

DBMS LAB REPORT

NETWORK PACKET DATABASE

SANJAY SUNIL, PES1UG21CS535
SAI SOORAJ RAMAGIRI, PES1UG21CS515

STRUCTURE OF TABLES:

```
mysql> desc packets;
```

Field	Type	Null	Key	Default	Extra
PacketID	bigint	NO		NULL	
Source_IP	varchar(15)	NO		NULL	
Destination_IP	varchar(15)	NO		NULL	
Time_Stamp	timestamp	YES		NULL	

4 rows in set (0.03 sec)

```
mysql> desc connection_details;
```

Field	Type	Null	Key	Default	Extra
Sequence_number	bigint	NO		NULL	
Protocol	enum('TCP','UDP','ICMP','HTTP','HTTPS','SMTP','POP3','IMAP','DNS','FTP','Other')	NO		NULL	
TTL	bigint	NO		NULL	
Source_MAC	varchar(17)	NO		NULL	
Destination_MAC	varchar(17)	NO		NULL	
Source_port	bigint	NO		NULL	
Destination_port	bigint	NO		NULL	
Info	varchar(1518)	YES		NULL	
Length	bigint	NO		NULL	
PacketID	bigint	NO		NULL	

10 rows in set (0.00 sec)

```
mysql> desc router;
```

Field	Type	Null	Key	Default	Extra
Router_MAC	varchar(17)	NO	PRI	NULL	
Device_MAC	varchar(17)	NO	PRI	NULL	
Interface	int	NO	PRI	NULL	
Sequence_number	bigint	NO		NULL	

4 rows in set (0.00 sec)

```
mysql> desc devices_on_interface;
```

Field	Type	Null	Key	Default	Extra
Device_MAC	varchar(17)	NO	PRI	NULL	
Interface	int	NO	PRI	NULL	
IP_Address	varchar(15)	NO		NULL	
Device_Name	varchar(255)	YES		NULL	

4 rows in set (0.00 sec)

```
mysql> desc arp_table;
```

Field	Type	Null	Key	Default	Extra
MAC_Address	varchar(17)	NO	PRI	NULL	
Device_MAC	varchar(17)	NO	PRI	NULL	
Device_IP	varchar(15)	NO		NULL	
TTL	bigint	NO		NULL	
Protocol	enum('TCP','UDP','ICMP','HTTP','HTTPS','SMTP','POP3','IMAP','DNS','FTP','other')	NO		NULL	
Host_Name	varchar(20)	NO		NULL	
Interface	int	NO		NULL	

7 rows in set (0.00 sec)

- The database consists of four main tables: packets, connection_details, router, and devices_on_interface, each designed to store specific information related to network communication and device connectivity.
- The packets table captures packet level details, including PacketID, source and destination IP addresses, and a timestamp, providing a granular view of network traffic.
- The connection_details table contains information about network connections, such as sequence number, protocol type, Time To Live (TTL), source and destination MAC addresses, ports, packet length, and additional information.
- The router table maintains data about routers, with Router_MAC, Device_MAC, Interface, and Sequence_number fields, facilitating the organization and management of routing devices in the network.
- The arp_table table focuses on Address Resolution Protocol (ARP) details, featuring MAC_Address, Device_MAC, Device_IP, TTL, protocol type, host name, and interface fields, offering insights into device connectivity and address resolution within the network.

LINKS

- Linkage between packets and connection_details: Both tables have a common field named PacketID, which serves as a foreign key in the connection_details table, linking each connection detail entry to a specific packet in the packets table.
- Linkage between connection_details and router: The connection_details table contains a field named Sequence_number, which serves as a foreign key in the router table, linking each router entry to a specific connection detail.
- Linkage between devices_on_interface and router: The devices_on_interface table has two fields, Device_MAC and Interface, serving as foreign keys that link to the Router_MAC and Interface fields in the router table. This linkage establishes the relationship between devices connected to specific router interfaces.
- Linkage between arp_table and devices_on_interface: The arp_table table has a field named Device_MAC, which is a foreign key linking to the Device_MAC field in the devices_on_interface table. This linkage connects ARP details to specific devices on interfaces.
- Linkage between arp_table and router: The arp_table table also contains an Interface field, serving as a foreign key that links to the Interface field in the router table. This linkage associates ARP details with specific router interfaces.

Content of the DB after executing the code which we have put up after the output:

```
mysql> select * from packets;
```

PacketID	Source_IP	Destination_IP	Time_Stamp
53621	20.189.173.1	192.168.1.36	2023-11-28 16:02:42
34545	104.208.16.89	192.168.1.36	2023-11-28 16:02:42
34547	104.208.16.89	192.168.1.36	2023-11-28 16:02:43
53026	192.168.1.36	142.250.66.5	2023-11-28 16:02:44
42143	142.250.66.5	192.168.1.36	2023-11-28 16:02:44

5 rows in set (0.00 sec)

```
mysql> select * from connection_details;
```

Sequence_number	Protocol	TTL	Source_MAC	Destination_MAC	Source_port	Destination_port	Info	Length	PacketID
2865050379	TCP	113	78:17:35:2a:f1:10	e8:84:a5:24:ec:9e	443	53746		0	5362
190595222	TCP	111	78:17:35:2a:f1:10	e8:84:a5:24:ec:9e	443	53631		0	3454
190595222	TCP	111	78:17:35:2a:f1:10	e8:84:a5:24:ec:9e	443	53631	Raw	101	3454
650999516	TCP	128	e8:84:a5:24:ec:9e	78:17:35:2a:f1:10	53749	443	Raw	80	5302
1522901402	TCP	124	78:17:35:2a:f1:10	e8:84:a5:24:ec:9e	443	53749		0	4214

5 rows in set (0.00 sec)

```
mysql> select * from router;
```

Router_MAC	Device_MAC	Interface	Sequence_number
00:11:22:33:44:66	78:17:35:2a:f1:10	4	-2911795648484622078
00:11:22:33:44:66	e8:84:a5:24:ec:9e	5	-8710045550435728588

2 rows in set (0.00 sec)

```
mysql> select * from arp_table;
```

MAC_Address	Device_MAC	Device_IP	TTL	Protocol	Host_Name	Interface
00:11:22:33:44:66	e8:84:a5:24:ec:9e	192.168.1.36	128	SMTP	Unknown	5

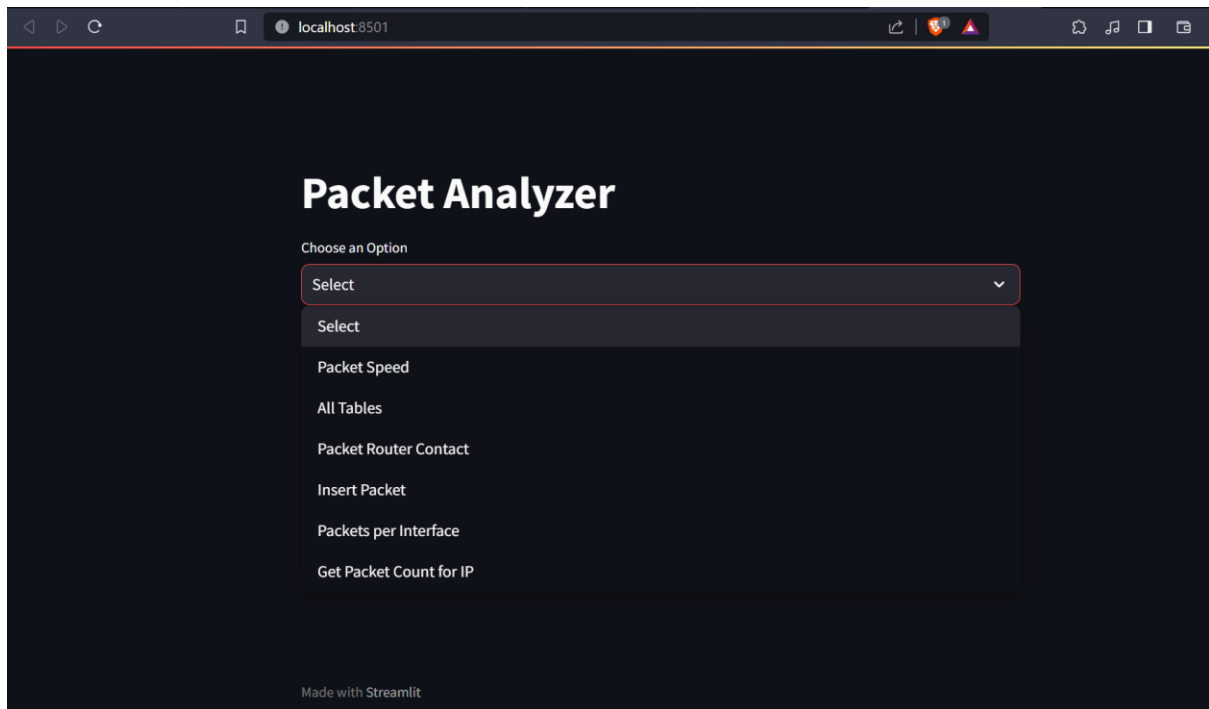
1 row in set (0.00 sec)

```
mysql> select * from devices_on_interface;
```

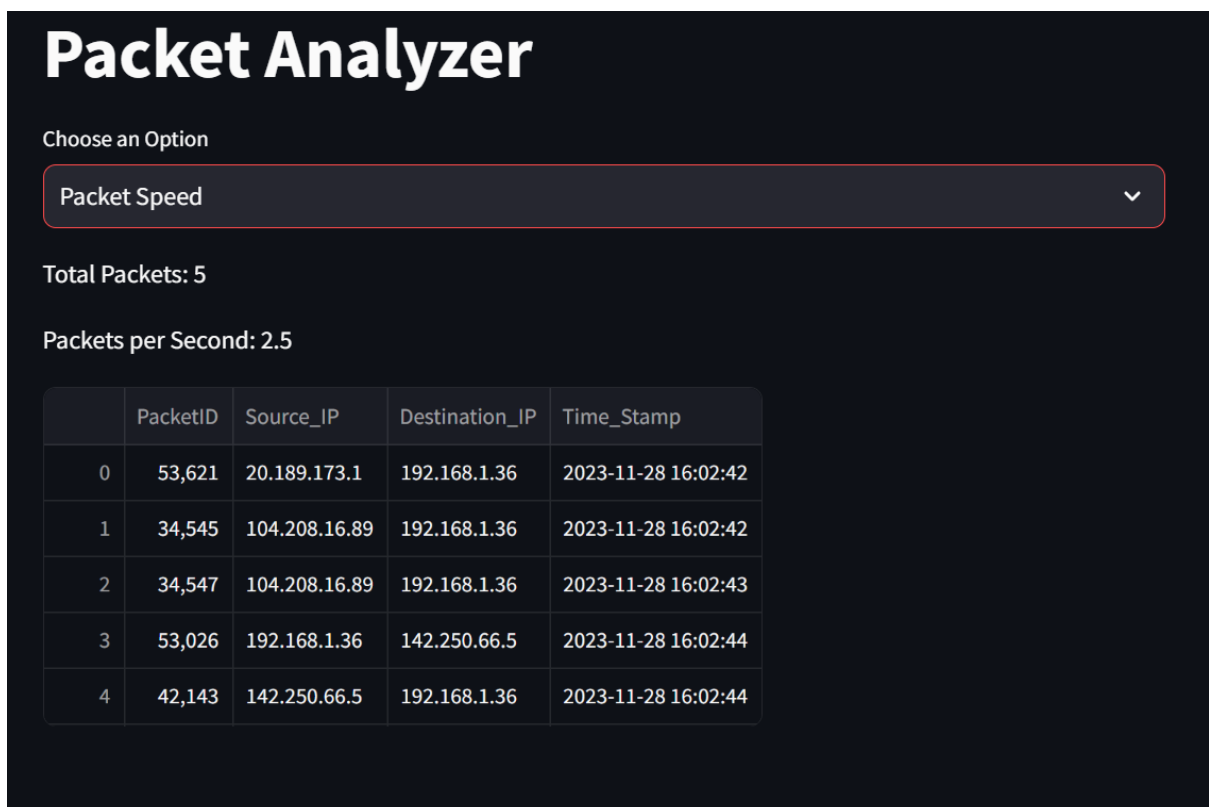
Device_MAC	Interface	IP_Address	Device_Name
78:17:35:2a:f1:10	4	116.119.62.146	Unknown
e8:84:a5:24:ec:9e	5	192.168.1.36	Unknown

2 rows in set (0.00 sec)

FRONTEND:



6 options as seen above



This computes the packet speed based on the first and last timestamps of packet table entries.

Packet Analyzer

Choose an Option

All Tables|

▼

Table: Packets

	PacketID	Source_IP	Destination_IP	Time_Stamp
0	53,621	20.189.173.1	192.168.1.36	2023-11-28 16:02:42
1	34,545	104.208.16.89	192.168.1.36	2023-11-28 16:02:42
2	34,547	104.208.16.89	192.168.1.36	2023-11-28 16:02:43
3	53,026	192.168.1.36	142.250.66.5	2023-11-28 16:02:44
4	42,143	142.250.66.5	192.168.1.36	2023-11-28 16:02:44

Table: Connection_details

	Sequence_number	Protocol	TTL	Source_MAC	Destination_MAC	Source_port	Destination_p
0	2,865,050,379	TCP	113	78:17:35:2a:f1:10	e8:84:a5:24:ec:9e	443	53,

Table: Connection_details

	Sequence_number	Protocol	TTL	Source_MAC	Destination_MAC	Source_port	Destination_p
0	2,865,050,379	TCP	113	78:17:35:2a:f1:10	e8:84:a5:24:ec:9e	443	53,
1	190,595,222	TCP	111	78:17:35:2a:f1:10	e8:84:a5:24:ec:9e	443	53,
2	190,595,222	TCP	111	78:17:35:2a:f1:10	e8:84:a5:24:ec:9e	443	53,
3	650,999,516	TCP	128	e8:84:a5:24:ec:9e	78:17:35:2a:f1:10	53,749	
4	1,522,901,402	TCP	124	78:17:35:2a:f1:10	e8:84:a5:24:ec:9e	443	53,

Table: Router

	Router_MAC	Device_MAC	Interface	Sequence_number
0	00:11:22:33:44:66	78:17:35:2a:f1:10	4	⚠️ -2911795648484622078
1	00:11:22:33:44:66	e8:84:a5:24:ec:9e	5	⚠️ -8710045550435728588

Table: ARP_table

	MAC_Address	Device_MAC	Device_IP	TTL	Protocol	Host_Name	Interface
0	00:11:22:33:44:66	e8:84:a5:24:ec:9e	192.168.1.36	128	SMTP	Unknown	5

Table: Devices_on_interface

	Device_MAC	Interface	IP_Address	Device_Name
0	78:17:35:2a:f1:10	4	116.119.62.146	Unknown
1	e8:84:a5:24:ec:9e	5	192.168.1.36	Unknown

All the tables are displayed.

Packet Analyzer

Choose an Option

Packet Router Contact

	PacketID	Destination MAC	Router_MAC
0	53,621	e8:84:a5:24:ec:9e	00:11:22:33:44:66
1	34,545	e8:84:a5:24:ec:9e	00:11:22:33:44:66
2	34,547	e8:84:a5:24:ec:9e	00:11:22:33:44:66
3	53,026	78:17:35:2a:f1:10	00:11:22:33:44:66
4	42,143	e8:84:a5:24:ec:9e	00:11:22:33:44:66

Displays the packets and the routers they pass through along with the device MAC addresses.



Packet Analyzer

Choose an Option

Insert Packet

Enter PacketID to insert:

560092

Insert PacketID

Error inserting PacketID: 1644 (45000): Not allowed to insert this PacketID

A procedure has been defined to prevent the addition of packets by anyone logged in other than the admin.

Packet Analyzer

Choose an Option

Packets per Interface

	Interface	PacketCount
0	4	1
1	5	1

Packet Analyzer

Choose an Option

Get Packet Count for IP



Get Packet Count

	Destination_IP	Occurrences
0	192.168.1.36	4
1	142.250.66.5	1

```
mysql> SELECT doi.IP_Address, c.Sequence_number
->      FROM Devices_on_interface doi
->      JOIN Connection_details c ON doi.Device_MAC = c.Destination_MAC
->      ORDER BY doi.IP_Address, c.Sequence_number;
+-----+-----+
| IP_Address | Sequence_number |
+-----+-----+
| 116.119.62.146 | 650999516 |
| 192.168.1.36 | 190595222 |
| 192.168.1.36 | 190595222 |
| 192.168.1.36 | 1522901402 |
| 192.168.1.36 | 2865050379 |
+-----+-----+
5 rows in set (0.00 sec)
```

We had plans to display the packets and to which IP addresses they are going to. Unfortunately, this wasn't being displayed on the front end.