

ETHERNET BACKHAUL

Data sheet for the MEF-Defined E-Access Service Type

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Supported MEF Service Types¹	E-Access: Access EPL (Port-based at the UNI) Access EVPL (CE-VLAN ID based at UNI)
Service Speeds	2 Mbps to 2 Gbps

ENNI ATTRIBUTES

Interface Types	1000Base-T 1000Base-SX 1000Base-LX 10GBASE-SR 10GBASE-LR
Interface Modes	Auto Negotiate (Default) Full Duplex
Physical Access Technology	Fibre-based
ENNI Access Availability Target	99.90%: Single uplink (fibre-based access) 99.98%: Fully redundant ² pair (fibre-based access). The ENNI pair can either be co-located or geographically diverse ³
Frame Formats	IEEE Std 802.1ad (0x88A8) or IEEE Std 802.1q (0x8100)
ENNI MTU Size	Standard – 1600 bytes Jumbo - 9004 bytes
ENNI Service Multiplexing	One-to-one, for both Access EPL and Access EVPL and based on the S-Tag VLAN ID. i.e. a single S-VLAN ID is mapped to the OVC at the ENNI

¹ The MEF-defined E-Line service Type (EVPL) is also supported on the EA product. E-Line services are described in a separate technical sheet at <https://www.telstrawholesale.com.au/products/data/ethernet-access.html>

² Fully redundant (FR) 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

³ Business rules apply to the locations of an FR pair of ENNIs

UNI ATTRIBUTES

Interface Types	10Base-T 100Base-Tx 1000Base-T 1000Base-SX 1000Base-LX 10GBASE-SR 10GBASE-LR
Interface Mode	Auto Negotiate (Default) Full Duplex Half Duplex
Physical Access Technology	Fibre-based
UNI Access Availability Target	99.90%: Single uplink (fibre-based access) 99.80%: Single uplink (copper-based access) 99.98%: Fully redundant (FR) FR tail UNIs cannot be geo-diverse
UNI MTU Size	Fibre accesses: 1596 bytes (standard) 9000 bytes (jumbo)
UNI Shut Down	Disabled for both Access EPL and Access EVPL services
UNI Service Multiplexing	Access EVPL only, based on CE VLAN ID
CE-VLAN ID Bundling	Access EPL: All-to-one (All C-VIDs mapped to one OVC at the UNI) Access EVPL: One-to-one (One CVID mapped to one OVC at the UNI) Many-to-one (>1 CVIDs mapped to one OVC at the UNI)

OVC ATTRIBUTES

<p>Available Classes of Service</p>	<p>Expedited (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 on OVCs with copper-access UNIs.</p> <p>Priority (1:1 CIR:PIR): Medium queues with reliable delivery even if delayed. Used for selected ‘real time’ applications like SQL database queries and unidirectional streaming video. Not available on OVCs with copper-access UNIs</p> <p>Premium (1:1 CIR:PIR): Small queues with low discard preference, used for key business applications like email and large file transfers. This is the only class of service available on OVCs with copper access UNIs.</p> <p>Standard (0:1 CIR:PIR): Deep queues with higher discard preference, used for best effort applications like web browsing. Not available on OVCs with copper-access UNIs.</p>																																	
<p>Class of Service Operation</p>	<p>Single CoS: Any one of the four available CoS can be used within the OVC Multi-CoS: Up to four CoS are concurrently supported within the same OVC</p>																																	
<p>OVC Frame Mapping</p>	<p>At the ENNI end-point, frames are mapped to the OVC using the S-Tag VLAN ID At the UNI endpoint: Single-CoS: Frames mapped to the OVC irrespective of customer CoS marking Multi-CoS: Frames can be either PCP-mapped or DSCP-mapped</p>																																	
<p>Target Network Performance Objectives, (ENNI-to-UNI)</p>	<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><0.01%</td> <td><5.7ms</td> <td><14.5ms</td> <td><37.5ms</td> <td><1ms</td> </tr> <tr> <td>Priority</td> <td><0.01%</td> <td><10ms</td> <td><20ms</td> <td><43ms</td> <td>Not Specified</td> </tr> <tr> <td>Premium</td> <td><0.1%</td> <td colspan="3">Not Specified</td> <td>Not Specified</td> </tr> <tr> <td>Standard</td> <td colspan="5">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				
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<p>Bandwidth Profile Rates⁴</p>	<p>Access EPL: For single-CoS OVC: Per UNI and per ENNI.OVC For multi-CoS OVC: Per UNI.CoS and per ENNI.OVC.CoS</p> <p>Access EVPL: For single-CoS OVC: Per UNI.OVC and per ENNI.OVC For multi-CoS OVC: Per UNI.OVC.CoS and per ENNI.OVC.CoS</p>																																	

⁴ Bandwidth Profile is a method of characterising Service Frames for the purpose of rate enforcement or policing. Incorrectly shaped traffic ingressing a UNI or ENNI 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 arrival basis. This means non-conforming high-value and low-value traffic have similar probability of being discarded.

Colour Mode	Colour blind ⁵ : Expedited - 1:1 (CIR Only) Priority - 1:1 (CIR Only) Premium - 1:1 (CIR Only) Standard - 0:1 (PIR only)
Colour Forwarding ⁶	Yes
CoS Marking Preservation	Layer 2 priority (802.1p PCP) and Layer 3 priority (DSCP) always preserved
CE-VLAN ID Preservation	CE-VLAN IDs are preserved from UNI to ENNI as per relevant MEF specifications
Layer 2 Control Processing	Discard for both Access EPL and Access EVPL
S-Tag VLAN ID	Telstra allocates SVID, or customer indicates preference ⁷ Valid S-VID range in both cases is 1001-2999
Service Frame Delivery	Known Unicast: Unconditionally supported ⁸ Unknown Unicast: Conditionally Supported ⁹ Broadcast: Conditionally Supported ¹⁰ Multicast: Conditionally Supported ¹⁰
MAC Address Limit	50 (Enforced in the network)
OVC MTU	Fibre accesses: 1600 bytes (default) 9004 bytes (requires approval) Copper Accesses: 1522 bytes
Service OAM Processing	IEEE 802.1ag CFM is used for internal operational purposes. Customer Service OAM frames with MD-Level = 5, 6 or 7 will be transparently passed at the UNI and ENNI.
Relevant Specifications	MEF 33, MEF 10.2, MEF 23, IEEE802.1ad
MEF Certification	E-Access Services on fibre accesses ¹⁰ are designed to be compliant with MEF 33, but are not yet certified

⁵ A colour-blind profile is one where the ingress OVC policer (at the UNI or the ENNI) ignores any existing colour indication that the service frame is already conformant to CIR (green) or EIR (yellow)

⁶ Colour Forwarding describes the relationship between the colour on an ingress frame into the Operator Network and the colour of the resulting egress ENNI Frame. When Colour Forwarding is Yes, the OVC cannot “promote” a frame from Yellow to Green

⁷ Customer preferences may not be allocable on shared infrastructure, in which case Telstra will allocate an available S-VID

⁸ Subject to the CoS performance objectives

⁹ Where CoS = Premium and the ENNI Access Topology is fully redundant, broadcast, unknown unicast and multicast (BUM) frames are passed, but not transparently.

¹⁰ There is no intent to MEF-certify copper accesses

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