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# PARTIAL PRIVATE CIRCUIT

## PRODUCT DESCRIPTION



Version Control

Version	Status	Update	Effective Date
2.3		Updated with PPC STM 4/16 TL Wholesale Ethernet Access Option.  Annex A updated.	7 September 2009
V3.0	Final	This document is based on V2.3 Implementation of Standardised Change Control.	23/06/2017
V3.1	Proposed	Introduction of In Building Handover (IBH)	01/07/2109

This document follows change control procedure:

**Proposed** is defined as a document status when the approved document is uploaded to Proposals Section of open eir Website.

**Final** is defined as a document status when the approved document is uploaded to the relevant section of the open eir Website following the publication period.

For information:

Historical Document History Table located at end of Document.

Publish means the action of uploading a document to the website regardless of status or location.

**If there are changes to the document between ‘Proposed’ and ‘Final’, change control operates.**



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## 1. Preface

This document defines the open eir Product Description for Partial Private Circuits (PPCs).

This document is without prejudice to any future position that may be adopted relative to the provision of PPCs. It should be read in conjunction with the associated documents detailing processes, technical specifications and service level agreements published on open eir's website. The documents may be updated and modified from time to time following agreement with the National Regulator with industry input. The controlling versions are the latest published version.

## 2. Introduction

This document defines the product description for Partial Private Circuits.

A PPC is an interconnect service providing transparent (that is, not circuit switched) transmission capacity from an end user premises termination point to an Operator's Point of Handover.

The points of demarcation between the two networks will be the Point Of Handover (PoH) between an open eir exchange and an Operator Point of Presence (PoP).

The point of demarcation between open eir and the end user is a termination point located in the end user premises. Where the end user is an Operator, the termination point may also be a DDF or ODF.

The product is available to licensed Operators only.



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### 3. Product Components

A PPC consists of two components:

**A Transport Link**, being the link between the open eir network and the Operator network. The Transport Link can be provided using either Customer Sited Handover (CSH) or In-Span Handover (ISH) between the open eir serving exchange, and the Operator's PoP, or using an existing Interconnect Link provided under service schedule 001 of the open eir RIO. The Transport Link can also be provided using an In Building Handover (IBH) within the Operator's CoLo rack at a nominated exchange..

**An End User Link (EUL)**, being the link between the end user NTU/NTP, via the eircomOpen eir exchange serving that end user, into and across the open eir network to an Operator specified Transport Link.

For the avoidance of doubt, EULs will be aggregated onto higher bandwidth transmission systems, as appropriate, within the open eir transmission network.

#### 3.1 Customer Sited Handover (CSH) Transport Link

Using CSH, a point to point 2mb, STM-1, STM-4 or STM-16 connection is provided by open eir between the open eir nominated serving exchange and the Operator's premises. This is provided over the open eir network. open eir will terminate the connection on appropriate open eir-provided termination equipment in the Operator premises.

See Annex D for an illustrative diagram showing how this would be achieved.

##### 3.1.1 CSH Handover

The PoH is at the open eir **provided termination equipment in the Operator's premises, at** which open eir will present the 2mb, STM-1, STM-4 or STM-16 to the Operator. Extraction of individual circuits is the responsibility of the Operator.

##### 3.1.2 Operator access to the CSH Transport Link

The Operator connects to the 2mb and/or STM-x Transport Link via electrical or optical interface as appropriate. The electrical interface is specified in ITU-T Recommendation G.703. The optical interface is specified in ITU-T Recommendations G.707 and G.957.

##### 3.1.3 CSH Capacity

The maximum capacity of the PoH will be 1984kb at 2mb, 63 x 2mb or 3 x 34mb at STM-1, 252 x 2mb or 12 x 34mb at STM-4 and 1008x2Mb or 48x34Mb at STM-16, or equivalents. Within the

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capacity supplied, the individual End User Links can be activated as required.

### 3.1.4 CSH availability

CSH connectivity at STM-1 and STM-4 level will be supported between the Operator nominated PoP and the appropriate<sup>i</sup> open eir recommended exchange as listed in Annex A.

CSH connectivity at STM-16 level to the Point of Handover will be assessed on a case by case basis. If there is spare STM-1 within a STM-4 / STM-16 TL it can be allocated to aggregate Wholesale Ethernet Access circuits. Please see Wholesale Ethernet Access Product Description for further details.

Annex A will be amended as required from time to time by open eir as its network evolves. A process for Operator notification of such amendments will be developed and agreed at the appropriate Operator process group<sup>ii</sup>.

### 3.1.5 In Span Handover (ISH) Transport Link

Using ISH, an STM-1, STM-4 or STM-16 connection is provided by open eir between the open eir nominated serving exchange and a PoH, located between the Operator's premises and the open eir serving exchange. open eir will provide an STM1/4/16 bearer over fibre to the PoH, and the Operator completes the link back to its own premises using its own network. The PoH is the ODF at which the bearers from an Operator's cable are connected to the open eir bearers.

See Annex D for an illustrative diagram showing how this would be achieved.

### 3.1.6 ISH Point of Handover

The physical location of the PoH may be in an underground manhole or in a street cabinet, and is provided by the Operator. It should be located not more than 100 metres from the curtilage of the open eir serving exchange.

The closure to be used in either event is the Raychem, FOSS 400 Xcon closure, which is an ODF type closure for 12 fibre to 12 fibre.

open eir will terminate its fibres on one side of the ODF, and the Operator will terminate its fibres on the other side. The fibres will be connected using an Operator provided patch cord.

### 3.1.7 Operator Access to the ISH Transport Link

The Operator is to use the same optical SDH interface as open eir. This will be either an S1.1

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interface at STM-1, S4.1 at STM-4 or S16.1 at STM-16. The interfaces should be in accordance with ITU-T Recommendation G.957.

### 3.1.8 ISH Capacity

The maximum capacity of the SDH PoH will be 63 x 2mb or 3 x 34mb at STM-1, 252 x 2mb or 12 x 34mb at STM-4, and 1008 x 2Mb or 48 x 34Mb at STM-16 or equivalents. The individual End User Links within the STM-x connection can be activated as required.

### 3.1.9 ISH availability

ISH connectivity at STM-1 level to the Point of Handover will be offered from any open eir exchange listed in Annex A.

ISH connectivity at STM-4 level to the Point of Handover will be offered from any open eir exchange listed in Annex A.

ISH connectivity at STM-16 level to the Point of Handover will be assessed on a case by case basis. If there is spare STM-1 within a STM-4 / STM-16 TL it can be allocated to aggregate Wholesale Ethernet Access circuits. Please see Wholesale Ethernet Access Product Description for further details.

Annex A will be amended as required from time to time by open eir as its network evolves. A process for Operator notification of such amendments will be developed and agreed at the appropriate Operator process group<sup>iii</sup>.

### 4.1.1 IBH Handover

The PoH is at the open eir provided ODF which connected to the patch panel within the **Operator's** colo, at which open eir will present the 2mb, STM-1, STM-4 or STM-16 to the Operator. Extraction of individual circuits is the responsibility of the Operator.

### 4.1.2 Operator access to the IBH Transport Link

The Operator connects to the 2mb and/or STM-x Transport Link via electrical or optical interface as appropriate. The electrical interface is specified in ITU-T Recommendation G.703. The optical interface is specified in ITU-T Recommendations G.707 and G.957.

### 4.1.3 IBH Capacity

The maximum capacity of the PoH will be 1984kb at 2mb, 63 x 2mb or 3 x 34mb at STM-1, 252 x 2mb or 12 x 34mb at STM-4 and 1008x2Mb or 48x34Mb at STM-16, or equivalents. Within the capacity supplied, the individual End User Links can be activated as required.



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### 5.1.3 IBH availability

IBH connectivity at STM-1 level to the Point of Handover will be offered from any open eir exchange listed in Annex A. A fibre cable is installed between an Operator footprint and an open eir patch panel within the same open eir exchange. See Annex D Section 4 for details.

The physical Co-location operational processes that support the interactions between open eir and an Operator for the delivery of serviced accommodation in an open eir exchange are outlined in the Process Manual for open eir Physical Co-location Service.

open eir will connect an Operator directly from an open eir installed patch panel, in the Operator rack via the open eir ODF to the open eir network.

## 3.2 End User Link

This is the circuit from the open eir serving exchange to the end user, via the open eir exchange serving that end user. For the avoidance of doubt, the end user may be the Operator in whose name the EUL is ordered.

See Annex D for an illustrative diagram.

### 3.2.1 End User Link Termination Point

The termination point for the End User Link will be at an appropriate open eir provided Network Termination Unit / Network Termination Point at the end user's premises, which in some cases may be a Digital Distribution Frame or an Optical Distribution Frame.

The other end of the EUL will be at a point where it is aggregated onto an Operator-specified Transport Link or Subsidiary Link.

### 3.2.2 End User Link Capacity

End User Links will be provided at the following levels:

1. n x 64kb circuits up to 1984kb
2. 2048kb
3. 34mb
4. 45mb
5. STM-1





Where sub 2mb EULs are provided, these will be aggregated onto either an individual Operator-nominated 2mb Transport Link, or on a discrete Subsidiary Link within the Operator-nominated Transport Link.

### 3.2.3 End User Link Availability

An End User Link will be provided in accordance with the PPC Inter-operator Operations & Maintenance Manual and the PPC EUL Service Level Agreement, and may be dependent on:

1. Available appropriate capacity both at and between both the end user's premises and the open eir local exchange
2. Available capacity on an Operator-specified Transport Link.
3. Available capacity across the open eir core network

Where capacity issues are identified, the EUL will be provided on a non-standard basis as defined by the PPC EUL Service Level Agreement.

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## 4. Link Protection

### 4.1 PPC STM-1/4/16 Transport Link Protection

Protection will be available on PPC STM-1/4/16 Transport Links. In the event of a outage, all traffic over the PPC Transport Link would be lost. This solution will protect these single points of failure by offering protection for CSH, ISH and IBH Transport Links. When an Operator places an order for TL Protection, a feasibility study will be carried out, involving an initial survey to determine slot availability, diverse fibre route availability, dual access to building, duct diversity and any other capacity or infrastructure constraints. The output of this study will determine whether it is feasible to provide the requested solution and to what delivery lead times. The protected path is a separate product entity to the existing Transport Link.

The following conditions will apply

- ❖ All requests for protection are subject to desk top and full site survey and these are mandatory
- ❖ Operator equipment testing may also need to be carried out to determine interoperability between both ends.
- ❖ Sub Network Connection Protection (SNCP) solution is non-revertive

### 4.2 Service Availability

This service for PPC STM-1 / STM-4 will be offered at all nominated open eir PPC serving exchanges as outlined in Annex A, Section 1.

This service for PPC STM-16 shall be assessed on a case by case basis.

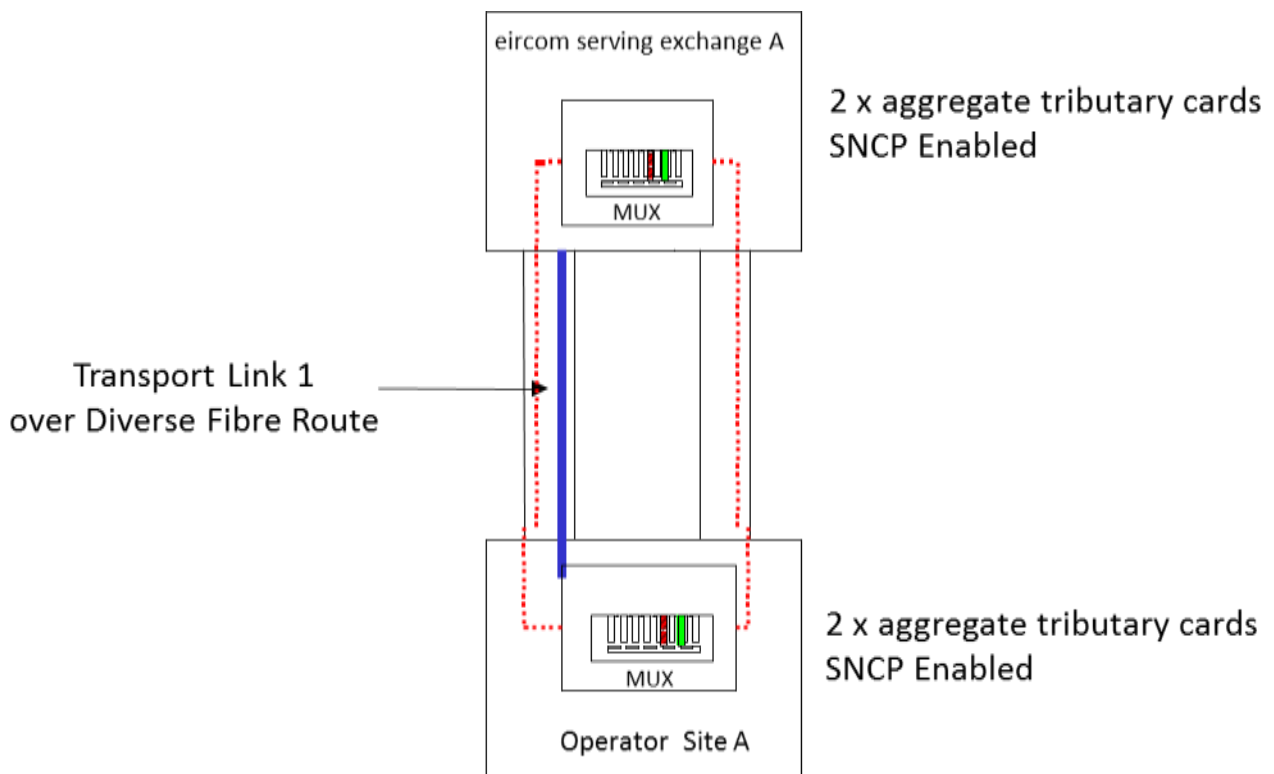
### 4.3 CSH Transport Link Protection

This describes where an Operator wishes to connect one or more CSH transport links over separate diverse fibre routes

The solution is completed by the application of SNCP protection on the open eir owned SDH equipment. Protection will apply from the ADM in the open eir serving exchange to the open eir owned ADM in the Customer Premises only. In the event of an outage open eir will re-route all PPC traffic over that link on an alternative route over the open eir network to a nominated handover point.

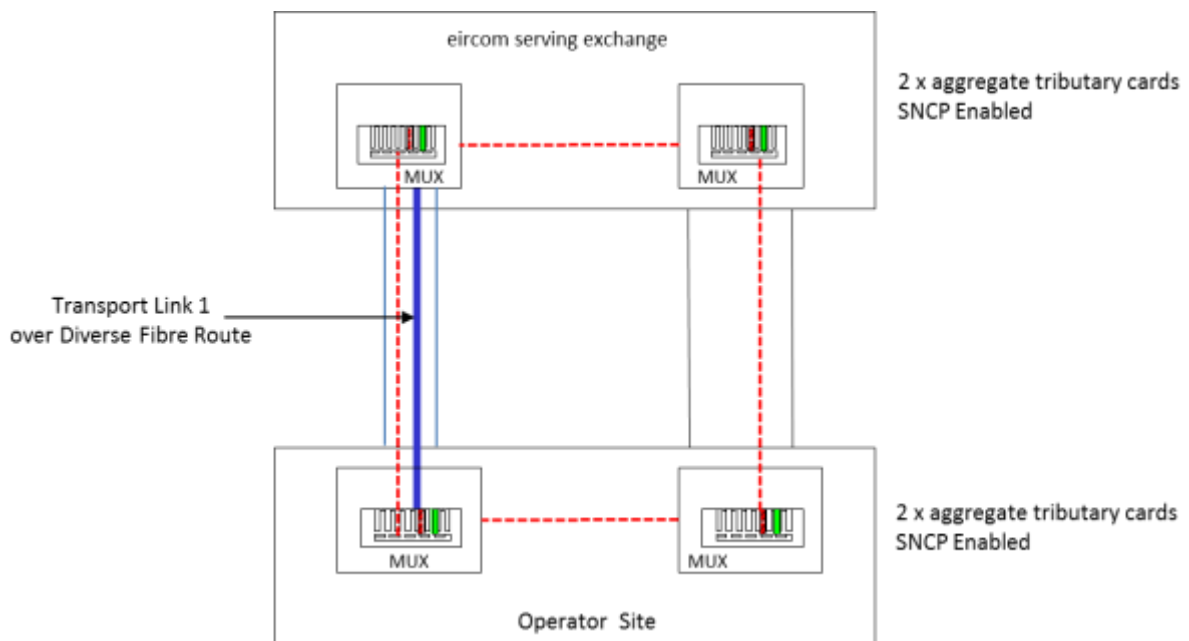
4.3.1 Option 1 - Protect IBH/CSH STM-X: 2 Nodes, 1 ADM (same open eir & Operator sites with single ADM each end)

- ❖ A working IBH/CSH Transport Link is in-situ between the open eir PPC exchange and the Operator POP
- ❖ A second diverse STMx route is built between the open eir exchange and the Operator POP creating a closed ring.
- ❖ SNCP is then enabled providing a protected path.



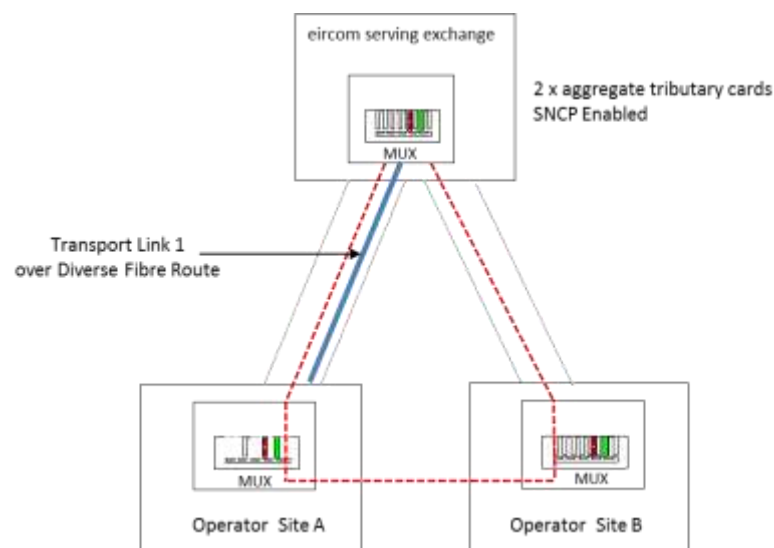
4.3.2 Option 2: Protect IBH/CSH STM-X 2 Nodes, 2 ADMs (same open eir & Operator sites with dual ADM each end)

- ❖ A working IBH/CSH Transport Link is in-situ between the open eir PPC exchange and the Operator POP
- ❖ A second diverse STMx route is built between the open eir exchange and the Operator POP from separate ADMs, the muxs are closed with patch cords creating a ring.
- ❖ SNCP is then enabled providing a protected path.



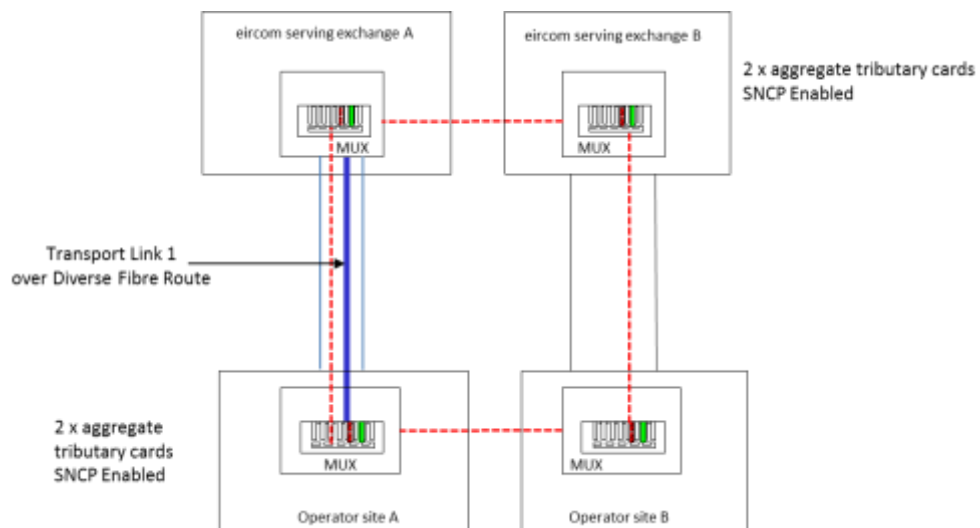
4.3.3 Option 3 - Protect IBH/CSH STM-X 3 Nodes, 1 ADM (a single open eir site and separate Operator sites)

- ❖ A working IBH/CSH Transport Link is in-situ between the open eir PPC exchange and the Operator POP
- ❖ A second diverse STMx route is built between the open eir exchange and a second Operator POP, the two Operator muxs are closed with fibre paths between sites creating a ring.
- ❖ SNCP is then enabled providing a protected path.



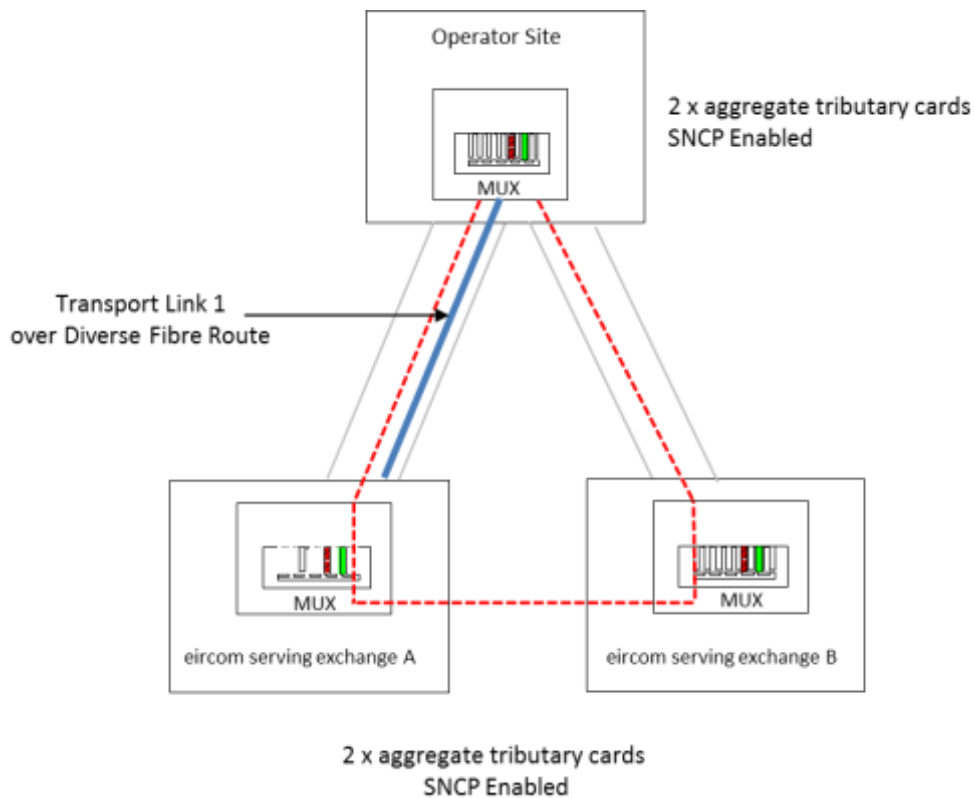
4.3.4 Option 4 - Protect IBH/CSH STM-X 4 Nodes, 1 ADM (separate open eir sites and separate Operator sites).

- ❖ A working IBH/CSH Transport Link is in-situ between the open eir PPC exchange and the Operator POP
- ❖ A second diverse STMx route is built between a second open eir exchange and a second Operator POP from separate ADMs, the muxs are closed with fibre paths between sites creating a ring.
- ❖ SNCP is then enabled providing a protected path.



4.3.5 Option 5 - Protect IBH/CSH STM-X 3 Nodes, (1 ADM separate open eir sites and single Operator site).

- ❖ A working IBH/CSH Transport Link is in-situ between the open eir PPC exchange and the Operator POP
- ❖ A second diverse STMx route is built between the second open eir exchange and the Operator POP, the two open eir muxs are closed with fibre paths between sites creating a ring.
- ❖ SNCP is then enabled providing a protected path.





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#### 4.3.6 ISH Transport Link Protection

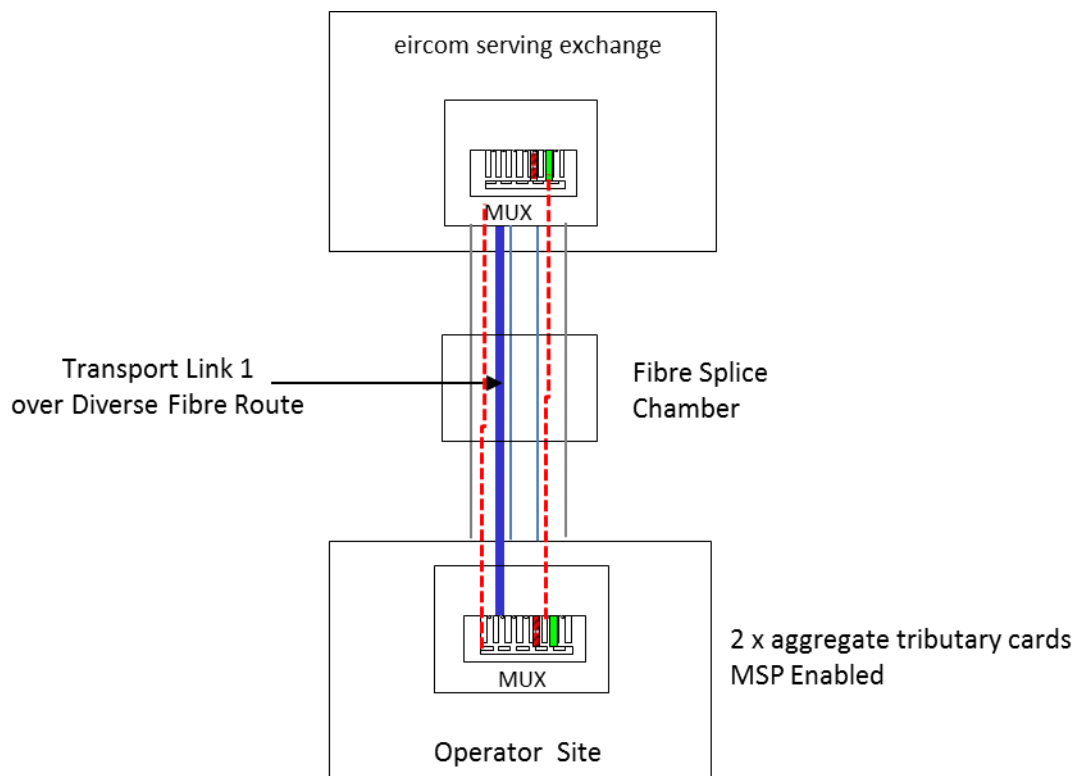
This describes where an Operator wishes to connect one or more ISH transport links over separate diverse fibre routes

The solution is completed by the application of Multiplex Section Protection (MSP) on the open eir owned SDH equipment. Protection will apply from the ADM in the open eir serving exchange to the point of interconnect. In the event of an outage open eir will re-route all PPC traffic to the point of interconnect.



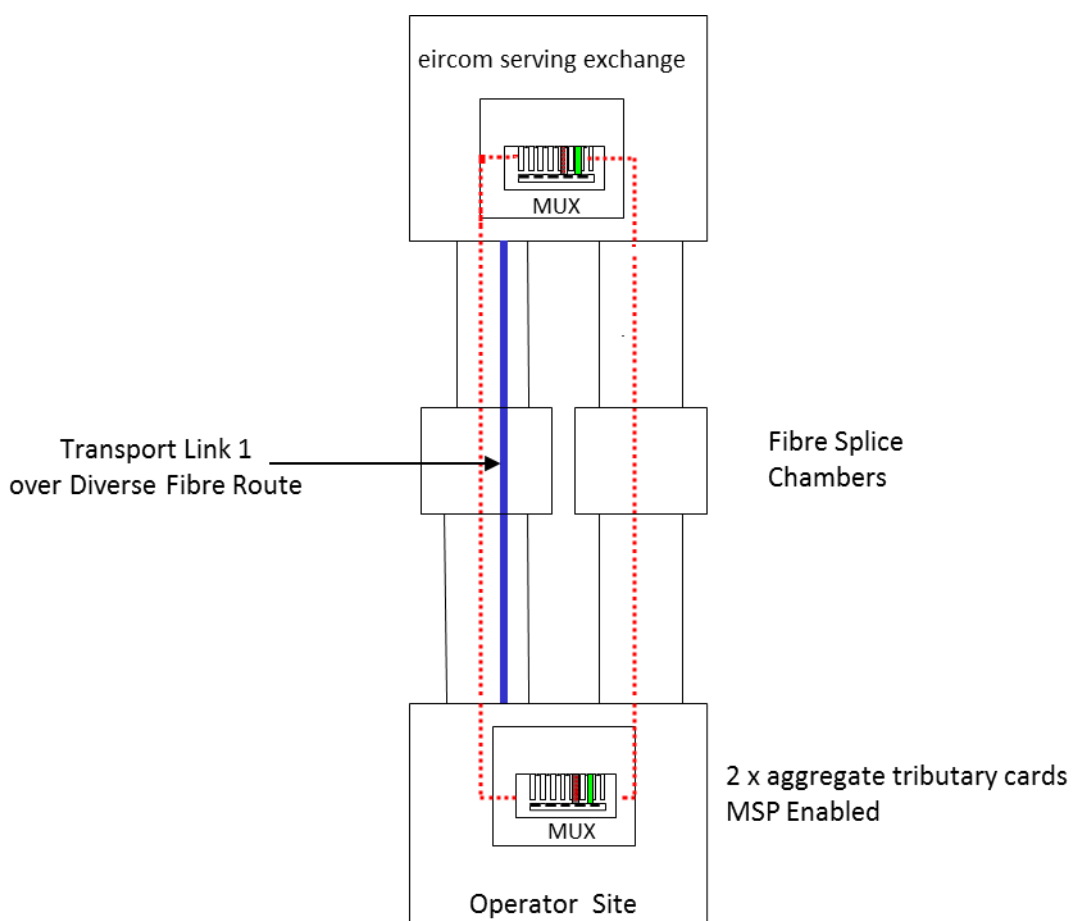
4.3.7 Option 6 - Protect ISH STM-X 2 Nodes, 1 Chamber (from the open eir site to the same ISH chamber)

- ❖ A working ISH Transport Link is in-situ between the open eir PPC exchange and the POH
- ❖ A second card is installed and connected to a different fibre pair on the same cable
- ❖ Enable MSP 1+1 protection
- ❖ Operator enable MSP 1+1 protection
- ❖ There is no fibre diversity on the TL



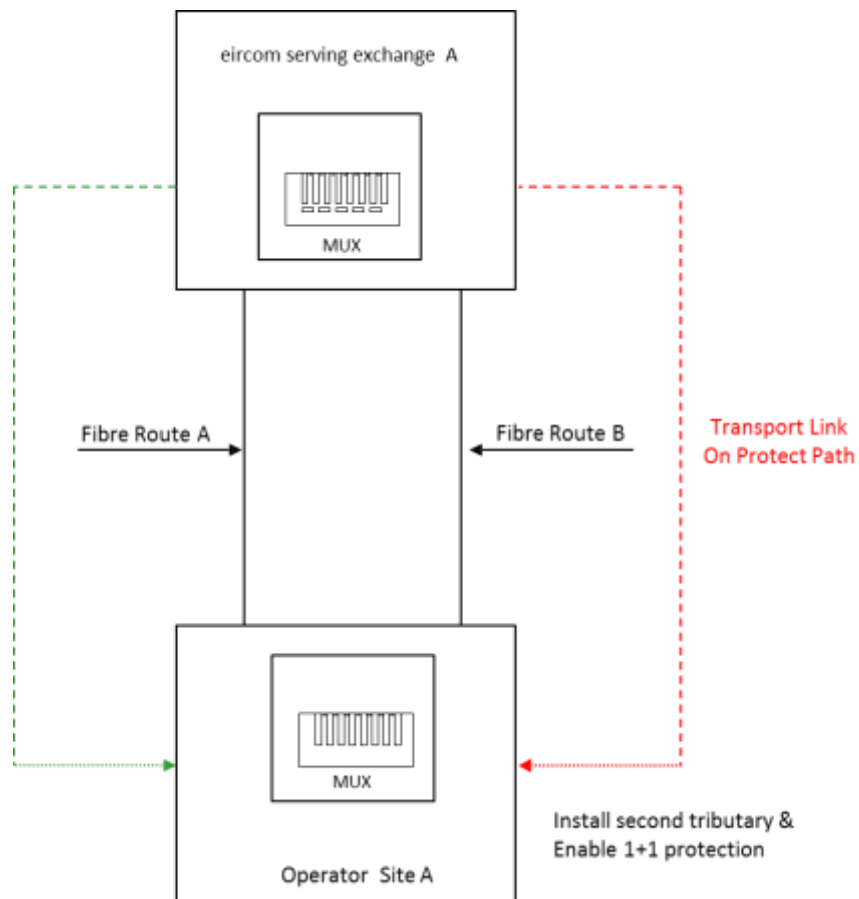
#### 4.3.8 Option 7 - Protect ISH STM-C 2 Nodes, 2 Chambers (from the open eir site to a second ISH chamber)

- ❖ A working ISH Transport Link is in-situ between the open eir PPC exchange and the POH
- ❖ A second card is installed in the same ADM and connected to a second fibre pair feeding an alternate POH
- ❖ Enable MSP 1+1 protection
- ❖ Operator enable MSP 1+1 protection



4.3.9 Card Protection Option - Protect IBH/CSH STM-X 2 Nodes (MSP 1+1 Card Protection at both ends)

- ❖ A working IBH/CSH Transport Link is in-situ between the open eir PPC exchange and the Operator POP
- ❖ A second diverse STMx route is built between the open eir exchange and the Operator POP creating a closed ring.
- ❖ Install a second tributary card and enable MSP 1+1 protection





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## 5. Terms and Conditions

Please reference the PPC Service Schedules 001, 002, 003, 004 as per the RIO, Reference Interconnect Offer. This is available on [www.openeir.ie](http://www.openeir.ie).

The terms and conditions include provisions for:

- ❖ Migration of existing leased lines
- ❖ Contract periods
- ❖ Service Level Agreement
- ❖ Operations and Maintenance
- ❖ Upgrade PPC EULs

## ANNEX A

The following is the list of open eir exchanges at which CSH / ISH STM-1 and STM-4 links will be initially offered. This list will be updated by open eir from time to time. Section 1

PPC STMx TL Nodes	
Adelaide Road *	Letterkenny
Bantry	Lucan Ballydowd
Beggars Bush *	Mallow
Belcamp	Merrion
Birr Merrion	Mervue
Blanchardstown	Mullingar
Bray	Naas
Carlow	Nutley *
Castlebar	Palmerstown
Castleblaney	Portlaoise
Castlerea	Priory Park
Castletroy	Quaker Road
Cavan	Rathedmond
Churchfield	Roches Street
Citywest *	Roslevin
Clondalkin	Sandyford
Clonmel	Shantalla
Clontarf	Ship Street
Crown Alley	Summerhill
Crumlin	Swords
Dame Court	Tallaght *
Dolphins Barn	Terenure
Drogheda	Tralee
Dun Laoghaire	Waterford Central
Dundalk	Waterford Tycor
Dundrum *	Wexford
Ennis	Whitehall
Kilkenny *	

\* There will not be the facility to provide PPC voice interconnect paths terminating at Adelaide Road, Beggars Bush, Dundrum, Kilkenny, Nutley, Citywest or Tallaght exchange over a transport link terminating at these exchanges.



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## ANNEX B

2mb CSH Transport Link

2mb CSH Transport Links will be available from appropriately equipped open eir exchanges.



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## ANNEX C

### SERVICE LEVEL AGREEMENT

SLAs have been developed to cover the end-to-end service as provided to the customer. It contains appropriate commitments around process points which are identified within industry process documents.



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## ANNEX D

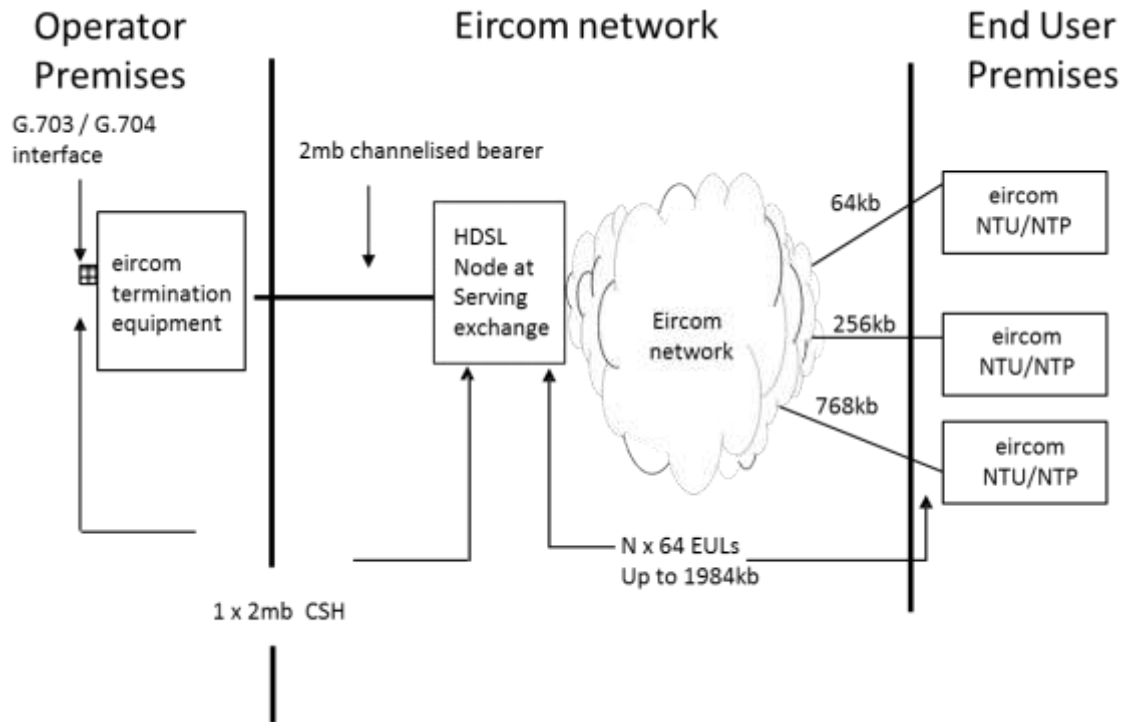
### PRODUCT DIAGRAMS (FOR ILLUSTRATION ONLY)

- SECTION 1: TYPICAL DELIVERY OF  $n \times 64\text{kb}$  EULs (up to 1984kb) OVER 1 x 2MB CSH TRANSPORT LINK
- SECTION 2: TYPICAL DELIVERY OF EULs (PPCs ONLY) OVER 1 x STM-1 OR STM-4 CSH TRANSPORT LINK
- SECTION 3: TYPICAL DELIVERY OF EULs (PPCs ONLY) OVER 1 x STM-1 OR STM-4 ISH TRANSPORT LINK
- SECTION 4: TYPICAL DELIVERY OF VOICE INTERCONNECT CIRCUITS AND PPCs OVER 1 X STM-1 OR STM-4 CSH TRANSPORT LINK
- SECTION 5: TYPICAL DELIVERY OF VOICE INTERCONNECT CIRCUITS AND PPCs OVER 1 X STM-1 OR STM-4 ISH TRANSPORT LINK
- SECTION 6: TYPICAL INFRASTRUCTURE USED TO DELIVER CSI CIRCUITS
- SECTION 7: TYPICAL INFRASTRUCTURE USED TO DELIVER SUB-2MB, 2MB AND >2MB CIRCUITS
- SECTION 8: TYPICAL DELIVERY OF AN END USER LINK



ANNEX D SECTION 1

TYPICAL DELIVERY OF n x 64kb EULs (up to 1984kb) OVER 1 x 2MB CSH TRANSPORT LINK

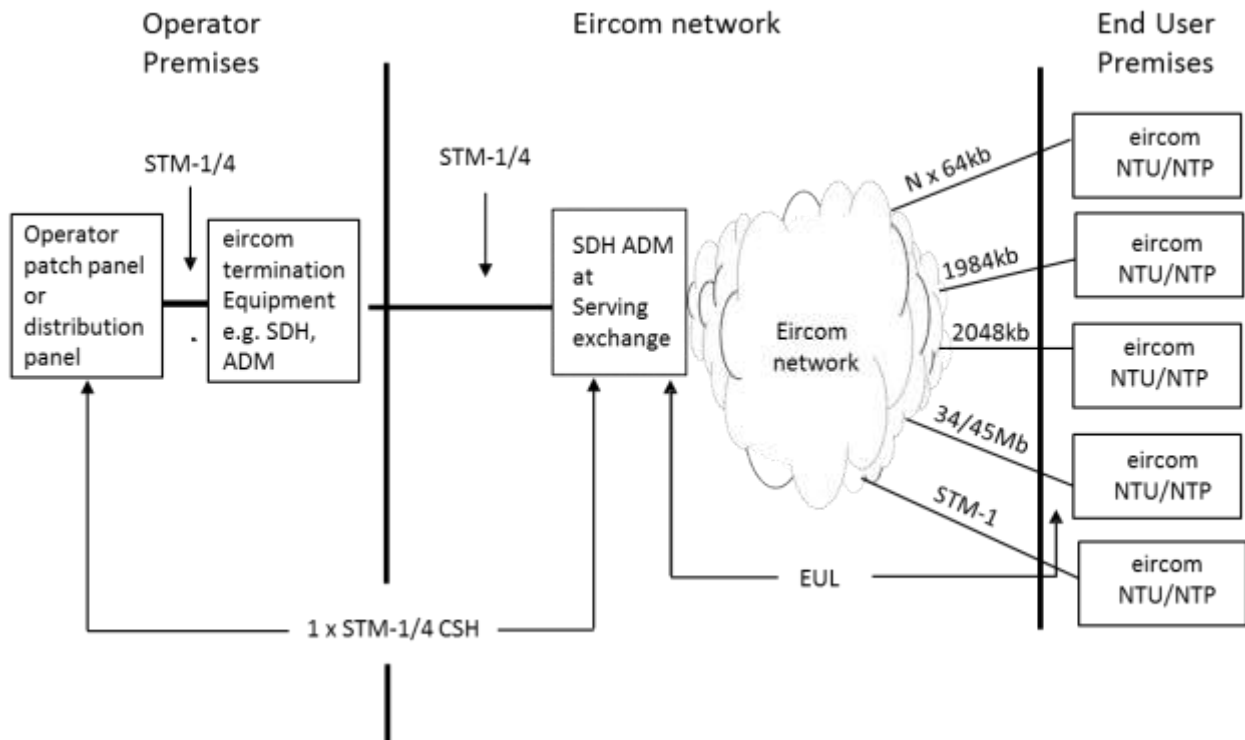


Notes:

1. Each 2mb CSH bearer has a maximum payload of 1984kb. Timeslot 0 is used for framing.
2. Each bearer will be delivered on individual open eir termination equipment at the Operator premises.
3. Where multiple 2mb CSH bearers are delivered, open eir may choose to install a node at the Operator's premises to support multiple G.703 / G.704 terminations. The decision to install such a node will be taken where this represents a more efficient solution than the installation of individual termination equipment for each bearer.

## ANNEX D SECTION 2

TYPICAL DELIVERY OF EULs (PPCs ONLY) OVER 1 x STM-1 OR STM-4 CSH TRANSPORT LINK

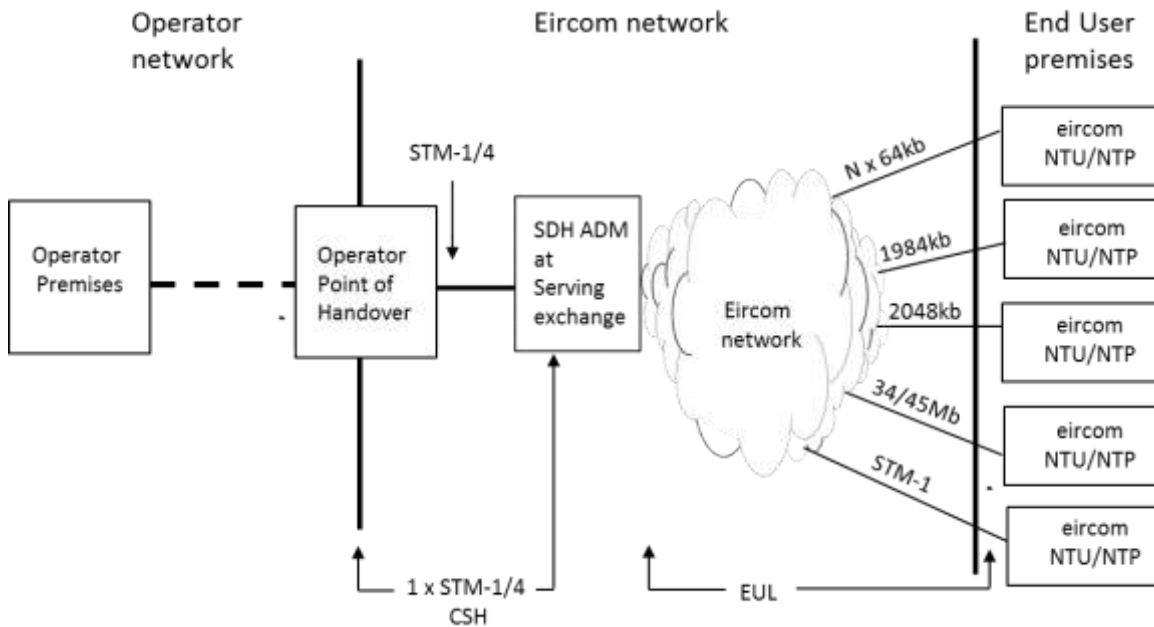


Notes:

1. Each STM-1 / 4 CSH bearer will be delivered on an open eir-provided SDH ADM at the Operator's premises.
2. An STM-1 EUL will be delivered over a channelised STM-4 Transport Link.

ANNEX D SECTION 3

TYPICAL DELIVERY OF EULs (PPCs ONLY) OVER 1 x STM-1 OR STM-4 ISH TRANSPORT LINK

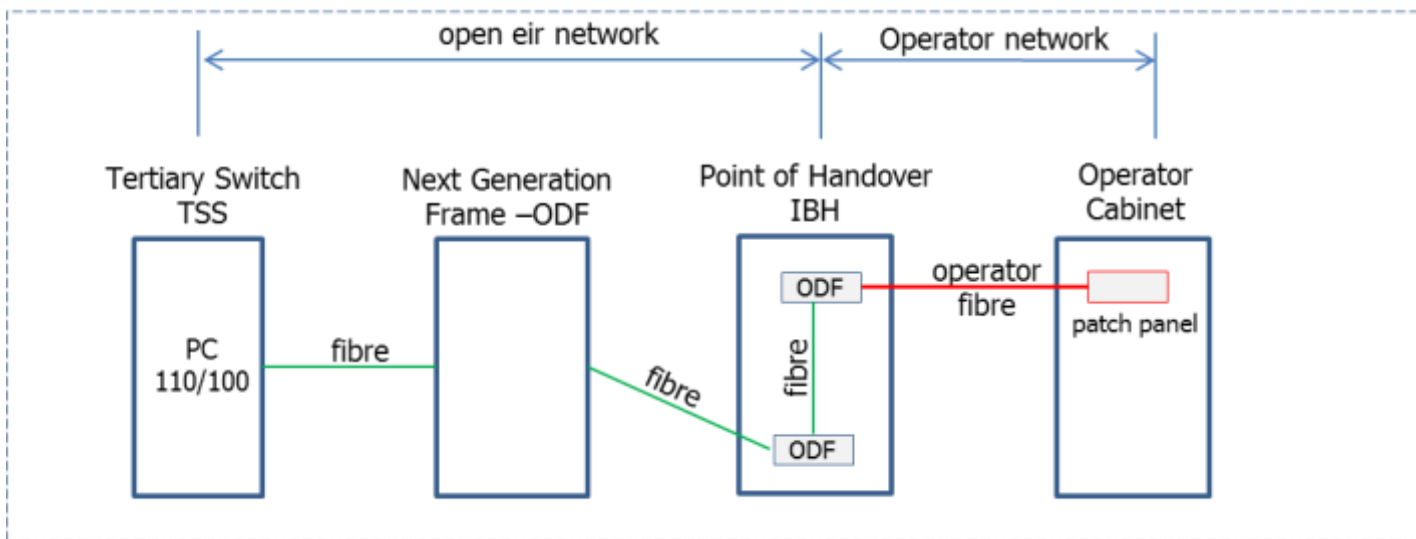


Notes:

1. An STM-1 EUL will be delivered over a channelised STM-4 Transport Link.

## ANNEX D SECTION 4

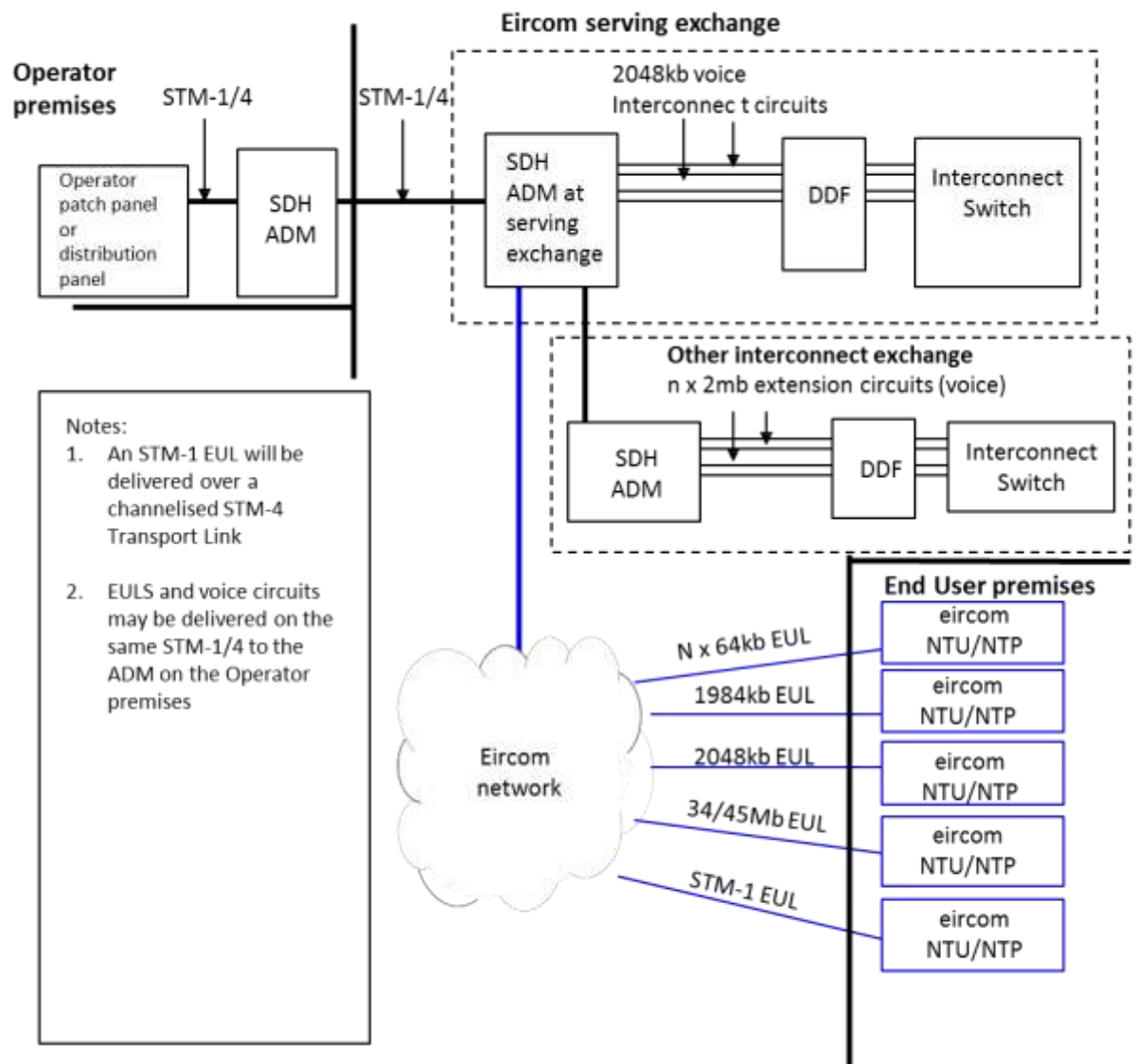
TYPICAL DELIVERY OF STM-1/4/16 IBH TRANSPORT LINK



## ANNEX D SECTION 5

TYPICAL DELIVERY OF VOICE INTERCONNECT CIRCUITS AND PPCs OVER 1 X STM-1 OR STM- 4 IBH/CSH TRANSPORT LINK

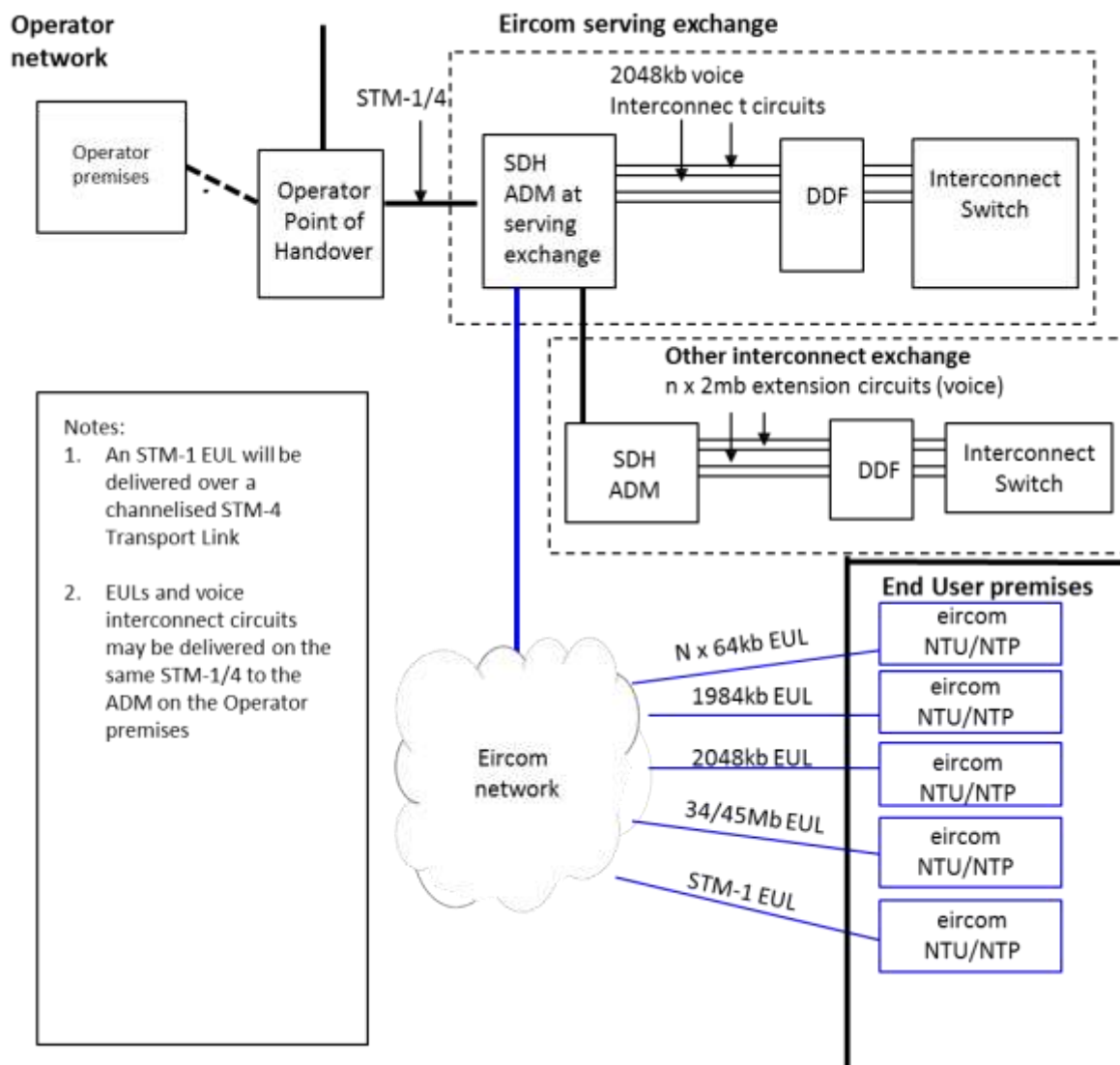
BLUE LINES INDICATE THE SHARING OF PPC EULs



ANNEX D SECTION 6

TYPICAL DELIVERY OF VOICE INTERCONNECT CIRCUITS AND PPCs OVER 1 X STM-1 OR STM- 4 ISH TRANSPORT LINK

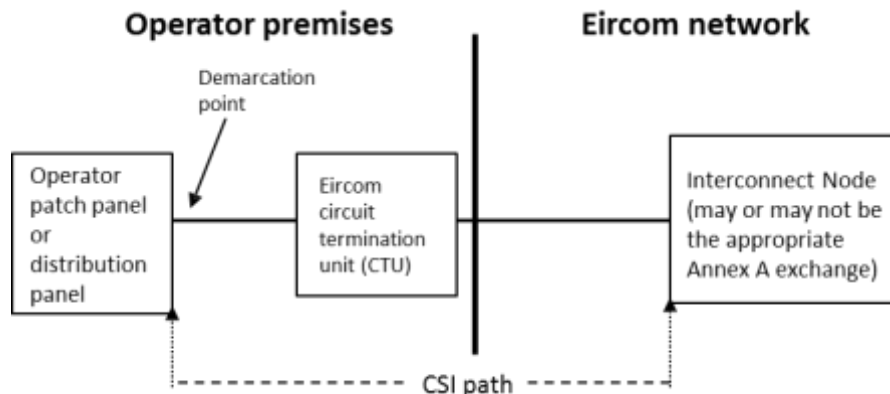
BLUE LINES INDICATE THE SHARING OF PPC EULs



**ANNEX D SECTION 7**

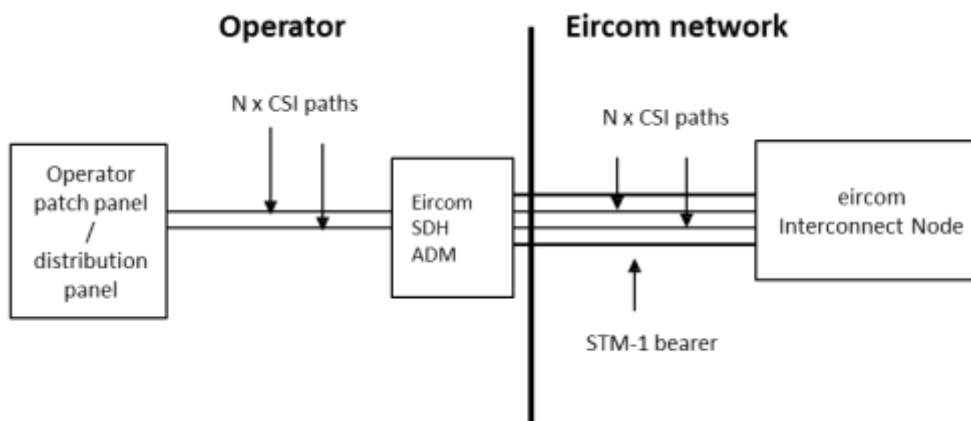
**TYPICAL INFRASTRUCTURE USED TO DELIVER CSI CIRCUITS**

Currently, a CSI circuit is provided as follows:



Infrastructure sharing over individual CSI paths is not possible, as the point to point circuit is a clear 2048kb channel. There is no capacity available on the channel for PPC circuits.

Where multiple CSI paths are delivered to the same Operator premises, while these may be delivered separately to the Operator’s DDF, they may be provided over an STM-1 bearer to the Operator’s premises, as follows:



In this scenario, the Operator may elect to designate the STM-1 bearer as an STM-1 CSH. Available capacity on the bearer may then be utilised for EULs or voice interconnect circuits. The n x CSI paths provided from the open eir SDH ADM to the Operator’s DDF will be replaced by a single STM-1 bearer.

## ANNEX D SECTION 8

### TYPICAL INFRASTRUCTURE USED TO DELIVER SUB-2MB, 2MB AND >2MB CIRCUITS

#### SUB-2MB CIRCUITS

Individual sub-2mb circuits are normally provided over HDSL. The Operator may elect to aggregate sub-2mb circuits onto a single 2mb CSH, to be delivered as a single 2mb Transport Link to its premises rather than as individual sub-2mb circuits.

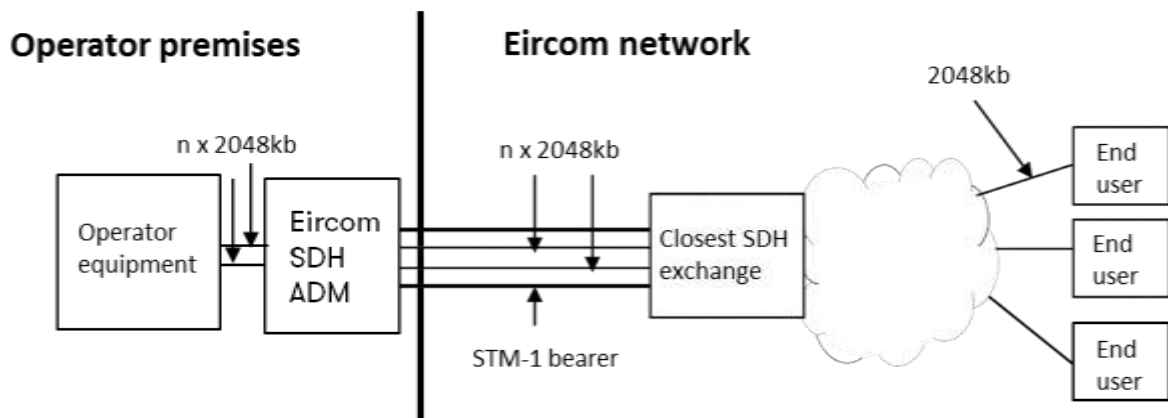
Infrastructure sharing is not possible in this scenario. The maximum payload of the 2mb CSH Transport Link is 1984kb. Voice circuits require a payload of 2048kb.

#### 2MB CIRCUITS

This is where the Operator has existing end to end 2048kb data circuits.

Infrastructure sharing over a single 2048kb circuit is not possible, as voice circuits require the full 2048kb payload. If one or more 64kb channels are used for data, then the full 2048kb payload required for voice is unavailable.

Where multiple 2mb paths are delivered from the same Operator premises, these may be delivered as follows:



In this scenario, the Operator may elect to designate the STM-1 bearer as an STM-1 CSH. Available capacity on the bearer may then be utilised for EULs or voice interconnect circuits. The  $n \times 2048\text{kb}$  paths provided from the open eir SDH ADM to the Operator's DDF will be replaced by a single STM-1 bearer.

#### >2MB CIRCUITS

Where an Operator has an existing STM-1 circuit from their premises to an end user (the end user may be retail customer or the Operator itself), the Operator has the opportunity to seek to migrate the STM-1 to a PPC by effectively "breaking up" the circuit into its equivalent PPC components.

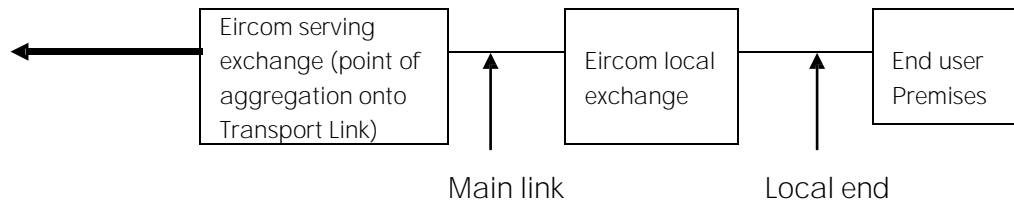
The Operator may not, however, migrate the circuit to an STM-1 CSH and an STM-1 End User Link, as this is a point to point leased line, not a Partial Private Circuit.



## ANNEX D SECTION 9

### TYPICAL DELIVERY OF AN END USER LINK

#### Operator Transport Link



<sup>i</sup> The appropriate exchange may be:

- (a) An open eir Interconnect Node serving an existing ISI Interconnect Link;
- (b) An Annex A exchange where the Operator's PoP may be served by more than one Annex A exchange;
- (c) The local Annex A exchange; or
- (d) The Annex A exchange as agreed between the parties.

<sup>ii</sup> It is agreed that two notification processes may be required, one for additions to Annex A, and one for deletions.

<sup>iii</sup> It is agreed that two notification processes may be required, one for additions to Annex A, and one for deletions.



## Version Control History

Version	Status	Update	Effective Date
1.0		Product launch	14 October 03
1.1		Annex A updated to include Dundrum exchange at which CSH / ISH links will be offered	20 October 04
1.2		Updated to include 45Mb EUL	1 July 05
2.0		Updated to include PPC EUL upgrade and downgrade process and PPC Transport Link Protection.	12 August 05
2.1		Updated following industry forum on 18 August.	16 September 2005
2.2		Updated to include PPC STM-16 CSH and ISH Annex A updated to include Tallaght & Citywest and Lucan Ballydowd exchanges at which CSH / ISH links will be offered.	30 July 2007
2.3		Updated with PPC STM 4/16 TL Wholesale Ethernet Access Option.  Annex A updated.	7 September 2009
V3.0	Final	This document is based on V2.3 Implementation of Standardised Change Control.	23/06/2017
V3.1	Proposed	Introduction of In Building Handover (IBH)	01/07/2109