Client Server in Java

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Framework

- Server (application)
  - Java or other language
- Client (applet...)
  - Java...
- Socket
  - Connects Server and Client

The server provides a service by listening on a port
Initializing a Connection

- **Socket**
  - Two way link between client and server

- **Client Connects to the port at the Server**
  - This creates the socket

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Server Creates Service

```java
ServerSocket servsock = new ServerSocket(4404);
// Create a new service at a port

while (true) {
    // wait for the next client connection
    Socket sock = servsock.accept(); // Listen
    // Blocks until a client connects.
    // handle connection
    ...
}
```
Client Connects

Socket sock = new Socket("foo.bar.edu", 4404);
    // Connect to a Service at a site.

    // Get I/O streams from the socket
in = new BufferedReader(new InputStreamReader (sock.getInputStream()));
out = new PrintStream( sock.getOutputStream() );

String fromServer = in.readLine(); // Get initial string
String reply = ...
...
out.println(reply); out.flush();

Server Responds

while (true) {
    // wait for the next client connection
Socket sock=servsock.accept(); // Listen
    // Blocks until a client connects.
PrintStream out =
    new PrintStream( sock.getOutputStream() );
BufferedReader in  = new BufferedReader(
    new InputStreamReader (sock.getInputStream() ));
// Send our initial message
String initial = ...;
out.println(initial ); out.flush();
...
}
Either Terminates Connection

... sock.close();

Notes

- Can have several sockets on one port
- Each socket should have its own thread
  - Reading and writing can even be in different threads
- Should perhaps have a limit on number of threads/sockets handled
- Listening thread creates others.
Advanced Techniques

- Can broadcast to all open sockets
  - e.g. Manage a multi-user game.
- Server can connect to other services and act as an intermediary filter
  - e.g. This is how you get gopher and ftp service from an http server.
- Streams don’t have to be text streams