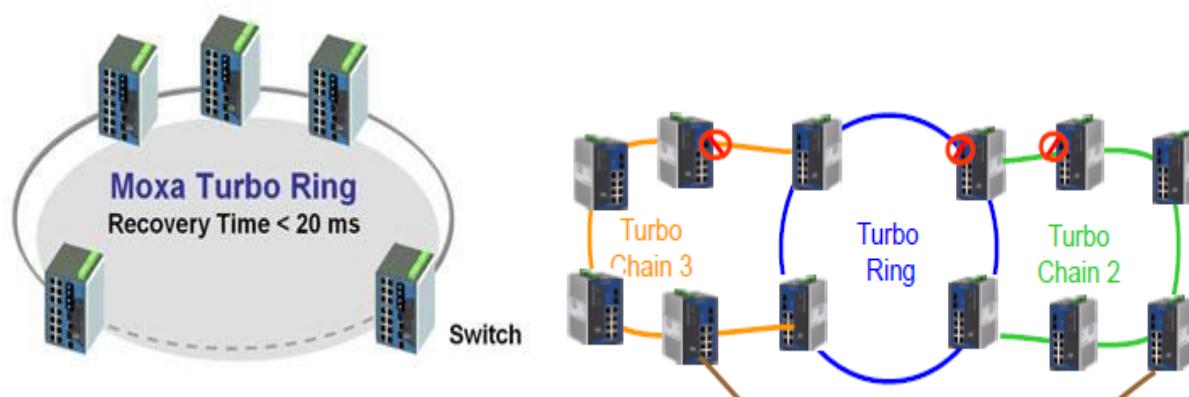# Turbo Ring and Turbo Chain

What are Turbo Ring and Turbo Chain

Turbo Ring is a technology developed by Moxa in 2007 that provides network redundancy for systems have network redundancy. Essentially, Turbo Ring connects all switches in a ring topology. Usually when this is done with unmanaged switches, an infinite loop is created thus creating a network failure. However, by using Moxa managed switches, you can eliminate the infinite loop by setting up an Ethernet port on a managed switch to be disabled and only to be enabled when a fault is detected.

Turbo Chain is an extension of Turbo Ring. Turbo Ring topology allows for ring coupling, dual-homing, and dual-ring. Turbo Chain topology is the same but can be built on an existing network allowing for separate networks to work while still being connected to the main network.

Why are they important?

Turbo Ring and Turbo Chain are extremely important because they allow network redundancy without having to add extra hardware or cabling cost. Also, when the ring identifies a fault in its networks main path, it will redirect to the backup path in less than 20 ms (milliseconds). Moxa Turbo Ring ability to self-heal itself in less than 20 ms is one of the fastest in the industry. Their technology is light speed faster than using the typical RSTP (Rapid Spanning Tree Protocol) which takes anywhere between 4 to 10 seconds to find a new path. The down time can be critical to the application so having a fast recovery time is vital. Also if a fault is detected, an alarm can be set up in order to notify support and have them issue a fix for the problem immediately. This technology would be useful for mission critical applications that need to work and continue to pass data even when there is a fault in the network.

Ring Master

Ring Master

< 20 ms for up to 250 switches

< 20 ms for up to 250 switches

Broken
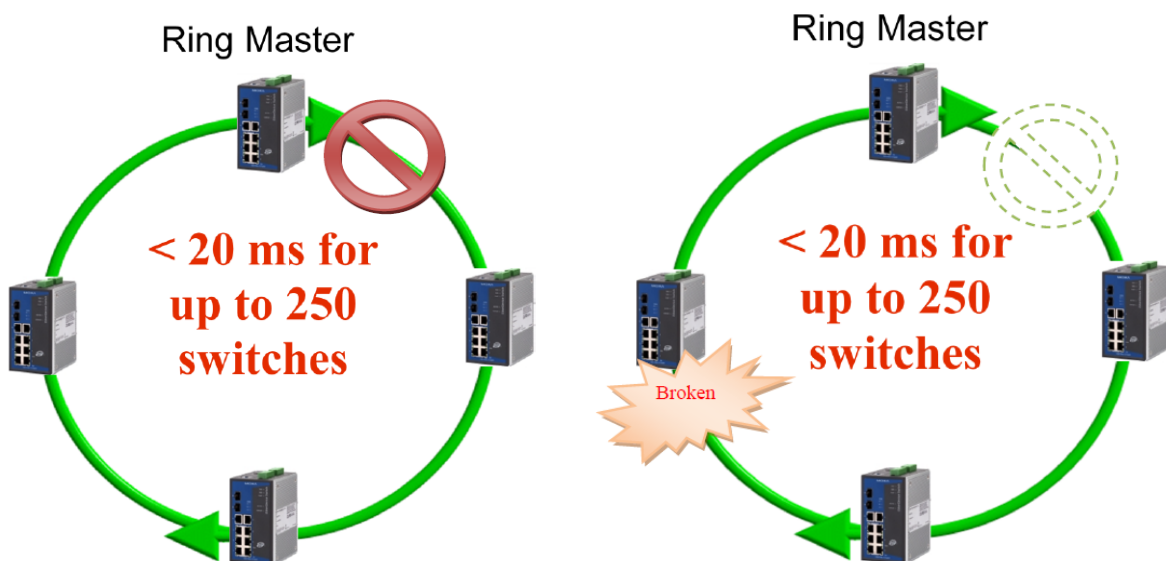
Turbo Chain can be useful due to the fact that it can be expanded on an existing network without having to disrupt what was already in place. With Turbo Chain, it is still possible to keep several sub networks separate from each other allowing for better security among the different rings.

How to implement them into your system

Turbo Ring

Enabling Turbo Ring is easy as flipping a dip switch. On the Moxa managed switches EDS-4xx and higher, there is a dip switch that can be flipped to denote that the switch is part of a Turbo Ring.
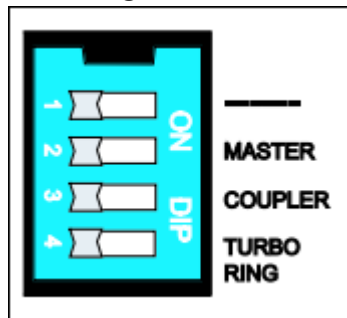
Another method of setting up the Turbo Ring involves the web interface. In the web interface, locate communication redundancy and under settings set Redundancy Protocol to Turbo Ring. Next, denote which ports will be a part of the ring. Once these ports are set, these ports can only communicate with other Turbo Ring ports.

Turbo Chain

To set up Turbo Chain, most likely there needs to be an existing Turbo Ring in the network but isn't always the case. Loops could be done around an existing ring or a single switch similar that is very similar to dual ring. When connecting the Turbo Chain to the Turbo Ring, your first switch will be called "Head." The "Head" switch will have its "Head" port going back into the ring. In the web interface, go to Communication Redundancy and select Turbo Chain. Select the role to be "Head" and denote which port are the "Head" port and the "Member" port. The "Head" and "Member" port are arbitrary meaning there is not a predetermine port already established. This will also be the same for the "Tail" and "Member" switches. Also like the Turbo Ring, once these ports are defined, they can only be used for Turbo Ring.

The last switch that will be used will connect back into the Turbo ring on the other side will be called "Tail." Again go into the web interface, go to Communication Redundancy and select Turbo Chain. Select the role to be "Tail" and denote which port are the "Tail" port and the member port. The defined "Tail" port will go back into the ring to complete its own separate ring. All other switches in between the "Head" and the "Tail" switch will be called "Member." Again go into the web interface, go to Communication Redundancy and select Turbo Chain. Select the role to be "Member" and denote which ports are the "Member" ports.

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Main Menu
- Overview
- Basic Settings
- SNMP Settings
- Communication Redundancy
- Traffic Prioritization
- Virtual LAN
- Multicast Filtering
- Bandwidth Management
- Auto Warning
- Line-Swap Fast Recovery
- Set Device IP
- Diagnosis
- Monitor
- MAC Address Table
- System Log
- Industrial Protocol

Communication Redundancy

Current Status

Now Active   **Turbo Ring V2**

Settings

| Redundancy Protocol | Turbo Chain ▼ |
| Role | Head ▼ |

Port Role	Port Num	Port Status
Head Port	4 ▼	---
Member Port	5 ▼	---

Activate

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Communication Redundancy

Current Status

Now Active   **Turbo Ring V2**

Settings

Redundancy Protocol   [Turbo Chain ▼]

Role   [Tail ▼]

Port Role	Port Num	Port Status
Tail Port	4 ▼	---
Member Port	5 ▼	---

[Activate]

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Communication Redundancy

Current Status

Now Active   **Turbo Ring V2**

Settings

Redundancy Protocol   [Turbo Chain ▼]

Role   [Member ▼]

Port Role	Port Num	Port Status
1st Member Port	4 ▼	---
2nd Member Port	5 ▼	---

[Activate]

Conclusion:

The Turbo Ring and Turbo Chain created by Moxa are far beyond anything anyone in the industry has created. Allowing redundancy in the networks can give a little peace of mind to managers by allowing everyday operations to continue even when there is a failure. More impressive than the recovery time of less than 20 ms with up 250 switches is the time and money that will be saved when switching to this technology. The simplicity of the setup allows it to be done in a

few minutes while the extra cabling and additional hardware won't make you break the bank!

Question?

What are the 3 roles of the switches that can be found in Turbo Chain?

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