# *RapidRing*™ — Redundancy from Contemporary Controls

***RapidRing*** provides Ethernet networks with high-speed redundancy using EISX8M, EICP8M or various EISB switches. A network of up to 50 switches can recover in under 300 ms. If a break occurs, each switch that loses ring connectivity will transmit a link-down SNMP trap and (if desired) flash an LED and activate a relay — identifying the failed link.

***RapidRing*** employs a simple ring structure of either copper or fiber optic cable (depending on switch model) using just two ports of each switch (Figure 1). The two ports are set for traditional or RapidRing operation via either web pages or console port screens.

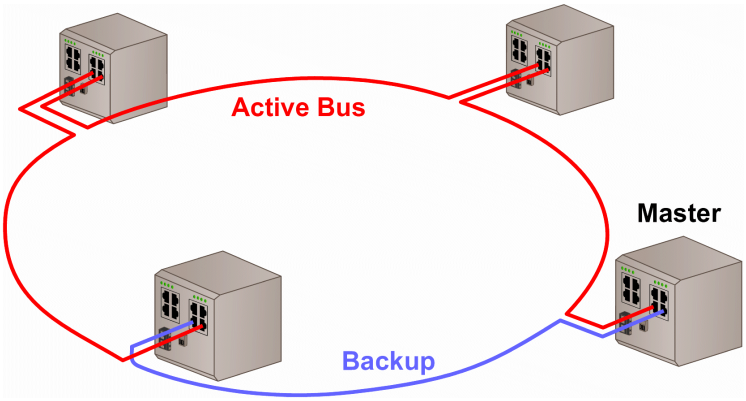


***Figure 1 — A Single RapidRing***

***RapidRing*** switches are "slave" devices by default, but one must be chosen as the **master**. In normal operation the master keeps a "backup" port deactivated.

**Response to a primary link failure —**

If a link failure is detected, the master is alerted and it "rebuilds" the network by activating its backup port — allowing normal communication to continue. Also, the ring port definitions in the address table of each switch in the ring are cleared to allow communication using the new network structure. If these tables were not cleared, slaves would try to communicate via obsolete paths until those paths were "aged" out of existence — a process taking as long as five minutes. Instead, detection of the link failure and activation of the master's backup link and clearing of each switch's address table all occur in under 300 ms.

**Restoration of normal operation —**

When the defective cable is repaired, the slaves will automatically alert the master and the network will return to normal mode — the backup link will be deactivated and the repaired link used. After repair of the failed link, the network is again restructured in less than 300 ms.

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***RapidRing*** will also support two interconnected rings (Figure 2) — allowing greater flexibility of wiring and network styles. The two rings are interconnected via a network link which can also be redundant, if desired.

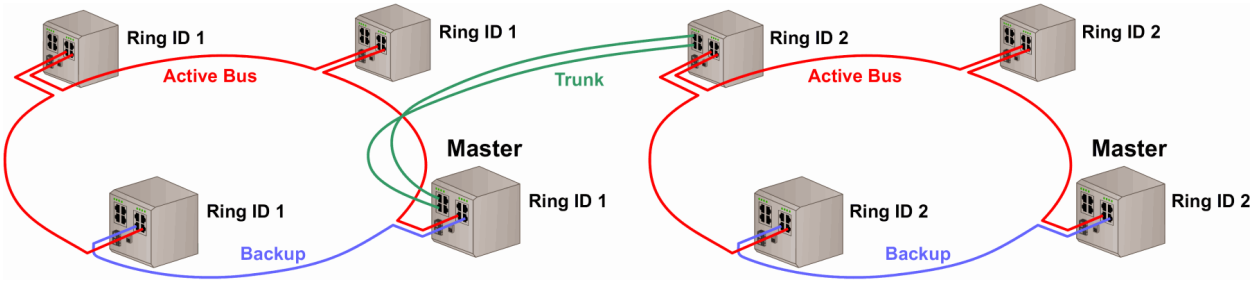


***Figure 2 — Two Interconnected RapidRings***

**Ease of configuration —**

A ring is easy to configure. First *enable* ***RapidRing*** mode on each switch in the ring. For a single ring, leave the "Ring ID" at its default setting. For dual rings, select Ring ID 1 for all switches in the first ring and Ring ID 2 for all switches in the second ring. And for inter-ring redundancy, configure a *trunk* on the switches which connect the two rings.

**Local monitoring —**

If the user wants to be warned *locally* of a link failure, the **Port Monitoring** function can be set so that a **fault relay** and **status LED** will activate under fault conditions. After a cable failure has been repaired, the relay and LED will return to their normal states — indicating a properly restored ring.

**Remote monitoring —**

For *remote* monitoring of ***RapidRing***, the user must provide an SNMP application to receive the SNMP *link-down* traps transmitted by each switch affected by a failed link. Each switch is programmed with *private MIBs* to inform the remote user of its status. Each switch can report:

- if it is enabled for ring operation
- the value of its Ring ID
- if it is a ring master or a slave
- if its ring is normal — or if its backup link is in use

An "incomplete" ring means a link has failed and the backup link has been activated.

**Mixed media option within a ring —**

***RapidRing*** also allows the use of Contemporary Control media converters (EIMC-100T/FC, EIMC-100T/FCS and EIMC-100T/FT) which convert from copper links to fiber links. Using a pair of these devices, a ring can accommodate both copper and fiber links (Figure 3).

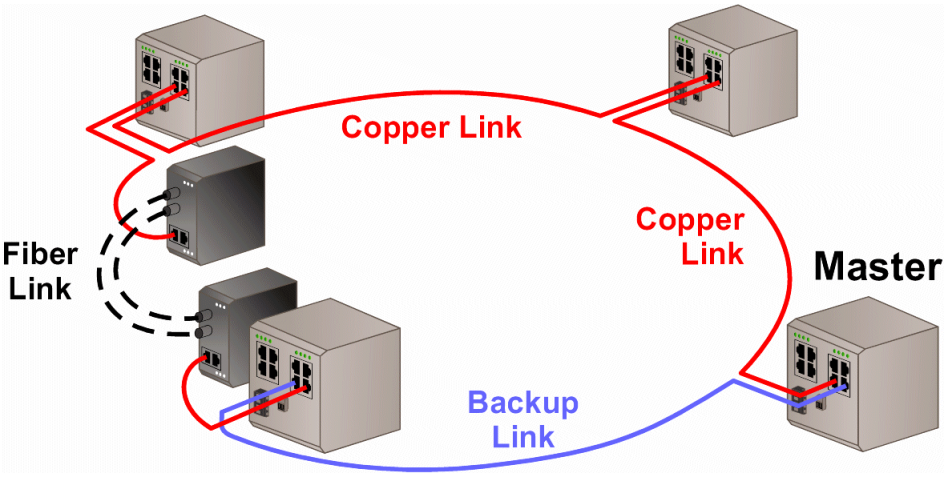


***Figure 3 — A Pair of Media Converters Allow a Fiber Link in a RapidRing***

**Fiber trunk option for dual rings —**

The trunk interconnecting two RapidRings can also use fiber cabling if a pair of EIMC units are employed. If the trunk is to be redundant, four media converters would be needed (Figure 4).

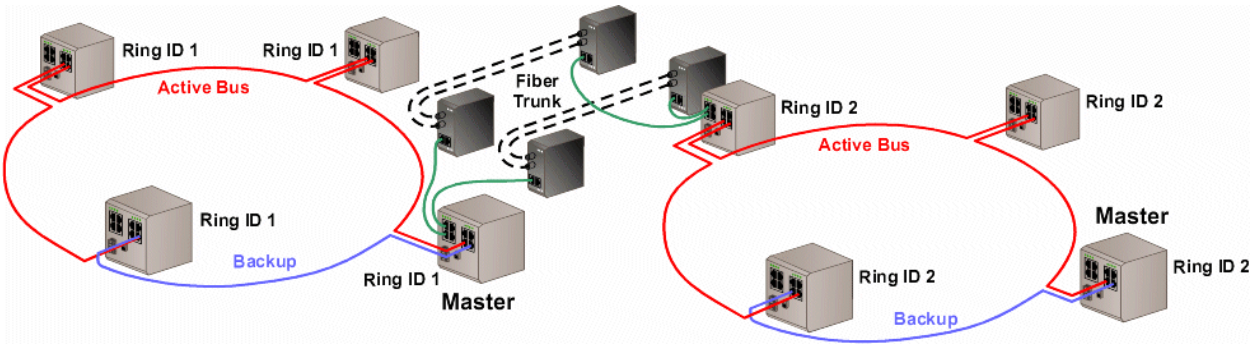


***Figure 4 — Four Media Converters Are Needed for a Redundant Fiber Trunk***