Projekt remek

Készítette:
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Szijjártó László

2021.

Bevezető

- A megvalósított hálózat részei:
  - XYZ Laboratórium: központi telephely, ADMIN, GYARTAS, KUTATOK és SECRET VLAN-okkal
  - Szerverfarm: Windows 2019 és Linux szerverekkel
  - Fiókiroda: távoli része a vállalatnak, Windows szerverrel
  - Távmunkás: otthonról dolgozó munkavállaló, akár lehet a rendszergazda is

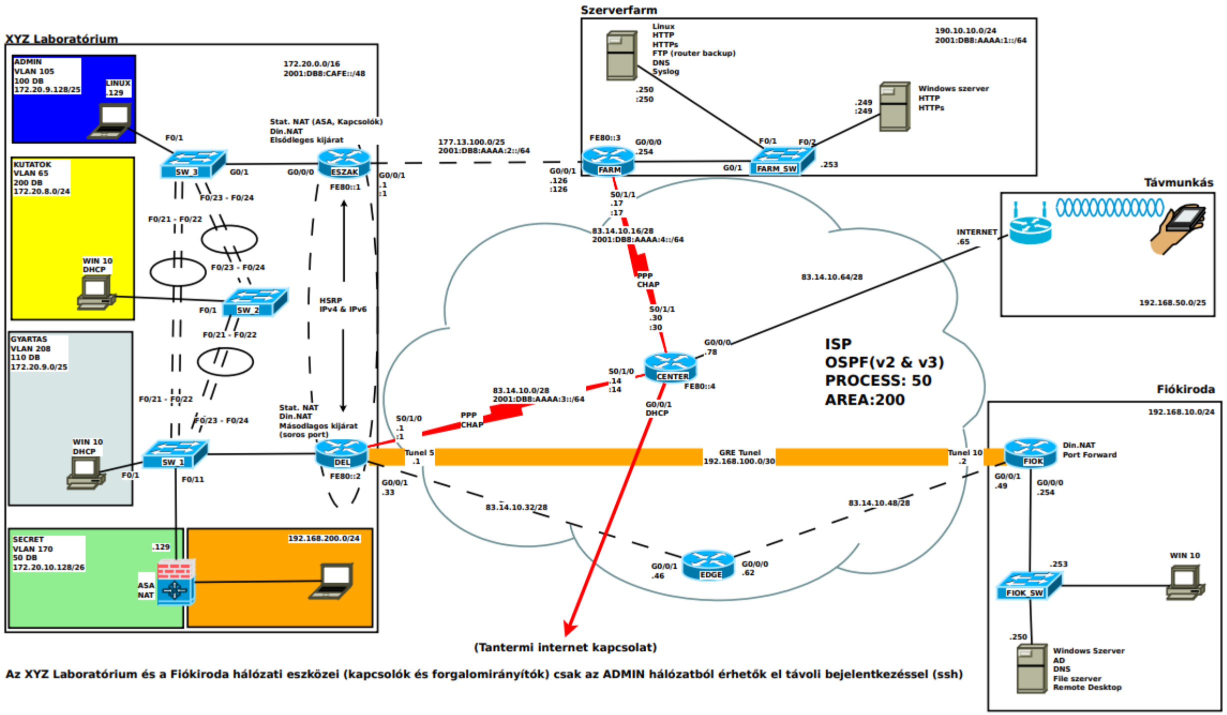
A megvalósítás során használt eszközök

- CISCO 4221 forgalomirányító 6 db
- CISCO 2960 kapcsoló 5 db
- VirtualBox a szerverek és a windows kliensek számára
- Ubuntu 20.04 az ADMIN VLAN-ban valós eszközön
- Okostelefon a távmunkás részére

A dokumentáció részei

- A fizikai topológia: Fizikai_topo.pdf
- A logikai topológia: Logikai_topo.xlsx (VLSM, VLAN-ok, VTP, Portkiosztás)
- Az eszközök konfigurációs fájljai FTP szerverre mentve és onnan letöltve.
- A hálózat prezentációja: Bemutato.pdf
- Szervereken futó alkalmazások konfigurációs állományai elmentve.
- A tesztelés során készült video: Teszt.mkv

A projekt részeinek bemutatása

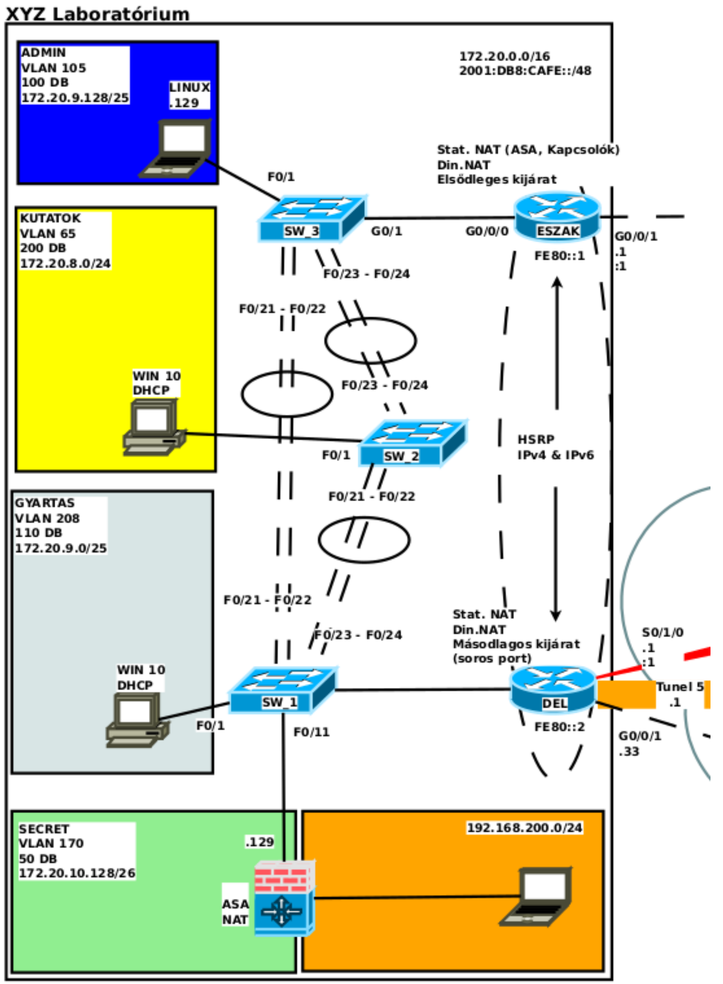


Az XYZ Laboratórium és a Fiókiroda hálózati eszközei (kapcsolók és forgalomirányítók) csak az ADMIN hálózatból érhetők el távoli bejelentkezéssel (ssh)

Az XYZ Laboratórium

XYZ Laboratórium

- Alkalmazott technológiák:
  - VLAN-ok
  - VTP
  - Etherchannel
  - Rapid PVST+
  - Portbiztonság
  - HSRP (IPv4 és IPv6)
  - SSH az eszközök eléréséhez
  - GRE Tunnel



VLAN-ok

VLAN azonosító	VLAN neve	Szükséges IP-címek száma
VLAN 105	ADMIN	100 db
VLAN 65	KUTATOK	200 db
VLAN 208	GYARTAS	110 db
VLAN 170	SECRET	50 db
VLAN 310	FELUGYELET	50 db
VLAN 350	URES	0 db
VLAN 390	NATIV	0 db

VTP

Paraméterek	Eszközök
Szerver	SW_3
Kliensek	SW_2, SW_1
Domain	xyz.local
Password	xyz

Portkiosztások

Eszköz	ADMIN VLAN 105	KUTATOK VLAN 65	GYARTAS VLAN208	SECRET VLAN170	URES VLAN 350
SW_3	F0/1 - F0/3	F0/4 - F0/10	F0/11 - F0/18	-	F0/19 - F0/20, G0/2
SW_2	-	F0/1 - F0/5	-	-	F0/6 - F0/20, G0/1 - G0/2
SW_1	-	-	F0/1 - F0/11	F0/11 - F0/15	F0/16 - F0/20, G0/2

Etherchannel ***SW_3***, Rapid PVST+

- interface Port-channel1
  - switchport trunk native vlan 390
  - switchport mode trunk
  - spanning-tree link-type point-to-point

- interface Port-channel3
  - switchport trunk native vlan 390
  - switchport mode trunk
  - spanning-tree link-type point-to-point

spanning-tree mode rapid-pvst

Etherchannel ***SW_2***, Rapid PVST+

- interface Port-channel1
  - switchport trunk native vlan 390
  - switchport mode trunk
  - spanning-tree link-type point-to-point

- interface Port-channel2
  - switchport trunk native vlan 390
  - switchport mode trunk
  - spanning-tree link-type point-to-point

spanning-tree mode rapid-pvst

Etherchannel ***SW_1***, Rapid PVST+

- interface Port-channel2
  - switchport trunk native vlan 390
  - switchport mode trunk
  - spanning-tree link-type point-to-point

- interface Port-channel3
  - switchport trunk native vlan 390
  - switchport mode trunk
  - spanning-tree link-type point-to-point

spanning-tree mode rapid-pvst

Portbiztonság ***SW_2***

```
interface FastEthernet0/1
        switchport access vlan 65
        switchport mode access
        switchport port-security maximum 2  # A gazda gép és a virtuális gép miatt
        switchport port-security violation  restrict       # Naplózás syslog szerverre
        switchport port-security mac-address sticky
        switchport port-security mac-address sticky 0800.27f7.19ca
        switchport port-security mac-address sticky e0d5.5ee1.d88d
        switchport port-security
```

A többi porton a portbiztonság hasonló beállítások szerint

Portbiztonság ***SW_1***

```
interface FastEthernet0/1
            switchport access vlan 65
            switchport mode access
            switchport port-security maximum 2  # A gazda gép és a virtuális gép miatt
            switchport port-security violation  restrict        # Naplózás syslog szerverre
            switchport port-security mac-address sticky
            switchport port-security mac-address sticky 0800.275e.baa6
            switchport port-security mac-address sticky e0d5.5ee1.d88f
            switchport port-security
```

A többi porton a portbiztonság hasonló beállítások szerint

HSRP IPv4 ***Eszak*** forgalomirányító

- interface GigabitEthernet0/0/0.65
- ip address 172.20.8.253 255.255.255.0
- standby 65 ip 172.20.8.254
- standby 65 priority 150
- standby 65 preempt

- interface GigabitEthernet0/0/0.105
- ip address 172.20.9.253 255.255.255.128
- standby 105 ip 172.20.9.254
- standby 105 priority 150
- standby 105 preempt

- interface GigabitEthernet0/0/0.170
- ip address 172.20.10.189 255.255.255.192
- standby 170 ip 172.20.10.190
- standby 170 priority 150
- standby 170 preempt

- interface GigabitEthernet0/0/0.208
- ip address 172.20.9.125 255.255.255.128
- standby 208 ip 172.20.9.126
- standby 208 priority 150
- standby 208 preempt

- interface GigabitEthernet0/0/0.310
- ip address 172.20.10.125 255.255.255.128
- standby 31 ip 172.20.10.126
- standby 31 priority 150
- standby 31 preempt

- **Az *ESZAK* az elsődleges kijárat mindegyik VLAN esetén!**

HSRP IPv4 ***Del*** forgalomirányító

- interface GigabitEthernet0/0/0.65
- ip address 172.20.8.252 255.255.255.0
- standby 65 ip 172.20.8.254

- interface GigabitEthernet0/0/0.105
- ip address 172.20.9.252 255.255.255.128
- standby 105 ip 172.20.9.254

- interface GigabitEthernet0/0/0.170
- ip address 172.20.10.188 255.255.255.192
- standby 170 ip 172.20.10.190

- interface GigabitEthernet0/0/0.208
- ip address 172.20.9.124 255.255.255.128
- standby 208 ip 172.20.9.126

- interface GigabitEthernet0/0/0.310
- ip address 172.20.10.124 255.255.255.128
- standby 31 ip 172.20.10.126

- **A *Del* a másodlagos kijárat mindegyik VLAN esetén!**

HSRP IPv6 ***Eszak*** forgalomirányító

- interface GigabitEthernet0/0/0.65
- standby version 2
- standby 6 ipv6 2001:DB8:CAFE:65::254/64
- standby 6 priority 150
- standby 6 preempt
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:CAFE:65::253/64

- interface GigabitEthernet0/0/0.105
- standby version 2
- standby 10 ipv6 2001:DB8:CAFE:105::254/64
- standby 10 priority 150
- standby 10 preempt
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:CAFE:105::253/64

- interface GigabitEthernet0/0/0.170
- standby version 2
- standby 17 ipv6 2001:DB8:CAFE:170::190/64
- standby 17 priority 150
- standby 17 preempt
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:CAFE:170::189/64

- interface GigabitEthernet0/0/0.208
- standby version 2
- standby 20 ipv6 2001:DB8:CAFE:208::126/64
- standby 20 priority 150
- standby 20 preempt
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:CAFE:208::125/64

- interface GigabitEthernet0/0/0.310
- standby version 2
- standby 32 ipv6 2001:DB8:CAFE:310::126/64
- standby 32 priority 150
- standby 32 preempt
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:CAFE:310::125/64

- **Az *ESZAK* az elsődleges kijárat mindegyik VLAN esetén!**

HSRP IPv6 *Del* forgalomirányító

- interface GigabitEthernet0/0/0.65
- standby version 2
- standby 6 ipv6 2001:DB8:CAFE:65::254/64
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:CAFE:65::252/64

- interface GigabitEthernet0/0/0.105
- standby version 2
- standby 10 ipv6 2001:DB8:CAFE:105::254/64
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:CAFE:105::252/64

- interface GigabitEthernet0/0/0.170
- standby version 2
- standby 6 ipv6 2001:DB8:CAFE:170::190/64
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:CAFE:170::188/64

- interface GigabitEthernet0/0/0.208
- standby version 2
- standby 20 ipv6 2001:DB8:CAFE:208::126/64
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:CAFE:208::124/64

- interface GigabitEthernet0/0/0.310
- standby version 2
- standby 32 ipv6 2001:DB8:CAFE:310::126/64
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:CAFE:310::124/64

- **A *Del* a másodlagos kijárat mindegyik VLAN esetén!**

SSH a távoli eléréshez

- username admin privilege 15 secret 5 $1$8XGl$SmTC321yjFRtoQ8vVshGs1

- line vty 0 4
  access-class SSH in
  login local
  transport input ssh

- line vty 5 15
  access-class SSH in
  login local
  transport input ssh

- ip access-list standard SSH
  permit 172.20.9.128 0.0.0.127

GRE Tunnel

- *Del forgalomirányító*
- interface Tunnel5
- ip address 192.168.100.1 255.255.255.252
- tunnel source GigabitEthernet0/0/1
- tunnel destination 83.14.10.49

- *Fiok forgalomirányító*
- interface Tunnel10
- ip address 192.168.100.2 255.255.255.252
- tunnel source GigabitEthernet0/0/1
- tunnel destination 83.14.10.33

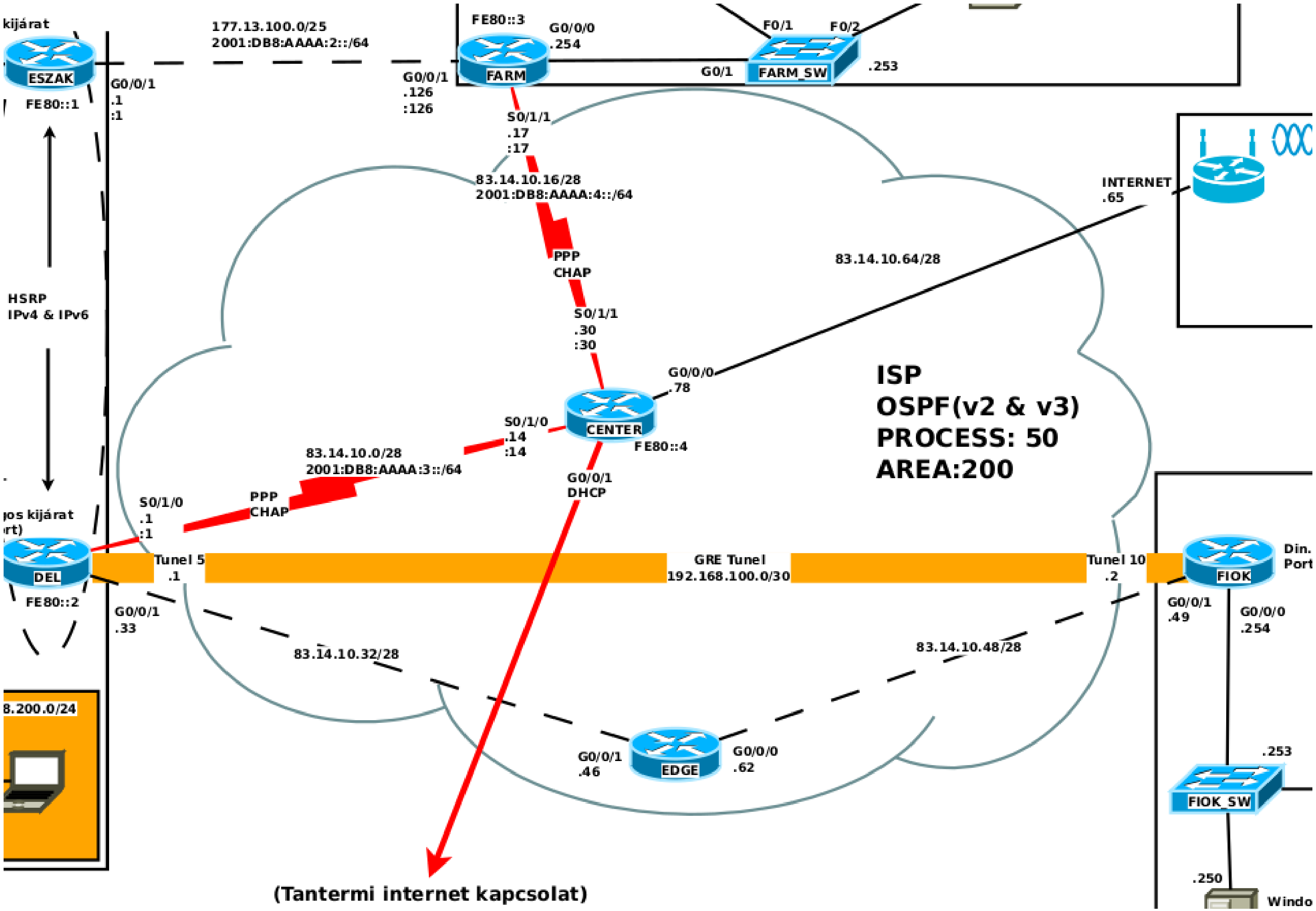
- *Edge forgalomirányító*

- ip access-list extended NOPRIVATE
  - deny   ip 10.0.0.0 0.255.255.255 any
  - deny   ip 127.0.0.0 0.255.255.255 any
  - deny   ip 172.16.0.0 0.15.255.255 any
  - deny   ip 192.168.0.0 0.0.255.255 any
  - permit ip any any

Privát címek tiltása a közbülső forgalomirányítón →

```
interface GigabitEthernet0/0/0
 ip address 83.14.10.62 255.255.255.240
 ip access-group NOPRIVATE in

interface GigabitEthernet0/0/1
 ip address 83.14.10.46 255.255.255.240
 ip access-group NOPRIVATE in
```

OSPF terület - IPv4


kijárat
ESZAK
FE80::1
G0/0/1
.1
:1
177.13.100.0/25
2001:DB8:AAAA:2::/64
G0/0/1
.126
:126
FE80::3
FARM
G0/0/0
.254
G0/1
F0/1
F0/2
FARM_SW
.253
S0/1/1
.17
:17
83.14.10.16/28
2001:DB8:AAAA:4::/64
PPP
CHAP
S0/1/1
.30
:30
HSRP
IPv4 & IPv6
INTERNET
.65
83.14.10.64/28
G0/0/0
.78
CENTER
FE80::4
S0/1/0
.14
:14
83.14.10.0/28
2001:DB8:AAAA:3::/64
PPP
CHAP
G0/0/1
DHCP
ISP
OSPF(v2 & v3)
PROCESS: 50
AREA:200
S0/1/0
.1
:1
jos kijárat
rt)
DEL
FE80::2
Tunel 5
.1
GRE Tunel
192.168.100.0/30
Tunel 10
.2
FIOK
Din.
Port
G0/0/1
.33
83.14.10.32/28
83.14.10.48/28
G0/0/1
.49
G0/0/0
.254
8.200.0/24
G0/0/1
.46
EDGE
G0/0/0
.62
.253
FIOK_SW
.250
Windo
(Tantermi internet kapcsolat)

Eszak forgalomirányító

- router ospf 50
- router-id 1.1.1.1
- area 200 authentication message-digest
- network 177.13.100.0 0.0.0.127 area 200

- interface GigabitEthernet0/0/1
- ip address 177.13.100.1 255.255.255.128
- ip nat outside
- ip ospf message-digest-key 50 md5 internet

Del forgalomirányító

- router ospf 50
- router-id 2.2.2.2
- area 200 authentication message-digest
- network 83.14.10.0 0.0.0.15 area 200
- network 83.14.10.32 0.0.0.15 area 200

- interface Serial0/1/0
- ip address 83.14.10.1 255.255.255.240
- ip nat outside
- encapsulation ppp
- ip ospf message-digest-key 50 md5 internet

- interface GigabitEthernet0/0/1
- ip address 83.14.10.33 255.255.255.240
- ip ospf message-digest-key 50 md5 internet

Del forgalomirányító Tunnel kapcsolat

```
router ospf 100
router-id 20.20.20.20
passive-interface GigabitEthernet0/0/0
passive-interface GigabitEthernet0/0/0.65
passive-interface GigabitEthernet0/0/0.105
passive-interface GigabitEthernet0/0/0.170
passive-interface GigabitEthernet0/0/0.208
passive-interface GigabitEthernet0/0/1
passive-interface Serial0/1/0
network 172.20.8.0 0.0.0.255 area 200
network 172.20.9.0 0.0.0.127 area 200
network 172.20.9.128 0.0.0.127 area 200
network 172.20.10.0 0.0.0.127 area 200
network 172.20.10.128 0.0.0.63 area 200
network 192.168.100.0 0.0.0.3 area 200
```

Farm forgalomirányító

- router ospf 50
- router-id 3.3.3.3
- area 200 authentication message-digest
- passive-interface GigabitEthernet0/0/0
- network 83.14.10.16 0.0.0.15 area 200
- network 177.13.100.0 0.0.0.127 area 200
- network 190.10.10.0 0.0.0.255 area 200

- interface GigabitEthernet0/0/1
- ip address 177.13.100.126 255.255.255.128
- ip ospf message-digest-key 50 md5 internet

- interface Serial0/1/1
- ip address 83.14.10.17 255.255.255.240
- encapsulation ppp
- ip ospf message-digest-key 50 md5 internet

Center forgalomirányító

- router ospf 50
- router-id 4.4.4.4
- area 200 authentication message-digest
- passive-interface GigabitEthernet0/0/0
- network 83.14.10.0 0.0.0.15 area 200
- network 83.14.10.16 0.0.0.15 area 200
- network 83.14.10.64 0.0.0.15 area 200
- default-information originate

- # tantermi alapértelmezett átjáró, statikus útvonal
- ip route 0.0.0.0 0.0.0.0 10.10.109.254

- interface Serial0/1/0
- ip address 83.14.10.14 255.255.255.240
- ip nat inside
- encapsulation ppp
- ip ospf message-digest-key 50 md5 internet

- interface Serial0/1/1
- ip address 83.14.10.30 255.255.255.240
- ip nat inside
- encapsulation ppp
- ip ospf message-digest-key 50 md5 internet

Fiok forgalomirányító

- router ospf 50
- router-id 6.6.6.6
- area 200 authentication message-digest
- passive-interface GigabitEthernet0/0/0
- network 83.14.10.48 0.0.0.15 area 200

- interface GigabitEthernet0/0/1
- ip address 83.14.10.49 255.255.255.240
- ip nat outside
- ip ospf message-digest-key 50 md5 internet

Fiok forgalomirányító Tunnel kapcsolat

```
router ospf 100
router-id 60.60.60.60
passive-interface GigabitEthernet0/0/0
passive-interface GigabitEthernet0/0/1
network 192.168.10.0 0.0.0.255 area 200
network 192.168.100.0 0.0.0.3 area 200
```

OSPF terület IPv6

Eszak forgalomirányító

- interface GigabitEthernet0/0/0.65
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:CAFE:65::253/64
- ipv6 ospf 50 area 200

- interface GigabitEthernet0/0/0.105
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:CAFE:105::253/64
- ipv6 ospf 50 area 200

- interface GigabitEthernet0/0/0.170
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:CAFE:170::189/64
- ipv6 ospf 50 area 200

- interface GigabitEthernet0/0/0.208
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:CAFE:208::125/64
- ipv6 ospf 50 area 200

- interface GigabitEthernet0/0/0.310
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:CAFE:310::125/64
- ipv6 ospf 50 area 200

- interface GigabitEthernet0/0/1
- ipv6 address FE80::1 link-local
- ipv6 address 2001:DB8:AAAA:2::1/64
- ipv6 ospf 50 area 200

Del forgalomirányító

- interface GigabitEthernet0/0/0.65
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:CAFE:65::252/64
- ipv6 ospf 50 area 200

- interface GigabitEthernet0/0/0.105
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:CAFE:105::252/64
- ipv6 ospf 50 area 200

- interface GigabitEthernet0/0/0.170
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:CAFE:170::188/64
- ipv6 ospf 50 area 200

- interface GigabitEthernet0/0/0.208
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:CAFE:208::124/64
- ipv6 ospf 50 area 200

- interface GigabitEthernet0/0/0.310
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:CAFE:310::124/64
- ipv6 ospf 50 area 200

- interface Serial0/1/0
- ipv6 address FE80::2 link-local
- ipv6 address 2001:DB8:AAAA:3::1/64
- ipv6 ospf 50 area 200

Center forgalomirányító

- interface Serial0/1/0
- ipv6 address FE80::4 link-local
- ipv6 address 2001:DB8:AAAA:3::14/64
- ipv6 ospf 50 area 200

- interface Serial0/1/1
- ipv6 address FE80::4 link-local
- ipv6 address 2001:DB8:AAAA:4::30/64
- ipv6 ospf 50 area 200

Farm forgalomirányító

```
interface GigabitEthernet0/0/1
ipv6 address FE80::3 link-local
ipv6 address 2001:DB8:AAAA:2::126/64
ipv6 ospf 50 area 200
```

```
interface Serial0/1/1
ipv6 address FE80::3 link-local
ipv6 address 2001:DB8:AAAA:4::17/64
ipv6 ospf 50 area 200
```

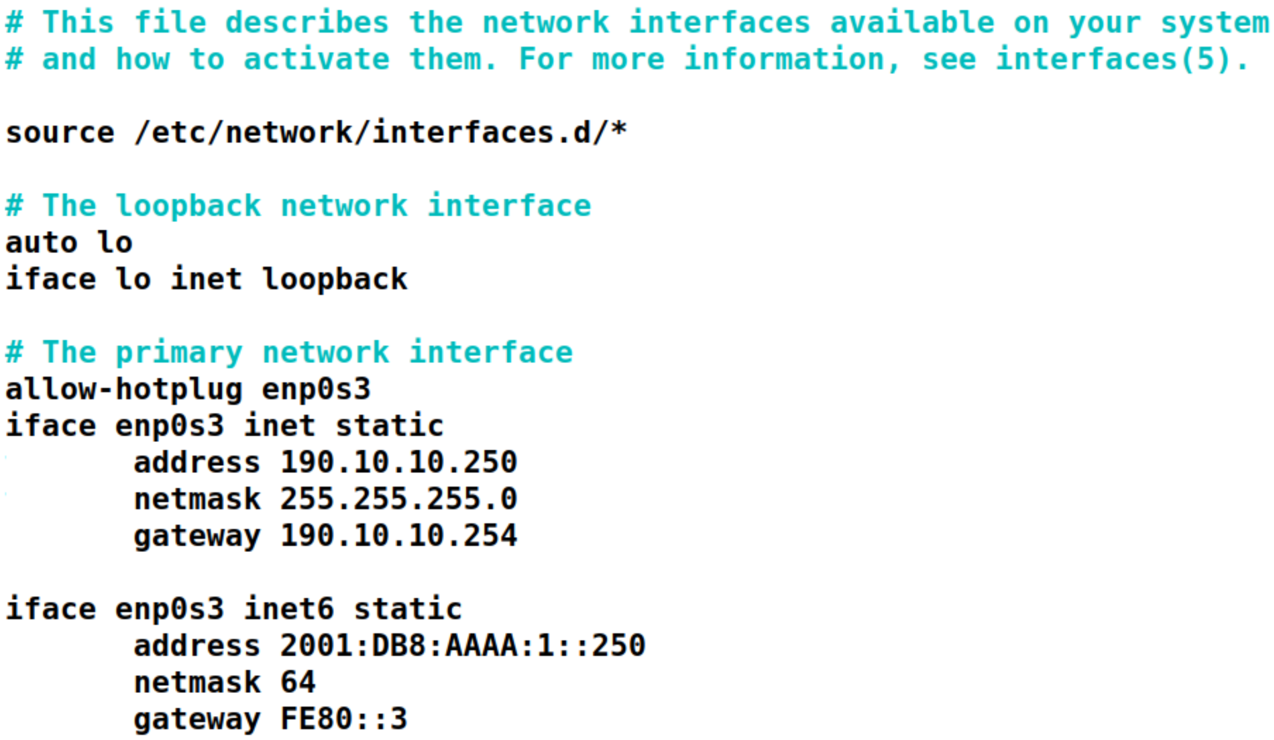
Szerverfarm

A Linux szerver

A virtuális gép

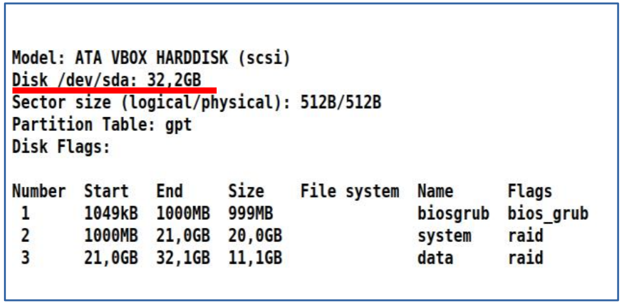
- Merevlemezek száma: 5 x 30 GB
- Memória: 2048 MB
- Operációs rendszer: Debian 11.0
- Karakteres felület, távoli elérés SSH -val

A hálózati beállítások

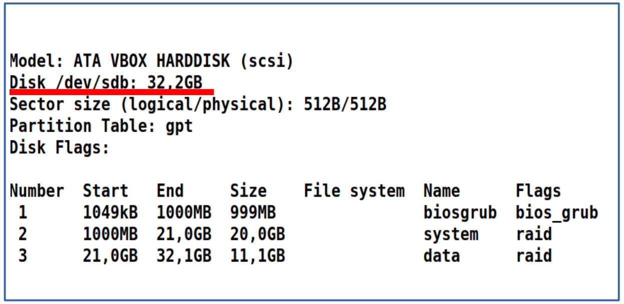


```
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
allow-hotplug enp0s3
iface enp0s3 inet static
       address 190.10.10.250
       netmask 255.255.255.0
       gateway 190.10.10.254

iface enp0s3 inet6 static
       address 2001:DB8:AAAA:1::250
       netmask 64
       gateway FE80::3
```

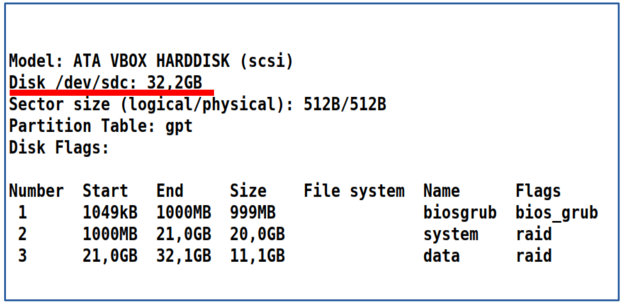
GPT



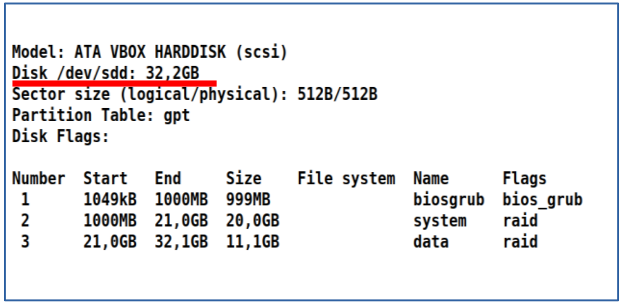
```
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 32,2GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name      Flags
 1      1049kB  1000MB  999MB                biosgrub  bios_grub
 2      1000MB  21,0GB  20,0GB               system    raid
 3      21,0GB  32,1GB  11,1GB               data      raid
```



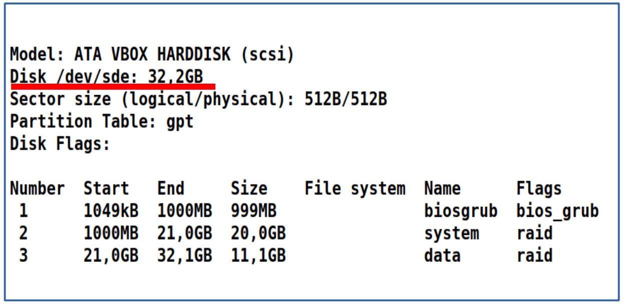
```
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sdb: 32,2GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name      Flags
 1      1049kB  1000MB  999MB                biosgrub  bios_grub
 2      1000MB  21,0GB  20,0GB               system    raid
 3      21,0GB  32,1GB  11,1GB               data      raid
```



```
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sdc: 32,2GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name      Flags
 1      1049kB  1000MB  999MB                biosgrub  bios_grub
 2      1000MB  21,0GB  20,0GB               system    raid
 3      21,0GB  32,1GB  11,1GB               data      raid
```



```
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sdd: 32,2GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name      Flags
 1      1049kB  1000MB  999MB                biosgrub  bios_grub
 2      1000MB  21,0GB  20,0GB               system    raid
 3      21,0GB  32,1GB  11,1GB               data      raid
```



```
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sde: 32,2GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name      Flags
 1      1049kB  1000MB  999MB                biosgrub  bios_grub
 2      1000MB  21,0GB  20,0GB               system    raid
 3      21,0GB  32,1GB  11,1GB               data      raid
```

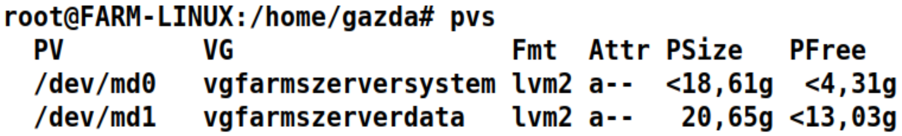
- **A merevlemezeken GPT partíciós táblák**

RAID1 és RAID6

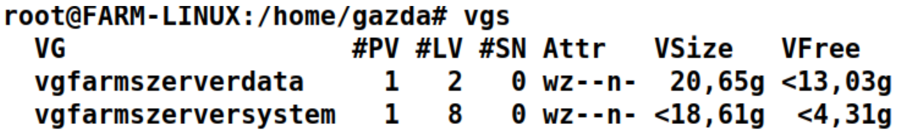
```
root@FARM-LINUX:/home/gazda# mdadm --detail /dev/md0
/dev/md0:
           Version : 1.2
     Creation Time : Mon Oct 25 20:52:35 2021
        Raid Level : raid1
        Array Size : 19513344 (18.61 GiB 19.98 GB)
     Used Dev Size : 19513344 (18.61 GiB 19.98 GB)
      Raid Devices : 4
     Total Devices : 5
       Persistence : Superblock is persistent

       Update Time : Fri Dec  3 19:24:56 2021
             State : clean
    Active Devices : 4
   Working Devices : 5
    Failed Devices : 0
     Spare Devices : 1

Consistency Policy : resync

              Name : FARM-LINUX:0  (local to host FARM-LINUX)
              UUID : 28931313:ffd13d73:235fddf2:d3114d24
            Events : 558

    Number   Major   Minor   RaidDevice State
       0       8        2        0      active sync   /dev/sda2
       1       8       18        1      active sync   /dev/sdb2
       2       8       34        2      active sync   /dev/sdc2
       3       8       66        3      active sync   /dev/sde2

       4       8       50        -      spare   /dev/sdd2
```

```
root@FARM-LINUX:/home/gazda# mdadm --detail /dev/md1
/dev/md1:
           Version : 1.2
     Creation Time : Mon Oct 25 20:52:55 2021
        Raid Level : raid6
        Array Size : 21659648 (20.66 GiB 22.18 GB)
     Used Dev Size : 10829824 (10.33 GiB 11.09 GB)
      Raid Devices : 4
     Total Devices : 5
       Persistence : Superblock is persistent

       Update Time : Fri Dec  3 19:10:30 2021
             State : clean
    Active Devices : 4
   Working Devices : 5
    Failed Devices : 0
     Spare Devices : 1

            Layout : left-symmetric
        Chunk Size : 512K

Consistency Policy : resync

              Name : FARM-LINUX:1  (local to host FARM-LINUX)
              UUID : 3e8405c6:d525e7b8:3b6dc8c4:26cfe738
            Events : 134

    Number   Major   Minor   RaidDevice State
       0       8        3        0      active sync   /dev/sda3
       1       8       19        1      active sync   /dev/sdb3
       2       8       35        2      active sync   /dev/sdc3
       3       8       67        3      active sync   /dev/sde3

       4       8       51        -      spare   /dev/sdd3
```

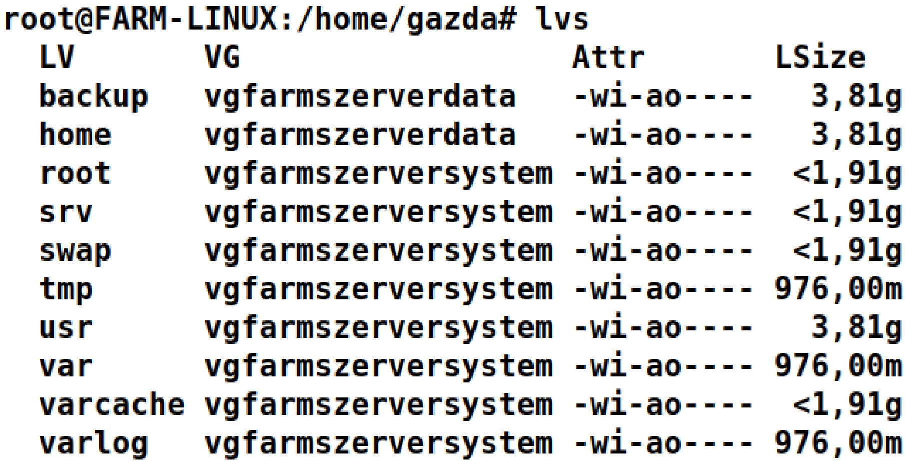
LVM



```
root@FARM-LINUX:/home/gazda# pvs
  PV         VG                  Fmt  Attr PSize   PFree
  /dev/md0   vgfarmszerversystem lvm2 a--  <18,61g  <4,31g
  /dev/md1   vgfarmszerverdata   lvm2 a--   20,65g <13,03g
```

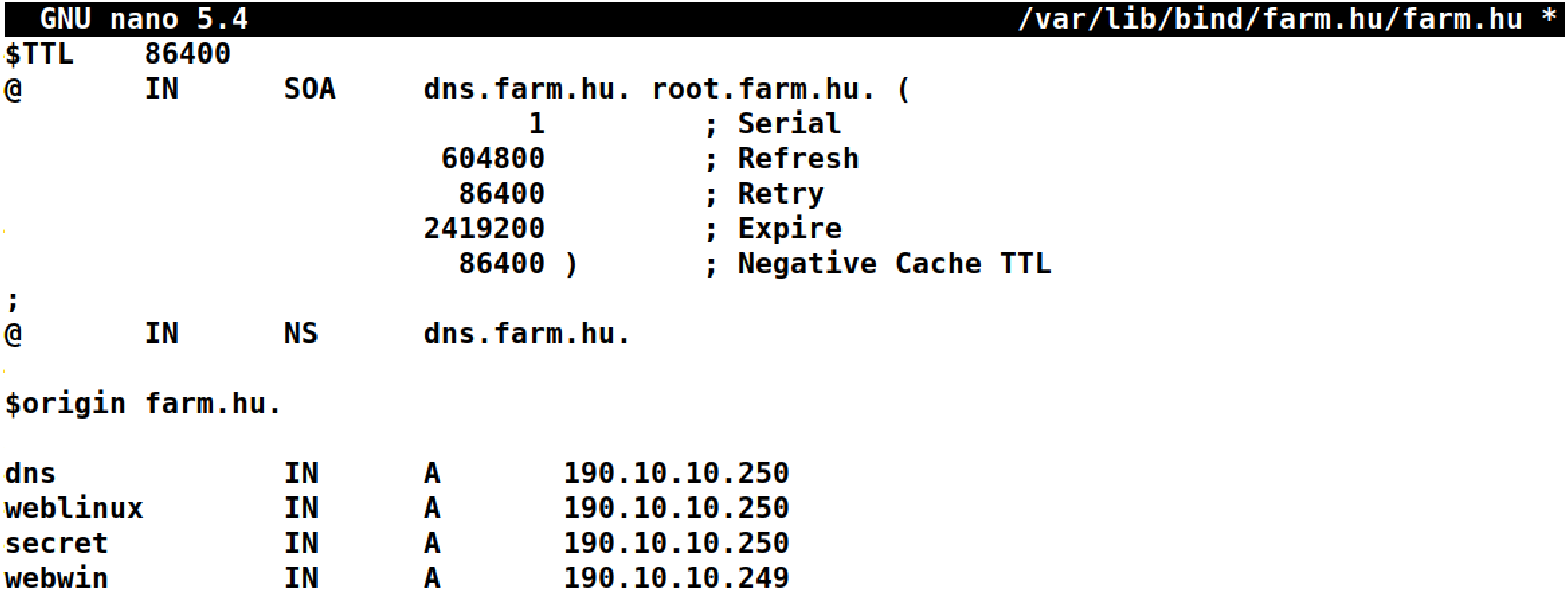


```
root@FARM-LINUX:/home/gazda# vgs
  VG                  #PV #LV #SN Attr   VSize   VFree
  vgfarmszerverdata     1   2   0 wz--n-  20,65g <13,03g
  vgfarmszerversystem   1   8   0 wz--n- <18,61g  <4,31g
```



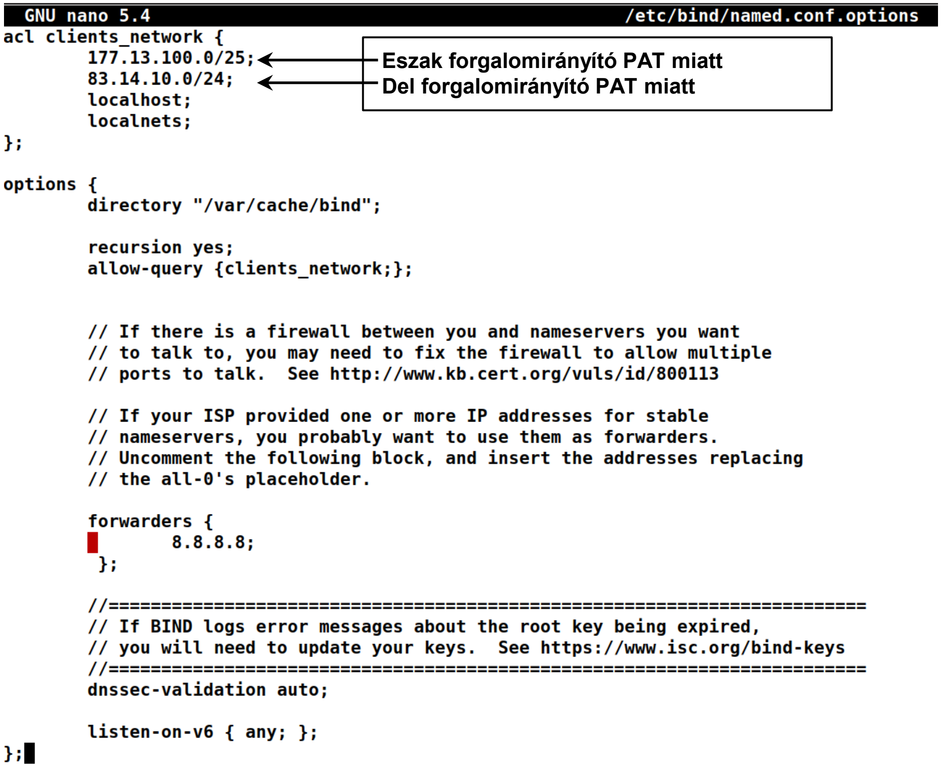
```
root@FARM-LINUX:/home/gazda# lvs
  LV       VG                  Attr       LSize
  backup   vgfarmszerverdata   -wi-ao----   3,81g
  home     vgfarmszerverdata   -wi-ao----   3,81g
  root     vgfarmszerversystem -wi-ao----  <1,91g
  srv      vgfarmszerversystem -wi-ao----  <1,91g
  swap     vgfarmszerversystem -wi-ao----  <1,91g
  tmp      vgfarmszerversystem -wi-ao---- 976,00m
  usr      vgfarmszerversystem -wi-ao----   3,81g
  var      vgfarmszerversystem -wi-ao---- 976,00m
  varcache vgfarmszerversystem -wi-ao----  <1,91g
  varlog   vgfarmszerversystem -wi-ao---- 976,00m
```

DNS bejegyzések (BIND9)



```
  GNU nano 5.4                                                 /var/lib/bind/farm.hu/farm.hu *
$TTL    86400
@       IN      SOA     dns.farm.hu. root.farm.hu. (
                              1         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      dns.farm.hu.

$origin farm.hu.

dns             IN      A       190.10.10.250
weblinux        IN      A       190.10.10.250
secret          IN      A       190.10.10.250
webwin          IN      A       190.10.10.249
```

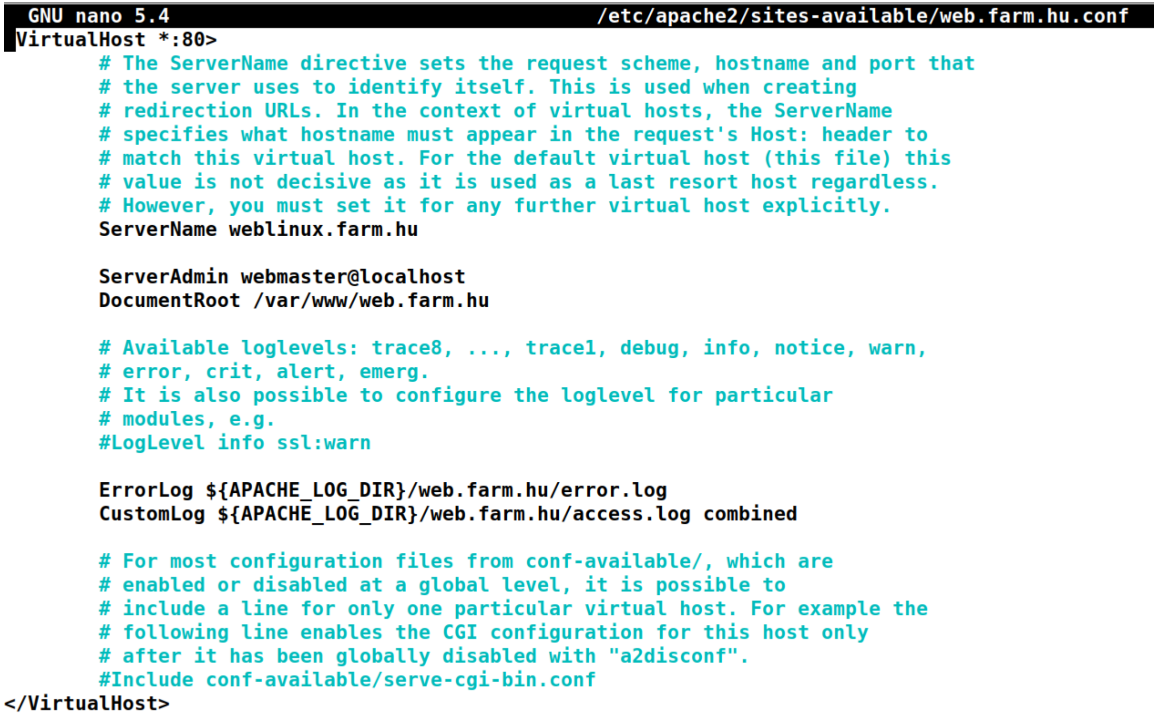
DNS Forward



```
  GNU nano 5.4                                    /etc/bind/named.conf.options
acl clients_network {
        177.13.100.0/25;
        83.14.10.0/24;
        localhost;
        localnets;
};

options {
        directory "/var/cache/bind";

        recursion yes;
        allow-query {clients_network;};


        // If there is a firewall between you and nameservers you want
        // to talk to, you may need to fix the firewall to allow multiple
        // ports to talk.  See http://www.kb.cert.org/vuls/id/800113

        // If your ISP provided one or more IP addresses for stable
        // nameservers, you probably want to use them as forwarders.
        // Uncomment the following block, and insert the addresses replacing
        // the all-0's placeholder.

        forwarders {
                8.8.8.8;
         };

        //========================================================================
        // If BIND logs error messages about the root key being expired,
        // you will need to update your keys.  See https://www.isc.org/bind-keys
        //========================================================================
        dnssec-validation auto;

        listen-on-v6 { any; };
};
```

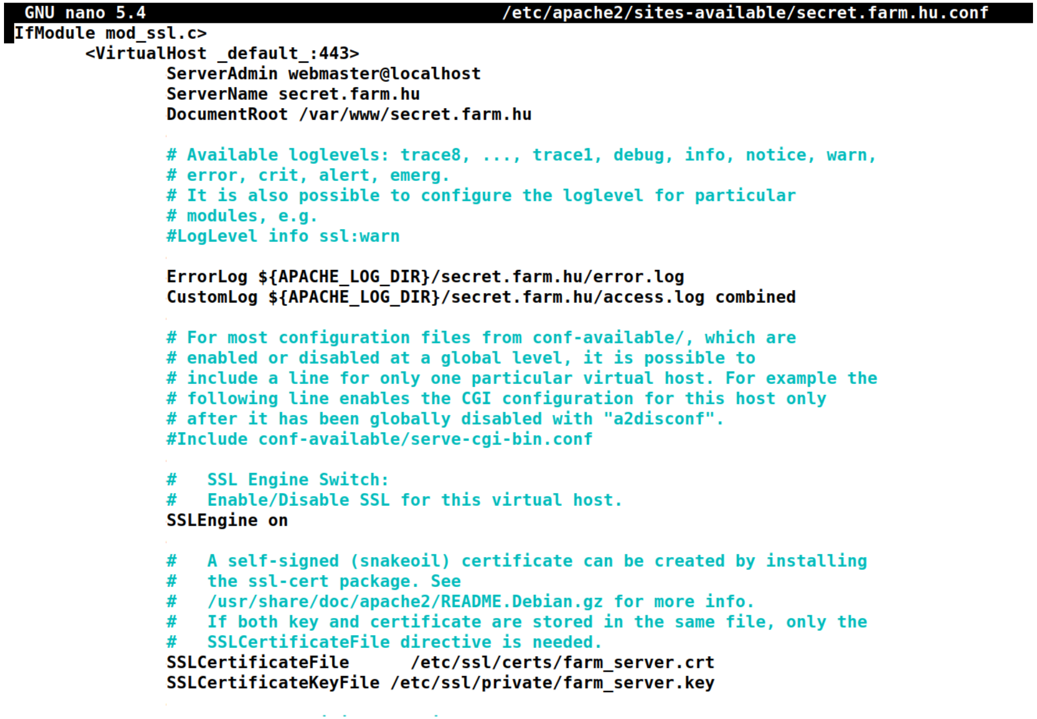
Eszak forgalomirányító PAT miatt
Del forgalomirányító PAT miatt

Virtuális Apache szerver HTTP protokollal



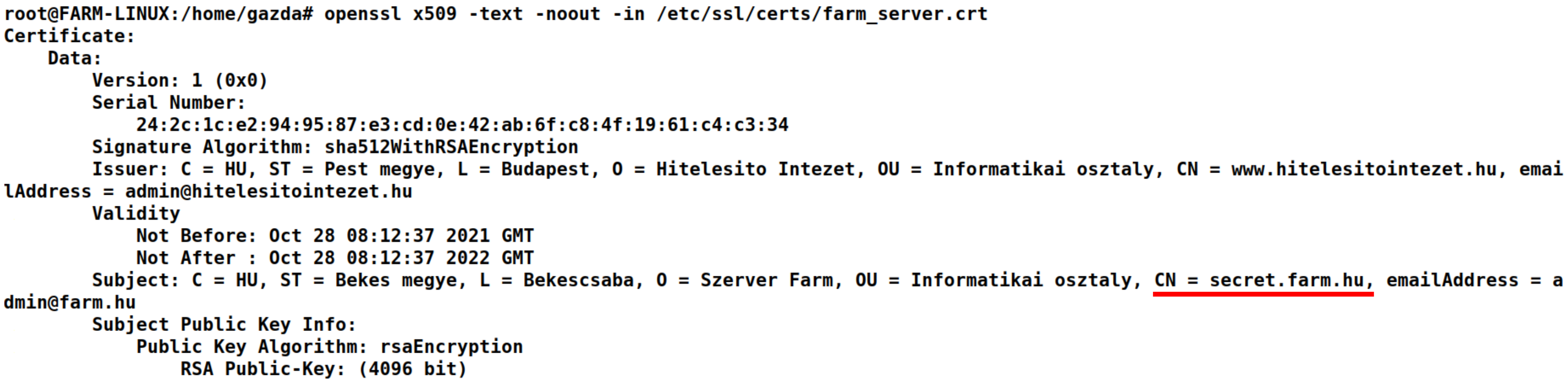
```
  GNU nano 5.4                                  /etc/apache2/sites-available/web.farm.hu.conf
<VirtualHost *:80>
        # The ServerName directive sets the request scheme, hostname and port that
        # the server uses to identify itself. This is used when creating
        # redirection URLs. In the context of virtual hosts, the ServerName
        # specifies what hostname must appear in the request's Host: header to
        # match this virtual host. For the default virtual host (this file) this
        # value is not decisive as it is used as a last resort host regardless.
        # However, you must set it for any further virtual host explicitly.
        ServerName weblinux.farm.hu

        ServerAdmin webmaster@localhost
        DocumentRoot /var/www/web.farm.hu

        # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel for particular
        # modules, e.g.
        #LogLevel info ssl:warn

        ErrorLog ${APACHE_LOG_DIR}/web.farm.hu/error.log
        CustomLog ${APACHE_LOG_DIR}/web.farm.hu/access.log combined

        # For most configuration files from conf-available/, which are
        # enabled or disabled at a global level, it is possible to
        # include a line for only one particular virtual host. For example the
        # following line enables the CGI configuration for this host only
        # after it has been globally disabled with "a2disconf".
        #Include conf-available/serve-cgi-bin.conf
</VirtualHost>
```

Virtuális Apache szerver HTTPs protokollal



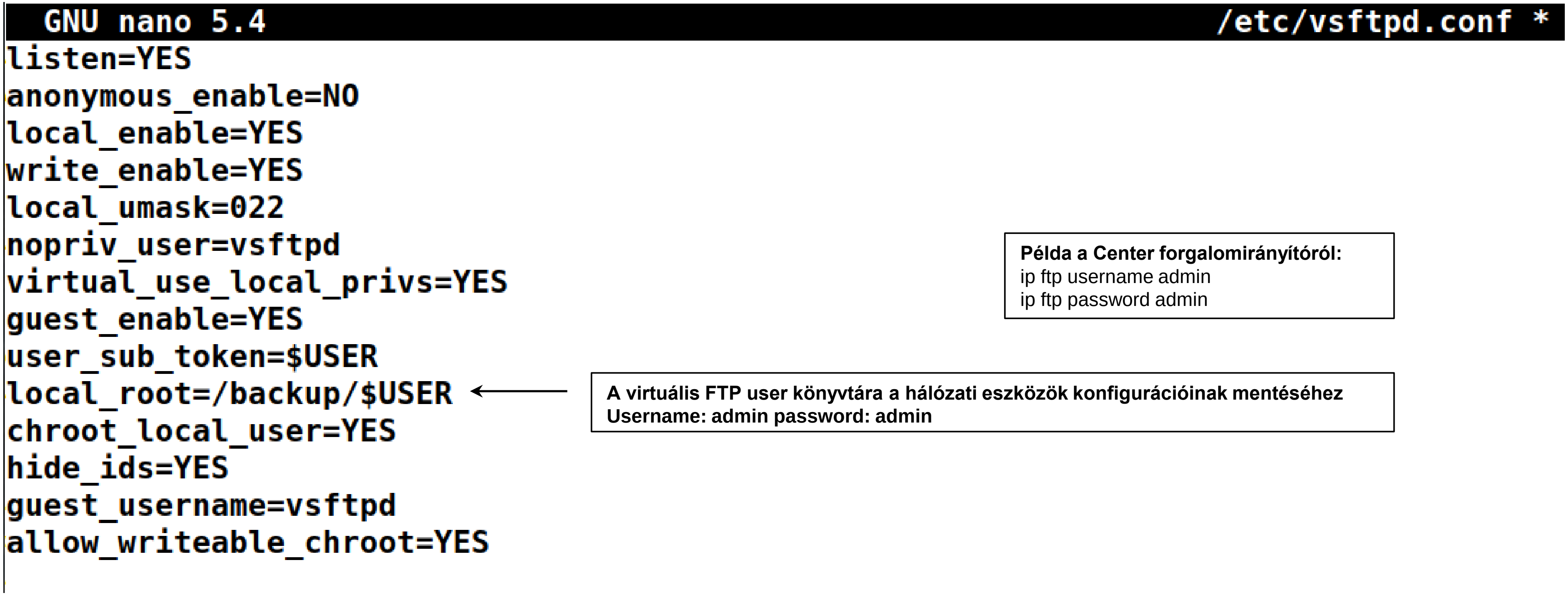
```
  GNU nano 5.4                                          /etc/apache2/sites-available/secret.farm.hu.conf
<IfModule mod_ssl.c>
        <VirtualHost _default_:443>
                ServerAdmin webmaster@localhost
                ServerName secret.farm.hu
                DocumentRoot /var/www/secret.farm.hu

                # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
                # error, crit, alert, emerg.
                # It is also possible to configure the loglevel for particular
                # modules, e.g.
                #LogLevel info ssl:warn

                ErrorLog ${APACHE_LOG_DIR}/secret.farm.hu/error.log
                CustomLog ${APACHE_LOG_DIR}/secret.farm.hu/access.log combined

                # For most configuration files from conf-available/, which are
                # enabled or disabled at a global level, it is possible to
                # include a line for only one particular virtual host. For example the
                # following line enables the CGI configuration for this host only
                # after it has been globally disabled with "a2disconf".
                #Include conf-available/serve-cgi-bin.conf

                #   SSL Engine Switch:
                #   Enable/Disable SSL for this virtual host.
                SSLEngine on

                #   A self-signed (snakeoil) certificate can be created by installing
                #   the ssl-cert package. See
                #   /usr/share/doc/apache2/README.Debian.gz for more info.
                #   If both key and certificate are stored in the same file, only the
                #   SSLCertificateFile directive is needed.
                SSLCertificateFile      /etc/ssl/certs/farm_server.crt
                SSLCertificateKeyFile /etc/ssl/private/farm_server.key
```

HTTPs tanusítvány



```
root@FARM-LINUX:/home/gazda# openssl x509 -text -noout -in /etc/ssl/certs/farm_server.crt
Certificate:
    Data:
        Version: 1 (0x0)
        Serial Number:
            24:2c:1c:e2:94:95:87:e3:cd:0e:42:ab:6f:c8:4f:19:61:c4:c3:34
        Signature Algorithm: sha512WithRSAEncryption
        Issuer: C = HU, ST = Pest megye, L = Budapest, O = Hitelesito Intezet, OU = Informatikai osztaly, CN = www.hitelesitointezet.hu, emai
lAddress = admin@hitelesitointezet.hu
        Validity
            Not Before: Oct 28 08:12:37 2021 GMT
            Not After : Oct 28 08:12:37 2022 GMT
        Subject: C = HU, ST = Bekes megye, L = Bekescsaba, O = Szerver Farm, OU = Informatikai osztaly, CN = secret.farm.hu, emailAddress = a
dmin@farm.hu
        Subject Public Key Info:
            Public Key Algorithm: rsaEncryption
                RSA Public-Key: (4096 bit)
```

Virtuális FTP user

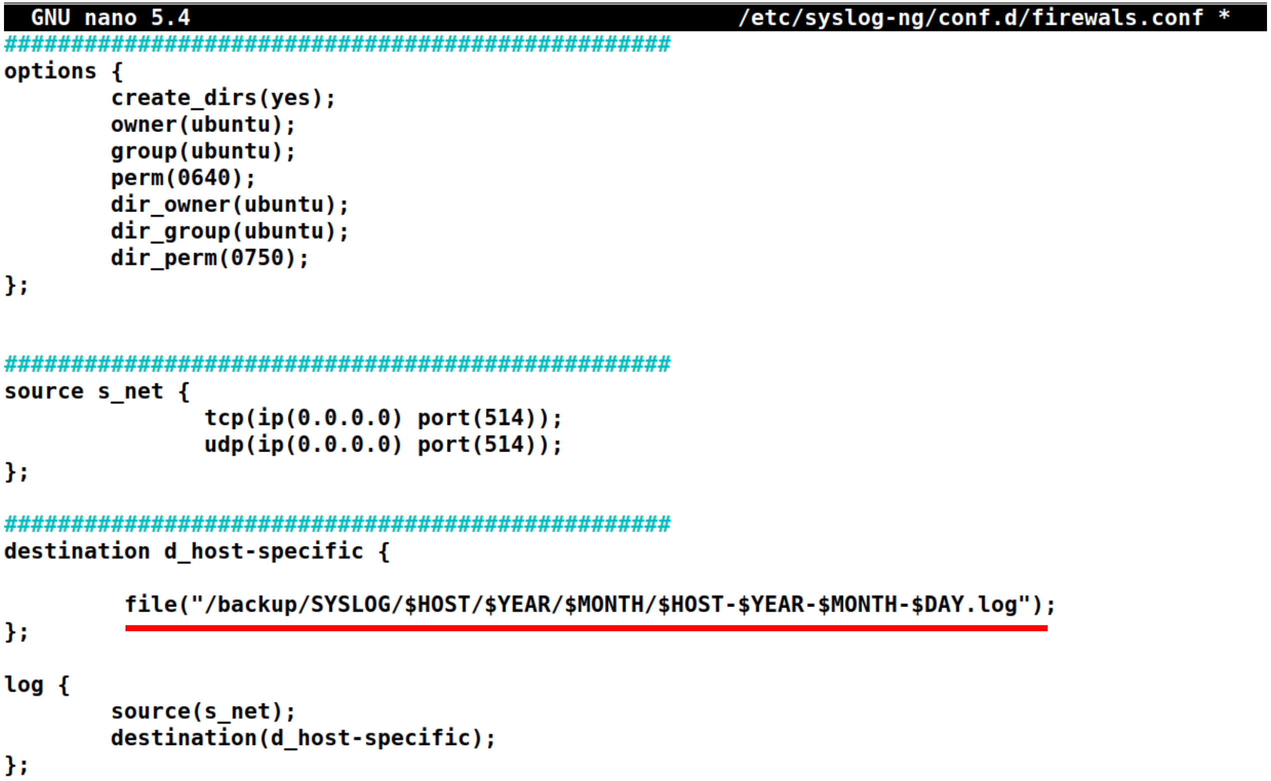


```
  GNU nano 5.4                                              /etc/vsftpd.conf *
listen=YES
anonymous_enable=NO
local_enable=YES
write_enable=YES
local_umask=022
nopriv_user=vsftpd
virtual_use_local_privs=YES
guest_enable=YES
user_sub_token=$USER
local_root=/backup/$USER
chroot_local_user=YES
hide_ids=YES
guest_username=vsftpd
allow_writeable_chroot=YES
```

Példa a Center forgalomirányítóról:
ip ftp username admin
ip ftp password admin

A virtuális FTP user könyvtára a hálózati eszközök konfigurációinak mentéséhez
Username: admin password: admin

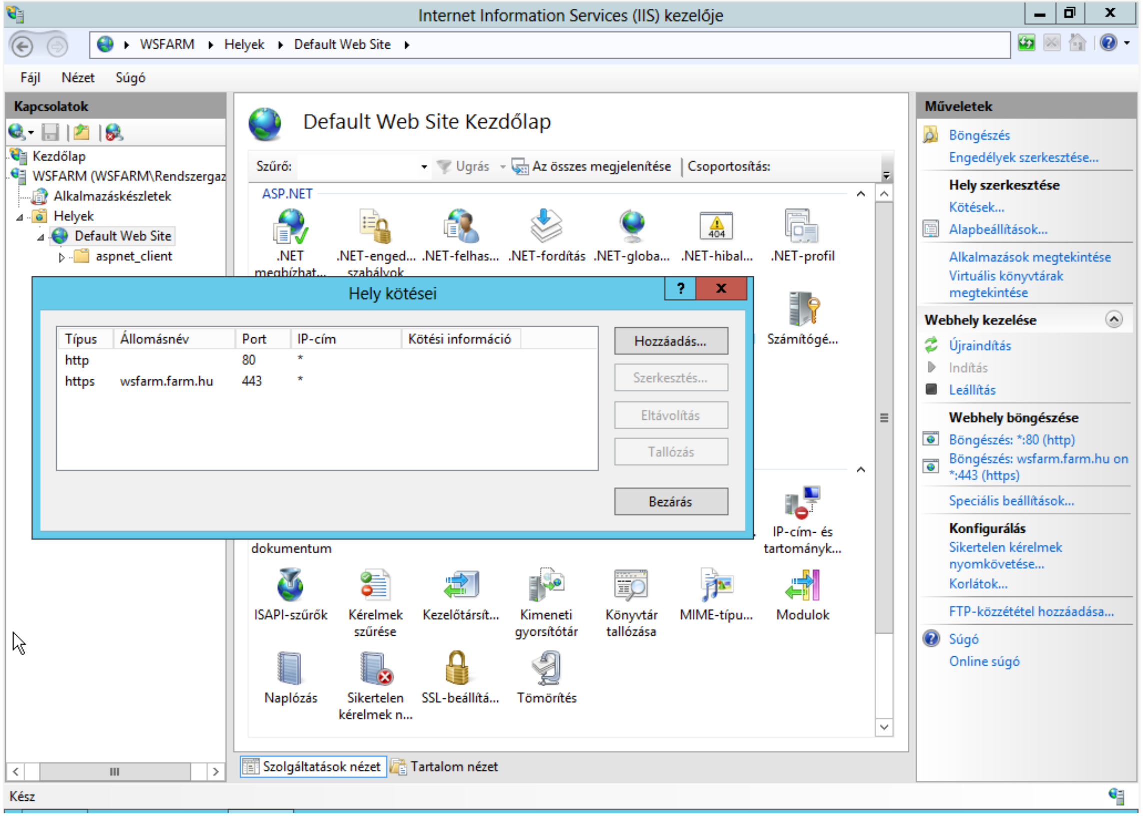
Syslog-ng



```
  GNU nano 5.4                                                /etc/syslog-ng/conf.d/firewals.conf *
##################################################
options {
        create_dirs(yes);
        owner(ubuntu);
        group(ubuntu);
        perm(0640);
        dir_owner(ubuntu);
        dir_group(ubuntu);
        dir_perm(0750);
};


##################################################
source s_net {
               tcp(ip(0.0.0.0) port(514));
               udp(ip(0.0.0.0) port(514));
};

##################################################
destination d_host-specific {

         file("/backup/SYSLOG/$HOST/$YEAR/$MONTH/$HOST-$YEAR-$MONTH-$DAY.log");
};

log {
        source(s_net);
        destination(d_host-specific);
};
```

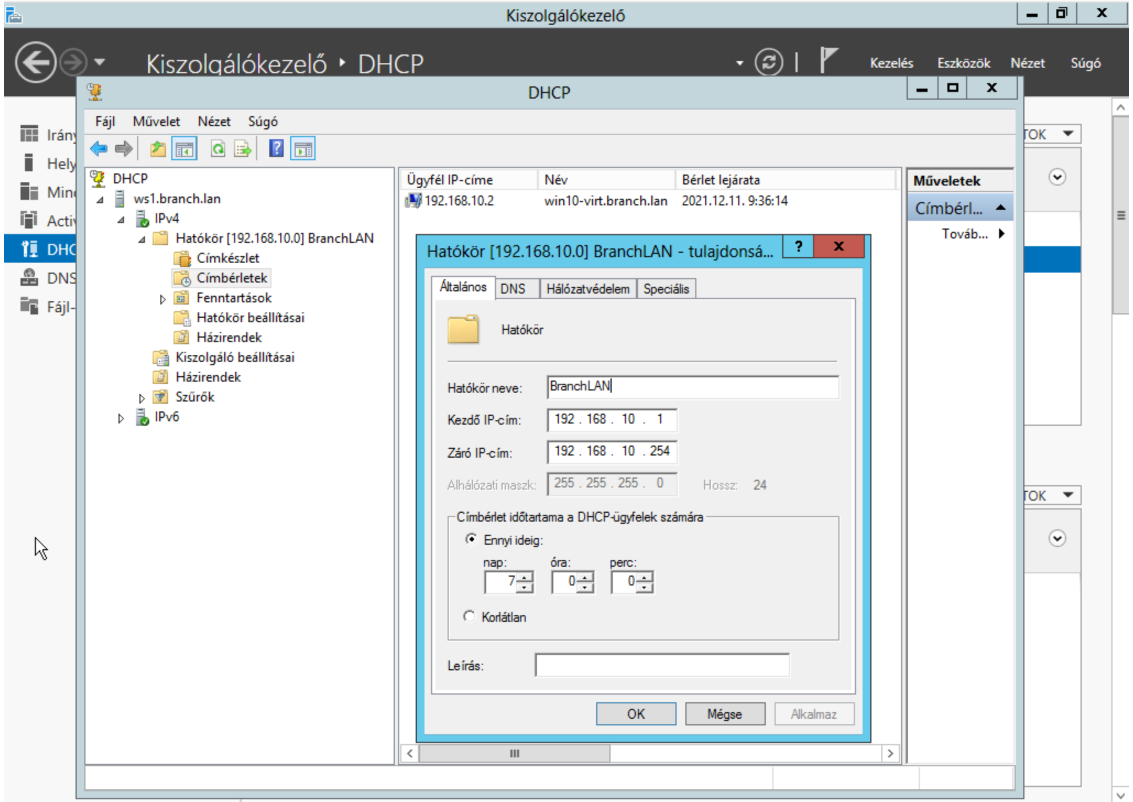
A Windows Szerverek

A Farm webszolgáltatása



Típus	Állomásnév	Port	IP-cím	Kötési információ
http		80	*	
https	wsfarm.farm.hu	443	*	

Fiók DHCP



Ügyfél IP-címe	Név	Bérlet lejárata
192.168.10.2	win10-virt.branch.lan	2021.12.11. 9:36:14

Hatókör [192.168.10.0] BranchLAN - tulajdonsá...

Hatókör neve: BranchLAN

Kezdő IP-cím: 192 . 168 . 10 . 1

Záró IP-cím: 192 . 168 . 10 . 254

Alhálózati maszk: 255 . 255 . 255 . 0 Hossz: 24

Címbérlet időtartama a DHCP-ügyfelek számára

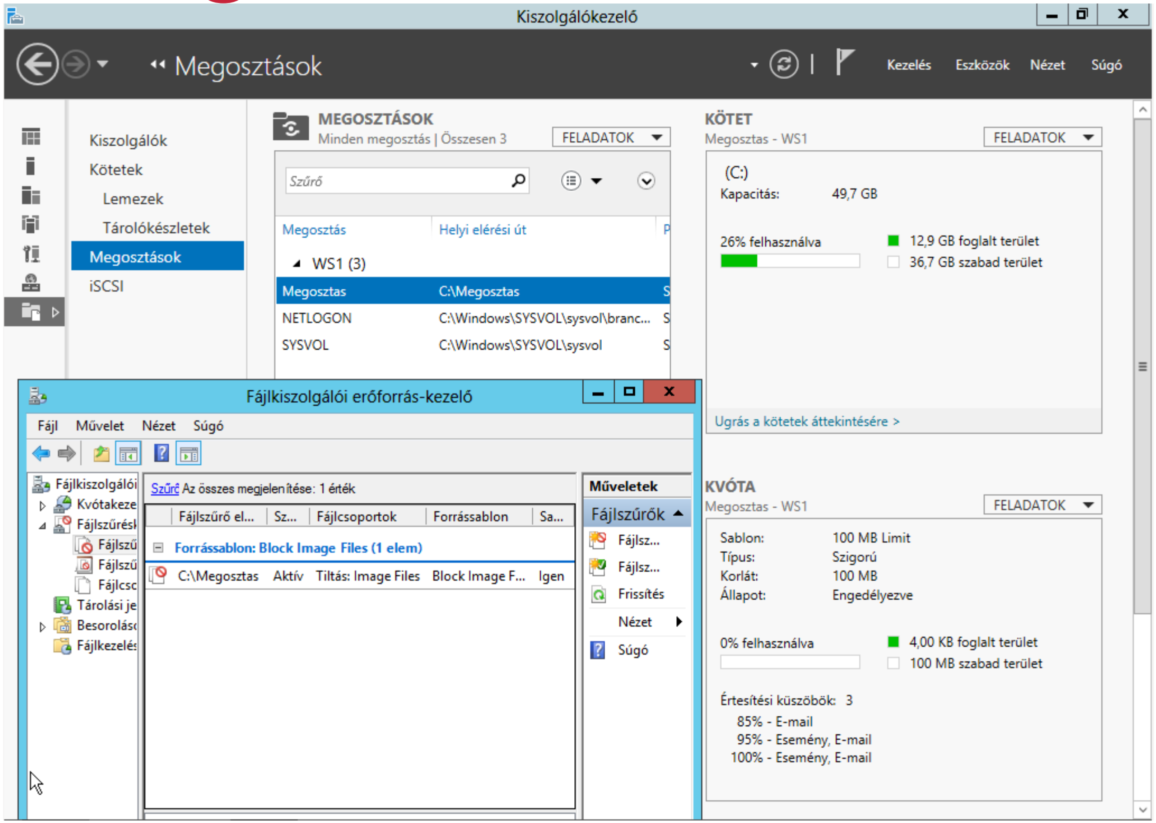
● Ennyi ideig:

nap: 7 óra: 0 perc: 0

○ Korlátlan

Leírás:

Fiók fájlmegosztás



MEGOSZTÁSOK
Minden megosztás | Összesen 3

Megosztás	Helyi elérési út	P
WS1 (3)		
Megosztas	C:\Megosztas	S
NETLOGON	C:\Windows\SYSVOL\sysvol\branc...	S
SYSVOL	C:\Windows\SYSVOL\sysvol	S

KÖTET
Megosztas - WS1

(C:)
Kapacitás: 49,7 GB

26% felhasználva

🟩 12,9 GB foglalt terület
□ 36,7 GB szabad terület

Ugrás a kötetek áttekintésére >

KVÓTA
Megosztas - WS1

Sablon:	100 MB Limit
Típus:	Szigorú
Korlát:	100 MB
Állapot:	Engedélyezve

0% felhasználva

🟩 4,00 KB foglalt terület
□ 100 MB szabad terület

Értesítési küszöbök: 3
85% - E-mail
95% - Esemény, E-mail
100% - Esemény, E-mail

Szűrő Az összes megjelenítése: 1 érték

Fájlszűrő el...	Sz...	Fájlcsoportok	Forrássablon	Sa...
Forrássablon: Block Image Files (1 elem)				
C:\Megosztas	Aktív	Tiltás: Image Files	Block Image F...	Igen

Az ASA

Alapbeállítások

```
hostname ASA
enable password cisco

interface Gig1/1
description SW_1 switch-hez
nameif outside
ip address 172.20.10.129 255.255.255.192
no shutdown

interface Gig1/2
description Privat LAN fele
nameif inside
ip address 192.168.200.254 255.255.255.0
no shutdown

route outside 0.0.0.0 0.0.0.0 172.20.10.189
```

DHCP, SSH

```
dhcpd address 192.168.200.1-192.168.200.99 inside
dhcpd option 3 ip 192.168.200.254
dhcpd dns 190.10.10.250
dhcpd domain protected.local
dhcpd enable inside

domain-name protected.local
crypto key generate rsa modulus 2048
username admin password cisco
aaa authentication ssh console LOCAL
ssh 172.20.9.129 255.255.255.255
ssh version 2
```

NAT, ICMP

```
object network LAN
subnet 192.168.200.0 255.255.255.0
nat (inside,outside) dynamic interface

policy_map global_policy
class inspection_default
inspect icmp
```

Hálózatprogramozás

VTP jelszó egységes beállítása

```
from netmiko import ConnectHandler
vtpass = input("VTP jelszo: ")
s1 = {'device_type': 'cisco_ios','host': '172.20.10.121','username':
'admin','password': 'cisco' }
s2 = {'device_type': 'cisco_ios','host': '172.20.10.122','username':
'admin','password': 'cisco' }
s3 = {'device_type': 'cisco_ios','host': '172.20.10.123','username':
'admin','password': 'cisco' }
switchlist = [s1, s2,s3]
for switch in switchlist:
    k = ConnectHandler(**switch)
    print(switch["host"]," VTP jelszava:")
    output = k.send_command("show vtp password")
    print(output)
    line = output.split()
    if line[2] != vtpass:
        o1 = k.send_config_set(['vtp password ' + vtpass])
        print(o1)
        k.disconnect()
```

Köszönöm a figyelmet!