

Configuració de xarxa

Configuració de xarxa

Exemple d'esquema de xarxa en el model de centre

Alfredo Rafael Vicente Boix i Javier Estellés Dasi

05-05-2024

Virtualització als centres educatius
amb LliureX i Proxmox



CEFIRE
FORMACIÓ PROFESSIONAL
ENSENYANÇES ARTÍSTIQUES
I ESPORTIVES

Continguts

1	Valencià	3
1.1	Activitat	3
1.2	Característiques de la xarxa	3
1.3	Procediment de l'activitat	4
1.4	Aconseguir Apte en l'activitat	4
1.5	Exemple de captures de pantalla	5
2	CASTELLANO	11
2.1	Actividad	11
2.2	Características de la red	12
2.3	Procedimiento de la actividad	13
2.4	Conseguir Apto en la actividad	13
2.5	Ejemplo de capturas de pantalla	13



Este documento está sujeto a una licencia creative commons que permite su difusión y uso comercial reconociendo siempre la autoría de su creador. Este documento se encuentra para ser modificado en el siguiente repositorio de github: <https://github.com/arvicenteboix/lliurexproxmox>

1 Valencià

1.1 Activitat

L'activitat que vos proposem és crear un esquema de la vostra xarxa, aquest esquema ha de ser semblant a aquest:

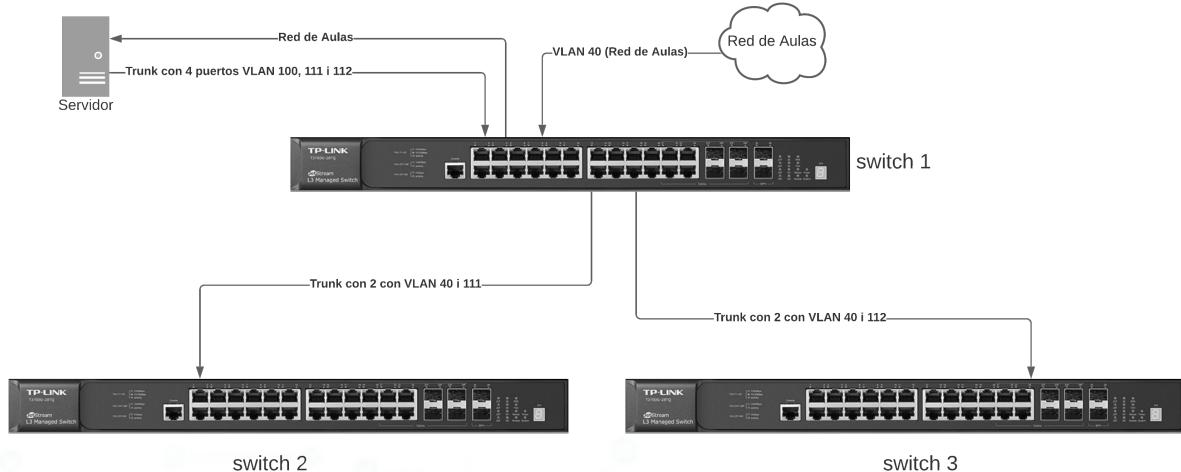


Figura 1: Esquema de xarxa

Si no disposeu de temps o la vostra xarxa del centre és massa complexa, podeu utilitzar l'esquema ací proposat. Podeu utilitzar el switch que vullgueu i la configuració de xarxa que desitgeu.

1.2 Característiques de la xarxa

La xarxa ha de tenir al menys les següents característiques:

Switch	Característiques
Router	Servirà la VLAN 40 que es la xarxa de Aules
Switch 1	Entrada de la red d'Aules, trunk amb 4 ports per a l'hipervisor, aquest servirà la VLAN 100, 111 i 112, trunk de 2 ports per als altres dos switchs

Switch	Característiques
Switch 2	Trunk amb 2 ports i donar servei en la resta de ports a ordinadors de la VLAN 40 i 111
Switch 3	Trunk amb 2 ports i donar servei en la resta de ports a ordinadors de la VLAN 40 i 112



Els ports podeu escollir-los vosaltres, el criteri comú és utilitzar els últims ports per a fer el trunk. La resta de ports els heu de deixar configurats per a donar servei als ordinadors. La red d'aules es connecta sempre al port 1 del switch 1 (pista: com untagged 40)

1.3 Procediment de l'activitat

1. Organitzar el plantejament. És important que vos feu un esquema abans de començar amb paper i boli. L'activitat no és gens complexa, però cal tenir clar el que es fa.
2. Realitzar el esquema de la xarxa, es pot fer a mà o utilitzar algun programa com lucidchart
3. Configurar els 3 switchs. Es pot utilitzar el switch que vullgueu per a fer la configuració. Si no disposeu de switch podeu utilitzat un emulador de switch. Nosaltres vos proposem aquests:
4. tp-link 3700g
5. tp-link 2600g
6. Realitzar captures de pantalla de cada pas.



Els emuladors no guarden la configuració quan li doneu a apply, per tant heu d'anar fent captura de pantalla abans de sortir de la pàgina.

1.4 Aconseguir Apte en l'activitat

L'activitat es considerarà APTA si es fan tots els punts. S'ha d'entregar un full en format pdf amb les següents captures de pantalla:

- Configuració de cada VLAN amb cada switch
- Configuració del trunk

1.5 Exemple de captures de pantalla

Es mostres exemples per a un dels switch (les pantalles no corresponen a la tasca correcta obviament), i haureu de mostrar més pantalles per al switch 1:

Select	Port	Admin Key	Port Priority(0-65535)	Mode	Status	LAG
<input type="checkbox"/>	Gi1/0/1	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/2	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/3	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/4	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/5	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/6	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/7	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/8	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/9	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/10	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/11	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/12	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/13	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/14	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/15	0	128	Passive	Disable	---

Figura 2: Exemple de trunk

The screenshot shows the configuration interface for a T3700G-28TQ switch. The left sidebar contains a navigation menu with various system and networking options. The main area is titled 'VLAN Config' and displays 'Port Config' settings for VLAN 170. The 'VLAN Info' section shows the VLAN ID as 170 (2 - 4093) and the name as 'Ordinador'. The 'Untagged port' section shows ports 1 through 26 assigned to LAG 1. The 'Tagged port' section shows ports 1 through 26 assigned to LAG 1. Buttons for 'All', 'Clear', 'Apply', and 'Help' are present. A legend at the bottom indicates that white icons represent 'Unselected Port(s)', blue icons represent 'Selected Port(s)', and grey icons represent 'Not Available for Selection'.

Figura 3: Exemple de VLAN

T3700G-28TQ

VLAN Config Port Config

VLAN Info

VLAN ID: (2 - 4093)

Name : (16 characters maximum)

Untagged port

UNIT: LAGS

2	4	6	8	10	12	14	16	18	20	22	24	26
1	3	5	7	9	11	13	15	17	19	21	23	25

All Clear

Tagged port

UNIT: LAGS

2	4	6	8	10	12	14	16	18	20	22	24	26
1	3	5	7	9	11	13	15	17	19	21	23	25

All Clear Apply Help

Unselected Port(s) Selected Port(s) Not Available for Selection

Logout

Figura 4: Exemple de VLAN

VLAN Info

VLAN ID: (2 - 4093)

Name : (16 characters maximum)

Untagged port

UNIT: LAGS

2	4	6	8	10	12	14	16	18	20		22	24	26
1	3	5	7	9	11	13	15	17	19		21	23	25

All Clear

Tagged port

UNIT: LAGS

2	4	6	8	10	12	14	16	18	20		22	24	26
1	3	5	7	9	11	13	15	17	19		21	23	25

All Clear Apply Help

Unselected Port(s) Selected Port(s) Not Available for Selection

Figura 5: Exemple de VLAN

tp-link

T3700G-28TQ

LAG Table Static LAG LACP Config

Global Config

System Priority: 32768 (0-65535) Apply

LACP Config

UNIT: 1

Select	Port	Admin Key	Port Priority(0-65535)	Mode	Status	LAG
<input type="checkbox"/>	Gi1/0/12	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/13	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/14	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/15	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/16	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/17	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/18	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/19	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/20	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/21	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/22	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/23	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/24	0	128	Passive	Disable	---
<input type="checkbox"/>	Te1/0/25	0	128	Passive	Disable	---
<input type="checkbox"/>	Te1/0/26	0	128	Passive	Disable	---

All Apply Help

Note:

- To avoid any broadcast storm when LACP takes effect, you are suggested to enable Spanning Tree function.
- LACP function can not be enabled for the port already in a static link aggregation group.

Figura 6: Exemple de trunk

Select	Port	Admin Key	Port Priority(0-65535)	Mode	Status	LAG
<input type="checkbox"/>	Gi1/0/12	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/13	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/14	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/15	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/16	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/17	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/18	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/19	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/20	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/21	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/22	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/23	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/24	0	128	Passive	Disable	---
<input type="checkbox"/>	Te1/0/25	0	128	Passive	Disable	---
<input type="checkbox"/>	Te1/0/26	0	128	Passive	Disable	---

Note:

1. To avoid any broadcast storm when LACP takes effect, you are suggested to enable Spanning Tree function.
2. LACP function can not be enabled for the port already in a static link aggregation group.

Figura 7: Exemple de trunk

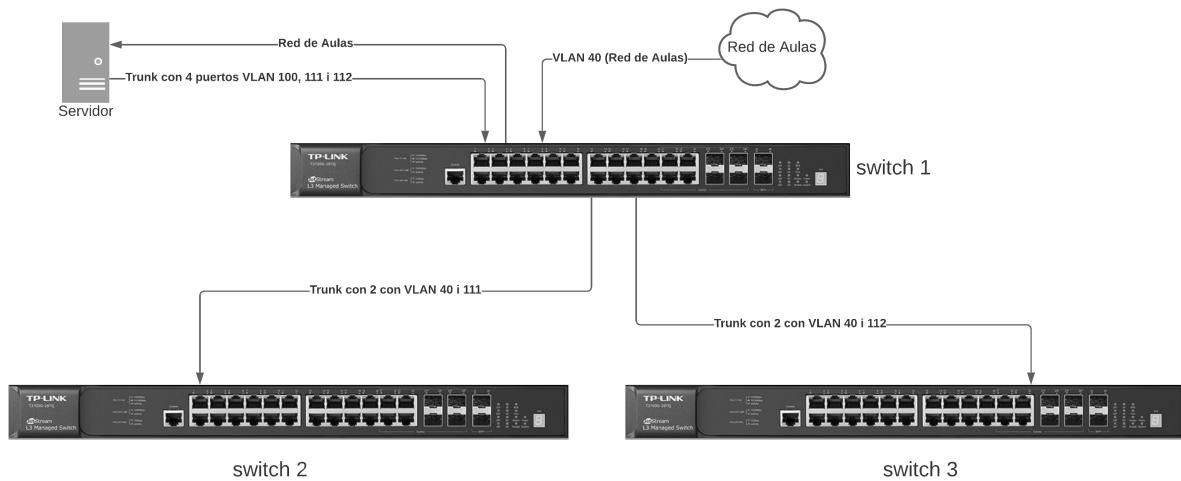
Select	Port	Admin Key	Port Priority(0-65535)	Mode	Status	LAG
<input checked="" type="checkbox"/>	Gi1/0/1	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/2	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/3	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/4	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/5	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/6	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/7	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/8	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/9	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/10	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/11	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/12	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/13	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/14	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/15	0	128	Passive	Disable	---

Figura 8: Exemple de trunk

2 CASTELLANO

2.1 Actividad

La actividad que os proponemos es crear un esquema de vuestra red, este esquema debe ser similar a este:

**Figura 9:** Esquema de red

Si no disponéis de tiempo o vuestra red del centro es demasiado compleja, podéis utilizar el esquema aquí propuesto. Podéis utilizar el switch que queráis y la configuración de red que deseéis.

2.2 Características de la red

La red debe tener al menos las siguientes características:

Switch	Características
Router	Servirá la VLAN 40 que es la red de Aulas
Switch 1	Entrada de la red de Aulas, trunk con 4 puertos para el hipervisor, este servirá la VLAN 100, 111 y 112, trunk de 2 puertos para los otros dos switches

Switch	Características
Switch 2	Trunk con 2 puertos y dar servicio en el resto de puertos a ordenadores de la VLAN 40 y 111
Switch 3	Trunk con 2 puertos y dar servicio en el resto de puertos a ordenadores de la VLAN 40 y 112



Los puertos podéis elegirlos vosotros, el criterio común es utilizar los últimos puertos para hacer el trunk. El resto de puertos debéis dejarlos configurados para dar servicio a los ordenadores. La red de aulas se conecta siempre al puerto 1 del switch 1 (pista: como untagged 40)

2.3 Procedimiento de la actividad

1. Organizar el planteamiento. Es importante que os hagáis un esquema antes de comenzar con papel y bolígrafo. La actividad no es nada compleja, pero hay que tener claro lo que se hace.
2. Realizar el esquema de la red, se puede hacer a mano o utilizar algún programa como lucidchart.
3. Configurar los 3 switches. Se puede utilizar el switch que queráis para hacer la configuración. Si no disponéis de switch podéis utilizar un emulador de switch. Nosotros os proponemos estos:
4. tp-link 3700g
5. tp-link 2600g
6. Realizar capturas de pantalla de cada paso.



Los emuladores no guardan la configuración cuando le das a apply, por lo tanto debéis ir haciendo captura de pantalla antes de salir de la página.

2.4 Conseguir Apto en la actividad

La actividad se considerará APTA si se hacen todos los puntos. Se debe entregar una hoja en formato pdf con las siguientes capturas de pantalla:

- Configuración de cada VLAN con cada switch
- Configuración del trunk

2.5 Ejemplo de capturas de pantalla

Se muestran ejemplos para uno de los switches (las pantallas no corresponden a la tarea correcta obviamente), y deberéis mostrar más pantallas para el switch 1:

tp-link

T3700G-28TQ

LAG Table Static LAG **LACP Config**

System Stack Switching • Port • LAG • Traffic Monitor • MAC Address VLAN Spanning Tree Multicast Routing QoS ACL Network Security SNMP LLDP Maintenance Save Config Index Logout

Global Config
System Priority: 32768 (0-65535) **Apply**

LACP Config
UNIT: 1

Select	Port	Admin Key	Port Priority(0-65535)	Mode	Status	LAG
<input checked="" type="checkbox"/>	Gi1/0/1	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/2	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/3	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/4	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/5	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/6	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/7	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/8	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/9	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/10	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/11	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/12	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/13	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/14	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/15	0	128	Passive	Disable	---

All Apply Help

Note:

1. To avoid any broadcast storm when LACP takes effect, you are suggested to enable Spanning Tree function.
2. LACP function can not be enabled for the port already in a static link aggregation group.

Figura 10: Ejemplo de trunk

The screenshot shows the 'VLAN Config' tab selected in the top navigation bar. On the left, a sidebar lists various configuration categories. The main area displays 'VLAN Info' with a VLAN ID of 170 and a name of 'Ordinador'. It includes two sections: 'Untagged port' and 'Tagged port', both set to UNIT 1 LAGS. The untagged port section shows ports 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 as unselected (light blue), 22, 24, 26 as selected (dark blue), and 1, 3, 5, 7, 9, 11, 13, 15, 17, 19 as not available for selection (gray). The tagged port section shows ports 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 as unselected, 22, 24, 26 as selected, and 1, 3, 5, 7, 9, 11, 13, 15, 17, 19 as not available for selection. Buttons for 'All', 'Clear', 'Apply', and 'Help' are at the bottom.

Figura 11: Ejemplo de VLAN

T3700G-28TQ

VLAN Config Port Config

VLAN Info

VLAN ID: (2 - 4093)

Name : (16 characters maximum)

Untagged port

UNIT: LAGS

2	4	6	8	10	12	14	16	18	20	22	24	26
1	3	5	7	9	11	13	15	17	19	21	23	25

All Clear

Tagged port

UNIT: LAGS

2	4	6	8	10	12	14	16	18	20	22	24	26
1	3	5	7	9	11	13	15	17	19	21	23	25

All Clear Apply Help

Unselected Port(s) Selected Port(s) Not Available for Selection

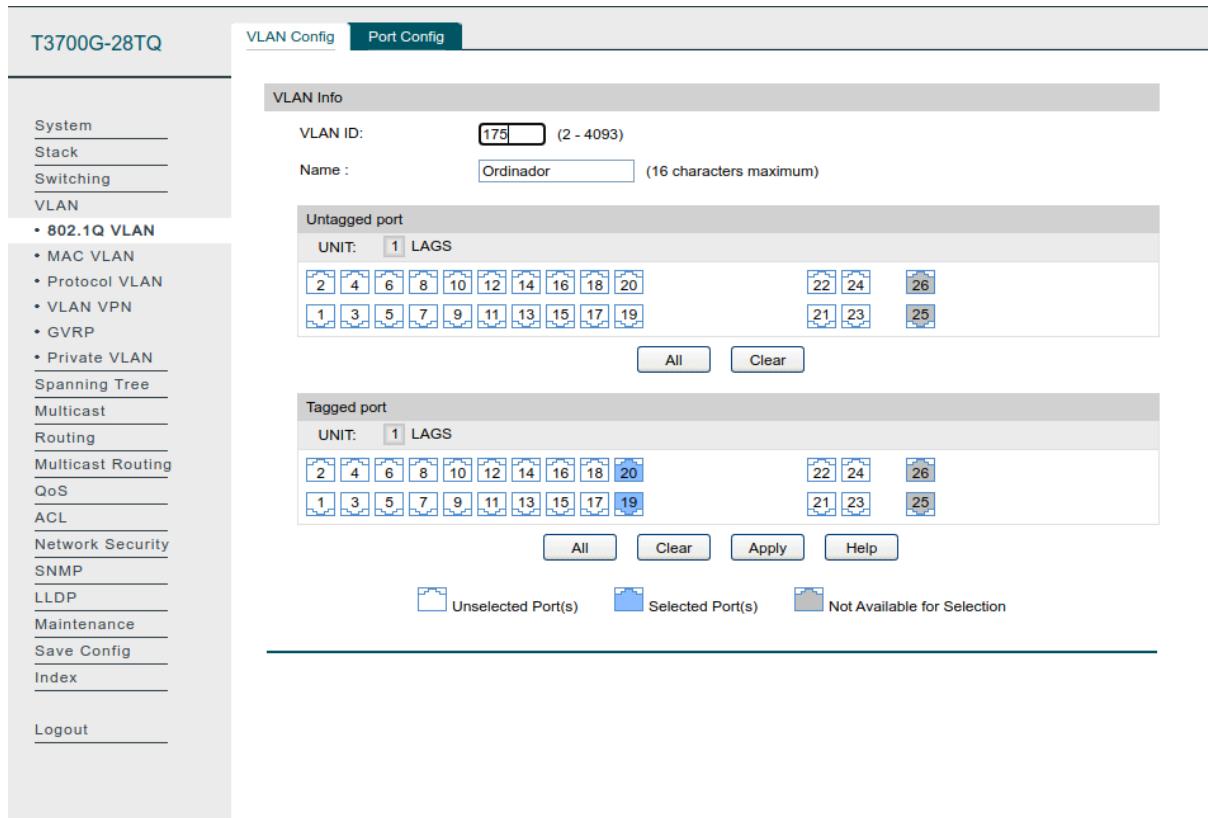


Figura 12: Ejemplo de VLAN

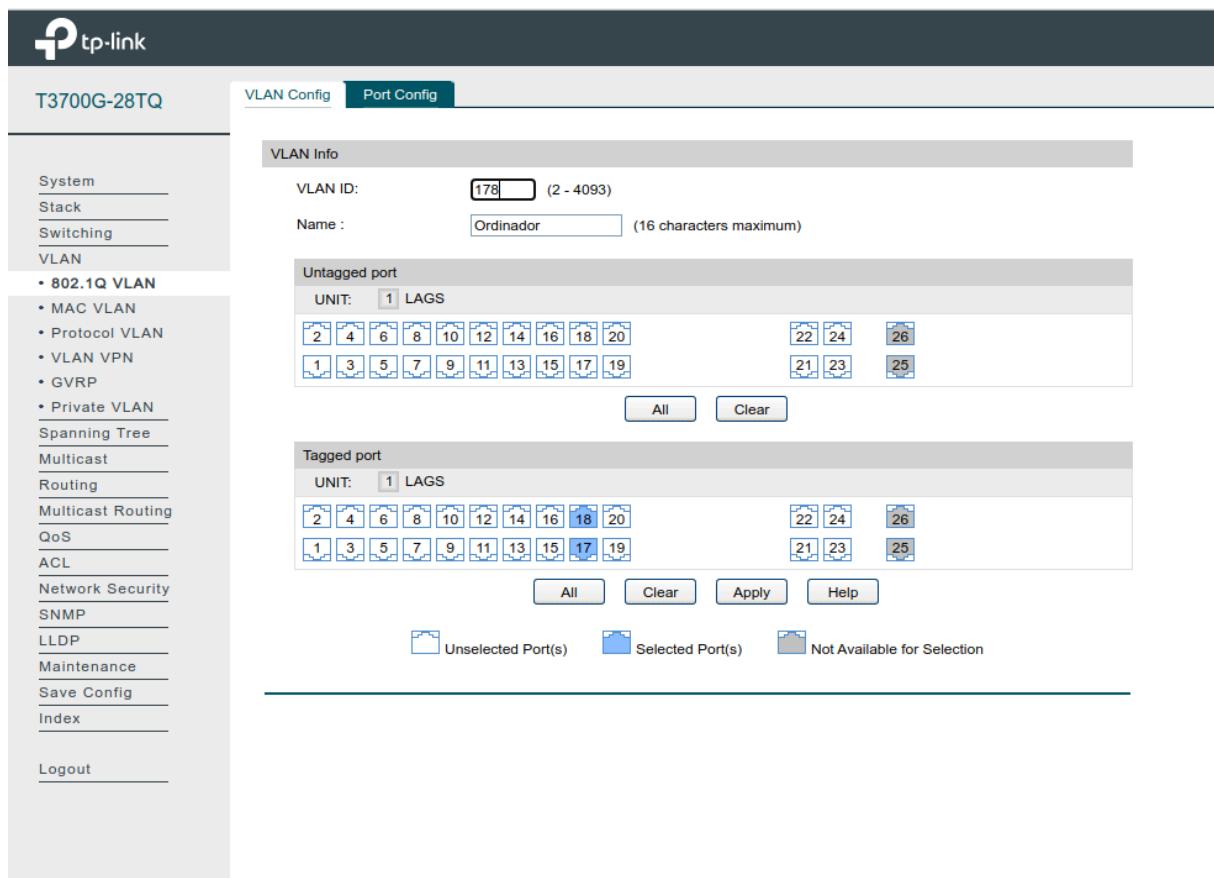


Figura 13: Ejemplo de VLAN

tp-link

T3700G-28TQ

LAG Table Static LAG LACP Config

Global Config

System Priority: 32768 (0-65535) Apply

LACP Config

UNIT: 1

Select	Port	Admin Key	Port Priority(0-65535)	Mode	Status	LAG
<input type="checkbox"/>	Gi1/0/12	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/13	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/14	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/15	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/16	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/17	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/18	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/19	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/20	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/21	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/22	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/23	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/24	0	128	Passive	Disable	---
<input type="checkbox"/>	Te1/0/25	0	128	Passive	Disable	---
<input type="checkbox"/>	Te1/0/26	0	128	Passive	Disable	---

All Apply Help

Note:

- To avoid any broadcast storm when LACP takes effect, you are suggested to enable Spanning Tree function.
- LACP function can not be enabled for the port already in a static link aggregation group.

Figura 14: Ejemplo de trunk

Global Config

System Priority: 32768 (0-65535)

LACP Config

UNIT:	1	Select	Port	Admin Key	Port Priority(0-65535)	Mode	Status	LAG
<input type="checkbox"/>	Gi1/0/12	0	128	Passive	Disable	---		
<input type="checkbox"/>	Gi1/0/13	0	128	Passive	Disable	---		
<input type="checkbox"/>	Gi1/0/14	0	128	Passive	Disable	---		
<input type="checkbox"/>	Gi1/0/15	0	128	Passive	Disable	---		
<input type="checkbox"/>	Gi1/0/16	0	128	Passive	Disable	---		
<input type="checkbox"/>	Gi1/0/17	0	128	Passive	Disable	---		
<input type="checkbox"/>	Gi1/0/18	0	128	Passive	Disable	---		
<input type="checkbox"/>	Gi1/0/19	0	128	Passive	Disable	---		
<input type="checkbox"/>	Gi1/0/20	0	128	Passive	Disable	---		
<input checked="" type="checkbox"/>	Gi1/0/21	0	128	Passive	Disable	---		
<input checked="" type="checkbox"/>	Gi1/0/22	0	128	Passive	Disable	---		
<input type="checkbox"/>	Gi1/0/23	0	128	Passive	Disable	---		
<input type="checkbox"/>	Gi1/0/24	0	128	Passive	Disable	---		
<input type="checkbox"/>	Te1/0/25	0	128	Passive	Disable	---		
<input type="checkbox"/>	Te1/0/26	0	128	Passive	Disable	---		

Note:

1. To avoid any broadcast storm when LACP takes effect, you are suggested to enable Spanning Tree function.
2. LACP function can not be enabled for the port already in a static link aggregation group.

Figura 15: Ejemplo de trunk

tp-link

T3700G-28TQ

LAG Table Static LAG **LACP Config**

System Stack Switching • Port • LAG • Traffic Monitor • MAC Address VLAN Spanning Tree Multicast Routing QoS ACL Network Security SNMP LLDP Maintenance Save Config Index Logout

Global Config
System Priority: 32768 (0-65535) **Apply**

LACP Config
UNIT: 1

Select	Port	Admin Key	Port Priority(0-65535)	Mode	Status	LAG
<input checked="" type="checkbox"/>	Gi1/0/1	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/2	0	128	Passive	Disable	---
<input checked="" type="checkbox"/>	Gi1/0/3	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/4	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/5	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/6	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/7	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/8	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/9	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/10	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/11	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/12	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/13	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/14	0	128	Passive	Disable	---
<input type="checkbox"/>	Gi1/0/15	0	128	Passive	Disable	---

All Apply Help

Note:

1. To avoid any broadcast storm when LACP takes effect, you are suggested to enable Spanning Tree function.
2. LACP function can not be enabled for the port already in a static link aggregation group.

Figura 16: Ejemplo de trunk