

SWR-lab1-STP - Rapport

1. Pourquoi l'utilisation de STP est-elle nécessaire avec une telle topologie réseau ?

Car une boucle existe entre les switches.

2. Est-ce que les switches utilisés dans cette simulation ont STP activé par défaut ? Justifiez votre réponse avec une capture WireShark du trafic entre les switches.

Oui le protocole STP semble actif par défaut.

1	0.000000	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf.	Root = 32768/1/aa:bb:cc:00:10:00	Cost = 0	Port = 0x8001
2	2.000047	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf.	Root = 32768/1/aa:bb:cc:00:10:00	Cost = 0	Port = 0x8001
3	4.000004	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf.	Root = 32768/1/aa:bb:cc:00:10:00	Cost = 0	Port = 0x8001
4	5.999990	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf.	Root = 32768/1/aa:bb:cc:00:10:00	Cost = 0	Port = 0x8001
5	7.999994	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf.	Root = 32768/1/aa:bb:cc:00:10:00	Cost = 0	Port = 0x8001

3. Quelle est la différence entre la topologie initiale et celle ci-dessous ?

Le switch 3 n'est pas présent et cela supprime la boucle.

4. Comment est élu le root bridge dans notre cas, étant donné qu'aucune priorité n'est configurée ?

Le switch ayant l'adresse MAC la plus basse est sélectionné pour être le root bridge.

5. Trouvez l'adresse MAC de chacun des switches dans le réseau que vous avez simulé. Aidez-vous de la commande show interfaces.

Switch	MAC address 0/0	MAC address 0/1	MAC address 0/2	MAC address 0/2
S1	aabb.cc00.1000	aabb.cc00.1010	aabb.cc00.1020	aabb.cc00.1030
S2	aabb.cc00.2000	aabb.cc00.2010	aabb.cc00.2020	aabb.cc00.2030
S3	aabb.cc00.3000	aabb.cc00.3010	aabb.cc00.3020	aabb.cc00.3030
S4	aabb.cc00.4000	aabb.cc00.4010	aabb.cc00.4020	aabb.cc00.4030

6. Pourquoi y'a-t-il plusieurs adresses MAC sur un switch ?

Il y a une MAC adresse par port.

7. En vous basant sur votre réponse, qui devra être le switch élu dans votre réseau?

Le S1 sera l'élu.

8. Vérifiez votre réponse à l'aide des paquets STP échangés et joignez une capture d'écran.

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
92	112.124516	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
93	112.238809	aa:bb:cc:00:10:00	CDP/VTP/DTP/PAgP/UD...	CDP	345	Device ID: Switch Port ID: Ethernet0/0
94	114.124450	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
95	116.128545	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
96	118.128583	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
97	120.130503	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
98	122.134534	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
99	123.129537	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x2d25920e
100	123.130607	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xbaadd36d
101	124.134605	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
102	126.134145	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xbaadd36d
103	126.134284	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x2d25920e
104	126.134422	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
105	128.138704	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
106	129.137922	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x2d25920e
107	129.138750	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xbaadd36d
108	130.142818	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001

▶ Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480) on interface 0

▶ IEEE 802.3 Ethernet

▶ Logical-Link Control

▶ Spanning Tree Protocol

Protocol Identifier: Spanning Tree Protocol (0x0000)

Protocol Version Identifier: Spanning Tree (0)

BPDU Type: Configuration (0x00)

▶ BPDU flags: 0x00

▶ Root Identifier: 32768 / 1 / aa:bb:cc:00:10:00

Root Path Cost: 0

▶ Bridge Identifier: 32768 / 1 / aa:bb:cc:00:10:00

Port identifier: 0x8001

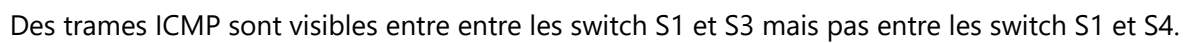
Message Age: 0

Max Age: 20

Hello Time: 2

Forward Delay: 15

9. Créez un schéma du réseau et représentez le switch racine ainsi que les ports racines, désignés et bloqués en utilisant les connaissances acquises en cours. Indiquez également le chemin que devrait emprunter un ping entre PC1 et PC2. Prouvez-le en exécutant le ping et en joignant une capture d'écran (en capturant entre S1 et S4 ou S1 et S3 par exemple).



No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
2	1.999953	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
3	3.999908	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
4	5.999836	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001

<ul style="list-style-type: none"> ▶ Frame 3: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface ▶ IEEE 802.3 Ethernet ▶ Logical-Link Control ▶ Spanning Tree Protocol 	0000 0010 0020 0030	01 80 c2 00 00 00 aa bb cc 00 10 00 00 26 42 42 03 00 00 00 00 00 80 01 aa bb cc 00 10 00 00 00 00 00 80 01 aa bb cc 00 10 00 00 01 00 00 14 00 02 00 0f 00 00 00 00 00 00 00 00 00&BB
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Capture S3

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb90b, seq=76/19456, ttl=64 (reply in 2)
2	0.000596	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb90b, seq=76/19456, ttl=64 (request in 1)
3	0.655411	aa:bb:cc:00:10:10	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8002
4	1.000343	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb90b, seq=77/19712, ttl=64 (reply in 5)
5	1.000880	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb90b, seq=77/19712, ttl=64 (request in 4)
6	2.000535	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb90b, seq=78/19968, ttl=64 (reply in 7)
7	2.001091	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb90b, seq=78/19968, ttl=64 (request in 6)
8	2.655387	aa:bb:cc:00:10:10	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8002
9	3.001001	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb90b, seq=79/20224, ttl=64 (reply in 10)
10	3.001603	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb90b, seq=79/20224, ttl=64 (request in 9)
11	4.001208	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb90b, seq=80/20480, ttl=64 (reply in 12)
12	4.001740	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb90b, seq=80/20480, ttl=64 (request in 11)
13	4.655385	aa:bb:cc:00:10:10	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8002
14	4.723191	aa:bb:cc:00:30:10	CDP/VTP/DTP/PAgP/UD...	DTP	60	Dynamic Trunk Protocol
15	4.723304	aa:bb:cc:00:10:10	CDP/VTP/DTP/PAgP/UD...	DTP	60	Dynamic Trunk Protocol

Frame 1: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interface	0000	00 50 00 00 06 00 00 50	00 00 05 00 08 00 45 00	P	...	P	...	E
Ethernet II, Src: Nexocommunic_00:50:00:00:05:00, Dst: Nexocommunic_	0010	00 54 8d 62 40 00 40 01	29 d8 c0 a8 01 0a c0 a8	T	b	@	@)
Internet Protocol Version 4, Src: 192.168.1.10, Dst: 192.168.1.20	0020	01 14 08 00 4a 3c b9 0b	00 4c 26 23 ce 48 00 00	...	J	<	...	L&# H
Internet Control Message Protocol	0030	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	...	...	...	...	...
	0040	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	...	...	...	...	...
	0050	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	...	...	...	...	...
	0060	00 00	00 00	...	...	...	...	...

10. En milieu de boucle (entre deux autres switches), Repérez le switch par lequel le ping passait entre PC1 et PC2. Choisissez une des deux interfaces connectées. a. Lancez une capture Wireshark sur l'interface choisie. b. Après quelques secondes, une trame STP un peu spéciale devrait apparaître sur la capture, de quoi s'agit-il ?

a) Le ping passe par le switch S3 b) La nouvelle trame notifie d'un changement dans la topologie

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	aa:bb:cc:00:10:10	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8002
2	0.000591	aa:bb:cc:00:30:10	Spanning-tree-(for...	STP	60	Topology Change Notification
3	0.664466	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xab0b, seq=250/64000, ttl=64 (no response found!)
4	1.003969	aa:bb:cc:00:10:10	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8002
5	1.664789	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xab0b, seq=251/64256, ttl=64 (no response found!)
6	2.004134	aa:bb:cc:00:10:10	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8002
7	2.665192	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xab0b, seq=252/64512, ttl=64 (no response found!)
8	3.665287	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xab0b, seq=253/64768, ttl=64 (no response found!)
9	4.004057	aa:bb:cc:00:10:10	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8002
10	4.665447	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xab0b, seq=254/65024, ttl=64 (no response found!)
11	5.665661	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xab0b, seq=255/65280, ttl=64 (no response found!)
12	6.008186	aa:bb:cc:00:10:10	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8002
13	6.665741	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xab0b, seq=256/1, ttl=64 (no response found!)
14	7.665949	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xab0b, seq=257/257, ttl=64 (no response found!)
15	8.008185	aa:bb:cc:00:10:10	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8002
16	8.666287	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xab0b, seq=258/513, ttl=64 (no response found!)
17	9.666607	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xab0b, seq=259/769, ttl=64 (no response found!)
18	10.012199	aa:bb:cc:00:10:10	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8002

Frame 2: 60 bytes on wire (480 bits), 60 bytes captured (480	0000	01 80 c2 00 00 00 aa bb cc 00 30 10 00 07 42 42	...	0	...	BB
IEEE 802.3 Ethernet	0010	03 00 00 00 80 00 00 00	00 00 00 00 00 00 00 00	...	...	...
Logical-Link Control	0020	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	...	...	...
Spanning Tree Protocol	0030	00 00 00 00 00 00 00 00	00 00 00 00	...	...	...
Protocol Identifier: Spanning Tree Protocol (0x0000)						
Protocol Version Identifier: Spanning Tree (0)						
BPDU Type: Topology Change Notification (0x80)						

11. Attendez un instant et refaites un ping. Joignez une capture d'écran prouvant que le ping emprunte un chemin différent cette fois-ci.

Nous pouvons constater que le ping passe maintenant par le switch S4

dtp || icmp						
No.	Time	Source	Destination	Protocol	Length	Info
8	12.409757	aa:bb:cc:00:10:00	CDP/VTP/DTP/PagP/UD...	DTP	60	Dynamic Trunk Protocol
9	12.409873	aa:bb:cc:00:40:00	CDP/VTP/DTP/PagP/UD...	DTP	60	Dynamic Trunk Protocol
1797	42.408931	aa:bb:cc:00:10:00	CDP/VTP/DTP/PagP/UD...	DTP	60	Dynamic Trunk Protocol
1798	42.417185	aa:bb:cc:00:40:00	CDP/VTP/DTP/PagP/UD...	DTP	60	Dynamic Trunk Protocol
16	21.178115	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb10b, seq=9/2304, ttl=64 (reply in 17)
17	21.178539	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb10b, seq=9/2304, ttl=64 (request in 16)
18	21.180162	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb00b, seq=179/45824, ttl=64 (reply in 25)
19	21.180178	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb00b, seq=152/38912, ttl=64 (reply in 26)
20	21.180183	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb00b, seq=164/41984, ttl=64 (reply in 27)
21	21.180187	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb00b, seq=169/43264, ttl=64 (reply in 28)
22	21.180192	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb00b, seq=141/36096, ttl=64 (reply in 29)
23	21.180200	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb00b, seq=177/45312, ttl=64 (reply in 30)
24	21.180269	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb00b, seq=186/47616, ttl=64 (reply in 31)
25	21.181899	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb00b, seq=179/45824, ttl=64 (request in 18)
26	21.181939	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb00b, seq=152/38912, ttl=64 (request in 19)
27	21.181966	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb00b, seq=164/41984, ttl=64 (request in 20)
28	21.181986	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb00b, seq=169/43264, ttl=64 (request in 21)
29	21.182006	192.168.1.20	192.168.1.10	ICMP	98	Echo (ping) reply id=0xb00b, seq=141/36096, ttl=64 (request in 22)

Frame 1798: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interf	0000	01 00 0c cc cc aa bb	cc 00 40 00 81 00 00 01@.....
Ethernet II, Src: aa:bb:cc:00:40:00 (aa:bb:cc:00:40:00), Dst: CDP/VTP/DTP/PagP/	0010	00 22 aa aa 03 00 00 0c	20 04 01 00 01 00 05 00@.....
Destination: CDP/VTP/DTP/PagP/UDLD (01:00:0c:cc:cc:cc)	0020	00 02 00 05 83 00 03 00	05 40 00 04 00 0a aa bb@.....
Source: aa:bb:cc:00:40:00 (aa:bb:cc:00:40:00)	0030	cc 00 40 00 00 00 00 00	00 00 00 00@.....
Type: 802.1Q Virtual LAN (0x8100)				
802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 1				
000. = Priority: Best Effort (default) (0)				
...0 = DEI: Ineligible				
.... 0000 0000 0001 = ID: 1				
Length: 34				
Padding: 0000000000000000				
Logical-Link Control				
DSAP: SNAP (0xaa)				
SSAP: SNAP (0xaa)				
Control field: U, func=UI (0x03)				
Organization Code: 00:00:0c (Cisco Systems, Inc)				
PID: DTP (0x2004)				
Dynamic Trunk Protocol: (Operating/Administrative): Trunk/Desirable (0x83) (Op				
Version: 1				
Domain				
Trunk Status				
Trunk Type				
Sender ID				

12. Pourquoi faut-il attendre quelques secondes avant de pouvoir communiquer après avoir eu un changement de topologie ?

Une fois le changement de topologie notifié, le BPDU doit être recalculé et cela prend un peu de temps.

13. Est-ce qu'un nouveau root bridge a été élu ? Justifiez votre réponse.

Non, un nouveau root bridge n'a pas été élu car le cost a été augmenté sur le S3 et et non pas le S1 qui est le root bridge actuel.

14. Nous allons maintenant forcer l'élection d'un autre switch en tant que racine. Quel est le paramètre à modifier pour ce faire ?

Il faut augmenter la priorité du spanning tree sur le switch S1 pour qu'un autre switch avec une priorité moins élevée devienne la racine.

15. Modifiez ce paramètre et indiquez également la commande utilisée pour le changer. Vérifiez qu'un nouveau switch a été élu root.

Augmentation de la priorité du spanning-tree sur le switch S1

```
Switch#conf t
Switch(config)#spanning-tree vlan 1 priority 4096
```

Diminution de la priorité du spanning-tree sur le switch S2

```
Switch#conf t
Switch(config)#spanning-tree vlan 1 priority 0
```

Nous constatons ici que le nouveau switch racine est le swithc S2

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	aa:bb:cc:00:40:00	Spanning-tree-(for-...	STP	60	Conf. TC + Root = 0/1/aa:bb:cc:00:20:00 Cost = 100 Port = 0x8001
2	2.000389	aa:bb:cc:00:40:00	Spanning-tree-(for-...	STP	60	Conf. TC + Root = 0/1/aa:bb:cc:00:20:00 Cost = 100 Port = 0x8001
3	4.000120	aa:bb:cc:00:40:00	Spanning-tree-(for-...	STP	60	Conf. TC + Root = 0/1/aa:bb:cc:00:20:00 Cost = 100 Port = 0x8001
4	6.000124	aa:bb:cc:00:40:00	Spanning-tree-(for-...	STP	60	Conf. TC + Root = 0/1/aa:bb:cc:00:20:00 Cost = 100 Port = 0x8001
5	8.000014	aa:bb:cc:00:40:00	Spanning-tree-(for-...	STP	60	Conf. TC + Root = 0/1/aa:bb:cc:00:20:00 Cost = 100 Port = 0x8001

Frame 2: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface

IEEE 802.3 Ethernet

Logical-Link Control

Spanning Tree Protocol

Protocol Identifier: Spanning Tree Protocol (0x0000)

Protocol Version Identifier: Spanning Tree (0)

BPDU Type: Configuration (0x00)

BPDU flags: 0x01, Topology Change

Root Identifier: 0 / 1 / aa:bb:cc:00:20:00

Root Path Cost: 100

Bridge Identifier: 32768 / 1 / aa:bb:cc:00:40:00

Port identifier: 0x8001

Message Age: 1

Max Age: 20

Hello Time: 2

Forward Delay: 15

0000 01 80 c2 00 00 00 aa bb cc 00 40 00 00 26 42 42@.BBB

0010 03 00 00 00 00 01 00 01 aa bb cc 00 20 00 00 00@.....

0020 00 64 80 01 aa bb cc 00 40 00 80 01 01 00 14 00d.....

0030 02 00 0f 00 00 00 00 00 00 00 00 00 00 00@.....

16. Modifiez la topologie existante de sorte à obtenir le réseau suivant : a. Quel switch sera élu comme racine avec ce nouveau réseau ? b. Quels sont les ports racine, désignés et bloqués ? c. Quel serait le chemin emprunté par un ping entre PC1 et PC2 ? Justifiez votre réponse avec une capture Wireshark.

a) Le switch racine reste le S1

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 4096/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
2	2.000370	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 4096/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
3	4.000220	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 4096/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
4	6.000927	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 4096/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
5	8.001526	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 4096/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
6	10.000981	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 4096/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
7	12.002133	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 4096/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
8	14.003904	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 4096/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001
9	15.708697	aa:bb:cc:00:10:00	CDP/VTP/DTP/PAgP/UD...	DTP	60	Dynamic Trunk Protocol
10	15.749628	aa:bb:cc:00:40:00	CDP/VTP/DTP/PAgP/UD...	DTP	60	Dynamic Trunk Protocol
11	16.004064	aa:bb:cc:00:10:00	Spanning-tree-(for-...	STP	60	Conf. Root = 4096/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8001

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface

IEEE 802.3 Ethernet

Logical-Link Control

Spanning Tree Protocol

Protocol Identifier: Spanning Tree Protocol (0x0000)

Protocol Version Identifier: Spanning Tree (0)

BPDU Type: Configuration (0x00)

BPDU flags: 0x00

Root Identifier: 4096 / 1 / aa:bb:cc:00:10:00

Root Path Cost: 0

Bridge Identifier: 4096 / 1 / aa:bb:cc:00:10:00

Port identifier: 0x8001

Message Age: 0

Max Age: 20

Hello Time: 2

Forward Delay: 15

0000 01 80 c2 00 00 00 aa bb cc 00 10 00 00 26 42 42@.BBB

0010 03 00 00 00 00 00 10 01 aa bb cc 00 10 00 00 00@.....

0020 00 00 10 01 aa bb cc 00 10 00 80 01 01 00 14 00@.....

0030 02 00 0f 00 00 00 00 00 00 00 00 00 00 00@.....

b) Les ports devraient rester comme auparavant à l'exception des ports concernés par le nouveau lien créer

pour cette question qui eux seront bloqués. c) Le passe par le switch S4 comme démontré dans la capture ci-dessous :

No.	Time	Source	Destination	Protocol	Length	Info
478	0.356048	aa:bb:cc:00:10:00	CDP/VTP/DTP/PagP/UD...	DTP	60	Dynamic Trunk Protocol
498	0.367551	aa:bb:cc:00:40:00	CDP/VTP/DTP/PagP/UD...	DTP	60	Dynamic Trunk Protocol
991	0.686893	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=61/15616, ttl=64 (no response found!)
3029	1.687148	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=62/15872, ttl=64 (no response found!)
4701	2.687372	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=63/16128, ttl=64 (no response found!)
6140	3.687736	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=64/16384, ttl=64 (no response found!)
7406	4.687993	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=65/16640, ttl=64 (no response found!)
9649	5.688507	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=66/16896, ttl=64 (no response found!)
11124	6.688877	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=67/17152, ttl=64 (no response found!)
13311	7.690712	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=68/17408, ttl=64 (no response found!)
14751	8.690829	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=69/17664, ttl=64 (no response found!)
16207	9.691046	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=70/17920, ttl=64 (no response found!)
19665	10.691302	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=71/18176, ttl=64 (no response found!)
21285	11.691683	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=72/18432, ttl=64 (no response found!)
22628	11.740810	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=72/18432, ttl=64 (no response found!)
22629	11.740853	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=72/18432, ttl=64 (no response found!)
24793	12.691949	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=73/18688, ttl=64 (no response found!)
27349	13.692512	192.168.1.10	192.168.1.20	ICMP	98	Echo (ping) request id=0xb70b, seq=74/18944, ttl=64 (no response found!)

Frame 7406: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interf	0000	00 50 00 00 06 00 00 50	00 00 05 00 08 00 45 00	P P E
Ethernet II, Src: NexoCommunic_00:05:00 (00:50:00:00:05:00), Dst: NexoCommunic_	0010	00 54 55 2f 40 00 40 01	62 0b c0 a8 01 0a c0 a8	TU/@ @ b
Internet Protocol Version 4, Src: 192.168.1.10, Dst: 192.168.1.20	0020	01 14 08 00 ff e9 b7 0b	00 41 6d ed d2 db 00 00	. . . . . Am
Internet Control Message Protocol	0030	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	. . . . .
	0040	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	. . . . .
	0050	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	. . . . .
	0060	00 00		. . . . .

17. Lancez une capture Wireshark entre deux switches. Montrez l'évolution du contenu des trames STP durant le processus d'élection du root. Vous pouvez redémarrer les switches afin de réinitialiser les configurations précédentes.

Afin de mieux observer le processus d'élection de la racine, nous avons ajouté un nouveau switch S5. Pour pouvoir provoquer cet évènement le S5 est démarré après tous les autres switches.

Nous observons sur la capture d'écran ci-dessous la "Topology change notification" qui représente l'annonce du S5 comme racine temporairement.

No.	Time	Source	Destination	Protocol	Length	Info
3	3.999999	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
4	6.000080	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
5	8.000046	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
6	10.000410	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
7	12.008287	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
8	14.012377	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
9	16.016548	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
10	18.024452	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
13	20.028689	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
32	24.032618	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
33	24.032860	aa:bb:cc:00:70:00	Spanning-tree-(for...	STP	60	Topology Change Notification
34	25.036806	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
35	26.038083	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
36	28.037190	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
37	30.036801	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
38	32.040843	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004
39	34.044864	aa:bb:cc:00:10:30	Spanning-tree-(for...	STP	60	Conf. TC + Root = 32768/1/aa:bb:cc:00:10:00 Cost = 0 Port = 0x8004

Frame 33: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interfac	0000	01 80 c2 00 00 00 aa bb cc 00 70 00 00 07 42 42	. . . . . p
IEEE 802.3 Ethernet	0010	03 00 00 00 80 00 00 00	. . . . .
Logical-Link Control	0020	00 00 00 00 00 00 00 00	. . . . .
Spanning Tree Protocol	0030	00 00 00 00 00 00 00 00	. . . . .