

MSTP

(Multiple Spanning Tree Protocol)

Ethernet Switch

ZyNOS 3.8

Support Notes

Version 3.80

July 2007



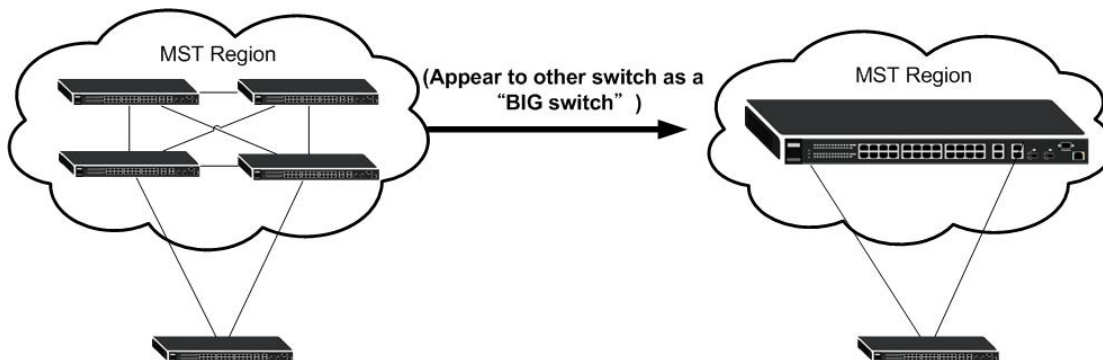
Overview of MSTP

Multiple Spanning Tree Protocol (IEEE 802.1s) is backwards compatible with STP/RSTP and addresses the limitations of existing spanning tree protocols (STP and RSTP) in networks and includes the following features:

- One Common and Internal Spanning Tree (CIST) that represents the entire network's connectivity.
- Grouping of multiple bridges (or switching devices) into regions that appear as one single bridge on the network.
- A VLAN can be mapped to a specific Multiple Spanning Tree Instance (MSTI). MSTI allows multiple VLANs to use the same spanning tree.
- Load-balancing is possible as traffic from different VLANs can use distinct paths in a region.

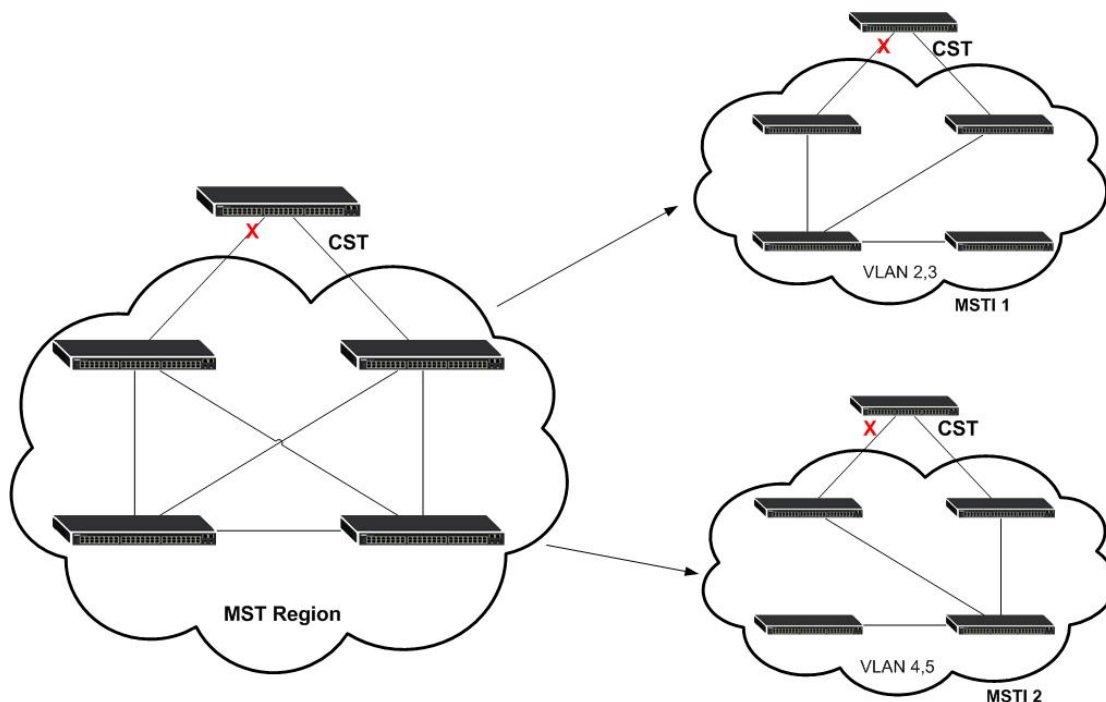
MST Region:

An MST region is a logical grouping of multiple network devices that appears as a single device to the rest of the network. Each MSTP-enabled device can only belong to one MST region.



MST Instance:

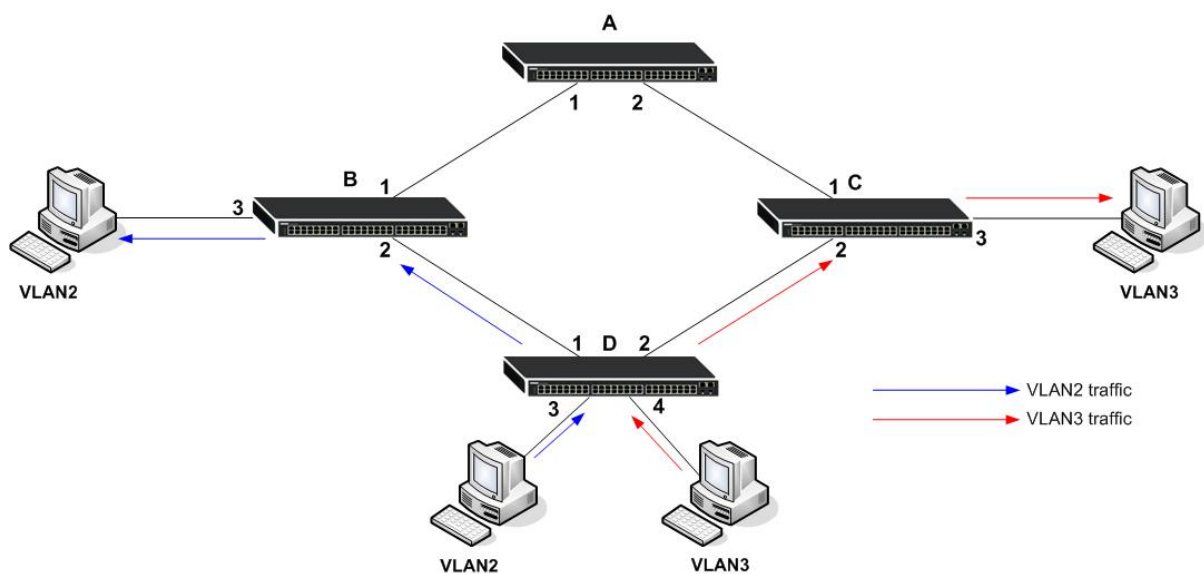
An MST Instance (MSTI) is a spanning tree instance. VLANs can be configured to run on a specific MSTI. Each created MSTI is identified by a unique number (known as an MST ID) known internally to a region. Thus an MSTI does not span across MST regions.



This MST Region can be decompose into two MSTIs. One for VLAN 2,3 , and another for VLAN 4,5. Different MSTIs have different topologies.

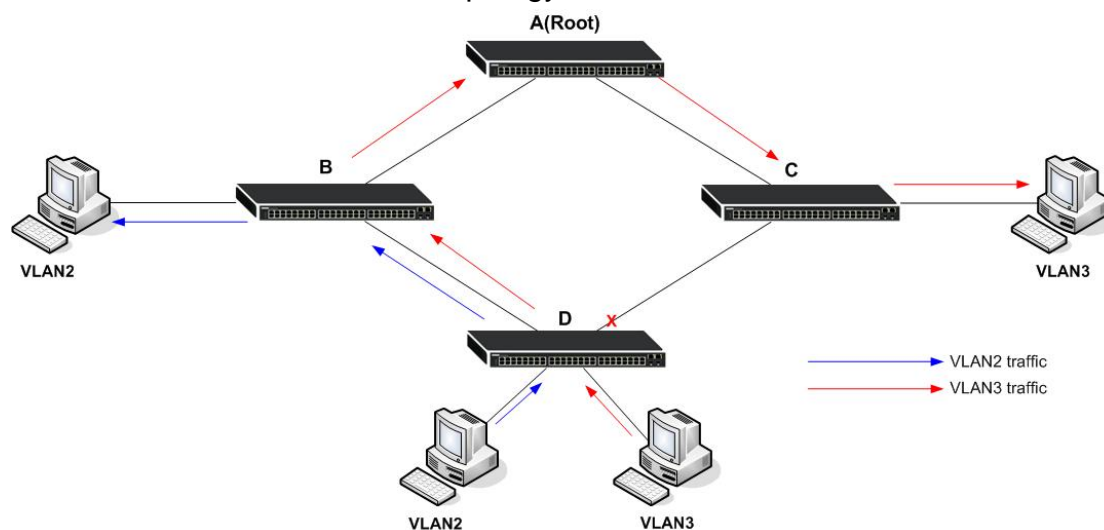
Scenario&Benefits

Consider the following topology:

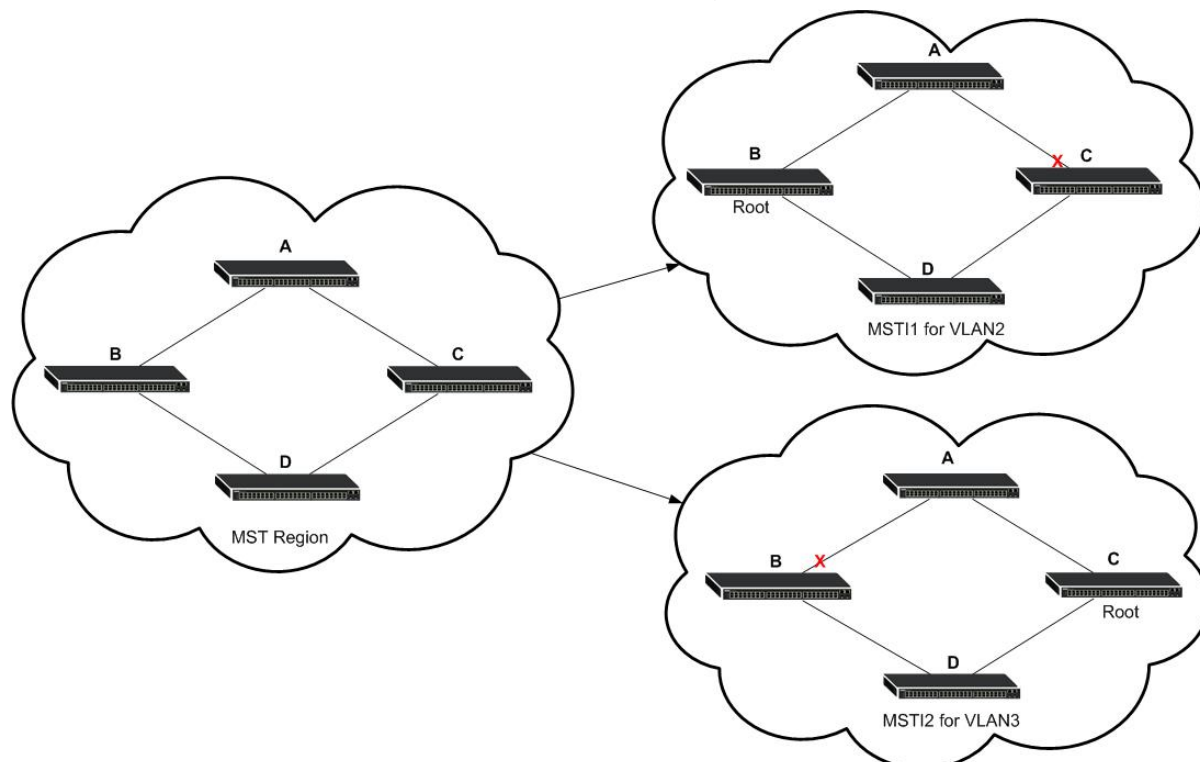


If we use STP/RSTP in this topology, all traffics from D to hosts connected to other switches will go through the root port.

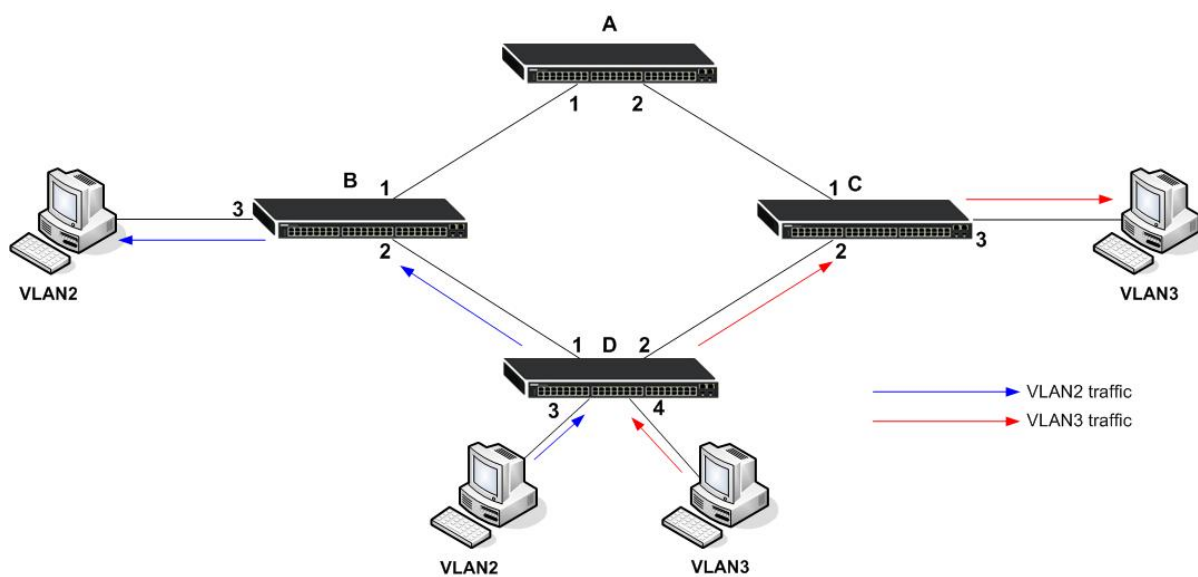
Traffic on STP/RSTP enabled topology.



Now what if we applied MSTP in the same topology?



When there're traffics belonging to VLAN2 and VLAN3, then each of them can go through different uplink.



With multiple uplink ports be enabled, the traffic loading will be balanced between two uplink ports, which also increases the network throughput and usage.

Configuration using the Web GUI – Switch A

1. Connect MGMT port with a PC or Notebook via the RJ45 Cable.
2. By default, the MGMT IP of the out-band port is 192.168.0.1/24
3. Set your NIC to 192.168.0.100/24
4. Open an Internet browser (e.g. IE) and enter <http://192.168.0.1> in the URL field.
5. By default, the username for the administrator is “admin” and the corresponding password is “1234”.
6. After successful login, you will see a screen similar to the one on the screenshot below.

ZyXEL Save Status Logout Help

MENU

- Basic Setting
- Advanced Application
- IP Application
- Management
- System Info
- General Setup
- Switch Setup
- IP Setup
- Port Setup

Port Status

Port	Name	Link	State	LACP	TxPkts	RxPkts	Errors	Tx KB/s	Rx KB/s	Up Time
1	100M/F	FORWARDING	Disabled	345	674	0	0.0	0.64	0.03:52	
2	100M/F	FORWARDING	Disabled	168	0	0	0.64	0.0	0:01:33	
3	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
4	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
5	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
6	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
7	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
8	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
9	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
10	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
11	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
12	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
13	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
14	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
15	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
16	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
17	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
18	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
19	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
20	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	

☐ Any
☒ Port

10 Clear Counter

7. First of all, create VLANs corresponding to the MST instances.
8. Go to “Static VLAN” page by clicking “Advanced Application” → “VLAN” → “Static VLAN”

ZyXEL Save Status Logout Help

MENU

- Basic Setting
- Advanced Application
- IP Application
- Management
- VLAN**
 - Static MAC Forwarding
 - Filtering
 - Spanning Tree Protocol
 - Bandwidth Control
 - Broadcast Storm Control
 - Mirroring
 - Link Aggregation
 - Port Authentication
 - Port Security
 - Classifier
 - Policy Rule
 - Queueing Method
 - VLAN Stacking
 - Multicast
 - Auth and Acct
 - IP Source Guard
 - Loop Guard

VLAN Status VLAN Port Setting Static VLAN

The Number of VLAN = 3

Index	VID	Elapsed Time	Status
1	1	0:11:13	Static
2	2	0:11:13	Static
3	3	0:11:13	Static

Change Pages Previous Next

9. Create VLAN 2 and include port 1 and port 2 for MSTI 1. Click “Add”

Static VLAN VLAN Status

ACTIVE ☒

Name

VLAN Group ID 2

Port	Control	Tagging
*	Normal <input type="button" value="v"/>	<input checked="" type="checkbox"/> Tx Tagging
1	<input type="radio"/> Normal <input checked="" type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
2	<input type="radio"/> Normal <input checked="" type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
3	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
4	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
5	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
6	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
7	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
8	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
9	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
10	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
11	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging

10. Create VLAN 3 and include port 1, port 2 for MSTI 2, click “Add”

Static VLAN

VLAN Status

ACTIVE

☒

Name

VLAN Group ID

3

Port		Control		Tagging
*		Normal	▼	<input checked="" type="checkbox"/> Tx Tagging
1	<input type="radio"/> Normal	<input checked="" type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
2	<input type="radio"/> Normal	<input checked="" type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
3	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
4	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
5	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
6	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
7	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
8	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
9	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
10	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
11	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
12	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
13	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging

11. Then, you need to enable the switch's MSTP function. To do so, click the items as below. **Advanced Application -> Spanning Tree Protocol -> Configuration**

ZyXEL

Save Status Logout Help

MENU

Basic Setting

Advanced Application

IP Application

Management

VLAN

Static MAC Forwarding

Filtering

Spanning Tree Protocol

Bandwidth Control

Broadcast Storm Control

Mirroring

Link Aggregation

Port Authentication

Port Security

Classifier

Policy Rule

Queuing Method

VLAN Stacking

Multicast

Auth and Acct

IP Source Guard

Loop Guard

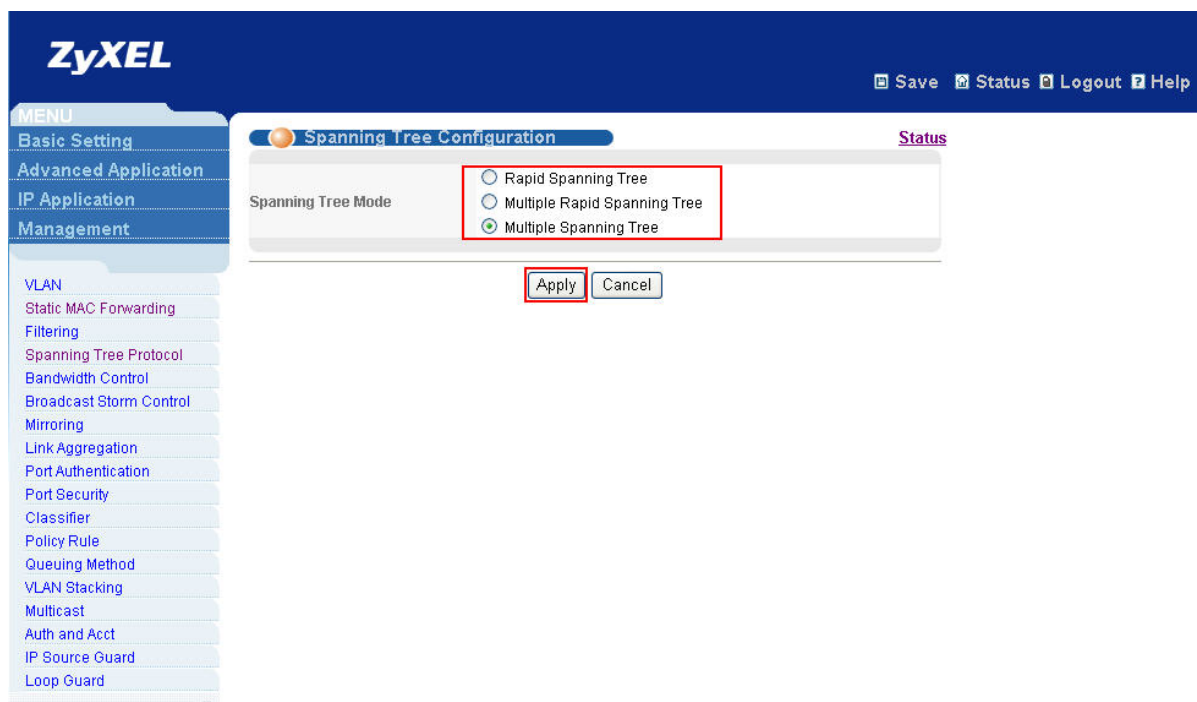
Spanning Tree Protocol Status

Configuration RSTP MRSTP MSTP

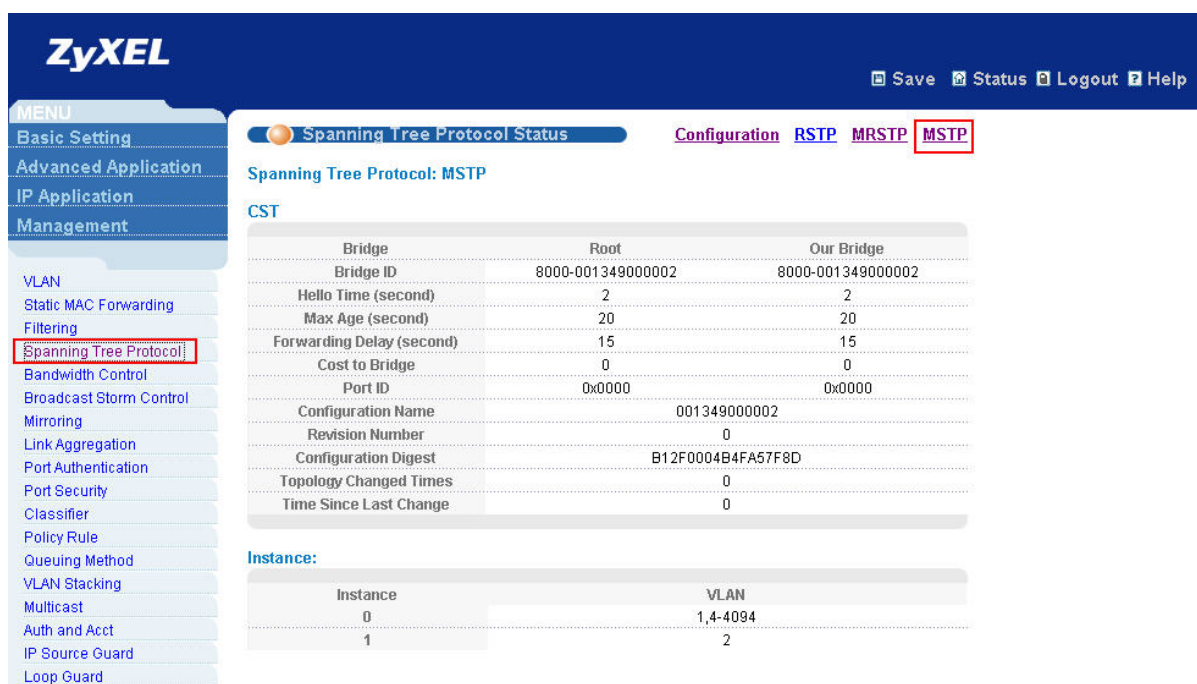
Spanning Tree Protocol: RSTP

Bridge	Root	Our Bridge
Bridge ID	0000-000000000000	0000-000000000000
Hello Time (second)	0	0
Max Age (second)	0	0
Forwarding Delay (second)	0	0
Cost to Bridge	0	
Port ID	0x0000	
Topology Changed Times	0	
Time Since Last Change	0:00:00	

12. After step 11, it will direct you to a “**Spanning Tree Configuration**” page. Choose “**Multiple Spanning Tree**” then click the “**Apply**” button.



13. Click “**Spanning Tree Protocol**” button and go back to “**Spanning Tree Protocol Status**” page. Click “**MSTP**” and go to the “**Multiple Spanning Tree Protocol**” page. Here you can set detail MSTP configuration.



14. At the “**Multiple Spanning Tree Protocol**” page, configure the MSTI 0 setting by

following the steps. All ports want to join MSTP must be included into MSTI 0.

15. Configure the MSTP bridge parameters. (All switches in the same region must have the same "Configuration Name", "Revision Number" and "VLAN-MSTI mapping".)

16. Check "**Active**".

17. Configure the "**Hello Time**".

18. Configure the "**Max Age**" time.

19. Configure the "**Forwarding Delay**" time.

20. Configure the "**Max hops**".

21. Configure the "**Configuration Name**".

22. Configure the "**Revision Number**".

23. Click the "**Apply**" button

Multiple Spanning Tree Protocol [Status](#)

Bridge:

Active	<input checked="" type="checkbox"/>
Hello Time	2 seconds
MAX Age	20 seconds
Forwarding Delay	15 seconds
Maximum hops	128
Configuration Name	demo
Revision Number	111

24. Configure the MSTI parameters and choose which VLAN should join this MSTI and click "**Add**". Because switch A is the root of this region, we must set the "Bridge Priority" of MSTI 0 to "0"

Instance:

Instance	0
Bridge Priority	0
VLAN Range	Start End

Enabled VLAN(s): 1-4094

25. Choose which port should be included in this MSTI. Click **"Add"**

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

26. At the **"Multiple Spanning Tree Protocol"** page, create an MSTI 1 setting by following the steps.

27. Configure the MSTI parameters and choose which VLAN should join this MSTI and click **"Add"**.

Instance:

Instance	1
Bridge Priority	32768
VLAN Range	Start End
<input type="button" value="Add"/> <input type="button" value="Remove"/> <input type="button" value="Clear"/>	
Enabled VLAN(s)	2

28. Choose which port should be included in this MSTI. Click **"Add"**.

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

29. At the “**Multiple Spanning Tree Protocol**” page, create an MSTI 1 setting by following the steps.

30. Configure the MSTI parameters and choose which VLAN should join this MSTI and click “**Add**”.

Instance:

Instance	2
Bridge Priority	32768 <input type="button" value="v"/>
VLAN Range	Start <input type="text"/> End <input type="text"/>
<input type="button" value="Add"/> <input type="button" value="Remove"/> <input type="button" value="Clear"/>	
Enabled VLAN(s)	3

31. Choose which port should be included in this MSTI. Click “**Add**”.

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

Configuration using the Web GUI – Switch B

1. Connect MGMT port with a PC or Notebook via the RJ45 Cable.
2. By default, the MGMT IP of the out-band port is 192.168.0.1/24
3. Set your NIC to 192.168.0.100/24
4. Open an Internet browser (e.g. IE) and enter <http://192.168.0.1> in the URL field.
5. By default, the username for the administrator is “admin” and the corresponding password is “1234”.
6. After successful login you will see a screen similar to the one on the screenshot below.

ZyXEL Save Status Logout Help

MENU

- Basic Setting
- Advanced Application
- IP Application
- Management
- System Info
- General Setup
- Switch Setup
- IP Setup
- Port Setup

Port Status

Port	Name	Link	State	LACP	TxPkts	RxPkts	Errors	Tx KB/s	Rx KB/s	Up Time
1	100M/F	FORWARDING	Disabled	345	674	0	0.0	0.64	0.03:52	
2	100M/F	FORWARDING	Disabled	168	0	0	0.64	0.0	0:01:33	
3	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
4	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
5	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
6	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
7	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
8	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
9	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
10	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
11	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
12	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
13	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
14	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
15	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
16	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
17	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
18	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
19	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
20	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	

☐ Any
☒ Port

7. First of all, create VLANs corresponding to MST instances.
8. Go to “Static VLAN” page by clicking “Advanced Application” → “VLAN” → “Static VLAN”.

ZyXEL Save Status Logout Help

MENU

- Basic Setting
- Advanced Application**
- IP Application
- Management

VLAN

- Static MAC Forwarding
- Filtering
- Spanning Tree Protocol
- Bandwidth Control
- Broadcast Storm Control
- Mirroring
- Link Aggregation
- Port Authentication
- Port Security
- Classifier
- Policy Rule
- Queueing Method
- VLAN Stacking
- Multicast
- Auth and Acct
- IP Source Guard
- Loop Guard

VLAN Status VLAN Port Setting **Static VLAN**

The Number of VLAN = 3

Index	VID	Elapsed Time	Status
1	1	0:11:13	Static
2	2	0:11:13	Static
3	3	0:11:13	Static

Change Pages Previous Next

9. Create VLAN 2 and include port 1, port 2 and port 3 for MSTI 1. Because port 3 is connecting to a host in VLAN 2, the egress traffic on port 3 should be untagged. Then click **“Add”**.

Static VLAN VLAN Status

ACTIVE ☒

Name

VLAN Group ID

Port	Control	Tagging
*	Normal <input type="button" value="v"/>	<input checked="" type="checkbox"/> Tx Tagging
1	<input type="radio"/> Normal <input checked="" type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
2	<input type="radio"/> Normal <input checked="" type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
3	<input type="radio"/> Normal <input checked="" type="radio"/> Fixed <input type="radio"/> Forbidden	<input type="checkbox"/> Tx Tagging
4	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
5	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
6	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
7	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
8	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
9	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
10	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
11	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
12	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging

10. Create VLAN 3 and include port 1, port 2 for MSTI 2, click **“Add”**.

Static VLAN

VLAN Status

ACTIVE	<input checked="" type="checkbox"/>
Name	
VLAN Group ID	3

Port	Control			Tagging
*		Normal		<input checked="" type="checkbox"/> Tx Tagging
1	<input type="radio"/> Normal	<input checked="" type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
2	<input type="radio"/> Normal	<input checked="" type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
3	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
4	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
5	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
6	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
7	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
8	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
9	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
10	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
11	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
12	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
13	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging

11. Then, you need to enable the switch's MSTP function. To do so, click the items as below. **Advanced Application -> Spanning Tree Protocol -> Configuration**

ZyXEL

[Save](#)
[Status](#)
[Logout](#)
[Help](#)

MENU

Basic Setting

Advanced Application

IP Application

Management

VLAN

Static MAC Forwarding

Filtering

Spanning Tree Protocol

Bandwidth Control

Broadcast Storm Control

Mirroring

Link Aggregation

Port Authentication

Port Security

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Policy Rule

Queuing Method

VLAN Stacking

Multicast

Auth and Acct

IP Source Guard

Loop Guard

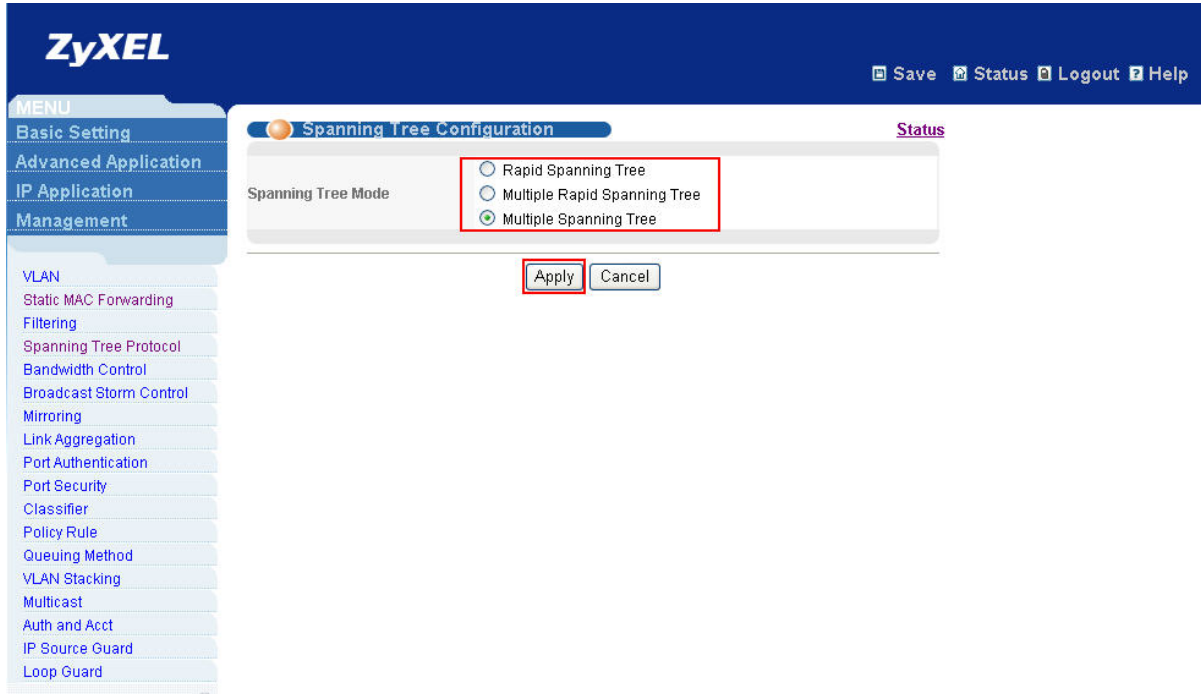
Spanning Tree Protocol Status

Configuration RSTP MRSTP MSTP

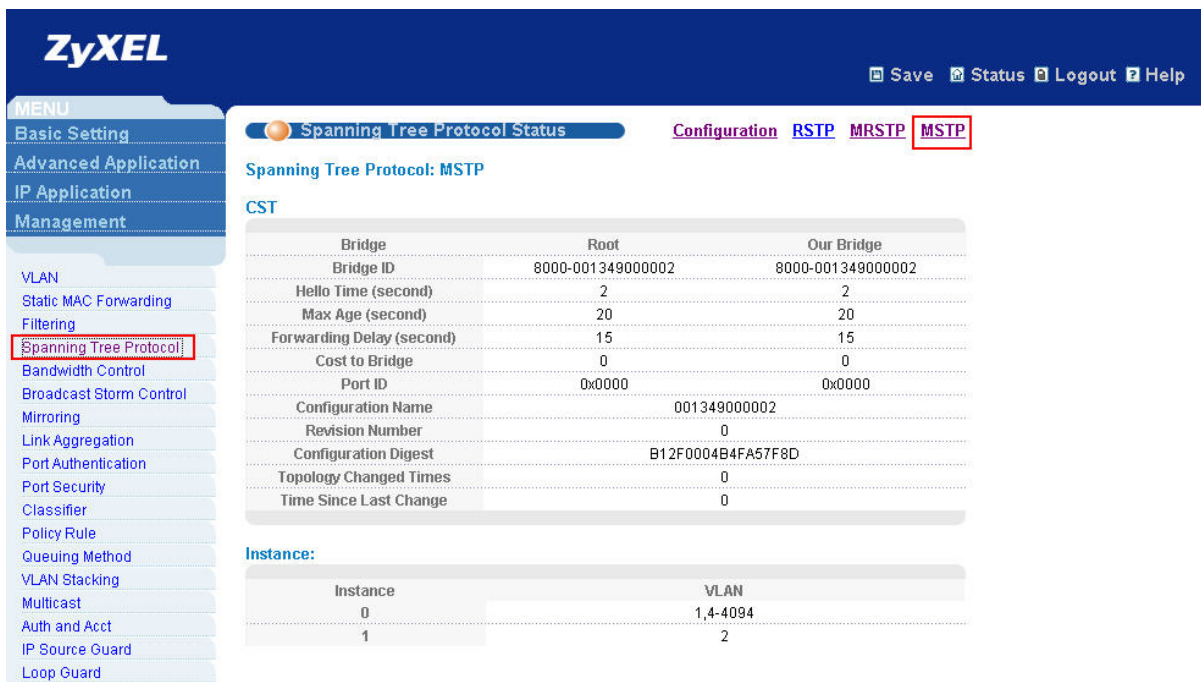
Spanning Tree Protocol: RSTP

Bridge	Root	Our Bridge
Bridge ID	0000-000000000000	0000-000000000000
Hello Time (second)	0	0
Max Age (second)	0	0
Forwarding Delay (second)	0	0
Cost to Bridge	0	
Port ID	0x0000	
Topology Changed Times	0	
Time Since Last Change	0:00:00	

12. After step 11, it will direct you to a **“Spanning Tree Configuration”** page, choose **“Multiple Spanning Tree”** then click the **“Apply”** button.



13. Click **“Spanning Tree Protocol”** button and go back to **“Spanning Tree Protocol Status”** page. Click **“MSTP”** and go to the **“Multiple Spanning Tree Protocol”** page. Here you can perform detail MSTP configuration.



14. At the “**Multiple Spanning Tree Protocol**” page, configure the MSTI 0 setting by following steps. **All ports that are desired to join MSTP must be included into MSTI 0.**

15. Configure the MSTP bridge parameters. (All switches in the same region must have the same “**Configuration Name**”, “**Revision Number**” and “**VLAN-MSTI mapping**”.)

16. Check “**Active**”.

17. Configure the “**Hello Time**”.

18. Configure the “**Max Age**” time.

19. Configure the “**Forwarding Delay**” time.

20. Configure the “**Max hops**”.

21. Configure the “**Configuration Name**”.

22. Configure the “**Revision Number**”.

23. Click the “**Apply**” button.

Multiple Spanning Tree Protocol [Status](#)

Bridge:

Active	<input checked="" type="checkbox"/>
Hello Time	2 seconds
MAX Age	20 seconds
Forwarding Delay	15 seconds
Maximum hops	128
Configuration Name	demo
Revision Number	111

Apply **Cancel**

24. Configure the MSTI parameters and choose which VLAN should join this MSTI and click “**Add**”.

Instance:

Instance	0
Bridge Priority	32768
VLAN Range	Start End Add Remove Clear
Enabled VLAN(s)	1, 4-4094

25. Choose which port should be included in this MSTI. Click **"Add"**.

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

26. At the **"Multiple Spanning Tree Protocol"** page, create an MSTI 1 setting by following the steps.

27. Configure the MSTI parameters and choose which VLAN should join this MSTI and click **"Add"**. Because Switch B is the root of MSTI 1, we need to configure the **"Bridge Priority"** of this instance to "0".

Instance:

Instance	1
Bridge Priority	0 <input type="button" value="v"/>
VLAN Range	Start <input type="text"/> End <input type="text"/>

Enabled VLAN(s)

2

28. Choose which port should be included in this MSTI. Click **"Add"**

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

29. At the “**Multiple Spanning Tree Protocol**” page, create an MSTI 1 setting by following steps.

30. Configure the MSTI parameters and choose which VLAN should join this MSTI and click “**Add**”.

Instance:

Instance	2	
Bridge Priority	32768	▼
VLAN Range	Start	End
		<input type="button" value="Add"/> <input type="button" value="Remove"/> <input type="button" value="Clear"/>
Enabled VLAN(s)	3	

31. Choose which port should be included in this MSTI. Click “**Add**”.

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

Configuration using the Web GUI – Switch C

1. Connect MGMT port with a PC or Notebook via the RJ45 Cable.
2. By default, the MGMT IP of the out-band port is 192.168.0.1/24
3. Set your NIC to 192.168.0.100/24
4. Open an Internet browser (e.g. IE) and enter <http://192.168.0.1> in the URL field.
5. By default, the username for the administrator is “admin” and the corresponding password is “1234”.
6. After successful login you will see a screen similar to the one on the screenshot below.

ZyXEL Save Status Logout Help

MENU

- Basic Setting
- Advanced Application
- IP Application
- Management
- System Info
- General Setup
- Switch Setup
- IP Setup
- Port Setup

Port Status

Port	Name	Link	State	LACP	TxPkts	RxPkts	Errors	Tx KB/s	Rx KB/s	Up Time
1	100M/F	FORWARDING	Disabled	345	674	0	0.0	0.64	0.03:52	
2	100M/F	FORWARDING	Disabled	168	0	0	0.64	0.0	0:01:33	
3	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
4	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
5	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
6	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
7	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
8	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
9	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
10	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
11	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
12	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
13	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
14	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
15	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
16	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
17	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
18	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
19	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
20	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	

☐ Any
☒ Port

7. First of all , create VLANs corresponding to the MST instances.
8. Go to “**Static VLAN**” page by clicking “**Advanced Application**”→“**VLAN**”→“**Static VLAN**”

ZyXEL Save Status Logout Help

MENU

- Basic Setting
- Advanced Application**
- IP Application
- Management

VLAN

- Static MAC Forwarding
- Filtering
- Spanning Tree Protocol
- Bandwidth Control
- Broadcast Storm Control
- Mirroring
- Link Aggregation
- Port Authentication
- Port Security
- Classifier
- Policy Rule
- Queueing Method
- VLAN Stacking
- Multicast
- Auth and Acct
- IP Source Guard
- Loop Guard

VLAN Status VLAN Port Setting **Static VLAN**

The Number of VLAN = 3

Index	VID	Elapsed Time	Status
1	1	0:11:13	Static
2	2	0:11:13	Static
3	3	0:11:13	Static

Change Pages Previous Next

9. Create VLAN 2 and include port 1, port 2 for MSTI 1, then click “Add”.

Static VLAN VLAN Status

ACTIVE ☒

Name

VLAN Group ID 2

Port	Control	Tagging
*	Normal	<input checked="" type="checkbox"/> Tx Tagging
1	<input type="radio"/> Normal <input checked="" type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
2	<input type="radio"/> Normal <input checked="" type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
3	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
4	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
5	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
6	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
7	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
8	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
9	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
10	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
11	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging

10. Create VLAN 3 and include port 1, port 2 and port 3 for MSTI 2, because port 3 is

connected to a host in VLAN 3, the egress traffic on port 3 should be untagged. Then click **"Add"**.

Static VLAN [VLAN Status](#)

ACTIVE ☒

Name

VLAN Group ID

Port	Control			Tagging
*	Normal <input type="button" value="v"/>			<input checked="" type="checkbox"/> Tx Tagging
1	<input type="radio"/> Normal	<input checked="" type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
2	<input type="radio"/> Normal	<input checked="" type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
3	<input type="radio"/> Normal	<input checked="" type="radio"/> Fixed	<input type="radio"/> Forbidden	<input type="checkbox"/> Tx Tagging
4	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
5	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
6	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
7	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
8	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
9	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
10	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
11	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
12	<input checked="" type="radio"/> Normal	<input type="radio"/> Fixed	<input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging

11. Then, you need to enable the switch's MSTP function. To do so, click items as below. **Advanced Application -> Spanning Tree Protocol -> Configuration**

ZyXEL Save Status Logout Help

MENU

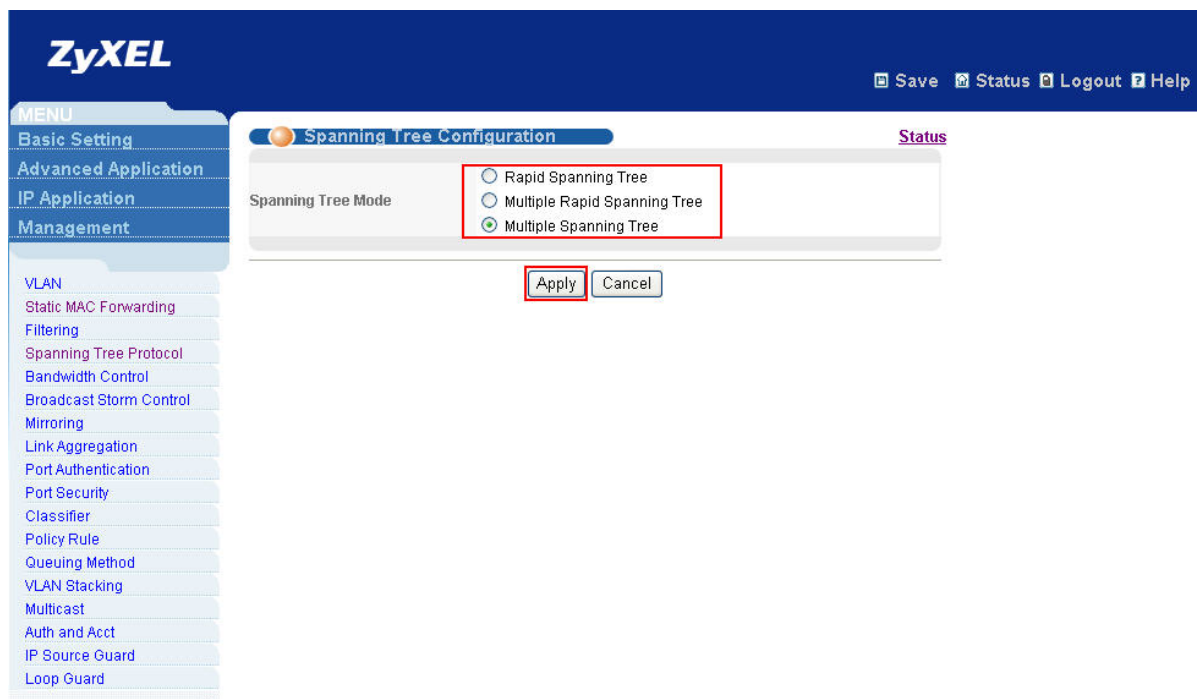
- Basic Setting
- Advanced Application 1.
- IP Application
- Management
- VLAN
- Static MAC Forwarding
- Filtering
- Spanning Tree Protocol 2.
- Bandwidth Control
- Broadcast Storm Control
- Mirroring
- Link Aggregation
- Port Authentication
- Port Security
- Classifier
- Policy Rule
- Queuing Method
- VLAN Stacking
- Multicast
- Auth and Acct
- IP Source Guard
- Loop Guard

Spanning Tree Protocol Status [Configuration](#) [RSTP](#) [MRSTP](#) [MSTP](#)

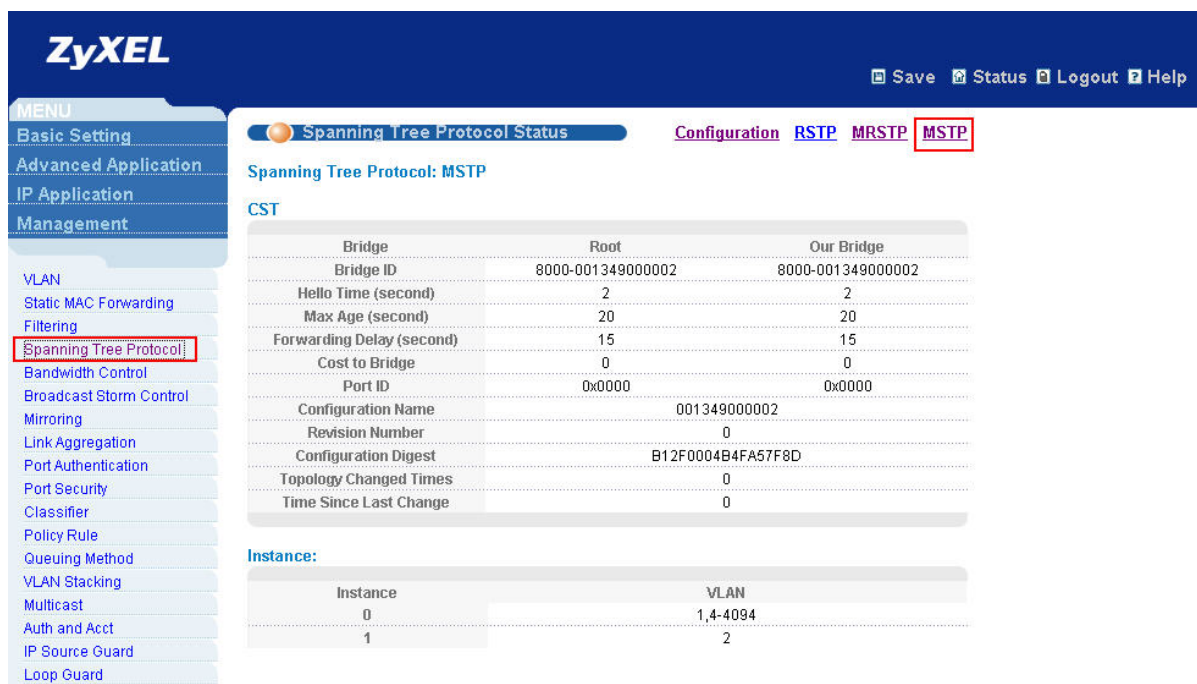
Spanning Tree Protocol: RSTP 3.

Bridge	Root	Our Bridge
Bridge ID	0000-000000000000	0000-000000000000
Hello Time (second)	0	0
Max Age (second)	0	0
Forwarding Delay (second)	0	0
Cost to Bridge	0	
Port ID	0x0000	
Topology Changed Times	0	
Time Since Last Change	0:00:00	

12. After step 11, it will direct you to a **“Spanning Tree Configuration”** page, choose **“Multiple Spanning Tree”** then click the **“Apply”** button.



13. Click **“Spanning Tree Protocol”** button and back to **“Spanning Tree Protocol Status”** page. Click **“MSTP”** and go to the **“Multiple Spanning Tree Protocol”** page. Here you can configure MSTP in detail.



14. At the “**Multiple Spanning Tree Protocol**” page, configure the MSTI 0 setting by following the steps. **All ports that are desired to join MSTP must be included into MSTI 0.**

15. Configure the MSTP bridge parameters. (All switches in the same region must have the same “**Configuration Name**”, “**Revision Number**” and “**VLAN-MSTI mapping**”.)

16. Check “**Active**”.

17. Configure the “**Hello Time**”.

18. Configure the “**Max Age**” time.

19. Configure the “**Forwarding Delay**” time.

20. Configure the “**Max hops**”.

21. Configure the “**Configuration Name**”.

22. Configure the “**Revision Number**”.

23. Click the “**Apply**” button.

Multiple Spanning Tree Protocol [Status](#)

Bridge:

Active	<input checked="" type="checkbox"/>
Hello Time	2 seconds
MAX Age	20 seconds
Forwarding Delay	15 seconds
Maximum hops	128
Configuration Name	demo
Revision Number	111

24. Configure the MSTI parameters and choose which VLAN should join this MSTI and click “**Add**”.

Instance:

Instance	<input type="text" value="0"/>		
Bridge Priority	<input type="text" value="32768"/>		
VLAN Range	Start <input type="text"/>	End <input type="text"/>	<input type="button" value="Add"/> <input type="button" value="Remove"/> <input type="button" value="Clear"/>
Enabled VLAN(s)	<div>1, 4-4094</div>		

25. Choose which port should be included in this MSTI. Click **"Add"**.

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

26. At the **"Multiple Spanning Tree Protocol"** page, create an MSTI 1 setting by following the steps.

27. Configure the MSTI parameters and choose which VLAN should join this MSTI and click **"Add"**.

Instance:

Instance	1		
Bridge Priority	32768		
VLAN Range	Start	End	<input type="button" value="Add"/> <input type="button" value="Remove"/> <input type="button" value="Clear"/>
Enabled VLAN(s)	2		

28. Choose which port should be included in this MSTI. Click **"Add"**.

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

29. At the **"Multiple Spanning Tree Protocol"** page, create an MSTI 1 setting by following the steps.

30. Configure the MSTI parameters and choose which VLAN should join this MSTI and click **"Add"**. Because Switch C is the root of MSTI 2, we need to configure the **"Bridge Priority"** of this instance to **"0"**.

Instance:

Instance	2		
Bridge Priority	0	▼	
VLAN Range	Start	End	<input type="button" value="Add"/> <input type="button" value="Remove"/> <input type="button" value="Clear"/>
Enabled VLAN(s)	3		

31. Choose which port should be included in this MSTI. Click **"Add"**.

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

Configuration using the Web GUI – Switch D

1. Connect MGMT port with a PC or Notebook via the RJ45 Cable.
2. By default, the MGMT IP of the out-band port is 192.168.0.1/24.
3. Set your NIC to 192.168.0.100/24.
4. Open an Internet browser (e.g. IE) and enter <http://192.168.0.1> in the URL field.
5. By default, the username for the administrator is “admin” and the corresponding password is “1234”.
6. After successful login you will see a screen similar to the one on the screenshot below.

ZyXEL Save Status Logout Help

MENU

- Basic Setting
- Advanced Application
- IP Application
- Management
- System Info
- General Setup
- Switch Setup
- IP Setup
- Port Setup

Port Status

Port	Name	Link	State	LACP	TxPkts	RxPkts	Errors	Tx KB/s	Rx KB/s	Up Time
1	100M/F	FORWARDING	Disabled	345	674	0	0.0	0.64	0.03:52	
2	100M/F	FORWARDING	Disabled	168	0	0	0.64	0.0	0:01:33	
3	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
4	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
5	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
6	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
7	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
8	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
9	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
10	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
11	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
12	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
13	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
14	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
15	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
16	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
17	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
18	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
19	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	
20	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00	

☐ Any
☒ Port 10 Clear Counter

7. First of all, you need to create VLANs corresponding to MST instances.
8. Go to “**Static VLAN**” page by clicking “**Advanced Application**”→“**VLAN**”→“**Static VLAN**”

ZyXEL Save Status Logout Help

MENU

- Basic Setting
- Advanced Application**
- IP Application
- Management

VLAN

- Static MAC Forwarding
- Filtering
- Spanning Tree Protocol
- Bandwidth Control
- Broadcast Storm Control
- Mirroring
- Link Aggregation
- Port Authentication
- Port Security
- Classifier
- Policy Rule
- Queueing Method
- VLAN Stacking
- Multicast
- Auth and Acct
- IP Source Guard
- Loop Guard

VLAN Status VLAN Port Setting **Static VLAN**

The Number of VLAN = 3

Index	VID	Elapsed Time	Status
1	1	0:11:13	Static
2	2	0:11:13	Static
3	3	0:11:13	Static

Change Pages Previous Next

9. Create VLAN 2 and include port 1, port 2 and port 3 for MSTI 1, because port 3 is connecting to a host in VLAN 2, the egress traffic on port 3 should be untagged. Then click “Add”.

Static VLAN VLAN Status

ACTIVE ☒

Name

VLAN Group ID

Port	Control	Tagging
*	Normal <input type="button" value="v"/>	<input checked="" type="checkbox"/> Tx Tagging
1	<input type="radio"/> Normal <input checked="" type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
2	<input type="radio"/> Normal <input checked="" type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
3	<input type="radio"/> Normal <input checked="" type="radio"/> Fixed <input type="radio"/> Forbidden	<input type="checkbox"/> Tx Tagging
4	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
5	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
6	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
7	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
8	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
9	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
10	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
11	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging
12	<input checked="" type="radio"/> Normal <input type="radio"/> Fixed <input type="radio"/> Forbidden	<input checked="" type="checkbox"/> Tx Tagging

10. Create VLAN 3 and include port 1, port 2 and port 4 for MSTI 2. Because port 4 is connected to a host in VLAN 3, the egress traffic on port 4 should be untagged. Then click **"Add"**.

Static VLAN

VLAN Status

ACTIVE
☒

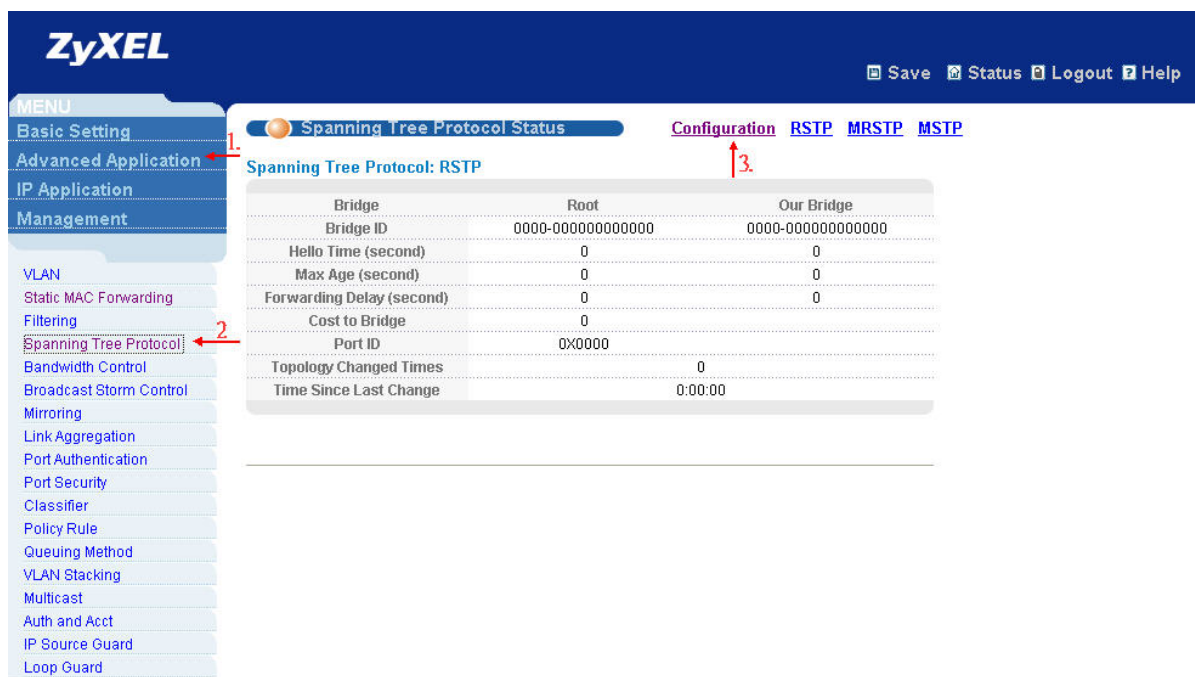
Name

VLAN Group ID

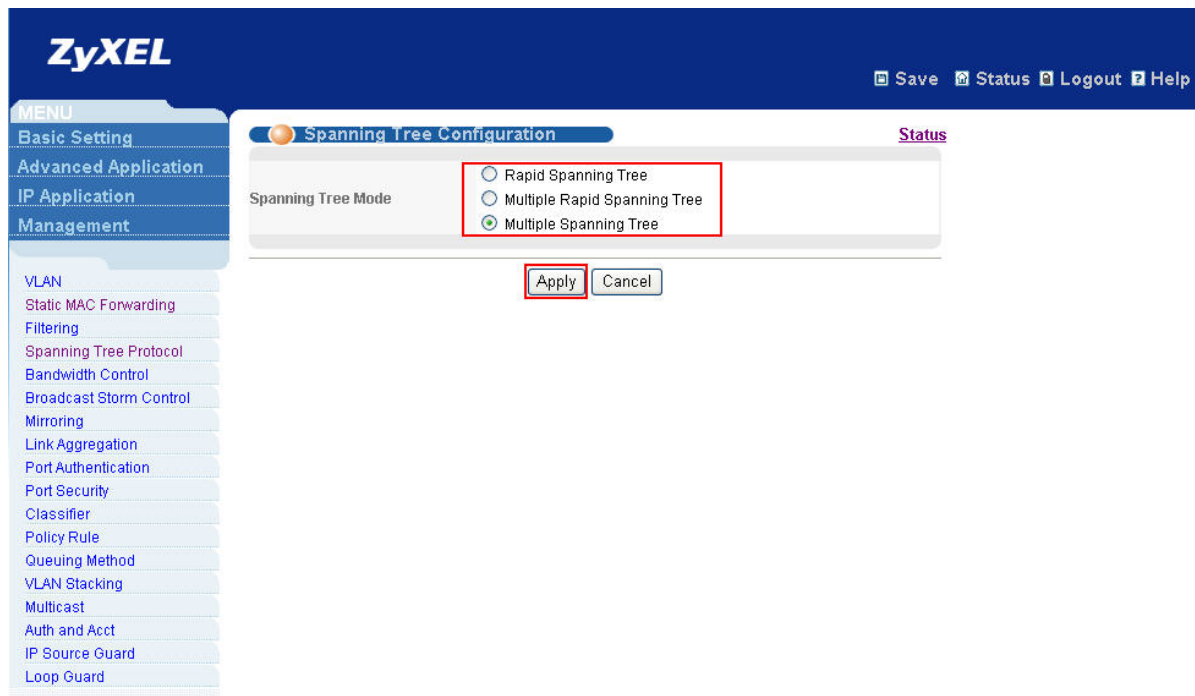
Port	Control			Tagging
*		Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
1	Normal <input type="radio"/>	Fixed <input checked="" type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
2	Normal <input type="radio"/>	Fixed <input checked="" type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
3	Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
4	Normal <input type="radio"/>	Fixed <input checked="" type="radio"/>	Forbidden <input type="radio"/>	<input type="checkbox"/> Tx Tagging
5	Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
6	Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
7	Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
8	Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
9	Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
10	Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
11	Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
12	Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging
13	Normal <input checked="" type="radio"/>	Fixed <input type="radio"/>	Forbidden <input type="radio"/>	<input checked="" type="checkbox"/> Tx Tagging

1

1. Then, you need to enable the switch's MSTP function. To do so, click the items as below. **Advanced Application -> Spanning Tree Protocol -> Configuration**



12. After step 11, it will direct you to a “Spanning Tree Configuration” page, choose “Multiple Spanning Tree” then click the “Apply” button.



13. Click “Spanning Tree Protocol” button and go back to “Spanning Tree Protocol Status” page. Click “MSTP” and go to the “Multiple Spanning Tree Protocol” page. Here you can configure MSTP in detail..

ZyXEL Save Status Logout Help

MENU

- Basic Setting
- Advanced Application
- IP Application
- Management

Spanning Tree Protocol Status Configuration RSTP MRSTP **MSTP**

Spanning Tree Protocol: MSTP

CST

Bridge	Root	Our Bridge
Bridge ID	8000-001349000002	8000-001349000002
Hello Time (second)	2	2
Max Age (second)	20	20
Forwarding Delay (second)	15	15
Cost to Bridge	0	0
Port ID	0x0000	0x0000
Configuration Name	001349000002	
Revision Number	0	
Configuration Digest	B12F0004B4FA57F8D	
Topology Changed Times	0	
Time Since Last Change	0	

Instance:

Instance	VLAN
0	1,4-4094
1	2

14. At the “**Multiple Spanning Tree Protocol**” page, configure the MSTI 0 setting by following the steps. **All ports that are desired to join MSTP must be included into MSTI 0.**

15. Configure the MSTP bridge parameters. (All switches in the same region must have the same “Configuration Name”, “Revision Number” and “VLAN-MSTI mapping”).)

16. Check “**Active**”.

17. Configure the “**Hello Time**”.

18. Configure the “**Max Age**” time.

19. Configure the “**Forwarding Delay**” time.

20. Configure the “**Max hops**”.

21. Configure the “**Configuration Name**”.

22. Configure the “**Revision Number**”.

23. Click the “**Apply**” button.

Multiple Spanning Tree Protocol

[Status](#)

Bridge:

Active	<input checked="" type="checkbox"/>	
Hello Time	2	seconds
MAX Age	20	seconds
Forwarding Delay	15	seconds
Maximum hops	128	
Configuration Name	demo	
Revision Number	111	

24. Configure the MSTI parameters and choose which VLAN should join this MSTI and click **"Add"**.

Instance:

Instance	<input type="text" value="0"/>		
Bridge Priority	32768	<input type="button" value="v"/>	
VLAN Range	Start <input type="text"/>	End <input type="text"/>	<input type="button" value="Add"/> <input type="button" value="Remove"/> <input type="button" value="Clear"/>
Enabled VLAN(s)	<div style="border: 1px solid #ccc; padding: 5px; min-height: 100px;"> 1, 4-4094 </div>		

25. Choose which port should be included in this MSTI. Click **"Add"**.

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

26. At the “**Multiple Spanning Tree Protocol**” page, create an MSTI 1 setting by following the steps.

27. Configure the MSTI parameters and choose which VLAN should join this MSTI and click “**Add**”

Instance:

Instance	1
Bridge Priority	32768
VLAN Range	Start End
	Add Remove Clear
Enabled VLAN(s)	2

28. Choose which port should be included in this MSTI. Click “**Add**”.

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

29. At the “**Multiple Spanning Tree Protocol**” page, create an MSTI 1 setting by following the steps.

30. Configure the MSTI parameters and choose which VLAN should join this MSTI and click “**Add**”,

Instance:

Instance	2
Bridge Priority	32768
VLAN Range	Start End
<input type="button" value="Add"/> <input type="button" value="Remove"/> <input type="button" value="Clear"/>	
Enabled VLAN(s)	3

31. Choose which port should be included in this MSTI. Click “**Add**”.

Port	Active	Priority	Path Cost
*	<input type="checkbox"/>		
1	<input checked="" type="checkbox"/>	128	19
2	<input checked="" type="checkbox"/>	128	19
3	<input type="checkbox"/>	128	19
4	<input type="checkbox"/>	128	19
5	<input type="checkbox"/>	128	19
6	<input type="checkbox"/>	128	19
7	<input type="checkbox"/>	128	19
8	<input type="checkbox"/>	128	19
9	<input type="checkbox"/>	128	19
10	<input type="checkbox"/>	128	19
11	<input type="checkbox"/>	128	19
12	<input type="checkbox"/>	128	19
13	<input type="checkbox"/>	128	19
14	<input type="checkbox"/>	128	19
15	<input type="checkbox"/>	128	19
16	<input type="checkbox"/>	128	19

Configuration using the CLI – Switch A

```
vlan 1
  name 1
  normal ""
  fixed 1-28
  forbidden ""
  untagged 1-28
  ip address 192.168.1.1 255.255.255.0
exit
vlan 2
  normal 3-28
  fixed 1-2
  forbidden ""
  untagged ""
exit
vlan 3
  normal 3-28
  fixed 1-2
  forbidden ""
  untagged ""
exit
interface route-domain 192.168.1.1/24
exit
ip address 192.168.0.1 255.255.255.0
spanning-tree mode MSTP
mstp
mstp configuration-name demo
mstp revision 111
mstp instance 0 vlan 1,4-4094
mstp instance 1 vlan 2
mstp instance 2 vlan 3
mstp instance 0 priority 0
mstp instance 0 interface port-channel 1
mstp instance 0 interface port-channel 2
mstp instance 1 interface port-channel 1
mstp instance 1 interface port-channel 2
```

mstp instance 2 interface port-channel 1
mstp instance 2 interface port-channel 2

Configuration using the CLI – Switch B

```
vlan 1
  name 1
  normal ""
  fixed 1-28
  forbidden ""
  untagged 1-28
  ip address 192.168.1.2 255.255.255.0
exit
vlan 2
  normal 3-28
  fixed 1-3
  forbidden ""
  untagged "3"
exit
vlan 3
  normal 3-28
  fixed 1-2
  forbidden ""
  untagged ""
exit
interface route-domain 192.168.1.2/24
exit
ip address 192.168.0.1 255.255.255.0
spanning-tree mode MSTP
mstp
mstp configuration-name demo
mstp revision 111
mstp instance 0 vlan 1,4-4094
mstp instance 1 vlan 2
mstp instance 2 vlan 3
mstp instance 1 priority 0
mstp instance 0 interface port-channel 1
mstp instance 0 interface port-channel 2
mstp instance 1 interface port-channel 1
mstp instance 1 interface port-channel 2
```

```
mstp instance 2 interface port-channel 1  
mstp instance 2 interface port-channel 2
```


Configuration using the CLI – Switch C

```
vlan 1
  name 1
  normal ""
  fixed 1-28
  forbidden ""
  untagged 1-28
  ip address 192.168.1.3 255.255.255.0
exit
vlan 2
  normal 3-28
  fixed 1-2
  forbidden ""
  untagged ""
exit
vlan 3
  normal 3-28
  fixed 1-3
  forbidden ""
  untagged "3"
exit
interface route-domain 192.168.1.3/24
exit
ip address 192.168.0.1 255.255.255.0
spanning-tree mode MSTP
mstp
mstp configuration-name demo
mstp revision 111
mstp instance 0 vlan 1,4-4094
mstp instance 1 vlan 2
mstp instance 2 vlan 3
mstp instance 2 priority 0
mstp instance 0 interface port-channel 1
mstp instance 0 interface port-channel 2
mstp instance 1 interface port-channel 1
mstp instance 1 interface port-channel 2
```

mstp instance 2 interface port-channel 1
mstp instance 2 interface port-channel 2

Configuration using the CLI – Switch D

```
vlan 1
  name 1
  normal ""
  fixed 1-28
  forbidden ""
  untagged 1-28
  ip address 192.168.1.4 255.255.255.0
exit
vlan 2
  normal 3-28
  fixed 1-3
  forbidden ""
  untagged "3"
exit
vlan 3
  normal 3-28
  fixed 1-2,4
  forbidden ""
  untagged "4"
exit
interface route-domain 192.168.1.4/24
exit
ip address 192.168.0.1 255.255.255.0
spanning-tree mode MSTP
mstp
mstp configuration-name demo
mstp revision 111
mstp instance 0 vlan 1,4-4094
mstp instance 1 vlan 2
mstp instance 2 vlan 3
mstp instance 0 interface port-channel 1
mstp instance 0 interface port-channel 2
mstp instance 1 interface port-channel 1
mstp instance 1 interface port-channel 2
mstp instance 2 interface port-channel 1
```

mstp instance 2 interface port-channel 2