WAN PHY DEFINITIONS

Adhoc Contributors

Brad Booth

Ben Brown

Steve Haddock

Jeff Lynch

Stuart Robinson

Nader Vijeh

Paul Bottorff

Roy Bynum

David Law

David Martin

Geoff Thompson

Some definitions for us from 802.3 and SONET

‘802.3 MAC’

a) 802.3 standard.
b) MAC client above.
c) Reconciliation sublayer below.
d) Single channel, no multiplexor.
e) Full duplex (for 10GbE), no CSMA/CD.
f) No buffering.

‘802.1D Relay’

a) Connects elements (eg MACs) at MAC-client interface to create a bridge / switch.

b) A MAC client.

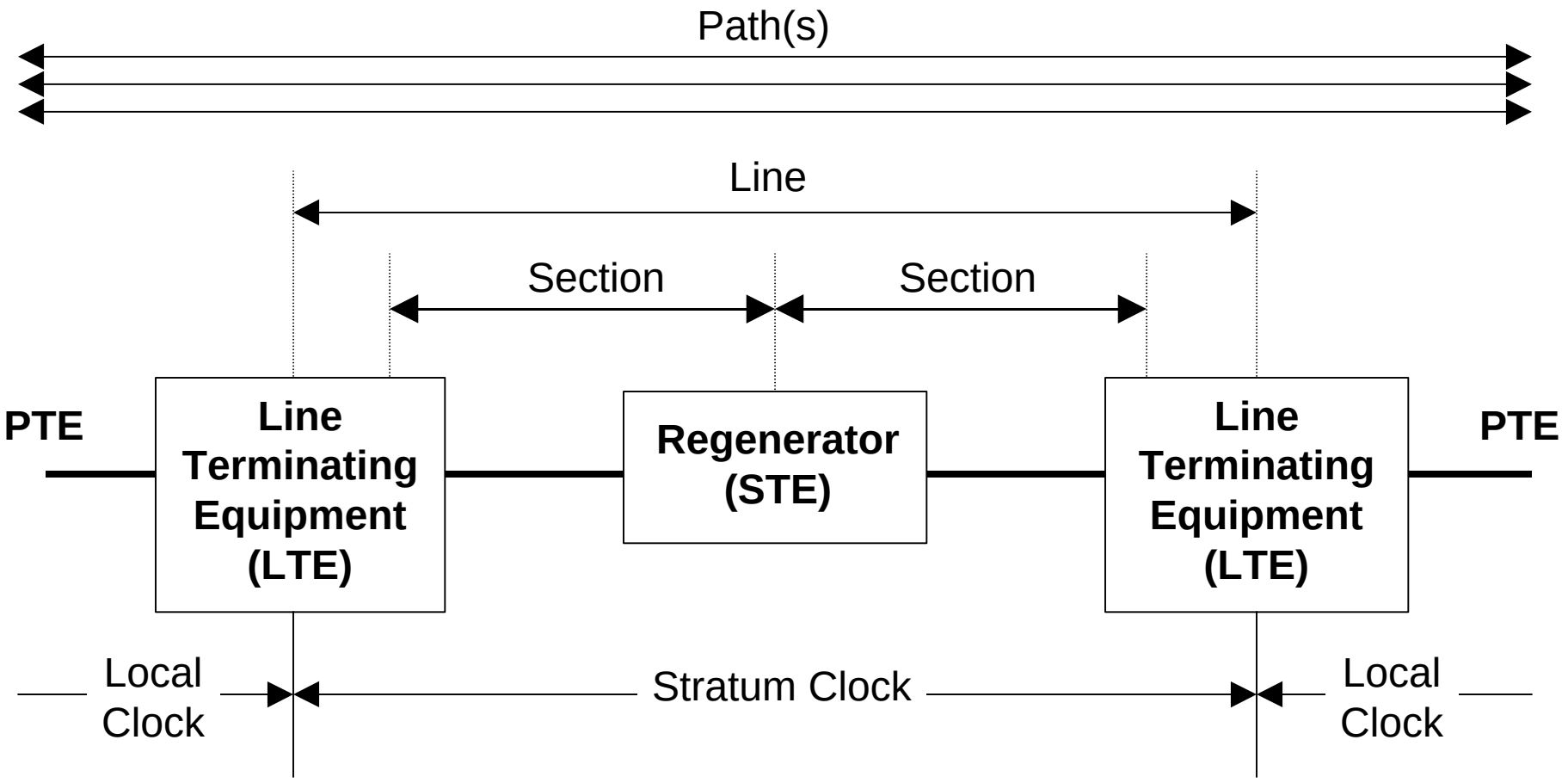
c) Packet store and forward (no cut through).

d) Accommodates speed changes port to port.

‘802.3 Repeater’

a) 10, 100, 1000 single speed.
b) Half-duplex, CSMA/CD only (no full-duplex).
c) Shared access to a single channel.
d) Bit store and forward for clock tolerance differences.
e) Fractional packet latency.

‘Path’, ‘Line’, ‘Section’



Note: A Line can be longer than two Sections

‘SONET Regenerator’

a) Full-duplex (dual-simplex).

b) Operates on one and only one wavelength in each direction.

c) Input wavelength equals the output wavelength in each direction.

d) Forward wavelength may or may not equal the reverse wavelength.

e) Couples SONET *Sections* within a *Line*.

f) Buffer-less. Pipeline fixed delay. Transmit clock is the recovered receive clock.

continued ...

‘SONET Regenerator’ (cont’)

g) Examines and/or writes SONET section overhead.

h) Payload, *Line* and *Path* information are passed through unmodified.

i) Unscrambles and re-scrambles to support g).

j) Keeps output *Section* active even if input *Section* fails (fault isolation).

k) This is a ‘3R’ (re-amplify, re-shape, re-time).

l) This is a ‘STE’ (Section Terminating Equipment)

SONET ‘Line Terminating Equipment (LTE)’

a) Everything a SONET Regenerator does plus:
b) Terminates a *Line* and the associated *Section*.
c) Source of clock.
d) Multiplexes *Paths* onto a *Line* and de-multiplexes a *Line* into *Paths*.
e) It is a dual simplex *Path* mux.
f) Maintenance/Protection switching for muxed *Paths* between *LTEs*.

SONET ‘Path Terminating Equipment (PTE)’

a) Terminates a *Path* and the associated *Line* and *Section*.

b) Operates on Local clock.

c) This is where the SONET path overhead is processed.

d) This is the 802.3 WAN PHY.

e) In 802.3 this is the where we attach the Reconciliation sublayer.

f) This is where the 802.3 MAC Frames are mapped into the SONET payload.

‘SONET Transponder’

a) Couples differing optical PMDs back to back.

b) E.G. wavelength 1 to wavelength 2, multimode to singlemode, 850nm to 1300nm.

c) Dual simplex.

‘Passive Transponder’ (emerging term) :

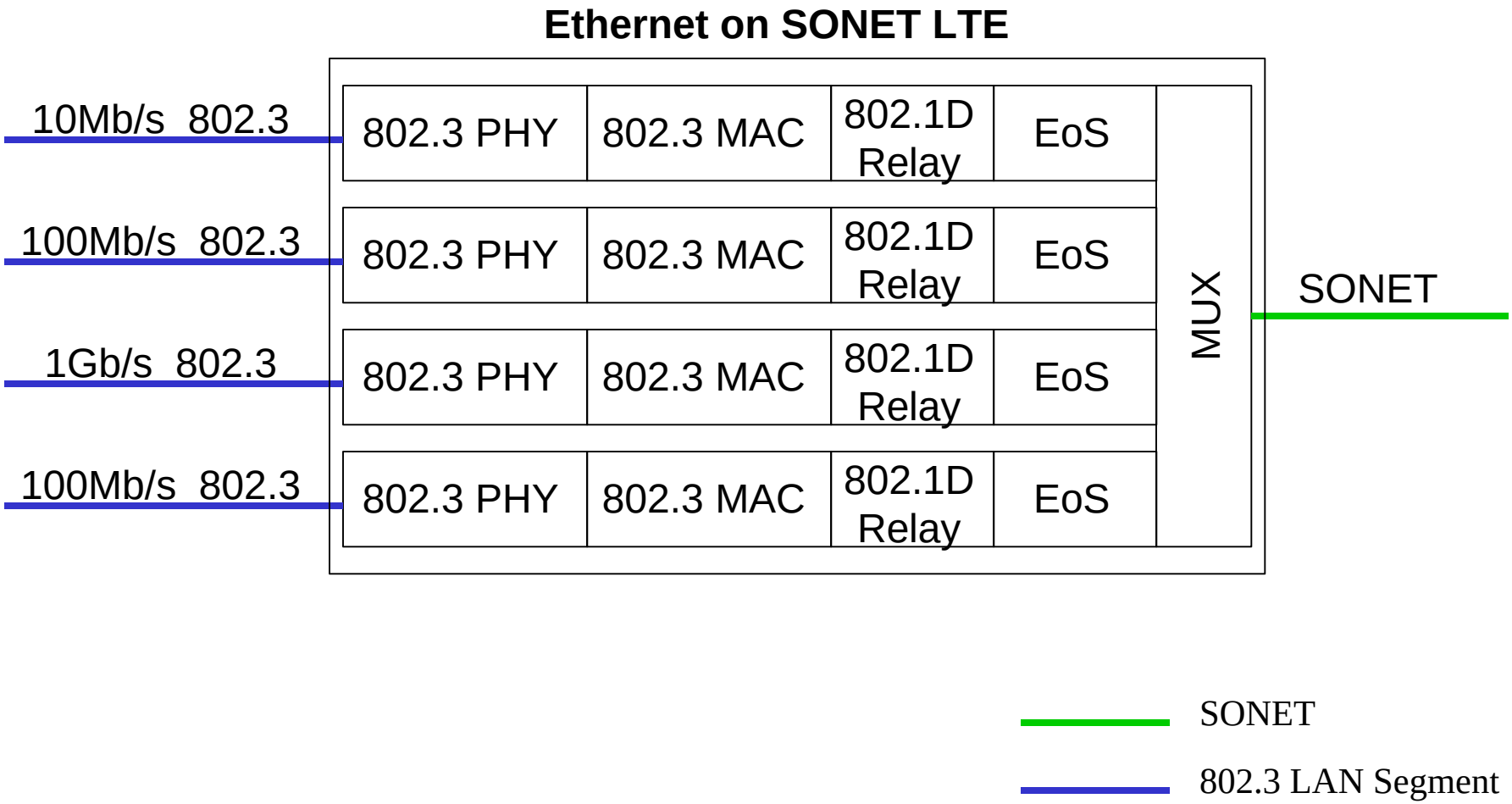
d) Transparently passes all bits (Items a, b, c).

‘Active Transponder’ (emerging term) :

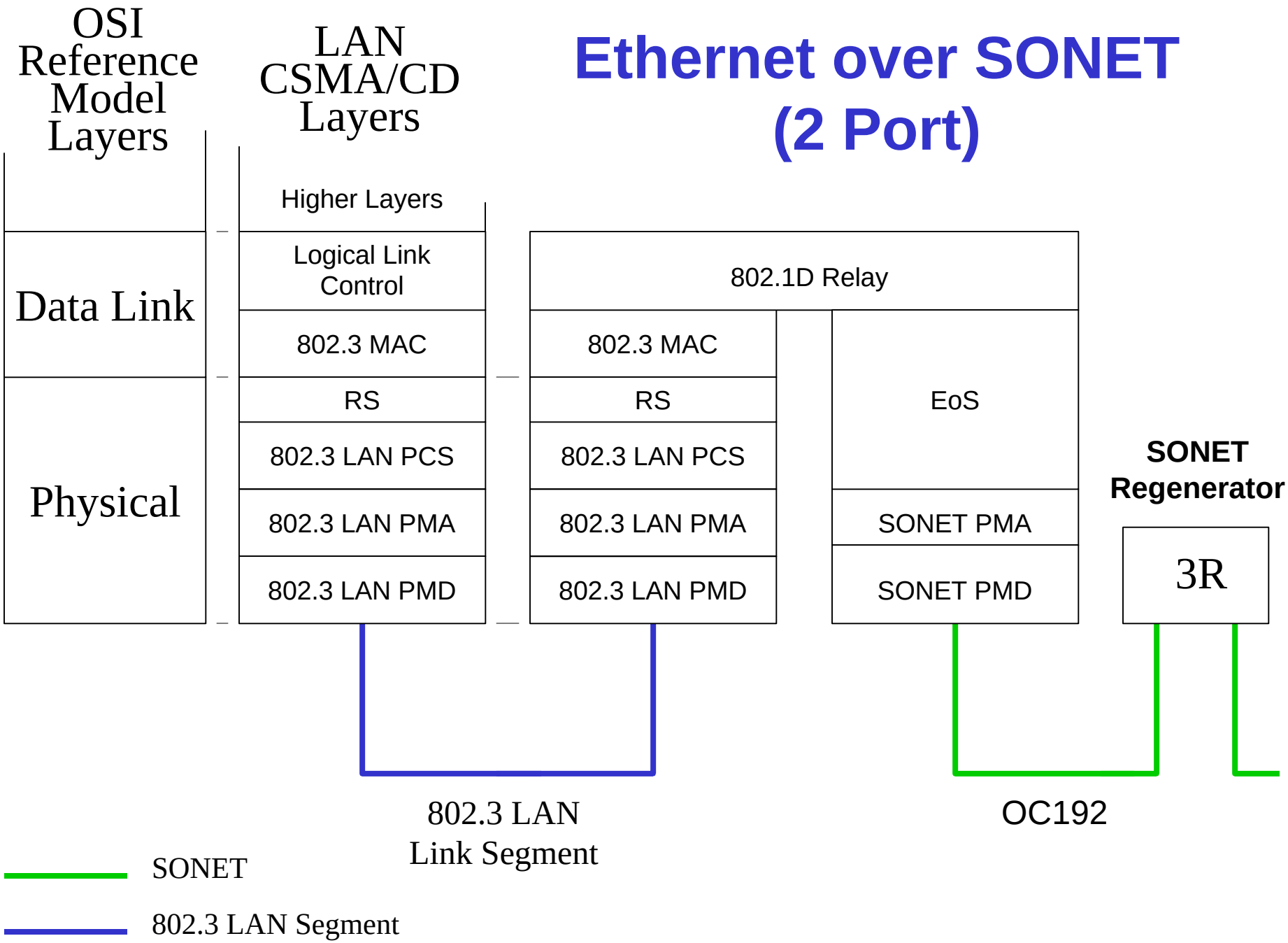
e) This is a special case of SONET *Regenerator* because of item a).

f) Terminates *Section* (see *Regenerator*).

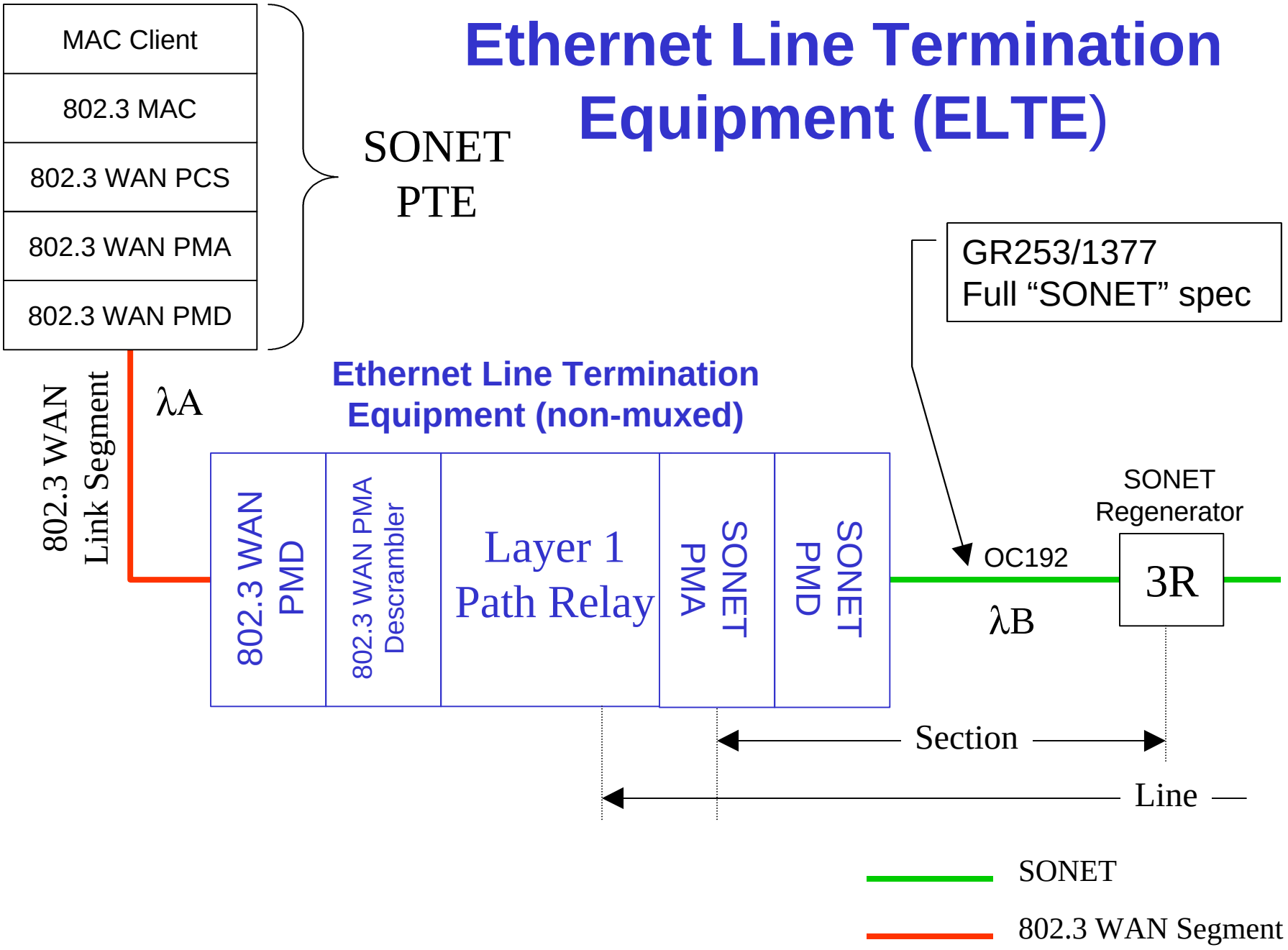
Ethernet on SONET LTE



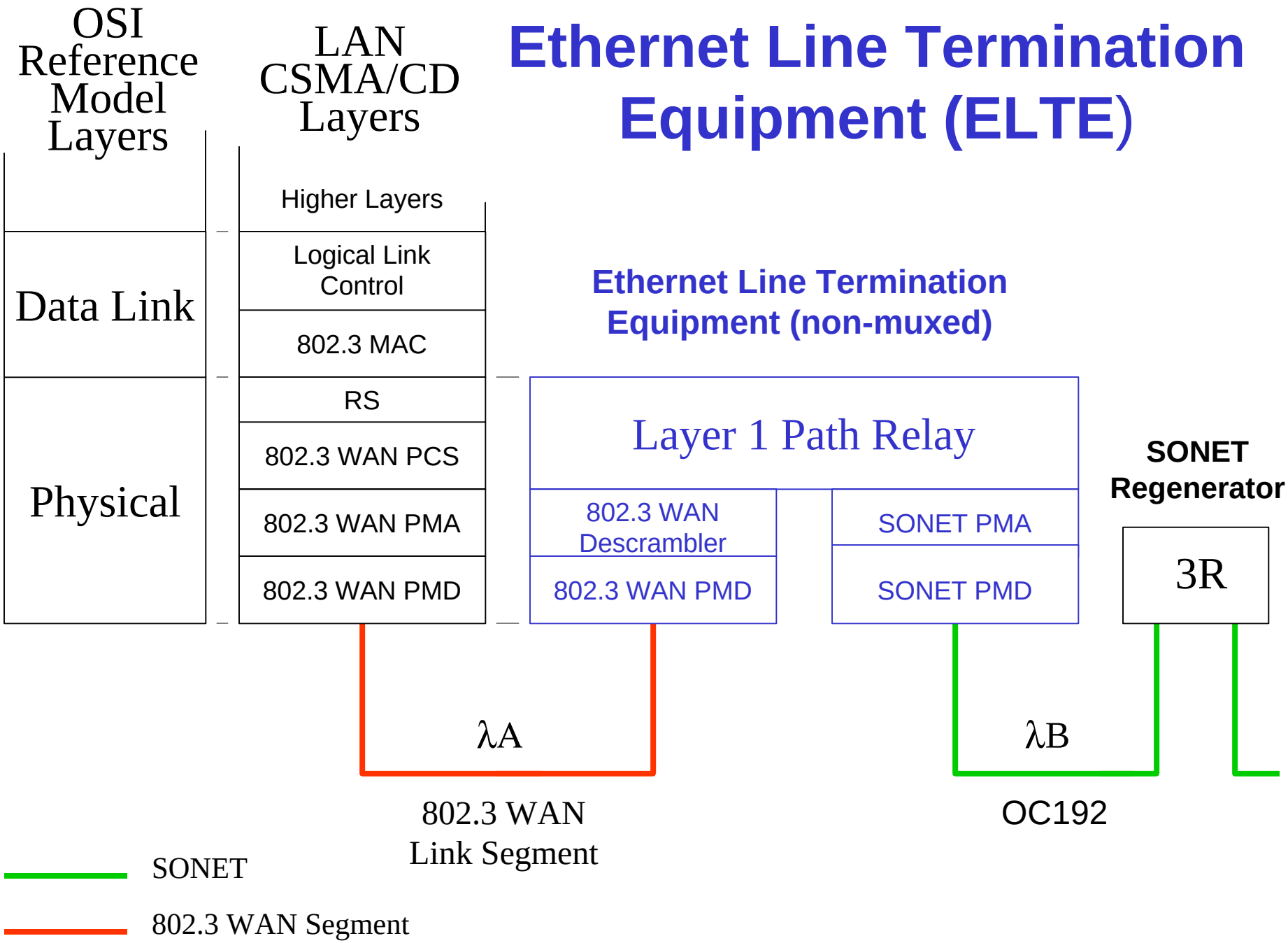
Ethernet over SONET (2 Port)



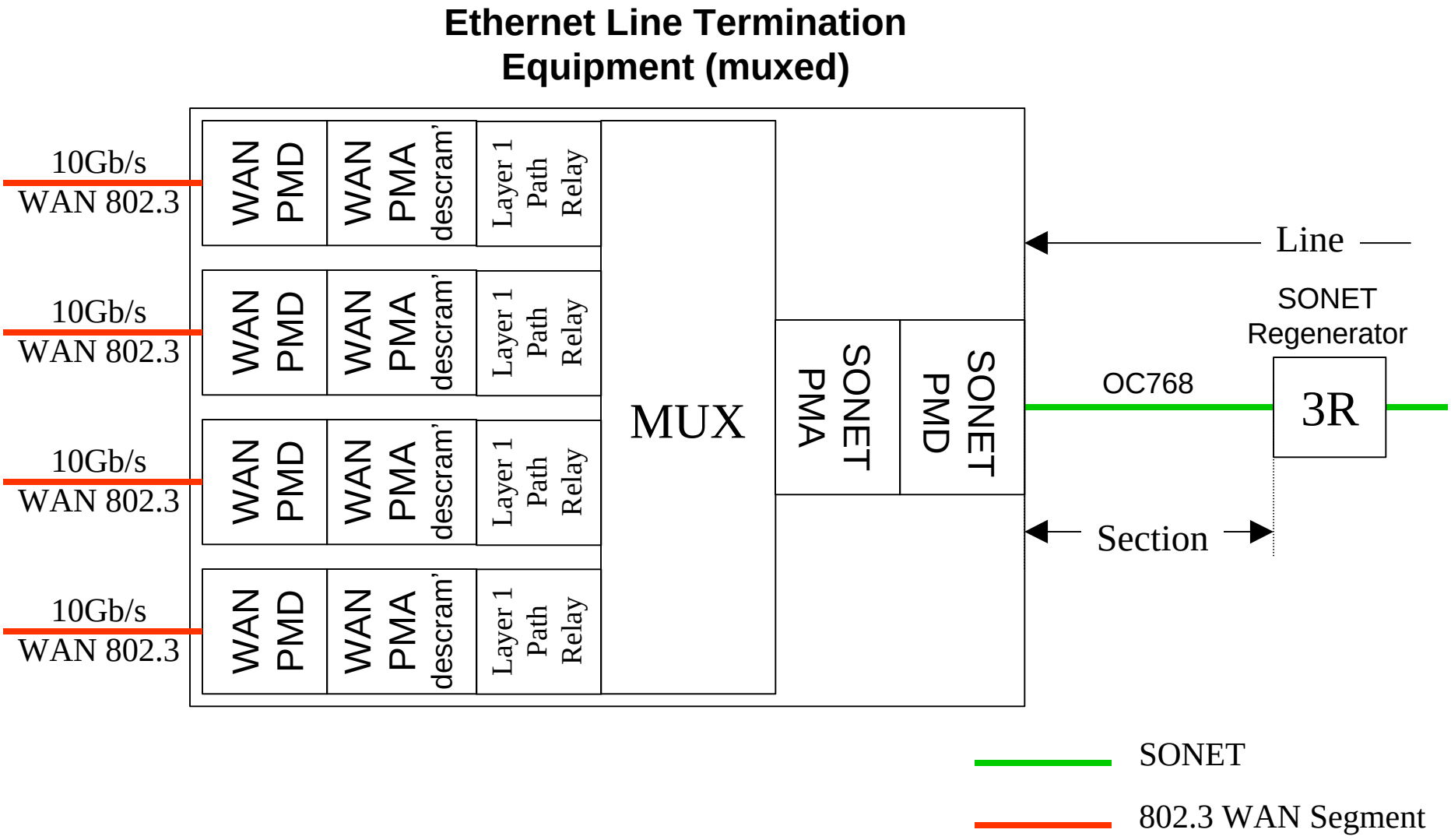
Ethernet Line Termination Equipment (ELTE)



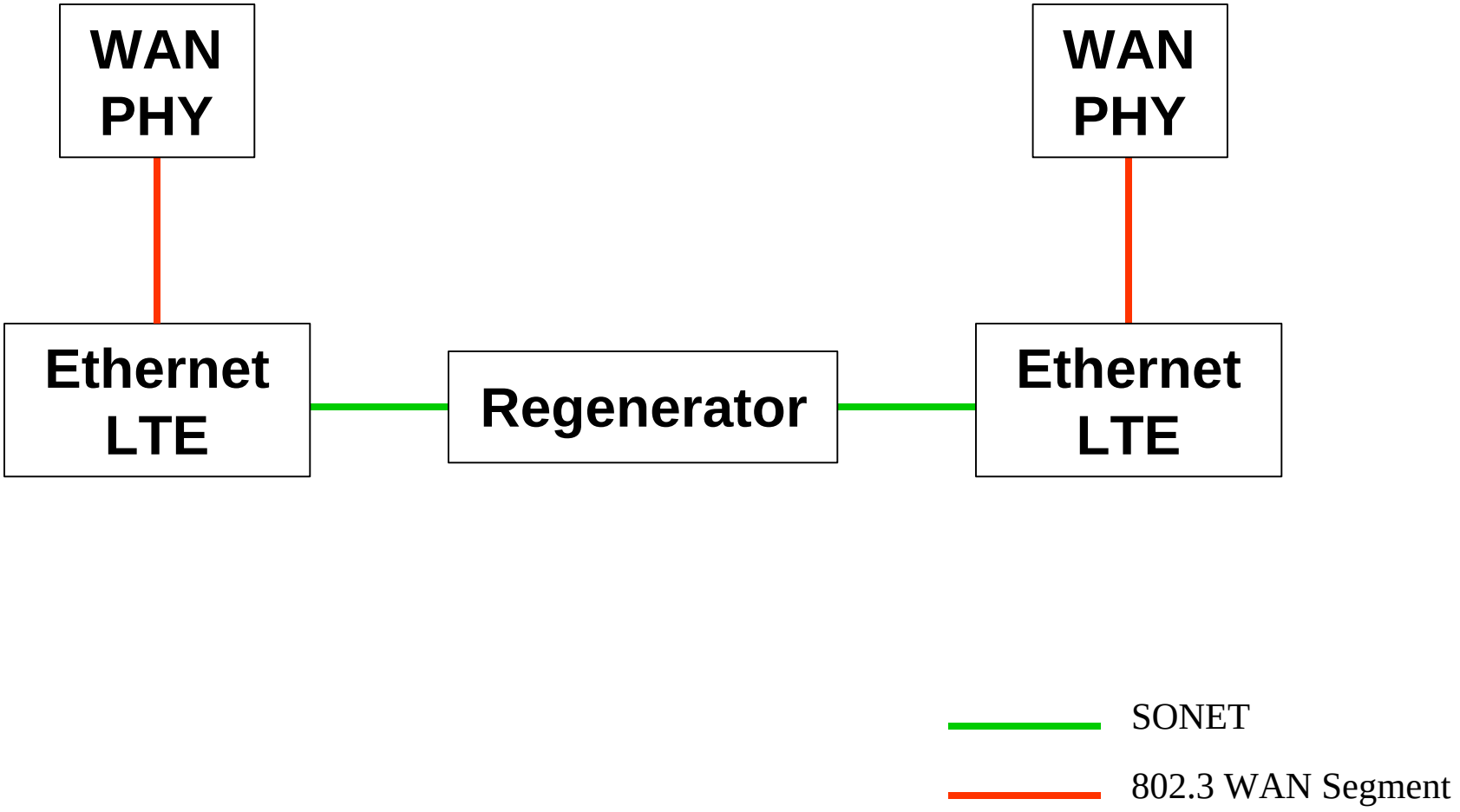
Ethernet Line Termination Equipment (ELTE)



Ethernet Line Termination Equipment (ELTE)



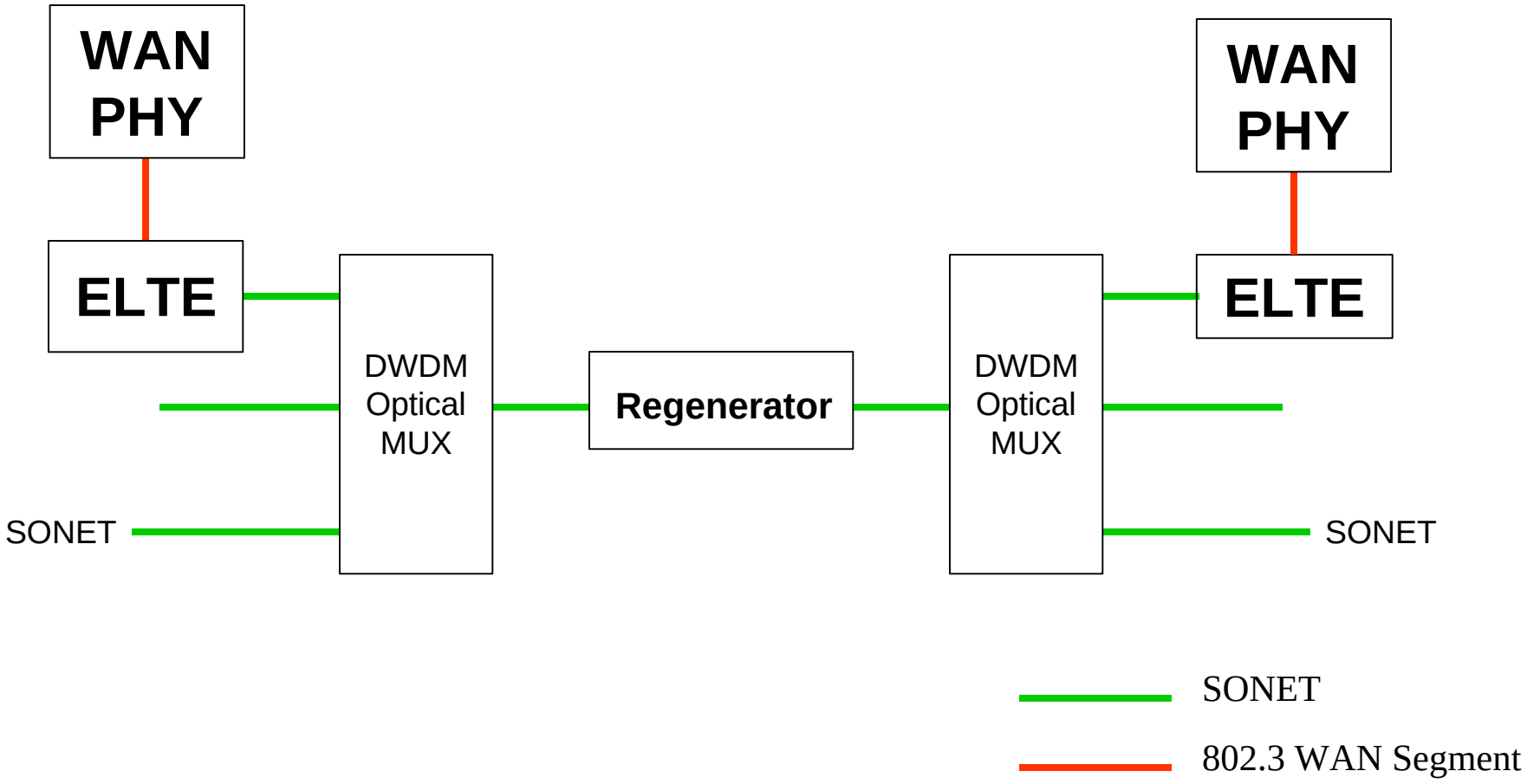
Point to Point SONET Interconnect



Dark Fiber

802.3 WAN Segment

DWDM Case


WAN PHY
ELTE
DWDM Optical MUX
Regenerator
DWDM Optical MUX
WAN PHY
ELTE
SONET
SONET
SONET
802.3 WAN Segment