

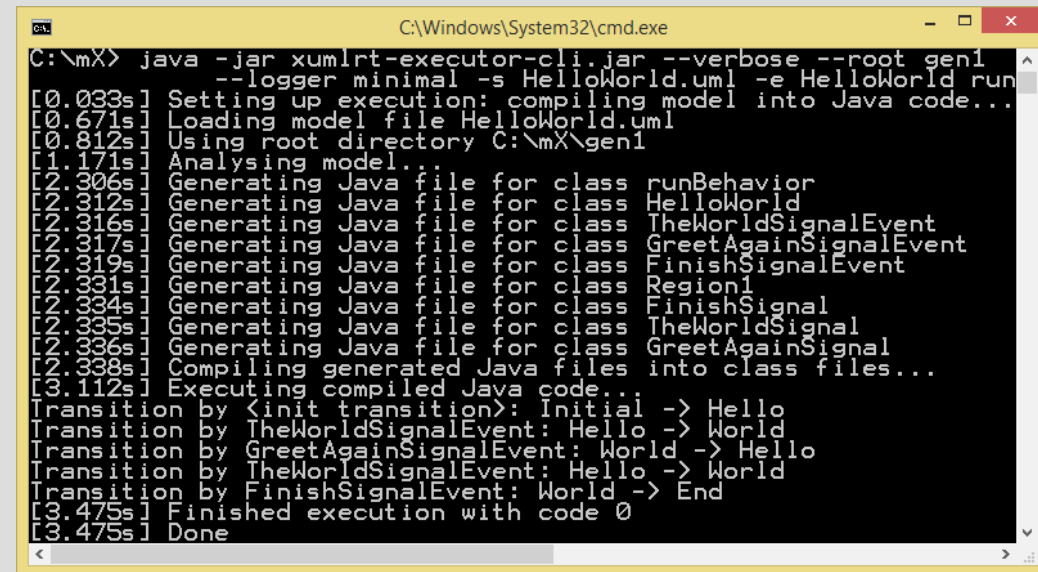
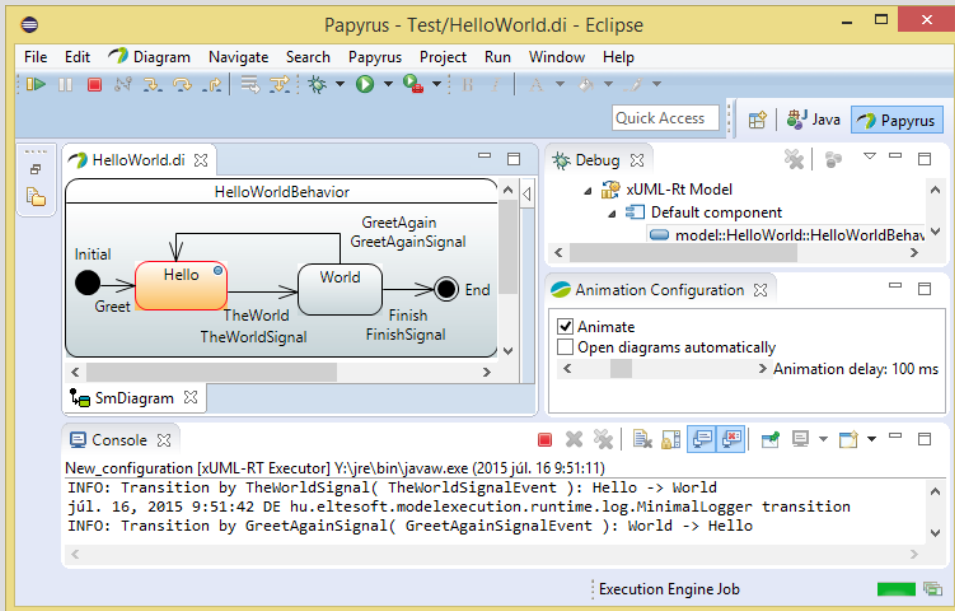
UML Model Execution via Code Generation

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Model Execution Use Cases

- Interactive debugging
- Automated testing



→ Integration with
debug GUI

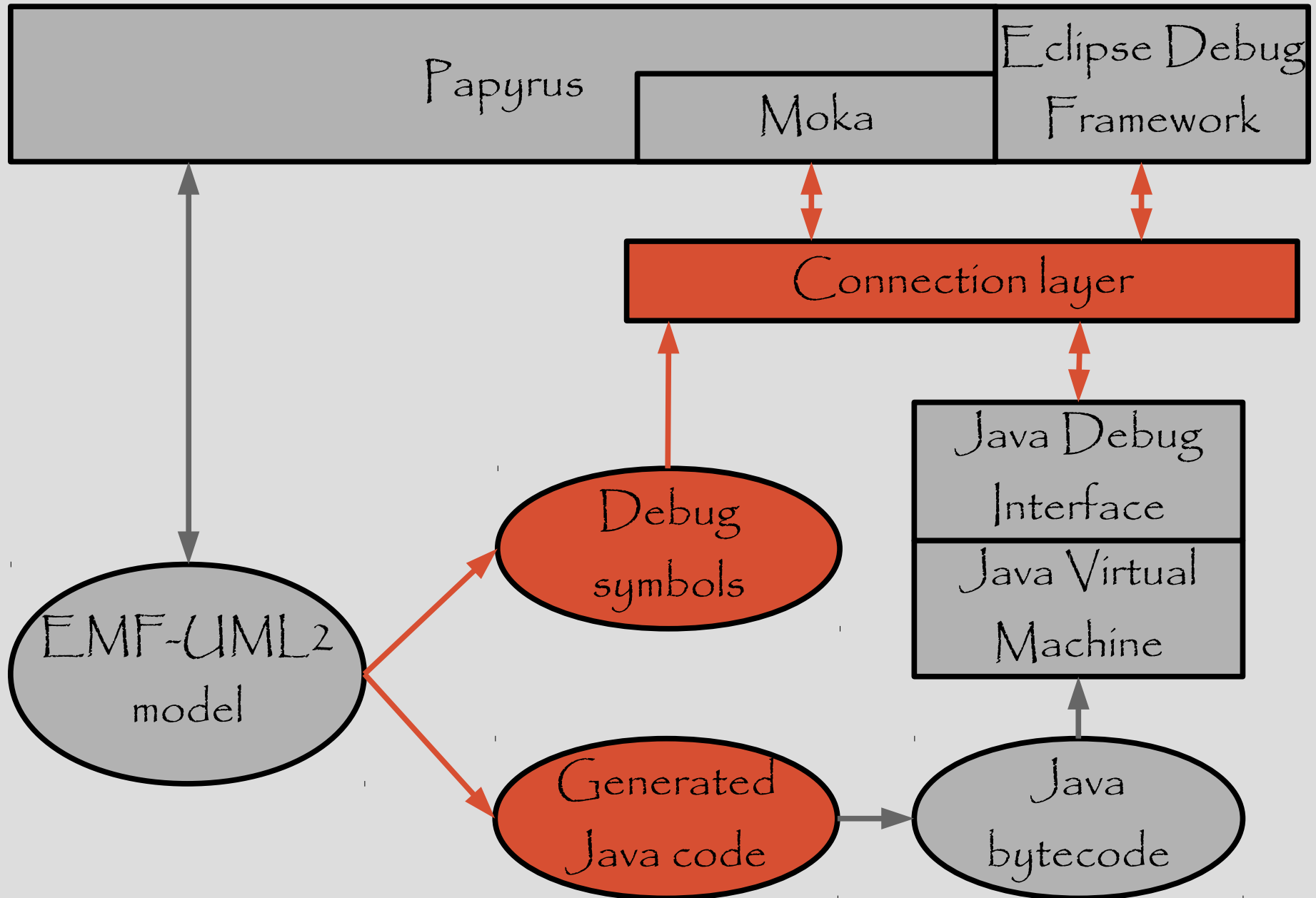
→ Performance

Interpreter, Code Generation, JIT

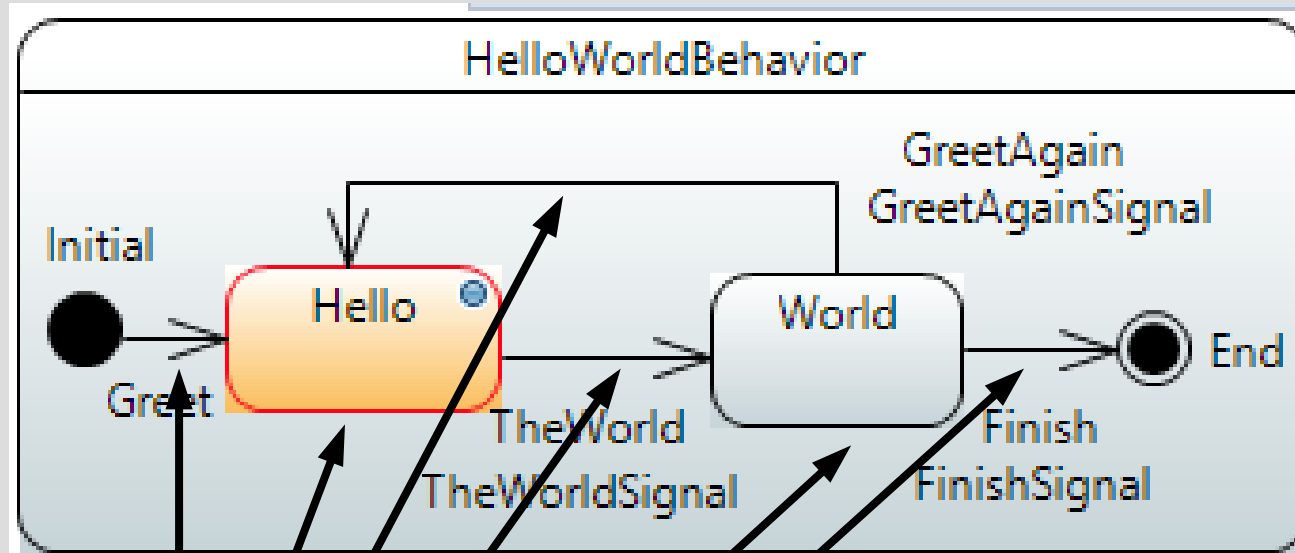
Technology	1000 instances		5000 instances	
	Config-1	Config-2	Config-1	Config-2
Interpreter	11 436	7 687	69 288	41 192
Generated Java Code	496	354	2 849	2 339
JIT to Java	7 295	4 986	29 796	13 134
JIT to Bytecode	1 468	1 332	23 583	10 060

Model execution times for processing 10 000 signals (ms)

Architecture



Animation and breakpoints



```

57 @SuppressWarnings("incomplete-switch")
58 private void state50(hu.eltesoft.model.execution.runtime.base.Event event) {
59     if (event instanceof hu.eltesoft.model.execution.runtime.base.SignalEvent) {
60         hu.eltesoft.model.execution.runtime.base.Signal signal = ((hu.eltesoft.model.execution.runtime.base.SignalEvent) event).getSignal();
61         switch (currentState) {
62             case _M8S9_KuFEe5BF899A_G5w:
63                 break;
64             case _DvsQKuFEe5BF899A_G5w:
65                 if (signal instanceof _anOt4KuGEe5BF899A_G5w)
66                     // State exit
67                     hu.eltesoft.model.execution.runtime.BaseRuntime.getInstance().logExitState("On");
68                 // Transition effect
69                 hu.eltesoft.model.execution.runtime.BaseRuntime.getInstance().logTransition(
70                     "SwitchOffEvent",
71                     "SwitchOff",
72                     "On",
73                     "Off");
74                 currentState = State._CB0QKuFEe5BF899A_G5w;
75             // State entry
76             hu.eltesoft.model.execution.runtime.BaseRuntime.getInstance().logEnterState("On");
77             } else
78             if (signal instanceof _VvKwMKuGEe5BF899A_G5w)
79             {
80                 // State exit
81                 hu.eltesoft.model.execution.runtime.BaseRuntime.getInstance().logExitState("On");
82             // Transition effect
83             hu.eltesoft.model.execution.runtime.BaseRuntime.getInstance().logTransition(
84                 "HammerHit",
85                 "On",
86                 "On");
87         }
88     }
89 }
90 }
91

```

Generated Java,
instrumented with breakpoints

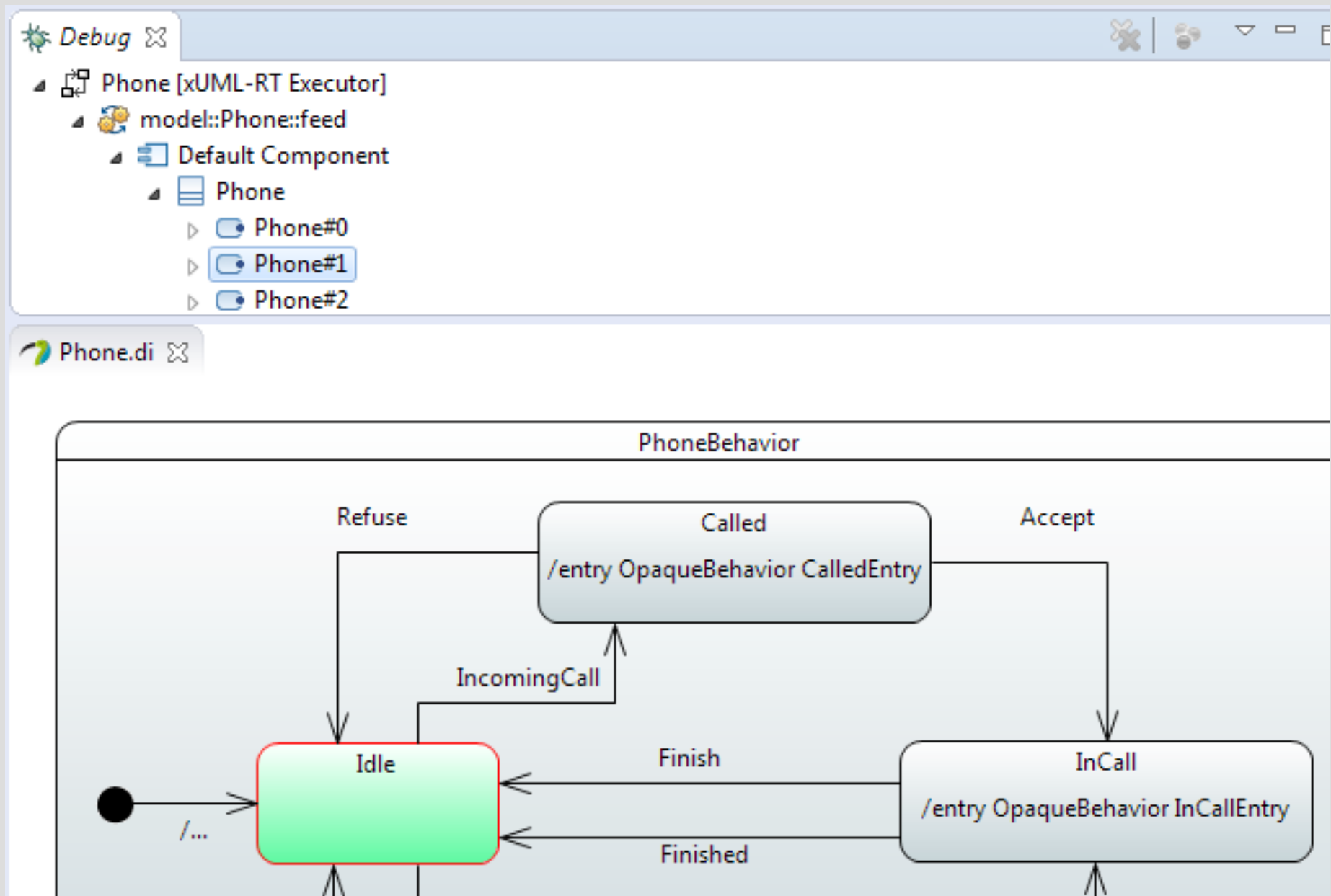
JDI Breakpoint Performance

Breakpoints	10	100	1 000	10 000	20 000
Runtime of 100 hits (ms)	8.93	10.25	24.35	169.52	347.41
Set (ms)	~0	~0	112	1 602	4 965
Disable (ms)	~0	~0	66	1 750	5 753

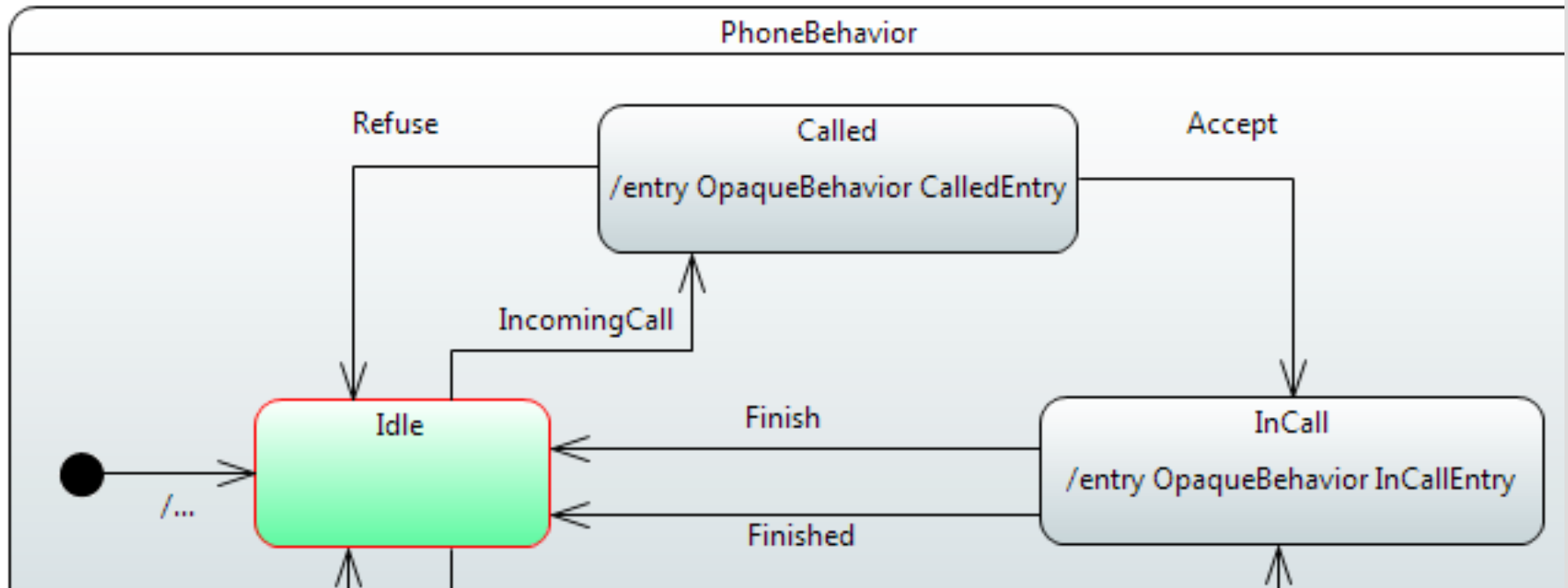
User-initiated Termination

- Terminate JVM?
 - Cannot close resources, such as log files
- Send “kill signal”?
 - Platform specific
- Communicate through debugger?
 - Will not work in “run mode”
- Start control thread and communicate via a socket

Multiple Object Instances



Phone.di ☒



Thank you!*

Software:

modelexecution.eltesoft.hu

*What is the name of this font? :)

