

PowerPC Birds of a Feather

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PowerPC BOF

- Finished projects
- Current/future work

Finished projects

- GCC farm machine
- Advance toolchain
- PowerPC code improvements

GCC farm machine

- IBM donated a large power7 machine (gcc110) to the Compile Farm

Advance Toolchain

- Advance Toolchain provides newer compilers to those users needing newer optimizations, etc.
- Backports of features from trunk to AT
- AT 5.0 based on GCC 4.6
- AT 6.0 will be based on GCC 4.7
- Oprofile moving to Perf
- SLES 10/11, RHEL 5/6
- tcmalloc

PowerPC improvements

- Improvements for instruction group formation, explicit group ending nops
- Pow/sqrt/reciprocal tree optimizations
- Elimination of soft-float 32-bit libs on ppc64
- IEEE tests improvements
- Vector tuning
- Conditional move of adjacent memory refs

PowerPC improvements #2

- Optional elimination of static chain in indirect calls
- Optional movement of saving the TOC to the prologue
- Medium/Large code model support (on by default in AT, via option in distros)
- Target specific function support
- 32-bit out of line saves
- Thread local storage improvements
- Switch statement if vs. jump table tuning

Current/future work

- Improve conditional move, integer abs/min/max. Add support for branch conditional+8 on power7.
- Source code analyzer to help with porting issues
- Avoiding using saved CR registers
- Allow use of 64 VSX regs for scalar floating point

Current/future work #2

- Improvement of calls to modules in the same shared libraries where no runtime overload is in process
- Update glibc to use ifunc attribute for target specific optimizations
- Eliminate/reduce setting VRSAVE register
- Elimination of old POWER support

Current/future work #3

- Libstdc++ improvements (thread locking, strings, etc.)
- Fusion of instructions
- More vectorization tuning, enable vector cost model by default
- Explore adding unroll loops for -O3 or -Ofast
- Improve creation of MD builtin functions
- Improve shrink-wrapping