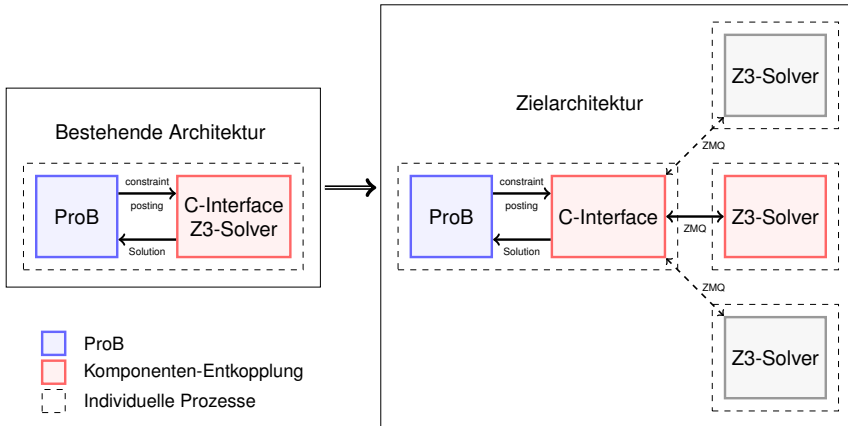


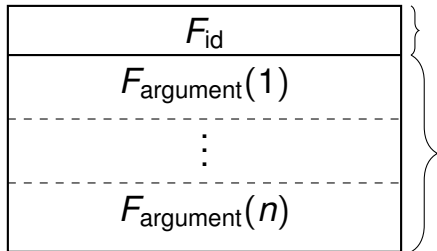
Bachelorarbeit: Entkopplung der Z3 Komponente in ProB mit ZeroMQ

Silas A. Kraume



- ProB: Animator, Model Checker und Constraint Solver für B-Methoden.
- Z3: Constraint Solver von Microsoft Research.
- ZeroMQ: Kommunikationsbibliothek für verteilte Systeme.

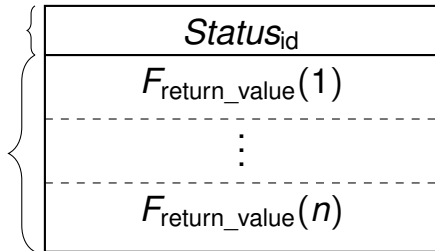
Request



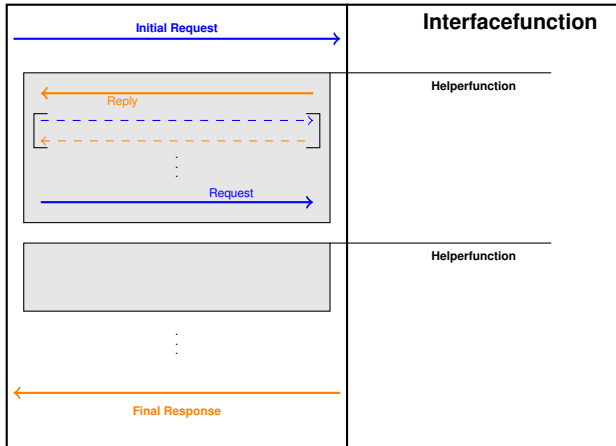
Integer

zmsg_t

Response



Struktur einer refaktoriisierten Interfacefunktion

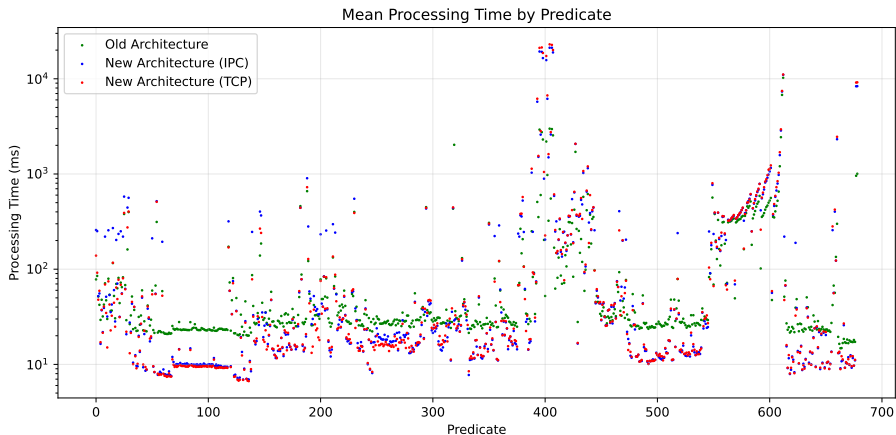


- ① dient der verbesserten Nachvollziehbarkeit und Transparenz
- ② lässt sich über die Systemargumente steuern („--log“)
- ③ schreibt beispielsweise in `z3rver96485092.probz.log`

```
while (true) {  
    { // wait for threads to finish  
    std::lock_guard<std::mutex> threads_guard(running_threads_mutex);  
    if (running_threads.size() == 0)  
        break;  
    }  
    std::this_thread::sleep_for(std::chrono::milliseconds(5));  
}
```

```
send_solver_interrupts("all"); // implemented workaround

while (true) {
    { // wait for threads to finish
        std::lock_guard<std::mutex> threads_guard(running_threads_mutex);
        if (running_threads.size() == 0)
            break;
    }
    std::this_thread::sleep_for(std::chrono::milliseconds(5));
}
```

- Die Restrukturierung des Systems konnte erfolgreich umgesetzt werden
- Es wurde eine unerwartete Laufzeitverbesserung erzielt

latest 5 jobs 15 minutes 39 seconds, queued for 2 seconds

Pipeline Jobs 5 Tests 16100

Group jobs by

Stage

Job dependencies

Show dependencies ☒

✓ build:linux64
build

✓ build:linux64-swi
build

✓ test:check-for-tabs
test

✓ test:on-commit
test

✓ test:on-commit-swi
test

```
#0 0x00007ffff786d6e3 in sat::local_search::flip_walksat(unsigned int) () from ./prefix/bin/libz3.so
(gdb) bt
#0 0x00007ffff786d6e3 in sat::local_search::flip_walksat(unsigned int) () from ./prefix/bin/libz3.so
#1 0x00007ffff786dce8 in sat::local_search::propagate(sat::literal) () from ./prefix/bin/libz3.so
#2 0x00007ffff786e918 in sat::local_search::pick_flip_walksat() () from ./prefix/bin/libz3.so
#3 0x00007ffff786ed02 in sat::local_search::walksat() () from ./prefix/bin/libz3.so
#4 0x00007ffff7870b08 in sat::local_search::check(unsigned int, sat::literal const*, sat::parallel*)
from ./prefix/bin/libz3.so
#5 0x00007ffff782b651 in sat::solver::invoke_local_search(unsigned int, sat::literal const*) ()
```

⋮

TestID	QueryID	Old(ns)	New(IPC, ns)	New(TCP, ns)	Req. Count
⋮	⋮	⋮	⋮	⋮	⋮
1510	1	114 815 014	283 392 117	113 503 997	191
1510	2	52 048 678	59 273 375	44 489 012	166
1510	3	30 853 103	24 983 820	25 212 332	286
1511	1	69 240 686	199 325 313	61 823 314	21
1511	2	61 404 523	62 220 124	48 522 297	20
1513	1	80 829 324	202 694 845	75 877 790	25
⋮	⋮	⋮	⋮	⋮	⋮