Status: I successfully pulled the STASE demo repository and reproduced the Use-After-Free (UAF) vulnerability using KLEE. I hit a few environment issues with LLVM version mismatches, but I resolved them by aligning our compiler versions. The tool is now running correctly, and I've confirmed the bug is reproducible. Currently, I have moved on to modeling different WMI 3 use after free in the basic challenge.

```
vishva@VishvaLaptop:~/stase_klee_demo/1-basic/demo_klee$ ./run.sh
+ klee --search=bfs --max-time=30s --exit-on-error-type=Assert uaf_demo.bc
KLEE: output directory is "/home/vishva/stase_klee_demo/1-basic/demo_klee/klee-out-1"
KLEE: Using STP solver backend
KLEE: SAT solver: MiniSat
KLEE: Deterministic allocator: Using quarantine queue size 8
KLEE: Deterministic allocator: globals (start-address=0x7819f0000000 size=10 GiB)
KLEE: Deterministic allocator: constants (start-address=0x781770000000 size=10 GiB)
KLEE: Deterministic allocator: heap (start-address=0x771770000000 size=1024 GiB)
KLEE: Deterministic allocator: stack (start-address=0x76f770000000 size=128 GiB)
KLEE: WARNING ONCE: Alignment of memory from call "malloc" is not modelled. Using alignment of 8.
KLEE: WARNING ONCE: Alignment of memory from call "calloc" is not modelled. Using alignment of 8.
KLEE: ERROR: ../metalogin.c:408: memory error: use after free
KLEE: NOTE: now ignoring this error at this location

KLEE: done: total instructions = 1924
KLEE: done: completed paths = 0
KLEE: done: partially completed paths = 1
KLEE: done: generated tests = 1
+ echo '[OK] KLEE finished; see klee-out-* for errors/tests'
[OK] KLEE finished; see klee-out-* for errors/tests
vishva@VishvaLaptop:~/stase_klee_demo/1-basic/demo_klee$
```

WMI 3: The attacker uses the stale reference to trick the program into deleting (freeing) a memory address of the attacker's choosing, one that wasn't supposed to be deleted.

```
================================================
   METALOGIN v0.7.3 - Avatar Authentication System
   Black Sun Terminal #4471
   *Legacy system - use at own risk*
================================================

[BOOT] Initializing MetaLogin system...
KLEE: WARNING ONCE: Alignment of memory from call "calloc" is not modelled. Using alignment of 8.
[LIBRARIAN] Maybe this will help(0x7ce884e00000)
KLEE: ERROR: ./metalogin.c:48: memory error: out of bound pointer
KLEE: NOTE: now ignoring this error at this location

KLEE: done: total instructions = 13124
KLEE: done: completed paths = 0
KLEE: done: partially completed paths = 1
KLEE: done: generated tests = 1
+ echo '[OK] KLEE finished; see klee-last/ for results.'
[OK] KLEE finished; see klee-last/ for results.
vishva@VishvaLaptop:~/wmi3-arbfree-demo$
```