

IES ZAIDÍN- VERGELES

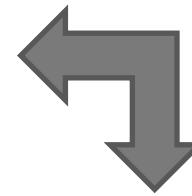
**ESQUEMA DE CONFIGURACIÓN DE RED
DEPARTAMENTO DE INFORMATICA**



J.L. Navarro



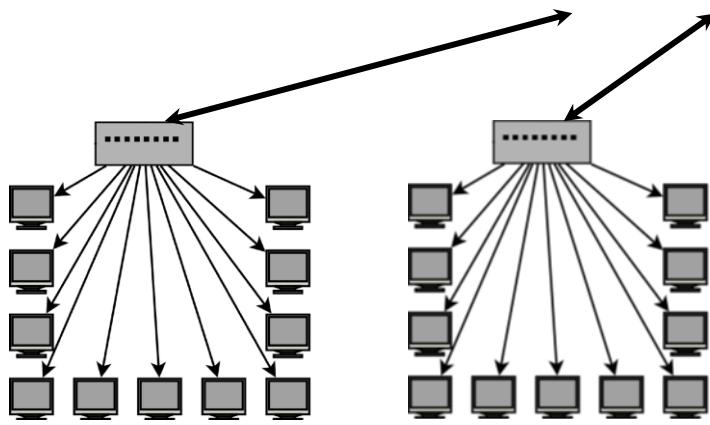
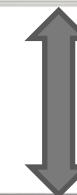
ONT Alcatel-Lucent I-240G-B



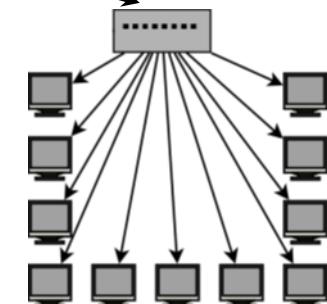
CCR1016-12G

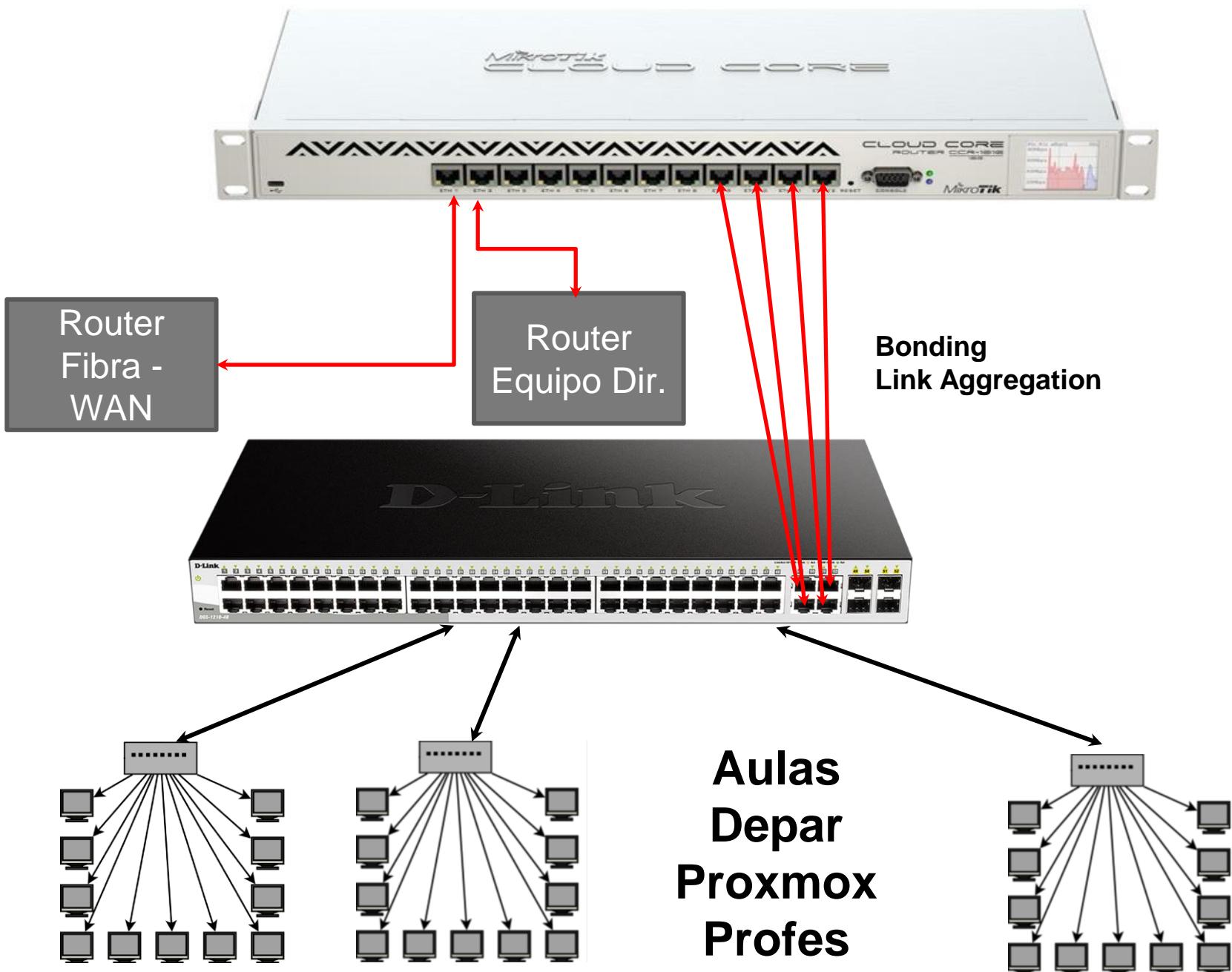


DGS-1210-48

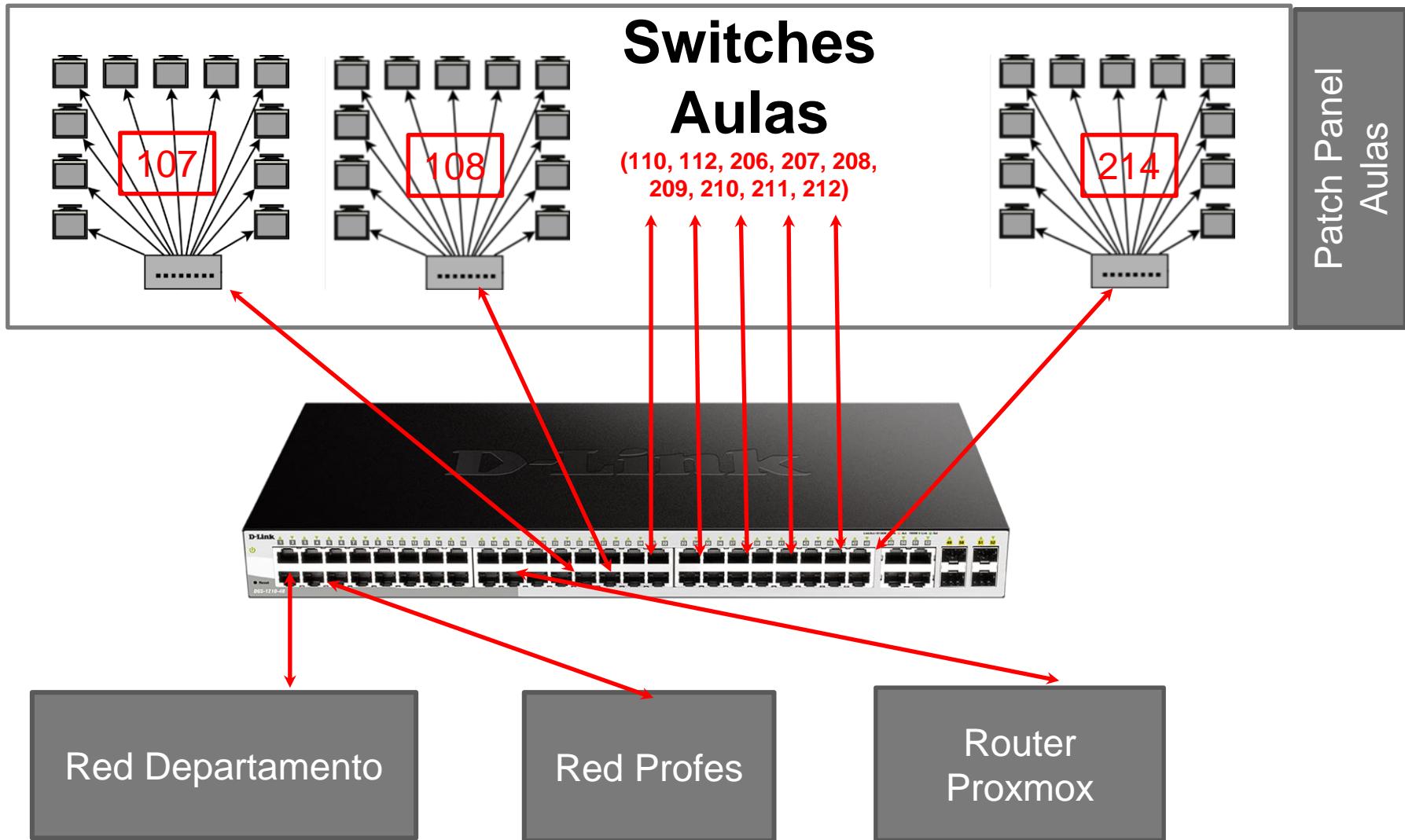


**Aulas
Depar
Proxmox
Profes**



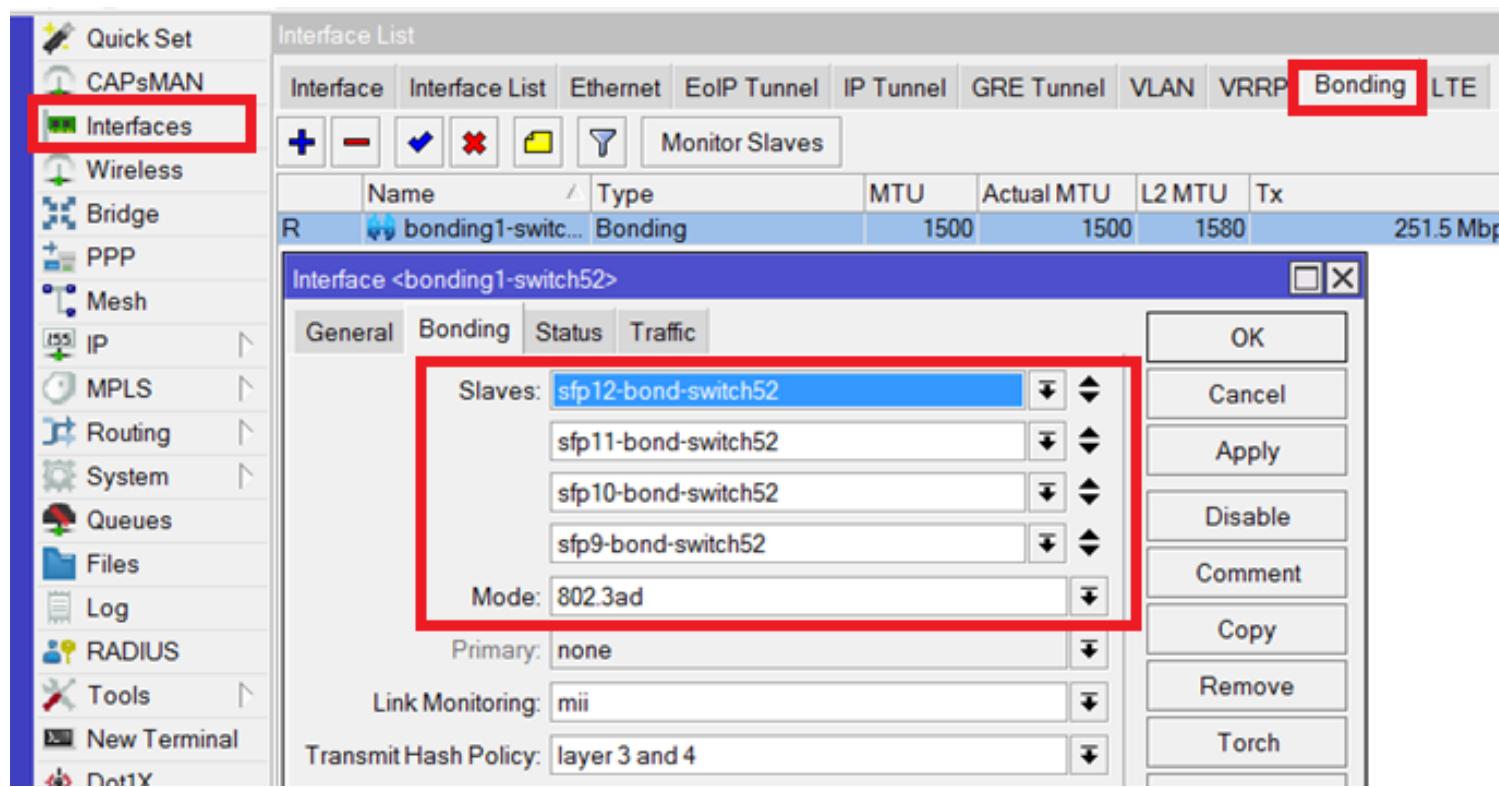


CABLEADO DEL SWITCH



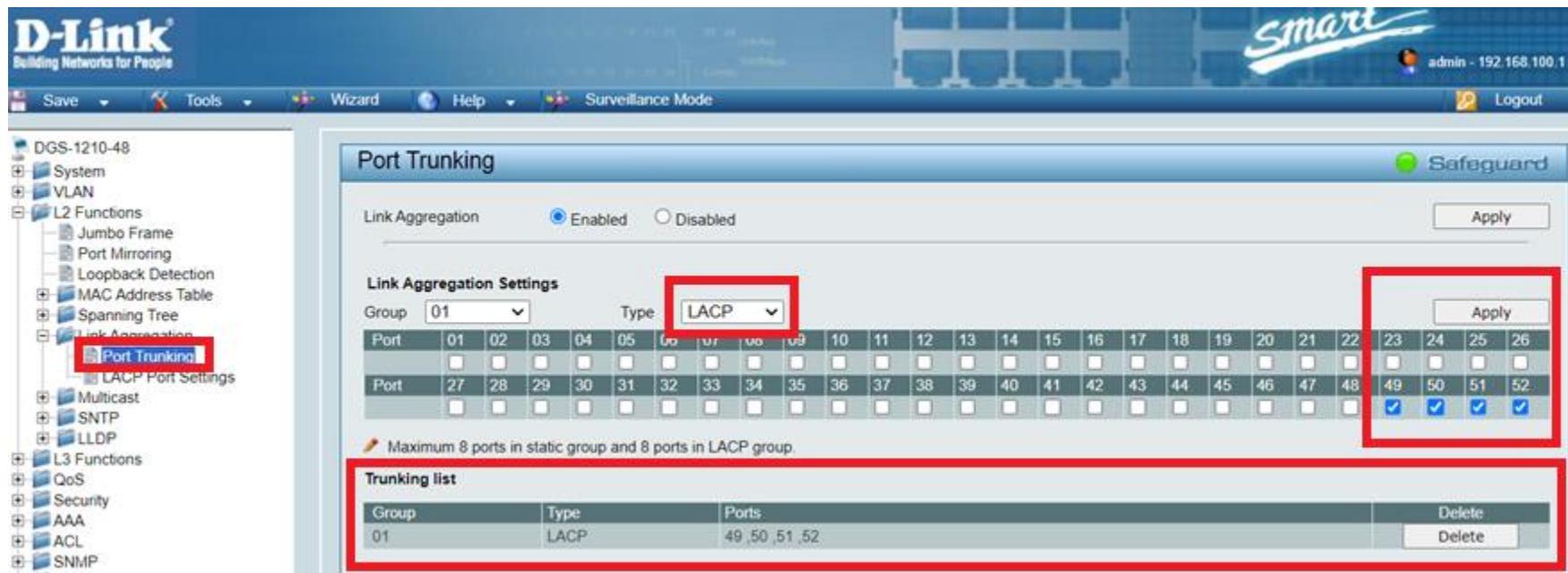
CHANNEL BOUNDING / LINK AGGREGATION / LACP (802.3ad)

- Configuración en el router Mikrotik CCR1016 enlazándolo con el Switch, protocolo LACP

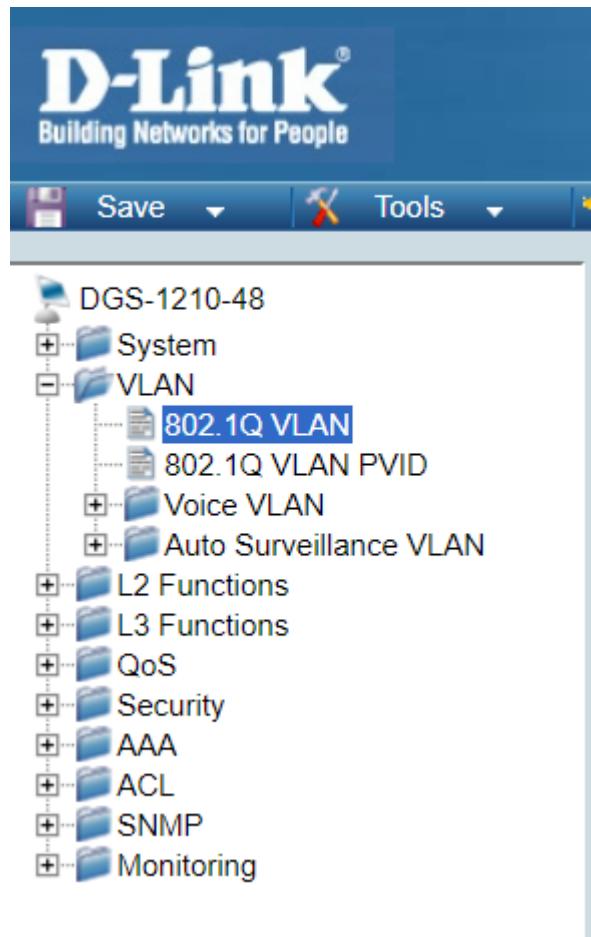


CHANNEL BOUNDING / LINK AGGREGATION / LACP (802.3ad)

- Configuración en el switch DLINK DGS-1210 enlace LACP con el router



CABLEADO DE VLANS EN EL SWITCH



VID	VLAN Name	Untagged	Tagged
1	default	01	26-28 ,34 ,39-46 ,48-52
5	proxmox	23-25	28 ,49-52
11	profes	29-33	26-28 ,34 ,39-46 ,48-52
12	depar	02-22	49-52
107	aula107	47	49-52
108	aula108		41 ,49-52
110	aula110		26 ,49-52
112	aula112		40 ,49-52
206	aula206		34 ,49-52
207	aula207		42 ,49-52
208	aula208		43 ,49-52
209	aula209		44 ,49-52
210	aula210		45 ,49-52
211	aula211		46 ,49-52
212	aula212		48-52
214	aula214		39 ,49-52

CABLEADO DE VLANS EN EL SWITCH

VID Settings

VID 5

VLAN Name proxmox

Back Apply

Port	Select All	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Untagged	All	<input type="radio"/>																									
Tagged	All	<input type="radio"/>																									
Not Member	All	<input checked="" type="radio"/>																									
Port	Select All	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Untagged	All	<input type="radio"/>																									
Tagged	All	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Not Member	All	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	

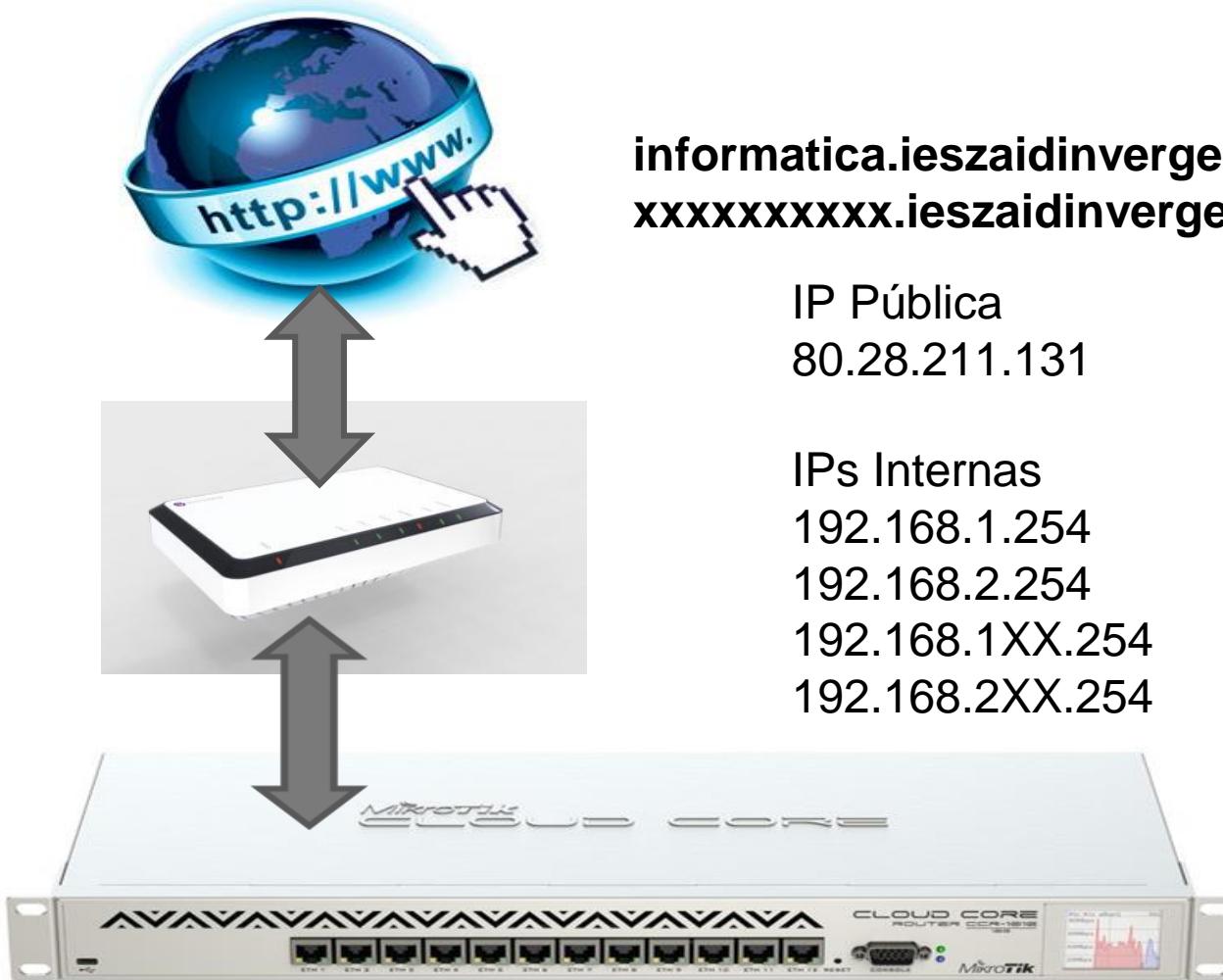
802.1Q VLAN PVID Settings

Safeguard

Port	01	02	03	04	05	06	07	08	09	10	11	12	13
PVID	1	12	12	12	12	12	12	12	12	12	12	12	12
Port	14	15	16	17	18	19	20	21	22	23	24	25	26
PVID	12	12	12	12	12	12	12	12	12	5	5	5	1
Port	27	28	29	30	31	32	33	34	35	36	37	38	39
PVID	1	1	11	11	11	11	11	1	1	1	1	1	1
Port	40	41	42	43	44	45	46	47	48	49	50	51	52
PVID	1	1	1	1	1	1	1	107	1	1	1	1	1

Apply

CONFIGURACIÓN WAN



[informatica.ieszaidinvergeles.org](http://www.ieszaidinvergeles.org)
[xxxxxxxxxx.ieszaidinvergeles.es](http://www.ieszaidinvergeles.es)

IP Pública
80.28.211.131

IPs Internas
192.168.1.254
192.168.2.254
192.168.1XX.254
192.168.2XX.254

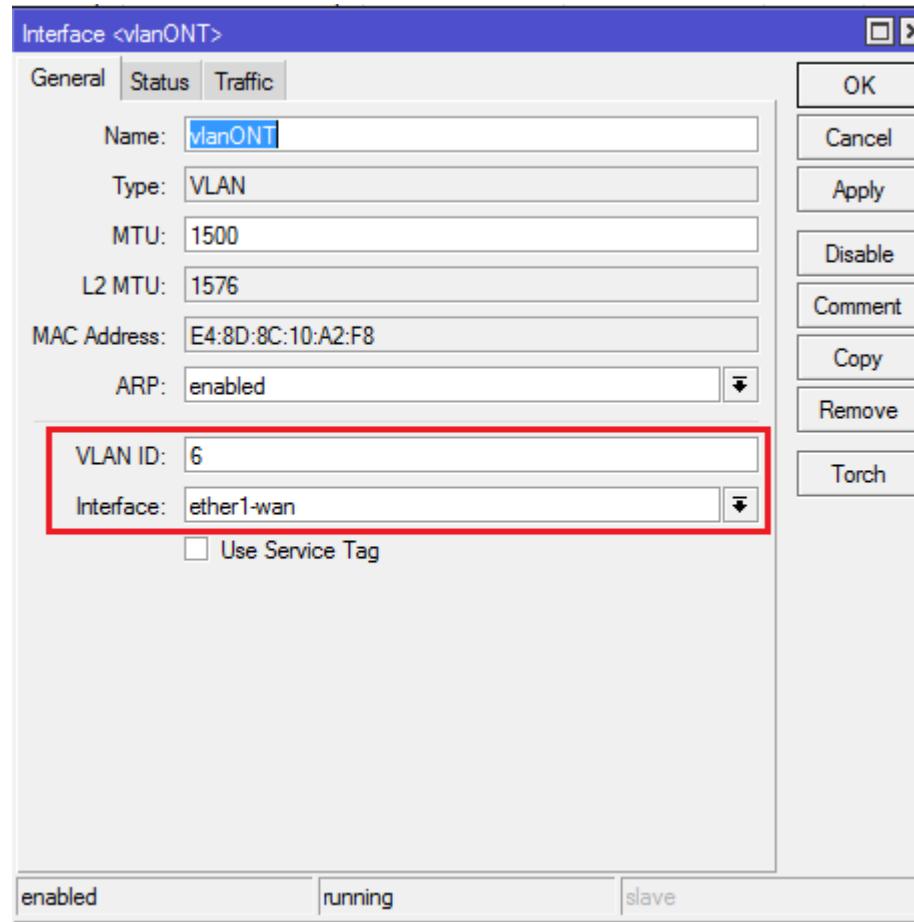
Puerto 1 - WAN
PPPoE client – VLAN ID 6

INTERFACES DEL ROUTER MIKROTIK

DETALLE

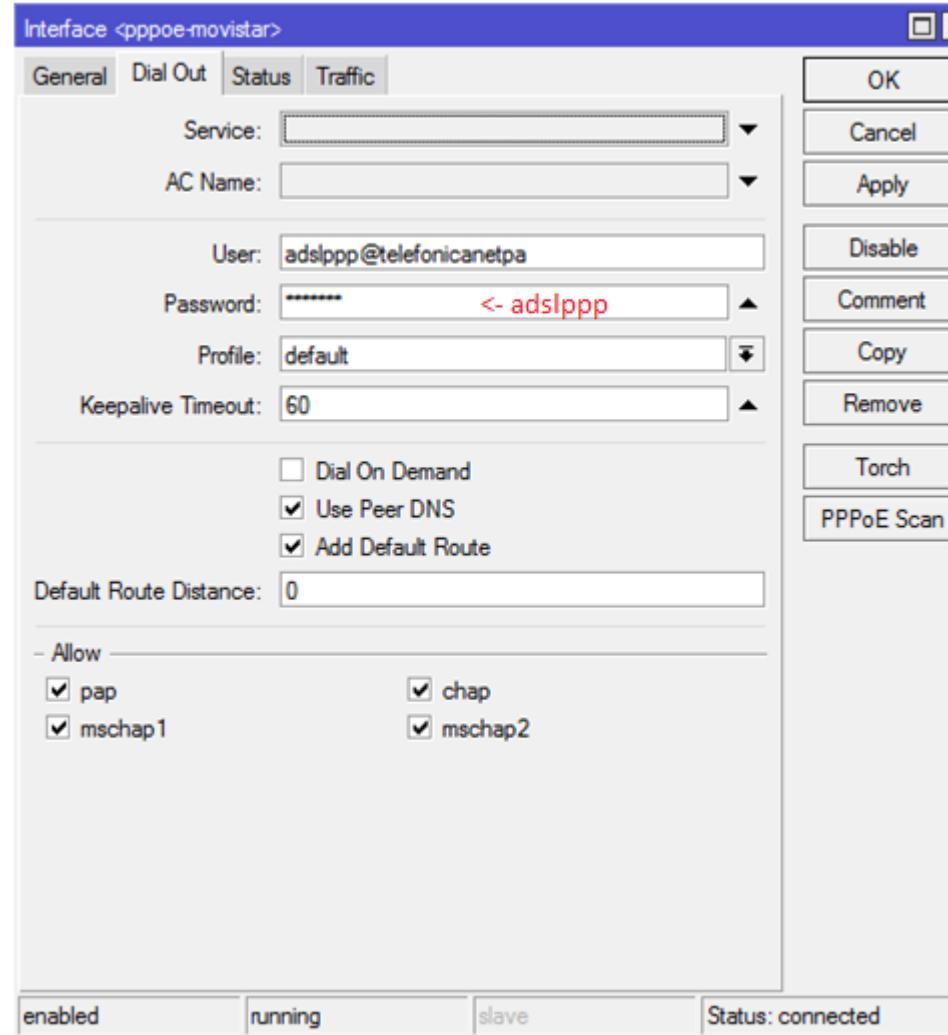
```
/interface ethernet
set [ find default-name=ether1 ] name=ether1-wan rx-flow-control=on \
    tx-flow-control=on
set [ find default-name=ether2 ] name=ether2-direccion rx-flow-control=on \
    tx-flow-control=on
set [ find default-name=ether3 ] name=ether3 rx-flow-control=on \
    tx-flow-control=on
set [ find default-name=ether4 ] name=ether4 rx-flow-control=on \
    tx-flow-control=on
set [ find default-name=ether5 ] name=ether5 rx-flow-control=on \
    tx-flow-control=on
set [ find default-name=ether6 ] name=ether6 rx-flow-control=on \
    tx-flow-control=on
set [ find default-name=ether7 ] name=ether7 rx-flow-control=on \
    tx-flow-control=on
set [ find default-name=ether8 ] name=ether8 rx-flow-control=on \
    tx-flow-control=on
set [ find default-name=ether9 ] name=ether9-bond-switch52 rx-flow-control=on \
    tx-flow-control=on
set [ find default-name=ether10 ] name=ether10-bond-switch52 rx-flow-control=\
    on tx-flow-control=on
set [ find default-name=ether11 ] name=ether11-bond-switch52 rx-flow-control=\
    on tx-flow-control=on
set [ find default-name=ether12 ] name=ether12-bond-switch52 rx-flow-control=\
    on tx-flow-control=on
```

CONFIGURACIÓN WAN ROUTER FIBRA - ONT



CONFIGURACIÓN WAN ROUTER FIBRA - ONT

CONFIGURACIÓN WAN ROUTER FIBRA - ONT



CONFIGURACIÓN WAN ROUTER FIBRA - ONT

DETALLE DE CONFIGURACIÓN PPPoE CON MOVISTAR

```
/interface vlan
add interface=ether1-wan l2mtu=1576 name=vlanONT vlan-id=6

/interface pppoe-client
add add-default-route=yes disabled=no interface=vlanONT name=pppoe-movistar \
password=adslppp use-peer-dns=yes user=adslppp@telefonicanetpa
```

CONFIGURACIÓN AULAS SWITCHES GESTIONABLES TL-SG2424

A screenshot of the TP-LINK login page. The page has a blue header with the 'TP-LINK' logo. Below the header is a white login form. The form contains two text input fields: 'User Name:' with the value 'admin' and 'Password:' with a masked value. At the bottom of the form are two buttons: 'Login' and 'Clear'. The background of the page is white.

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CONFIGURACIÓN AULAS SWITCHES GESTIONABLES TL-SG2424



- Ejemplo de configuración del Aula XXX

Puertos	VLAN ID	Nombre VLAN	Dirección IP
1	11	vlanAlumnosXXX	192.168.1.X
2-23	XXX	vlanAlumnosXXX	192.168.XXX.YYY
24	10	AdminSwitch	192.168.10.1 (admin)
	11	vlanAlumnosXXX	192.168.1.X
	XXX	vlanAlumnosXXX	192.168.XXX.YYY

CONFIGURACIÓN AULAS SWITCHES GESTIONABLES TL-SG2424

VLAN Config

VLAN Create

VLAN ID:	<input type="text"/>	(2-4094)	<input type="button" value="Create"/>
Name:	<input type="text"/>	(16 characters maximum)	

VLAN Table

Select	VLAN ID	Name	Untagged Ports	Tagged Ports	Operation
<input checked="" type="checkbox"/>	1	Default VLAN	1-23	24	Delete
<input type="checkbox"/>	11	profesores	1	24	Delete
<input type="checkbox"/>	208	alumnos208	2-23	24	Delete

VLAN Membership

VLAN ID		1							VLAN Name							Default VLAN	
Port		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Untagged	<input checked="" type="radio"/>																
Tagged	<input type="radio"/>																
NotMember	<input type="radio"/>																
PVID	<input type="text" value="11"/>	<input type="text" value="208"/>															
LAG	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Port	15	16	17	18	19	20	21	22	23	24							
Untagged	<input checked="" type="radio"/>																
Tagged	<input type="radio"/>																
NotMember	<input type="radio"/>																
PVID	<input type="text" value="208"/>	<input type="text" value="1"/>															
LAG	---	---	---	---	---	---	---	---	---	---							

CONFIGURACIÓN AULAS SWITCHES GESTIONABLES TL-SG2424

VLAN Config						
Select	VLAN ID	Name	Untagged Ports	Tagged Ports	Operation	
<input type="checkbox"/>	1	Default VLAN	1-24			Delete
<input checked="" type="checkbox"/>	11	profesores	1	24		Delete
<input type="checkbox"/>	208	alumnos208	2-23	24		Delete

VLAN Membership														
VLAN ID				11				VLAN Name				profesores		
Port	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Untagged	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tagged	●	●	●	●	●	●	●	●	●	●	●	●	●	●
NotMember	●	●	●	●	●	●	●	●	●	●	●	●	●	●
PVID	11 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼
LAG	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Port	15	16	17	18	19	20	21	22	23	24				
Untagged	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tagged	●	●	●	●	●	●	●	●	●	●	●	●	●	●
NotMember	●	●	●	●	●	●	●	●	●	●	●	●	●	●
PVID	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	1 ▼				
LAG	---	---	---	---	---	---	---	---	---	---				

CONFIGURACIÓN AULAS

SWITCHES GESTIONABLES TL-SG2424

VLAN Config

Select	VLAN ID	Name	Untagged Ports				Tagged Ports				Operation
<input type="checkbox"/>	1	Default VLAN	1-24								Delete
<input type="checkbox"/>	11	profesores	1				24				Delete
<input checked="" type="checkbox"/>	208	alumnos208	2-23				24				Delete

VLAN Membership

VLAN ID		208						VLAN Name						alumnos208		
Port	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Untagged	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Tagged	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
NotMember	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
PVID	11 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼		
LAG	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Port	15	16	17	18	19	20	21	22	23	24						
Untagged	●	●	●	●	●	●	●	●	●	●						
Tagged	●	●	●	●	●	●	●	●	●	●						
NotMember	●	●	●	●	●	●	●	●	●	●						
PVID	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	208 ▼	1 ▼						
LAG	---	---	---	---	---	---	---	---	---	---						

CONFIGURACIÓN VLANS

Screenshot of WinBox interface list showing VLAN configuration.

The left sidebar menu is visible, with the "Interfaces" option highlighted by a red box.

The top navigation bar shows tabs: Interface, Interface List, Ethernet, EoIP Tunnel, IP Tunnel, GRE Tunnel, VLAN, VRRP, Bonding, and LTE. The "VLAN" tab is selected.

The main area displays a table titled "Interface List" with the following columns: Name, Type, MTU, Actual MTU, L2 MTU, VLAN ID, and Interface.

	Name	Type	MTU	Actual MTU	L2 MTU	VLAN ID	Interface
R	vlanAlumnado107	VLAN	1500	1500	1576	107	bonding1-swit...
R	vlanAlumnado108	VLAN	1500	1500	1576	108	bonding1-swit...
R	vlanAlumnado110	VLAN	1500	1500	1576	110	bonding1-swit...
R	vlanAlumnado112	VLAN	1500	1500	1576	112	bonding1-swit...
R	vlanAlumnado206	VLAN	1500	1500	1576	206	bonding1-swit...
R	vlanAlumnado207	VLAN	1500	1500	1576	207	bonding1-swit...
R	vlanAlumnado208	VLAN	1500	1500	1576	208	bonding1-swit...
R	vlanAlumnado209	VLAN	1500	1500	1576	209	bonding1-swit...
R	vlanAlumnado210	VLAN	1500	1500	1576	210	bonding1-swit...
R	vlanAlumnado211	VLAN	1500	1500	1576	211	bonding1-swit...
R	vlanAlumnado212	VLAN	1500	1500	1576	212	bonding1-swit...
R	vlanAlumnado214	VLAN	1500	1500	1576	214	bonding1-swit...
R	vlanDepartamento12	VLAN	1500	1500	1576	12	bonding1-swit...
R	vlanONT	VLAN	1500	1500	1576	6	sfp1-wan
R	vlanProfes11	VLAN	1500	1500	1576	11	bonding1-swit...
R	vlanProxmox5	VLAN	1500	1500	1576	5	bonding1-swit...
R	vlanSwitches	VLAN	1500	1500	1576	1	bonding1-swit...

CONFIGURACIÓN VLANS

Session Settings Dashboard

Session: 192.168.1.254 (RouterOS)

Quick Set CAPsMAN Interfaces Wireless Bridge PPP Mesh IP MPLS Routing System Queues Files Log RADIUS Tools New Terminal Dot1X LCD Partition Make Supout.rif

Session: 192.168.1.254

Interface List

Interface Interface List Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding LTE

+ **-** **↶** **✖** **📁** **🔍**

Interface <vlanAlumnado107>

General Loop Protect Status Traffic

Name: vlanAlumnado107

Type: VLAN

MTU: 1500

Actual MTU: 1500

L2 MTU: 1576

MAC Address: 18:FD:74:E2:4B:33

ARP: enabled

ARP Timeout:

VLAN ID: 107

Interface: bonding1-switch52

Use Service Tag

OK Cancel Apply Disable Comment Copy Remove Torch

TU	L2 MTU	VLAN ID	Inte
1500	1576	107	bon
1500	1576	108	bon
1500	1576	110	bon
1500	1576	112	bon
1500	1576	206	bon
1500	1576	207	bon
1500	1576	208	bon
1500	1576	209	bon
1500	1576	210	bon
1500	1576	211	bon
1500	1576	212	bon
1500	1576	214	bon
1500	1576	12	bon
1500	1576	6	sfp1
1500	1576	11	bon
1500	1576	5	bon
1500	1576	1	bon

CONFIGURACIÓN VLANS

PUERTO	DESCRIPCION	RED	DIRECCIÓN	INTERFACE
1	WAN – Salida a Internet	80.58.67.86	80.28.211.131	pppoe-movistar
2	Red del Departamento	192.168.2.0/24	192.168.2.254	vlanDepartamento12
3	Red TIC - Andared	192.168.0.0/22	192.168.3.51	ether3-andared
bonding 9,10,11,12	Red de Profesores – Equipos Aulas	192.168.1.0/24	192.168.1.254	vlanAlumnos11
bonding 9,10,11,12	Aula 107	192.168.107.0/24	192.168.107.X	vlanAlumnos107
		192.168.1.0/24	192.168.1.X	vlanAlumnos107
		192.168.0.0/24	192.168.0.107	vlanSwitches
bonding 9,10,11,12	Aula 108	192.168.108.0/24	192.168.108.X	vlanAlumnos108
		192.168.1.0/24	192.168.1.X	vlanAlumnos11
		192.168.0.0/24	192.168.0.108	vlanSwitches
bonding 9,10,11,12	Aula 110	192.168.110.0/24	192.168.110.X	vlanAlumnos108
		192.168.1.0/24	192.168.1.X	vlanAlumnos11
		192.168.0.0/24	192.168.0.110	vlanSwitches
bonding 9,10,11,12	Aula 206	192.168.206.0/24	192.168.206.X	vlanAlumnos206
		192.168.1.0/24	192.168.1.X	vlanAlumnos11
		192.168.0.0/24	192.168.0.108	vlanSwitches
bonding 9,10,11,12	Aula 207	192.168.207.0/24	192.168.207.X	vlanAlumnos207
		192.168.1.0/24	192.168.1.X	vlanAlumnos11
		192.168.0.0/24	192.168.0.207	vlanSwitches

CONFIGURACIÓN VLANS

PUERTO	DESCRIPCION	RED	DIRECCIÓN	INTERFACE
bonding 9,10,11,12	Aula 208	192.168.208.0/24	192.168.208.X	vlanAlumnos208
		192.168.1.0/24	192.168.1.X	vlanAlumnos11
		192.168.0.0/24	192.168.0.208	vlanSwitches
bonding 9,10,11,12	Aula 209	192.168.209.0/24	192.168.209.X	vlanAlumnos209
		192.168.1.0/24	192.168.1.X	vlanAlumnos11
		192.168.0.0/24	192.168.0.209	vlanSwitches
bonding 9,10,11,12	Aula 210	192.168.210.0/24	192.168.210.X	vlanAlumnos210
		192.168.1.0/24	192.168.1.X	vlanAlumnos11
		192.168.0.0/24	192.168.0.210	vlanSwitches
bonding 9,10,11,12	Aula 211	192.168.211.0/24	192.168.211.X	vlanAlumnos211
		192.168.1.0/24	192.168.1.X	vlanAlumnos11
		192.168.0.0/24	192.168.0.211	vlanSwitches
bonding 9,10,11,12	Aula 212	192.168.212.0/24	192.168.212.X	vlanAlumnos212
		192.168.1.0/24	192.168.1.X	vlanAlumnos11
		192.168.0.0/24	192.168.0.212	vlanSwitches
bonding 9,10,11,12	Aula 214	192.168.214.0/24	192.168.214.X	vlanAlumnos214
		192.168.1.0/24	192.168.1.X	vlanAlumnos11
		192.168.0.0/24	192.168.0.212	vlanSwitches

CONFIGURACIÓN VLANS

DETALLE DE CONFIGURACIÓN

/interface vlan

```
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos107 vlan-id=107
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos108 vlan-id=108
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos110 vlan-id=110
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos206 vlan-id=206
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos207 vlan-id=207
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos208 vlan-id=208
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos209 vlan-id=209
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos210 vlan-id=210
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos211 vlan-id=211
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos212 vlan-id=214
add interface=bonding1-switch52 l2mtu=1576 name=vlanAlumnos214 vlan-id=214
```

```
add interface=bonding1-switch52 name=vlanDepartamento12 vlan-id=12
add interface=bonding1-switch52 name=vlanProfes11 vlan-id=11
add interface=bonding1-switch52 name=vlanProxmox5 vlan-id=5
add interface=bonding1-switch52 name=vlanSwitches vlan-id=1
```

CONFIGURACIÓN DHCP

RED	DESCRIPCION	RANGO IPS	GATEWAY	INTERFACE
192.168.1.0/24	Red de Profesores	192.168.1.2-99	192.168.1.254	vlanProfes
192.168.2.0/24	Red del Departamento	192.168.2.2-199	192.168.2.254	vlanDepar
192.168.100.0/24	Red Equipo Directivo	192.168.100.2-199	192.168.100.254	ether2
192.168.107.0/24	Aula 107	192.168.107.2-199	192.168.107.254	vlanAlumnos107
192.168.108.0/24	Aula 108	192.168.108.2-199	192.168.108.254	vlanAlumnos108
192.168.110.0/24	Aula 110	192.168.110.2-199	192.168.110.254	vlanAlumnos110
192.168.206.0/24	Aula 206	192.168.206.2-199	192.168.206.254	vlanAlumnos206
192.168.207.0/24	Aula 207	192.168.207.2-199	192.168.207.254	vlanAlumnos207
192.168.208.0/24	Aula 208	192.168.208.2-199	192.168.208.254	vlanAlumnos208
192.168.209.0/24	Aula 209	192.168.209.2-199	192.168.209.254	vlanAlumnos209
192.168.210.0/24	Aula 210	192.168.210.2-199	192.168.210.254	vlanAlumnos210
192.168.211.0/24	Aula 211	192.168.211.2-199	192.168.211.254	vlanAlumnos211
192.168.212.0/24	Aula 212	192.168.212.2-199	192.168.212.254	vlanAlumnos212
192.168.214.0/24	Aula 214	192.168.214.2-199	192.168.214.254	vlanAlumnos214

Otros Parámetros	Valor
DNS	192.168.5.2 (Adguard Docker)
	80.58.61.250 (Telefónica)
	80.58.61.254 (Telefónica)
Domain	18700098.18.andared.ced.junta-andalucia.es

CONFIGURACIÓN POOLS IP

The screenshot shows the WinBox interface with the 'IP' menu item highlighted by a red box. A sub-menu titled 'IP Pool' is open, also highlighted by a red box. The 'Pools' tab is selected, displaying a list of configured IP pools.

Name	Addresses	Next Pool
Pool-IP-Depar	192.168.2.2-192.168.2.199	none
Pool-IPs-Profes-Aulas	192.168.1.10-192.168.1.99	none
Pool-VPN-red	192.168.2.210-192.168.2.230	none
pool-IPs-Alumnos-108	192.168.108.2-192.168.108.199	none
pool-IPs-Alumnos-206	192.168.206.2-192.168.206.199	none
pool-IPs-Alumnos-207	192.168.207.2-192.168.207.199	none
pool-IPs-Alumnos-208	192.168.208.2-192.168.208.199	none
pool-IPs-Alumnos-209	192.168.209.2-192.168.209.199	none
pool-IPs-Alumnos-210	192.168.210.2-192.168.210.199	none
pool-IPs-Alumnos-211	192.168.211.2-192.168.211.199	none
pool-IPs-Alumnos-212	192.168.212.2-192.168.212.199	none

11 items

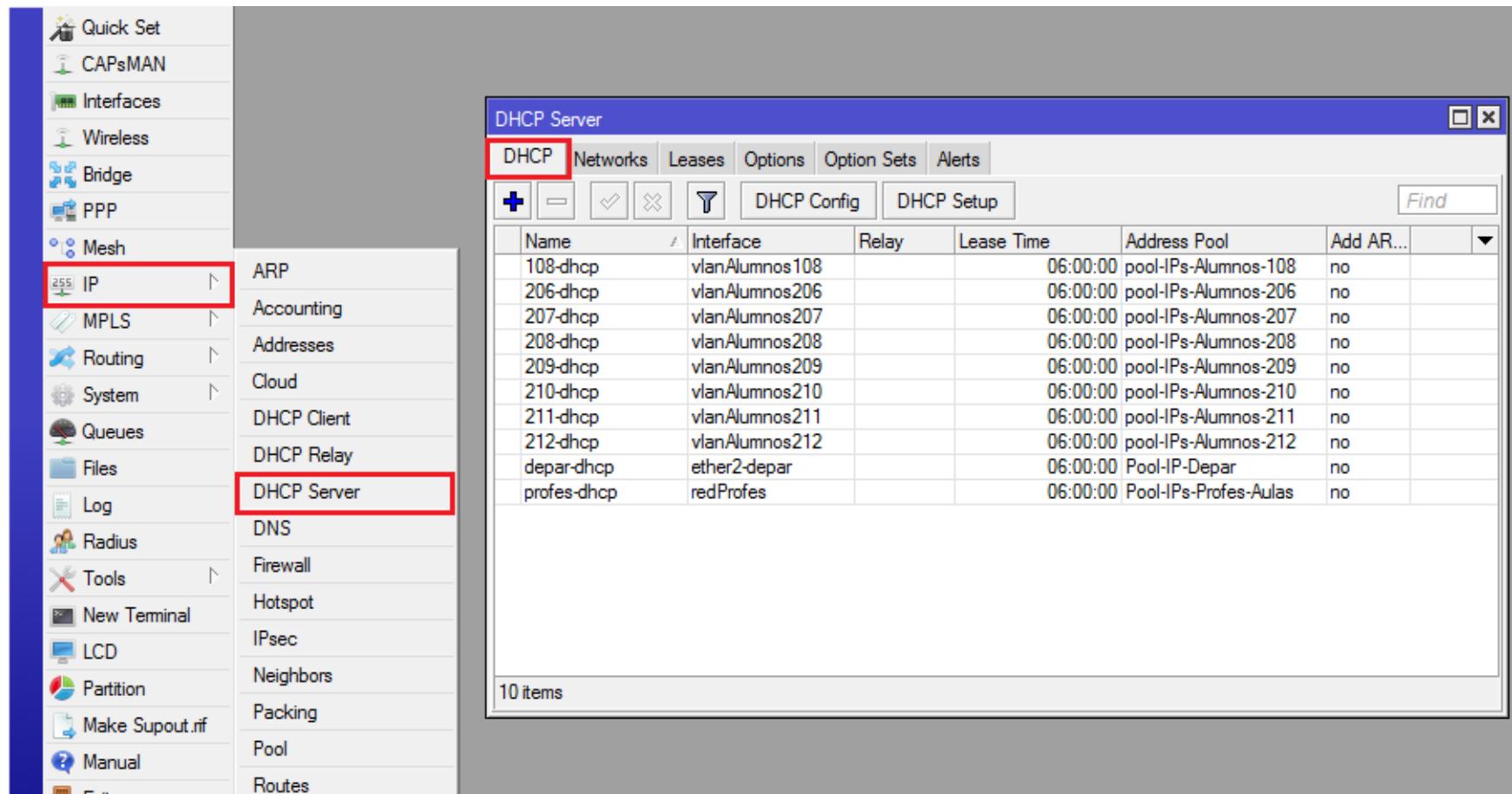
CONFIGURACIÓN POOLS IP

DETALLE DE CONFIGURACIÓN

/ip pool

```
add name=Pool-IP-Depar ranges=192.168.2.2-192.168.2.199
add name=Pool-IPs-Profes-Aulas ranges=192.168.1.10-192.168.1.99
add name=pool-IPs-Alumnos-108 ranges=192.168.108.2-192.168.108.199
add name=pool-IPs-Alumnos-206 ranges=192.168.206.2-192.168.206.199
add name=pool-IPs-Alumnos-209 ranges=192.168.209.2-192.168.209.199
add name=pool-IPs-Alumnos-210 ranges=192.168.210.2-192.168.210.199
add name=pool-IPs-Alumnos-211 ranges=192.168.211.2-192.168.211.199
add name=pool-IPs-Alumnos-212 ranges=192.168.212.2-192.168.212.199
add name=pool-IPs-Alumnos-207 ranges=192.168.207.2-192.168.207.199
add name=pool-IPs-Alumnos-208 ranges=192.168.208.2-192.168.208.199
```

CONFIGURACIÓN SERVICIO DHCP

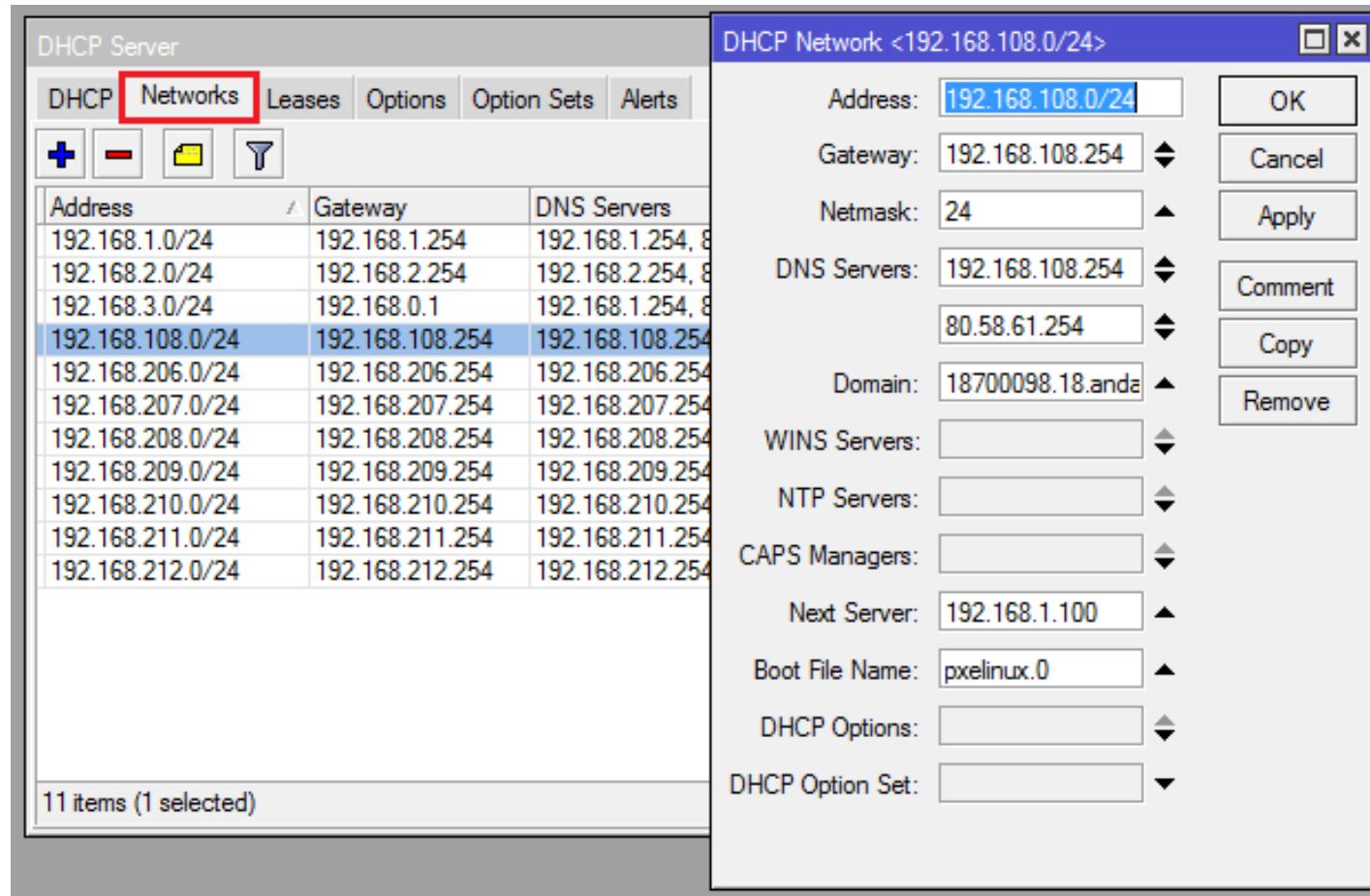


CONFIGURACIÓN SERVICIO DHCP

DETALLE DE CONFIGURACIÓN

```
/ip dhcp-server
add address-pool=Pool-IP-Depar disabled=no interface=ether2-depar lease-time=\
    6h name=depar-dhcp
add address-pool=Pool-IPs-Profes-Aulas disabled=no interface=redProfes \
    lease-time=6h name=profes-dhcp
add address-pool=pool-IPs-Alumnos-108 disabled=no interface=vlanAlumnos108 \
    lease-time=6h name=108-dhcp
add address-pool=pool-IPs-Alumnos-209 disabled=no interface=vlanAlumnos209 \
    lease-time=6h name=209-dhcp
add address-pool=pool-IPs-Alumnos-210 disabled=no interface=vlanAlumnos210 \
    lease-time=6h name=210-dhcp
add address-pool=pool-IPs-Alumnos-211 disabled=no interface=vlanAlumnos211 \
    lease-time=6h name=211-dhcp
add address-pool=pool-IPs-Alumnos-212 disabled=no interface=vlanAlumnos212 \
    lease-time=6h name=212-dhcp
add address-pool=pool-IPs-Alumnos-206 disabled=no interface=vlanAlumnos206 \
    lease-time=6h name=206-dhcp
add address-pool=pool-IPs-Alumnos-207 disabled=no interface=vlanAlumnos207 \
    lease-time=6h name=207-dhcp
add address-pool=pool-IPs-Alumnos-208 disabled=no interface=vlanAlumnos208 \
    lease-time=6h name=208-dhcp
```

CONFIGURACIÓN REDES DHCP



CONFIGURACIÓN REDES DHCP

DETALLE DE CONFIGURACIÓN

/ip dhcp-server network

```
add address=192.168.1.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.1.254,80.58.61.254,8.8.8.8 domain=\n        ieszaidinvergeles.org gateway=192.168.1.254 netmask=\n            24 next-server=192.168.1.100\nadd address=192.168.2.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.2.254,80.58.61.254 domain=\n        ieszaidinvergeles.org gateway=192.168.2.254 netmask=\n            24 next-server=192.168.1.100\nadd address=192.168.3.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.1.254,80.58.61.254 domain=\n        ieszaidinvergeles.org gateway=192.168.0.1 netmask=22 \n    next-server=192.168.1.100\nadd address=192.168.108.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.108.254,80.58.61.254 domain=\n        ieszaidinvergeles.org gateway=192.168.108.254 \n    netmask=24 next-server=192.168.1.100\nadd address=192.168.206.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.206.254,80.58.61.254 domain=\n        ieszaidinvergeles.org gateway=192.168.206.254 \n    netmask=24 next-server=192.168.1.100
```

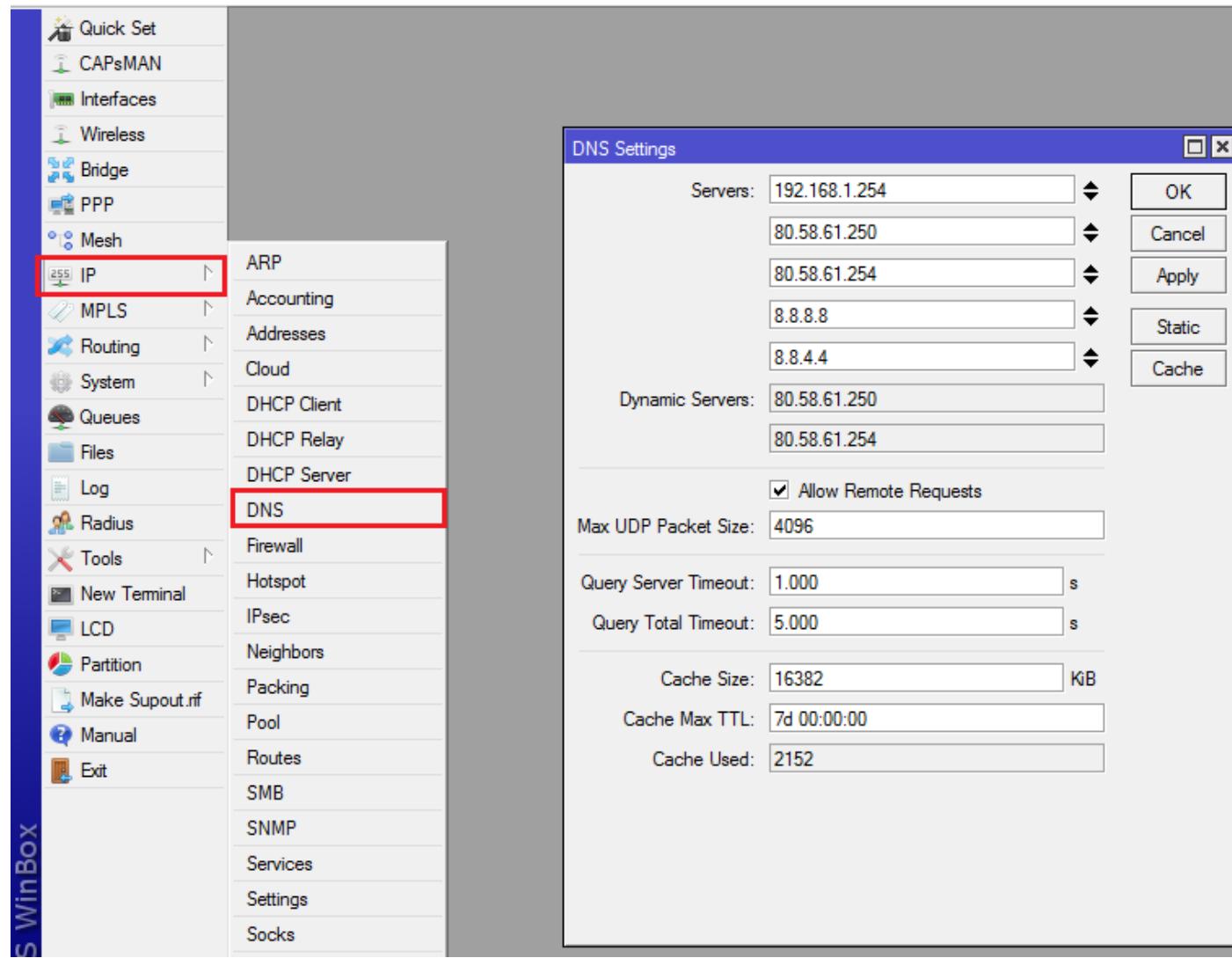
CONFIGURACIÓN REDES DHCP

DETALLE DE CONFIGURACIÓN

/ip dhcp-server network

```
add address=192.168.207.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.207.254,80.58.61.250 domain=\n        ieszaidinvergeles.org gateway=192.168.207.254 \n        netmask=24 next-server=192.168.1.100\nadd address=192.168.208.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.208.254,80.58.61.254 domain=\n        ieszaidinvergeles.org gateway=192.168.208.254 \n        netmask=24 next-server=192.168.1.100\nadd address=192.168.209.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.209.254,80.58.61.254 domain=\n        ieszaidinvergeles.org gateway=192.168.209.254 \n        netmask=24 next-server=192.168.1.100\nadd address=192.168.210.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.210.254,80.58.61.254 domain=\n        ieszaidinvergeles.org gateway=192.168.210.254 \n        netmask=24 next-server=192.168.1.100\nadd address=192.168.211.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.211.254,80.58.61.254 domain=\n        ieszaidinvergeles.org gateway=192.168.211.254 \n        netmask=24 next-server=192.168.1.100\nadd address=192.168.212.0/24 boot-file-name=pxelinux.0 dns-server=\n    192.168.212.254,80.58.61.254 domain=\n        ieszaidinvergeles.org gateway=192.168.212.254 \n        netmask=24 next-server=192.168.1.100
```

CONFIGURACIÓN DNS-CACHE



CONFIGURACIÓN DNS-CACHE

DETALLE DE CONFIGURACIÓN

/ip dns

```
set allow-remote-requests=yes cache-size=16382KiB query-server-timeout=1s \
query-total-timeout=5s servers=\
192.168.1.254,80.58.61.250,80.58.61.254,8.8.8.8,8.8.4.4
```

/ip dns static

```
add address=192.168.1.100 name="informatica.ieszaidinvergeles.org.18700098.18.\
andared.ced.junta-andalucia.es"
add address=192.168.1.100 name=\
diskstation.18700098.18.andared.ced.junta-andalucia.es
add address=192.168.0.2 name=c0.18700098.18.andared.ced.junta-andalucia.es
add address=192.168.1.1 name=\
webserver.18700098.18.andared.ced.junta-andalucia.es
```

/ip firewall nat

```
add action=redirect chain=dstnat comment="Redirigir a DNS Cache" dst-port=53 protocol=\
udp to-ports=53
```

CONFIGURACIÓN DEL FIREWALL

Packet Flow Mikrotik



PREROUTING

Hotspot Input
Conn-Tracking
MANGLE
Dst-NAT
Global-in Queue
Global-Total Queue

INPUT

Mangle Filter

FORWARD

Mangle Filter
Accounting

OUTPUT

Conn-Tracking
Mangle Filter

POSTROUTING

Mangle
Global-Out Queue
Global-Total Queue
Source-NAT
Hotspot Output

CONFIGURACIÓN DEL FIREWALL REGLAS FILTER

The screenshot shows the Winbox interface for configuring firewall rules. The left sidebar has a 'Quick Set' menu with various network-related options like CAPsMAN, Interfaces, Wireless, Bridge, PPP, Mesh, IP, MPLS, Routing, System, Queues, Files, Log, Radius, Tools, New Terminal, LCD, Partition, Make Supout.rif, Manual, and Exit. The 'IP' and 'Tools' sections are highlighted with red boxes. The main window has tabs for Queue List, Firewall, Simple Queues, Interfaces, Filter Rules (which is selected and highlighted with a red box), NAT, Mangle, Service Ports, Connections, Address Lists, and Layer7 Protocols. Below the tabs is a toolbar with icons for adding, deleting, and modifying rules, along with 'Reset Counters' and 'Reset All Counters' buttons. The main area displays a table of 18 filter rules:

#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Interface	Out. Interface
0	reject	input			6 (tcp)		1-1023,8...	pppoe-movistar	
1	drop	forward			6 (tcp)				
2	drop	forward			6 (tcp)				
3	drop	forward			17 (udp)	0			
4	drop	forward			17 (udp)		0		
5	acc...	forward		192.168.0....					
6	acc...	forward	192.168.0....	192.168.1.1					
7	acc...	forward	192.168.0....	192.168.1....					
8	acc...	forward	192.168.2....	192.168.1....					
9	acc...	forward	192.168.2....	192.168.0....					
10	drop	forward	192.168.1....	192.168.2....					
11	drop	forward	192.168.10...	192.168.0....					
12	drop	forward	192.168.20...	192.168.0....					
13	drop	forward	192.168.20...	192.168.0....					
14	drop	forward	192.168.20...	192.168.0....					
15	drop	forward	192.168.20...	192.168.0....					
16	drop	forward	192.168.21...	192.168.0....					
17	drop	forward	192.168.21...	192.168.0....					
18	drop	forward	192.168.21...	192.168.0....					

CONFIGURACIÓN DEL FIREWALL

REGLAS FILTER

DETALLE DE CONFIGURACIÓN

```
/ip firewall filter
add action=reject chain=input comment="Cortar puertos Exterior" dst-port=1-1023,8291 \
    in-interface=pppoe-movistar protocol=tcp reject-with=icmp-port-unreachable
add action=drop chain=forward comment="TCP flags and Port 0 attacks" \
    protocol=tcp tcp-flags=fin,!ack
add action=drop chain=forward protocol=tcp tcp-flags=fin,urg
add action=drop chain=forward protocol=udp src-port=0
add action=drop chain=forward dst-port=0 protocol=udp
add chain=forward comment="Permitir destino redTIC" dst-address=\
    192.168.0.0/24
add chain=forward comment="Permitir acceso al Servidor Web" dst-address=\
    192.168.1.1 src-address=192.168.0.0/16
add chain=forward comment="Permitir conexion NAS" dst-address=192.168.1.100 \
    src-address=192.168.0.0/16
add chain=forward comment="Permitir conexion ITX" dst-address=192.168.1.200 \
    src-address=192.168.2.0/24
add chain=forward comment="Permitir conexion desde Departamento a TODOS" \
    dst-address=192.168.0.0/16 src-address=192.168.2.0/24
add action=drop chain=forward comment="Aislar Red Departamento" \
    connection-state=new dst-address=192.168.2.0/24 src-address=\
    192.168.1.0/24 src-address-list=!192.168.1.100
add action=drop chain=forward comment="Aislar Redes Aulas Alumnos" \
    connection-state=new dst-address=192.168.0.0/16 src-address=192.168.108.0/24
```

CONFIGURACIÓN DEL FIREWALL REGLAS FILTER

DETALLE DE CONFIGURACIÓN

```
/ip firewall filter
add action=drop chain=forward connection-state=new dst-address=192.168.0.0/16 \
    src-address=192.168.206.0/24
add action=drop chain=forward connection-state=new dst-address=192.168.0.0/16 \
    src-address=192.168.207.0/24
add action=drop chain=forward connection-state=new dst-address=192.168.0.0/16 \
    src-address=192.168.208.0/24
add action=drop chain=forward connection-state=new dst-address=192.168.0.0/16 \
    src-address=192.168.209.0/24
add action=drop chain=forward connection-state=new dst-address=192.168.0.0/16 \
    src-address=192.168.210.0/24
add action=drop chain=forward connection-state=new dst-address=192.168.0.0/16 \
    src-address=192.168.211.0/24
add action=drop chain=forward connection-state=new dst-address=192.168.0.0/16 \
    src-address=192.168.212.0/24
add action=drop chain=forward comment=108 src-address=192.168.108.0/24
add action=drop chain=forward comment=206 src-address=192.168.206.0/24
add action=drop chain=forward comment=207 src-address=192.168.207.0/24
add action=drop chain=forward comment=208 disabled=yes src-address=\
    192.168.208.0/24
add action=drop chain=forward comment=209 src-address=192.168.209.0/24
add action=drop chain=forward comment=210 disabled=yes src-address=192.168.210.0/24
add action=drop chain=forward comment=211 disabled=yes src-address=192.168.211.0/24
add action=drop chain=forward comment=212 src-address=192.168.212.0/24
```

CONFIGURACIÓN DEL FIREWALL REGLAS NAT

The screenshot shows the Winbox interface for configuring Firewall NAT rules. The left sidebar has a red box around the 'IP' section, and the 'Firewall' option in the bottom list is also highlighted with a red box.

Firewall NAT Rules:

#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Dst. Port	In. Inter...	Out. Interface
0	masquerade	srcnat							pppoe-movistar
1	masquerade	srcnat							ether3-andared
2	masquerade	srcnat		192.168.1.200					redProfs
3	dst-nat	dstnat		80.28.211.131	6 (tcp)		1723		
4	masquerade	srcnat		192.168.1.1					redProfs
5	masquerade	srcnat		192.168.1.100					redProfs
6	dst-nat	dstnat		80.28.211.131	6 (tcp)	5000			
7	dst-nat	dstnat		80.28.211.131	6 (tcp)	5001			
8	redirect	dstnat			17 (u...)	53			

CONFIGURACIÓN DEL FIREWALL

REGLAS NAT

DETALLE DE CONFIGURACIÓN

```
/ip firewall nat
add action=masquerade chain=srcnat comment="Masquerade WAN" out-interface=\
pppoe-movistar
add action=masquerade chain=srcnat comment="Masquerade ANDARED" \
out-interface=ether3-andared
add action=masquerade chain=srcnat comment="Masquerade FIREWALL" dst-address=\192.168.1.200 out-interface=redProfes
add action=dst-nat chain=dstnat comment="Redireccion al servidor VPN" \
dst-address=80.28.211.131 dst-port=1723 protocol=tcp to-addresses=\192.168.2.254
add action=masquerade chain=srcnat comment="Masquerade WebServer" \
dst-address=192.168.1.1 dst-address-list=192.168.1.1 out-interface=\redProfes
add action=masquerade chain=srcnat comment="Masquerade NAS" dst-address=\192.168.1.100 out-interface=redProfes
add action=dst-nat chain=dstnat dst-address=80.28.211.131 dst-port=5000 \
protocol=tcp to-addresses=192.168.1.100 to-ports=5000
add action=dst-nat chain=dstnat dst-address=80.28.211.131 dst-port=5001 \
protocol=tcp to-addresses=192.168.1.100 to-ports=5001
add action=redirect chain=dstnat comment="DNS Cache" dst-port=53 protocol=\udp to-ports=53
```

CONFIGURACIÓN DEL FIREWALL

REGLAS MANGLE

Quick Set

CAPsMAN

Interfaces

Wireless

Bridge

PPP

Mesh

IP

MPLS

Routing

System

Queues

Files

Log

Radius

Tools

New Terminal

LCD

Partition

Make Supout.rf

Manual

Exit

Queue List

Firewall

Simple Queues

Interfaces

Mangle

Filter Rules

NAT

Service Ports

Connections

Address Lists

Layer7 Protocols

#

Name

Action Chain Src. Address Dst.... Protocol Src... Dst... In. Interface Out. Interface

0 D	✓ change MSS	forward		6 (tcp)				all ppp
1 D	✓ change MSS	forward		6 (tcp)				
::: Conexion VPN pptp								
2	✓ mark connection	input		47 (gre)				
3	✓ mark packet	input						
4	✓ mark packet	output						
5	✓ mark connection	input		6 (tcp)	1723			
6	✓ mark packet	input						
7	✓ mark packet	output						
::: P2P								
8	✓ mark connection	postrouting						
9	✓ mark packet	prerouting					pppoe-movistar	
10	✓ mark packet	postrouting					pppoe-movistar	
::: Trafico de AULAS, PROFES y DEPAR								
11	✓ mark connection	postrouting	192.168.1.0/24					pppoe-movistar
12	✓ mark packet	prerouting					pppoe-movistar	
13	✓ mark packet	postrouting					pppoe-movistar	
14	✓ mark connection	postrouting	192.168.2.0/24					pppoe-movistar
15	✓ mark packet	prerouting					pppoe-movistar	
16	✓ mark packet	postrouting					pppoe-movistar	
17	✓ mark connection	postrouting	192.168.108.0/24					pppoe-movistar
18	✓ mark packet	prerouting					pppoe-movistar	
19	✓ mark packet	postrouting					pppoe-movistar	
20	✓ mark connection	postrouting	192.168.206.0/24					pppoe-movistar
21	✓ mark packet	prerouting					pppoe-movistar	
22	✓ mark packet	postrouting					pppoe-movistar	
23	✓ mark connection	postrouting	192.168.207.0/24					pppoe-movistar
24	✓ mark packet	prerouting					pppoe-movistar	
25	✓ mark packet	postrouting					pppoe-movistar	
26	✓ mark connection	postrouting	192.168.208.0/24					pppoe-movistar
27	✓ mark packet	prerouting					pppoe-movistar	
28	✓ mark packet	postrouting					pppoe-movistar	
29	✓ mark connection	postrouting	192.168.209.0/24					pppoe-movistar
30	✓ mark packet	prerouting					pppoe-movistar	
31	✓ mark packet	postrouting					pppoe-movistar	
32	✓ mark connection	postrouting	192.168.210.0/24					pppoe-movistar
33	✓ mark packet	prerouting					pppoe-movistar	
34	✓ mark packet	postrouting					pppoe-movistar	
35	✓ mark connection	postrouting	192.168.211.0/24					pppoe-movistar
36	✓ mark packet	prerouting					pppoe-movistar	
37	✓ mark packet	postrouting					pppoe-movistar	
38	✓ mark connection	postrouting	192.168.212.0/24					pppoe-movistar
39	✓ mark packet	prerouting					pppoe-movistar	

CONFIGURACIÓN DEL FIREWALL REGLAS MANGLE

Ejemplo de Marcados de Conexiones y Paquetes de Entrada/Salida

```
/ip firewall mangle
add action=mark-connection chain=postrouting comment=\
"Conexiones nuevas desde la red de profes" connection-state=new \
new-connection-mark=redprofes out-interface=pppoe-movistar src-address=\
192.168.1.0/24
add action=mark-packet chain=prerouting connection-mark=redprofes \
in-interface=pppoe-movistar new-packet-mark=profes_in passthrough=no
add action=mark-packet chain=postrouting connection-mark=redprofes \
new-packet-mark=profes_out out-interface=pppoe-movistar passthrough=no
```