

# Session 04

## Socket Programming - 01

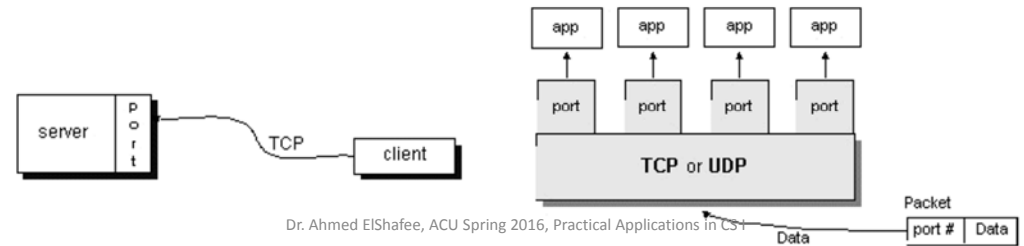
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# Concepts of socket programming

## Ports

- Ports are a virtual channels that enables applications to share the single network channel to exchange data.
- Port numbers are represented by 16-bit numbers. (0 to 65,535) The port numbers ranging from 0 - 1023 reserved for use by well known application
- services such as HTTP and FTP and other system services.



## Sockets

You can reach required service via its network and port IDs. what then?

a) If you are a client

- you need an API that will allow you to send messages to that service and read replies from it

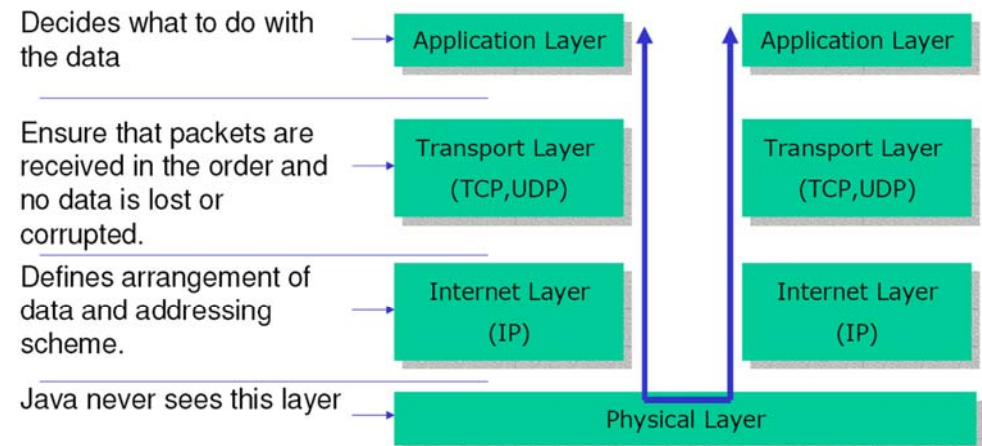
b) If you are a server

- you need to be able to create a port and listen at it.
- you need to be able to read the message comes in and reply to it.

The **Socket** and **ServerSocket** are the Java client and server classes to do this.

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## Network Layers



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## TCP and UDP

Java only supports TCP (Transmission Control Protocol), UDP (User Datagram Protocol) and application layer protocols built on top of these.

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## TCP/IP client/server

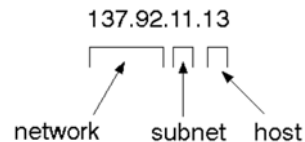


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## Internet Addressing

Internet address (IP address) is a unique number for identifying a device connected to the Internet.

The current standard is IPv4 which are four bytes long.



The hostname and IP address is, in Java, represented by `java.net.InetAddress`.

`InetAddress` is used by many other networking classes, including `Socket`, `ServerSocket`, `URL`, `DatagramSocket`, `DatagramPacket`, and more.

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## Internet Addressing (2)

### `InetAddress` class

methods:

- `.getLocalHost()`
- `.getByName("webserver name")`
- `.getByAddress(byte[4])`
- `.getHostAddress()`
- `.getHostName()`

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## Sockets0401

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Assignment

The screenshot shows a Java application window with the following fields and buttons:

- Local Host:  IP:
- Name:
- WebServer Address Name:
- 
- 
- WebServer IP Address:
- 
- 

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## Internet Addressing (3)

The URL Class

```
.getProtocol()  
.getHost()  
.getPath()  
.getQuery()  
.getRef()  
.getUserInfo()  
.getAuthority()  
.openConnection()
```

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## Internet Addressing (4)

For example, given the URL :

<http://www.ibiblio.org/javafaq/javabooks/index.html?isbn=123456789#toc>

1. Protocol: http
2. authority : www.ibiblio.org
3. path : /javafaq/books/javabooks/index.html
4. query string : isbn=123456789
5. fragment identifier : toc

## Sockets0402

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Assignment

The screenshot shows a Java application window with the following fields and buttons:

- URL:
- 
- Protocol:
- Host:
- Path:
- Query:
- Reference:
- User Info:
- Authority:

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# Internet Addressing (4)

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## URLConnection class

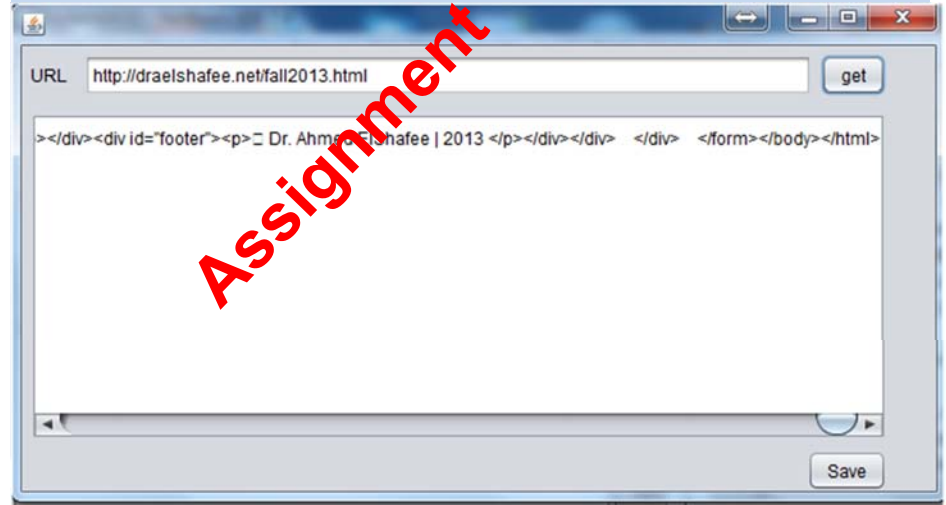
- `urlc.getInputStream()`

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# Sockets0403

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Thanks,..  
See you next week (ISA),...

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