System Support for Custom Speculation Policies

Benjamin Wester, Peter M. Chen
University of Michigan

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Overview
Speculation Policy

Default

• Predict system calls
• Allow no uncommitted output
• Commit identical results
• Roll back after any change

Custom

• Predict arbitrary operations
• Allow harmless uncommitted output
• Commit equivalent results
• Correction appropriate to error
spec_fork()

Controlling process

try to establish x

if (x) commit()

[else rollback()]

allow_fd_output()

Speculative process assume x

Set output policy {allow, taint, defer, block}

Arbitrary operations

Define equivalence

Error correction
Uses

• Predicting user actions
  – Bash shell
• Authentication
• User-level network services

More?