

Prototype

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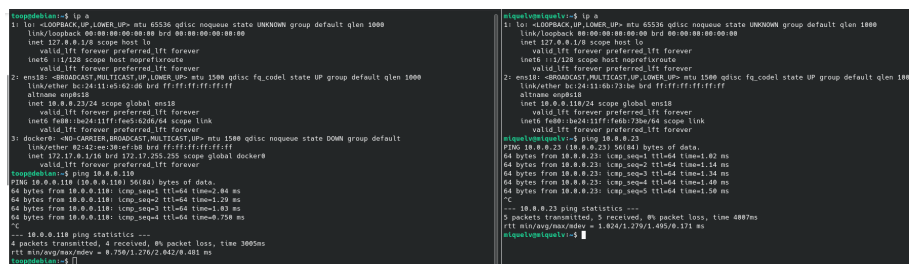
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1 Introduction

Ce document regroupe un total de **n** captures d'écran accompagnées d'explications détaillées.

2 Communication entre deux VM

L'image ci-dessous illustre un ping entre la machine virtuelle de Toni et celle de Vianney, qui ne se trouvent pas sur le même hyperviseur.



The image displays two terminal windows side-by-side. The left window, titled 'sageohlan1-4 10.0', shows the configuration of a network interface 'lo' with IP 127.0.0.1 and a bridge 'veth' with IP 10.0.0.1. It also shows the configuration of a network interface 'veth' with IP 10.0.0.1 and a bridge 'veth' with IP 10.0.0.1. The right window, titled 'sageohlan1-4 10.0', shows the configuration of a network interface 'lo' with IP 127.0.0.1 and a bridge 'veth' with IP 10.0.0.1. It also shows the configuration of a network interface 'veth' with IP 10.0.0.1 and a bridge 'veth' with IP 10.0.0.1. Both windows show the results of a ping command, indicating successful communication between the two VMs.

FIGURE 1 – Ping entre deux machines virtuelles sur des hyperviseurs distincts

3 Interfaces du routeur et sous-réseaux

Le routeur 10.0.0.1 est une machine virtuelle hébergée sur le proxmox de Vianney. L'image suivante montre les interfaces du routeur d'entrée dans chaque sous-réseau de l'infrastructure. On a donc le sous-réseau 10.0.10.X, 10.0.20.X, 10.0.30X et 10.0.40.X pour les utilisateurs, administrateurs, serveurs de fichiers et DMZ respectivement.

```
Virtual Machine 204 (VM 204) on node 'Proxmox:miquelv-214' No Tags
Summary
Console
Hardware
Cloud-Init
Options
Task History
Monitor
Backup
Replication
Snapshots
Firewall
Permissions

root@miquelv:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether bc:24:11:6b:73:be brd ff:ff:ff:ff:ff:ff
    altname enp0s18
    inet 10.0.0.1/24 scope global ens18
        valid_lft forever preferred_lft forever
    inet6 fe80::be24:11ff:feb7:3be/64 scope link
        valid_lft forever preferred_lft forever
3: eth0: <BROADCAST,NOARP,UP,LOWER_UP> mtu 1500 qdisc noqueue state UNKNOWN group default qlen 1000
    link/ether 5e:03:e4:15:33:17 brd ff:ff:ff:ff:ff:ff
    inet6 fe80::5e03:e4ff:fe15:3317/64 scope link
        valid_lft forever preferred_lft forever
4: ens19: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether bc:24:11:79:e7:d3 brd ff:ff:ff:ff:ff:ff
    altname enp0s19
    inet 192.168.42.11/24 scope global ens19
        valid_lft forever preferred_lft forever
    inet6 fe80::be24:11ff:fe79:e7d3/64 scope link
        valid_lft forever preferred_lft forever
9: ens18.10@ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether bc:24:11:6b:73:be brd ff:ff:ff:ff:ff:ff
    inet 10.0.10.1/24 brd 10.0.10.255 scope global ens18.10
        valid_lft forever preferred_lft forever
    inet6 fe80::be24:11ff:feb7:3be/64 scope link
        valid_lft forever preferred_lft forever
10: ens18.20@ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether bc:24:11:6b:73:be brd ff:ff:ff:ff:ff:ff
    inet 10.0.20.1/24 brd 10.0.20.255 scope global ens18.20
        valid_lft forever preferred_lft forever
    inet6 fe80::be24:11ff:feb7:3be/64 scope link
        valid_lft forever preferred_lft forever
11: ens18.30@ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether bc:24:11:6b:73:be brd ff:ff:ff:ff:ff:ff
    inet 10.0.30.1/24 brd 10.0.30.255 scope global ens18.30
        valid_lft forever preferred_lft forever
    inet6 fe80::be24:11ff:feb7:3be/64 scope link
        valid_lft forever preferred_lft forever
12: ens18.40@ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether bc:24:11:6b:73:be brd ff:ff:ff:ff:ff:ff
    inet 10.0.40.1/24 brd 10.0.40.255 scope global ens18.40
        valid_lft forever preferred_lft forever
    inet6 fe80::be24:11ff:feb7:3be/64 scope link
        valid_lft forever preferred_lft forever
root@miquelv:~#
```

FIGURE 2 – Interfaces du routeur

4 Accès à Internet

L'image suivante montre un ping du routeur vers google.com, prouvant qu'il peut accéder à internet. Suivi d'un ping vers une machine prototype du réseau, 10.0.0.23.

```

root@miquelv:~# ping google.com
PING google.com (172.217.19.46) 56(84) bytes of data.
64 bytes from ham02s11-in-f46.1e100.net (172.217.19.46): icmp_seq=1 ttl=110 time=6.93 ms
64 bytes from mrs08s03-in-f14.1e100.net (172.217.19.46): icmp_seq=2 ttl=110 time=6.97 ms
64 bytes from mrs08s03-in-f14.1e100.net (172.217.19.46): icmp_seq=3 ttl=110 time=7.16 ms
64 bytes from mrs08s03-in-f14.1e100.net (172.217.19.46): icmp_seq=4 ttl=110 time=6.98 ms
64 bytes from mrs08s03-in-f14.1e100.net (172.217.19.46): icmp_seq=5 ttl=110 time=7.03 ms
64 bytes from mrs08s03-in-f14.1e100.net (172.217.19.46): icmp_seq=6 ttl=110 time=7.18 ms
64 bytes from ham02s11-in-f46.1e100.net (172.217.19.46): icmp_seq=7 ttl=110 time=7.03 ms
^C
--- google.com ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6012ms
rtt min/avg/max/mdev = 6.927/7.040/7.178/0.088 ms
root@miquelv:~# ping 10.0.0.23
PING 10.0.0.23 (10.0.0.23) 56(84) bytes of data.
64 bytes from 10.0.0.23: icmp_seq=1 ttl=64 time=15.7 ms
64 bytes from 10.0.0.23: icmp_seq=2 ttl=64 time=3.33 ms
64 bytes from 10.0.0.23: icmp_seq=3 ttl=64 time=0.937 ms
64 bytes from 10.0.0.23: icmp_seq=4 ttl=64 time=1.34 ms
64 bytes from 10.0.0.23: icmp_seq=5 ttl=64 time=0.754 ms
64 bytes from 10.0.0.23: icmp_seq=6 ttl=64 time=1.19 ms

--- 10.0.0.23 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5009ms
rtt min/avg/max/mdev = 0.754/3.878/15.730/5.367 ms
root@miquelv:~# _

```

FIGURE 3 – Test de connexion Internet et réseau local

5 Configuration du VXLAN

Les images suivantes montrent la création et configuration d'un VXLAN qui nous permet de communiquer entre les VM.

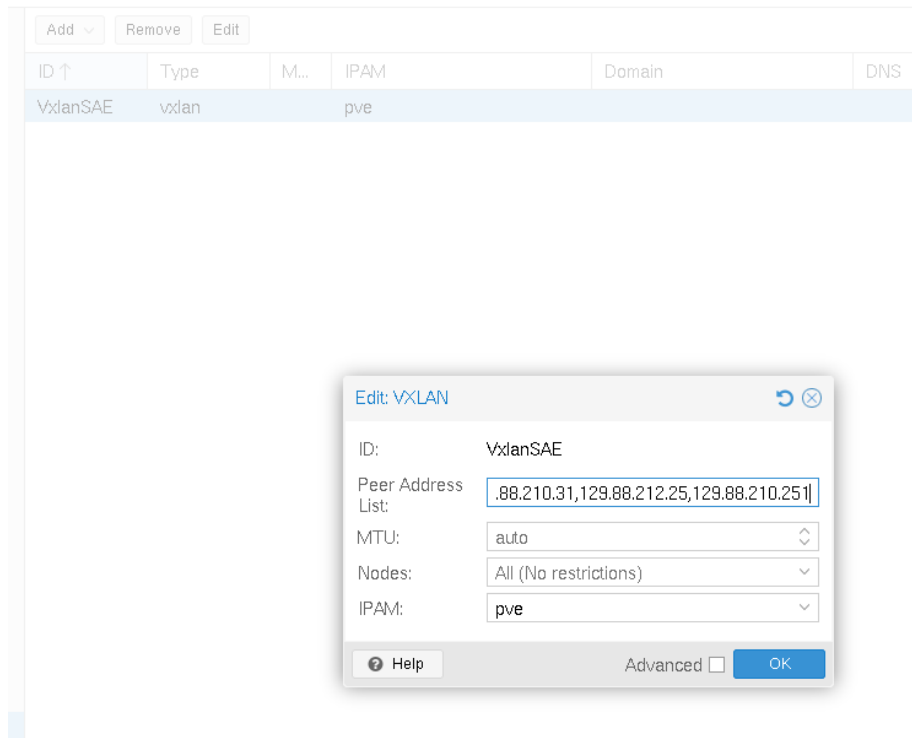


FIGURE 4 – Création de la zone VXLAN

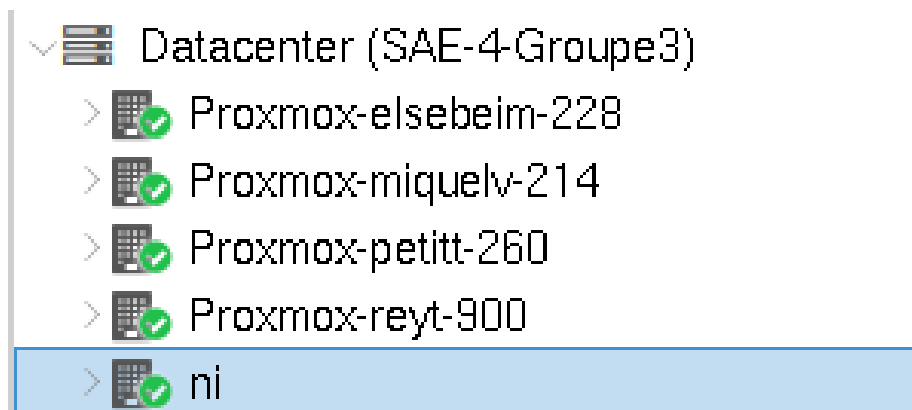


FIGURE 5 – Tous les proxmox sont dans le meme cluster

Zone 'VlanSAC' on node 'Proxmox-miqueiv-214' Help

Content	Vlans			Vlan Permissions		
Permissions	Vlan ↑	Alias	Status	Add ↓ Remove		
	1 (1 item)			User/Group/API Token	Role	Vlan ↑
	vxnet0		available			

FIGURE 6 – Configuration du sous-réseau vxnet0

Edit: Network Device ↺ ✕

Bridge:	vxnet0	Model:	VirtIO (paravirtualized)
VLAN Tag:	no VLAN	MAC address:	BC:24:11:E5:62:D6
Firewall:	<input type="checkbox"/>		

Help Advanced ☐ OK

FIGURE 7 – Ajout du bridge vxnet0 sur une machine virtuelle