

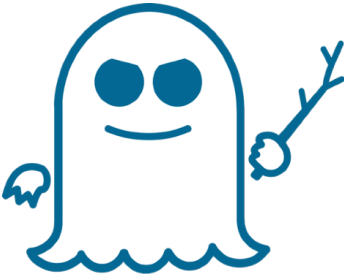


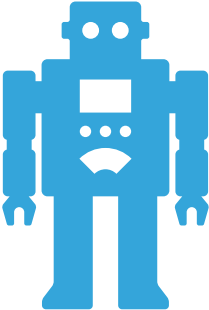




**SPECTRE: SPECTACULAR EXERCUTION**

45

































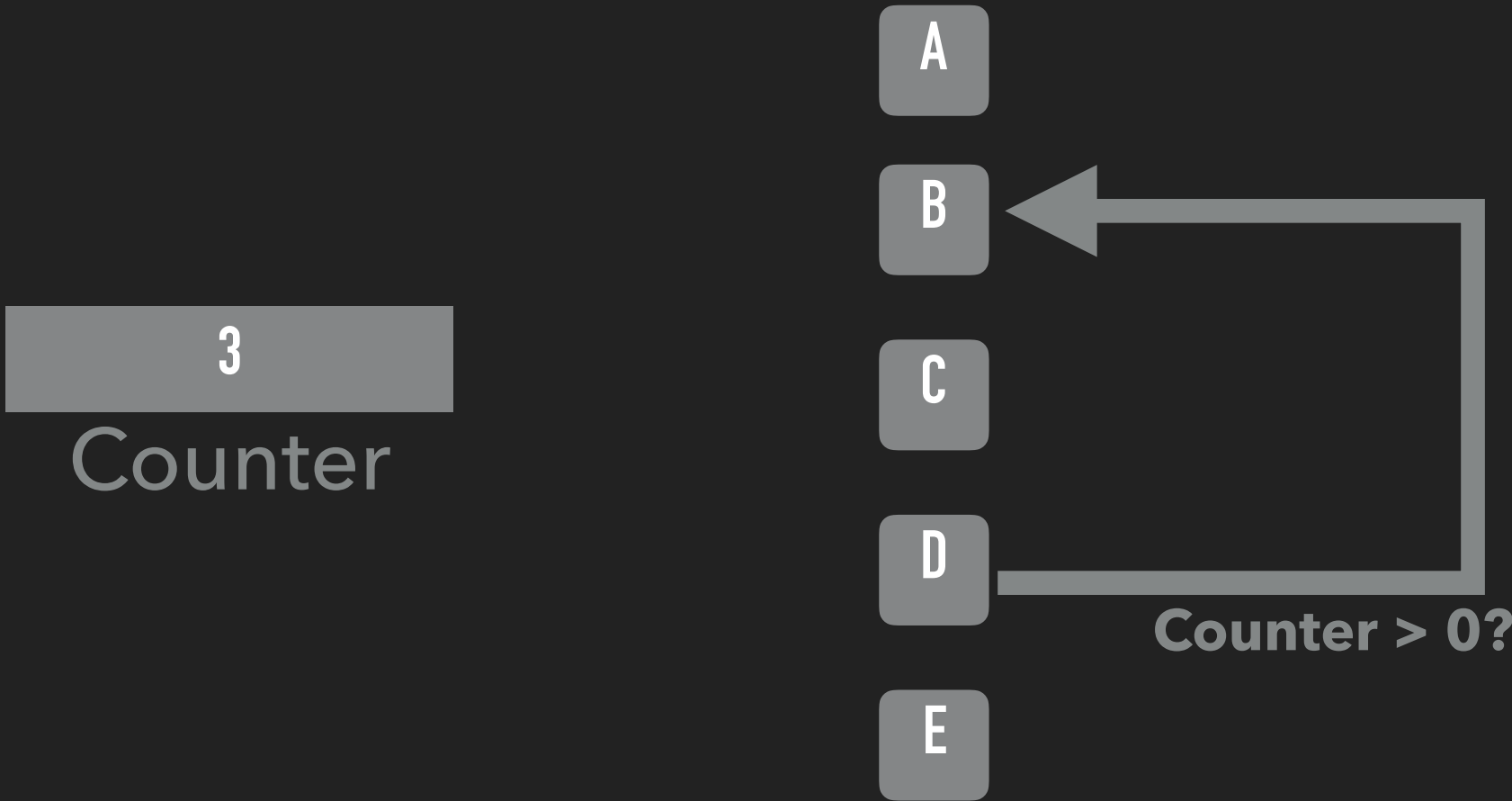
The CPU can improve the coffee machine utilisation by  
*speculatively* brewing the coffee for 

This is very similar to the effect seen in Meltdown.

► In the **Meltdown** attack the CPU knows the next instruction (order) and asynchronously checks the permissions

► In Spectre the CPU guesses the next instructions based on heuristics (brew coffee without knowing the order)

# SPECTRE: SPECULATIVE EXECUTION



COUNTER

A B ... E

A



Some variable used in branch

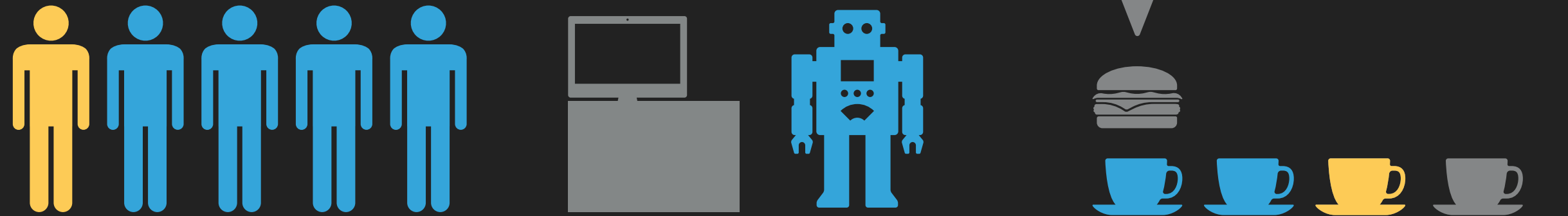
Instructions


Currently active instruction

Conditional branch



## SPECTRE: SPECULATIVE EXECUTION



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