

Multiple Spanning Protocol

Before starting to discuss a protocol STP (Spanning-Tree)

CST V1 IEEE 802.1D

PVST+

RSTP V2 IEEE 802.1W

MTS V3 IEEE 802.1S

MISTP >MST

* **CST V1 802.1D** :- His problem is dealing with all VLAN instance Alone So there is one Root At every level VLANS

And Cisco does not support it

***PVST+** :- He works with everyone VLAN Calculation independent He is creating instance all vlans

RSTP V2:- He works with everyone VLAN Calculation independent He is creating instance all vlans

The problem here lies according to the calculations that the protocol will implement and the possibility of the presence of a large number of...VLANS Due to which overload may occur accordingly, a protocol was created (**Multiple Spanning Protocol**)

And it's true that (**MTS V3**) It was called (**MISTP**)It was limited to Cisco (**cisco proprietary**)

After a while, it turned into a standard and was given a name (**MTS V3**)

It is his idea that every group of VLANS Will be calculations and creating instance independent

for example

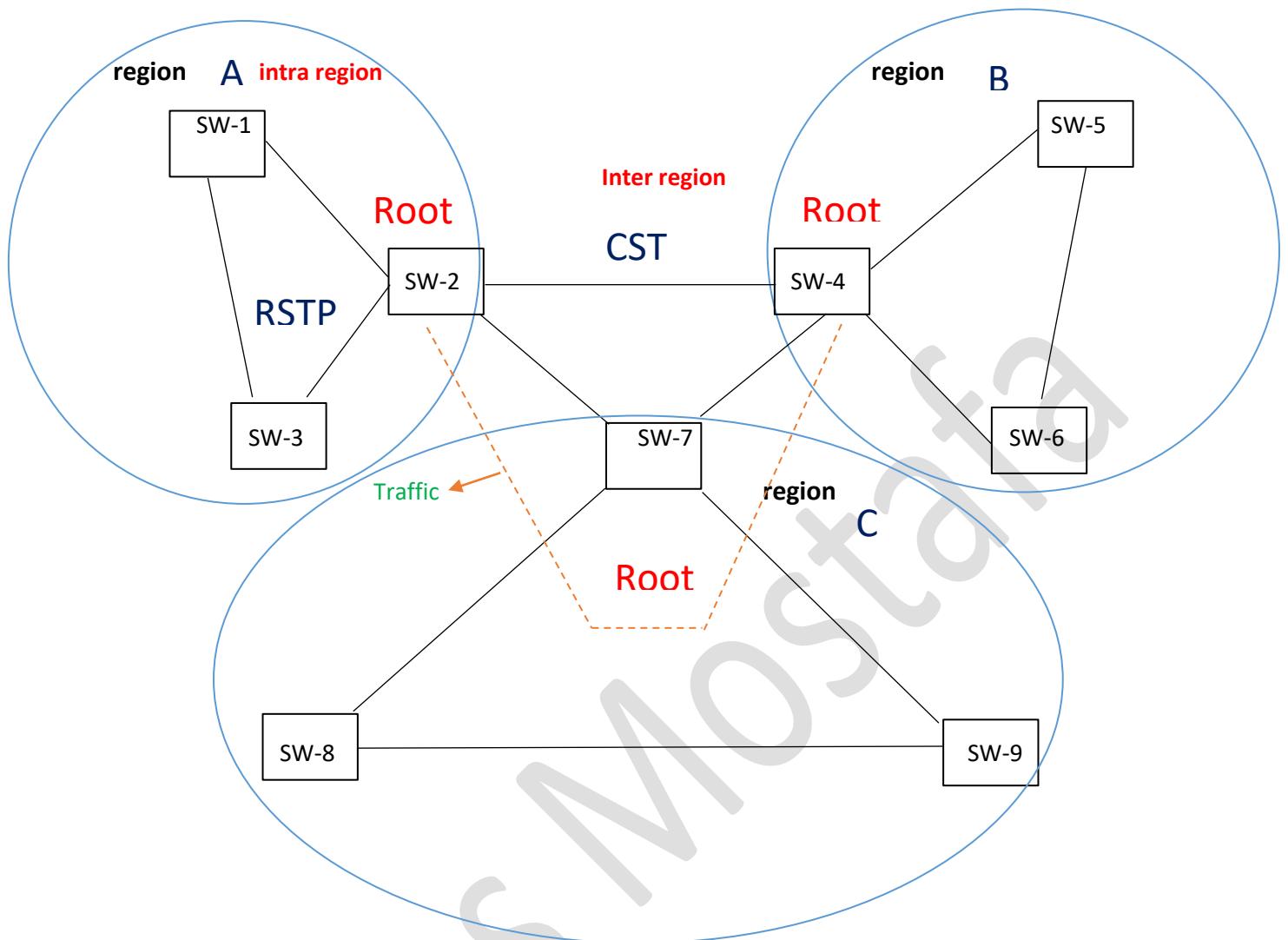
The company you are in has 100 VLAN Each group will be selected VLAN And create instance independent

Therefore, there will be one calculation for each group vlan This makes the work environment more stable

Let's talk in more detail about the protocol (Multiple Spanning Protocol**)**

It works through the region, meaning that each group has the same region and the following topology is placed as follows:

- Same name
- Same revision number
- Same mapping between VLAN database and instance number



Clarification

The switches were divided into three groups A, B, and C

At the level of one region, the RSTP protocol will work, but between the region and the other, the **CST** protocol will work.

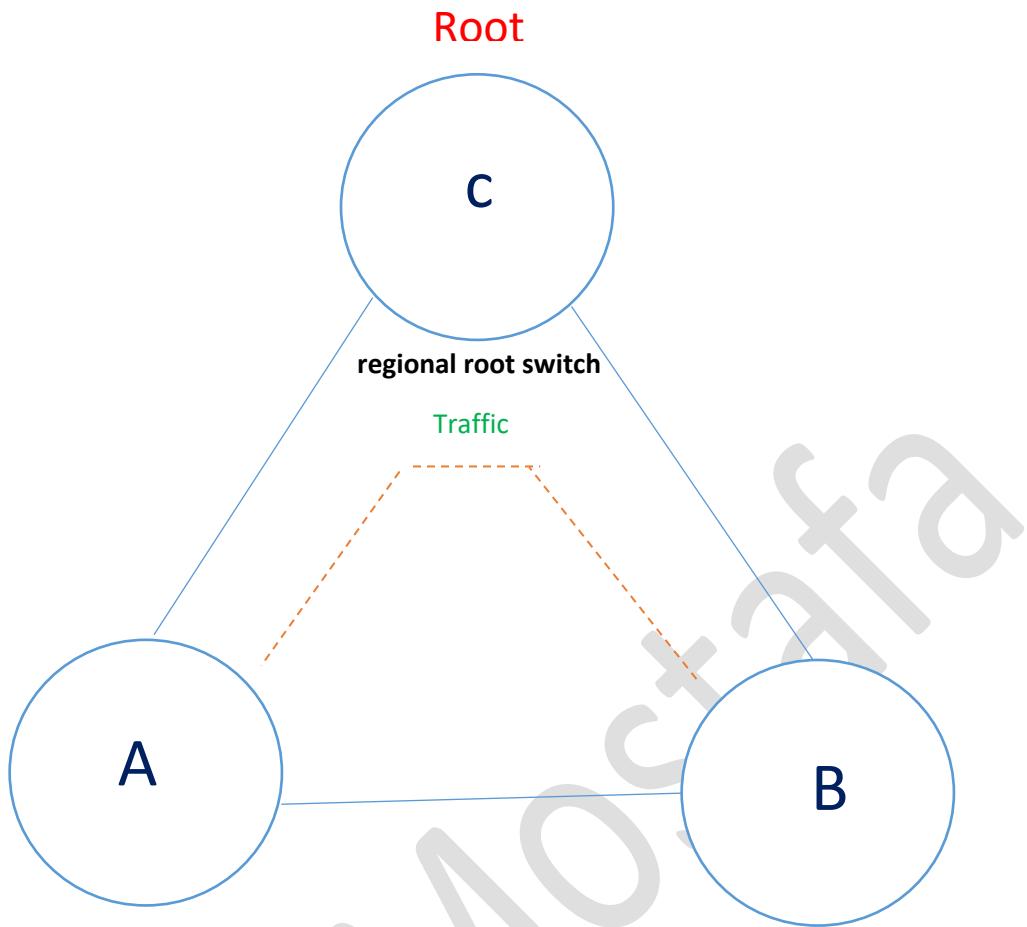
At the level of each region, there will be **Root**

From a CST point of view

Topological work will be done from the point of view of CST

It will treat each region as a switch

Therefore, it will make a regional root switch



Note

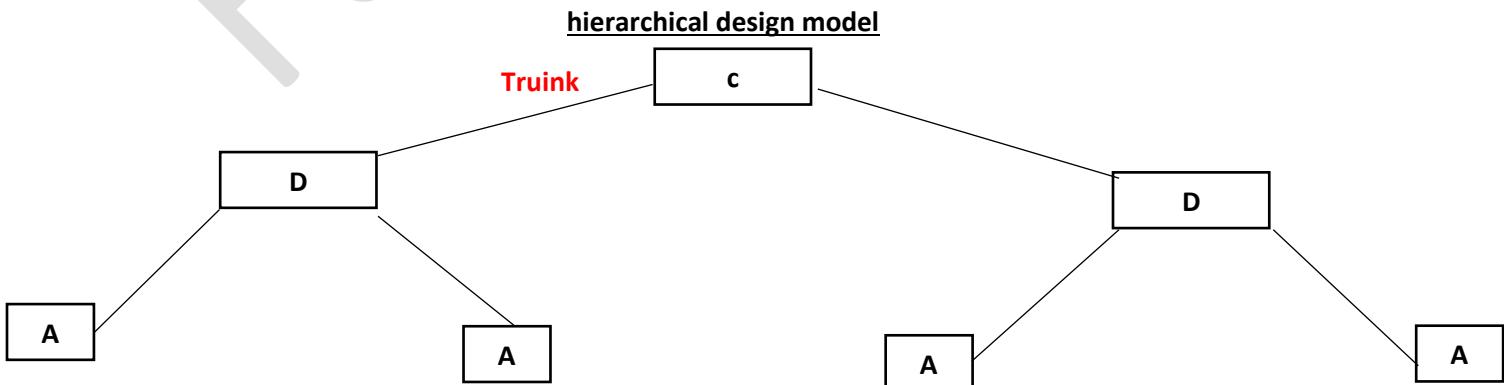
I have the right to create a instance This is due to the iOS version, meaning In older versions, Muhammad is from 0-15

New versions support higher numbers, but they do not have a fixed scale

It is recommended not to exceed 4

Why is it not recommended to create more than one 3-4 instance?

The answer to this question will make us think back hierarchical design model



The problem with this design is assuming that there is a computer transmitting broadcasts, and the reason is that the uplink is of the trunk type.

Therefore, most large companies resorted to transforming their area Distribution, core Distribution, Access They are being transferred routed interface

Note

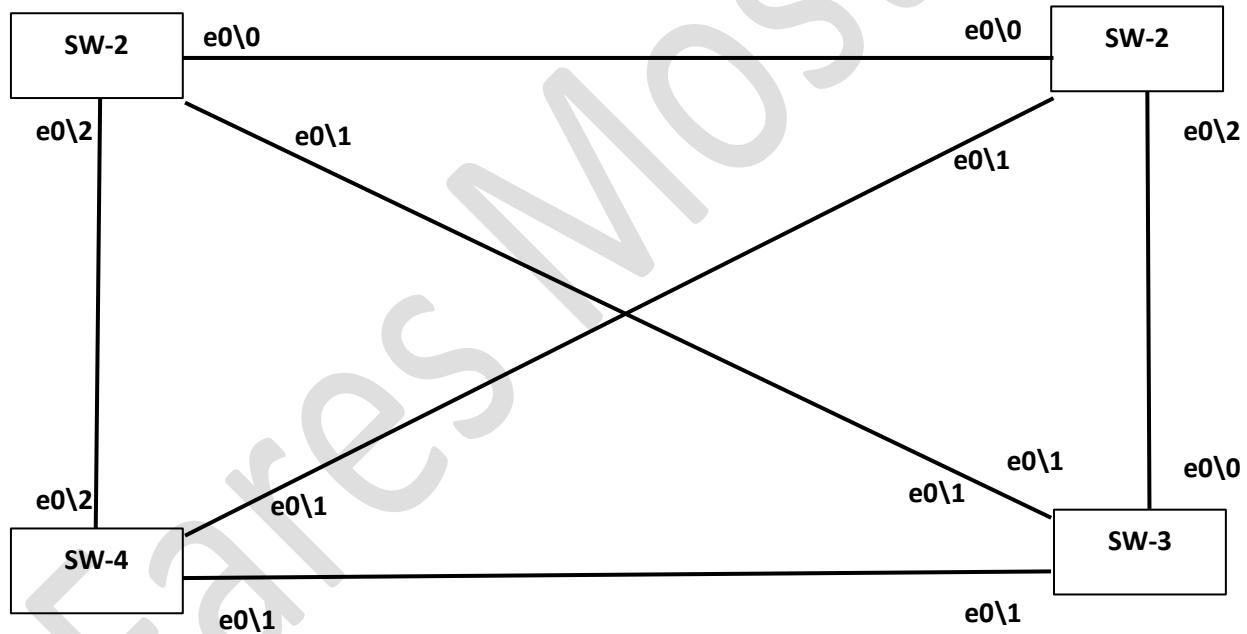
What is the traffic within a single region called?

There are two names for traffic: the first is inside the region and the second is outside the region

Inter region :- It works within a single region and uses a protocol RSTP

Intra region It works outside the region and uses a protocol CST

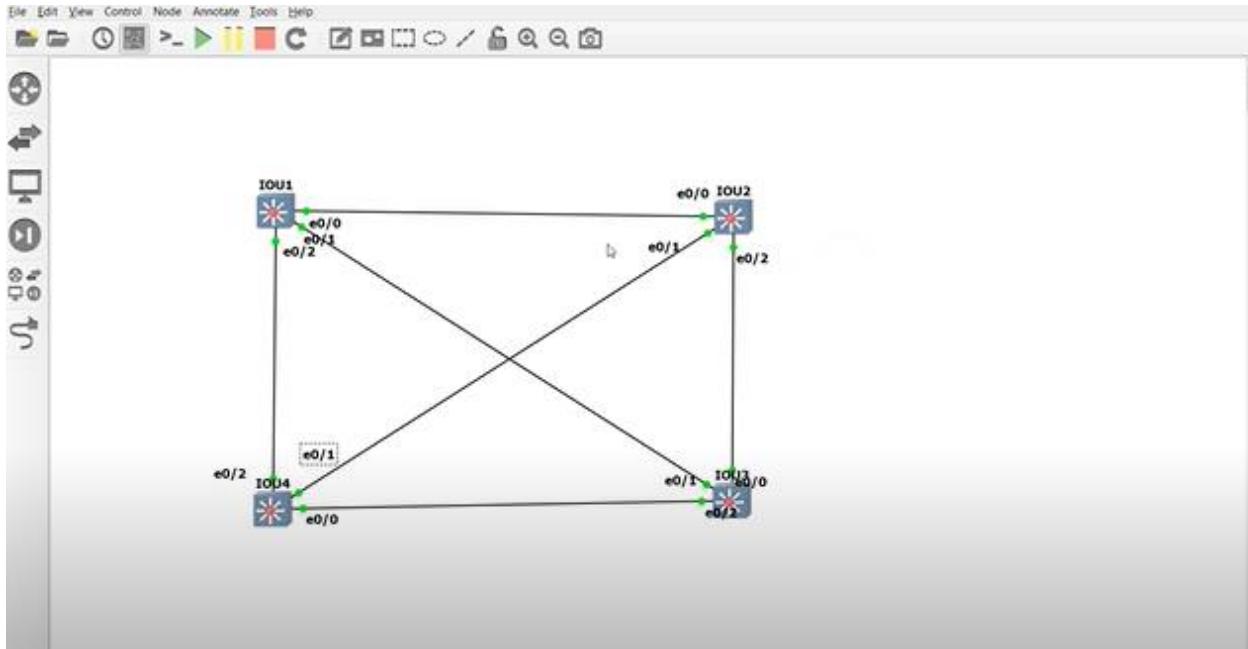
Topology LAB



In this topology, we will use only one region, since Switch 2 becomes root Switch

Configuration method

Either through commands applied to all switches or using the VTP v3 protocol



Root switch

```

IOU1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
IOU1 IOU2 IOU3 IOU4

Root ID Priority 32769
Address aabb.cc00.0100
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
Address aabb.cc00.0100
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300 sec

Interface Role Sts Cost Prio.Nbr Type
----- 
Et0/0 Desg BLK 100 128.1 Shr
Et0/1 Desg BLK 100 128.2 Shr
Et0/2 Desg BLK 100 128.3 Shr
Et0/3 Desg BLK 100 128.4 Shr
Et1/0 Desg BLK 100 128.5 Shr
Et1/1 Desg BLK 100 128.6 Shr
Et1/2 Desg BLK 100 128.7 Shr
Et1/3 Desg BLK 100 128.8 Shr

```

Protocol activation commands

```

IOU1(config)#spanning-tree mode ?
mst Multiple spanning tree mode
pvst Per-Vlan spanning tree mode
rapid-pvst Per-Vlan rapid spanning tree mode

```

Highly recommended

There are two solutions, the first is the application on the root switch, the first is complete configuration

Or activate the command on all switches and then use the mode command

To avoid entering into an unexpected scenario

Sw-1

```
IOU1(config)#spanning-tree mst co
IOU1(config)#spanning-tree mst configuration
IOU1(config-mst)#
IOU1(config-mst)#
abort          Exit region configuration mode, aborting changes
exit           Exit region configuration mode, applying changes
instance        Map vlans to an MST instance
name            Set configuration name
no              Negate a command or set its defaults
private-vlan    Set private-vlan synchronization
revision        Set configuration revision number
show            Display region configurations
IOU1(config-mst)#[
```

The first step is the name of the region

```
name          Set configuration name
```

And

```
revision      Set configuration revision number
```

```
instance       Map vlans to an MST instance
```

Because if we want to put a group of switches in one region, it must be taken into account (Name – revision – instance)

```
IOU1(config-mst)#name MST
IOU1(config-mst)#re
IOU1(config-mst)#revision ?
<0-65535> Configuration revision number

IOU1(config-mst)#revision 1
IOU1(config-mst)#instance ?
<0-4094> MST instance id

IOU1(config-mst)#instance 1 ?
vlan Range of vlans to add to the instance mapping

IOU1(config-mst)#instance 1
```

'Explain how to connect the VLAN

Instance 1 VLAN 10 - 19

Instance 2 VLAN 20 - 29

Instance 3 VLAN 30 – 39

```
IOU1(config-mst)#instance 1 vlan 10-19
IOU1(config-mst)#instance 2 vlan 20-29
IOU1(config-mst)#instance 3 vlan 30-39
IOU1(config-mst)#
IOU1(config-mst)#exit#[
```

```
IOU1(config)#vlan 10-40
IOU1(config-vlan)#end
IOU1#
*May 24 11:34:19.992: %SYS-5-CONFIG_I: Configured from console by console
IOU1#
```

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```

IOU1#show run | s mst
spanning-tree mst configuration
  name MST
  revision 1
  instance 1 vlan 10-19
  instance 2 vlan 20-29
  instance 3 vlan 30-39
IOU1#

```

'Explanation run on all switches

SW-2

```

IOU2(config)#spanning-tree mst configuration
IOU2(config-mst)# name MST
IOU2(config-mst)# revision 1
IOU2(config-mst)# instance 1 vlan 10-19
IOU2(config-mst)# instance 2 vlan 20-29
IOU2(config-mst)# instance 3 vlan 30-39
IOU2(config-mst)#

```

SW-3

```

IOU2(config)#spanning-tree mst configuration
IOU2(config-mst)# name MST
IOU2(config-mst)# revision 1
IOU2(config-mst)# instance 1 vlan 10-19
IOU2(config-mst)# instance 2 vlan 20-29
IOU2(config-mst)# instance 3 vlan 30-39
IOU2(config-mst)#

```

SW-4

```

IOU2(config)#spanning-tree mst configuration
IOU2(config-mst)# name MST
IOU2(config-mst)# revision 1
IOU2(config-mst)# instance 1 vlan 10-19
IOU2(config-mst)# instance 2 vlan 20-29
IOU2(config-mst)# instance 3 vlan 30-39
IOU2(config-mst)#

```

SW1

To know the protocol that works now

```

IOU1#show sp
IOU1#show spanning-tree

```

VLAN0001						
Spanning tree enabled protocol rstp						
Root ID	Priority	32769				
	Address	aabb.cc00.0100				
	This bridge is the root					
	Hello Time	2 sec	Max Age	20 sec	Forward Delay	15 sec
Bridge ID	Priority	32769	(priority 32768 sys-id-ext 1)			
	Address	aabb.cc00.0100				
	Hello Time	2 sec	Max Age	20 sec	Forward Delay	15 sec
	Aging Time	300 sec				
Interface	Role	Sts	Cost	Prio.Nbr	Type	
Et0/0	Desg	FWD	100	128.1	Shr	
Et0/1	Desg	FWD	100	128.2	Shr	
Et0/2	Desg	FWD	100	128.3	Shr	
Et0/3	Desg	FWD	100	128.4	Shr	
Et1/0	Desg	FWD	100	128.5	Shr	
Et1/1	Desg	FWD	100	128.6	Shr	
Et1/2	Desg	FWD	100	128.7	Shr	
Et1/3	Desg	FWD	100	128.8	Shr	
--More--						

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The next step is to apply it to all protocol switches MST

```
IOU4(config)#spanning-tree mode mst

IOU1#show sp
IOU1#show spanning-tree mst co
IOU1#show spanning-tree mst configuration
Name      [MST]
Revision  1      Instances configured 4

Instance  vlans mapped
-----
0        1-9,40-4094
1        10-19
2        20-29
3        30-39
-----
```

Sw-1

```
IOU1 x  IOU2  IOU3  IOU4
Spanning tree enabled protocol mstp
Root ID  Priority 32768
          Address aabb.cc00.0100
          This bridge is the root
          Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768 (priority 32768 sys-id-ext 0)
Address aabb.cc00.0100
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Interface      Role Sts Cost      Prio.Nbr Type
-----
Et0/0          Desg FWD 2000000  128.1   Shr
Et0/1          Desg FWD 2000000  128.2   Shr
Et0/2          Desg FWD 2000000  128.3   Shr
Et0/3          Desg FWD 2000000  128.4   Shr
Et1/0          Desg FWD 2000000  128.5   Shr
Et1/1          Desg FWD 2000000  128.6   Shr
Et1/2          Desg FWD 2000000  128.7   Shr
Et1/3          Desg FWD 2000000  128.8   Shr
Et2/0          Desg FWD 2000000  128.9   Shr
--More--
```

```
IOU1#
IOU1#
IOU1#show sp
IOU1#show spanning-tree

MST0
Spanning tree enabled protocol mstp
Root ID  Priority 32768
          Address aabb.cc00.0100
          This bridge is the root
          Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32768 (priority 32768 sys-id-ext 0)
Address aabb.cc00.0100
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Interface      Role Sts Cost      Prio.Nbr Type
-----
Et0/0          Desg FWD 2000000  128.1   Shr
Et0/1          Desg FWD 2000000  128.2   Shr
Et0/2          Desg FWD 2000000  128.3   Shr
Et0/3          Desg FWD 2000000  128.4   Shr
```

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```

IOU1(config)#int range e0/0 - 2
IOU1(config-if-range)#sw
IOU1(config-if-range)#switchport tr
IOU1(config-if-range)#switchport trunk en
IOU1(config-if-range)#switchport trunk encapsulation do
IOU1(config-if-range)#switchport trunk encapsulation dot1q
IOU1(config-if-range)#sw
IOU1(config-if-range)#switchport mode tr
IOU1(config-if-range)#switchport mode trunk
IOU1(config-if-range)#

```

Sw-2

```

IOU2(config)#int range e0/1 - 2
IOU2(config-if-range)#swi
IOU2(config-if-range)#switchport tr
IOU2(config-if-range)#switchport trunk en
IOU2(config-if-range)#switchport trunk encapsulation do
IOU2(config-if-range)#switchport trunk encapsulation dot1q
IOU2(config-if-range)#sw
IOU2(config-if-range)#switchport mode tr
IOU2(config-if-range)#switchport mode trunk
IOU2(config-if-range)#
IOU2(config-if-range)#
IOU2(config-if-range)#

```

Sw-4

```

IOU4(config)#int e0/0
IOU4(config-if)#
IOU4(config-if)#
IOU4(config-if)#sw
IOU4(config-if)#switchport tr
IOU4(config-if)#switchport trunk en
IOU4(config-if)#switchport trunk encapsulation do
IOU4(config-if)#switchport trunk encapsulation dot1q
IOU4(config-if)#sw
IOU4(config-if)#switchport mode tr
IOU4(config-if)#switchport mode trunk
IOU4(config-if)#end
IOU4#
IOU4#

```

All switches

Send commands to all sessions

```

show interface trunk

```

Port	Mode	Encapsulation	Status	Native vlan
Et0/0	auto	n-802.1q	trunking	1
Et0/1	auto	n-802.1q	trunking	1
Et0/2	auto	n-802.1q	trunking	1

Port vlans allowed on trunk

Et0/0	1-4094
Et0/1	1-4094
Et0/2	1-4094

Port vlans allowed and active in management domain

Et0/0	1,10-40
Et0/1	1,10-40
Et0/2	1,10-40

Port vlans in spanning tree forwarding state and not pruned

Et0/0	none
-------	------

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```
IOU1#show spanning-tree
```

MST0

```
Spanning tree enabled protocol mstp
Root ID Priority 32768
Address aabb.cc00.0100
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 32768 (priority 32768 sys-id-ext 0)
Address aabb.cc00.0100
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Et0/0	Desg	FWD	2000000	128.1	Shr
Et0/1	Desg	FWD	2000000	128.2	Shr
Et0/2	Desg	FWD	2000000	128.3	Shr
Et0/3	Desg	FWD	2000000	128.4	Shr
Et1/0	Desg	FWD	2000000	128.5	Shr
Et1/1	Desg	FWD	2000000	128.6	Shr
Et1/2	Desg	FWD	2000000	128.7	Shr

MST1

```
Spanning tree enabled protocol mstp
Root ID Priority 32769
Address aabb.cc00.0100
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
Address aabb.cc00.0100
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Et0/0	Desg	FWD	2000000	128.1	Shr
--More--					

MST2

```
Spanning tree enabled protocol mstp
Root ID Priority 32770
Address aabb.cc00.0100
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 32770 (priority 32768 sys-id-ext 2)
Address aabb.cc00.0100
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

--More--

MST3

```
Spanning tree enabled protocol mstp
Root ID Priority 32771
Address aabb.cc00.0100
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 32771 (priority 32768 sys-id-ext 3)
Address aabb.cc00.0100
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Et0/0	Desg	FWD	2000000	128.1	Shr
Et0/1	Desg	FWD	2000000	128.2	Shr
Et0/2	Desg	FWD	2000000	128.3	Shr
--More--					

Focus on instance Number 0

```
IOU1#
IOU1#
IOU1#show spanning-tree mst 0
#####
MST0      vlans mapped:  1-9,40-4094
Bridge    address aabb.cc00.0100  priority      32768 (32768 sysid 0)
Root      this switch for the CIST
Operational hello time 2 , forward delay 15, max age 20, txholdcount 6
Configured   hello time 2 , forward delay 15, max age 20, max hops  20

Interface      Role Sts Cost      Prio.Nbr Type
-----
Et0/0          Desg FWD 2000000  128.1    Shr
Et0/1          Desg FWD 2000000  128.2    Shr
Et0/2          Desg FWD 2000000  128.3    Shr
Et0/3          Desg FWD 2000000  128.4    Shr
Et1/0          Desg FWD 2000000  128.5    Shr
Et1/1          Desg FWD 2000000  128.6    Shr
Et1/2          Desg FWD 2000000  128.7    Shr
Et1/3          Desg FWD 2000000  128.8    Shr
Et2/0          Desg FWD 2000000  128.9    Shr
Et2/1          Desg FWD 2000000  128.10   Shr
```

Sw-1

```
IOU1#
IOU1#
IOU1#show spanning-tree mst 0
#####
MST0      vlans mapped:  1-9,40-4094
Bridge    address aabb.cc00.0100  priority      32768 (32768 sysid 0)
Root      this switch for the CIST
Operational hello time 2 , forward delay 15, max age 20, txholdcount 6
Configured   hello time 2 , forward delay 15, max age 20, max hops  20

Interface      Role Sts Cost      Prio.Nbr Type
```

Sw-2

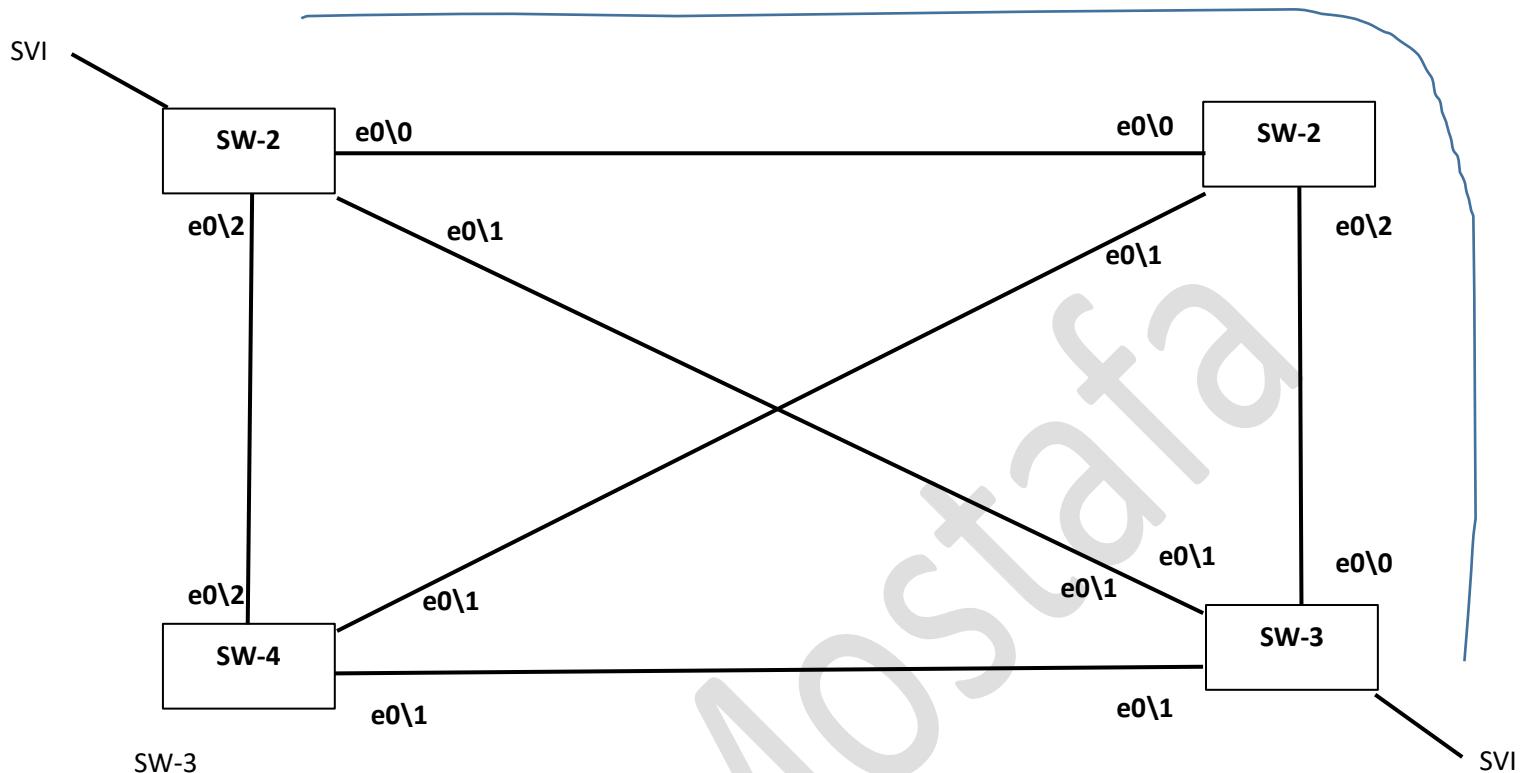
```
IOU2(config)#sp
IOU2(config)#spanning-tree mst ?
WORD          MST instance range, example: 0-3,5,7-9
configuration Enter MST configuration submode
forward-time Set the forward delay for the spanning tree
hello-time   Set the hello interval for the spanning tree
max-age      Set the max age interval for the spanning tree
max-hops     Set the max hops value for the spanning tree
simulate     Set the simulation options for the spanning tree

IOU2(config)#spanning-tree mst 2 ?
priority     Set the bridge priority for the spanning tree
root        Configure switch as root

IOU2(config)#spanning-tree mst 2 ro
IOU2(config)#spanning-tree mst 2 root pr
IOU2(config)#spanning-tree mst 2 root primary
IOU2(config)#[■]
```

If you want to make sure that Switch 2 is the root switch

svi is created on switch 3 and 1 and tracks traffic



SW-3

```
IOU3#confi
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
IOU3(config)#int vlan 20
IOU3(config-if)#ip add 20.0.0.3
*May 24 11:42:48.613: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan20, changed state to down
IOU3(config-if)#ip add 20.0.0.3 255.255.255.0
IOU3(config-if)#no shut
IOU3(config-if)#■
```

SW-1

```
IOU1#confi
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
IOU1(config)#
IOU1(config)#int vlan 20
IOU1(config-if)#ip add 20.0.0.1
*May 24 11:43:00.538: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan20, changed state to down
IOU1(config-if)#ip add 20.0.0.1 255.255.255.0
IOU1(config-if)#no shut
IOU1(config-if)#■
```

Ping sw1

```
IOU3#ping
*May 24 11:43:09.114: %SYS-5-CONFIG_I: Configured from console by console
IOU3#ping 20.0.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 20.0.0.1, timeout is 2 seconds:
!!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 5/5/6 ms
IOU3#
```

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Sw-3

To find out the package is out of any interface

```
| IOU3#show arp  
Protocol Address Age (min) Hardware Addr Type Interface  
Internet 20.0.0.1 0 aabb.cc80.0100 ARPA Vlan20  
Internet 20.0.0.3 - aabb.cc80.0300 ARPA Vlan20  
IOU3#
```

```
| IOU3#show mac ad  
IOU3#show mac address-table dy  
IOU3#show mac address-table dynamic ad  
IOU3#show mac address-table dynamic address aabb.cc80.0100  
Mac Address Table  
-----  
vlan Mac Address Type Ports  
-----  
20 aabb.cc80.0100 DYNAMIC Et0/0  
Total Mac Addresses for this criterion: 1  
IOU3#
```

We will delete all configuration for the switches to implement a second method using the VTP V3 protocol

```
| IOU1(config)#sp  
| IOU1(config)#spanning-tree mst co  
| IOU1(config)#no spanning-tree mst configuration  
| IOU1(config)#
```

To confirm

```
| IOU1(config)#do show spa mst conf  
Name []  
Revision 0 Instances configured 1  
Instance vlans mapped  
-----  
0 1-4094  
-----  
IOU1(config)#
```

```
| IOU1 x | IOU2 | IOU3 | IOU4  
MST0  
Spanning tree enabled protocol mstp  
Root ID Priority 32768  
Address aabb.cc00.0100  
This bridge is the root  
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec  
Bridge ID Priority 32768 (priority 32768 sys-id-ext 0)  
Address aabb.cc00.0100  
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec  
Interface Role Sts Cost Prio.Nbr Type  
-----  
Et0/0 Desg FWD 2000000 128.1 Shr  
Et0/1 Desg FWD 2000000 128.2 Shr  
Et0/2 Desg FWD 2000000 128.3 Shr  
Et0/3 Desg FWD 2000000 128.4 Shr  
Et1/0 Desg FWD 2000000 128.5 Shr  
Et1/1 Desg FWD 2000000 128.6 Shr  
Et1/2 Desg FWD 2000000 128.7 Shr  
Et1/3 Desg FWD 2000000 128.8 Shr  
Et2/0 Desg FWD 2000000 128.9 Shr  
--More--
```

The second method is to activate the VTP V3 protocol on the root switch

SW-1

```
|IOU1(config)#  
|IOU1(config)#  
|IOU1(config)#vtp pri  
|IOU1(config)#vtp domain CISCO  
Changing VTP domain name from NULL to CISCO  
|IOU1(config)#■
```

```
|IOU2(config)#do show vtp st  
VTP Version capable : 1 to 3  
VTP version running : 1  
VTP Domain Name : CISCO  
VTP Pruning Mode : Disabled  
VTP Traps Generation : Disabled  
Device ID : aabb.cc80.0200  
Configuration last modified by 0.0.0.0 at 5-24-21 11:34:19  
Local updater ID is 0.0.0.0 (no valid interface found)
```

Feature VLAN:

```
-----  
VTP Operating Mode : Server  
Maximum VLANs supported locally : 1005  
Number of existing VLANs : 36  
Configuration Revision : 1  
MD5 digest : 0x7E 0x77 0x23 0x42 0x57 0x3E 0x28 0x77  
              0x79 0xEE 0x14 0xA1 0xAD 0x92 0x76 0xA7  
|IOU2(config)#■
```

VTP all switches v3

```
|IOU3(config)#  
|IOU3(config)#vtp version 3
```

Sw-1

```
File Edit View Options Transfer Script Tools Window Help  
Enter host <Alt+R>  
IOU1 x IOU2 IOU3 IOU4  
VTP version running : 3  
VTP Domain Name : CISCO  
VTP Pruning Mode : Disabled  
VTP Traps Generation : Disabled  
Device ID : aabb.cc80.0100  
  
Feature VLAN:  
-----  
VTP Operating Mode : Server  
Number of existing VLANs : 36  
Number of existing extended VLANs : 0  
Maximum VLANs supported locally : 4096  
Configuration Revision : 0  
Primary ID : 0000.0000.0000  
Primary Description :  
MD5 digest :  
  
Feature MST:  
-----  
VTP Operating Mode : Transparent  
--More-- ■
```

```
Feature MST:  
-----  
VTP Operating Mode : Transparent  
  
Feature UNKNOWN:  
-----  
VTP Operating Mode : Transparent  
IOU1#
```

note

If we want to convert Switch 1 to Primary Switch, an error will occur because it is in mode Transparent
the solution

The first is to transfer to a server, and then the primary

```
IOU1#vtp pri  
IOU1#vtp primary ?  
  force  Do not check for conflicting devices  
  mst    MST feature  
  vlan   Vlan feature  
<cr>  
  
IOU1#vtp primary mst  
System can become primary server for Mst feature only when configured as a serve  
r  
IOU1#  
  
IOU1#vtp primary mst  
System can become primary server for Mst feature only when configured as a serve  
r  
IOU1#
```

the solution

```
IOU1#confi  
Configuring from terminal, memory, or network [terminal]?  
Enter configuration commands, one per line. End with CNTL/Z.  
IOU1(config)#vtp mode ser  
IOU1(config)#vtp mode server ?  
  mst      Set the mode for MST VTP instance.  
  unknown   Set the mode for unknown VTP instances.  
  vlan     Set the mode for VLAN VTP instance.  
<cr>  
IOU1(config)#vtp mode server mst
```

At this time, I can assume that he will be the primary

```
IOU1(config)#vtp mode server mst  
Setting device to VTP Server mode for MST.  
IOU1(config)#end  
IOU1#vtp primary mst  
*May 24 11:48:38.519: %SYS-5-CONFIG_I: Configured from console by console  
IOU1#vtp primary mst  
This system is becoming primary server for feature mst
```

We are missing now

Switches 2, 3 and 4 are in Transparent mode

Transparent No sync

Sw-2

```
|IOU2(config)#vtp mode cl  
|IOU2(config)#vtp mode client mst  
Setting device to VTP Client mode for MST.  
|IOU2(config)#
```

*May 24 11:49:06.298: %SW_VLAN-4-VTP_PRIMARY_SERVER_CHG: aabb.cc80.0100 has become the primary server for the MST VTP feature

Sw-1

```
|IOU1(config)#sp  
|IOU1(config)#spanning-tree mst co  
|IOU1(config)#spanning-tree mst configuration  
|IOU1(config-mst)#  
|IOU1(config-mst)#  
|IOU1(config-mst)#  
|IOU1(config-mst)#?  
abort      Exit region configuration mode, aborting changes  
exit       Exit region configuration mode, applying changes  
instance   Map vlans to an MST instance  
name      Set configuration name  
no        Negate a command or set its defaults  
private-vlan Set private-vlan synchronization  
revision  Set configuration revision number  
show      Display region configurations  
  
|IOU1(config-mst)#
```

```
|IOU1(config-mst)#name MST  
|IOU1(config-mst)#revision 1  
|IOU1(config-mst)#instance 1 vlan 10-19  
|IOU1(config-mst)#instance 2 vlan 20-29  
|IOU1(config-mst)#instance 3 vlan 30-39  
|IOU1(config-mst)#end  
|IOU1#
```

```
|IOU1#show sp  
|IOU1#show spanning-tree mst co  
|IOU1#show spanning-tree mst configuration  
Name      [MST]  
Revision  1      Instances configured 4  
  
Instance  vlans mapped  
-----  
0         1-9,40-4094  
1         10-19  
2         20-29  
3         30-39  
-----  
|IOU1#
```

Sw-2

Setting device to VTP Client mode for MST.

```
IOU2(config)#  
IOU2(config)#  
IOU2(config)#  
IOU2(config)#end  
IOU2#  
IOU2#  
IOU2#show sp  
*May 24 11:51:06.970: %SYS-5-CONFIG_I: Configured from console by console  
IOU2#show sp  
IOU2#show spanning-tree mst co  
IOU2#show spanning-tree mst configuration  
Name      [MST]  
Revision  1      Instances configured 4  
  
Instance  vlans mapped  
-----  
0        1-9,40-4094  
1        10-19  
2        20-29  
3        30-39  
-----  
IOU2#
```

Sw-3

*May 24 11:49:06.297: %SW_VLAN-4-VTP_PRIMARY_SERVER_CHG: aabb.cc80.0100 has become the primary server for the MST VTP feature

```
IOU3(config)#vtp mode client mst  
Setting device to VTP Client mode for MST.  
IOU3(config)#  
IOU3(config)#  
IOU3(config)#  
IOU3(config)#  
IOU3(config)#  
IOU3(config)#do show spa mst con  
Name      [MST]  
Revision  1      Instances configured 4  
  
Instance  vlans mapped  
-----  
0        1-9,40-4094  
1        10-19  
2        20-29  
3        30-39  
-----  
IOU3(config)#■
```

Sw-4

```
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
IOU1 | IOU2 | IOU3 | IOU4 x
IOU4(config)#
IOU4(config)#vtp version 3
IOU4(config)#
IOU4(config)#
IOU4(config)#
*May 24 11:49:06.297: %SW_VLAN-4-VTP_PRIMARY_SERVER_CHG: aabb.cc80.0100 has become the primary server for the MST VTP feature
IOU4(config)#vtp mode client mst
Setting device to VTP Client mode for MST.
IOU4(config)#
IOU4(config)#
IOU4(config)#do show spa mst con
Name      [MST]
Revision  1    Instances configured 4
Instance  vlans mapped
-----
0        1-9,40-4094
1        10-19
2        20-29
3        30-39
-----
IOU4(config)#

```

next step

It is a protocol application MST all switches

We will delete all configuration for the switches to implement a second method using the More than Region

```
-----
IOU1#confi
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
IOU1(config)#
IOU1(config)#
IOU1(config)#
IOU1(config)#no spanning-tree mst configuration
IOU1(config)#

```

Sw-2

```
IOU2(config)#no spanning-tree mst configuration
MST region is not configurable as the system is not the primary server for MST database
IOU2(config)#vtp mode tra
IOU2(config)#vtp mode transparent mst
Setting device to VTP Transparent mode for MST.
IOU2(config)#no spanning-tree mst configuration
IOU2(config)#

```

Delete configuration sw-2 and sw-3 and disable VTP SW-1

```
IOU1(config)#vtp mode tr
IOU1(config)#vtp mode transparent
Setting device to VTP Transparent mode for VLANS.
IOU1(config)#
IOU1(config)#
IOU1(config)#
IOU1(config)#
IOU1(config)#

```

```

Device ID : aabb.cc80.0200

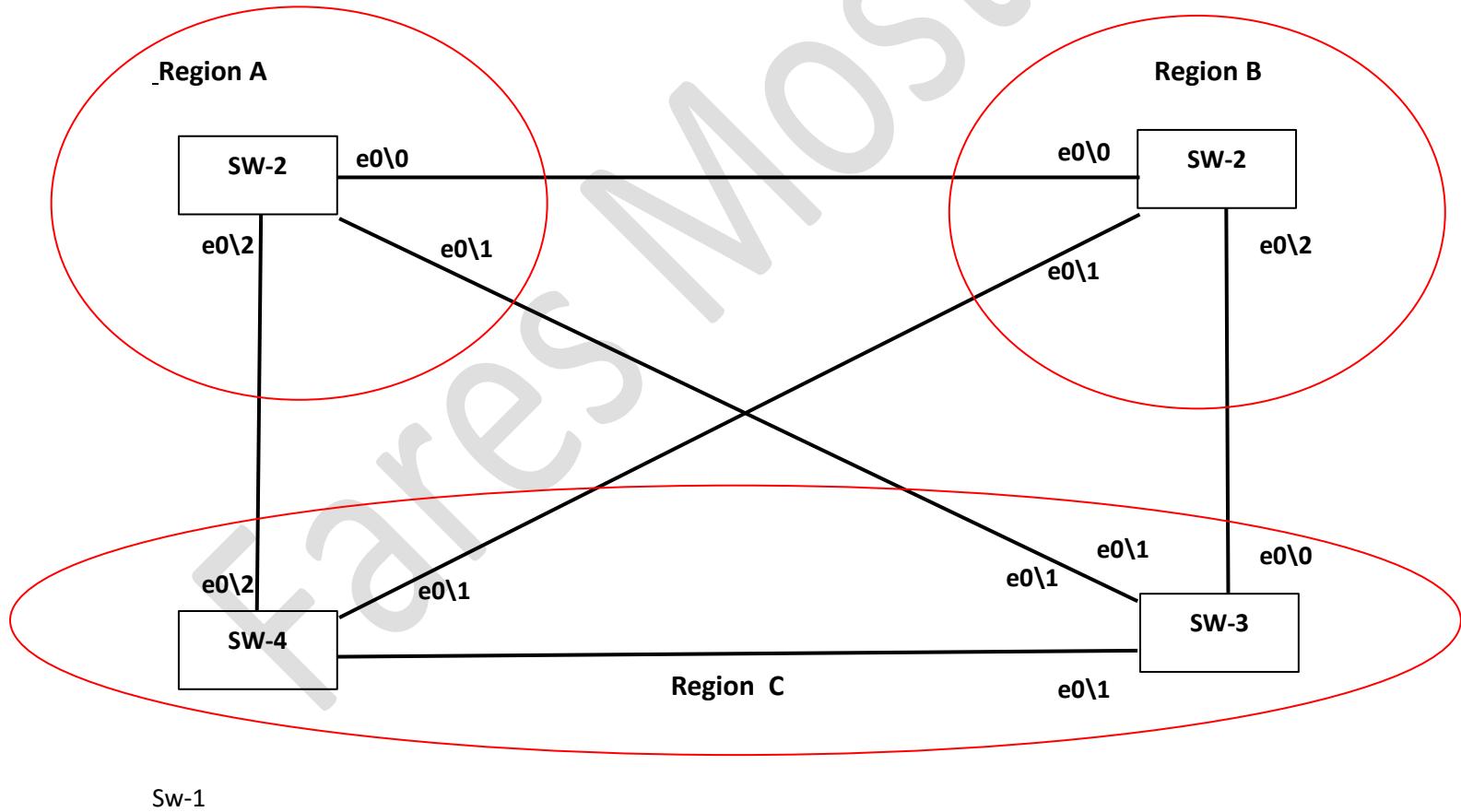
Feature VLAN:
-----
VTP Operating Mode : Server
Number of existing VLANs : 36
Number of existing extended VLANs : 0
Maximum VLANs supported locally : 4096
Configuration Revision : 0
Primary ID : 0000.0000.0000
Primary Description :
MD5 digest :

Feature MST:
-----
VTP Operating Mode : Transparent

Feature UNKNOWN:
-----
VTP Operating Mode : Transparent
--More-- ■

```

LAB 3



```
Enter host <Alt+R> Enter host <Alt+R>
IOU1 X IOU2 IOU3 IOU4
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
IOU1(config)#
IOU1(config)#
IOU1(config)#sp
IOU1(config)#spanning-tree mst co
IOU1(config)#spanning-tree mst configuration
IOU1(config-mst)#
    abort      Exit region configuration mode, aborting changes
    exit       Exit region configuration mode, applying changes
    instance   Map vlans to an MST instance
    name      Set configuration name
    no        Negate a command or set its defaults
    private-vlan Set private-vlan synchronization
    revision  Set configuration revision number
    show      Display region configurations

IOU1(config-mst)#name A
IOU1(config-mst)#re
IOU1(config-mst)#revision 1
IOU1(config-mst)#in
IOU1(config-mst)#instance 1 vlan 10-19
IOU1(config-mst)#

```

Sw-2

```
IOU2(config)#spanning-tree mst co
IOU2(config)#spanning-tree mst configuration
IOU2(config-mst)#name B
IOU2(config-mst)#re
IOU2(config-mst)#revision 2
IOU2(config-mst)#in
IOU2(config-mst)#instance 2 vlan 19-20
IOU2(config-mst)#

```

Sw-3

```
IOU3(config)#sp
IOU3(config)#spanning-tree ms
IOU3(config)#spanning-tree mst co
IOU3(config)#spanning-tree mst configuration
IOU3(config-mst)#name C
IOU3(config-mst)#re
IOU3(config-mst)#revision 3
IOU3(config-mst)#in
IOU3(config-mst)#instance 3 vlan 29-30
IOU3(config-mst)#

```

```
IOU3#show run | s mst
spanning-tree mode mst
spanning-tree mst configuration
    name C
    revision 3
    instance 3 vlan 29-30
IOU3#
```

Sw-4

```
IOU4(config)#spanning-tree mst configuration
IOU4(config-mst)# name C
IOU4(config-mst)# revision 3
IOU4(config-mst)# instance 3 vlan 29-30
IOU4(config-mst)#
IOU4(config-mst)#
IOU4(config-mst)#end
IOU4#
*May 24 12:25:56.921: %SYS-5-CONFIG_I: Configured from console by console
IOU4#
```

Fares Mostafa

Sw-1

```
##### MST1    vlans mapped: 10-19
Bridge      address aabb.cc00.0100 priority      32769 (32768 sysid 1)
Root        this switch for MST1

Interface   Role Sts Cost      Prio.Nbr Type
-----      --- -- --      ---- --
Et0/0        Desg FWD 2000000  128.1   Shr
Et0/1        Desg FWD 2000000  128.2   Shr
Et0/2        Desg FWD 2000000  128.3   Shr

IOU1#
```

Sw-2

```
##### MST2    vlans mapped: 19-20
Bridge      address aabb.cc00.0200 priority      24578 (24576 sysid 2)
Root        this switch for MST2

Interface   Role Sts Cost      Prio.Nbr Type
-----      --- -- --      ---- --
Et0/0        Mstr FWD 2000000  128.1   Shr Bound(RSTP)
Et0/1        Desg FWD 2000000  128.2   Shr
Et0/2        Desg FWD 2000000  128.3   Shr
```

If you want to know the global root, switch to regional groups

```
IOU1# show spanning-tree mst

##### MST0    vlans mapped: 1-9,20-4094
Bridge      address aabb.cc00.0100 priority      32768 (32768 sysid 0)
Root        this switch for the CIST
Operational hello time 2 , forward delay 15, max age 20, txholdcount 6
Configured  hello time 2 , forward delay 15, max age 20, max hops 20

Interface   Role Sts Cost      Prio.Nbr Type
-----      --- -- --      ---- --
Et0/0        Desg FWD 2000000  128.1   Shr
Et0/1        Desg FWD 2000000  128.2   Shr
Et0/2        Desg FWD 2000000  128.3   Shr
Et0/3        Desg FWD 2000000  128.4   Shr
Et1/0        Desg FWD 2000000  128.5   Shr
Et1/1        Desg FWD 2000000  128.6   Shr
Et1/2        Desg FWD 2000000  128.7   Shr
Et1/3        Desg FWD 2000000  128.8   Shr
Et2/0        Desg FWD 2000000  128.9   Shr
Et2/1        Desg FWD 2000000  128.10  Shr
Et2/2        Desg FWD 2000000  128.11  Shr
Et2/3        Desg FWD 2000000  128.12  Shr
```

Sw-2

```
##### MST0    vlans mapped: 1-18,21-4094
Bridge      address aabb.cc00.0200 priority      32768 (32768 sysid 0)
Root        address aabb.cc00.0100 priority      32768 (32768 sysid 0)
                    port Et0/0          path cost 2000000
Regional Root this switch
Operational hello time 2 , forward delay 15, max age 20, txholdcount 6
Configured  hello time 2 , forward delay 15, max age 20, max hops 20

Interface   Role Sts Cost      Prio.Nbr Type
```

Sw-3

```
v1OUT v1OU2 v1OU3 x v1OU4
#####
MST0    vlans mapped: 1-28,31-4094
Bridge   address aabb.cc00.0300 priority      32768 (32768 sysid 0)
Root     address aabb.cc00.0100 priority      32768 (32768 sysid 0)
          port   Et0/1      path cost      2000000
Regional Root this switch
Operational hello time 2 , forward delay 15, max age 20, txholdcount 6
Configured  hello time 2 , forward delay 15, max age 20, max hops 20

Interface Role Sts Cost      Prio.Nbr Type
-----
```

Sw-4

```
v1OUT v1OU2 v1OU3 x v1OU4 x
#####
MST0    vlans mapped: 1-28,31-4094
Bridge   address aabb.cc00.0400 priority      32768 (32768 sysid 0)
Root     address aabb.cc00.0100 priority      32768 (32768 sysid 0)
          port   Et0/0      path cost      2000000
Regional Root address aabb.cc00.0300 priority      32768 (32768 sysid 0)
          internal cost 2000000 rem hops 19
Operational hello time 2 , forward delay 15, max age 20, txholdcount 6
Configured  hello time 2 , forward delay 15, max age 20, max hops 20

Interface Role Sts Cost      Prio.Nbr Type
-----
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Et0/0	Root	FWD	2000000	128.1	Shr
Et0/1	Altn	BLK	2000000	128.2	Shr Bound(RSTP)
Et0/2	Altn	BLK	2000000	128.3	Shr Bound(RSTP)
Et0/3	Desg	FWD	2000000	128.4	Shr
Et1/0	Desg	FWD	2000000	128.5	Shr
Et1/1	Desg	FWD	2000000	128.6	Shr
Et1/2	Desg	FWD	2000000	128.7	Shr
Et1/3	Desg	FWD	2000000	128.8	Shr
Et2/0	Desg	FWD	2000000	128.9	Shr
Et2/1	Desg	FWD	2000000	128.10	Shr
Et2/2	Desg	FWD	2000000	128.11	Shr

--More--

```
v1OU1 v1OU2 v1OU3 x v1OU4 x
IOU4#show sp
IOU4#show spanning-tree su
Switch is in mst mode (IEEE Standard)
Root bridge for: none
Extended system ID           is enabled
Portfast Default             is disabled
Portfast Edge BPDU Guard Default is disabled
Portfast Edge BPDU Filter Default is disabled
Loopguard Default            is disabled
PVST Simulation               is enabled
Bridge Assurance              is enabled
EtherChannel misconfig guard is enabled
Configured Pathcost method used is short (Operational value is long)
UplinkFast                   is disabled
BackboneFast                  is disabled

Name          Blocking Listening Learning Forwarding STP Active
-----
```

Name	Blocking	Listening	Learning	Forwarding	STP	Active
MST0	2	0	0	14		16
MST3	2	0	0	1		3
2 msts	4	0	0	15		19

```
IOU4#
```