

# ***RING MATERIAL FOR SAE PRODUCTS***

## ***COMMERCIAL AND INDUSTRIAL POE SWITCHES***

***SECOND EDITION V2.0 DATE: 25 APR 2022***

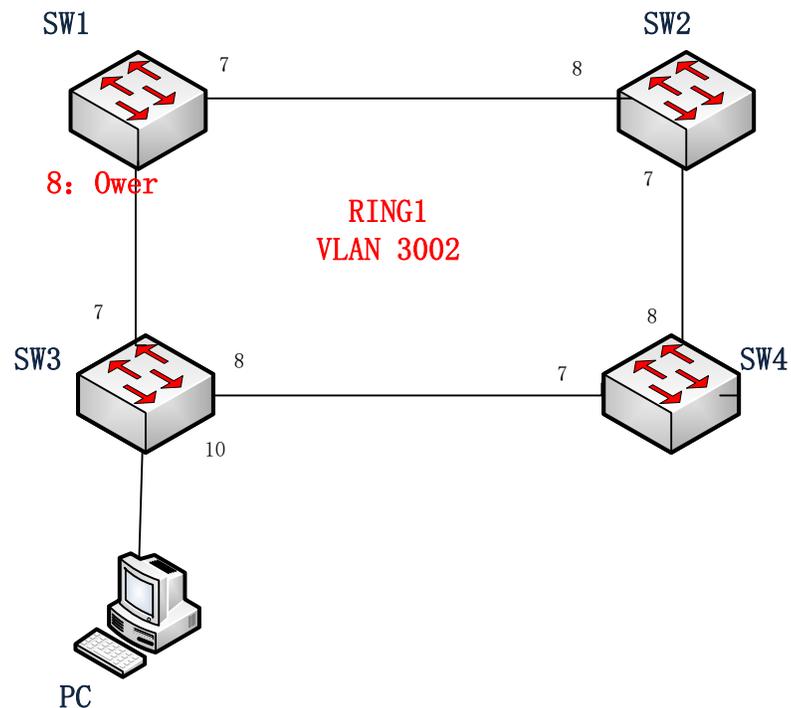


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## A. Single-Ring Configuration

1. Form SW1 - SW4 to a single ring through ERPS, Users can ping SW1-SW4 in PC, also can ping them if Ring is disconnected.



2. Set the IP of SW1-SW4 as (192.168.2.1) - (192.168.2.4), and set the port to trunk port, which is used to connect with the ring.

**Information & Status**  
 ▶ MLD Snooping  
 ▶ DHCP  
 ▶ Security  
 ▶ QoS  
 ▶ Network Admin  
   • **IP**  
     • NTP  
     • Timezone  
     • SNMP  
     • SysLog  
 ▶ Port Configure  
 ▶ PoE  
 ▶ Advanced Configure  
   ▶ Security Configure  
   ▶ QoS Configure  
   ▶ Diagnostics  
   ▶ Maintenance

**IP Configuration**

Mode	Host
DNS Server 0	No DNS server
DNS Server 1	No DNS server
DNS Server 2	No DNS server
DNS Server 3	No DNS server
DNS Proxy	<input type="checkbox"/>

**IP Interfaces**

Delete	VLAN	DHCPv4			IPv4		DHCPv6			IPv6	
		Enable	Fallback	Current Lease	Address	Mask Length	Enable	Rapid Commit	Current Lease	Address	Mask Length
<input type="checkbox"/>	1	<input type="checkbox"/>	0		192.168.2.2	24	<input type="checkbox"/>	<input type="checkbox"/>			

Add Interface

**IP Routes**

Delete	Network	Mask Length	Gateway	Next Hop VLAN
<input type="checkbox"/>				

Add Route

Save Reset

**Information & Status**  
 ▶ MLD Snooping  
 ▶ DHCP  
 ▶ Security  
 ▶ QoS  
 ▶ Network Admin  
 ▶ Port Configure  
 ▶ PoE  
 ▶ Advanced Configure  
   • MAC Table  
   ▶ Ethernet Services  
     • **VLANs**  
     ▶ Port Isolation  
     • Loop Protection  
     ▶ Spanning Tree  
   ▶ IPMC Profile  
   • MEP  
   • ERPS  
   ▶ IGMP Snooping  
   ▶ IPv6 MLD Snooping  
   • LLDP

**Global VLAN Configuration**

Allowed Access VLANs	1
Ethertype for Custom S-ports	88A8

**Port VLAN Configuration**

Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
1	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
2	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
3	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
7	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
8	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
9	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
10	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	

3. Set SW1 as Ring1, the type is Major, and set control VLAN as 3002. Enable APS Protocol in MEP, the type is R-APS. And set Port 7 as the East port, Port 8 as the West port. Port 8 is as the owner.

**Information & Status**  
 ▶ MLD Snooping  
 ▶ DHCP  
 ▶ Security  
 ▶ QoS  
 ▶ Network Admin  
 ▶ Port Configure  
 ▶ PoE  
 ▶ Advanced Configure  
   • MAC Table  
   ▶ Ethernet Services  
     • VLANs  
     ▶ Port Isolation  
     • Loop Protection  
     ▶ Spanning Tree  
   ▶ IPMC Profile  
   • **MEP**  
   • ERPS  
   ▶ IGMP Snooping  
   ▶ IPv6 MLD Snooping  
   • LLDP  
 ▶ Security Configure  
 ▶ QoS Configure  
 ▶ Diagnostics  
 ▶ Maintenance

**Maintenance Entity Point**

Delete	Instance	Domain	Mode	Direction	Residence Port	Level	Flow Instance	Tagged VID	This MAC	Alarm
<input type="checkbox"/>	Z	Port	Mep	Down	7	0		3002	9A-86-03-3B-69-08	<input checked="" type="checkbox"/>
<input type="checkbox"/>	8	Port	Mep	Down	8	0		3002	9A-86-03-3B-69-09	<input checked="" type="checkbox"/>

Add New MEP Save Reset

vlan

**MEP Configuration** Refresh

**Instance Data**

Instance	Domain	Mode	Direction	Residence Port	Flow Instance	Tagged VID	EPS Instance	This MAC
9	Port	Mep	Down	9		3003	2	9A-86-03-3B-58-0A

**Instance Configuration**

Level	Format	Domain Name	MEG id	MEP id	Tagged VID	Syslog	cLevel	cMEG	cMEP	cAIS	cLCK	cLoop	cConfig
0	ITU ICC		IC000MEG0000	1	3003	<input type="checkbox"/>	<input checked="" type="checkbox"/>						

**Peer MEP Configuration**

Delete	Peer MEP ID	Unicast Peer MAC	cLOC	cRDI	cPeriod	cPriority	cDEG
No Peer MEP Added							

**Functional Configuration**

Continuity Check				APS Protocol				
Enable	Priority	Frame rate	TLV	Enable	Priority	Cast	Type	Last Octet
<input type="checkbox"/>	0	1 f/sec	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	Multi	R-APS	1

**TLV Configuration**

Organization Specific TLV (Global)				
OUI First	OUI Second	OUI Third	Sub-Type	Value
0	0	12	1	2

**TLV Status**

Peer MEP ID	CC Organization Specific						CC Port Status		CC Interface Status	
	OUI First	OUI Second	OUI Third	Sub-Type	Value	Last RX	Value	Last RX	Value	Last RX
No Peer MEP Added										

**Link State Tracking**

**Enable**

**Ethernet Rapid Ring Protection Switching**

Delete	Ring ID	East Port	West Port	Ring Type	Interconnected Node	Major RRing ID	Alarm
<input type="checkbox"/>	1	7	8	Major	No	1	<input checked="" type="checkbox"/>

**Rapid Ring Configuration 1** Auto-refresh  Refresh

**Instance Data**

Ring ID	East Port	West Port	East Port SF MEP	West Port SF MEP	East Port APS MEP	West Port APS MEP	Ring Type
1	7	8	7	8	7	8	Major Ring

**Instance Configuration**

Configured	WTR(Wait to Restore) Time	Revertive	VLAN config
<input checked="" type="checkbox"/>	1min	<input checked="" type="checkbox"/>	VLAN Config

**RPL Configuration**

RPL Role	RPL Port	Clear
RPL_Owner	West Port	<input type="checkbox"/>

**Instance State**

Protection State	East Port	West Port	Transmit APS	East Port Receive APS	West Port Receive APS	WTR Remaining	RPL Un-blocked	No APS Received	East Port Block Status	West Port Block Status	FOP Alarm
Idle	OK	OK	NR RB BPR1	NR RB BPR1 9A-86-03-3B-69-08	NR RB BPR1 9A-86-03-3B-69-08	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Unblocked	Blocked	<input checked="" type="checkbox"/>

4. Set SW2-SW4 as Ring1, the type is Major, and set control VLAN as 3002. Enable APS Protocol in MEP, the type is R-APS. And set Port 7 as the East port, Port 8 as the West port. Different in the configuration of Port 8 in SW1, **no need to** set the port 8 of SW2-SW4 as the Owner.

**Rapid Ring Configuration 1** Auto-refre

**Instance Data**

Ring ID	East Port	West Port	East Port SF MEP	West Port SF MEP	East Port APS MEP	West Port APS MEP	Ring
1	7	8	7	8	7	8	Maj

**Instance Configuration**

Configured	WTR(Wait to Restore) Time	Revertive	VLAN config
<input checked="" type="checkbox"/>	1min	<input checked="" type="checkbox"/>	VLAN Config

**RPL Configuration**

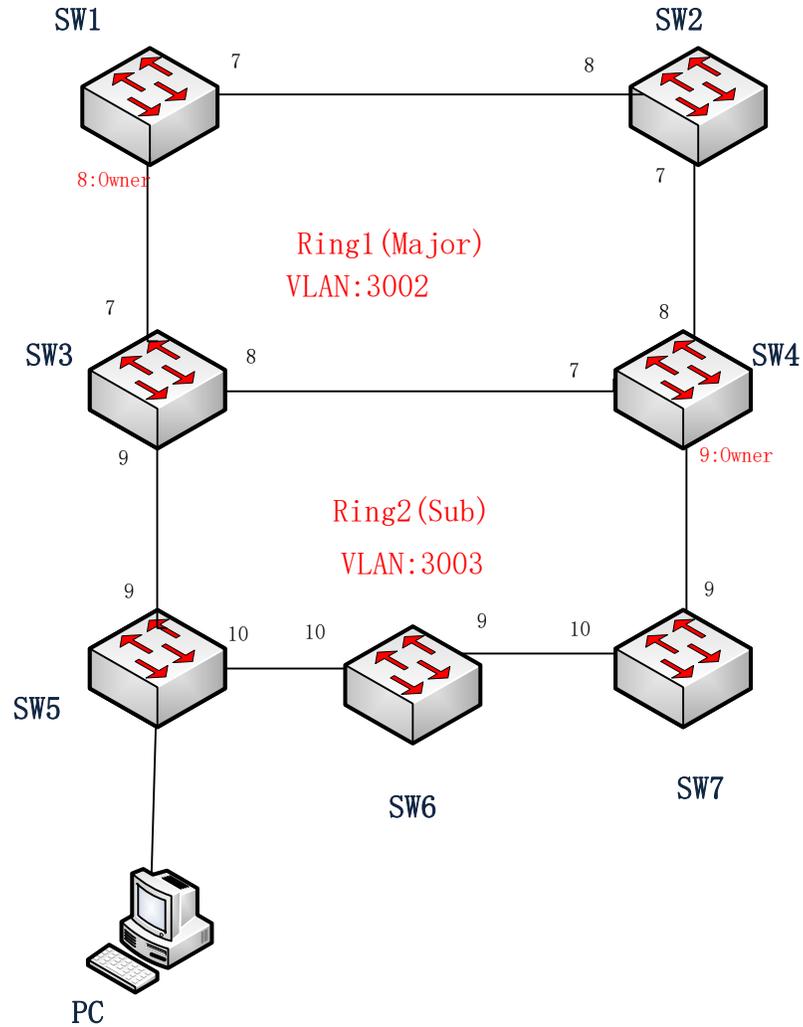
RPL Role	RPL Port	Clear
None	None	<input type="checkbox"/>

**Instance State**

Protection State	East Port	West Port	Transmit APS	East Port Receive APS	West Port Receive APS	WTR Remaining	RPL Un-blocked	No APS Received	East Port Block Status	W

## B. Coupling-ring Configuration

1. Form SW1 - SW7 to a coupling ring through ERPS, Users can ping SW1-SW7 in PC, also can ping them if Ring is disconnected.



2. Set the IP of SW1-SW7 as (192.168.2.1) - (192.168.2.7), and set the port to trunk port, which is used to connect with the ring.

- Information & Status
- MLD Snooping
- DHCP
- Security
- QoS
- Network Admin
  - IP**
  - NTP
  - Timezone
  - SNMP
  - SysLog
- Port Configure
- PoE
- Advanced Configure
  - Security Configure
  - QoS Configure
  - Diagnostics
  - Maintenance

### IP Configuration

Mode	Host
DNS Server 0	No DNS server
DNS Server 1	No DNS server
DNS Server 2	No DNS server
DNS Server 3	No DNS server
DNS Proxy	<input type="checkbox"/>

### IP Interfaces

Delete	VLAN	DHCPv4			IPv4		DHCPv6		IPv6	
		Enable	Fallback	Current Lease	Address	Mask Length	Enable	Rapid Commit	Current Lease	Address
<input type="checkbox"/>	1	<input type="checkbox"/>	0		192.168.2.2	24	<input type="checkbox"/>	<input type="checkbox"/>		

### IP Routes

Delete	Network	Mask Length	Gateway	Next Hop VLAN
<input type="button" value="Add Route"/>				

Information & Status  
MLD Snooping  
DHCP  
Security  
QoS  
Network Admin  
Port Configure  
PoE  
Advanced Configure  
MAC Table  
Ethernet Services  
VLANs  
Port Isolation  
Loop Protection  
Spanning Tree  
IPMC Profile  
MEP  
ERPS  
IGMP Snooping  
IPv6 MLD Snooping  
LLDP  
Security Configure

### Global VLAN Configuration

Allowed Access VLANs: 1  
Ethertype for Custom S-ports: 88A8

### Port VLAN Configuration

Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
*	<>	1	<>	<>	<>	<>	1	
1	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
2	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
3	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
7	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
8	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
9	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
10	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	

Save Reset

3. Set SW1 as Ring1, the type is Major, and set control VLAN as 3002. Enable APS Protocol in MEP, the type is R-APS. And set Port 7 as the East port, Port 8 as the West port. Port 8 is as the owner. New added VLAN 3003 to protect Ring1 from message in Ring2.

Information & Status  
MLD Snooping  
DHCP  
Security  
QoS  
Network Admin  
Port Configure  
PoE  
Advanced Configure  
MAC Table  
Ethernet Services  
VLANs  
Port Isolation  
Loop Protection  
Spanning Tree  
IPMC Profile  
MEP  
ERPS  
IGMP Snooping  
IPv6 MLD Snooping  
LLDP  
Security Configure  
QoS Configure  
Diagnostics  
Maintenance

### Maintenance Entity Point

Delete	Instance	Domain	Mode	Direction	Residence Port	Level	Flow Instance	Tagged VID	This MAC	Alarm
<input type="checkbox"/>	Z	Port	Mep	Down	7	0		3002	9A-86-03-3B-69-08	<span style="color: green;">●</span>
<input type="checkbox"/>	g	Port	Mep	Down	8	0		3002	9A-86-03-3B-69-09	<span style="color: green;">●</span>

Add New MEP Save Reset

vlan

**MEP Configuration** Refresh

**Instance Data**

Instance	Domain	Mode	Direction	Residence Port	Flow Instance	Tagged VID	EPS Instance	This MAC
9	Port	Mep	Down	9		3003	2	9A-86-03-3B-58-0A

**Instance Configuration**

Level	Format	Domain Name	MEG id	MEP id	Tagged VID	Syslog	cLevel	cMEG	cMEP	cAIS	cLCK	cLoop	cConfig
0	ITU ICC		IC000MEG0000	1	3003	<input type="checkbox"/>	<input checked="" type="checkbox"/>						

**Peer MEP Configuration**

Delete	Peer MEP ID	Unicast Peer MAC	cLOC	cRDI	cPeriod	cPriority	cDEG
No Peer MEP Added							

**Functional Configuration**

Continuity Check				APS Protocol				
Enable	Priority	Frame rate	TLV	Enable	Priority	Cast	Type	Last Octet
<input type="checkbox"/>	0	1 f/sec	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	Multi	R-APS	1

**TLV Configuration**

Organization Specific TLV (Global)				
OUI First	OUI Second	OUI Third	Sub-Type	Value
0	0	12	1	2

**TLV Status**

Peer MEP ID	CC Organization Specific						CC Port Status		CC Interface Status	
	OUI First	OUI Second	OUI Third	Sub-Type	Value	Last RX	Value	Last RX	Value	Last RX
No Peer MEP Added										

**Link State Tracking**

**Enable**

**Ethernet Rapid Ring Protection Switching**

Delete	Ring ID	East Port	West Port	Ring Type	Interconnected Node	Major RRing ID	Alarm
<input type="checkbox"/>	1	7	8	Major	No	1	<input checked="" type="checkbox"/>

**Rapid Ring Configuration 1** Auto-refresh  Refresh

**Instance Data**

Ring ID	East Port	West Port	East Port SF MEP	West Port SF MEP	East Port APS MEP	West Port APS MEP	Ring Type
1	7	8	7	8	7	8	Major Ring

**Instance Configuration**

Configured	WTR(Wait to Restore) Time	Revertive	VLAN config
<input checked="" type="checkbox"/>	1min	<input checked="" type="checkbox"/>	VLAN Config

**RPL Configuration**

RPL Role	RPL Port	Clear
RPL_Owner	West Port	<input type="checkbox"/>

**Instance State**

Protection State	East Port	West Port	Transmit APS	East Port Receive APS	West Port Receive APS	WTR Remaining	RPL Un-blocked	No APS Received	East Port Block Status	West Port Block Status	FOP Alarm
Idle	OK	OK	NR RB BPR1	NR RB BPR1 9A-86-03-3B-69-08	NR RB BPR1 9A-86-03-3B-69-08	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Unblocked	Blocked	<input checked="" type="checkbox"/>

**Rapid Ring VLAN Configuration 1**

Delete	VLAN ID
<input type="checkbox"/>	1
<input type="checkbox"/>	3003

4. Set SW2 as Ring1, the type is Major, and set control VLAN as 3002. And set Port 7 as the East port, Port 8 as the West port. New added VLAN 3003 to protect Ring1 from message in Ring2. The configuration of MEP is same with step 3.



**Maintenance Entity Point** Refresh

Delete	Instance	Domain	Mode	Direction	Residence Port	Level	Flow Instance	Tagged VID	This MAC	Alarm
<input type="checkbox"/>	Z	Port	Mep	Down	7	0		3002	9A-86-03-3C-79-08	<span style="color: green;">●</span>
<input type="checkbox"/>	g	Port	Mep	Down	8	0		3002	9A-86-03-3C-79-09	<span style="color: green;">●</span>

Add New MEP

**Ethernet Rapid Ring Protection Switching**

Delete	Ring ID	East Port	West Port	Ring Type	Interconnected Node	Major RRing ID	Alarm
<input type="checkbox"/>	1	7	8	Major	No	1	<span style="color: green;">●</span>

Add New Ring Group

**Rapid Ring Configuration 1** Auto-refresh  Refresh

**Instance Data**

Ring ID	East Port	West Port	East Port SF MEP	West Port SF MEP	East Port APS MEP	West Port APS MEP	Ring Type
1	7	8	7	8	7	8	Major Ring

**Instance Configuration**

Configured	WTR(Wait to Restore) Time	Revertive	VLAN config
<span style="color: green;">●</span>	1min	<input checked="" type="checkbox"/>	VLAN Config

**RPL Configuration**

RPL Role	RPL Port	Clear
None	None	<input type="checkbox"/>

**Instance State**

Protection State	East Port	West Port	Transmit APS	East Port Receive APS	West Port Receive APS	WTR Remaining	RPL Un-blocked	No APS Received	East Port Block Status	West Port Block Status	FOP Alarm
Idle	OK	OK		NR RB BPR1 9A-86-03-3B-69-08	NR RB BPR1 9A-86-03-3B-69-08	0	<span style="color: green;">●</span>	<span style="color: green;">●</span>	Unblocked	Unblocked	<span style="color: green;">●</span>

**Rapid Ring VLAN Configuration 1**

Delete	VLAN ID
<input type="checkbox"/>	1
<input type="checkbox"/>	3003

Buttons: Add New Entry, Back, Save, Reset

5. Set port 7-8 of SW3 as Ring1, the type is Major, and set control VLAN as 3002. And set Port 7 as the East port, Port 8 as the West port. New added VLAN 3003 to protect Ring1 from message in Ring2.

Set port 9-10 of SW3 as Ring2, the type is Major, and set control VLAN as 3003. And set Port 9 as the East port, Port 10 as the West port. New added VLAN 3002 to protect Ring2 from message in Ring1. Click Interconnected Node for RING1 and RING2.

### RING1:

**Maintenance Entity Point**

Delete	Instance	Domain	Mode	Direction	Residence Port	Level	Flow Instance	Tagged VID	This MAC	Alarm
<input type="checkbox"/>	7	Port	Mep	Down	7	0		3002	9A-86-03-3B-58-08	<span style="color: green;">●</span>
<input type="checkbox"/>	8	Port	Mep	Down	8	0		3002	9A-86-03-3B-58-09	<span style="color: green;">●</span>
<input type="checkbox"/>	9	Port	Mep	Down	9	0		3003	9A-86-03-3B-58-0A	<span style="color: green;">●</span>

Buttons: Add New MEP, Save, Reset



**Ethernet Rapid Ring Protection Switching**

Delete	Ring ID	East Port	West Port	Ring Type	Interconnected Node	Major RRing ID	Alarm
<input type="checkbox"/>	1	7	8	Major	Yes	1	<span style="color: green;">●</span>
<input type="checkbox"/>	2	9	-	Sub	Yes	1	<span style="color: green;">●</span>

**Rapid Ring Configuration 1** Auto-refresh

**Instance Data**

Ring ID	East Port	West Port	East Port SF MEP	West Port SF MEP	East Port APS MEP	West Port APS MEP	Ring Type
1	7	8	7	8	7	8	Major Ring

**Instance Configuration**

Configured	WTR(Wait to Restore) Time	Revertive	VLAN config
<span style="color: green;">●</span>	1min	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**RPL Configuration**

RPL Role	RPL Port	Clear
None	None	<input type="checkbox"/>

**Instance State**

Protection State	East Port	West Port	Transmit APS	East Port Receive APS	West Port Receive APS	WTR Remaining	RPL Un-blocked	No APS Received	East Port Block Status	West Port Block Status	FOP Alarm
Idle	OK	OK		NR RB BPR1 9A-86-03-3B- 69-08	NR RB BPR1 9A-86-03-3B- 69-08	0	<span style="color: green;">●</span>	<span style="color: green;">●</span>	Unblocked	Unblocked	<span style="color: green;">●</span>



- ▶ Information & Status
- ▶ MLD Snooping
- ▶ DHCP
- ▶ Security
- ▶ QoS
- ▶ Network Admin
- ▼ Port Configure
- ▶ PoE
- ▼ Advanced Configure
  - MAC Table
  - ▶ Ethernet Services
  - VLANs
  - ▶ Port Isolation
  - Loop Protection
  - ▶ Spanning Tree
  - ▶ IPMC Profile
  - MEP
  - ERPS
  - ▶ IGMP Snooping
  - ▶ IPV6 MLD Snooping
  - LLDP

## Rapid Ring VLAN Configuration 1

Delete	VLAN ID
<input type="checkbox"/>	1
<input type="checkbox"/>	3003

Add New Entry Back

Save Reset

## RING2:

- ▶ Information & Status
- ▶ MLD Snooping
- ▶ DHCP
- ▶ Security
- ▶ QoS
- ▶ Network Admin
- ▼ Port Configure
- ▶ PoE
- ▼ Advanced Configure
  - MAC Table
  - ▶ Ethernet Services
  - VLANs
  - ▶ Port Isolation
  - Loop Protection
  - ▶ Spanning Tree
  - ▶ IPMC Profile
  - MEP
  - ERPS
  - ▶ IGMP Snooping
  - ▶ IPV6 MLD Snooping
  - LLDP
- ▶ Security Configure
- ▶ QoS Configure
- ▶ Diagnostics
- ▶ Maintenance

### Rapid Ring Configuration 2

Auto-refresh  Refresh

Instance Data

Ring ID	East Port	West Port	East Port SF MEP	West Port SF MEP	East Port APS MEP	West Port APS MEP	Ring Type
2	9	0	9	0	9	0	Sub Ring

Instance Configuration

Configured	WTR(Wait to Restore) Time	Revertive	VLAN config
<input checked="" type="checkbox"/>	1min	<input checked="" type="checkbox"/>	VLAN.Config

RPL Configuration

RPL Role	RPL Port	Clear
None	None	<input type="checkbox"/>

Sub-Ring Configuration

Ring Type	Topology Change
Sub Ring	<input checked="" type="checkbox"/>

Instance State

Protection State	East Port	West Port	Transmit APS	East Port Receive APS	West Port Receive APS	WTR Remaining	RPL Un-blocked	No APS Received	East Port Block Status	West Port Block Status	FOP Alarm
Idle	OK	OK		NR RB BPR0 9A-86-03-3B- 3F-0A		0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Unblocked	Unblocked	<input checked="" type="checkbox"/>

Save Reset

The screenshot shows a configuration page for 'Rapid Ring VLAN Configuration 2'. On the left is a navigation menu with 'ERPS' highlighted. The main area contains a table with 'Delete' and 'VLAN ID' columns, listing VLANs 1 and 3002. Below the table are buttons for 'Add New Entry', 'Back', 'Save', and 'Reset'.

Delete	VLAN ID
<input type="checkbox"/>	1
<input type="checkbox"/>	3002

6. Same configuration with SW3 for SW4. The different is need to set port 9 as the owner.

The screenshot shows a configuration page for 'Rapid Ring Configuration 2'. The left menu has 'MEP' and 'ERPS' highlighted. The main area includes sections for Instance Data, Instance Configuration, RPL Configuration, Sub-Ring Configuration, and Instance State.

Ring ID	East Port	West Port	East Port SF MEP	West Port SF MEP	East Port APS MEP	West Port APS MEP	Ring Type
2	9	0	9	0	9	0	Sub Ring

Protection State	East Port	West Port	Transmit APS	East Port Receive APS	West Port Receive APS	WTR Remaining	RPL Unblocked	No APS Received	East Port Block Status	West Port Block Status	FOP Alarm
Idle	OK	OK	NR RB BPR0			0	<span style="color: green;">●</span>	<span style="color: green;">●</span>	Blocked	Unblocked	<span style="color: green;">●</span>

7. Set SW5 as Ring2, the type is Sub, and set control VLAN as 3003. And set Port 9 as the East port, Port 10 as the West port. New added VLAN 3002 to protect Ring2 from message in Ring1. Configuration of MEP is same with Step 3.



**Maintenance Entity Point**

Delete	Instance	Domain	Mode	Direction	Residence Port	Level	Flow Instance	Tagged VID	This MAC	Alarm
<input type="checkbox"/>	9	Port	Mep	Down	9	0		3003	9A-86-03-3A-3C-0A	<span style="color: green;">●</span>
<input type="checkbox"/>	10	Port	Mep	Down	10	0		3003	9A-86-03-3A-3C-0B	<span style="color: green;">●</span>

Buttons: Add New MEP, Save, Reset

Left sidebar menu: Information & Status, MLD Snooping, DHCP, Security, QoS, Network Admin, Port Configure, PoE, Advanced Configure (MAC Table, Ethernet Services, VLANs, Port Isolation, Loop Protection, Spanning Tree, IPMC Profile, **MEP**, ERPS, IGMP Snooping, IPv6 MLD Snooping, LLDP), Security Configure, QoS Configure, Diagnostics, Maintenance.

**Rapid Ring Configuration 2** Auto-refresh  Refresh

**Instance Data**

Ring ID	East Port	West Port	East Port SF MEP	West Port SF MEP	East Port APS MEP	West Port APS MEP	Ring Type
2	9	10	9	10	9	10	Sub Ring

**Instance Configuration**

Configured	WTR(Wait to Restore) Time	Revertive	VLAN config
<span style="color: green;">●</span>	1min	<input checked="" type="checkbox"/>	VLAN Config

**RPL Configuration**

RPL Role	RPL Port	Clear
None	None	<input type="checkbox"/>

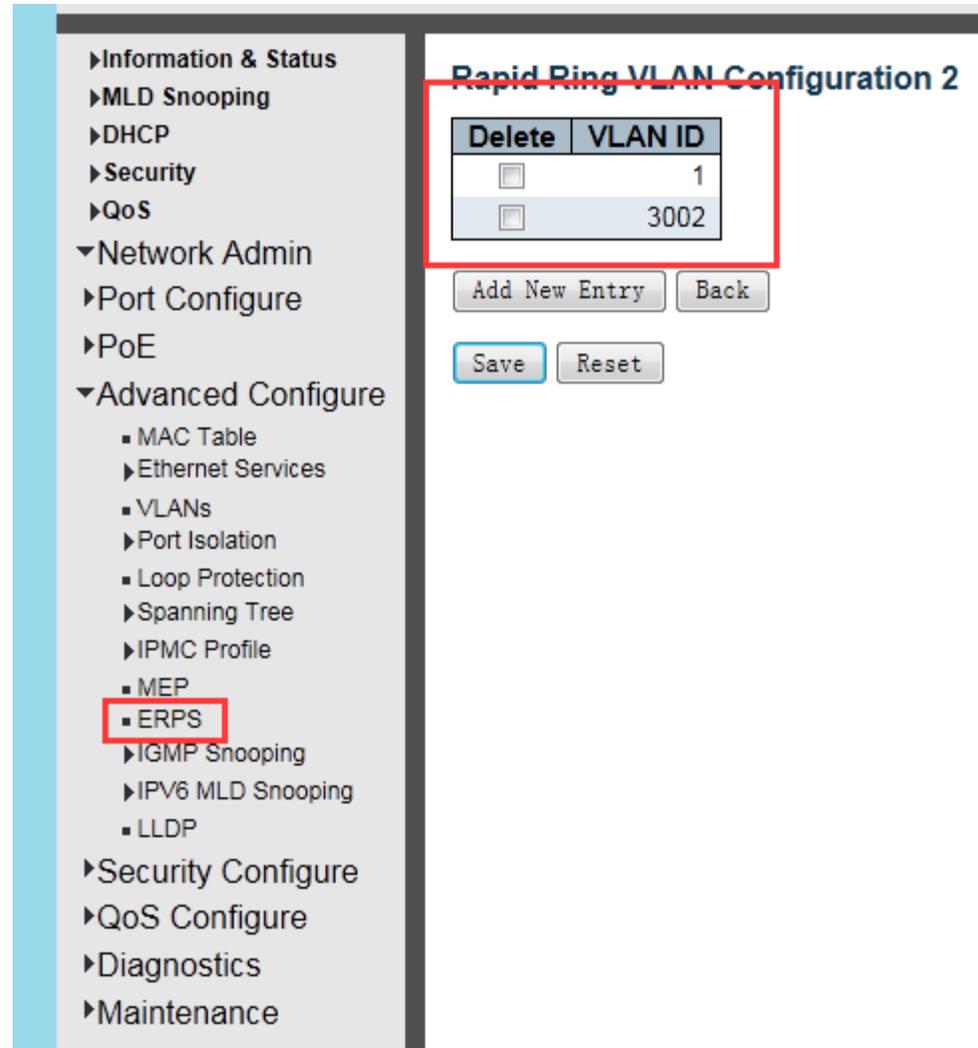
**Sub-Ring Configuration**

Ring Type	Topology Change
Sub Ring	<input checked="" type="checkbox"/>

**Instance State**

Protection State	East Port	West Port	Transmit APS	East Port Receive APS	West Port Receive APS	WTR Remaining	RPL Un-blocked	No APS Received	East Port Block Status	West Port Block Status	FOP Alarm
Idle	OK	OK		NR RB BPR0 9A-86-03-3B-3F-0A		0	<span style="color: green;">●</span>	<span style="color: green;">●</span>	Unblocked	Unblocked	<span style="color: green;">●</span>

Left sidebar menu: Information & Status, MLD Snooping, DHCP, Security, QoS, Network Admin, Port Configure, PoE, Advanced Configure (MAC Table, Ethernet Services, VLANs, Port Isolation, Loop Protection, Spanning Tree, IPMC Profile, MEP, **ERPS**, IGMP Snooping, IPv6 MLD Snooping, LLDP), Security Configure, QoS Configure, Diagnostics, Maintenance.



The screenshot shows a network configuration interface. On the left is a navigation menu with the following items: Information & Status, MLD Snooping, DHCP, Security, QoS, Network Admin, Port Configure, PoE, Advanced Configure (with sub-items: MAC Table, Ethernet Services, VLANs, Port Isolation, Loop Protection, Spanning Tree, IPMC Profile, MEP, ERPS, IGMP Snooping, IPV6 MLD Snooping, LLDP), Security Configure, QoS Configure, Diagnostics, and Maintenance. The ERPS item is highlighted with a red box. On the right, the 'Rapid Ring VLAN Configuration 2' page is shown, featuring a table with two columns: 'Delete' and 'VLAN ID'. The table contains two rows: one with a checkbox and '1', and another with a checkbox and '3002'. Below the table are buttons for 'Add New Entry', 'Back', 'Save', and 'Reset'. The 'Save' button is highlighted with a blue border.

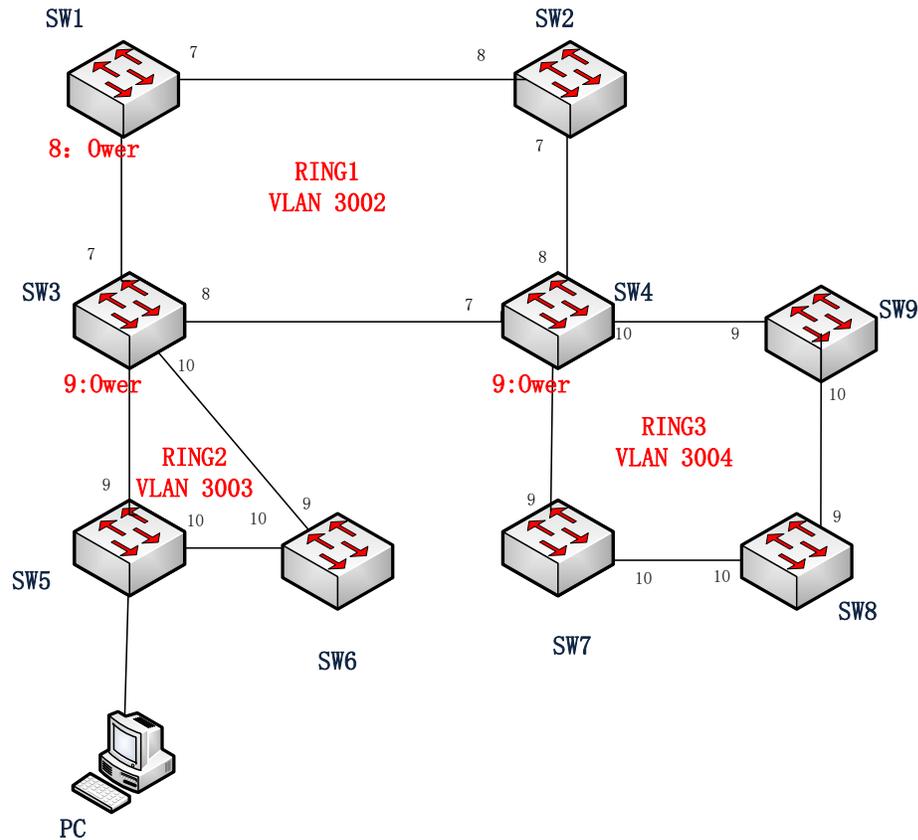
Delete	VLAN ID
<input type="checkbox"/>	1
<input type="checkbox"/>	3002

8. Configuration of SW6 & SW7 is same with SW5.

9. Test the configuration result. Users can ping SW1-SW7 in PC, also can ping them if the ring is connected.

## C. Intersecting-ring Configuration

1. Form SW1 - SW9 to a intersecting ring through ERPS, Users can ping SW1 - SW9 in PC, also can ping them if Ring is disconnected.



2. Set the IP of SW1-SW9 as (192.168.2.1) - (192.168.2.9), and set the port to trunk port, which is used to connect with the ring.

- Information & Status
- MLD Snooping
- DHCP
- Security
- QoS
- Network Admin
  - IP**
  - NTP
  - Timezone
  - SNMP
  - SysLog
- Port Configure
- PoE
- Advanced Configure
  - Security Configure
  - QoS Configure
  - Diagnostics
  - Maintenance

### IP Configuration

Mode	Host
DNS Server 0	No DNS server
DNS Server 1	No DNS server
DNS Server 2	No DNS server
DNS Server 3	No DNS server
DNS Proxy	<input type="checkbox"/>

### IP Interfaces

Delete	VLAN	DHCPv4			IPv4		DHCPv6		IPv6	
		Enable	Fallback	Current Lease	Address	Mask Length	Enable	Rapid Commit	Current Lease	Address
<input type="checkbox"/>	1	<input type="checkbox"/>	0		192.168.2.2	24	<input type="checkbox"/>	<input type="checkbox"/>		

Add Interface

### IP Routes

Delete	Network	Mask Length	Gateway	Next Hop VLAN
<input type="checkbox"/>				

Add Route

Save Reset

**Global VLAN Configuration**

Allowed Access VLANs: 1  
Ethertype for Custom S-ports: 88A8

**Port VLAN Configuration**

Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
*	<>	1	<>	<>	<>	<>	1	
1	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
2	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
3	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1	
7	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
8	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
9	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
10	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	

Save Reset

3. Set SW1 as Ring1, the type is Major, and set control VLAN as 3002. Enable APS Protocol in MEP, the type is R-APS. And set Port 7 as the East port, Port 8 as the West port. Port 8 is as the owner. New added VLAN 3003 & 3004 to protect Ring1 from message in Ring2 & Ring3.

**Maintenance Entity Point** Refresh

Delete	Instance	Domain	Mode	Direction	Residence Port	Level	Flow Instance	Tagged VID	This MAC	Alarm
<input type="checkbox"/>	Z	Port	Mep	Down	7	0		3002	9A-86-03-3B-69-08	<input checked="" type="checkbox"/>
<input type="checkbox"/>	g	Port	Mep	Down	8	0		3002	9A-86-03-3B-69-09	<input checked="" type="checkbox"/>

Add New MEP Save Reset

vlan

**MEP Configuration** Refresh

**Instance Data**

Instance	Domain	Mode	Direction	Residence Port	Flow Instance	Tagged VID	EPS Instance	This MAC
9	Port	Mep	Down	9		3003	2	9A-86-03-3B-58-0A

**Instance Configuration**

Level	Format	Domain Name	MEG id	MEP id	Tagged VID	Syslog	cLevel	cMEG	cMEP	cAIS	cLCK	cLoop	cConfig
0	ITU ICC		IC000MEG0000	1	3003	<input type="checkbox"/>	<input checked="" type="checkbox"/>						

**Peer MEP Configuration**

Delete	Peer MEP ID	Unicast Peer MAC	cLOC	cRDI	cPeriod	cPriority	cDEG
No Peer MEP Added							

**Functional Configuration**

Continuity Check				APS Protocol				
Enable	Priority	Frame rate	TLV	Enable	Priority	Cast	Type	Last Octet
<input type="checkbox"/>	0	1 f/sec	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	Multi	R-APS	1

**TLV Configuration**

Organization Specific TLV (Global)				
OUI First	OUI Second	OUI Third	Sub-Type	Value
0	0	12	1	2

**TLV Status**

Peer MEP ID	CC Organization Specific						CC Port Status		CC Interface Status	
	OUI First	OUI Second	OUI Third	Sub-Type	Value	Last RX	Value	Last RX	Value	Last RX
No Peer MEP Added										

**Link State Tracking**

**Enable**

**Ethernet Rapid Ring Protection Switching**

Delete	Ring ID	East Port	West Port	Ring Type	Interconnected Node	Major RRing ID	Alarm
<input type="checkbox"/>	1	7	8	Major	No	1	<input checked="" type="checkbox"/>

**Rapid Ring Configuration 1** Auto-refresh  Refresh

**Instance Data**

Ring ID	East Port	West Port	East Port SF MEP	West Port SF MEP	East Port APS MEP	West Port APS MEP	Ring Type
1	7	8	7	8	7	8	Major Ring

**Instance Configuration**

Configured	WTR(Wait to Restore) Time	Revertive	VLAN config
<input checked="" type="checkbox"/>	1min	<input checked="" type="checkbox"/>	VLAN Config

**RPL Configuration**

RPL Role	RPL Port	Clear
RPL_Owner	West Port	<input type="checkbox"/>

**Instance State**

Protection State	East Port	West Port	Transmit APS	East Port Receive APS	West Port Receive APS	WTR Remaining	RPL Unblocked	No APS Received	East Port Block Status	West Port Block Status	FOP Alarm
Idle	OK	OK	NR RB BPR1	NR RB BPR1 9A-86-03-3B-69-08	NR RB BPR1 9A-86-03-3B-69-08	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Unblocked	Blocked	<input checked="" type="checkbox"/>

**Rapid Ring VLAN Configuration 1**

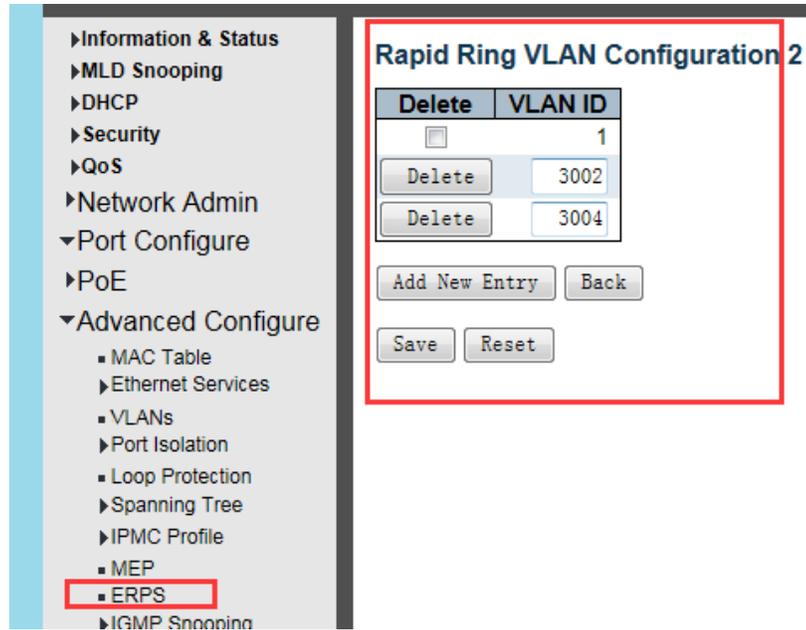
Delete	VLAN ID
<input type="checkbox"/>	1
<input type="checkbox"/>	3003
<input type="button" value="Delete"/>	<input type="text" value="3004"/>

4. Configuration of SW2 is same with SW1.









Information & Status  
MLD Snooping  
DHCP  
Security  
QoS  
Network Admin  
Port Configure  
PoE  
Advanced Configure  
MAC Table  
Ethernet Services  
VLANs  
Port Isolation  
Loop Protection  
Spanning Tree  
IPMC Profile  
MEP  
ERPS  
IGMP Snooping

### Rapid Ring VLAN Configuration 2

Delete	VLAN ID
<input type="checkbox"/>	1
Delete	3002
Delete	3004

Add New Entry Back

Save Reset

7. Configuration of SW4 is same with SW3.

8. Configuration of SW6-9 is same with SW5.