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Informatyki ZUT



Wydział Informatyki ZUT



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Sieci komputerowe i Telekomunikacyjne

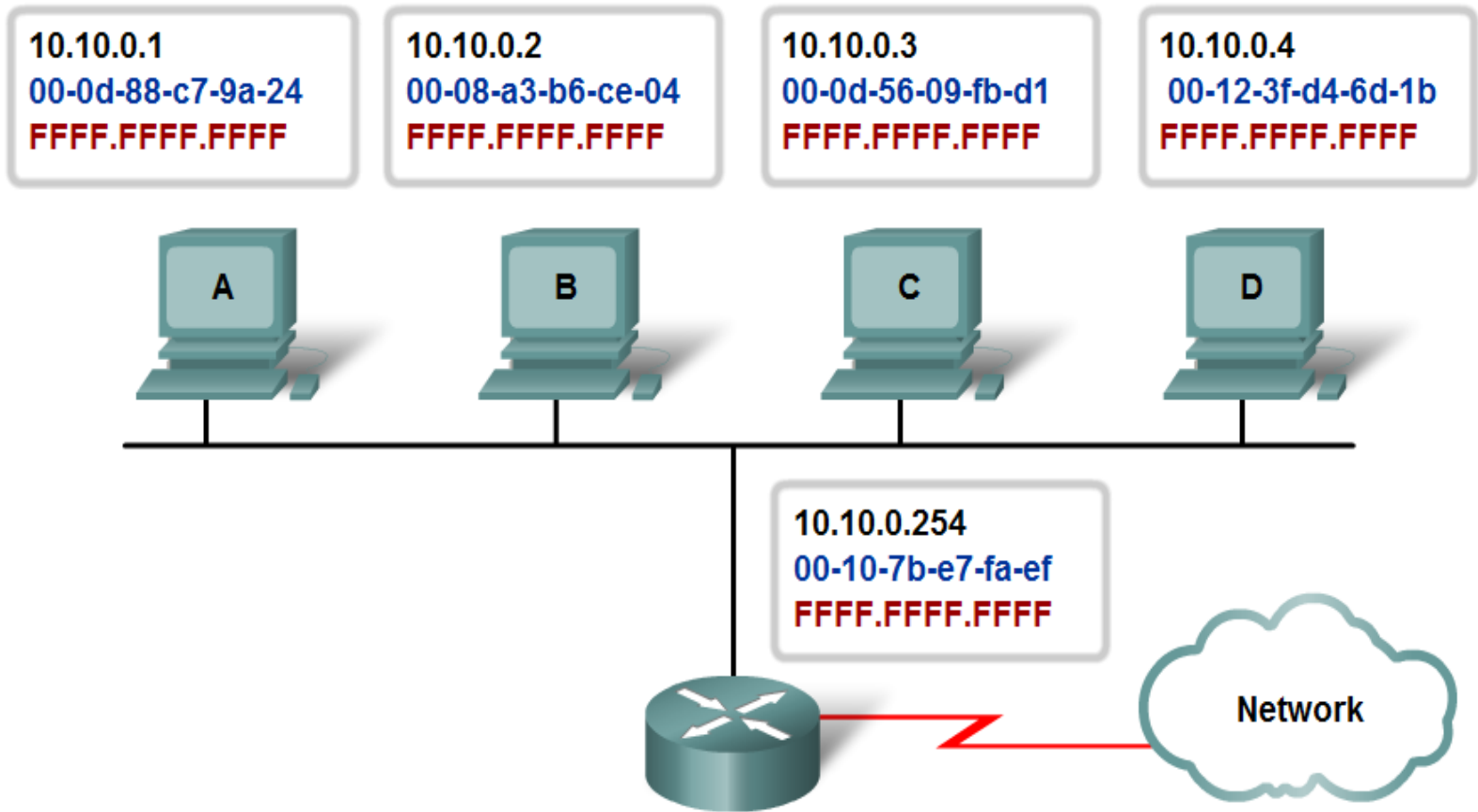
ARP – Address Resolution Protocol

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The ARP Process — Mapping Addresses



- 1
- 2
- 3
- 4
- 5
- 6

Click to see the steps.

Tablica ARP

Adres IP	Adres MAC	Time
10.10.0.2	00-08-a3-b6-ce-04	300 s
10.10.0.3	00-0d-56-09-fb-d1	400 s
10.10.0.4	00-12-3f-d4-6d-1b	350 s

Przełożenie adresów IP na adresy MAC

Przykład dla sieci lokalnej

The ARP Process — Mapping Addresses

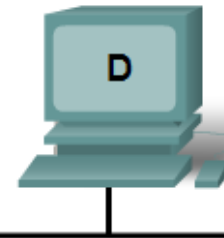
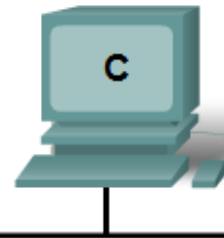
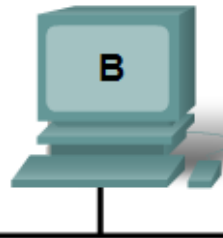
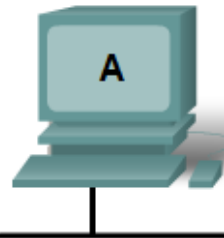
A's ARP CACHE

10.10.0.1
00-0d-88-c7-9a-24
FFFF.FFFF.FFFF

10.10.0.2
00-08-a3-b6-ce-04
FFFF.FFFF.FFFF

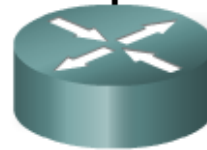
10.10.0.3
00-0d-56-09-fb-d1
FFFF.FFFF.FFFF

10.10.0.4
00-12-3f-d4-6d-1b
FFFF.FFFF.FFFF



Follow the steps for generating a new pair in the ARP table when the destination is on the local network.

10.10.0.254
00-10-7b-e7-fa-ef
FFFF.FFFF.FFFF



Click to see the steps.

The ARP Process — No ARP Entry

A's ARP CACHE

10.10.0.1
00-0d-88-c7-9a-24
FFFF.FFFF.FFFF

10.10.0.2
00-08-a3-b6-ce-04
FFFF.FFFF.FFFF

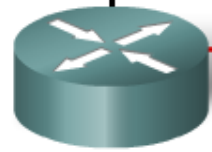
10.10.0.3
00-0d-56-09-fb-d1
FFFF.FFFF.FFFF

10.10.0.4
00-12-3f-d4-6d-1b
FFFF.FFFF.FFFF



I need to send a frame to 10.10.0.3 but I don't know the MAC address.

10.10.0.254
00-10-7b-e7-fa-ef
FFFF.FFFF.FFFF



- 1
- 2
- 3
- 4
- 5
- 6

Click to see the steps.

The ARP Process — Broadcast ARP Request to Devices

A's ARP CACHE

10.10.0.1
00-0d-88-c7-9a-24
FFFF.FFFF.FFFF

10.10.0.2
00-08-a3-b6-ce-04
FFFF.FFFF.FFFF

10.10.0.3
00-0d-56-09-fb-d1
FFFF.FFFF.FFFF

10.10.0.4
00-12-3f-d4-6d-1b
FFFF.FFFF.FFFF



If your IP address is 10.10.0.3, please tell 10.10.0.1 (00-0d-88-c7-9a-24).

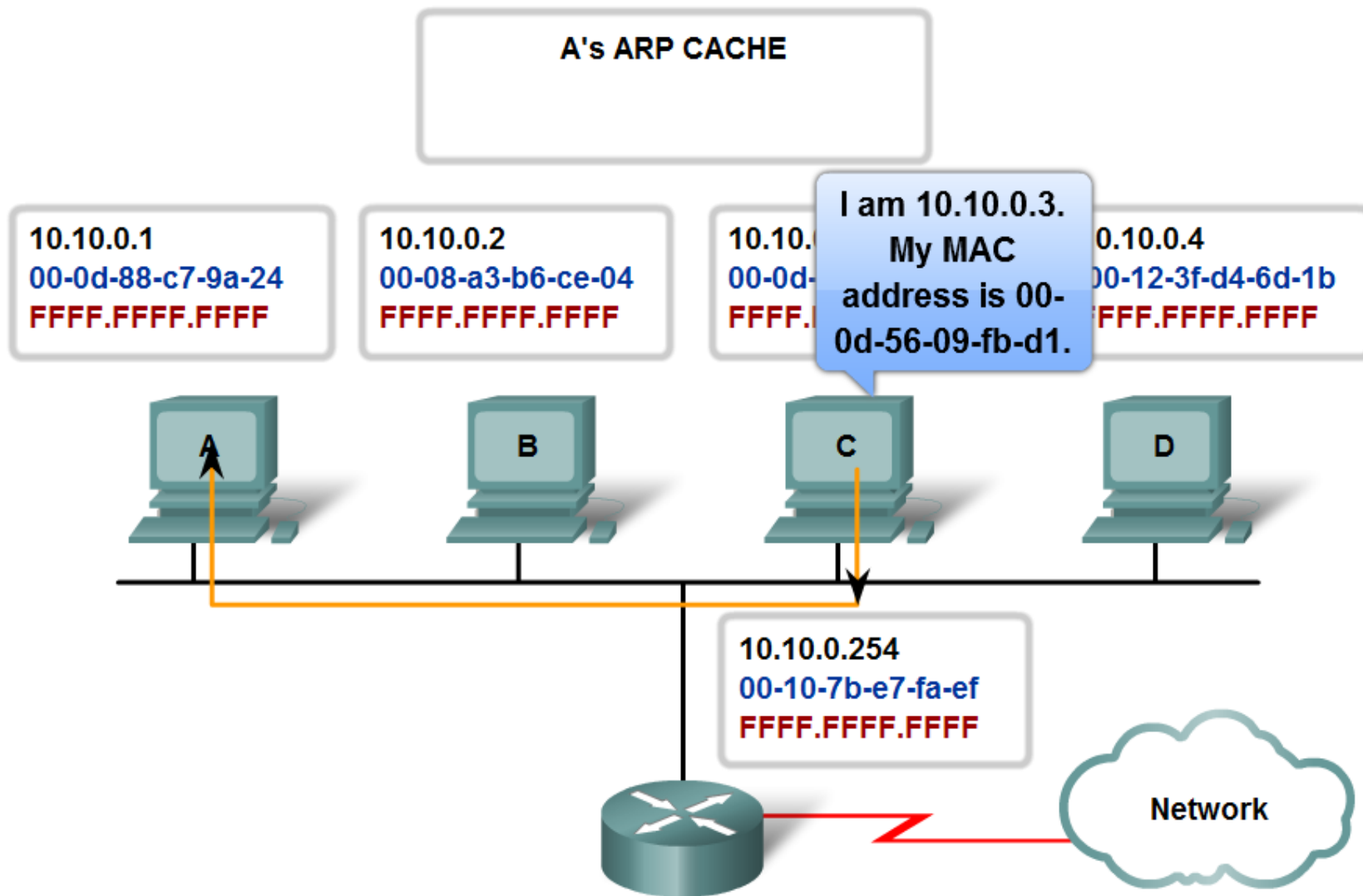
10.10.0.254
00-10-7b-e7-fa-ef
FFFF.FFFF.FFFF



- 1
- 2
- 3
- 4
- 5
- 6

Click to see the steps.

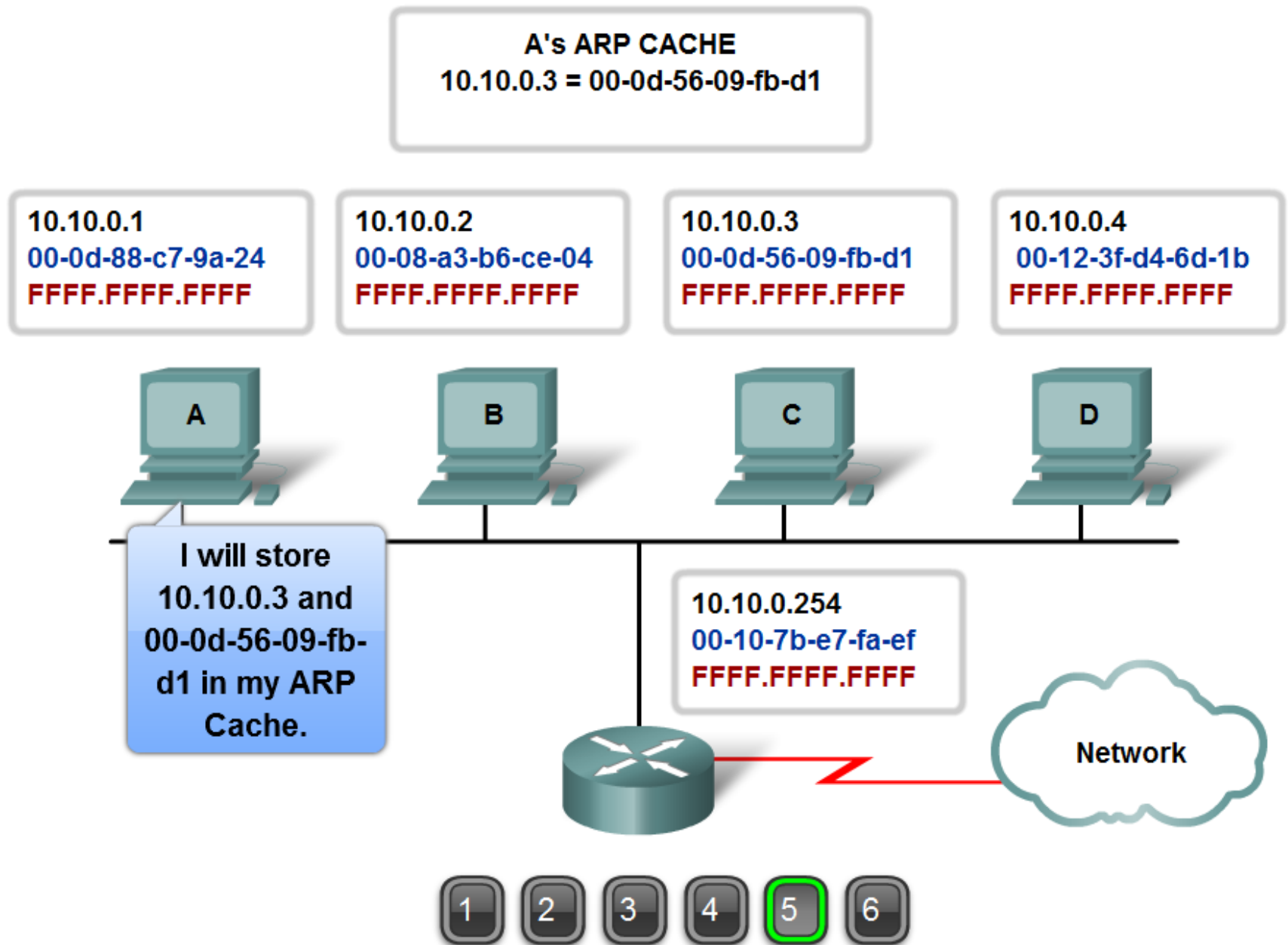
The ARP Process — Unicast ARP Reply with MAC Address



- 1
- 2
- 3
- 4
- 5
- 6

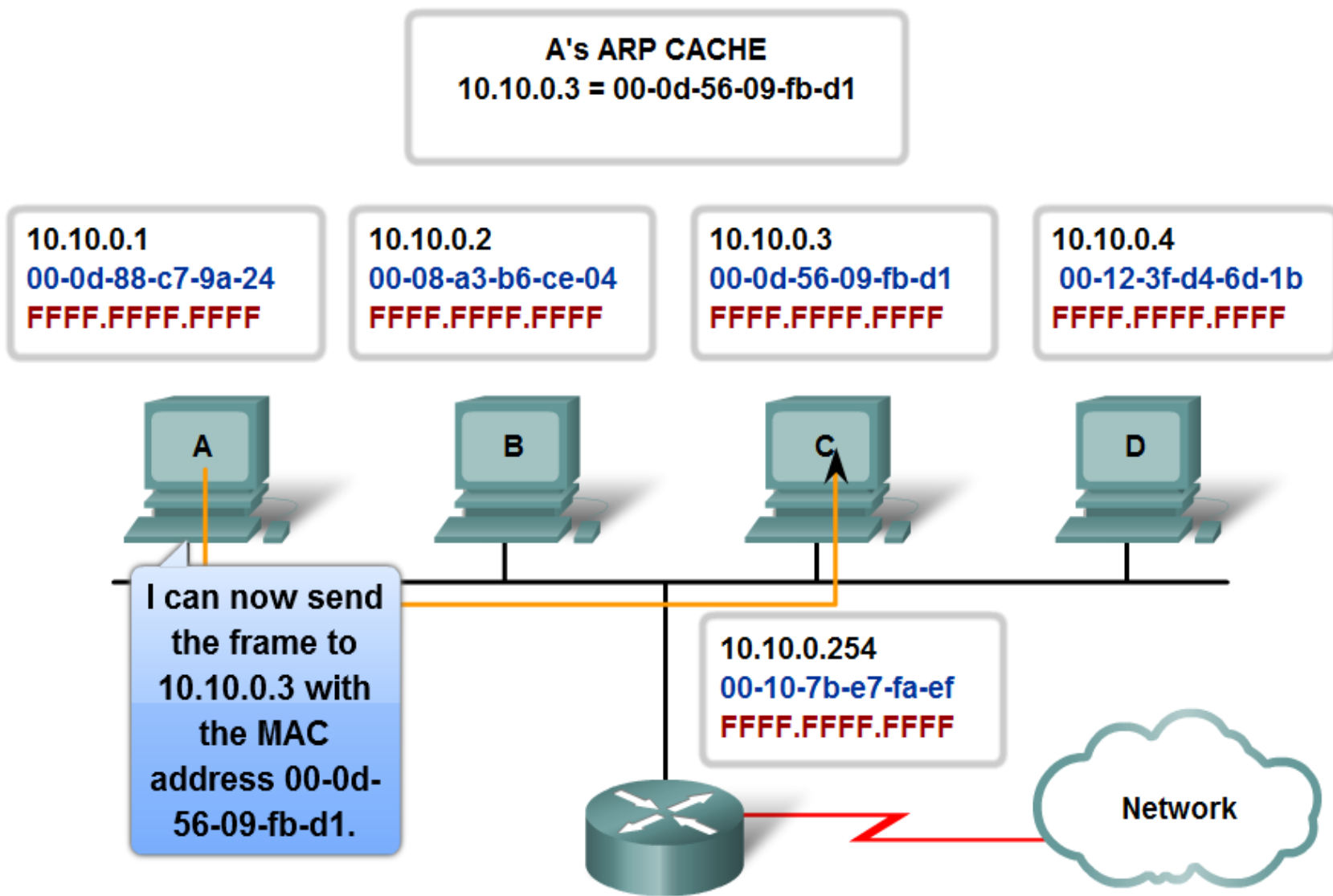
Click to see the steps.

The ARP Process — IP and MAC Addresses Stored in ARP Cache



Click to see the steps.

The ARP Process — ARP Entry Enables Frame to be Sent



- 1
- 2
- 3
- 4
- 5
- 6

Click to see the steps.

Tablica ARP

Adres IP	Adres MAC	Time
10.10.0.2	00-08-a3-b6-ce-04	300 s
10.10.0.3	00-0d-56-09-fb-d1	400 s
10.10.0.4	00-12-3f-d4-6d-1b	350 s

Przełożenie adresów IP na adresy MAC

Przykład dla sieci rozległej

ARP—No ARP Entry for the Gateway

A's ARP CACHE
10.10.0.3 = 00-0d-56-09-fb-d1

10.10.0.1
00-0d-88-c7-9a-24
FFFF.FFFF.FFFF

10.10.0.2
00-08-a3-b6-ce-04
FFFF.FFFF.FFFF

10.10.0.3
00-0d-56-09-fb-d1
FFFF.FFFF.FFFF

10.10.0.4
00-12-3f-d4-6d-1b
FFFF.FFFF.FFFF



I need to send a frame to 172.16.0.10, but it is outside my network and I don't know the MAC address of my gateway (10.10.0.254).

10.10.0.254
00-10-7b-e7-fa-ef
FFFF.FFFF.FFFF



Network



Click to see the steps.

ARP—Broadcast ARP Request to Devices

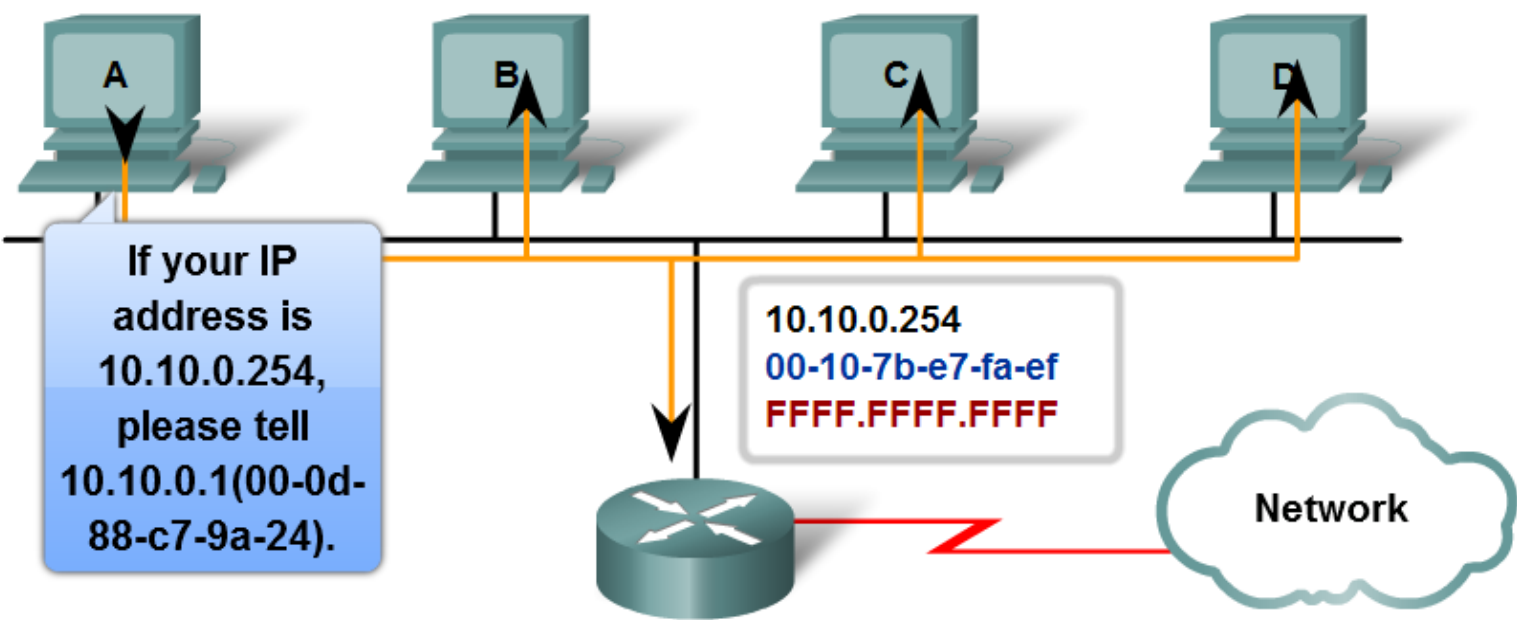
A's ARP CACHE
10.10.0.3 = 00-0d-56-09-fb-d1

10.10.0.1
00-0d-88-c7-9a-24
FFFF.FFFF.FFFF

10.10.0.2
00-08-a3-b6-ce-04
FFFF.FFFF.FFFF

10.10.0.3
00-0d-56-09-fb-d1
FFFF.FFFF.FFFF

10.10.0.4
00-12-3f-d4-6d-1b
FFFF.FFFF.FFFF



- 1
- 2
- 3
- 4
- 5
- 6

Click to see the steps.

ARP—Reply with MAC Address of Gateway

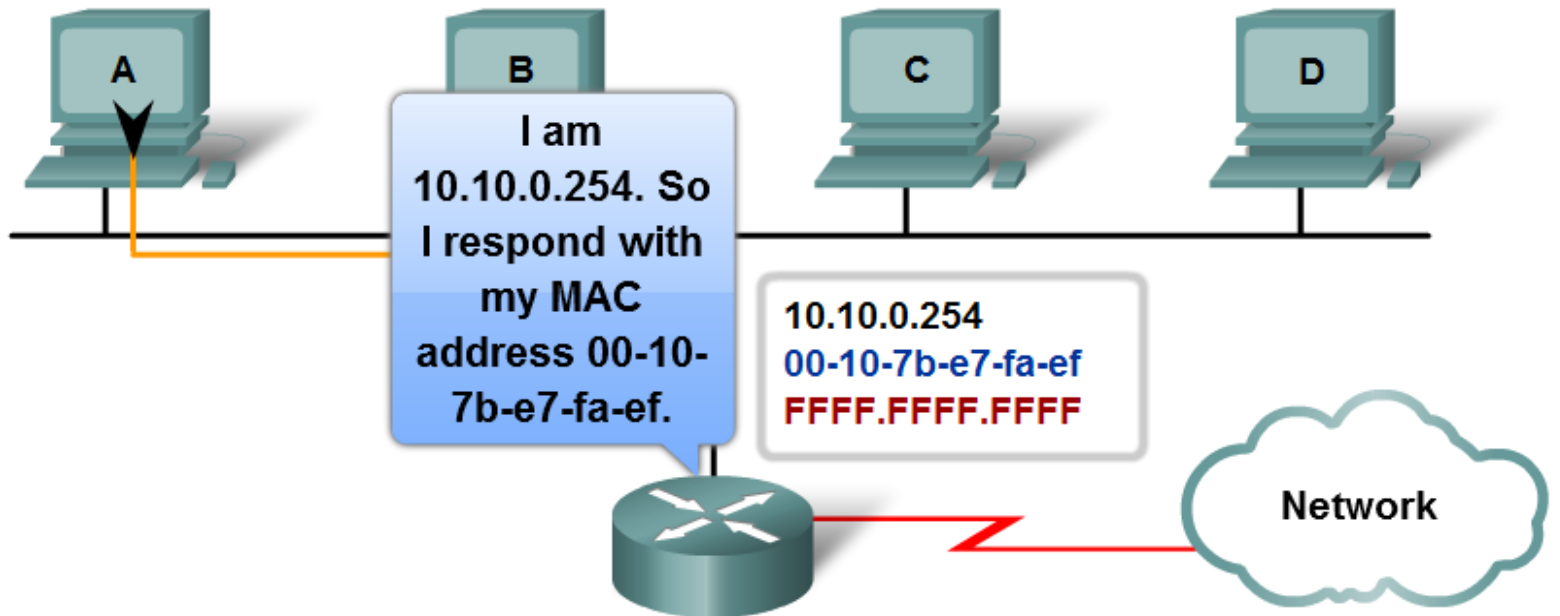
A's ARP CACHE
10.10.0.3 = 00-0d-56-09-fb-d1

10.10.0.1
00-0d-88-c7-9a-24
FFFF.FFFF.FFFF

10.10.0.2
00-08-a3-b6-ce-04
FFFF.FFFF.FFFF

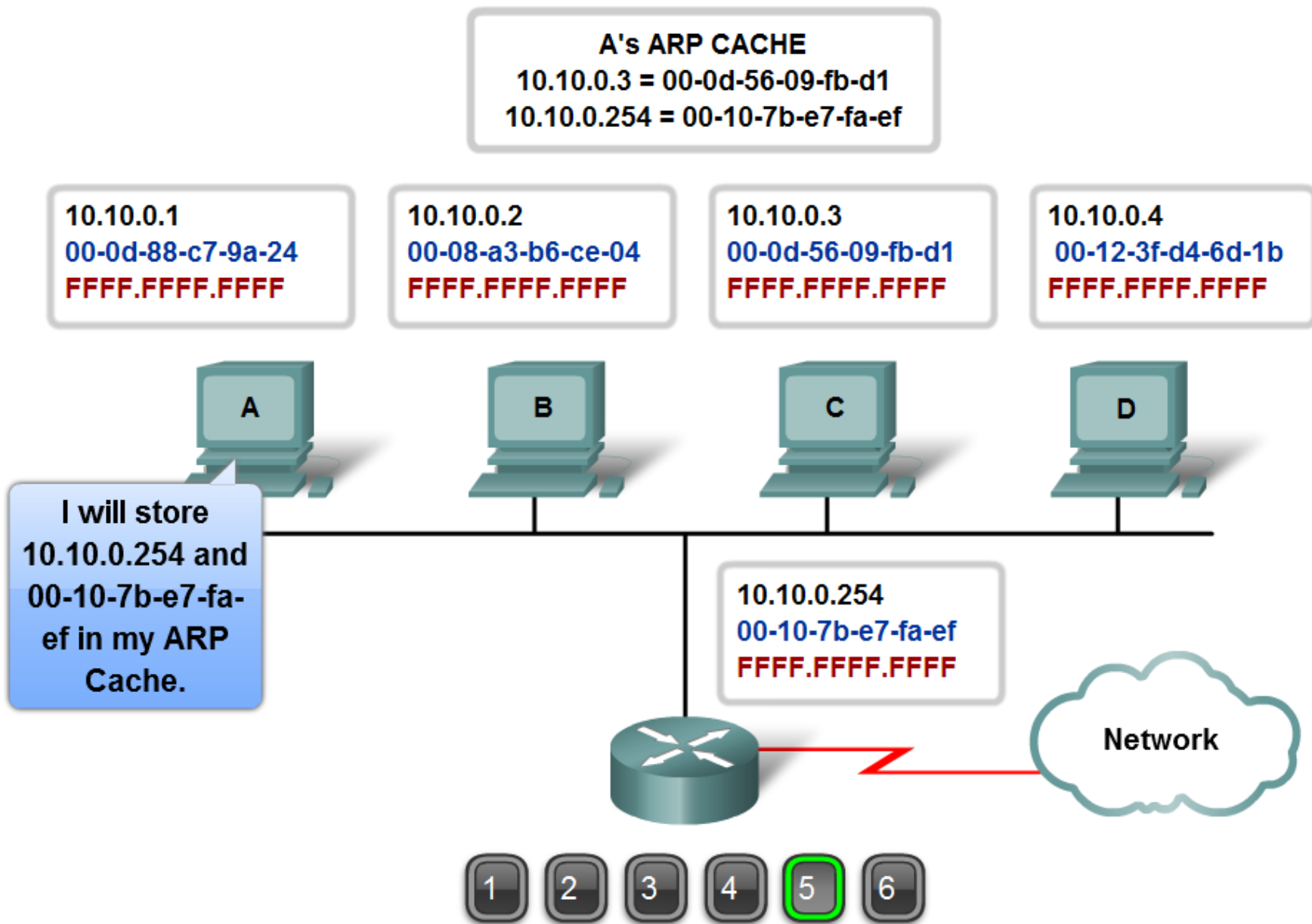
10.10.0.3
00-0d-56-09-fb-d1
FFFF.FFFF.FFFF

10.10.0.4
00-12-3f-d4-6d-1b
FFFF.FFFF.FFFF



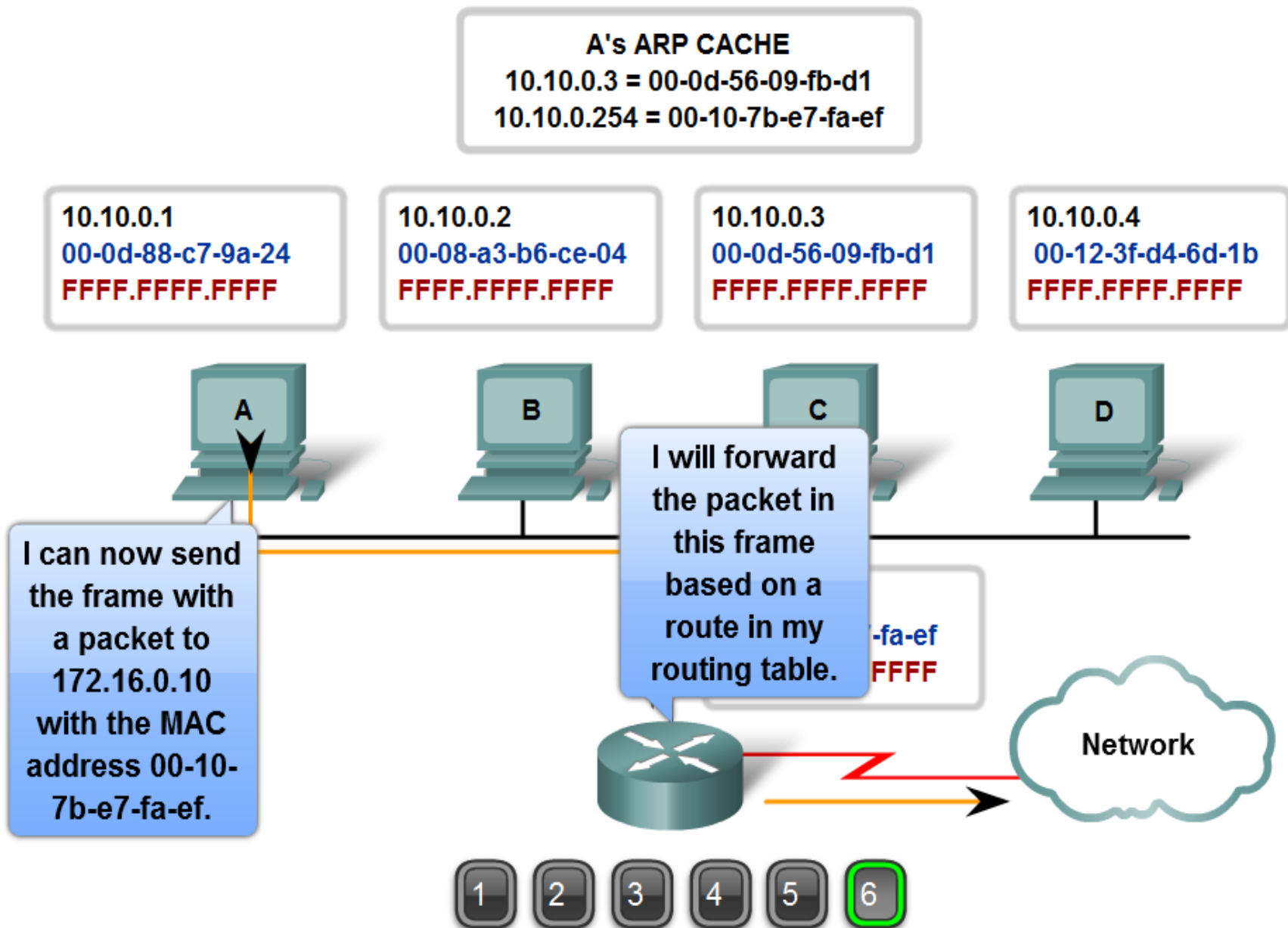
Click to see the steps.

The ARP Process—IP and MAC Addresses Stored in ARP Cache



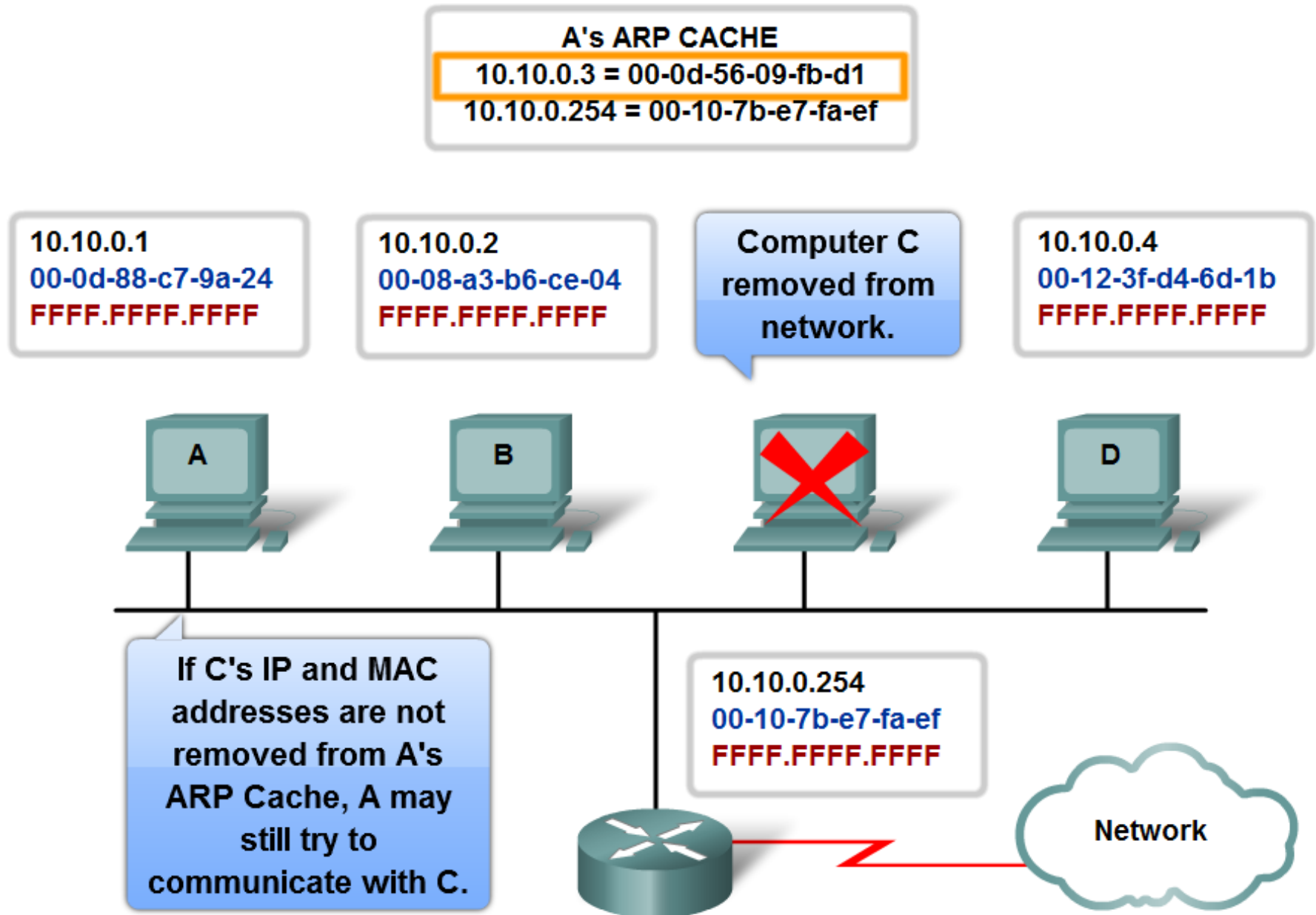
Click to see the steps.

The ARP Process—ARP Entry Enables Frame to be Sent



Click to see the steps.

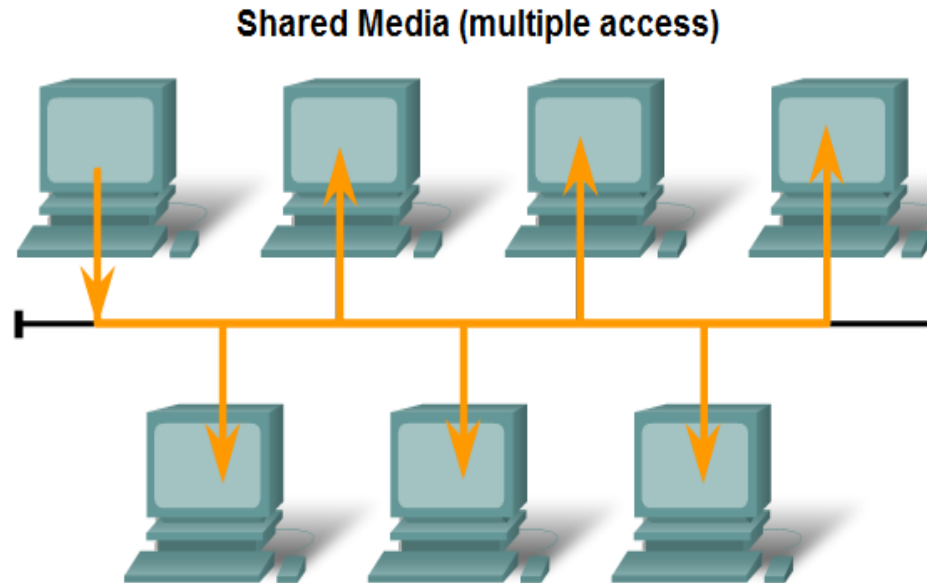
The ARP Process - Removing Address Mappings



ARP Issues:

- Broadcasts, overhead on the Media
- Security

ARP broadcasts can flood the local media.



A false ARP message can provide an incorrect MAC address that will then hijack frames using that address (called a spoof).

Ethernet					
8	6	6	2	46 to 1500	4
Preamble	Destination Address	Source Address	Type	Data	Frame Check Sequence

Koniec

Inne prezentacje znajdują się na stronie:

<http://kbogu.man.szczecin.pl>