jAdvise

(http://crazybob.org/)

Runtime Method Interception for POJOs

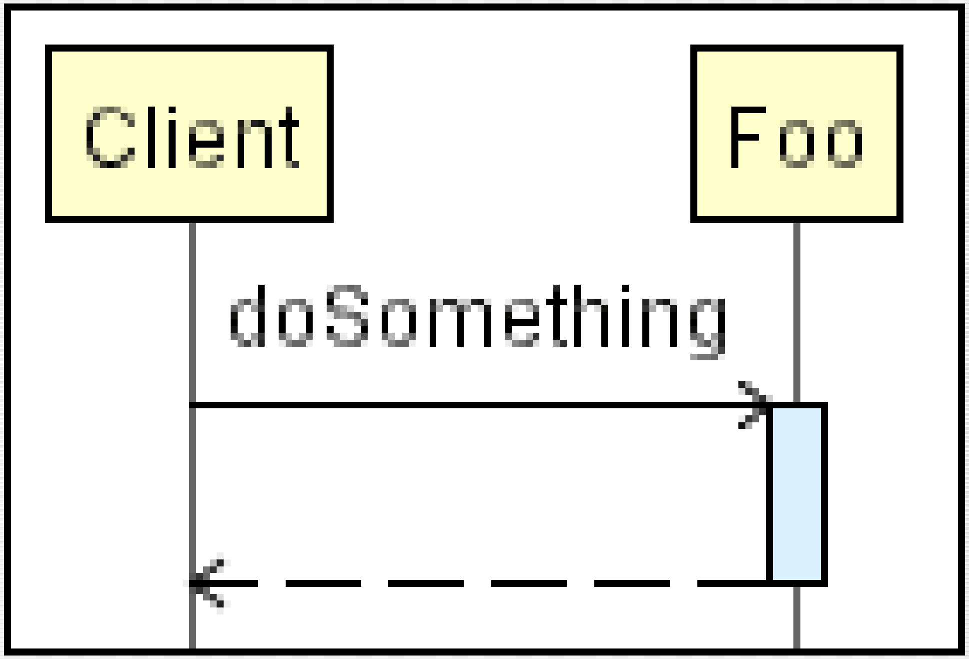
Features

- Add method interceptor (Aspect) chains at runtime.
- Minimal performance overhead.
- No need for source code.

Vocabulary

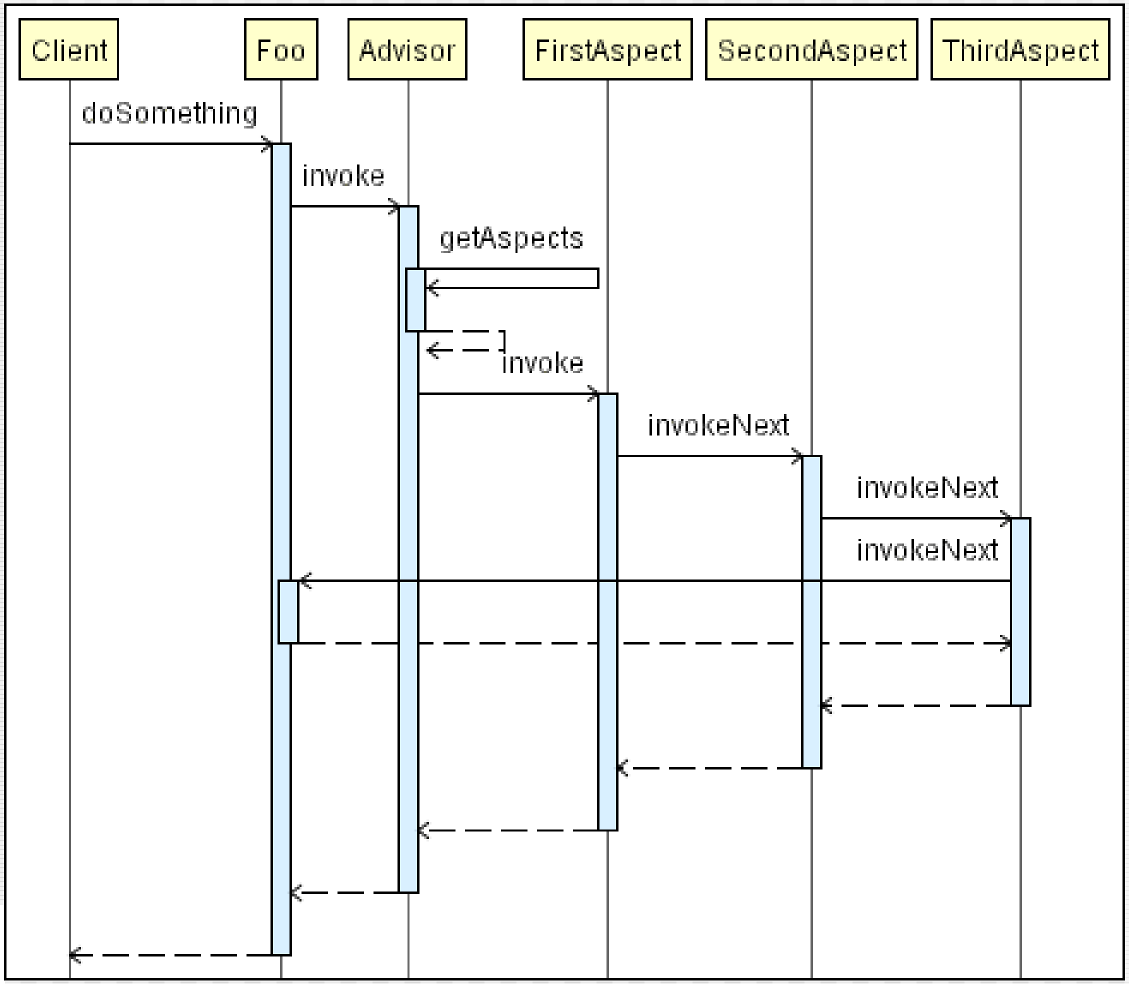
- **Aspect** – Intercepts method invocations.
- **Advised** – Describes a class with Aspects applied.
- **Instrumentor** – Instruments the class's bytecode, enabling aspects to be applied.

A Normal Invocation



Client invokes doSomething() on Foo.

An Advised Invocation



1. The Client invokes doSomething() on Foo.
2. Foo wraps arguments and delegates to its Advisor.
3. Advisor gets aspect chain.
4. Advisor runs invocation through aspect chain back to original doSomething() implementation.

API (Aspect)

Interface implemented by Aspects. The Aspect does its work and delegates to the next Aspect in the chain (or the advised object at the end of the chain).

```
interface Aspect {
        Object invoke(Invocation i)
                throws Throwable;
}
```

API (Invocation)

A method invocation. Passed to Aspects. Enables Aspect to invoke next Aspect in the chain or the advised object at the end of the chain.

```
class Invocation {
        Object getAdvised();
        Object[] getArguments();
        Method getMethod();
        Object invokeNext()
                throws Throwable;
        …
}
```

API (Advisor)

Manages advisement of a class. One Advisor instance per class. Executes Aspects in order.

```
class Advisor {
        static Advisor getInstance(Class clazz);
        Aspect[] getAspects();
        void setAspects(Aspect[] aspects);
        …
}
```

A Simple Example

```
class PerformanceAspect implements Aspect {
    public Object invoke(Invocation i) throws Throwable {
        long startTime = System.currentTimeMillis();
        try {
            return i.invokeNext();
        }
        finally {
            logElapsed(startTime);
        }
    }
    ...
}
```

Potential Applications

- Debugging/Performance (Duh.)
- Transparent Persistence
- Exception Handling, Retry Logic
- Lazy Loading
- Caching
- And more.

A More Complex Example

- jAdvise SEQUENCE, combining Alex Moffat’s SEQUENCE (http://www.zanthan.com/itymbi/) and jAdvise to produce live sequence diagrams for running applications.

More to come...

- JBoss AOP
- http://crazybob.org/