Compiler Optimizations in SPIN

Dynamic compilation:

- with respect to program data
- with respect to event handler (spindle) dispatch

Brian Bershad

Craig Chambers

Susan Eggers

Dynamic Compilation

What it is:

compile code at run time after data values are known

Why we do it:

better performance

How we do it

- Programmer annotations
- Static compiler
  - machine code template with holes
  - directives to the dynamic compiler
  - some setup code
- Dynamic Compiler (the stitcher)
  - turn the template in to executable code

Dynamic Compilation

Compiler requirements

- extensible IR operand descriptions
- IR annotations remain or can be regenerated over multiple optimization passes
- optimization passes independent and easy to add
- portable code generation
- printable/readable IR
- in the public domain
- good code quality, robust, modular, documentation, multiple front ends, multiple back ends

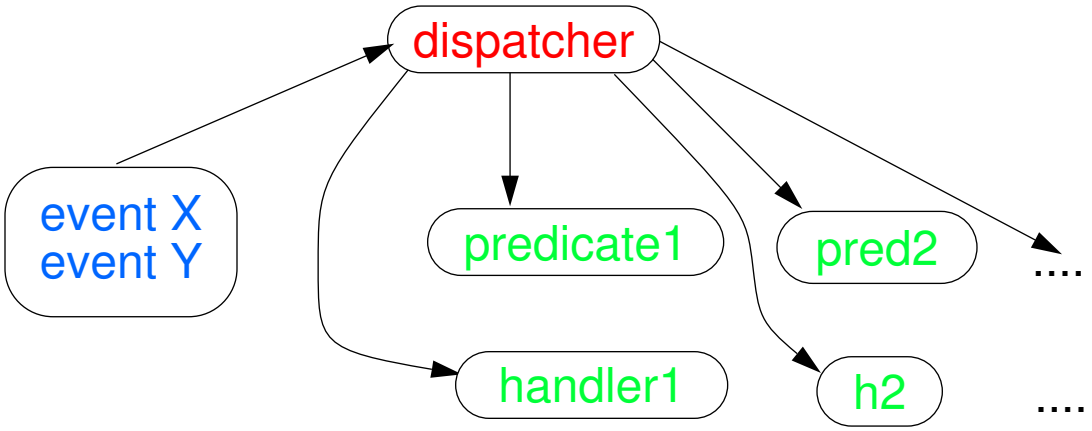
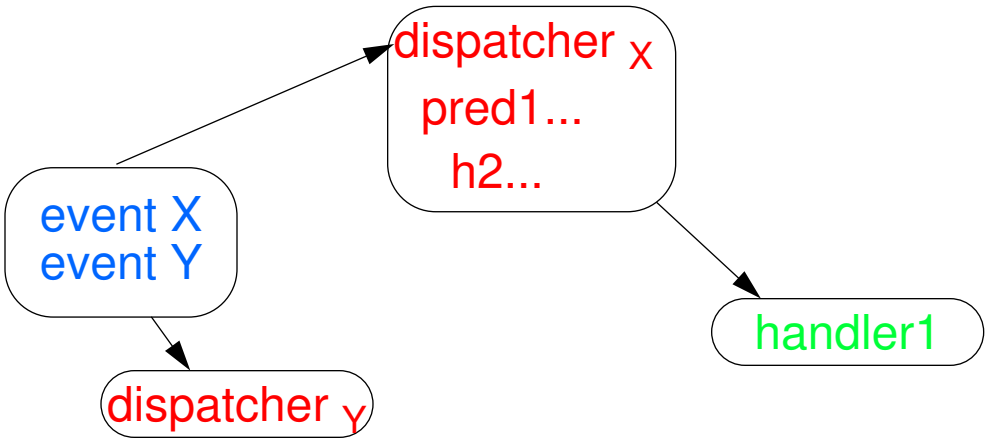
Architectural requirements

- Fast cache flush

==> ARPA-sponsored compiler infrastructure

Dispatching

Unoptimized



Optimized