CPALockator

Thread-Modular Approach with Transition Abstraction for Analysis of Multithreaded Software

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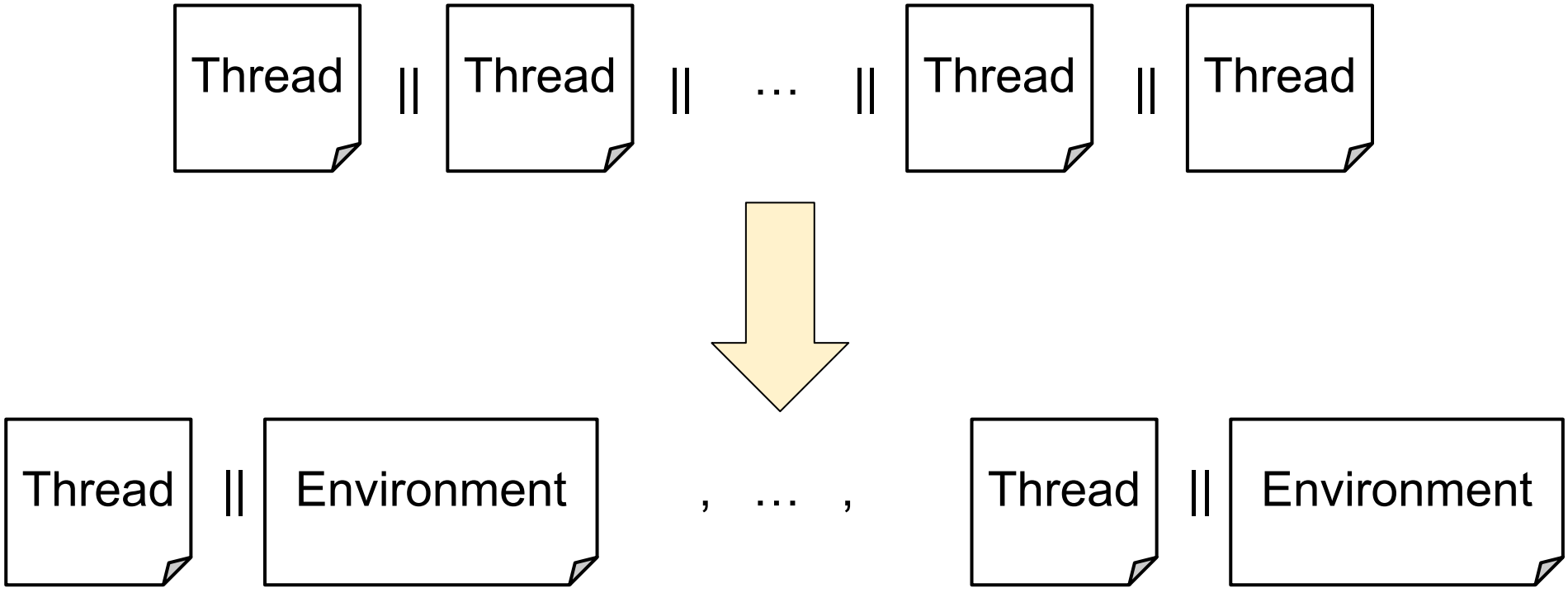
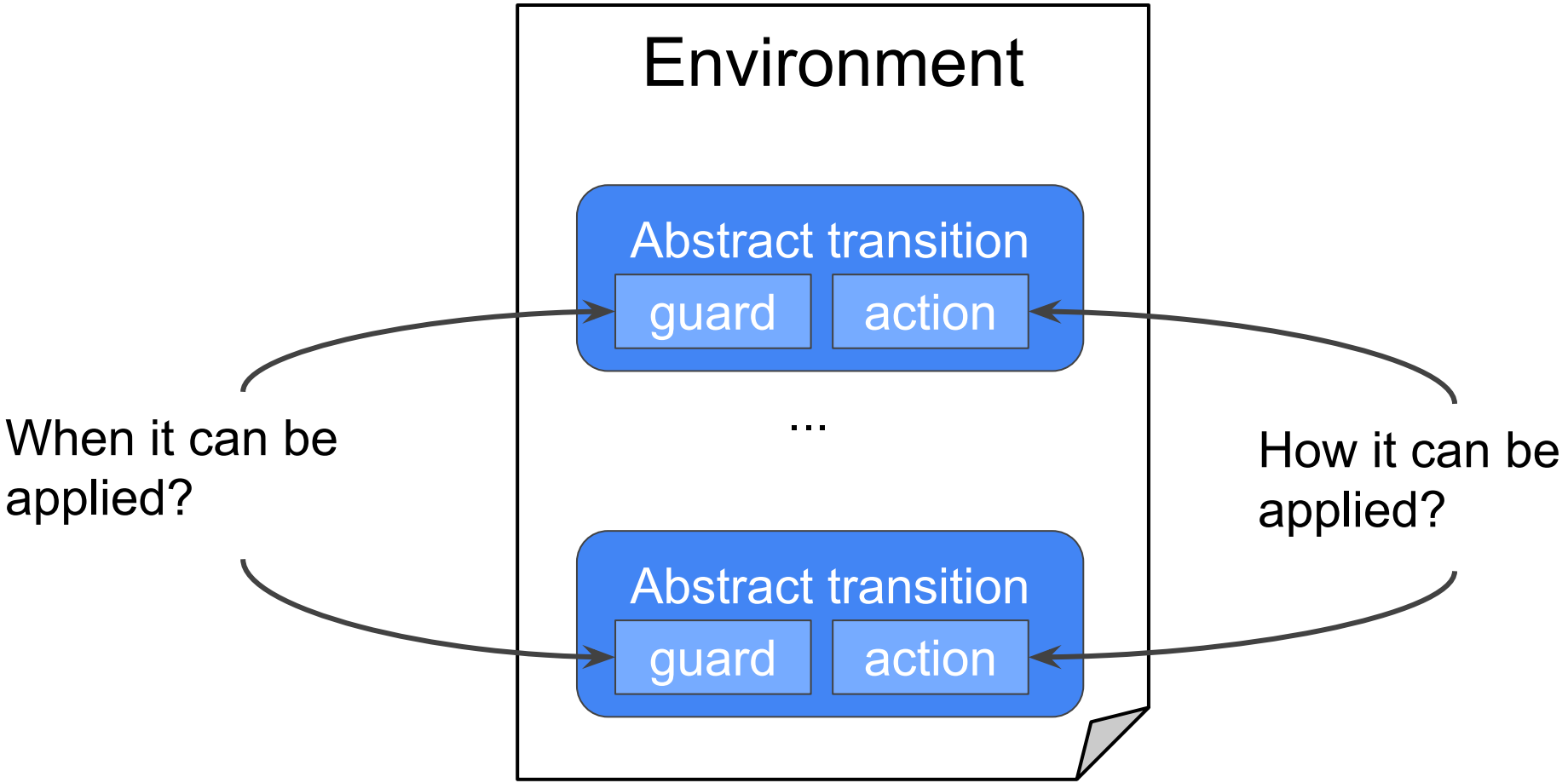
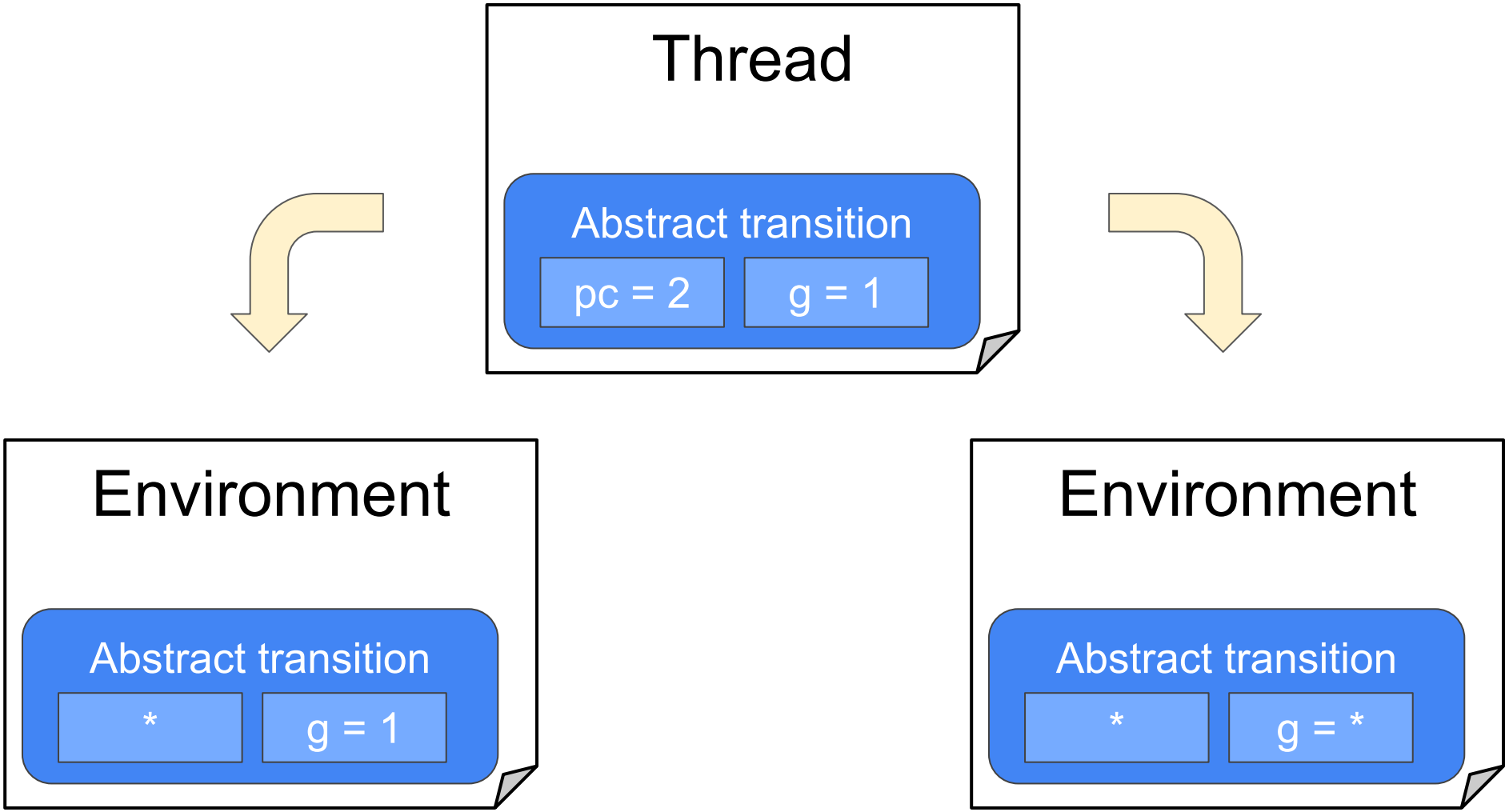
Thread-Modular Approach




Environment
Abstract transition
guard
action
...
Abstract transition
guard
action
When it can be applied?
How it can be applied?


Thread
Abstract transition
pc = 2
g = 1
Environment
Abstract transition
*
g = 1
Environment
Abstract transition
*
g = *

Fast static analysis

RELAY, Locksmith,...

- Scaling on a real software
- Unsound bug finding

Precise model checking

CBMC, SMACK,...

- Small amount of false alarms
- Theoretically sound approach

Adjustable balance between speed and precision

Benchmark	kLOC	Threads	CPALockator	Other participants
cafe_ccic.ko_false	13	4	X	X
nsc-ircc.ko_false	13	5	X	X
w83977af_ir.ko_false	10	3	V	X
spi-tegra20-slink.ko_false	7	4	V	X
adutux.ko_false	9	3	V	V
iowarrior.ko_false	8	3	V	X
cafe_ccic.ko_true	13	4	V	X