

[Build Tool-kit 工具指令]

NFS&SAMBA Docker Tool-kit 目錄下的 **docker-ctl** 提供以下功能，自動化 build/run/stop/exec 操作指令。

- 建立 CentOS7 的 NFS 與 SAMBA Docker Image
- 刪除 Docker Image
- 啟動 Container 依照 Container 內要開啟的 Service 類型映射對應的端口。
- 停止 Container 停止並刪除 Container
- 執行 Container 內的指令或程式

docker-ctl 指令參數：

- build
- run [nfs | smb | nfsmb] [<host-dir-path>:<container-dir-path>:<permission>]
- stop [nfs | smb | nfsmb]
- exec <command and arguments>
- status

Tool-kit 所建立的 Docker Image 會包進下列3個指令，提供 NFS/SAMBA 的基本設定與服務啟動/關閉。

- **server-run** 啟動與關閉 NFS/SAMBA 服務
參數: [status | restart | stop] (無帶入參數時為啟動服務)
範例: ./server-run status
- **config-nfs** 設定 /etc/exports
參數: [add | del] <export-path> <export-options>
範例: ./config-nfs add /mnt *(rw,async,no_root_squash)
 ./config-nfs del /mnt
- **config-smb** 設定 /etc/samba/smb.conf (只提供匿名登入設定)
參數: [add | del] <share-name> <share-path>
範例: ./config-smb add myshare1 /mnt
 ./config-smb del myshare1

[NFS&SAMBA Docker Image]

Download links

Docker tool-kit:

<https://drive.google.com/open?id=12aPBVh38q-4uA-rbFZw0QQpPFFKKgB5BY>

Build Docker Image

```
root@ycheng:~# tar -xvf ./nfsmb-docker-build-kits.tar
./nfsmb-docker-build-kits/
./nfsmb-docker-build-kits/config-nfs
./nfsmb-docker-build-kits/exports.example
```

```

./nfsmb-docker-build-kits/Dockerfile
./nfsmb-docker-build-kits/server-run
./nfsmb-docker-build-kits/docker-ctl
./nfsmb-docker-build-kits/config-smb
./nfsmb-docker-build-kits/samba.conf.example
root@ycheng:~# cd ./nfsmb-docker-build-kits
root@ycheng:~/nfsmb-docker-build-kits# ls -l
total 36
-rwxr-xr-x 1 root root 634 2月 1 10:19 config-nfs
-rwxr-xr-x 1 root root 1413 2月 5 11:27 config-smb
-rwxr-xr-x 1 root root 2291 2月 5 16:40 docker-ctl
-rw-r--r-- 1 root root 1294 2月 5 16:00 Dockerfile
-rw-r--r-- 1 root root 72 2月 5 15:49 exports.example
-rw-r--r-- 1 root root 11297 2月 5 11:28 samba.conf.example
-rwxr-xr-x 1 root root 1775 2月 2 15:31 server-run
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl build
...中間省略
Successfully built 8bb7358f6aca
Successfully tagged centos7-nfs-smb:1.0
REPOSITORY          TAG          IMAGE ID          CREATED           SIZE
centos7-nfs-smb      1.0          fee775886aab      4 seconds ago    382MB
centos                7           ff426288ea90      3 weeks ago      207MB

```

*** 當完成 Image 建立後，可以透過 `docker save` 指令打包輸出 .tar 檔。**

```
[root@ceph-smart ~]# docker save centos7-nfs-smb:1.0 > centos7-nfs-smb-server.tar
```

*** 透過 `docker import` 匯入**

```

[root@ceph-smart ~]# cat ./centos7-nfs-smb-server.tar | docker import - centos7-nfs-smb:1.0
sha256:89f8f77c53af7aa4c67232a58691f81e333bc8a94ac2c9e3e58bd42d48a1a25a
[root@ceph-smart ~]# docker images
REPOSITORY          TAG          IMAGE ID          CREATED           SIZE
centos7-nfs-smb      1.0          89f8f77c53af      5 seconds ago    392MB
centos                7           ff426288ea90      4 weeks ago      207MB

```

*** 透過 `docker load` 匯入**

```

[root@ceph-smart nfsmb-docker-build-kit]# docker load --input ./centos7-nfs-smb-server.tar
e15afa4858b6: Loading layer [=====>]
215.8MB/215.8MB
35e2f9be6606: Loading layer [=====>]
29.18kB/29.18kB
1be61bd3a78a: Loading layer [=====>]
2.048kB/2.048kB
d6a2aef32762: Loading layer [=====>]
155.3MB/155.3MB
c4e24baa249d: Loading layer [=====>]
20.99MB/20.99MB
5515283a7c3e: Loading layer [=====>]
4.096kB/4.096kB
355c28e51178: Loading layer [=====>]
3.072kB/3.072kB
591994a084e7: Loading layer [=====>]
3.584kB/3.584kB
06588d228761: Loading layer [=====>]
4.608kB/4.608kB
639626103202: Loading layer [=====>]
4.608kB/4.608kB
Loaded image: centos7-nfs-smb:1.0
[root@ceph-smart nfsmb-docker-build-kit]# docker images
REPOSITORY          TAG          IMAGE ID          CREATED           SIZE

```

Delete the Docker Image

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl rmi
Remove image
Untagged: centos7-nfs-smb:1.0
Deleted: sha256:fee775886aabc884d830efde5b308b4b467005f5bfdddcbec78b15923cc276c4
Deleted: sha256:8b602d6cb296f6dd47d83cab5700803a9b878a47f1877ec0353d50a6ca7fc715
Deleted: sha256:6b4c190354238948d85db3290675dabd361b9accc69390b2cbc5ab1a42b79c97
Deleted: sha256:669d5b9ed7aebbbad61b008ab06f4e0d2aff836aa1ce99d624aebfdecff125d0
Deleted: sha256:77c8972da27b6b20d1fbdacc0b78d5f3443c3624acf70ac3aa1c9ac21d1626be
Deleted: sha256:33b7aeb58dbe6f77ec89a1772253c0ff0d0ef77c95219f312a76767eddb2913f
Deleted: sha256:1aece30539237c9d04bf31dbb569398de2a9c02b279a40d3c720ab156c675b5b
Deleted: sha256:caa4522bbd5e54a6a432b24d42e0850dbc487ce62285af421980a064ab50360b
Deleted: sha256:4d4664f6fcfbec75a6cdc7b07bbc192f734f0c9bde4da37a9ce56e7f3034672c
Deleted: sha256:236c14a894aaec569cd80a48c3437255f0d8b7483d3620bb6d911365cc085039
Deleted: sha256:a4a3ee06816c78d65512f7a309d3de708fcad7495e77d6d559afbc83d7588f01
Deleted: sha256:5c8217d7541755ae013beab4444bf01d464f920b4fcc34b2733eb860ac32f756
Deleted: sha256:f27a84e9b25bd67f3b91dbe2d572b995b141f4b2399233a21e8295e6e3caec5f
Deleted: sha256:8f93055c785993c236b95e93b34fb7489032714a6ab2a22be908f96b63d6ffa5
Deleted: sha256:2f89c14997fb0c5f7ed0bef205belacc506c160cffbdb9d493033286c5c418af
Deleted: sha256:20a15917b9c0affa261cd47cba3dba27af0ef08fec2ab936a628d3aac2b6fe82
Deleted: sha256:b0aed3ce4dfb4dc5989498f29478b47827c751583d1498baa512a88baa82a56f
Deleted: sha256:6d6293b6e7a32bc7faf823cade8513b167b1cda96060f9c631675b99ac05a6df
Deleted: sha256:0d8552428842cbf67c649041a297b93da567fedfa132bcb15bcf136b3cf6da6f
Deleted: sha256:73c8ea8c2cb4af06e999893f9604af3f1631cbb13ff0ca27d7b832c8b528da80
REPOSITORY          TAG          IMAGE ID          CREATED          SIZE
centos               7            ff426288ea90     3 weeks ago     207MB
```

[Run Docker Container & Service]

啟動/停止 Docker Container

- 啟動 Docker Container 時將 Host 上 /mnt 掛載至 Docker Container 的 /mnt，並擁有讀寫權限。(空格分開可掛載多個 volume 路徑)

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl run nfsmb /mnt:/mnt:rw
Run docker
- volume bind to docker: /mnt:/mnt:rw
all volumes: -v /mnt:/mnt:rw
- run docker as both nfs and smb server
ccf69a5fece902a74242f54a2aeecc3d476ace12914be9e0b24b2979b7cd4172f
CONTAINER ID          IMAGE          COMMAND          CREATED          STATUS
PORTS
NAMES
ccf69a5fece9          centos7-nfs-smb:1.0  "/usr/sbin/init"  2 seconds ago   Up Less
than a second
0.0.0.0:139->139/tcp, 0.0.0.0:445->445/tcp, 0.0.0.0:137-138->137-138/udp,
0.0.0.0:2049->2049/tcp  my-server
```

啟動/停止 NFS/SAMBA Service

NFS 設定

- 新增一筆 export 紀錄，export /mnt 資料夾與相關參數

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl exec config-nfs add /mnt
*(rw,fsid=1,nohide,insecure,async,no_subtree_check,no_root_squash)
Exec 'config-nfs add /mnt
*(rw,fsid=1,nohide,insecure,async,no_subtree_check,no_root_squash) ' in docker
- add /mnt *(rw,fsid=1,nohide,insecure,async,no_subtree_check,no_root_squash) to
/etc/exports.
```

- 刪除該 export 設定

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl exec config-nfs del /mnt
Exec 'config-nfs del /mnt ' in docker
```

- 檢視 nfs export 設定檔

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl exec config-nfs
Exec 'config-nfs ' in docker
/mnt *(rw,fsid=1,nohide,insecure,async,no_subtree_check,no_root_squash)
```

SMB 設定

- 新增一個名為 mnt-share 的匿名 samba 的分享，資料夾路徑為 /mnt

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl exec config-smb add mnt-share /mnt
Exec 'config-smb add mnt-share /mnt ' in docker
[Tue Feb  6 16:29:57 CST 2018] Add SAMBA share name = mnt-share, share path = /mnt
- add follow new section and options.
[mnt-share]
    path = /mnt
    create mode = 0777
    directory mode = 0777
    guest ok = Yes
    guest only = Yes
    writable = Yes
    comment = mnt-share produced by config-smb
```

- 刪除該分享

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl exec config-smb del mnt-share
Exec 'config-smb del mnt-share ' in docker
[Tue Feb  6 16:30:47 CST 2018] Del SAMBA share name = mnt-share
```

- 檢視 samba 設定檔

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl exec config-smb
Exec 'config-smb ' in docker
[Tue Feb  6 16:30:18 CST 2018] Get SAMBA config.
# See smb.conf.example for a more detailed config file or
# read the smb.conf manpage.
# Run 'testparm' to verify the config is correct after
# you modified it.

[global]
    workgroup = WORKGROUP
    security = user

    passdb backend = tdbsam
    map to guest = bad user
    dns proxy = no
```

```
unix charset = UTF-8
dos charset = CP932
```

```
[mnt-share]
path = /mnt
create mode = 0777
directory mode = 0777
guest ok = Yes
guest only = Yes
writable = Yes
comment = mnt-share produced by config-smb
```

啟動服務

- 完成設定後即可啟動/重起服務。

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl exec server-run
Exec 'server-run ' in docker
[Tue Feb  6 16:31:57 CST 2018] Enable NFS server.
Created symlink from /etc/systemd/system/multi-user.target.wants/nfs-server.service to
/usr/lib/systemd/system/nfs-server.service.
[Tue Feb  6 16:31:57 CST 2018] Enable SMB server.
Created symlink from /etc/systemd/system/multi-user.target.wants/smb.service to
/usr/lib/systemd/system/smb.service.
Created symlink from /etc/systemd/system/multi-user.target.wants/nmb.service to
/usr/lib/systemd/system/nmb.service.
```

- 檢查服務狀態。

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl exec server-run status
Exec 'server-run status ' in docker
• nfs-server.service - NFS server and services
  Loaded: loaded (/usr/lib/systemd/system/nfs-server.service; enabled; vendor preset:
disabled)
  Drop-In: /run/systemd/generator/nfs-server.service.d
           └─order-with-mounts.conf
  Active: active (exited) since Tue 2018-02-06 10:52:42 CST; 7s ago
  Main PID: 166 (code=exited, status=0/SUCCESS)
  CGroup:
/docker/ccf69a5fece902a74242f54a2aeec3d476ace12914be9e0b24b2979b7cd4172f/system.slice/nfs-s
erver.service
```

```
Feb 06 10:52:42 ccf69a5fece9 systemd[1]: Starting NFS server and services...
```

```
Feb 06 10:52:42 ccf69a5fece9 systemd[1]: Started NFS server and services.
```

```
• smb.service - Samba SMB Daemon
  Loaded: loaded (/usr/lib/systemd/system/smb.service; enabled; vendor preset: disabled)
  Active: failed (Result: exit-code) since Tue 2018-02-06 10:52:42 CST; 7s ago
  Process: 187 ExecStart=/usr/sbin/smbd $SMBDOPTIONS (code=exited, status=1/FAILURE)
  Main PID: 187 (code=exited, status=1/FAILURE)
```

```
Feb 06 10:52:42 ccf69a5fece9 systemd[1]: Starting Samba SMB Daemon...
```

```
Feb 06 10:52:42 ccf69a5fece9 smbd[187]: [2018/02/06 10:52:42.854027,  0] ../...
```

```
Feb 06 10:52:42 ccf69a5fece9 smbd[187]: set_variable_helper(Yes #__mnt-sha...!
```

```
Feb 06 10:52:42 ccf69a5fece9 systemd[1]: smb.service: main process exited, c...E
```

```
Feb 06 10:52:42 ccf69a5fece9 systemd[1]: Failed to start Samba SMB Daemon.
```

```
Feb 06 10:52:42 ccf69a5fece9 systemd[1]: Unit smb.service entered failed state.
```

```
Feb 06 10:52:42 ccf69a5fece9 systemd[1]: smb.service failed.
```

```
• nmb.service - Samba NMB Daemon
  Loaded: loaded (/usr/lib/systemd/system/nmb.service; enabled; vendor preset: disabled)
```

```
Active: active (running) since Tue 2018-02-06 10:52:42 CST; 7s ago
Main PID: 189 (nmbd)
Status: "nmbd: ready to serve connections..."
CGroup:
/docker/ccf69a5fece902a74242f54a2aeec3d476ace12914be9e0b24b2979b7cd4172f/system.slice/nmb.s
ervice
└─189 /usr/sbin/nmbd
```

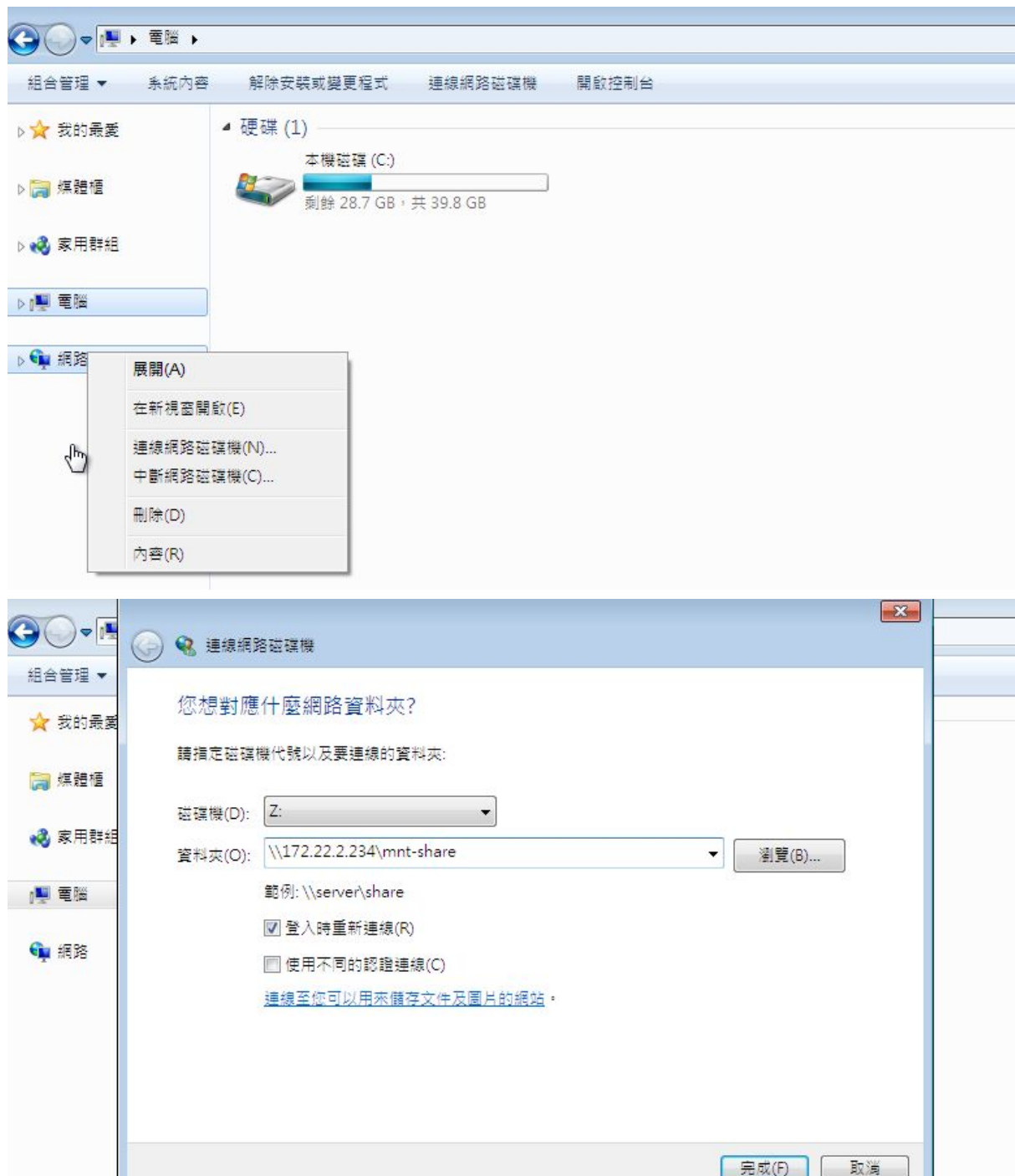
```
Feb 06 10:52:42 ccf69a5fece9 systemd[1]: Starting Samba NMB Daemon...
Feb 06 10:52:42 ccf69a5fece9 systemd[1]: nmb.service: Supervising process 18....
Feb 06 10:52:42 ccf69a5fece9 systemd[1]: Started Samba NMB Daemon.
Feb 06 10:52:42 ccf69a5fece9 nmbd[189]: [2018/02/06 10:52:42.849877, 0] ../...)
Feb 06 10:52:42 ccf69a5fece9 nmbd[189]: STATUS=daemon 'nmbd' finished star...s
Hint: Some lines were ellipsized, use -l to show in full.
```

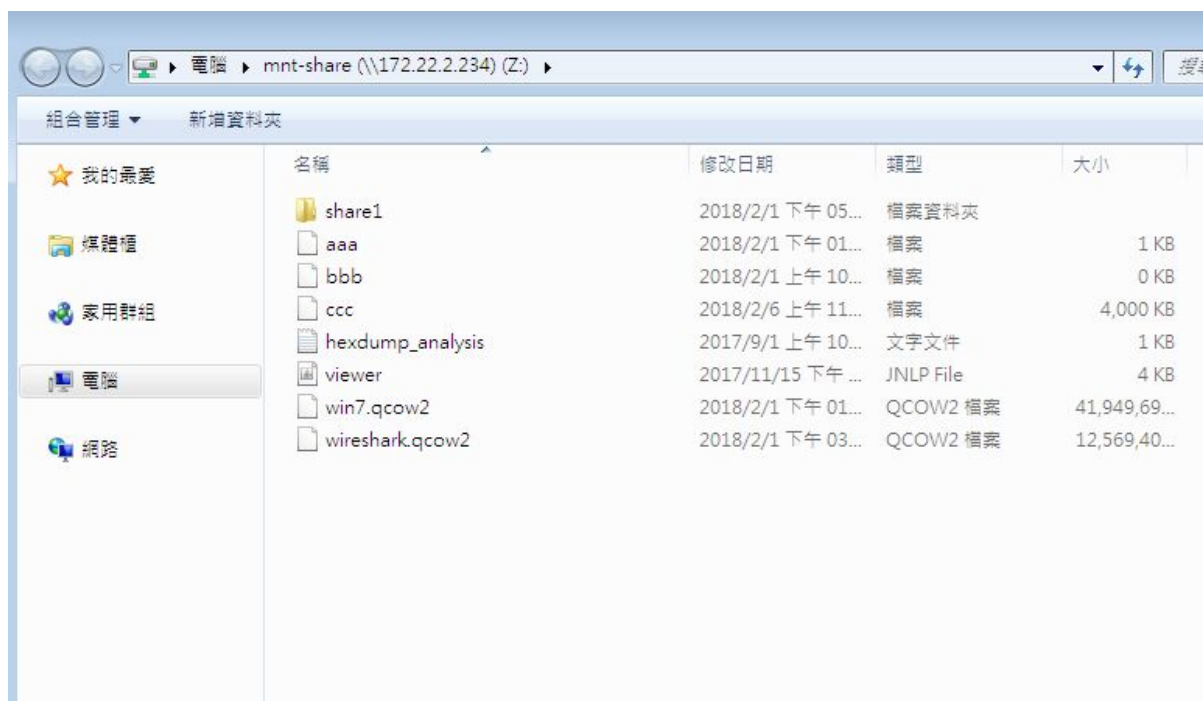
掛載

- 掛載 NFS Server 上 /mnt 資料夾

```
root@ycheng:/home/ycheng# mount -t nfs4 172.22.2.234:/mnt/ /mnt/data
root@ycheng:/home/ycheng# df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            16G   0    16G   0% /dev
tmpfs           3.2G   50M   3.1G   2% /run
/dev/sda2       886G  297G   544G  36% /
tmpfs           16G   346M   16G   3% /dev/shm
tmpfs           5.0M   4.0K   5.0M   1% /run/lock
tmpfs           16G   0    16G   0% /sys/fs/cgroup
/dev/sdc        110G   77G   29G   74% /mnt/data_disk2
/dev/sdb1       917G  274G   597G  32% /mnt/data_disk1
/dev/sda1       511M   3.5M   508M   1% /boot/efi
cgmanagerfs     100K   0    100K   0% /run/cgmanager/fs
tmpfs           3.2G   36K   3.2G   1% /run/user/1000
/dev/rbd0       14Z   14Z   0 100% /mnt/tmp1
172.22.2.234:/mnt 50G   25G   26G   50% /mnt/data
root@ycheng:/home/ycheng# ls -l /mnt/data
total 20470324
-rw-r--r-- 1 root root          4 2月 1 13:38 aaa
-rw-r--r-- 1 root root          0 2月 1 10:11 bbb
-rwxrw-rw- 1 99 99          237 9月 1 10:45 hexdump_analysis.txt
drwxrwx--- 2 ycheng 1001          6 2月 1 17:45 share1
-rwxrw-rw- 1 99 99        3751 11月 15 18:07 viewer.jnlp
-rw----- 1 root root 42956488704 2月 1 13:46 win7.qcow2
-rw-r--r-- 1 root root 12871073792 2月 1 15:26 wireshark.qcow2
root@ycheng:/home/ycheng# cat /mnt/data/aaa
AAA
root@ycheng:/home/ycheng# dd if=/dev/urandom of=/mnt/data/cac bs=4096 count=1000
1000+0 records in
1000+0 records out
4096000 bytes (4.1 MB, 3.9 MiB) copied, 0.139656 s, 29.3 MB/s
root@ycheng:/home/ycheng# ls -l /mnt/data
total 20474324
-rw-r--r-- 1 root root          4 2月 1 13:38 aaa
-rw-r--r-- 1 root root          0 2月 1 10:11 bbb
-rw-r--r-- 1 root root 4096000 2月 6 11:58 cac
-rwxrw-rw- 1 99 99          237 9月 1 10:45 hexdump_analysis.txt
drwxrwx--- 2 ycheng 1001          6 2月 1 17:45 share1
-rwxrw-rw- 1 99 99        3751 11月 15 18:07 viewer.jnlp
-rw----- 1 root root 42956488704 2月 1 13:46 win7.qcow2
-rw-r--r-- 1 root root 12871073792 2月 1 15:26 wireshark.qcow2
```

- 掛載 SAMBA Server 的 mnt-share





- * 啟動時服務時，會依照 Docker Container 啟動時的所開啟的服務類型啟動。
- * 使用者亦可完全手動管理 Container 內的NFS/SAMBA服務。
- * 由於只可透過 nfs4 掛載，port 111 (portmapper) 沒有加入映射至 Docker Container 內(被 systemd使用)，故 showmount -e 無法取得 NFS server 的 exports 資訊。(只可在 host 主機上取得)

```
[root@ceph-smart nfsmb-docker-build-kits]# ./docker-ctl exec ifconfig
Exec 'ifconfig' in docker
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 172.17.0.2 netmask 255.255.0.0 broadcast 172.17.255.255
    ether 02:42:ac:11:00:02 txqueuelen 0 (Ethernet)
    RX packets 3513 bytes 333245 (325.4 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 1383 bytes 151860 (148.3 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    loop txqueuelen 1 (Local Loopback)
    RX packets 2 bytes 196 (196.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 2 bytes 196 (196.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

[root@ceph-smart nfsmb-docker-build-kits]# showmount -e 172.17.0.2
Export list for 172.17.0.2:
/mnt *
```

[References]

<https://www.linuxquestions.org/questions/linux-networking-3/nfsv4-and-nat-traversal-751892/>
<https://linux.die.net/man/5/exports>
<https://github.com/CentOS/CentOS-Dockerfiles/blob/master/systemd/centos7/Dockerfile>

<http://dockone.io/question/729>

<https://www.phpini.com/linux/centos-7-install-samba>

<https://github.com/namazu510/nfs-server/blob/master/run-mountd.sh>

https://www.server-world.info/en/note?os=CentOS_7&p=nfs