



Proposed FTTH Product and Pricing Structure

FOR INDUSTRY DISCUSSION
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Overview

The new Open Access Entity (OAE) products and services will broadly consist of a range of Layer 1 (physical) products that provide dark fiber access between the handover point at the OAE exchange / central office¹ and the end customer's premises. Additional services will include co-location, backhaul and other ancillary services needed to support service providers.

All OAE products and services will be supplied to all licensed retail service providers on an open access and non-discriminatory basis.

The OAE products and services can be grouped into five product portfolios:

1. Fiber Access Products – connectivity from customer premise to exchange.
2. Backhaul Products – connectivity between exchanges to a service provider handover point.
3. Co-location Products – rental of space in an exchange.
4. Field Services Products – activity-based services supporting the provisioning, maintenance and build of the above products.
5. Long-haul Submarine Transport Products – linking FSM States to each other and Guam

The purpose of this paper is to outline OAE's proposed Fiber to the Home (FTTH) pricing and product structure and strategy. Further detailed product descriptions, contracts and operational manuals will be developed over time.

Long-haul Submarine connectivity is covered in a separate paper.

1. Fiber access products

OAE proposes to offer a range of Layer 1 fiber access products that will be delivered over the new OAE fiber network.

OAE has chosen to only offer Layer 1 services to allow service providers more flexibility in meeting customer needs.

The introduction of the fiber network will see the development and deployment of a new generation of fiber-based access services that will support retail service providers in targeting the residential, business and Government customer base.

The new services will allow service providers to choose their own electronics and technologies to run over the fiber network.

A new Fiber to the Home Network

The network build process will be broken into two stages. The first, called the communal network is building the network that will go past homes and businesses in the main islands of Yap, Pohnpei and Kosrae.² This is will involve running approximately 760 km of new fiber lines alongside roads, either

¹ OAE is yet to determine the precise location of its proposed Central Offices / Telephone Exchanges. They may be in an existing facility or a yet to be built facility.

² Plans for the inner Chuuk lagoon have not yet been developed. The goal of the Digital FSM program is to deliver connectivity throughout in the inner lagoon.

underground or on existing power poles. The precise mix of underground vs overhead is yet to be determined.

The communal network will be left in a ready to connect state. This means that when an end customer wants to take a new FTTH service, they will order it from their existing or new service provider and OAE will then organize for the fiber to be connected to the home and back to the OAE Central Office. The service provider will then be able to connect their electronics in the customer’s premise back to their electronics in the OAE Central Office or exchange.

Open Access Fiber

An Open Access Layer 1 Network is designed to allow for multiple providers electronic equipment to be used. Each operator or service provider gets equal access to the same underlying network no matter how large or small they are.

The network must be designed to easily allow the following services:

- Colocation space, power and cooling at the Central Office;
- Dark fiber backhaul from the splitter location to the CO;
- Splitter colocation space;
- Built so that multiple service providers can achieve a minimum viable scale; and
- Dark fiber between splitter location and home.

An open access network is built less efficiently than it would be for just one operator. The trade-off that network regulators and policy makers make in most markets (including FSM) is that the small increase in cost is made up for from the consumer benefits in lower prices, innovation and higher-quality services to end users.

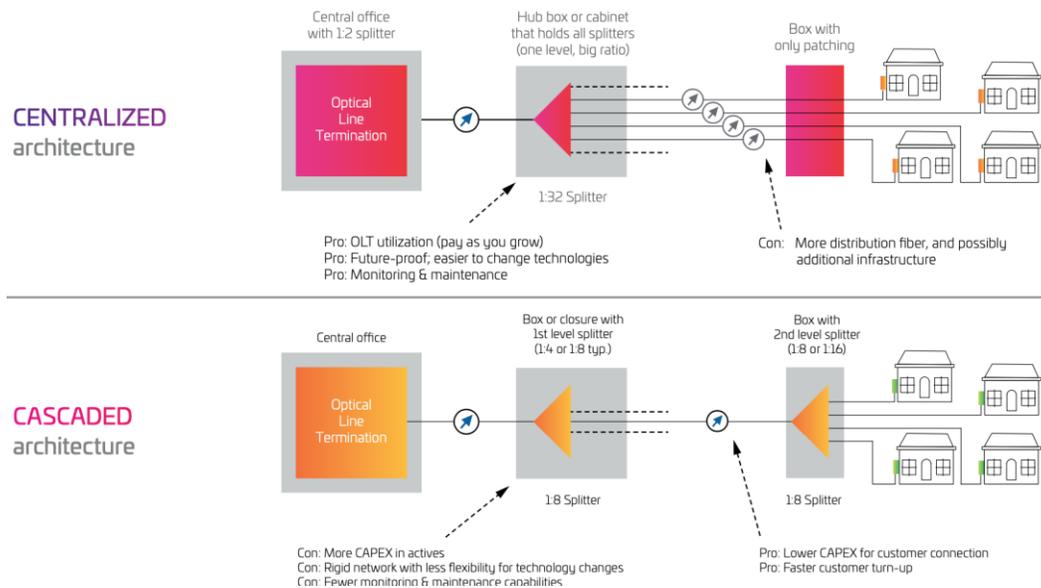


Figure 1 - Comparison of open access (at the top) network design to vertically integrated (at the bottom) network design. The difference between the two is about how they support more than one operator. The Centralized approach, (adopted by OAE), inherently supports multiple Layer 1 operators allowing competition and service innovation.

When comparing an open access Layer 1 network to one built for only one operator; the main differences are typically that the first splitter is located much closer to the customer (typically in the pole or pit) with no space for additional splitters and minimal spare fibers back to the central office. The costs for the single operator are marginally lower, but the design prevents any other person from being able to use the network. In this environment a competitor could only use the technology and pricing that is set by the network builder.

The key point is that the deliberate choices made in how the network is designed and built makes it better or worse for allowing others to access fiber services. OAE's design is for multiple providers.

OAE is in the process of selecting a supplier to complete the detailed design of the new FTTH networks and will submit proposed designs as per its obligations as a licensed telecommunications operator and comply with Section 342 of the Telecommunications Act.

Product Architecture

Fiber access services are assumed to either be GPON or point to point services. It is expected that the market will prefer GPON for mass market and small business services and point to point for key government and business sites as well as mobile site backhaul.

OAE proposes that it includes the splitter as part of the dark fiber service. This is to minimize operational complexities in the network. 32:1 splits are proposed as they give a good compromise between high speed and efficient use of electronics. OAE is open to feedback from the industry over alternative suggestions.

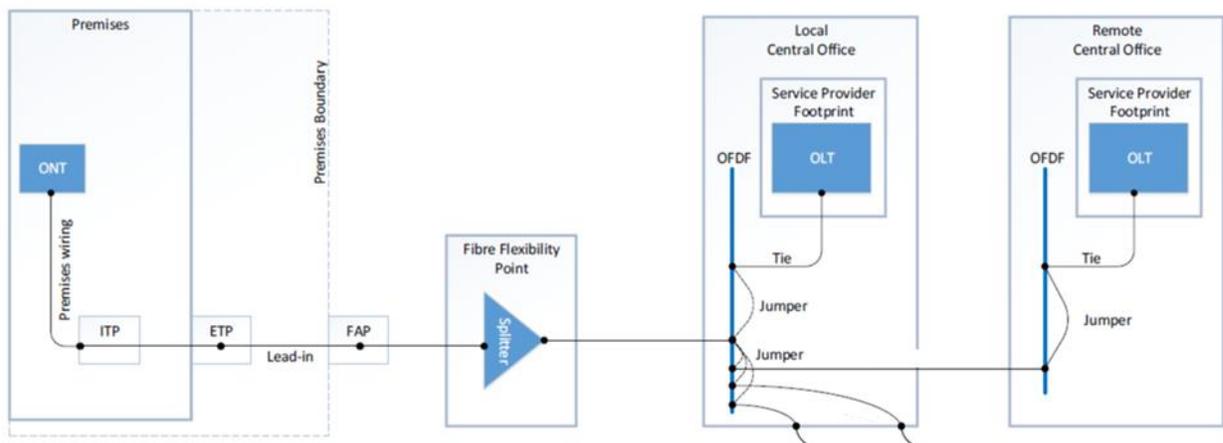


Figure 2- OAE's access business. Items between the ONT and the OLT are the scope of OAE's Fiber Access Service. Retail service providers will provide equipment in the home (Optical Network Terminal - ONT) and at the telephone exchange (central office) – (Optical Line Terminal - OLT)

Alternative services

OAE does recognize that a Layer 1 only product set is a choice and is interested in industry feedback.

For instance, it might be preferable for OAE to invest in the OLTs and customer gateways to lower overall industry costs. Different countries have adopted different paths; in the wider Pacific, Singapore adopted Layer 1 as its model for fiber rollout, Australia adopted Layer 2 and New Zealand adopted a hybrid of both.

There are different reasons for why Layer 2 (or higher) might be preferred (especially with regard to supporting legacy voice applications, industry investment and prices).

The starting assumption is that the preference is for OAE to make the least investment possible to leave more room for RSPs.

Proposed Access Products and Prices

Pricing has been set that OAE will cover its operational costs of running the network. As take up occurs the network will run at a loss which OAE expects to recover once a minimum level of uptake has been achieved.

Core FTTH Product and Pricing Table:

Product		Proposed Wholesale Monthly Recurring Price
Consumer Shared Fiber 32:1³	Designed for GPON technologies that support up to 10Gbps today. Expect to be used to support 1Gbps services to all consumers.	\$10
Small Business Shared Fiber 32:1	Designed for GPON technologies that support up to 10Gbps today. Expect to be used to support 1Gbps services to all businesses. Some service providers may choose to offer 10Gbps service.	\$20
Government / Business Service – GPON 32:1	Designed for GPON technologies that support up to 10Gbps today. Definition will be created for what defines a small vs large business.	\$50
Government / Large Business Service – P2P 1:1⁴	Designed for Point to Point services where the fiber is dedicated between the premise and exchange.	\$100
Mobile site backhaul 1:1	Point to Point service from mobile site to exchange.	\$200

³ 32:1 represents the sharing ratio. Each handover fiber will have 32 end premises connected to it. OAE will combine the feeder fiber, splitter and distribution fiber in one product bundle to provide a simpler service. Other options will be possible over time.

⁴ 1:1 are direct point to point services that have no splitter present

Because the capital for building the network has been Grant funded through the World Bank and in agreement with the FSM National Government (OAE's shareholder), there is no requirement for OAE to make a return on the capital invested or recover the costs of building the core network and connecting customers to it.

Pricing has been set to achieve Consumer, Small Business and Large Business / Government end customers with high quality fiber services for the similar prices they pay today for an entry level service. These wholesale prices, combined with OAE's submarine connectivity, should allow an entry level consumer fiber service for around \$25 to \$30 per month. The objective is rapid take up of fiber.

Over time OAE will review prices to ensure that it is meeting its uptake and non-profit objectives.

In addition to the core services described above, a range of additional service building blocks are possible. These will allow retail service providers to tailor and further differentiate their offerings in the market. These building blocks are expected to be developed by OAE over time in conjunction with the retail service providers.

Initial installation of the fiber is free as it is planned to be covered by the World Bank funding. Post the initial build period, OAE may elect to charge new customers a connection fee to recover costs. Likely examples will be for new building developments, connection to mobile base stations or network extensions created after the initial build period. Any such charges will be based on recovering costs.

OAE will develop a series of ancillary services, that will cover services like changing service provider (which would require a technician to move the fiber from one provider to another). The assumption is that OAE will pass all on all costs to service providers. OAE would cover the maintenance and manage any fiber fault or repair as part of providing the core service.

2. Backhaul products

To support retail service providers with the aggregation and transportation of their customer access traffic from a local telephone exchange back to a core site. This is only likely to be an issue in Pohnpei and the Chuuk inner lagoon. Yap and Kosrae are expected to have only one Central Office where OLTs and other equipment would need to be collocated.

In Pohnpei they will be dark fiber services and in the Inner lagoon they are likely to be a Layer 2 service. The architecture and design of the inner lagoon has not yet been confirmed.

Pricing has yet to be developed for these services. Dark fiber backhaul services will be priced so that the dark fibers are efficiently used and that all existing and potential service providers (both mobile and fixed) will be able to get access to them to deliver new services to market.

3. Co-location products

OAE will provide a range of co-location products that will support retail service providers to deliver telecommunications services to their customers.

Co-location products allow retail service providers to rent space in or on OAE premises (exchanges) enabling retail service providers to house telecommunications and, in some cases, ICT equipment.

Locating this equipment in OAE premises allows retail service providers to efficiently and cost effectively connect to the OAE network, or a third party network, by providing retail service providers with not only the physical space their equipment requires but a range of power, security, backup and seismic support options. The Co-location Product portfolio will also incorporate the various tie cables and handover connections required to physically connect equipment both internally and externally as the retail service providers require.

Pricing has not yet been developed for these services. They will be priced to recover the direct costs involved in providing the service with a small margin to cover overheads.

4. Field services products

OAE will grow to having at peak as many as 30 outsourced field service technicians who will be trained to undertake a range of network provisioning, maintenance and build activities for business and residential customers on behalf of retail service providers. There may be opportunities to expand this business to configuring and supporting end customer's network equipment (configuring wifi routers and other home networks).

OAE is interested in feedback from existing industry participants and future ones of what services they may require.

They would be expected to be priced at the direct cost of providing the services with a small margin to cover overheads.