

Big Bay fibre optic cable installation & network overview.

The installation of another fibre cable (blue) in the Big Bay area prompted a meeting to understand & gather information for the BBMPO (Big Bay Master Property Owners) to formulate a plan going into the near future.

Three objectives were set for the discussion:

1. Get input of a technical nature to gain a greater understanding as to what was going on, what was on offer.
2. Share information of prices of packages being offered in order to understand the commercial options available and the possibility of bulk purchasing and free use of infrastructure for BB security needs.
3. Establish a collective effort to ensure the bad workmanship relating to the cable installation is rectified.

The content is intended for the layman.

CABLING

- FO for explanatory purposes is a glass type cable allowing light signals to travel at high speed from one end to another. Reliability & signal quality is excellent and relatively low maintenance & after an installation, this cable has no commercial value which eliminates the risk of theft.
- The blue cable (Octotel) is the forth fibre optic cable in the Big Bay area. The others are **Telkom**, **Dark Fibre Africa** and **Neotel**. The cost of these 'backbone' installations are recovered by fees for the use thereof by service providers/users of this fibre infrastructure. Services that can be offered include internet, VOIP, DSTV & security camera surveillance information. The number of cores in the cable in relation to the potential number of users will set the parameter for the services the operator can provide. The Neotel cable has no branch out facility installed around Big Bay, and they have not marketed any services. DFA offers services via registered ISP's such as Sonic, Vodacom, Afrihost etc. Telkom offers services directly, as well as via ISP's.
- The greatest infrastructure cost is in the 'last mile', where the cable branches out to service the individual users. There are two systems available :
 - Active Ethernet, (AON) which uses active components (eg laser) at the point of branching to the users building or estate to extend Ethernet to the subscriber in a switched topology offering a fully symmetrical 100 Mbits/sec or 1 Gbit/sec of bandwidth to every subscriber. If additional bandwidth is required, 10-Gbit/sec standard based Ethernet solutions are available. Because this branch out is active, it can link to other networks from that point. It is said that the typical set up cost per user is around R10 000
 - Gigabit Passive Optical Networks (GPON). . The GPON system is a chord of many fibres which all run from a central terminal and branch out with eventually a single strand ending at your home or business. You can't break out except at the central terminal. It is a shared network, in that the 'central optical line terminal' (OLT) (in Octotel's case in Cape Town) sends a single stream of traffic on a single fibre that is seen by all optical network users (ONUs) on that fibre. The fibre can be split into 64 lines, thus there can be a maximum of 64 users on a single fibre. Each ONU only reads the content of those packets that are addressed to it. Encryption is used to prevent eavesdropping on downstream traffic.

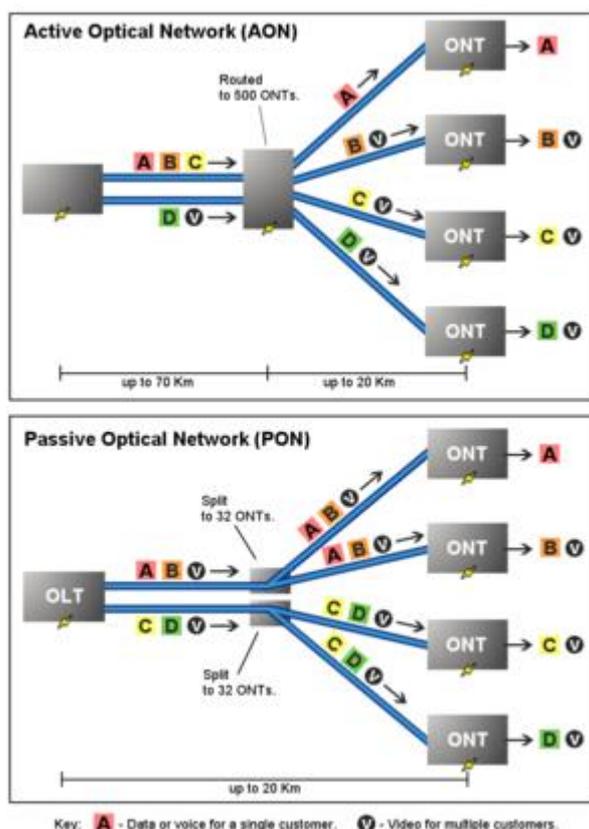
Usage is managed by an algorithm to ensure equal access according to the package sold to the user. It is a closed system that does not allow operability or breakout with other systems.

A concern was raised at our meeting that the GPON system may run out of capacity and speeds become limited as the user base grows. Octotel claim however: [A single fibre strand can safely handle 10Gbps. Our core route at this stage is a 144 core fibre cable. This can safely handle a bandwidth of 1440Gbps. This alone could handle 1440 residents on a 1Gbps service, 14400](#)

residents on a 100Mbps service or 144000 residents on a 10Mbps service. Should further bandwidth/capacity be required, we simply float more fibre in the ducts. We provide for 10Mbps, 20Mbps, 100Mbps and 1Gbps services and ensure there is sufficient capacity to cater for demand.

Whether or not the fibre will in fact be fired at 10 Gbps over the distance from Cape Town to BB is being disputed by some ...they say this is a generalisation, and more likely it will be 2.4Gbps on the Big bay fibres due to the distance from the OLT. The typical set up cost is about R5000 per user.

- Octotel are installing a GPON system. Telkom and DFA will facilitate either system. The Octotel cores have not yet been pulled at the time of writing.



- The current FO (fibre optic) backbone does not include installation inside any business/residential complex or private home. This will either be an additional cost for the business centre, home owner & BC (Body Corporate) or will be installed by a service provider against a fixed term usage contract applied to the whole complex. Once an ISP has 'captured' a complex by installing infrastructure, there is a disincentive for another ISP to install their own fibre infrastructure.
- At the time the Big Bay BEACH (BBB) precinct was developed (subsequent to the rest of Big Bay) the developer installed fibre into this precinct which is connected to the main backbones running along Otto du Plessis. The BBBEPOA installed 'active equipment' onto this infrastructure and owns this 'layer 2' infrastructure. The precinct has an 'open access network' enabling any ISP to offer services to developments in this area. This layer 2 infrastructure enables the developments within BBB to communicate internally at no cost (other than maintenance), to convey security data at no cost, and to receive DSTV by fibre (provided the fibre and DSTV ports within the home or unit can be linked). The BBB developments are supposedly not tied into fixed term contracts, and should enjoy discounted rates from the ISP since the ISP is only paying for use of the backbone and not the 'last mile'.

USES & advantages of FO over wireless

- High speed internet, reliable data transmission. Eg movie channels like Netflix.
- Security camera surveillance – allows huge amounts of data to be shared with security & policing organisations. Can be used by BC's for gate/access control.
- Dish or satellite signals have no physical connection & are connected by a beam which must be direct line of sight. These are subjected to interference by weather conditions & objects/trees/buildings etc but nevertheless do offer high speed signal transmission.

PRO' AND CONS

- In the Big Bay context, the starting point seems to be for the Estate/BC to determine its needs around security data transmission, internal communication and DSTV. DSTV is not transmitted via the backbone, it will be received at the estate or building via a satellite dish, and then distributed via fibre throughout the estate or building. The same applies to security networks and internal communication. If the ISP is going to install the internal network, it wants to recover its costs against a charge for internet services. There is no reason for the ISP to allow its fibre infrastructure to be used for these other services...it gains nothing from it, and clutters usage of their fibre. So generally the Estate or BC will have to pay for this installation. An option will be to ask the ISP to install a two or 4 core infrastructure. The add on cost to do this is marginal, so the ISP can probably be persuaded to run the extra cores while setting up the internal infrastructure at a small additional cost to the BC.
- The debate about the merits of an AON for an integrated security system seems to have been won by those arguing for a combination of 2-core GPON together with wireless and use of the WWW. While it would be a 'nice to have', our security needs probably do not justify a fully integrated fibre based AON system. A combination of fibre and wireless would appear to be workable for BB.
- Most homeowners only want high speed internet, and the GPON system should be able to provide this. There seems to be little merit in a BC/HOA to paying for the installation of internal fibre if this is the objective. But you are then in the hands of one ISP. You may not be able to change your SP after the end of your 2 year contract if the SP eg Telkom still owns the fibre in your complex, and no other SP has installed their fibre (the likely scenario).
- Any maintenance or repairs of an AON would essentially be for the home owner or BC's account unless there is a service contract in place with a third party provider.
- There are constant changes & improvements to technology. Equipment installed & commissioned today will be obsolete soon. In view of this one opinion is that it does not make sense to pay & own it. Rather let the SP supply the package & manage the upgrades/changes if & when necessary. The other is that the SP will still want to recover their investment and make a profit, and will not implement significant infrastructure change until it is recovered.
- It is inconclusive if the BC/HOA's that have paid for their own installations are really receiving discounted services. The Sonic offering to WEE (who have their own fibre infrastructure) with no minimum contract period is R1499 for uncapped/unthrottled/100Mbps internet, while VOX /Octotel seem to be offering the same for R1199 plus a once off connection fee of R1710 on a 2 year contract. HOWEVER, it may be that this offer assumes existing ducting from street to complex to home that it can use.
- Possibly the most important aspect of having a common SP for all complexes is to combine the camera surveillance infrastructure. It seems security management is becoming critical in Big Bay & to have one SP responsible for all, there can be no blame or passing the buck between different SP's in the unlikely event of problems.
- At double the price of the GPON/WWW, the AON route is a very secure package linking complexes together & not using the internet for any information traffic, which eliminates interference by would be hackers. This seems the best long term solution, but the cost differential almost makes this impossible to justify. Having said that, this may well be the future or long term choice.

- Some questions remain: Will technology change the way information is shared/communicated. Will this drive the costs down?

We have requested BC's/ HOA's not to conclude agreements with SP's until we have clarified options and gained consensus on a way forward from an MPOA perspective, and not with Octotel in particular until we are satisfied that they have properly repaired the damage to our verges.