

Client – Server Compilation:

```
[vishakha@Vishakhas-MacBook-Pro Final % gcc -o client client.c  
vishakha@Vishakhas-MacBook-Pro Final %
```

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] [vishakha@Vishakhas-MacBook-Pro Final % gcc -o server server.c  
vishakha@Vishakhas-MacBook-Pro Final %
```

Test 1: Sending of 5 error free packets.

- Packet 1 and 2 transmission and receiving of ACK1 and ACK2

<pre>[vishakha@Vishakhas-MacBook-Pro Final % ./client localhost 1626 Test1: Send 5 Error-free packets Packet is created: Packet No: 1 Packet ID : "0xFFFF" Client ID : "0xFF" DATA : "0xFFFF1" Sequence Number : "1" Length of payload : "0X16" End of Packet ID : "0xFFFF" -----End of Packet ----- Sending message: Payload of a package. INFO: Received an ACK ACK: 1 Packet ID : "0xFFFF" Client ID : "0xFF" ACK : "0xFFFF2" Received Sequence Number : "1" End of Packet ID : "0xFFFF" ----- End of ACK ----- Packet is created: Packet No: 2 Packet ID : "0xFFFF" Client ID : "0xFF" DATA : "0xFFFF1" Sequence Number : "2" Length of payload : "0X16" End of Packet ID : "0xFFFF" -----End of Packet ----- Sending message: Payload of a package. INFO: Received an ACK ACK: 2 Packet ID : "0xFFFF" Client ID : "0xFF" ACK : "0xFFFF2" Received Sequence Number : "2" End of Packet ID : "0xFFFF" ----- End of ACK ----- Packet is created: Packet No: 3 Packet ID : "0xFFFF" Client ID : "0xFF" DATA : "0xFFFF1" Sequence Number : "3" Length of payload : "0X16" End of Packet ID : "0xFFFF" -----End of Packet -----</pre>	<pre>] [vishakha@Vishakhas-MacBook-Pro Final % gcc -o server server.c vishakha@Vishakhas-MacBook-Pro Final % ./server 1626 Server started successfully and now ready for incoming messages INFO: Received a packet: Packet number: 1 Packet size: 32 Content: Payload of a package. Packet No: 1 Packet ID : "0xFFFF" Client ID : "0xFF" DATA : "0xFFFF1" Sequence Number : "1" Length of payload : "0X16" End of Packet ID : "0xFFFF" -----End of Packet ----- INFO: Packet is accepted by the Server Sending an ACK sizeof(ack) == 10 ACK: 1 Packet ID : "0xFFFF" Client ID : "0xFF" ACK : "0xFFFF2" Received Sequence Number : "1" End of Packet ID : "0xFFFF" ----- End of ACK ----- INFO: Received a packet: Packet number: 2 Packet size: 32 Content: Payload of a package. Packet No: 2 Packet ID : "0xFFFF" Client ID : "0xFF" DATA : "0xFFFF1" Sequence Number : "2" Length of payload : "0X16" End of Packet ID : "0xFFFF" -----End of Packet ----- INFO: Packet is accepted by the Server Sending an ACK sizeof(ack) == 10 ACK: 2 Packet ID : "0xFFFF" Client ID : "0xFF" ACK : "0xFFFF2" Received Sequence Number : "2" End of Packet ID : "0xFFFF" ----- End of ACK -----</pre>
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● Packet 3 and 4 transmission and receiving of ACK3 and ACK4

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End of Packet ID : "0xFFFF"
----- End of ACK -----

Packet is created:

Packet No: 3
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "3"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet ----

Sending message: Payload of a package.

INFO: Received an ACK

ACK: 3
Packet ID : "0xFFFF"
Client ID : "0xFF"
ACK : "0xFFFF2"
Received Sequence Number : "3"
End of Packet ID : "0xFFFF"
----- End of ACK -----

Packet is created:

Packet No: 4
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "4"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet ----

Sending message: Payload of a package.

INFO: Received an ACK

ACK: 4
Packet ID : "0xFFFF"
Client ID : "0xFF"
ACK : "0xFFFF2"
Received Sequence Number : "4"
End of Packet ID : "0xFFFF"
----- End of ACK -----

Packet is created:

Packet No: 5
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "5"
Length of payload : "0X16"
----- End of ACK -----

INFO: Received a packet:
Packet number: 3
Packet size: 32
Content: Payload of a package.

Packet No: 3
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "3"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet ----

INFO: Packet is accepted by the Server
Sending an ACK
sizeof(ack) == 10

ACK: 3
Packet ID : "0xFFFF"
Client ID : "0xFF"
ACK : "0xFFFF2"
Received Sequence Number : "3"
End of Packet ID : "0xFFFF"
----- End of ACK -----

INFO: Received a packet:
Packet number: 4
Packet size: 32
Content: Payload of a package.

Packet No: 4
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "4"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet ----

INFO: Packet is accepted by the Server
Sending an ACK
sizeof(ack) == 10

ACK: 4
Packet ID : "0xFFFF"
Client ID : "0xFF"
ACK : "0xFFFF2"
Received Sequence Number : "4"
End of Packet ID : "0xFFFF"
----- End of ACK -----

INFO: Received a packet:
Packet number: 5
Packet size: 32
Content: Payload of a package.

Packet No: 5
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "5"
Length of payload : "0X16"
----- End of ACK -----

```

- Packet 5 transmission and receiving of ACK5.

```
Received Sequence Number : "4"  
End of Packet ID : "0xFFFF"  
----- End of ACK -----  
  
Packet is created:  
  
Packet No: 5  
Packet ID : "0xFFFF"  
Client ID : "0xFF"  
DATA : "0xFFF1"  
Sequence Number : "5"  
Length of payload : "0X16"  
End of Packet ID : "0xFFFF"  
-----End of Packet -----  
  
Sending message: Payload of a package.  
  
INFO: Received an ACK  
  
ACK: 5  
Packet ID : "0xFFFF"  
Client ID : "0xFF"  
ACK : "0xFFFF2"  
Received Sequence Number : "5"  
End of Packet ID : "0xFFFF"  
----- End of ACK -----  
  
Resetting the packet counter for Test2  
  
----- End of ACK -----  
  
INFO: Received a packet:  
Packet number: 5  
Packet size: 32  
Content: Payload of a package.  
  
Packet No: 5  
Packet ID : "0xFFFF"  
Client ID : "0xFF"  
DATA : "0xFFF1"  
Sequence Number : "5"  
Length of payload : "0X16"  
End of Packet ID : "0xFFFF"  
-----End of Packet -----  
  
INFO: Packet is accepted by the Server  
Sending an ACK  
sizeoff(ack) == 10  
  
ACK: 5  
Packet ID : "0xFFFF"  
Client ID : "0xFF"  
ACK : "0xFFFF2"  
Received Sequence Number : "5"  
End of Packet ID : "0xFFFF"  
----- End of ACK -----
```

Test 2: Sending of 1 correct and 4 error packets

- Error Free Packet transmission and receiving ACK

----- End of ACK -----

Resetting the packet counter for Test2

Test2: Sending 5 packets- 1 Correct and 4 error packets

Packet 1: Correct Packet

Packet is created:

Packet No: 1
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "1"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet -----

Sending message: Payload of a package.

INFO: Received an ACK

ACK: 1
Packet ID : "0xFFFF"
Client ID : "0xFF"
ACK : "0xFFFF2"
Received Sequence Number : "1"
End of Packet ID : "0xFFFF"
----- End of ACK -----

----- Resetting the packet counter -----

INFO: Received a packet:
Packet number: 1
Packet size: 32
Content: Payload of a package.

Packet No: 1
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "1"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet -----

INFO: Packet is accepted by the Server
Sending an ACK
sizeof(ack) == 10

ACK: 1
Packet ID : "0xFFFF"
Client ID : "0xFF"
ACK : "0xFFFF2"
Received Sequence Number : "1"
End of Packet ID : "0xFFFF"
----- End of ACK -----

● Duplicate Packet transmission

Packet 2: Testing Duplicate Packet Error

Packet is created:

```
Packet No: 1
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "1"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet -----
```

Sending message: Payload of a package.

INFO: Received a reject Packet. Error Message: Duplicate Packet

```
Reject Packet: 1
Packet ID : "0xFFFF"
Client ID : "0xFF"
REJECT : "0xFFFF3"
Reject sub code : "0xFFFF7"
Received Sequence Number : "1"
End of Packet ID : "0xFFFF"
----- End of Reject Packet -----
```

Packet 3: Testing out of Sequence Error

```
INFO: Received a packet:
Packet number: 1
Packet size: 32
Content: Payload of a package.
```

```
Packet No: 1
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "1"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet -----
```

```
INFO: Packet is rejected by the Server
Error: Duplicate Packet Found
```

```
Reject Packet: 1
Packet ID : "0xFFFF"
Client ID : "0xFF"
REJECT : "0xFFFF3"
Reject sub code : "0xFFFF7"
Received Sequence Number : "1"
End of Packet ID : "0xFFFF"
----- End of Reject Packet -----
```

● Out Of Sequence packet transmission

Packet 3: Testing out of Sequence Error

Packet is created:

```
Packet No: 3
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "3"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet -----
```

Sending message: Payload of a package.

INFO: Received a reject Packet. Error Message: Out of Sequence

```
Reject Packet: 3
Packet ID : "0xFFFF"
Client ID : "0xFF"
REJECT : "0xFFFF3"
Reject sub code : "0xFFFF4"
Received Sequence Number : "3"
End of Packet ID : "0xFFFF"
----- End of Reject Packet -----
```

Packet 4: Testing length Mismatch Error

```
INFO: Received a packet:
Packet number: 3
Packet size: 32
Content: Payload of a package.
```

```
Packet No: 3
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "3"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet -----
```

```
INFO: Packet is rejected by the Server
Error: Out of Sequence
```

```
Reject Packet: 3
Packet ID : "0xFFFF"
Client ID : "0xFF"
REJECT : "0xFFFF3"
Reject sub code : "0xFFFF4"
Received Sequence Number : "3"
End of Packet ID : "0xFFFF"
----- End of Reject Packet -----
```

● Length Mismatch Packet Transmission

Packet 4: Testing length Mismatch Error

Packet is created:

```
Packet No: 2
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "2"
Length of payload : "0X44"
End of Packet ID : "0xFFFF"
-----End of Packet -----
```

Sending message: Payload of a package.

INFO: Received a reject Packet. Error Message: Length Mismatch

```
Reject Packet: 2
Packet ID : "0xFFFF"
Client ID : "0xFF"
REJECT : "0xFFFF3"
Reject sub code : "0xFFFF5"
Received Sequence Number : "2"
End of Packet ID : "0xFFFF"
----- End of Reject Packet -----
```

Packet 5: Testing end of Packet missing error

Packet is created:

```
Packet No: 2
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "2"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet -----
```

Packet is altered: End of Packet ID changed

```
Packet No: 2
Packet ID : "0xFFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "2"
Length of payload : "0X16"
End of Packet ID : "0xFFFF0"
-----End of Packet -----
```

Sending message: Payload of a package.

INFO: Received a reject Packet. Error Message: Packet's end is missing

```
Reject Packet: 2
Packet ID : "0xFFFF"
Client ID : "0xFF"
REJECT : "0xFFFF3"
Reject sub code : "0xFFFF6"
Received Sequence Number : "2"
End of Packet ID : "0xFFFF"
----- End of Reject Packet -----
```

INFO: Received a packet:

Packet number: 2

Packet size: 32

Content: Payload of a package.

```
Packet No: 2
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "2"
Length of payload : "0X44"
End of Packet ID : "0xFFFF"
-----End of Packet -----
```

INFO: Packet is rejected by the Server

Error: Length Mismatch

```
Reject Packet: 2
Packet ID : "0xFFFF"
Client ID : "0xFF"
REJECT : "0xFFFF3"
Reject sub code : "0xFFFF5"
Received Sequence Number : "2"
End of Packet ID : "0xFFFF"
----- End of Reject Packet -----
```

● End of Packet missing Transmission

Packet 5: Testing end of Packet missing error

Packet is created:

```
Packet No: 2
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "2"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet -----
```

```
Client ID : "0xFF"
REJECT : "0xFFFF3"
Reject sub code : "0xFFFF5"
Received Sequence Number : "2"
End of Packet ID : "0xFFFF"
----- End of Reject Packet -----
```

INFO: Received a packet:

Packet number: 2

Packet size: 32

Content: Payload of a package.

```
Packet No: 2
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "2"
Length of payload : "0X16"
End of Packet ID : "0xFFFF0"
-----End of Packet -----
```

INFO: Packet is rejected by the Server

Error: Packet's end is missing

```
Reject Packet: 2
Packet ID : "0xFFFF"
Client ID : "0xFF"
REJECT : "0xFFFF3"
Reject sub code : "0xFFFF6"
Received Sequence Number : "2"
End of Packet ID : "0xFFFF"
----- End of Reject Packet -----
```

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Test 3: Server Not responding, ACK timer running

```
[vishakha@Vishakhas-MacBook-Pro Final % ./client localhost 1627
```

```
Test1: Send 5 Error-free packets
```

```
Packet is created:
```

```
Packet No: 1
Packet ID : "0xFFFF"
Client ID : "0xFF"
DATA : "0xFFFF1"
Sequence Number : "1"
Length of payload : "0X16"
End of Packet ID : "0xFFFF"
-----End of Packet -----
```

```
Sending message: Payload of a package.
```

```
Sending message failed. Trying to resend
Sending message: Payload of a package.
```

```
Sending message failed. Trying to resend
Sending message: Payload of a package.
```

```
Sending message failed. Trying to resend
Sending message: Payload of a package.
```

```
Error: Server does not respond
: Resource temporarily unavailable
vishakha@Vishakhas-MacBook-Pro Final %
```