Création d'une infrastructure virtualisée

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Proxmox

Objectif de notre projet

Deux extraterrestres nous ont assignés un brief avec toutes ces modalités afin de nous laisser en vie:

Un Pfsense :

•Wan (votre Vlan initial)
•LAN (a définir)
•VLAN 10 administratif (GLPI, Le DNS, la console d'administration)
•VLAN 20 production (serveur web contenant le site des fierté Valenciennoise).

Le DNS doit être sur une machine Windows Serveur.
Le GLPI, la console et le serveur web devront être réaliser a partir d'un template.
Chaque machine une fois fonctionnelle devra possédé un cliché instantané.
Le DNS, GLPI, le serveur Web, le firewall seront monitorées sur Grafana / Prometheus.
Chaque machine linux aura son portail webmin.

Le DNS saura résoudre les nom des serveurs GLPI, du Serveur Web et de la console
Un script d'exploitation (avec menu) sera créé sur chaque machine pour réaliser les arrêts / démarrages des services les plus usités sur les machines respectives.
Les connexions SSH depuis votre VLAN initial seront configurer pour accéder à la console.
La console aura une connexion SSH par clé sur chaque machine.
Votre site web devra être accessible aussi depuis votre VLAN initial.

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(SSH, Script, Webmin)

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(Node exporter)

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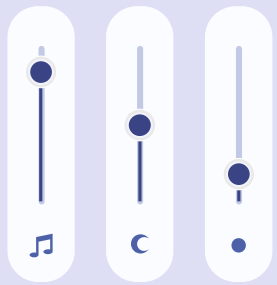


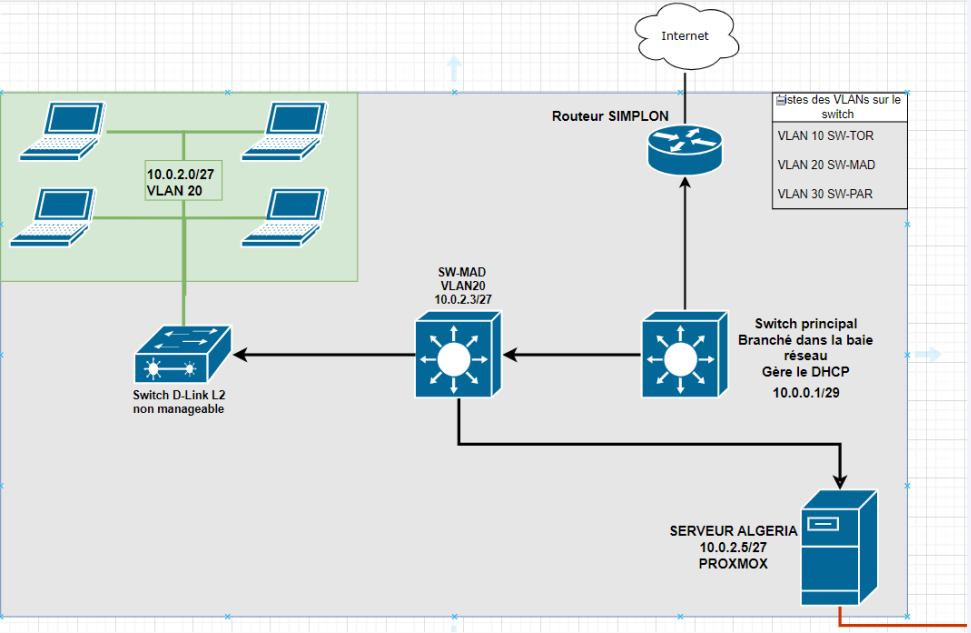
01

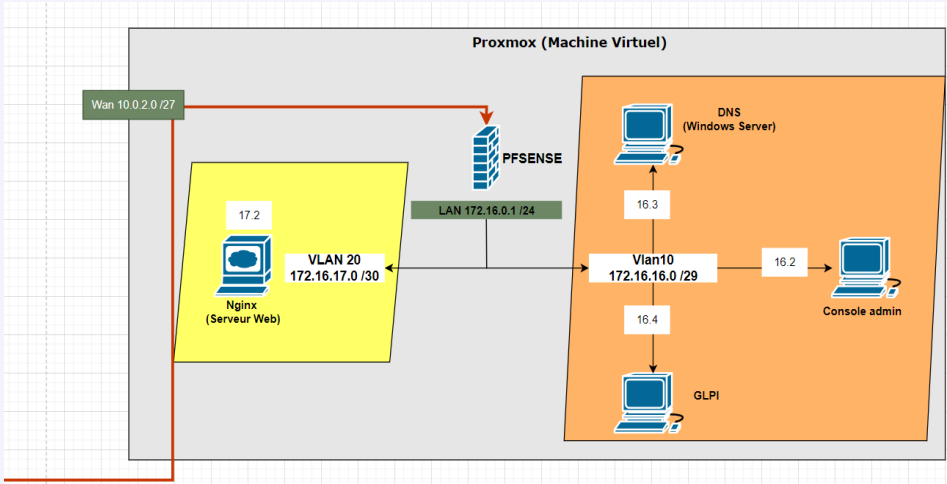
Installation de Proxmox

Hyperviseur de type 1

Proxmox

Schéma de l'infrastructure





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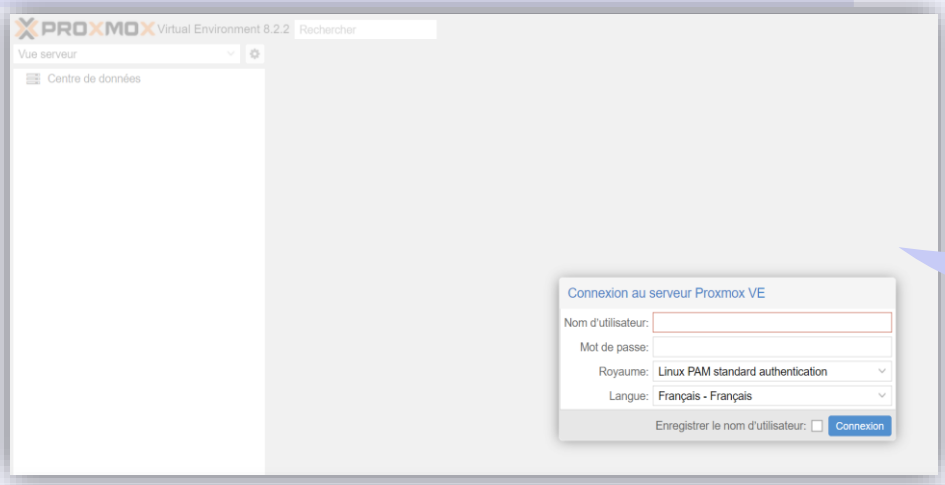
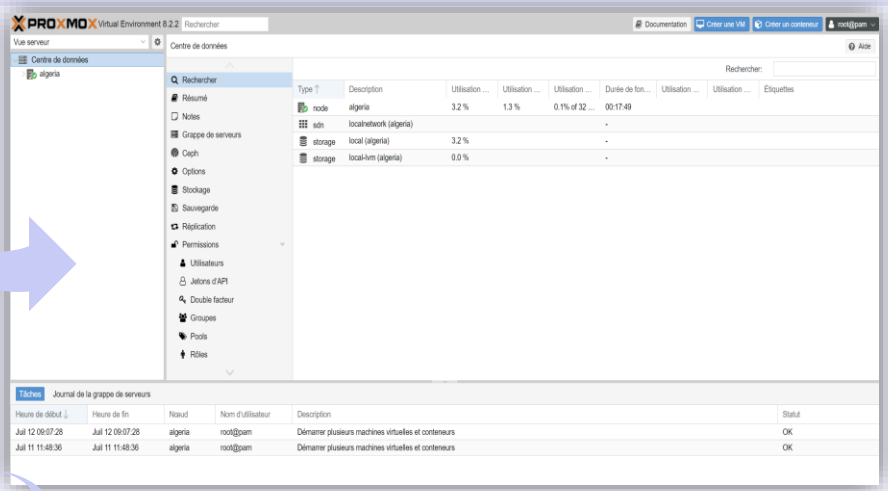
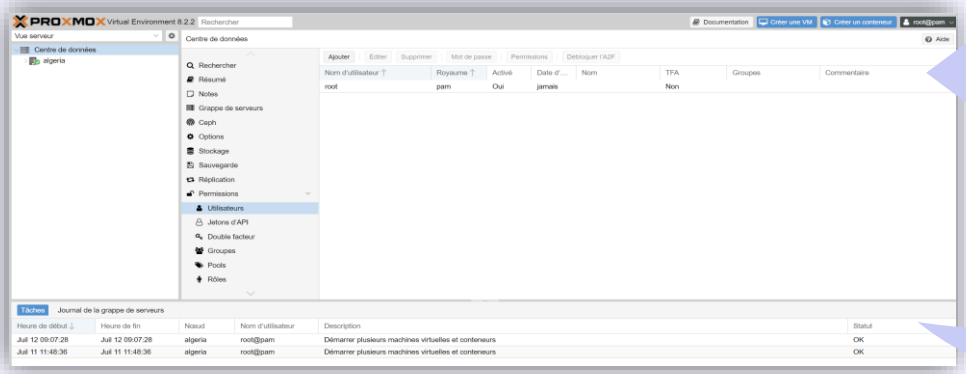
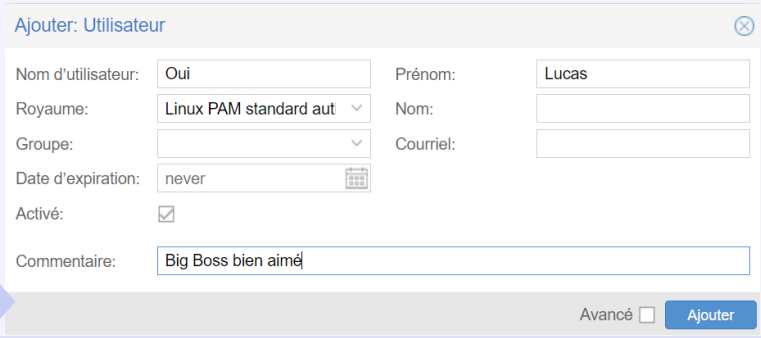

PROXMOX Virtual Environment 8.2.2
Rechercher
Vue serveur
Centre de données
Connexion au serveur Proxmox VE
Nom d'utilisateur:
Mot de passe:
Royaume:
Linux PAM standard authentication
Langue:
Français - Français
Enregistrer le nom d'utilisateur:
Connexion


PROXMOX Virtual Environment 8.2.2
Centre de données
algeria
Rechercher
Résumé
Notes
Grappe de serveurs
Ceph
Options
Stockage
Sauvegarde
Réplication
Permissions
Utilisateurs
Jetons d'API
Double facteur
Groupes
Pools
Rôles
Tâches
Journal de la grappe de serveurs


PROXMOX Virtual Environment 8.2.2
Centre de données
algeria
Utilisateurs
Tâches
Journal de la grappe de serveurs


Ajouter: Utilisateur
Nom d'utilisateur:
Oui
Prénom:
Lucas
Royaume:
Linux PAM standard aut
Nom:
Groupe:
Courriel:
Date d'expiration:
never
Activé:
Commentaire:
Big Boss bien aimé
Avancé
Ajouter

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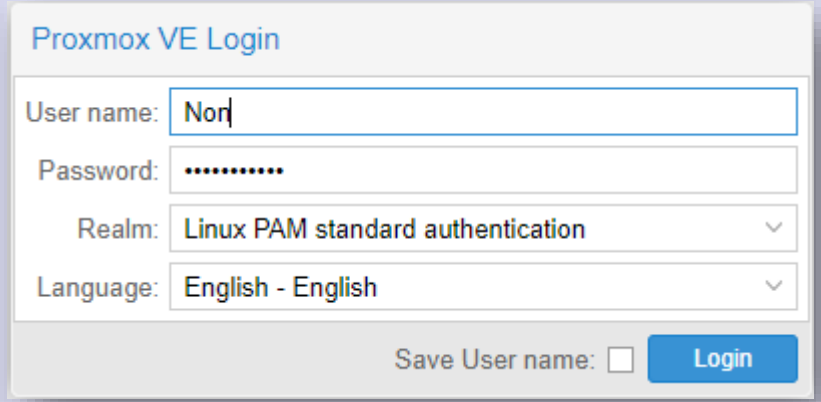
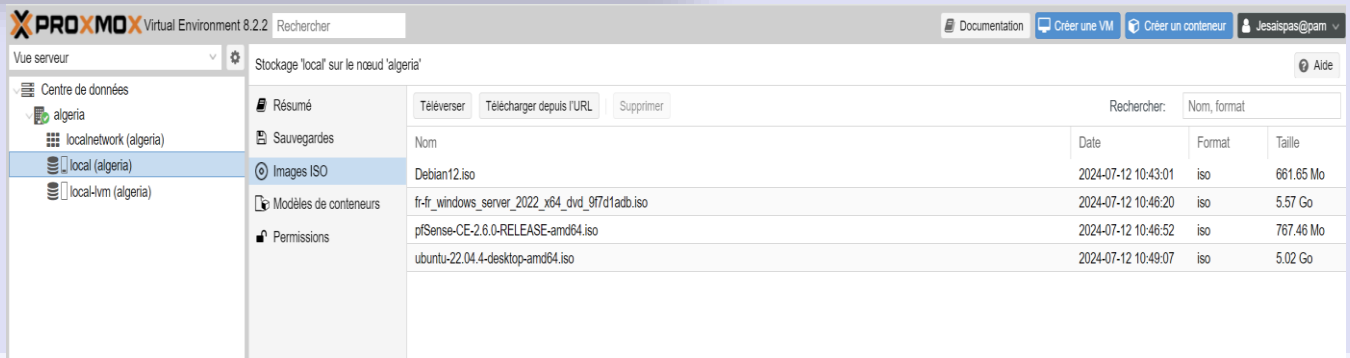
```
root@algeria:~# adduser Non
adduser: Please enter a username matching the regular expression
         configured via the NAME_REGEX configuration variable.  Use the
         `--allow-bad-names' option to relax this check or reconfigure
         NAME_REGEX in configuration.
root@algeria:~# adduser Non --allow-bad-names
Allowing use of questionable username.
Adding user `Non' ...
Adding new group `Non' (1001) ...
Adding new user `Non' (1001) with group `Non (1001)' ...
Creating home directory `/home/Non' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for Non
Enter the new value, or press ENTER for the default
        Full Name []: Arnaud
```





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02

PF SENSE

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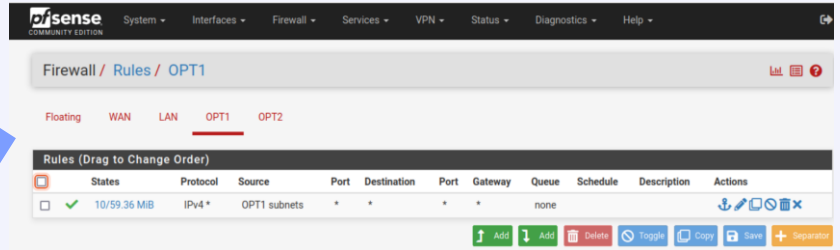
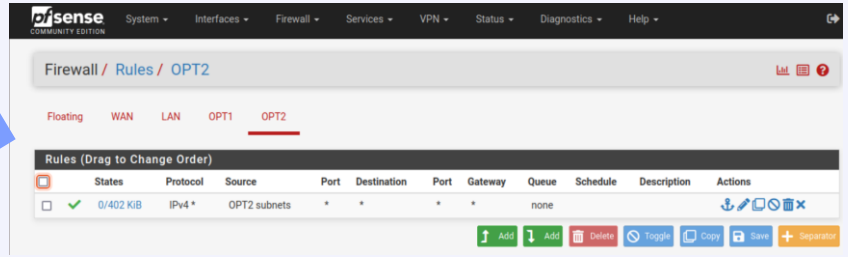
Création de VLAN sur *pf sense*

```
You can now access the webConfigurator by opening the following URL in your web
browser:
                https://172.16.17.1/

Press <ENTER> to continue.
KVM Guest - Netgate Device ID: b2bb951e33474117350d

*** Welcome to pfSense 2.7.2-RELEASE (amd64) on pfSense ***

 WAN (wan)       -> vtnet0     -> v4/DHCP4: 10.0.2.25/27
 LAN (lan)       -> vtnet1     -> v4: 172.16.0.1/24
 OPT1 (opt1)     -> vtnet1.10  -> v4: 172.16.16.1/29
 OPT2 (opt2)     -> vtnet1.20  -> v4: 172.16.17.1/30

 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
```





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ubuntu®

03

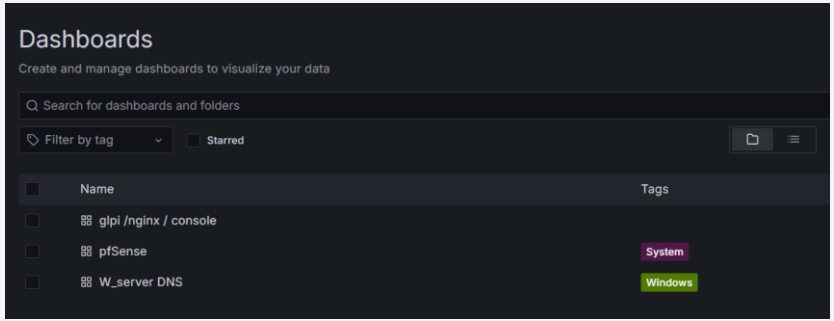
Console administrateur

Proxmox

Rôle de la console admin

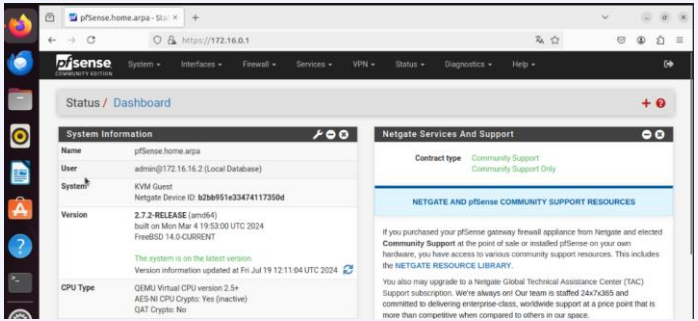
Prometheus / Grafana

Notre console d'administration servira à collecter les données des autres machines pour permettre la supervision



Interface graphique

La console sera la seule machine de l'infrastructure a disposer d'une interface graphique et donc d'un navigateur web qui nous permettra de manager les différents serveur via webmin ou de pouvoir paramétrer le firewall *pf sense*



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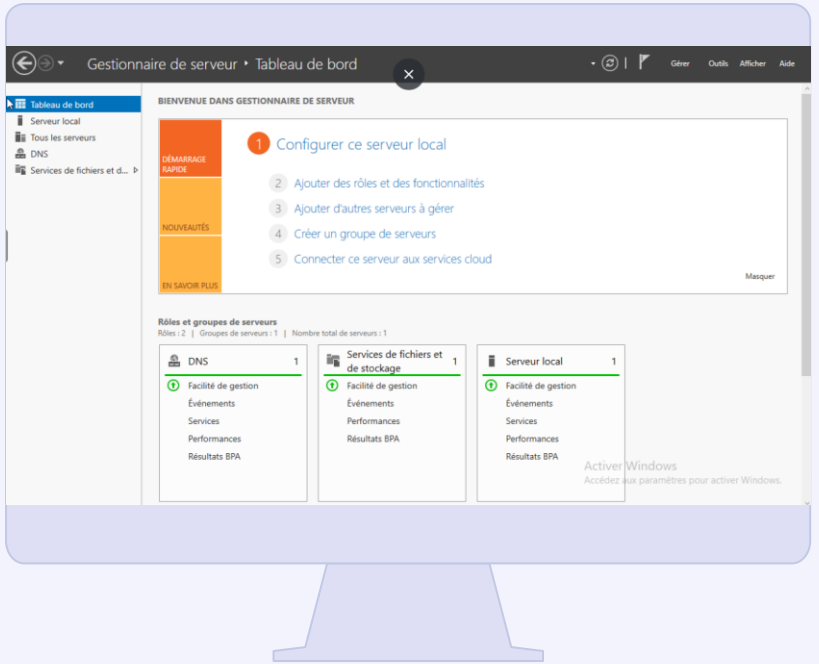
DNS/GLPI/NGINX

04



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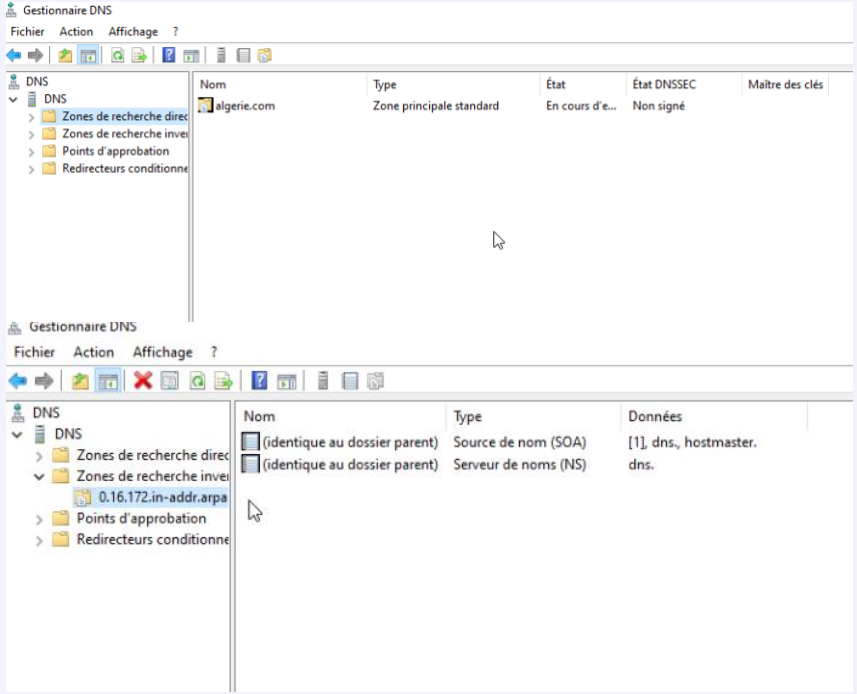
Configuration du DNS



Traduction d'adresse sur notre console

```
peutetre@fifou:~$ ping google.com
PING google.com (172.217.20.174) 56(84) bytes of data.
64 bytes from par10s49-in-f14.1e100.net (172.217.20.174): icmp_seq=1 ttl=117 time=4.92 ms
64 bytes from waw02s07-in-f14.1e100.net (172.217.20.174): icmp_seq=2 ttl=117 time=4.83 ms
64 bytes from waw02s07-in-f174.1e100.net (172.217.20.174): icmp_seq=3 ttl=117 time=4.77 ms
64 bytes from waw02s07-in-f174.1e100.net (172.217.20.174): icmp_seq=4 ttl=117 time=5.08 ms
64 bytes from par10s49-in-f14.1e100.net (172.217.20.174): icmp_seq=5 ttl=117 time=4.79 ms
64 bytes from par10s49-in-f14.1e100.net (172.217.20.174): icmp_seq=6 ttl=117 time=4.74 ms
64 bytes from par10s49-in-f14.1e100.net (172.217.20.174): icmp_seq=7 ttl=117 time=4.69 ms
64 bytes from waw02s07-in-f14.1e100.net (172.217.20.174): icmp_seq=8 ttl=117 time=4.71 ms
64 bytes from par10s49-in-f14.1e100.net (172.217.20.174): icmp_seq=9 ttl=117 time=4.83 ms
64 bytes from waw02s07-in-f174.1e100.net (172.217.20.174): icmp_seq=10 ttl=117 time=4.67 ms
64 bytes from waw02s07-in-f174.1e100.net (172.217.20.174): icmp_seq=11 ttl=117 time=4.75 ms
^C
```

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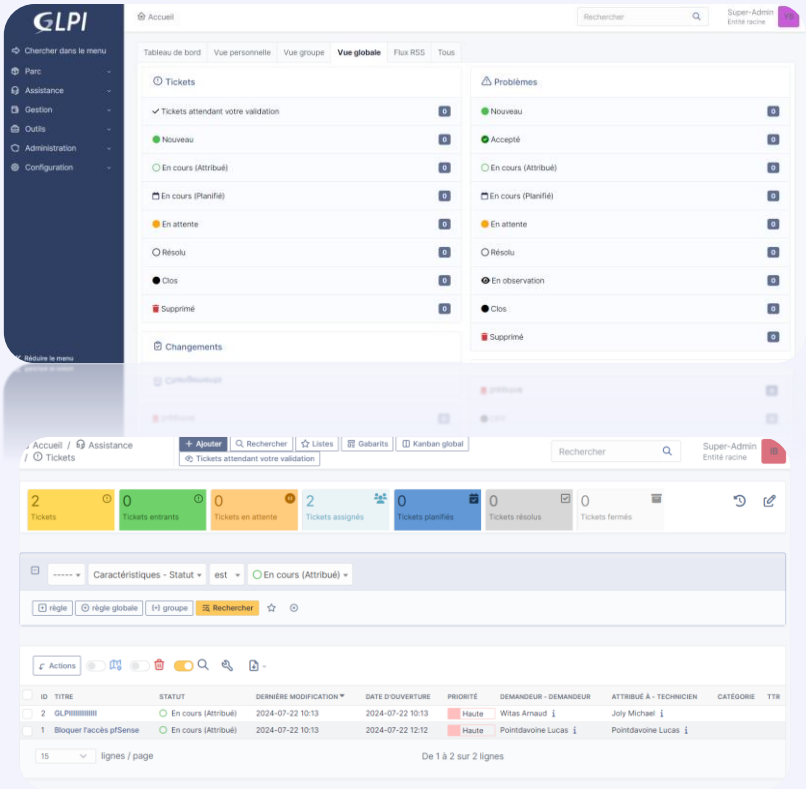
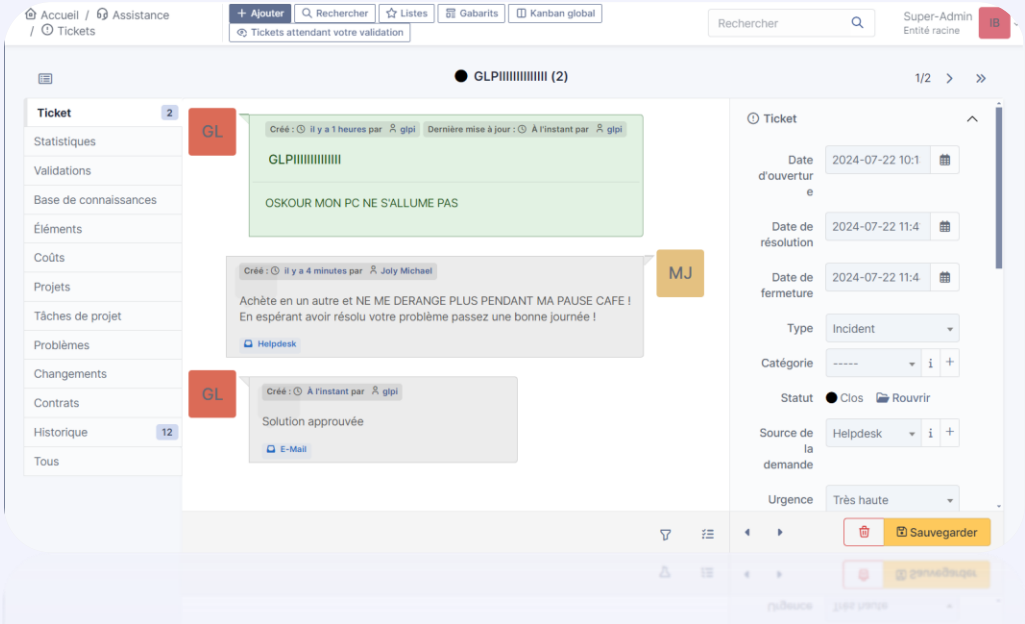
GLPI

Exemple d'un ticket GLPI avec résolution du problème





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NGINX

```
peutetre@djanet:/var/www/html$ ls
index.html  index.nginx-debian.html
peutetre@djanet:/var/www/html$ sudo nano index.html
```

```
GNU nano 7.2                                    index.html
            list-style: none;
            padding: 0;
        }
        li {
            margin-bottom: 10px;
        }
        a {
            color: #007bff;
            text-decoration: none;
        }
        a:hover {
            text-decoration: underline;
        }
    </style>
</head>
<body>
    <header>
        <h1>Les 2 Grandes Fiertés du Valenciennois</h1>
    </header>

    <section id="biographie_lefebvre">
        <h2>Biographie de Jean Lefebvre</h2>
        <p>Né le 3 octobre 1919 à Valenciennes, Jean Lefebvre est un acteur français emblématique du XXe siècle. Il commence sa car
    </section>

    <section id="biographie_richard">
        <h2>Biographie de Pierre Richard</h2>
        <p>Né le 16 août 1934 à Valenciennes, Pierre Richard est un acteur, réalisateur et scénariste français. Son style comique e
    </section>

    <footer>
        <p>&copy; 2024 Les 2 Grandes Fiertés du Valenciennois. Contactez-nous à <a href="mailto:contact@destinsexceptionnels.com">c
    </footer>
</body>
</html>
```

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SECURE SHELL (SSH)

SSH sur notre super GLPI

```
PS C:\windows\system32> ssh -t peutetre@10.0.2.25 -p 9022 ssh peutetre@172.16.16.4
Linux superglpi 6.1.0-18-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.1.76-1 (2024-02-01) 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: Thu Jul 18 10:39:18 2024 from 10.0.2.12
peutetre@superglpi:~$
```

SSH sur notre Windows serveur (DNS)

```
Connection to 10.0.2.25 closed.
PS C:\windows\system32> ssh -t peutetre@10.0.2.25 -p 9022 ssh ylias@172.16.16.3
ylias@172.16.16.3's password:
Microsoft Windows [version 10.0.20348.169]
(c) Microsoft Corporation. Tous droits réservés.

ylias@SERVEURDNS C:\Users\Ylias>
```

SSH sur notre serveur web NGINX

```
peutetre@djanet: ~
PS C:\windows\system32> ssh -t peutetre@10.0.2.25 -p 9022 ssh peutetre@172.16.17.2
Linux djanet 6.1.0-23-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.1.99-1 (2024-07-15) 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: Thu Jul 18 10:16:34 2024 from 10.0.2.12
peutetre@djanet:~$
```

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Scripts pour les différentes machines

SCRIPT POUR NGINX

```bash
#!/bin/bash

#Démarre nginx
nginx_start() {
    sudo systemctl enable --now nginx
}

#Arrête nginx
nginx_stop() {
    sudo systemctl disable --now nginx
}

#Redémarre nginx
nginx_restart() {
    sudo systemctl restart nginx
}

#Met à jour le système
package_update() {
    sudo apt-get update
}

#Arrête le script
script_stop() {
    exit 1
}

#Affichage du menu
echo "Menu :"
echo "1. Démarrer nginx"
echo "2. Arrêter nginx"
echo "3. Redémarrer nginx"
echo "4. Mettre à jour le système"
echo "5. Quitter le menu"

#Choix de l'utilisateur
read -p "Choisissez une option : " choice

#Lancement de la fonction selon le choix
case $choice in
    1)
        nginx_start
        ;;
    2)
        nginx_stop
        ;;
    3)
        nginx_restart
        ;;
    4)
        package_update
        ;;
    5)
        script_stop
        ;;
esac
```

SCRIPT POUR & Grafana

```bash
#!/bin/bash

#démarre prometheus
prometheus_start() {
    sudo systemctl enable --now prometheus.service
}

#Arrête prometheus
prometheus_stop() {
    sudo systemctl disable --now prometheus.service
}

#Redémarre prometheus
prometheus_restart() {
    sudo systemctl restart prometheus.service
}

#Démarre graphana
graphana_start() {
    sudo systemctl enable --now graphana-server.service

#Arrête graphana
graphana_stop() {
    sudo systemctl disable --now graphana-server.service
}

#Redémarre graphana
graphana_restart() {
    sudo systemctl restart grapahana-server.service
}
#Met à jour le système
package_update() {
    sudo apt-get update
}

#Arrête le script
script_stop() {
    exit 1
}

#Affichage du menu
echo "Menu :"
echo "1. Démarrer Prometheus"
echo "2. Arrêter Prometheus"
echo "3. Redémarrer Prometheus"
echo "4. Démarrer Graphana"
echo "5. Arrêter Graphana"
echo "6. Redémarrer Graphana"
echo "7. Mettre à jour le système"
echo "8. Quitter le menu"

#Choix
read -p "Choisissez une option : " choice

#Lancement de la fonction selon le choix
case $choice in
  1)
    prometheus_start
    ;;
  2)
    prometheus_stop
    ;;
  3)
    prometheus_restart
    ;;
  4)
    graphana_start
    ;;
  5)
    graphana_stop
    ;;
  6)
    graphana_restart
    ;;
  7)
    package_update
    ;;
  8)
    script_stop
    ;;
esac
```

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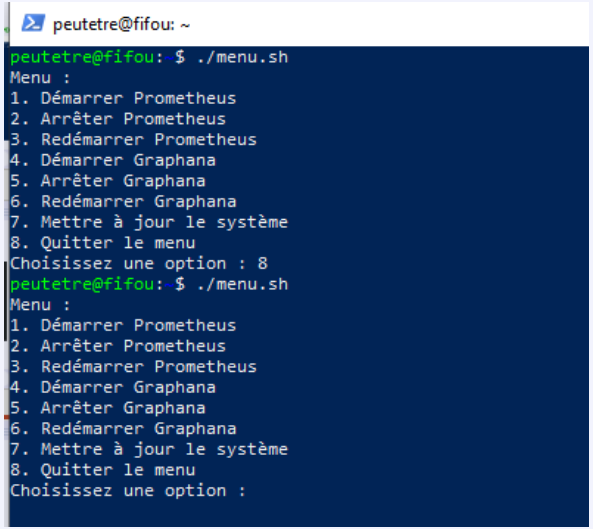
Scripts pour les différentes machines

SCRIPT POUR NGINX

```
peutetre@djanet:~$ ./menu.sh
Menu :
1. Démarrer nginx
2. Arrêter nginx
3. Redémarrer nginx
4. Mettre à jour le système
5. Quitter le menu
Choisissez une option : 3
peutetre@djanet:~$ ./menu.sh
Menu :
1. Démarrer nginx
2. Arrêter nginx
3. Redémarrer nginx
4. Mettre à jour le système
5. Quitter le menu
Choisissez une option : 5
peutetre@djanet:~$
```

SCRIPT POUR & Grafana



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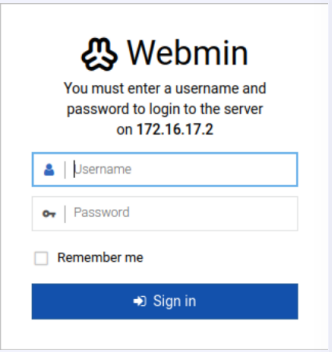
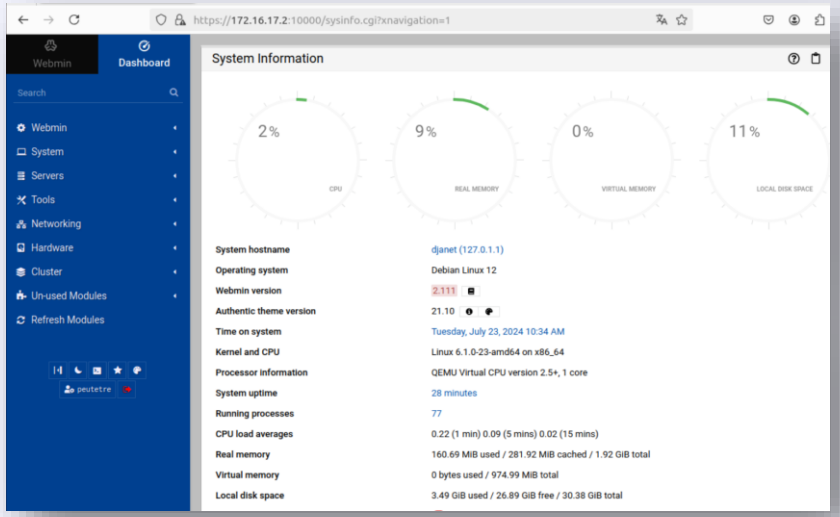
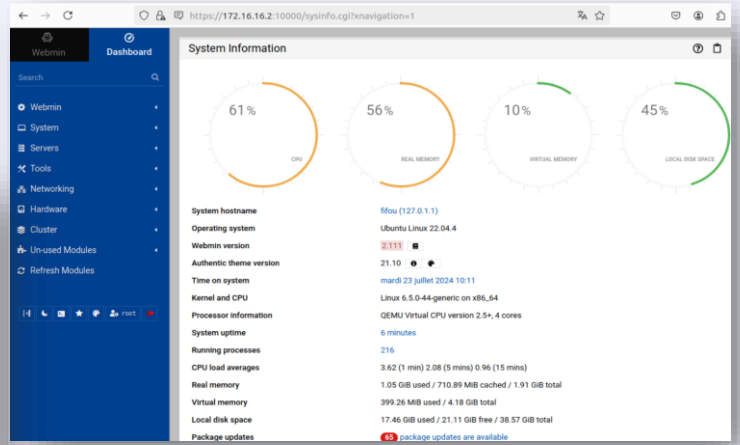
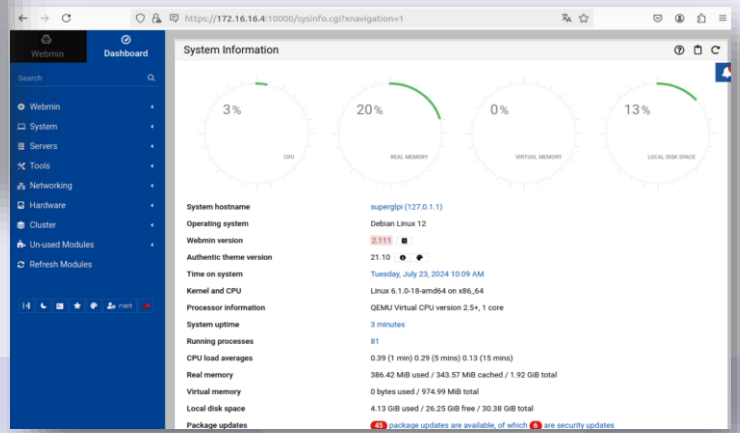
Webmin

Portail Webmin sur chaque machine linux









Grafana

05

Prometheus/Grafana

Node Exporter

Node Exporter

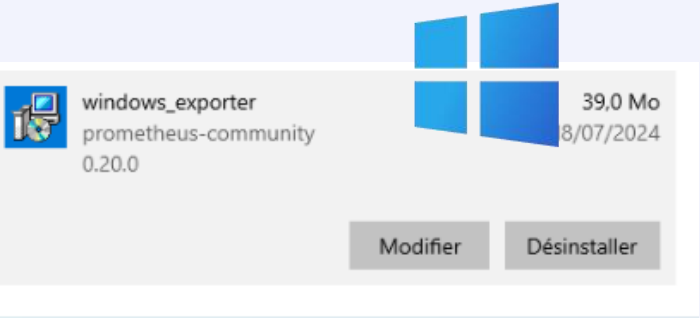
```
peutetre@fifou:~$ sudo systemctl status node_exporter
● node_exporter.service - Node Exporter
     Loaded: loaded (/etc/systemd/system/node_exporter.service; enabled; vendor preset: enabled)
     Active: active (running) since Tue 2024-07-23 10:05:01 CEST; 39min ago
   Main PID: 611 (node_exporter)
      Tasks: 5 (limit: 2259)
     Memory: 784.0K
        CPU: 67ms
     CGroup: /system.slice/node_exporter.service
             └─611 /usr/local/bin/node_exporter

juil. 23 10:05:02 fifou node_exporter[611]: ts=2024-07-23T08:05:02.802Z caller=node_exporter.go:117 level=info collector=thermal_zo
juil. 23 10:05:02 fifou node_exporter[611]: ts=2024-07-23T08:05:02.803Z caller=node_exporter.go:117 level=info collector=time
juil. 23 10:05:02 fifou node_exporter[611]: ts=2024-07-23T08:05:02.803Z caller=node_exporter.go:117 level=info collector=timex
juil. 23 10:05:02 fifou node_exporter[611]: ts=2024-07-23T08:05:02.803Z caller=node_exporter.go:117 level=info collector=udp_queues
juil. 23 10:05:02 fifou node_exporter[611]: ts=2024-07-23T08:05:02.803Z caller=node_exporter.go:117 level=info collector=uname
juil. 23 10:05:02 fifou node_exporter[611]: ts=2024-07-23T08:05:02.803Z caller=node_exporter.go:117 level=info collector=vmstat
juil. 23 10:05:02 fifou node_exporter[611]: ts=2024-07-23T08:05:02.803Z caller=node_exporter.go:117 level=info collector=xfs
juil. 23 10:05:02 fifou node_exporter[611]: ts=2024-07-23T08:05:02.803Z caller=node_exporter.go:117 level=info collector=zfs
juil. 23 10:05:02 fifou node_exporter[611]: ts=2024-07-23T08:05:02.805Z caller=tls_config.go:232 level=info msg="Listening on" addr
juil. 23 10:05:02 fifou node_exporter[611]: ts=2024-07-23T08:05:02.805Z caller=tls_config.go:235 level=info msg="TLS is disabled."
lines 1-20/20 (END)
```

```
peutetre@djanet:~$ sudo systemctl status node_exporter
● node_exporter.service - Node Exporter
     Loaded: loaded (/etc/systemd/system/node_exporter.service; enabled; preset: enabled)
     Active: active (running) since Tue 2024-07-23 10:05:19 CEST; 56min ago
   Main PID: 433 (node_exporter)
      Tasks: 5 (limit: 2306)
     Memory: 29.1M
        CPU: 8.361s
     CGroup: /system.slice/node_exporter.service
             └─433 /usr/local/bin/node_exporter
```

NGINX

```
peutetre@supergl pi:~$ sudo systemctl status node_exporter
● node_exporter.service - Node Exporter
     Loaded: loaded (/etc/systemd/system/node_exporter.service; enabled; preset: enabled)
     Active: active (running) since Tue 2024-07-23 10:05:09 CEST; 46min ago
   Main PID: 433 (node_exporter)
      Tasks: 4 (limit: 2307)
     Memory: 31.0M
        CPU: 6.757s
     CGroup: /system.slice/node_exporter.service
             └─433 /usr/local/bin/node_exporter

Jul 23 10:05:10 supergl pi node_exporter[433]: ts=2024-07-23T08:05:10.387Z caller=node_exporter.go:117 level=info collector=thermal_zone
Jul 23 10:05:10 supergl pi node_exporter[433]: ts=2024-07-23T08:05:10.387Z caller=node_exporter.go:117 level=info collector=time
Jul 23 10:05:10 supergl pi node_exporter[433]: ts=2024-07-23T08:05:10.387Z caller=node_exporter.go:117 level=info collector=timex
Jul 23 10:05:10 supergl pi node_exporter[433]: ts=2024-07-23T08:05:10.388Z caller=node_exporter.go:117 level=info collector=udp_queues
Jul 23 10:05:10 supergl pi node_exporter[433]: ts=2024-07-23T08:05:10.388Z caller=node_exporter.go:117 level=info collector=uname
Jul 23 10:05:10 supergl pi node_exporter[433]: ts=2024-07-23T08:05:10.388Z caller=node_exporter.go:117 level=info collector=vmstat
Jul 23 10:05:10 supergl pi node_exporter[433]: ts=2024-07-23T08:05:10.388Z caller=node_exporter.go:117 level=info collector=xfs
Jul 23 10:05:10 supergl pi node_exporter[433]: ts=2024-07-23T08:05:10.388Z caller=node_exporter.go:117 level=info collector=zfs
Jul 23 10:05:10 supergl pi node_exporter[433]: ts=2024-07-23T08:05:10.396Z caller=tls_config.go:232 level=info msg="Listening on" address=[::]:9100
Jul 23 10:05:10 supergl pi node_exporter[433]: ts=2024-07-23T08:05:10.396Z caller=tls_config.go:235 level=info msg="TLS is disabled." http2=false address=[::]:9
lines 1-20/20 (END)
peutetre@supergl pi:~$
```

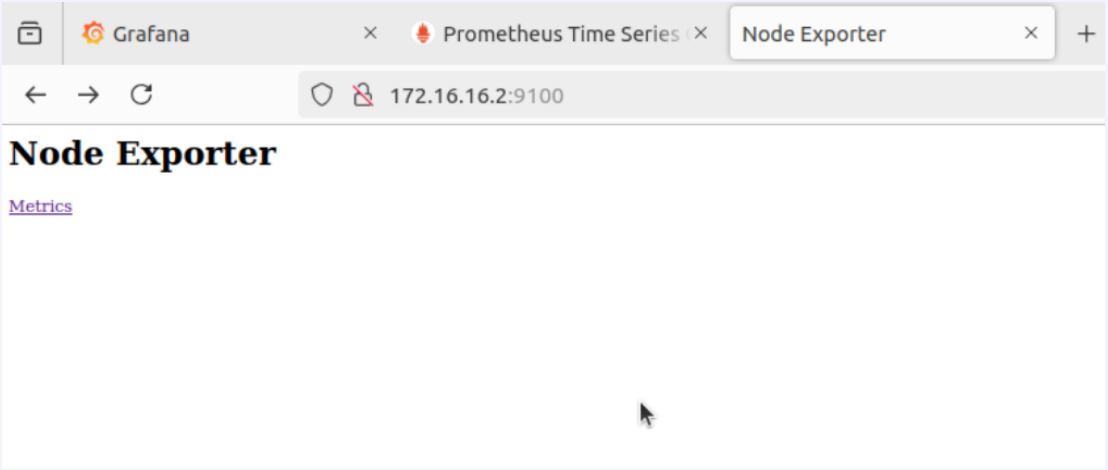
Glpi

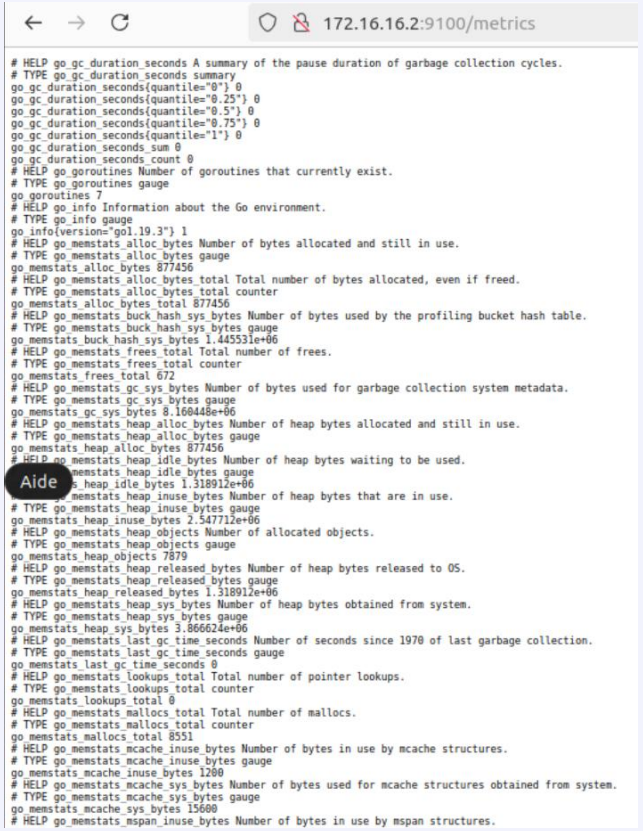



```
[2.7.2-RELEASE][admin@pfSense.home.arpa]/root: service node_exporter onestart
Starting node_exporter.
[2.7.2-RELEASE][admin@pfSense.home.arpa]/root: service node_exporter enable
node_exporter enabled in /etc/rc.conf
[2.7.2-RELEASE][admin@pfSense.home.arpa]/root: service node_exporter status
node_exporter is running as pid 5264.
[2.7.2-RELEASE][admin@pfSense.home.arpa]/root:
```

Download:

Node exporter



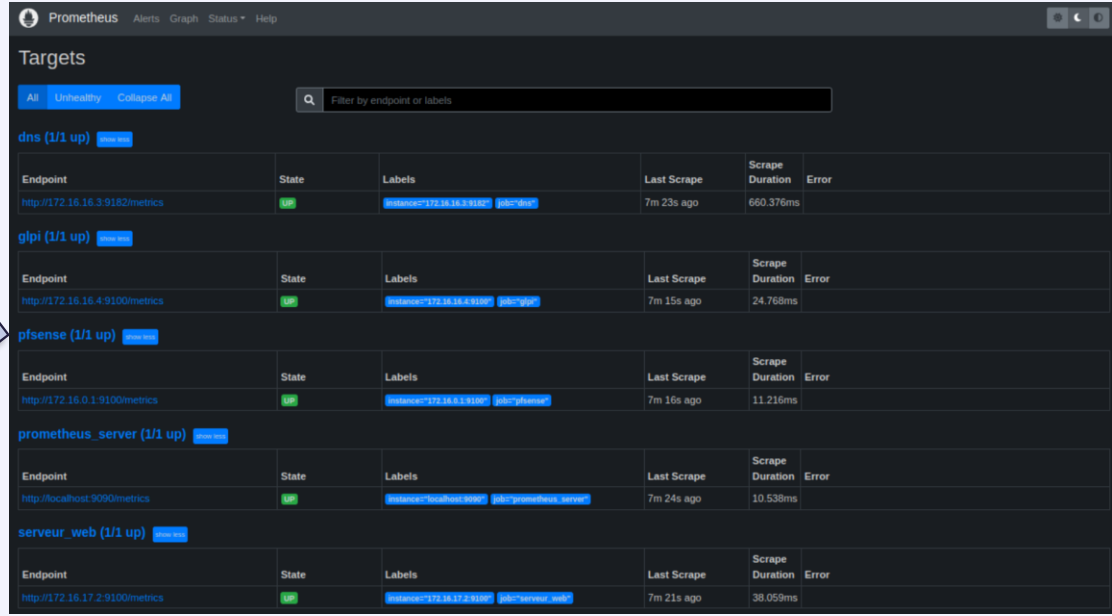


Download:

Prometheus

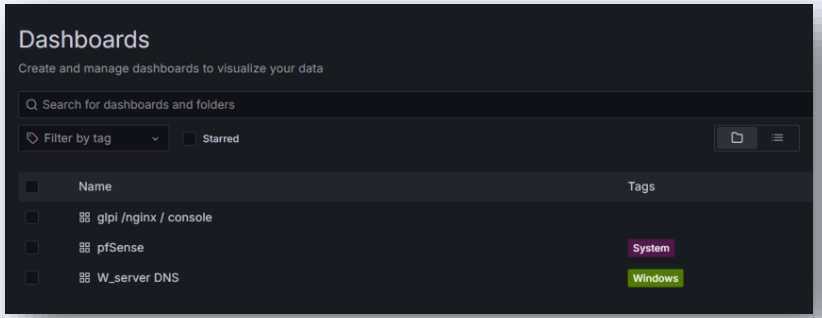
Fichier yml

```yaml
# Load rules once and periodically evaluate them according to the global 'evaluation_interval'.
rule_files:
  # - "first_rules.yml"
  # - "second_rules.yml"

# A scrape configuration containing exactly one endpoint to scrape:
# Here it's Prometheus itself.
scrape_configs:
  # The job name is added as a label `job=<job_name>` to any timeseries scraped from this config.
  - job_name: "prometheus_server"
    static_configs:
      - targets: ["localhost:9090"]

  - job_name: "glpi"
    scrape_interval: 10s
    static_configs:
     - targets: ["172.16.16.4:9100"]

  - job_name: "serveur_web"
    scrape_interval: 10s
    static_configs:
     - targets: ["172.16.17.2:9100"]

  - job_name: "dns"
    scrape_interval: 10s
    static_configs:
     - targets: ["172.16.16.3:9182"]

  - job_name: "pfsense"
    scrape_interval: 10s
    static_configs:
     - targets: ["172.16.0.1:9100"]
```



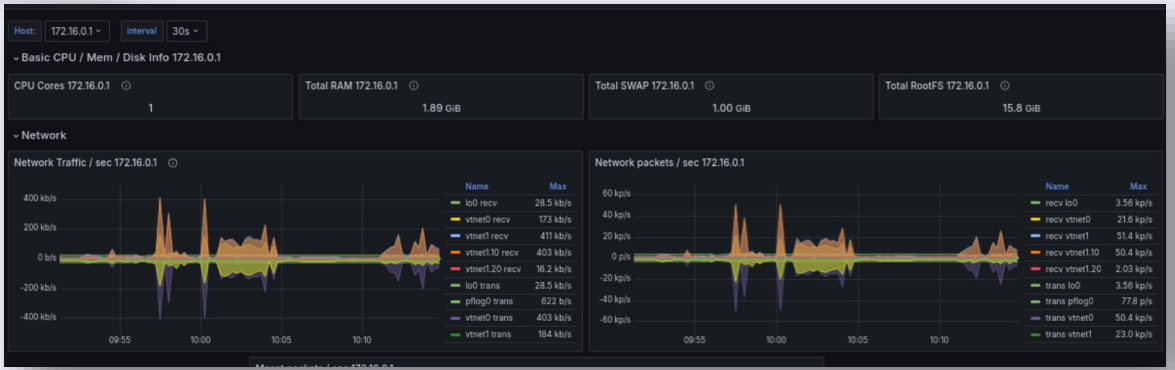
Download:

Grafana



pfsense

ID: 11491



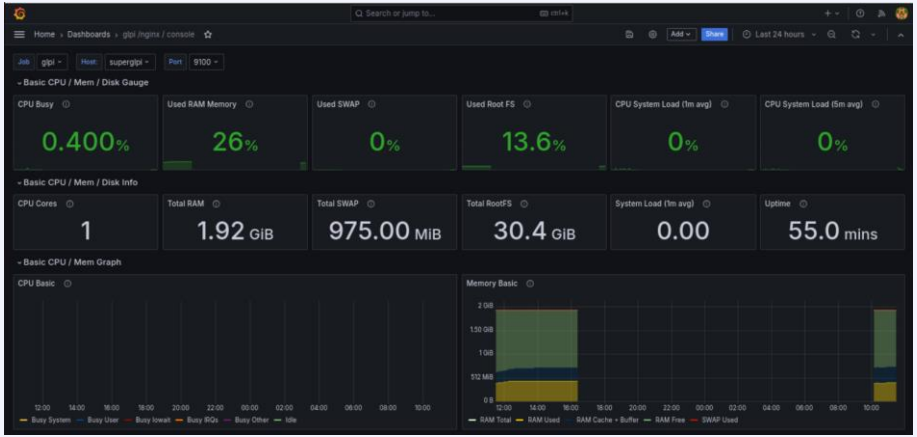
Download:

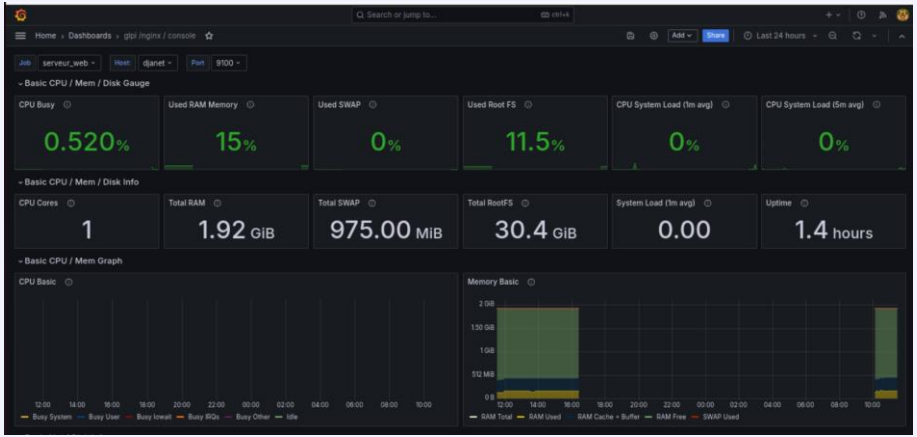
Grafana

Glpi

ID: 12486

NGINX

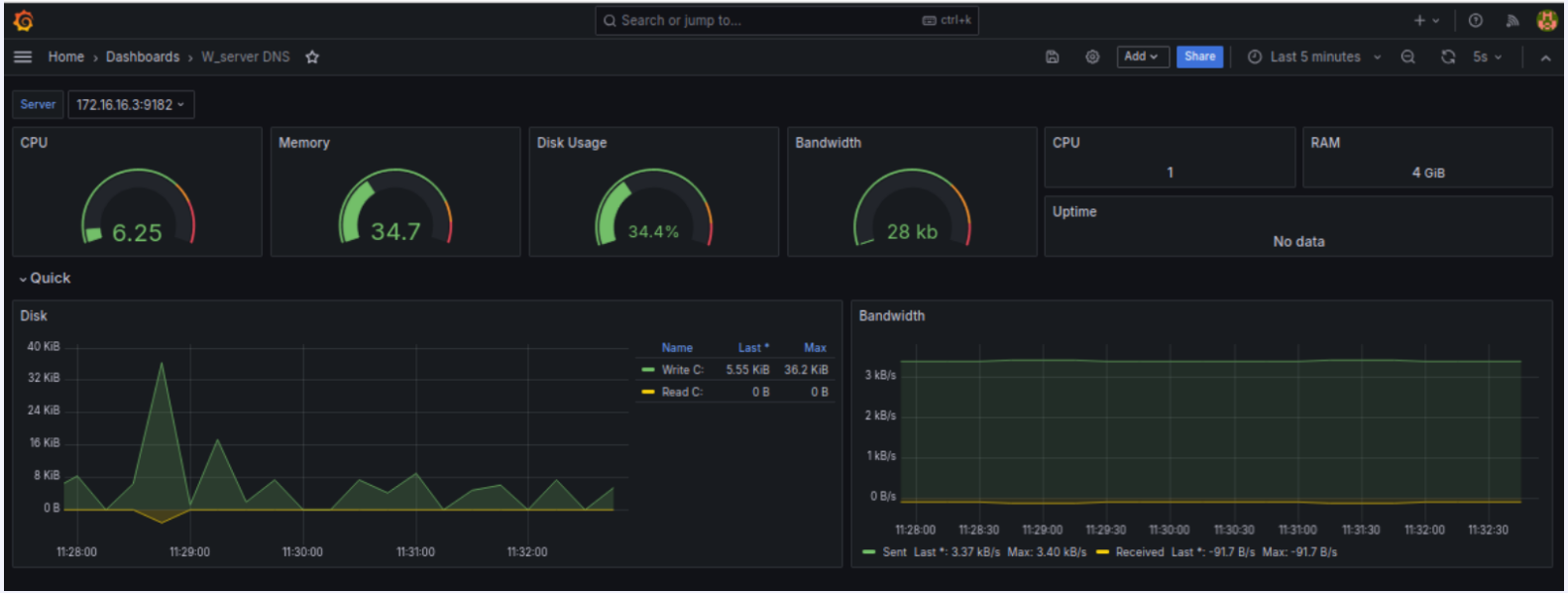




Download:

Grafana

ID: 3969



Download:

Merci !

De la part de Michaël, Arnaud, Ilyas et le grand chef Lucas !