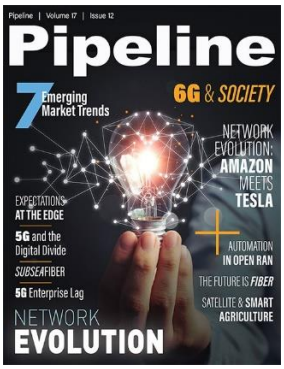

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Slicing and Dicing Subsea Fiber Networks

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With the rising demand for Internet of Things (IoT) tethering our connected lives more and more, businesses are experiencing an increased need for higher bandwidth and better reliability. Although there are several options available, fiber optic cable provides faster, more effective throughput. Many global corporations, enterprises and businesses have discovered the benefits of fiber connectivity dedicated to their operations, enabling the next generation of IoT to provide optimal performance for businesses and their consumers alike.

However, smaller businesses have previously been at a disadvantage when it comes to utilizing optical fiber networks, specifically connecting to subsea cable networks. For some, despite the benefits, owning their own cable simply wasn't financially feasible. This is why slicing and dicing fiber networks can become a viable and attractive option for enterprises to reap the benefits of high-quality, high-capacity optical fiber services.

Choosing the best route

Picture the subsea communications network as a major road network, the highway of the fiber networks. The subsea fiber is the highest-capacity, longest-distance path on the network. It's the highway linking very large populations and countries. Think of it like data generating centers. Now, picture the slicing and dicing of the fiber spectrum, creating those individual lanes of that highway, with each lane carrying a different set of traffic. Yet, unlike an actual highway, each lane has an owner that has designated a specific endpoint. Also, any "crashes" seen by a particular

user (for example, optical power fluctuations by any of the traffic) have no impact on any other traffic present on the network. They essentially only ever see their own lane and have no interference from nor interaction with any other traffic.

In a terrestrial environment, due to cost and availability, businesses have the option to run their own networks on their own fiber. Sharing their network is not an option. However, in a subsea environment, the overall expense—along with smaller fiber counts—causes the cost of ownership to be quite a bit pricier. Because the availability of such a network has only recently been accessible to large corporations, service providers now can grow and scale their businesses, taking on customers they may have previously not serviced. By sharing the spectrum, smaller enterprises can maximize the full value of the optical network infrastructure without the premium.

Availability of ownership

Sharing the subsea optical spectrum allows smaller enterprises to have availability of ownership of their optical network. In having their own part of the spectrum, enterprise service providers can essentially have their own fiber pair. Even though they do not “own” it, they can reap the benefits of the network as well as provide a route for the businesses they serve. Because of this advantage, these smaller enterprises can quickly scale without having to purchase the use of an entire cable. In addition, the benefit from the increased bandwidth and throughput of the fiber network gives them the support they need to direct their data from point of presence (PoP) to PoP. In other words, their business will operate more efficiently and more securely.

As the need for connectivity grows, the need for reliability, cost-effectiveness and security grows as well. It is important to note that sharing a cable with other enterprises in no way endangers the security of the information passed through each enterprises’ fiber pair. Effective optical power management is put into place to guarantee that any changes that happen on one end user’s spectrum do not impact the other end users that share the same fiber pair. Businesses can rest assured that their data is being transmitted securely through their spectrum on the subsea fiber network.

Provisioning of services and equipment

Traditionally, enterprises have been forced to rely on optical cable providers for services. Although many of these service providers can provision services quickly and effectively, they are also at the mercy of their own capabilities and may not have the perfect solution for each business’s needs. With spectrum sharing, businesses havethe option to purchase their own vendor equipment and provision their own services. By employing their own virtual fiber pair, businesses have the flexibility and freedom to select hardware and platforms that work best in

their existing high-capacity PoP locations. This gives end users the freedom to take their own direction rather than rely on the supplier.

The dicing of a subsea fiber pair benefits both the customer and provider. Customers installing their own vendor equipment are in complete control of provisioning and the ability to monitor their own sub-network, removing the responsibility from the provider. Other benefits to both customer and provider are the need for further multiplexing or regenerating equipment at the cable landing stations, which reduces cost, space, and power requirements. Also, less equipment in the network reduces potential points of failure, increasing reliability, which is a win-win situation for both customer and provider. With the changes to how the network is provisioned, reduction in infrastructure and ownership gives the end customer a 20 to 30 percent cost savings.

Benefits for service providers

There are also numerous advantages for service providers in dicing optical spectrum. By sharing the spectrum, service providers can monetize their infrastructure and supply a wider variety of service offerings to their customers. For example, the customer can purchase a swath of spectrum for the life of the system as an IRU or on a lease basis. This spectrum can be managed or unmanaged. Where the spectrum is managed, it is delivered via dedicated end terminal equipment at both locations in a wavelength form; for example, GbE, 10/100/400 Gbit wavelengths. In this scenario, the provider will still manage and provision the end-to-end solution as normal. However, as the customer owns the spectrum and use of the end terminal equipment, only their services will ever utilize the spectrum allocated as well as the end-specific equipment. Alternatively, the customer is provided the raw spectrum where they terminate their own vendor equipment at each end location, which will be their responsibility to manage and provision upon. In both cases, the customer has an irrevocable right of use of the spectrum for the contracted period.

In addition, they will not only benefit from the reliability and speed of the submarine fiber optic cable systems, but they can also leverage their slice as a marketing tool to drive business. Instead of only touting wavelengths and dark fiber networks, service providers have the power to advertise the compelling benefits of using their own subsea optical fiber pair. The bandwidth and reliability of an optical fiber network give their end users confidence that their data will remain secure from the point of origin.

Owning a slice of the spectrum also allows service providers to be freed from monitoring and servicing their customers' equipment. When customers have the option to choose and use their own equipment, the service provider is no longer responsible for the cost of power to operate the equipment, or the cost of maintenance and repairs. Because of this, service providers save a significant amount of time and resources, increasing their profit margins. By having their own fiber pair, service providers can pass on both the advantages of a high-quality, high-capacity fiber network along with the savings they receive from equipment ownership.

Get a slice of the spectrum

To continue innovating sustainable, high-quality, high-capacity IP and content services connecting different regions of the world, some owners of subsea communications cables have forged strategic partnerships for spectrum-sharing with equipment providers. By leveraging a partnership that marries cable with hardware solutions, service providers can now offer flexible spectrum-sharing POP-to-POP solutions for both core network and customer-specific applications. Such networks have greater spectral efficiencies with extended range. With such a complete platform in place, customers experience minimal impact to the overall capacity of the subsea fiber pair.

This allows customers to take advantage of open cable demarcation, while staying protected from potential optical power instability caused by other tenants on the same fiber pair. Service providers can enhance their network to deliver maximum capacity at the longest reach, while offering more robust service flexibility. This reduces operating costs and delivers savings they can pass on to their customers.