Dark Fiber Market Realities

By Hunter Newby

With the acceptance and growth of Internet Protocol and the Internet itself the demand for almost everything IP packet-based in the networking world has increased. That would include servers, routers, Ethernet switches and related data center space, power and wavelength transport to and from. The root of all major transport and Internet transit networks is dark fiber and this too has experienced a tremendous increase in demand in recent years. It is truly an ecological structure of interconnected systems.

Fiber optic cable was introduced for communications networks in the 1970's. Back then the addressable market was much different than it is today. The buyers were few in number and so were the uses – mainly the telephone network. The manufacturing cost of the cable as well as the quality was also significantly different. In the past three decades there have been many advances in technology that have contributed to the booming demand today. As we continue to evolve the same metrics remain true: Better fiber with greater capabilities will succeed older fiber with lesser capabilities; and the users or direct buyers of dark fiber will continue to expand and grow in number as the applications and their associated need for fiber, aptitude and networking skill level all increase.

The main drivers and reasons behind the demand for dark fiber today include:

Network Control

More and more network operators, especially enterprises, are seeking to take control of their network operation from a cost and time perspective.

This driver is one of the biggest for the carriers themselves as their existence is hinged upon ownership and the long term economic benefits that come from it. Being in control of your network and its associated costs is like the difference between renting your home and owning it. In some instances smaller carriers prefer to lease wavelength services as it saves them the upfront costs and ongoing maintenance of the equipment necessary to run a network, but in recent years the price of that equipment has gone down considerably while the performance and capacity of the same gear has gone up.

Many carriers have reached a threshold where their wavelength orders have increased to the point that their underlying providers cannot keep up with the demand. At that point it makes logical sense for the buyer to consider dark fiber. In many cases they do not even need to "run" the network themselves, but rather they hire a maintenance company to do it for them. This gives them the benefits of ownership including reduced costs per wavelength and control of delivery times, but they do not need to deal with the day-to-day technical issues of running the fiber network.

For some enterprises network control is very high on the priority list as well. Although enterprises are not in the business of selling network services they do rely heavily, if not totally, on their network for daily business functions. This makes the network a critical component of their business operation and not something that can be left to a couple of carriers that may or may not be able to get things done for them as they need it. Those requirements include rate, available capacity and delivery date. This level of control is not always required, but it is available to the enterprise today and more and more of them are taking control and reaping the benefits as an advantage over their competition by improving their bottom line and accelerating speed to market.

Latency

On certain routes, particularly those that carry financial data for transaction execution, new fiber with shorter distances between the endpoints is required.

This phenomenon is limited to certain routes such as New York to Chicago, but it is very meaningful to the users. Shaving milliseconds off of transaction execution times means adding tens of millions of dollars to their bottom line per year. Latency can come in a few different forms, but the main causes are hops, or interconnection (add – drop) points and the actual distance traveled. The lower the fiber mileage the better it is for the buyer.

This is a very special group of buyers as well. They have plenty of money to spend on things that make them money and they understand the impact that latency has on their business every day. Their application is unique, but fairly straight forward. They do not need several add-drop points as the carriers do because they are not looking to resell network services. Instead they are looking for the longest range optics with the greatest throughput and least loss they can get.

That is an interesting twist as it natu-

rally keeps their costs of running a network at a minimum. By not needing all of the add-drops and only needing a few regeneration points they can build and operate basically what is an extended wide area network (WAN) for a reasonable price. This then gives them the benefit of not having any other network in between their servers and the financial exchanges.

own lit revenue streams so that they are not enabling others to become competitors. Or they lease fiber to a lit service buyer that will then never need to buy lit services on that route again. There are a few carriers that do still actively lease dark fiber, but they are usually in metros, or regional pockets. Attempting to connect those pockets is the bigger concern.

manner possible. This can have a serious impact on a network operator's ability to get the most out of its investment as it is limited to how many circuits it can successfully run over the fiber. Those that possess that fiber think – or at least say – that they will never need to lay new fiber given how much they have in the ground already. When factoring in the hit to ROI by not being able to use the best equipment available on the market today to build a network it makes a lot of the fiber that was put in the ground in the 1990s look less valuable.

Today it is becoming **even more difficult** to obtain and/or **retain diverse** paths as **many carriers** that once **sold dark fiber** no longer do, **or do so only rarely** and under **very special circumstances**.

Diversity and Redundancy

Building around what an operator currently has in their network is critical and this applies to carriers, ISPs, enterprises, etc., equally.

Having full knowledge of where your routes are whether lit or dark is essential in building diversity. There is no added value in having circuits from multiple carriers that are all in the same path, trench or on the same pole. That is unless all you seek is billing diversity.

Today it is becoming even more difficult to obtain and/or retain diverse paths as many carriers that once sold dark fiber no longer do, or do so only rarely and under very special circumstances. There is a bit of confusion in the market as to whether or not there is a glut or drought of fiber in the ground. The truth is that it all depends on the specific route and how many providers have how much fiber in that segment. Beyond that, though, there is the bigger issue of whether or not those that own the glass are actually leasing it. By not making it available they are in essence creating a false shortage where there may be in fact a physical abundance.

Many carriers do this to protect their

In addition to the scarcity of available dark fiber paths there is the reality of existing routes being rolled on to other existing routes for cost-cutting reasons. Due to consolidation in the transport business and the associated cost reduction "synergies" factored in to the deals many of the acquired networks have been combined to reduce the overall operating expense of the system. Although this makes sense from a financial perspective it does not leave the buyers with much comfort in knowing that there once (somewhat) diverse paths and nodes are now collapsed and they are left with fewer options (maybe just one) to achieve their network goals and objectives.

Better Performance

Older fiber needs to be decommissioned because it does not carry light in the quantity and quality of today's fiber.

This has to do with the limits of physics. A lot of the fiber cable that was laid 10 years ago or more is now considered old. This may be from a physical deterioration perspective, but mainly the fiber is physically alright, it is just not optimized for carrying the greatest number of wavelengths in the most efficient

IP Network Capacity Growth

Video over IP and also over the Internet as downloads, uploads, peer-to-peer and streaming have all placed a tremendous strain on the networks built with a 1999-2005 engineering design.

The demand for fiber has clearly increased as a result of video over IP. It has had an impact on several businesses including the cable TV industry, ISPs and even Hollywood itself. There are many recent examples, but one of the best is the BBC iPlayer in the United Kingdom. The BBC "Catch-Up TV" service has put an incredible strain on the DSL, cable and wireless Internet access service providers in that country. It has also prompted BT to accelerate its fiber deployments in the access network to connect to its 21CN (the 21st Century Network) to end users. Being able to finance that type of network is challenging to say the least, causing many ISPs to ask the BBC to pay for their upgrades. (Not BT though.) By the way, did anyone notice that Verizon

recently passed their last hurdle to bring FiOS in to New York City?

Wireless Network Capacity Growth

Fiber to the Tower is often needed to meet the growing demands of high-speed applications to mobile devices. As in the early days of the fixed line Internet, when dial-up peaked and cable modem broadband speeds were being utilized by the early adopters, new applications were built that literally required cable Internet access. Dial-up simply did not work! VoIP services were some of the first applications that required a broadband connection. We now find ourselves at the same point in the wireless network evolution. History never fails to repeat itself and this is no exception.

Today's T1 and DS3 access to the wireless towers and the associated 19.2k to 33k GSM, GPRS, EDGE, etc., networks are analogous to the old T1 and DS3 with 33k to 56k dial-up Internet of the mid to late 1990s. Once cable access hit the scene the ISPs were forced to upgrade their backbones to OC48 and OC192. One fed the other. In the fixed line access and core we have now moved away from that to multi-400 Gbps systems being fed by fiber to the home in many places.

In the early days of high speed MSO Internet access there were neighborhoods defined by where the service was available and where it wasn't. Soon we will experience the same thing in the wireless market where certain devices and associated applications work in certain places and not in others. Those realities are usually very good drivers for user behavior and related carrier investment.

Looking at each of the above drivers independently provides specific details about a potentially unique motivation making fiber very compelling for a buyer in that group or user class. If they are viewed collectively the justification becomes overwhelmingly clear. In most cases the threshold for being a dark fiber buyer has come down considerably and buyers touch not just one driver, but several. More drivers correlates to higher motivation and then they are more likely to be a dark fiber buyer in the near term. The end result is that the ecosystem gets larger and the utility increases as the number of nodes and speeds increase. This is a beneficial outcome for everyone – everyone that can get dark fiber that is. **IP**

Hunter Newby is a monthly contributor to IP Business and can be reached at hunternewby@gmail.com