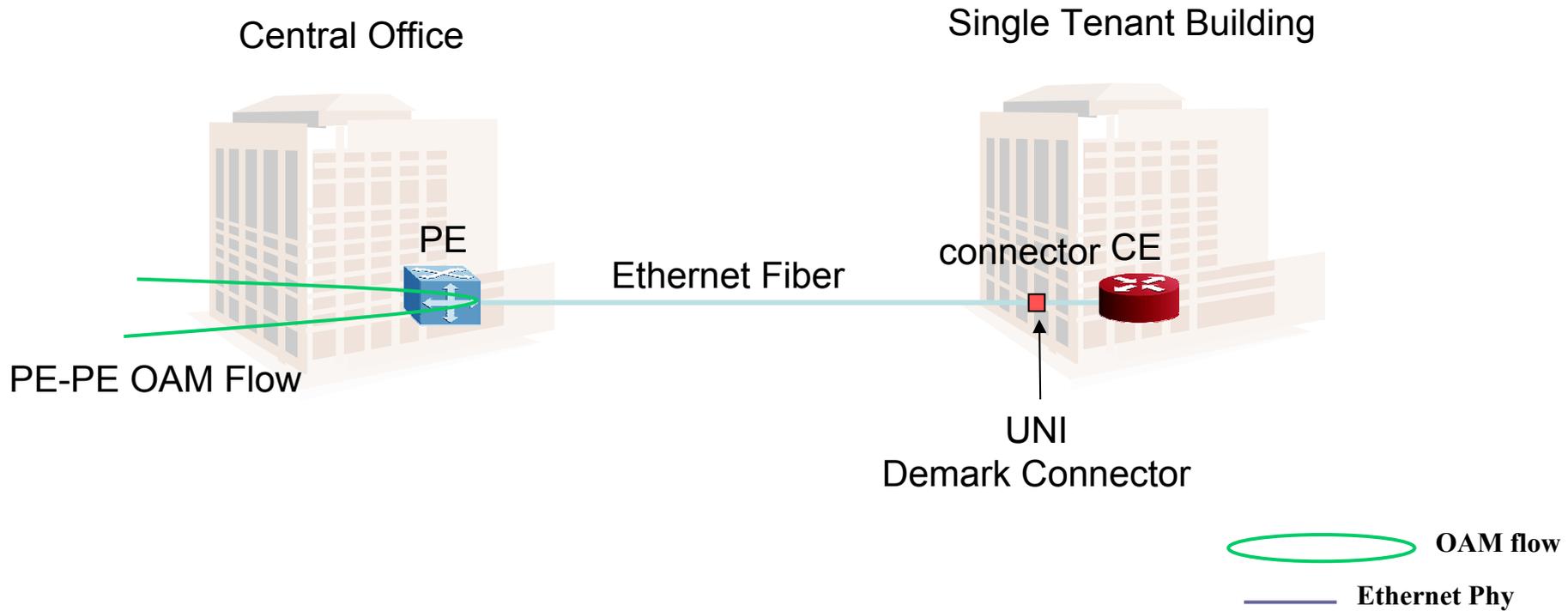# Media Converters

Paul Bottorff, Michael Chen, Dinesh
Mohan, Glenn Parsons
Version 2.0
October 4, 2004 Ottawa

NØRTEL
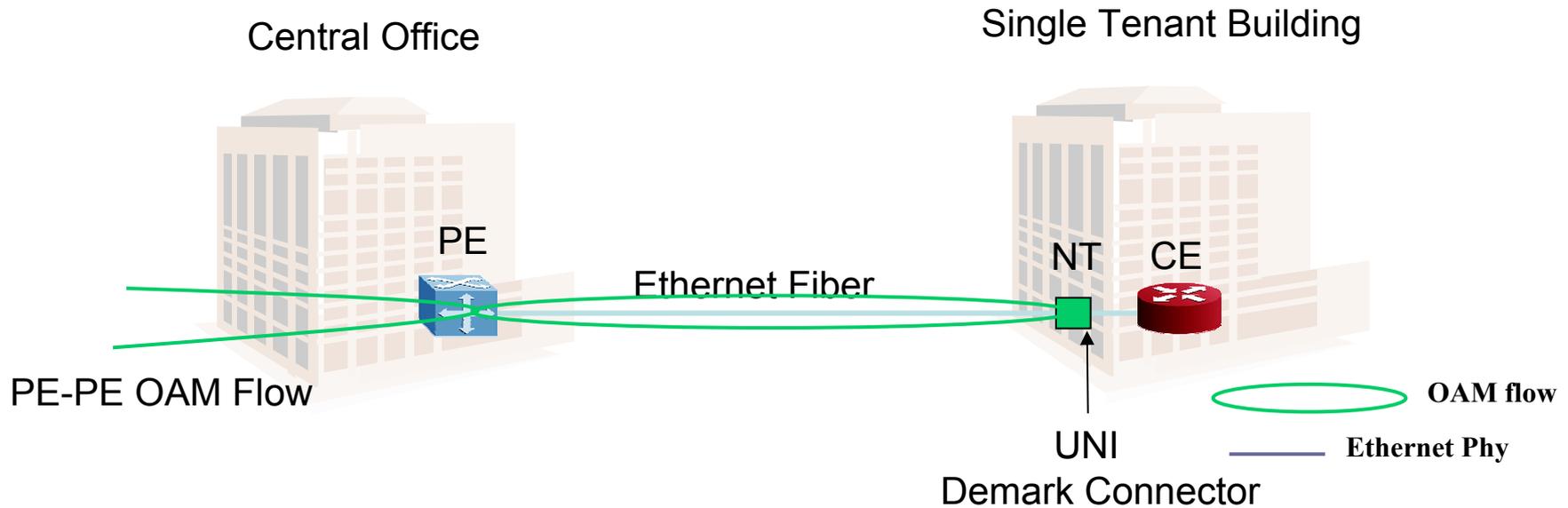**NETWORKS**

Generic Equipment Names

- NT: Network Termination Equipment. This is the end point of the provider network and the beginning of the customer network. The NT's responsibilities include line performance monitoring, timing, protocol conversion...

- TE: Transport Edge Equipment. May be a 'dumb' Multiplexer enables TDM/packet multiplexing of multiple customer flows into single physical link. The TE doesn't 'inspect' the customer Ethernet frames.

- PE: Provider Edge Equipment. The PE is the first box from the customer which is responsible for service provisioning.

- P: Provider Core Equipment. Many possible types.

NORTEL NETWORKS™

Single Tenant Serviced by a dedicated Fiber

Central Office

Single Tenant Building

PE

connector CE

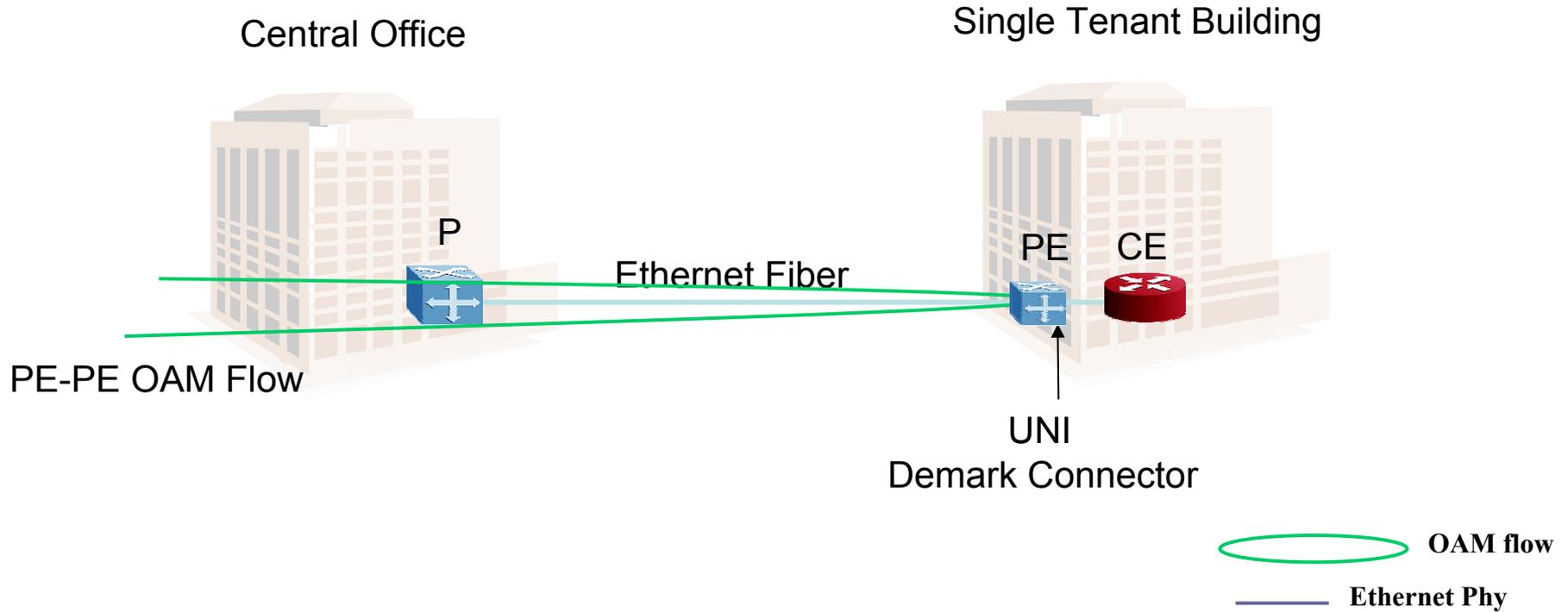Ethernet Fiber

PE-PE OAM Flow

UNI
Demark Connector

OAM flow

Ethernet Phy

- Dumb demark equipment (a light box connector) does not give carrier ability to manage to the edge of the provider network.

NORTEL
NETWORKS

Single Tenant dedicated fiber using a managed NT

Central Office

Single Tenant Building

PE

NT   CE

Ethernet Fiber

PE-PE OAM Flow

UNI
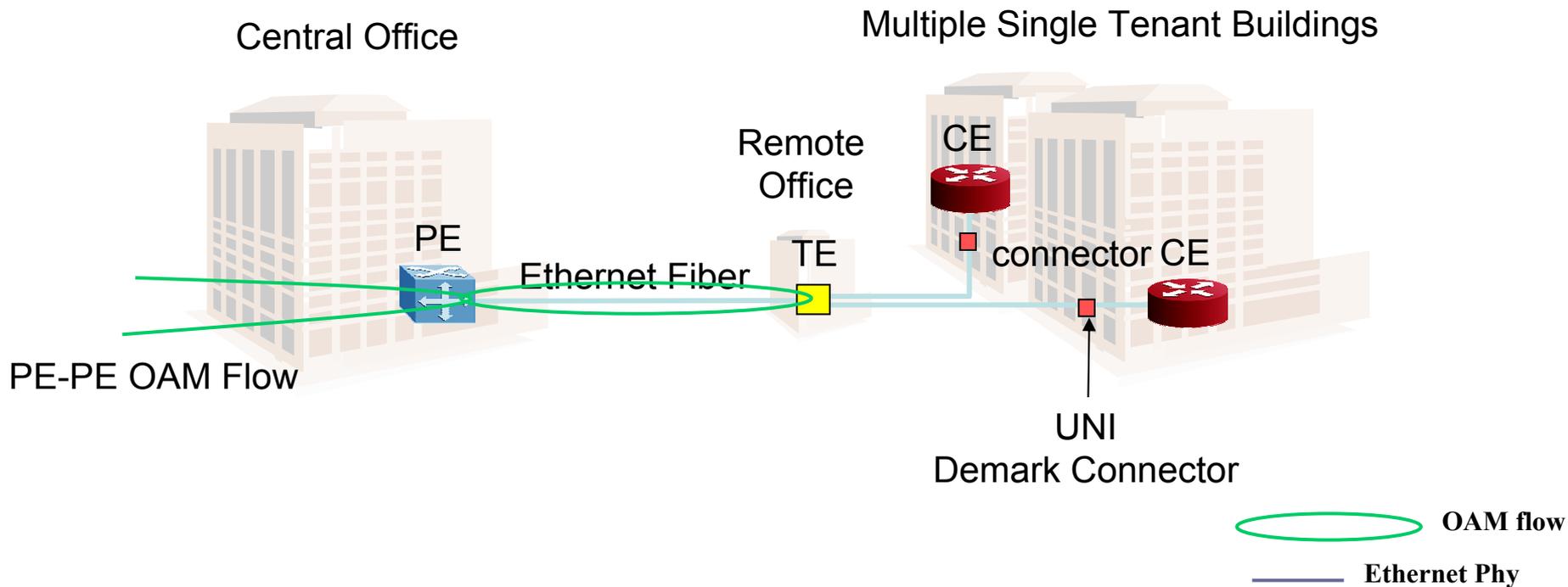Demark Connector

OAM flow

Ethernet Phy

- Managed demark equipment NTE (integrates demark function) provides termination of the Carrier Network and OAM turn around allowing the carrier the ability to manage to the edge of the provider network.

- Should provide out of service loopback point near demark.

- Should monitor customer link and report to PE.

NORTEL NETWORKS™

Single Tenant Serviced by a dedicated Fiber

Central Office

Single Tenant Building

P

PE   CE

Ethernet Fiber

PE-PE OAM Flow

UNI
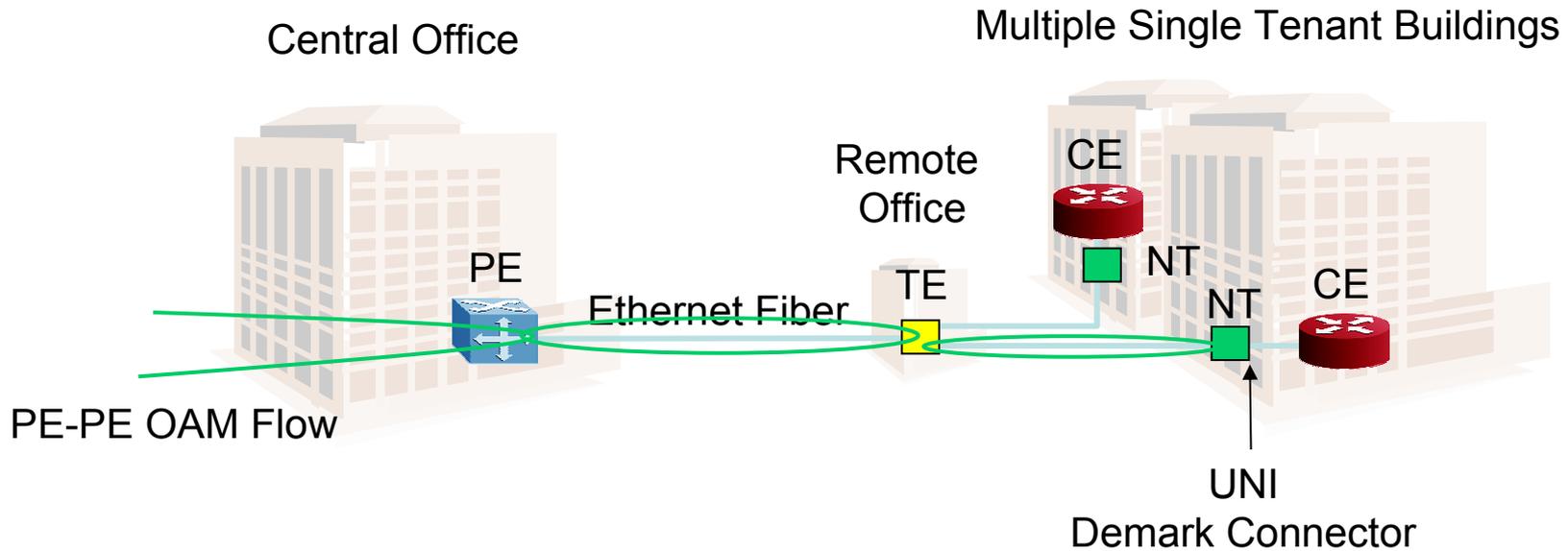Demark Connector

⬭ OAM flow

▬ Ethernet Phy

- Smart demark equipment.

- The difference between this and the media converter is the PE device is service aware.

Multiple Tenants Serviced by shared Fiber

Central Office

Multiple Single Tenant Buildings

CE

PE

Remote Office

TE

connector CE

Ethernet Fiber

PE-PE OAM Flow

UNI
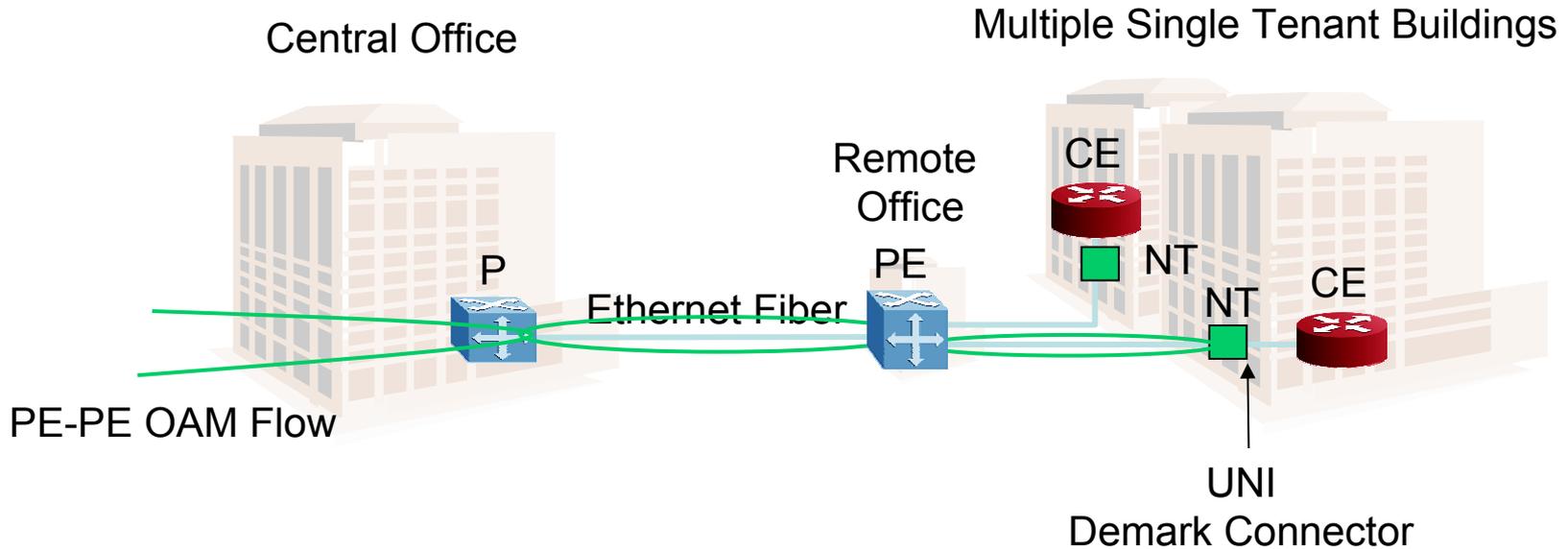Demark Connector

OAM flow

Ethernet Phy

- Dumb demark equipment (a light box connector) does not give carrier ability to manage to the edge of the provider network.
- Transport layer multiplexing (add 'label' to service frames)

NORTEL
NETWORKS

Multiple Tenants Serviced by shared Fiber

Central Office

Multiple Single Tenant Buildings

Remote Office

CE

PE

Ethernet Fiber

TE

NT

NT

CE

PE-PE OAM Flow

UNI
Demark Connector

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NETWORKS™

NTE and TE Properties

- Very simple devices which don't require knowledge of the specific services multiplexed on the links.

- Used to manage the infrastructure not the service.

- Where services need to be managed at the edge of the network the Provider Bridge may be extended to the customer site.

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Network Termination Equipment

- The NTE converts one Ethernet Interface to another without doing any switching.

- Does NTE do rate conversion (i.e. 100BaseT UNI to a 1GE carrier link)?
  - If so then some rate control may be implied at the PE to support the UNI

- The NTE must indicate the operational state of the customer attachment link to the PE.

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Multiplexer Equipment

- Used to build a multi-user access network infrastructure using Ethernet link.

- Used as a demark for a multi-tenant building.

- Needs a multiplexing tag for the uplink.

- Needs to report the state of all tributary and user links to the PE.

- May be blocking or non-blocking.

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Recommendations

- Both Network Termination and Multiplexing equipment are desirable for Metro Ethernet Networks.

- Termination Equipment should support rate conversions between carrier and customer, customer link status reporting, and out of service loopback.

- Multiplexing Equipment should support blocking operation, customer link status reporting, and out of service loopback.

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