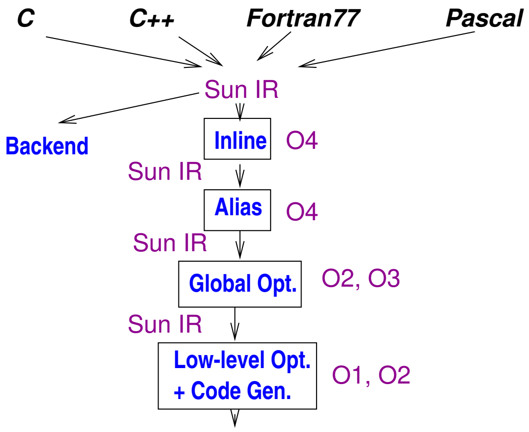
Sun Sparc Compilers



Sun Sparc Compilers

Global Optimizations

✲ Repeats

Scalar Replacement of aggr.

- Constant Prop. ✲
- Dead Code Elim. ✲
- Control Flow Anal.
- Dependence Anal.
- Loop Distrib./Interch./Fusion
- Scalar replacement of arrays
- Reduction Recognition
- Tiling

Parallel and cache opt.

Linear. of arrays

Reassoc.

Inv. Code Motion

Strength Red.

✲ *Constant Prop.*

✲ *Dead. Code Elim.*

Sun Sparc Compilers

Low Level Optimizations ☼ Repeats

Instruction Sel.
Inline
Local Opt.
Dependence Anal.
SW Pipelining
Instruction Sched. ☼
Register Allocation (graph coloring)
Instruction Sched. ☼

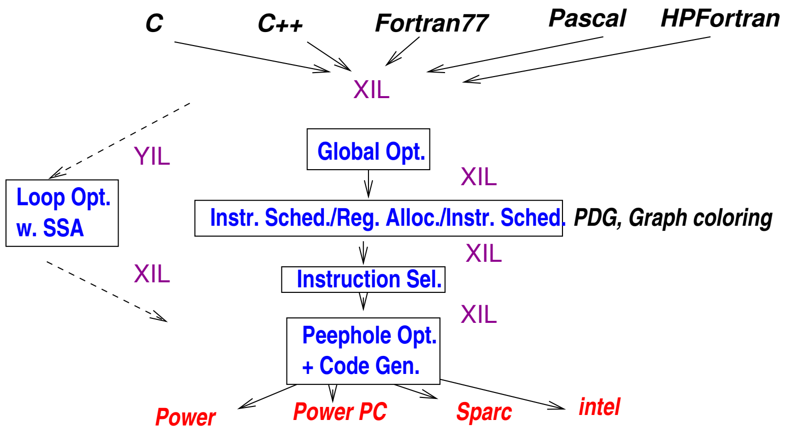
GC Compiler

Many front ends and back ends! ☼ Repeats

Uses RTL, machine-dependent IL ***(from machine description)***

☼ **Jump Opt.**
☼ **CSE, CP, branch folding**
Loop optimizations, CSE ☼
DFA: live registers
Instruction combining: peephole opt., instr. sel.
☼ **Instruction Sched.**
Local, global Reg. Alloc
☼ **Instruction Sched.**
☼ **Jump Opt.**
Branch Opt.

IBM XL Compilers



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IBM XL Compilers

✲ Repeats

Global Optimizations

- **Branch Opt.**
- **Heuristic-based Inline**
- **(aggressive) Value No.** ✲
- ✲ **Global CSE, Loop-inv. code motion**
- **Store motion and elim.**
- **Reassoc.**
- **Global Constant Prop.**
- **Dead Code Elim.**
- **Value No.**
- ✲ **Global CSE**
- **Dead Code Elim.** ✲

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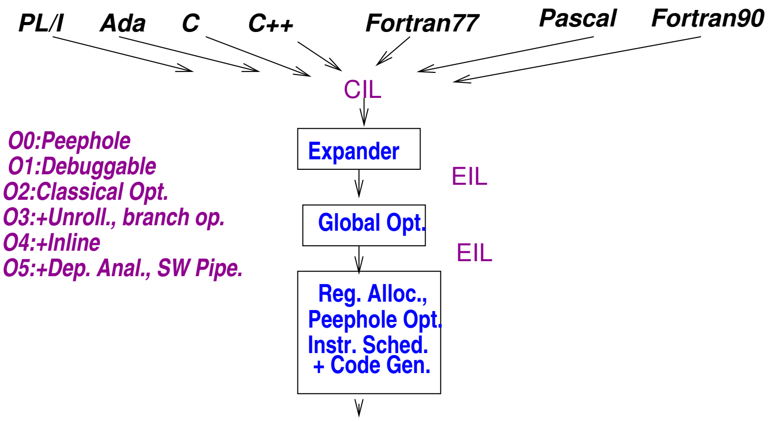
DEC Alpha Compilers



DEC Alpha Compilers

Global Optimizations

Strenth Reduction

Loop unrolling

Global CSE

Loop Inv. Code Motion

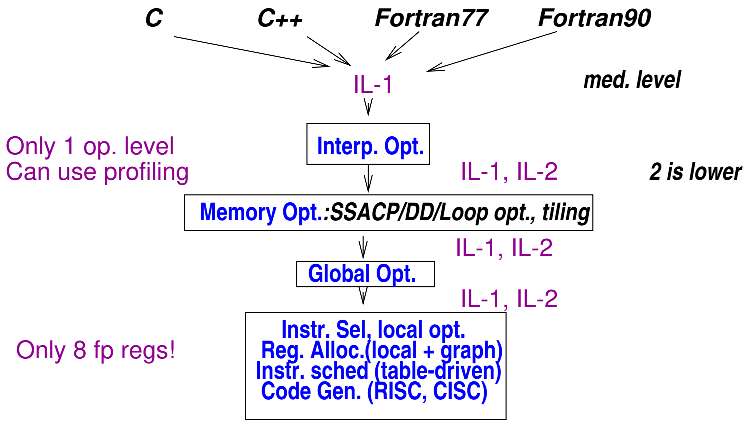
Dead store Elim.

SW Pipelining

✲ Repeats

(not clear)

Intel 386 Family Compilers



Intel 386 Family Compilers

Global Optimizations ✲ Repeats

Global Constant Prop.

Dead Code Elim. ✲

✲ **Copy Prop.**

Partial Red. Elim.

✲ **Copy Prop.**

Dead Code Elim. ✲

Tera Compiler

F77, C, C++, parallel assertions, futures

Whole program compilation

- ***Interprocedural Analysis and Optimization***
  - ***Call graph, automatic and user-directed inlining, dep info.***
- ***Incremental recompilation***

Optimizations

- **Classical scalar**
- **Parallelization (multiple nodes, threads)**
- **Loop unrolling, SW pipelining**

Canal (Compiler Analysis Tool)

- ***Reports compiler transformations, # ops, # streams needed***