SFO15-212: OpenJDK on ARM 32bit

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Hotspot

- Two interpreters
  - Zero
  - Template
- Two compilers
  - C1
  - C2
Existing

- **32-bit:**
  - OpenJDK 7, 8, 9: Zero
  - Icedtea 7: Zero, ARM microJIT & ASM interpreter.

- **64-bit:**
  - OpenJDK 7, 8, 9: Full Temp. Interp, C1, C2
Technical Choices

- Based on AArch64 port
- Kept as much as possible same
- Minor changes to frame layout
- Fewer registers meant use of sp as esp too - in hindsight perhaps not the best choice.
Template

ISHL:

(Stack: …, <val>, <sft>)

pop   {r0}                       ; (ldr r0, [sp], #4)
pop   {r1}                       ; (ldr r1, [sp], #4)
lsl      r0, r1, r0
ldrb    r9, [r5, #1]!
add    ip, r9, #768          ; 0x300
ldr      pc, [r4, ip, lsl #2]
Progress

- Currently only working on ARMv7, but aiming to target ARMv6 too.
- Works with a range of programs, javac, eclipse, jedit etc...
- Hard-float and soft-fp (not tested)
- Some known bugs and issues remaining.
Demo
Benchmarks

EEMBC GrinderBench 1.0
Quad-core ARMv7 1.7Ghz, 2GB ram

Graph showing performance of different benchmarks like Parallel, kXML, PNG Decode, Chess, and Crypto against various Java runtime environments such as Oracle JDK8, MicroJit (JDK7), ASM Interp (JDK7), Template Interp, and Zero (JDK8).
Benchmarks II
Code

Latest code at:
https://bitbucket.org/joe-j/aarch32-openjdk

Binaries and info at:
http://openjdk.linaro.org
Future Work

- Needs a clean up
- Work on build system and packaging
- 64-bit atomic loads and stores
- Hopefully moving to an Icetea repository
- Needs more testing.
Questions?