

# NASA HW7 - 金哲安(B12902118)

1

## References

- B12902116 (林靖昀)
- B12902066 (宋和峻)
- <https://blog.gtwang.org/linux/kvm-qemu-virt-install-command-tutorial/>
- <https://linux.die.net/man/1/virt-install>
- <https://pve.proxmox.com/pve-docs/chapter-sysadmin.html>
- <https://johnliu55.tw/ssh-tunnel.html>

1

On nasa workstation, get the iso file to the current working directory.

```
cp /tmp2/rabhunter/hw7/proxmox.iso .
```

And then create a virtual disk file.

```
qemu-img create -f qcow2 proxmox.qcow2 10G
```

Install the vm.

```
virt-install --name b12902118-1 \  
  --vcpus 2 \  
  --ram 8192 \  
  --disk proxmox.qcow2,format=qcow2 \  
  --network bridge=br0,mac=52:54:90:21:18:01,model=virtio \  
  --cdrom=proxmox.iso \  
  --os-variant debian11 \  
  --boot useserial=on \  
  --graphics vnc \  
  --noautoconsole
```

And then see which port it is using:

```
virsh vncdisplay b12902118-1
```

It showed:

```
127.0.0.1:0
```

On local computer, create an ssh tunnel:

```
ssh -NL 5900:localhost:5900 b12902118@140.112.91.3
```

On local computer, use vnc viewer to connect to the vm to proceed with the installation. Basically stick with the defaults.

```
vncviewer localhost:5900
```

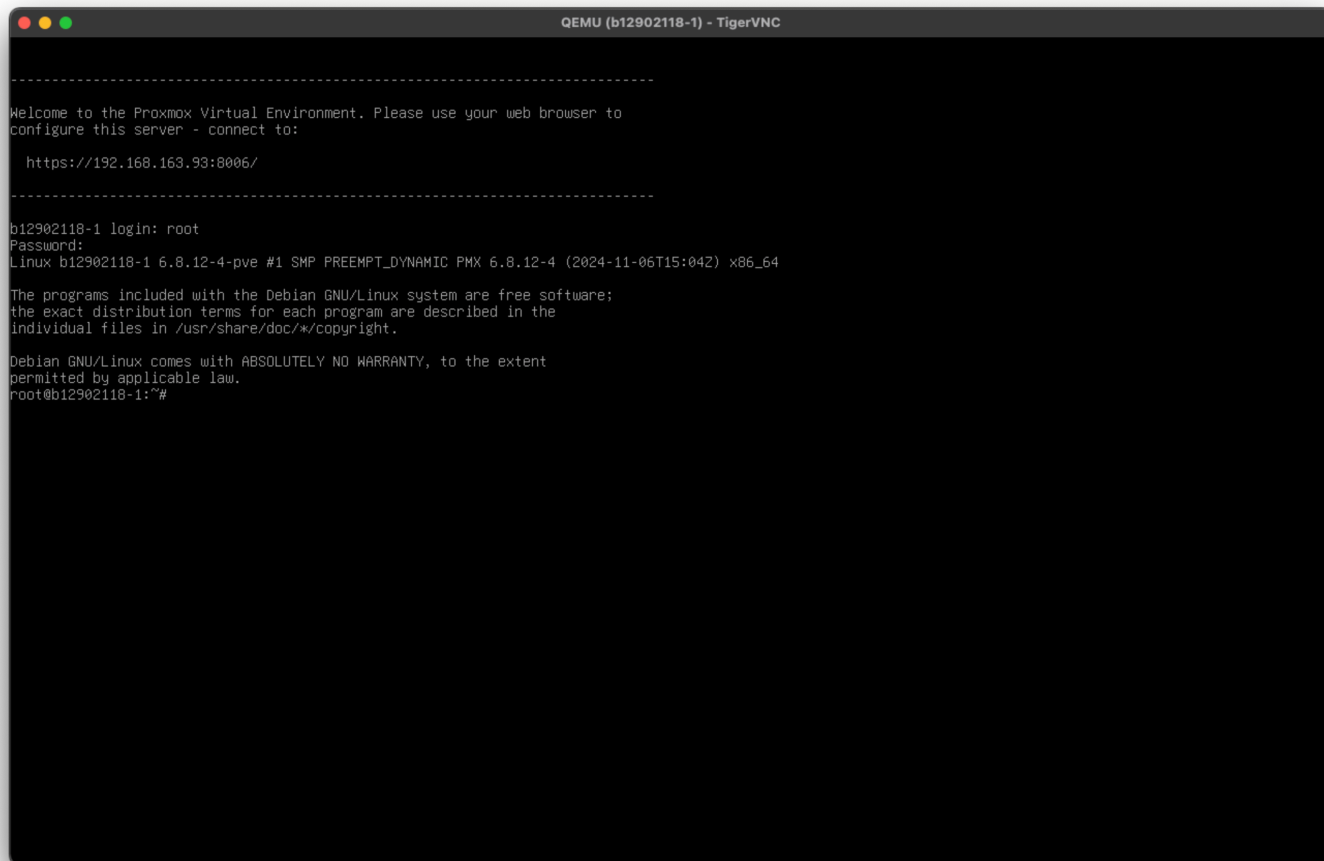
After finishing installation, start the vm

```
virsh start b12902118-1
```

Check which port it is using and connect to it on local computer. If it hasn't changed then connect to it.

```
vncviewer localhost:5900
```

Log in as root



## 2

Thanks for the kind explanation.

## 3

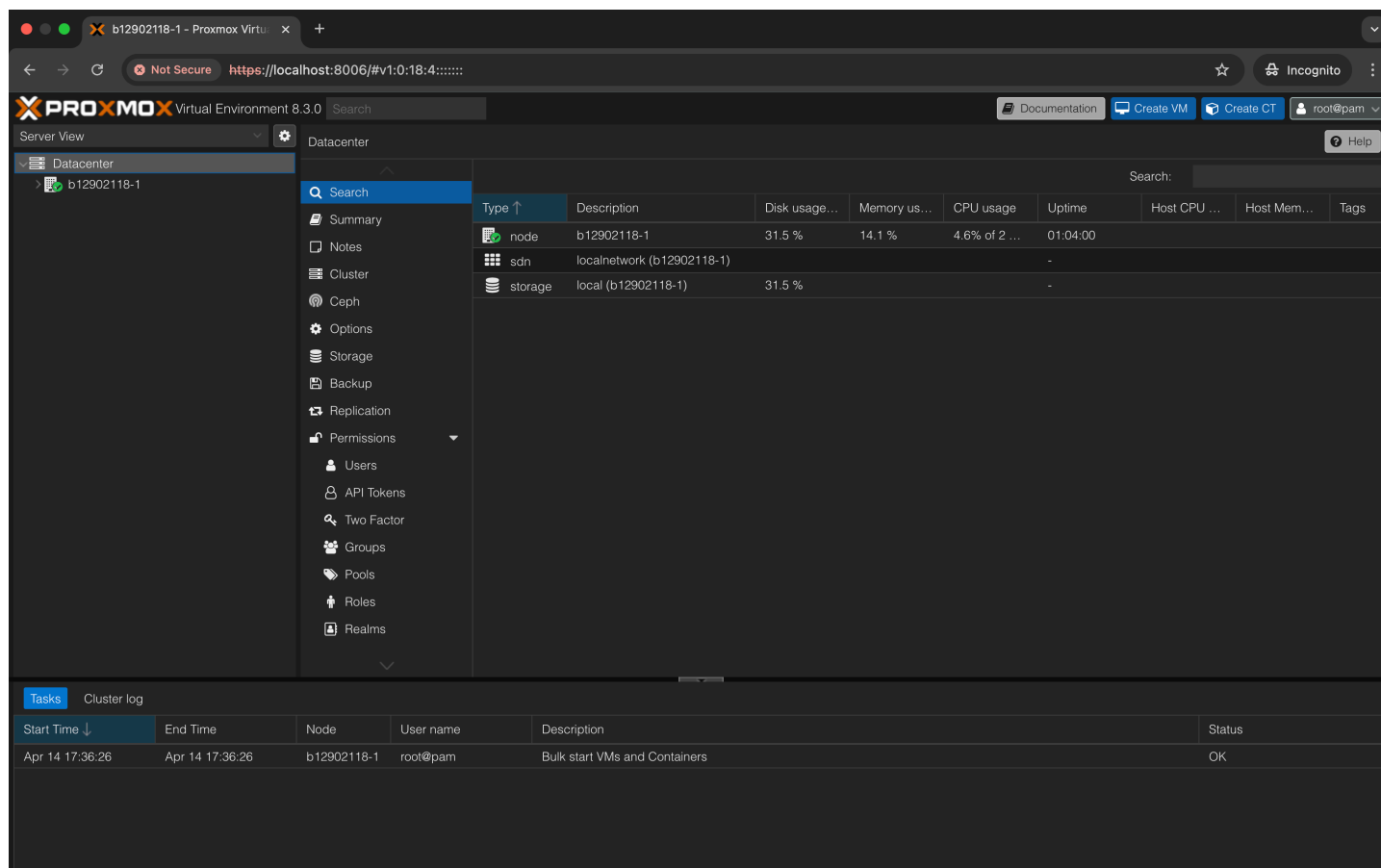
After login, we can see the ip and port of the web-gui

```
192.168.163.93:8006
```

On local computer, create an ssh tunnel:

```
ssh -NL 8006:192.168.163.93:8006 b12902118@140.112.91.3
```

On local computer, type `localhost:8006` in the browser to connect. And then log in.



## 2

## References

- B12902116 (林靖昀)
- B12902066 (宋和峻)
- <https://linux.die.net/man/1/virsh>
- <https://wiki.debian.org/ZFS>
- <https://purevoltage.com/2023/10/05/linux-basics-disk-management-and-partitioning-using-fdisk-mkfs-zfs-df/>
- [https://docs.redhat.com/en/documentation/red\\_hat\\_enterprise\\_linux/7/html/virtualization\\_deployment\\_and\\_administration\\_guide/sect-manipulating\\_the\\_domain\\_xml-devices#sect-Network\\_interfaces-Bridge\\_to\\_LAN](https://docs.redhat.com/en/documentation/red_hat_enterprise_linux/7/html/virtualization_deployment_and_administration_guide/sect-manipulating_the_domain_xml-devices#sect-Network_interfaces-Bridge_to_LAN)
- <https://forum.proxmox.com/threads/how-to-add-hard-drive-to-host.119376/>

## 1

On nasa workstation, create a virtual disk file

```
qemu-img create -f qcow2 proxmox1.qcow2 20G
```

Change the default editor to vim

```
export EDITOR=vim
```

And then edit the configuration file

```
virsh edit b12902118-1
```

Inside the `<devices>` , add a new `<disk>` entry like this

```
<disk type='file' device='disk'>  
  <driver name='qemu' type='qcow2' />  
  <source file='/tmp2/b12902118/nasa/HW7/proxmox1.qcow2' />  
  <target dev='vdb' bus='virtio' />  
</disk>
```

Shut down the vm and start it again

```
virsh shutdown b12902118-1  
virsh start b12902118-1
```

On the proxmox web page, go to Datacenter > b12902118-1

On this node, go to Disks > ZFS and click Create: ZFS

Click the disk /dev/vdb and enter name: nasapool

Others can be left as default, and click Create

## 2

Edit the configuration file

```
virsh edit b12902118-1
```

Inside the `<devices>` section, add the following:

```
<interface type='user'>  
  <model type='virtio' />  
  <mac address='52:54:90:21:18:02' />  
</interface>
```

Shut down the vm and start it again

```
virsh shutdown b12902118-1
virsh start b12902118-1
```

On the vm, check the added interface name:

```
ip a
```

It shows

```
3: enp8s0: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether 52:54:90:21:18:02 brd ff:ff:ff:ff:ff:ff
```

Then request a DHCP lease

```
dhclient enp8s0
```

Then change the default route

```
ip route del default
ip route add default via 10.0.2.2 dev enp8s0
```

### 3

1. Go to the web page of proxmox.
2. On the left sidebar, expand Datacenter and click b12902118-1.
3. For this node, click Network.
4. Click the vmbr0 interface > Edit and remove the gateway.
5. Click OK.
6. Click Create > Linux Bridge:
  - Name: vmbr1
  - IPv4/CIDR: 10.0.2.15/24
  - Gateway (IPv4): 10.0.2.2
  - Bridge ports: enp8s0
7. Others can be left blank, and then click Apply Configuration.

### 4

1. Download the iso file from /tmp2/rabhunter/hw7/alpine.iso and then upload to proxmox
2. On the left sidebar: Datacenter > b12902118-1 > local (b12902118-1)

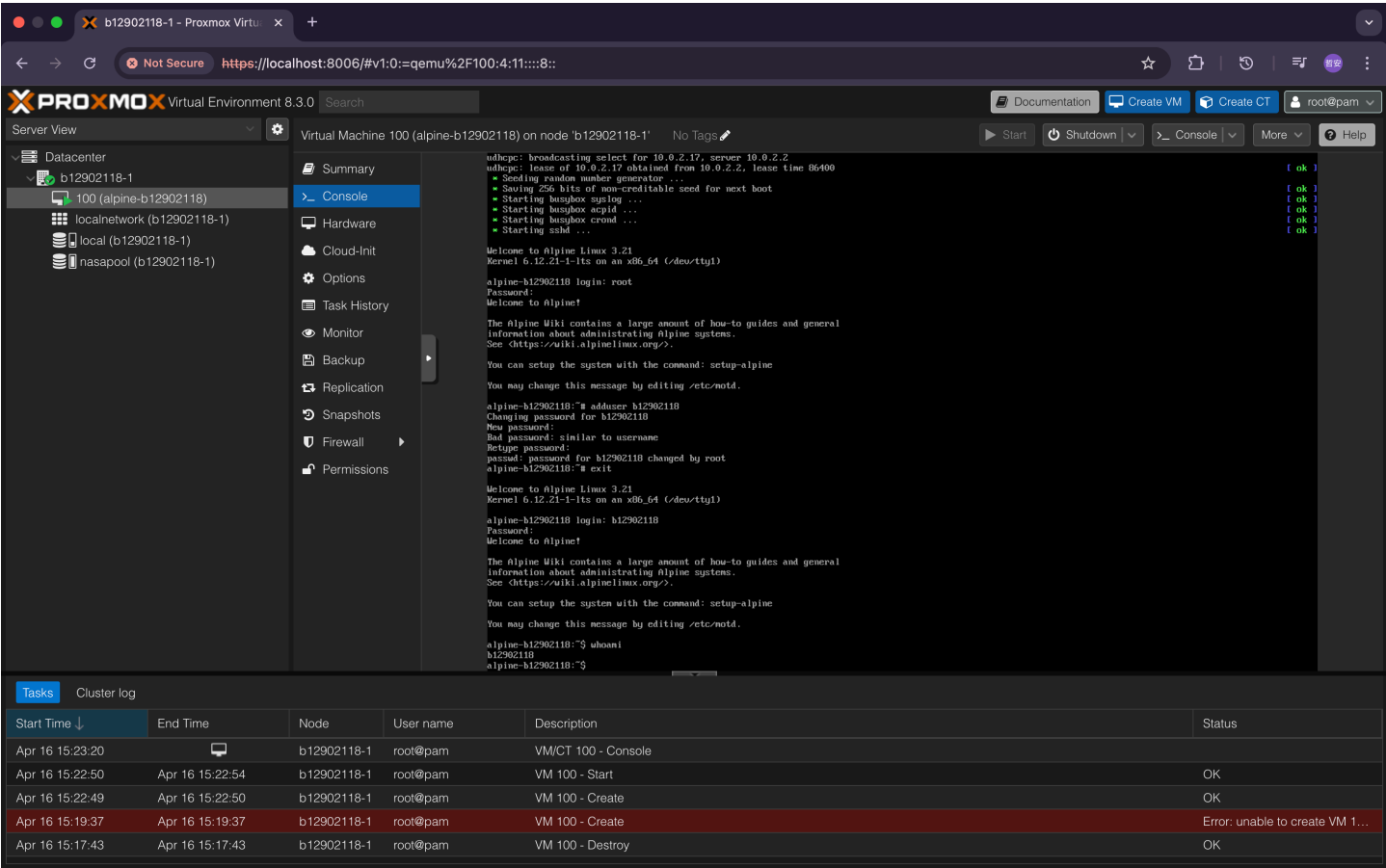
3. Click ISO images
4. Click upload
5. Choose the downloaded iso
6. Click Create VM
7. Enter alpine-b12902118 for the Name
8. Choose the uploaded iso image
9. Choose nasapool for storage
10. Disk size 18 GiB
11. Choose vmbr1 for bridge
12. Others can be left as default, and then click Check Start after created
13. After starting alpine, login as root
14. Run setup-alpine
  - keyboard layout: us
  - keyboard variant: us
  - Hostname: alpine-b12902118
15. Set up root password
  - Timezone Asia, Taipei
  - Select disk sda for install
  - Use sys mode

Others can be left as default, and then reboot

## 5

```
adduser b12902118
```

set up a password



References

- B12902116 (林靖昀)
- B12902066 (宋和峻)
- [https://pve.proxmox.com/wiki/Cluster\\_Manager](https://pve.proxmox.com/wiki/Cluster_Manager)
- [https://pve.proxmox.com/wiki/QEMU/KVM\\_Virtual\\_Machines#qm\\_migration](https://pve.proxmox.com/wiki/QEMU/KVM_Virtual_Machines#qm_migration)
- <https://pve.proxmox.com/pve-docs/chapter-ha-manager.html>

Create two virtual disk files

```
qemu-img create -f qcow2 proxmox2.qcow2 10G
qemu-img create -f qcow2 proxmox3.qcow2 20G
```

Install the vm



```
virt-install --name b12902118-2 \  
  --vcpus 2 \  
  --ram 8192 \  
  --disk proxmox2.qcow2,format=qcow2 \  
  --network bridge=br0,mac=52:54:90:21:18:03,model=virtio \  
  --cdrom=proxmox.iso \  
  --os-variant debian11 \  
  --boot useserial=on \  
  --graphics vnc \  
  --noautoconsole
```

And then see which port it is using:

```
virsh vncdisplay b12902118-2
```

It showed:

```
127.0.0.1:2
```

On local computer, create an ssh tunnel:

```
ssh -NL 5902:localhost:5902 b12902118@140.112.91.3
```

On local computer, use vnc viewer to connect to the vm to proceed with the installation. Basically stick with the defaults.

```
vncviewer localhost:5902
```

After finishing installation, edit the configuration file

```
virsh edit b12902118-2
```

Inside the `<devices>` , add a the following:

```
<disk type='file' device='disk'>
  <driver name='qemu' type='qcow2' />
  <source file='/tmp2/b12902118/nasa/HW7/proxmox3.qcow2' />
  <target dev='vdb' bus='virtio' />
</disk>
<interface type='user'>
  <model type='virtio' />
  <mac address='52:54:90:21:18:04' />
</interface>
```

Then start proxmox

```
virsh start b12902118-2
```

Connect through vnc viewer to see the ip and port the web page proxmox is hosting on

```
vncviewer localhost:5902
```

It showed

```
192.168.163.96:8006
```

Create an ssh tunnel

```
ssh -NL 8006:192.168.163.96:8006 b12902118@140.112.91.3
```

On the proxmox web page, go to Datacenter > b12902118-2

On this node, go to Disks > ZFS and click Create: ZFS

Click the disk /dev/vdb and enter name: nasapool

Others can be left as default, and click Create

On the left sidebar, click Network.

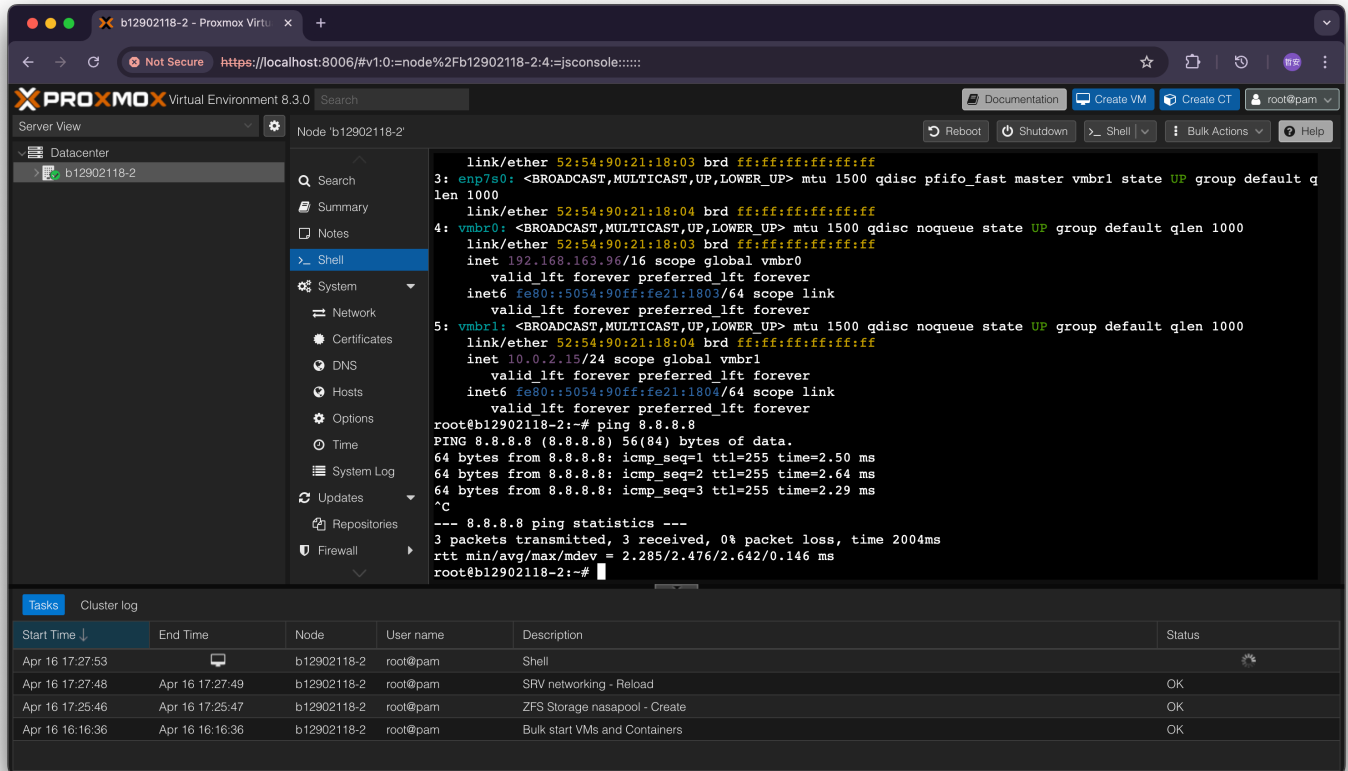
Click the vmbr0 interface > Edit and remove the gateway.

Click OK.

Click Create > Linux Bridge:

- Name: vmbr1
- IPv4/CIDR: 10.0.2.15/24
- Gateway (IPv4): 10.0.2.2
- Bridge ports: enp7s0

Others can be left blank.  
Click Apply Configuration.



### 3

To connect to the web gui's of both proxmoxes, create the ssh tunnels must use different ports.  
Stop previous tunnels and use these:

```
ssh -NL 8006:192.168.163.93:8006 b12902118@140.112.91.3
ssh -NL 8007:192.168.163.96:8006 b12902118@140.112.91.3
```

Then, log in to pve1 and pve2 via ssh.  
On pve1, create a cluster

```
pvecm create cluster-118
```

On pve2, join the cluster

```
pvecm add 192.168.163.93
```

The screenshot shows the Proxmox VE 8.3.0 web interface. The left sidebar displays the 'Datacenter (cluster-118)' tree with nodes b12902118-1 and b12902118-2. The main panel shows a search results table for 'b12902118-1'. The bottom panel displays a 'Tasks' log with entries for cluster operations.

Type	Description	Disk usage...	Memory us...	CPU usage	Uptime	Host CPU ...	Host Mem...	Tags
node	b12902118-1	36.4 %	21.8 %	4.8% of 2 ...	1 day 06:12:13			
node	b12902118-2	33.3 %	15.7 %	2.1% of 2 ...	1 day 01:16:23			
qemu	100 (alpine-b12902118)	0.0 %	4.8 %	3.1% of 2 ...	1 day 02:09:45	3.1% of 2 ...	1.2 %	
sdn	localnetwork (b12902118-1)				-			
sdn	localnetwork (b12902118-2)				-			
storage	local (b12902118-1)	36.4 %			-			
storage	nasapool (b12902118-1)	96.8 %			-			
storage	local (b12902118-2)	33.3 %			-			

Start Time	End Time	Node	User name	Description	Status
Apr 17 17:23:25	Apr 17 17:23:51	b12902118-2	root@pam	Join Cluster	OK
Apr 17 17:19:09	Apr 17 17:19:11	b12902118-1	root@pam	Create Cluster	OK
Apr 17 05:31:40	Apr 17 05:31:42	b12902118-1	root@pam	Update package database	Error: command 'apt-get up...
Apr 17 04:05:21	Apr 17 04:05:24	b12902118-2	root@pam	Update package database	Error: command 'apt-get up...
Apr 16 17:27:53	Apr 16 17:38:43	b12902118-2	root@pam	Shell	OK

## 4

1. Remove the iso file first. Go to Datacenter (cluster-118) > b12902118-1 > local (b12902118-1)
2. Click ISO Images and then click alpine.iso
3. Click remove
4. Then go to Datacenter (cluster-118) > b12902118-1 > 100 (alpine-b12902118)
5. Click Hardware
6. Click CD/DVD Drive (ide2)
7. Click Remove
8. Click Yes

On pve1, migrate the alpine to pve2

```
qm migrate 100 b12902118-2 --online --with-local-disks
```

The screenshot displays the Proxmox Virtual Environment (VE) 8.3.0 interface. The left sidebar shows the server view with a tree structure of nodes and VMs. The main panel shows the console output for VM 100, which is currently being migrated from node b12902118-2 to node b12902118-1. The console output shows the migration progress, including data transfer rates and completion status.

```

drive-scsi0: transferred 15.6 GiB of 18.0 GiB (86.40%) in 47s
drive-scsi0: transferred 15.9 GiB of 18.0 GiB (88.35%) in 48s
drive-scsi0: transferred 16.2 GiB of 18.0 GiB (90.16%) in 49s
drive-scsi0: transferred 16.6 GiB of 18.0 GiB (92.31%) in 50s
drive-scsi0: transferred 17.1 GiB of 18.0 GiB (94.82%) in 51s
drive-scsi0: transferred 17.5 GiB of 18.0 GiB (97.38%) in 52s
drive-scsi0: transferred 17.9 GiB of 18.0 GiB (99.39%) in 53s
drive-scsi0: transferred 17.9 GiB of 18.0 GiB (99.48%) in 54s
drive-scsi0: transferred 18.0 GiB of 18.0 GiB (100.00%) in 55s
drive-scsi0: transferred 18.0 GiB of 18.0 GiB (100.00%) in 56s
drive-scsi0: transferred 18.0 GiB of 18.0 GiB (100.00%) in 57s, ready
all 'mirror' jobs are ready
2025-04-18 15:30:09 switching mirror jobs to actively synced mode
drive-scsi0: switching to actively synced mode
drive-scsi0: successfully switched to actively synced mode
2025-04-18 15:30:10 starting online/live migration on unix:/run/qemu-server/100.migrate
2025-04-18 15:30:10 set migration capabilities
2025-04-18 15:30:10 migration downtime limit: 100 ms
2025-04-18 15:30:10 migration cachesize: 256.0 MiB
2025-04-18 15:30:10 set migration parameters
2025-04-18 15:30:10 start migrate command to unix:/run/qemu-server/100.migrate
2025-04-18 15:30:12 average migration speed: 1.0 GiB/s - downtime 1024 ms
2025-04-18 15:30:12 migration status: completed
all 'mirror' jobs are ready
drive-scsi0: Completing block job...
drive-scsi0: Completed successfully.
drive-scsi0: mirror-job finished
2025-04-18 15:30:14 stopping NBD storage migration server on target.
2025-04-18 15:30:20 migration finished successfully (duration 00:01:13)
root@b12902118-1:~#

```

The bottom section of the interface shows a table of tasks, including the migration of VM 100.

Start Time	End Time	Node	User name	Description	Status
Apr 18 15:29:03		b12902118-1	root@pam	Shell	
Apr 18 15:29:09	Apr 18 15:29:11	b12902118-2	root@pam	VM 100 - Start	OK
Apr 18 15:29:07	Apr 18 15:30:20	b12902118-1	root@pam	VM 100 - Migrate	OK
Apr 18 15:28:55	Apr 18 15:29:03	b12902118-1	root@pam	VM/CT 100 - Console	OK
Apr 18 15:28:51	Apr 18 15:28:53	b12902118-1	root@pam	Shell	OK

## 5

1. Go to Datacenter (cluster-118) > b12902118-2 > 100 (alpine-b12902118)
2. Click Replication
3. Click Add
4. Set Target: b12902118-1
5. Set Schedule: Every 30 minutes
6. Others can be left as default, and then click Create

The screenshot shows the Proxmox VE 8.3.0 web interface. The left sidebar displays a tree view of the datacenter (cluster-118) with nodes b12902118-1 and b12902118-2. The main content area shows the 'Replication' tab for VM 100 (alpine-b12902118) on node 'b12902118-2'. The replication table shows a single entry with status 'OK'. The bottom task log shows several tasks, including VM/CT 100 - Console and VM 100 - Migrate, all with status 'OK'.

Enabled	Guest	Job	Target	Status	Last Sync	Dur...	Next Sync	Sched...	Comment
✓	100	0	b12902118-1	✓ OK	-	-	pending	*30	

Start Time ↓	End Time	Node	User name	Description	Status
Apr 18 15:33:07	Apr 18 15:33:09	b12902118-1	root@pam	VM/CT 100 - Console	OK
Apr 18 15:29:09	Apr 18 15:29:11	b12902118-2	root@pam	VM 100 - Start	OK
Apr 18 15:29:07	Apr 18 15:30:20	b12902118-1	root@pam	VM 100 - Migrate	OK
Apr 18 15:29:03	Apr 18 15:33:07	b12902118-1	root@pam	Shell	OK
Apr 18 15:28:55	Apr 18 15:29:03	b12902118-1	root@pam	VM/CT 100 - Console	OK

## 6

1. Go to Datacenter (cluster-118)
2. Click HA
3. Click Groups
4. Click Create
5. Set ID: group-b12902118
6. Check both nodes: b12902118-1, b12902118-2
7. Others can be left as default, and then click Create

Proxmox VE 8.3.0 Virtual Environment

Server View | Datacenter

Groups configuration for group-b12902118:

Group	restricted	nofailback	Nodes	Comment
group-b12902118	No	No	b12902118-1,b12902118-2	

Tasks | Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Apr 18 15:41:48	Apr 18 15:45:28	b12902118-1	root@pam	Shell	OK
Apr 18 15:33:07	Apr 18 15:33:09	b12902118-1	root@pam	VM/CT 100 - Console	OK
Apr 18 15:29:09	Apr 18 15:29:11	b12902118-2	root@pam	VM 100 - Start	OK
Apr 18 15:29:07	Apr 18 15:30:20	b12902118-1	root@pam	VM 100 - Migrate	OK
Apr 18 15:29:03	Apr 18 15:33:07	b12902118-1	root@pam	Shell	OK

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1. Go to Datacenter (cluster-118) > b12902118-2 > 100 (alpine-b12902118)
2. Click More
3. Click Manage HA
4. Set Group: group-b12902118
5. Others can be left as default, and then click Create

QEMU/KVM Virtual Machines

b12902118-1 - Proxmox Virtu

Not Securehttps://localhost:8006/#v1:0:=qemu%2F100:4:4:=contentiso:::7::47

PROXMOX

Virtual Environment 8.3.0

Search

Documentation

Create VM

Create CT

root@pam

Server View

Virtual Machine 100 (alpine-b12902118) on node 'b12902118-2'

No Tags

Start

Shutdown

Migrate

Console

More

Help

Datcenter (cluster-118)

b12902118-1

localnetwork (b12902118-1)

local (b12902118-1)

nasapool (b12902118-1)

b12902118-2

100 (alpine-b12902118)

localnetwork (b12902118-2)

local (b12902118-2)

nasapool (b12902118-2)

Summary

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Disk Action

Revert

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BIOS

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Machine

SCSI Controller

Hard Disk (scsi0)

Network Device (net0)

2.00 GiB

2 (1 sockets, 2 cores) [x86-64-v2-AES]

Default (SeaBIOS)

Default

Default (i440fx)

VirtualIO SCSI single

nasapool:vm-100-disk-0,format=raw,ioread=1,size=18G

virtio=BC:24:11:22:0E:5E,bridge=vmb1,firewall=1

VM: 100

Group: group-b12902118

Max. Restart: 1

Request State: started

Max. Relocate: 1

Comment:

At least three quorum votes are recommended for reliable HA.

Help

OK

Tasks

Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Apr 18 15:41:48	Apr 18 15:45:28	b12902118-1	root@pam	Shell	OK
Apr 18 15:33:07	Apr 18 15:33:09	b12902118-1	root@pam	VM/CT 100 - Console	OK
Apr 18 15:29:09	Apr 18 15:29:11	b12902118-2	root@pam	VM 100 - Start	OK
Apr 18 15:29:07	Apr 18 15:30:20	b12902118-1	root@pam	VM 100 - Migrate	OK
Apr 18 15:29:03	Apr 18 15:33:07	b12902118-1	root@pam	Shell	OK