1. Strong vs. weak memory
- Memory models describe all possible behaviors resulting from concurrent accesses to shared memory locations.
- Most verification work assumes a strong memory model (i.e. interleaving semantics).
- In practice, hardware behaves weakly (x86-TSO, POWER, ARM, ...).
- The C11 memory model unifies various existing hardware models.

2. Examples of weak behavior in C11

3. Fences in C11
Fences can be used to achieve synchronization:

4. Fenced separation logic (FSL)
- Extension of relaxed separation logic (RSL).

5. Inference rules

6. Example proof

Other synchronization primitives, such as release writes and acquire reads, can be implemented using fences.