Network Administration/System Administration Homework #7

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1 PVE

ref:

- Proxmox Installation
- KVM/QEMU 以 virt-install 指令建立虛擬機器、VNC 顯示畫面教學
- virt-install(1) - Linux man page
- Create a virtual machine in KVM using virt-install

1. ```
   qemu-img create -f qcow2 /tmp2/b10202012/hw7.qcow2 10G
   virt-install \
     --name b10202012-1 \
     --vcpus 2 \
     --memory 8192 \
     --disk path=/tmp2/b10202012/hw7.qcow2,format=qcow2,bus=virtio \
     --cdrom /tmp2/hw7/proxmox.iso \
     --network bridge=br0,mac=52:54:20:20:12:01 \
     --graphics vnc,listen=0.0.0.0 \
     --noautoconsole \
     --os-variant debian11
   virsh vncdisplay b10202012-1
   ```

   此時我看到是 `:9`，代表 vnc port 是 5909。用 vnc 連上後選 Install Proxmox VE (Terminal UI, Debug Mode) 。

   - Country: Taiwan
   - Timezone: Asia/Taipei
   - U.S. English
   - 填 password、email

   剩下都選預設。我重的時候他沒有自動開，我用了 `virsh start b10202012-1`。重 vnc 即可看到 IP: 192.168.141.102。再用

   ```
   ssh root@192.168.141.102
   ```
   ```

即可連線。

```
b10202012@nasaws3:/tmp2/b10202012$ ssh root@192.168.141.102
The authenticity of host '192.168.141.102 (192.168.141.102)' can't be established.
ED25519 key fingerprint is SHA256:tO0yItaEq36kUvNE3WCfLDF1HtnCsXOk1RvTnSZGcBc.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.141.102' (ED25519) to the list of known hosts.
root@192.168.141.102's password:
Linux b10202012 6.8.12-4-pve #1 SMP PREEMPT_DYNAMIC PMX 6.8.12-4 (2024-11-06T15:04Z) x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Nov  4 22:33:10 2025
root@b10202012:~#
```

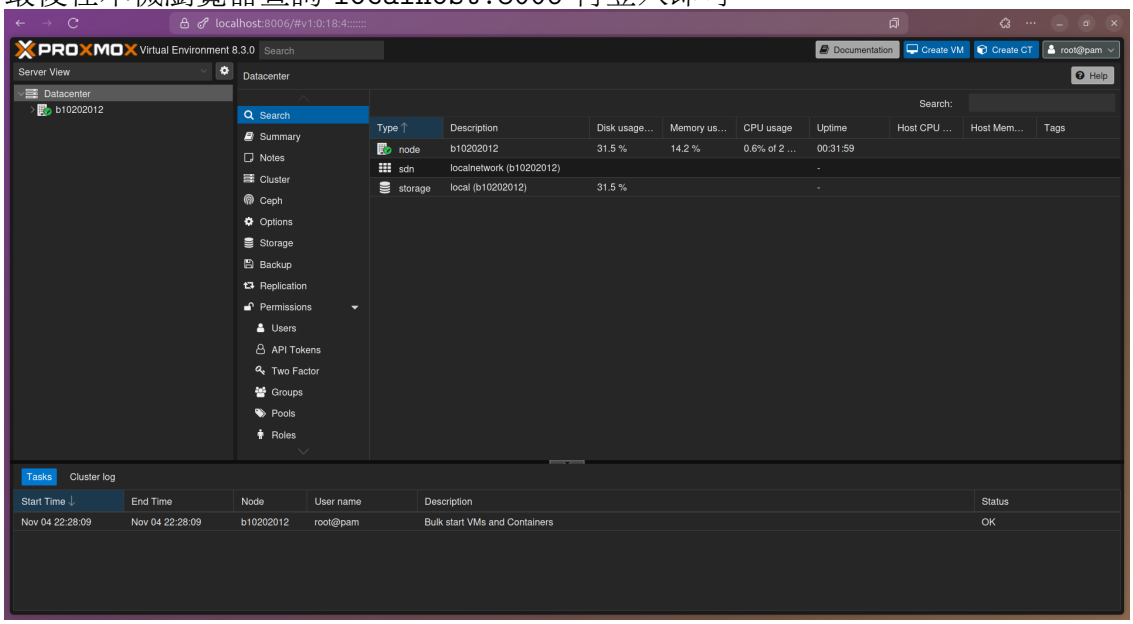
2. 如上一題所說，或是也可以在 vnc 登入後用 `ip a`
3. 首先在本機連線到 nasaws 的時候用下列指令 forward 工作站的 8006 到本機（如果不行就換一個 port）

   `ssh -L 8006:localhost:8006 b10202012@140.112.187.53`

   接在工作站用下列指令 forward 虛擬機的 8006 到工作站

   `ssh -L 8006:192.168.141.102:8006 root@192.168.141.102`

   最後在本機瀏覽器查詢 `localhost:8006` 再登入即可。



2 Create VM

ref:proxmox: ZFS on Linux#zfs administration

1. 和上一題一樣的方法新增磁碟

```
qemu-img create -f qcow2 /tmp2/b10202012/hw7-disk2.qcow2 20G
```

接用 `virsh edit b10202012-1` 修改 config。找到 devices 中 disk 的 block 複製一份後，將 .qcow2 file 換成上面的位置，vda 換成 vdb。例如：

```
<disk type='file' device='disk'>
  <driver name='qemu' type='qcow2'/>
  <source file='/tmp2/b10202012/hw7-disk2.qcow2'/>
  <target dev='vdb' bus='virtio'/>
</disk>
```

然後 reboot：

```
virsh shutdown b10202012-1
virsh start b10202012-1
```

重新 ssh 連線後，用 `lsblk` 檢查可以看到 vdb 20G。接創建 zpool

```
zpool create -f tank /dev/vdb
```

最後可以用 `zpool status` 檢查。

2. 先關機 `virsh shutdown b10202012-1`
   接一樣用 `virsh edit b10202012-1` 修改 config。參考 devices 中 interface 的 block 新增：

```
<interface type='user'>
  <mac address='52:54:20:20:12:02'/>
  <model type='virtio'/>
</interface>
```

開虛擬機、連線後，檢查 `ip a` 確定有連上網卡，以及找到接口名稱（enp8s0）。在 `/etc/network/interfaces` 新增

```
auto enp8s0
iface enp8s0 inet static
    address 10.0.2.15/24
    gateway 10.0.2.2
```

接重：`systemctl restart networking` 這時候我發現直接 `curl 140.250.77.14` 會成功，但是 `curl google.com` 會沒辦法 resolved，因此我用 webgui 找到 `System > DNS` 新增 8.8.8.8 就成功了。

3. 將之前改的 enp8s0 改成

```
auto enp8s0
iface enp8s0 inet manual

auto vmbr1
iface vmbr1 inet static
    address 10.0.2.15/24
    gateway 10.0.2.2
    bridge-ports enp8s0
```

```
bridge-stp off
bridge-fd 0
dns-nameservers 8.8.8.8
```

4. 使用以下指令將 ISO 檔放入虛擬機。

   ```
   scp /tmp2/hw7/alpine.iso root@192.168.141.102:/var/lib/vz/template/iso/alpine.iso
   ```

   在新增虛擬機過程中，我發現我沒辦法用 ZFS，我發現是沒將之前新增的 ZFS 加入 Datacenter，具體步驟如下：

   (a) 點選 `Datacenter > Storage > Add > ZFS`
   (b) ID 輸入 `tank` 剩下可以預設，按下 Create，這時候會看到左邊多了一個 database 圖示，表示 tank。

   接在 webgui 上點選 `Create VM` 填入以下資料，沒寫的都填預設就好

   - **General**: Name: alpine-b10202012
   - **OS**: Use CD/DVD disc image file (ISO): ISO image: alpine.iso
   - **Disks**: Storage: tank, Disk size (GiB): 8
   - **Memory**: Memory (MiB): 1024
   - **Network**: Bridge: vmbr1

   接在左邊選單選擇 `alpine-b10202012 > Console > Start Now` 動，接下來要安裝 alpine。首先用 root 登入，不需要密碼。接執行

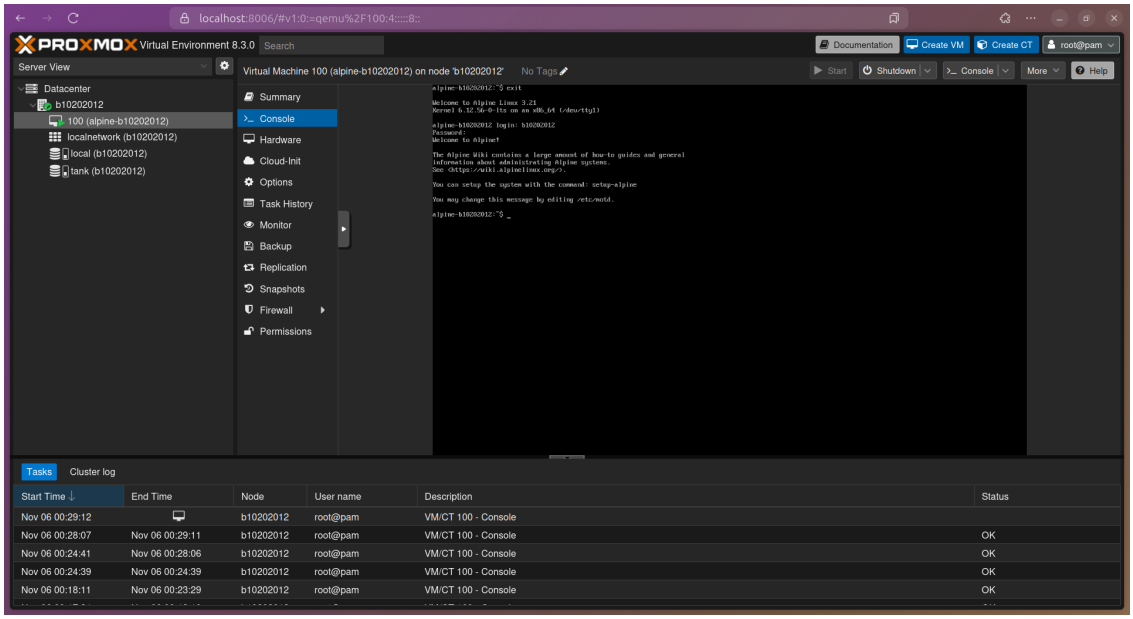
   ```
   setup-alpine
   ```

   (a) Keyboard: layout: us, variant: us
   (b) Hostname: alpine-b10202012
   (c) Network Configuration
      - Interface: eth0
      - Ip address: dhcp
      - Manual network configuration: n
   (d) Reset Password
   (e) Timezone: Asia/Taipei
   (f) Proxy: none
   (g) APK Mirror: 1 (find and use the fastest)
   (h) setup user: no
   (i) ssh: openssh, allow root: yes, key: none
   (j) NTP: chrony
   (k) Disk setup: disk: sda, how: sys, erase: y

   設定完後 `reboot`。重後，點 `Hardware > CD/DVD ... alpine.iso > Remove`。

5. `adduser b10202012`

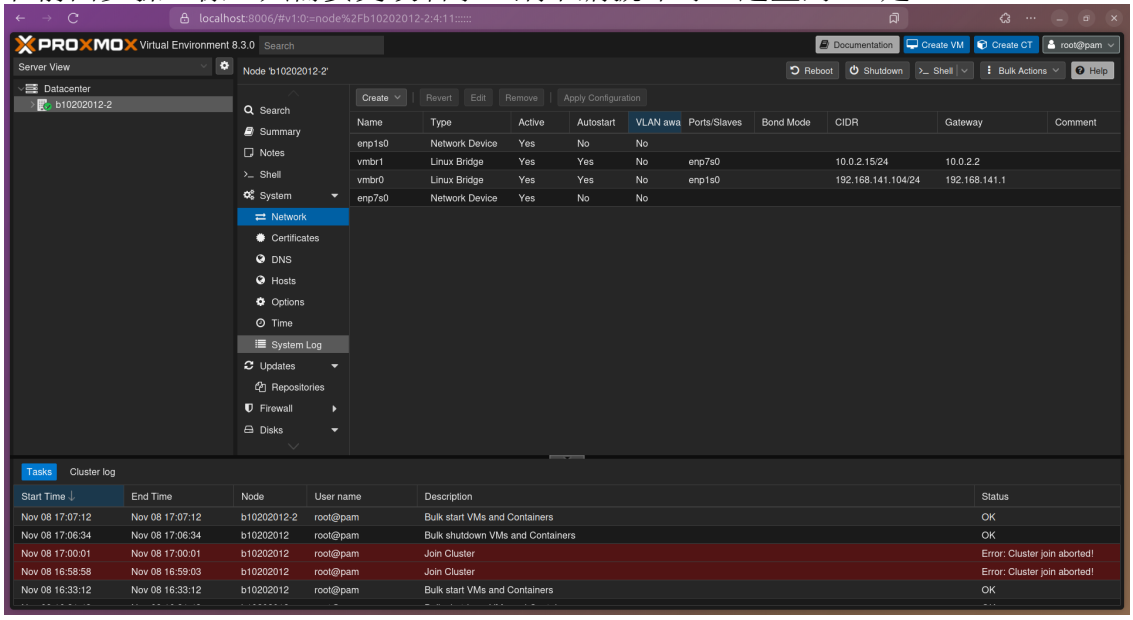
，設定密碼。

6. 

3 Cluster and HA

ref: Proxmox: Cluster Manager

1. 略
2. 和前面步驟一樣，只需要更改名字、網卡編號即可。這臺的 IP 是 192.168.141.104。



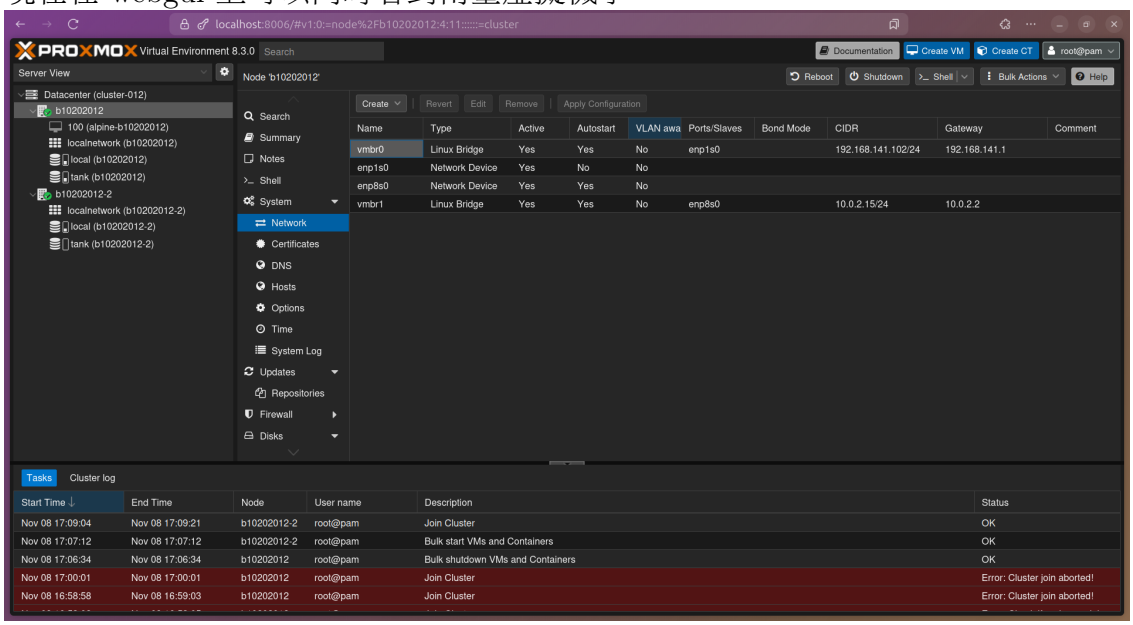
3. 用以下指令在第一個 proxmox 建立 cluster：

   `pvecm create cluster-012`

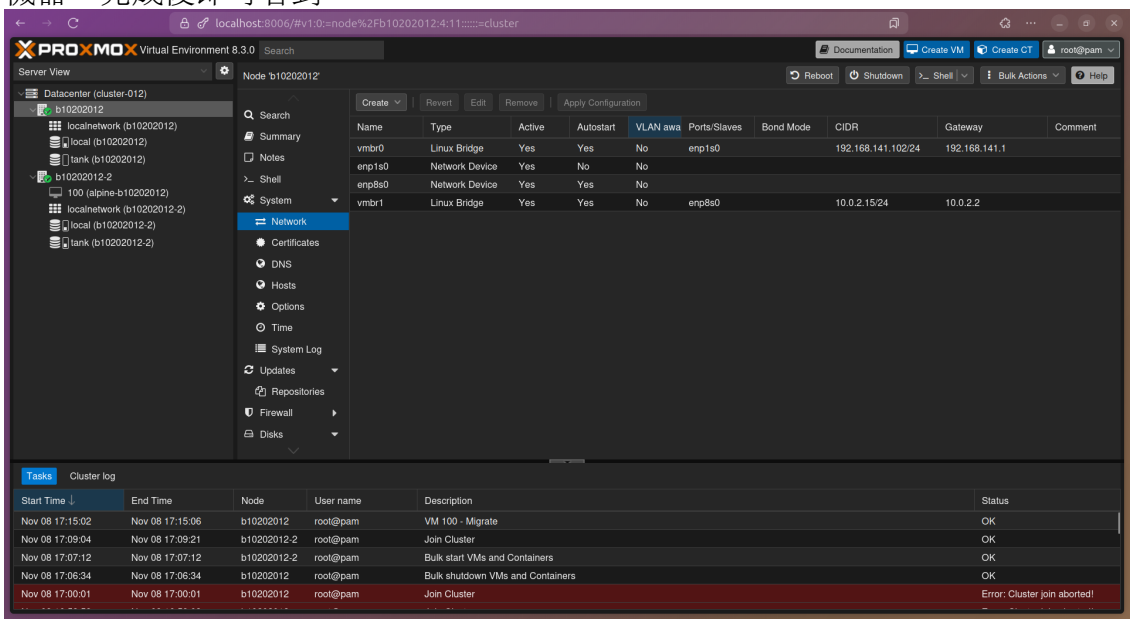
   接到第二個 proxmox 加入 cluster

```
pvecm add 192.168.141.102
```

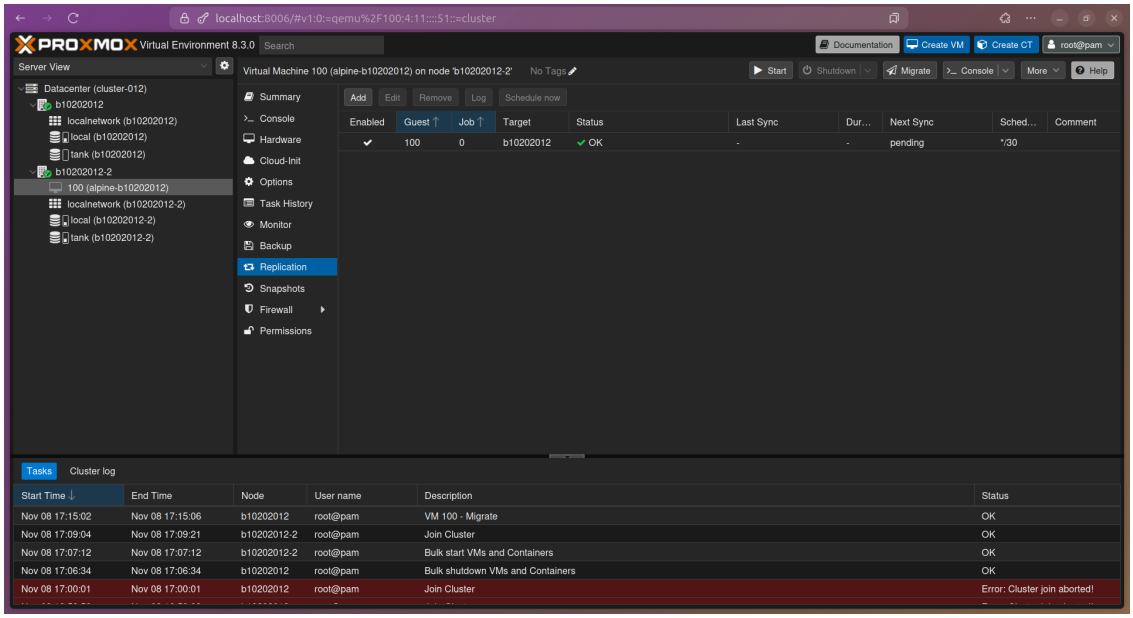
現在在 webgui 上可以同時看到兩臺虛擬機了：



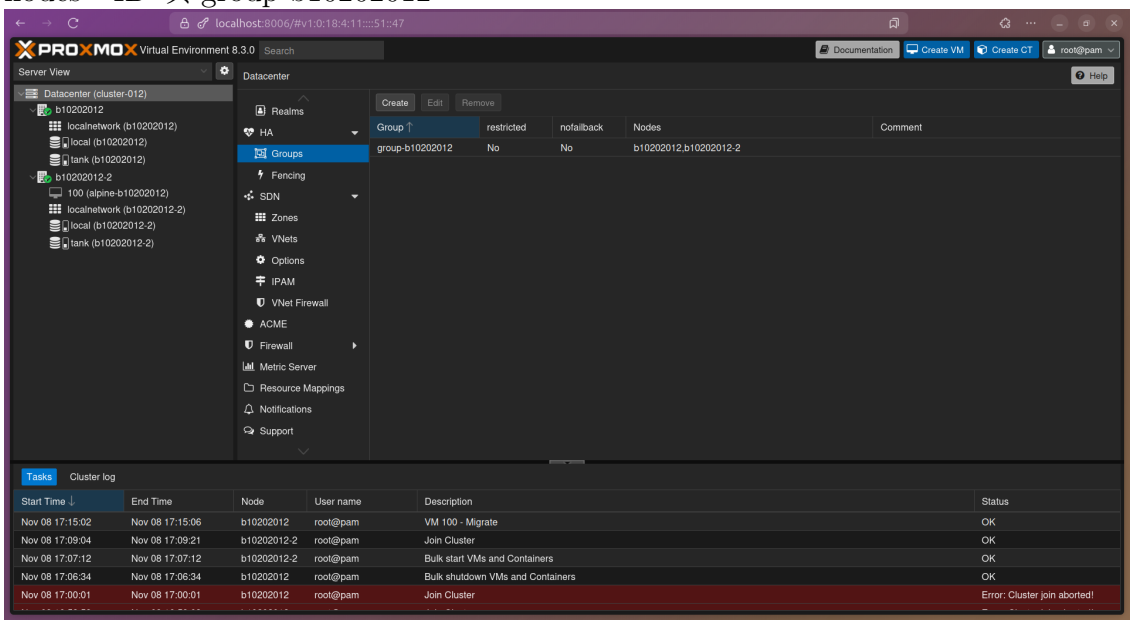
4. 在 gui 上左側選單右鍵點選 alpine 虛擬機，點選 Migrate，target node 選另一臺機器。完成後即可看到：



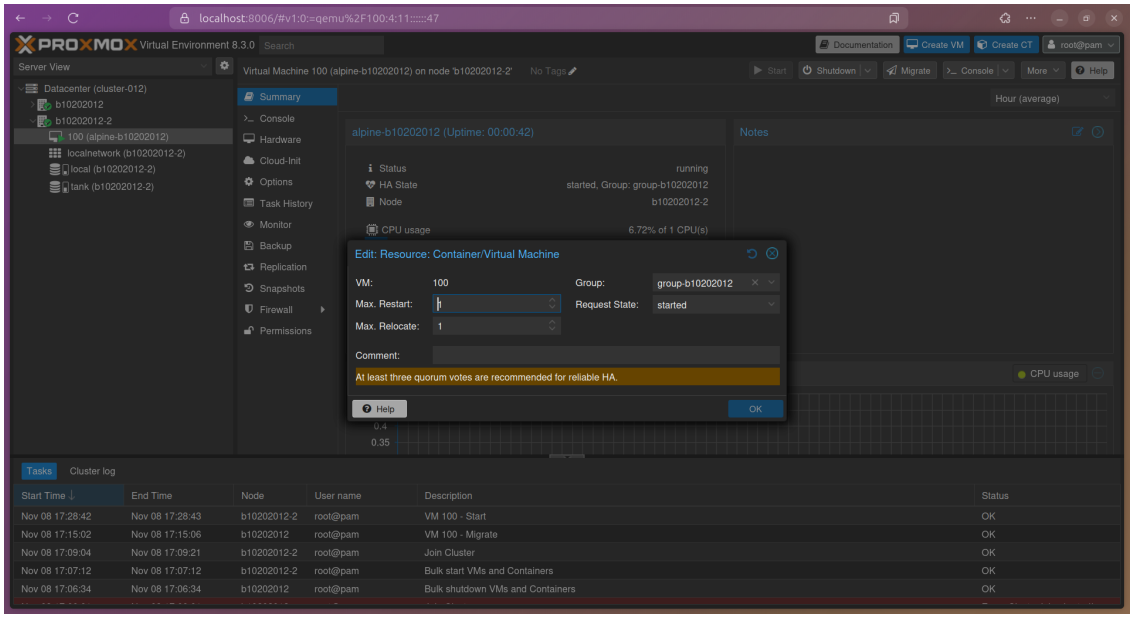
5. 在 gui 上左側選單右鍵點選 alpine 虛擬機，點選 `Replication > Add` Node 選另一臺、Schedule 選 30 分鐘。



6. 在 gui 上左側選單右鍵點選 `Datacenter > HA > Groups > Create`，勾選兩個 nodes，ID 填 group-b10202012。



7. 點選 alpine 虛擬機，在右上角的 More 中點選 Manage HA。Group 選剛剛建立的 group-b10202012。


localhost:8006/#v1:0:=qemu%2F100:4:11::::::47
PROXMOX Virtual Environment 8.3.0
Search
Documentation
Create VM
Create CT
root@pam
Server View
Datacenter (cluster-012)
b10202012
b10202012-2
100 (alpine-b10202012)
localnetwork (b10202012-2)
local (b10202012-2)
tank (b10202012-2)
Virtual Machine 100 (alpine-b10202012) on node 'b10202012-2'
No Tags
Start
Shutdown
Migrate
Console
More
Help
Summary
Console
Hardware
Cloud-Init
Options
Task History
Monitor
Backup
Replication
Snapshots
Firewall
Permissions
Hour (average)
alpine-b10202012 (Uptime: 00:00:42)
Notes
Status
running
HA State
started, Group: group-b10202012
Node
b10202012-2
CPU usage
6.72% of 1 CPU(s)
Edit: Resource: Container/Virtual Machine
VM:
100
Group:
group-b10202012
Max. Restart:
1
Request State:
started
Max. Relocate:
1
Comment:
At least three quorum votes are recommended for reliable HA.
Help
OK
CPU usage
0.4
0.35
Tasks
Cluster log
Start Time
End Time
Node
User name
Description
Status
Nov 08 17:28:42
Nov 08 17:28:43
b10202012-2
root@pam
VM 100 - Start
OK
Nov 08 17:15:02
Nov 08 17:15:06
b10202012
root@pam
VM 100 - Migrate
OK
Nov 08 17:09:04
Nov 08 17:09:21
b10202012-2
root@pam
Join Cluster
OK
Nov 08 17:07:12
Nov 08 17:07:12
b10202012-2
root@pam
Bulk start VMs and Containers
OK
Nov 08 17:06:34
Nov 08 17:06:34
b10202012
root@pam
Bulk shutdown VMs and Containers
OK