FTTB/C sites: Where it all comes together

The rise of VDSL2, Vectoring (which delivers 100Mbps bandwidth at up to 300 meters) and Giga DSL will hold off the obsolescence of copper for the foreseeable future, in the form of FTTB/C. This represents a new approach to high-bandwidth networking, and Huawei is helping operators best leverage it through its New Copper Cable (NCC) solution.

By Lv Yongpu

Mixed fiber deployment represents a serious cost savings for incumbents with widespread legacy copper. Besides reducing the logistical headaches involved in routing fiber through the bowels of older buildings, FTTB/C also reduces the number of door visits, while shortening service provisioning times, and thus the wait for payback. Impact on both personnel and the legacy network management system is also reduced, making for reduced investments in development, integration, and training.

In 2011, 41 of the world’s top 100 carriers adopted mixed FTTB/FTTC/FTTH construction, while the overall scale of FTTB/C construction saw a 37.1% increase over 2010 levels, making FTTB/C site construction an increasing part of the average operator’s workload.

New concerns in site construction

The key feature for Huawei NCC is that access devices are moved from the central office (CO) to an outdoor site, closer to the end user (within 800 meters), enabling high bandwidth (20 to 100Mbps) over the twisted pairs in place.

The FTTB/C site acquisition process is expensive and arduous but worthwhile as each site makes for a convergence point for fiber, copper, and electrical lines, enabling transmission rates of 10G/40G and access modes such as VDSL2, LAN, xPON, and Wi-Fi at the users’ end.

FTTB/C sites will evolve to become small integrated regional equipment rooms in the future – functioning as the capacity centers for bandwidth expansion, power supply, mobile backhaul, and network management, and ultimately the core control point for both mobile & fixed operation.
Acceleration center

Bandwidth expansion is the key function of any FTTB/C site, and since these sites are moving downward (with access devices getting closer to the end user), bandwidth is expanding thanks to reduced signal attenuation over the twisted pairs. But of course, FTTB/C only postpones the inevitable if it is not future-proof.

This is where Huawei comes in with New Copper Cable, which enables smooth site evolution, providing greater bandwidth through mere capacity expansion and software upgrade, delivering long-term benefit with minimal effort. By leveraging ADSL2+ technology, NCC provides access bandwidth of 20Mbps or lower, with upgrade to 50Mbps or above possible through board replacement and VDSL2 utilization; even 100Mbps can be reached via Bonding and Vectoring, both of which require a mere software upgrade. What’s more, Super MIMO and Giga DSL technologies expand the bandwidth to the 200Mbps to 1Gbps range.

On the transport layer, operators can carry out the evolutions from GE to 10GE and PON to 10G PON or 40G PON through simple replacement of the interface board or optical module.

Power center

Power supply is a key concern in FTTB/FTTC site construction. Normally, FTTC sites are pole-adjacent for aerial line access or near a manhole for powering by the underground mains. Legacy twisted pairs can both take power in and transmit it to remote devices. However, things are not all wine and roses here.

Municipal and real estate regulations can restrict power supply access or make it prohibitively expensive to carry out video surveillance or power Wi-Fi devices near an FTTB/C site. Under these circumstances, the site itself must play a central role in the supply of power. Fortunately, this scenario brings two benefits. The first is integrated device management and metering, while the second is the lack of a need for standby power supply for the aforementioned lower-layer devices; both significantly cut down on construction & maintenance costs.

Huawei’s FTTB/C site solution, as a key element of Huawei NCC, accommodates remote power supply technologies such as power over Ethernet (POE), low-voltage DC supply, and high-voltage DC supply, enabling operators to choose how they will power their lower-layer devices with ease. Currently, this solution is being used for a variety of FTTB/C scenarios involving video surveillance and Wi-Fi coverage in China.

Backhaul center

With the rapid development of MBB, fixed carrier networks will probably become part of the mobile backhaul infrastructure in the near future. As ubiquitous endpoints for the former, FTTB/C sites will become the optimal access points for mobile backhaul.

Firstly, though a regional coverage center, an FTTB/C site will highly overlap in coverage and partially overlap in location with small cells, so existing site resources can be reused. Secondly, as the access convergence point, an FTTB/C site can provide reliable PON, P2P, and xDSL interfaces for small cells, by leveraging existing fiber resources.

Huawei FTTB/C sites provide multiple access modes, support various clock interfaces and type B/C protections, and are suitable for enterprise, WLAN, and base station services, helping to implement fast, low-cost, and highly reliable backhaul.

Management center

Traditional MSAN sites are usually managed less intelligently as they are large in capacity, small in number, and centralized in location, with dedicated personnel involved in their daily maintenance. However, with FTTB/C sites, everything is the opposite; they require more intelligent management so that they themselves can manage in three different areas.

The first is management of all devices within the coverage area through e-labeling so that elements are monitored, consumptive ones especially, so damage or loss can be dealt with immediately. The second is assurance that all devices within coverage run stably and economically, through intelligent management methods for batteries, consumption, and autonomous power supply adaptation. Lastly, these sites must manage all lines within coverage, with the assistance of the line management system, so that fault location/troubleshooting are smooth & efficient. With these functions in place, FTTB/C sites are brought into the era of intelligent management, making for sharp reductions in operator OPEX.

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