

COEN 233 Computer Networks

Programming Assignment

1. Client using customized protocol on top of UDP protocol for sending information to the server.

Client.exe output

```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\ksben> cd Desktop
PS C:\Users\ksben\Desktop> gcc Client.c -o client.exe -lws2_32
PS C:\Users\ksben\Desktop> .\client.exe
Packet 1 sent. Waiting for ACK...
ACK received for packet 1
Simulating out-of-sequence error for packet 3
Packet 2 sent. Waiting for ACK...
Reject received for packet 3, sub-code: 0xFFFF4
Retrying packet 2 (1/3)
Simulating length mismatch error for packet 2
Packet 2 sent. Waiting for ACK...
Reject received for packet 2, sub-code: 0xFFFF5
Retrying packet 2 (2/3)
Simulating missing end identifier error for packet 2
Packet 2 sent. Waiting for ACK...
Reject received for packet 2, sub-code: 0xFFFF6
Retrying packet 2 (3/3)
Server does not respond. Aborting.
PS C:\Users\ksben\Desktop> |
```

Server.exe output

```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\ksben> cd Desktop
PS C:\Users\ksben\Desktop> gcc Server.c -o server.exe -lws2_32
PS C:\Users\ksben\Desktop> .\server.exe
Server is running on port 8080...
Valid packet received: segment 1
ACK sent for segment 1
Out-of-sequence packet received: segment 3
REJECT sent for segment 3 with sub-code 0xFFFF4
Length mismatch for segment 2
REJECT sent for segment 2 with sub-code 0xFFFF5
Missing end of packet identifier for segment 2
REJECT sent for segment 2 with sub-code 0xFFFF6
|
```

2. Client using customized protocol on top of UDP protocol for requesting identification from server for access permission to the network.

Clientpa2.exe output

```
PS C:\Users\ksben\Desktop> gcc Clientpa2.c -o clientpa2.exe -lws2_32
PS C:\Users\ksben\Desktop> .\clientpa2.exe
```

**** Establishing connection with the Server.....

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission fff8
Segment number : 1
Length 6
Technology: 2
Source Subscriber No: 4085546805
End of packetID: ffff

Response Received from the Server ==>>>

** INFO: Subscriber does not exist **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission fff8
Segment number : 2
Length 6
Technology: 3
Source Subscriber No: 4086668821
End of packetID: ffff

Response Received from the Server ==>>>

** INFO: Subscriber has not paid **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission fff8
Segment number : 3
Length 6
Technology: 3
Source Subscriber No: 4086668819
End of packetID: ffff

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission fff8
Segment number : 3
Length 6
Technology: 3
Source Subscriber No: 4086668819
End of packetID: ffff

Response Received from the Server ==>>>

** INFO: Subscriber has access **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission fff8
Segment number : 4
Length 6
Technology: 5
Source Subscriber No: 4085536805
End of packetID: ffff

Response Received from the Server ==>>>

** INFO: Subscriber does not exist **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission fff8
Segment number : 5
Length 6
Technology: 2
Source Subscriber No: 4073455431
End of packetID: ffff

Response Received from the Server ==>>>

Response Received from the Server ==>>>

** INFO: Subscriber does not exist **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission fff8
Segment number : 6
Length 6
Technology: 2
Source Subscriber No: 4086808820
End of packetID: ffff

Response Received from the Server ==>>>

** INFO: Subscriber does not exist **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission fff8
Segment number : 7
Length 6
Technology: 4
Source Subscriber No: 4086808824
End of packetID: ffff

Response Received from the Server ==>>>

** INFO: Subscriber has not paid **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission fff8
Segment number : 8
Length 6
Technology: 4
Source Subscriber No: 4086808812

```
** INFO: Subscriber has not paid **
```

```
Details of Received Packet:
```

```
****
```

```
Sun Mar 09 14:27:19 2025 packetID: ffff
```

```
ClientID : ff
```

```
Access Permission fff8
```

```
Segment number : 8
```

```
Length 6
```

```
Technology: 4
```

```
Source Subscriber No: 4086808812
```

```
End of packetID: ffff
```

```
****
```

```
Response Received from the Server ==>>>
```

```
** INFO: Subscriber does not exist **
```

```
Details of Received Packet:
```

```
****
```

```
Sun Mar 09 14:27:19 2025 packetID: ffff
```

```
ClientID : ff
```

```
Access Permission fff8
```

```
Segment number : 9
```

```
Length 6
```

```
Technology: 3
```

```
Source Subscriber No: 4086808827
```

```
End of packetID: ffff
```

```
****
```

```
Response Received from the Server ==>>>
```

```
** INFO: Subscriber does not exist **
```

```
PS C:\Users\ksben\Desktop>
```

Serverpa2.exe output

```
PS C:\Users\ksben\Desktop> .\serverpa2.exe
```

```
***** Starting Server *****
```

```
***** Server started. Listening for Packets *****
```

```
Details of Received Packet:
```

```
*****
```

```
Sun Mar 09 14:27:19 2025 packetID: ffff
```

```
ClientID : ff
```

```
Access Permission: fff8
```

```
Segment Number: 1
```

```
Length: 6
```

```
Technology: 2
```

```
Source Subscriber No: 4085546805
```

```
End of packetID: ffff
```

```
*****
```

```
** Subscriber does not exist **
```

```
-----  
Details of Received Packet:
```

```
*****
```

```
Sun Mar 09 14:27:19 2025 packetID: ffff
```

```
ClientID : ff
```

```
Access Permission: fff8
```

```
Segment Number: 2
```

```
Length: 6
```

```
Technology: 3
```

```
Source Subscriber No: 4086668821
```

```
End of packetID: ffff
```

```
*****
```

```
** Subscriber has not paid **
```

```
-----  
Details of Received Packet:
```

```
*****
```

```
Sun Mar 09 14:27:19 2025 packetID: ffff
```

```
ClientID : ff
```

```
Access Permission: fff8
```

```
Segment Number: 3
```

```
Length: 6
```

```
Technology: 3
```

```
Source Subscriber No: 4086668819
```

```
End of packetID: ffff
```

```
*****
```

```
** Subscriber has access **
```

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission: fff8
Segment Number: 4
Length: 6
Technology: 5
Source Subscriber No: 4085536805
End of packetID: ffff

** Subscriber does not exist **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission: fff8
Segment Number: 5
Length: 6
Technology: 2
Source Subscriber No: 4073455431
End of packetID: ffff

** Subscriber does not exist **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission: fff8
Segment Number: 6
Length: 6
Technology: 2
Source Subscriber No: 4086808820
End of packetID: ffff

** Subscriber does not exist **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission: fff8
Segment Number: 7
Length: 6
Technology: 4
Source Subscriber No: 4086808824

Length: 6
Technology: 4
Source Subscriber No: 4086808824
End of packetID: ffff

** Subscriber has not paid **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission: fff8
Segment Number: 8
Length: 6
Technology: 4
Source Subscriber No: 4086808812
End of packetID: ffff

** Subscriber does not exist **

Details of Received Packet:

Sun Mar 09 14:27:19 2025 packetID: ffff
ClientID : ff
Access Permission: fff8
Segment Number: 9
Length: 6
Technology: 3
Source Subscriber No: 4086808827
End of packetID: ffff

** Subscriber does not exist **
