ASX NET

In Detail: Connectivity Guide

ASX

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INTRODUCTION

ASX Net is a high-bandwidth, low latency network covering the whole of Australia. It enables ASX customers to connect with each other as well as the Australian and global financial markets like never before.

ASX Net is a point-to-point optical (dark) fibre network, achieving high degrees of availability and performance. The point-to-point nature of the network ensures fixed network routes and consistent performance. Network infrastructure is minimised to help create a network free of complexity and therefore, improving the overall availability of the service.

ASX Net is provisioned, monitored and managed by ASX. ASX has significant experience and expertise in managing critical financial market networks gained by operating the networks that have supported the Australian financial markets since the introduction of electronic trading and distributed connectivity in 1987. The network is monitored 24x7 from the Network Operations Centre (NOC) in the Australian Liquidity Centre (ALC) and offers the redundancy and stability required by the Australian financial community. Every ASX Net site is fully managed by ASX including initial installation and any upgrades required as customer or community platforms and systems change - you provide the cabinet, and ASX will do the rest.

ASX Net is a hub-and-spoke design centred on two data centres situated in Sydney. These data centres house all of ASX's critical systems and provide a fully redundant service to customer ASX Net sites. ASX Net has over 150 sites nationally, with redundant data centre Points of Presence (PoPs) in Melbourne, Brisbane, Adelaide and Perth as well as a global reach with high speed links to London, Singapore, Hong Kong and Chicago.

Historically, ASX Net has been used to carry traffic for the purposes of trading and clearing/settlement on ASX's exchanges along with associated ASX services. More recently however, ASX Net has interconnected the entire Australian financial community including buy and sell side participants, data vendors, third party service providers, other major financial data centres and even other exchanges.

This connectivity guide details technical connectivity over ASX Net. If you require further information regarding any of the services described in this guide, please contact the ASX Information and Technical Services team.

ASX NET SITE REQUIREMENTS

ASX provides ASX Net infrastructure as a fully managed solution. It is the responsibility of the customer to provide the hosting facilities for ASX-provided Customer Premise Equipment (CPE). As a managed service, it is a requirement that the ASX infrastructure:

- Must be housed in a secure environment; and
- Must not be moved or tampered with, unless under instruction from ASX technical staff.

ASX will make arrangements for the equipment installation or movement with the customers' nominated technical contact, and in the case of equipment faults, repair of the relevant communications equipment. This work will be carried out by ASX technical staff (or appointed agent), or by the carrier. The customer must allow for ASX or appointed technical personnel to have access to ASX Net equipment.

Communications Cabinet

All ASX CPE must be installed in secure cabinets located in a locked room with dedicated power supply. It is the responsibility of the user to provide the cabinets. The minimum required cabinet specifications are:

- W x D x H: 600mm x 800mm x 1940 mm.
- A minimum of 650mm clear space is required to open the rear door and one metre is required at the front.
- The cabinet can be installed with either or no side against a wall.
- Dedicated nominal 230volt power supply.
- ASX recommends all ASX equipment is housed centrally. Cable runs of over 100 meters from the ASX termination point cannot be supported.

Electrical Power

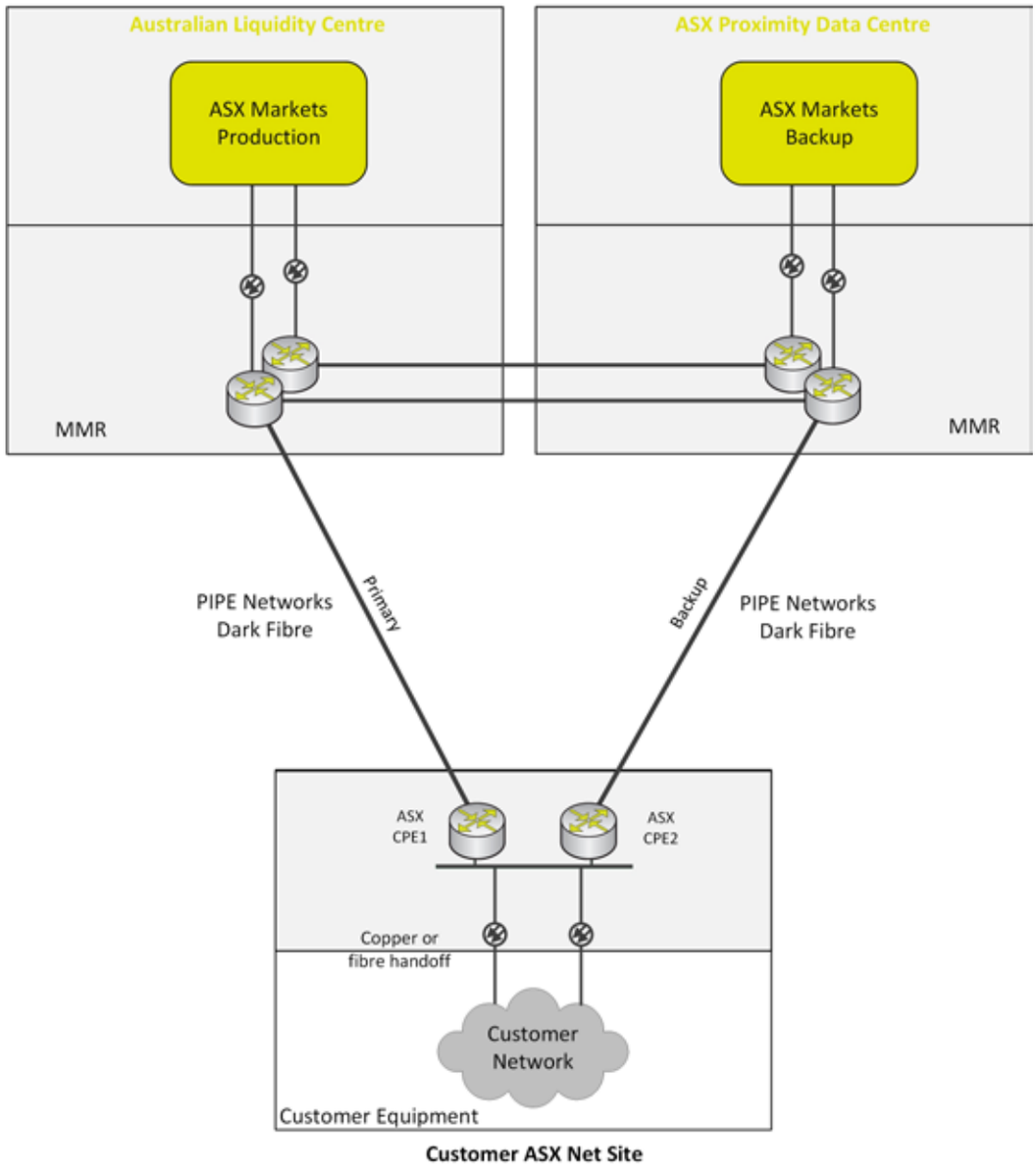
The communications cabinet must be connected to a minimum 10amp power supply.

It is recommended the electrical connection between the cabinet and power should be via a 56P310 plug and 56C310 socket. This captive plug and socket configuration provides an additional layer of safety as it cannot be accidentally unplugged.

Depending on the size of the site and the number and type of services ordered, additional power capacity may be required.

ASX NET SERVICES – OVERVIEW

Depending on the ASX services the customer is subscribing to, a number of different networks will be delivered to the customer site. These services are all delivered as a managed service over a pair of dark fibre circuits from ASX's two data centres in that metro area i.e. ALC and Bondi Junction in Sydney.



Customer ASX Net Site

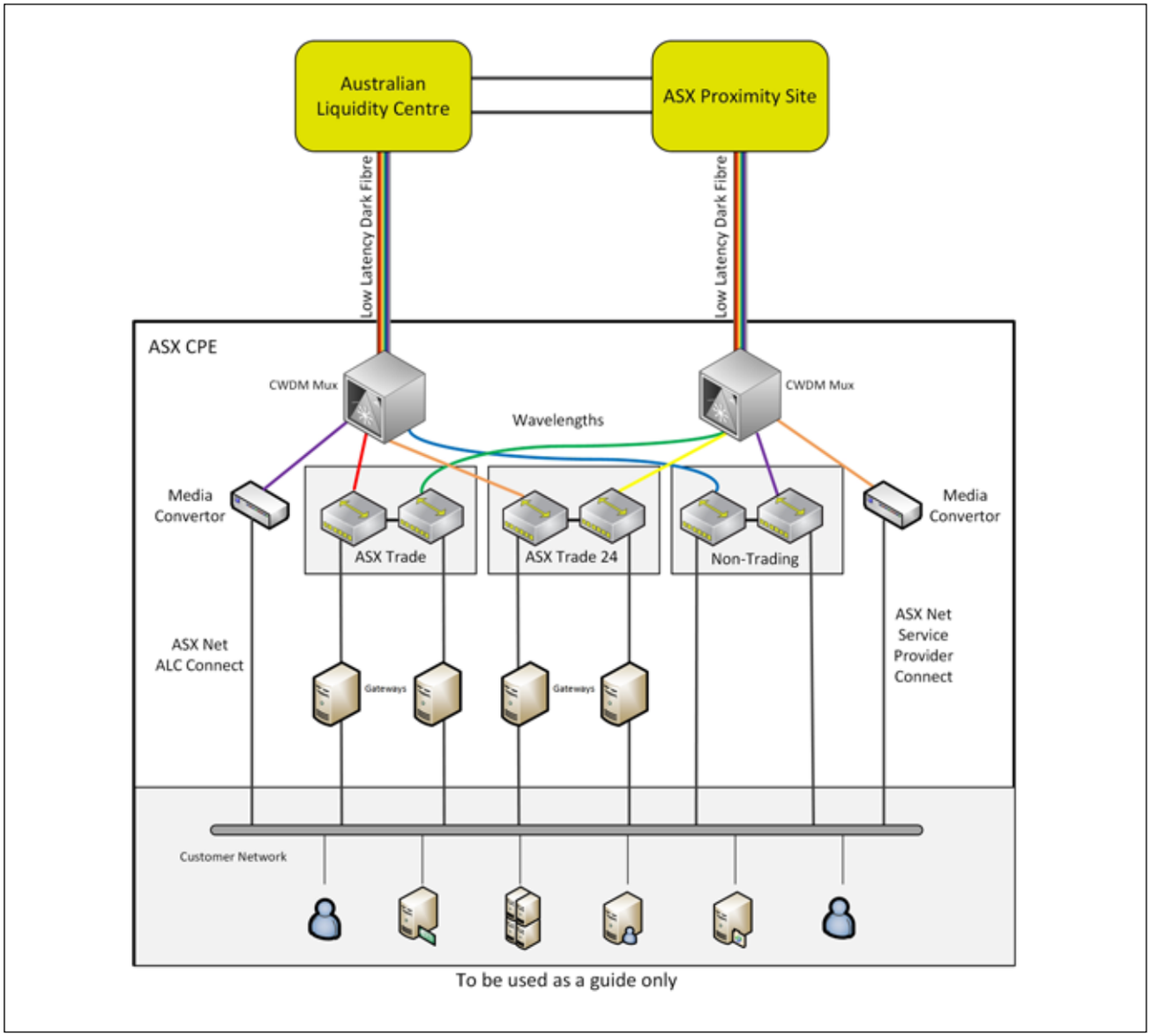
*Redundant = Dual Fibre -- Non-Redundant = Single Fibre to ALC Only

ASX NET SERVICES – IN DETAIL

Each ASX service is delivered over dedicated infrastructure. As such, depending on what ASX services are delivered to a given customer site, the following architecture may need to be installed.

- Communications lines: ASX Net (ASX managed fibre connection)
- Media Converter (Transceivers) or MUX's dependent on the number of subscribed services
- ASX routers for ASX Trade and ASX Trade24 services
- ASX Switches for ASX Trade, ASX Trade24 or E2 services
- One or more Gateways
- Local Area Network (LAN) connection between customer devices and the gateways/switches
- Infrastructure required for user software such as Genium Clearing CWS Workstation (ASX Clear (Futures)), and proprietary or vendor Open Interface systems.

The design of this architecture is shown below:



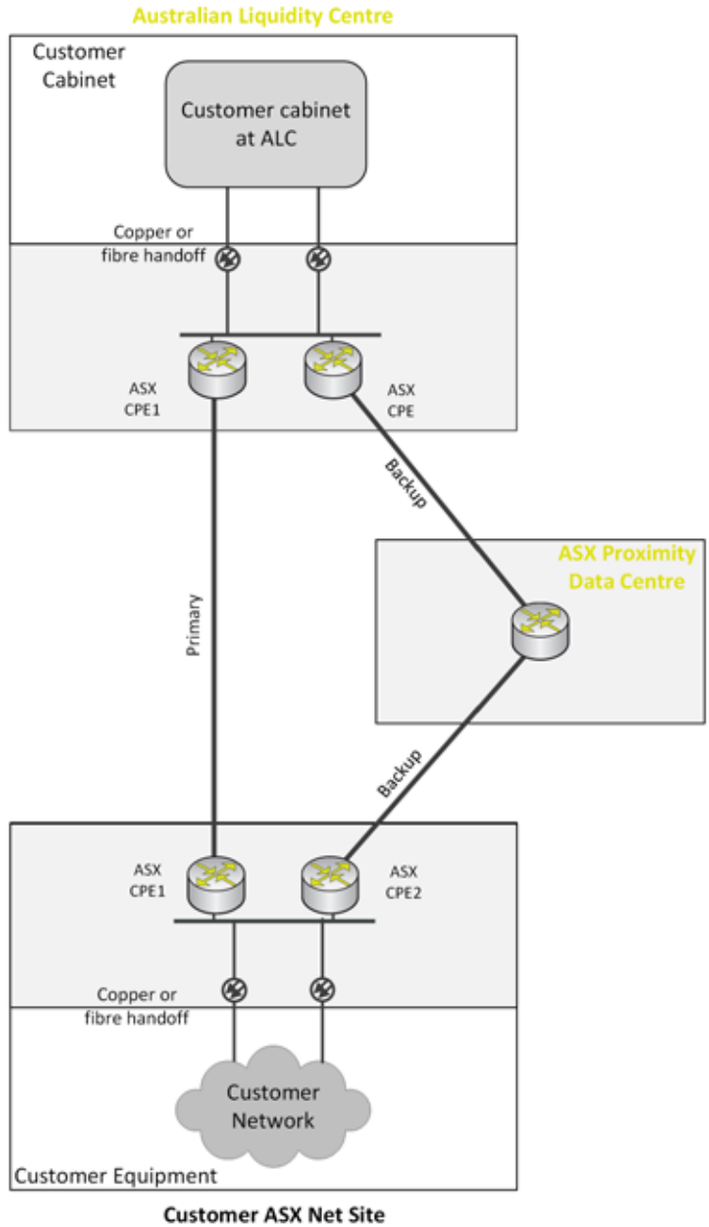
ASX NET – NETWORK SERVICES

ASX Net ALC Connect

A low latency, direct connection from an ASX Net site to a dedicated customer cabinet in the ALC data centre inclusive of any cross connects required to deliver the service. Choose between a 1Gbps or 10Gbps connection. Customers can opt to have a non-redundant (single path) or a redundant (dual path, dual hand-off) service.

PHYSICAL LAYER

- Connection will be delivered into the customer's rack - cross connects at the ALC end are included.
- Depending on the bandwidth of the service and the customer's preference, the media standard can be either copper 1000BASE-T or fibre 1000GBASE-SX or 10GBASE-SR (10G may not be available at all ASX Net sites).
- It is the customer's responsibility to provide the termination equipment
- Please note this service is presented as a Layer 1 service and the traffic across the link is transparent to ASX



Customer ASX Net Site

ASX Net Connect

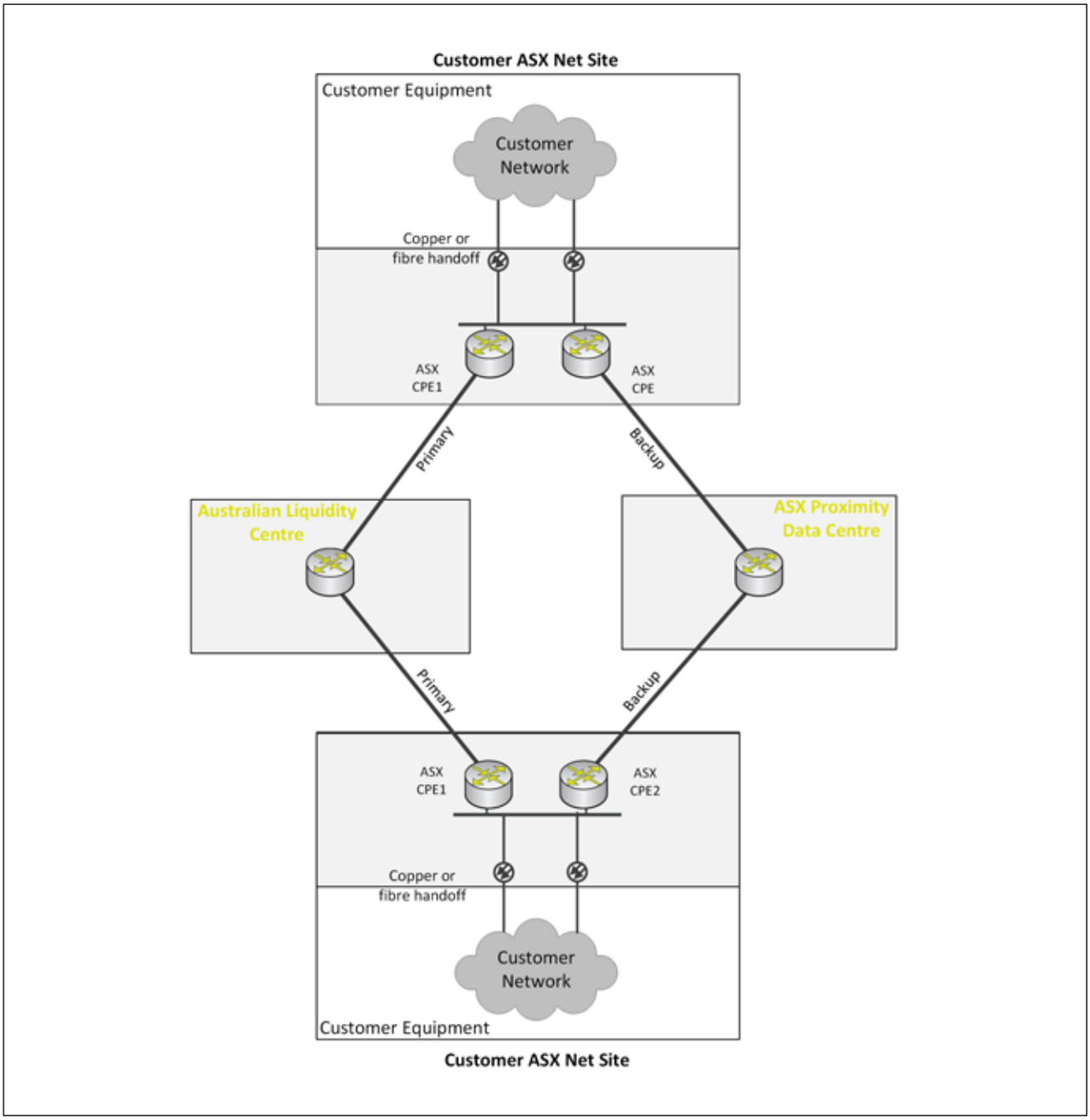
Dedicated network bandwidth between two ASX Net sites. This service can be used for connecting two customer owned sites together or this service can connect two different customers together to provide a business-to-business connection. Customers can choose between a variety of bandwidths to suit their needs.

Customers can opt to have a non-redundant (single path) or a redundant (dual path, dual hand-off) service.

PHYSICAL LAYER

- Connection will be delivered on copper or multi-mode fibre at customers ASX Net site
- Depending on the bandwidth of the service and the customer's preference, the media standard can be either copper 1000BASE-T or fibre 1000GBASE-SX or 10GBASE-SR (10G may not be available at all ASX Net sites).
- It is the customer's responsibility to provide the termination equipment

This service can be presented as a Layer 1, 2 or 3 service. This allows customers the flexibility to choose what best suits their needs. (Layer 1 only available within the same CBD)



ASX Net Service Provider Connect

A 10Mbps, 100Mbps or 1Gbps connection between a domestic ASX Net site and a third-party service provider in the ALC or their ASX Net site. This service is managed by ASX.

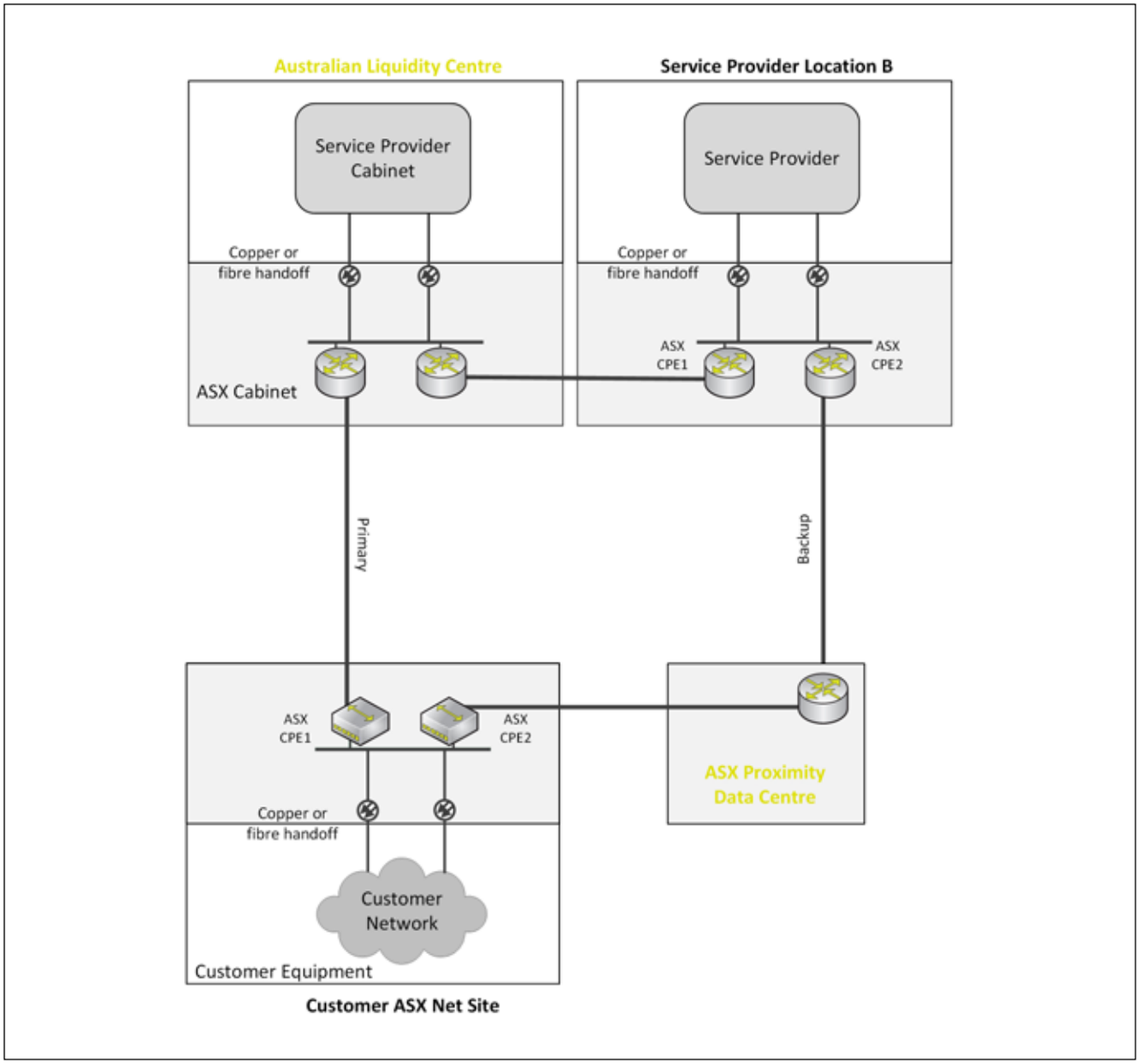
Customers will get a single hand-off that can route to either of the service provider environments. Physical redundancy can be obtained via the purchase of a second hand-off.

Please note that the ASX fee for this service feed does not include fees that the vendor may charge separately.

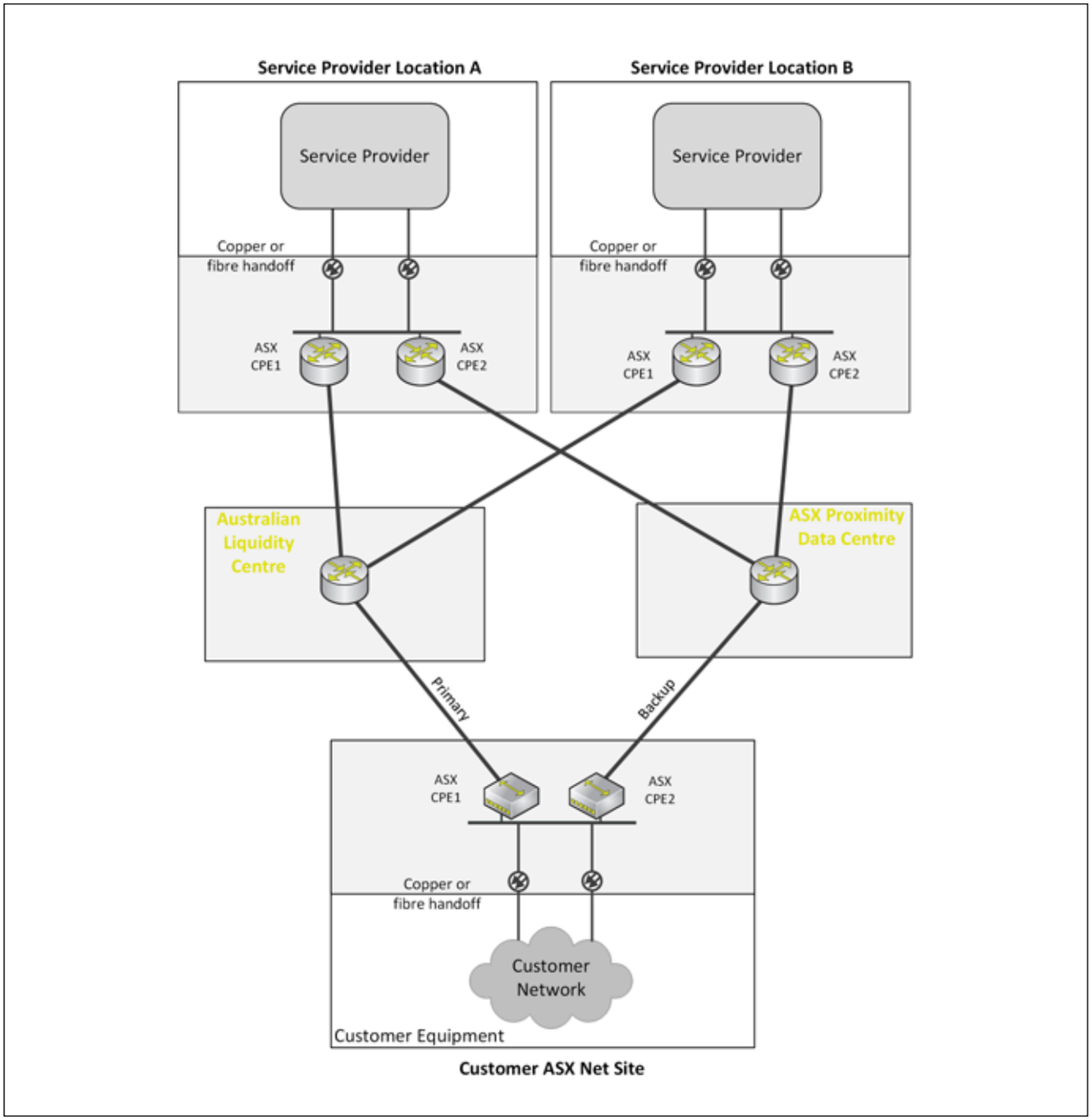
PHYSICAL LAYER

- Connection will be delivered on 1Gbps copper at customers ASX Net site
- The media standard is copper 1000BASE-T
- It is the customer's responsibility to provide the termination equipment
- All services are presented as Layer 3 services

Example 1



Example 2


Service Provider Location A
Service Provider Location B
Service Provider
Service Provider
Copper or fibre handoff
Copper or fibre handoff
ASX CPE1
ASX CPE2
ASX CPE1
ASX CPE2
Australian Liquidity Centre
ASX Proximity Data Centre
Primary
Backup
ASX CPE1
ASX CPE2
Copper or fibre handoff
Customer Network
Customer Equipment
Customer ASX Net Site

ASX Net – Equinix / Global Switch

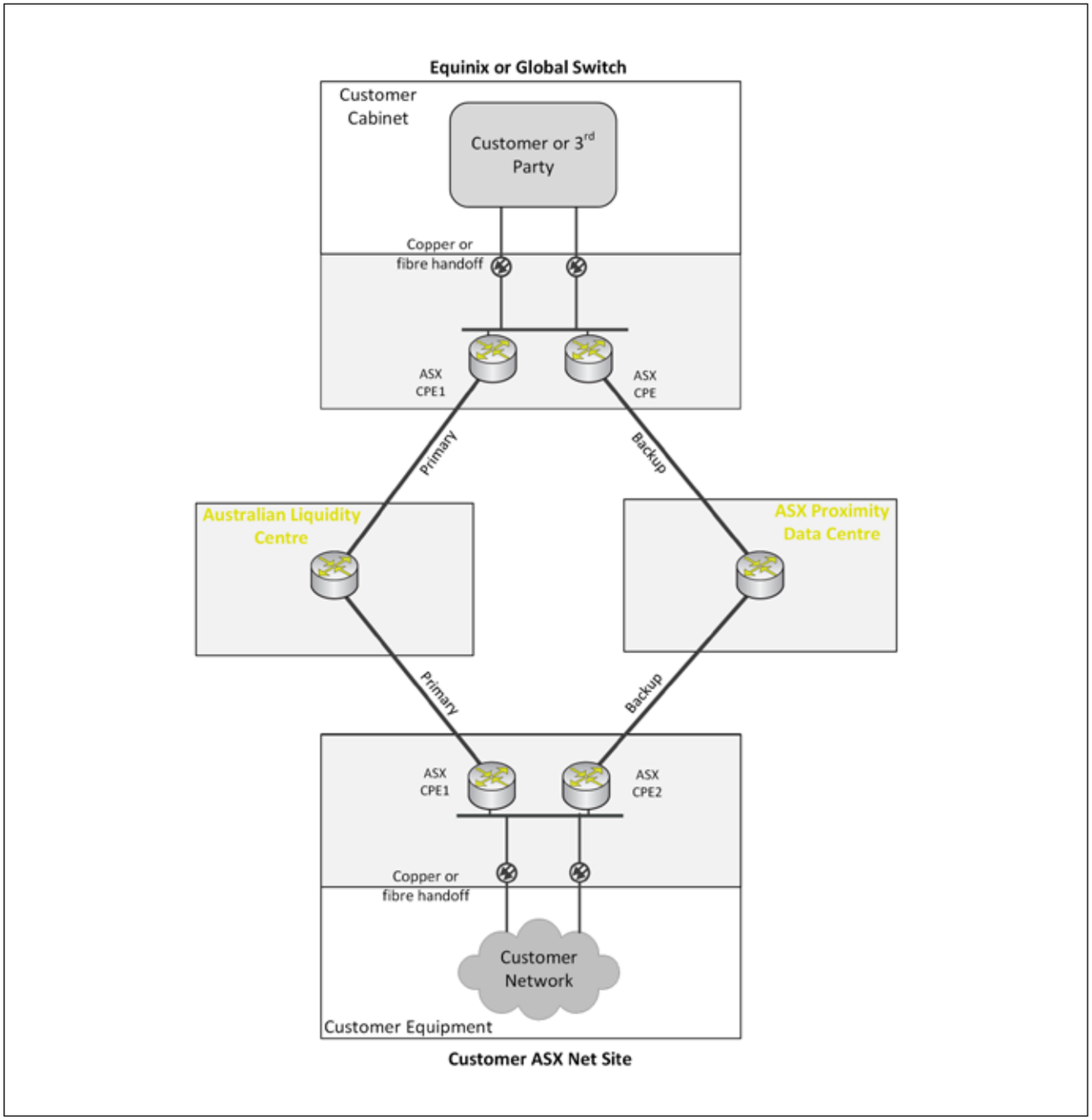
A portbased service across dedicated Provider Edge device providing connectivity from an ASX Net Site to either of ASX's points of presence in Equinix or Global Switch, including the crossconnect to a customer or 3rd party cabinet.

Customers can opt to have a nonredundant (single path) or a redundant (dual path, dual handoff) service.

PHYSICAL LAYER

- Connection will be delivered on 1Gbps copper or MMF at customers ASX Net Site
- The media standard is copper 1000BASET, 1000BASESX/LX (LC connector)
- It is the customer's responsibility to provide the termination equipment

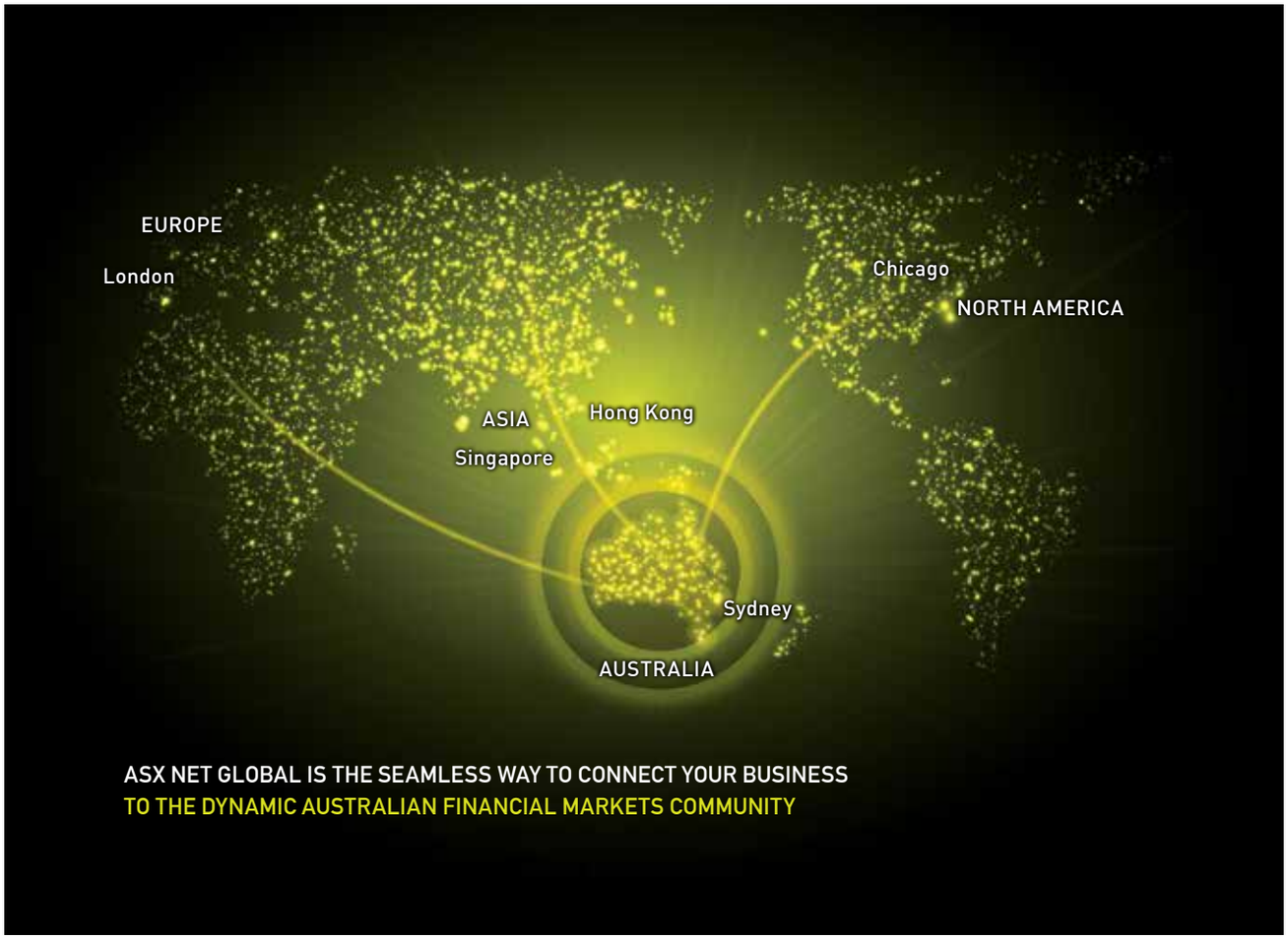
Please note that this is presented as a layer 2 EVC service with one VLAN (additional VLAN support can be requested).



ASX NET GLOBAL – OVERVIEW

ASX Net Global is a low latency fully managed network solution, which takes you straight to the heart of ASX's financial markets data centre, the Australian Liquidity Centre (ALC). With Points of Presence (PoP) in North America, Europe, and Asia, ASX Net Global is specifically designed to give the world's biggest financial markets deep access to the Australian financial trading and data community.

It connects you to more than just ASX's trading, clearing, settlement and market data services. It can also connect you to Australian-based investment banks, brokerage firms, data vendors and application service providers. Fast, secure and robust, ASX Net Global makes connecting 'Down Under' a simple and cost effective solution.



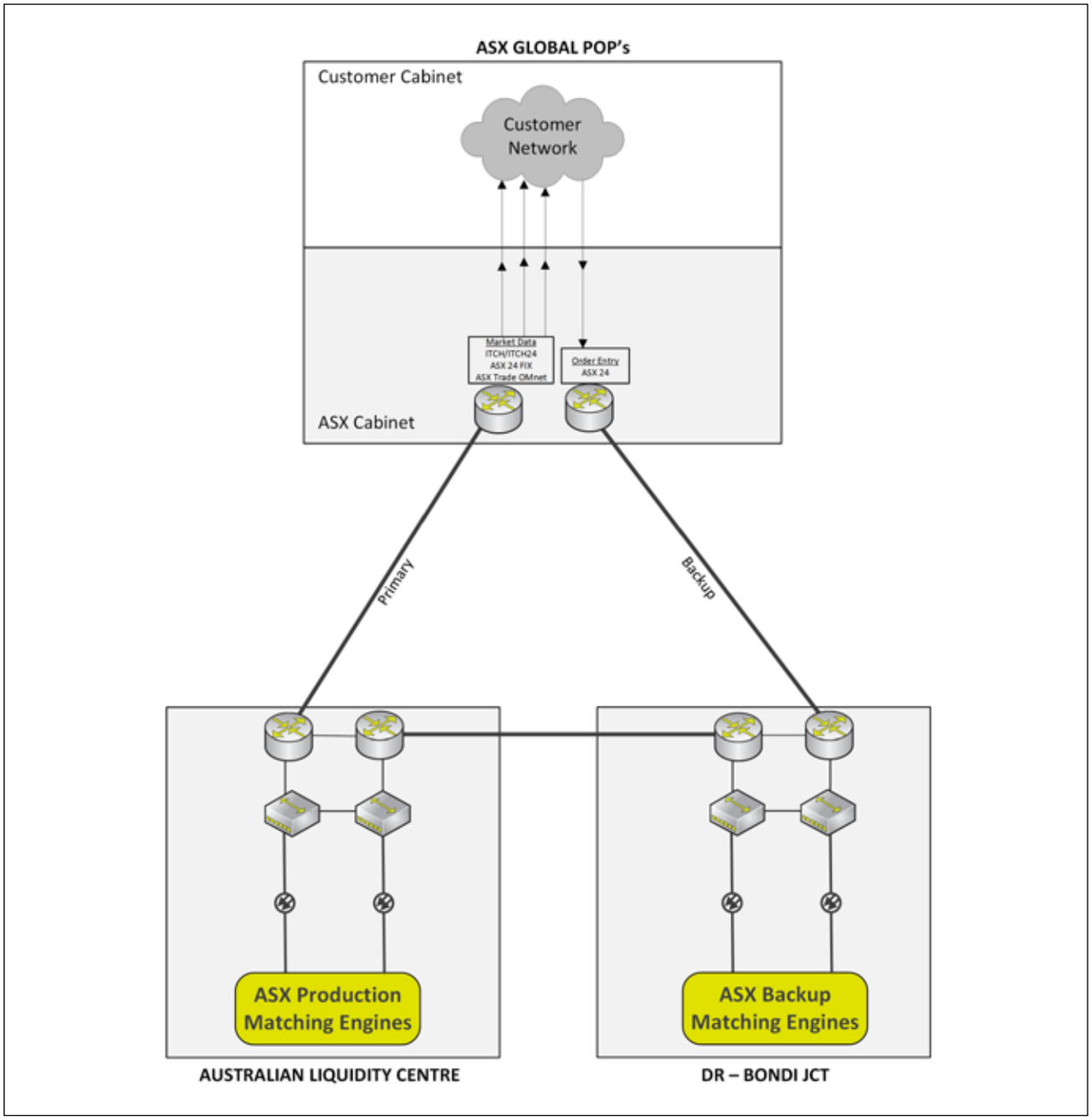
ASX NET GLOBAL – INTERNATIONAL SERVICE AND HOSTING

The following products are available at all international hubs:

- ASX Trade 24 FIX Gateways for the purpose of trading and market data consumption
- ASX Trade 24 ITCH Gateways for the purpose of market data consumption
- ASX Trade Gateways for the purpose of market data consumption via the OMNet API protocol
- ASX Trade ITCH Gateways for the purpose of market data consumption

It is the customer's responsibility to provide the termination equipment and termination port for the cross connect.

ASX also offers bandwidth solutions from our PoP's to the ALC and the financial community within.

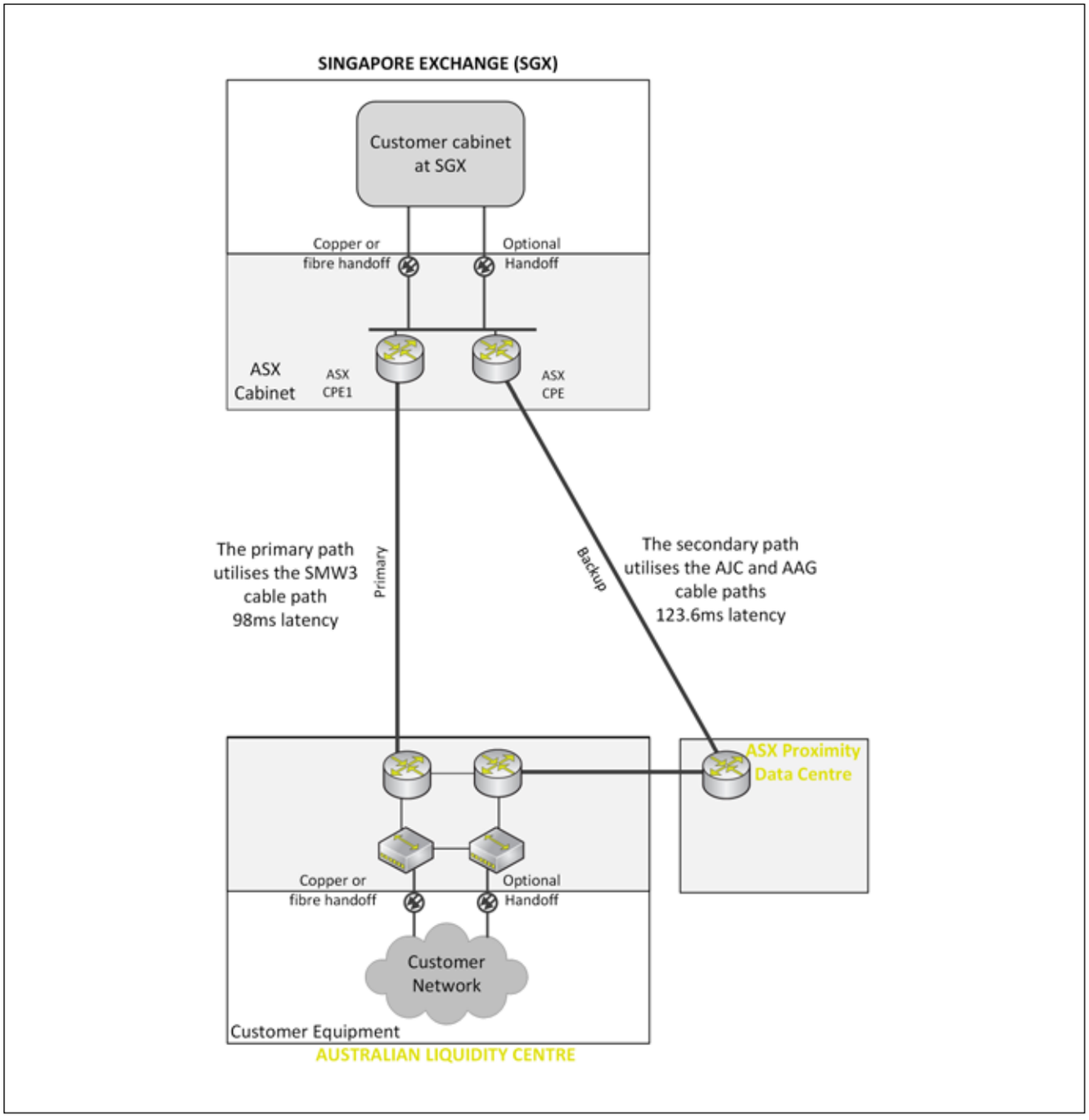


Direct Low Latency – Singapore Connect (SGX)

Dedicated bandwidth connecting customers from the SGX data centre to ASX colocation facilities in Sydney.

PHYSICAL LAYER

- Connection will be delivered on 1Gbps copper or multimode fibre into the customer's rack
- The media standard is copper 1000BASE-T or 1000BASE-SX (LC connector)
- It is the customer's responsibility to provide the termination equipment and termination port for the cross connect
- This service has redundant paths between Singapore and the ALC with one cross connect at either end. Additional cross connects are available. All services over 10Mbps include both cross connects in each location.

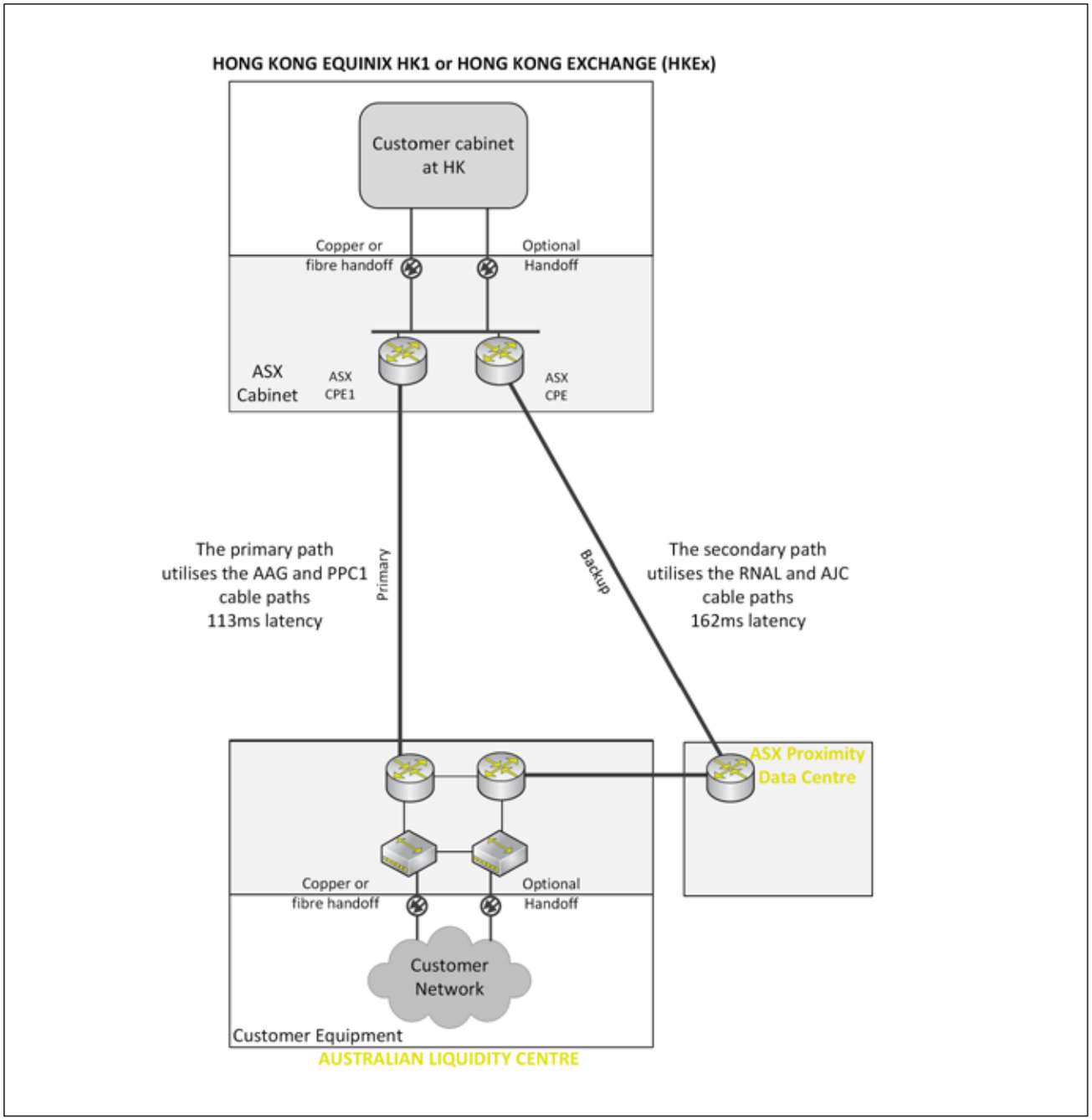


Direct Low Latency – Hong Kong Connect

Dedicated bandwidth connecting customers from the Equinix HK1 data centre or the Hong Kong Exchange to ASX colocation facilities in Sydney.

PHYSICAL LAYER

- Connection will be delivered on 1Gbps copper or multimode fibre into the customer's rack
- The media standard is copper 1000BASE-T or 1000BASE-SX (LC connector)
- It is the customer's responsibility to provide the termination equipment and termination port for the cross connect
- This service has redundant paths between Singapore and the ALC with one cross connect at either end. Additional cross connects are available. All services over 10Mbps include both cross connects in each location.

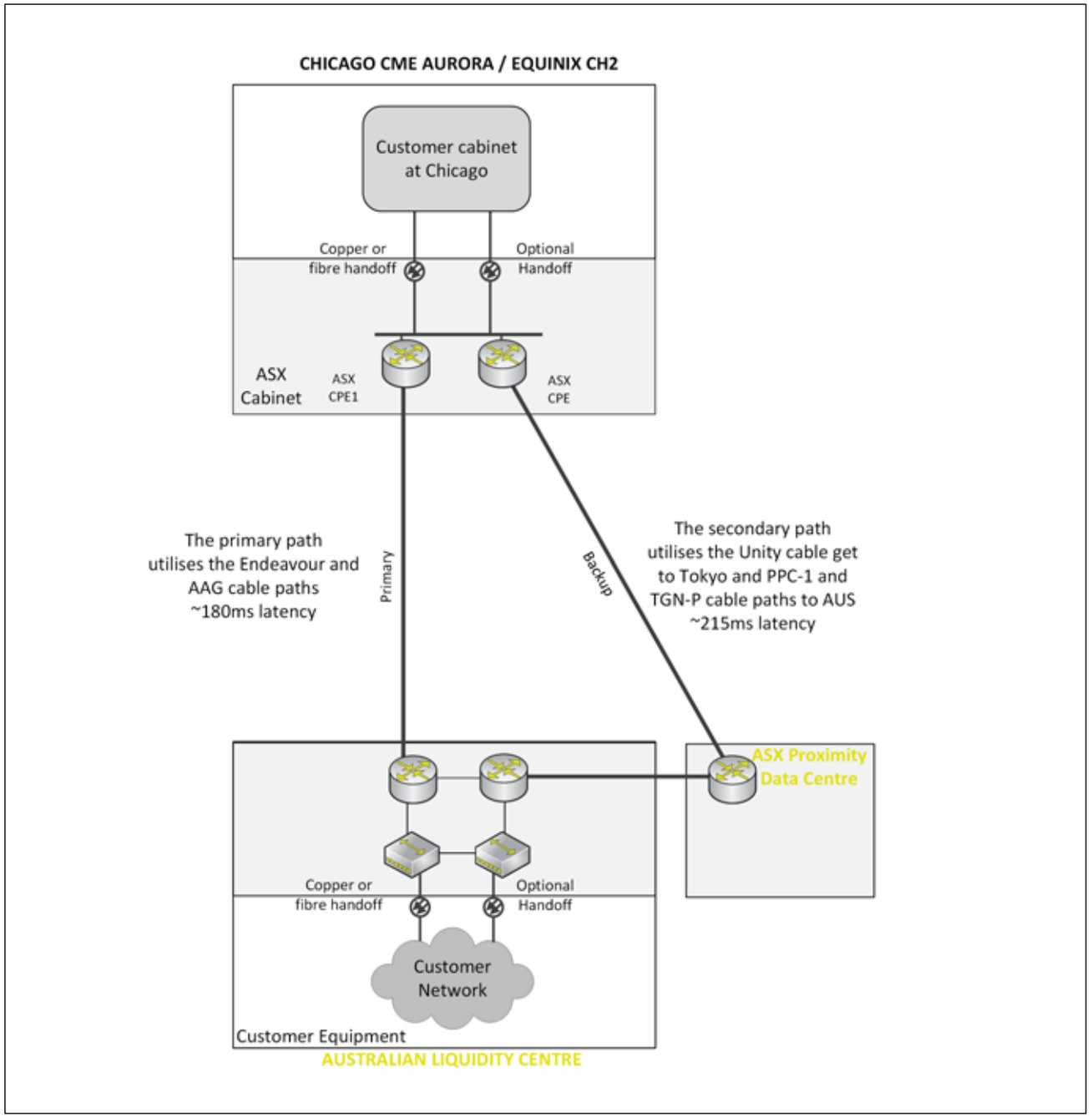


Direct Low Latency – Chicago Connect (Aurora or Equinix CH2)

Customers in Chicago ASX Net PoP sites can leverage ASX Net Global network connectivity back to ASX colocation facilities in Sydney. The technical information is set out as per below:

PHYSICAL LAYER

- Connection will be delivered on 1Gbps copper or multimode fibre into the customer's rack
- The media standard is copper 1000BASE-T or 1000BASE-SX (LC connector)
- It is the customer's responsibility to provide the termination equipment and termination port for the cross connect
- This service has redundant paths between Chicago and the ALC with one cross connect at either end. Additional cross connects are available. All services over 10Mbps include both cross connects in each location.

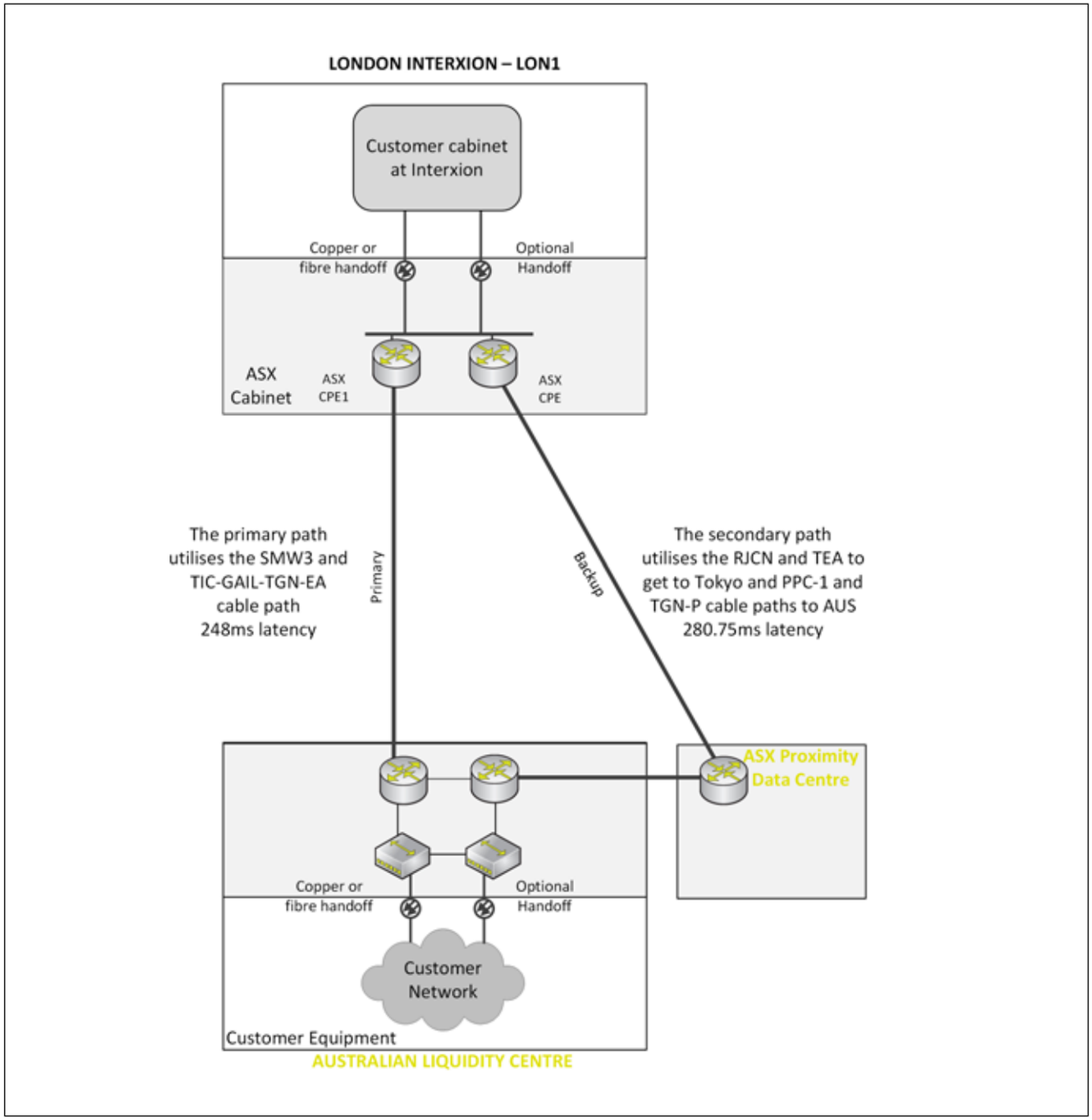


Direct Low Latency – London Connect (Interxion)

Customers in London ASX Net PoP site can leverage ASX Net Global network connectivity back to ASX colocation facilities in Sydney. The technical information is set out as per below:

PHYSICAL LAYER

- Connection will be delivered on 1Gbps copper or multimode fibre into the customer's rack
- The media standard is copper 1000BASE-T or 1000BASE-SX (LC connector)
- It is the customer's responsibility to provide the termination equipment and termination port for the cross connect
- This service has redundant paths between London and the ALC with one cross connect at either end. Additional cross connects are available. All services over 10Mbps include both cross connects in each location.



FURTHER INFORMATION

To hear more about how ASX Net can give your business unparalleled access to the heart of Australia's financial markets community, contact:

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