

# Ethernet Access

Data sheet for the E-Line Service Type

# General

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|--|--|
| <b>Related Documents</b>                       | Telstra Wholesale fact sheet:<br><a href="https://www.telstrawholesale.com.au/content/dam/tw/products/data_ip/ethernet-access/Documents/Telstra_Wholesale_Ethernet_Access_Factsheet.pdf">https://www.telstrawholesale.com.au/content/dam/tw/products/data_ip/ethernet-access/Documents/Telstra_Wholesale_Ethernet_Access_Factsheet.pdf</a><br>Telstra Service Interface Specification (TSIS) [commercial-in-confidence]<br>TSIS Addendum for E-Access [commercial-in-confidence] |
| <b>Supported MEF Service Types<sup>1</sup></b> | E-Line:<br>EVPL (CE-VLAN ID based at UNI) – Supported on all access types<br>EPL (Port-based at the UNI) – Only supported on Telstra Fibre   |
| <b>Service Speeds<sup>2</sup></b>              | Telstra Fibre Accesses: 20 Mbps to 2Gbps<br>NBN Accesses, FTTP: 5, 10, 20, 30, 40 & 50 Mbps<br>FTTN, FTTB and FTTC: 5 Mbps & 10 Mbps<br>Telstra Mobile Accesses: up to 10/10, 20/20, 40/40 and 100/50Mbps <sup>3</sup>   |

## UNI Attributes (Aggregated Head-end)

|                                       |  |
|---------------------------------------|--|
| <b>Interface Types</b>                | 1000Base-T<br>1000Base-SX<br>1000Base-LX<br>10GBASE-SR<br>10GBASE-LR<br>100GBASE-SR4<br>100GBASE-LR4   |
| <b>Interface Modes</b>                | Auto Negotiate (Default)<br>Full Duplex  |
| <b>Access Type</b>                    | Fibre-based  |
| <b>UNI Access Availability Target</b> | 99.90%: Single uplink (fibre-based access)<br>99.98%: Fully redundant <sup>4</sup> UNI pair (fibre-based access)<br>The pair can either be co-located or geographically diverse <sup>5</sup> |
| <b>Frame Formats</b>                  | IEEE Std 802.1Q (0x8100)   |
| <b>UNI MTU Size<sup>6</sup></b>       | Jumbo: 9000 bytes  |
| <b>UNI Service Multiplexing</b>       | Yes ( $\geq 1$ EVC associated with the UNI)  |

<sup>1</sup> The MEF 33-defined E-Access service type is also supported on the EA product and is described in a separate associated data sheet at [https://www.telstrawholesale.com.au/content/dam/tw/products/data\\_ip/ethernet-access/Documents/Ethernet\\_Access\\_E-Access\\_Service\\_Type\\_Data\\_Sheet.pdf](https://www.telstrawholesale.com.au/content/dam/tw/products/data_ip/ethernet-access/Documents/Ethernet_Access_E-Access_Service_Type_Data_Sheet.pdf)

<sup>2</sup> Actual speeds achieved are dependent on a range of factors described in the TSIS documents, including (but not limited to) distance from exchanges for accesses which are not on Telstra fibre

<sup>3</sup> When use as a backup for Telstra fibre access, the service speed on the Telstra mobile access cannot exceed the service speed on Telstra fibre. The speed tiers on Telstra mobile access represent the maximum data speeds applied to downstream and upstream transmissions on our network. The typical speeds the End User will experience will vary depending on a range of factors and will not always be at or towards the top of the typical speed range. Depending on the speed tier selected, mobile access can experience typical 4G speeds of 2-50Mbps in the download and 1-10Mbps in the upload.

<sup>4</sup> Fully redundant means that there is a second NTU that is dual-homed to the Layer 2 Edge of the pseudowire/ VPLS cloud, with geographically diverse fibre access paths, enabling flexible customer-managed failover at Layer 3

<sup>5</sup> Business rules apply to the locations of a fully redundant pair of head-end UNIs

<sup>6</sup> The MTU at the head-end UNI cannot be considered in isolation and needs to be cognisant of the tail UNI MTU and physical access (bearer) technology

## UNI Attributes (Tail End)

|                                       |   |   |  |
|---------------------------------------|---|---|--|
| <b>Interface Types</b>                | <b>Telstra Fibre Access</b><br>10Base-T<br>100Base-Tx<br>1000Base-T<br>1000Base-SX<br>1000Base-LX<br>10GBASE-SR<br>10GBASE-LR   | <b>NBN Access</b><br>100Base-Tx<br>1000Base-T<br>1000Base-SX<br>1000Base-LX | <b>Telstra Mobile Access</b><br>10Base-T<br>100Base-Tx<br>1000Base-T<br>1000Base-SX <sup>7</sup><br>1000Base-LX <sup>7</sup> |
| <b>Interface Mode</b>                 | Auto Negotiate (Default)<br>Full Duplex<br>Half Duplex  |   |  |
| <b>Access Type</b>                    | Telstra Fibre-based<br>NBN: FTTP, FTTN, FTTB, FTTC: Premium CoS (1:1) only<br>Telstra Mobile: Use for rapid activation or as a backup for a tail-end Telstra Fibre-based access type only <sup>8</sup>  |   |  |
| <b>UNI Access Availability Target</b> | 99.70%: Single uplink (NBN Access)<br>99.90%: Single uplink (Telstra fibre accesses)<br>99.95%: Single uplink with Mobile Backup (Telstra Fibre access + Telstra Mobile access)<br>99.98%: Fully redundant uplink (Telstra fibre accesses) <sup>9</sup> |   |  |
| <b>UNI MTU Size</b>                   | Telstra Fibre accesses: 1596 bytes (standard)<br>9000 bytes (jumbo – requires approval)<br>NBN Accesses: 1522 bytes<br>Mobile Accesses: 1596 bytes <sup>10</sup>  |   |  |
| <b>UNI Shut Down</b>                  | Supported on EPL service type<br>Disabled on EVPL service type  |   |  |
| <b>UNI Service Multiplexing</b>       | For E-Line EVPL only<br>Telstra Fibre accesses: Yes (≥1 EVC associated with the UNI)<br>NBN Accesses: No<br>Mobile Accesses: No (only 1 EVC associated with the UNI) <sup>11</sup>  |   |  |
| <b>CE-VLAN ID Bundling</b>            | For Line EPL:<br>All-to-one: All CVIDs mapped to one EVC at the UNI<br>E-Line EVPL:<br>One-to-one: One CVID mapped to one EVC at the UNI<br>Many-to-one: >1 CVIDs mapped to one EVC at the UNI (Telstra fibre and Telstra mobile accesses only)         |   |  |

<sup>7</sup> Optical interfaces for the tail UNI not initially supported on EA Mobile access use for rapid activation

<sup>8</sup> By default, EA Mobile access use for rapid activation is automatically converted to mobile backup once the tail-end EA fibre is delivered. Cannot be used in conjunction with E-Line EPL

<sup>9</sup> Fully Redundant tail UNIs cannot be geo-diverse nor NBN-based

<sup>10</sup> Jumbo frames are not supported on Telstra mobile accesses and therefore should not be used for rapid activation and/or as a backup for Telstra fibre accesses if Jumbo frames are required

<sup>11</sup> Only one EVC can be associated with the tail UNI on Telstra mobile accesses and therefore should not be used for rapid activation and/or as a backup for Telstra fibre accesses if more than one EVC needs to be associated with the tail UNI

# EVC Attributes

| <b>Available Classes of Service</b>                        | <p><b>Expedited</b> (1:1 CIR:PIR): Short queues and strictly enforced rates, optimised for small frame sizes and low-jitter interactive unidirectional applications, like VoIP and videoconferencing. Not available over NBN accesses and Telstra mobile accesses.</p> <p><b>Priority</b> (1:1 CIR:PIR): Short queues with reliable delivery even if delayed. Used for selected ‘real time’ applications like SQL database queries and unidirectional streaming video. Not available over NBN accesses and Telstra mobile accesses.</p> <p><b>Premium</b> (1:1 and 1:4 CIR:PIR): Medium queues with low discard preference, used for key business applications like email and large file transfers. Premium (1:1) is the only class of service available over NBN accesses. Not available over Telstra mobile accesses.</p> <p><b>Standard</b> (0:1 CIR:PIR): Deep queues with higher discard preference, used for best effort applications like web browsing. Not available over NBN accesses. This is the only Class of Service available over Telstra mobile accesses<sup>12</sup>.</p> |                  |                  |                             |               |  |                               |                               |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |
|--|--|------------------|------------------|-----------------------------|---------------|--|-------------------------------|-------------------------------|------------|--------------|-----------|--------|--------|---------|---------|------|----------|--------|-------|-------|-------|---------------|---------|-------|--|---------------|--|---------------|----------|--|--|-------------|--|--|
| <b>Class of Service Operation</b>                          | <p>Single CoS: Any one of the four available CoS can be used within the EVC, subject to the access type as above</p> <p>Multi-CoS<sup>13</sup>: Up to four CoS are concurrently supported within the same EVC. (Only supported on Telstra fibre accesses)</p>  |                  |                  |                             |               |  |                               |                               |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |
| <b>EVC Frame Mapping</b>                                   | <p>Single-CoS: Frames are C-VID mapped to the EVC irrespective of customer CoS marking</p> <p>Multi-CoS<sup>11</sup>: Frames can be either C-tag mapped (C-VID and PCP) or DSCP-mapped</p>   |                  |                  |                             |               |  |                               |                               |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |
| <b>Target Network Performance Objectives, (UNI-to-UNI)</b> | <table border="1"> <thead> <tr> <th rowspan="2">Class of Service</th> <th rowspan="2">Frame Loss Ratio</th> <th colspan="3">Average One-way Frame Delay</th> <th rowspan="2">Average Frame Delay Variation</th> </tr> <tr> <th>0-161km</th> <th>162-1609km</th> <th>1610-16093km</th> </tr> </thead> <tbody> <tr> <td>Expedited</td> <td>&lt;0.01%</td> <td>&lt;5.7ms</td> <td>&lt;14.5ms</td> <td>&lt;37.5ms</td> <td>&lt;1ms</td> </tr> <tr> <td>Priority</td> <td>&lt;0.01%</td> <td>&lt;10ms</td> <td>&lt;20ms</td> <td>&lt;43ms</td> <td>Not Specified</td> </tr> <tr> <td>Premium</td> <td>&lt;0.1%</td> <td></td> <td colspan="2">Not Specified</td> <td>Not Specified</td> </tr> <tr> <td>Standard</td> <td></td> <td></td> <td colspan="3">Best Effort</td> </tr> </tbody> </table>   | Class of Service | Frame Loss Ratio | Average One-way Frame Delay |               |  | Average Frame Delay Variation | 0-161km                       | 162-1609km | 1610-16093km | Expedited | <0.01% | <5.7ms | <14.5ms | <37.5ms | <1ms | Priority | <0.01% | <10ms | <20ms | <43ms | Not Specified | Premium | <0.1% |  | Not Specified |  | Not Specified | Standard |  |  | Best Effort |  |  |
| Class of Service   | Frame Loss Ratio   |                  |                  | Average One-way Frame Delay |               |  |                               | Average Frame Delay Variation |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |
|  |  | 0-161km          | 162-1609km       | 1610-16093km                |               |  |                               |                               |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |
| Expedited  | <0.01%   | <5.7ms           | <14.5ms          | <37.5ms                     | <1ms          |  |                               |                               |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |
| Priority   | <0.01%   | <10ms            | <20ms            | <43ms                       | Not Specified |  |                               |                               |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |
| Premium  | <0.1%  |                  | Not Specified    |                             | Not Specified |  |                               |                               |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |
| Standard   |  |                  | Best Effort      |                             |               |  |                               |                               |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |
| <b>Bandwidth Profile Rates<sup>14</sup></b>                | <p>For single-CoS EVC: Per UNI.EVC</p> <p>For multi-CoS<sup>11</sup> EVC: Per UNI.EVC.CoS</p>  |                  |                  |                             |               |  |                               |                               |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |
| <b>Colour Mode</b>   | <p>Colour blind<sup>15</sup>: Expedited: 1:1 (CIR Only)</p> <p>Priority: 1:1 (CIR Only)</p> <p>Premium: 1:1 (CIR Only)</p> <p>Standard: 0:1 (EIR only)</p>   |                  |                  |                             |               |  |                               |                               |            |              |           |        |        |         |         |      |          |        |       |       |       |               |         |       |  |               |  |               |          |  |  |             |  |  |

<sup>12</sup> For Telstra mobile access, the traffic is carried in a best-effort capacity only. There is no Class of Service differential treatment in the Telstra mobile network. When use as a backup for Telstra fibre access, traffic failover occurs when the physical fibre between the tail-end NTU and the aggregation switch located in the Telstra exchange is down.

<sup>13</sup> Multi-CoS is not supported on Telstra mobile accesses and therefore should not be used for rapid activation and/or as a backup for Telstra fibre accesses if Multi-Cos is being enabled.

<sup>14</sup> Bandwidth Profiles are a method of characterising Service Frames for the purpose of rate enforcement or policing. Incorrectly shaped traffic ingressing a UNI towards Telstra will be policed accordingly. The policers are agnostic to any layer-2 marking for single CoS services so will discard traffic on an ‘as they arrive’ basis. This means non-conforming high-value and low-value traffic have similar probability of being discarded.

<sup>15</sup> A colour-blind profile is one where the ingress EVC policer at the UNI ignores any existing colour indication that the service frame is already conformant to CIR (green) or EIR (yellow)

## EVC Attributes cont.

|                                       |   |
|---------------------------------------|---|
| <b>Colour Forwarding<sup>16</sup></b> | Yes   |
| <b>CoS Marking Preservation</b>       | Layer 2 priority (802.1p) and Layer 3 priority (DSCP) always preserved end-to-end   |
| <b>CE-VLAN ID Preservation</b>        | For Telstra fibre accesses:<br>Yes : CE-VLAN IDs are preserved UNI to UNI<br>No: CE-VLAN ID re-write/translation occurs (one-to-one bundling only)<br>For NBN Accesses:<br>Untagged at tail-end results in tagged at head-end<br>When tagged at tail-end, CE-VLAN preservation must be “Yes” (i.e. no translation)<br>For Mobile accesses:<br>Yes : CE-VLAN IDs are preserved UNI to UNI<br>No: CE-VLAN ID re-write/translation occurs (one-to-one bundling only) |
| <b>Layer 2 Control Processing</b>     | As per MEF specifications for EVPL, the following Layer 2 control protocols will be discarded at UNI ingress: xSTP, LLDP, PAUSE frames, GARP/MRP, LACP/LAMP, CDP, Link OAM, VTP, Port Authentication, UDLD, E-LMI. For EPL, PAUSE frames will be discarded at UNI ingress.  |
| <b>Service Frame Delivery</b>         | Known Unicast: Unconditionally supported <sup>17</sup><br>Unknown Unicast: Unconditionally supported<br>Broadcast: Unconditionally supported<br>Multicast: Unconditionally supported  |
| <b>MAC Address Limit</b>              | 50 (Enforced in the network)  |
| <b>EVC MTU</b>                        | Fibre Accesses: 1596 bytes (default)<br>9000 bytes (requires approval)<br>NBN Accesses: 1522 bytes<br>Mobile Accesses: 1596 bytes <sup>8</sup>  |
| <b>Service OAM Processing</b>         | IEEE 802.1ag CFM is used for internal operational and fault sectionalisation purposes<br>Customer Service OAM frames with MD-Level = 5, 6 or 7 will be transparently passed at the UNI  |
| <b>Relevant Specifications</b>        | MEF 10.2, MEF 23, IEEE802.3   |

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<sup>16</sup> Colour Forwarding describes the relationship between the colour on an ingress frame into the Operator (Telstra) Network and the colour of the resulting egress Frame. When Colour Forwarding is Yes, the EVC cannot “promote” a frame from Yellow to Green

<sup>17</sup> Subject to the CoS performance objectives