ТЕХНОАТОМ

Java

Servlets

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Servlets

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Отметьтесь на портале.

Agenda

TEXHOATOM

- Collections revisited
- Streams
- Threads
- Servlets

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Collections

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Let’s talk

Collections practice

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```
@see ru.atom.collections.practice
```

Implement **Uniq** and **Sort** via collections
Uniq - returns only unique strings
Sort - return sorted strings (case-insensitive order)
(2 points)

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TEXHOATOM

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Streams

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Stream - a sequence of elements supporting sequential and parallel aggregate operations

```
interface Stream<T> extends
   BaseStream<T, Stream<T>>
```

Streams example

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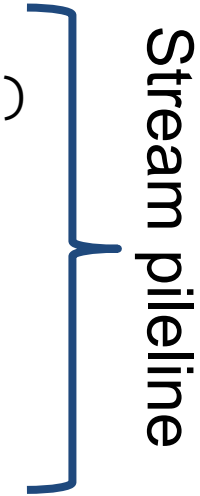
```
Arrays.asList("a1", "a2", "b1", "c2", "c1")
    .stream()
    .filter(s -> s.startsWith("c"))
    .map(String::toUpperCase)
    .sorted()
    .forEach(System.out::println);
```



Streams operations

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- **intermediate operations**
  return Stream
  examples:
  filter(), map(), sorted()

- **terminal operations**
  return void or some aggregated result
  examples:
  forEach(), toArray(), reduce(), collect()

Streams operations

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- **parallelism**
  parallel() - uses common ThreadPool
- **non-interference**
  data source is not modified during stream pipeline lifetime
- **stateles**
  no global mutable state affect stream pipeline
- **ordering**
  no ordering leads to better optimization

http://docs.oracle.com/javase/8/docs/api/java/util/stream/package-summary.html

Streams examples

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```
@see ru.atom.streams.examples
```

Streams practice

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`@see ru.atom.streams.practice`

1. Implement **Uniq** and **Sort** via Streams **(2 points)**

`@see ru.atom.tinder.client`

2. Implement
   `findYoungerThan29()`
   `groupByLocation()`
   (2 points)

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Concurrency vs parallelism

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Why do we need parallel execution?

Concurrency vs parallelism

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Concurrency - contention on shared resources
Parallelism is possible without concurrency

Java is implemented with concurrency in mind (unlike e.g. Python).

Concurrency is hard (later)

Processes and threads

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What’s the difference?

Processes and threads

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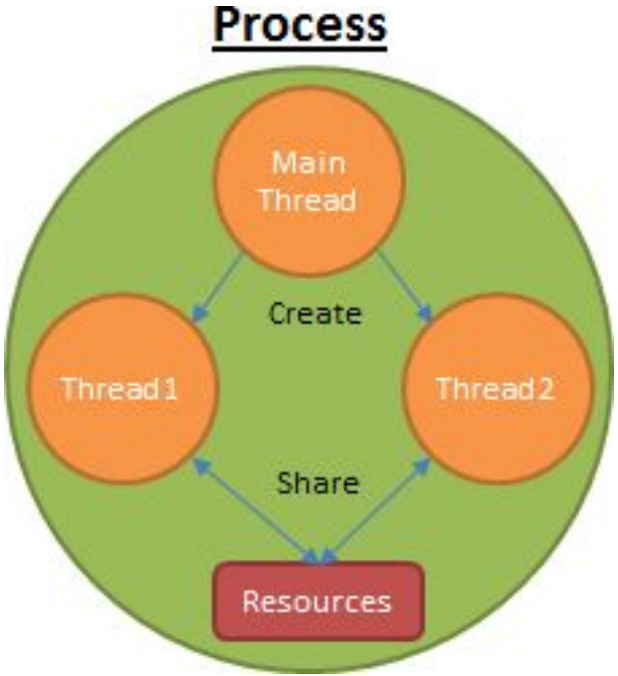
Processes have dedicated resources (memory space)

Threads share memory space



Thread and Runnable

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```
class Thread implements Runnable{
   //here all the interface for thread
management
}

@FunctionalInterface
interface Runnable{
   //will be executed when thread starts
   public abstract void run();
}
```

Thread creation and interface

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@see ru.atom.thread.examples.CreateThreadExample

Thread public methods

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@See ru.atom.thread.examples

```
start();                    //executes run() of provided Runnable
targetThread.sleep(long millis);     //Sleeps for (not exactly) “millis” milliseconds
interrupt();                //Throws InterruptedException if waiting
                            //sets Thread.isInterrupted otherwise
targetThread.join();  //Block current Thread until target finishes
yeild();                   //Recommendation for scheduler to switch to another thread
```

How to destroy a thread?

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@See ru.atom.thread.practice.NeutralizerBombTest

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Web application architecture

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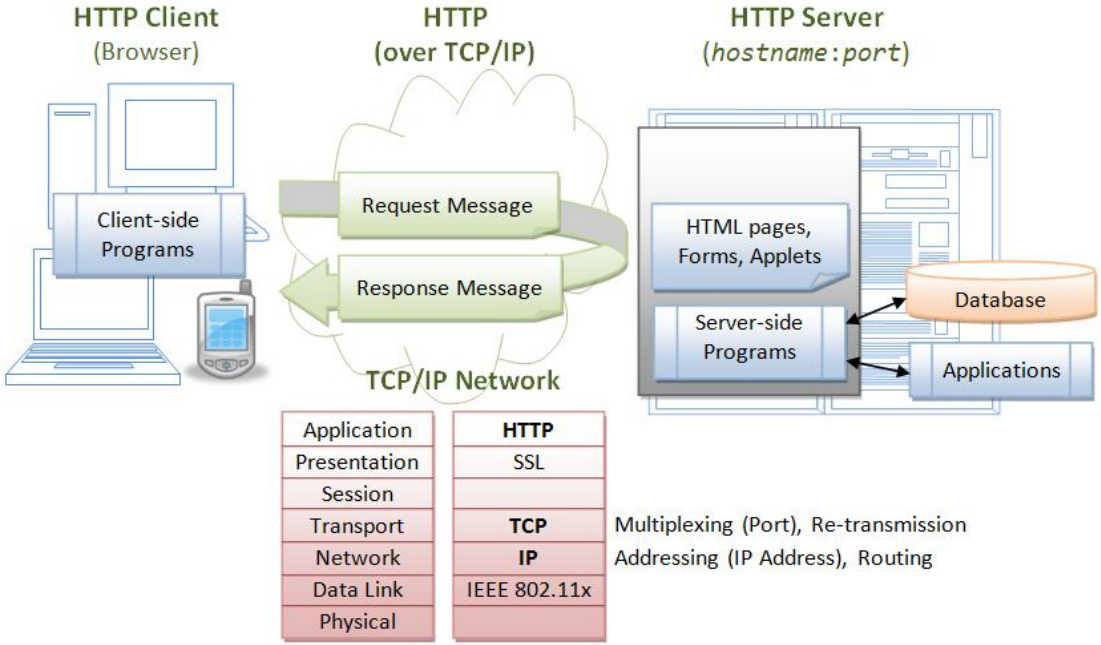
REST Service is a Web Application



Web server

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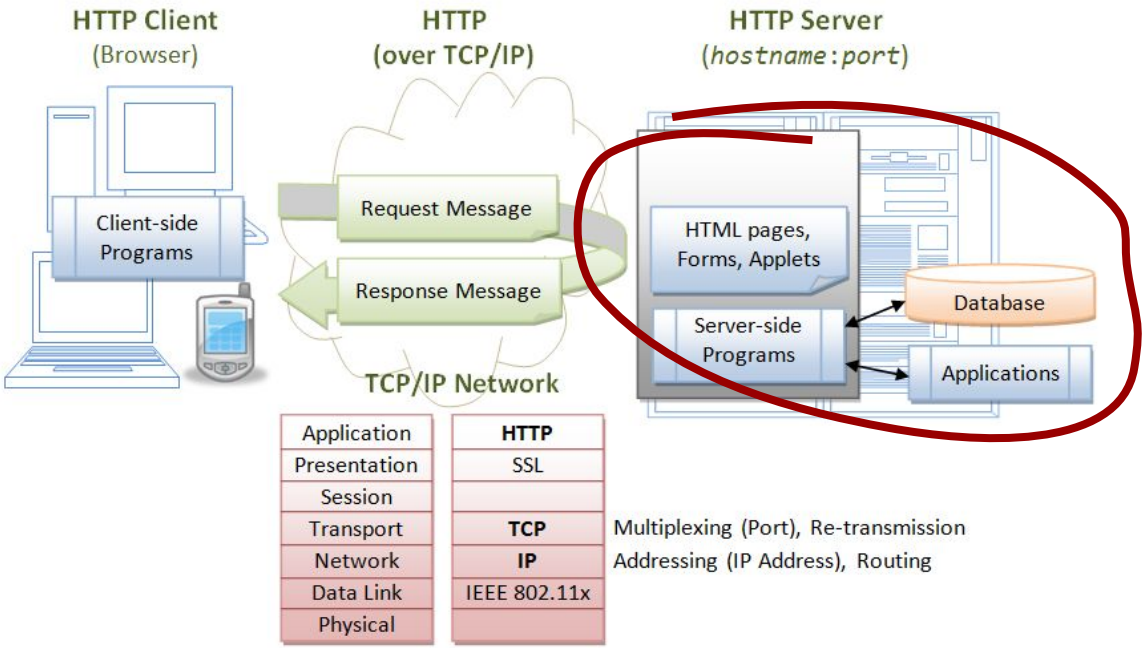
Examples:

- Apache HTTP Server
- NGINX

Can be embedded into application (as library)

- Jetty

Static pages are not interesting.
How to server dynamic content?



Application servers

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Java EE provides a set of APIs that every Application Server must implement
JavaEE - EJB, JMS, CDI, JTA, the servlet API (including JSP, JSTL), etc.

Application server is an Enterprise Level Solution

Application Server examples:
Sun GlassFish, IBM WebSphere, RedHat JBoss Application Server

What if we need a simpler solution?

Servlet

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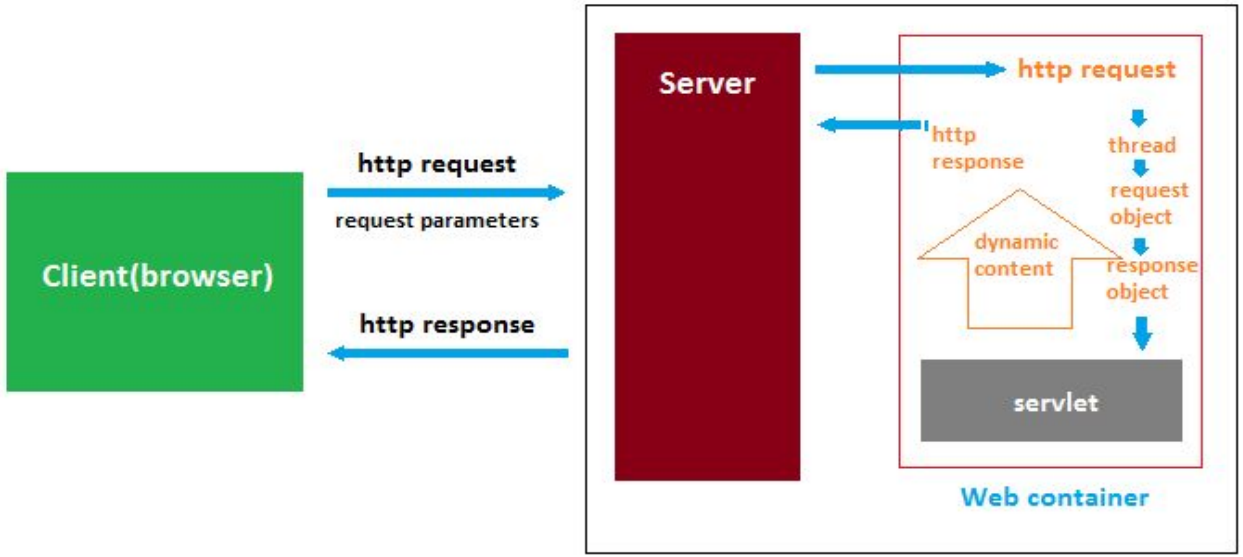
java program that extends capabilities of server with custom logic



request-response model of web

Servlet example

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@see ru.atom.servlets.examples

More production-ready way

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Tinder servlets with Jersey**:**

@see ru.atom.tinder.server

Servlet practice

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Implement REST API for MatchMaker

GET /activeGameSessions

return json - collection of session identifiers

Session is identified via UUID

(2 points)

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Спасибо за внимание!

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