FTTB Technology
A trend towards high-tech buildings

Fiber-optic technology and wireless data communication systems are becoming a necessity in many residential and commercial projects across the globe. It's the evolution of the market and as the options keep getting more and more advanced, realtors are keen on offering 'futuristic' products to their clients. Today, several initiatives promise to make FTTB more economical to deploy and better positioned to meet even the most aggressive bandwidth demand forecasts.

Demands for bandwidth are constantly rising. Very soon the required bandwidth on copper pairs will only be applicable on short distances for new and enhanced Internet applications. Optical fibers and their ability to transmit high bandwidths over long distances are a solution. Investments in distributing optical fibers to single flats can be reduced by using the already installed infrastructure in multi-tenant buildings. A network operator can plant a DSLAM in a house to terminate the optical fiber inside the building (FTTB). The DSLAM then connects the subscribers via DSL using the existing telephone cabling. Each subscriber gets more than 100 Mbps on these short telephone lines using VDSL2 transmission. Thus, the network operator can offer the full bouquet of services like broadband Internet, VoIP, Video-on-Demand and Internet television (IPTV) at minimal costs.

What is FTTB?

FTTB stands for "Fiber to the Building", which is a communications architecture in which the fiber reaches the boundary of the building, such as the basement of a multi-dwelling unit, with the final connection to the individual living space being made using any non-optical medium, such as twisted pair, coaxial cable, wireless, or power line communication. This is sometimes also called "Fiber to the basement".

The global fiber industry

Fiber-to-the-Home (FTTH) and Fiber-to-the-Building (FTTB) are set to overtake the number of wireless internet connections in the Asia-Pacific region from 2014, Ovum has claimed. The analyst firm predicts that FTTH and FTTB wireline broadband subscribers in the region will exceed 285 million in 2014 with a compounded annual growth rate (CAGR) of 26 per cent over four years, compared to 0 per cent for DSL and 5 per cent for cable modem for the same period.

While fiber networks have high penetration in developed countries, China – as one of the rising economies – ranks top in broadband deployment and continues to exhibit exponential growth. The country has one of the fastest economic growth patterns in the world and its telecom infrastructure is rapidly developing as well with the adoption of the latest 3G/4G technologies and optical fiber networks. Moreover, the Chinese government's recently published 12th Five Year Plan will further fuel greater broadband deployment and the development of related applications.

In 2011, India's Department of Telecommunication released its long awaited draft of the New Telecom Policy (NTP 2011), which mostly suggests guidelines for policy makers in the country to consider when framing government policy and rules. The policy intends to provide high speed and high quality broadband access to all village panchayats through optical fiber by the year 2014 and progressively to all villages and habitations. A big problem being faced by Internet Service Providers is getting right of way access for providing wireline connections to users, and the policy – taking into account both mobile and broadband suggests a review and simplification of "sectoral policy for Right of Way/Installation of Tower for facilitating smooth coordination between the service providers and the State Governments/ local bodies".

In addition, the policy suggests engagement with ministries such as "Surface Transport, Ministry of Urban Development, Ministry of Power, Ministry of Rural Development, Ministry of Railways, State Governments and local bodies for facilitating development of guidelines for provision of common service ducts for orderly growth of Telecom Infrastructure". In addition, the policy wants the encouragement of "FTTH by independent Infrastructure Providers (IPs) with enabling guidelines and policies, favouring fast transformation of cities and towns into Always Connected society." It suggestions the creation of an institutional framework to co-ordinate with different government departments for laying of Optical Fibre Cable networks.

Why FTTB?

Fiber technology provides unlimited bandwidth capabilities and offers today's fastest high-speed data connectivity. Fiber-optics uses light to transmit data, a totally different architecture from that used by ADLS or VSAT. In fact, one bundle of fiber cable not much thicker than a pencil can carry all of the world's current communications traffic. The technologies for transmitting data over fiber are well understood, and the upgrade path for the electronic components that send and receive signals has been defined for years into the future. If anything, increasing fiber bandwidth will become less expensive rather than more expensive.

FTTB enables a wide variety of uses, from real time applications, web based applications, telemedicine, VoIP & Video. Besides, FTTB is extremely flexible to customer preference; new products and services can be deployed very easily and remotely. FTTB provides a launch pad for technology innovators in Tanzania to create the tools and uses of FTTB for the rapidly growing broadband economy.

Sterlite

Understanding Fiber Network Architectures

Today, network builders can choose among several options or even mix and match them as needed. The "family" of passive optical networks now has two major branches – PON and AON (also called P2P) – and many technical variants within those branches. PON stands for "passive optical network." Networks are passive when they have no powered electrical devices between a central office and an end user. All the handling of the light beams that carry the signal is done with mirrors, prisms and fiber.

AON stands for "active optical network." As the name implies, these networks have electrical devices – generally Ethernet routers and switches – along the fiber path. These days, the "active electronics" are usually in central offices rather than in remote cabinets or local points of presence.

For this reason, the industry has begun to call active networks pointto-point or P2P networks. This refers to the fact that each end user gets a dedicated fiber (or several dedicated fibers) extending from the central office to the user premises. By contrast, in a PON, which is sometimes called a point-to-multipoint network, each fiber in the central office carries signals to as many as 128 customers (16- and 32-way splits are normal with today's most widely used PON standards).

Because each fiber requires its own laser, P2P networks require more power and space in the central office.

But because they do not require fiber distribution hubs (containing optical splitters) in the field, they tend to be simpler to operate.

Global ranking of FTTH/FTTB+LAN penetration

The FTTH Council has updated the global ranking of FTTH/FTTB+LAN penetration. Asian countries maintain the lead in the fiber optic broadband service offerings. Many new countries made their entry to the list of fiber optic broadband connected homes list with the current update. The update is based on the data available on Decemeber 2010.

FTTH Council rank the countries based on the percentage of homes connected with Fiber to the home or building and fiber optic based LAN connections. FTTH Council defines fiber connected homes when either it is connected directly with the fiber optic cable to the house or to the building basement. This means either FTTH or FTTB. In multi dwelling apartments, fiber optic cable is terminated at the FDH placed at the basement of the building. FTTH Council's ranking includes all the countries with minimum 200,000 houses where the optical fiber penetration has reached 1% of the total number of homes. This gives a significant input about the fiber optic broadband activities happening in those countries.

South Korea maintains its first rank in the list followed by Japan and then Hong Kong. An amazing addition to the ranking list is the emergence of UAE, a small, yet powerful and strong country in the Middle East Asia. If we consider only FTTH, UAE is at the top of the ranking. The data available is only for FTTH in UAE and it is more than 32%. UAE does not report any FTTB activities. There are two major telecom operators in UAE, Etisalat and du. Etisalat is the leading telecom operator who has been deploying fiber to the home in a massive scale for the last three years. UAE's model status was achieved with the effort of Etisalat in deploying fiber to the home. UAE ranks at the fourth position if FTTH and FTTB+LAN are added together. Taiwan is at the fifth position followed by Lithuania with approximately 22.5% Fiber connected homes.

Norway also has reported only FTTH connected homes and has 13% ranking seventh position. Sweden also has 13% fiber connected homes and out of these 7% are connected directly with fiber ranking at eighth position. Slovenia has around 12% and Slovakia has around 9% fiber connections.

United States and Russia are almost same in terms of percentage, but US leads in terms of FTTH, while FTTB is dominant in Russia. FTTH is around 5.5% in US while that in Russsia is below 0.5%.

FTTB - Features and Benefits

- Reduces upfront investment
- Suitable for a wide range of environments and buildings
- Allows quick, non-disruptive network modification, configuration and maintenance
- Multi-fiber counts possible
- One tube does it all—a single fiberflow tube bundle can accommodate all the needs of a campus area, such as telemetry, data, fire-alarm and CCTV
- Budgets from different departments can be combined to have a shared network
- The tube bundle accommodates different fiber types for different applications—e.g., 50/125 for internal routes and single-mode G652d for external, longer routes
- Temporary links can be blown out after usage, leaving empty tubes for future needs Fibre can be blown seamlessly from outside to inside environment without splicing

FTTB versus other type of Fiber Networks

FTTB versus other type of Fiber Networks
In 2006, the FTTH Councils for Europe, Asia and North America standardized the definitions for fiber to the home and fiber to the building (also called fiber to the basement). They are:

Fiber to the Building (FTTB)
A fiber optic communications path that extends from an operator's switching equipment to at least the boundary of a private property enclosing homes or businesses. The optical fiber terminates before reaching home living spaces or business office spaces. The access path then continues over another access medium – such as copper or wireless – to subscribers.

Fiber to the Home (FTTH)
A fiber optic communications path that extends from an operator's switching equipment to at least the boundary of a home living space or business office space. The definition excludes architectures in which the optical fiber terminates before reaching either a home living space or business office space and the access path continues over a physical medium other than optical fiber.

Other definitions are not standardized but are commonly used by people in the industry:

Sterlite

Fiber to the Node or Fiber to the Neighborhood (FTTN)

FTTB versus other type of Fiber Networks In 2006, the FTTH Councils for Europe, Asia and North America standardized the definitions for fiber to the home and fiber to the building (also called fiber to the basement). They are:

FTTN should not be confused with hybrid fibercoax (HFC), an architecture used mainly by cable companies to implement DOCSIS, the standard that allows data to be transmitted over cable TV systems. In a typical HFC system, fiber runs to each DOCSIS node and coaxial cable running from the node serves between 100 and 500 users. Nor should FTTN be confused with RFoG, an FTTH technology that uses the signal protocols developed for DOCSIS. With RFoG, each user gets its own DOCSIS micronode.

Fiber to the Curb (FTTC)

Similar to FTTN, except that the fiber is brought much closer to user premises – typically closer than 1,000 feet and often closer than 300 feet. FTTC installations may use either VDSL or Ethernet (over copper cable or wireless) to bring the signal from the fiber termination point to the user. Point-to-point wireless is sometimes (and rarely) used in rural areas simply to bring a signal from the roadway to a home that could be a mile or more away.