

[RESEAU] Projet DHONT Florent - THOMAS Nicolas

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Projet - DHONT Florent - THOMAS Nicolas

Livrable intermédiaire

1. Configuration réseau.

Pour cette première itération nous avons eu beaucoup de mal à faire communiquer les 6 VMs. Nous y avons donc beaucoup passé de temps.

Chose faite nous sommes passés à l'installation des serveurs echo sur VM3 et VM3-6.

Pour lancer correctement echo il faut faire :

```
$ dhclient eth0
```

```
$ apt install inetutils-inetd
```

```
$ update-inetd --add "echo stream tcp6 nowait nobody internal"
```

```
$ service inetutils-inetd start
```

Ne pas oublier de faire

```
$ service inetutils-inetd status
```

et si on a active(excited) :

```
$ service inetutils-inetd restart
```

avant d'appliquer la configuration avec

```
$ salt-call state.apply
```

On peut ensuite tester avec

```
root@vm1:/home/m1reseaux# telnet fc00:1234:2::36 echo
```

```
Trying fc00:1234:2::36...
```

```
Connected to fc00:1234:2::36.
```

```
Escape character is '^]'.
```

```
bonjour
```

```
bonjour
```

```
salut
```

```
salut
```

Et

```
m1reseaux@vm1:~$ telnet fc00:1234:4::3 echo
```

```
Trying fc00:1234:4::3...
```

```
Connected to fc00:1234:4::3.
```

```
Escape character is '^]'.
```

bonjour

bonjour

N'ayant plus de temps pour la suite nous la ferons pour le prochain rendu.

Livrable final

Il est possible de faire que le serveur sur VM3 n'écoute que en IPv6 en modifiant le protocole dans les fichiers de configuration il faut ajouter 6 au nom du protocole tel que 'tcp6'

1.2. Un grand malheur !

Tout ceci est bien embêtant..

2. L'interface virtuelle TUN

On créer un script shell :

```
#!/bin/bash

ip -6 link set tun0 up
ip -6 addr add fc00:1234:ffff::1/64 dev tun0
```

On modifie alors également tunalloc.c qui devient :

```
#include <stdlib.h>
#include <stdio.h>
#include <string.h>
#include <sys/socket.h>
#include <sys/stat.h>
#include <sys/ioctl.h>

#include <unistd.h>
#include <fcntl.h>
#include <linux/if.h>
#include <linux/if_tun.h>

int tun_alloc(char *dev)
{
    struct ifreq ifr;
    int fd, err;

    if( (fd = open("/dev/net/tun", O_RDWR)) < 0 ){
        perror("alloc tun");
        exit(-1);
    }

    memset(&ifr, 0, sizeof(ifr));

    /* Flags: IFF_TUN - TUN device (no Ethernet headers)
```

```

* IFF_TAP - TAP device
*
* IFF_NO_PI - Do not provide packet information
*/
ifr.ifr_flags = IFF_TUN;
if( *dev )
strncpy(ifr.ifr_name, dev, IFNAMSIZ);

if( (err = ioctl(fd, TUNSETIFF, (void *) &ifr)) < 0 ){
close(fd);
return err;
}
strcpy(dev, ifr.ifr_name);
return fd;
}

int main (int argc, char** argv){

int tunfd;
printf("Création de %s\n",argv[1]);
tunfd = tun_alloc(argv[1]);
printf("Faire la configuration de %s...\n",argv[1]);

system("bash /vagrant/configure-tun.sh");
system("ip route add fc00:1234:4::/64 via fc00:1234:ffff::10 dev tun0");

printf("Interface %s Configurée:\n",argv[1]);
system("ip addr");
printf("Appuyez sur une touche pour terminer\n");
getchar();

return 0;
}

```

Le script shell met donc bien le tunnel avec fc00:1234:ffff::1 et un masque de 64.
Il ajoute également la route

Il ne faut pas modifier les informations sur VM1 mais on modifie la route vers VM1-6
afin de rajouter :

On ajoute à VM1-6

```

ip route add fc00:1234:ffff::/64 via fc00:1234:3::1 dev eth2:
cmd:
- run

```

Pour l'instant il faudra rajouter manuellement

```

$ gcc -o ../../mnt/partage/tunalloc ../../mnt/partage/tunalloc.c
$ ../../mnt/partage/tunalloc tun0

```

Ce qui configurera bien les réseaux via les tunnels

Il faut faire de même pour VM3 et VM3-6.

Avec wireshark (sur VM1) lors du ping6 fc00:1234:ffff::1 on a depuis VM1-6 et VM1:

No. Time Source Destination Protocol Length Info

1 0.000000000 fe80::a00:27ff:fe5e:f04e fe80::a00:27ff:fe0f:7e4e ICMPv6 86 Neighbor Solicitation for fe80::a00:27ff:fe0f:7e4e from 08:00:27:5e:f0:4e

Frame 1: 86 bytes on wire (688 bits), 86 bytes captured (688 bits) on interface 3

Ethernet II, Src: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e), Dst: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e)

Internet Protocol Version 6, Src: fe80::a00:27ff:fe5e:f04e (fe80::a00:27ff:fe5e:f04e), Dst:

fe80::a00:27ff:fe0f:7e4e (fe80::a00:27ff:fe0f:7e4e)

Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

2 0.000033000 fe80::a00:27ff:fe0f:7e4e fe80::a00:27ff:fe5e:f04e ICMPv6 78 Neighbor Advertisement fe80::a00:27ff:fe0f:7e4e (sol)

Frame 2: 78 bytes on wire (624 bits), 78 bytes captured (624 bits) on interface 3

Ethernet II, Src: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e), Dst: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e)

Internet Protocol Version 6, Src: fe80::a00:27ff:fe0f:7e4e (fe80::a00:27ff:fe0f:7e4e), Dst:

fe80::a00:27ff:fe5e:f04e (fe80::a00:27ff:fe5e:f04e)

Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

3 286.007555000 fc00:1234:3::16 fc00:1234:ffff::1 ICMPv6 118 Echo (ping) request id=0x08e0, seq=1, hop limit=64 (reply in 4)

Frame 3: 118 bytes on wire (944 bits), 118 bytes captured (944 bits) on interface 3

Ethernet II, Src: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e), Dst: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e)

Internet Protocol Version 6, Src: fc00:1234:3::16 (fc00:1234:3::16), Dst: fc00:1234:ffff::1

(fc00:1234:ffff::1)

Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

4 286.007621000 fc00:1234:ffff::1 fc00:1234:3::16 ICMPv6 118 Echo (ping) reply id=0x08e0, seq=1, hop limit=64 (request in 3)

Frame 4: 118 bytes on wire (944 bits), 118 bytes captured (944 bits) on interface 3

Ethernet II, Src: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e), Dst: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e)

Internet Protocol Version 6, Src: fc00:1234:ffff::1 (fc00:1234:ffff::1), Dst: fc00:1234:3::16

(fc00:1234:3::16)

Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

5 287.009725000 fc00:1234:3::16 fc00:1234:ffff::1 ICMPv6 118 Echo (ping) request id=0x08e0, seq=2, hop limit=64 (reply in 6)

Frame 5: 118 bytes on wire (944 bits), 118 bytes captured (944 bits) on interface 3

Ethernet II, Src: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e), Dst: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e)

Internet Protocol Version 6, Src: fc00:1234:3::16 (fc00:1234:3::16), Dst: fc00:1234:ffff::1
(fc00:1234:ffff::1)

Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

6 287.009756000 fc00:1234:ffff::1 fc00:1234:3::16 ICMPv6 118 Echo (ping) reply id=0x08e0, seq=2, hop limit=64 (request in 5)

Frame 6: 118 bytes on wire (944 bits), 118 bytes captured (944 bits) on interface 3

Ethernet II, Src: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e), Dst: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e)

Internet Protocol Version 6, Src: fc00:1234:ffff::1 (fc00:1234:ffff::1), Dst: fc00:1234:3::16
(fc00:1234:3::16)

Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

7 288.008827000 fc00:1234:3::16 fc00:1234:ffff::1 ICMPv6 118 Echo (ping) request id=0x08e0, seq=3, hop limit=64 (reply in 8)

Frame 7: 118 bytes on wire (944 bits), 118 bytes captured (944 bits) on interface 3

Ethernet II, Src: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e), Dst: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e)

Internet Protocol Version 6, Src: fc00:1234:3::16 (fc00:1234:3::16), Dst: fc00:1234:ffff::1
(fc00:1234:ffff::1)

Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

8 288.008863000 fc00:1234:ffff::1 fc00:1234:3::16 ICMPv6 118 Echo (ping) reply id=0x08e0, seq=3, hop limit=64 (request in 7)

Frame 8: 118 bytes on wire (944 bits), 118 bytes captured (944 bits) on interface 3

Ethernet II, Src: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e), Dst: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e)

Internet Protocol Version 6, Src: fc00:1234:ffff::1 (fc00:1234:ffff::1), Dst: fc00:1234:3::16
(fc00:1234:3::16)

Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

9 289.008222000 fc00:1234:3::16 fc00:1234:ffff::1 ICMPv6 118 Echo (ping) request id=0x08e0, seq=4, hop limit=64 (reply in 10)

Frame 9: 118 bytes on wire (944 bits), 118 bytes captured (944 bits) on interface 3

Ethernet II, Src: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e), Dst: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e)

Internet Protocol Version 6, Src: fc00:1234:3::16 (fc00:1234:3::16), Dst: fc00:1234:ffff::1
(fc00:1234:ffff::1)

Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

10 289.008262000 fc00:1234:ffff::1 fc00:1234:3::16 ICMPv6 118 Echo (ping) reply id=0x08e0, seq=4, hop limit=64 (request in 9)

Frame 10: 118 bytes on wire (944 bits), 118 bytes captured (944 bits) on interface 3
 Ethernet II, Src: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e), Dst: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e)
 Internet Protocol Version 6, Src: fc00:1234:ffff::1 (fc00:1234:ffff::1), Dst: fc00:1234:3::16
 (fc00:1234:3::16)
 Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

11 291.010200000 fe80::a00:27ff:fe0f:7e4e fc00:1234:3::16 ICMPv6 86 Neighbor Solicitation for
 fc00:1234:3::16 from 08:00:27:0f:7e:4e

Frame 11: 86 bytes on wire (688 bits), 86 bytes captured (688 bits) on interface 3
 Ethernet II, Src: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e), Dst: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e)
 Internet Protocol Version 6, Src: fe80::a00:27ff:fe0f:7e4e (fe80::a00:27ff:fe0f:7e4e), Dst: fc00:1234:3::16
 (fc00:1234:3::16)
 Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

12 291.010723000 fc00:1234:3::16 fe80::a00:27ff:fe0f:7e4e ICMPv6 78 Neighbor Advertisement
 fc00:1234:3::16 (rtr, sol)

Frame 12: 78 bytes on wire (624 bits), 78 bytes captured (624 bits) on interface 3
 Ethernet II, Src: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e), Dst: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e)
 Internet Protocol Version 6, Src: fc00:1234:3::16 (fc00:1234:3::16), Dst: fe80::a00:27ff:fe0f:7e4e
 (fe80::a00:27ff:fe0f:7e4e)
 Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

13 296.017935000 fe80::a00:27ff:fe5e:f04e fe80::a00:27ff:fe0f:7e4e ICMPv6 86 Neighbor Solicitation for
 fe80::a00:27ff:fe0f:7e4e from 08:00:27:5e:f0:4e

Frame 13: 86 bytes on wire (688 bits), 86 bytes captured (688 bits) on interface 3
 Ethernet II, Src: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e), Dst: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e)
 Internet Protocol Version 6, Src: fe80::a00:27ff:fe5e:f04e (fe80::a00:27ff:fe5e:f04e), Dst:
 fe80::a00:27ff:fe0f:7e4e (fe80::a00:27ff:fe0f:7e4e)
 Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

14 296.018099000 fe80::a00:27ff:fe0f:7e4e fe80::a00:27ff:fe5e:f04e ICMPv6 78 Neighbor Advertisement
 fe80::a00:27ff:fe0f:7e4e (sol)

Frame 14: 78 bytes on wire (624 bits), 78 bytes captured (624 bits) on interface 3
 Ethernet II, Src: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e), Dst: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e)
 Internet Protocol Version 6, Src: fe80::a00:27ff:fe0f:7e4e (fe80::a00:27ff:fe0f:7e4e), Dst:
 fe80::a00:27ff:fe5e:f04e (fe80::a00:27ff:fe5e:f04e)
 Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

```
15 301.025981000 fe80::a00:27ff:fe0f:7e4e fe80::a00:27ff:fe5e:f04e ICMPv6 86 Neighbor Solicitation for
fe80::a00:27ff:fe5e:f04e from 08:00:27:0f:7e:4e
```

Frame 15: 86 bytes on wire (688 bits), 86 bytes captured (688 bits) on interface 3

Ethernet II, Src: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e), Dst: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e)

Internet Protocol Version 6, Src: fe80::a00:27ff:fe0f:7e4e (fe80::a00:27ff:fe0f:7e4e), Dst:

fe80::a00:27ff:fe5e:f04e (fe80::a00:27ff:fe5e:f04e)

Internet Control Message Protocol v6

No. Time Source Destination Protocol Length Info

```
16 301.026471000 fe80::a00:27ff:fe5e:f04e fe80::a00:27ff:fe0f:7e4e ICMPv6 78 Neighbor Advertisement
fe80::a00:27ff:fe5e:f04e (rtr, sol)
```

Frame 16: 78 bytes on wire (624 bits), 78 bytes captured (624 bits) on interface 3

Ethernet II, Src: CadmusCo_5e:f0:4e (08:00:27:5e:f0:4e), Dst: CadmusCo_0f:7e:4e (08:00:27:0f:7e:4e)

Internet Protocol Version 6, Src: fe80::a00:27ff:fe5e:f04e (fe80::a00:27ff:fe5e:f04e), Dst:

fe80::a00:27ff:fe0f:7e4e (fe80::a00:27ff:fe0f:7e4e)

Internet Control Message Protocol v6

Depuis VM1 et VM1-6 on a donc bien les packets qui sont transmis et les réponses. Ce n'est pas le cas depuis VM3 et VM3-6 ou nous ne recevons pas les packets.

Si on ping6 fc00:1234:ffff::10 depuis VM1 ou VM1-6 on a les packets qui sont bien transmis à fc00:1234:ffff::1 mais on a pas de réponse.

```
$ ../../mnt/partage/tunalloc tun0 | hexdump -C
```