

迁移

2024年10月9日 22:23

进程迁移：（非常的玄学，不行就重开，成功了马上截图，因为第二次就会有bug了）

- 允许作为程序执行文件

```
test1@test1-virtual-machine:~$ crlu restore -D checkpoint_file -j
Error (crлу/uttl.c:666): exited, status=3
Error (crлу/uttl.c:666): exited, status=3
iptables v1.6.0: can't initialize iptables table 'filter': Permission denied (you must be root)
Perhaps iptables or your kernel needs to be upgraded.
Warn (crлу/sk-top.c:1842): TCP_REPAIR isn't available to unprivileged users
Error (crлу/cr-restore.c:1922): 10539: Write 10538 to sys/kernel/ns_last_pid: Operation not permitted
Error (crлу/cr-restore.c:1890): Restoring FAILED.
test1@test1-virtual-machine:~$ sudo crlu restore -D checkpoint_file -j
Chain INPUT (policy ACCEPT)
target prot opt source destination
```

```
test1@test1-virtual-machine:~$ sudo setuid ./test.sh </dev/null &&$PWD/test.out
*[[A]]B*CC*CC*CC已杀死
test1@test1-virtual-machine:~$ tail test.out
1728484212.127702854
1728484212.135880297
1728484212.145354634
1728484212.153777097
1728484212.165464634
1728484212.178428179
1728484212.186241442
1728484212.195421070
1728484212.204888824
1728484212.219688891
test1@test1-virtual-machine:~$
```

```
test1@test1-virtual-machine:~$ ps -ef | grep test
avahi 960 1 0 19:37 ? 00:00:00 avahi-daemon: running [test1-virtual-machine.local]
test1 2341 1 0 19:37 ? 00:00:00 /lib/systemd/systemd --user
test1 2342 2341 0 19:37 ? 00:00:00 (sd-pam)
test1 2423 1 0 19:37 ? 00:00:00 /usr/bin/gnome-keyring-daemon --daemonize --login
test1 2427 1951 0 19:37 ? 00:00:01 /sbin/upstart --user
test1 2506 2427 0 19:37 ? 00:00:00 vartestudevbridge --daemon --user
```

```
test1 10376 3242 0 22:18 pts/2 00:00:00 bash
test1 10508 4427 0 22:21 ? 00:00:02 gedit /home/test1/test.out
root 10538 4226 0 22:22 pts/2 00:00:00 sudo setuid ./test.sh
root 10539 10538 14 22:22 ? 00:00:28 /bin/bash ./test.sh
test1 11536 3242 0 22:22 pts/22 00:00:00 bash
test1 12408 3344 1 22:25 ? 00:00:00 /usr/lib/firefox/firefox -contentproc -childid
test1 61173 11536 0 22:25 pts/22 00:00:00 ps -ef
```

- 保证挂载和被挂载路径完全一致（这里是test2的图，但是由于test2这台机器的库版本和test1不同，导致无法restore）

```
test2@test2-virtual-machine:~$ sudo mount 192.168.91.135:/home /home
[sudo] test2 的密码:
test2@test2-virtual-machine:~$ ls
bin/ dev/ initrd.img lib64/ mnt/ proc//sbin/ sys/ var/
boot/ etc/ initrd.img.old lost-found nfs/ root/ snap/ vmlinuz
cdrom/ home/ lib/ media/ opt/ run/ srv/ usr/
test2@test2-virtual-machine:~$ ls
bin dev initrd.img
boot etc initrd.img.old lost-found nfs root snap vmlinuz
cdrom home lib media opt run srv usr
test2@test2-virtual-machine:~$ cd home
```

```
test2@test2-virtual-machine:~/home$ cd home
test2@test2-virtual-machine:~/home$ cd test1
test2@test2-virtual-machine:~/home/test1$ ls
checkpoint_file vrs test.sh 模板 文档 桌面
crлу-3.14 test.log Untitled.1.odt 搜索 下载
examples.desktop test.out 公共的 图片 音乐
test2@test2-virtual-machine:~/home/test1$ sudo crлу restore -D checkpoint_file -j
10539: Error (crлу/files-reg.c:1674): File home/test1/test.out has bad size 136
6575 (expect 820680)
10539: Error (crлу/files.c:1191): Unable to open fd=1 id=8x9
Error (crлу/cr-restore.c:2171): Restoring FAILED.
test2@test2-virtual-machine:~/home/test1$ truncate -s 820680 test.out
test2@test2-virtual-machine:~/home/test1$ sudo crлу restore -D checkpoint_file -j
10539: Error (crлу/files-reg.c:1674): File user/lib/locale/locale-archive has ba
d size 4795408 (expect 10219088)
10539: Error (crлу/mem.c:1260): '- Can't open vma
Error (crлу/cr-restore.c:2171): Restoring FAILED.
test2@test2-virtual-machine:~/home/test1$ sudo crлу restore -D checkpoint_file -j
10539: Error (crлу/files-reg.c:1674): File user/lib/locale/locale-archive has ba
d size 4795408 (expect 10219088)
10539: Error (crлу/mem.c:1260): '- Can't open vma
Error (crлу/cr-restore.c:2171): Restoring FAILED.
test2@test2-virtual-machine:~/home/test1$
```

遇到问题，链接库版本不一样：重新开了个虚拟机 保证链接库版本一样

```
lrwxrwxrwx 1 root root 12 10月 9 15:34 /lib/x86_64-linux-gnu/libc.so.6 -> libc-
2.37.so
```

```
test2@test2-virtual-machine:~/home/test1$ ls -l /lib/x86_64-linux-gnu/libc.so.6
lrwxrwxrwx 1 root root 12 5月 3 2022 /lib/x86_64-linux-gnu/libc.so.6 -> libc-
2.27.so
```

迁移到另一台主机的进程

```
test3@test3-virtual-machine:~/vmware-tools-distrib$ sudo mount 192.168.91.1
35:/home /home
```

```
test3@test3-virtual-machine:~/home/test1
test3@test3-virtual-machine:~/home$ cd test1
test3@test3-virtual-machine:~/home/test1$ tail test.out
1728528421.066471845
1728528421.078010318
1728528421.088385295
1728528421.106438381
1728528421.112442730
1728528421.122917681
1728528421.134512414
1728528421.144364526
1728528421.155994509
1728528421.237779998
test3@test3-virtual-machine:~/home/test1$ tail test.out
1728528430.478811410
1728528430.488919245
1728528430.499246387
1728528430.509991162
1728528430.526286337
1728528430.538942456
1728528430.539909890
1728528430.549489270
1728528430.568118867
1728528430.577899729
test3@test3-virtual-machine:~/home/test1$

ration not permitted
Error (crлу/cr-restore.c:1890): Restoring FAILED.
test3@test3-virtual-machine:~/home/test1$ crлу restore -D checkpoint_file -j
Error (crлу/uttl.c:666): exited, status=3
Error (crлу/uttl.c:666): exited, status=3
iptables v1.6.0: can't initialize iptables table 'filter': Table does not exist
(do you need to lnssnd?)
Perhaps iptables or your kernel needs to be upgraded.
Warn (crлу/sk-top.c:1842): TCP_REPAIR isn't available to unprivileged users
Error (crлу/cr-restore.c:1922): 10539: Write 10538 to sys/kernel/ns_last_pid: Ope
ration not permitted
Error (crлу/cr-restore.c:1890): Restoring FAILED.
test3@test3-virtual-machine:~/home/test1$ sudo crлу restore -D checkpoint_file -j
Chain INPUT (policy ACCEPT)
target prot opt source destination
Chain FORWARD (policy ACCEPT)
target prot opt source destination
Chain OUTPUT (policy ACCEPT)
target prot opt source destination
```

```
spawn -communication-method unix_socket --socket-path /run/user/1000/speech-
catcher/speechd.sock
root 10539 6440 8 10:40 ? 00:00:11 /bin/bash ./test.sh
test3 14818 2197 0 10:48 pts/2 00:00:00 ps -ef
test3 14811 2197 0 10:48 pts/2 00:00:00 grep --color=auto test
test3@test3-virtual-machine:~/home/test1$
```

容器热迁移:

- * 如果所有操作报错不允许, 直接csdn搜保存信息开权限, 还是不行就要加上sudo, 有些

命令不行的, 都加上sudo给权限重试几次

```
test3@test3-virtual-machine:~$ sudo usermod -ac docker test3
test3@test3-virtual-machine:~$ systemctl restart docker
test3@test3-virtual-machine:~$ chmod 666 /var/run/docker.sock
bmod: 更改 /var/run/docker.sock 的权限: 不允许的操作
test3@test3-virtual-machine:~$ sudo chmod 666 /var/run/docker.sock
test3@test3-virtual-machine:~$ docker pull swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4
1.29-4: Pulling from ddn-k8s/registry.k8s.io/e2e-test-images/busybox
4ade23922dd: Pull complete
Digest: sha256:7dddb83e44b8f6e2f1fccace9562f560eb71e7717515ebd2131bd94ad8634c
Status: Downloaded newer image for swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4
test3@test3-virtual-machine:~$
```

- 镜像拉取:
 - 需要pull一个busybox的镜像, 因为容器要基于busybox运行, 但是不能直接pull busybox. 从一个镜像站pull, https://docker.aityp.com/i/search?search=busybox#google_vignette 直接找到下载命令
docker pull swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4
 - 检测是否拉取到了 docker images查看是

```
test3@test3-virtual-machine:~$ docker pull swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4
1.29-4: Pulling from ddn-k8s/registry.k8s.io/e2e-test-images/busybox
b4ade23922dd: Pull complete
Digest: sha256:7dddb83e44b8f6e2f1fccace9562f560eb71e7717515ebd2131bd94ad8634c
Status: Downloaded newer image for swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4
test3@test3-virtual-machine:~$ docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS              PORTS               NAMES
test3@test3-virtual-machine:~$ docker run -d --name loop2 --security-opt seccomp:unconfined busybox /bin/sh -c 'l=0; while true; do echo $l; l=$((expr $l + 1)); sleep 1; done'
Unable to find image 'busybox:latest' locally
^C
test3@test3-virtual-machine:~$ docker run -d --name loop2 --security-opt seccomp:unconfined busybox /bin/sh -c 'l=0; while true; do echo $l; l=$((expr $l + 1)); sleep 1; done'
Unable to find image 'busybox:latest' locally
^C
test3@test3-virtual-machine:~$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox   1.29-4             d59c675982d8       5 years ago        1.15MB
test3@test3-virtual-machine:~$
```

- 容器创建:
 - docker run -d --name loop2 --security-opt seccomp:unconfined busybox /bin/sh -c 'l=0; while true; do echo \$l; l=\$((expr \$l + 1)); sleep 1; done' (这个是教程上的命令会报错, 因为我们下载的根本不是busybox名字的镜像, 上面的docker images查看了), 需要复制名字替换掉, 还需要加上版本号1.29-4

```
test3@test3-virtual-machine:~$ docker run -d --name loop2 --security-opt seccomp:unconfined busybox /bin/sh -c 'l=0; while true; do echo $l; l=$((expr $l + 1)); sleep 1; done'
Unable to find image 'busybox:latest' locally
^C
test3@test3-virtual-machine:~$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox   1.29-4             d59c675982d8       5 years ago        1.15MB
test3@test3-virtual-machine:~$ docker run -d --name loop2 --security-opt seccomp:unconfined swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4 /bin/sh -c 'l=0; while true; do echo $l; l=$((expr $l + 1)); sleep 1; done'
3889b4ed4abb713a46622b4b0aaf1711ce49afc5ad1b5e5407574ede0ee4d03e
test3@test3-virtual-machine:~$
```

- checkpoint:
 - 先暂停容器: docker pause loop2
 - 开启实验属性
 - 按照教程sudo echo "(\"experimental\": true)" >> /etc/docker/daemon.json 会报错, 因为这个docker文件根本没有权限打开
 - 现在执行
sudo mkdir -p /etc/docker
sudo tee /etc/docker/daemon.json <<-'EOF'
{
 "experimental": true
}
EOF 注意不要自己乱添加标点符号, 因为可能是中文的标点符号, 导致等等
restart报错
 - sudo systemctl daemon-reload
 - sudo systemctl restart docker 如果restart报错, 可能就是上面搞错了, 可以直接sudo gedit /etc/docker/daemon.json修改
 - 检查是否开启 docker info ,但是可能会抽风显示没开启, 上面的步骤重试几次



```
test3@test3-virtual-machine:~$ sudo systemctl restart docker
test3@test3-virtual-machine:~$ sudo gedit /etc/docker/daemon.json
(gedit:9323): Gtk-WARNING **: Calling Inhibit failed: GDBus.Error:org.freedesktop.DBus.Error.ServiceUnknown: The name org.gnome.SessionManager
** (gedit:9323): WARNING **: Set document metadata failed: 不支持设置属性 metadata:gedit-spell-enabled
** (gedit:9323): WARNING **: Set document metadata failed: 不支持设置属性 metadata:gedit-encoding
test3@test3-virtual-machine:~$ sudo systemctl restart docker
```

- 确认容器状态
 - 上面刚刚暂停的容器开起来 (直接csdn)
 - 检查容器状态 docker ps -a
 - 检查容器里面是不是有一个计数的进程 (刚刚创建容器时候跑起来的), docker top loop2

```
test3@test3-virtual-machine:~$ sudo systemctl restart docker
test3@test3-virtual-machine:~$ docker unpause loop2
Error response from daemon: Container 3889b4ed4abb713a46622b4b0aaf1711ce49afc5ad1b5e5407574ede0ee4d03e is not paused
test3@test3-virtual-machine:~$ docker ps -a
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS              PORTS               NAMES
3889b4ed4abb       swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4   "/bin/sh -c 'l=0; ..."   9 minutes ago       Exited (137) 5 minutes ago               loop2
test3@test3-virtual-machine:~$ docker start loop2
loop2
test3@test3-virtual-machine:~$ docker top
```

```

test1@test1-virtual-machine:~$ sudo systemctl restart docker
test1@test1-virtual-machine:~$ docker unpause loopier2
Error response from daemon: Container 3889b4edabb713a46622b46baaf1711ce49afc5ad1b5e5407574ede0ee4d03e is not paused
test1@test1-virtual-machine:~$ docker ps -a
CONTAINER ID        IMAGE                                     COMMAND                  CREATED             STATUS              PORTS              NAMES
3889b4edabb713a46622b46baaf1711ce49afc5ad1b5e5407574ede0ee4d03e  swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4  "/bin/sh -c 'l=0; ..."  9 minutes ago       Exited (137) 5 minutes ago              loopier2
test1@test1-virtual-machine:~$ docker start loopier2
loopier2
test1@test1-virtual-machine:~$ docker top
"docker top" requires at least 1 argument(s).
See 'docker top --help'.

Usage: docker top CONTAINER [ps OPTIONS]

Display the running processes of a container
test1@test1-virtual-machine:~$ docker top loopier2
UID        PID        PPID        C           STIME       TTY         TIME         CMD
root        9545        9524        0           11:40       7           00:00:00     /bin/sh -c l=0; while true; do echo $l; l=$((expr $l + 1)); sleep 1; done
root        9718        9545        0           11:41       7           00:00:00     sleep 1
test1@test1-virtual-machine:~$

```

- 设置checkpoint

```

test1@test1-virtual-machine:~$ sudo docker checkpoint create --checkpoint-dir=/home/container/ loopier2 checkpoint2
checkpoint2
test1@test1-virtual-machine:~$ sudo docker logs loopier2
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
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26
27
28

```

```

72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
test1@test1-virtual-machine:~$

```

设置checkpoint后退出了

```

72
73
74
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78
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82
83
84
85
86
87
88
89
90
91
test1@test1-virtual-machine:~$

```

另一台: 具体根据教程, 需要做出修改的地方和上面差不多

- nfs挂载: 注意注意挂载完后挂载文件的具体位置要和原机器上的具体位置一样, 教程把原机器的home挂到了现在的nfs/home下面, 容器热迁移会不会错不知道, 但是进程热迁移一定错
 - 在教程中挂载部分具体要修改的就是挂载位置和ip
 - IP: 用ifconfig查看, 192开头那个就是, 把教程里面所有服务器和客户端的ip换成实际两台机器的ip
 - 在客户端挂载时, 挂载位置不是nfs/home, 是/home (挂载完可以进home目录看看是不是挂载好了, cd ls操作)

- 拉取镜像

```

Get permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Post http://%2Fvar%2Frun%2Fdocker.sock/v1.38/images/create?fromImage=swr.cn-north-4.myhuaweicloud.com%2Fddn-k8s%2Fregistry.k8s.io%2Fe2e-test-images%2Fbusybox%3A1.29-4: dial unix /var/run/docker.sock: connect: permission denied

```

```

test3@test3-virtual-machine:~$ sudo usermod -aG docker test3
test3@test3-virtual-machine:~$ systemctl restart docker
test3@test3-virtual-machine:~$ chmod 666 /var/run/docker.sock
hmad: 更改 /var/run/docker.sock 的权限: 不允许的操作
test3@test3-virtual-machine:~$ sudo chmod 666 /var/run/docker.sock
test3@test3-virtual-machine:~$ docker pull swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4
1.29-4: Pulling from ddn-k8s/registry.k8s.io/e2e-test-images/busybox
44ee23922d6: Pull complete
Digest: sha256:7dddb83e44b8f6e2f1fccace9562f560eb71e7717515ebd2131bd94ad8634c
Status: Downloaded newer image for swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4
test3@test3-virtual-machine:~$

```

- 创建克隆容器

```

test3@test3-virtual-machine:~$ sudo docker create --name loopier-clone --security-opt seccomp=unconfined swr.cn-north-4.myhuaweicloud.com/ddn-k8s/registry.k8s.io/e2e-test-images/busybox:1.29-4 /bin/sh -c 'l=0; while true; do echo $l; l=$((expr $l + 1)); sleep 1; done'
fc20eb4cb5c920aabbfe5495d2aed435994fbc058d714170928c74db8886d50
test3@test3-virtual-machine:~$

```

- 迁移成功: 可以看到从92开始打印, 接上上面打印到91了

```

test3@test3-virtual-machine:~$ sudo docker start --checkpoint-dir=/home/container/3889b4edabb713a46622b46baaf1711ce49afc5ad1b5e5407574ede0ee4d03e/checkpoints/ --checkpoint=checkpoint2 loopier-clone
loopier-clone
test3@test3-virtual-machine:~$

```

```
test3@test3-virtual-machine:/home/container$ sudo docker logs looper-clone
92
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94
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108
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110
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160
test3@test3-virtual-machine:/home/container$
```