在VMM上运行Arceos跑helloworld程序

`测试环境`

`Unbuntu22.04`

`qemu三个架构(riscv64/aarch64/x86_64)版本均为9.2.50`

`   VMM: git clone https://github.com/arceos-hypervisor/arceos-umhv.git`

`ARCEOS: git clone https://github.com/arceos-org/arceos.git`

在vmm中的MakeFile中加入一些测试脚本，方便后期创建disk.img

脚本 Plain Text

```
COPYFILE ?=
test:
rm disk.img
make disk_img
sudo mount disk.img tmp/
sudo cp $(COPYFILE) tmp
sudo umount tmp
//使用方法
make test COPYFILE=$(YOUR_FILE)
```

在aarch64架构下vmm运行arceos跑helloworld

加载镜像

先编译arceos，然后将编译后的arceos的bin文件放入$(YOUR_FILE)中

加载镜像 Plain Text

```
make test COPYFILE=$(YOUR_FILE)
```

运行VMM

运行VMM Plain Text

```
cd arceos-vmm
make deconfig ARCH=aarch64
make ACCEL=n ARCH=aarch64 LOG=info VM_CONFIGS=configs/vms/arceos-aarch64.toml APP_FEATURES=fs run
```

运行结果

运行结果 Plain Text

```
   Running on qemu...
qemu-system-aarch64 -m 4G -smp 1 -cpu cortex-a72 -machine virt,virtualization=on,gic-version=2 -kernel /home/zjz/arceos/arceos-umhv/arceos-vmm/arceos-vmm_aarch64-qemu-virt-hv.bin -device virtio-blk-pci,drive=disk0 -drive id=disk0,if=none,format=raw,file=disk.img -nographic -machine virtualization=on,gic-version=2

       d8888                            .d88888b.   .d8888b.
      d88888                           d88P" "Y88b d88P  Y88b
     d88P888                           888     888 Y88b.
    d88P 888 888d888  .d8888b  .d88b.  888     888  "Y888b.
   d88P  888 888P"   d88P"    d8P  Y8b 888     888     "Y88b.
  d88P   888 888     888      88888888 888     888       "888
 d8888888888 888     Y88b.    Y8b.     Y88b. .d88P Y88b  d88P
d88P     888 888      "Y8888P  "Y8888   "Y88888P"   "Y8888P"

arch = aarch64
platform = aarch64-qemu-virt-hv
target = aarch64-unknown-none-softfloat
build_mode = release
log_level = info
smp = 1

[  0.008753 0 axruntime:130] Logging is enabled.
[  0.010849 0 axruntime:131] Primary CPU 0 started, dtb = 0x48000000.
[  0.012084 0 axruntime:133] Found physcial memory regions:
[  0.016156 0 axruntime:135]   [PA:0x40080000, PA:0x400f4000) .text (READ | EXECUTE | RESERVED)
[  0.018016 0 axruntime:135]   [PA:0x400f4000, PA:0x40113000) .rodata (READ | RESERVED)
[  0.018996 0 axruntime:135]   [PA:0x40113000, PA:0x40119000) .data .tdata .tbss .percpu (READ | WRITE | RESERVED)
[  0.019634 0 axruntime:135]   [PA:0x40119000, PA:0x40159000) boot stack (READ | WRITE | RESERVED)
[  0.020214 0 axruntime:135]   [PA:0x40159000, PA:0x4015f000) .bss (READ | WRITE | RESERVED)
[  0.020936 0 axruntime:135]   [PA:0x4015f000, PA:0x48000000) free memory (READ | WRITE | FREE)
[  0.022756 0 axruntime:135]   [PA:0x9000000, PA:0x9001000) mmio (READ | WRITE | DEVICE | RESERVED)
[  0.023274 0 axruntime:135]   [PA:0x9100000, PA:0x9101000) mmio (READ | WRITE | DEVICE | RESERVED)
[  0.023991 0 axruntime:135]   [PA:0x8000000, PA:0x8020000) mmio (READ | WRITE | DEVICE | RESERVED)

```

```
[  0.024456 0 axruntime:135]   [PA:0xa000000, PA:0xa004000) mmio (READ | WRITE | DEVICE | RESERVED)
[  0.024896 0 axruntime:135]   [PA:0x10000000, PA:0x3eff0000) mmio (READ | WRITE | DEVICE | RESERVED)
[  0.025390 0 axruntime:135]   [PA:0x4010000000, PA:0x4020000000) mmio (READ | WRITE | DEVICE | RESERVED)
[  0.026851 0 axruntime:208] Initialize global memory allocator...
[  0.027417 0 axruntime:209]   use TLSF allocator.
[  0.030429 0 axmm:60] Initialize virtual memory management...
[  0.223625 0 axruntime:150] Initialize platform devices...
[  0.224356 0 axhal::platform::aarch64_common::gic:67] Initialize GICv2...
[  0.226139 0 axtask::api:73] Initialize scheduling...
[  0.229125 0 axtask::api:79]   use FIFO scheduler.
[  0.229667 0 axdriver:152] Initialize device drivers...
[  0.230434 0 axdriver:153]   device model: static
[  0.245882 0 virtio_drivers::device::blk:59] config: 0x1000e000
[  0.247012 0 virtio_drivers::device::blk:64] found a block device of size 65536KB
[  0.251115 0 axdriver::bus::pci:104] registered a new Block device at 00:02.0: "virtio-blk"
[  0.322213 0 axfs:41] Initialize filesystems...
[  0.323565 0 axfs:44]   use block device 0: "virtio-blk"
[  0.382464 0 fatfs::dir:139] Is a directory
[  0.431004 0 fatfs::dir:139] Is a directory
[  0.496010 0 fatfs::dir:139] Is a directory
[  0.573213 0 fatfs::dir:139] Is a directory
[  0.603955 0 axruntime:176] Initialize interrupt handlers...
[  0.605828 0 axruntime:186] Primary CPU 0 init OK.
[  0.606453 0:2 arceos_vmm:17] Starting virtualization...
[  0.607165 0:2 arceos_vmm:19] Hardware support: true
[  0.610231 0:4 arceos_vmm::hal:113] Hardware virtualization support enabled on core 0
[  0.641297 0:2 arceos_vmm::vmm::config:33] Creating VM [1] "arceos"
[  0.643254 0:2 axvm::vm:113] Setting up memory region: [0x40000000~0x41000000] READ | WRITE | EXECUTE
[  0.655848 0:2 axvm::vm:156] Setting up passthrough device memory region: [0x8000000~0x8050000] -> [0x8000000~0x8050000]
[  0.658051 0:2 axvm::vm:156] Setting up passthrough device memory region: [0x9000000~0x9001000] -> [0x9000000~0x9001000]
[  0.659376 0:2 axvm::vm:156] Setting up passthrough device memory region: [0x9010000~0x9011000] -> [0x9010000~0x9011000]
[  0.660302 0:2 axvm::vm:156] Setting up passthrough device memory region: [0x9030000~0x9031000] -> [0x9030000~0x9031000]
[  0.661829 0:2 axvm::vm:156] Setting up passthrough device memory region: [0xa000000~0xa004000] -> [0xa000000~0xa004000]
[  0.664675 0:2 axvm::vm:191] VM created: id=1
[  0.667671 0:2 axvm::vm:206] VM setup: id=1
```

```
[  0.669053 0:2 arceos_vmm::vmm::config:40] VM[1] created success, loadin
g images...
[  0.670164 0:2 arceos_vmm::vmm::images::fs:102] Loading VM images from f
ilesystem
[  0.761866 0:2 arceos_vmm::vmm:27] Setting up vcpus...
[  0.763358 0:2 arceos_vmm::vmm::vcpus:176] Initializing VM[1]'s 1 vcpus
[  0.764545 0:2 arceos_vmm::vmm::vcpus:207] Spawning task for VM[1] Vcpu
[0]
[  0.766103 0:2 arceos_vmm::vmm::vcpus:219] Vcpu task Task(5, "VM[1]-VCpu
[0]") created cpumask: [0, ]
[  0.767563 0:2 arceos_vmm::vmm:34] VMM starting, booting VMs...
[  0.768188 0:2 axvm::vm:273] Booting VM[1]
[  0.768802 0:2 arceos_vmm::vmm:40] VM[1] boot success
[  0.770386 0:5 arceos_vmm::vmm::vcpus:240] VM[1] Vcpu[0] waiting for run
ning
[  0.771406 0:5 arceos_vmm::vmm::vcpus:243] VM[1] Vcpu[0] running...

       d8888                            .d88888b.   .d8888b.
      d88888                           d88P" "Y88b d88P  Y88b
     d88P888                           888     888 Y88b.
    d88P 888 888d888  .d8888b  .d88b.  888     888  "Y888b.
   d88P  888 888P"   d88P"    d8P  Y8b 888     888     "Y88b.
  d88P   888 888     888      88888888 888     888       "888
 d8888888888 888     Y88b.    Y8b.     Y88b. .d88P Y88b  d88P
d88P     888 888      "Y8888P  "Y8888   "Y88888P"   "Y8888P"

arch = aarch64
platform = aarch64-qemu-virt
target = aarch64-unknown-none-softfloat
build_mode = release
log_level = debug
smp = 1

[  0.780832 0 axruntime:130] Logging is enabled.
[  0.782800 0 axruntime:131] Primary CPU 0 started, dtb = 0x40000000.
[  0.784054 0 axruntime:133] Found physcial memory regions:
[  0.786008 0 axruntime:135]   [PA:0x40080000, PA:0x40087000) .text (REA
D | EXECUTE | RESERVED)
[  0.787558 0 axruntime:135]   [PA:0x40087000, PA:0x40089000) .rodata (RE
AD | RESERVED)
[  0.788795 0 axruntime:135]   [PA:0x40089000, PA:0x4008d000) .data .tdat
a .tbss .percpu (READ | WRITE | RESERVED)
[  0.789631 0 axruntime:135]   [PA:0x4008d000, PA:0x400cd000) boot stack
(READ | WRITE | RESERVED)
[  0.790173 0 axruntime:135]   [PA:0x400cd000, PA:0x400ce000) .bss (READ
| WRITE | RESERVED)
[  0.790836 0 axruntime:135]   [PA:0x400ce000, PA:0x48000000) free memor
y (READ | WRITE | FREE)
```

```
[  0.792366 0 axruntime:135]   [PA:0x9000000, PA:0x9001000) mmio (READ | WRITE | DEVICE | RESERVED)
[  0.795351 0 axruntime:135]   [PA:0x9100000, PA:0x9101000) mmio (READ | WRITE | DEVICE | RESERVED)
[  0.798234 0 axruntime:135]   [PA:0x8000000, PA:0x8020000) mmio (READ | WRITE | DEVICE | RESERVED)
[  0.799719 0 axruntime:135]   [PA:0xa000000, PA:0xa004000) mmio (READ | WRITE | DEVICE | RESERVED)
[  0.801336 0 axruntime:135]   [PA:0x10000000, PA:0x3eff0000) mmio (READ | WRITE | DEVICE | RESERVED)
[  0.803186 0 axruntime:135]   [PA:0x4010000000, PA:0x4020000000) mmio (READ | WRITE | DEVICE | RESERVED)

[  0.804481 0 axruntime:150] Initialize platform devices...
[  0.806243 0 axruntime:186] Primary CPU 0 init OK.
Hello, world!
[  0.810679 0 axruntime:199] main task exited: exit_code=0
[  0.812620 0 axhal::platform::aarch64_common::psci:98] Shutting down...
[  0.815648 0:5 arceos_vmm::vmm::vcpus:288] VM[1] run VCpu[0] SystemDown
[  0.818275 0:5 axhal::platform::aarch64_common::psci:98] Shutting down...
```

在riscv64架构qemu环境下vmm运行arceos跑helloworld

建议qemu版本更新到合适的版本，版本过旧的话会出现问题。因为vmm上的sbi调用方式是经过修改的，而sbi和qemu版本现在好像存在一些不兼容的问题，所以qemu版本也是一个比较重要的问题。

加载镜像

先编译arceos，然后将编译后的arceos的bin文件放入$(YOUR_FILE)中

加载镜像 Plain Text

```
make test COPYFILE=$(YOUR_FILE)
```

运行VMM

运行VMM Plain Text

```
cd arceos-vmm
make defconfig ARCH=riscv64
make ACCEL=n ARCH=riscv64 LOG=info VM_CONFIGS=configs/vms/arceos-riscv64.to
ml APP_FEATURES=fs run
```

运行结果

会出现输出乱码问题，但是能跑通，应该是sbi的问题

在x86_64架构qemu环境下vmm运行arceos跑helloworld

流程和前面的riscv64和aarch64大致是类似的，但是值得注意的是，在mac上用qemu跑x86_64版本时，可能是不支持虚拟化的，所以尽可能避免用mac来跑x86_64版本的vmm。下图是mac跑时的报错

```
[  0.483339 0:4 axruntime::lang_items:5] panicked at arceos-vmm/src/hal.rs:111:18:
Failed to enable virtualization: Unsupported
```

还有一个点是make run中的ACCEL=y和前面架构是不同的，前面的架构中都是ACCEL=n

加载镜像

先编译arceos，然后将编译后的arceos的bin文件放入$(YOUR_FILE)中

make test COPYFILE=$(YOUR_FILE)

运行VMM

`cd arceos-vmm`

`make defconfig ARCH=x86_64`

make ACCEL=y ARCH=x86_64 LOG=info VM_CONFIGS=configs/vms/arceos-x86_64.toml APP_FEATURES=fs run