

CS 6V81-002: Quiz 9 Solutions

February 25, 2008

1. SASI enforces which of the following security policies? (circle all that apply)

- (a) **control-flow integrity**
- (b) **memory safety**
- (c) type safety
- (d) **security automata**

The x86 implementation of SASI enforces control-flow integrity and memory-safety in order to prevent untrusted code from circumventing the runtime security checks. (The Java implementation doesn't need to enforce either since both are already guarantees provided by the Java bytecode language.) SASI security policies are expressed as security automata, making (d) a correct answer. SASI has no type-system, so (c) does not apply.

2. SASI prototypes have been implemented for... (circle all that apply)

- (a) **untyped x86 assembly language**
- (b) typed x86 assembly language (TAL)
- (c) **Java bytecode (JVML)**
- (d) Java source code

3. The “alphabet” of a security automaton is... (circle one)

- (a) the set of security “states” encoded by the automaton
- (b) **all runtime “events” observable by the automaton**
- (c) a language of logical predicates
- (d) the set of event sequences “accepted” by the automaton

4. When SASI was used to enforce the same policy enforced by Java’s SecurityManager, the SASI implementation incurred approximately how much runtime overhead above the Sun JVM implementation? (circle one)

- (a) 150%
- (b) 50%
- (c) 10%
- (d) **0%**

5. Label the edges of the security automaton below so that it encodes the security policy, “at most one *send*.”

