
Triple Play, IPTV & VoD – The Route To Market For UK ISPs

Mass Market Telco TV Using Hybrid Free-To-Air/IPTV Services

By Alexander Cameron, Managing Director, Digital TX Ltd. 1st October 2005.

There are more than 300 ISPs in the UK of varying sizes, from VISP resellers to tier 1 backbone carriers – most resell BT Wholesale's core DSL product, basing their service costs on the deals they can offer on BT Central backhaul, network bandwidth and external connectivity arrangements. They share a common destiny in that it is not longer acceptable that their networks are 'best effort' but they are evolving into QoS-enabled multi-service architectures, incorporating partitioned 'virtual channels' of voice, video and data traffic.

Bandwidth is rapidly becoming commoditized with high-speed copper technologies such as ADSL2+ and VDSL catalysing the roll-out of value-added services such as HDTV. The speed of the connection matters less and less as time goes on – what's becoming more and more important every day is what the connection is used for. The cornerstone of all these services is the broadband connectivity that empowers each one of them.

The crowded television market is also changing at an unprecedented pace thanks to the surge in interest for IP-based delivery. The future of the market is no longer solely the big boy's domain – the future lies in aggregated niche audiences gathered and owned by ISPs and telcos. Digital distribution is enabling 'long tail' economic models that make niche back-catalogue library assets more profitable than premium content. Content owners are slowly getting used to the idea of retiring the idea audience figures in the millions for fractions of highly-targeted demographic groups in the thousands and tens of thousands.

The drive towards 'telco TV' has been lead by large US telecoms companies wanting to compete against cable carriers stealing telephony revenues through their 'triple play' packages. But this scenario is considerably more relevant in most other parts of the world other than the UK, where the market share of the 4 main platforms (Sky Digital, NTL, Telewest & Freeview) is far more established and the technology more mature. There are precious few opportunities for ISPs to compete and differentiate what they offer as what already

exists in a saturated market. Indeed it's ironic that the vast majority of UK technology companies trading in the IPTV space have never had their products deployed in their country of operation.

Most companies researching video-centric technology have spent so much time in perpetual loops second-guessing themselves that they have not been able to look past the basic models of deployment to help understand the possibilities the technology empowers. In layman's terms, they're so worried about viability that they haven't used their imagination to think of compelling applications and their constituent parts.

So as the inevitable march towards the triple-play panacea continues unabated, 2 viable routes to market in the British entertainment market have been identified to date – create and monopolise your own IPTV service platform or add value to an existing one. The former is a path that awaits the most fearless (HomeChoice, Bulldog, KIT), whereas the majority seem to be tilting in favour of the latter (BT, Eclipse). In practice, this means adding a powerful interactive back-channel to either Freeview, or its new cousin, FreeSat. What is also an interesting angle is that the 'pass-through' approach for DSL TV used by satellite operators in Europe (e.g. CanalSat and TPS' service with France Telecom – 'MaLigne.TV') does not seem to have the same interest in the UK, despite its apparent effectiveness and natural habitat as a competitive weapon against cable rivals.

Many ISPs are rightly sceptical of IPTV technology, the network's ability to run TV services, and indeed even the business models the existing precedents currently run on. Some simply do not have the resources to countenance even going so far as to provide the simplest of voice services. But in such a fiercely competitive and fast-moving industry, it's important to keep up with the Joneses or you get left behind very quickly, and in telecoms terms that tends to be weeks rather than months or years. Equally important is the need to differentiate products and services from rivals. So our business question is how do we get these companies to market with TV services now and insure them against the need to deploy more advanced services in future?

Operators wanting to build their own platforms are more than capable of finding their own way, but they are a percentage of the top ten UK carriers, predominantly owning their own infrastructure (such as LLU networks). That leaves the other huge segment of the market – over 90% of the industry that is still researching viability and flirting with the idea of expanding their commercial reach if the necessary resources are conveniently available.

The business that best fits these potential vendors is the add-value platform model – i.e. providing the broadband back-channel as it can be standardised, differentiated and also be marketed in the most

flexible way. The two trends that can be immediately exploited are the growth in Free-to-Air (FTA) television (Freeview, FreeSat, or collectively known as 'Freeband') and the demand for Sky Plus-like DVR/PVR devices.

This approach can be described as multi-value, as it is built on the premise that a marriage of the technology systems adds value to both individually and the end product collectively. For all their financial and commercial clout, BSkyB can arguably do little to rival the potential of Freeview combined with a DVD/VoD rental partner offering tens of thousands of video titles.

If our objective is to empower ISPs to grab 'triple play' market share as their larger rivals also do, their best option is to look at TV in the wider context of the digital home network, or the residential IP ecosystem. In the current conditions, it will be sometime until all services are transitioned onto exclusive IP-based delivery, and until then a hybrid model needs to be used to grow their subscriber base.

In today's market, the triple-play monthly bundle price ceiling (i.e. the point at which the cost of the service outweighs the value the customer perceives they are getting and becomes a churn incentive) is approximately £45-50. The good news is that it is generally accepted that the demand for value-added broadband services is clearly growing, and the vast majority of customers look to their service providers to act both as a guide, and as the intermediary that can make the technology available to them.

The simplest way for ISPs in the UK to deploy mass market TV services at this moment is to offer a branded Free-to-Air television PVR receiver (based on either Freeview or FreeSat) that has built in Ethernet capability to provide a broadband back-channel return path. Such a device can accomplish exactly what these companies are looking to achieve – so called brand 'mindshare' and customer retention. Such devices are already plentiful in electronic shops, use the same (ugly) internal software and can be sourced as base components extremely cheaply in Asian markets.

It is increasingly thought that the simplest solution for enabling broadband network connectivity in a set-top box without complex re-wiring is via HomePlug-style technology (broadband over power cabling). The recently ratified HomePlug AV specification guarantees up to 200Mbit/s (twice the speed of traditional LANs) throughput over a house's existing electricity cabling, which is enough for more than 10 high-definition TV channels.

Trials with currently available 'turbo' product versions (85Mbit/s) are encouraging in the face of Wi-Fi's worrying lack of reliability. Only 2 single adaptors are needed to extend the network's reach from the broadband router – one connected next to the home gateway and the

other to a plugboard behind the television set (or any other power point in the home for that matter). It is slowly becoming seen as the technology that will enable the industry's goal of the unified broadband networked home.

If and when HomePlug AV functionality is built natively into electronic devices as part of the cabling, it is arguable that we truly will have arrived upon the long-forecasted digital revolution. ISPs need to be working in more detail to shepherd their subscribers into enabling digital home networks by supplying HomePlug technology in tandem with connectivity CPE (routers, USB modems etc).

The commercial mechanism by which hybrid receivers could be offered is established and generally trusted to be sound, having served the market since its humble beginnings over a decade ago. CPE devices, such as routers and USB modems, are offered as loss-leading incentives that drive sign-up and customer acquisition, as well as being a very effective deterrent to churn and hence a reducer of subscription losses. The maximum price point is generally set at around a maximum of £150 (\$300), and is typically amortised against several years' subscription.

A FTA/IP hybrid set-top box (also known as the broadcast TV and broadband video model) provided by an ISP will work, but needs to have a certain mandatory feature-set to be a compelling consumer proposition against what would normally be found on the high street. Generally speaking, an ISP's customer base is considerably more tech-savvy and more predisposed to adopting technology earlier than the average everyday citizen. They look for maximum value and discriminate ruthlessly, requiring a great amount of commercial design on behalf of the vendor.

The answer to such a demanding audience is to include a mixture of their favourite technology, safe in the knowledge that you will be able to please them for some time to come before the functionality offered is redundant or depreciated. That combination is Free-to-Air broadcast TV (complete with smart-card access if necessary), intelligent PVR functionality, and the software built in to provide advanced interactive services like IPTV, VoD, gaming, network multimedia browsing and more later on. The latter is crucial to insure future-proofing for the challenges to come.

Advantages of taking this more considered value-added approach are that the demand for the hybrid device mass market product is already proven and it allows an operator to 'piggyback' on the platform rather than be forced to adsorb the risks associated with building something from scratch. As most ISPs resell BT Wholesale DSL products, it is also the only way to incorporate live television as the core legacy copper network does not have multicast capability until the 21CN project is concluded. In an ever more crowded marketplace, extending

DVB-T reach is the best fit an operator can expect if they do not have the budgets of the top 10 carriers.

There are certain inescapable pre-conditions that need to be addressed in order to meet the expectations of subscribers used to 100% TV reception and/or '5 nines' connection reliability from their ISP. At the top of the list of these issues is Quality of Service (QoS), which as a working system enforces strict rules on the broadband connection supplied by the home and is used to create 'virtual channels' that are respective traffic partitions for voice, video and internet data. QoS is split into two distinct territories – the backhaul network and the home network.

The core BT Wholesale products (DataStream & IPStream), which fall into the former category for most ISPs, are contended mass-market offerings that deliberately have no QoS built in – vested interests and common wisdom dictate that as soon as BT apply QoS to their network, their considerable core revenues from PSTN traffic will begin to spiral due to competition from VoIP services.

Backhaul QoS is implemented by the ISP operator as a multiplex of 'virtual' traffic channels, typically as a mix of ATM and IP technologies. Despite open industry QoS standards, residential premises are trickier as bandwidth control is not implemented in a formulaic way that it needs to be – there are nearly 10 major providers of connectivity CPE (including Belkin, Netgear, Linksys, DLink, Actiontec etc), and all have different QoS capabilities and implementations. What this means in practice is that each ISP must support a very small range of devices which they have pre or re-configured.

The TV receiver device can incorporate extensive branding and marketing opportunities at many different levels – customisation can be achieved on the physical casing(s), and/or in the software applications that are used to operate it. In day to day terms, this can mean start-up screens, start-up videos, screensavers, EPG 'skins' and the specifying of a portal 'homepage' for interactive services that can be hosted by the ISP.

Rather than individually customising each unit on the production factory floor, it is possible to build an 'activation' mechanism that is executed over the broadband network to download the necessary personalisation features when the box is first used (DHCP supplies several useful parameters too, such as a starting homepage). These basic functions of the device must be left intact and be usable at all times, regardless of whether the ISP that supplied it stays as the owner's preferred provider.

The promises of converged IP services and advanced technologies that the set-top box is capable of delivering do not need to be enabled by default, and in fact, shouldn't be. These features would almost

need to be activated at the discretion of the ISP as and when they believe the market is ready for them. The key point is to make them available for use. Adding the capability for new technologies into the set-top box is as simple as a personalised and intelligent software update. Granting access to each per subscriber requires a commercial activation mechanism supplied by the distributor to make them 'live'.

However, there are challenges to this approach. Chief is getting a unit retail price below the symbolic £100 (\$200) mark, including all mark-up given in each point in the chain. Next is the raw horsepower needed to process the both the latest video compression technologies (such as H.264 AVC, WM9, Dirac or VP6) in a 'hot swap' dynamic fashion and general computation requirements of most modern middleware systems.

The choice of architecture is absolutely critical here, with the current wisdom advising the use of a dual-processor solution – twin microprocessors dedicated to video (DSP) and general (GPP) operations respectively. The market leaders in this field are the ARM9 GPP and Texas Instruments DM642, both having had significant success in recent months. The best choice for these next-generation devices is the newly-announced TI 'Da Vinci' platform, which combines the 2 into one powerful chipset.

Surprisingly, despite the demand for hybrid DVB/IP devices, no off-the-shelf software product exists that can be easily integrated into a marketable device. The obvious candidates in the UK market are vendors of MHEG DVB-T interpreters (e.g. Eldon, Ocean Blue, S&T or Cabot) and next-generation IPTV display engines (e.g. Mozilla, Ant, Espial).

The intrinsic barrier to releasing a working hybrid product is getting the two systems to interact transparently, which predicates a need for abstracting the concept of what we know as a 'channel', whether it be a DVB MPEG-2 transport stream, a multicast group, a unicast video on-demand feed or a string of material stored on a hard drive. In development terms, it should not necessary to know the source of the channel once the line-up has been dynamically configured; only that it is available to tune to.

An imperative choice for operators is a middleware display engine based on a user interface mark-up language – this generates all the screens, menus and operational features of the service. The obvious candidate for this scenario is an HTML/Javascript browser (such as Liberate, Mozilla, or Ant Fresco/Galio) as it is a widely known standard with a large pool of expertise available in the market. There are alternatives, such as WTVML as used on the Sky Digital platform, or Espial's Escape browser.

Macromedia also offer version 6 of the Flash player that can enable a certain degree of cross-platform abstraction. At some point in the future, more advanced rendering may be available – languages such as XUL, XAML and Lazlo will be the forerunners that mature on the PC desktop before being ported to the television environment.

What the largest platforms have learnt to their cost is that this particular decision is critical to the effectiveness of interactive applications that run on the set-top box and in most cases, generate revenue that help to recoup the original investment needed for the rollout. Television is a fast-moving medium where reaction to change is a survival factor – it is crucial to get applications to the screen in minutes, especially if they are topical. This cannot be done with cumbersome set-top software such as OpenTV or MHP, even if they do offer low-level access to the device hardware needed for gaming and other advanced functions.

Security can be offered on the set-top box in 3 ways, and is mandated by content rightholders. Identifying individual devices has privacy implications but generally takes the form of using unique serial numbers and hardware (e.g. MAC) addresses. The first is protection against physical theft, or a 'lockdown' mechanism, which generally takes the form of blocking the device's operation should it be used outside the customer's residence. The latter two are extremely important and interdependent – conditional access (CA – i.e. encryption), and analogue copy protection. Video content must be encrypted from the point of its origin to the point of display, with viewing permissions strictly controlled.

The most resilient and dynamic way to implement security is a more powerful evolution of the 'smart card' model – client/server software-only. In this model, security client software replaces a physical card and automatically updates itself at specified intervals (so if a weakness is found, it can be patched almost instantaneously), and can also control the second part of the puzzle – analogue copy protection. Copy protection stops viewers from making recordings and is based on technology that exploits the automatic gain control feature of VCRs by adding pulses to the vertical blanking sync signal. Cheap circuits are widely available that will defeat the protection by removing the pulses.

In conclusion, the UK market may look like a more hostile environment in which to operate, but in reality it simply needs a more adaptive deployment model than in other countries. Time will move on and stabilise technology, delivery conditions and viewers' tastes will mature, meaning that we must focus on providing the most compelling and rich experience rather than the basic bottom denominator that gets the services to market.

About Digital TX Limited

Formed in early 2004, privately owned and based in **London** (UK), Digital TX Limited is a provider of technology and consultancy solutions for interactive digital television and broadband media. Some of the keywords you might associate with us are **IPTV, Video On-Demand, Triple Play, Broadband Entertainment, Video Over IP, Interactive TV, Network Video Gaming** and **Telco TV**.

Our mission is to be the world's leading wholesale provider of broadband entertainment. Our vision is of a world where personalised entertainment is available on-demand 24 hours a day, 365 days a year, at any time, anywhere in the world, on any device. Our technology can power anything your mind can imagine, and beyond.

Digital TX Limited has worked with many leading blue chip communications providers and can help catalyse your route to market for IPTV services by working with you to design your next-generation multimedia network, build your commercial deployment model and broker relationships with vendors, rightsholders, partners and customers. If we can be of any assistance please don't hesitate to contact **Alexander Cameron** on **+44 (0) 7986 373177** or via email on **alex.cameron@digitaltx.tv**.