



Réalisation du projet SAE 2.01 : Mise en place d'une infrastructure de réseau d'entreprise

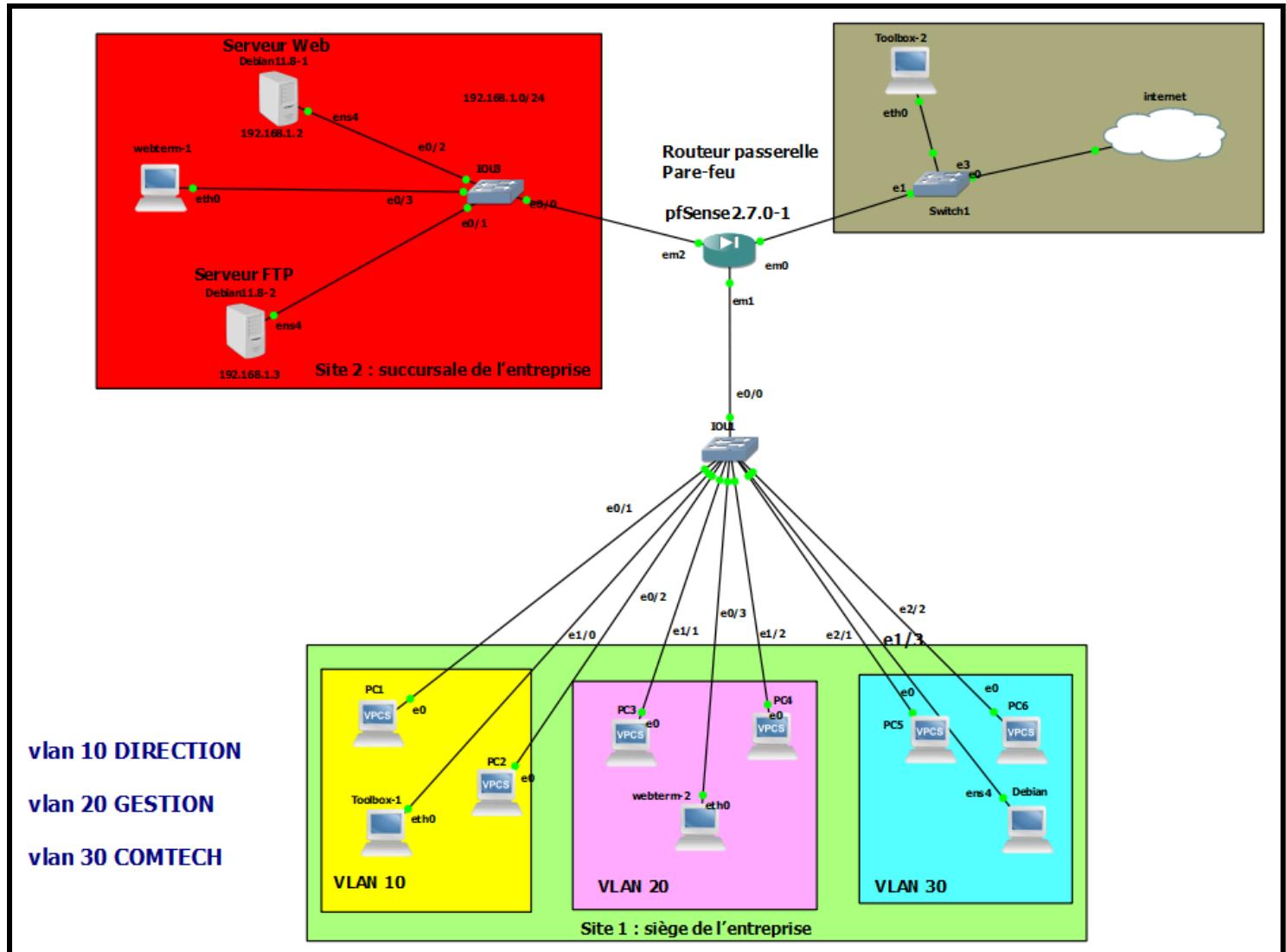
PROBLÉMATIQUE PROFESSIONNELLE :

Vous travaillez au sein d'une société de services du domaine du numérique.

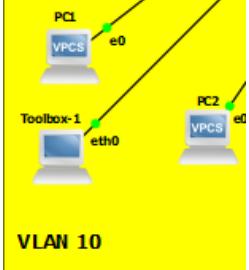
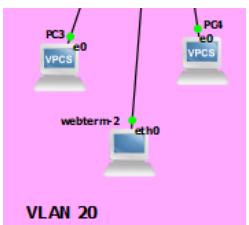
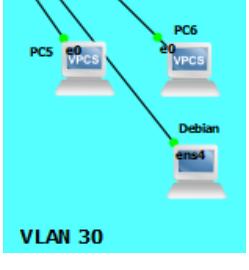
- Une entreprise passe une commande à votre société : Elle demande de déployer un réseau d'entreprise dans son nouveau siège.
- Votre mission consistera à :
 - Proposer et mettre en place une infrastructure de réseau d'entreprise dotée de services réseaux et de règles de sécurité ;
 - Mettre en place une DMZ pour héberger les serveurs publics de l'entreprise ;
 - Configurer l'accès à Internet ;
 - Mettre en place des règles de sécurité ;

- Produire une documentation technique sur la solution déployée.

Maquette du réseau de l'entreprise :



Étape 1 : Élaboration du plan d'adressage IPv4 :

| Périphérique | interface | adresse ip | Masque | passerelle |
|--------------|---|--------------------------|---------------|--------------|
| serveur ftp | ens4 | 192.168.1.3 | 255.255.255.0 | 192.168.1.1 |
| serveur web | ens4 | 192.168.1.2 | 255.255.255.0 | 192.168.1.1 |
| pfSense | em0 | 192.168.122.19 (dhcp) | 255.255.255.0 | |
| | em1 | | | |
| | em1.10 | 192.168.10.1 | 255.255.255.0 | |
| | em1.20 | 192.168.20.1 | 255.255.255.0 | |
| | em1.30 | 192.168.30.1 | 255.255.255.0 | |
| | em2 | 192.168.1.1 | 255.255.255.0 | |
| vlan 10 |  | 192.168.10.10-100(dhcp) | 255.255.255.0 | 192.168.10.1 |
| vlan 20 |  | 192.168.20.10-100(dhcp) | 255.255.255.0 | 192.168.20.1 |
| vlan 30 |  | 192.168.30.10-100(dhcp) | 255.255.255.0 | 192.168.30.1 |

Étape 2 : création d'un réseau segmenté avec la mise en place et la configuration des VLAN et Mise en place et configuration du routage inter-VLAN .

```
configure terminal
vlan 10
 name Direction
no shut
int vlan 10
no shut
exit

vlan 20
 name Gestion
no shut
int vlan 20
no shut
exit

vlan 30
 name COMTECH
no shut
int vlan 30
no shut
exit

interface eth0/0
switchport trunk encapsulation dot1q
switchport mode trunk
no shut
exit

interface range eth0/1-3
switchport mode access
switchport access vlan 10
no shut
exit

interface range eth1/0-3
switchport mode access
switchport access vlan 20
no shut
exit

interface range eth2/0-3
switchport mode access
switchport access vlan 30
no shut
end
wr
```

Configuration du switch

```
IOU2#show vlan br

VLAN Name          Status    Ports
----  -----
1    default        active    Et3/0, Et3/1, Et3/2, Et3/3
10   Direction      active    Et0/1, Et0/2, Et0/3
20   Gestion         active    Et1/0, Et1/1, Et1/2, Et1/3
30   COMTECH        active    Et2/0, Et2/1, Et2/2, Et2/3
1002 fddi-default  act/unsup
1003 token-ring-default  act/unsup
1004 fddinet-default  act/unsup
1005 trnet-default   act/unsup
IOU2# 

IOU2#sh ip int br
Interface      IP-Address  OK? Method Status      Protocol
Ethernet0/0    unassigned  YES unset  up           up
Ethernet0/1    unassigned  YES unset  up           up
Ethernet0/2    unassigned  YES unset  up           up
Ethernet0/3    unassigned  YES unset  up           up
Ethernet1/0    unassigned  YES unset  up           up
Ethernet1/1    unassigned  YES unset  up           up
Ethernet1/2    unassigned  YES unset  up           up
Ethernet1/3    unassigned  YES unset  up           up
Ethernet2/0    unassigned  YES unset  up           up
Ethernet2/1    unassigned  YES unset  up           up
Ethernet2/2    unassigned  YES unset  up           up
Ethernet2/3    unassigned  YES unset  up           up
Ethernet3/0    unassigned  YES unset  up           up
Ethernet3/1    unassigned  YES unset  up           up
Ethernet3/2    unassigned  YES unset  up           up
Ethernet3/3    unassigned  YES unset  up           up
Vlan1          unassigned  YES unset  up           up
Vlan10         unassigned  YES unset  up           up
Vlan20         unassigned  YES unset  up           up
Vlan30         unassigned  YES unset  up           up
IOU2# 

IOU2#show int trunk

Port      Mode          Encapsulation  Status      Native vlan
Et0/0    on            802.1q        trunking    1

Port      Vlans allowed on trunk
Et0/0    1-4094

Port      Vlans allowed and active in management domain
Et0/0    1,10,20,30

Port      Vlans in spanning tree forwarding state and not pruned
Et0/0    1,10,20,30
```

Configuration du pfSense

Attribution des vlans au port em1 (LAN)

The screenshot shows the pfSense 'Interfaces / VLANs' configuration page. The 'VLAN Interfaces' table lists three entries:

| Interface | VLAN tag | Priority | Description | Actions |
|-----------|----------|----------|-------------|---------|
| em1 (lan) | 10 | | | |
| em1 (lan) | 20 | | | |
| em1 (lan) | 30 | | | |

Création de l'interface Vlan 10-20-30

Interfaces / Interface Assignments

Interface Assignments Interface Groups Wireless VLANs QinQs PPPs GREs GIGs Bridges LAGGs

| Interface | Network port | |
|--------------------------|-------------------------|-----------------------|
| WAN | em0 (0c:39:cf:70:00:00) | ✓ |
| LAN | em1 (0c:39:cf:70:00:01) | ✓ Delete |
| dmz | em2 (0c:39:cf:70:00:02) | ✓ Delete |
| vlan10 | VLAN 10 on em1 - lan | ✓ Delete |
| vlan20 | VLAN 20 on em1 - lan | ✓ Delete |
| vlan30 | VLAN 30 on em1 - lan | ✓ Delete |
| Available network ports: | em3 (0c:39:cf:70:00:03) | ✓ Add |

Vérification des attribution des port

QEMU (pfSense2.7.0-1) - TightVNC Viewer

freeBSD/amd64 (pfSense.home.arpa) (ttyv0)

QEMU Guest - Netgate Device ID: 3ae45b5af40eba2a1276

*** Welcome to pfSense 2.7.0-RELEASE (amd64) on pfSense ***

| | | |
|---------------|-----------|--------------------------------|
| WAN (wan) | -> em0 | -> v4/DHCP4: 192.168.122.19/24 |
| LAN (lan) | -> em1 | -> |
| DMZ (opt1) | -> em2 | -> v4: 192.168.1.1/24 |
| VLAN10 (opt2) | -> em1.10 | -> v4: 192.168.10.1/24 |
| VLAN20 (opt3) | -> em1.20 | -> v4: 192.168.20.1/24 |
| VLAN30 (opt4) | -> em1.30 | -> v4: 192.168.30.1/24 |

0) Logout (SSH only) 9) pfTop
1) Assign Interfaces 10) Filter Logs
2) Set interface(s) IP address 11) Restart webConfigurator
3) Reset webConfigurator password 12) PHP shell + pfSense tools
4) Reset to factory defaults 13) Update from console
5) Reboot system 14) Enable Secure Shell (sshd)
6) Halt system 15) Restore recent configuration
7) Ping host 16) Restart PHP-FPM
8) Shell

Enter an option: ■

Ping du PC1(vlan1) au PC des autre vlan et serveur WEB et FTP :

```
PC1          PC2
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VPCS is free software, distributed under the terms of the "BS
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

VPCS> ip dhcp
DDORA IP 192.168.10.19/24 GW 192.168.10.1

VPCS> ping 192.168.10.20
84 bytes from 192.168.10.20 icmp_seq=1 ttl=64 time=1.066 ms
84 bytes from 192.168.10.20 icmp_seq=2 ttl=64 time=1.387 ms
84 bytes from 192.168.10.20 icmp_seq=3 ttl=64 time=1.221 ms
84 bytes from 192.168.10.20 icmp_seq=4 ttl=64 time=2.003 ms
84 bytes from 192.168.10.20 icmp_seq=5 ttl=64 time=2.791 ms

VPCS> ping 192.168.20.11
192.168.20.11 icmp_seq=1 timeout
192.168.20.11 icmp_seq=2 timeout
84 bytes from 192.168.20.11 icmp_seq=3 ttl=63 time=4.978 ms
84 bytes from 192.168.20.11 icmp_seq=4 ttl=63 time=2.536 ms
84 bytes from 192.168.20.11 icmp_seq=5 ttl=63 time=3.128 ms

VPCS> ping 192.168.20.18
192.168.20.18 icmp_seq=1 timeout
192.168.20.18 icmp_seq=2 timeout
84 bytes from 192.168.20.18 icmp_seq=3 ttl=63 time=25.336 ms
84 bytes from 192.168.20.18 icmp_seq=4 ttl=63 time=10.192 ms
84 bytes from 192.168.20.18 icmp_seq=5 ttl=63 time=3.690 ms

VPCS> ping 192.168.30.14
192.168.30.14 icmp_seq=1 timeout
192.168.30.14 icmp_seq=2 timeout
84 bytes from 192.168.30.14 icmp_seq=3 ttl=63 time=6.260 ms
84 bytes from 192.168.30.14 icmp_seq=4 ttl=63 time=3.201 ms
84 bytes from 192.168.30.14 icmp_seq=5 ttl=63 time=4.539 ms

VPCS> ping 192.168.30.15
192.168.30.15 icmp_seq=1 timeout
192.168.30.15 icmp_seq=2 timeout
84 bytes from 192.168.30.15 icmp_seq=3 ttl=63 time=11.613 ms
84 bytes from 192.168.30.15 icmp_seq=4 ttl=63 time=4.857 ms
84 bytes from 192.168.30.15 icmp_seq=5 ttl=63 time=5.783 ms

VPCS> ping 192.168.1.2
84 bytes from 192.168.1.2 icmp_seq=1 ttl=63 time=5.469 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=63 time=3.173 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=63 time=3.477 ms
84 bytes from 192.168.1.2 icmp_seq=4 ttl=63 time=4.893 ms
84 bytes from 192.168.1.2 icmp_seq=5 ttl=63 time=4.504 ms

VPCS> ping 192.168.1.3
84 bytes from 192.168.1.3 icmp_seq=1 ttl=63 time=6.739 ms
84 bytes from 192.168.1.3 icmp_seq=2 ttl=63 time=3.692 ms
84 bytes from 192.168.1.3 icmp_seq=3 ttl=63 time=6.358 ms
84 bytes from 192.168.1.3 icmp_seq=4 ttl=63 time=4.732 ms
84 bytes from 192.168.1.3 icmp_seq=5 ttl=63 time=2.820 ms
```

Ping du PC3(vlan2) au PC des autre vlan et serveur WEB et FTP :

The screenshot shows a Virtual PC Simulator interface. At the top, there are two host icons labeled "PC1" and "PC2". Below them is a network diagram with several nodes: a central "Router" node connected to "PC1", "PC2", and "PC3". "PC3" is also connected to a "Switch" node, which is further connected to "PC4", "PC5", and "PC6". A "Server" node is also connected to the "Switch". The "Server" node has an external connection labeled "External IP: 192.168.1.1".

```
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

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Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

VPCS> ip dhcp
DDORA IP 192.168.20.11/24 GW 192.168.20.1

VPCS> ping 192.168.10.19
84 bytes from 192.168.10.19 icmp_seq=1 ttl=63 time=5.317 ms
84 bytes from 192.168.10.19 icmp_seq=2 ttl=63 time=3.306 ms
84 bytes from 192.168.10.19 icmp_seq=3 ttl=63 time=19.859 ms

VPCS> ping 192.168.20.18
84 bytes from 192.168.20.18 icmp_seq=1 ttl=64 time=1.009 ms
84 bytes from 192.168.20.18 icmp_seq=2 ttl=64 time=4.153 ms
84 bytes from 192.168.20.18 icmp_seq=3 ttl=64 time=1.212 ms

VPCS> ping 192.168.30.14
84 bytes from 192.168.30.14 icmp_seq=1 ttl=63 time=5.723 ms
84 bytes from 192.168.30.14 icmp_seq=2 ttl=63 time=9.268 ms
84 bytes from 192.168.30.14 icmp_seq=3 ttl=63 time=3.307 ms

VPCS> ping 192.168.1.2
84 bytes from 192.168.1.2 icmp_seq=1 ttl=63 time=2.888 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=63 time=3.862 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=63 time=6.123 ms

VPCS> ping 192.168.1.3
84 bytes from 192.168.1.3 icmp_seq=1 ttl=63 time=7.627 ms
84 bytes from 192.168.1.3 icmp_seq=2 ttl=63 time=4.036 ms
84 bytes from 192.168.1.3 icmp_seq=3 ttl=63 time=3.035 ms

VPCS> 
```

Ping du PC5(vlan 3) au PC des autre vlan et serveur WEB et FTP :

```
VPCS> ip dhcp
DDORA IP 192.168.30.14/24 GW 192.168.30.1

VPCS> ping 192.168.10.19
84 bytes from 192.168.10.19 icmp_seq=1 ttl=63 time=4.671 ms
84 bytes from 192.168.10.19 icmp_seq=2 ttl=63 time=4.556 ms
84 bytes from 192.168.10.19 icmp_seq=3 ttl=63 time=3.874 ms

VPCS> ping 192.168.20.11
84 bytes from 192.168.20.11 icmp_seq=1 ttl=63 time=5.950 ms
84 bytes from 192.168.20.11 icmp_seq=2 ttl=63 time=4.212 ms
84 bytes from 192.168.20.11 icmp_seq=3 ttl=63 time=3.153 ms

VPCS> ping 192.168.30.15
84 bytes from 192.168.30.15 icmp_seq=1 ttl=64 time=1.221 ms
84 bytes from 192.168.30.15 icmp_seq=2 ttl=64 time=1.554 ms
84 bytes from 192.168.30.15 icmp_seq=3 ttl=64 time=3.758 ms

VPCS> ping 192.168.1.2
84 bytes from 192.168.1.2 icmp_seq=1 ttl=63 time=4.580 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=63 time=3.071 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=63 time=2.597 ms

VPCS> ping 192.168.1.3
84 bytes from 192.168.1.3 icmp_seq=1 ttl=63 time=5.712 ms
84 bytes from 192.168.1.3 icmp_seq=2 ttl=63 time=3.001 ms
84 bytes from 192.168.1.3 icmp_seq=3 ttl=63 time=5.529 ms
```

Etape 3 - installation et configurations des services DHCP, SSH, FTP et HTTP sur des serveurs (virtualisés) de l'infrastructure réseau -> prendre machine Debian 11.8

Configuration du **DHCP**(dans pfSense) :

The screenshot shows the pfSense web interface at 192.168.20.1/interfaces.php?if=opt2. The navigation bar is visible with tabs for System, Interfaces, Firewall, Services, VPN, Status, Diagnostics, and Help. The Services menu is open, and the DHCP Server option is selected. The main panel shows the configuration for the 'vlan10 (em1.10)' interface. Under General Configuration, the 'Enable' checkbox is checked. The 'Description' field is set to 'vlan10'. Under IPv4 Configuration, the 'Type' is set to 'Static IPv4'. Under MAC Address, the value is 'XX:XX:XX:XX:XX:XX'. A note at the bottom states: 'The MAC address of a VLAN interface must be set on its parent interface'. A warning message in a red box says: 'WARNING: The 'admin' account password is set to the default value. Please change it in the User Manager.'

Configuration de la plage d'adresse ip VLAN 10 192.168.10-100:

The screenshot shows the configuration of the DHCP server for the VLAN10 interface. The top navigation bar includes tabs for DMZ, VLAN10 (highlighted in yellow), VLAN20, and VLAN30. The main panel is titled 'General Options' for the VLAN10 interface. It includes fields for 'Enable' (checked), 'BOOTP' (unchecked), 'Deny unknown clients' (set to 'Allow all clients'), 'Ignore denied clients' (unchecked), 'Ignore client identifiers' (unchecked), 'Subnet' (192.168.10.0), 'Subnet mask' (255.255.255.0), 'Available range' (192.168.10.1 - 192.168.10.254), and 'Range' (From: 192.168.10.10, To: 192.168.10.100). A note below the subnet mask says: 'This option may be useful when a client can dual boot using different client identifiers but the same hardware (MAC) address. Note that the resulting server behavior violates the official DHCP specification.'

configuration de la plage d'adresse ip VLAN20 192.168.10-100:

DMZ VLAN10 **VLAN20** VLAN30

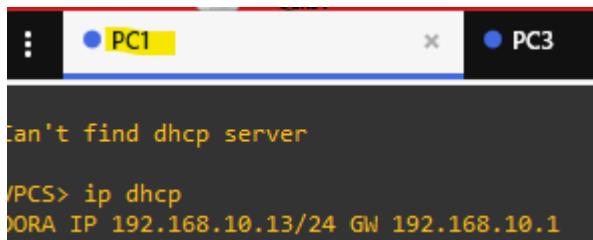
| General Options | |
|---|--|
| Enable | <input checked="" type="checkbox"/> Enable DHCP server on VLAN20 interface |
| BOOTP | <input type="checkbox"/> Ignore BOOTP queries |
| Deny unknown clients | Allow all clients |
| When set to Allow all clients , any DHCP client will get an IP address within this scope/range on this interface. If set to Allow known clients from any interface , any DHCP client with a MAC address listed in a static mapping on any scope(s)/interface(s) will get an IP address. If set to Allow known clients from only this interface , only MAC addresses listed in static mappings on this interface will get an IP address within this scope/range. | |
| Ignore denied clients | <input type="checkbox"/> Ignore denied clients rather than reject This option is not compatible with failover and cannot be enabled when a Failover Peer IP address is configured. |
| Ignore client identifiers | <input type="checkbox"/> Do not record a unique identifier (UID) in client lease data if present in the client DHCP request This option may be useful when a client can dual boot using different client identifiers but the same hardware (MAC) address. Note that the resulting server behavior violates the official DHCP specification. |
| Subnet | 192.168.20.0 |
| Subnet mask | 255.255.255.0 |
| Available range | 192.168.20.1 - 192.168.20.254 |
| Range | 192.168.20.10 From 192.168.20.100 To |

Configuration de la plage d'adresse ip VLAN 30 192.168.10-100:

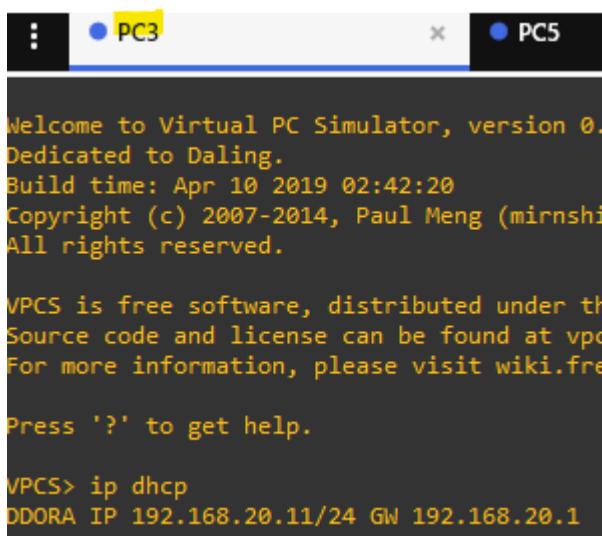
DMZ VLAN10 VLAN20 **VLAN30**

| General Options | |
|---|--|
| Enable | <input checked="" type="checkbox"/> Enable DHCP server on VLAN30 interface |
| BOOTP | <input type="checkbox"/> Ignore BOOTP queries |
| Deny unknown clients | Allow all clients |
| When set to Allow all clients , any DHCP client will get an IP address within this scope/range on this interface. If set to Allow known clients from any interface , any DHCP client with a MAC address listed in a static mapping on any scope(s)/interface(s) will get an IP address. If set to Allow known clients from only this interface , only MAC addresses listed in static mappings on this interface will get an IP address within this scope/range. | |
| Ignore denied clients | <input type="checkbox"/> Ignore denied clients rather than reject This option is not compatible with failover and cannot be enabled when a Failover Peer IP address is configured. |
| Ignore client identifiers | <input type="checkbox"/> Do not record a unique identifier (UID) in client lease data if present in the client DHCP request This option may be useful when a client can dual boot using different client identifiers but the same hardware (MAC) address. Note that the resulting server behavior violates the official DHCP specification. |
| Subnet | 192.168.30.0 |
| Subnet mask | 255.255.255.0 |
| Available range | 192.168.30.1 - 192.168.30.254 |
| Range | 192.168.30.10 From 192.168.30.100 To |

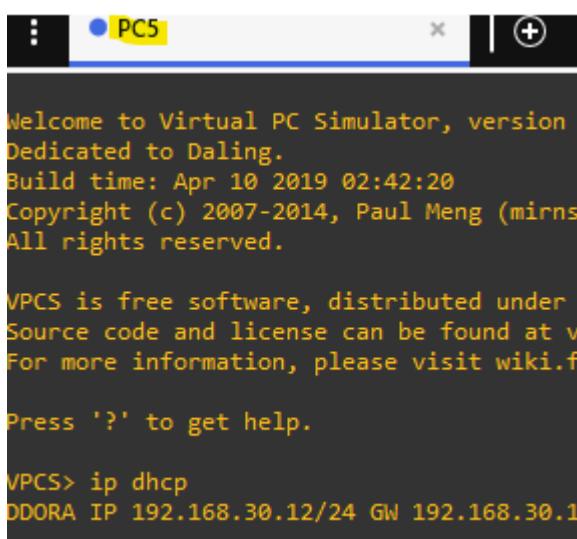
Test du **dhcp** sur les différents PCs de chaque Vlans : “ip dhcp”



```
PC1 : Can't find dhcp server  
VPCS> ip dhcp  
DDORA IP 192.168.10.13/24 GW 192.168.10.1
```

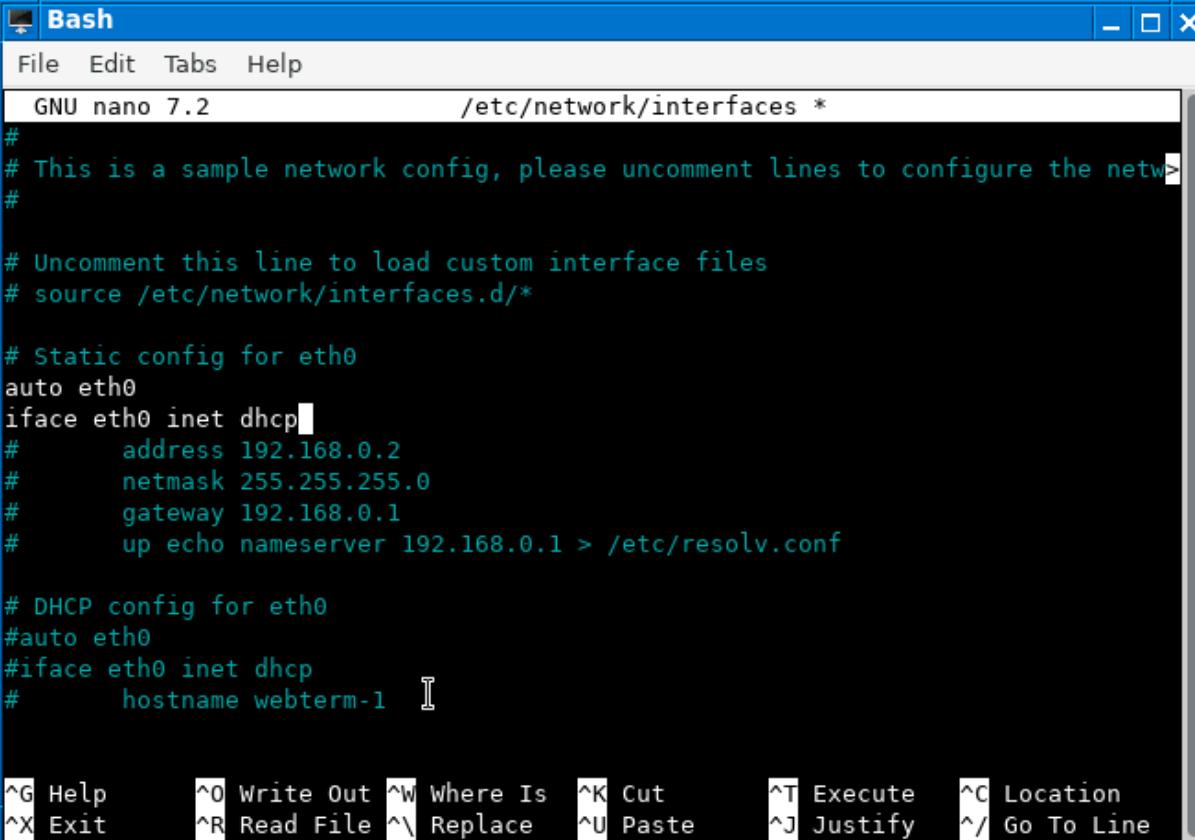


```
Welcome to Virtual PC Simulator, version 0.  
Dedicated to Daling.  
Build time: Apr 10 2019 02:42:20  
Copyright (c) 2007-2014, Paul Meng (mirnshi@163.com)  
All rights reserved.  
  
VPCS is free software, distributed under the terms of the  
Source code and license can be found at vpc.sourceforge.net  
For more information, please visit wiki.freecode.com  
  
Press '?' to get help.  
  
VPCS> ip dhcp  
DDORA IP 192.168.20.11/24 GW 192.168.20.1
```



```
Welcome to Virtual PC Simulator, version 0.  
Dedicated to Daling.  
Build time: Apr 10 2019 02:42:20  
Copyright (c) 2007-2014, Paul Meng (mirnshi@163.com)  
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VPCS is free software, distributed under the terms of the  
Source code and license can be found at vpc.sourceforge.net  
For more information, please visit wiki.freecode.com  
  
Press '?' to get help.  
  
VPCS> ip dhcp  
DDORA IP 192.168.30.12/24 GW 192.168.30.1
```

Activer le service **dhcp** sur un webterm(linux) :

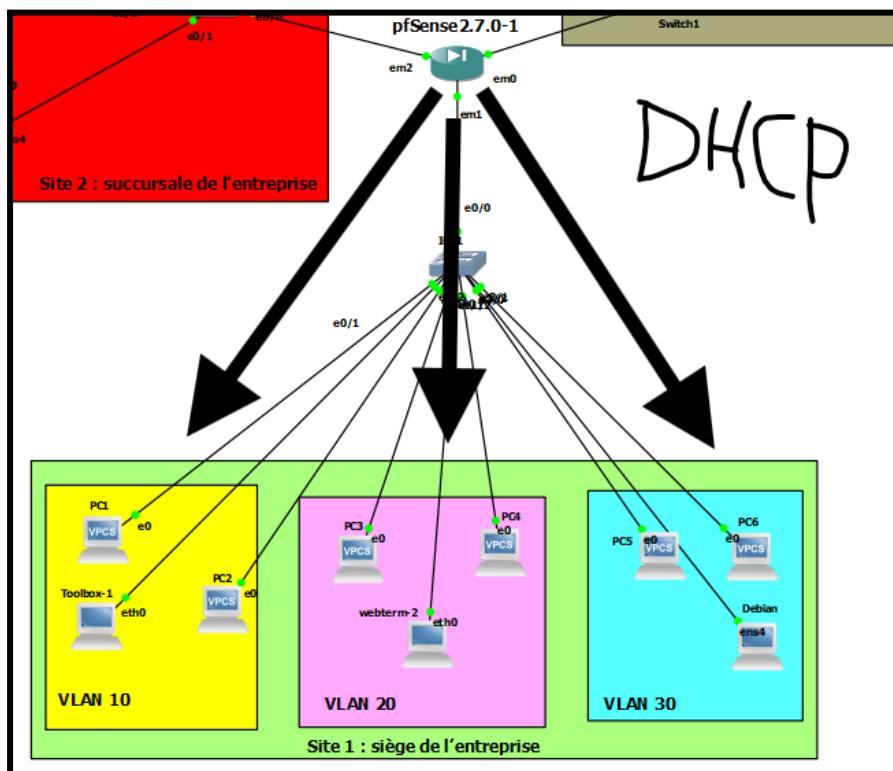


```
Bash
File Edit Tabs Help
GNU nano 7.2          /etc/network/interfaces *
#
# This is a sample network config, please uncomment lines to configure the network
#
# Uncomment this line to load custom interface files
# source /etc/network/interfaces.d/*
#
# Static config for eth0
auto eth0
iface eth0 inet dhcp
#       address 192.168.0.2
#       netmask 255.255.255.0
#       gateway 192.168.0.1
#       up echo nameserver 192.168.0.1 > /etc/resolv.conf

# DHCP config for eth0
#auto eth0
#iface eth0 inet dhcp
#       hostname webterm-1

^G Help      ^O Write Out  ^W Where Is   ^K Cut      ^T Execute   ^C Location
^X Exit     ^R Read File  ^\ Replace    ^U Paste    ^J Justify   ^/ Go To Line
```

Schema du service **dhcp** sur les vlans :



Test du SSH depuis un PC de la vlan 10 au serveur WEB :

```

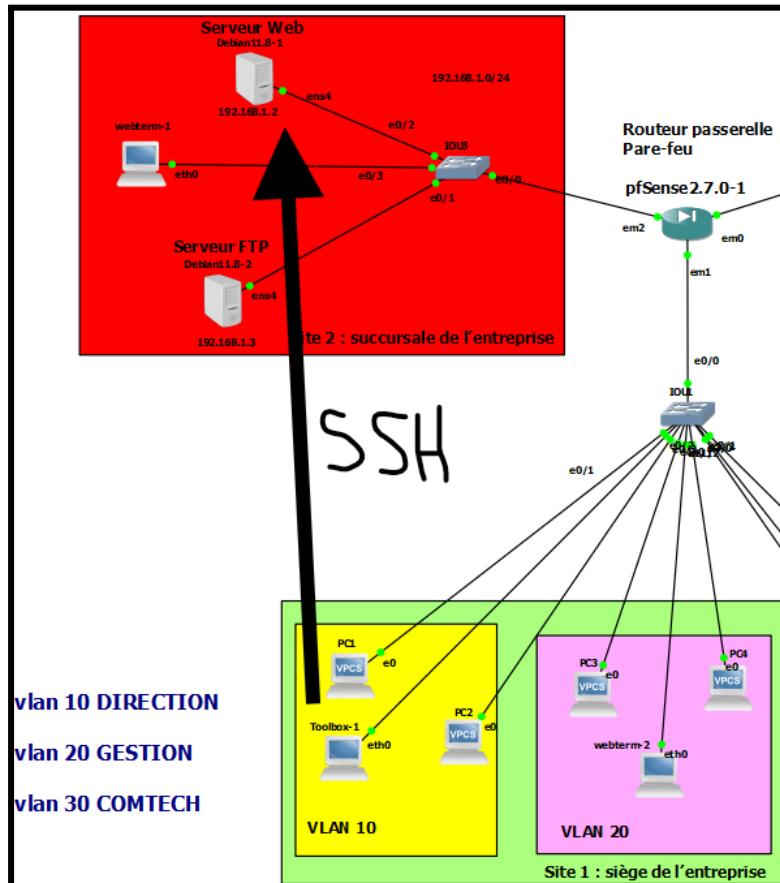
root@Toolbox-1:~# ip -c a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
41: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN group default qlen 1000
    link/ether 22:2a:05:cc:ec:10 brd ff:ff:ff:ff:ff:ff
    inet 192.168.10.17/24 brd 192.168.10.255 scope global eth0
        valid_lft forever preferred_lft forever
root@Toolbox-1:~# ssh debian@192.168.1.2
debian@192.168.1.2's password:
Linux debian 5.10.0-30-cloud-amd64 #1 SMP Debian 5.10.218-1 (2024-06-01) 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: Sun Jun 16 21:32:58 2024
debian@debian:~$ sudo -i
root@debian:~#

```

Schéma SSH :



Installation et configuration de **FTP** et de ses utilisateur :

- **sudo apt install vsftpd**

```
debian@debian:~$ sudo apt install vsftpd
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  vsftpd
0 upgraded, 1 newly installed, 0 to remove and 31 not upgraded.
Need to get 153 kB of archives.
After this operation, 358 kB of additional disk space will be used.
Get:1 http://deb.debian.org/debian bullseye/main amd64 vsftpd amd64 3.0.3-12+b1 [153 kB]
Fetched 153 kB in 0s (759 kB/s)
Preconfiguring packages ...
Selecting previously unselected package vsftpd.
(Reading database ... 22642 files and directories currently installed.)
Preparing to unpack .../vsftpd_3.0.3-12+b1_amd64.deb ...
Unpacking vsftpd (3.0.3-12+b1) ...
Setting up vsftpd (3.0.3-12+b1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/vsftpd.service → /lib/systemd/system/vsftpd.service.
Processing triggers for man-db (2.9.4-2) ...
debian@debian:~$
```

Création du dossier partagé share

```
debian@debian:~$ sudo mkdir -p /srv/ftp/share
debian@debian:~$ sudo chmod 777 /srv/ftp/share
```

Création d'utilisateur ftp1 et ftp2

```
debian@debian:~$ sudo adduser ftp1
Adding user `ftp1' ...
Adding new group `ftp1' (1004) ...
Adding new user `ftp1' (1004) with group `ftp1' ...
Creating home directory `/home/ftp1' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for ftp1
Enter the new value, or press ENTER for the default
      Full Name []:
      Room Number []:
      Work Phone []:
      Home Phone []:
      Other []
Is the information correct? [Y/n] y
debian@debian:~$
```

```
debian@debian:~$ sudo adduser ftp2
Adding user `ftp2' ...
Adding new group `ftp2' (1005) ...
Adding new user `ftp2' (1005) with group `ftp2' ...
Creating home directory `/home/ftp2' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for ftp2
Enter the new value, or press ENTER for the default
      Full Name []:
      Room Number []:
      Work Phone []:
      Home Phone []:
      Other []
Is the information correct? [Y/n] y
debian@debian:~$
```

ajout des utilisateurs aux groupe ftpaccess et commande pour donner les droits :

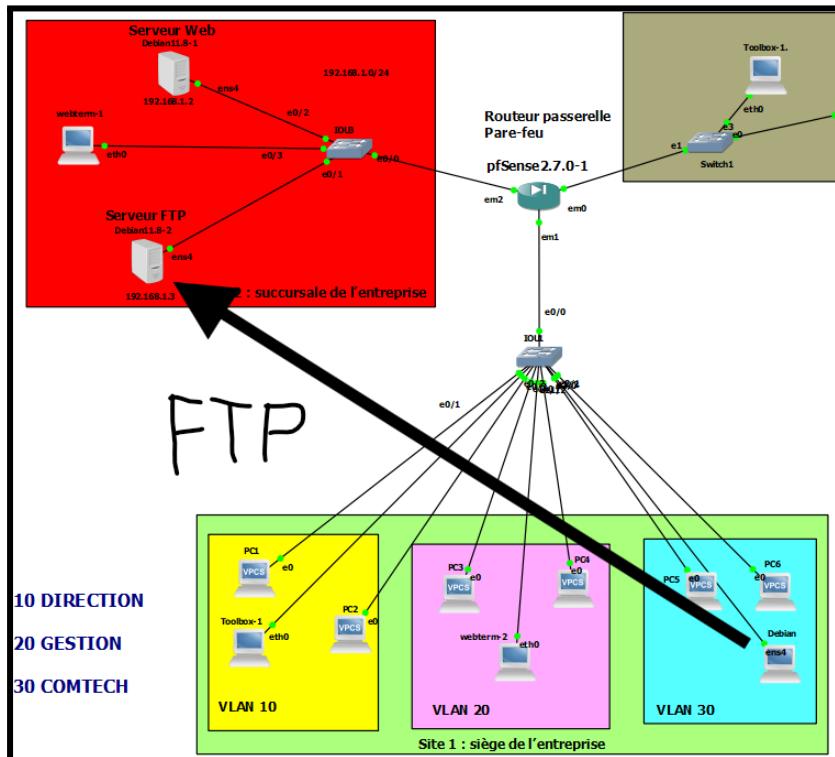
```
debian@debian:~$ sudo groupadd ftpaccess
debian@debian:~$ sudo usermod -aG ftpaccess ftp1
debian@debian:~$ sudo usermod -aG ftpaccess ftp2
debian@debian:~$ sudo chgrp ftpaccess /srv/ftp/share/
debian@debian:~$ sudo chmod 770 /srv/ftp/share/
debian@debian:~$
```

Test “*ftp 192.168.1.3*” des deux compte crée (*ftp1* et *ftp2*) depuis un PC de la Vlan 30 sur le serveur *ftp 192.168.1.3* :

```
debian@debian:~$ ip -c a
1: lo: <LOOPBACK,NO-SIUP> 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
        valid_lft forever preferred_lft forever
2: ens4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 0c:fe:30:4f:00:00 brd ff:ff:ff:ff:ff:ff
    al name enp0s4
    inet 192.168.30.10/24 brd 192.168.30.255 scope global dynamic ens4
        valid_lft 6843sec preferred_lft 6843sec
    inet6 fe80::1cfe:30ff:fe4f:0/64 scope link
        valid_lft forever preferred_lft forever
debian@debian:~$ ftp 192.168.1.3
Connected to 192.168.1.3.
220 Bienvenue !
Name (192.168.1.3:debian): ftp1
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> get test
local: test remote: test
200 PORT command successful. Consider using PASV.
150 Opening BINARY mode data connection for test (0 bytes).
226 Transfer complete.
ftp> ls -l
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
-rwxrwxrwx    1 1005      1005          0 Jun 16 17:22 test
226 Directory send OK.
ftp>
```

```
debian@debian:~$ ftp 192.168.1.3
Connected to 192.168.1.3.
220 Bienvenue !
Name (192.168.1.3:debian): ftp2
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> ls -l
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
-rwxrwxrwx    1 1005      1005          0 Jun 16 17:22 test
226 Directory send OK.
ftp>
```

SCHÉMA DU PROTOCOLE FTP EFFECTUE :



Installation et configuration de HTTP et de ses utilisateurs :

```
sudo apt update
```

```
sudo apt install apache2
```

```
debian@debian:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apache2 is already the newest version (2.4.59-1~deb11u1).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

ls -l pour voir les fichiers dans /var/www/html pour le fichier de la page web

```
debian@debian:~$ cd /var/www/html/
debian@debian:/var/www/html$ ls
index.html
```

Modification du code html pour avoir un rendu personnel

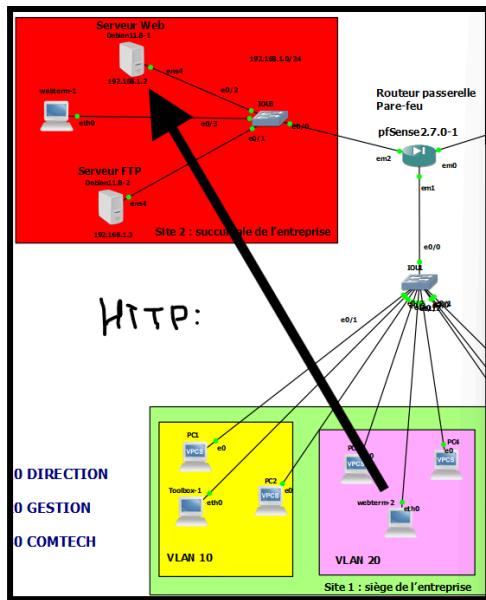
```
GNU nano 5.4                               index.html *
<!DOCTYPE html>
<html>
<head>
    <title>Bienvenue sur sae201.com</title>
</head>
<body>
    <h1>Serveur WEB SAE201</h1>
    <p>SERVEUR DE SUCURSAL</p>
</body>
</html>
```

Accès à la page apache de la vm depuis pc vlan 20

The screenshot shows a web browser with three tabs: "pfSense.home.arpa - Ser", "moodle reunion - Recherch", and "Bienvenue sur SAE201.com". The address bar shows "192.168.1.2". The main content area displays the "Serveur WEB SAE201" page. Below it, a terminal window titled "Bash" shows the command "ip -c a" output:

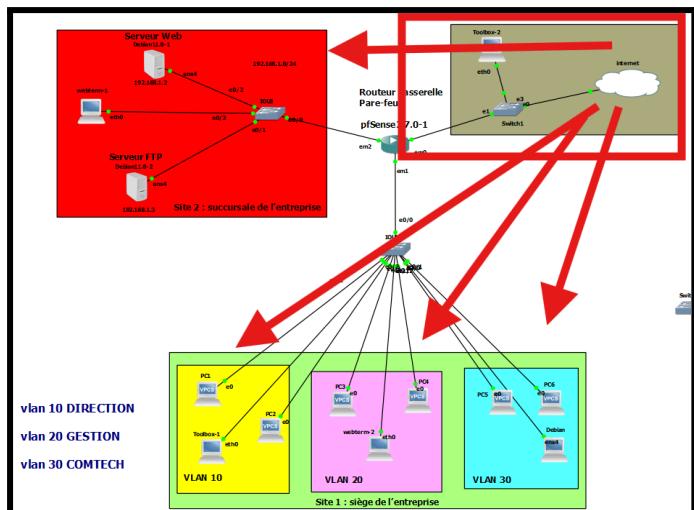
```
root@webterm-2:~# ip -c a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
39: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN group default qlen 1000
    link/ether 6a:36:9c:04:72:6b brd ff:ff:ff:ff:ff:ff
    inet 192.168.20.15/24 brd ff:ff:ff:ff:ff:ff scope global eth0
        valid_lft forever preferred_lft forever
root@webterm-2:~#
```

SCHÉMA DU PROTOCOLE HTTP EFFECTUE



Etape 4 - Mise en place et configuration de l'accès à Internet

Grâce au nuage (NAT) on nous donne *ici internet*



Test pingServeur google (8.8.8.8) des périphérique de chaque vlan :

```
⋮ ● PC1 ✘ ● PC3 ● PC5

VPCS> ip dhcp
DORA IP 192.168.10.13/24 GW 192.168.10.1

VPCS> ping 8.8.8.8
84 bytes from 8.8.8.8 icmp_seq=1 ttl=126 time=50.592 ms
84 bytes from 8.8.8.8 icmp_seq=2 ttl=126 time=48.116 ms
84 bytes from 8.8.8.8 icmp_seq=3 ttl=126 time=51.183 ms
84 bytes from 8.8.8.8 icmp_seq=4 ttl=126 time=47.510 ms
84 bytes from 8.8.8.8 icmp_seq=5 ttl=126 time=49.920 ms

VPCS> ⌂
```

```
⋮ ● PC1 ✘ ● PC3 ✘ ● PC5

Bad command: "[3~". Use ? for help.

VPCS> ip dhcp
DORA IP 192.168.20.11/24 GW 192.168.20.1

VPCS> ping 8.8.8.8
84 bytes from 8.8.8.8 icmp_seq=1 ttl=126 time=49.809 ms
84 bytes from 8.8.8.8 icmp_seq=2 ttl=126 time=66.074 ms
84 bytes from 8.8.8.8 icmp_seq=3 ttl=126 time=48.242 ms
84 bytes from 8.8.8.8 icmp_seq=4 ttl=126 time=50.608 ms
84 bytes from 8.8.8.8 icmp_seq=5 ttl=126 time=50.205 ms

VPCS> ⌂
```

```

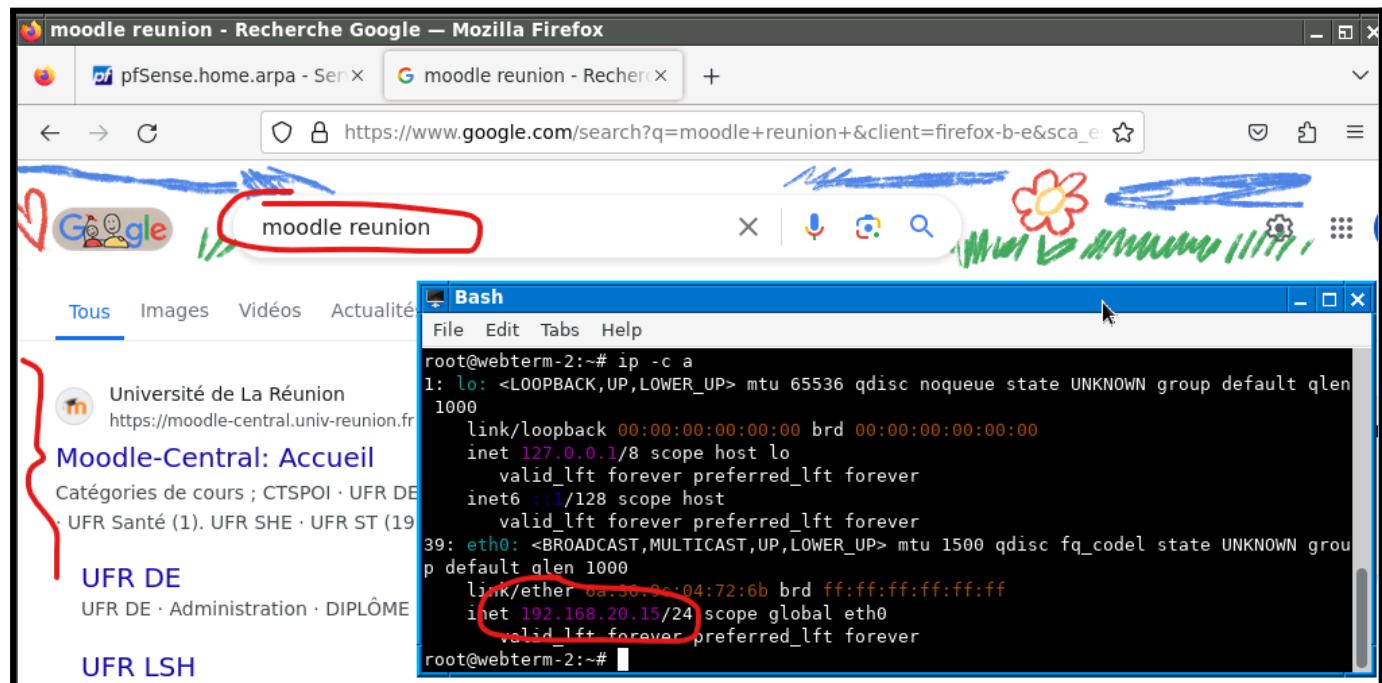
PC1          PC3          PC5
VPCS> ip dhcp
DORAping IP 192.168.30.12/24 GW 192.168.30.1

VPCS> ping 8.8.8.8
84 bytes from 8.8.8.8 icmp_seq=1 ttl=126 time=51.351 ms
84 bytes from 8.8.8.8 icmp_seq=2 ttl=126 time=47.163 ms
84 bytes from 8.8.8.8 icmp_seq=3 ttl=126 time=47.484 ms
84 bytes from 8.8.8.8 icmp_seq=4 ttl=126 time=50.816 ms
84 bytes from 8.8.8.8 icmp_seq=5 ttl=126 time=47.905 ms

VPCS>

```

(LAN) PC de la vlan 20 vers internet (ex: moodle reunion)



Test du ping **internet** depuis les serveurs (WEB et FTP)

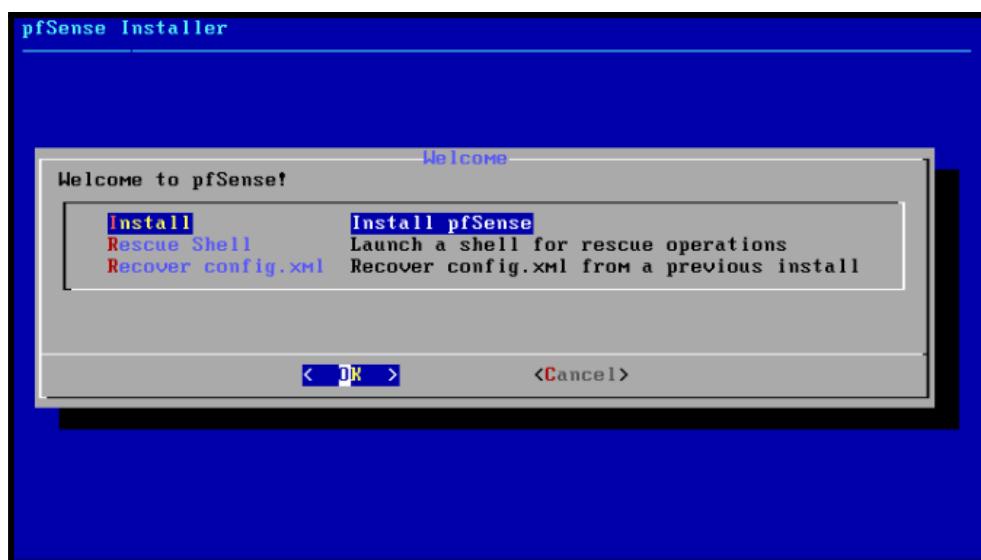
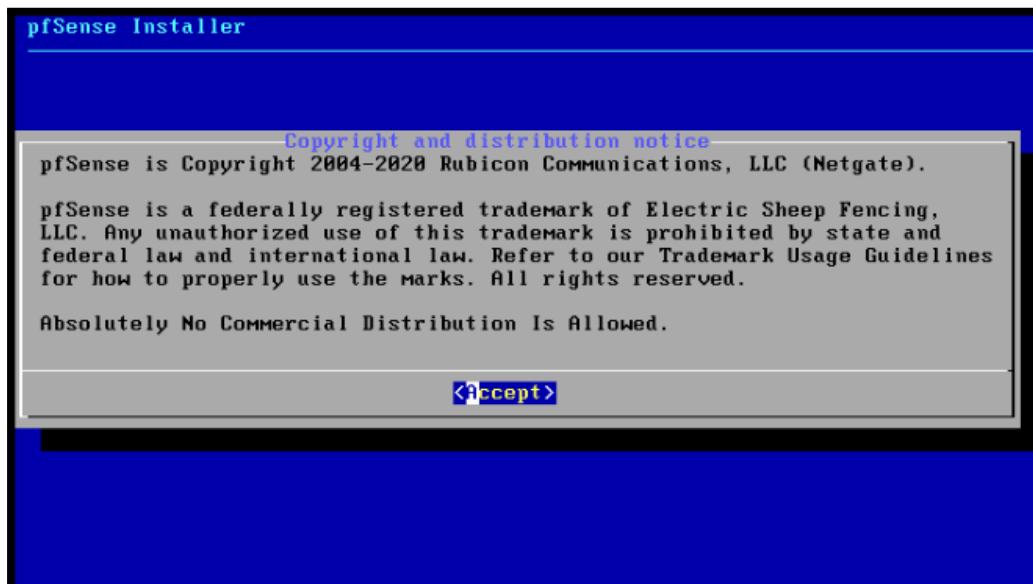
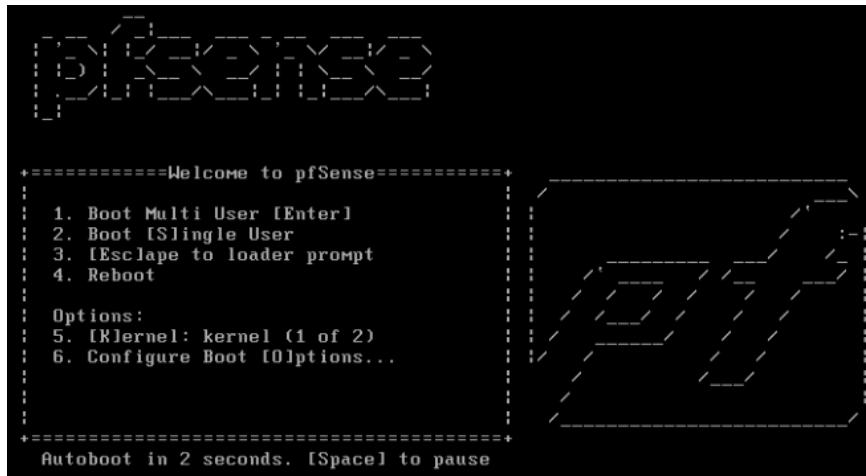
Serveur web -

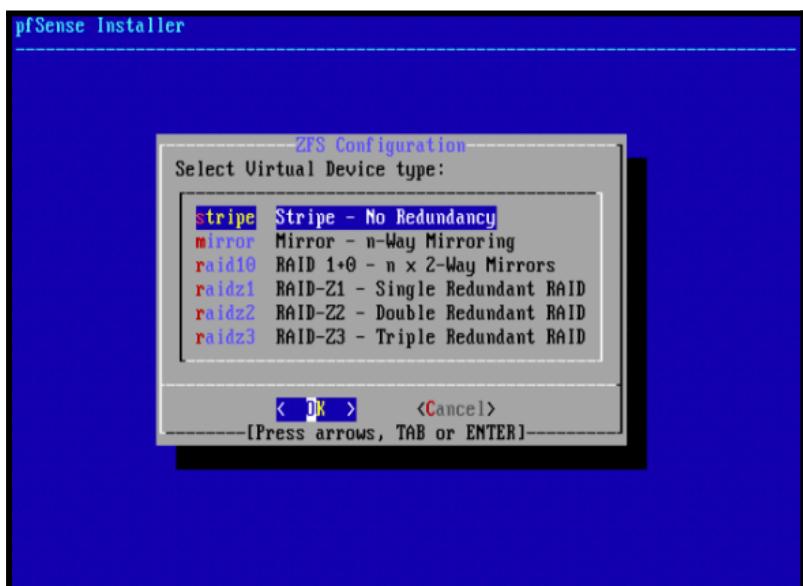
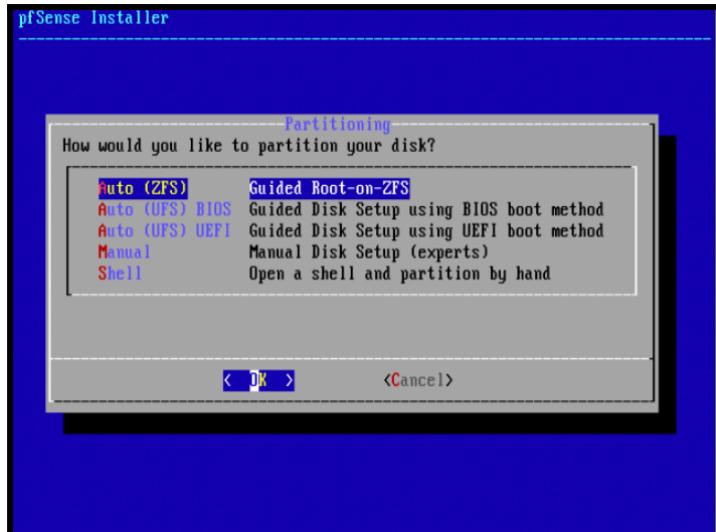
```
debian@debian:~$ ip -c a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
        inet 127.0.0.1/8 scope host lo
            valid_lft forever preferred_lft forever
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
2: ens4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default
    link/ether 0c:e9:cc:42:00:00 brd ff:ff:ff:ff:ff:ff
    altname enp0s4
        inet 192.168.1.2/24 brd 192.168.1.255 scope global ens4
            valid_lft forever preferred_lft forever
        inet6 fe80::ee9:ccff:fe42:0/64 scope link
            valid_lft forever preferred_lft forever
debian@debian:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=126 time=47.8 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=126 time=47.6 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=126 time=47.0 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=126 time=50.6 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=126 time=47.1 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=126 time=46.6 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=126 time=48.9 ms
64 bytes from 8.8.8.8: icmp_seq=8 ttl=126 time=46.2 ms
64 bytes from 8.8.8.8: icmp_seq=9 ttl=126 time=46.2 ms
64 bytes from 8.8.8.8: icmp_seq=10 ttl=126 time=51.1 ms
64 bytes from 8.8.8.8: icmp_seq=11 ttl=126 time=49.4 ms
64 bytes from 8.8.8.8: icmp_seq=12 ttl=126 time=47.8 ms
64 bytes from 8.8.8.8: icmp_seq=13 ttl=126 time=47.7 ms
64 bytes from 8.8.8.8: icmp_seq=14 ttl=126 time=47.9 ms
64 bytes from 8.8.8.8: icmp_seq=15 ttl=126 time=46.4 ms
```

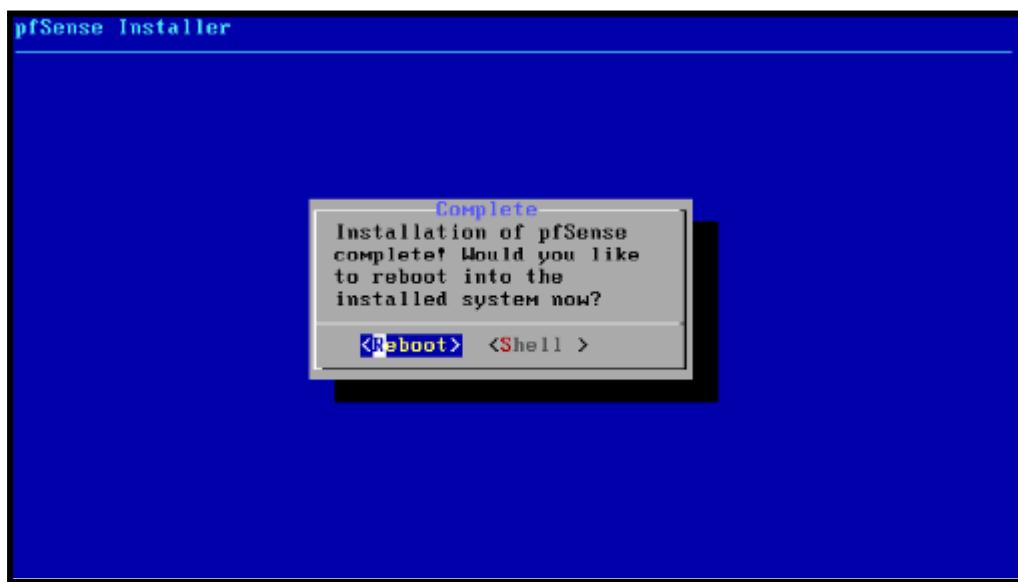
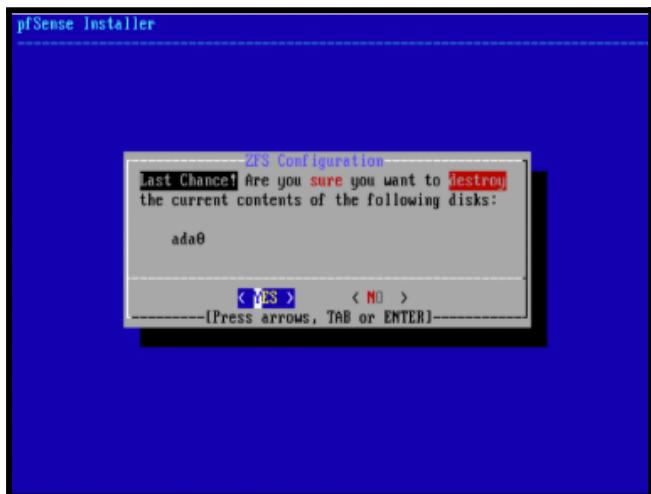
Serveur FTP-

```
debian@debian:~$ ip -c 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
            valid_lft forever preferred_lft forever
2: ens4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 0c:db:5c:77:00:00 brd ff:ff:ff:ff:ff:ff
    altname enp0s4
        inet 192.168.1.3/24 scope global ens4
            valid_lft forever preferred_lft forever
        inet6 fe80::edb:5cff:fe77:0/64 scope link
            valid_lft forever preferred_lft forever
debian@debian:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=126 time=46.6 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=126 time=48.5 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=126 time=47.8 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=126 time=45.3 ms
```

Installation et configuration d'un pare-feu PfSense :







on arrive dans les options :

The screenshot shows a terminal window titled "QEMU (pfSense2.7.0-1) - TightVNC Viewer". The window contains the following text:

```
Enabling SSHD...
Reloading firewall rules. done.

QEMU Guest - Netgate Device ID: 3ae45b5af40eba2a1276

*** Welcome to pfSense 2.7.0-RELEASE (amd64) on pfSense ***

WAN (wan)      -> em0      -> v4/DHCP4: 192.168.122.19/24
LAN (lan)      -> em1      ->
DMZ (opt1)     -> em2      -> v4: 192.168.1.1/24
VLAN10 (opt2)  -> em1.10   -> v4: 192.168.10.1/24
VLAN20 (opt3)  -> em1.20   -> v4: 192.168.20.1/24
VLAN30 (opt4)  -> em1.30   -> v4: 192.168.30.1/24

0) Logout (SSH only)          9) pfTop
1) Assign Interfaces           10) Filter Logs
2) Set interface(s) IP address 11) Restart webConfigurator
3) Reset webConfigurator password 12) PHP shell + pfSense tools
4) Reset to factory defaults   13) Update from console
5) Reboot system               14) Enable Secure Shell (sshd)
6) Halt system                 15) Restore recent configuration
7) Ping host                   16) Restart PHP-FPM
8) Shell
```

Commande pour attribuer les règles de base au port WAN pour les protocole qui passe par lui:

```
[2.7.0-RELEASE][root@pfSense.home.arpal/root: pfSsh.php playback enableallowallwan
Adding allow all rule...
Turning off block private networks (if on)...
Turning off block bogon networks (if on)...
Reloading the filter configuration...]
```

Règles sur le parefeu pfSense (Mettre en place et configurer la DMZ pour les serveurs FTP et Web (HTTP):

règle du port pour le WAN (on laisse passer le protocole ssh sur les deux serveur:

The screenshot shows the Firewall / Rules / WAN interface. The WAN tab is selected. The rules table lists five entries:

| States | Protocol | Source | Port | Destination | Port | Gateway | Queue | Schedule | Description | Actions | |
|--------|----------|--------|------|-------------|-----------|---------|-------|----------|-----------------------------------|---------|--|
| 0/0 B | IPv4 TCP | * | * | 192.168.1.3 | 22 (SSH) | * | none | | | | |
| 0/0 B | IPv4 TCP | * | * | 192.168.1.2 | 22 (SSH) | * | none | | | | |
| 0/0 B | IPv4 TCP | * | * | 192.168.1.2 | 80 (HTTP) | * | none | | | | |
| 0/0 B | IPv4 TCP | * | * | 192.169.1.3 | 21 (FTP) | * | none | | | | |
| 0/0 B | IPv4+6 | * | * | * | * | * | * | none | Allow all ipv4+ipv6 via pfSsh.php | | |

Buttons at the bottom include: Add, Delete, Toggle, Copy, Save, and Separator.

règle du port pour le Vlan 10(on laisse tout passer)

The screenshot shows the Firewall / Rules / VLAN10 interface. The VLAN10 tab is selected. The rules table lists one entry:

| States | Protocol | Source | Port | Destination | Port | Gateway | Queue | Schedule | Description | Actions | |
|----------|----------|--------|------|-------------|------|---------|-------|----------|-------------|---------|--|
| 0/44 KIB | IPv4 | * | * | * | * | * | * | none | | | |

Buttons at the bottom include: Add, Delete, Toggle, Copy, Save, and Separator.

règle du port pour le Vlan 20(on laisse tout passer)

The screenshot shows the Firewall / Rules / VLAN20 interface. The VLAN20 tab is selected. The rules table lists one entry:

| States | Protocol | Source | Port | Destination | Port | Gateway | Queue | Schedule | Description | Actions | |
|-------------|----------|--------|------|-------------|------|---------|-------|----------|-------------|---------|--|
| 9/30.97 MiB | IPv4 | * | * | * | * | * | * | none | | | |

Buttons at the bottom include: Add, Delete, Toggle, Copy, Save, and Separator.

règle du port pour le Vlan 30(on laisse tout passer)

The screenshot shows the 'Firewall / Rules / VLAN30' interface. At the top, there are tabs for Floating, WAN, LAN, DMZ, VLAN10, VLAN20, and VLAN30, with VLAN30 being the active tab. Below the tabs is a table titled 'Rules (Drag to Change Order)'. The table has columns: States, Protocol, Source, Port, Destination, Port, Gateway, Queue, Schedule, Description, and Actions. A single rule is listed: '0/90 KIB' with IPv4 as the protocol, source and destination set to '*', and gateway set to 'none'. The Actions column includes icons for anchor, edit, copy, save, and delete. Below the table are buttons for Add, Delete, Toggle, Copy, Save, and Separator.

| States | Protocol | Source | Port | Destination | Port | Gateway | Queue | Schedule | Description | Actions |
|--------------------------|----------|--------|------|-------------|------|---------|-------|----------|-------------|---------|
| <input type="checkbox"/> | 0/90 KIB | IPv4 * | * | * | * | * | none | | | |

règle du port pour le DMZ(on laisse tout passer)

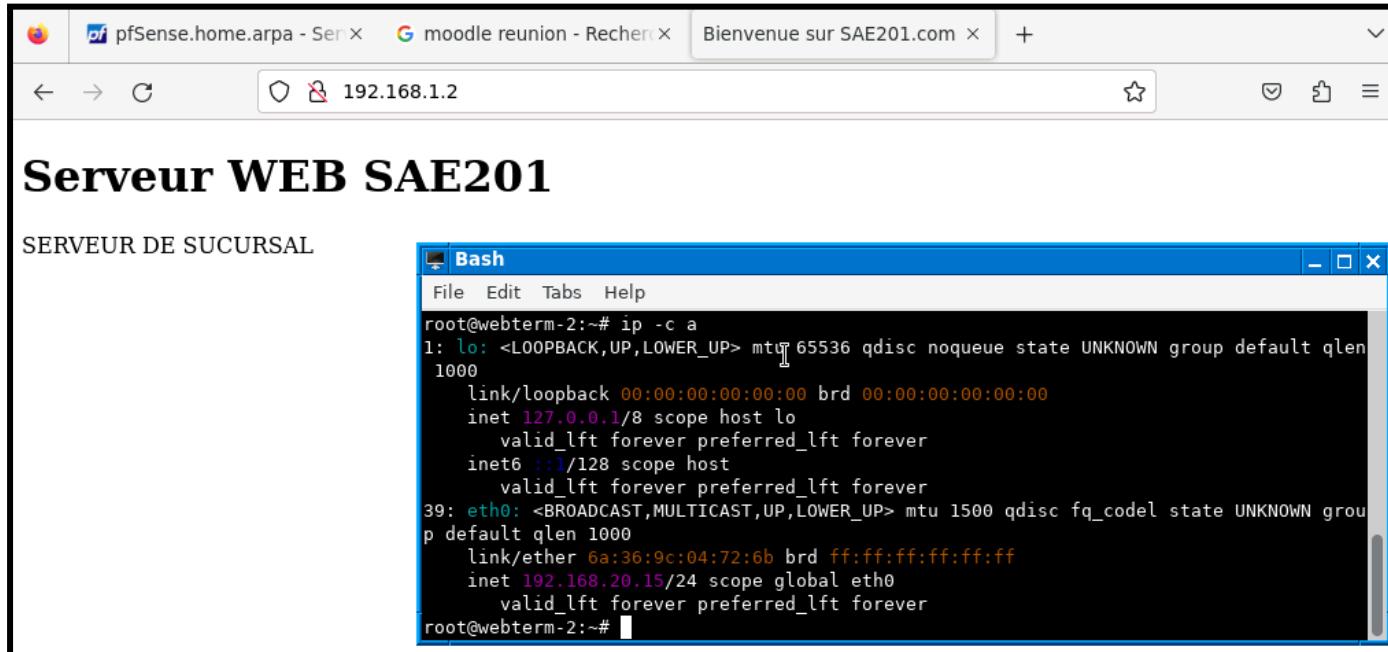
The screenshot shows the 'Firewall / Rules / DMZ' interface. At the top, there are tabs for Floating, WAN, LAN, DMZ, VLAN10, VLAN20, and VLAN30, with DMZ being the active tab. Below the tabs is a table titled 'Rules (Drag to Change Order)'. The table has columns: States, Protocol, Source, Port, Destination, Port, Gateway, Queue, Schedule, Description, and Actions. A single rule is listed: '1/235 KIB' with IPv4 as the protocol, source and destination set to '*', and gateway set to 'none'. The Actions column includes icons for anchor, edit, copy, save, and delete. Below the table are buttons for Add, Delete, Toggle, Copy, Save, and Separator.

| States | Protocol | Source | Port | Destination | Port | Gateway | Queue | Schedule | Description | Actions |
|--------------------------|-----------|--------|------|-------------|------|---------|-------|----------|-------------|---------|
| <input type="checkbox"/> | 1/235 KIB | IPv4 * | * | * | * | * | none | | | |

TEST FINAUX :

- Vérifier qu'un utilisateur interne à l'entreprise peut accéder aux services réseaux installés :

Test du ping d'un pc du vlan 20 au serveur WEB



Test “ftp 192.168.1.3” des deux compte crée (ftp1 et ftp2) depuis un PC de la Vlan 30 sur le serveur ftp 192.168.1.3 :

The screenshot shows a terminal session on a Debian system. It starts with the command "ip -c a" to show network interfaces. Then, it connects to the FTP server at 192.168.1.3 using the command "ftp 192.168.1.3". Once connected, it logs in as user "ftp1" and uploads a file named "test". The file has permissions "-rwxrwxrwx" and was created on June 16, 2017, at 17:22.

```
debian@debian:~$ ip -c a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 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
        valid_lft forever preferred_lft forever
2: ens4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 0c:fe:30:4f:00:00 brd ff:ff:ff:ff:ff:ff
    alt name ens4
    inet 192.168.30.10/24 brd 192.168.30.255 scope global dynamic ens4
        valid_lft 6843sec
        inet6 fe80::1cfe:30ff:fe4f:0/64 scope link
            valid_lft forever preferred_lft forever
debian@debian:~$ ftp 192.168.1.3
Connected to 192.168.1.3.
220 Bienvenue !
Name (192.168.1.3:debian): ftp1
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> get test
local: test remote: test
200 PORT command successful. Consider using PASV.
150 Opening BINARY mode data connection for test (0 bytes).
226 Transfer complete.
ftp> ls -l
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
-rwxrwxrwx    1 1005      1005          0 Jun 16 17:22 test
226 Directory send OK.
```

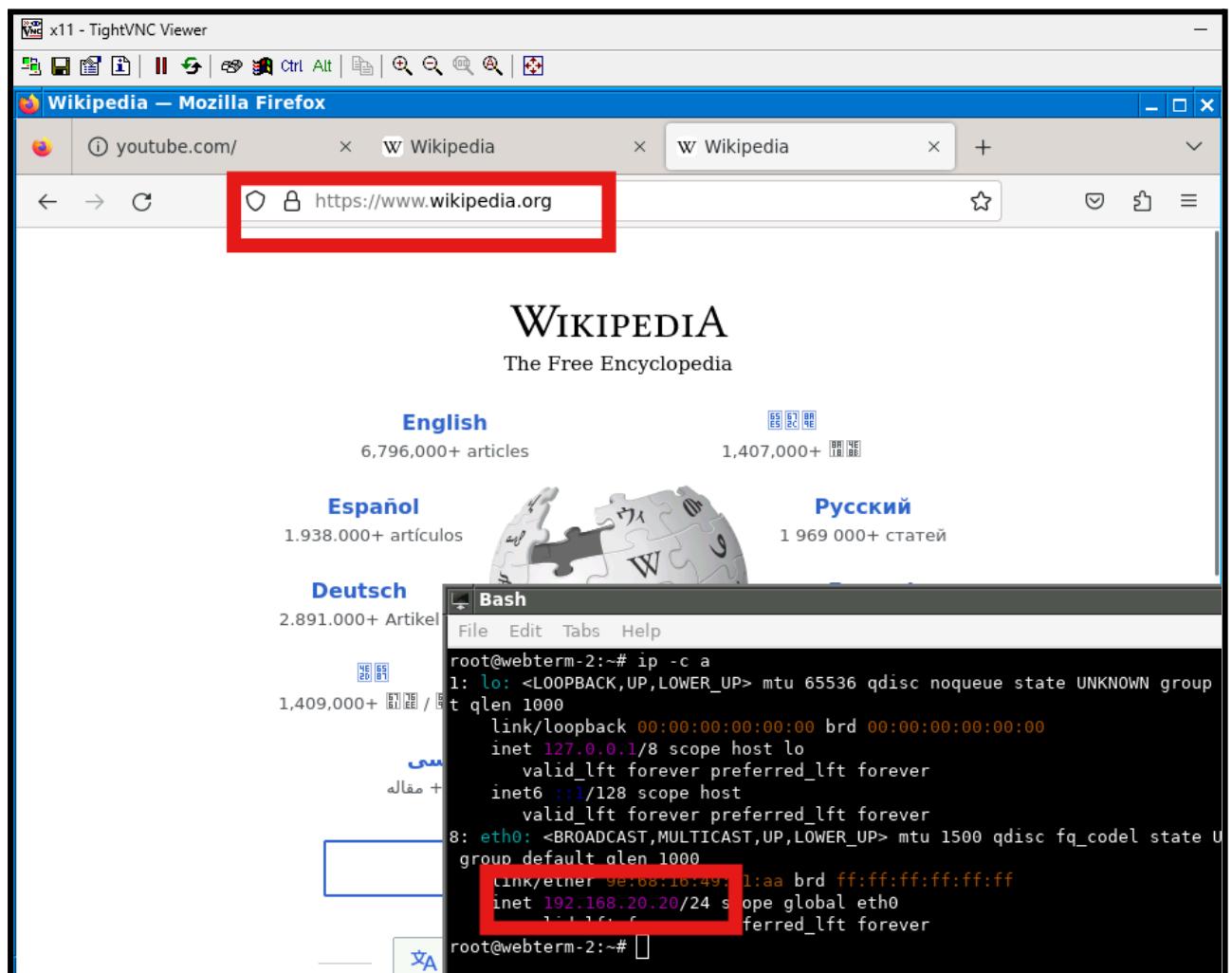
```

debian@debian:~$ ftp 192.168.1.3
Connected to 192.168.1.3.
220 Bienvenue !
Name (192.168.1.3:debian): ftp2
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> ls -l
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
-rwxrwxrwx    1 1005      1005          0 Jun 16 17:22 test
226 Directory send OK.
ftp>

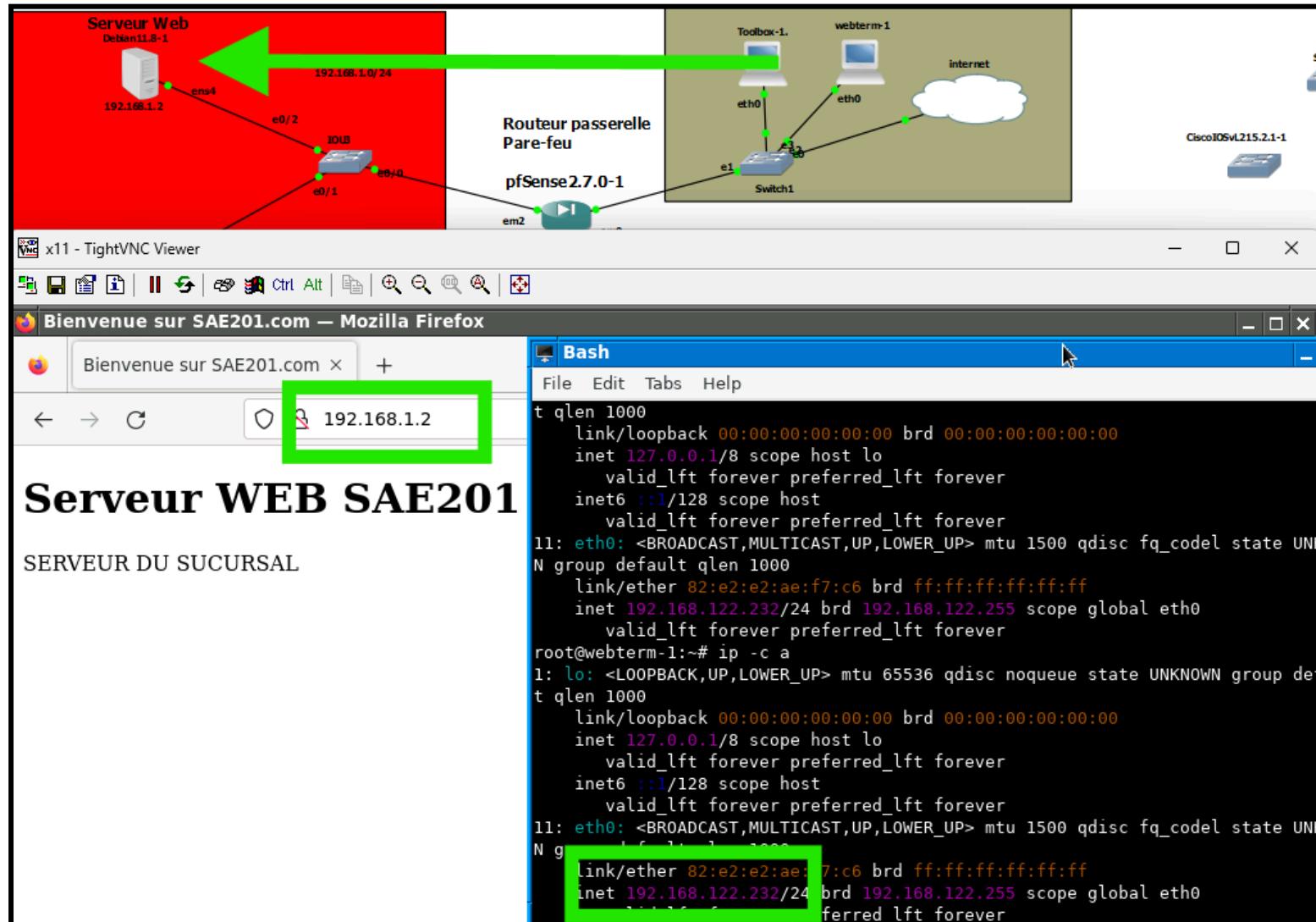
```

Vérifier qu'un utilisateur interne à l'entreprise peut se connecter à Internet

(LAN) PC de la vlan 20 vers internet (ex: wikipedia)



Vérifier si un utilisateur externe à l'entreprise peut se connecter au serveur Web depuis l'extérieur (placer un objet webterm ou Firefox dans la partie WAN)



Vérifier si l'administrateur réseau de l'entreprise peut gérer les équipements à l'aide d'une connexion SSH à l'intérieur de l'entreprise

Test du pc de la vlan 10 en ssh au serveur web

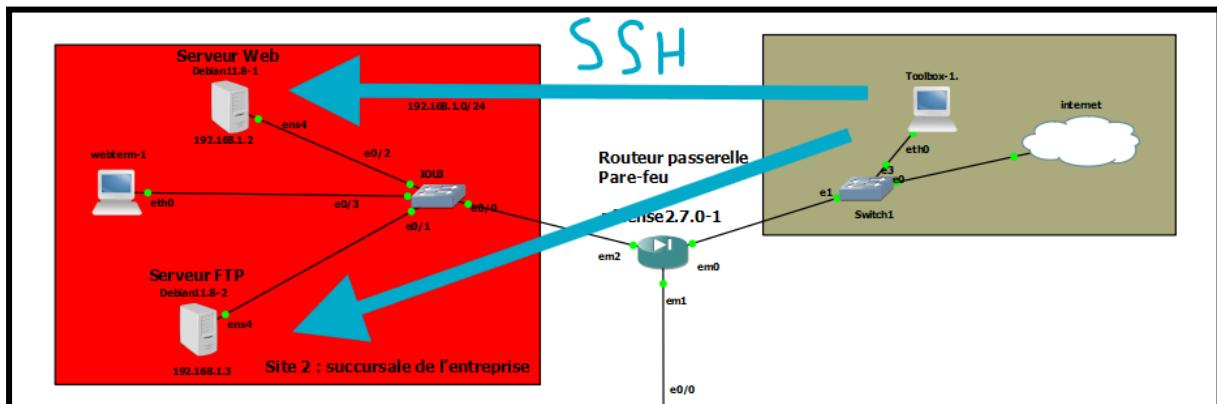
```
root@Toolbox-1:~# ip -c a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
41: eth0: <NO-CARRIER,BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN group default qlen 1000
    link/ether 22:2a:a5:7c:ec:10 brd ff:ff:ff:ff:ff:ff
    inet 192.168.10.17/24 brd 192.168.10.255 scope global eth0
        valid_lft forever preferred_lft forever
root@Toolbox-1:~# ssh debian@192.168.1.2
debian@192.168.1.2's password:
Linux debian 5.10.0-30-cloud-amd64 #1 SMP Debian 5.10.218-1 (2024-06-01) 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: Sun Jun 16 21:32:58 2024
debian@debian:~$ sudo -i
root@debian:~#
```

Vérifier si l'administrateur réseau de l'entreprise peut gérer les équipements à l'aide d'une connexion SSH hors de l'entreprise

TEST SSH DEPUIS LE WAN



SSH sur le serveur WEB

```
root@Toolbox-1:~# ssh debian@192.168.1.2
debian@192.168.1.2's password:
Linux debian 5.10.0-30-cloud-amd64 #1 SMP Debian 5.10.218-1 (2024-06-01) 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.

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permitted by applicable law.
Last login: Sun Jun 16 21:42:56 2024 from 192.168.10.17
debian@debian:~$ sudo -i
root@debian:~# exit
logout
debian@debian:~$ exit
logout
Connection to 192.168.1.2 closed.
```

SSH sur le serveur FTP

```
root@Toolbox-1:~# ssh debian@192.168.1.3
debian@192.168.1.3's password:
Linux debian 5.10.0-26-cloud-amd64 #1 SMP Debian 5.10.197-1 (2023-09-29) x86_64

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permitted by applicable law.
Last login: Mon Jun 17 06:15:33 2024
debian@debian:~$ sudo -i
root@debian:~# █
```