

# EKI-7700 Series X-Ring Pro Configuration SOP

- For EKI-7700/7428 series, and some for EKI- 9600 Series

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# X-Ring Pro Configuration SOP

- General Approach to Configure X-Ring



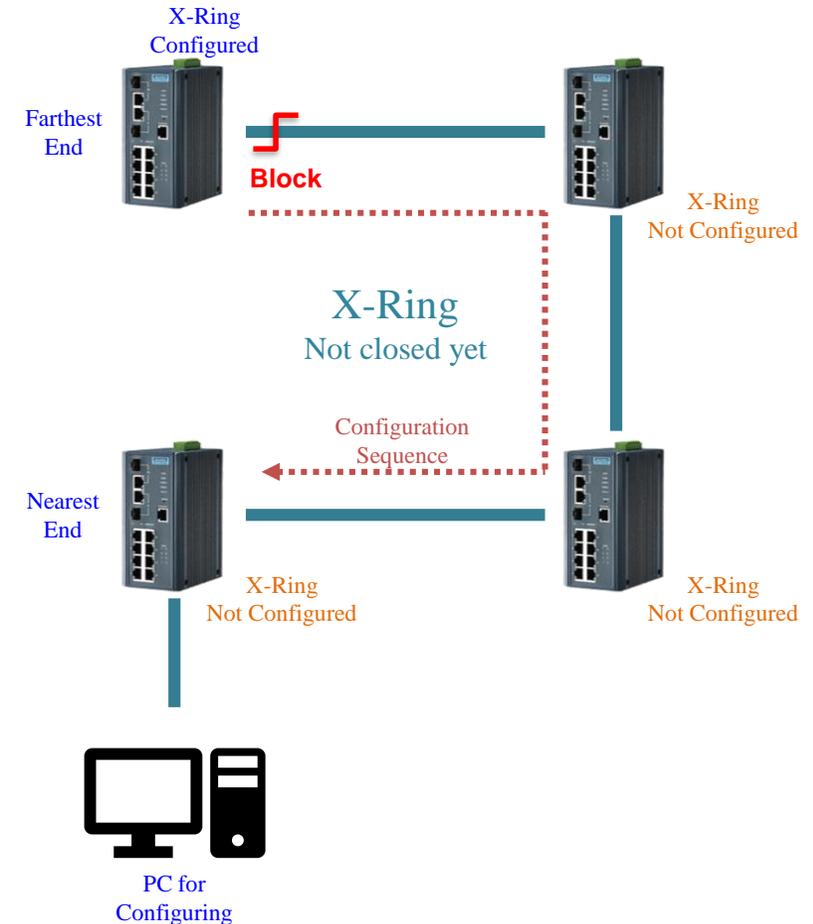
# General Approach to Configure X-Ring

X-Ring only works as expected when all the switches in the ring are configured correctly.

If the X-Ring is not configured on all switches in the specified topology, that possibly cause unexpected Blocking on some ports, even when the ring is not closed.

## Suggested Approach/Configuring Sequence:

1. Configure the X-Ring before connecting any of the links.
  - The best approach to avoid any potential problem. X-Ring will proceed the handshake when linked up.
2. If links has to be connected first: Synchronize the configuration through IXM.
  - The config synchronization is based on startup-config, so it will not take effect before switches are rebooted. Not going to cause Block during synchronization.
3. If links has to be connected first and not using IXM: Configure the X-Ring **from the farthest end to the nearest**.
  - The Blocking may possibly still shows up, but that doesn't affect the connection to the next switch. Will be unblocked after all the switches are configured with X-Ring.



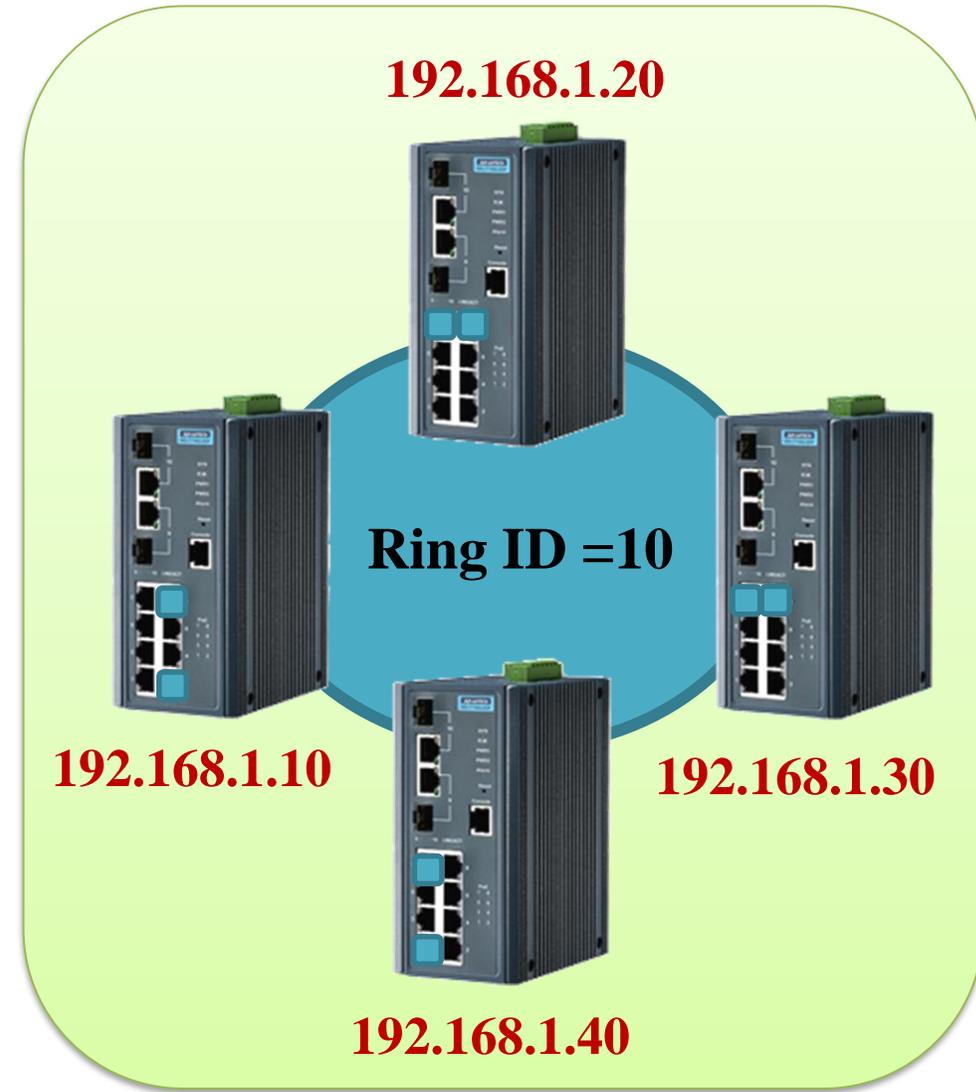
# X-Ring Pro Configuration SOP

- **Single Ring**
- Dual Ring – p.10
- Couple Ring – p.18
- Dual Homing – p.27
- X-Chain – p.32
- X-pair – p.38
- R-pair – p.46

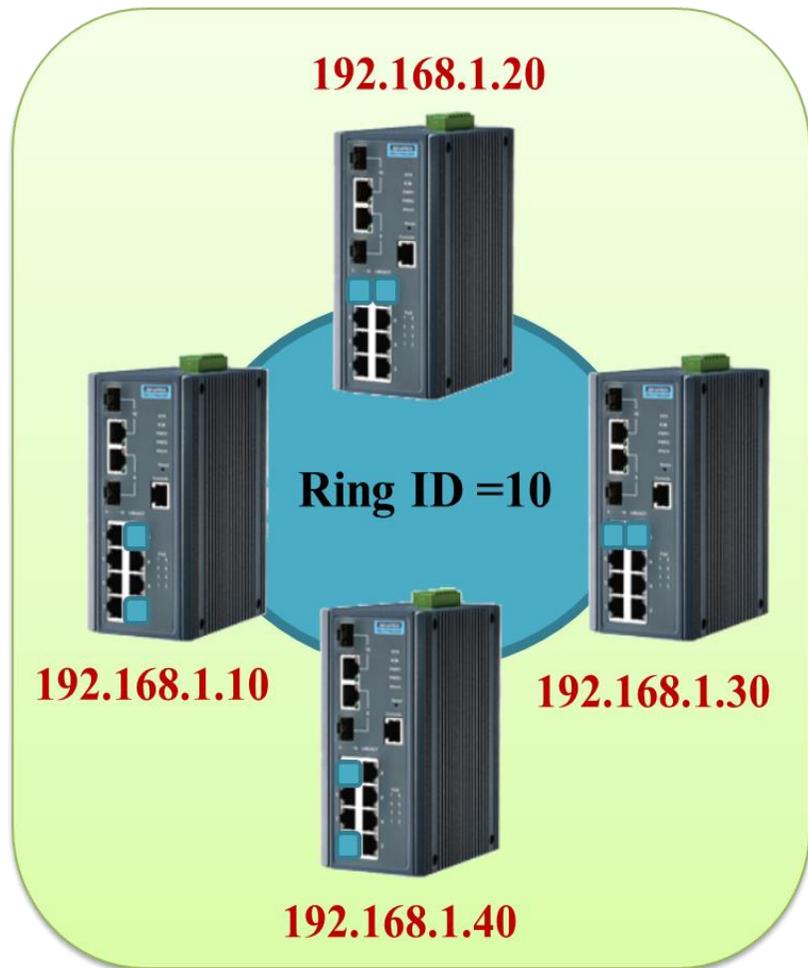


# Single Ring Structure

- There are 3 steps in configuration.
  1. Enabled X-Ring Pro.
  2. Select X-Ring type.
  3. Set up Ring's ID by ports.
- Please find out the X-Ring status.
  1. Web GUI
  2. Command Line Interface (CLI)
  3. R.M. (Ring Master) LED
  4. WebAccess/NMS



# Single Ring Configuration (1/2)



- For EKI-7710, the default X-Ring State is “Enabled”.

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Settings

X-Ring Pro Settings

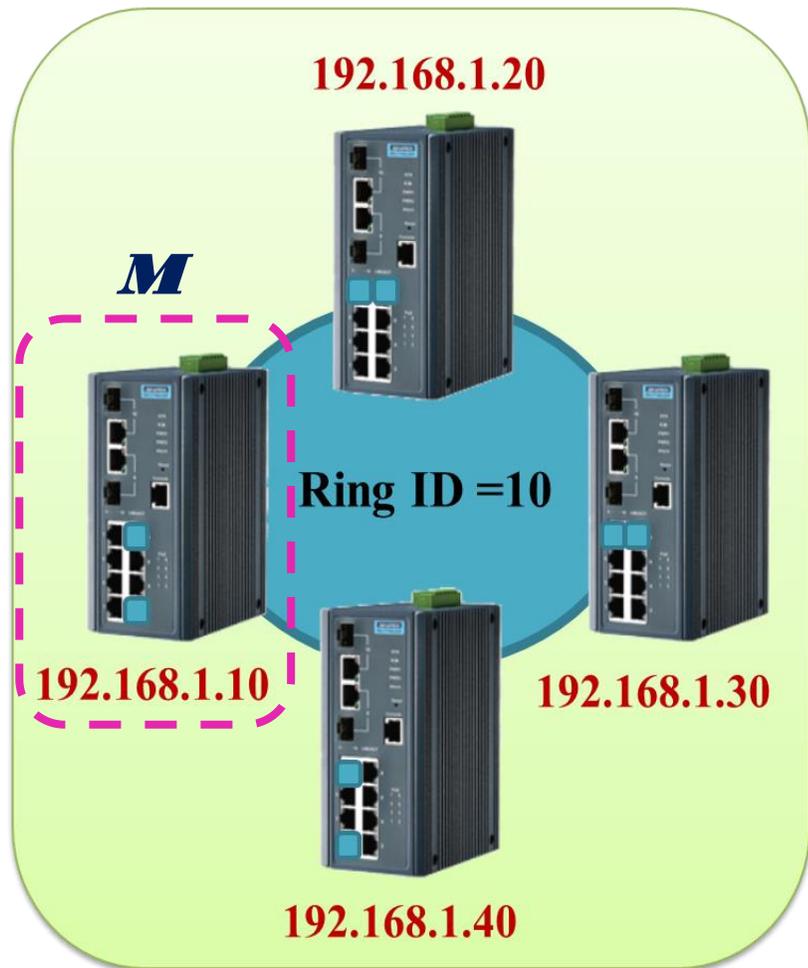
State  Enabled  Disabled

Apply

Information

Information Name	Information Value
X-Ring Pro State	Enabled

# Single Ring Configuration (2/2)



- Assign two X-Ring member ports in the ring group.
- The **Ring ID** within the same **X-Ring Pro group** switch **MUST** be identical.

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID	Port 1	Port 2	
<input type="text" value="10"/>	<input type="text" value="FE2"/>	<input type="text" value="FE8"/>	<input type="button" value="Add"/>

# Find Out the X-Ring Status – Web GUI

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

### X-Ring Pro Groups Settings

Ring ID:  Port 1:  Port 2:

### Chain Setting

Chain Ring ID:  Role:  Head Port:  Member Port:

### Couple Setting

Couple Ring ID:  Port:  Master Ring ID:

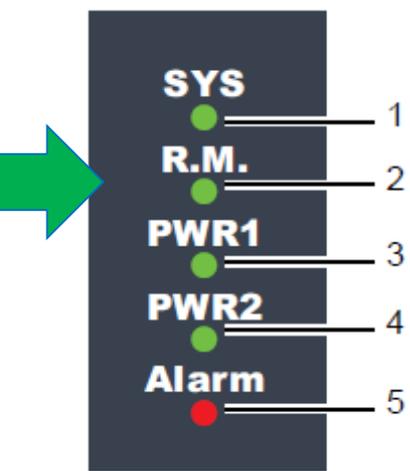


**Information**

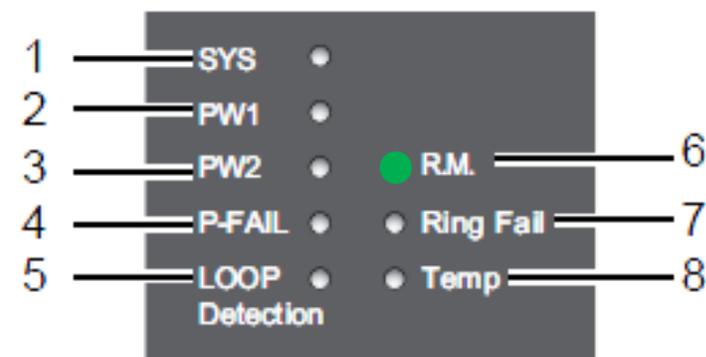
Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	MASTER	FE2	BLK	FE8	FWD	Delete

# Find Out the X-Ring Status – R.M. LED

- R.M. (Ring Master) LED: Ring Master Indicator
  - EKI-7710, EKI-7428



EKI-7710 System  
LED Panel



EKI-7428 System  
LED Panel

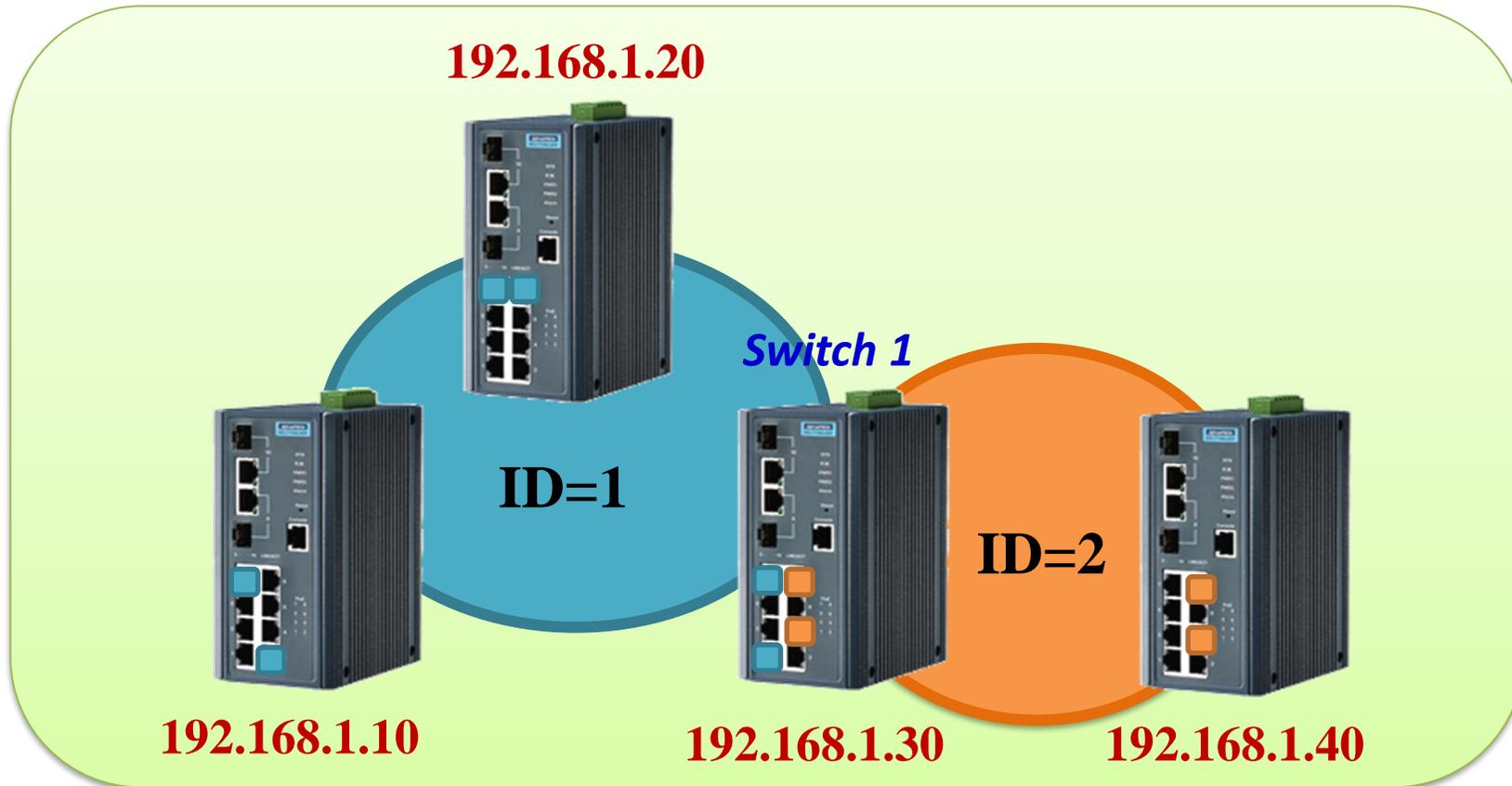
# X-Ring Pro Configuration SOP

- Single Ring
- **Dual Ring**
- Couple Ring
- Dual Homing
- X-Chain
- X-pair
- R-pair



# Dual Ring Structure

- There are 2 steps in Dual Ring .
  1. Enabled X-Ring Pro.
  2. Set up Ring's ID by ports.



# Dual Ring Configuration (1/5)

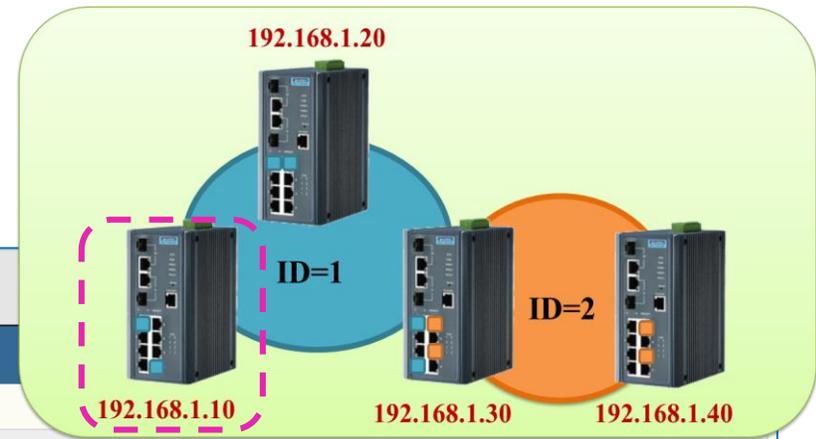
The screenshot displays the Advantech web interface for an EKI-7710E-2CPI-AE Intelligent Industrial Switch. The breadcrumb trail indicates the path: Switch / L2 Switching / X-Ring Pro / X-Ring Pro Settings. The main content area shows the X-Ring Pro Settings panel, where the State is set to Enabled. Below this, an information table shows the X-Ring Pro State as Enabled.

**1. L2 Switching -> X-Ring Pro Settings**

**2. Enabled X-Ring Pro**

Information Name	Information Value
X-Ring Pro State	Enabled

# Dual Ring Configuration (2/5)



**ADANTECH** EKI-7710E-2CPI-AE Intelligent Industrial Switch

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

**X-Ring Pro Groups Settings**

Ring ID	Port 1	Port 2	
1	FE2	FE7	Add

**Couple Setting**

Couple Ring ID	Port	Master Ring ID	
1-255	Select Port	1	Add

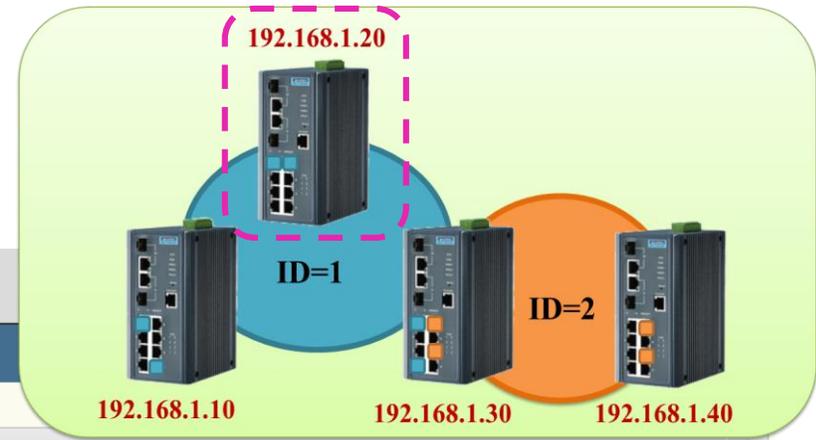
**Information**

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	TRANSIT	FE2	FWD	FE7	FWD	Delete

1. L2 Switching -> X-Ring Pro Groups

2. Set up 192.168.1.10 Ring's ID by ports

# Dual Ring Configuration (3/5)



**ADANTECH** EKI-7710G-2CPI-AE Intelligent Industrial Switch

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

**X-Ring Pro Groups Settings**

Ring ID	Port 1	Port 2	
1	GE7	GE8	Add

**Couple Setting**

Couple Ring ID	Port	Master Ring ID	
1-255	Select Port	1	Add

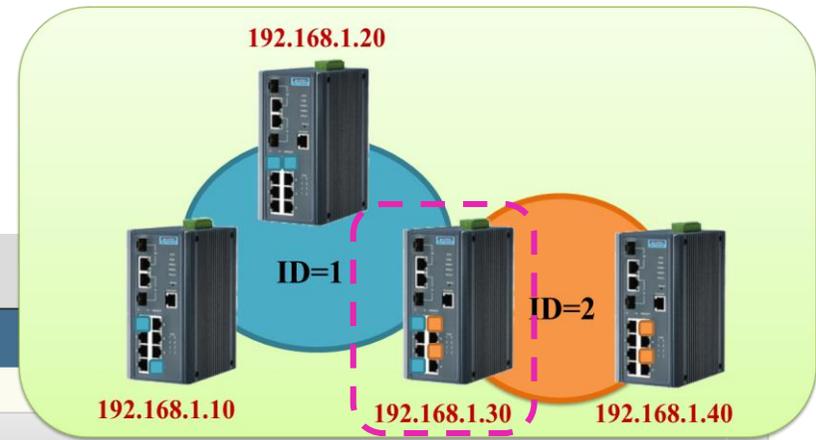
**Information**

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	TRANSIT	GE7	FWD	GE8	FWD	Delete

1. L2 Switching -> X-Ring Pro Groups

2. Set up 192.168.1.20 Ring's ID by ports

# Dual Ring Configuration (4/5)



ADANTECH EKI-7710G-2CPI-AE Intelligent Industrial Switch

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID	Port 1	Port 2	
<input type="text" value="2"/>	<input type="text" value="GE4"/>	<input type="text" value="GE8"/>	<input type="button" value="Add"/>

2. Set up 192.168.1.30 Ring's ID by ports

Couple Setting

Couple Ring ID	Port	Master Ring ID	
<input type="text" value="1-255"/>	<input type="text" value="Select Port"/>	<input type="text" value="2"/>	<input type="button" value="Add"/>

Set up two Ring's ID, cause it is connection of two Rings.

Information

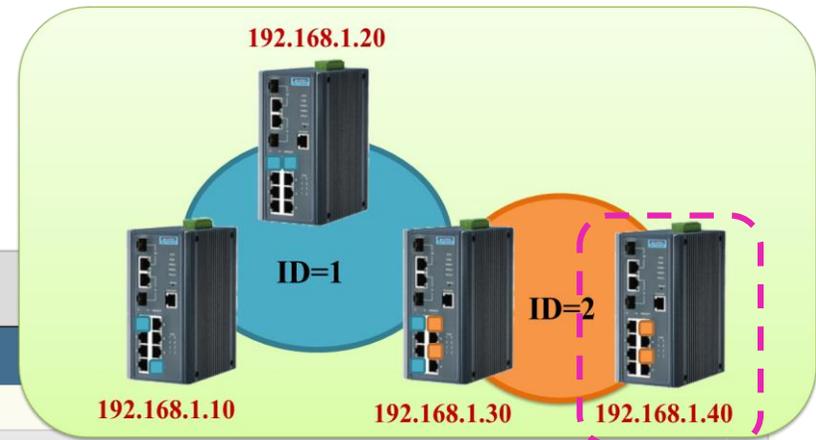
Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
2	Basic	TRANSIT	GE4	FWD	GE8	FWD	<input type="button" value="Delete"/>
1	Basic	MASTER	GE1	FWD	GE7	BLK	<input type="button" value="Delete"/>

1. L2 Switching -> X-Ring Pro Groups

X-Ring Pro Settings

X-Ring Pro Groups

# Dual Ring Configuration (5/5)



ADVANTECH EKI-7710E-2C-AE Intelligent Industrial Switch

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID	Port 1	Port 2	
2	FE8	FE4	Add

Couple Setting

Couple Ring ID	Port	Master Ring ID	
1-255	Select Port	2	Add

Information

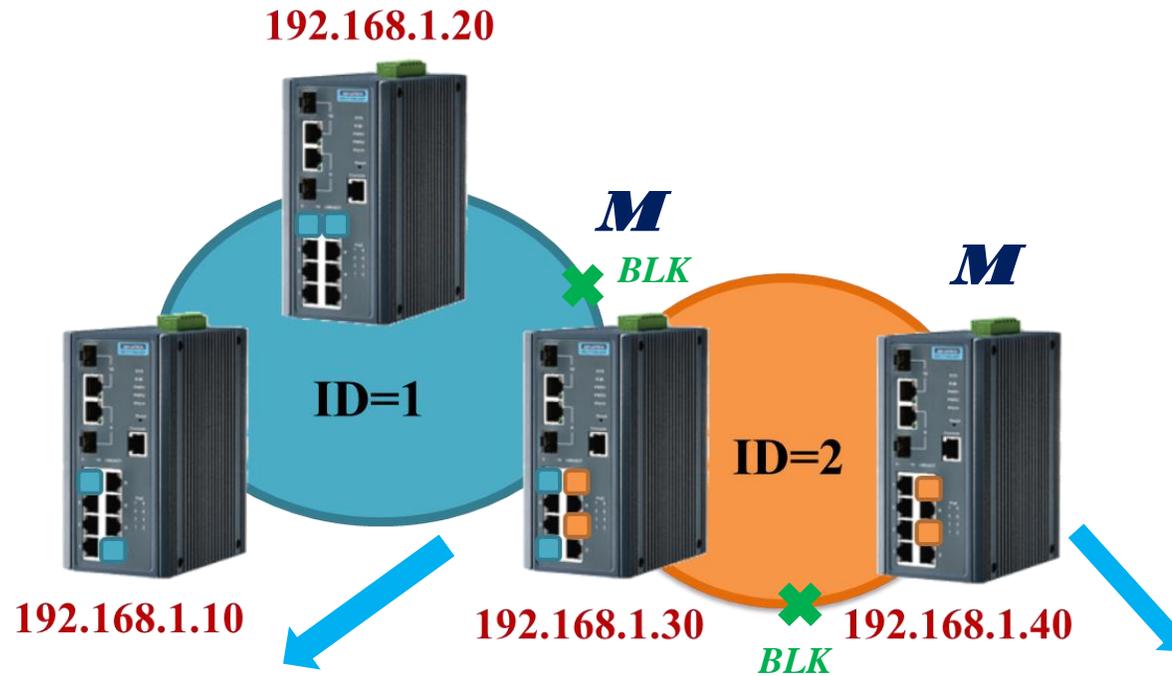
Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
2	Basic	MASTER	FE8	FWD	FE4	BLK	Delete

1. L2 Switching -> X-Ring Pro Groups

2. Set up 192.168.1.40 Ring's ID by ports

# Dual Ring Status

- CLI:
  - switch# show xring-plus



ID=2

ID=1

```
COM1 - PuTTY
switch# show ip
IP Address: 192.168.1.30
Subnet Netmask: 255.255.255.0
Default Gateway: 192.168.1.254
switch# show xring-plus
X-Ring Pro Information
X-Ring Pro Version:3.02
X-Ring Pro State :ENABLED

X-Ring Plus Ring ID..... 2
X-Ring Plus Ring Mode..... Basic
Operation State..... TRANSIT
Port GigabitEthernet4 Forwarding State..... FWD
Port GigabitEthernet8 Forwarding State..... FWD

X-Ring Plus Ring ID..... 1
X-Ring Plus Ring Mode..... Basic
Operation State..... MASTER
Port GigabitEthernet1 Forwarding State..... FWD
Port GigabitEthernet7 Forwarding State..... BLK
```

```
COM1 - PuTTY
switch# show ip
IP Address: 192.168.1.40
Subnet Netmask: 255.255.255.0
Default Gateway: 192.168.1.254
switch# show xring-plus
X-Ring Pro Information
X-Ring Pro Version:3.02
X-Ring Pro State :ENABLED

X-Ring Plus Ring ID..... 2
X-Ring Plus Ring Mode..... Basic
Operation State..... MASTER
Port FastEthernet8 Forwarding State..... FWD
Port FastEthernet4 Forwarding State..... BLK
```

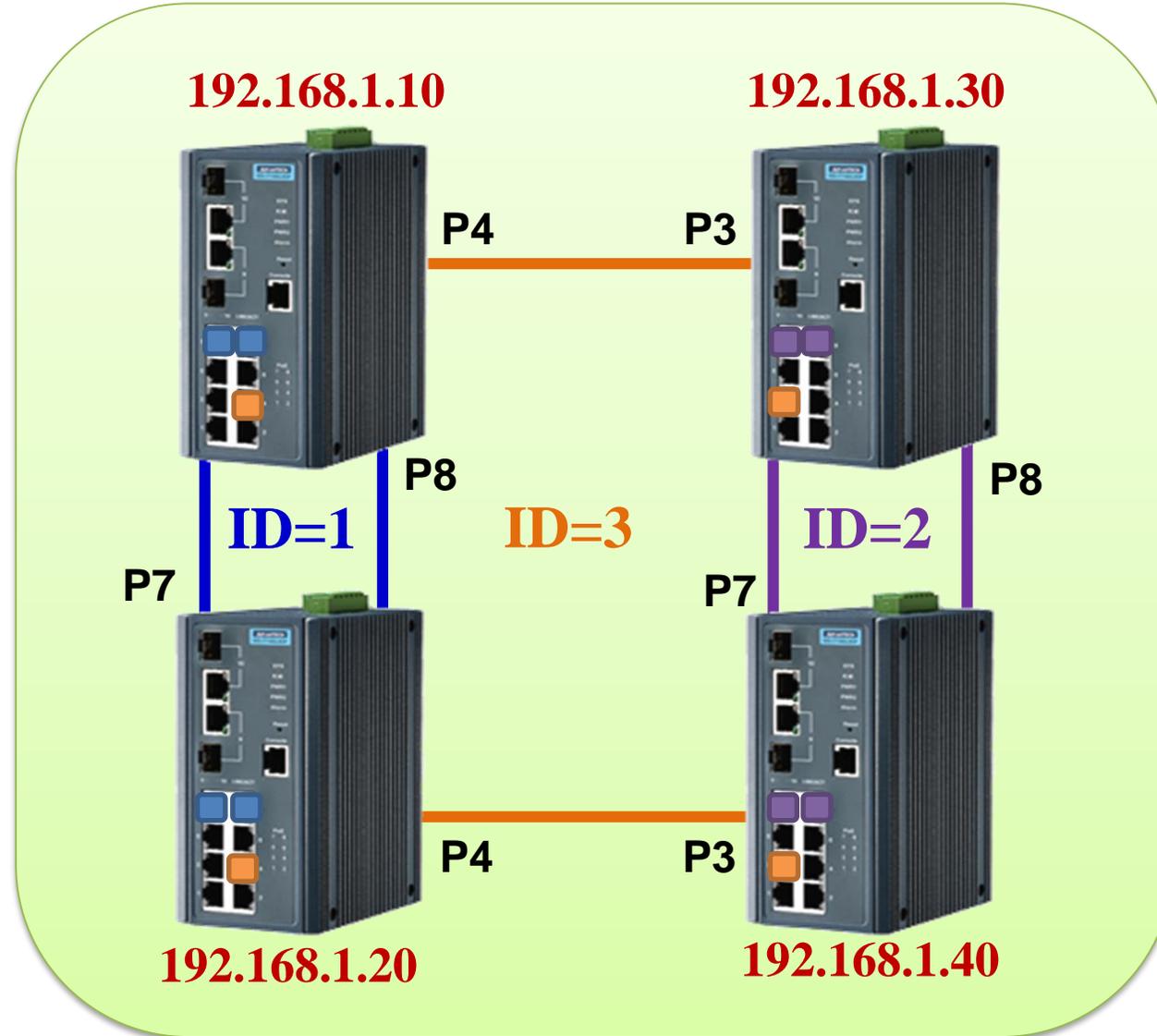
ID=2

# X-Ring Pro Configuration SOP

- Single Ring
- Dual Ring
- **Couple Ring**
- Dual Homing
- X-Chain
- X-pair
- R-pair



# Couple Ring Structure



# Couple Ring Configuration (1/5)

ADANTECH EKI-7710E-2CPI-AE Intelligent Industrial Switch

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Settings

X-Ring Pro Settings

State  Enabled  Disabled

Apply

2. Enabled X-Ring Pro

Information

Information Name	Information Value
X-Ring Pro State	Enabled

1. L2 Switching -> X-Ring Pro Groups

X-Ring Pro Settings

X-Ring Pro Groups

# Couple Ring Configuration (2/5)

**ADANTECH** EKI-7710E-2CPI-AE Intelligent Industrial Switch

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID	Port 1	Port 2	
1	FE7	FE8	Add

Couple Setting

Couple Ring ID	Port	Master Ring ID	
3	FE4	1	Add

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	EDGE	FE7	FWD	FE8	DWN	Delete
3	Couple	Disconnect	FE4	DWN			Delete

1. L2 Switching -> X-Ring Pro Groups

2. Set up 192.168.1.10 Ring's ID by ports

3. Couple Ring's ID

# Couple Ring Configuration (3/5)

**ADANTECH** EKI-7710G-2CPI-AE Intelligent Industrial Switch

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

### X-Ring Pro Groups Settings

Ring ID	Port 1	Port 2	
1	GE7	GE8	Add

**Couple Setting**

Couple Ring ID	Port	Master Ring ID	
3	GE4	1	Add

### Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
1	Basic	EDGE	GE7	FWD	GE8	DWN	Delete
3	Couple	Disconnect	GE4	DWN			Delete

**Diagram:** Four switches in a ring topology. Top-left: 192.168.1.10 (ID=1). Top-right: 192.168.1.30 (ID=2). Bottom-left: 192.168.1.20 (ID=3). Bottom-right: 192.168.1.40 (ID=3). Connections: 10-30, 30-40, 40-20, 20-10.

**1. L2 Switching -> X-Ring Pro Groups**

**2. Set up 192.168.1.20 Ring's ID by ports**

**3. Couple Ring's ID**

# Couple Ring Configuration (4/5)

**ADANTECH** EKI-7710G-2CPI-AE Intelligent Industrial Switch

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

X-Ring Pro Groups Settings

Ring ID	Port 1	Port 2	
2	GE7	GE8	Add

Couple Setting

Couple Ring ID	Port	Master Ring ID	
3	GE3	2	Add

Information

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
2	Basic	EDGE	GE7	DWN	GE8	FWD	Delete
3	Couple	Disconnect	GE3	DWN			Delete

1. L2 Switching -> X-Ring Pro Groups

2. Set up 192.168.1.30 Ring's ID by ports

3. Couple Ring's ID

192.168.1.10  
192.168.1.20  
192.168.1.30  
192.168.1.40

ID=1  
ID=3  
ID=2

# Couple Ring Configuration (5/5)

**ADVANTECH** EKI-7710E-2C-AE Intelligent Industrial Switch

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

**X-Ring Pro Groups Settings**

Ring ID	Port 1	Port 2	
2	FE7	FE8	Add

**Couple Setting**

Couple Ring ID	Port	Master Ring ID	
3	FE3	2	Add

**Information**

Ring ID	Mode	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
2	Basic	EDGE	FE7	DWN	FE8	FWD	Delete
3	Couple	Disconnect	FE3	DWN			Delete

**Diagram:** Four switches in a ring topology. Top-left: 192.168.1.10 (ID=1), Top-right: 192.168.1.30 (ID=2), Bottom-left: 192.168.1.20 (ID=3), Bottom-right: 192.168.1.40 (ID=2). Connections: 10-20, 20-30, 30-40, 40-10.

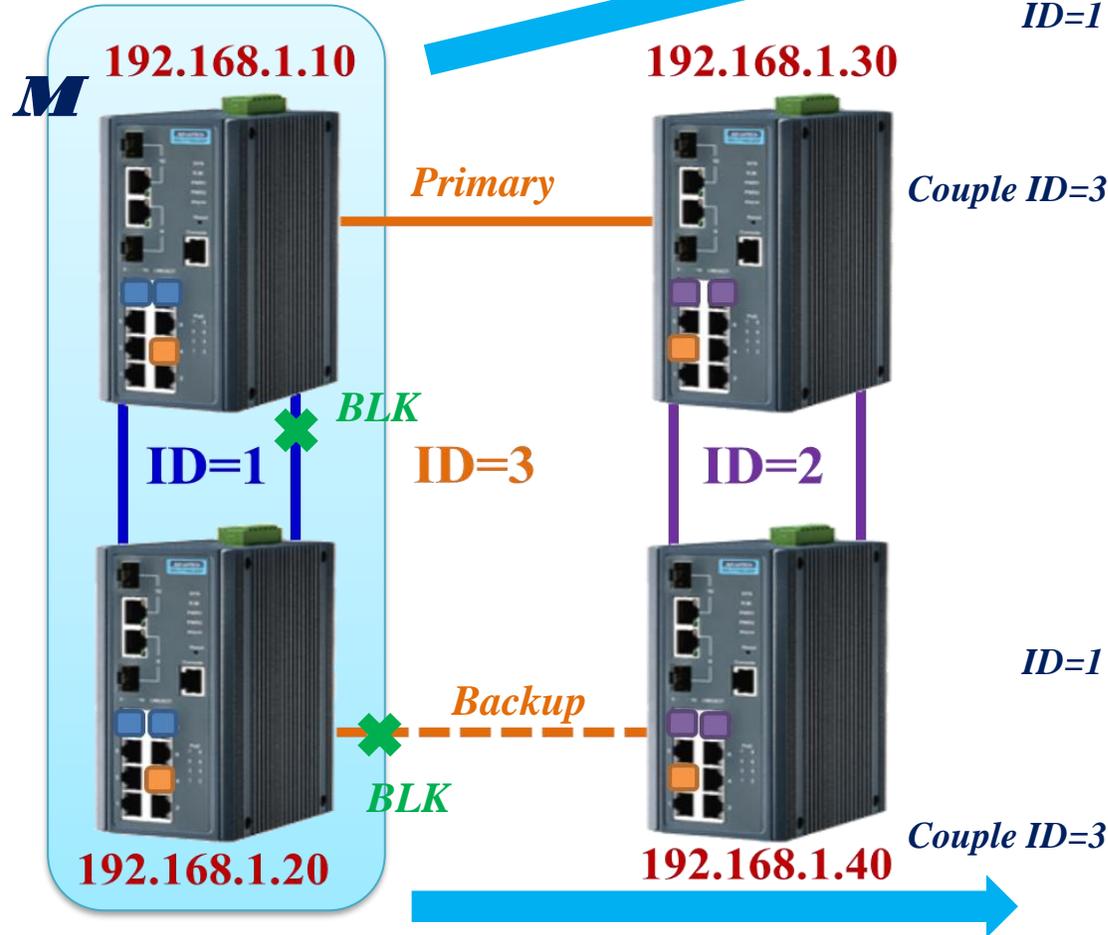
**Annotations:**

- 1. L2 Switching -> X-Ring Pro Groups
- 2. Set up 192.168.1.40 Ring's ID by ports
- 3. Couple Ring's ID

# Couple Ring Status (1/2)

■ CLI:

- switch# show xring-plus



```
COM1 - PuTTY
switch# show ip
IP Address: 192.168.1.10
Subnet Netmask: 255.255.255.0
Default Gateway: 192.168.1.254
switch# show xring-plus
X-Ring Pro Information
X-Ring Pro Version:3.02
X-Ring Pro State :ENABLED

X-Ring Plus Ring ID..... 1
X-Ring Plus Ring Mode..... Basic
Operation State..... MASTER
Port FastEthernet7 Forwarding State..... FWD
Port FastEthernet8 Forwarding State..... BLK

X-Ring Plus Ring ID..... 3
X-Ring Plus Ring Mode..... Couple
Operation State..... Primary
Port FastEthernet4 Forwarding State..... FWD
Master Ring ID..... 1
```

```
COM1 - PuTTY
switch# show ip
IP Address: 192.168.1.20
Subnet Netmask: 255.255.255.0
Default Gateway: 192.168.1.254
switch# show xring-plus
X-Ring Pro Information
X-Ring Pro Version:3.02
X-Ring Pro State :ENABLED

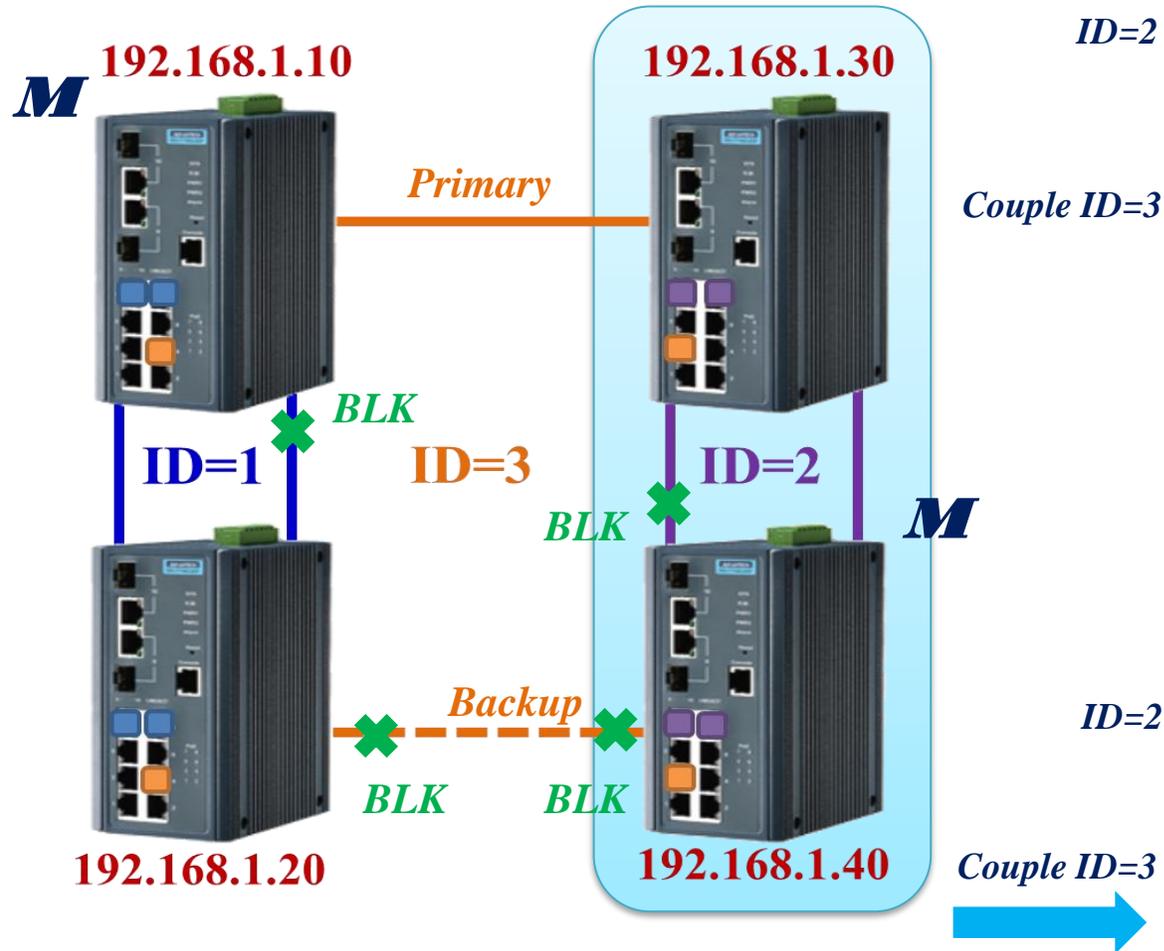
X-Ring Plus Ring ID..... 1
X-Ring Plus Ring Mode..... Basic
Operation State..... TRANSIT
Port GigabitEthernet7 Forwarding State..... FWD
Port GigabitEthernet8 Forwarding State..... FWD

X-Ring Plus Ring ID..... 3
X-Ring Plus Ring Mode..... Couple
Operation State..... Backup
Port GigabitEthernet4 Forwarding State..... BLK
Master Ring ID..... 1
```

# Couple Ring Status (2/2)

■ CLI:

- switch# show xring-plus



```
COM1 - PuTTY
switch# show ip
IP Address: 192.168.1.30
Subnet Netmask: 255.255.255.0
Default Gateway: 192.168.1.254
switch# show xring-plus
X-Ring Pro Information
X-Ring Pro Version:3.02
X-Ring Pro State :ENABLED

X-Ring Plus Ring ID..... 2
X-Ring Plus Ring Mode..... Basic
Operation State..... TRANSIT
Port GigabitEthernet7 Forwarding State..... FWD
Port GigabitEthernet8 Forwarding State..... FWD

X-Ring Plus Ring ID..... 3
X-Ring Plus Ring Mode..... Couple
Operation State..... Primary
Port GigabitEthernet3 Forwarding State..... FWD
Master Ring ID..... 2
```

```
COM1 - PuTTY
switch# show i[
Unknown command
switch# show ip
IP Address: 192.168.1.40
Subnet Netmask: 255.255.255.0
Default Gateway: 192.168.1.254
switch# show xring-plus
X-Ring Pro Information
X-Ring Pro Version:3.02
X-Ring Pro State :ENABLED

X-Ring Plus Ring ID..... 2
X-Ring Plus Ring Mode..... MASTER
Operation State..... MASTER
Port FastEthernet7 Forwarding State..... BLK
Port FastEthernet8 Forwarding State..... FWD

X-Ring Plus Ring ID..... 3
X-Ring Plus Ring Mode..... Couple
Operation State..... Backup
Port FastEthernet3 Forwarding State..... BLK
Master Ring ID..... 2
```

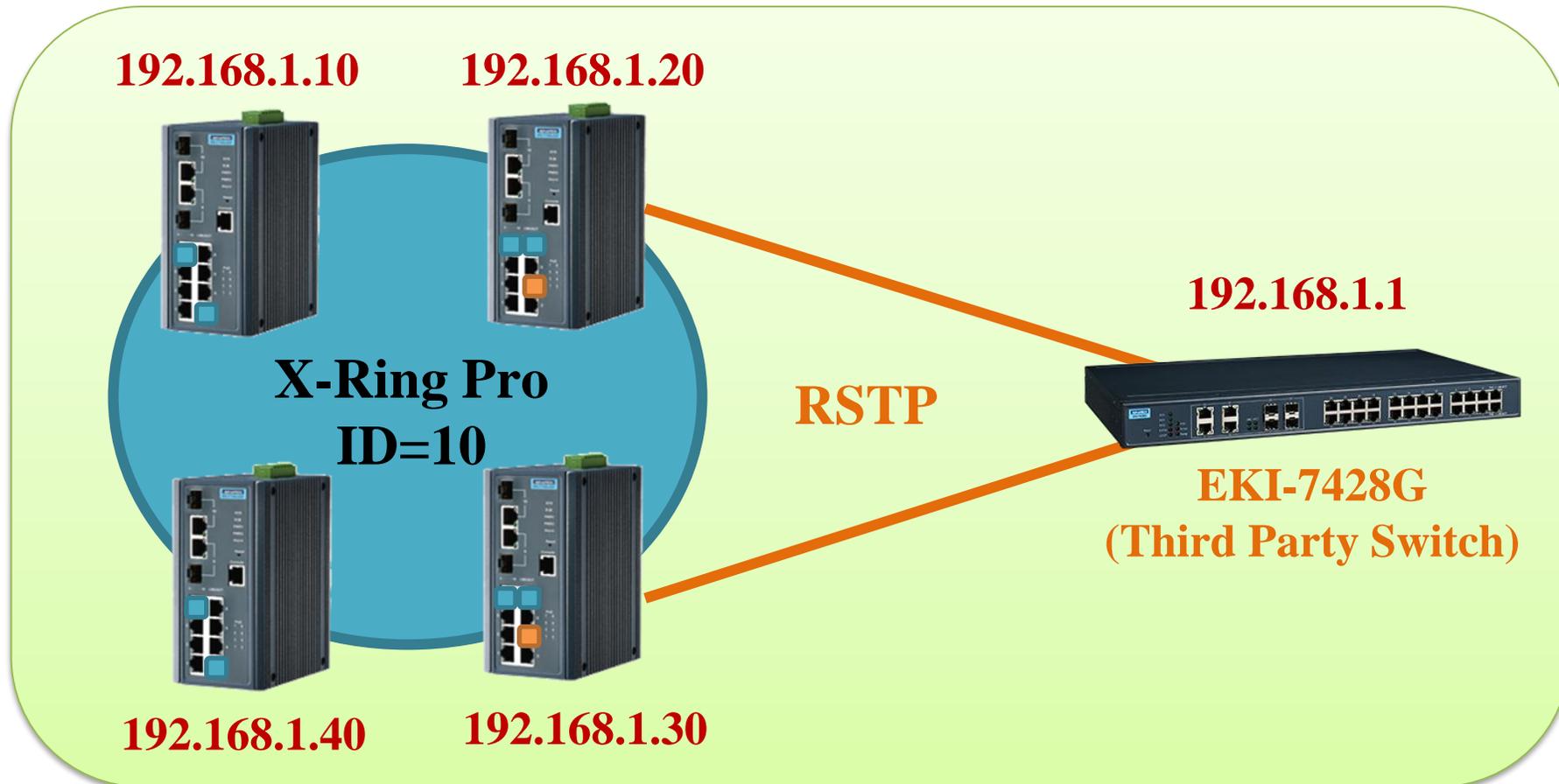
# X-Ring Pro Configuration SOP

- Single Ring
- Dual Ring
- Couple Ring
- **Dual Homing**
- X-Chain
- X-pair
- R-pair

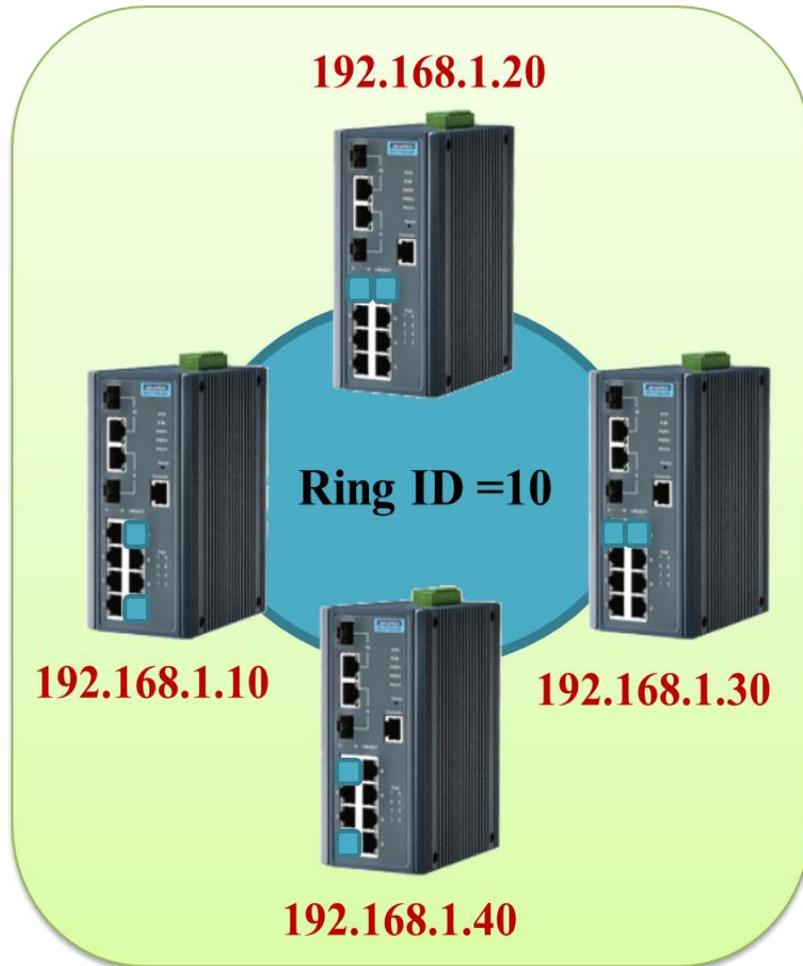


# Dual Homing Structure

- Dual Homing = **X-Ring** + **RSTP (Third Party Switch)**
- Enabling X-Ring Pro and STP on same port is always forbidden.



# Dual Homing Structure – X-Ring Single Ring Configuration



- For EKI-7710, the default X-Ring State is “Enabled”.

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Settings

X-Ring Pro Settings

State  Enabled  Disabled

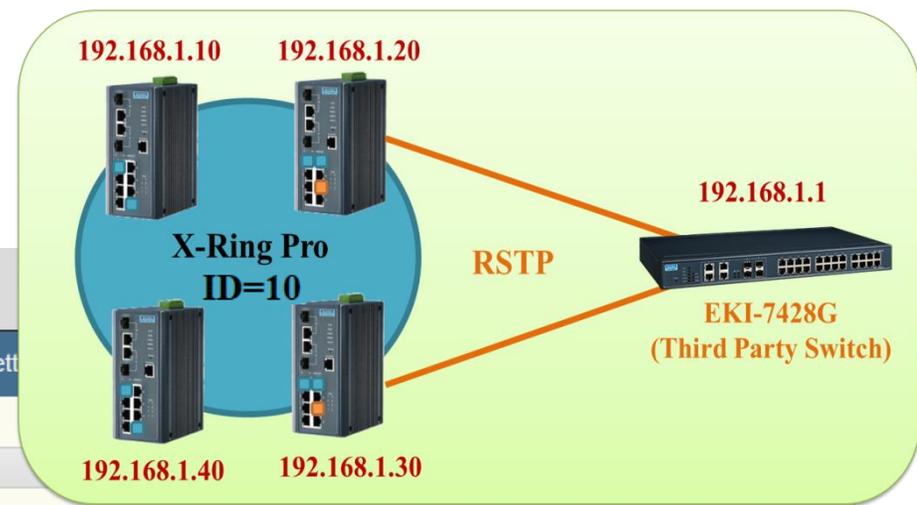
Apply

Information

Information Name	Information Value
X-Ring Pro State	Enabled

\*Please refer to the Single Ring part in this document for full configuration procedure.

# Dual Homing Configuration



**ADANTECH** EKI-7428G-4CPI-AE Intelligent Industrial Switch

Switch / L2 Switching / Spanning Tree / STP Global Settings

Global Settings

Enabled  Enabled  Disabled

BPDU Forward  flooding  filtering

PathCost Method  short  long

Force Version RSTP-Operation

Apply

STP Information

Information Name	Information Value
STP	Enabled
BPDU Forward	flooding
Force Version	RSTP-Operation

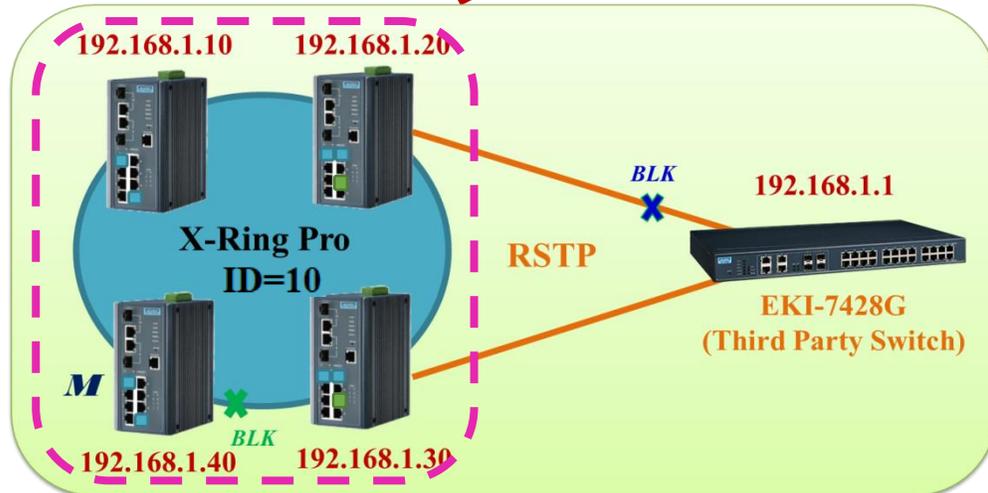
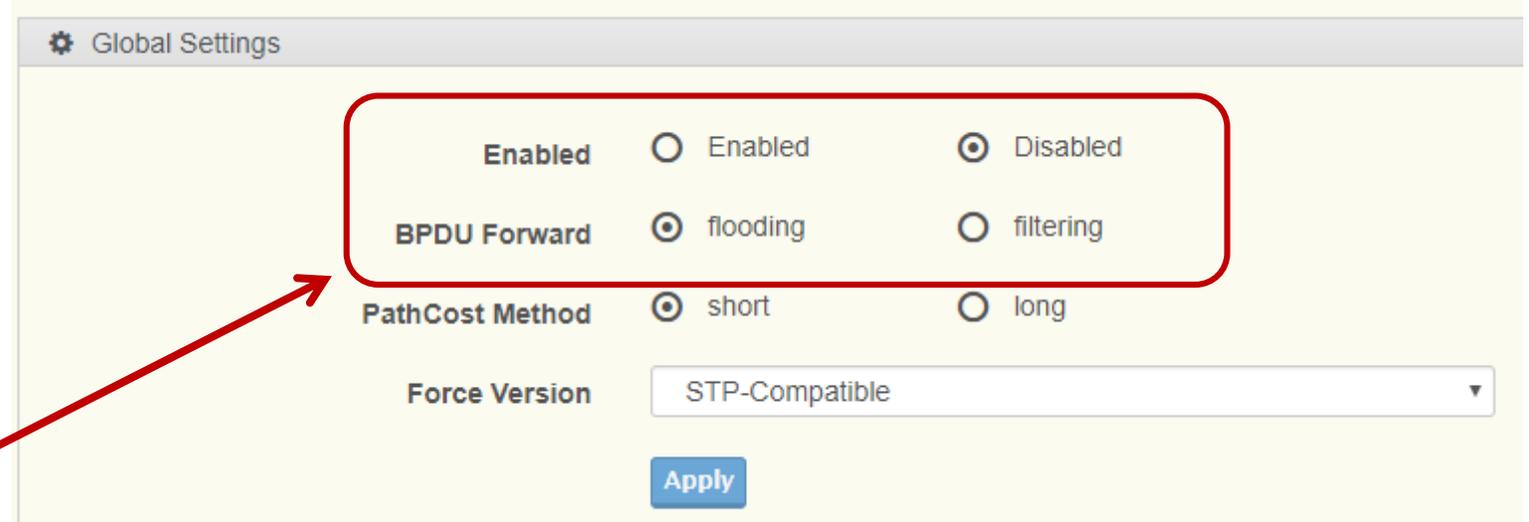
1. L2 Switching -> Spanning Tree -> STP Global Settings

2. Enabled RSTP

# Dual Homing Discussion – BPDU Flooding

## ■ Main Concept:

- To allow the RSTP BPDU to flow through the X-Ring Single Ring



## ■ BPDU Flooding:

- Enabled: EKI-7710, EKI-7428
- Disabled: EKI-9316

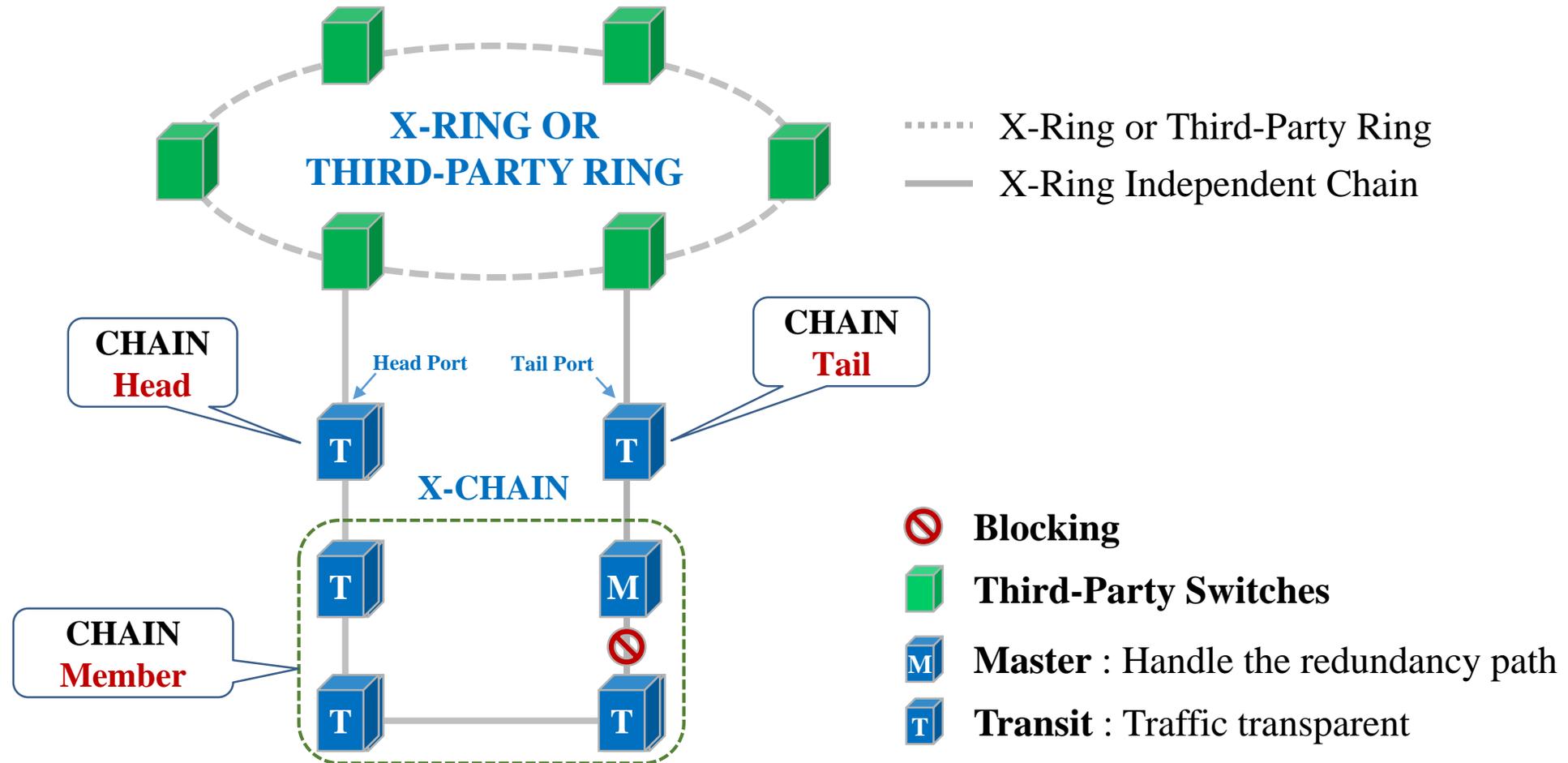
# X-Ring Pro Configuration SOP

- Single Ring
- Dual Ring
- Couple Ring
- Dual Homing
- **X-Chain**
- X-pair
- R-pair



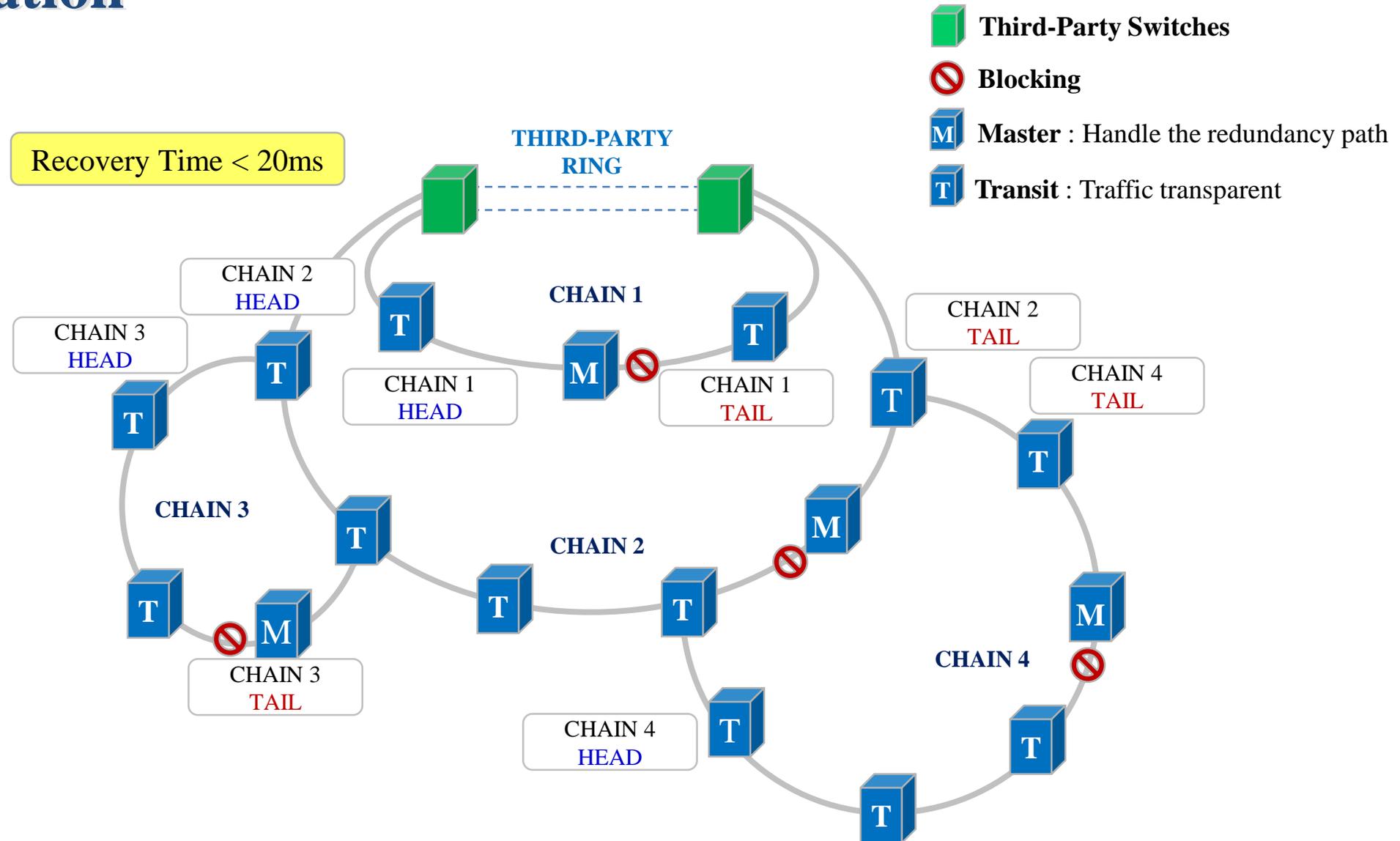
# X-Chain Structure

- Three roles in X-Ring: Head, Tail, Member
- “Master” would handle the redundancy path. Its election rule is the same as X-Ring.



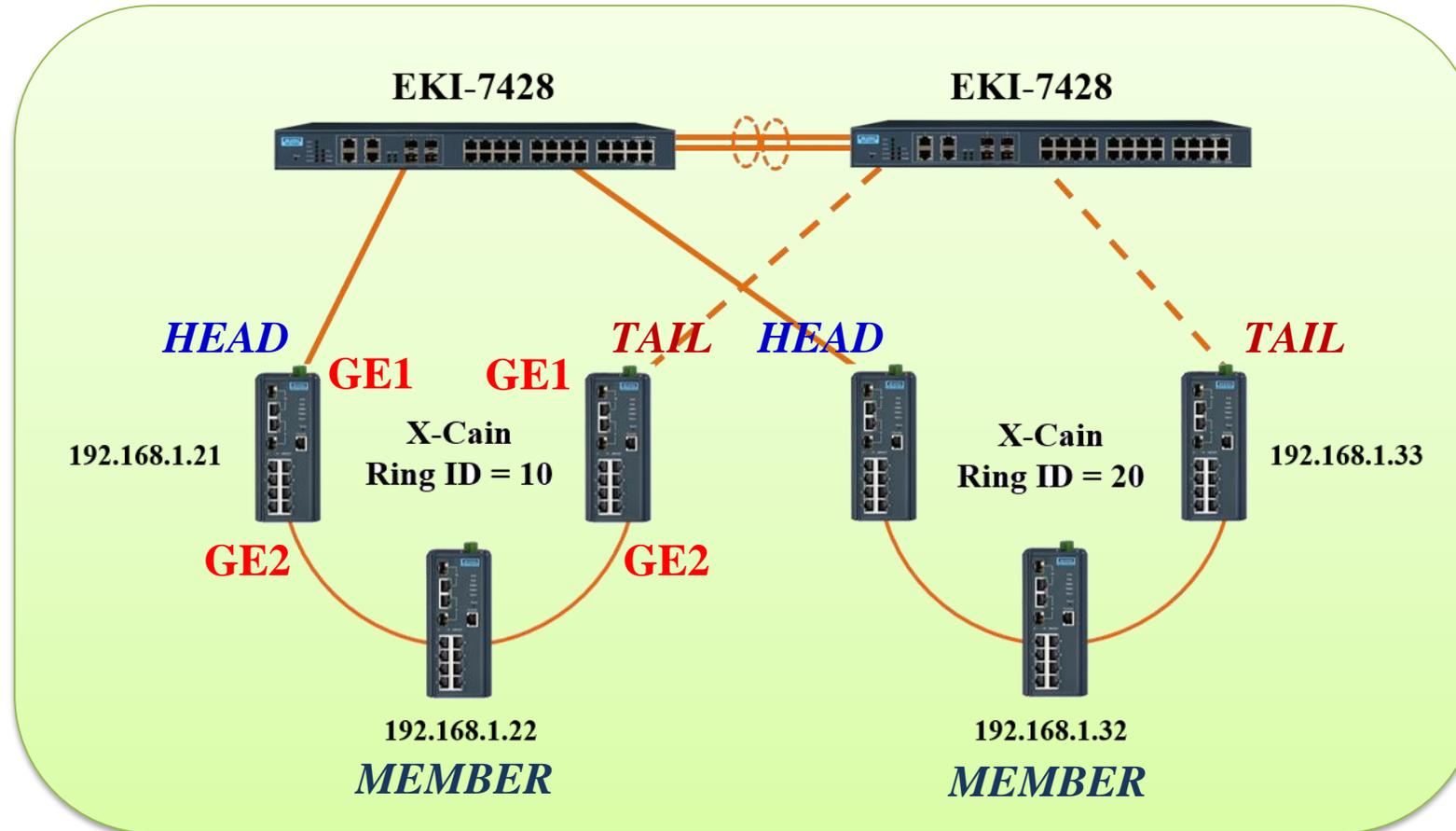
# X-Chain Application

- Chain could be “hooked” on any other topology, as long as the 2 hooked ports are communicating well. Actually, Even a single switch could be there.
- X-Chain will maintain the blocking within its member ports, but careless of the status of the 3<sup>rd</sup> party part. Users need to make sure the 3<sup>rd</sup> party part is transparent.



# X-Chain Configuration (1/3)

- In this example, we use EKI-7428 to mimic the 3<sup>rd</sup> party switches. Here the 2 EKI-7428 are connected using Static Trunk, no other protocol configured.



# X-Chain Configuration (2/3)

**ADVANTECH** EKI-7710E-2C-AE Intelligent Industrial Switch

**Chain Setting**

Chain Ring ID: 10

Role: Head

Head Port: GE1

Member Port: GE2

**Pair Setting**

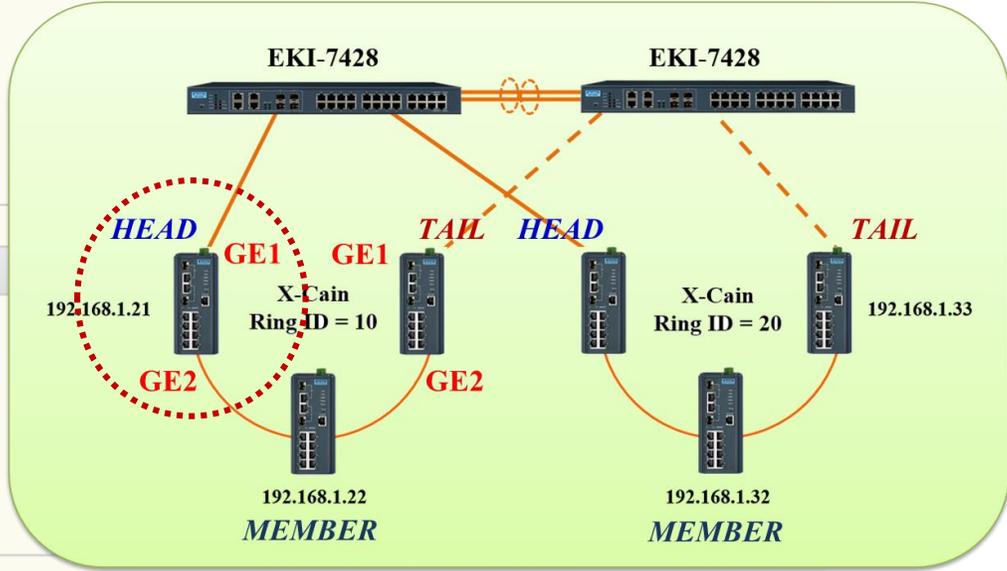
Pair Ring ID: 1-255

Port: Select Port

1. Set the Ring ID for each Chain, not overlapped with any other rings.

2. Set the Role for this Switch. Head/Tail will have one Head/Tail Port, and the other one is Member Port. For Member Switch, both ports are Member Port.

3. The Head/Tail Port should connect to the 3<sup>rd</sup> party part.\*



\*If Head/Tail Switch using Member Port to connect to 3<sup>rd</sup> Party Switch, the algorithm will not work correctly and possibly no blocking at all.

# X-Chain Configuration (3/3)

## HEAD

Information								
Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Chain	Head	TRANSIT	GE1	FWD	GE2	FWD	Delete

## MEMBER

Information								
Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Chain	Member	TRANSIT	GE1	FWD	GE2	FWD	Delete

## TAIL

Information								
Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Chain	Tail	MASTER	GE1	BLK	GE2	FWD	Delete

4. After connected, the Blocking Port could be on Head Port, Tail Port, or Member Port.

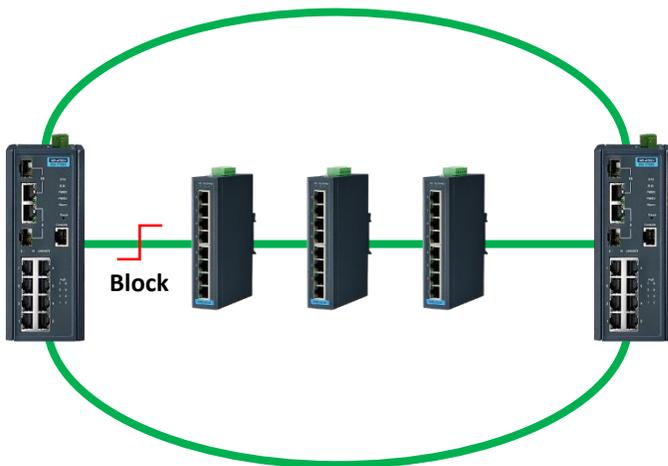
# X-Ring Pro Configuration SOP

- Single Ring
- Dual Ring
- Couple Ring
- Dual Homing
- X-Chain
- **X-pair**
- R-pair

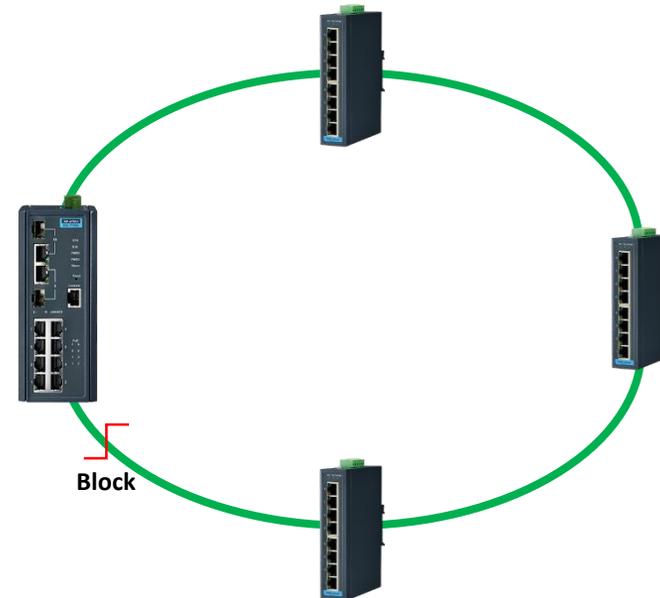


# X-Ring: X-Pair

- The **Pair topology** is for **unmanaged** or **third-party switch** that do not have X-Ring function but still want to have link backup function to prevent link down.
- Need at least 1 or 2 switch that support X-Ring Pro.
- Note:
  - Only **X-Ring Pro Single Ring** could be set as master ring in Pair topology.
  - The Pair Ring will attach to a Master Ring – set Master Ring before setting Pair Ring.
  - Also occupies a ring ID – set it different to Master Ring ID.



OR



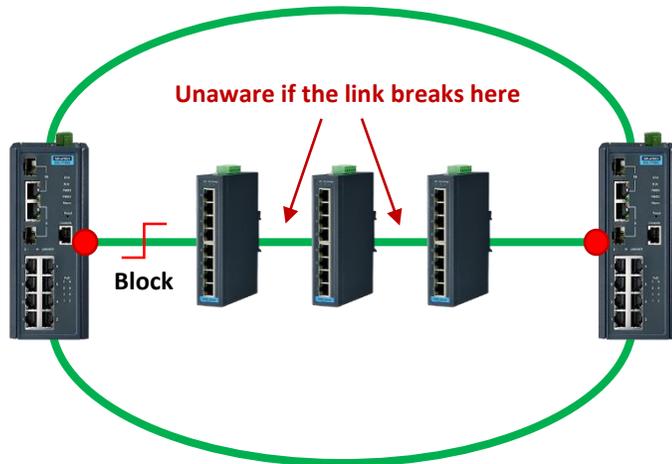
# Blocking Maintenance of X-Pair

Master Ring ID

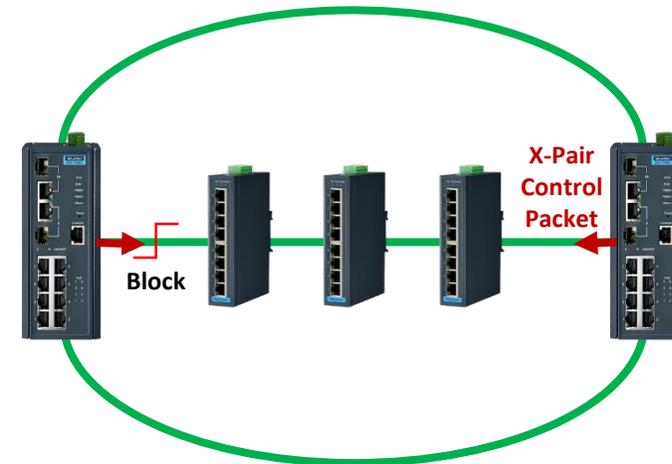
1

detect-pair-link

- From Firmware v1.02.01, X-Pair supports 2 kinds of detection method to maintain the blocking.
  - No **Detect Pair Link**: The EKI Switch only **sense the link up/down state** of the configured X-Pair ports.
    - Faster recovery
    - Unaware of the link down in between unmanaged or 3<sup>rd</sup> party switch, if there're more than 2 switches.
  - With **Detect Pair Link**: The EKI Switch will **send out control packets** through the X-Pair ports, to check if the path is still alive.
    - Slower recovery
    - Aware of the link down in between unmanaged or 3<sup>rd</sup> party switch, if there're more than 2 switches.
    - Some 3<sup>rd</sup> party switch don't forward our control packet and cause unexpected unblock.



Without Detect Pair Link



With Detect Pair Link

# X-Pair – Configuration

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

**X-Ring Pro Groups Settings**

Ring ID	Port 1	Port 2	
<input type="text" value="10"/>	GE7 <input type="button" value="v"/>	GE5 <input type="button" value="v"/>	<input type="button" value="Add"/>

**Pair Setting**

Pair Ring ID	Port	Master Ring ID	
<input type="text" value="1"/>	<input type="button" value="x GE2"/>	10 <input type="button" value="v"/>	<input type="button" value="Add"/>

**Information**

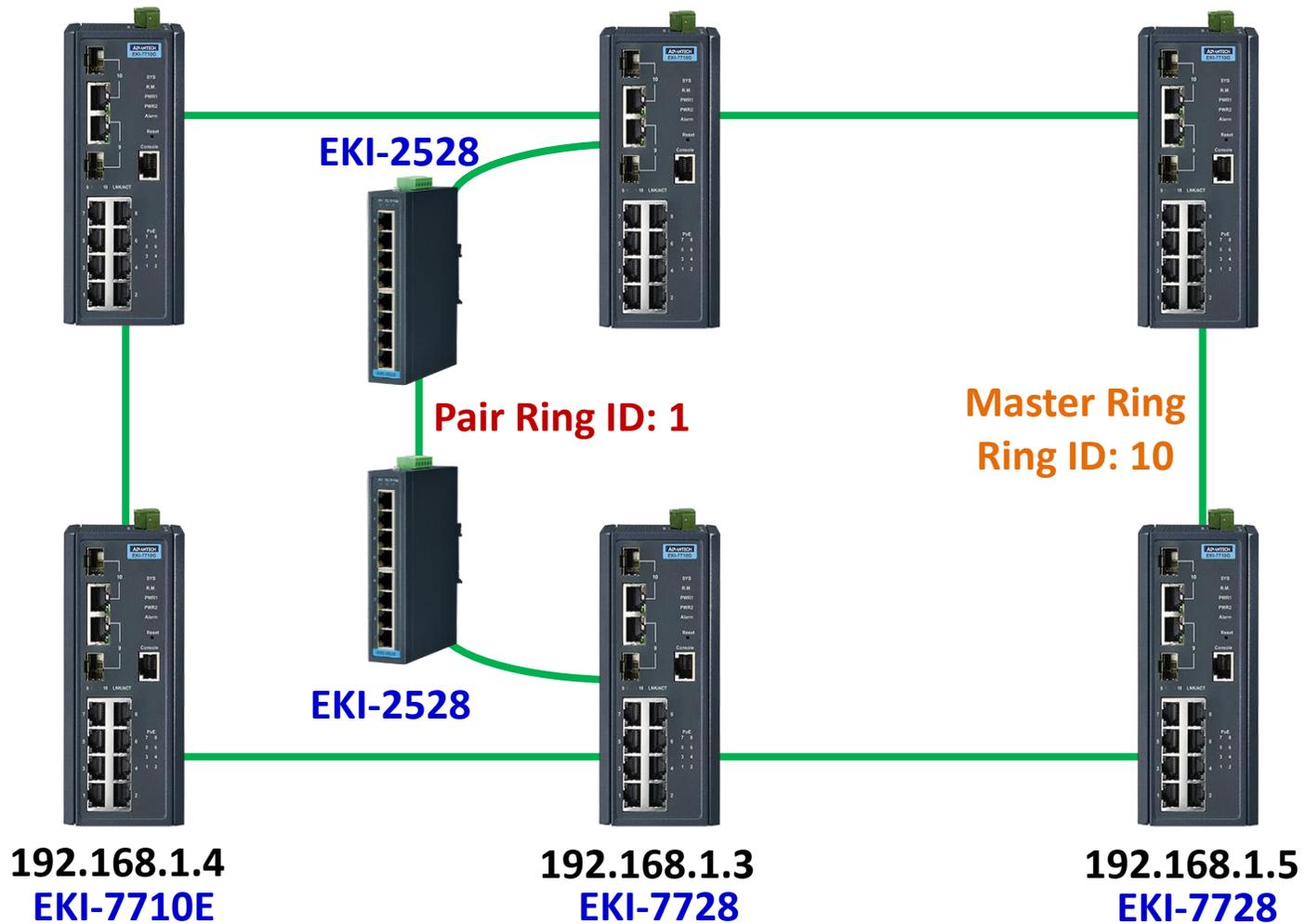
Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Edge	GE7	FWD	GE5	DWN	<input type="button" value="Delete"/>
1	Pair	N/A	Standby	GE2	DWN			<input type="button" value="Delete"/>

# X-Pair Configuration (1/4)

**EKI-7710G**  
192.168.1.2

**EKI-7710G**  
192.168.1.1

**EKI-7710E**  
192.168.1.6



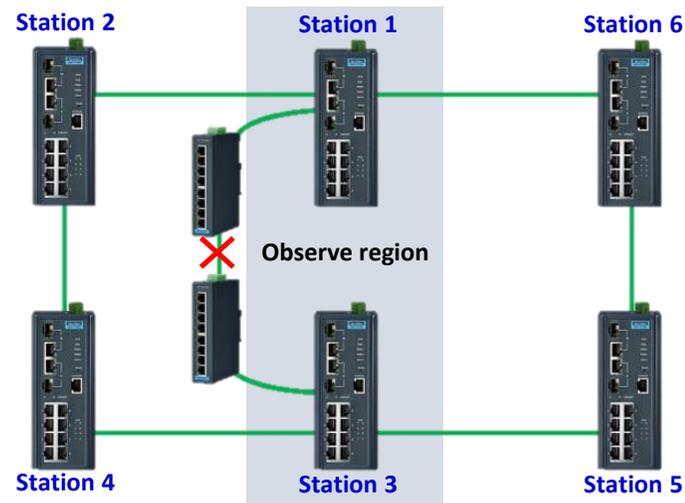
# X-Pair Configuration (2/4)

## Pair set but not linked yet between EKI-2528

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Transit	GE6	FWD	GE8	FWD	Delete
1	Pair	N/A	Primary	GE2	FWD			Delete

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	TRANSIT	GE7	FWD	GE5	FWD	Delete
1	Pair	N/A	Primary	GE2	FWD			Delete

Both sides of the pair link are present as Primary before linked up



# X-Pair Configuration (3/4)

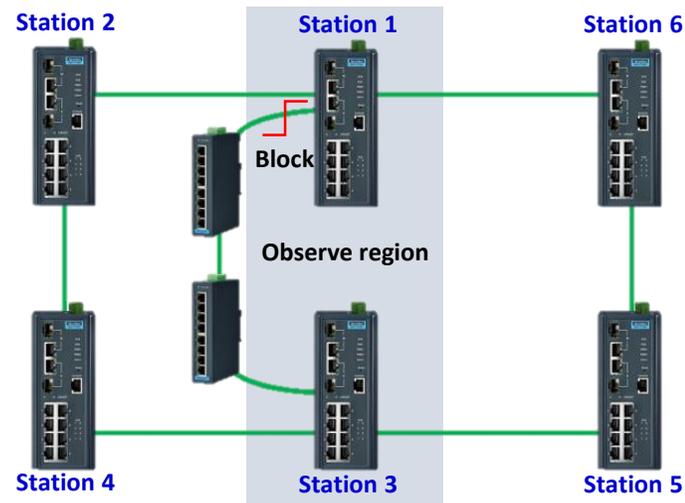
## Pair set and linked up between EKI-2528

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Transit	GE6	FWD	GE8	FWD	Delete
1	Pair	N/A	Backup	GE2	BLK			Delete

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	TRANSIT	GE7	FWD	GE5	FWD	Delete
1	Pair	N/A	Primary	GE2	FWD			Delete

One side of the pair link turned into Backup state and blocked after linked up



# X-Pair Configuration (4/4)

## Pair set and linked down between EKI-2528 and station 3: Seen at station 1 & 3

The left screenshot shows the configuration for EKI-7710G-2CPI-AE. The table below shows the state of various links:

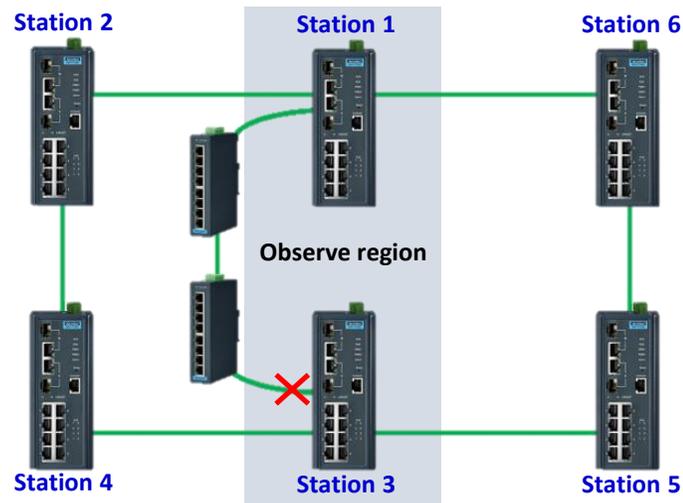
Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Transit	GE6	FWD	GE8	FWD	Delete
1	Pair	N/A	Primary	GE2	FWD			Delete

The right screenshot shows the configuration for EKI-7712G-4FI-AE. The table below shows the state of various links:

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	TRANSIT	GE7	FWD	GE5	FWD	Delete
1	Pair	N/A	Standby	GE2	DWN			Delete

The Pair link at station 1 turned into Primary state after link down

The Pair link at station 3 turned into Standby state after link down



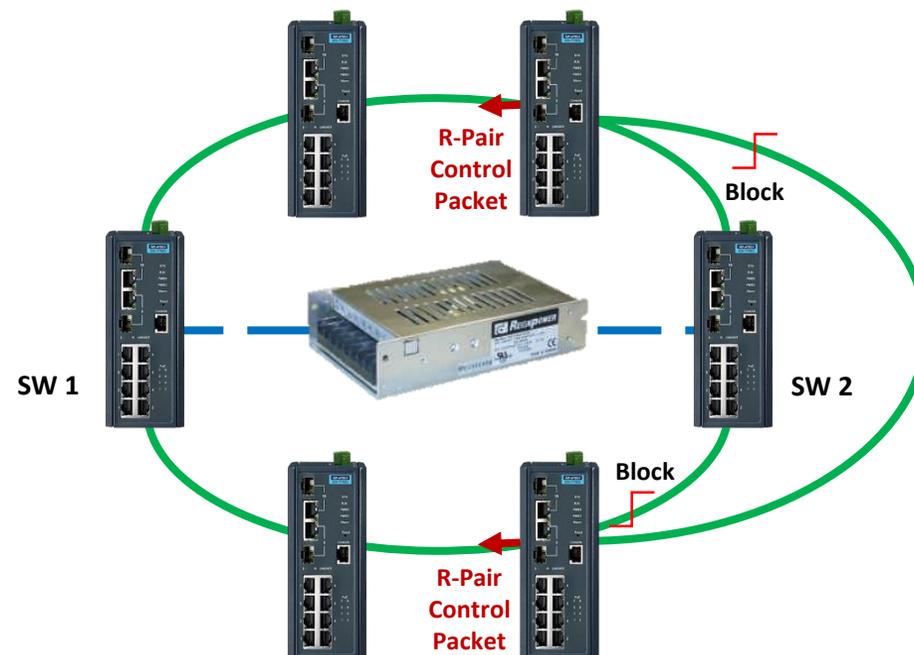
# X-Ring Pro Configuration SOP

- Single Ring
- Dual Ring
- Couple Ring
- Dual Homing
- X-Chain
- X-pair
- **R-pair**



# R-Pair

- The R-Pair is for **redundancy over X-Ring** while communication breaks down at more than one segment.
- Note:
  - Use only with **X-Ring Pro Single Ring**.
  - The Pair Ring will attach to a Master Ring – set Master Ring before setting Pair Ring.
  - Also occupies a ring ID – set it different to Master Ring ID.
  - Control Packets runs through the Master Ring. The blocking will be released only when the 2 switches with R-Pair Ring Port can't communicate with each other (Master Ring broke).



# X-Ring: R-Pair – Configuration

Switch / L2 Switching / X-Ring Pro / X-Ring Pro Groups

**X-Ring Pro Groups Settings**

Ring ID	Port 1	Port 2	
<input type="text" value="10"/>	GE7 <input type="button" value="v"/>	GE5 <input type="button" value="v"/>	<input type="button" value="Add"/>

**RPair Setting**

RPair Ring ID	Port	Master Ring ID	
<input type="text" value="2"/>	GE2 <input type="button" value="v"/>	10 <input type="button" value="v"/>	<input type="button" value="Add"/>

**Information**

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Edge	GE7	DWN	GE5	FWD	<input type="button" value="Delete"/>
2	R-Pair	N/A	Standby	GE2	DWN			<input type="button" value="Delete"/>

# R-Pair Configuration (1/5)

**EKI-7710G**  
192.168.1.2

**EKI-7710G**  
192.168.1.1

**EKI-7710E**  
192.168.1.6



**R-Pair Ring ID: 2**



**X-Ring Pro**  
**Ring ID: 10**

**192.168.1.4**  
**EKI-7710E**

**192.168.1.3**  
**EKI-7708G**

**192.168.1.5**  
**EKI-7708G**

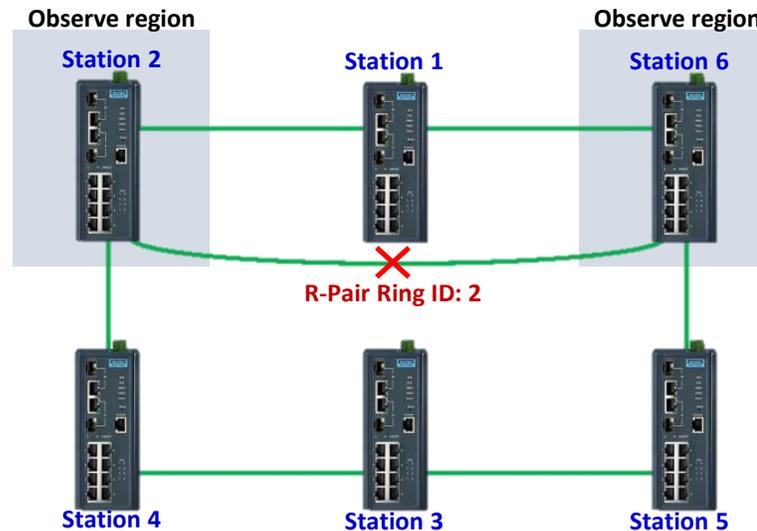
# R-Pair Configuration (2/5)

R-Pair set but not linked yet between station 2 & 6

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Transit	GE1	FWD	GE8	FWD	Delete
2	R-Pair	N/A	Standby	GE7	DWN			Delete

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Master	FE7	BLK	FE8	FWD	Delete
2	R-Pair	N/A	Standby	FE1	DWN			Delete

Both sides of the R-Pair link are present as Standby before linked up



# R-Pair Configuration (3/5)

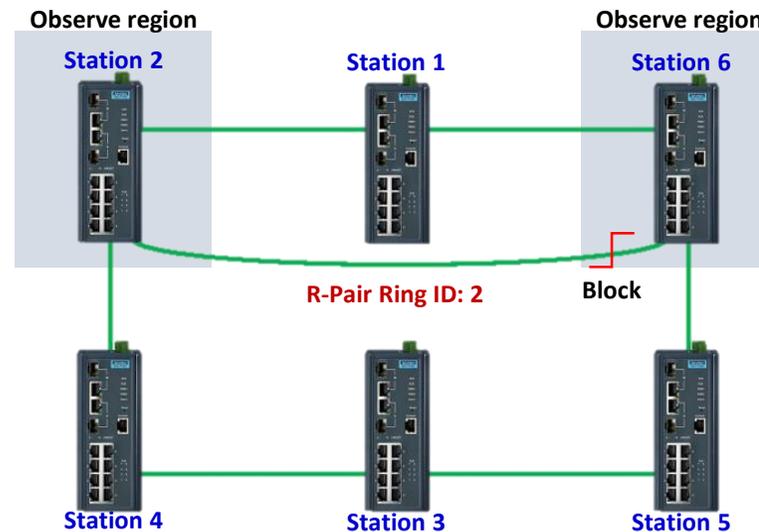
## R-Pair set and linked up between station 2 & 6

The screenshot displays two configuration pages for ANTECH switches. The left page is for Station 2 (EKI-7710G-2CI-AE) and the right page is for Station 6 (EKI-7710E-2C-AE). Both pages show an 'Information' table with columns for Ring ID, Mode, Role, Operation State, Port 1, Forwarding State, Port 2, Forwarding State, and Delete. In Station 2, Ring ID 2 is in 'Primary' state. In Station 6, Ring ID 2 is in 'Backup' state and is blocked.

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Transit	GE1	FWD	GE8	FWD	Delete
2	R-Pair	N/A	Primary	GE7	FWD			Delete

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Master	FE7	BLK	FE8	FWD	Delete
2	R-Pair	N/A	Backup	FE1	BLK			Delete

One side of the R-Pair link turned into Backup state and blocked after linked up, and the other one turned into Primary.



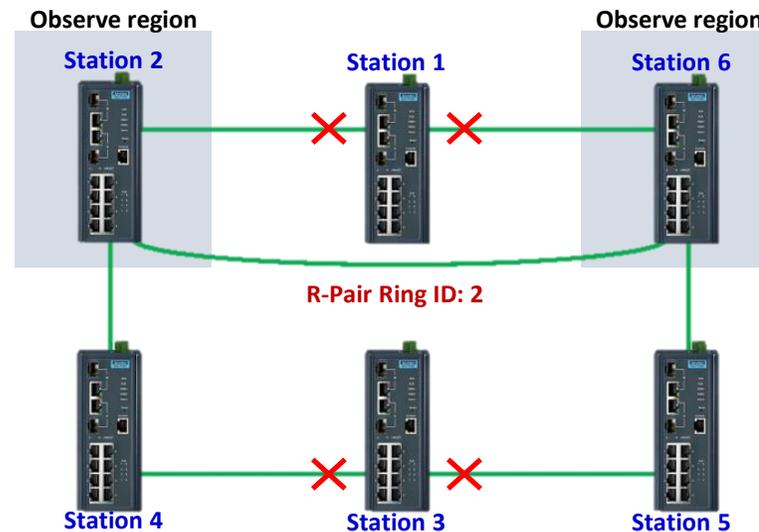
# R-Pair Configuration (4/5)

R-Pair set and linked down at station 1 & 3: Seen at station 2, 6

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Edge	GE1	FWD	GE8	DWN	Delete
2	R-Pair	N/A	Primary	GE7	FWD			Delete

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Edge	FE7	FWD	FE8	DWN	Delete
2	R-Pair	N/A	Primary	FE1	FWD			Delete

Both sides of the R-Pair link are present as Primary after station 1 & 3 link down; X-ring ports in Edge state.



# R-Pair Configuration (5/5)

R-Pair set and linked down at station 1 & 3: Seen at station 4, 5

The screenshot shows two browser windows displaying the configuration of ANTECH switches. The left window is for EKI-7710E-2C-AE and the right is for EKI-7708G-4F-AE. Both show a table with R-Pair ring information. In both tables, the 'Operation State' for Ring ID 10 is 'Edge', which is highlighted with a red box.

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	Edge	FE1	DWN	FE3	FWD	Delete

Ring ID	Mode	Role	Operation State	Port 1	Forwarding State	Port 2	Forwarding State	Delete
10	Basic	N/A	EDGE	GE1	DWN	GE2	FWD	Delete

Both stations' X-ring port are in Edge state.

