

Francisco Diaz

802-15-2172

CIIC4070 / ICOM5026 5

(VIII). Cellular Networks:

(1) What is the multiplexing scheme used in AMPS? AMPS uses FDM (Frequency Division Multiplexing)

(2) What is the multiplexing scheme used in GSM? GSM uses both FDM (Frequency Division Multiplexing) and TDM (Time Division Multiplexing)

(3) Which international organization specifies requirements for 4G/5G cellular systems? The ITU-R (International Telecommunications Union)

(4) What are the data rate requirements for 4G system? Up to 100Mbps for high mobility. Up to 1Gbps for low mobility

(5) What are the two key physical-layer technologies used in 4G systems?

1. All IP
2. OFDM and MIMO

(6) What are the data rate requirements for 5G systems? 20Gbps peak data rate.
1Gbps user experienced data rate

(IX). Use Wireshark to capture dns packets.

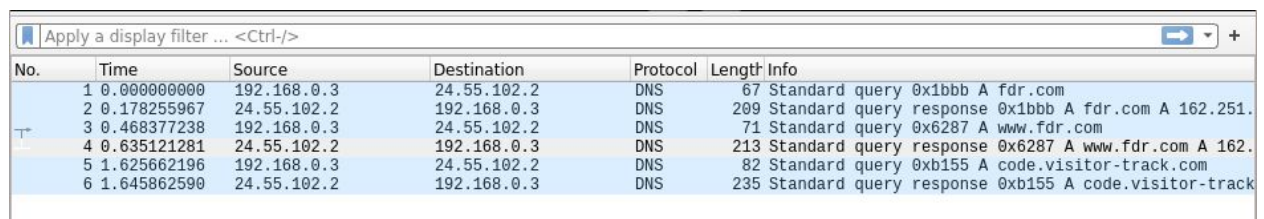
(1) Use your initial to create a string, then add “.com” to the string and visit the corresponding website. (For example, the initial of Prof. Kejie Lu is kl, so he shall visit a website: kl.com.) Write your website URL below:

My name is: Francisco Diaz Riollano

Website used: fdr.com

(2) In the DNS query packet, what are the three protocols for the application layer, the transport layer, and the network layer?

Application Layer protocol: DNS



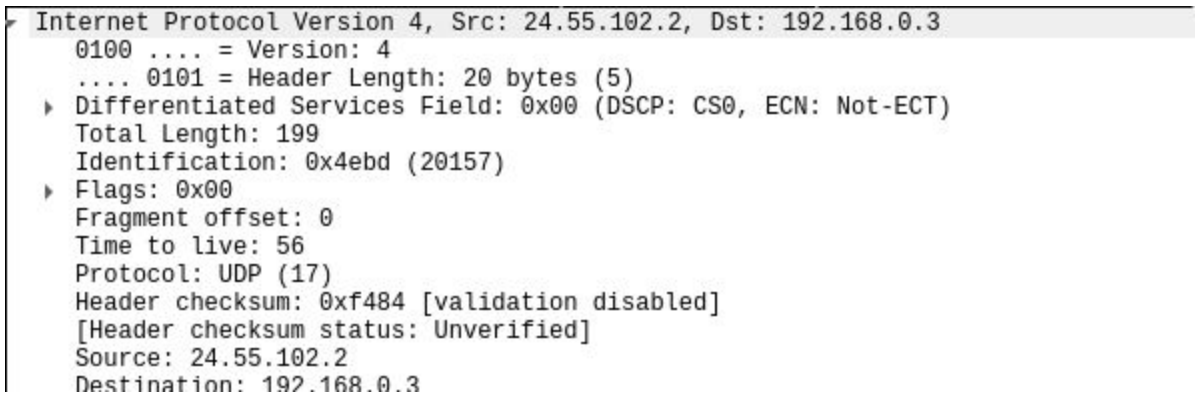
The image shows a Wireshark packet capture window with a display filter set to 'Apply a display filter ... <Ctrl-/>'. The packet list shows six packets, all of which are DNS-related. The first packet is a standard query for fdr.com. The second packet is a standard query response for fdr.com. The third packet is a standard query for www.fdr.com. The fourth packet is a standard query response for www.fdr.com. The fifth packet is a standard query for code.visitor-track.com. The sixth packet is a standard query response for code.visitor-track.com.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	192.168.0.3	24.55.102.2	DNS	67	Standard query 0x1bbb A fdr.com
2	0.178255967	24.55.102.2	192.168.0.3	DNS	209	Standard query response 0x1bbb A fdr.com A 162.251.
3	0.468377238	192.168.0.3	24.55.102.2	DNS	71	Standard query 0x6287 A www.fdr.com
4	0.635121281	24.55.102.2	192.168.0.3	DNS	213	Standard query response 0x6287 A www.fdr.com A 162.
5	1.625662196	192.168.0.3	24.55.102.2	DNS	82	Standard query 0xb155 A code.visitor-track.com
6	1.645862590	24.55.102.2	192.168.0.3	DNS	235	Standard query response 0xb155 A code.visitor-track

Transport Layer protocol: UDP



Network Layer Protocol: IPV4



(3) Attach a screen shot to show the details of the dns answer, in which the website you

visit and the details of the answer must be clearly shown.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.960999800	192.168.0.3	24.55.102.2	DNS	67	Standard query 0x1bbb A fdr.com
2	0.17825967	24.55.102.2	192.168.0.3	DNS	209	Standard query response 0x1bbb A fdr.com A 162.251.
3	0.468377238	192.168.0.3	24.55.102.2	DNS	71	Standard query 0x6287 A www.fdr.com
4	0.635121281	24.55.102.2	192.168.0.3	DNS	213	Standard query response 0x6287 A www.fdr.com A 162.
5	1.625662196	192.168.0.3	24.55.102.2	DNS	82	Standard query 0xb155 A code.visitor-track.com
6	1.645862590	24.55.102.2	192.168.0.3	DNS	235	Standard query response 0xb155 A code.visitor-track

Source: ARRTSGro 7f:50:a0 (c0:05:c2:7f:50:a0)
Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 24.55.102.2, Dst: 192.168.0.3
0100 = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 199
Identification: 0x4ebd (20157)
Flags: 0x00
Fragment offset: 0
Time to live: 56
Protocol: UDP (17)
Header checksum: 0xf484 [validation disabled]
[Header checksum status: Unverified]
Source: 24.55.102.2
Destination: 192.168.0.3
User Datagram Protocol, Src Port: 53, Dst Port: 37993
Source Port: 53
Destination Port: 37993
Length: 179
Checksum: 0x4bd0 [unverified]
[Checksum Status: Unverified]
[Stream index: 1]
[Timestamps]
UDP payload (171 bytes)
Domain Name System (response)
Transaction ID: 0x6287
Flags: 0x8180 Standard query response, No error
Questions: 1
Answer RRs: 1
Authority RRs: 6
Additional RRs: 0
Queries
Answers
www.fdr.com: type A, class IN, addr 162.251.239.122
Authoritative nameservers
fdr.com: type NS, class IN, ns ns15.dnsmadeeasy.com
fdr.com: type NS, class IN, ns ns14.dnsmadeeasy.com
fdr.com: type NS, class IN, ns ns11.dnsmadeeasy.com
fdr.com: type NS, class IN, ns ns12.dnsmadeeasy.com
fdr.com: type NS, class IN, ns ns13.dnsmadeeasy.com
fdr.com: type NS, class IN, ns ns10.dnsmadeeasy.com
[Request In: 3]
[Time: 0.166744043 seconds]

0000 50 e0 05 08 ef b2 c0 05 c2 7f 50 a0 88 00 45 00 P.....P:..C:

Type (eth.type), 2 bytes Packets: 6 · Displayed: 6 (100.0%) · Dropped: 0 (0.0%) Profile: Default

Innovation Data Processing

fdr.com

select an area for the screenshot

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FDRPAS/FDRPASVM as seen @ SHARE 2019-NEW Large Scale Migration

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