# Telstra Wholesale Ethernet Access

Flexible and scalable nationwide
Carrier Ethernet solutions

InfraCo

Ethernet is the most widely used networking technology for data transmission because it offers reliable and cost-effective wide-area network connectivity. Our industry-leading Ethernet services are designed to be customisable to meet the changing demands of your business and your customers.

Our extensive Ethernet coverage enables you to make the most of business opportunities across Australia.

## Using Ethernet Access

Ethernet Access connects tail ends with a head end. For example, it can be used to connect branch offices to a head office or connect your end user's premises to your point of presence. Examples of typical Ethernet Access end-users include:

- Retail stores – for inventory management systems using Virtual Private Networks (VPN)
- Small to medium businesses – for corporate Internet, cloud, collaboration, video and VoIP solutions
- Large corporations – for key components within a complex IP-VPN solution

## Ethernet Access Overview

The Ethernet Access (EA) offers Carrier Ethernet services targeting the business access market. Ethernet Access provides you with flexible and robust point-to-point and point-to-multipoint (aggregation) Ethernet connectivity through proven Virtual Private LAN Service (VPLS) and pseudowire technology in our core networks. Four classes of service (CoS) enable you to prioritise traffic end-to-end according to your performance needs.

Coverage is available nationally on Telstra-owned fibre. (A full ESA list detailing coverage footprint is available from Telstra on request). For a tail-endservice to be provided over a Telstra fibre access, a Telstra mobile access can be optionally used for Rapid Mobile Activation or as a backup to improve the service availability of the tail UNI.

A Telstra-supplied NTU conveniently hides these physical access considerations thereby seamlessly integrating with Telstra on-net services as part of the overall EA product construct, as shown in figures 1 and 2.

End-to-end 'logical' service connectivity across these physical accesses is via a virtual connection (VC). In the case of an E-Access service, the virtual connection associates a UNI at the tail end with an external network-network interface (ENNI) at the head end and is called an operator virtual connection (OVC).

UNIs and ENNIs are ports on the NTUs into which you connect your own customer premises equipment (CPE). OVC-based services are often colloquially called "Q-in-Q" services.

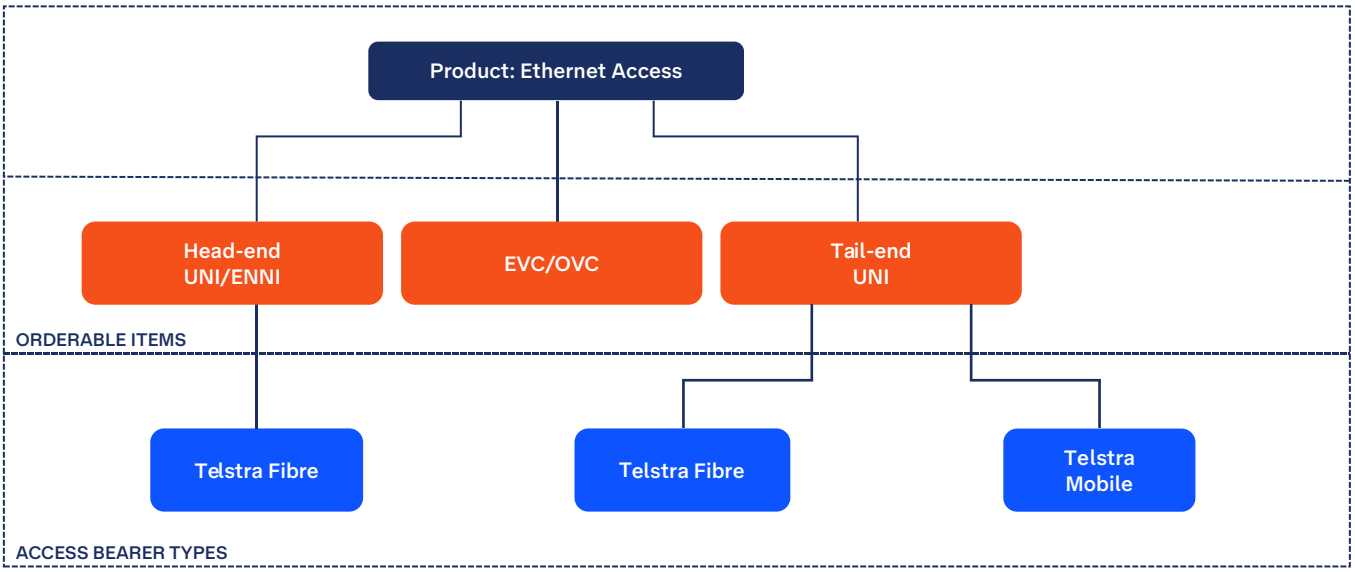
## What are the benefits?

### National coverage

Our national coverage means you only have to engage a single-supplier, leading to total cost of ownership benefits.

Using Telstra's Ethernet Access product means you only deal with one entity, avoiding the extra time and cost of managing operational and technical relationships with multiple suppliers.

*Figure 1: Product Construct*




### *Save costs*

Ethernet aggregation handoff to you at interface (UNI/ENNI) speeds of up to 100Gbps leads to cost saving, lower port count and rack space reduction compared to other/older technologies or using multiple lower speed Ethernet interfaces.

Lower your equipment costs and reduce space, power and cabling requirements through service multiplexing. This enables one interface (UNI or ENNI) to support multiple VCs. It also allows new VCs to be provisioned more efficiently and rapidly on the same interface (available on Telstra fibre accesses only).

### *Scalable Bandwidth*

Connect more flexibly across a range of bandwidths and easily upgrade bandwidth as needed with scalable and granular bandwidth options on virtual connections (EVCs/OVCs) provisioned with different classes of service (CoS).

### *Meet customer needs*

Prioritise traffic to meet your customers' needs with multiple classes of service (CoS) from end to end across the VC. This can be done using either Layer 2 (802.1p) or Layer 3 (DSCP) mapping and/or VLAN ID.

### *Protection*

Choose from network topology options that suit the way you want to protect against network failures with access resiliency options for EA. Single uplink (SU) (99.9%), SU with mobile backup (99.95%) and fully redundant (FR) (99.98%) head-end access target availability options for both E-Line and E-Access services are shown in figure 3. Geo-diverse access redundancy is subject to specific zoning business rules. For fibre tail-ends, only the SU, SU with mobile backup and FR co-located options are supported. Protection is customer-managed, typically at layer 3. However for SU with mobile backup, fibre link protection is automatically employed at layer 2 through Telstra-owned tail-end NTU.

### *Quick fault management*

End-to-end connectivity fault management (CFM) enables us to quickly diagnose and address customer-originated connectivity issues. Ethernet Access will also enable tunnelling of selected customer-originated service OAM frames for end-user Layer 2 diagnosis. In the event of faults, this

OAM also allows us to do performance monitoring on VCs to give you a high level of confidence because we can establish whether target SLA parameters like frame loss, frame delays and variation are operating within the design 'envelope'.

### *Online access*

Manage your IT and network provisioning more efficiently with online access to quoting, ordering and billing.

Our latest tool is the TW Hub – the strategic customer portal for Telstra Wholesale catering your end-to-end journey. The TW Hub enables you to perform assurance activities such as view service details, perform diagnostic testing, network schematics, view outages (service specific, Planned & Unplanned Network, System & API and mass outages), and fault ticketing.

*Figure 2: Physical Topologies and Access Bearer Types*

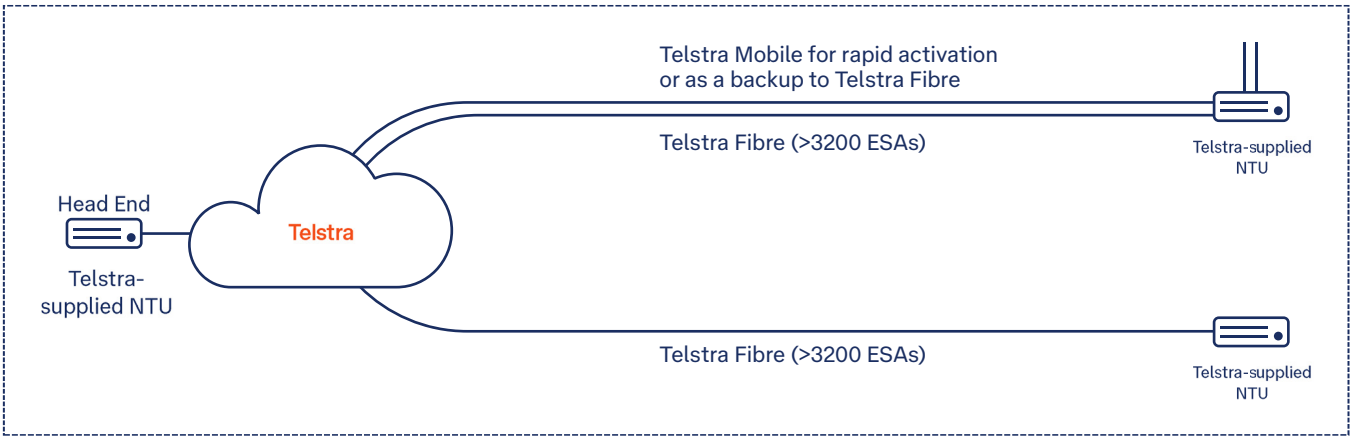



*Figure 3: Access Resiliency Options*

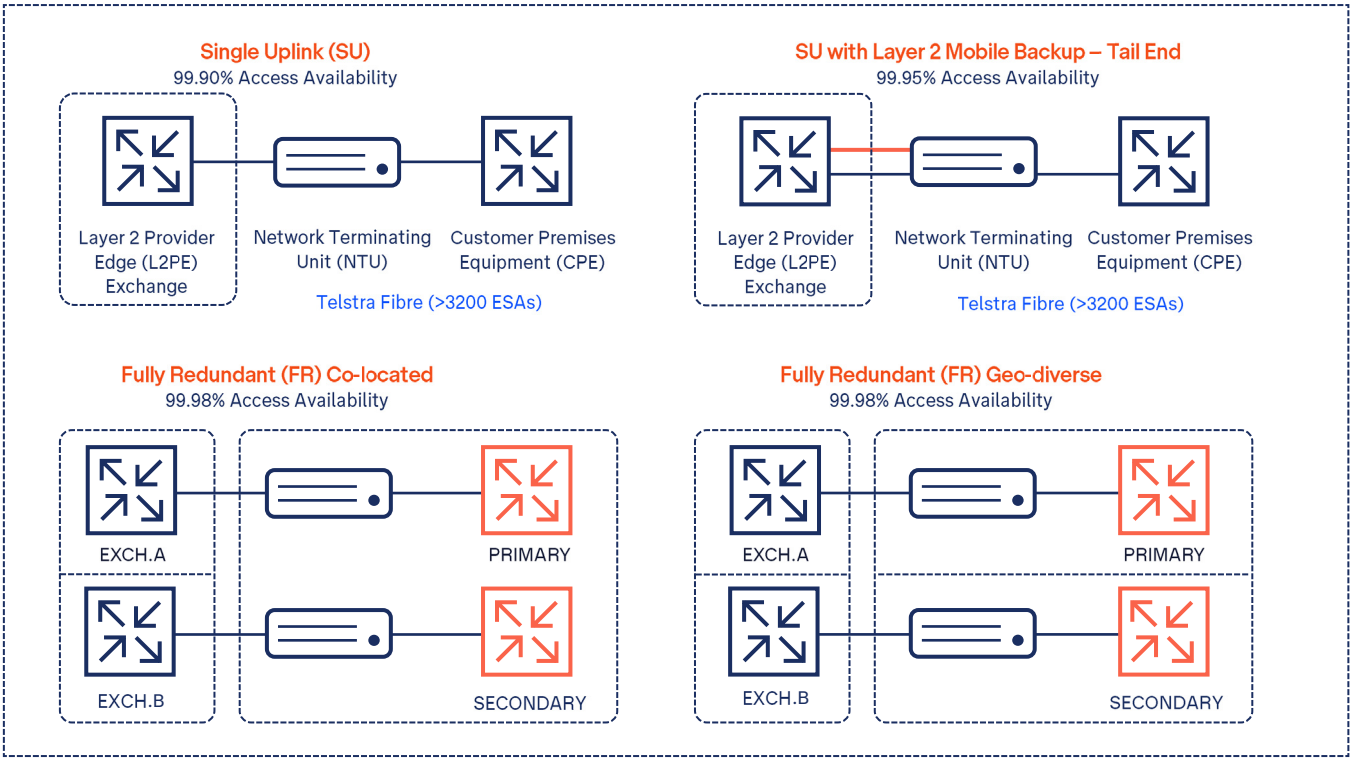


*Figure 4: Comparing Product Capabilities*

Using internationally recognised MEF terminology describing Carrier Ethernet Services, figure 4 summarises the relative capabilities of the EA Product.

| MEF Service Type | MEF Service Definition | Summary Description | EA Mobile Access* 10-100Mbps Standard CoS | EA Fibre Access 20-2000Mbps All CoS |
|---|---|---|---|---|
| E-Line | EPL (MEF 6.1 & 10.2) | • Point-to-Point<br>• EVC-based, UNI-to-UNI<br>• Port-based UNI | ✗ | ✓ |
| | EVPL (MEF 6.1 & 10.2) | • Aggregated Point-to-Point<br>• EVC-Based, UNI-to-UNI<br>• C-VLAN-based UNI | ✓ | ✓ |
| E-Access | Access EPL (MEF 33) | • Aggregated Point-to-Point<br>• OVC-Based, UNI-to-ENNI<br>• Port-based UNI<br>• S-VLAN based ENNI | ✓ | ✓ |
| | Access EVPL (MEF 33) | • Aggregated Point-to-Point<br>• OVC-Based, UNI-to-ENNI<br>• C-VLAN-based UNI<br>• S-VLAN based ENNI | ✓ | ✓ |

* Use as a backup for a tail-end service with Telstra fibre access as the primary. Also use for Rapid Mobile Activation. Not all aspects are MEF-aligned on mobile access

## Understanding E-Line Services

MEF-aligned E-line services associate a tail end UNI with a head end UNI, via an EVC. Topologically, you can order a service as single point-to-point, or as several point-to-point services to form an aggregated service-set. MEF defines both port-based and VLAN based services. A port-based E-Line service is called an Ethernet private line (EPL) and provides service transparency. A VLAN-based E-Line service is called an Ethernet virtual private line (EVPL) service. Using the MEF-aligned “preservation” attribute, if only one CE-VLAN is mapped at the tail end UNI, you can translate its VLAN-ID value so that a different value is mapped at the head-end. This tag-translation capability is useful when resolving duplicate CE-VLAN IDs. EVCs can be single-Cos or multi-Cos and EVCs can be service multiplexed to create an aggregated service at the head-end UNI. These versatile constructs are available on our Ethernet Access product as shown in figures 5 and 6 below.

*Figure 5: E-Line EVPL Services*

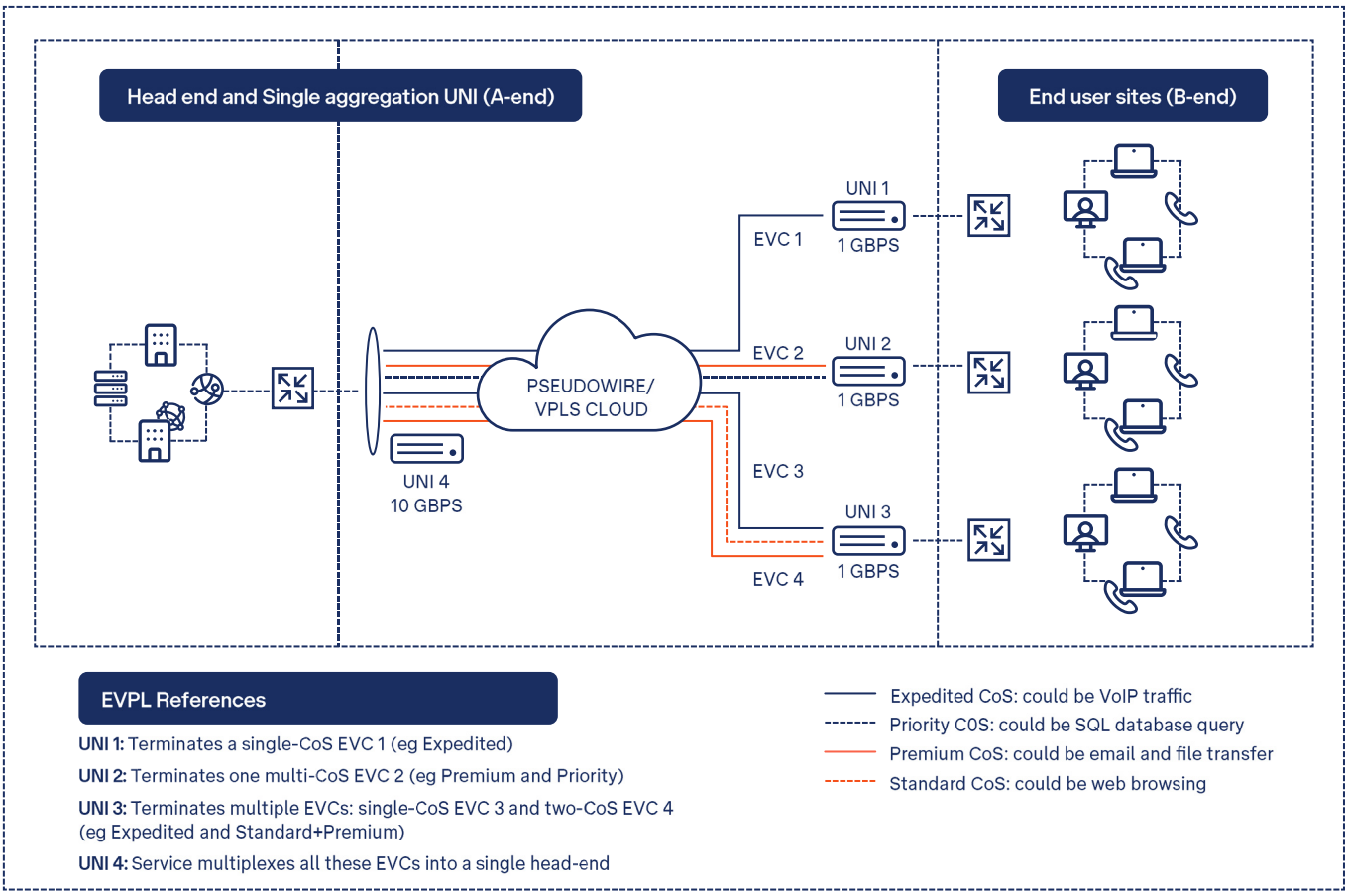
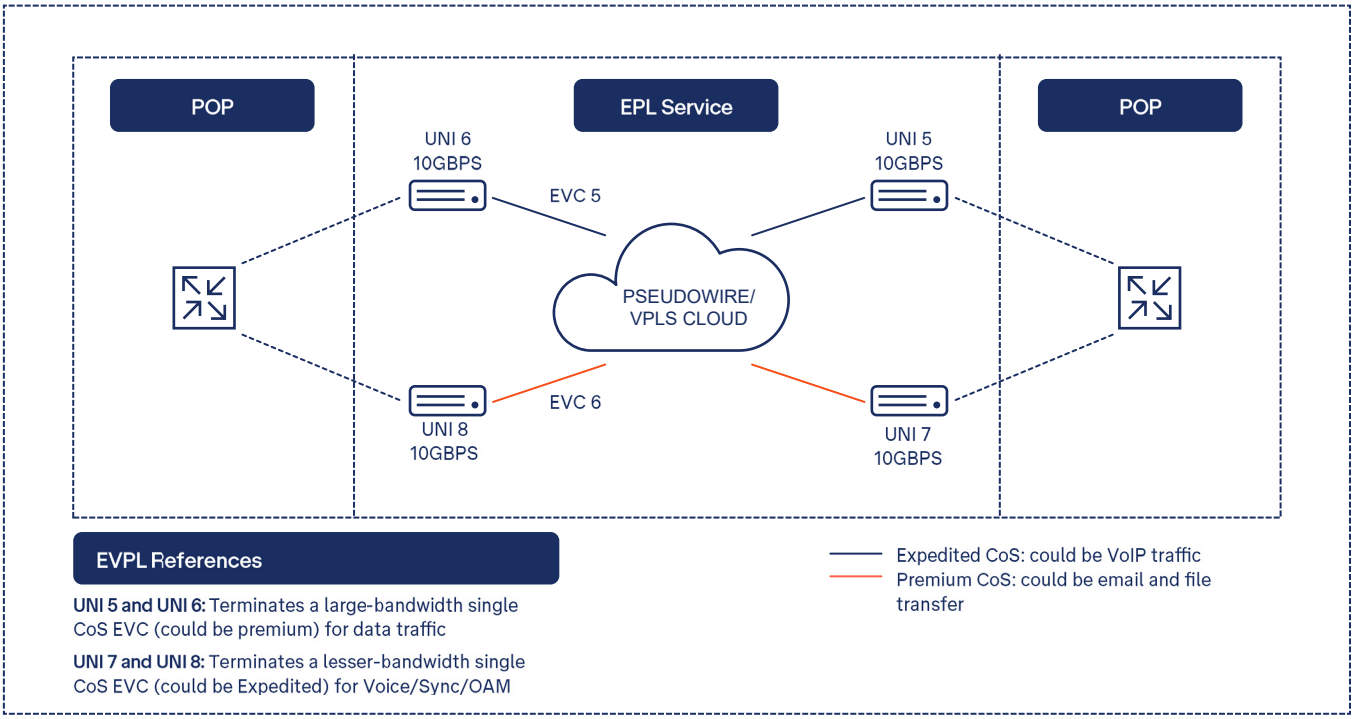



*Figure 6: E-Line EPL Services*



# Understanding E-Access Services

MEF aligned E-Access services associate a UNI at the tail end of a service with an ENNI at the head end, via an operator virtual connection (OVC). As traffic exits the ENNI towards your head-end, an extra VLAN tag is added to each Ethernet frame.

This service tag (S-tag) is concatenated with the customer VLAN tag to create a double-tagged Provider Bridging frame (aka Q-in-Q frame) as defined in the IEEE 802.1ad specification. Service multiplexing on an S-tag basis at the ENNI creates an aggregated service set. The double tagging provides you flexibility and scale when separating customers and/or traffic flows.

In particular where a duplicate C-tag may be in-service at the tail-end, the addition/concatenation of an S-tag on egress from the ENNI creates a unique identifier enabling traffic grouping/hierarchy. UNIs on an E-Access service behave identically to tail-end UNI's on E-Line services, noting that CE-VLAN IDs are always preserved on E-Access services.

These versatile constructs are available on our Ethernet Access product as shown in figures 7, 8 and 9 below.

*Figure 7: E-Access Services*

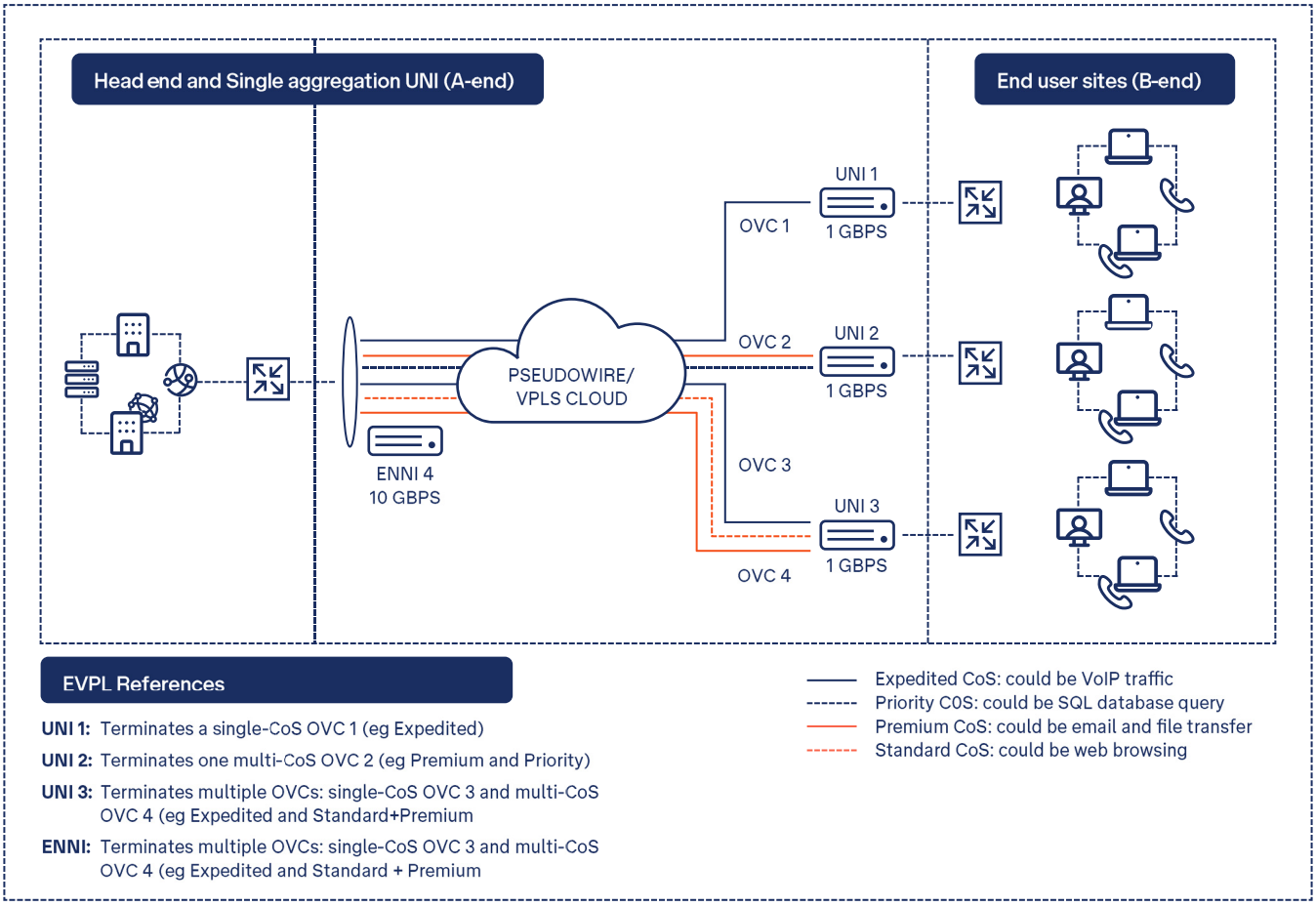


*Figure 8: Disambiguating Overlapping VLAN IDs using E-Access*

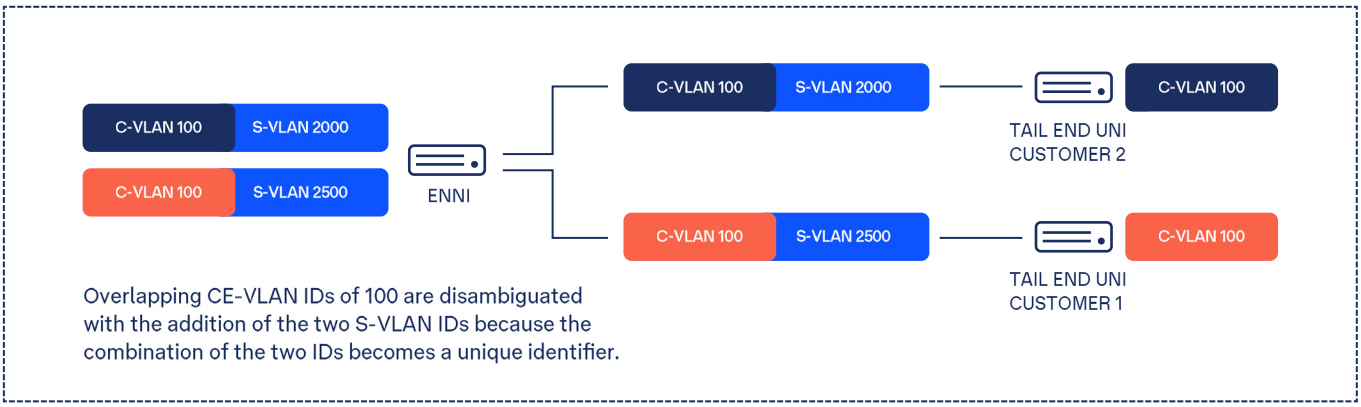
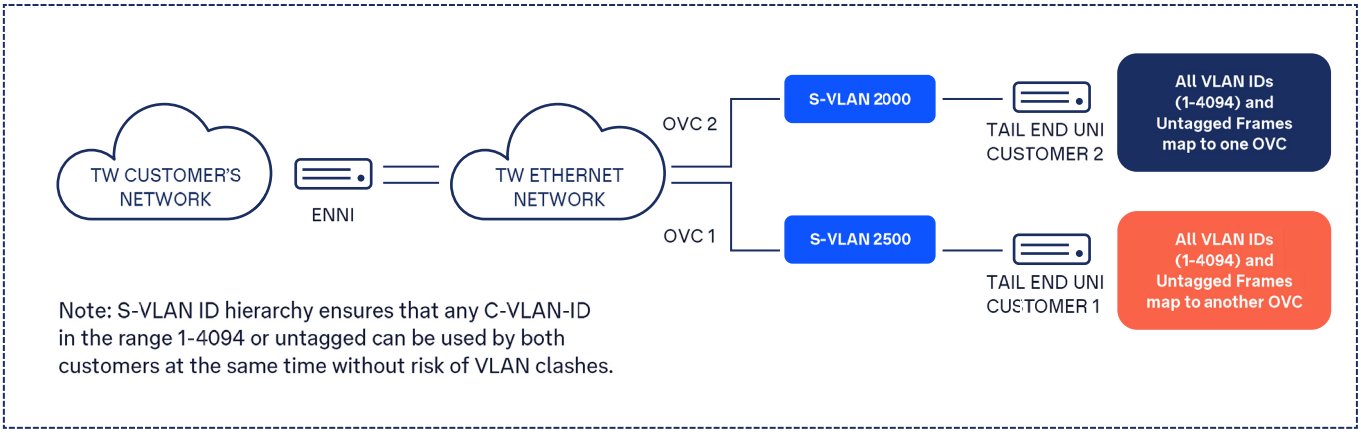



*Figure 9: Using S-VLANs to enable grouping, hierarchy and scale*




# Why Ethernet Access with Telstra Wholesale?

## *Our experienced people*

Telstra Wholesale offers a highly skilled and experienced team of specialists to help identify the solution that best suits your needs.

Our sales and service teams have the scale and experience you can count on, now and in the future. You will also receive our expert technical and operational support once the service has been delivered.

## *Durability*

Unmatched experience building our most resilient connection. Choose the right redundancy options for your requirements.

## *Mobility*

It starts with mobile backup and rapid mobile activation, but next-gen possibilities are endless with Australia's leading mobile network.

## *Scale*

Benefit from our already built network scale; the network, team, products and capabilities to grow with you. We're in the places that you need us, with the EA product having national coverage across more than 3,200 Telstra exchange service areas.

### *Our superior systems*

Our proven, integrated systems capabilities and operational support help you manage your business needs with various on line tools you can use to quote, order, support and review service inventory on your EA services.

### *Getting connected*

You can order EA services through the standard ordering process. Our latest tool is the TW Hub - the strategic customer portal for Telstra Wholesale catering your end-to-end journey. You will have access to TW Hub, an on line web browser-based tool that is available 24 hours a day, 7 days a week. Using TW Hub you can obtain preliminary price-checks and provisionally verify service availability information for prospective services on Telstra fibre with or without including the rapid mobile activation and mobile back up options. The TW Hub also enables you to perform assurance activities such as view service details, perform diagnostic testing, network schematics, view outages (service specific, Planned & Unplanned Network, System & API and mass outages), and fault ticketing. If you don't have access to TW Hub, ask your account manager to get you set up.

You'll find activation processes in our Ordering and Provisioning Manual (OPM), available from your service manager. Our team will work with you to ensure the product option combinations you order will optimally meet your needs.

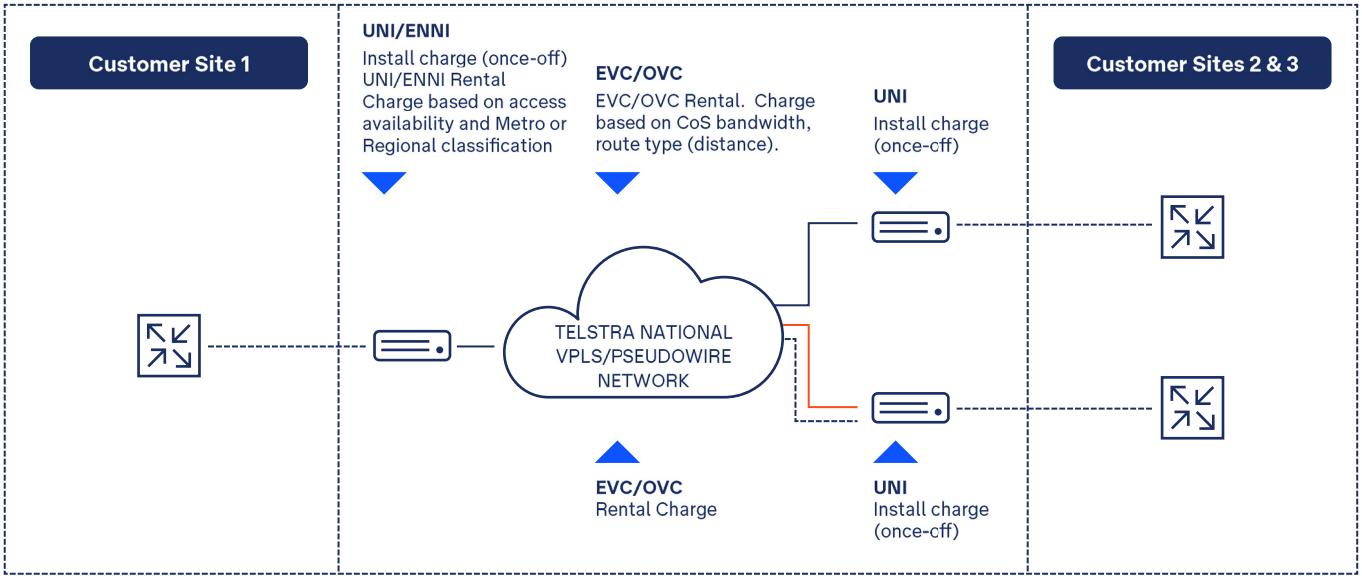
For any multi-site opportunities please speak directly with us.

### *Charges and billing*

EA uses route-based pricing for the recurring charges for both point-to-point and aggregated point-to-multipoint services. Our pricing takes into account class of service (CoS) and virtual connection (EVC/OVC) bandwidths, UNI/ENNI interface and the service assurance on each virtual connection.

These combinations give you a comprehensive range of possibilities. A minimum term of 12 months applies to each service. Non-recurring and recurring charges may be eligible for fixed term discounts. We will bill your services monthly, itemising the installation charges and recurring charges and service assurance charges as applicable.

*Figure 10: Key Pricing Elements*



## Operations and maintenance

You can report service difficulties 24 hours a day, 7 days a week through our TW Hub or by calling the Telstra fault reporting centre.

## Documents

Ethernet Access Data sheets:

- E-Line
- E-Access

Telstra's Service and Interface Specification (TSIS) for Ethernet Access

## More information

For more information, you can:

- Contact your Telstra Wholesale account manager for existing customers
- Contact our **Telstra Wholesale team** for new enquires
- Visit **telstrawholesale.com.au**