



OpenJDK8 for RV64 移植进展

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移植进展简介

移植主要内容：解释器、C1编译器&C2编译器（JIT）



移植进展简介

- 解释器成功运行 java 、 javac.

```
zhangxiang@plct-c8:~/jdk8u$ qemu64 ./build/linux-riscv64-normal-core-release/jdk/bin/java-bak -version
openjdk version "1.8.0_352-internal"
OpenJDK Runtime Environment (build 1.8.0_352-internal-zhangxiang_2023_11_30_22_34-b00)
OpenJDK 64-Bit VM (build 25.352-b00, interpreted mode)
zhangxiang@plct-c8:~/jdk8u$
```

```
zhangxiang@plct-c8:~/gitlab/jdk8u$ qemu64 ./build/linux-riscv64-normal-core-release/jdk/bin/java Hello
Hello,World!
zhangxiang@plct-c8:~/gitlab/jdk8u$
```



移植过程简介

JIT运行java

```
sys 0m0.455s
● zhangxiang@plct-c8:~/jdk8u$ time qemu64 ./build/linux-riscv64-normal-server-release/jdk/bin/java-bak -version
openjdk version "1.8.0_352-internal"
OpenJDK Runtime Environment (build 1.8.0_352-internal-zhangxiang_2023_11_27_13_17-b00)
OpenJDK 64-Bit Server VM (build 25.352-b00, mixed mode)

real    0m18.924s
user    0m18.504s
sys     0m0.544s
○ zhangxiang@plct-c8:~/jdk8u$
```



测试情况简介

测试

- dacapo测试: <https://github.com/zhangxiang-plct/jdk8u/issues/253#issuecomment-1378427549>
- -----通过率: 85.7%, 与x86通过情况保持一致。
- Specjvm2008测试: <https://github.com/zhangxiang-plct/jdk8u/issues/261>
- -----通过对比x86的测试情况, 当前测试情况与x86保持一致。
- jtreg测试: <https://github.com/zhangxiang-plct/jdk8u/issues/321>

测试情况简介

jtreg测试进展

常用选项介绍: <https://openjdk.org/jtreg/command-help.html>

jtreg使用指导: <https://github.com/zhangxiang-plct/jdk8u/wiki>

```
/home/zhangxiang/zx_temp/jtreg/bin/jtreg \  
-othervm \  
-v:fail,error,summary \  
-retain:fail,error \  
-concurrency:36 \-----加快运行速度  
-ignore:quiet \  
-timeoutFactor:16 \-----部分case需要比较大的timeoutFactor  
-w:/home/zhangxiang/zx_temp/jdk8u/jtreg-temp-1205-Temp-fail/JTreport \----记录测试结果  
-r:/home/zhangxiang/zx_temp/jdk8u/jtreg-temp-1205-Temp-del/JTreport \  
-jdk:/home/zhangxiang/jdk8u/build/linux-riscv64-normal-core-slowdebug/images/j2sdk-image \  
-nojit \  
-/home/zhangxiang/jdk8u/jdk/test/:jdk_tier1---此处只有tier1、tier2
```



测试情况简介

jtreg测试进度-<https://github.com/zhangxiang-plct/jdk8u/issues/321>

IPv6NameserverPlatformParsingTest.java: Failed. Execution failed: `main' threw exception: java.lang.RuntimeException: ERROR: No IPv6 address returned from platform.

In order to run this test be sure to place, for example, the following snippet into your platform's (@code /etc/resolv.conf):

```
nameserver 127.0.0.1 nameserver 2001:4860:4860::8888 nameserver [::1]:5353 nameserver 127.0.0.1:5353
```

Then, run this test as manual jtreg test.

Some tests, typically GUI tests, may require manual interaction in order to determine whether they pass or fail. To run just those tests, use the -m or -manual option. To avoid running such tests, use the -a or -automatic option.



java/lang/invoke/VarargsArrayTest.java: Failed. Execution failed: `main' threw exception: java.lang.VirtualMachineError: out of space in CodeCache for adapters

-XX:ReservedCodeCacheSize=128M 手动修改, 可以暂时解决这个问题

也可以

```
diff --git a/hotspot/src/share/vm/runtime/globals.hpp b/hotspot/src/share/vm/runtime/globals.hpp
index 9c52e0853a0..d7791ff0378 100644
--- a/hotspot/src/share/vm/runtime/globals.hpp
+++ b/hotspot/src/share/vm/runtime/globals.hpp
@@ -210,7 +210,11 @@ define_pd_global(intx, NewSizeThreadIncrease,      4*K);
define_pd_global(intx, InlineClassNatives,         true);
define_pd_global(intx, InlineUnsafeOps,             true);
define_pd_global(intx, InitialCodeCacheSize,        160*K);
+#if defined(RISCV64)
+define_pd_global(intx, ReservedCodeCacheSize,       128*M);
+#else
define_pd_global(intx, ReservedCodeCacheSize,        32*M);
+#endif
define_pd_global(intx, CodeCacheExpansionSize,       32*K);
define_pd_global(intx, CodeCacheMinBlockLength,      1);
define_pd_global(intx, CodeCacheMinimumUseSpace,     200*K);
(END)
```



测试情况简介

jtreg测试进度-<https://github.com/zhangxiang-plct/jdk8u/issues/321>

目前都是借用qemu进行测试，尝试在荔枝派以及unmatched上测试，效果均不理想



zhangxiang-plct commented now

Owner

Author



截止1214为止:

tier1通过率: 1305/1334=97.8%

tier2通过率: 3561/3635=98%



当前问题

interpreter frame

```
diff --git a/hotspot/src/cpu/riscv64/vm/frame_riscv64.cpp b/hotspot/src/cpu/riscv64/vm/frame_riscv64.cpp
index 6c35bf2aec6..5f8e9ca67a7 100644
--- a/hotspot/src/cpu/riscv64/vm/frame_riscv64.cpp
+++ b/hotspot/src/cpu/riscv64/vm/frame_riscv64.cpp
@@ -687,7 +687,7 @@ void frame::describe_pd(FrameValues& values, int frame_no) {
    DESCRIBE_FP_OFFSET(interpreter_frame_last_sp);
    DESCRIBE_FP_OFFSET(interpreter_frame_method);
    DESCRIBE_FP_OFFSET(interpreter_frame_mdx);
-   DESCRIBE_FP_OFFSET(interpreter_frame_mirror);
+   //DESCRIBE_FP_OFFSET(interpreter_frame_mirror);
    DESCRIBE_FP_OFFSET(interpreter_frame_cache);
    DESCRIBE_FP_OFFSET(interpreter_frame_locals);
    DESCRIBE_FP_OFFSET(interpreter_frame_bcx);
diff --git a/hotspot/src/cpu/riscv64/vm/frame_riscv64.hpp b/hotspot/src/cpu/riscv64/vm/frame_riscv64.hpp
index 568e287dd0e..7dadec196b8 100644
--- a/hotspot/src/cpu/riscv64/vm/frame_riscv64.hpp
+++ b/hotspot/src/cpu/riscv64/vm/frame_riscv64.hpp
@@ -124,9 +124,9 @@
    interpreter_frame_last_sp_offset      = interpreter_frame_sender_sp_offset - 1,
    interpreter_frame_method_offset       = interpreter_frame_last_sp_offset - 1,
    interpreter_frame_mdx_offset          = interpreter_frame_method_offset - 1,
-   interpreter_frame_padding_offset      = interpreter_frame_mdx_offset - 1,
-   interpreter_frame_mirror_offset       = interpreter_frame_padding_offset - 1,
-   interpreter_frame_cache_offset        = interpreter_frame_mirror_offset - 1,
+   //interpreter_frame_padding_offset    = interpreter_frame_mdx_offset - 1,
+   //interpreter_frame_mirror_offset      = interpreter_frame_padding_offset - 1,
+   interpreter_frame_cache_offset        = interpreter_frame_mdx_offset - 1,
    interpreter_frame_locals_offset       = interpreter_frame_cache_offset - 1,
    interpreter_frame_bcx_offset          = interpreter_frame_locals_offset - 1,
    interpreter_frame_initial_sp_offset   = interpreter_frame_bcx_offset - 1,
diff --git a/hotspot/src/cpu/riscv64/vm/globalDefinitions_riscv64.hpp b/hotspot/src/cpu/riscv64/vm/globalDefinitions_riscv64.hpp
index 569979205a9..ccff113a87 100644
```

```
diff --git a/hotspot/src/cpu/riscv64/vm/templateInterpreter_riscv64.cpp b/hotspot/src/cpu/riscv64/vm/templateInterpreter_riscv64.cpp
index 86731464505..da847a7a1c7 100644
--- a/hotspot/src/cpu/riscv64/vm/templateInterpreter_riscv64.cpp
+++ b/hotspot/src/cpu/riscv64/vm/templateInterpreter_riscv64.cpp
@@ -1069,17 +1069,17 @@ void InterpreterGenerator::lock_method() {
    void TemplateInterpreterGenerator::generate_fixed_frame(bool native_call) {
        // initialize fixed part of activation frame
        if (native_call) {
-           __ add(esp, sp, - 14 * wordSize);
+           __ add(esp, sp, - 12 * wordSize);
            __ mv(xbcpr, zr);
-           __ add(sp, sp, - 14 * wordSize);
+           __ add(sp, sp, - 12 * wordSize);
            // add 2 zero-initialized slots for native calls
-           __ sd(zr, Address(sp, 13 * wordSize));
-           __ sd(zr, Address(sp, 12 * wordSize));
+           __ sd(zr, Address(sp, 11 * wordSize));
+           __ sd(zr, Address(sp, 10 * wordSize));
        } else {
-           __ add(esp, sp, - 12 * wordSize);
+           __ add(esp, sp, - 10 * wordSize);
            __ ld(t0, Address(xmethod, Method::const_offset())); // get ConstMethod
            __ add(xbcpr, t0, in_bytes(ConstMethod::codes_offset())); // get codebase
-           __ add(sp, sp, - 12 * wordSize);
+           __ add(sp, sp, - 10 * wordSize);
        }
        __ sd(xbcpr, Address(sp, wordSize));
        __ sd(esp, Address(sp, 0));
@@ -1092,8 +1092,8 @@ void TemplateInterpreterGenerator::generate_fixed_frame(bool native_call) {
        __ bind(method_data_continue);
    }

-   __ sd(xmethod, Address(sp, 7 * wordSize));
-   __ sd(ProfileInterpreter ? t0 : zr, Address(sp, 6 * wordSize));
+   __ sd(xmethod, Address(sp, 5 * wordSize));
+   __ sd(ProfileInterpreter ? t0 : zr, Address(sp, 4 * wordSize));

    // Get mirror and store it in the frame as GC root for this Method*
```

当前问题

aarch64的编译问题: <https://github.com/zhangxiang-plct/jdk8u/issues/102>

```
root@iZ2zebn203xjy855jsmlheZ:~/jdk8u/build/linux-aarch64-normal-core-slowdebug/jdk/bin#
root@iZ2zebn203xjy855jsmlheZ:~/jdk8u/build/linux-aarch64-normal-core-slowdebug/jdk/bin#
root@iZ2zebn203xjy855jsmlheZ:~/jdk8u/build/linux-aarch64-normal-core-slowdebug/jdk/bin#
● root@iZ2zebn203xjy855jsmlheZ:~/jdk8u/build/linux-aarch64-normal-core-slowdebug/jdk/bin# vim Hello.java
⊗ root@iZ2zebn203xjy855jsmlheZ:~/jdk8u/build/linux-aarch64-normal-core-slowdebug/jdk/bin# ./javac ./Hello.java
# To suppress the following error report, specify this argument
# after -XX: or in .hotspotrc: SuppressErrorAt=/stubRoutines.hpp:473
#
# A fatal error has been detected by the Java Runtime Environment:
#
# Internal Error (/root/jdk8u/hotspot/src/share/vm/runtime/stubRoutines.hpp:473), pid=52399, tid=0x0000ffffa4c2c1e0
# assert(StubRoutines::SafeFetchN_stub()) failed: stub not yet generated
#
# JRE version: OpenJDK Runtime Environment (8.0_362) (build 1.8.0_362-internal-debug-root_2022_11_17_19_35-b00)
# Java VM: OpenJDK 64-Bit VM (25.362-b00-debug-internal-mode linux-aarch64 compressed oops)
```

当前问题

JIT的javac困境

```
# To suppress the following error report, specify this argument
# after -XX: or in .hotspotrc: SuppressErrorAt=/safepoint.cpp:413
#
# A fatal error has been detected by the Java Runtime Environment:
#
# Internal Error (/home/zhangxiang/jdk8u/c2_jdk8u/jdk8u/hotspot/src/share/vm/runtime/safepoint.cpp:413), pid=743977, ti
# assert(iterations < (uint)max_jint) failed: We have been iterating in the safepoint loop too long
#
# JRE version: OpenJDK Runtime Environment (8.0_352) (build 1.8.0_352-internal-debug-zhangxiang_2022_11_28_16_33-b00)
# Java VM: OpenJDK 64-Bit Server VM (25.352-b00-debug mixed mode linux-riscv64 compressed oops)
# Failed to write core dump. Core dumps have been disabled. To enable core dumping, try "ulimit -c unlimited" before sta
#
# An error report file with more information is saved as:
# /home/zhangxiang/jdk8u/c2_jdk8u/jdk8u/hs_err_pid743977.log
#
# If you would like to submit a bug report, please visit:
# http://bugreport.java.com/bugreport/crash.jsp
#
Current thread is 279156109792
Dumping core ...
```



当前问题

调试

- JIT调试方法汇总: <https://github.com/openjdk-riscv/jdk11u/issues/590>

OpenJDK8 for RV64 移植进展

谢谢大家！

