

Ring Version 2 Application Guide

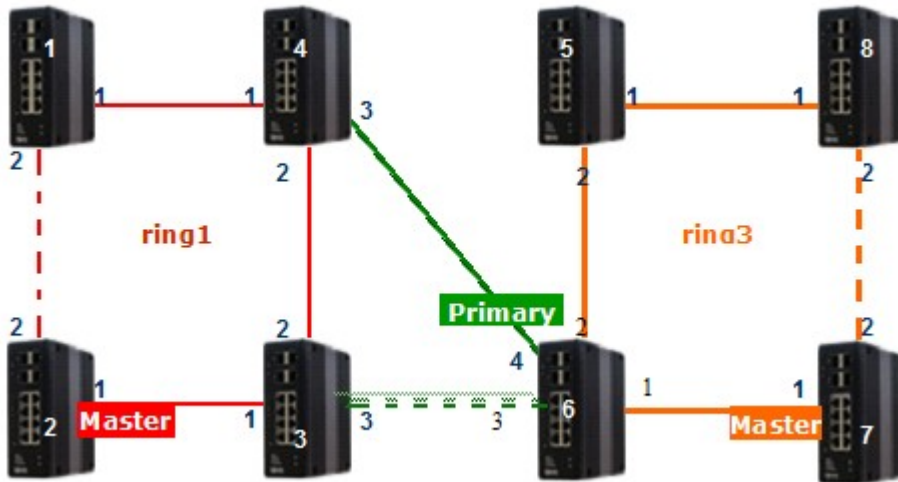
This document is introduction of the Industrial Ethernet Switch Software Spec for Ringv2.

In our current design, one device could support 3 ring index, they are include ring, coupling, dual-homing, chain, and balancing-chain.

Ring Configuration			
Index	Mode	Role	Ring Port(s)

- Note 1 - It must enable group1 before configure group2 as coupling.
- Note 2 - When group1 or group2 is enabled, the configuration of group3 is invisible.
- Note 3 - When group3 is enabled, the configuration of group1 and group3 is invisible.

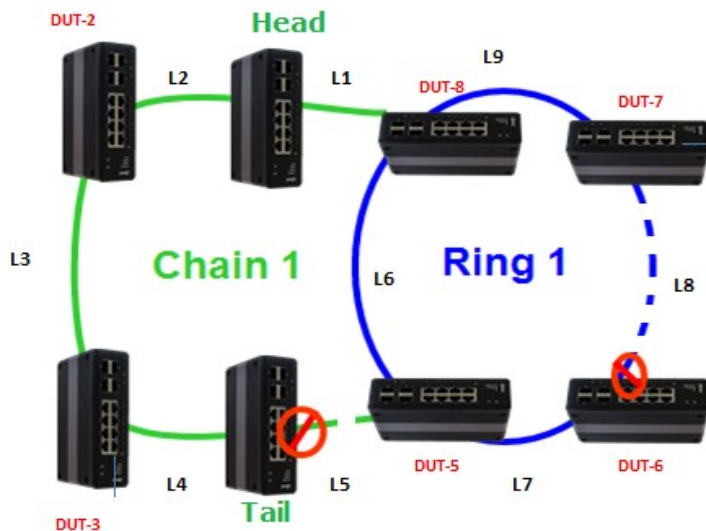
Dual-Homing



When role is dual-homing, one ring port is primary port and another is backup port. This backup port is redundant port. In normal state, it is blocked.

Group 3 - It support configuration of the **chain** and **balancing-chain**.

Chain - it could be head, tail or member.

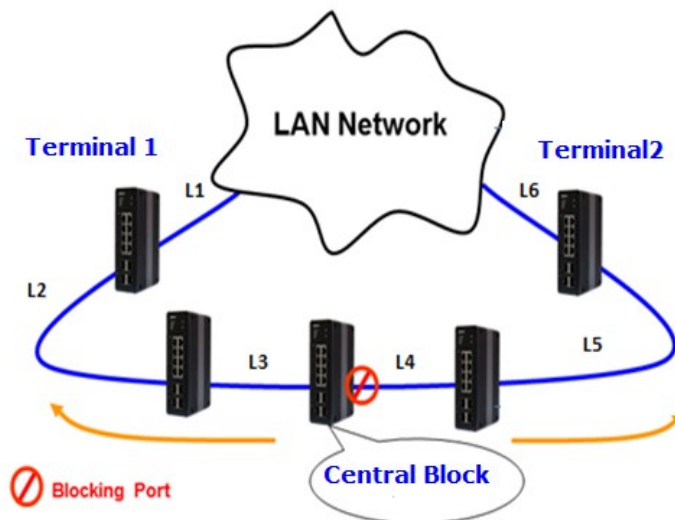


When role is chain/head, one ring port is head port and another is member port. Both ring ports are forwarded in normal state.

When role is chain/tail, one ring port is tail port and another is member port. The tail port is redundant port. It is blocked in normal state.

When role is chain/member, both ring ports are member port. Both ring ports are forwarded in normal state.

Balancing Chain - it could be central-block, terminal-1/2 or member.



When role is balancing-chain/central-block, one ring port is member port and another is block port. The block port is redundant port. It is blocked in normal state.

When role is balancing-chain/terminal-1/2, one ring port is terminal port and another is member port. Both ring ports are forwarded in normal state.

When role is balancing-chain/member, both ring ports are member port. Both ring ports are forwarded in normal state.

Note 1 - It must enable group1 before configure group2 as coupling.

Note 2 - When group1 or group2 is enabled, the configuration of group3 is invisible.

Note 3 - When group3 is enabled, the configuration of group1 and group3 is invisible.

How to Configure Ringv2

First Step: Disable RSTP on All Ring Port

Configuration

- ▶ System
- ▶ Green Ethernet
- ▶ Ports
- ▶ DHCP
- ▶ Security
- ▶ Aggregation
- ▶ Loop Protection
- ▶ Spanning Tree
 - Bridge Settings
 - MSTI Mapping
 - MSTI Priorities
 - CIST Ports (1)
 - MSTI Ports
- ▶ IPMC Profile
- ▶ MVR
- ▶ IPMC
- ▶ LLDP
- ▶ MAC Table
- ▶ VLANs
- ▶ Private VLANs
- ▶ VCL
- ▶ Voice VLAN
- ▶ QoS
- ▶ Mirroring
- ▶ GVRP
- ▶ sFlow
- ▶ Ring

Monitor

- ▶ System
- ▶ Green Ethernet
- ▶ Ports
- ▶ DHCP
- ▶ Security
- ▶ LACP
- ▶ Loop Protection
- ▶ Spanning Tree
- ▶ MVR
- ▶ IPMC
- ▶ LLDP
- ▶ MAC Table
- ▶ VLANs
- ▶ VCL
- ▶ sFlow

STP CIST Port Configuration

CIST Aggregated Port Configuration

Port	STP Enabled	Path Cost	Priority	Admin Edge	Auto Edge	Restricted Role	TCN	BPDU Guard	Point-to-point
-	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Forced True

CIST Normal Port Configuration

Port	STP Enabled	Path Cost	Priority	Admin Edge	Auto Edge	Restricted Role	TCN	BPDU Guard	Point-to-point
*	<input checked="" type="checkbox"/>	<>	<>	<>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<>
1	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
2	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
3	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
4	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
5	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
6	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
7	<input type="checkbox"/> (2)	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
8	<input type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
9	<input type="checkbox"/> (3)	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
10	<input type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
11	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
12	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
13	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
14	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto

Save Reset

1. Go to “ConfigurationSpanning Tree→ CIST ports” Web page
2. Do not enable STP global.
3. Click “Save” bottom

Ring Master

- ▼ Configuration
 - ▶ System
 - ▶ Green Ethernet
 - ▶ Ports
 - ▶ DHCP
 - ▶ Security
 - ▶ Aggregation
 - ▶ Loop Protection
 - ▶ Spanning Tree
 - ▶ IPMC Profile
 - ▶ MVR
 - ▶ IPMC
 - ▶ LLDP
 - ▶ MAC Table
 - ▶ VLANs
 - ▶ Private VLANs
 - ▶ VCL
 - ▶ Voice VLAN
 - ▶ QoS
 - ▶ Mirroring
 - ▶ GVRP
 - ▶ sFlow
 - ▶ RingV2
- ▶ Monitor

RingV2 Configuration

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Enable	Ring(Master)	Forward Port : Port-3 Block Port : Port-4
2	Disable	Dual Homing	Primary Port : Port-7 Backup Port : Port-2
3	Disable	Chain(Member)	Member Port : Port-1 Member Port : Port-2

1. Go to "Configuration→Ringv2" Web page
2. Enable Group1, and Select Role be "Ring(Master)
3. Select one port link to neighbor devices be "Forward Port", another is "Block Port"

Ring Slave

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Enable	Ring(Slave)	Forward Port : Port-3 Forward Port : Port-4
2	Disable	Dual Homing	Primary Port : Port-1 Backup Port : Port-2
3	Disable	Chain(Member)	Member Port : Port-1 Member Port : Port-2

1. Go to "Configuration→Ringv2" Web page
2. Enable Group1, and Select Role be "Ring(Slave)
3. Select two port link to neighbor devices be "Forward Port".

Coupling

Primary

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Enable ▼	Ring(Slave) ▼	Forward Port : Port-3 ▼ Forward Port : Port-4 ▼
2	Enable ▼	Coupling(Primary) ▼	Primary Port : Port-6 ▼
3	Disable ▼	Chain(Member) ▼	Member Port : Port-1 ▼ Member Port : Port-2 ▼

1. Go to “Configuration→Ringv2” Web page
2. Enable Group1, and Select Role be “Ring(Slave)”
3. Select two port link to neighbor devices be “Forward Port”.
4. Enable Group2, and Select Role be “Coupling(Primary)”
5. Select one port link to above ring be “Primary Port”.

Coupling Backup

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Enable ▼	Ring(Slave) ▼	Forward Port : Port-3 ▼ Forward Port : Port-4 ▼
2	Enable ▼	Coupling(Backup) ▼	Backup Port : Port-5 ▼
3	Disable ▼	Chain(Member) ▼	Member Port : Port-1 ▼ Member Port : Port-2 ▼

1. Go to “Configuration→Ringv2” Web page
2. Enable Group1, and Select Role be “Ring(Slave)”
3. Select two port link to neighbor devices be “Forward Port”.
4. Enable Group2, and Select Role be “Coupling(Backup)”
5. Select one port link to above ring be “Backup Port”.

to “Configuration→Ringv2”

Dual-Homing

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Enable ▼	Ring(Master) ▼	Forward Port : Port-3 ▼ Block Port : Port-4 ▼
2	Enable ▼	Dual Homing ▼	Primary Port : Port-5 ▼ Backup Port : Port-6 ▼
3	Disable ▼	Chain(Member) ▼	Member Port : Port-1 ▼ Member Port : Port-2 ▼

1. Go to “Configuration→Ringv2” Web page
2. Enable Group2, and Select Role be “Dual Homing”
3. Select one port link to other ring be “Backup Port”,

Chain(Member)

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Disable	Ring(Slave)	Forward Port : Port-1 Forward Port : Port-2
2	Disable	Ring(Slave)	Backup Port : Port-1
3	Enable	Chain(Member)	Member Port : Port-1 Member Port : Port-2

Save
Reset

- Chain(Member)
- Chain(Head)
- Chain(Tail)
- Balancing Chain(Central Block)
- Balancing Chain(Terminal-1)
- Balancing Chain(Terminal-2)
- Balancing Chain(Member)

Chain(Head)

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Disable	Ring(Slave)	Forward Port : Port-1 Forward Port : Port-2
2	Disable	Ring(Slave)	Backup Port : Port-1
3	Enable	Chain(Head)	Member Port : Port-1 Head Port : Port-2

Save
Reset

1. Go to “Configuration→Ringv2” Web page
2. Enable Group3, and Select Role be “Chain(Head)”
3. Select one port link to other ring or networks be “Head Port”.

Chain(Tail)

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Disable	Ring(Slave)	Forward Port : Port-1 Forward Port : Port-2
2	Disable	Ring(Slave)	Backup Port : Port-1
3	Enable	Chain(Tail)	Member Port : Port-1 Tail Port : Port-2

Save
Reset

1. Go to “Configuration→Ringv2” Web page
2. Enable Group3, and Select Role be “Chain(Head)”
3. Select one port link to other ring or networks be “Head Port”.

Balance Chain(Central Block)

Ring Configuration			
Index	Mode	Role	Ring Port(s)
1	Disable	Ring(Slave)	Forward Port : Port-1 Block Port : Port-2
2	Disable	Ring(Slave)	Primary Port : Port-3 Backup Port : Port-4
3	Enable	Balancing Chain(Central Block)	Member Port : Port-1 Block Port : Port-2

Save Reset

1. Go to “Configuration→Ringv2” Web page
2. Enable Group3, and Select Role be “Balance Chain(Central Block)”
3. Select one port be “Block Port” which could distribute traffic loading

Balance Chain(Terminal)

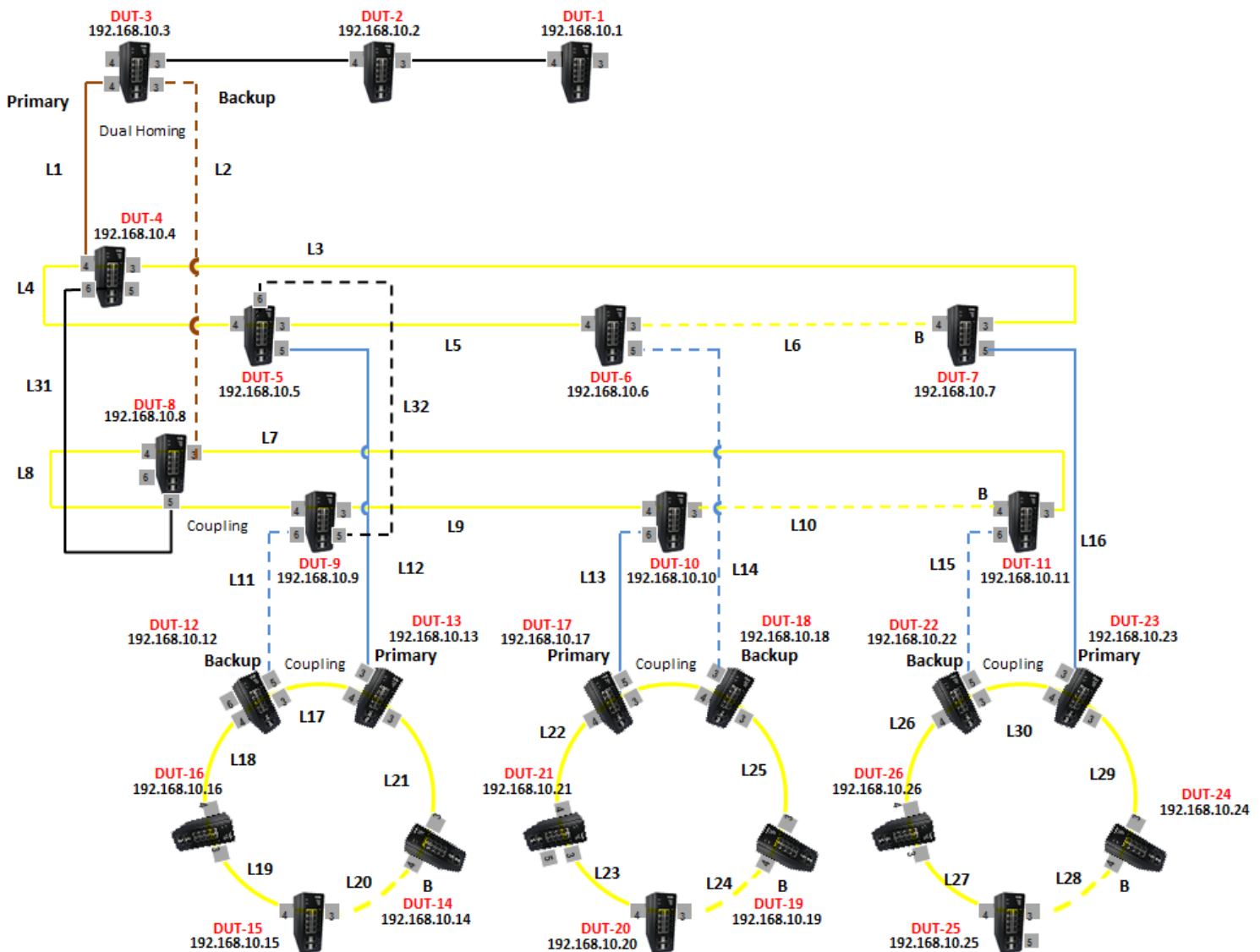
Ring Configuration			
Index	Mode	Role	Ring Port(s)
1	Disable	Ring(Slave)	Forward Port : Port-1 Forward Port : Port-2
2	Disable	Ring(Slave)	Backup Port : Port-1
3	Enable	Balancing Chain(Terminal-1)	Member Port : Port-1 Terminal Port : Port-2

Save Reset

- Chain(Member)
- Chain(Head)
- Chain(Tail)
- Balancing Chain(Central Block)
- Balancing Chain(Terminal-1)
- Balancing Chain(Terminal-2)
- Balancing Chain(Member)

1. Go to “Configuration→Ringv2” Web page
2. Enable Group3, and Select Role be “Balance Chain(Terminal-1(or2))”
3. Select one port be “Terminal Port” which connect to other ring group.

Application Scenario



DUT 3 is Dual-Homing to Ring1 and Ring2

DUT 4~7 are belong to Ring 1, DUT7 is master of Ring 1

DUT 8~11 are belong to Ring 2, DUT11 is master of Ring 2. DUT8 is coupling primary to Ring1, and DUT9 is coupling backup to Ring1.

DUT 12-16 are belong to Ring 3, DUT14 is master of Ring 3. DUT13 is coupling primary to Ring1, and DUT12 is coupling backup to Ring2.

DUT 17-21 are belong to Ring 4, DUT19 is master of Ring 4. DUT17 is coupling primary to Ring2, and DUT18 is coupling backup to Ring1

DUT 22-26 are belong to Ring 5, DUT24 is master of Ring 5. DUT23 is coupling primary to Ring1,

and DUT22 is coupling backup to Ring2.

Disable STP on all switch ring ports

Configuration

- System
- Green Ethernet
- Ports
- DHCP
- Security
- Aggregation
- Loop Protection
- Spanning Tree
- IPMC Profile
 - MVR
 - IPMC
 - LLDP
 - MAC Table
 - VLANs
 - Private VLANs
 - VCL
 - Voice VLAN
 - QoS
 - Mirroring
 - GVRP
 - sFlow
 - Ring
- Monitor**
- System
- Green Ethernet
- Ports
- DHCP
- Security
- LACP
- Loop Protection
- Spanning Tree
- MVR
- IPMC
- LLDP
- MAC Table
- VLANs
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- sFlow
- Ring

STP CIST Port Configuration

CIST Aggregated Port Configuration

Port	STP Enabled	Path Cost	Priority	Admin Edge	Auto Edge	Restricted Role	TCN	BPDU Guard	Point-to-point
-	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Forced True

CIST Normal Port Configuration

Port	STP Enabled	Path Cost	Priority	Admin Edge	Auto Edge	Restricted Role	TCN	BPDU Guard	Point-to-point
*	<input checked="" type="checkbox"/>	<>	<>	<>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<>
1	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
2	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
3	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
4	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
5	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
6	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
7	<input type="checkbox"/> (2)	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
8	<input type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
9	<input type="checkbox"/> (3)	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
10	<input type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
11	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/> (4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
12	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
13	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
14	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto

Save Reset

1. Go to “Configuration→Spanning Tree→ CIST ports” Web page
2. Do not enable on all Ring member ports
Click “Save” bottom.

On DUT3(Dual-Homing)

Configuration

- System
- Green Ethernet
- Ports
- DHCP
- Security
- Aggregation
- Loop Protection
- Spanning Tree
- IPMC Profile
 - MVR
 - IPMC
 - LLDP
 - MAC Table
 - VLANs
 - Private VLANs
 - VCL
 - Voice VLAN
 - QoS
 - Mirroring
 - GVRP
 - sFlow
 - RingV2
- Monitor**

RingV2 Configuration

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Enable	Ring(Master)	Forward Port : Port-3 Block Port : Port-4
2	Disable	Dual Homing	Primary Port : Port-7 Backup Port : Port-2 Member Port : Port-1
3	Disable	Chain(Member)	Member Port : Port-2

Save Reset

1. Go to “Configuration→RingV2” Web page
2. Enable Group2, and Select Role be “Dual Homing”
3. Select one port link to Ring2 or Ring3 be “Backup Port”, in this scenario backup port is on port 6 Click “Save” bottom

On DUT8, 13, 17, 23(Coupling Primary)

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Enable ▼	Ring(Slave) ▼	Forward Port : Port-3 ▼ Forward Port : Port-4 ▼
2	Enable ▼	Coupling(Primary) ▼	Primary Port : Port-6 ▼
3	Disable ▼	Chain(Member) ▼	Member Port : Port-1 ▼ Member Port : Port-2 ▼

1. Enable Group1, and Select Role be “Ring(Slave)”
2. Select two port link to neighbor devices be “Forward Port”.
3. Enable Group2, and Select Role be “Coupling(Primary)”
4. Select one port link to above ring be “Primary Port”.
5. Click “Save” bottom

On DUT9, 12, 18, 22(Coupling Backup)

G-RingV2 Configuration

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Enable ▼	Ring(Slave) ▼	Forward Port : Port-3 ▼ Forward Port : Port-4 ▼
2	Enable ▼	Coupling(Backup) ▼	Backup Port : Port-5 ▼
3	Disable ▼	Chain(Member) ▼	Member Port : Port-1 ▼ Member Port : Port-2 ▼

1. Enable Group1, and Select Role be “Ring(Slave)”
2. Select two port link to neighbor devices be “Forward Port”.
3. Enable Group2, and Select Role be “Coupling(Backup)”
4. Select one port link to above ring be “Backup Port”.
5. Click “Save” bottom

On DUT11, 14, 19, 24(Coupling Backup)

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Enable	Ring(Master)	Forward Port : Port-3 Block Port : Port-4
2	Disable	Dual Homing	Primary Port : Port-7 Backup Port : Port-2 Member Port : Port-1
3	Disable	Chain(Member)	Member Port : Port-2

1. Enable Group1, and Select Role be “Ring(Master)
2. Select one port link to neighbor devices be “Forward Port”, another is “Block Port”

Other devices are pure Ring Slave

Ring Configuration

Index	Mode	Role	Ring Port(s)
1	Enable	Ring(Slave)	Forward Port : Port-3 Forward Port : Port-4
2	Disable	Dual Homing	Primary Port : Port-1 Backup Port : Port-2 Member Port : Port-1
3	Disable	Chain(Member)	Member Port : Port-2

1. Enable Group1, and Select Role be “Ring(Slave)
2. Select two port link to neighbor devices be “Forward Port”.