Java Executor : Introduction

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Learning Objectives in this Part of the Lesson

- Recognize the single simple feature provided by the Java Executor interface

Interface Executor

All Known Subinterfaces:

`ExecutorService`, `ScheduledExecutorService`

All Known Implementing Classes:

`AbstractExecutorService`, `ForkJoinPool`, `ScheduledThreadPoolExecutor`, `ThreadPoolExecutor`

```
public interface Executor
```

An object that executes submitted `Runnable` tasks. This interface provides a way of decoupling task submission from the mechanics of how each task will be run, including details of thread use, scheduling, etc. An `Executor` is normally used instead of explicitly creating threads. For example, rather than invoking `new Thread(new(RunnableTask())).start()` for each of a set of tasks, you might use:

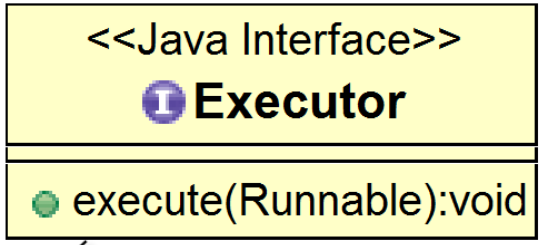
```
Executor executor = anExecutor;
executor.execute(new RunnableTask1());
executor.execute(new RunnableTask2());
...
```

However, the `Executor` interface does not strictly require that execution be asynchronous. In the simplest case, an executor can run the submitted task immediately in the caller's thread:

Overview of the Java Executor Interface

Overview of the Java Executor Interface

- Provides a method to submit new tasks for execution

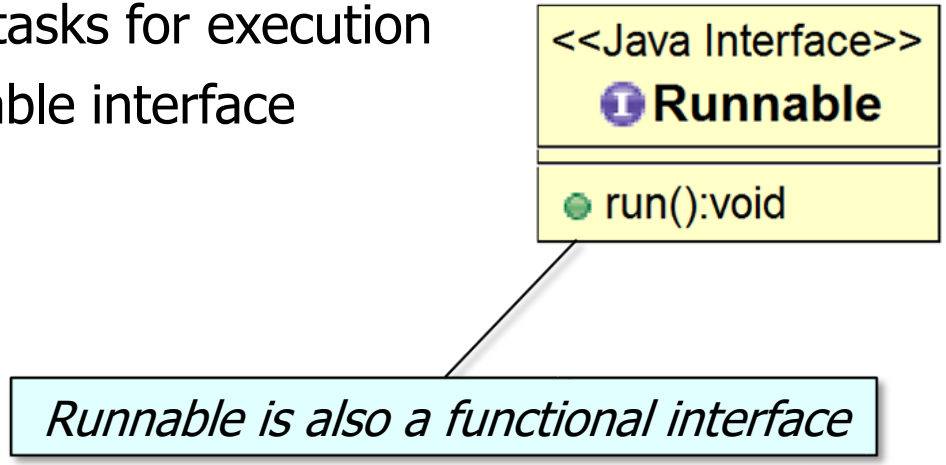


Defines a simple functional interface that decouples task submission from the mechanics of how each task is run

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/Executor.html

Overview of the Java Executor Interface

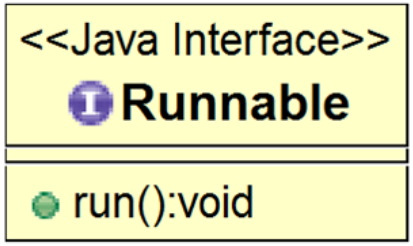
- Provides a method to submit new tasks for execution
  - Each task implements the Runnable interface

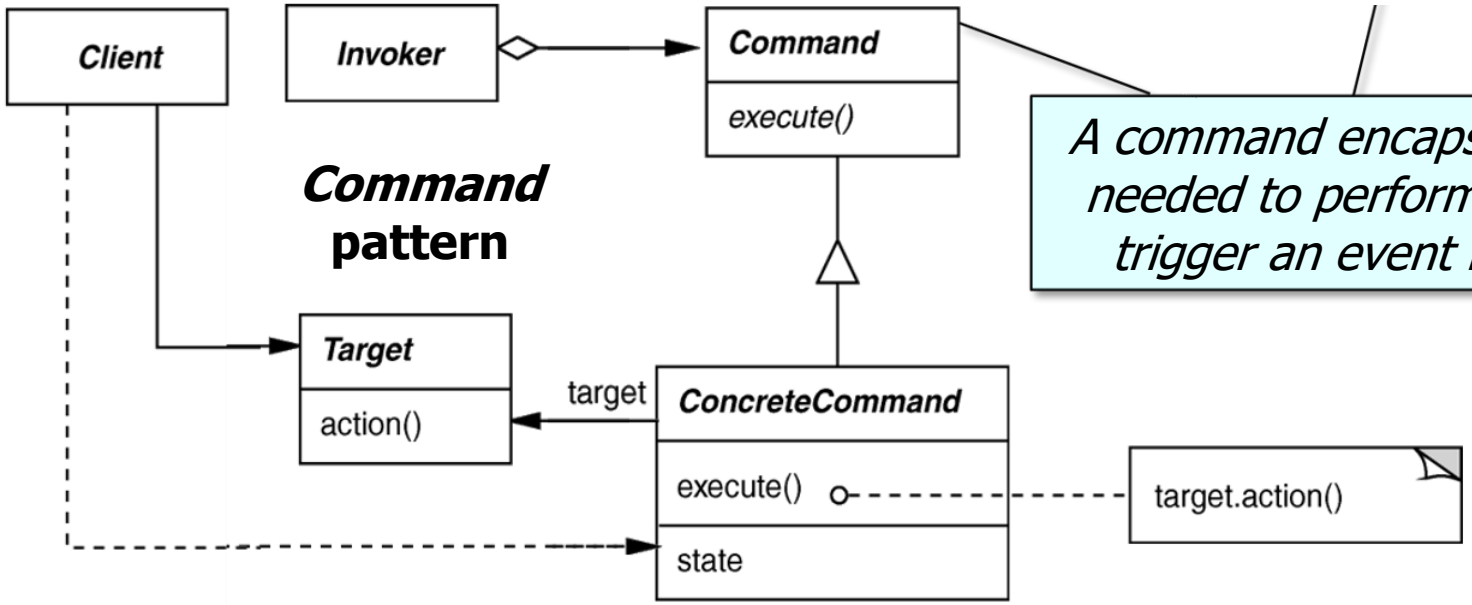


See docs.oracle.com/javase/8/docs/api/java/lang/Runnable.html

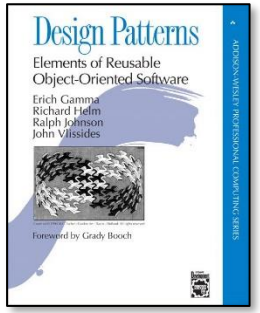
Overview of the Java Executor Interface

- Provides a method to submit new tasks for execution
  - Each task implements the Runnable interface
    - Represents a "command" to execute





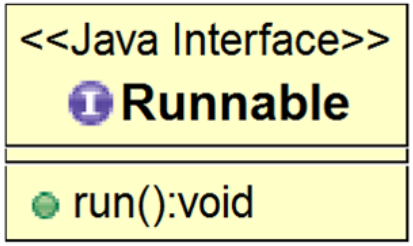
A command encapsulates all info needed to perform an action or trigger an event later in time

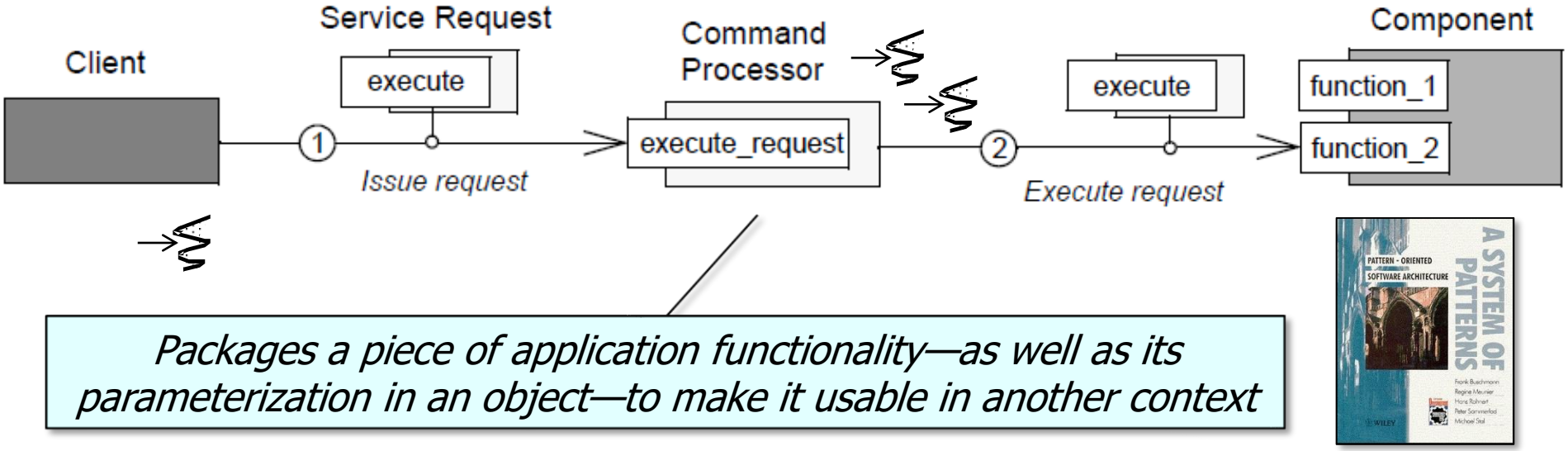


See en.wikipedia.org/wiki/Command_pattern

Overview of the Java Executor Interface

- Provides a method to submit new tasks for execution
  - Each task implements the Runnable interface
    - Represents a "command" to execute
    - Can also implement *Command Processor* pattern



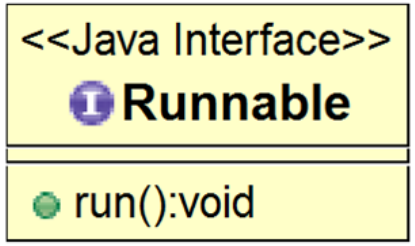


Packages a piece of application functionality—as well as its parameterization in an object—to make it usable in another context

See www.dre.vanderbilt.edu/~schmidt/CommandProcessor.pdf

Overview of the Java Executor Interface

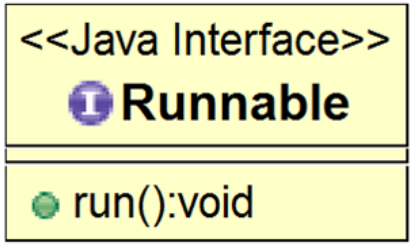
- Provides a method to submit new tasks for execution
  - Each task implements the Runnable interface
    - Represents a "command" to execute
    - Can also implement *Command Processor* pattern
    - Provides "one-way" task semantics
      - i.e., run() computations return no results

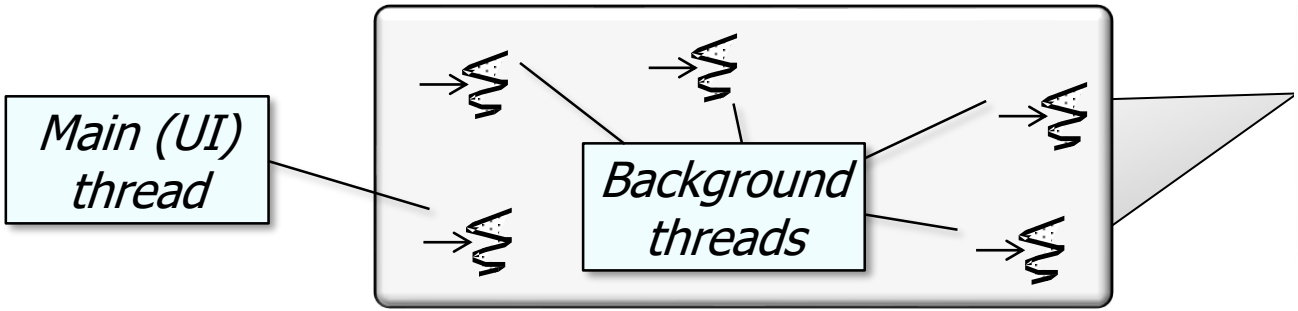


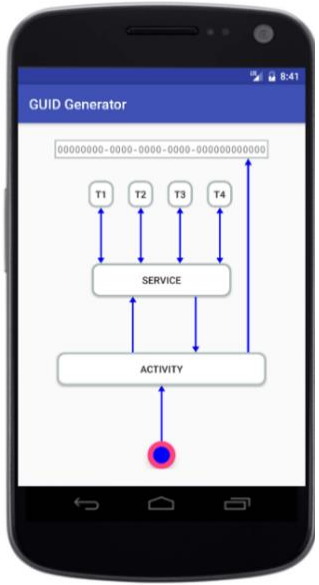
Results are typically "returned" via side-effects

Overview of the Java Executor Interface

- Provides a method to submit new tasks for execution
  - Each task implements the Runnable interface
    - Represents a "command" to execute
    - Can also implement *Command Processor* pattern
    - Provides "one-way" task semantics
  - Can execute in a background thread or main thread
    - Depending on Executor interface's implementation







There's even a single-threaded executor implementation!

End of Java Executor: Introduction