

测试crun与runc运行wasm镜像

准备工作

- 编译wasm程序 + 制作wasm镜像（不含runtime）
 - 参考：<https://github.com/WasmEdge/WasmEdge/blob/b9fd0297a09ffa93870b601dac07d7f9d590089/docs/book/zh/src/kubernetes/demo/wasi.md>
- 制作wasm镜像（含runtime）
 - ```
FROM wasmedge/slim-runtime:0.10.1
ADD wasi_example_main.wasm /
CMD ["wasmedge", "--dir", ".:/", "/wasi_example_main.wasm"]
```
  - [slim-runtime](#)
  - 参考：[https://github.com/WasmEdge/WasmEdge/blob/2fbea38d0cbe7b7c29867a8a1bed7e9723e00a46/docs/book/en/src/use\\_cases/kubernetes/docker/lxc.md](https://github.com/WasmEdge/WasmEdge/blob/2fbea38d0cbe7b7c29867a8a1bed7e9723e00a46/docs/book/en/src/use_cases/kubernetes/docker/lxc.md)
- 制作好的镜像
  - <https://hub.docker.com/r/leviyanx/wasm-hello-example>
  - <https://hub.docker.com/r/leviyanx/runc-wasm-example>

# 测试crun与runc运行wasm镜像

## 测试方案

- 为了方便，使用containerd运行容器（指定oci runtime）
  - containerd使用crun，参考：[https://wasmedge.org/book/en/use\\_cases/kubernetes/cri/containerd.html](https://wasmedge.org/book/en/use_cases/kubernetes/cri/containerd.html)
- 使用runc
  - `\time -v ctr run --rm --runc-binary runc --runtime io.containerd.runc.v2 docker.io/leviyanx/runc-wasm-example:v1.3 runc-wasm-example`
- 使用crun
  - `\time -v ctr run --rm --runc-binary crun --runtime io.containerd.runc.v2 --label module.wasm.image/variant=compat-smart docker.io/wasmedge/example-wasi:latest wasm-example /wasi_example_main.wasm`

# 测试crun与runc运行wasm镜像对比（左 runc | 右 crun）

- 运行的性能差距对比（顺序运行200个容器）

```
root@VM-0-17-ubuntu:~/test-perf# \time -v bash test-runc.sh
Command being timed: "bash test-runc.sh"
User time (seconds): 4.79
System time (seconds): 3.90
Percent of CPU this job got: 18%
Elapsed (wall clock) time (h:mm:ss or m:ss): 0:47.84
Average shared text size (kbytes): 0
Average unshared data size (kbytes): 0
Average stack size (kbytes): 0
Average total size (kbytes): 0
Maximum resident set size (kbytes): 28136
Average resident set size (kbytes): 0
Major (requiring I/O) page faults: 0
Minor (reclaiming a frame) page faults: 537240
Voluntary context switches: 166117
Involuntary context switches: 40770
Swaps: 0
File system inputs: 0
File system outputs: 0
Socket messages sent: 0
Socket messages received: 0
Signals delivered: 0
Page size (bytes): 4096
Exit status: 0
```

```
root@VM-0-17-ubuntu:~/test-perf# \time -v bash test-crun.sh
Command being timed: "bash test-crun.sh"
User time (seconds): 4.86
System time (seconds): 3.59
Percent of CPU this job got: 20%
Elapsed (wall clock) time (h:mm:ss or m:ss): 0:41.48
Average shared text size (kbytes): 0
Average unshared data size (kbytes): 0
Average stack size (kbytes): 0
Average total size (kbytes): 0
Maximum resident set size (kbytes): 28188
Average resident set size (kbytes): 0
Major (requiring I/O) page faults: 0
Minor (reclaiming a frame) page faults: 534802
Voluntary context switches: 163911
Involuntary context switches: 38717
Swaps: 0
File system inputs: 0
File system outputs: 0
Socket messages sent: 0
Socket messages received: 0
Signals delivered: 0
Page size (bytes): 4096
Exit status: 0
```

```
#!/bin/bash
i=0
times=199
while [$i -le $times]
do
let 'i++'
ctr run --rm --runc-binary runc --runtime io.containerd.runc.v2 docker.io/leviy
anx/runc-wasm-example:v1.3 runc-wasm-example 1>/dev/null 2>&1
done
```

# 测试crun与runc运行wasm镜像对比（左 runc | 右 crun）

- 制作镜像的复杂程度

|                                                             |                     |
|-------------------------------------------------------------|---------------------|
| FROM wasmedge/slim-runtime:0.10.1                           | FROM scratch        |
| ADD wasi_example_main.wasm /                                | ADD hello.wasm /    |
| CMD ["wasmedge", "--dir", ".:/", "/wasi_example_main.wasm"] | CMD ["/hello.wasm"] |

- 镜像大小

|                   |                   |
|-------------------|-------------------|
| COMPRESSED SIZE ⓘ | COMPRESSED SIZE ⓘ |
| 3.62 MB           | 510.55 KB         |

# 测试crun与runc运行wasm镜像

## 总结 crun的优势

- 性能更好一点；
- 制作镜像更方便；
- run multiple wasm containers from a single wasm runtime more easily
- 镜像更小；