Moduldokumentation

Modul Verteilte Systeme (vesys)

Simon Wächter

2017

Inhalt

[1 Einleitung 3](#_Toc475543664)

[1.1 Einleitung 3](#_Toc475543665)

[1.2 Lernziele 3](#_Toc475543666)

[1.3 Prüfungen 3](#_Toc475543667)

[2 Woche 1 4](#_Toc475543668)

[2.1 Definition of Distributed Systems 4](#_Toc475543669)

[2.1.1 Definitions 4](#_Toc475543670)

[2.1.2 Classification 4](#_Toc475543671)

[2.1.3 Pros and Cons 5](#_Toc475543672)

[2.1.4 Interaction Models 5](#_Toc475543673)

[2.1.5 Client/Server Model 6](#_Toc475543674)

[2.1.6 Communication Models 6](#_Toc475543675)

[2.1.7 Communication Styles 7](#_Toc475543676)

[2.2 Challenges of Distributed Systems 8](#_Toc475543677)

[2.2.1 Heterogeneity 8](#_Toc475543678)

[2.2.2 Latency 8](#_Toc475543679)

[2.2.3 Security 8](#_Toc475543680)

[2.2.4 Scalability 9](#_Toc475543681)

[2.2.5 Failures 9](#_Toc475543682)

[2.2.6 Concurrency 10](#_Toc475543683)

[2.2.7 Consistency 10](#_Toc475543684)

[2.3 Networking 10](#_Toc475543685)

[2.3.1 Protocol & Network Levels 10](#_Toc475543686)

[2.3.2 IP Socket Connections 11](#_Toc475543687)

[2.3.3 IP Addressing 11](#_Toc475543688)

[2.3.4 TCP/UDP Common Port Numbers 12](#_Toc475543689)

[2.3.5 InetAddress 12](#_Toc475543690)

[2.3.6 Network Interfaces 13](#_Toc475543691)

[2.4 Sockets 13](#_Toc475543692)

[2.4.1 Sockets 13](#_Toc475543693)

[2.4.2 TCP Sockets 14](#_Toc475543694)

[2.4.3 Java Socket 14](#_Toc475543695)

[2.4.4 Sample Client (Echo) 16](#_Toc475543696)

[2.4.5 Sample Client (Mailer) 16](#_Toc475543697)

[2.4.6 ServerSocket 17](#_Toc475543698)

[2.4.7 Echo Server 18](#_Toc475543699)

[2.4.8 Concurrent Echo Server 18](#_Toc475543700)

[2.4.9 Concurrent Echo Server (Threaded) 18](#_Toc475543701)

[2.4.10 Concurrent Echo Server (Limitierter Threadpool) 19](#_Toc475543702)

[2.4.11 Concurrent Echo Server (Dynamischer Threadpool) 20](#_Toc475543703)

[3 Woche 2 22](#_Toc475543704)

# Einleitung

## Einleitung

Dieses Dokument stellt die Moduldokumentation für das Modul vesys dar. Allfällige Unterlagen sind im Modulordner zu finden.

## Lernziele

Das Modul beinhaltet folgende Lernziele:

* Erstellen einer Verbindung zwischen zwei Rechnern mittels Sockets
* Wissen über http Protokoll und Webserver
* Implementieren einfacher Servlets
* Prinzipien und Programmierung von RMI
* Prinzipien von Webservices und Programmierung mittels JAXWS
* Verwendung von Webservices mittels WSDL
* Prinzipien und Programmierung von REST und deren Unterschiede zu SOA und ROA
* Prinzipien der asynchronen Programmierung mittels JMS und Akka
* Entscheidung, welche der Technologien für eine Situation geeignet ist

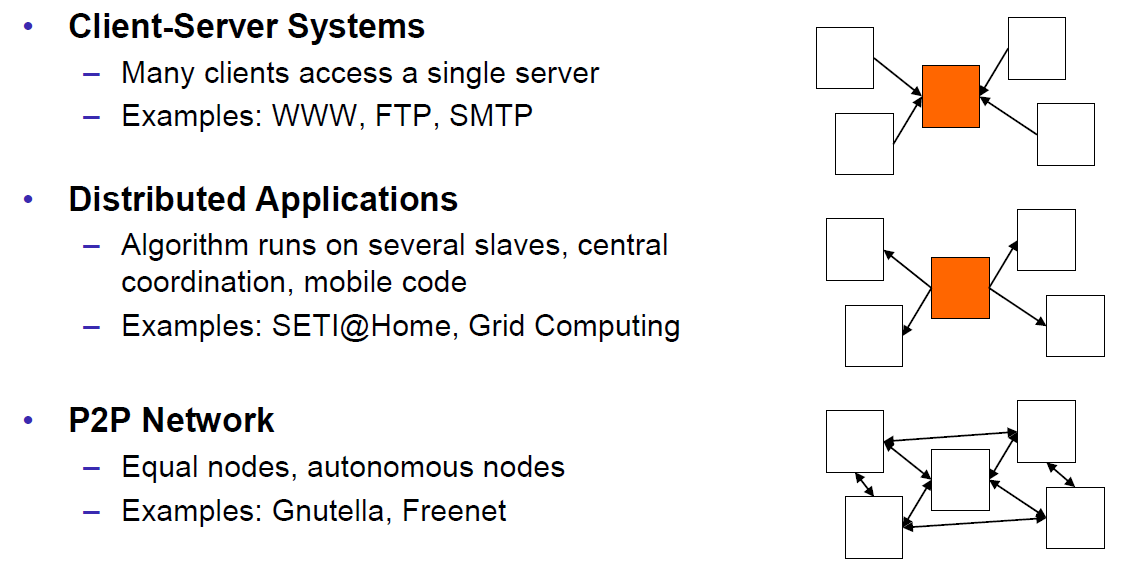
## Prüfungen

Die Modulnote setzt sich aus einer Semesterprüfung zu 50% und einer Modulschlussprüfung zu 50% zusammen. Zusätzlich müssen 4 von 8 Übungen erfüllt werden.

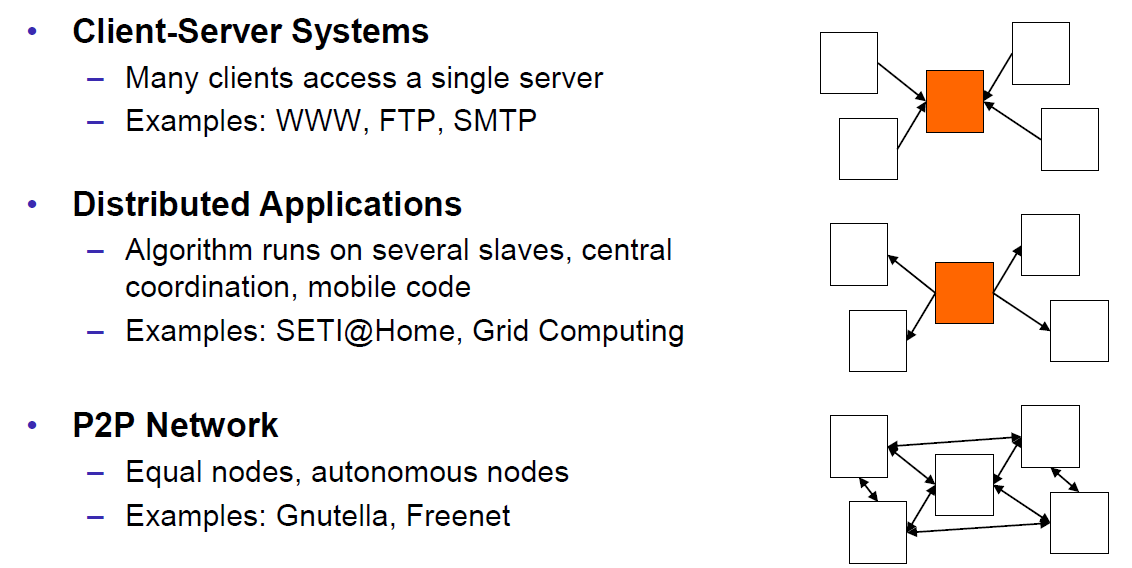
# Woche 1

## Definition of Distributed Systems

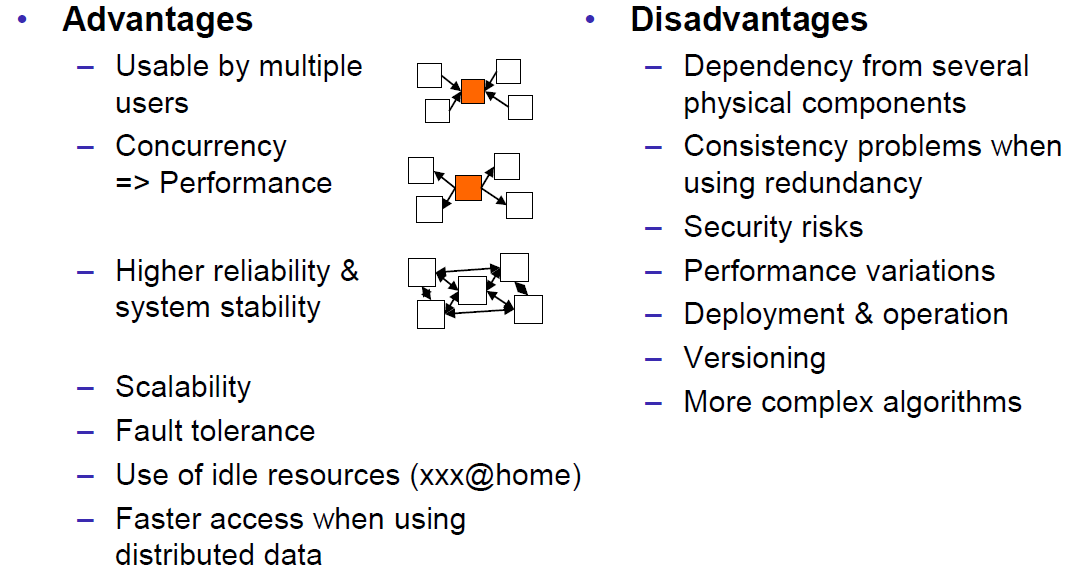
### Definitions



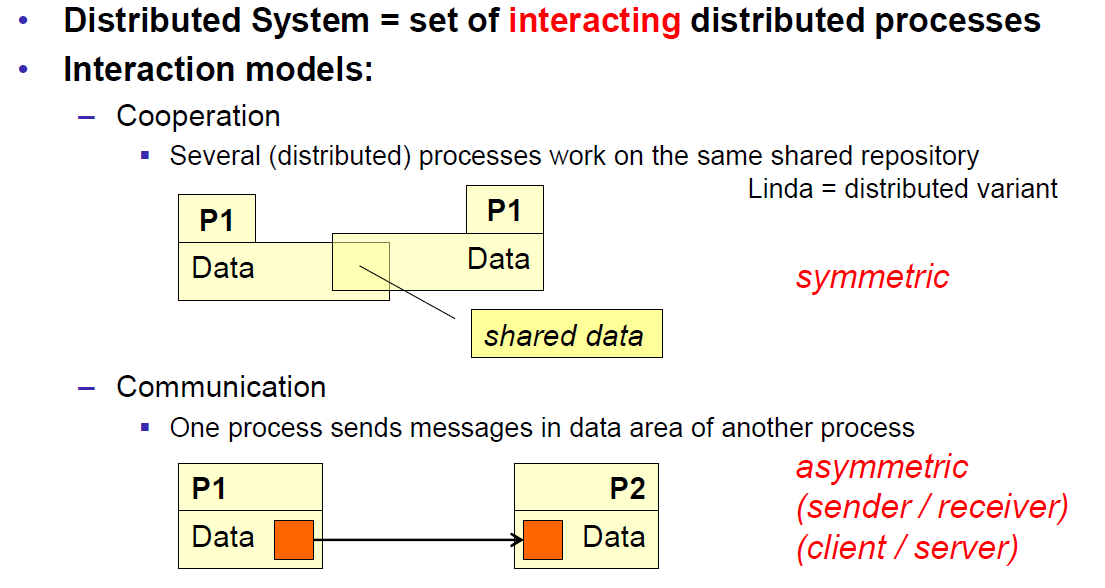
### Classification



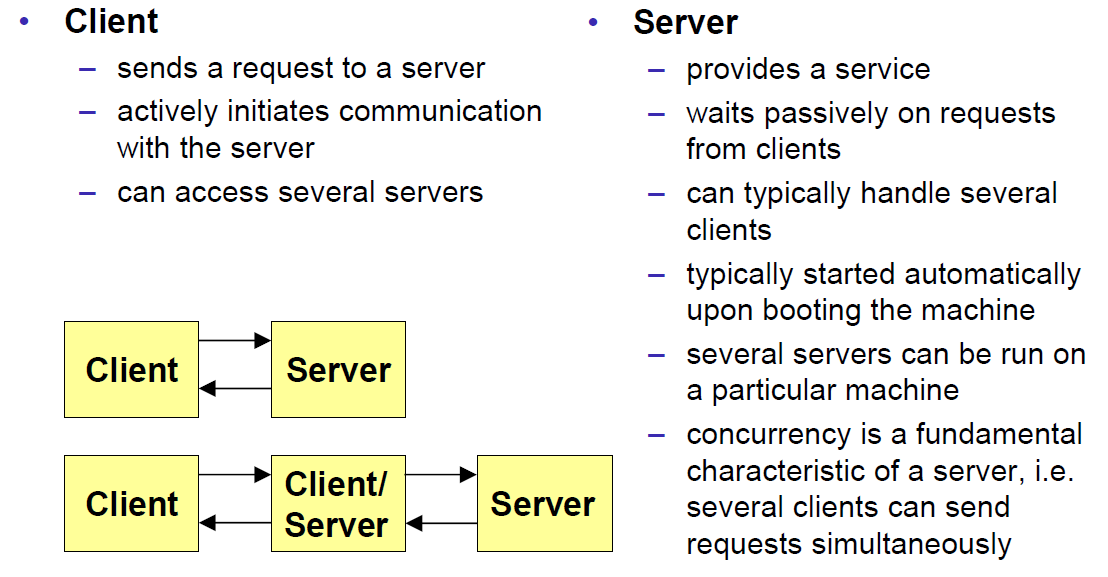
### Pros and Cons



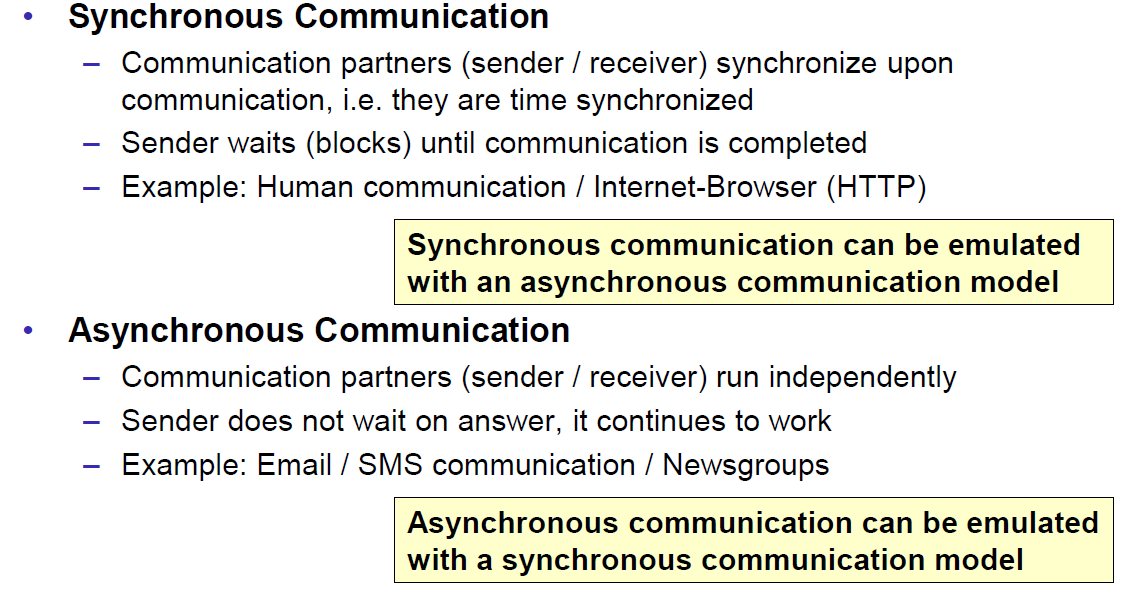
### Interaction Models

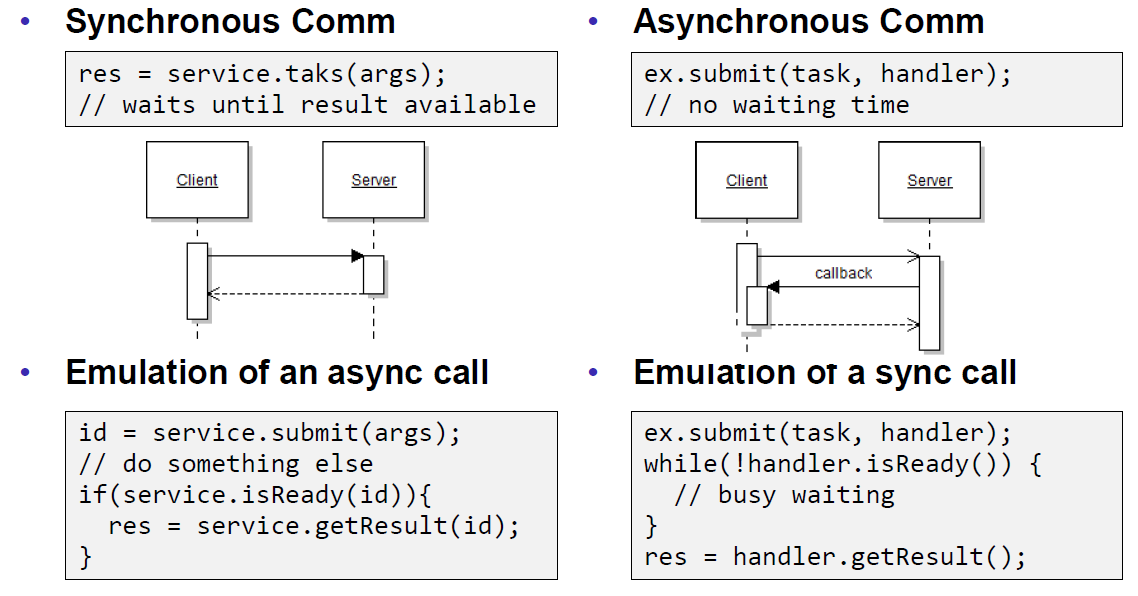


### Client/Server Model

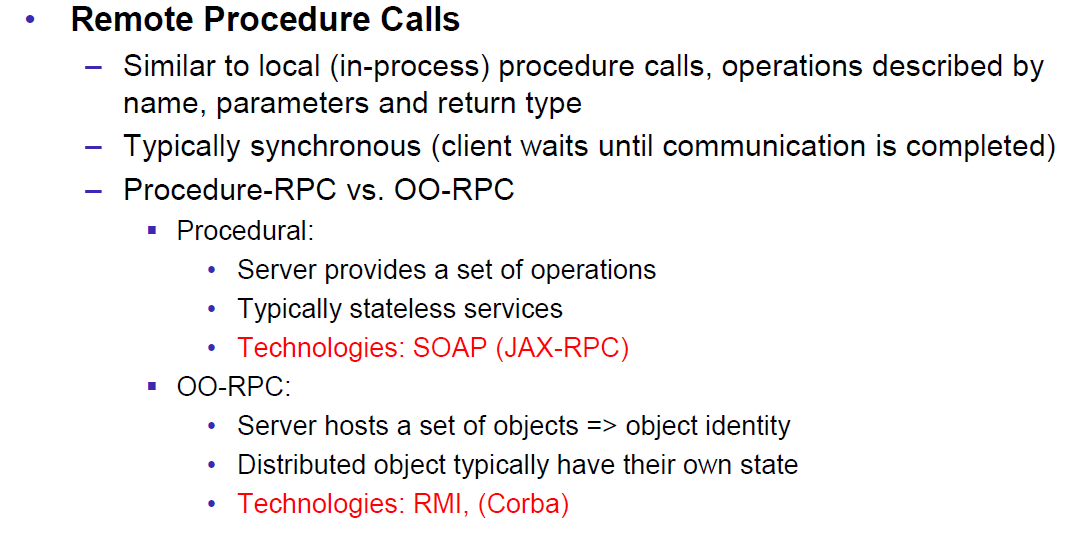


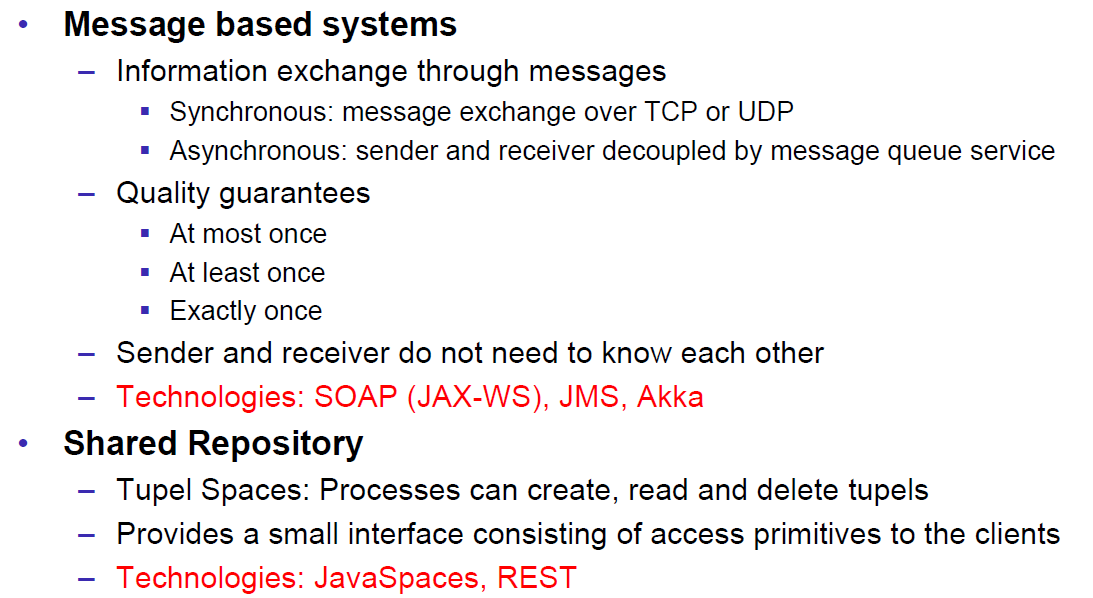
### Communication Models





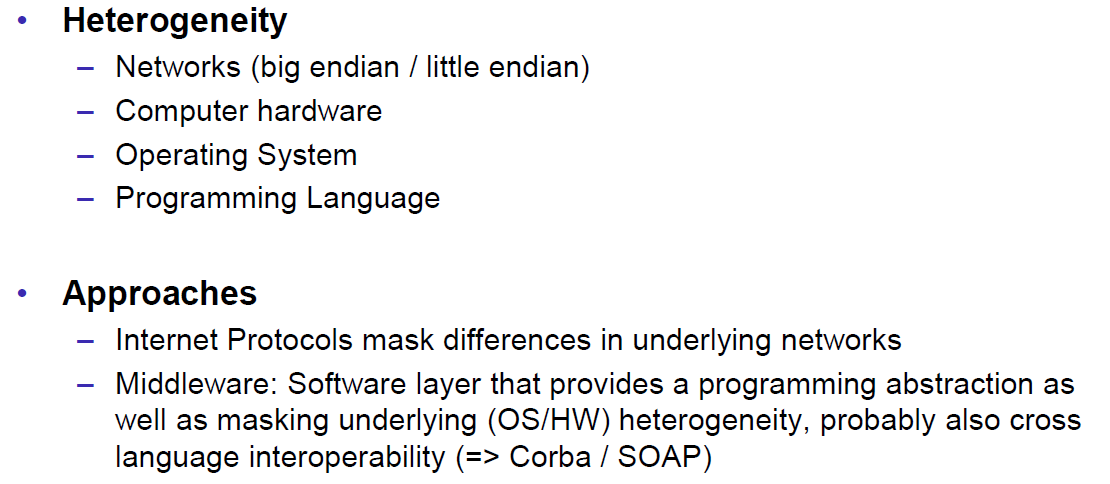
### Communication Styles



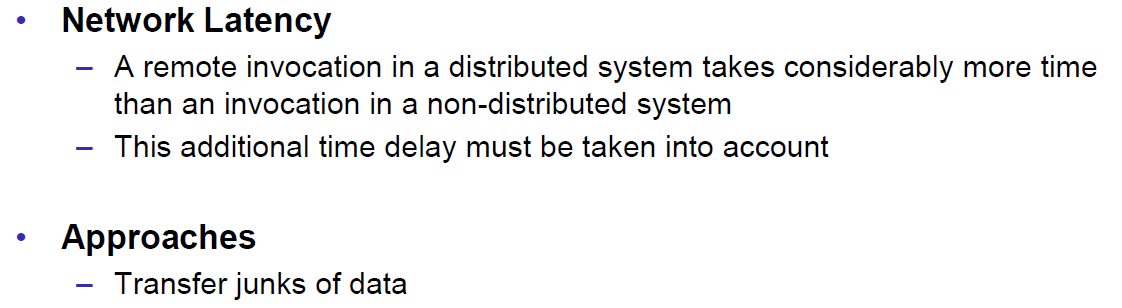


## Challenges of Distributed Systems

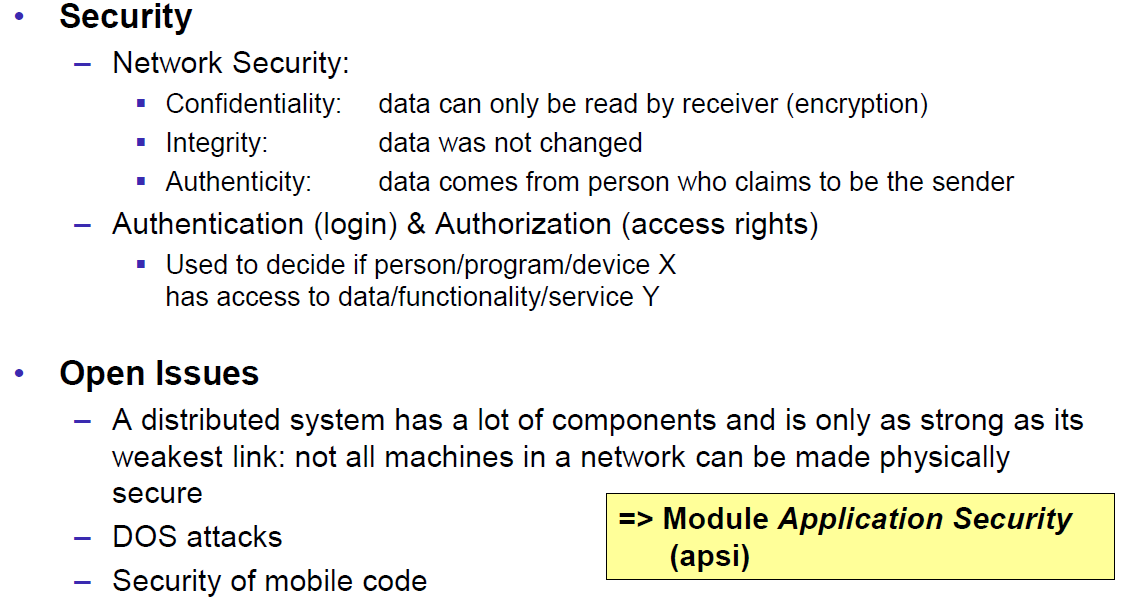
### Heterogeneity



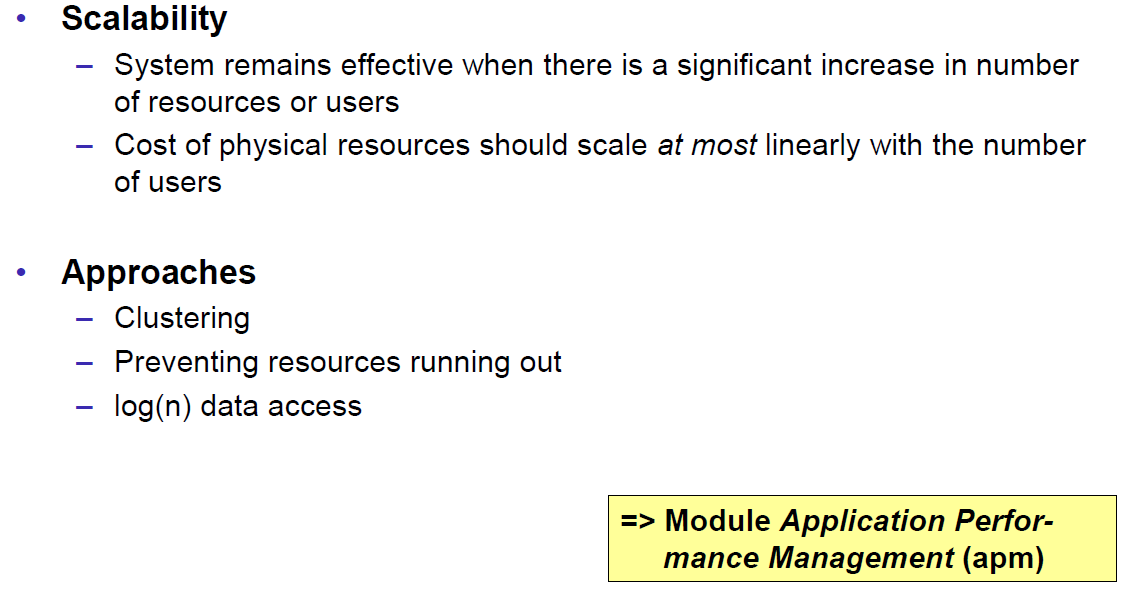
### Latency



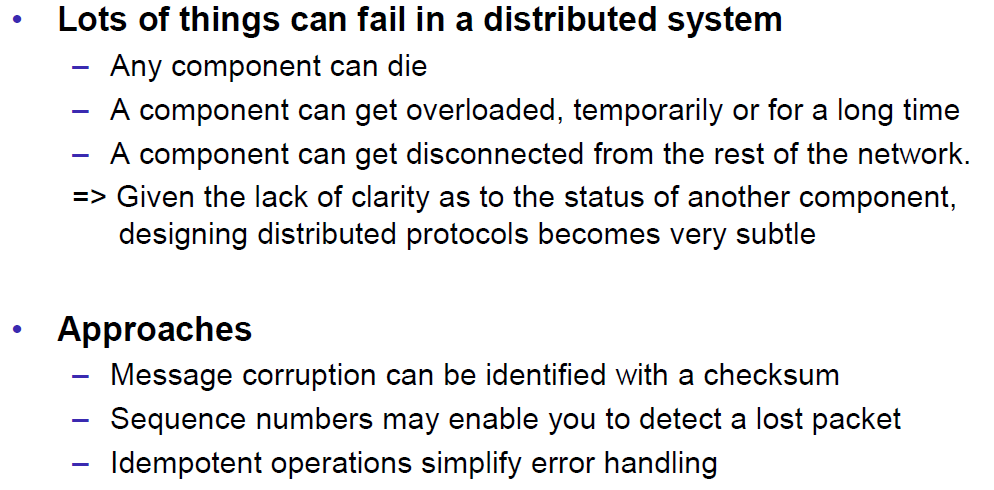
### Security



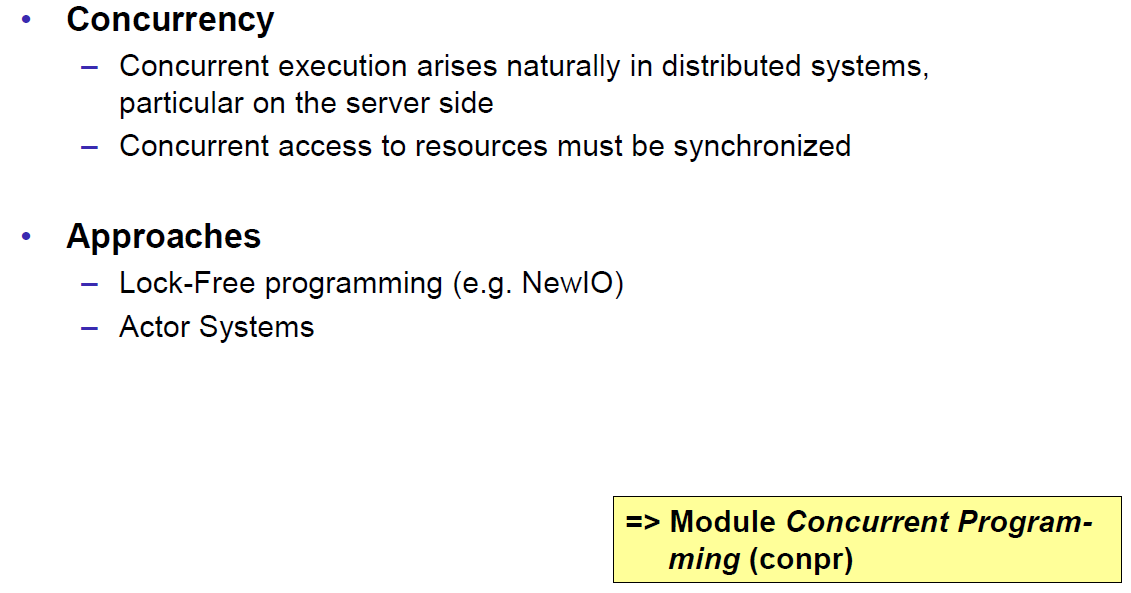
### Scalability



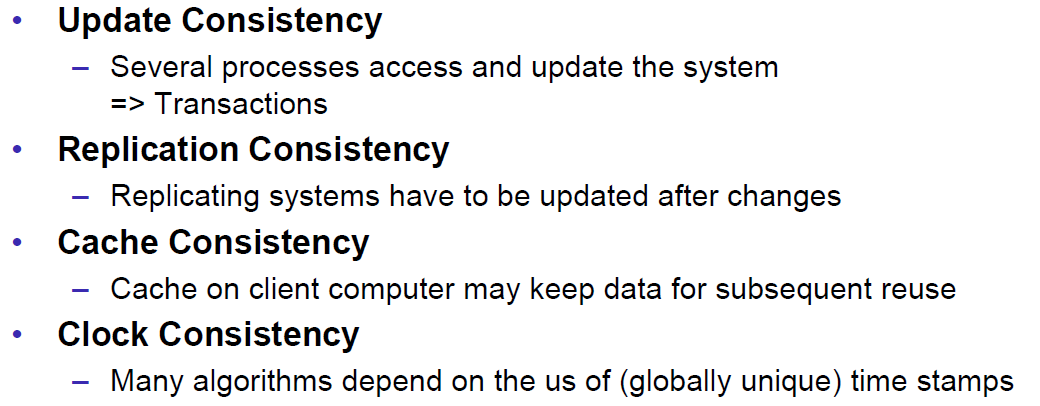
### Failures



### Concurrency

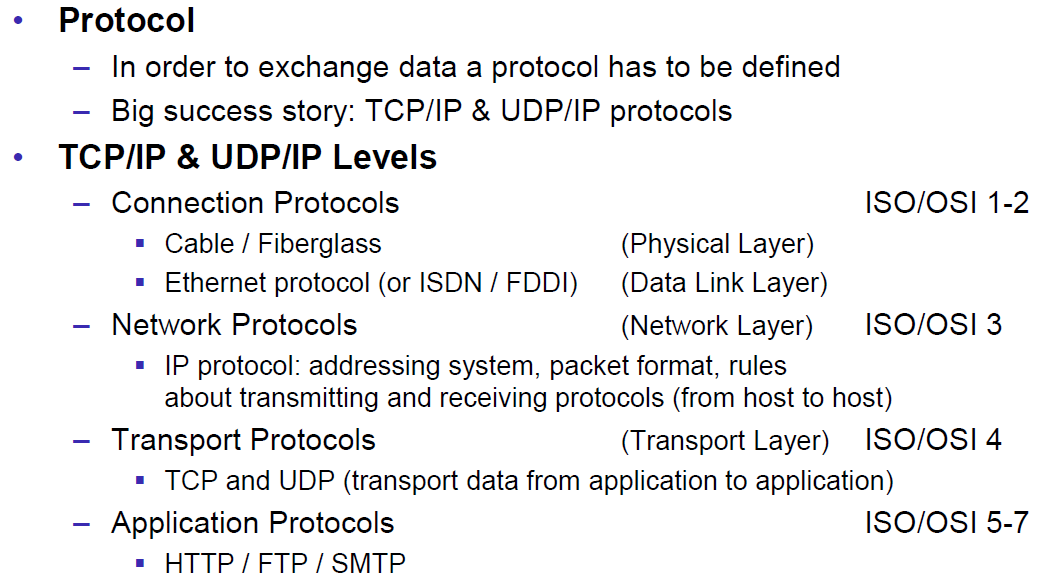


### Consistency

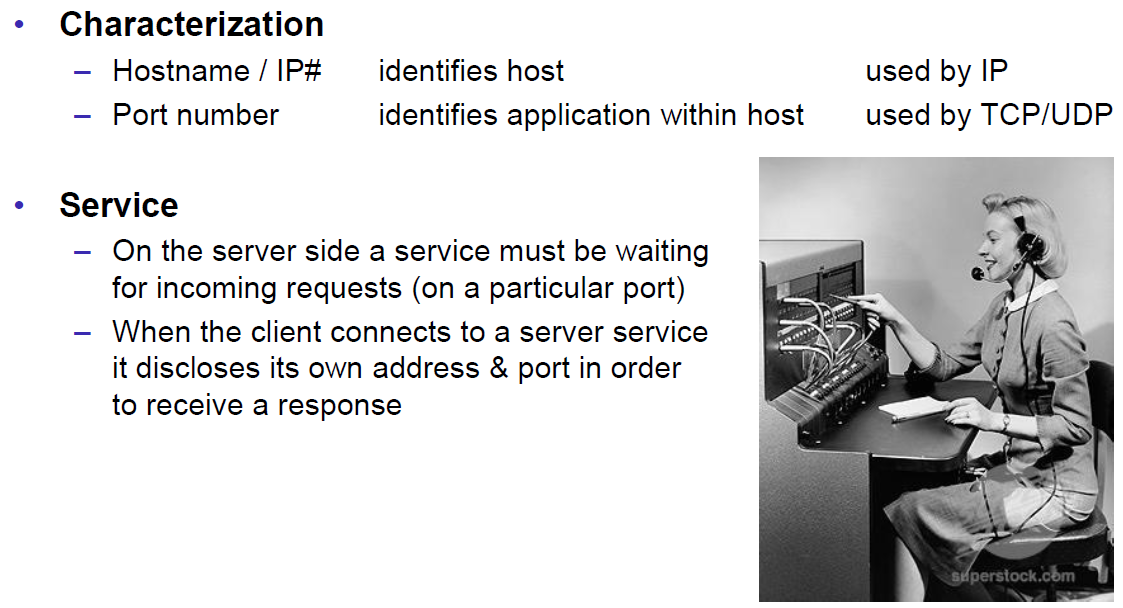


## Networking

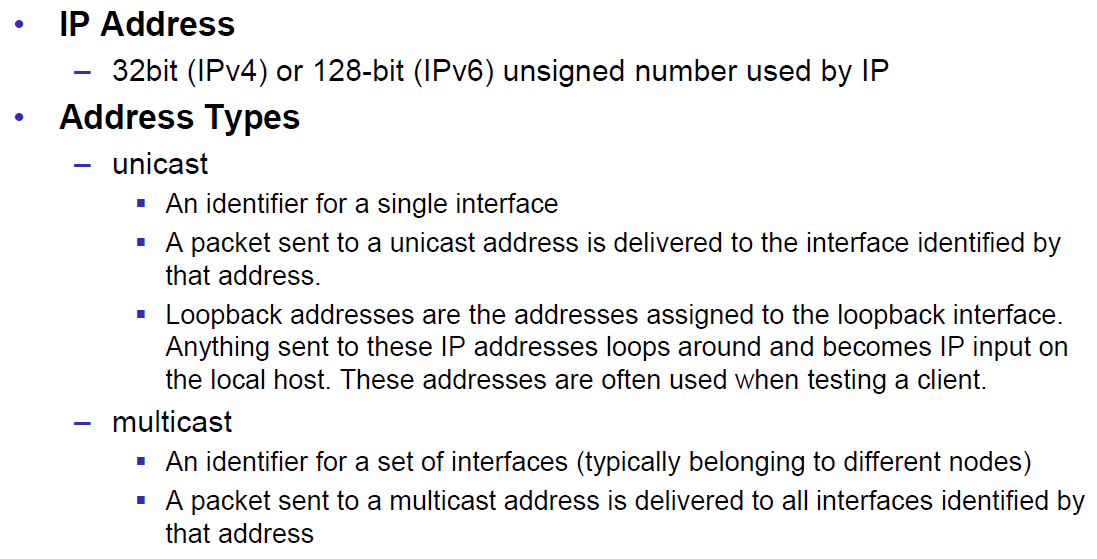
### Protocol & Network Levels



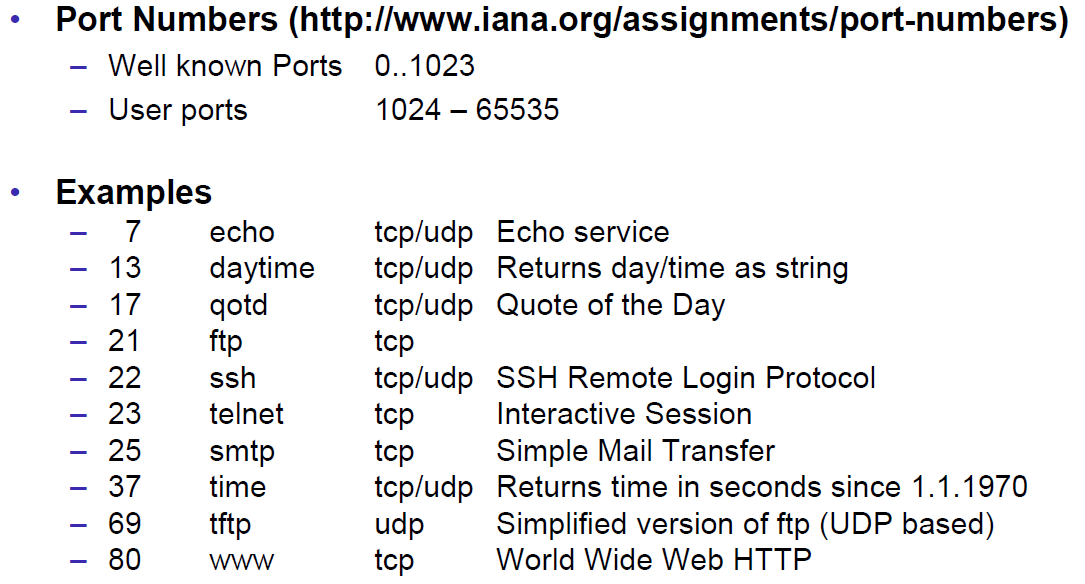
### IP Socket Connections



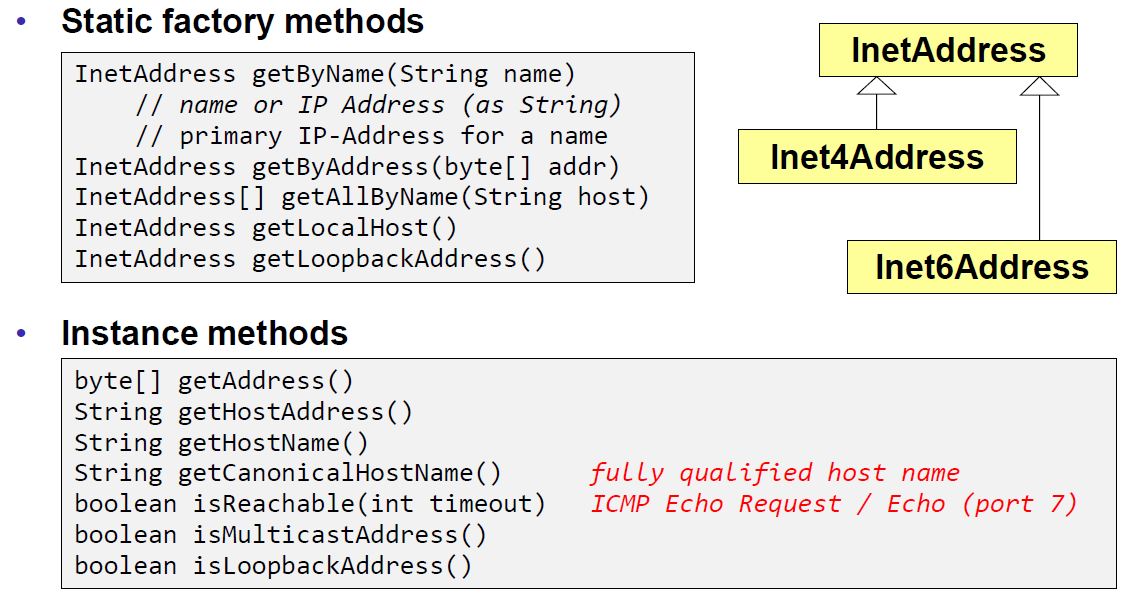
### IP Addressing



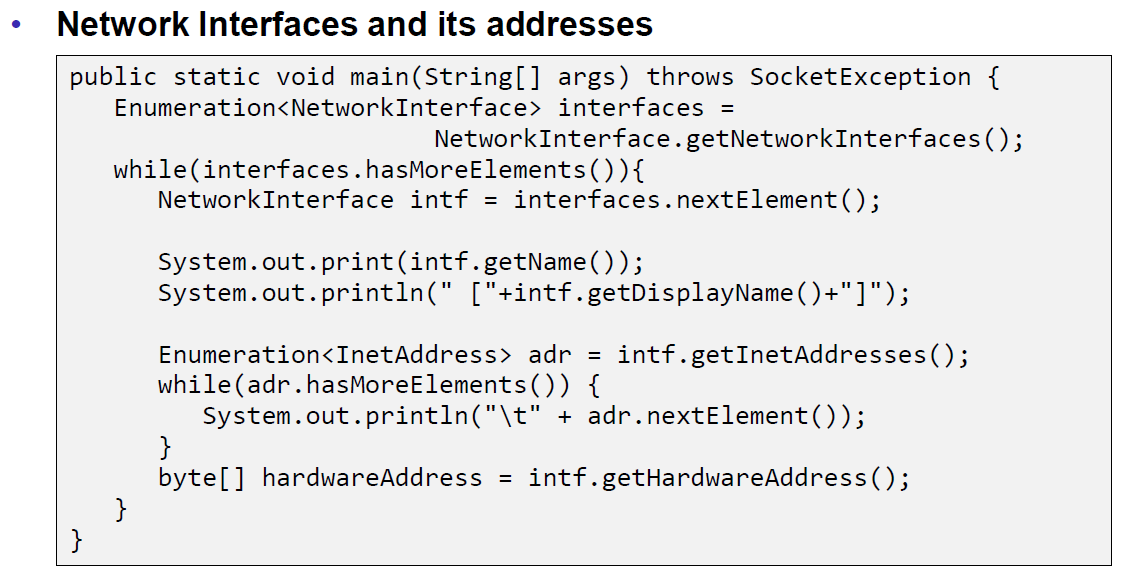
### TCP/UDP Common Port Numbers



### InetAddress

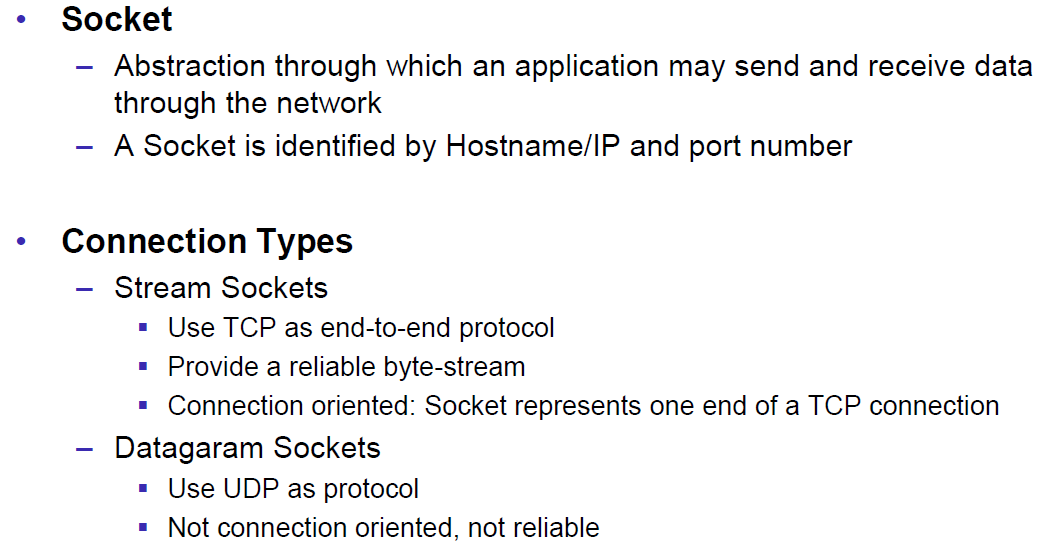


### Network Interfaces

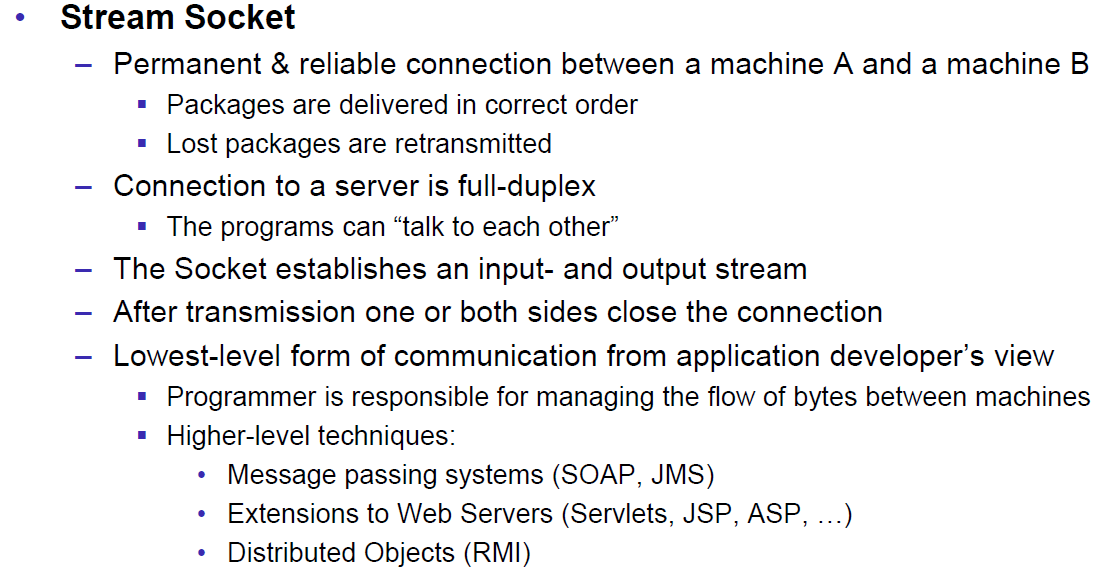


## Sockets

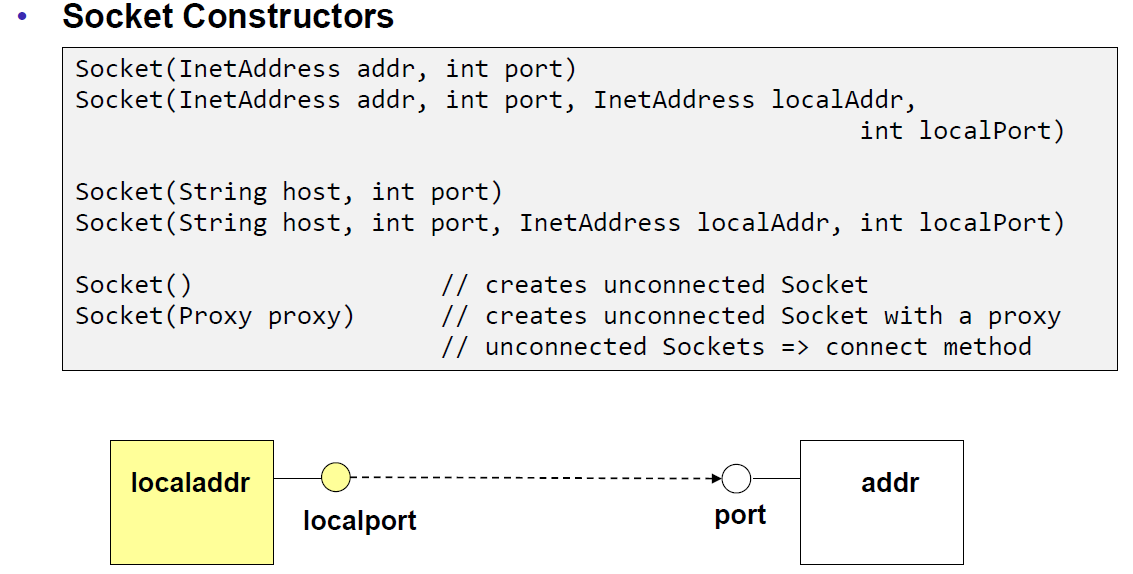
### Sockets

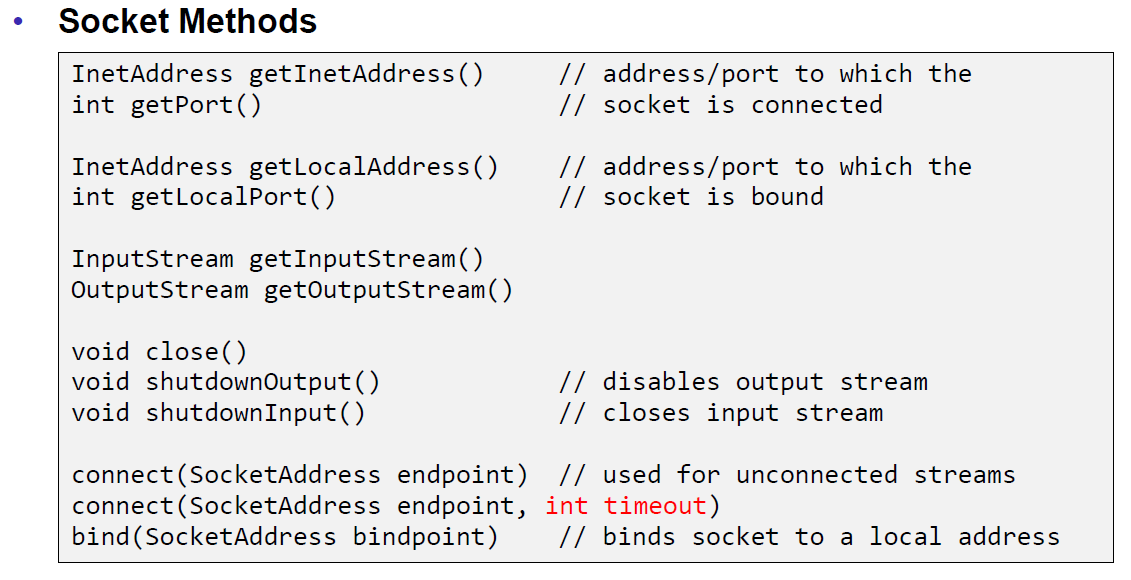


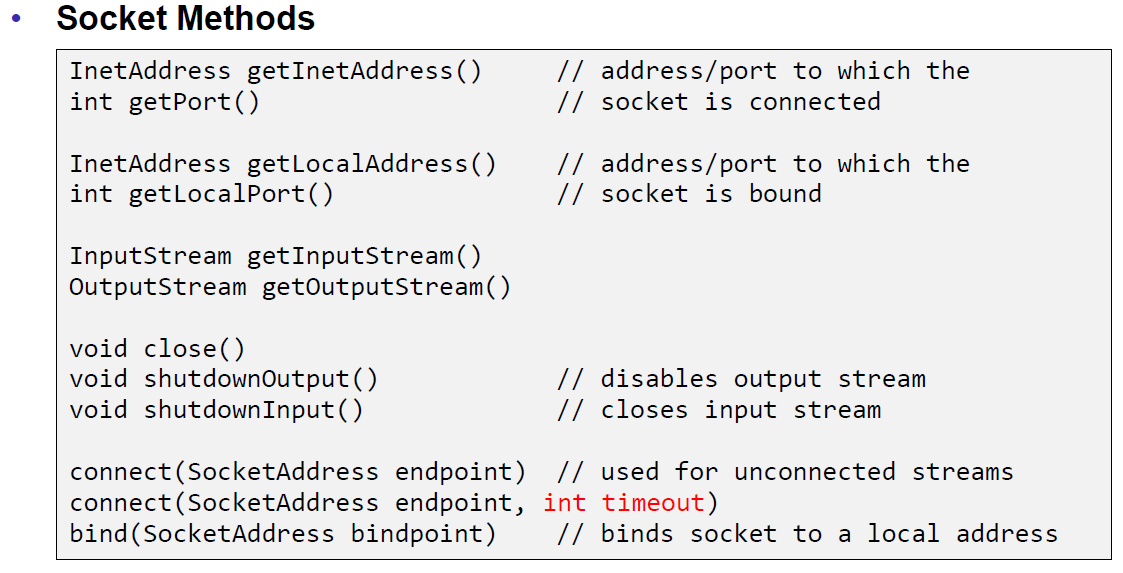
### TCP Sockets



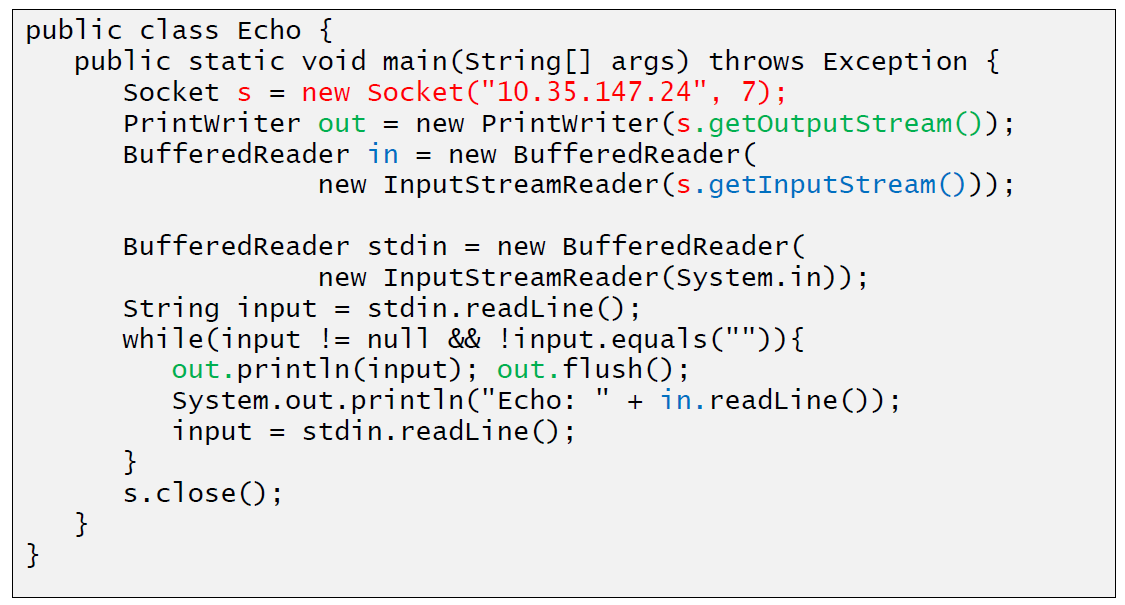
### Java Socket



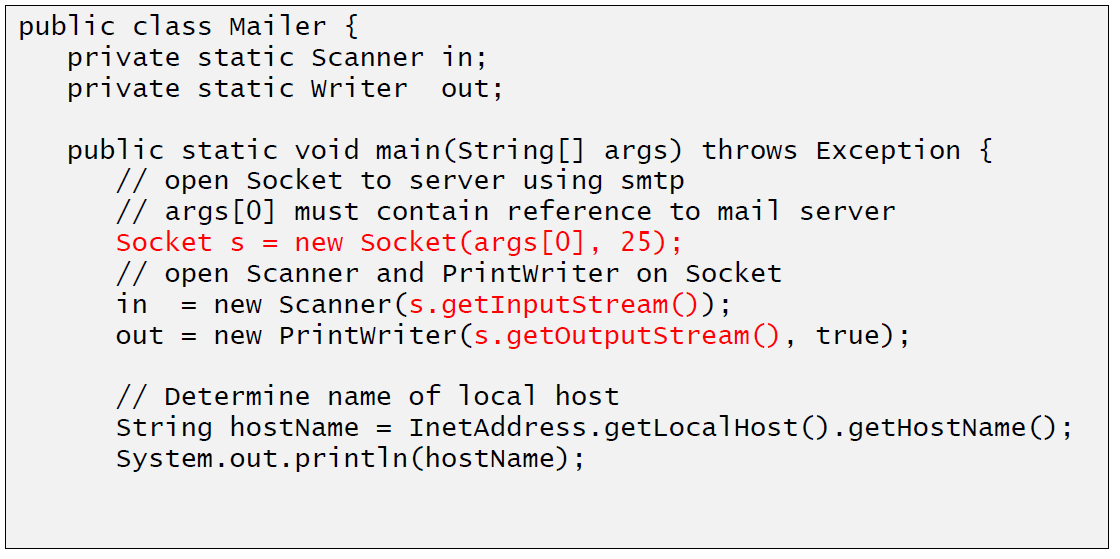


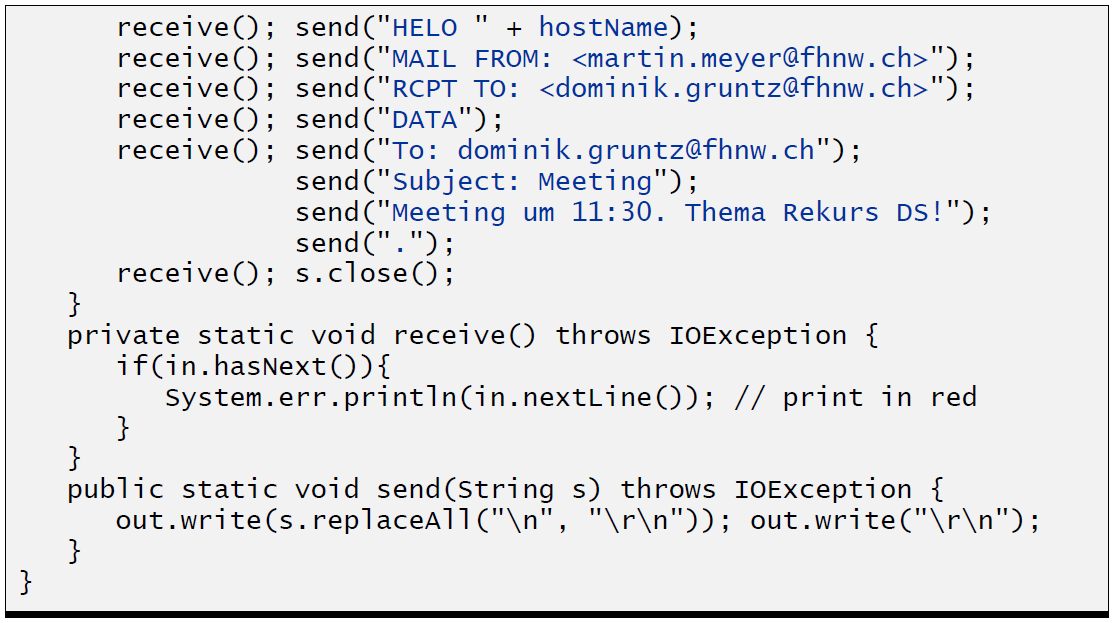


### Sample Client (Echo)

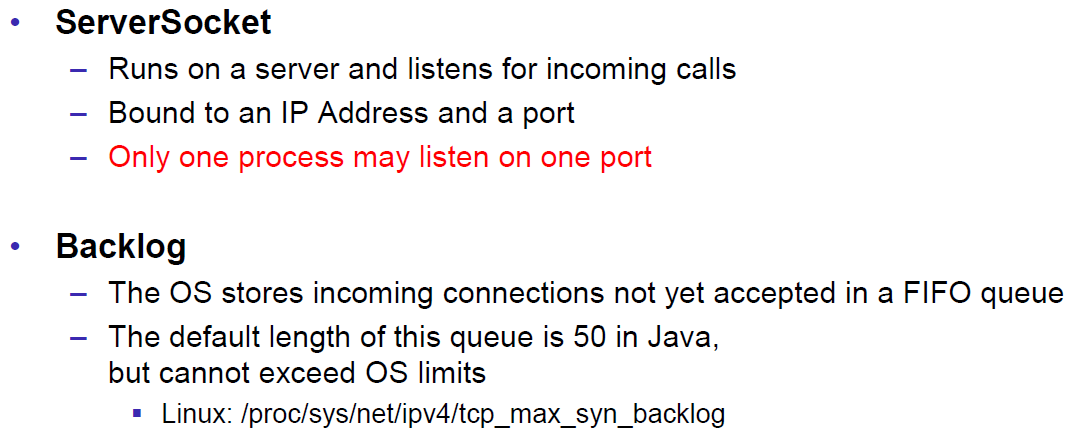


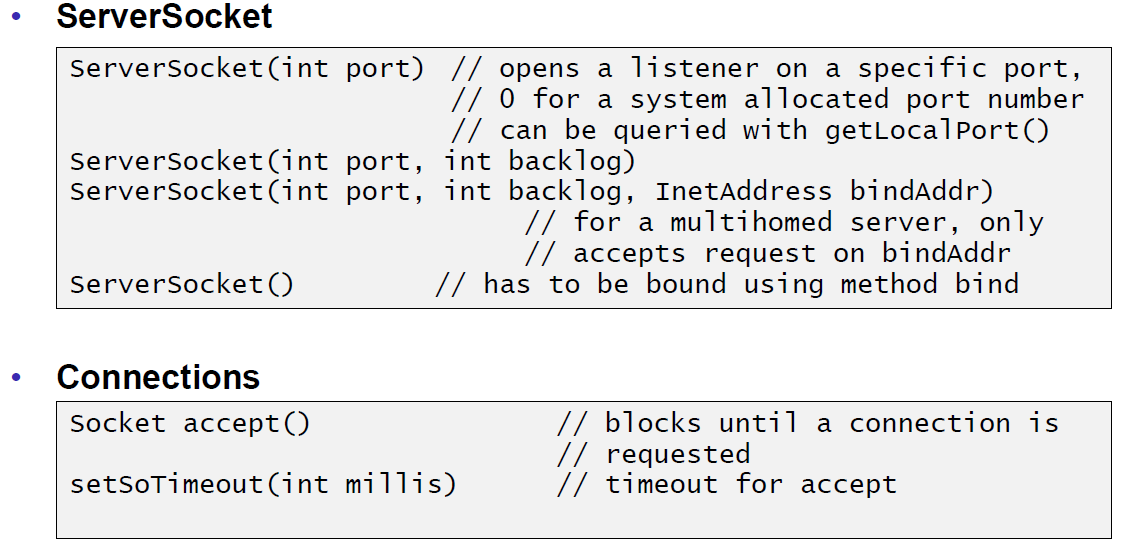
### Sample Client (Mailer)



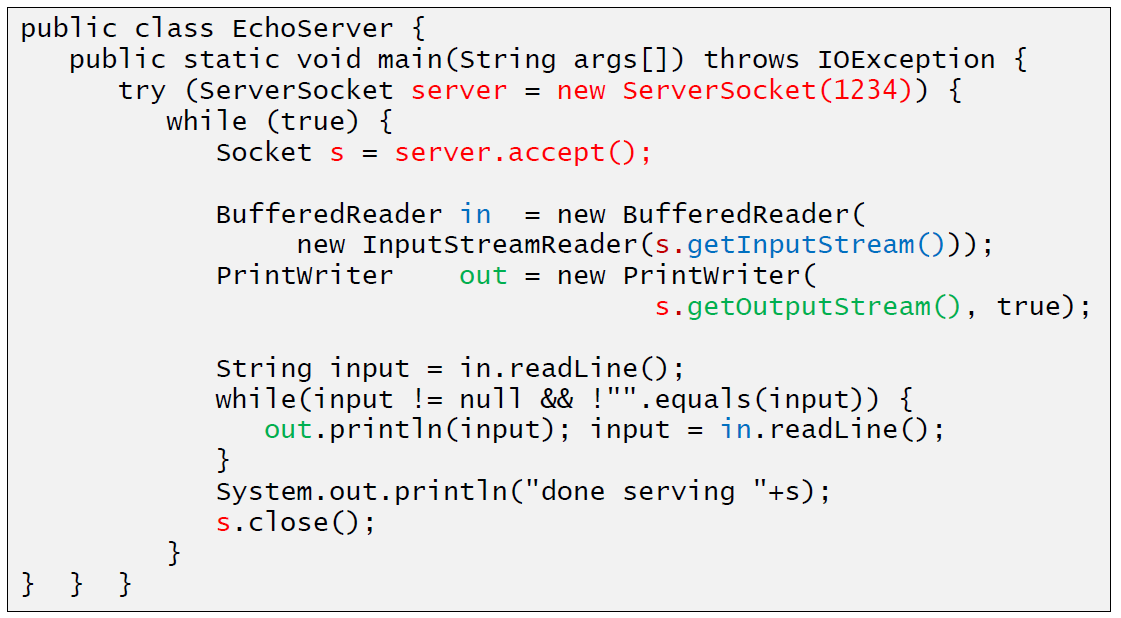


### ServerSocket

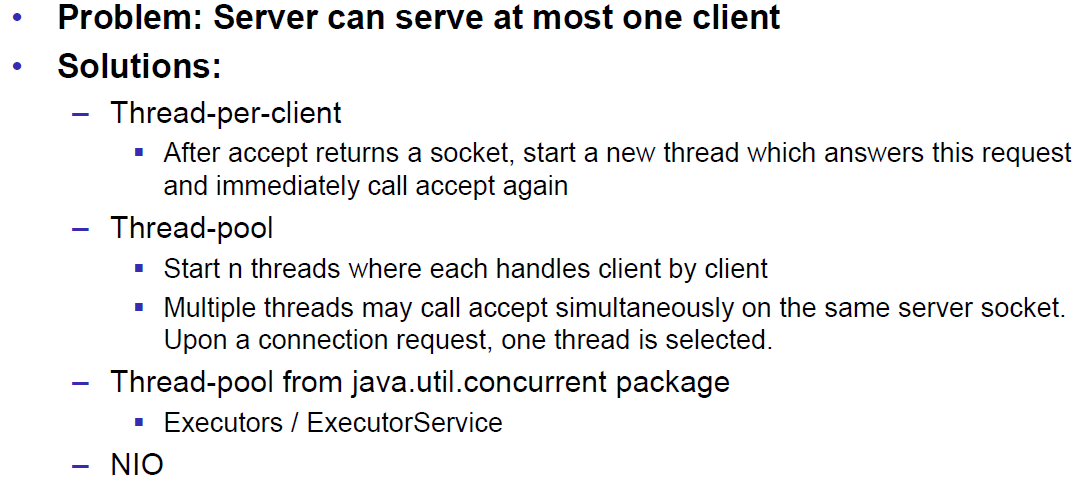




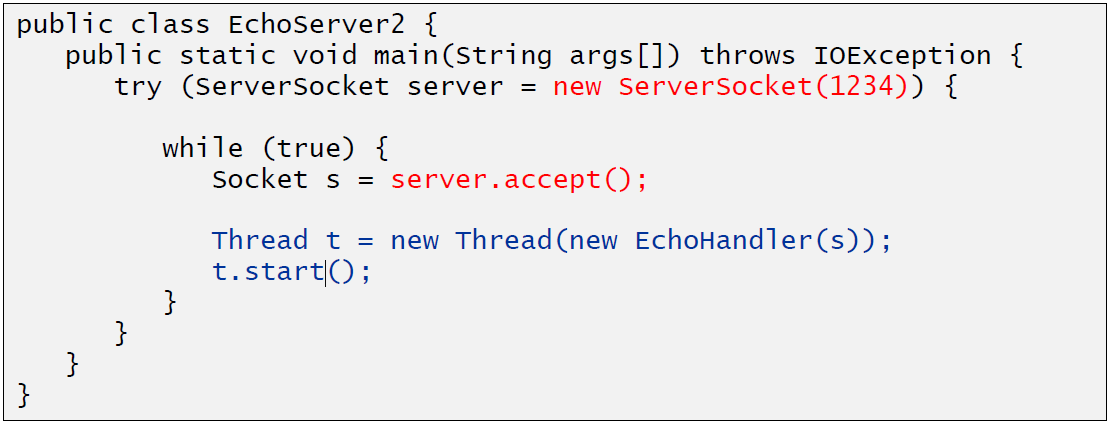
### Echo Server

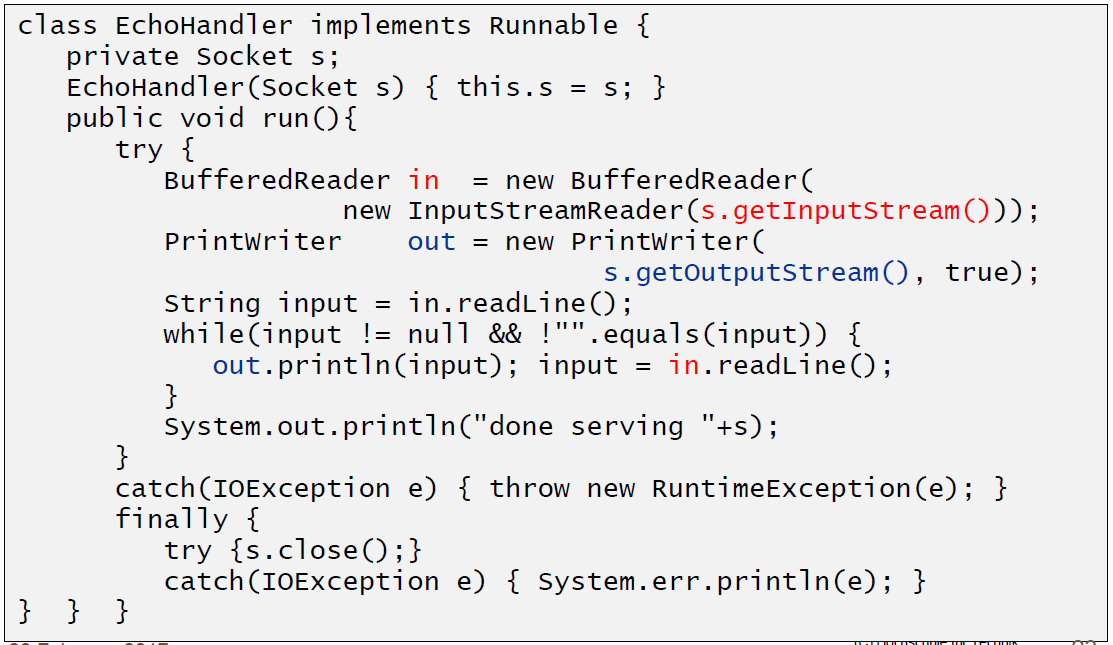


### Concurrent Echo Server

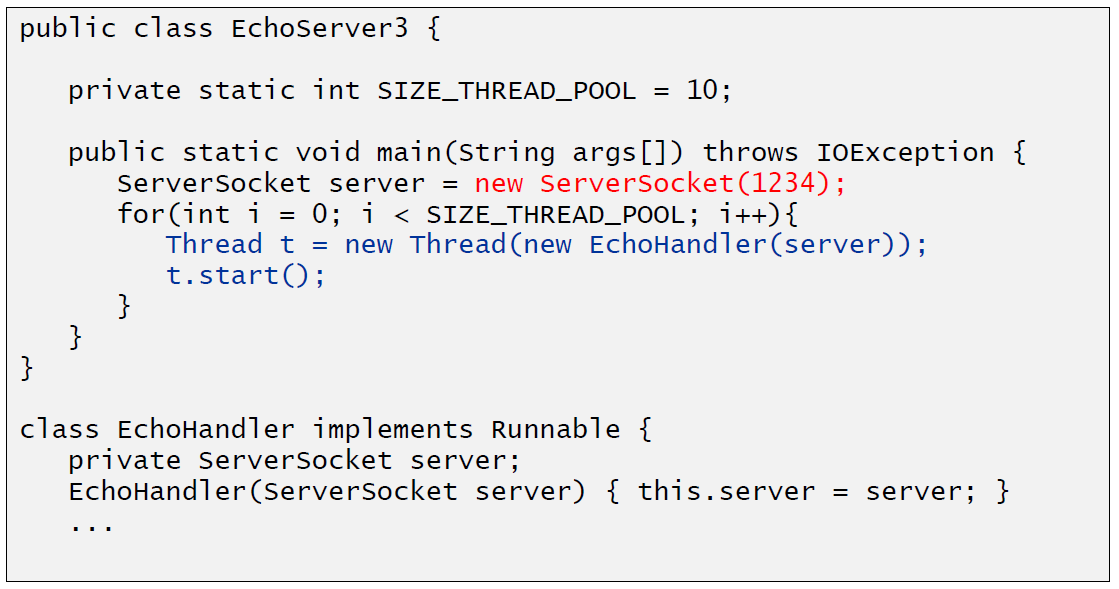


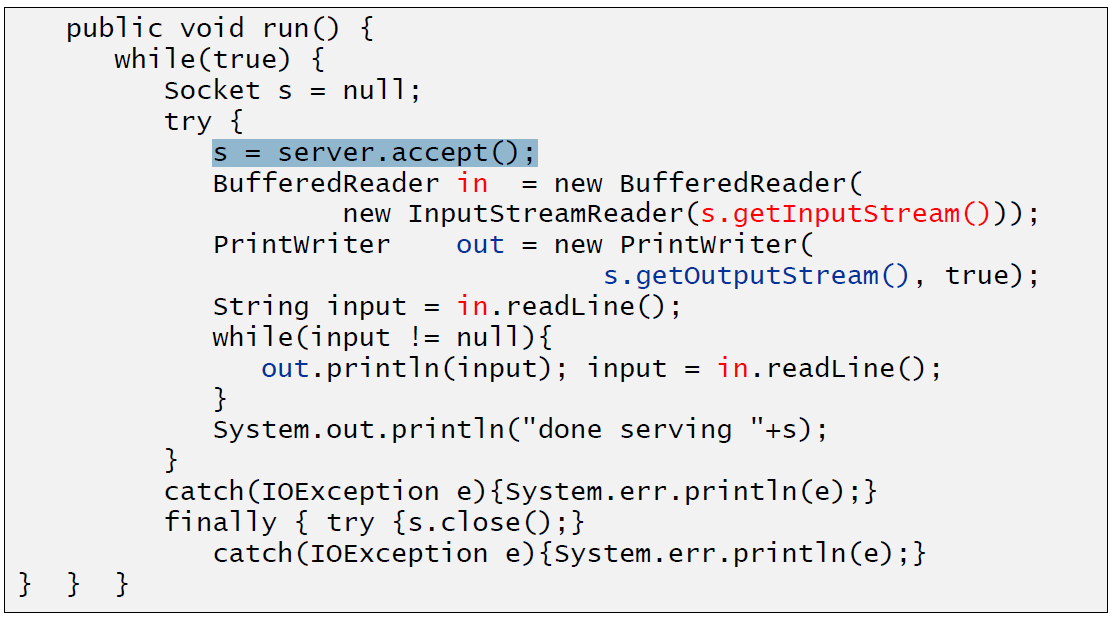
### Concurrent Echo Server (Threaded)



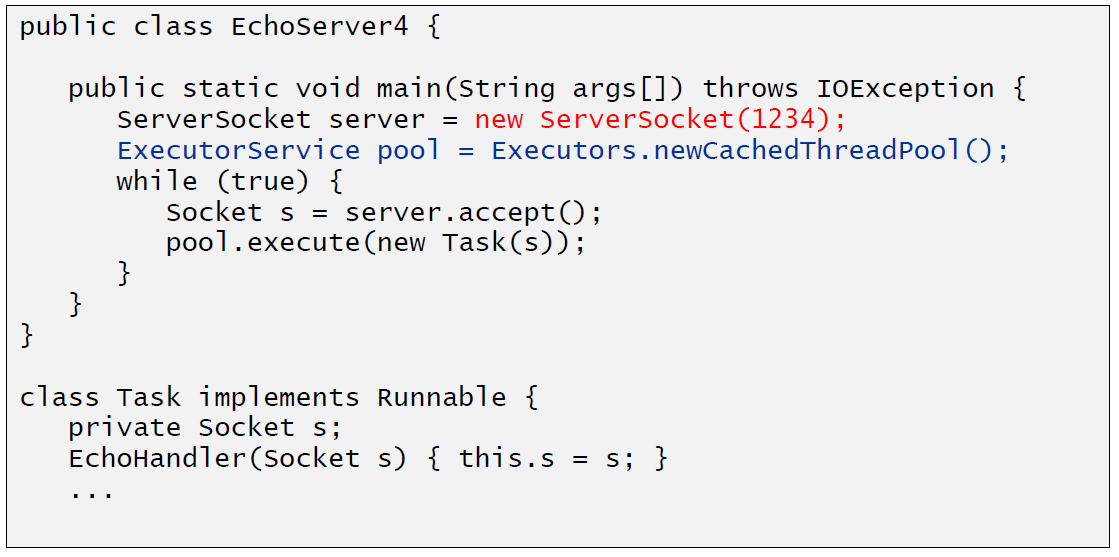


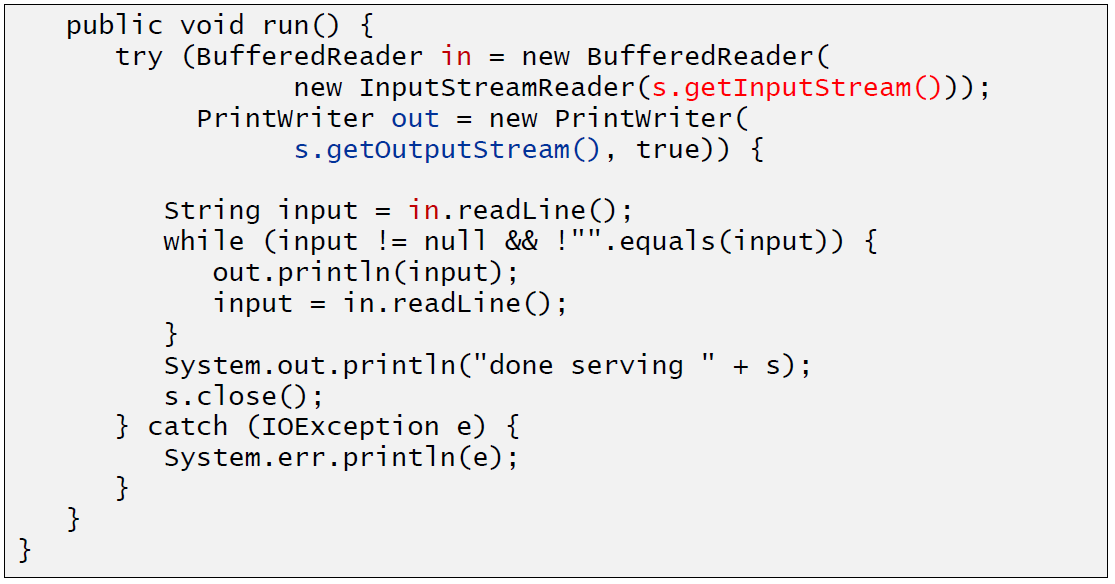
### Concurrent Echo Server (Limitierter Threadpool)





### Concurrent Echo Server (Dynamischer Threadpool)





# Woche 2

TODO