

Turbo Chain

A revolution in Industrial Ethernet

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Why Industrial Ethernet?

Why choose an Industrial Ethernet switch over a cheaper 'IT' product?

Construction – Built for rugged applications

Approvals – EN50155 / NEMA TS2 / ATEX

Fibre-optics – Eliminate electrical noise & increase distance

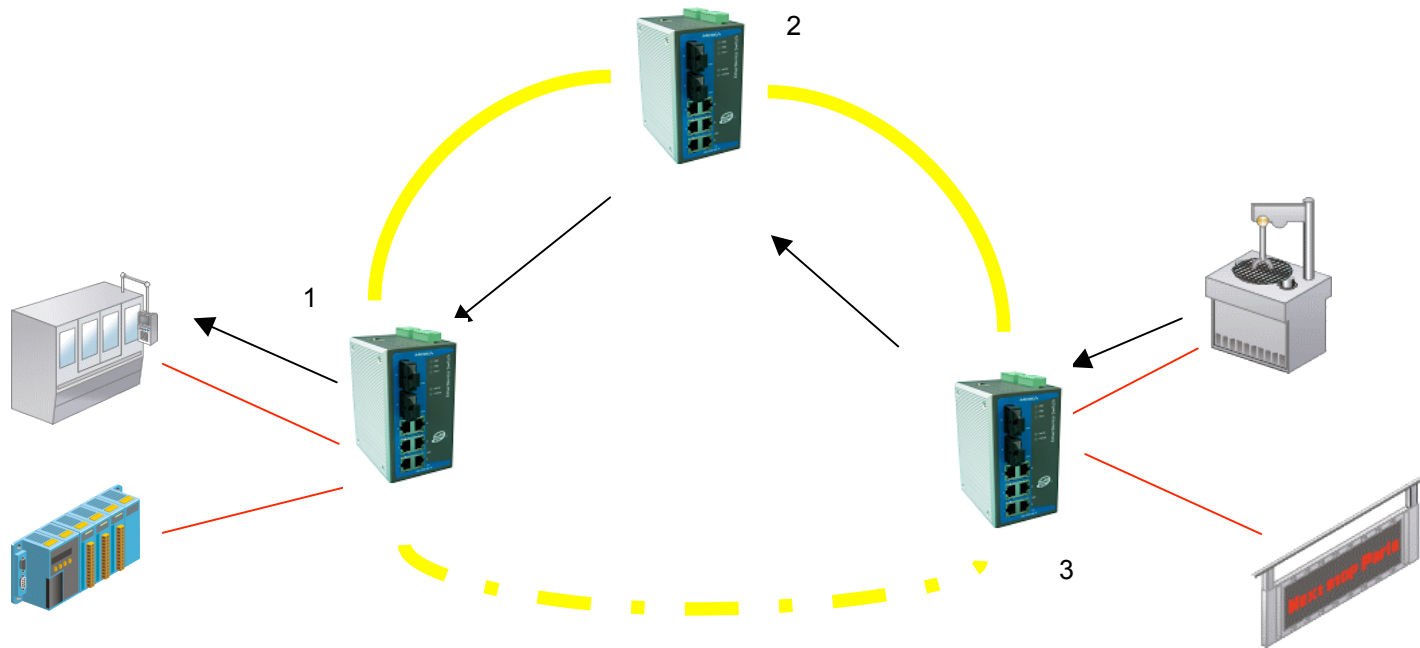
Power – 12/24/48/125VDC power with redundancy

Temperature – wider range, often -40 to +75°C

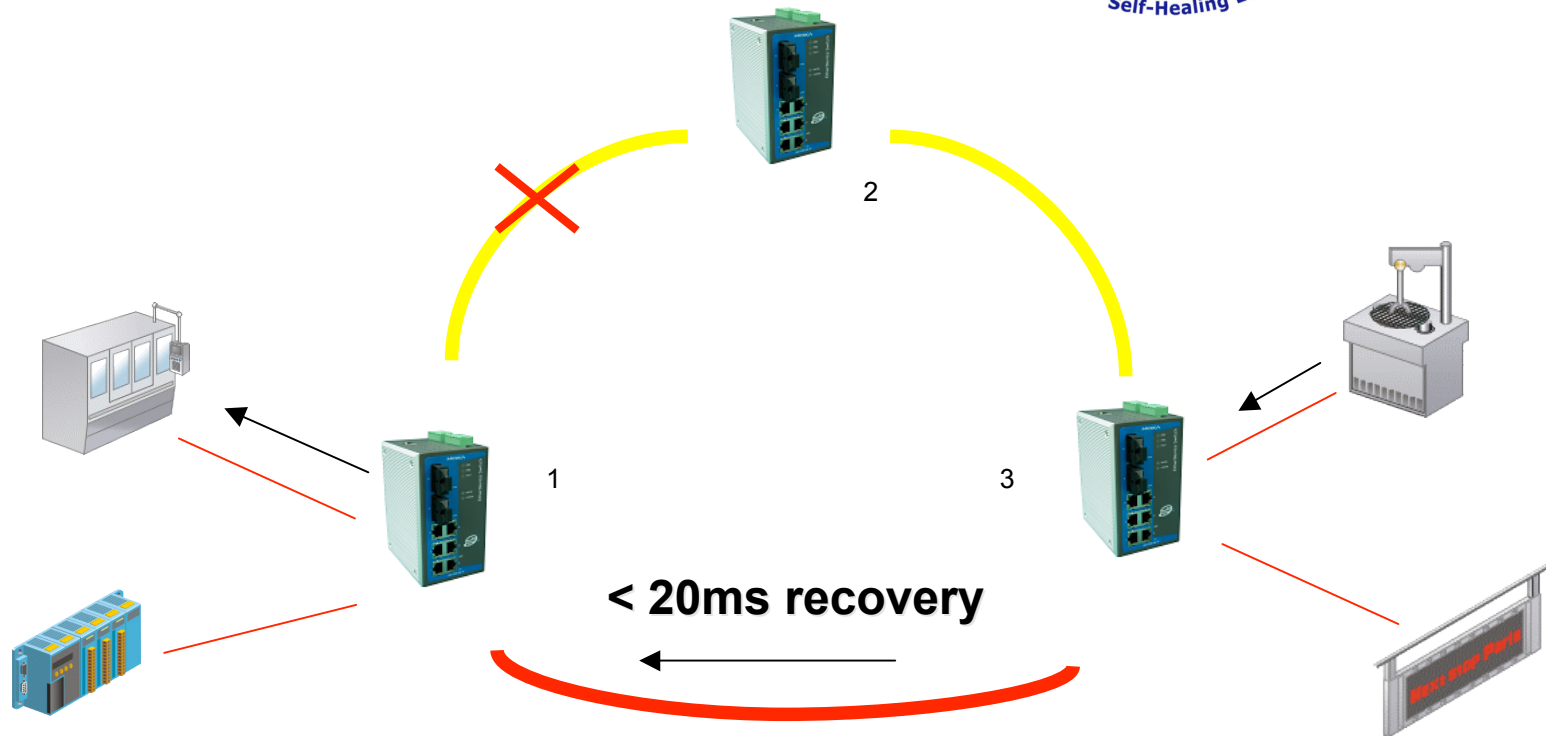
Redundancy – Fault tolerant networks for mission-critical apps



Ring Redundancy 1



Ring Redundancy 2

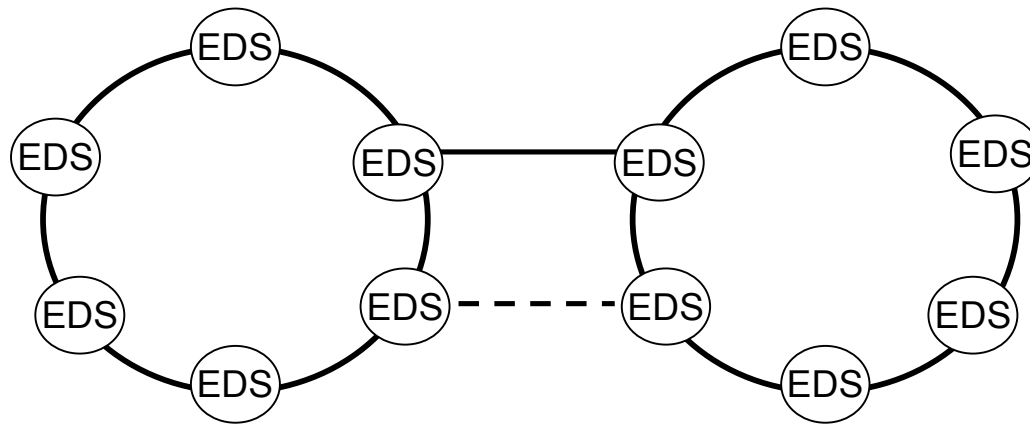


Turbo Ring V2 vs. RSTP/STP

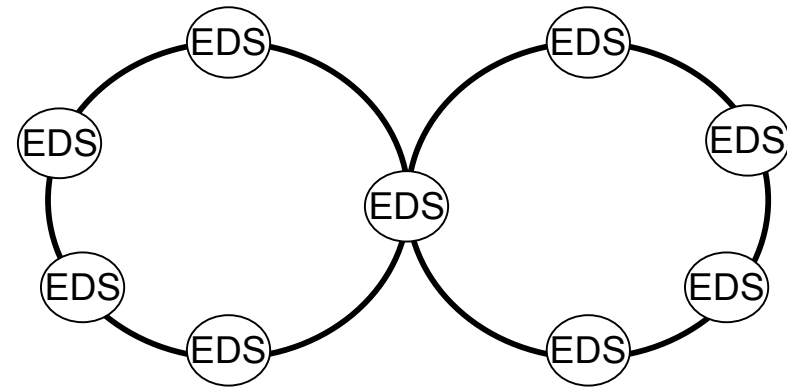
	<i>Turbo Ring V2</i>	<i>RSTP/STP</i>
Setup	Simple	Complicated
Error Detect	Faster Event triggered	Slower BPDU based
Recovery	< 20ms	Slower Up to seconds
Topology	Ring	Star & Mesh
Others	Proprietary	Standard

RSTP-2004 brings about substantial improvements over RSTP – call Amplicon for details

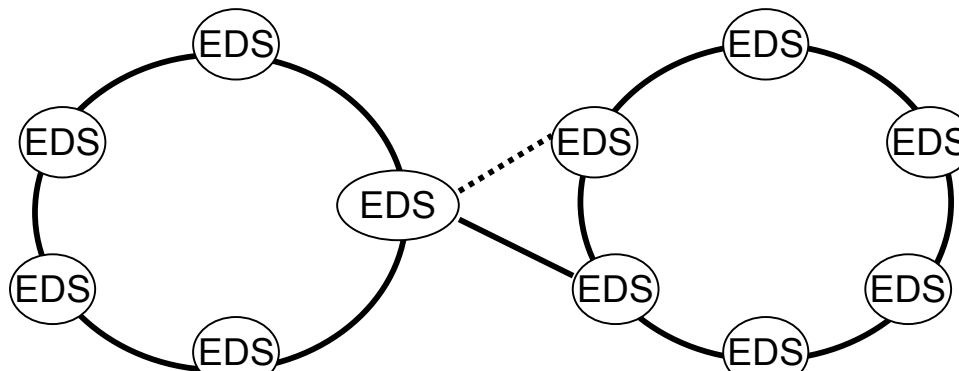
Possible Topologies



Coupling **w/o** Control Port

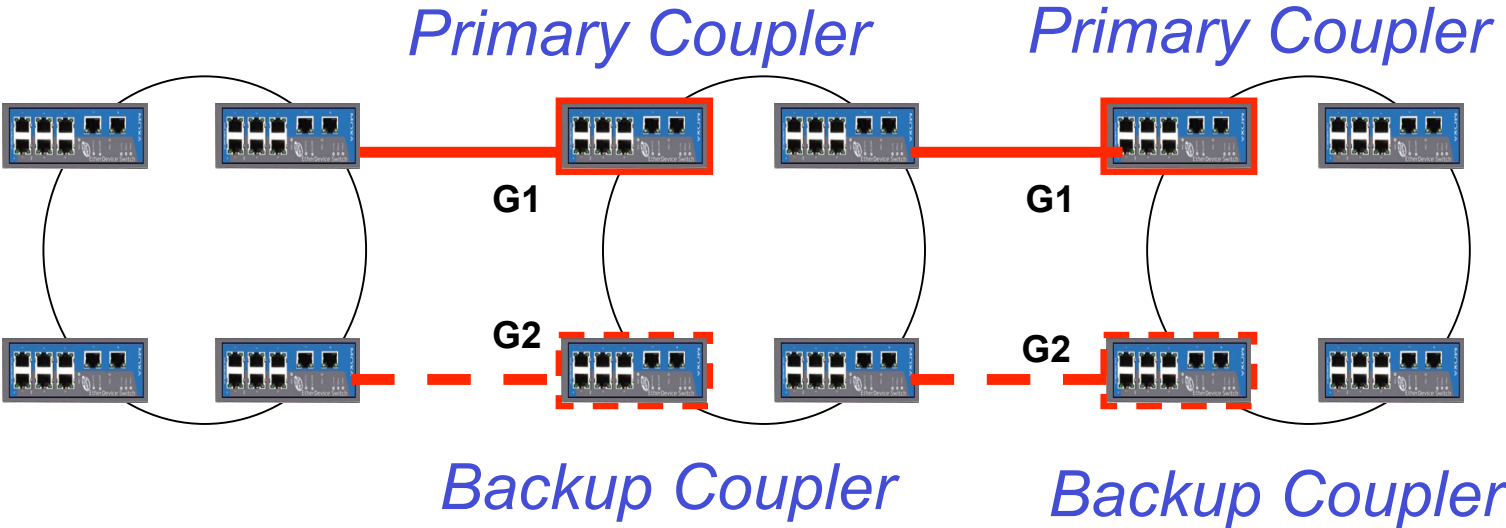


Coupling in 1 Switch

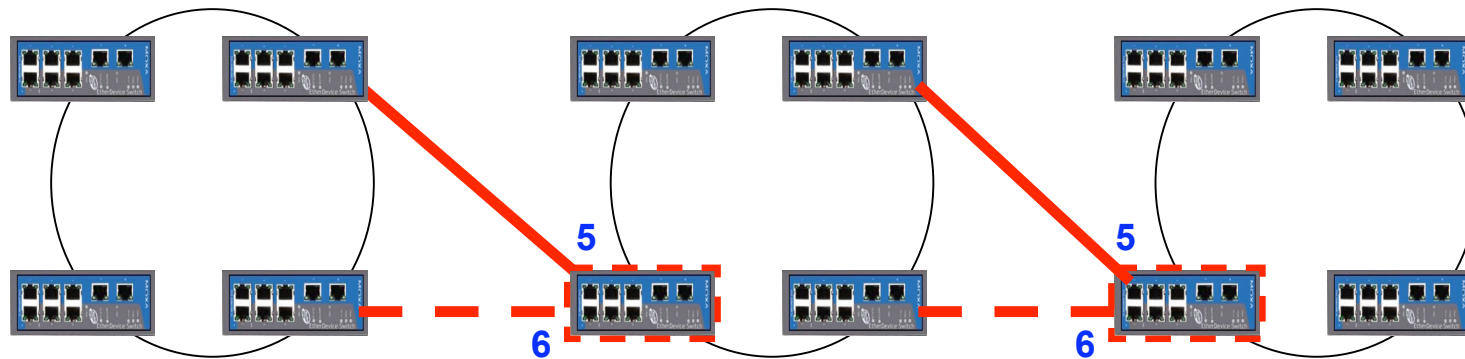


Dual Homing

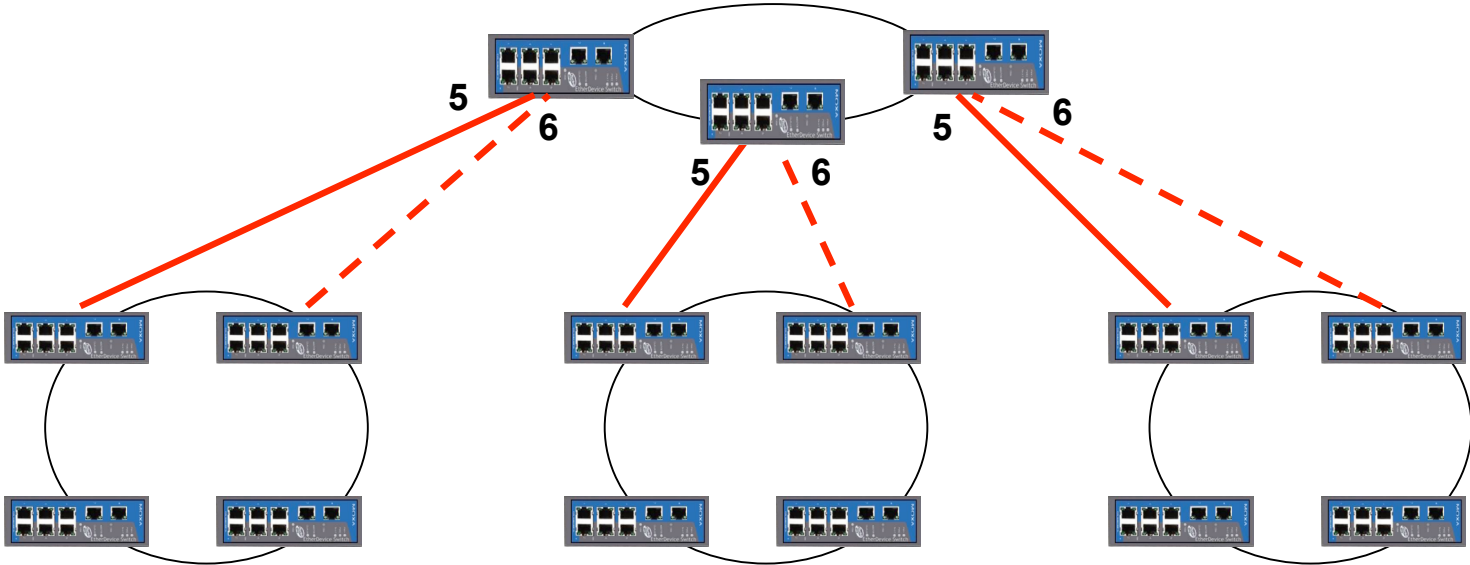
Multiple coupled rings



Cascaded Dual homing connection



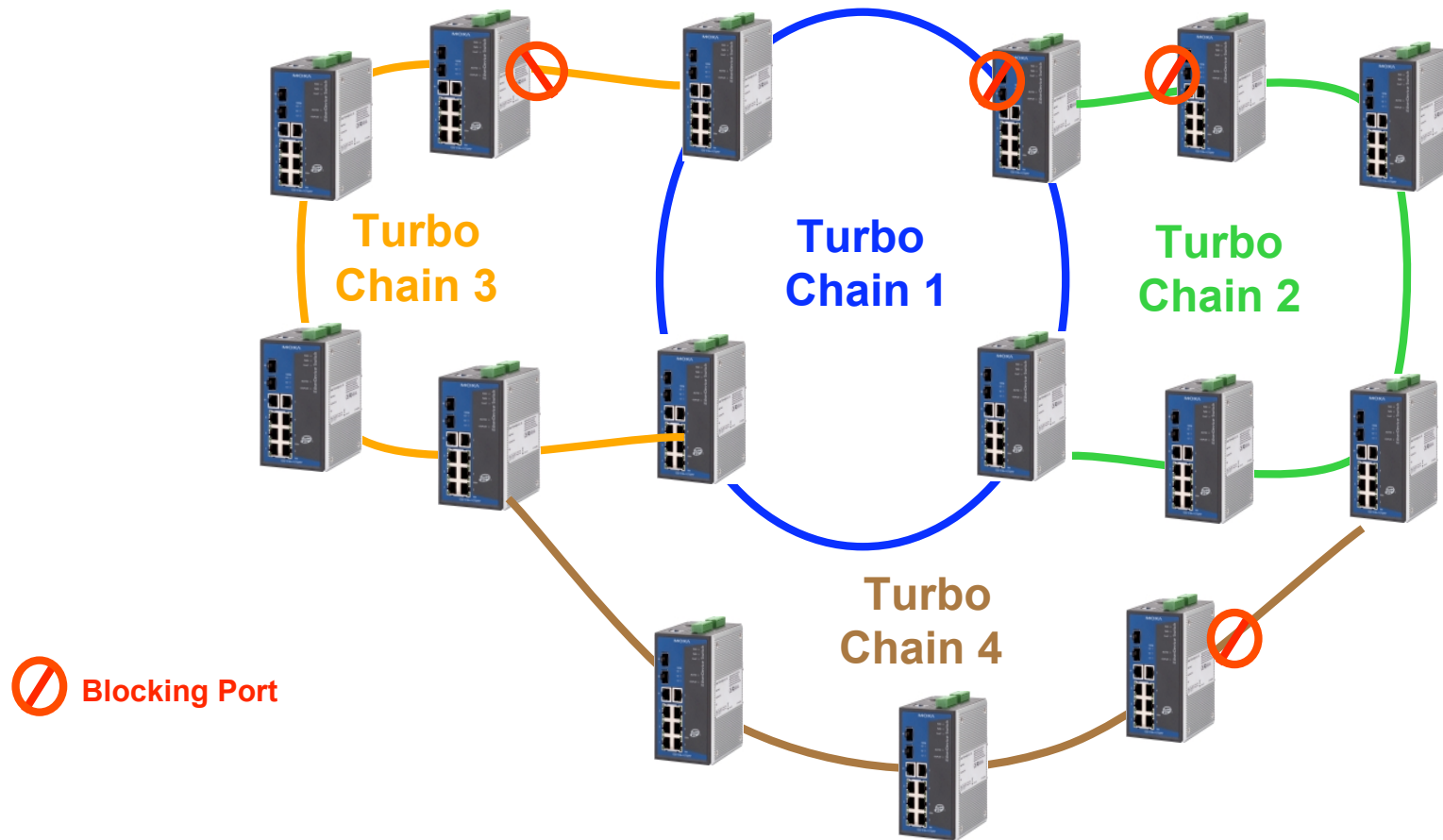
Multiple Dual Homing in one Ring



Introducing Turbo Chain

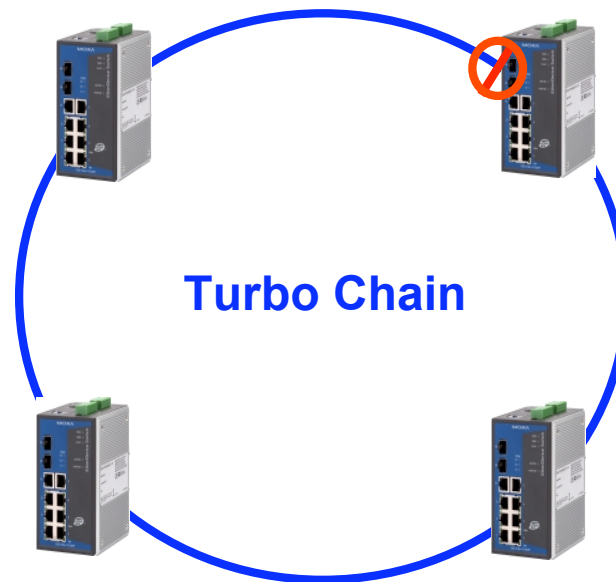
New and unique redundancy protocol from Moxa that makes network design easy!

Turbo Chain example



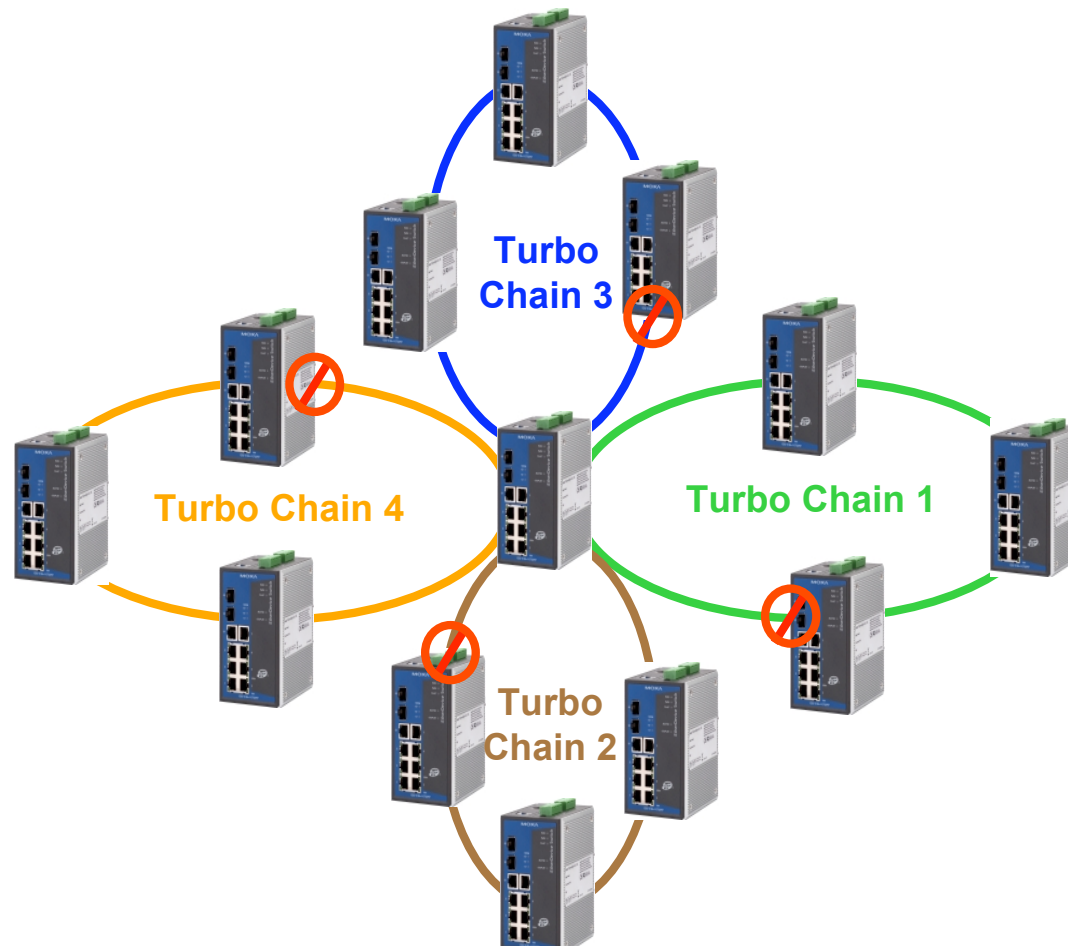
Flexible Network Topologies

- Ring Topology



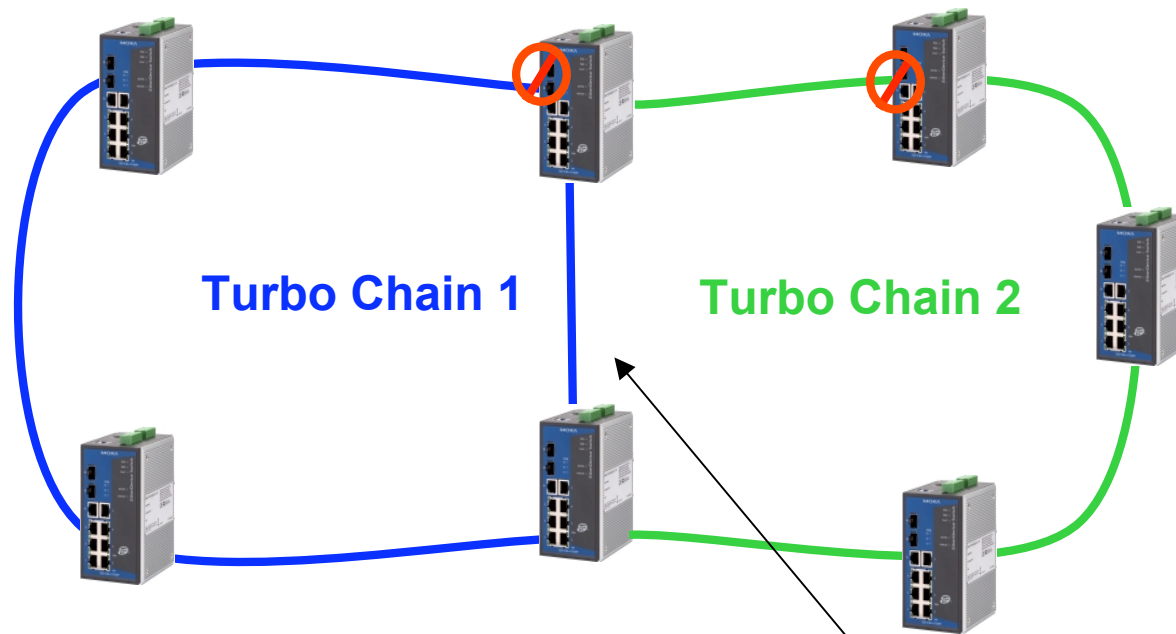
 Blocking Port

Flexible Network Topologies



 Blocking Port

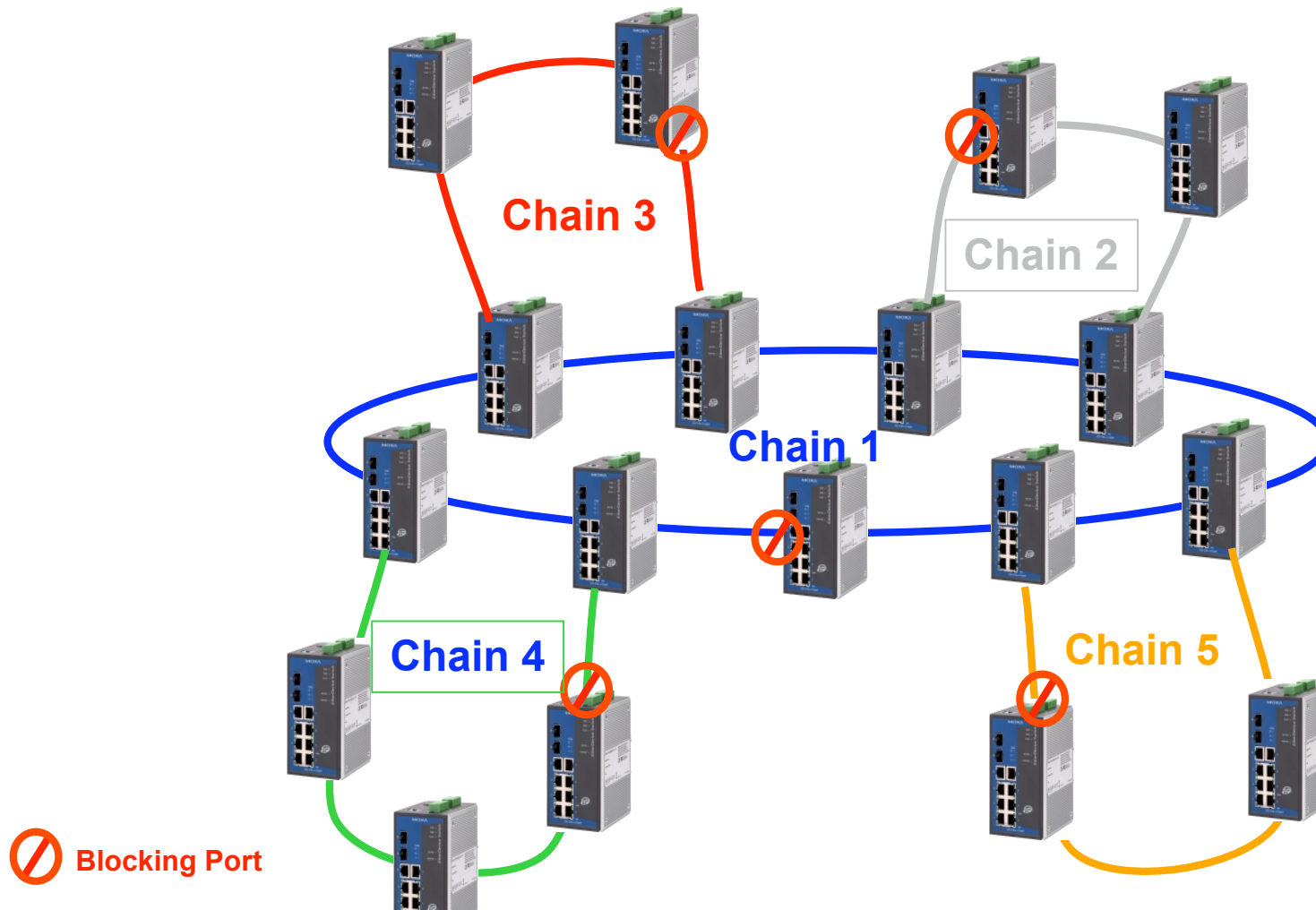
Flexible Network Topologies



 Blocking Port

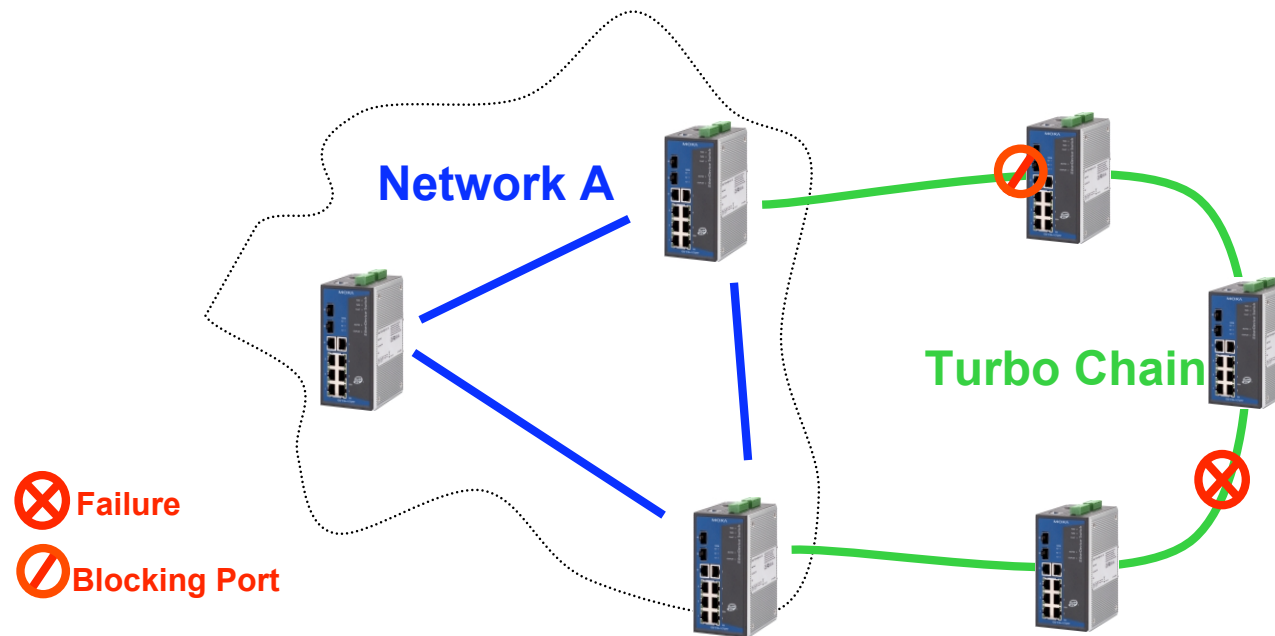
Dual rings with a single connection saves cabling

Flexible Network Topologies



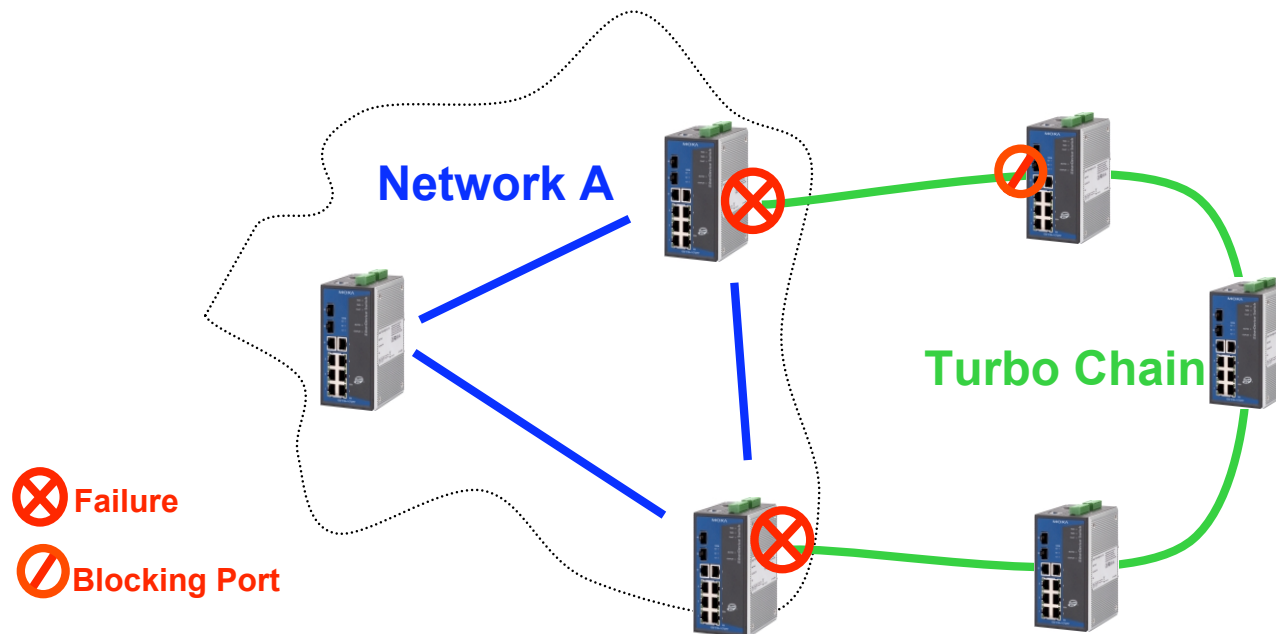
Inter-operation with existing RSTP network 1

- Network A – Only needs to understand and process RSTP topology change notification
- Turbo Chain – Turbo Chain protocol sends Network A topology change notification



Inter-operation with existing RSTP network 2

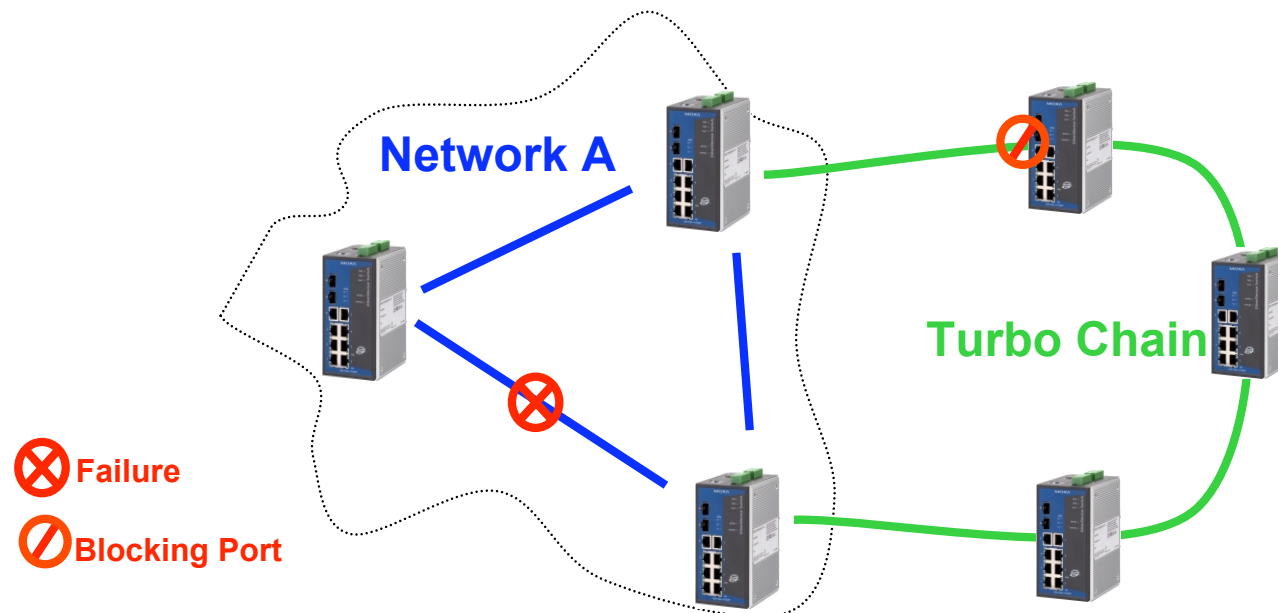
- Case 1 – Failure of any link or switch connected to the Turbo Chain
 - The failure is detected and handled by Turbo Chain
- Network A – No Action Required



Inter-operation with existing network 3

Case 2 – Failure of any link or switch not directly connected to the Turbo Chain

- The Network Topology from Turbo Chain point of view has not changed
- Network A – No Action Required



Benefit of Turbo Chain:

- **Lower Installation Cost**
 - Avoid unnecessary cable paths
- **Flexible Network Topologies**
 - Finally, fast redundant network design is simple
- **System Scalability**
 - Many Integrators are aware of future project phases at Phase 1 install
- **High Availability through Fast Recovery Time**
 - Retains 20mS redundancy despite many new benefits
- **Interoperability with other networks & RSTP**
 - Add redundancy benefits to existing networks

- **Thank you.**
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