

1. Program-program

Program C1

```
1  import java.io.IOException;
2  import java.net.ServerSocket;
3
4  public class TCPEchoServerThread {
5
6      private static ServerSocket servSock;
7      private static final int PORT = 12345;
8
9      public TCPEchoServerThread() {
10     }
11
12     public void start() {
13         try {
14             servSock = new ServerSocket(PORT);
15             while (true) {
16                 Thread clientThread = new Thread(new ClientHandler(servSock.accept()));
17                 clientThread.start();
18             }
19         } catch (IOException e) {
20             e.printStackTrace();
21         } finally {
22             try {
23                 System.out.println("Menutup koneksi....");
24                 servSock.close();
25             } catch (IOException e) {
26                 System.out.println("Tidak dapat memutuskan koneksi");
27                 e.printStackTrace();
28                 System.exit(1);
29             }
30         }
31     }
32
33     public static void main(String[] args) {
34         TCPEchoServerThread es = new TCPEchoServerThread();
35         System.out.println("Server telah berjalan di komputer ini pada port " + PORT);
36         es.start();
37     }
38 }
```

Aplikasi Program Server

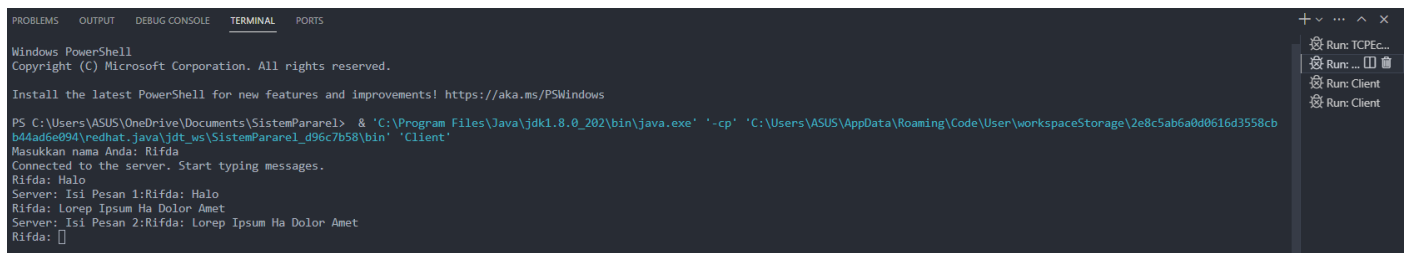
```
1  import java.io.BufferedReader;
2  import java.io.IOException;
3  import java.io.InputStreamReader;
4  import java.io.PrintWriter;
5  import java.net.Socket;
6
7  class ClientHandler implements Runnable {
8
9      private static int numConnections;
10     private int connectionId = 0;
11     Socket link;
12
13     public ClientHandler(Socket s) {
14         connectionId = numConnections++;
15         System.out.println("Melayani koneksi ke-" + connectionId);
16         link = s;
17     }
18
19     public void run() {
20         PrintWriter out = null;
21         BufferedReader in = null;
22         int numMessages = 0;
23
24         try {
25             out = new PrintWriter(link.getOutputStream(), true);
26             in = new BufferedReader(new InputStreamReader(link.getInputStream()));
27             String message = in.readLine();
28             while (!message.equals("close")) {
29                 System.out.println("Pesan diterima: [" + message + "] dari client " + connectionId + " dalam " + message.length() + " bytes");
30                 numMessages++;
31                 out.println("Isi Pesan " + numMessages + ":" + message);
32                 message = in.readLine();
33             }
34         } catch (Exception e) {
35             e.printStackTrace();
36         } finally {
37             out.close();
38             try {
39                 in.close();
40                 link.close();
41                 System.out.println("Menutup koneksi, #" + connectionId);
42             } catch (IOException e) {
43                 e.printStackTrace();
44             }
45         }
46     }
47 }
```

Aplikasi Program Client

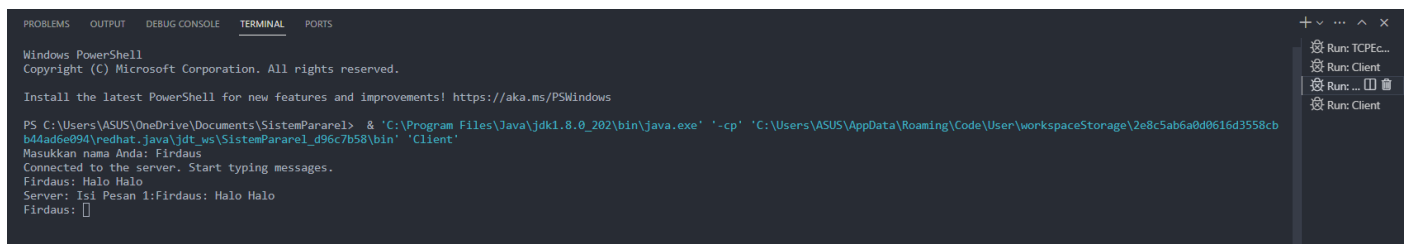


2. ScreenShot

Client 1 :



Client 2 :



Client 3 :



Server :

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

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

PS C:\Users\ASUS\OneDrive\Documents\SistemPararel> & 'C:\Program Files\Java\jdk1.8.0_202\bin\java.exe' '-cp' 'C:\Users\ASUS\AppData\Roaming\Code\User\workspaceStorage\2e8c5ab6a0d0616d3558cb
b44ad6e094\redhat.java\jdt_ws\SistemPararel_d96c7b58\bin' 'TCPEchoServerThread'
Server telah berjalan di komputer ini pada port 12345
Melayani koneksi ke-0
Pesan diterima: [Rifda: Halo] dari client 0 dalam 11 bytes
Melayani koneksi ke-1
Pesan diterima: [Firdaus: Halo Halo] dari client 1 dalam 18 bytes
Melayani koneksi ke-2
Pesan diterima: [Saputra: Halo Halo Halo] dari client 2 dalam 23 bytes
Pesan diterima: [Rifda: Lorep Ipsum Ha Dolor Amet] dari client 0 dalam 32 bytes
█
```