Skeleton programming environments
Programming with ProActive Calcium
Step-by-step

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Practical classes material

- **Most of the files presented during this week are now available**
  - *download from: http://www.isti.cnr.it/People/P.Dazzi/*
  - *teaching blog still under construction !!!*

- **Tentative Question time for practical classes**
  - *On monday, from 4 p.m. till 6 p.m.*
  - *if it overlaps with your lessons send me a mail*

Outline

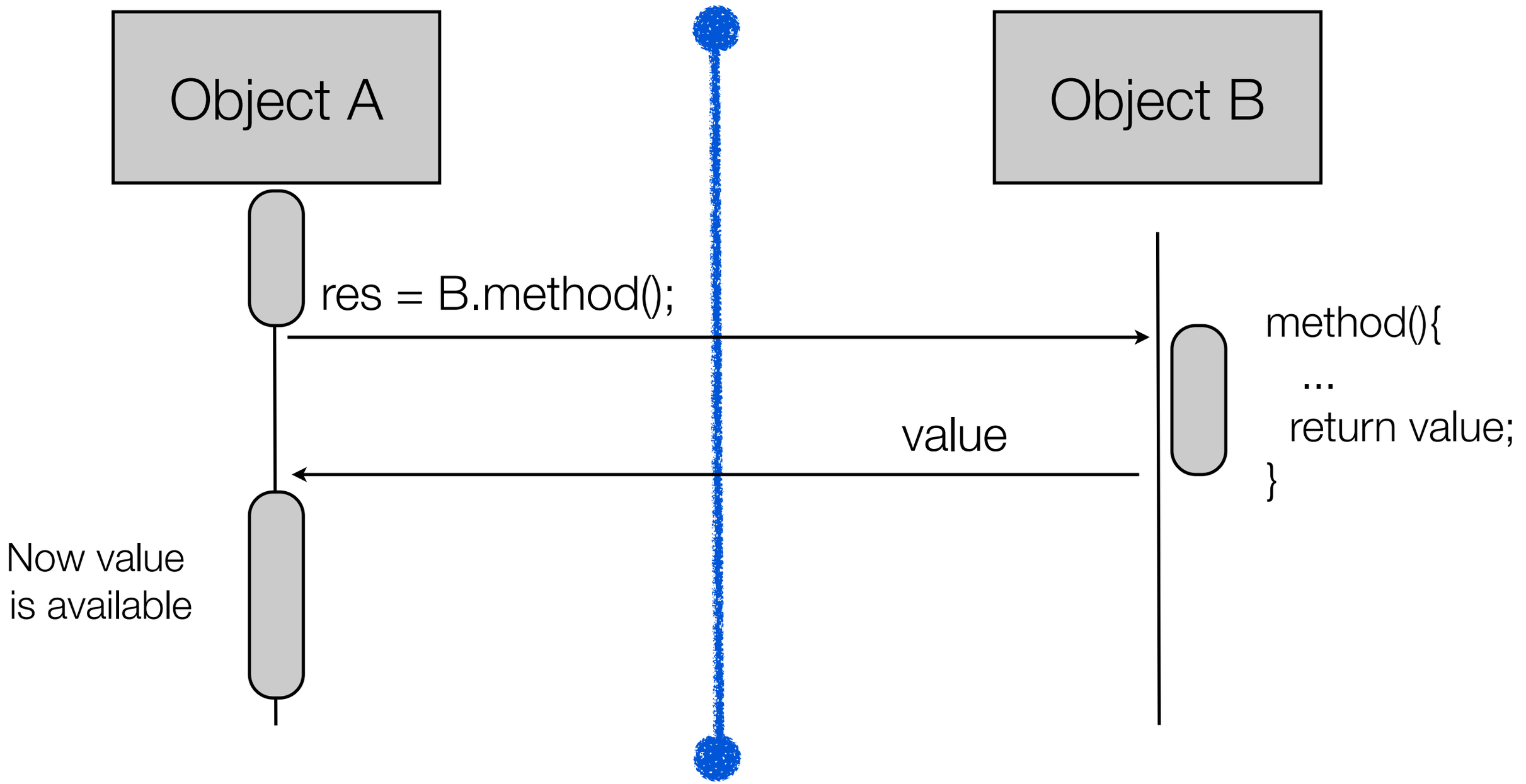
- **Recapping ProActive model**
  - *programming with futures*
- **Write/Compile/Run a Task Parallel Skeleton**
  - *Step-by-step description using Eclipse*
- **Recapping how-to Install ProActive**
  - *Software needed*
  - *environmental variables*

Programming with Futures

- **Typically used in RMI or RMI-like based communication models**
- **A Future represents the result of an asynchronous computation. Typically, it defines proper methods**
  - *to check if the computation has been completed*
  - *to wait for its completion, and to retrieve the result of the computation.*
- **From a more theoretical point of view this inter-object synchronization policy is known as wait-by-necessity**

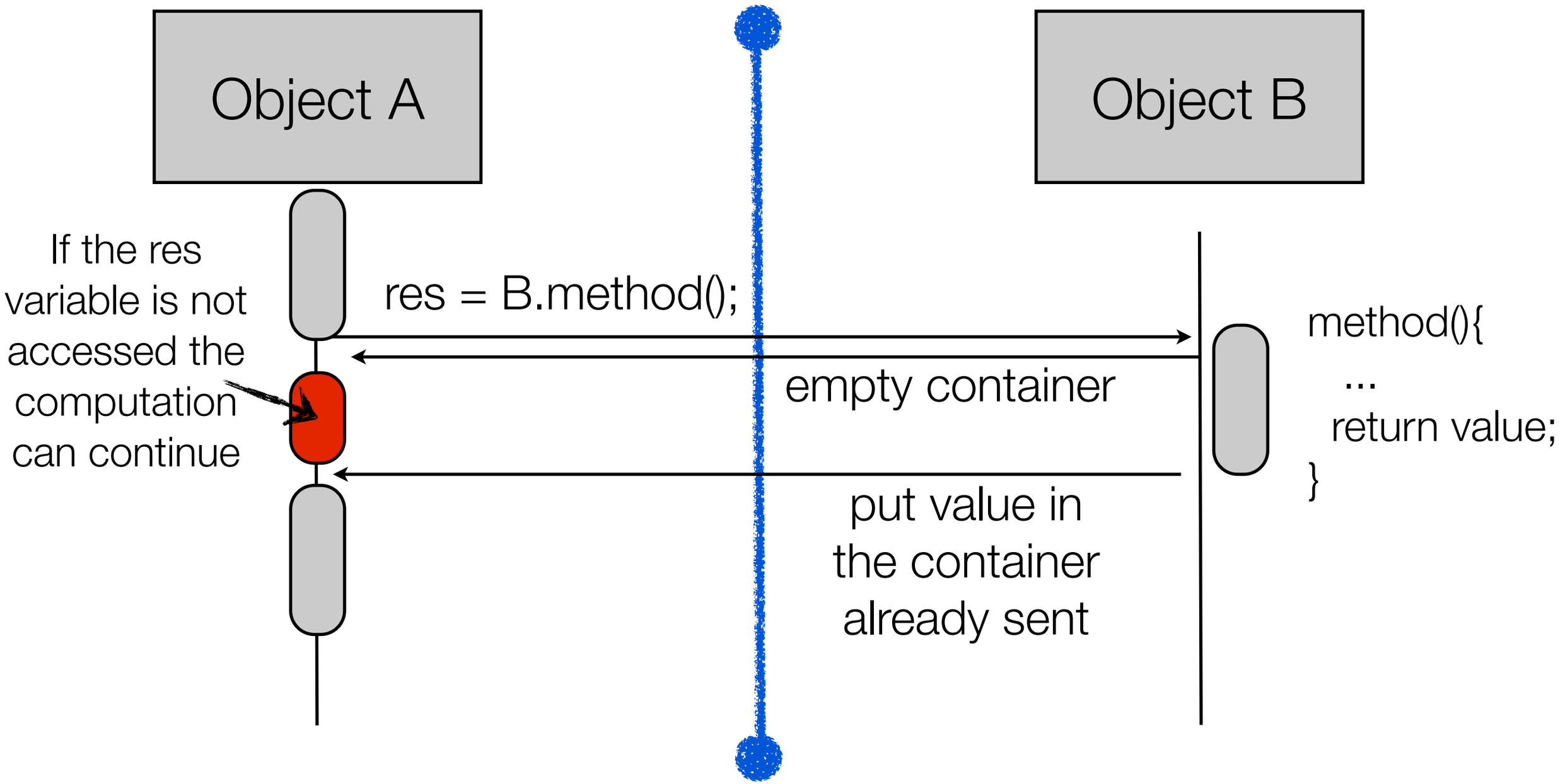
A Future example

RMI invocation without Futures

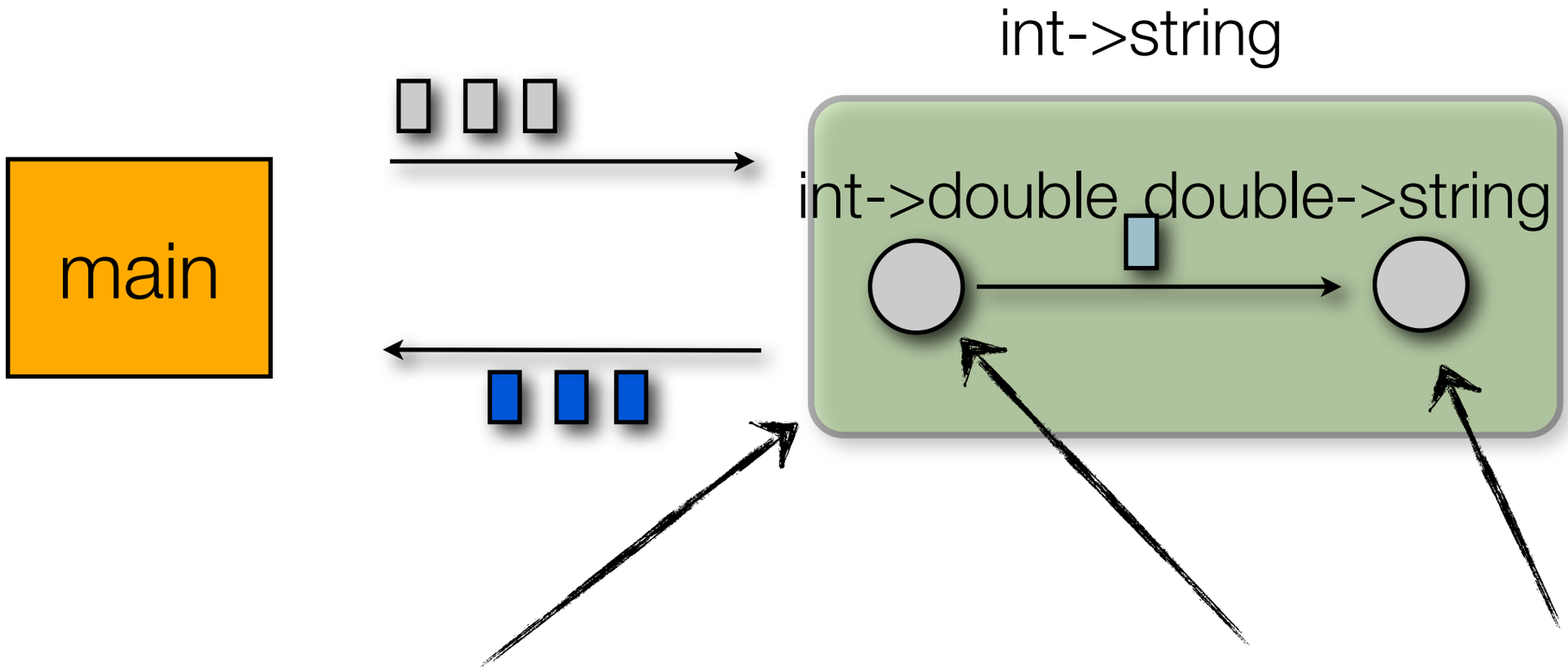


A Future example

RMI invocation with Futures

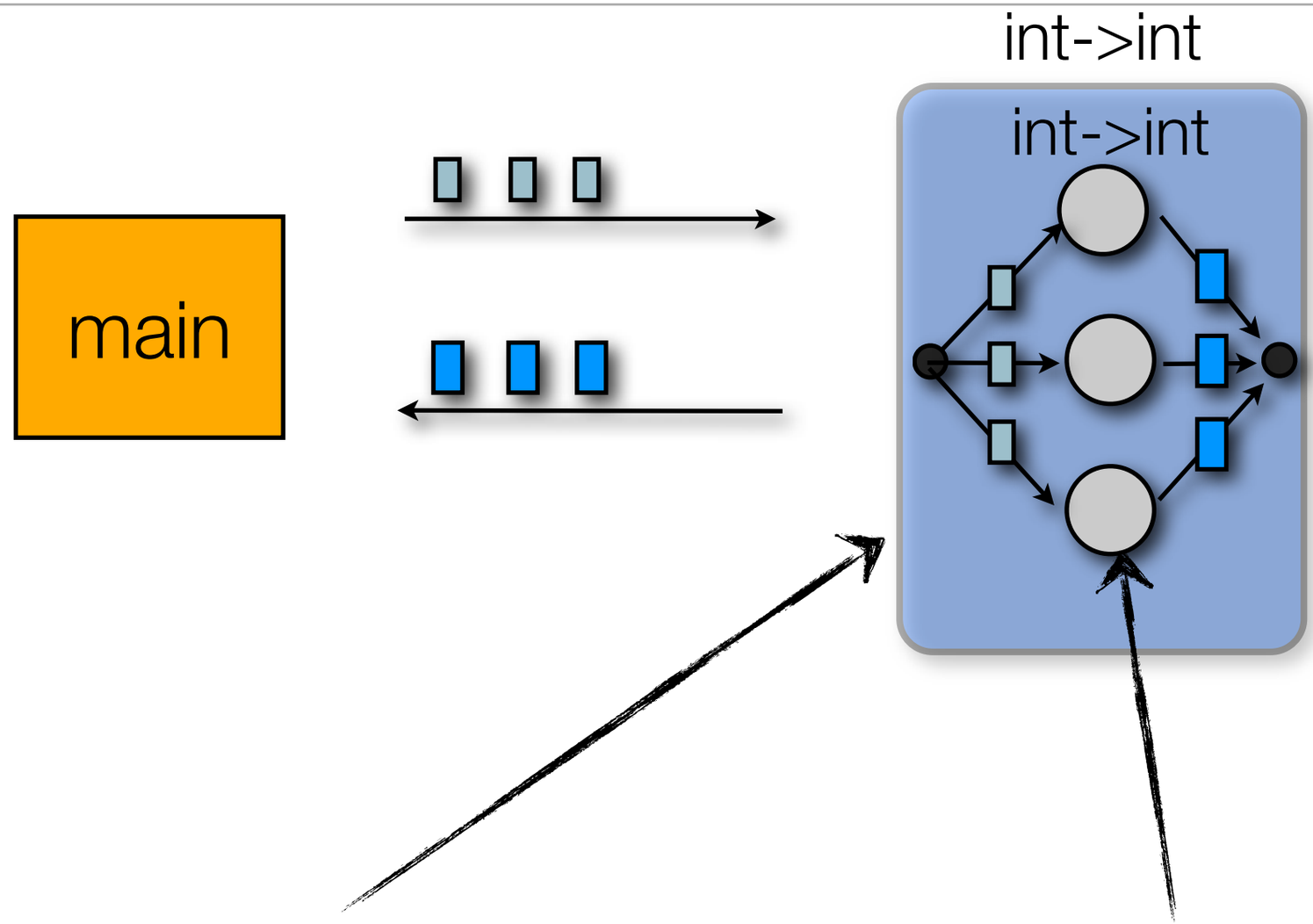


A Pipeline Example




```
Skeleton<Integer, String> root = new Pipe<Integer, String>(new Incr(), new StringMaker());
```

A Farm Example




```
Skeleton<Integer, Integer> root = new Farm<Integer, Integer>(new Worker());
```

Compiling a Calcium Application

- **Java Compiler, version >= 5**
  - *use sun complier, if possible*

- **Add to the Java CLASSPATH the jar file in dist/lib**
  - *a lot of jar files!*

- **Use javac <source code>**

Questions ?