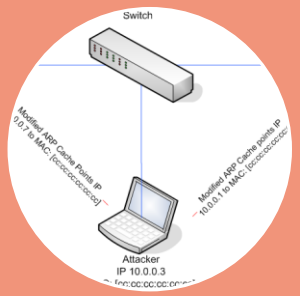
INTERCONEXIÓN DE EQUIPOS



AGENDA

Routers

Protocolo ICMP



Protocolo ARP

INTERNET PROTOCOL (IP)
ICMP

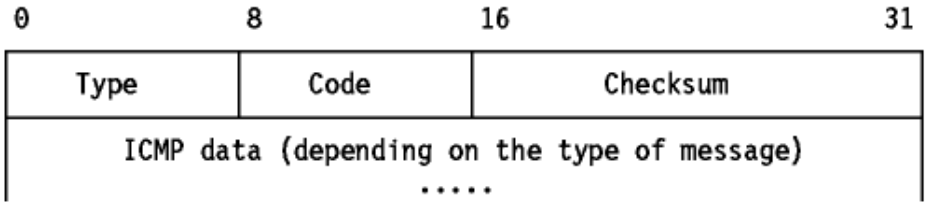
INTERNET PROTOCOL (IP)
ICMP

- Internet Control Protocol
- Proporciona información de control sobre la subred
- RFC 792, 1885
- Se utiliza el paquete IP básico y los primeros bytes de datos son el mensaje ICMP
- Dependiendo de lo que digan los primeros bits del mensaje ICMP, se leen los demás bits de datos

INTERNET PROTOCOL (IP)
ICMP

ICMP Type	Code	Description
0	0	echo reply (to ping)
3	0	destination network unreachable
3	1	destination host unreachable
3	2	destination protocol unreachable
3	3	destination port unreachable
3	6	destination network unknown
3	7	destination host unknown
4	0	source quench (congestion control)
8	0	echo request
9	0	router advertisement
10	0	router discovery
11	0	TTL expired
12	0	IP header bad

Figure 4.23 ♦ ICMP message types



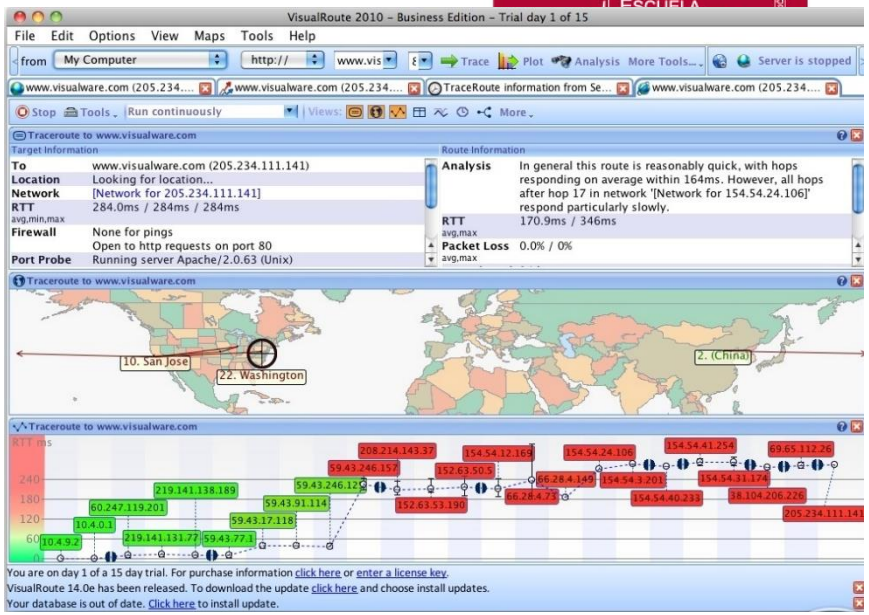
http://ditec.um.es/laso/docs/tut-tcpip/3376c24.html

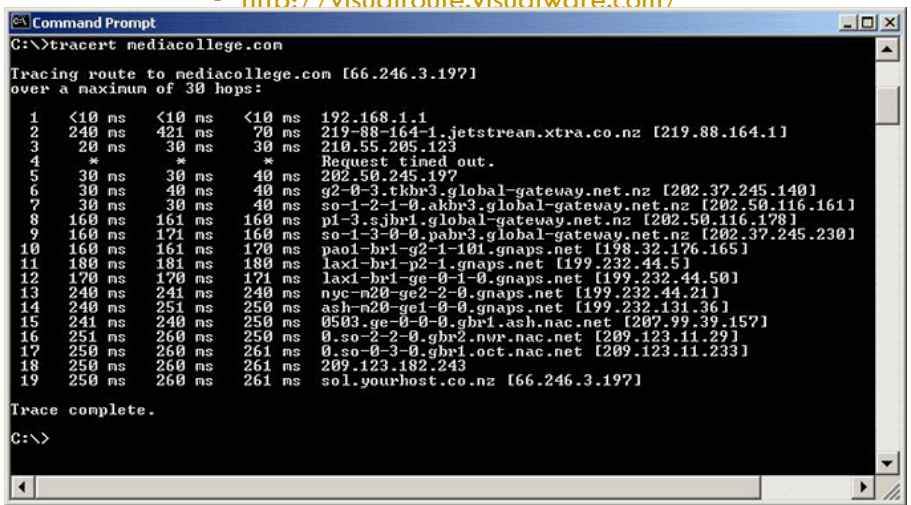
INTERNET PROTOCOL (IP) ICMP

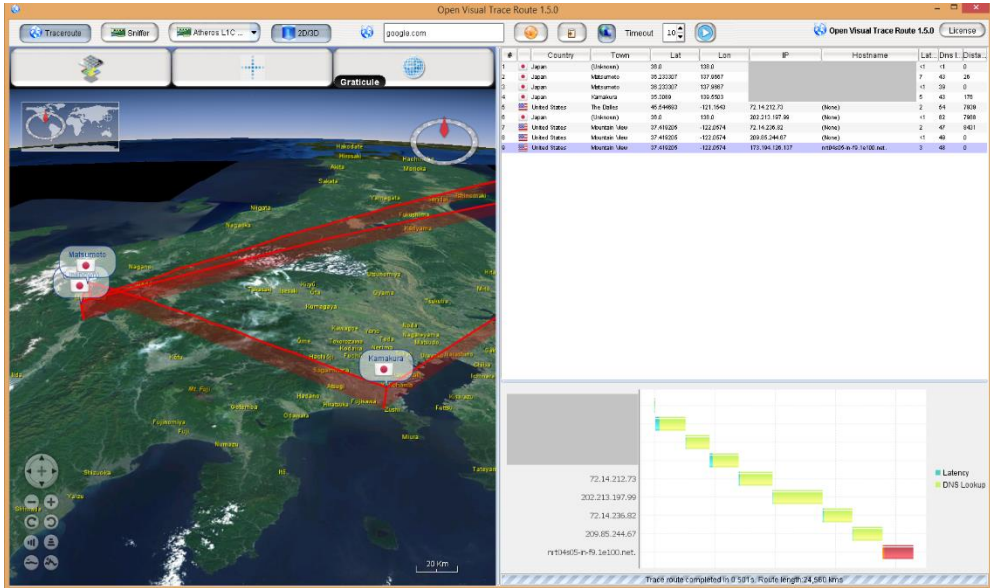
Ping

Tracert – traceroute

- Visual Trace Route Tool.
  - http://www.sarangworld.com/TRACEROUTE/
  - http://sourceforge.net/projects/openvisualtrace/
  - http://www.yougetsignal.com/tools/visual-tracert/
  - http://www.monitis.com/traceroute/
  - http://visualroute.visualware.com/







INTERNET PROTOCOL (IP)
ADMINISTRACIÓN DE LA SUBRED

Verificar el estado

Informar si hay problemas

Mirar rutas

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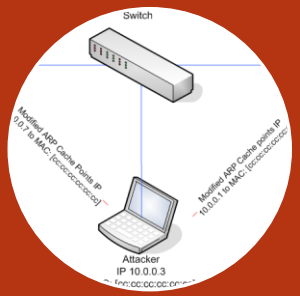

Protocolo ARP

RELACIÓN DIRECCIONES DE NIVEL DE ENLACE Y RED

Direcciones MAC y Direcciones IP

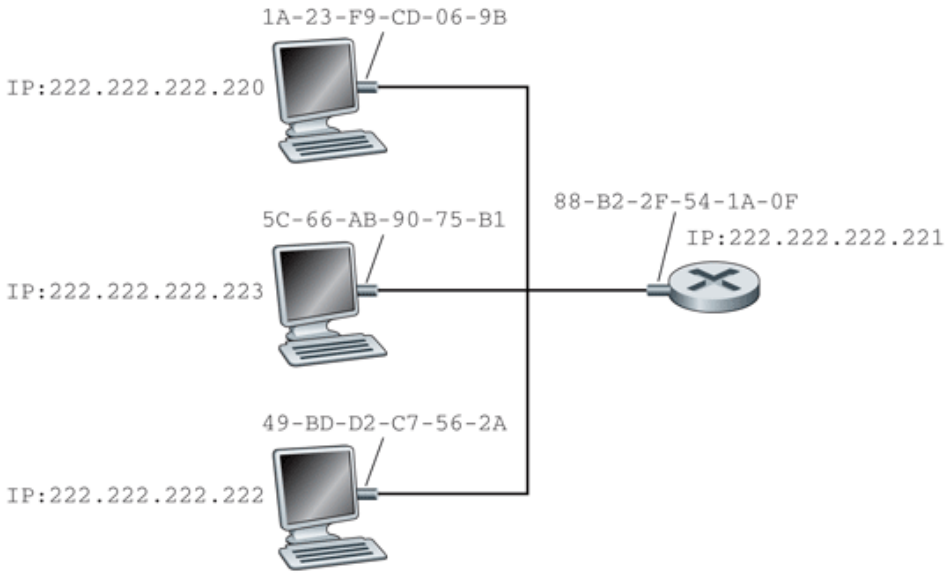

Figure 5.17 ♦ Each node on a LAN has an IP address, and each node's adapter has a MAC address.

Computer Networking: A Top-Down Approach, 4/E. **James F. Kurose**, **Keith W. Ross**,

RELACIÓN DIRECCIONES DE NIVEL DE ENLACE Y RED

Address Resolution Protocol - ARP

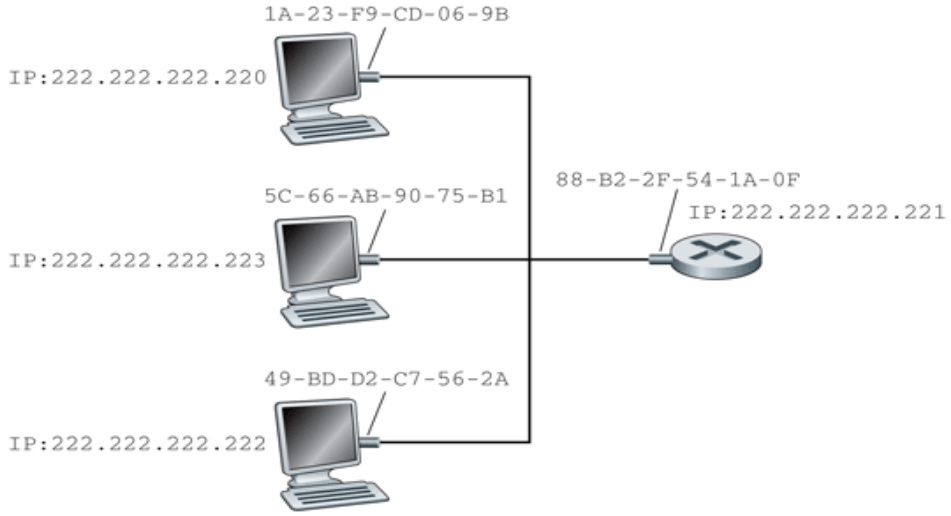

Figure 5.17 ♦ Each node on a LAN has an IP address, and each node's adapter has a MAC address.

IP Address	MAC Address	TTL
222.222.222.221	88-B2-2F-54-1A-0F	13:45:00
222.222.222.223	5C-66-AB-90-75-B1	13:52:00

Figure 5.18 ♦ A possible ARP table in node 222.222.222.220

RELACIÓN DIRECCIONES DE NIVEL DE ENLACE Y RED

Address Resolution Protocol - ARP

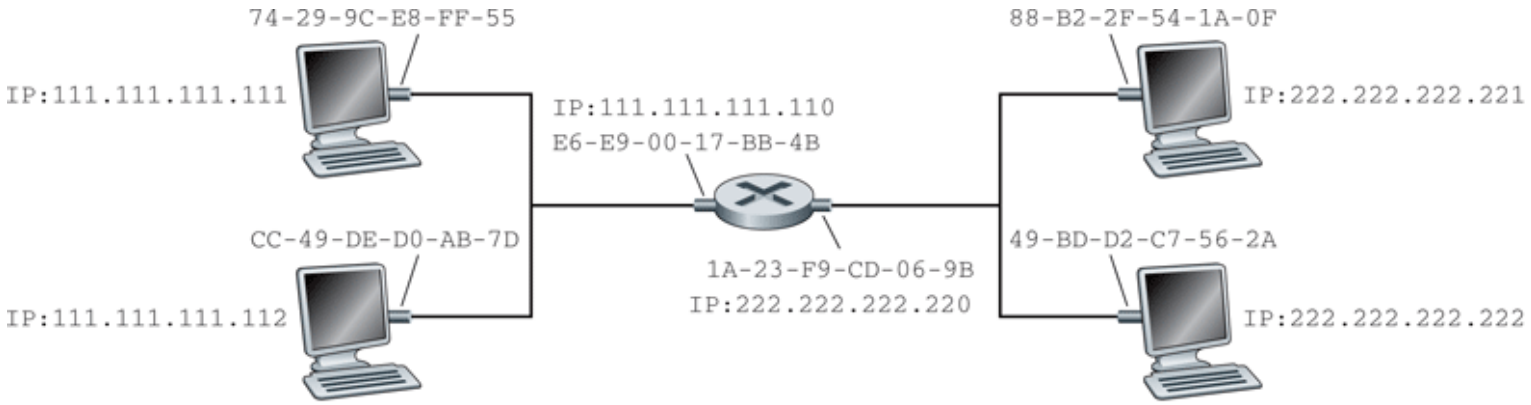

Figure 5.19 ♦ Two subnets interconnected by a router

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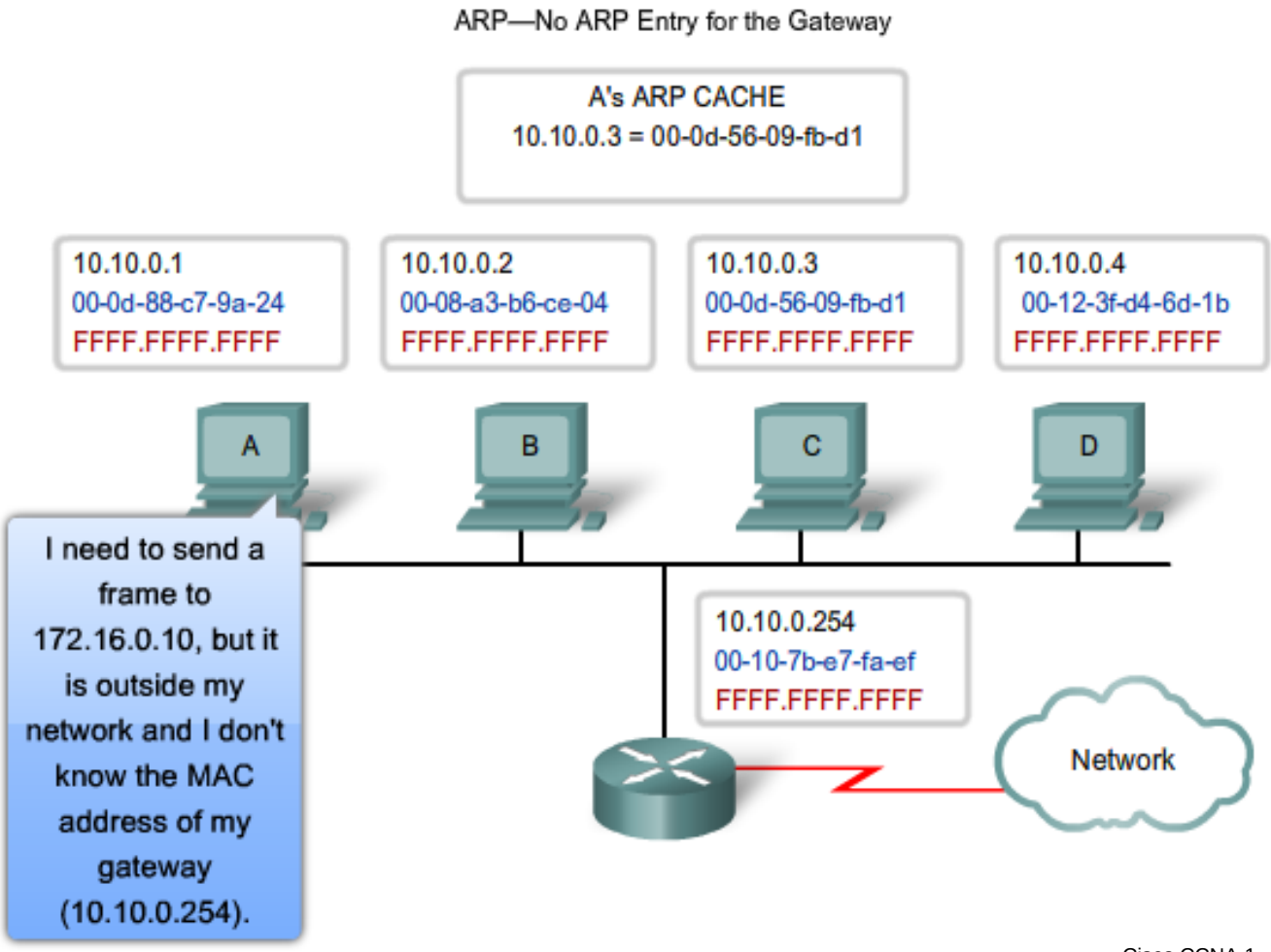
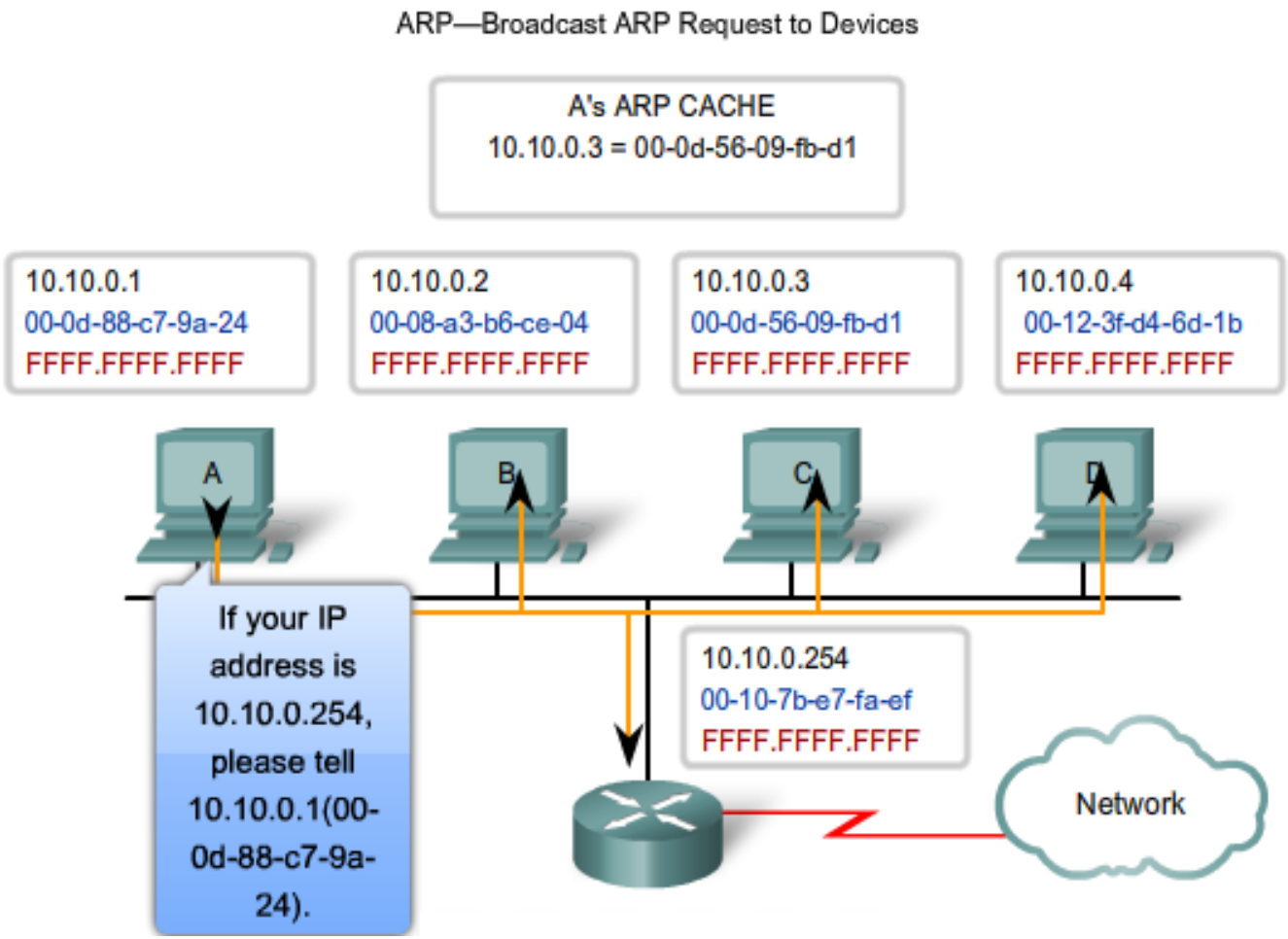
RELACIÓN DIRECCIONES DE NIVEL DE ENLACE Y RED



RELACIÓN DIRECCIONES DE NIVEL DE ENLACE Y RED



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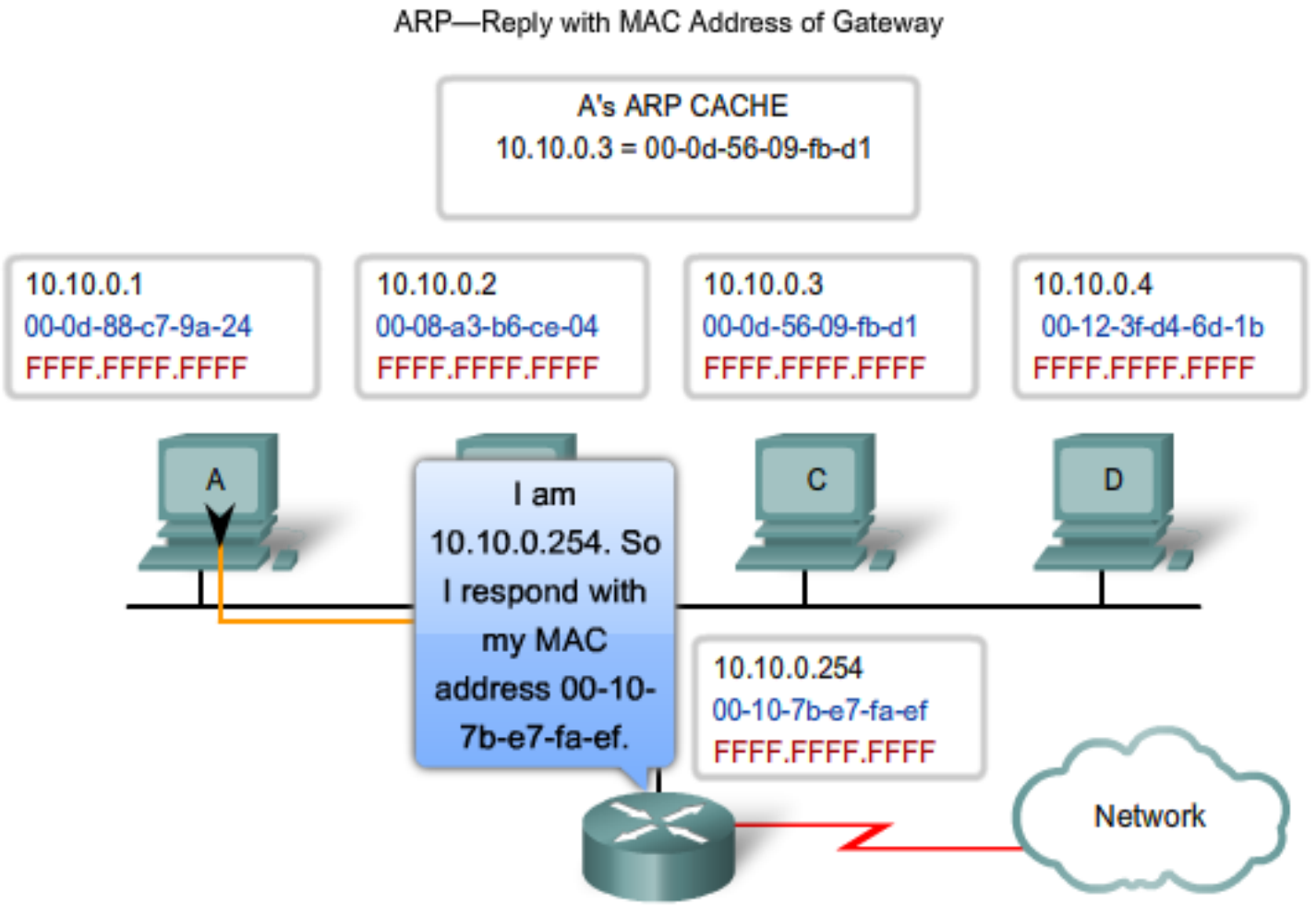

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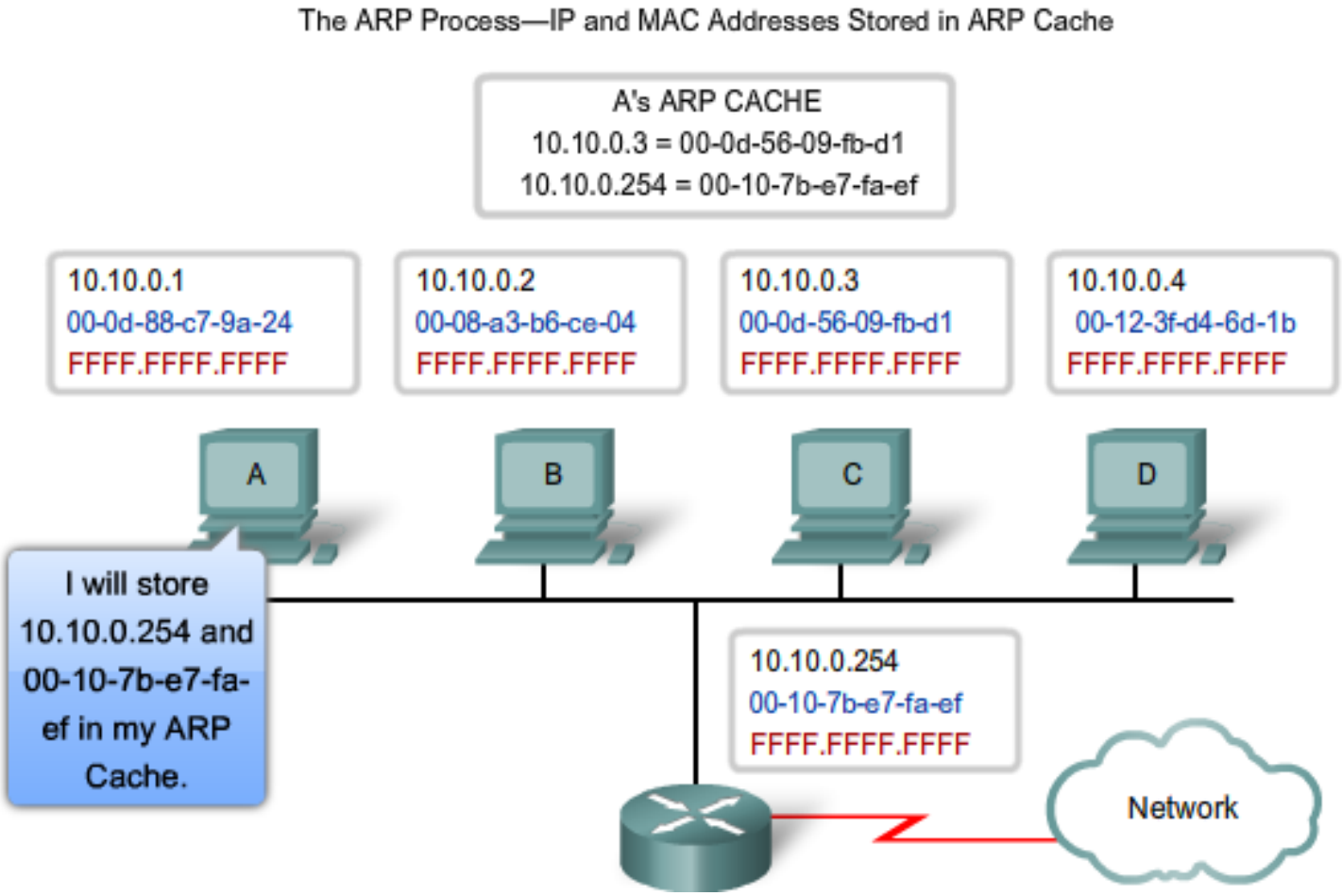

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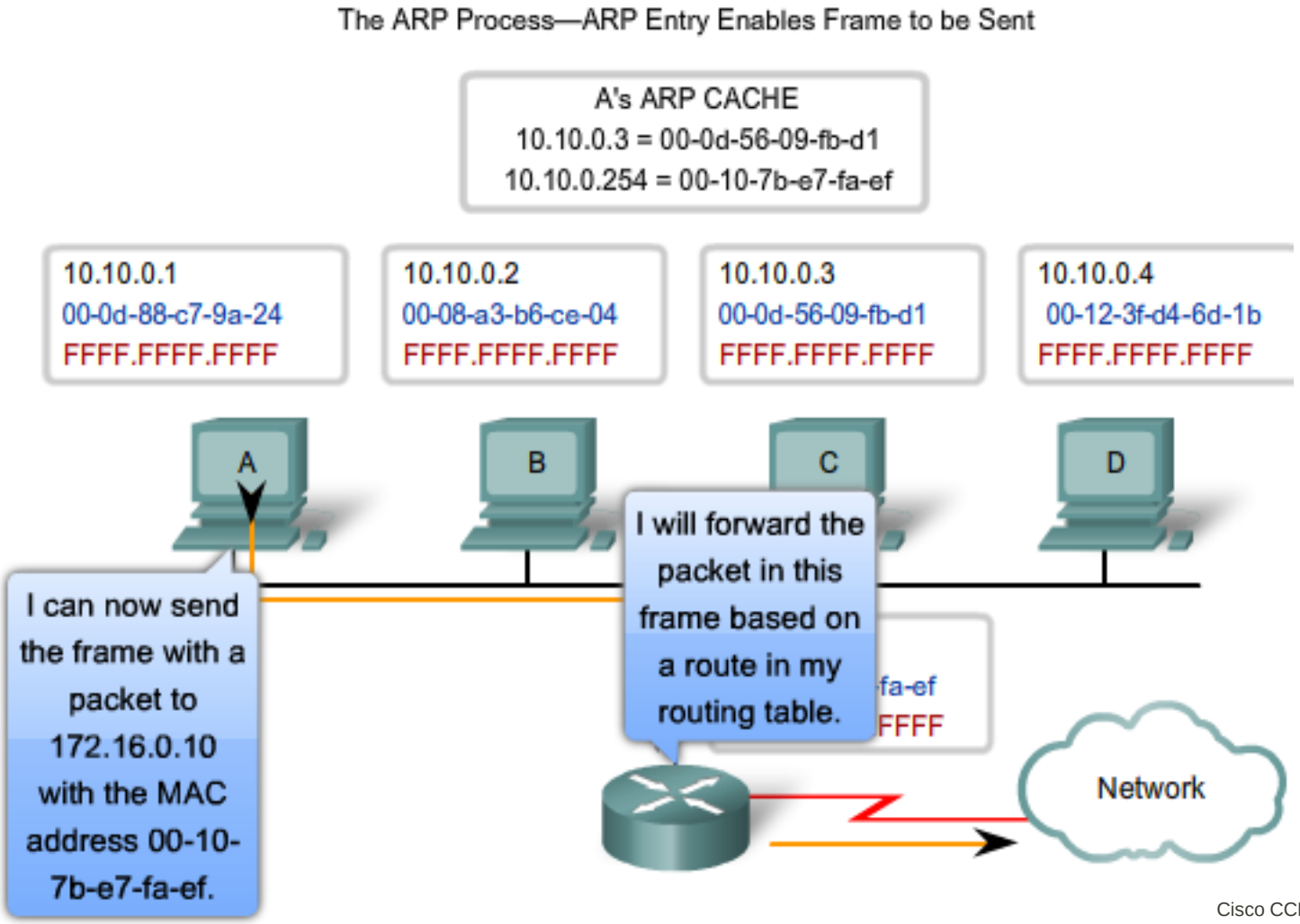

PREGUNTAS

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