



## Ethernet Path Protection and Restoration (High Availability Networking)

### The Problem: Network Downtime = Customer Unhappiness

A cut fiber optic cable can spell disaster for mission-critical broadband networks. That simple physical connection is literally the lifeline to the network. No amount of failover software can restore a network that's been physically disconnected. The end result is potentially millions of dollars of lost revenue and definitely some very frustrated users.

### The Solution: Dual (redundant) links to provide alternate data paths

Metroability Optical Systems' patented "redundant twister" models offer redundant Ethernet data paths for line protection and restoration to prevent data loss due to cable failure, port failure, or catastrophic switch failures.

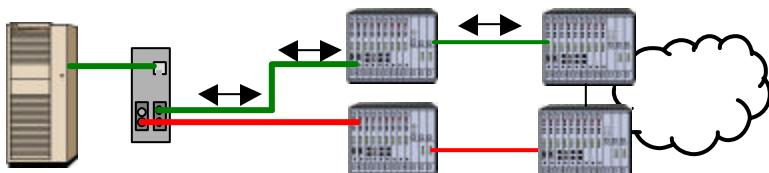
The "redundant twister" provides a secondary path for data through the network should the primary path fail. Once link is lost, the "redundant twister" switches data traffic to the secondary port which sends the data to a secondary segment, even to a different switch port or switch. The "redundant twister" can be dual attached to the network. This is equivalent to a major selling point of ring architectures called dual homing, which allows devices to have a primary connection to the network and a second link ready should the first link fail. But, of course, ring architectures are much more costly both in equipment and cost of ownership.

### No Risk of Data Loop

Most Ethernet networks use Spanning Tree or a proprietary protocol to provide resiliency in the core or backbone of the network. This greatly increases the complexity and convergence time for network recovery from a failed link or device. The "redundant twister" provides an extremely fast switch over (less than 200 microseconds at 100Mbps) which has minimal impact on the network and the end users. Since both ports are not active simultaneously, there is no potential for a data loop.

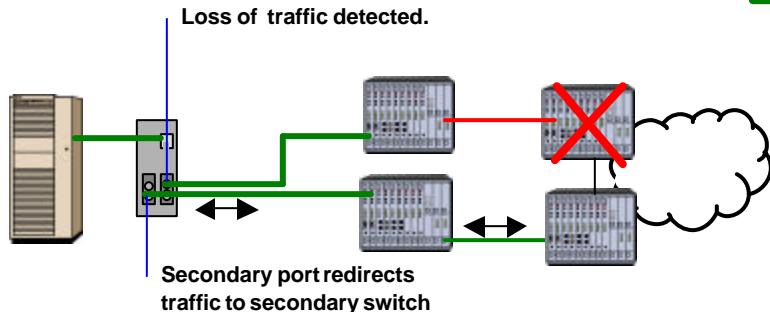
### SONAR: Innovative Traffic Monitoring

With the addition of SONAR (Switch on No Activity Received), the "redundant twister" not only monitors for loss of link on the active port, it also monitors for traffic. If the active port remains idle for a fixed amount of time (2 seconds) the "redundant twister" will verify activity on the secondary port, and switch traffic to the secondary port once traffic is detected. This protects against a switch or switch port failure from bringing a portion, or the entire network down. Monitoring of the secondary link prevents the switching of traffic to the secondary path during periods of light traffic on the network.



### Working Network – Traffic from Primary Switch

Link with no traffic  
 Link with active traffic



### SONAR Senses Primary Switch Failure – Traffic Redirected to Secondary Switch

#### Flexible Automatic or Manual Operation

The “redundant twister” has two operational modes to preserve network availability — Dynamic Recovery Mode or Network Select (A/B) Mode.

When set into Dynamic Recovery Mode, the “redundant twister” can be configured to automatically detect link failures and immediately reroutes traffic to a secondary path or switch. This instantaneous path restoration is ideal for critical areas that require a high degree of fault tolerance.

For areas in the network that don't require redundancy, the module port can be set for Network Select Mode to provide flexibility and security through link isolation. Network Select Mode redirects traffic from one link to another at any time through user interaction to implement, for example, dedicated networks for backup applications.

#### NetBeacon Element Manager Support

NetBeacon provides a visual confirmation of the link status.

**Redundant Twister Details - Chassis 1, Slot 7**

System: 192.132.65.76

Active Port	Secondary
Secondary Switch Occurred	Yes
SONAR	Enabled
Mode	Dynamic Recovery Mode
Mode Control	
Select A/B	Select A
Auto Restore Primary Circuit	Enabled
Link Pulse Control	Enabled
Redundant Transmission	Enabled

Mode selection can be controlled from a drop down menu.

## The Benefit: Save time and money = Happy Customers

The Metrobility patented path protection and restoration technology in the “redundant twister” offers unique advantages over traditional fault tolerant Ethernet approaches especially for time sensitive applications that require a higher level of security and alarm notification. Utilizing a Layer 1 failover device like the “redundant twister” offloads failover tasks from the server allowing the server to perform its primary functions faster.

## Product Information

The “redundant twister” is available as a line card for Radiance chassis, a module for the Lancast 7500 chassis, or as a standalone unit.

### 10Mbps

Radiance	Lancast	Standalone	Description
-----	7711-11-75	2711-11	RJ-45 to redundant RJ-45
R712-11	7712-11-75	2712-11	RJ-45 to redundant RJ-45 with SONAR

### 100Mbps

Radiance	Lancast	Standalone	Description
-----	7731-11-75	2731-11	RJ-45 to redundant RJ-45
R731-13	7731-13-75	2731-13	RJ-45 to redundant FX MM SC
R731-14	7731-14-75	2731-14	RJ-45 to redundant FX SM SC
R731-15	7731-15-75	2731-15	RJ-45 to redundant FX MM ST
R731-16	7731-16-75	2731-16	RJ-45 to redundant FX SM ST
R731-16	7731-17-75	2731-17	RJ-45 to redundant FX SM SC (40km)
R731-1J	7731-1J-75	2731-1J	RJ-45 to redundant FX SM SC (100km)
R732-11	-----	-----	RJ-45 to redundant RJ-45 with SONAR
R732-13	-----	-----	RJ-45 to redundant FX MM SC with SONAR
R732-14	-----	-----	RJ-45 to redundant FX SM SC with SONAR
R732-15	-----	-----	RJ-45 to redundant FX MM ST with SONAR
R732-16	-----	-----	RJ-45 to redundant FX SM ST with SONAR
R732-17	-----	-----	RJ-45 to redundant FX SM SC (40km) with SONAR
R732-1J	-----	-----	RJ-45 to redundant FX SM SC (100km) with SONAR

For additional information Metrobility's high availability product features including line protection, contact Metrobility Optical Systems at 1.877.526.2278 or 1.603.880.1833, or visit us at [www.metrobility.com](http://www.metrobility.com).