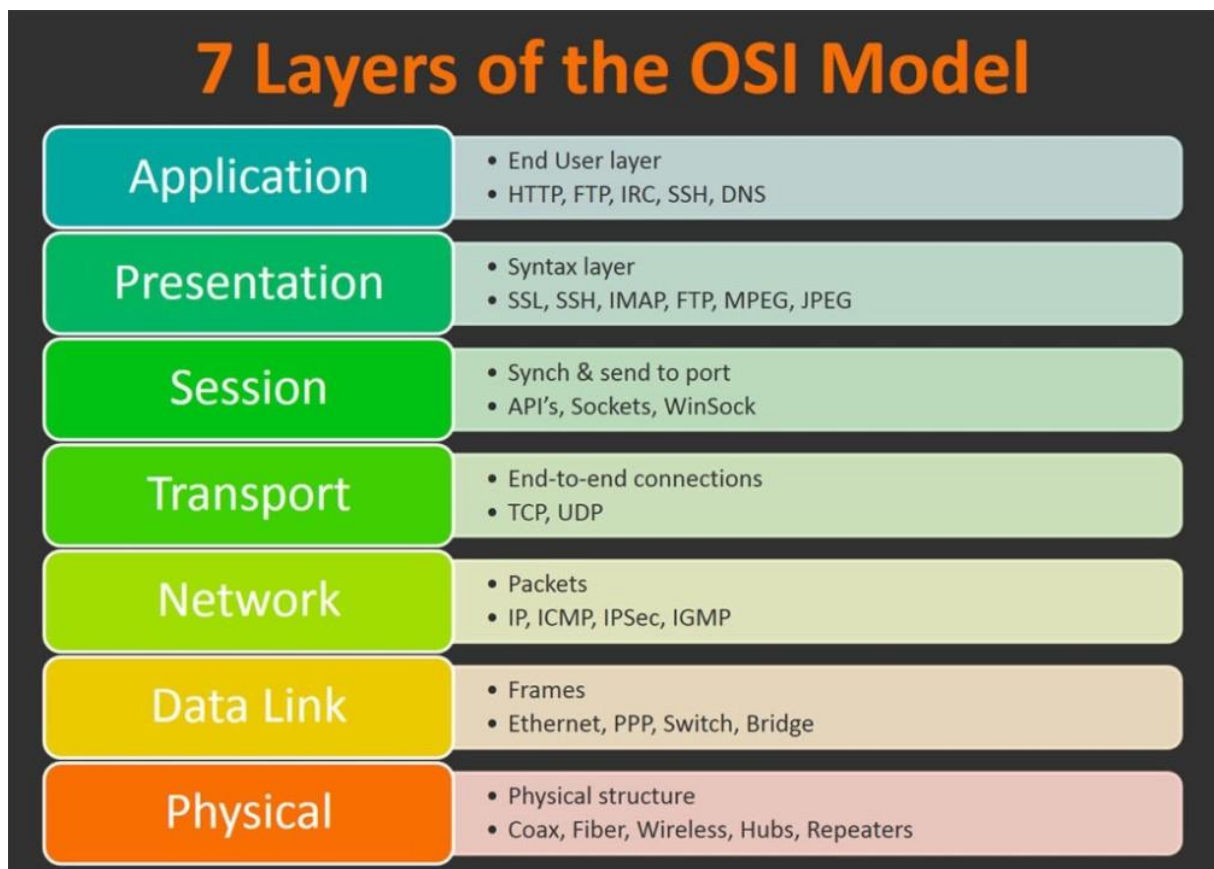


LV1: Enkapsulacija podataka kroz slojeve OSI modela

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Priprema

1. Nacrtaj OSI model
3. Za svaki od slojeva napiši najvažnije protokole



2. Definiraj enkapsulaciju.

Enkapsulacija je proces pakiranja podataka od 7. prema 1. u sloju u oblik pogodan za prijenos komunikacijskim vezama.

IZVOĐENJE VJEŽBE

1. zadatak

a. pronaći protokol na aplikacijskom sloju koji sudjeluje u prijenosu web stranice

No.	Source	Destination	Protocol	Length	Info
59672	192.168.50.15	216.104.20.24	HTTP	612	GET / HTTP/1.1
1430	192.168.50.15	192.168.50.15	HTTP	595	HTTP/1.1 304 Not Modified
1436	192.168.50.15	216.104.20.24	HTTP	589	GET /wp-content/plugins/revslider/rs-plugin/css/settings.css?rev=4.5.9&ver=4.1.1 HTTP/1.1
1437	192.168.50.15	216.104.20.24	HTTP	573	GET /wp-content/themes/starter_theme/css/bootstrap.css?ver=4.1.1 HTTP/1.1
1448	192.168.50.15	216.104.20.24	HTTP	568	GET /wp-content/themes/starter_theme/css/base.css?ver=4.1.1 HTTP/1.1
1451	192.168.50.15	216.104.20.24	HTTP	576	GET /wp-content/themes/starter_theme/css/font-awesome.css?ver=4.1.1 HTTP/1.1
1452	192.168.50.15	216.104.20.24	HTTP	565	GET /wp-content/themes/starter_theme/style.css?ver=4.1.1 HTTP/1.1
1455	192.168.50.15	216.104.20.24	HTTP	582	GET /wp-content/plugins/js_composer/assets/css/js_composer.css?ver=4.4.2 HTTP/1.1
1478	192.168.50.15	192.168.50.15	HTTP	532	HTTP/1.1 304 Not Modified

b. pronaći protokol koji na transportnom sloju enkapsulira web stranicu

No.	Source	Destination	Protocol	Length	Info
6111	192.168.50.15	142.251.143.195	TCP	55	[TCP Keep-Alive] 49888 → 443 [ACK] Seq=643 Ack=3707 Win=262400 Len=1
6112	192.168.50.15	142.251.143.195	TCP	60	[TCP Keep-Alive ACK] 443 → 49888 [ACK] Seq=3707 Ack=644 Win=65024 Len=0
6113	192.168.50.15	142.251.143.195	TLSv1.3	956	Application Data
6114	192.168.50.15	142.251.143.195	TLSv1.3	124	Application Data, Application Data
6115	192.168.50.15	142.251.143.195	TCP	54	49891 → 443 [ACK] Seq=1256 Ack=6465 Win=2102272 Len=0
6116	192.168.50.15	142.251.143.195	TLSv1.3	93	Application Data
6117	192.168.50.15	142.251.143.195	TLSv1.3	89	Application Data

c. kako se zove PDU na transportnom sloju?

Naziva se segment

2. zadatak

a. koji protokol na mrežnom sloju enkapsulira segmente s transportnog sloja?

Naziva se IP protokol.

b. Kako se zove PDU na mrežnom sloju?

Naziva se paket.

c. Napiši ishodišnu i odredišnu IP adresu paketa koji nosi web stranicu

Source: 216.104.20.24

Destination: 192.168.50.15

d. Pročitati i komentirati ostala polja zaglavlja jednog od paketa

```
Internet Protocol Version 4, Src: 192.168.50.15, Dst: 216.104.20.24
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    0000 00.. = Differentiated Services Codepoint: Default (0)
      .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
  Total Length: 555
  Identification: 0xdf3b (57147)
  Flags: 0x4000, Don't fragment
    0... .. = Reserved bit: Not set
    .1.. .. = Don't fragment: Set
    ..0. .. = More fragments: Not set
    ...0 0000 0000 0000 = Fragment offset: 0
  Time to live: 128
  Protocol: TCP (6)
  Header checksum: 0x3a59 [validation disabled]
  [Header checksum status: Unverified]
  Source: 192.168.50.15
  Destination: 216.104.20.24
```

Header Length – duljina zaglavlja (20 bajtova)

Total Length – ukupna duljina paketa (555)

Protocol – vrsta protokola (TCP)

Time to live – koliko puta paket može biti prosljeđen prije nego što se automatski izbriše (128)

3. zadatak

a. zapiši naziv okvira u koji je enkapsuliran paket na drugom sloju OSI modela

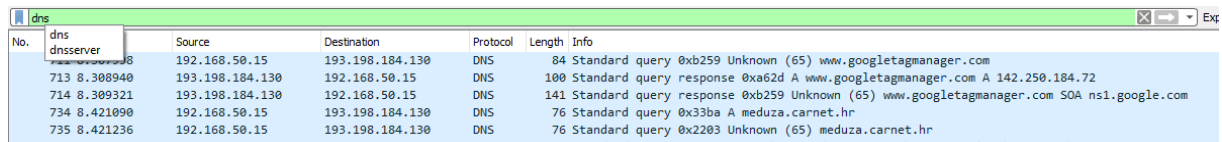
Ethernet II

b. napiši ishodišnu i odredišnu MAC adresu mrežnih kartica

> Ethernet II, Src: AsrockIn_ce:9b:e5 (70:85:c2:ce:9b:e5), Dst: Routerbo_a6:8c:7f (74:4d:28:a6:8c:7f)

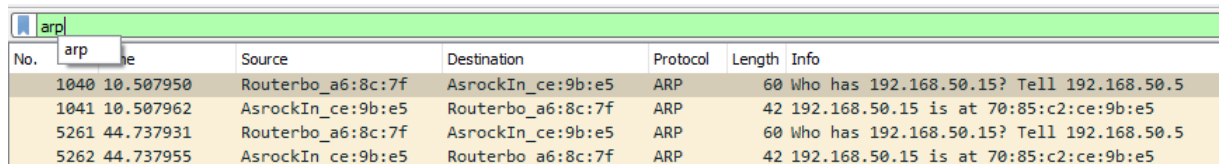
4. zadatak

a. pronaći protokol na aplikacijskom sloju koji je sudjelovao u traženju odredišne IP adrese za zadano ime web stranice



No.	dns dnsserver	Source	Destination	Protocol	Length	Info
713	8.308940	192.168.50.15	193.198.184.130	DNS	84	Standard query 0xb259 Unknown (65) www.googletagmanager.com
714	8.309321	193.198.184.130	192.168.50.15	DNS	100	Standard query response 0xa62d A www.googletagmanager.com A 142.250.184.72
734	8.421090	192.168.50.15	193.198.184.130	DNS	141	Standard query response 0xb259 Unknown (65) www.googletagmanager.com SOA ns1.google.com
735	8.421236	192.168.50.15	193.198.184.130	DNS	76	Standard query 0x33ba A meduza.carnet.hr
				DNS	76	Standard query 0x2203 Unknown (65) meduza.carnet.hr

b. pronaći protokol koji vraća odredišnu fizičku adresu (MAC adresu) za odredišnu IP adresu mrežne kartice (veza fizičke i logičke adrese)



No.	arp	Source	Destination	Protocol	Length	Info
1040	10.507950	Routerbo_a6:8c:7f	AsrockIn_ce:9b:e5	ARP	60	Who has 192.168.50.15? Tell 192.168.50.5
1041	10.507962	AsrockIn_ce:9b:e5	Routerbo_a6:8c:7f	ARP	42	192.168.50.15 is at 70:85:c2:ce:9b:e5
5261	44.737931	Routerbo_a6:8c:7f	AsrockIn_ce:9b:e5	ARP	60	Who has 192.168.50.15? Tell 192.168.50.5
5262	44.737955	AsrockIn_ce:9b:e5	Routerbo_a6:8c:7f	ARP	42	192.168.50.15 is at 70:85:c2:ce:9b:e5