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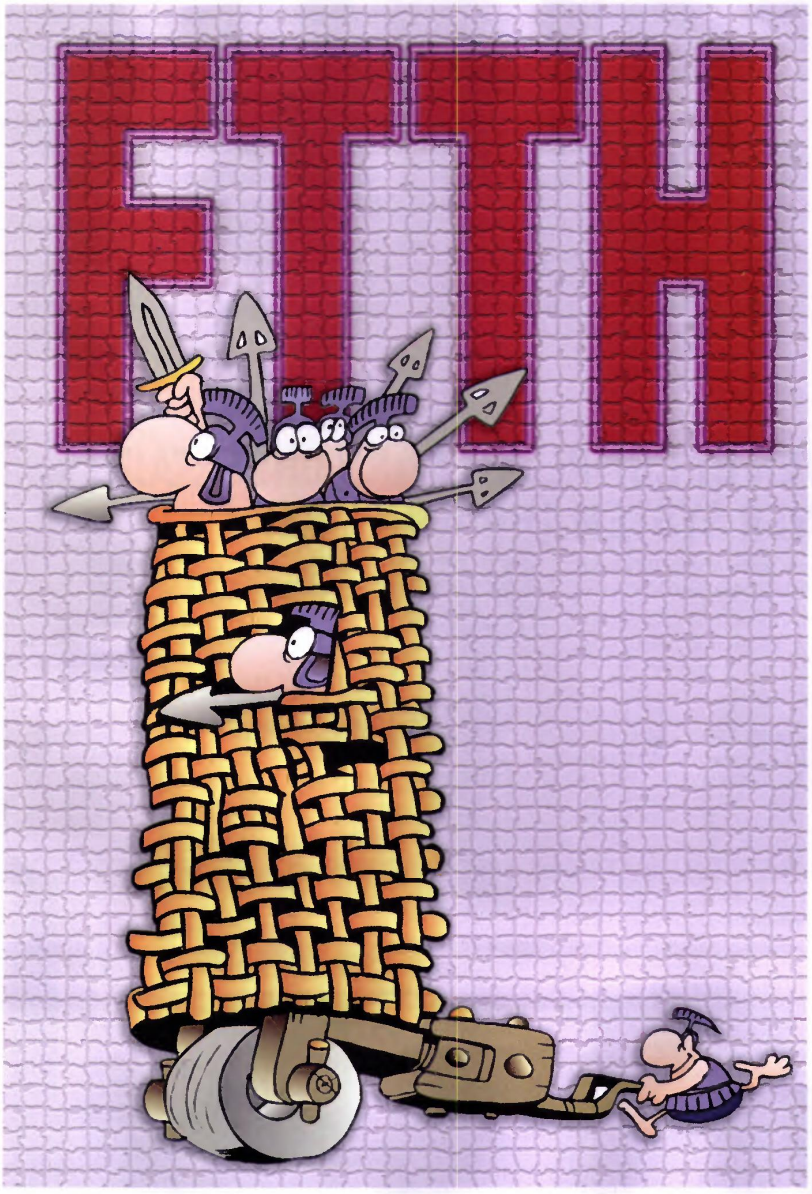
FTTH battles loom large in Europe

FTTH rollout gains momentum in Europe but unresolved regulatory and business case issues could slow progress

Ken Wieland



FOR SOME, FTTH is inevitable. It is a matter of when, not if.

"ADSL is like a carriage drawn by a very small horse, and ADSL2+ the equivalent of two small horses," says Joeri Van Bogaert, president of the FTTH Council Europe. "Meanwhile, you've a got a car standing beside you in the shape of FTTH. At a certain point in the future for those using copper, a decision will have to be made."

Many have already made their decision. Extensive citywide FTTH projects in Europe continue to grow, spurred by investment from a mixture of municipalities, utilities, alternative operators and public/private partnerships. Notable examples include Cologne, Vienna, Milan, Stockholm and Amsterdam.

Some Tier 1 operators—France Telecom, Telenor and Telekom Slovenia—have also announced extensive FTTH plans in their domestic markets.

But the move toward FTTH is far from universal. A large number of heavyweight Tier 1 operators in Europe have yet to make any firm FTTH commitment in their domestic markets, preferring instead to whip their "horse-drawn carriages" to faster speed through ADSL2+ and FTTN+VDSL2. BT, Deutsche Telekom, Telefónica and Telecom Italia each fall into this category.

FTTH stumbling blocks

The key stumbling block to FTTH commitment is the huge amount of capex required. According to IDATE, a research and consulting firm, it will cost operators in France a whopping total of between €10.4bn and €11.3bn to cover 40 percent of the population with FTTH.

Allied to anxiety about the high capex bill is investors' uncertainty as to when (and if) they will see a return on their money. Fuelling that uncertainty is a lack of clarity on what

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powers NRAs (national regulatory authorities) will have in dictating the terms incumbents have to share their fiber-based access networks with competitors.

Although Viviane Reding, the EU's telecom commissioner, announced last November a wide range of telecom markets now exempt from regulation, the wholesale access to the local loop market, and the broadband access market—as expected—were not included in the deregulation list. The question now remains as to what *ex ante* "remedies" EU will propose (expected to be finalized this summer) to stop operators, which are deemed to have significant market power status, from abusing their monopoly position.

Another potential worry for FTTH investors is the role of Reding's proposed European Telecom Market Authority, to be established by 2010 (if the European Parliament approves it). And if this organization has the power to overrule NRAs (which is part of Reding's proposal), than any assurances an NRA gives its national operator on FTTH investment protection may turn out to be worthless.

Within this potentially changeable (and highly charged) regulatory environment, vendors from the GPON (a point-to-multipoint solution) and EP2P (Ethernet point-to-point) camps continue to argue vociferously about the respective merits of the two FTTH architectures (see sidebar below).

While GPON appears to be winning favor with Tier 1 operators, EP2P is gaining ground in citywide projects, primarily undertaken by Tier 2 and Tier 3 operators. Yet EP2P is probably the favored FTTH option for many regulators as—arguably—it is easier to unbundle than a GPON architecture. This, in turn, makes high-speed broadband infrastructure competition more likely.

Variable FTTH returns

Didier Pouillot, a senior analyst with IDATE, believes it will be difficult for operators—with ambitions to roll out FTTH nationwide—to achieve FCF (free cash flow) in less than 13 years. And this is on the assumption that "nationwide" does not cover what Pouillot calls residential areas (small towns and villages comprising detached houses). "There is no FTTH business case for network operators in residential areas, unless, perhaps, they receive financial assistance through public funds," he says.

The relatively good news is that IDATE calculates FTTH network operators can achieve profitability within 7 to 8 years in urban areas nationwide, provided they can share costs on

EP2P and GPON battle for hearts and minds

Mud slinging between the EP2P and GPON camps, two rival FTTH architectures, shows no signs of abating. Point-to-point fiber enthusiasts continue to cast aspersions on GPON's security credentials and bandwidth capacity limitations; the point-to-multipoint GPON brigade continues to disparage what it claims to be the much higher power supply requirements and higher latency times of EP2P.

On security, EP2P supporters specifically question the wisdom of the GPON standard that stipulates only downstream traffic, and not upstream traffic, is encrypted.

"The standard is based on the premise that when light [carrying the data] is sent from the CPE back to the local exchange, no other customer on the PON tree will receive it," says Wolfgang Fischer, who heads up Cisco's business development team for service provider infrastructures in Europe. "But so much for the theory. Research from Stanford University has shown that PON splitters and optical connectors have the awkward property of reflecting some of the light that hits them. That means some of the light intended for the central office is sent back downstream to other customers on the PON tree. As the key exchange is also unencrypted, it can also allow hackers to unencrypt the downstream code."

It's a scenario that Alcatel-Lucent—GPON's principal supporter—dismisses out of hand. "You wouldn't see that happening," says Steve Kemp, Alcatel-Lucent's senior product director for broadband access. "The light going upstream is at a different frequency than downstream, so even if it were reflected the ONT [optical network terminal] is not looking for it. And also, by the time the light passed through the splitter and optical cable, there would be too much signal loss."

One of Alcatel-Lucent's favored lines of attack on EP2P is what it claims to be the much higher opex of an architecture that requires a fiber-per-customer to be terminated in the local exchange (as opposed to one fiber typically serving up to 32 customers on a single GPON). According to some Alcatel-Lucent presentations, only one fiber rack is required in a local exchange to serve 16,000 subscribers using GPONs, but an EP2P system—serving the same number of customers—would require 24 fiber racks. The result, says Alcatel-Lucent, is that GPONs require 80 percent less power than EP2P at the local exchange and 92 percent less floor space.

Cisco's Fischer believes Alcatel-Lucent is being disingenuous with its comparisons. "Optical distribution frames can accommodate up to 2,300 fiber installations in one rack, so it doesn't make sense to talk about 24 fiber racks," he says. Fischer further points out that in virtually all FTTH projects take-up rates are significantly below 50 percent, and on EP2P systems ports are only needed for paying customers. In a PON configuration, an OLT port is required for the first customer (although that port does become more cost efficient as more paying subscribers connect to it).

"EP2P can be a problem but only if the carrier is extremely space constrained and has to rent real estate," Fischer continues. "Most of the customers we have are happy to go for EP2P because of the bandwidth flexibility it offers them."

EP2P enthusiasts point to standardized Ethernet interfaces that allow carriers to move easily from 100Mbps per customer to 1Gbps by simply swapping the line card in the fiber rack and shipping out another CPE. But would the cost per gigabit Ethernet switch port be low enough to justify this strategy? "Yes," Fischer says. "They have come down to a level much lower than the price carriers can upsell the service, which makes for a good business case."

In response, Alcatel-Lucent's Kemp points out it's possible for a GPON to burst to 1Gbps without even having to change equipment and swap line cards. And while Kemp acknowledges that fiber racks are increasing in density, he does not accept there will be much power savings as a consequence. "There is no avoiding the fact that 32 subscribers sharing one fiber use much less power than one laser per person," he says. "High-density racks can cause so much heat you have to keep them far apart, which uses more space. And if the racks were packed more tightly together, there is always the possibility you might need to overhaul the air-conditioning system to cope."

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Joeri Van Bogaert, FTTH Council Europe

passive infrastructure, such as trenches and ducts (see table below). "When the population or building density doubles within urban areas, capex on passive infrastructure can be reduced by 30 percent," adds Pouillot.

For the Iliad Group, which has a 4-year plan (2007 to 2011) to pass 4 million homes with fiber in France's major cities, IDATE concurs with the operator when it says it can achieve FCF within 6 years. "Iliad has a specific set of circumstances, which will allow it to achieve profitability quicker," says Pouillot. "It is not only sharing passive infrastructure [by making use of tunnels in Paris' extensive underground sewage system], but also its marketing costs are comparatively low."

Iliad already has a popular ADSL service under the brandname Free. By targeting those areas where Iliad has at least a 15 percent penetration with ADSL, the aim is to transfer them all over to fiber (a service also branded as Free). This shouldn't be too much of a marketing challenge as Iliad is charging the same for its basic FTTH service (offering symmetrical speeds of up to 100Mbps) at the same price as its ADSL service—€29.90 per month. "Iliad says if it can achieve a 25 percent FTTH penetration, then profitability will happen within 4 years," says Pouillot. "It's a conclusion we agree with."

For the FTTH Council Europe's Bogaert, a long period before FCF (over 10 years in some cases) should not be off-putting to investors or be the only consideration. "FTTH infrastructure building is not just for the next three to five years," he says. "This is something you build for a generation. You have to look at the value you get from such a network."

Bogaert believes a case can also be made for FTTH investment with the view to selling the infrastructure for a profit. "There are other business models than holding on to networks for 30 to 35 years," he says. "There is more to look at than free cash flow."

Regulatory rumblings

The proposal by EU Commissioner Reding for a pan-European telecom authority that can override NRAs and even enforce functional separation on incumbents—where the retail and wholesale arms function separately and are seen to do so—is likely to cause friction with countries keen to encourage infrastructure competition (rather than having competition defined as multiple service providers using the incumbent's network).

Paul Champsaur, chairman of ARCEP, France's regulatory body—in an interview last November with French newspaper *Les Echos* shortly after Reding's proposals—said that "she is setting Europe on a path which will lead to opposition to change and to conflict with national regulators". And because the remedies for fiber-optic access regulation have yet to be fully articulated by Reding, Champsaur dismissed the entire proposal package as "totally unhelpful".

Bogaert from the FTTH Council Europe sees the proposed European Telecom Market Authority in a different light. "It's positive," he says, "if NRAs can adopt best practice—by working with the European regulator—and provide a consistent regulatory framework across Europe."

For the remedies due to be announced this summer, Bogaert would like to see measures that encourage access to passive infrastructure. "The FTTH Council believes that the linkage and the gradation of remedies between access to the passive infrastructure and the active elements of the networks will create an environment favorable for investment and the development of effective infrastructure-based competition," he says. "Consequently, the regulatory intervention [remedies] should be gradated starting from the lowest physical element of the infrastructure [passive infrastructure]. When lower elements of the network are available, upper remedies should not be applied or should be lighter."

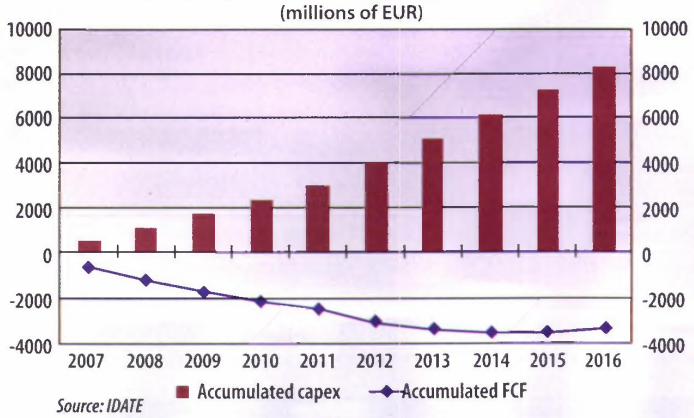
Bogaert's line of thinking is if incumbents make their ducts available, NRAs—in compensation for such a strong remedy—should relieve them of regulatory intervention on fiber and allow wholesale bit-stream services to be negotiated on a commercial basis (and not at prices set by the regulator).

How practical local loop unbundling at the physical layer will be for GPON architectures (generally favored by incumbents) is another issue NRAs will have to face. Although GPON vendors say there is no theoretical problem with unbundling, it will require collocation facilities at the local exchange and street cabinets (unlike EP2P systems). Who pays for those facilities and their management?

"One reason why incumbents are choosing GPON is because it *is* difficult to unbundle," says Carsten Storbeck, carrier product manager for ADC Krone, which supplies kit for both GPON and EP2P systems. "They now have good arguments to delay the unbundling process and make it more complicated, which requires ongoing discussion."

Europe's road to FTTH is sure to be a bumpy one. ●

Capex and FCF (free cash flow) for an incumbent operator deploying GPON technology nationwide



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