

Worldwide FTTH Deployments to Grow More Than 40% This Year; Quadruple by 2012

The number of households connected to a fiber optic network will grow by nearly 43 percent worldwide in 2008 and will continue to grow at rates above 30 percent a year through 2012, when the number of fiber-connected households will reach nearly 90 million, according to a new report from CMP's Heavy Reading (www.heavyreading.com).

The growth builds upon a strong 2007. Despite ongoing setbacks and delays in many territories, 2007 marked another landmark year in the long-term transition to fiber-to-the-home (FTTH) networks. Among other highlights this year:

- The now-unarguable success of Verizon's initial FTTH rollout, and a stronger commitment to FTTH than hitherto from the other major US ILEC, AT&T.
- Strong commitments to FTTH from France Telecom, Telefónica, and several smaller incumbents in Europe, starting the firing gun in Western Europe after a generally slow start on the old continent.
- Confirmed major rollouts in Korea and Singapore, and continuing strong growth in China.
- Growing interest and rollouts in Eastern Europe, the Middle East, and other "new" regions.

"The transition to FTTH is now well underway in many countries, including Denmark, France, Hong Kong, Japan, Korea, Sweden, Taiwan, and the US," notes Graham Finnie, chief analyst with Heavy Reading and author of the report, *FTTH Worldwide Technology*

Update & Market Forecast. "Over the next five years, we expect most other developed countries to join that list, and fiber will also have a significant impact in relatively less developed telecom markets, including India, Russia, and the Middle East."

Although the future clearly points toward fiber replacing copper, there is plenty of uncertainty surrounding which network operators and technology suppliers will lead the transition, Finnie says. "On the telco side, our five-year scenario points to a market that is increasingly dominated by incumbent telco investment, but there is plenty of room for other types of operators, including utilities, municipalities, CLECs, real estate developers and others," he notes.

"On the vendor side, it is already clear that the winners and losers will not necessarily be the same as those that dominated the DSL market, but again the picture is complicated, in particular by a likely upswing in M&A activity as FTTH deployment grows and smaller vendors are snapped up by the majors."

Key findings:

- The total number of fiber-connected homes will grow from about 20 million at the end of 2007 to 89 million at the end of 2012, representing 5 percent of all households worldwide.
- This growth will be dominated by deployment in Asia, where the number of connected households will grow to almost 54 million by the end of 2012.
- About 17 million will be connected in the Americas, with the majority in

the US, while about 18 million homes will be connected in Europe, the Middle East and Africa (EMEA).

One issue sure to affect the speed of rollouts is how rapidly the cost of components will decline as the market ramps up in volume. Although the market for components is becoming globalized, the construction of FTTH networks will continue to be strongly influenced by a wide range of local factors including the local regulatory environment, growth in demand for high-bandwidth services, greenfield housing development and local cost structures. For that matter, even the manufacture of optoelectronics will be regional or national to some degree, and for some time to come.

- Gigabit passive optical network (GPON) technology will dominate FTTH deployments in the US, since it is now certain to be used by the major incumbent telcos as well as by many independent telcos.
- Active Ethernet has some limited support in the US, but it will remain a minority technology, taking a declining share of the overall market.
- In Europe, initial rollout has been dominated by municipal and utility builders, most of which are using active Ethernet. Active Ethernet will continue to take the largest share of the European market for several more years. While the entry of incumbent telcos will gradually shift the market toward GPON, just as it has in the US, active Ethernet will remain important throughout the forecast period.

VENDOR DIFFERENTIATION STRATEGIES

DIFFERENTIATOR	COMMENTS
MSAP approach, with copper/fiber support from the same cabinet	Many vendors (such as ECI) support this approach, but others (such as Alcatel-Lucent and Ericsson) reject it on price-performance grounds.
Support for services such as VoIP, POTS, RF TV and IPTV	Implied in the GPON standard, but some vendors (such as ECI and UTStarcom) highlight their record in deploying IPTV services, for example. VoIP support varies; not all variants are always supported. POTS may not be supported.
Quality of service (QoS) and related features	Related to services support; GPON has some QoS features built in, but support such as for Layer 3 functionality is not consistent across different vendors.
Capacity	Vendors take different positions on the capacity users require. Some cite low capacity as a virtue in early deployments; others (such as Huawei) are going for big systems. The number of variants (large and small) also varies by vendor.
Density	Related to capacity; a move in 2006-2007 to four-port cards will be followed with eight-port cards in 2008 – one of several mechanisms for improving density. Implies lower cost per port.
Management systems	Main selling point for some vendors, such as PacketFront. Most management systems contain a lot of proprietary software, and the degree and depth of management is variable. Others emphasize the use of the same management system across all wireline access technologies – though this is now the norm.
Range of ONTs	Often cited as a differentiator, but most vendors now have a wide range to meet most basic requirements.
Operational and deployment experience	Typically cited by those with a significant installed base, such as Tellabs (BPON) and Calix.
Support for network design and engineering	Many vendors offer various kinds of professional services to assist such as with splitter siting, rollout schedules, and so on.
End-to-end proposal	Including not only OLTs and ONTs, but also in-house equipment, fiber, network construction, and so forth. Some such as Ericsson have in-house expertise in construction.
Technology neutrality	Many vendors support both one of the PON standards and active Ethernet – though degree of commitment varies. A few, such as Huawei and NSN, support both GPON and GePON.
Ability to customize offers	Such as by using own ASICs – both Calix and ECI cited this as a differentiator.
Power consumption	In light of environmental legislation, becoming more important, and cited by some, such as ZTE, as a strength.

Source: Heavy Reading

Because bandwidth demands will continue to increase relentlessly, PON supporters and builders need to develop a next-generation PON based on 10 Gbps Ethernet or wavelength division multiplexing (WDM) within the next five years. In the absence of successful development, the market could drift toward active optical networking approaches. However, the signs indicate that next-generation PONs will be available commercially from around 2011, extending PON deployment well out into the second decade of the century. WDM PONs look like the most probable winner in this transition, according to the report.

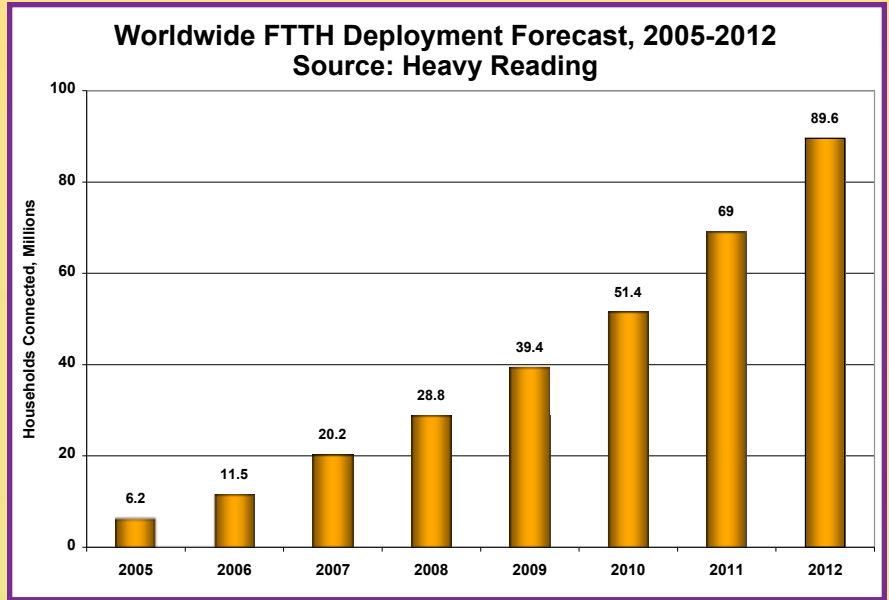
The report also reviews the optical network terminal (ONT) and optical line terminal (OLT) product strategies of more than 30 vendors, evaluating their strengths and weaknesses, and analyzing the key differentiators in their offerings (see table).

The forecast assumes that, following a period of experimentation and development, FTTH will begin to follow a typical S-curve growth in penetration, reaching 80 percent or more of households over a 15-to-20-year period in all developed nations. It also assumes that high-end households in most countries will opt for the new bandwidth “gold standard” of 100 Mbps by 2008-2009 wherever it is made available at competitive prices, boosting competitive build-out from 2009 on. Continuing rapid increases in the size of computer hard disks, digital memory, DVDs, cameras and all consumer electronic equipment, together with unanticipated high-bandwidth applications development will put continuing pressure on bandwidth needs.

Costs of equipment and construction will continue to fall steadily, but because costs remain dominated by construction labor and facilities, the percentage decline will be modest, and the overall high cost per household (in the range of \$500 to \$2,500, depending on circumstances) will continue to hold back mass rollout in some countries and prevent a truly rapid transition to FTTH. Skill and labor shortages will also be a factor.

The report notes, however, that competitive pressures will continue to increase as a result of the saturation of orthodox telephony markets, both wireline and wireless. In order to create a long-term platform for high-bandwidth services, and be first with a fiber into the home, providers will modify short-term return-on-investment approaches where these currently dominate planning and move to longer-term views.

In addition to high-level forecasts, *FTTH Worldwide Technology Update & Market Forecast* provides forecasts and analysis based on a range of parameters, including deployments by technology and customer types, carrier, regions and key national markets.



Rapid growth in FTTH deployments is forecast to continue through 2012.

In Europe, IPTV Grows Faster in Less Cabled TV Markets

According to the newest edition of TV Markets Quarterly Monitoring from analyst firm Info-Com, penetration of IPTV services in Europe during 2Q07 was most evident in Belgium, France, Italy, Netherlands,

Norway, Spain and Sweden – where IPTV subscriptions represent between 1 and 7 percent of the total TV audience. The IPTV subscriber base in these countries, as a group, reached over 3.3 million in June 2007, almost all (94

percent) of the total IPTV market in Western Europe. In other countries, especially the “highly cabled” ones, the uptake of IPTV is more difficult due to the strong competition from cable TV services.

Telecom Growth Indicator: IT Spending to Exceed \$46 Billion in 2008, says Insight Research

The global market for operations support systems (OSS) – the computing and software IT infrastructure that performs engineering, provisioning, and management functions in telecommunications networks – will exceed \$46 billion in 2008, according to a new report by Insight Research (www.insight-corp.com). Telecommunications industry spending for OSS is expected to lag only slightly the forecast growth in service revenue over the next five years, indicating that the industry is fully expecting sustainable growth in the years ahead.

According to *Operations Support Systems, 2007-2012*, telecommunica-

tions network operators worldwide will increase their investment in OSS at a compounded annual rate of just over 8 percent over the next five years. North American investment in the computing and software systems used to acquire, serve and bill customers will lag worldwide investment, growing at a compound rate of nearly 6 percent over the same period, while OSS expenditures made by carriers in the Asia Pacific and Latin America-Caribbean regions will grow at double-digit rates. The report found that telecommunications service providers are investing most heavily in those OSSes needed to support 3G data services. By the end of the forecast period, OSS spending to support broadband wireless

will be more than double the amount being spent on wireline OSS.

“The carrier community has fully recovered its confidence and is investing in OSSes at nearly the same rate that consumers and businesses are picking up new wireline and wireless services,” says Insight president Robert Rosenberg. “Our research suggests that terrific growth is ahead for those OSSes needed to support 3G wireless services. RF planning and engineering tools and the professional service need to support them, carrier-to-carrier billing and service provisioning tools, as well as customer-accessible service management systems all appear to be growth areas in the months ahead,” Rosenberg concludes.

In-Stat Says Telco TV Continuing Expansion; Asian Projections Don't Keep Up

The availability of telco TV services continues to expand to new countries as higher bandwidth networks are built to deliver video, reports In-Stat (www.in-stat.com). In many European countries, consumers even have choices among four or five broadband providers offering telco TV service, the high-tech market research firm says. This expansion of availability is driving much of the subscriber growth.

"Subscriber growth in North America is being driven by the largest telcos – Verizon and AT&T – who are aggressively rolling out telco TV services in parts of their territories," says Michelle Abraham, In-Stat analyst. "They are moving full speed ahead with expanding the areas they serve, with subscribers doubling in 2007."

In-Stat found that:

- Worldwide telco TV subscribers will grow to 54 million in 2011.
- Due to subscriber growth, telco TV subscription revenue will reach \$19 billion in 2011.
- Enabling subscribers to watch TV programs on their TV when they want (timeshifting) is more important today than enabling them to watch TV on multiple devices (placeshifting).

The research, *Worldwide Telco TV Services*, looks at where telco TV services are growing, which providers are offering telco TV, and what types of services are being offered. Worldwide five-year forecasts for subscribers, ARPU, and subscription revenues are provided by region. This research also contains the results of a consumer survey done in the US on the interest level in new applications coming soon as part of telco TV service.

The report is in line with an Infonetics report (First Mile, January 2008) that looked at IPTV-specific projected growth but also broke out telco figures. But iSuppli says the IPTV market in China did not meet 2007 growth expectations. Chinese operators had predicted 1.3 million mainland IPTV subscribers by the end of 2007, but the total was only 846,000. "The main reason for the IPTV deployment slowdown is the industry as a whole failed to develop a successful business model – one capable of being replicated in geographically dispersed urban centers," iSuppli analyst Loren Zhao was quoted as saying.

Shanghai Media Group offered the first IPTV service in China, in 2006, and had government approval to add 10 cities. China Central Television International (CCTV), the only other IPTV supplier, has announced IPTV tests in three provinces.

In a new study focused on residential FTTH in APAC, ABI Research (www.abiresearch.com) finds that different markets within the region are currently in very different stages of broad-

band growth, and that lack of content is part of the reason, said research analyst Serene Fong. "Demand is largely determined by CPE and infrastructure costs. Consumers are also looking out for sufficiently rich multimedia content to justify their subscriptions. But the irony is that carriers are also waiting to ride on economies of scale in order to offer more attractive and affordable packages."

"For instance, Hong Kong is one of the early adopters of FTTH and has the largest FTTH household penetration, currently 21 percent. On the other hand, countries such as China and India are still struggling to encourage greater broadband usage." For now, most FTTH activity is still in some of more developed countries within the region: Hong Kong, Japan and South Korea.

According to Fong, "There are compelling trends leading us to believe that IPTV and related content applications will drive demand for FTTH" in Asia. ABI Research's *Fiber Optic Services for Residences in APAC Markets* analyzes broadband development in six main markets – Japan, South Korea, Hong Kong, Taiwan, China and India.

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In-Stat Expects Growth in Videoconferencing

Strong efforts from major companies like Cisco, Microsoft and IBM to promote media-rich productivity tools are boosting prospects for videoconferencing, reports In-Stat (www.in-stat.com). The driving factors behind increased adoption and use are technology, bandwidth and convergence, the high-tech market research firm says. What's more, the decision to use or not use videoconferencing is no longer based on uncertainty over the quality of the experience, and cost alone does not seem to hinder adoption or use. "The shift to an IP environment that enables unified communications, presence and mobile integration provides a technological environment where

traditional videoconferencing, as well as telepresence, can become synergistic elements," says David Lemelin, In-Stat analyst. In-Stat also found:

- Current users of videoconferencing are generally satisfied.
- Past users are willing to reconsider videoconferencing if the quality, usability and cost are reasonable.
- Videoconferencing is beginning to resonate as a part of corporations' commitments to "green" environmental issues, though this benefit can be leveraged more aggressively in the future.

Mobile Data Implementations to Slow in 2008: Wireless Business Plans too Aggressive

Growth in revenue for mobile business applications, close to 50 percent between 2006 and 2007, will slow to 44 percent from 2007 to 2008, reports In-Stat (www.in-stat.com). These strong growth projections are good news for the wireless industry, but may be lower than some are planning on based upon literal reading of end-user survey data, the high-tech market research firm says. That's because there is a widening gap between what decision makers expect to do and what they actually implement.

"As business users approach saturation for horizontal mobile data applica-

tions, most of the growth potential remains for vertical market applications," says Bill Hughes, In-Stat analyst. "These require more planning and time to implement. The result is that many within the wireless industry may have overoptimistic forecasts."

In-Stat found:

- The penetration of at least one mobile data application among firms increased from 75 percent to 94 percent in 2007.
- Smartphone use among US business users increased 34 percent between 2006 and 2007.

- Four horizontal applications – wireless e-mail, wireless Internet access, wireless instant messaging and personal information management (PIM) – have the highest penetration rates because they are easier to implement than vertical market applications.

The research, *Wireless Data in the Enterprise 2007: Avoiding a CDPD Reprise*, covers the US market for mobile business data through 2011. It also contains results from a 2007 survey of US businesses regarding mobile data applications and analysis of the climate for mobile data among US businesses.

High-Speed Modem Service Aiding Global Cable TV's Strong Growth

As the market for basic video services becomes ever more competitive, cable TV operators around the world are now relying on data – cable modem services – to generate new revenue streams, reports In-Stat (www.in-stat.com). In fact, bundling video and data services is providing cable operators with a significant competitive advantage over their pay-TV service rivals, the high-tech market research firm says.

"Some markets, such as North America, are feeling the effects of increasing competition for video service subscribers," says Mike Paxton, In-Stat analyst. "However, in other markets, demand for cable video services is growing at an almost exponential rate. China is a good example. In 2007, it added over 20 million cable TV subscriber households."

In-Stat found:

- As of December 2007, total worldwide cable TV subscriber households numbered 408 million, an increase of 10 percent from December 2006.
- Worldwide cable modem subscribers recently hit 72 million.
- 91 million cable TV households are now digital video subscribers, an increase of 41 percent over the previous year.

The research, *Cable TV Services: Worldwide Video and High-Speed Data Subscribers*, discusses technology standards and market dynamics for cable modem services around the world, provides regional and country-by-country subscriber data for cable modem services, and forecasts subscriber growth through 2011.