Troubleshooting Networks With Unmanaged Optical Ethernet Devices

Link Loss Return and Link Loss Carry Forward

The Problem: Unmanaged fiber connectivity (media conversion) devices create troubleshooting nightmares.

Troubleshooting remote devices in a geographically disparate network usually requires that all devices have “intelligence” and can be sensed by the SNMP management system. Unmanaged media converters will mask problems in the physical layer that require hours of discovery by the network administrator. This is costly and creates unhappy end users.

Link indicator lights found on all media converters indicate if the unit is receiving link from a device on the opposite end of the cable, but not if the central site device is *transmitting* link pulses or if the remote device is *receiving* the link pulses. The link LED only allows IT troubleshooters to determine if there is an active device connected to the other end of a physical link.

The Solution: Optical Ethernet connectivity and media conversion with link loss capabilities

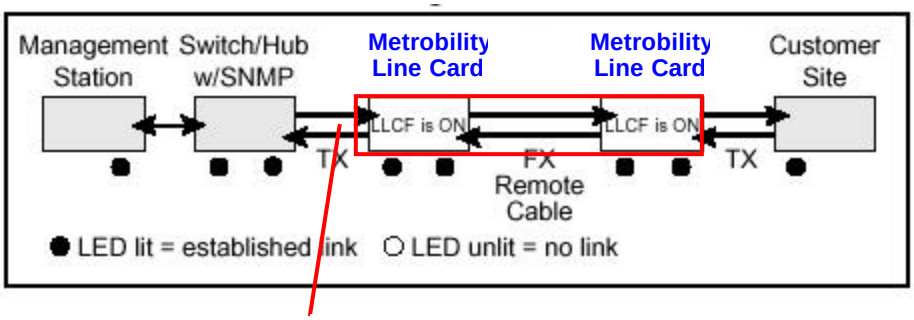
Link Loss Carry Forward (LLCF) and Link Loss Return LLR) are two mechanisms by which network administrators can troubleshoot unmanaged media converters.

When LLCF is enabled, the ports do not transmit a link signal until they receive a link signal from the opposite port. Link loss is “carried forward” to the managed switch or hub that is sending the link. LLCF can be used for either the copper or fiber ports.

When LLR is enabled, the fiber port’s transmitter shuts down if its receiver fails to detect a valid receive link. If one of the optical conductors is bad, the card with LLR enabled will return a no link condition to its link partner. LLR is used to detect link problems only on the fiber port.

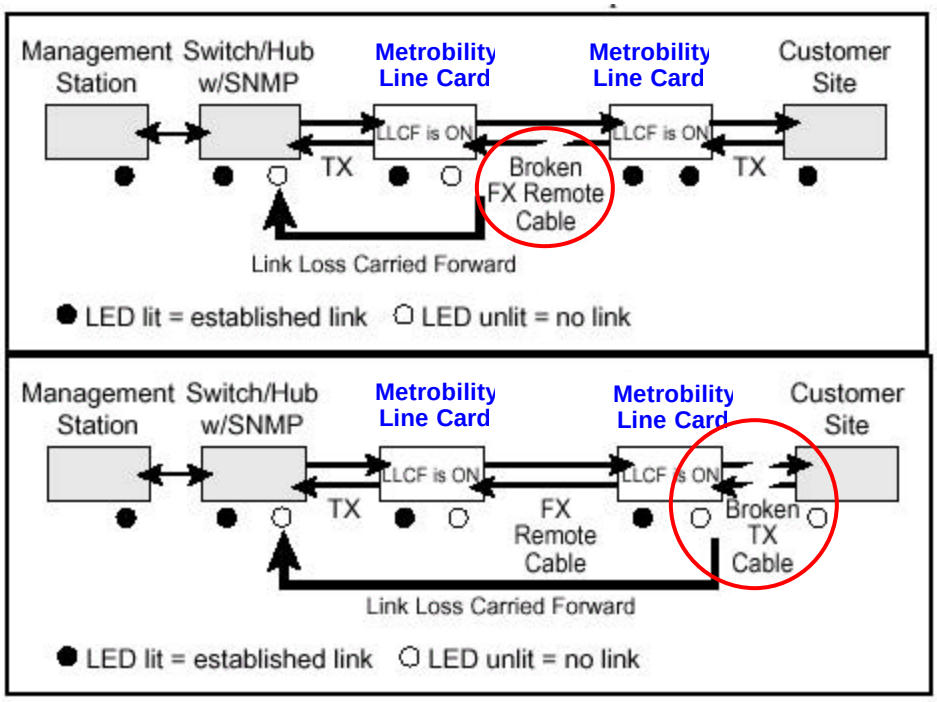
Link Loss Carry Forward

Working Network



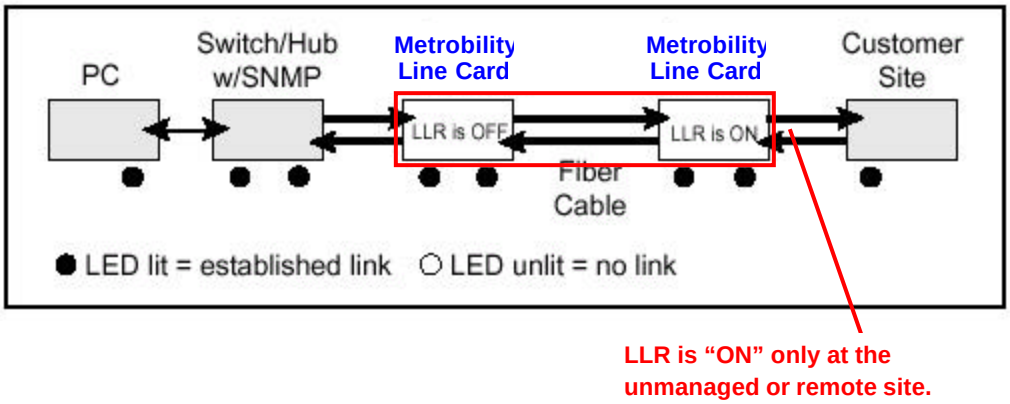
LLCF is "ON" at both cards.

Link Loss Carried Forward (Broken fiber or copper cable)

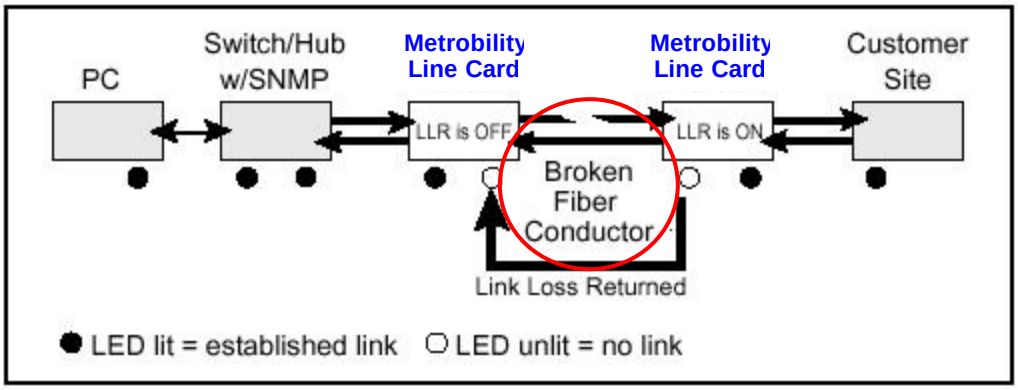


Link Loss Return

Working Network

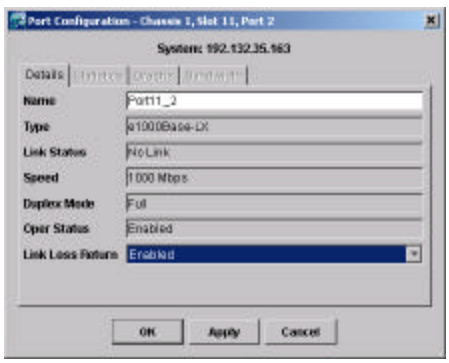


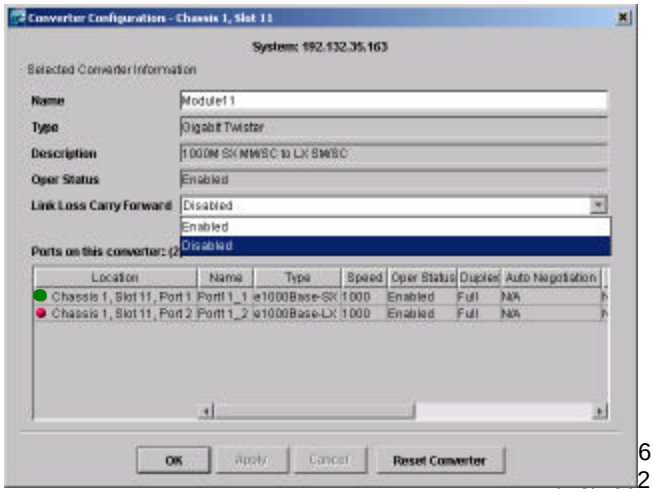
Link Loss Returned (Broken fiber)



The Best Solution: Using LLCF and LLR in conjunction with SNMP management

With the addition of SNMP, LLCF and LLR becomes a powerful troubleshooting tool. An SNMP managed switch combined with a Metrobility managed chassis (Lancast Intelligent 7500 or Radiance R5000, R1000 or R400) provides trap information that can quickly isolate the problem. LLCF and LLR can be turned on via Metrobility's NetBeacon or WebBeacon Element Manager.





The Benefit: Shorter troubleshooting time = Decreased cost-of-ownership and happy end-users

Cabling problems are the hardest problems to isolate. Without LLCF or LLR, a broken cable may remain unknown to a troubleshooter and the network device (hub, switch, router, or end node). This could be very critical in an unmanaged network. The link appears to be good from the network device since link indicator lights only allows IT troubleshooters to determine if there is an active device connected to the other end of a physical link.

LLCF and LLR provides trap information that can quickly isolate problems and greatly decreases the amount of time the technician required to restore the link.

Product Information

The following Metrobility products incorporate Link Loss Carry Forward and/or Link Loss Return.

Radiance 100Mbps Access Line Cards		**LLCF**	**LLR**
R231-13	100M TX to FX MM/SC	●	●
R231-14	100M TX to FX SM/SC	●	●
R231-15	100M TX to FX MM/ST	●	●
R231-16	100M TX to FX SM/ST	●	●
R231-17	100M TX to FX SM/SC LH (40km)	●	●
R231-1J	100M TX to FX SM/SC ELH (100km)	●	●

10/100Mbps AutoTwister™				**LLCF**	**LLR**
Radiance	**Lancast**	**Standalone**			
R621-11	7621-11-75	2621-11-01	10/100Mbps TX to 10/100Mbps TX		●
R641-14	7641-14-75	2641-14-01	10/100Mbps TX to 100Mbps FX/SM-SC		●
R641-17	7641-17-75	2641-17-01	10/100Mbps TX to 100Mbps FX/SM-SC, 40km		●
R611-51	7611-51-75	2641-51-01	10Mbps FL/MM-ST to 10/100Mbps TX		●
R641-13	7641-13-75	2641-13-01	10/100Mbps TX to 100Mbps FX/MM-SC		●
R641-15	7641-15-75	2641-15-01	10/100Mbps TX to 100Mbps FX/MM-ST		●
R641-1E	7641-1E-75	2641-1E-75	10/100Mbps TX to 100Mbps FX/MM-MT-RJ		●
R641-1G	7641-1G-75	2641-1G-01	10/100Mbps TX to 100Mbps FX/MM-VF45		●
R641-1J	7641-1J-75	2641-1J-01	10/100Mbps TX to 100Mbps FX/SM-SC, 100km		●
R641-53	7641-53-75	2641-53-01	10Mbps FL/MM-ST to 100Mbps FX/MM-SC		●
R641-55	7641-55-75	2641-55-01	10Mbps FL/MM-ST to 100Mbps FX/MM-ST		●

10/100Mbps AutoTwister™				LLCF	LLR
Radiance	**Lancast**	**Standalone**			
R642-14	7642-14-75	2642-14-01	10/100Mbps TX to 100Mbps FX/SM-SC	●	●
R642-17	7642-17-75	2642-17-01	10/100Mbps TX to 100Mbps FX/SM-SC, 40km	●	●
R612-51	7612-51-75	2642-51-01	10Mbps FL/MM-ST to 10/100Mbps TX	●	●
R642-13	7642-13-75	2642-13-01	10/100Mbps TX to 100Mbps FX/MM-SC	●	●
R642-15	7642-15-75	2642-15-01	10/100Mbps TX to 100Mbps FX/MM-ST	●	●
R642-1E	7642-1E-75	2642-1E-75	10/100Mbps TX to 100Mbps FX/MM-MT-RJ	●	●
R642-1G	7642-1G-75	2642-1G-01	10/100Mbps TX to 100Mbps FX/MM-VF45	●	●
R642-1J	7642-1J-75	2642-1J-01	10/100Mbps TX to 100Mbps FX/SM-SC, 100km	●	●
R642-53	7642-53-75	2642-53-01	10Mbps FL/MM-ST to 100Mbps FX/MM-SC	●	●
R642-55	7642-55-75	2642-55-01	10Mbps FL/MM-ST to 100Mbps FX/MM-ST	●	●

10Mbps Single Interface Line Cards

Radiance	Lancast	Standalone		LLCF	LLR
R111-12	7111-12-75	2111-12-01	10M TP to BNC	●	
R111-13	7111-13-75	2111-13-01	10M TP to FL MM/SC	●	
R111-15	7111-15-75	2111-14-01	10M TP to FL MM/ST	●	
R111-16	7111-16-75	2111-16-01	10M TP to FL SM/ST	●	
R111-18	7111-18-75	2111-16-01	10M TP to FL MM/SMA	●	

100Mbps Single Interface Line Cards

Radiance	Lancast	Standalone		LLCF	LLR
R131-13	7131-13-75	2131-13-01	100M TX to FX MM/SC	●	
R131-14	7131-14-75	2131-14-01	100M TX to FX SM/SC	●	
R131-15	7141-15-75	2131-15-01	100M TX to FX MM/ST	●	
R131-16	7131-16-75	2131-16-01	100M TX to FX SM/ST	●	
R131-17	7131-17-75	2131-17-01	100M TX to FX SM/SC LH (40km)	●	
R131-1J	7131-1J-75	2131-1J-01	100M TX to FX SM/SC ELH (100km)	●	
R131-33	7131-33-75	2131-33-01	100M FX MM/SC to MM/SC	●	
R131-44	7131-44-75	2131-44-01	100M FX SM/SC to SM/SC	●	
R131-55	7131-55-75	2131-55-01	100M FX MM/ST to MM/ST	●	
R131-66	7131-66-75	2131-66-01	100M FX SM/ST to SM/ST	●	
R131-77	7131-77-75	2131-77-01	100M FX SM/SC LH (40km) to SM/SC LH (40km)	●	
R131-JJ	7131-JJ-75	2131-JJ-01	100M FX SM/SC ELH (100km) to SM/SC ELH (100km)	●	
R131-J7	7131-4J-75	2131-JJ-01	100M FX SM/SC to SM/SC LH (40km)	●	
R131-4J	7131-47-75	2131-4J-01	100M FX SM/SC to SM/SC ELH (100km)	●	

1000Mbps Single Interface Line Card

Radiance	Standalone		LLCF	LLR
R152-1A	2152-1A-01	1000M TX to SX MM/SC	●	●
R152-1K	2152-1K-01	1000M TX to SX MM/LC	●	●
R152-1D	2152-1D-01	1000M TX to LX SM/SC	●	●
R152-1M	2152-1M-01	1000M TX to LX SM/LC	●	●
R152-1F	2152-1F-01	1000M TX to LX SM/SC (25km)	●	●
R152-17	2152-17-01	1000M TX to LH SM/SC (40km)	●	●
R152-1J	2152-1J-01	1000M TX to EX SM/SC ELH (70km)	●	●

1000Mbps Single Interface Line Card Singlemode to Multimode

Radiance	Standalone		LLCF	LLR
R151-AD	2152-AD-01	1000M SX MM/SC to LX SM/SC	●	●
R152-AA	2152-AA-01	1000M SX MM/SC to SX MM/SC	●	●
R152-AD	2152-AD-01	1000M SX MM/SC to LX SM/SC	●	●
R152-KM	2152-KM-01	1000M SX MM/LC to LX SM/LC	●	●
R152-AF	2152-AF-01	1000M SX MM/SC to LX SM/SC (25km)	●	●
R152-A7	2152-A7-01	1000M SX MM/SC to LH SM/SC (40km)	●	●
R152-AJ	2152-AJ-01	1000M SX MM/SC to EX SM/SC ELH (70km)	●	●

1000Mbps Single Interface Line Card Optical Extender Modules

Radiance	Standalone		LLCF	LLR
R152-DD	2152-DD-01	1000M LX SM/SC to LX SM/SC	●	●
R152-DF	2152-DF-01	1000M LX SM/SC to LX SM/SC (25km)	●	●
R152-D7	2152-D7-01	1000M LX SM/SC to LH SM/SC (40km)	●	●
R152-DJ	2152-DJ-01	1000M LX SM/SC to EX SM/SC ELH (70km)	●	●
R152-77	2152-77-01	1000M LH SM/SC to LH SM/SC (40km)	●	●
R152-JJ	2152-JJ-01	1000M EX SM/SC to EX SM/SC ELH (70km)	●	●

SONET Single Interface Line Cards

Radiance	Standalone		LLCF	LLR
R125-34	2125-34	OC-3/STM-1 MM/SC to SM/SC	●	●
R125-37	2125-37	OC-3/STM-1 MM/SC to SM/SC LH (40km)	●	●
R135-34	2135-34	OC-12/STM-4 MM/SC to SM/SC	●	●

For additional information Metrobility's products, contact Metrobility Optical Systems at 1.877.526.2278 or 1.603.880.1833, or visit us at www.metrobility.com.