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Summary:

In this lab I will make a simplified DHCP-like protocol that sends messages over the reliable TCP. I need to create a DHCP server and a client that will communicate over TCP socket. To simplify the protocol, our version of DHCP messages include only the transaction ID, and the IP address. Also, all phases are unicast-based.

The transaction ID is generated randomly except for the first time that client send the request to the server, which is '53'(818%255=53).

And each time the message which include the IP address and the Transaction ID(which is split by a simply space)will be sent between server and client.

Compilation Steps on terminal:

1. `g++ -o server 3074459818server.cpp`
2. `g++ -o client 3074459818client.cpp`

Executing Steps:

1. `./server`
2. `./client localhost`

Executing Results:

```

DHCP — -zsh — 80x24
[yebiao@kanous-MacBook-Pro DHCP % g++ -o server 3074459818server.cpp ]
[yebiao@kanous-MacBook-Pro DHCP % ./server ]
server: waiting for connections...
server: got connection form 127.0.0.1
Received the following Transaction ID from client: 53
Sending the following to Client:238.46.144.53
Transaction ID: 135
Received the following request:
Transaction ID: 203
Sending following acknowledgment:
IP address: 238.46.144.53
Transaction ID: 237
yebiao@kanous-MacBook-Pro DHCP % █

```

```

DHCP — -zsh — 80x24
[yebiao@kanous-MacBook-Pro DHCP % g++ -o client 3074459818client.cpp ]
[yebiao@kanous-MacBook-Pro DHCP % ./client localhost ]
client: connecting to 127.0.0.1
Sending the following Transaction ID to server: 53
Received the following:
IP address: 238.46.144.53
Transsaction ID: 135
Formally requesting the following server:
IP address: 238.46.144.53
Transaction ID: 203
Officially connected to IP Address: 238.46.144.53
client: received '237'
yebiao@kanous-MacBook-Pro DHCP % █

```