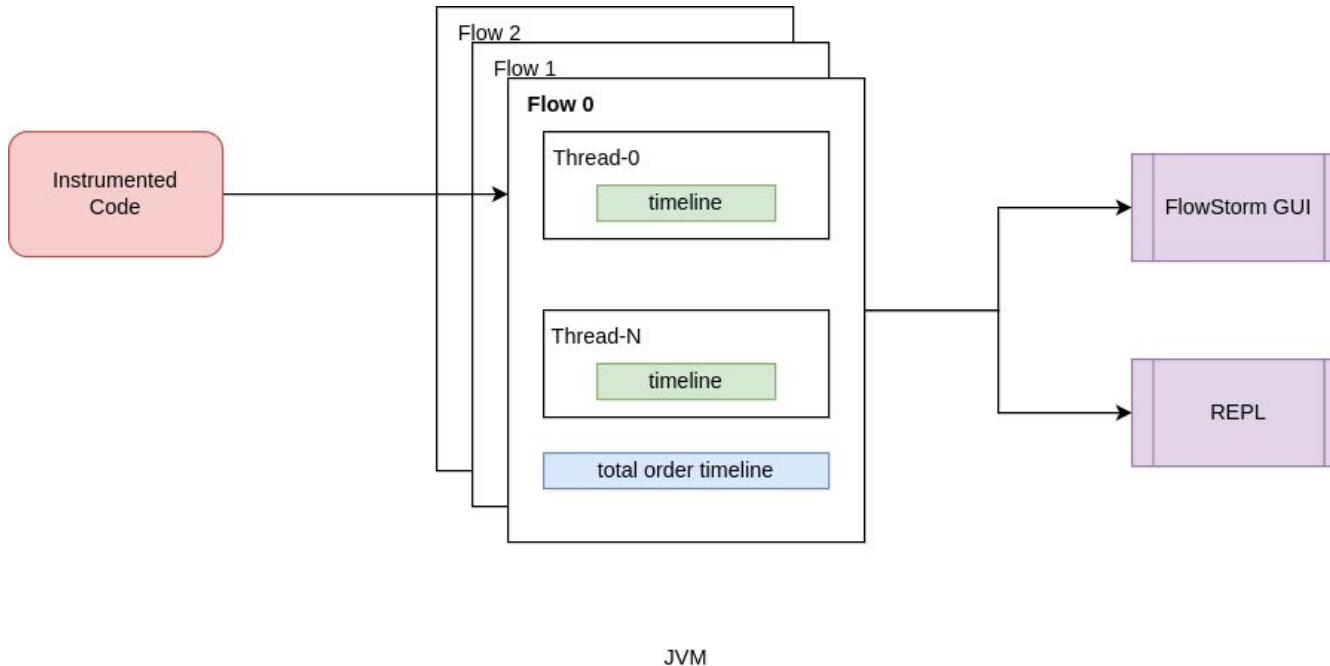


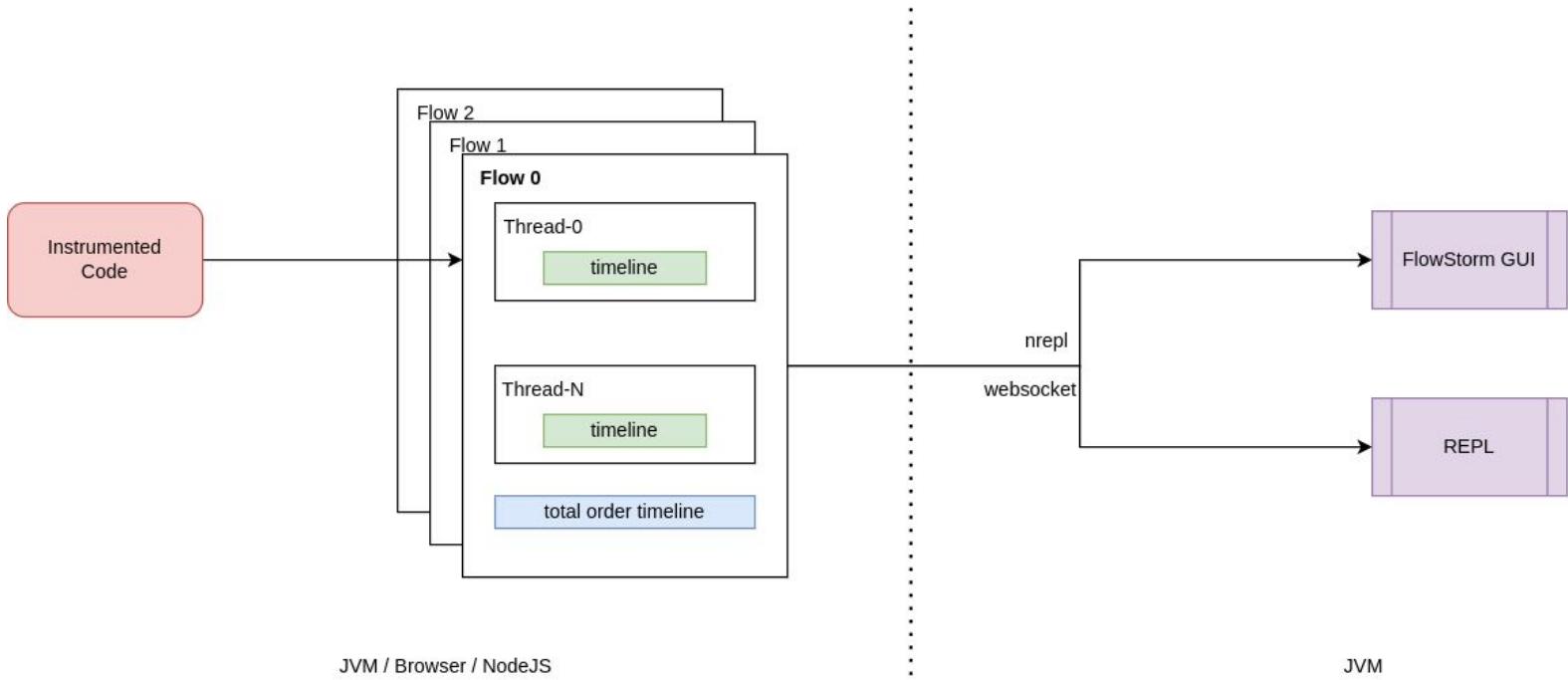
FlowStorm

Internals

The big picture (local / in-process)



The big picture (remote)



How instrumentation works with ClojureStorm

```
(defn add-age [m years]
  (assoc m :age years))
```



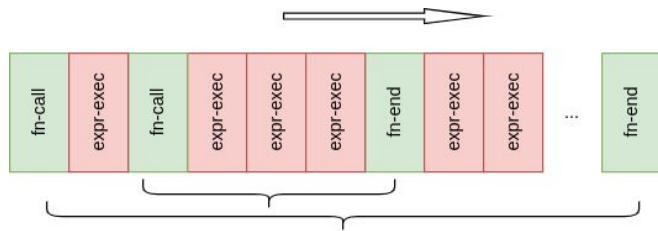
Copy pointers

```
public static java.lang.Object invokeStatic(java.lang.Object m, java.lang.Object years);
0:  iconst_2
1:  anewarray      Ljava/lang/Object;
4:  dup
5:  iconst_0
6:  aload_0
7:  aastore
8:  dup
9:  iconst_1
10: aload_1
11: aastore
12: ldc      "dev-tester"
14: ldc      "add-age"
16: ldc      "-82329772
18: invokestatic clojure/storm/Tracer.traceFnCall
21: aload_0
22: ldc      ""
24: ldc      "m"
26: invokestatic clojure/storm/Tracer.traceBind
29: aload_1
30: ldc      ""
32: ldc      "years"
34: invokestatic clojure/storm/Tracer.traceBind
37: getstatic dev_tester$add_age.const_0:Lclojure/lang/Var;
40: invokevirtual clojure/lang/Var.getRawRoot():Ljava/lang/Object;
43: checkcast Lclojure/lang/IFn;
46: aload_0
/* m */
47: dup
48: ldc      "3,1"
50: ldc      -82329772
52: invokestatic clojure/storm/Tracer.traceExpr
55: getstatic dev_tester$add_age.const_1
58: aload_1
/* years */
59: dup
60: ldc      "3,3"
62: ldc      -82329772
64: invokestatic clojure/storm/Tracer.traceExpr
67: invokeinterface clojure/lang/IFn.invoke
72: dup
73: ldc      "3"
75: ldc      -82329772
77: invokestatic clojure/storm/Tracer.traceExpr
80: dup
81: ldc      ""
83: ldc      -82329772
85: invokestatic clojure/storm/Tracer.traceFnReturn
88: goto    100
91: dup
92: ldc      ""
94: ldc      -82329772
96: invokestatic clojure/storm/Tracer.traceFnUnwind
99: athrow
100: areturn
```

hooks

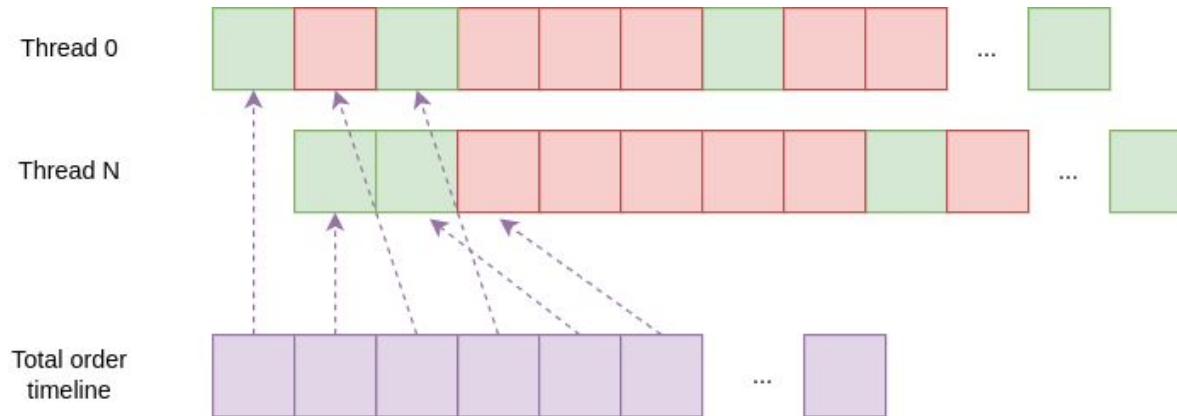
Source coords

Thread timeline



- One per **thread**
- Represented by an **array of events** (fn-calls, expression-executions, fn-returns, fn-unwinds)
- <https://raw.githubusercontent.com/flow-storm/flow-storm-debugger/master/docs/timeline.svg>

Total order timeline



- Record [thread interleaving](#)
- [Optional](#) to make everything faster

Architecture

High Level

https://raw.githubusercontent.com/flow-storm/flow-storm-debugger/master/docs/high_level_diagram.svg

Run configurations

https://raw.githubusercontent.com/flow-storm/flow-storm-debugger/master/docs/run_configs.svg