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GLOBAL CONTENT PROTECTION
When smartcard-less CA was first introduced it was treated with scepticism by content owners, network operators and smartcard CA vendors. Now it is accepted as a viable solution for two-way networks but there remains a debate about whether CA based on software only is secure enough, or whether hardware anchors are needed. We take a look under the covers starting p20.

John Moulding, Editor
Whether it's advanced compression, on-demand or interactive television, we deliver the technology and expertise that's moving digital video forward.
Half the 450 million mobile TV subscribers in 2011 will receive broadcast services

Anna Hunt of IMS Research says single tuner/demodulator chips and multi-standard handsets will help drive uptake

Mobile TV is finally gaining momentum and is the buzz of the CE [Consumer Electronics] industry. IMS Research estimates that over 13 million broadband mobile TV-enabled devices will have shipped in 2006, including cellular, automotive and PMP segments. When compared to 2003, with less than 25,000 devices shipped, IMS Research expects broadcast mobile TV to truly thrive during the upcoming years.

LOOMING UNCERTAINTIES

Yet, as with any nascent market, there are many uncertainties still looming. Poor quality of service, spectrum congestion, unproven business models, lack of network infrastructure and other issues must still be addressed in order for successful global implementation of mobile TV.

The cellular segment is by far the largest mobile TV market both now and in the foreseeable future. Subscribers to cellular network-based mobile TV services have likely doubled since about a year ago. By 2010, IMS Research expects that over 50 per cent of cellular subscribers opting for mobile TV will be receiving broadcast programming in addition to network-based video services. It just makes sense for cellular operators to use unicast and multicast technologies to complement broadcast TV.

In order to encourage adoption, handset suppliers and cellular operators are deploying equipment and content so they can offer a complete mobile TV package to consumers as soon as possible. IMS Research forecasts that in 2011, worldwide shipments of mobile TV-enabled handsets will reach about 300 million, with nearly two-thirds enabled for broadcast mobile TV reception. Expectations for adoption of mobile TV services are less optimistic, with a forecast of nearly 450 million subscribers worldwide, with slightly over 50 per cent of these receiving broadcast services.

Asia Pacific currently leads in shipments and adoption of TV-over-cellular. However, by 2011 it is likely that mobile TV-enabled handset volumes in Americas, Asia Pacific and Europe will be roughly the same. Mobile TV viewers, on the other hand, will remain preferentially in Asia, where free-to-air mobile TV is common. The rest of the world is expected to see a subscription model at least in the near term.

COMPETING STANDARDS

The introduction of broadcast services optimised for mobile TV has resulted in a new array of competing standards: DVB-H, T-DMB, DAB-IP, S-DMB, FLO, ISDB-T (1-Seg), etc. Hence, new chipsets are required for the reception of broadcast mobile TV. Currently, these chipsets consist of separate tuners, demodulators, and often media processors. Mobile TV chipsets usually represent less than 10pc of the cost of the device that they are going into. The next generation of devices are expected to integrate the video processing necessary to view mobile TV onto their primary processors.

IMS Research expects two general trends in mobile TV broadcast reception chipsets:

GENERAL TRENDS

1. Multi-standard chips. Most mobile TV chipmakers have announced that their next generation of chips will support two or more standards. Even Qualcomm, whose proprietary business model would not normally embrace competing open standards, has announced a mobile TV chipset that will receive two other standards, DVB-H and ISDB-T, in addition to FLO.

2. Consolidation onto fewer dies. Led by the needs of the cellular handset manufacturers, chip makers are moving as quickly as possible to minimise the size and cost of mobile TV chipsets. In the near-term, many companies are working to package separate tuner and demodulator chips into a SIP solution. However, by late 2007 a number of major chip makers, including TI and Frontier Silicon, are expected to be shipping SoC tuner-demodulators.

Anna Hunt manages IMS Research’s Digital Consumer research group. More about IMS at: www.imsresearch.com
Increasing volumes of on-demand content encourage headend vendors into VOD

During the summer, Harmonic Inc. bought Entone, Cisco/Scientific Atlanta purchased Arroyo and Motorola acquired Broadbus, marrying stand-alone VOD specialists with companies offering video acquisition, processing and network infrastructure equipment.

The increasing volume of on-demand content on cable and IPTV is one of the main reasons behind the recent trend for video headend vendors to purchase companies offering VOD hardware and software solutions. Free VOD (including Replay TV) is encouraging more one-to-one video sessions and there is a widely held expectation that during the next ten years there will be an evolution towards ‘everything-on-demand’, with only events-driven programming like sports relying on schedules.

The research company ABI Research is predicting that the number of concurrent ‘VOD’ streams worldwide will grow from 1.67 million in 2005 to 163 million in 2011, highlighting the introduction of time-shifting, network PVR and mobile video as the reasons.

ABI says the growing importance of on-demand streaming is reflected in the spate of corporate acquisitions in the summer – namely Cisco/Arroyo, Harmonic/Entone and Motorola/Broadbus Technologies. All were intended to add extra VOD capabilities to their purchasers’ portfolios, the company notes.

“Once you introduce time-shifted and ‘start-over’ video, and later nPVR, concurrency rates shoot up,” says Michael Arden, principal analyst at ABI Research. “In most networks today, they represent under ten per cent of customers. Once you start introducing new services such as time-shifted and ‘start-over’ video, and eventually broadcast is recorded at a headend site for on-demand viewing almost immediately after it starts airing. The Broadbus servers are not disk-based and they separate storage from streaming and ingest, delivering 20,000 MPEG-2 streams per video server.

Ingest speeds – which will be a key performance parameter for full nPVR – are helped in the Broadbus servers by the ability to deliver trick-play functionality ‘on-the-fly’. This, in turn, avoids the need to create a separate trick-play file alongside the main MPEG stream and is achieved by analysing the I-frames (reference frames) of the video as it is ingested, then inserting bookmarks and headers.

For Cisco (which already owns video headend, network and CPE specialist Scientific Atlanta) one of the key competencies that Arroyo adds is content distribution management for on-demand services. Arroyo OnDemand software allows operators to distribute the functions of ingest, storage and streaming anywhere in their network but manage them as a cohesive unit. The system uses standards-based hardware and once again, scalability, service availability and total cost of ownership – along with operational efficiency – are outlined as key benefits.

You can read about the rationale behind Harmonic/Entone on p13 and Cisco/SA’s end-to-end strategy on p8.
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Cisco hopes for ten per cent extra efficiency from end-to-end solution

Scientific Atlanta (now a Cisco company) argues that Pay TV operators are looking not just for vendors who can take end-to-end responsibility for TV platforms, but who can deliver fully integrated headend-to-home solutions that the ‘buck stops with them’. Video headend, networks and CPE (Customer Premise Equipment) vendor Scientific Atlanta, now part of Cisco, goes further and argues that the Pay TV market wants more integrated, complete solutions from a single vendor again.

**BEST-OF-BREED**

“The biggest risk in best-of-breed is that you don’t assure yourself scalability over time, because that depends on 5-10 different companies all agreeing to go the same way [with their product strategies] over a period of time,” declares George Stromeyer, Vice President, Managing Director, EMEA, Scientific Atlanta (Europe). SA/Cisco wants to maximise the synergies presented when combining Scientific Atlanta headends with IP-centric multi-service, next-generation network solutions from the Cisco product range and CPE from SA (like set-top boxes and DVRs) and Linksys (wireless home networking).

Scientific Atlanta emphasises that it will continue to work closely with third-party vendors, wherever requested, to deliver the best solution possible for operators, and all its products are designed to deliver high performance in their own right. But Nick Fielibert, VP, Chief Technical Officer and Chief Architect for Scientific Atlanta Europe and Asia, says “There will be some instances where something we do in the encoder and in the network and in the set-top boxes, when taken together, could provide a ten per cent edge compared to solutions that do not combine our products.”
The promise of satellite delivered mobile TV prompts SES/Eutelsat joint-venture

Europe’s satellite giants have set aside their usual rivalry to market an S-band multimedia delivery solution for mobile operators and Pay TV platforms. Eutelsat’s W2A satellite will carry the S-band payload, which will transmit up to ten channels direct to phones or complement terrestrial transmitters for a 45 channel service, using a derivative of DVB-H payload on the W2A satellite commissioned by Eutelsat and set for launch at the start of 2009. This is the first time the two organisations have worked together in this way.

W2A will be operated at 10 degrees East and the plan is that the new S-band frequency at 2.2GHz (S-band is also found at 2.0GHz) will be used to support video and other multimedia services to mobile devices. This includes mobile phones, of course, but also means PDAs, laptops and in-vehicle receive devices.

**S-BAND ECOSYSTEM**

Taken together, these moves represent the beginnings of an ecosystem for DVB-H in S-band and are a significant vote of confidence in the ‘Unlimited Mobile TV’ concept being promoted by Alcatel. This relies on a hybrid mobile TV network made up of terrestrial S-band transmitters or repeaters and satellite-based S-band transmission, all based on a new version of DVB-H that will be defined within the DVB-SSP (Satellite Services for Portable devices) Ad-Hoc Group at the DVB. In this hybrid model, a satellite beams services into S-band terrestrial repeaters or, where there is no terrestrial network available, direct to phone.

The majority of commercial mobile TV services today are delivered via 3G cellular networks but because of their one-to-one architectures, these do not have the capacity to cope with large volumes of mobile TV users. Terrestrial broadcast mobile TV networks have been deployed in several European markets, using DVB-H and DAB-IP to date, but Eutelsat, SES GLOBAL and Alcatel all believe satellite can also play a significant role in this fast-developing market.

SES GLOBAL and Eutelsat have put aside their usual rivalry to agree a 50/50 joint venture company that will operate and commercialise an S-band payload on the W2A satellite commissioned by Eutelsat and set for launch at the start of 2009. This is the first time the two organisations have worked together in this way. W2A will be operated at 10 degrees East and the plan is that the new S-band frequency at 2.2GHz (S-band is also found at 2.0GHz) will be used to support video and other multimedia services to mobile devices. This includes mobile phones, of course, but also means PDAs, laptops and in-vehicle receive devices.

**TELECOMS OPERATORS**

According to a spokesman at SES GLOBAL, the most likely contenders to build the ground-segment S-band network are telecoms operators, since S-band is very close to 3G frequencies and can be ‘piggy-backed’ onto existing cellular transmission sites, reducing the cost of the terrestrial network build. He points out that SES has no ambition to get involved in terrestrial networks itself (not does Eutelsat).

SES GLOBAL and Eutelsat both support the hybrid satellite/terrestrial model outlined by Alcatel in Unlimited Mobile TV and it is claimed this kind of architecture, when using the new S-band payload on W2A, will be able to deliver 45 channels of mobile TV per country in areas with terrestrial transmission. Robust indoor reception is also promised. Beyond the terrestrial S-band networks, the satellite will be able to deliver 8-10 channels direct into handheld devices.

The S-band venture is a EUR 130 million investment for Eutelsat and SES GLOBAL. The newly formed company will own the dedicated S-band capacity on W2A and will market the satellite service under a distinct brand name. The project still requires regulatory approval but this is not expected to be a problem.

**INNOVATIVE SERVICES**

According to Romain Bausch, President and CEO of SES GLOBAL, “This joint investment will allow for the development of new, innovative satellite delivered mobile broadcast services, thereby enabling satellite to compete with, as well as to complement, terrestrial infrastructure solutions in the mobile television and radio distribution chain.”

Eutelsat has commissioned W2A from Alcatel Alenia Space.
DVB wants DVB-T2 and DVB-H2 standards to exploit freed, expensive UHF spectrum

Mobile TV, HDTV over digital terrestrial and other, yet unknown, wireless multimedia services will be competing for spectrum freed by analogue switch-off. The new frequencies are likely to be expensive and the DVB is preparing new versions of its DVB-T and DVB-H standards that will deliver more – probably 30 per cent more – data for your bandwidth.

The DVB is preparing the ground for two major standards updates: DVB-T2 and DVB-H2, both of which are going to be closely interrelated as the mobile and fixed terrestrial TV services they enable will be competing for the same UHF spectrum after analogue switch-off – which is expected from 2010. In each case, the standards will be designed to improve video delivery efficiencies. Although the specifications have to be defined, DVB-T2 (DVB-Terrestrial) is sure to make use of improved modulation techniques, as the new DVB-S2 (DVB-Satellite) standard has done in order to generate a 30 per cent increase in data throughput over a given bandwidth.

EFFICIENCY GAINS

The DVB is not outlining efficiency targets but there is a view inside the organisation that major new standards like a new DVB-T should aim for a minimum 30 per cent improvement to make the effort worthwhile. There is an assumption that when UHF spectrum is made available after analogue switch-off, it will be very valuable.

It is the prospect of analogue switch-off that has prompted the standards review, with Peter MacAvock, Executive Director at the DVB Project Office stating: "Analogue switch-off will be around 2010 [varying market-by-market] and we see that as a great opportunity for new types of services using broadcast terrestrial spectrum. Significant amounts of UHF spectrum will become available, with lots of applications and we would like to make sure that when that opportunity arrives, we are ready with a set of standards that would allow you to exploit these opportunities."

At first glance it appears that a new version of the DVB-H (DVB-Handheld) standard for television-to-handhelds is premature, given the fact that DVB-H based mobile TV services only started to be launched commercially this year, with most still in the planning stages. Mobile TV is a fledgling market with multiple competing standards for terrestrial broadcast services including DAB-IP, DMB and FLO. So won’t the introduction of a new DVB-H standard at this stage simply confuse the market?

MacAvock thinks not. "We are talking about a 2010 introduction,” he comments. "DVB-H to DVB-H2 migration does need to be carefully managed but product lifecycles in the mobile phone industry are significantly shorter than in the broadcast industry of DVB-H at the same time. He views the future use of UHF spectrum as a single, integrated issue, with the requirements for over-the-air HDTV, standard-definition television and TV-to-handhelds wrapped together.

PARALLEL STANDARDS

"People were not talking about mobile TV 15 years ago but had we known of its importance at the beginning of DVB-T we would have made DVB-T and DVB-H at the same time. But you could not have predicted that first time around,” MacAvock explains.

The DVB wants the DVB-T2 standard to be ready for commercial use by 2010, which means DVB-T2 products are available that year. The timetable therefore requires that an early draft of the standard is ready by the end of 2007 or early 2008, which means the commercial requirements for DVB-T2 must be thrashed out by next summer.

Like DVB-S2, the new DVB-T standard will require new receivers so its introduction into the marketplace will almost certainly be via new services, in the same way that DVB-S2 and AVC (MPEG-4 Part 10/H.264) encoding were introduced on the back of HDTV, which required new set-top boxes anyway (with HDTV in turn being made economic thanks to AVC).

POST SWITCH-OFF

DVB-T2 is also viewed as a post switch-off technology – not a solution for existing terrestrial TV services. Analogue switch-off relies on mass consumer migration to DTT and that needs very low-cost DVB-T set-top boxes in the market. Invariably, new technologies are considerably more expensive than old.

The DVB used IBC to effectively launch the new standards process and must now match up the commercial and technical ambitions from across Europe, Asia and the US.
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World Forum Latin America addresses the challenges and opportunities for IPTV

Broadband penetration is growing fast in Latin America - with the number of broadband DSL subscribers up 79 per cent in 2005 to reach 6.37 million subscribers (figures from DSL Forum, March 2006 using data produced for DSL Forum by Point Topic). Meanwhile, Informa Telecoms & Media is predicting that Latin America will double the number of its digital homes in the period 2004 to the end of 2010. When combined with the relative immaturity of the 'traditional' Pay TV market in the region, these figures may present an opportunity for IPTV providers who want to give South American consumers their first taste of digital, interactive, on-demand TV.

DEBUT AWARDS
Junction, the organisers of the IPTV World Forum events in London, Asia and Eastern Europe, certainly thinks so and is taking its ‘World Forum’ brand to Rio de Janeiro in January for the debut IPTV World Forum Latin America. According to Junction’s Managing Director, Ian Johnson: “DSL-based broadband penetration is growing fast in Latin America, led principally by Brazil and Mexico, and there are signs that the region’s telcos are starting to think seriously about IPTV. The big question is whether this DSL growth, plus a growing taste for digital TV, can be converted into an IP-based video market.

Much depends on the regulators since telcos in Brazil, Mexico, Argentina and Venezuela have been prohibited from carrying video services. A key theme for the inaugural IPTV World Forum Latin America will be the regulatory conditions in the region and how governments view the video market: in particular, whether they think it is time for cross-media regulatory hurdles to be relaxed in line with most of the rest of the world.”

The big question is whether DSL growth and a taste for digital TV can be converted into an IP video market

IAN JOHNSON, MANAGING DIRECTOR, JUNCTION GROUP

Over 15 telcos and ISPs are speaking, including Brasil Telecom, Telecom Argentina, VTR, NTT, Telemar, Telefonica Peru, Comsat, Telefonica Brasil, Antel, Novis, SMG and Pioneer Telephone Cooperative. MTV and HBO Latin America will be among the content providers. There is a ‘showcase’ demonstration of ten IPTV services from around the world and a small exhibition as well.

New Video Technology magazine is a media partner for this event and will have magazines at the show.
Harmonic positions itself for integrated broadcast and on-demand infrastructure

Harmonic Inc. has built its business on headend and network solutions (including DiviCom encoders), primarily for broadcast TV. Its acquisition of VOD software specialist Entone Technologies mirrors the trend towards broadcast/VOD vendor consolidation and gives it the chance to deliver tightly integrated solutions for ‘start-over TV’ and full network PVR.

Harmonic Inc. believes the emergence of an ‘everything-on-demand’ video culture will mean the traditional divide between broadcast television and VOD is removed over the next few years and that its acquisition of Entone Technologies’ Video on Demand business leaves it well placed to provide the integrated broadcast/on-demand headend and network solutions required.

VOD SOFTWARE
The company announced its agreement to buy Entone’s video networking software business in August – one of three major VOD related deals in the summer (the others being Motorola/Broadbus and Cisco/Arroyo (more on page 6). It gives Harmonic the StreamLiner software product, which turns ‘commodity’ servers from the likes of IBM and HP into high performance VOD/nPVR servers, and the Armada intelligent asset allocation solution.

Armada uses intelligent automation to move on-demand content to where it makes the best use of network bandwidth and storage resources. It includes tools for scheduled asset replication and pre-caching of assets (e.g. video files) prior to use, and the system constantly monitors customer behaviour so it can adjust the asset management decisions according to changing conditions.

Harmonic Inc. itself is no stranger to on-demand video, having pioneered the edge-QAM technology needed for on-demand video on cable (the Narrowcast Services Gateway). The company offers offline storage encoding through its CLEARcut product range, while its ProStream 1000 with Mentor, introduced in June, is an MPEG-2 re-encoding platform for SD that will repurpose real-time programming or other pre-encoded content for CBR (Constant Bit Rate) delivery, as required for unicasting. It can process 16 streams in 1RU, whether VBR (Variable Bit Rate) to CBR conversion or CBR to CBR.

This stream density will be an important requirement as network PVR (nPVR) applications emerge, where all scheduled content is recorded for instant on-demand availability as a VOD session.

PARADIGM SHIFT
According to Patrick Harshman, President and CEO at Harmonic: “We anticipate a paradigm shift from broadcast television to on-demand. VOD was a stand-alone application running in parallel to the broadcast infrastructure but we believe they will not be separate platforms anymore. We believe time-shifted television, nPVR, personal advertising and the whole facility for on-demand will be a much more tightly integrated part of the Pay TV platform, and we see tremendous opportunities from unified deployments.”
Availability of system-on-chip processors, increasingly massive storage and an ever-broader array of peripheral device, software and form factor options mean the IP set-top box market is on the cusp of a generational change.

Report by Steve Hawley
or consumers, just a few short years ago, TV was simply TV. For service providers, the sheer weight of legacy equipment and infrastructure created a degree of inertia that seemed overwhelming. The idea of supplementing broadcast television with anything more than a programme guide seemed impractical – let alone the delivery of Video on Demand, dynamically-refreshed programme data and content from the Internet.

But all that has changed. Not only have commercially-produced and personal media content become digital, but consumers also want to supplement traditional linear TV with VOD and user-created content, and re-use it more universally. And service providers have envisioned new service models in response.

SET-TOP BOXES ARE EVOLVING

As a result, a revolution has been underway in video-related consumer electronics. Single-purpose TV set-top boxes designed simply to decode video for a single television have rapidly evolved into multifunctional and multi-TV-capable home media centres. What’s more, other personal electronics devices that historically have had no video capabilities are now video-capable: phones have become miniature media centres in their own right, capable of storing and playing not only MP3 music files but also of capturing and displaying photos and video. All of these new rich media options are attracting significant new revenue to service providers.

IPTV SET-TOP CLASSIFICATIONS

Worldwide, more than a hundred set-top box vendors are selling products into IPTV operators, although only a dozen or so are significant in any single geographic area. Generally speaking, there are three classifications of IPTV set-top boxes: low-end, mid-range and high-end.

At the low end of the spectrum are basic IPTV set-top boxes that are simple video decoders designed to accommodate a single TV, designed with a minimum of parts, small form-factor and sold at prices as low as $100 in high volume. Manufacturers include Amino Communications, Tilgin (formerly i3 micro), Motorola’s Kreatel unit, Netgem, Sagem, Thomson and others.

Mid-range IPTV set-top boxes, also designed to accommodate a single TV, essentially are also simple video decoder boxes, but with more memory, local mass-storage (for local PVR) and with the ability to accommodate options catering to specific geographic markets, such as karaoke for Asian consumers. In addition to the above suppliers, vendors include Wegener Communications, YuXing, Tatung, Samsung and others.

In addition to having the functionality found in low-end and mid-range boxes, high-end IPTV set-tops accommodate multiple viewing centres (i.e. TVs in multiple rooms) and in-home networking. Also, many mid-range and high-end set-top boxes are designed to accommodate multiple receivers.

These high-end boxes include devices from Advanced Digital Broadcast (ADB), Entone Technologies, the Motorola VIP/QIP series and Cisco’s Scientific Atlanta IPN series.

HDTV and advanced video coding (MPEG-4 Part 10) are becoming standard equipment across all three of these classifications and therefore are no longer considered to be differentiators between these three set-top categories. The same can be said for local connectivity options such as USB ports, to connect local peripherals, digital cameras, music players and the like.

Virtually all IPTV set-top boxes also have at least one >
In low-end set-tops, highly integrated multi-chip sets that include core processing and hardware video codecs provide a lower-cost alternative.

SET-TOP HARDWARE TRENDS

The most significant development affecting IPTV set-top boxes has been the availability of new-generation system-on-chip processors designed expressly for IPTV and able to accommodate downloadable software codecs, middleware and content protection clients. In low-end set-tops, highly integrated multi-chip sets that include core processing and hardware video codecs provide a lower-cost alternative.

Another development is modularity. This reduces the cost of set-top boxes to the IPTV carrier by capitalising on economies of scale for parts used in boxes globally, while making market-specific, geography-specific and customer-specific implementations possible. Finally, there has been the emergence of whole-home, high-end set-top boxes that go beyond TV functionality, acting as full-home media centres.

SINGLE-VENDOR VS BEST-OF-BREED

There are essentially two competing approaches to building an end-to-end IPTV delivery ecosystem. One is generally referred to as an ‘open-standards/best-of-breed’ approach, embraced by service providers that have heterogeneous systems environments and by those who want the flexibility to change platforms as enabling technologies evolve.

The other could be called the ‘vertically integrated’ approach, which is most famously represented by the Microsoft TV IPTV Edition platform, but which is an approach also taken by other end-to-end IPTV platform suppliers, albeit not necessarily using Microsoft software.

Microsoft positions its IPTV Edition platform as capable of functionality that heterogeneous systems cannot provide. This is because Microsoft develops a significant portion of the IPTV software ecosystem, including the middleware server, applications and video servers, database servers, the content protection system, and the operating systems of both the servers and the set-top box client, and has worked closely with chip suppliers to bring out the full capabilities of the set-top processor.

The set-top box uses the Microsoft Windows CE.net operating system. It hosts a terminal-like software client that receives both the TV programming and the user interface itself as an MPEG-4 or VC-1 video stream, and communicates with the Microsoft TV system using a patent-pending method of channel changing.

In contrast to the Microsoft approach is the heterogeneous IPTV approach. Here, the set-top box operating system is
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Mobile TV World Forum 2007

Mobile TV is starting to prove itself in the field - primarily over cellular networks - but remains a fledgling industry that, despite the marketing buzz and big-name backers, still has the potential to fail. 2007 will be a landmark year for mobile TV with a dramatic expansion of terrestrial broadcast services to complement cellular and the development of hybrid broadcast/cellular networks.

The Mobile TV World Forum 2007 will look at where mobile TV goes next, with a theme of 'Beyond 3G' to represent this new phase and the business/technical challenges and opportunities it presents. The conference will also look at developing consumer attitudes and behaviour towards video on mobiles, service propositions and content offerings, business models and value chains, transmission technologies, content production, interactivity, advertising, regulation and much more.

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LONG-TERM EVOLUTION OF IPTV SET-TOP BOXES

Some observers believe that the Personal Computer, not the latest set-top box or its evolutionary derivative, will provide the ultimate answer to consumer demands for multiple displays in the home, multiple formats, storage and mobility.

Others feel just the opposite: that the functionality of today’s PC will disappear into other consumer devices, and that the simpler user experience hosted by the set-top box will embrace and incorporate what the PC does.

In any case, a spirited discussion is underway as to which device will become the ‘king’ of the new media home, or whether there is some derivative that is yet to evolve.

But for now, developments within the IPTV set-top box category have focused the attention of the industry. As it should, since set-top boxes continue to represent the majority percentage of the telco’s capital equipment expenditure for the foreseeable future.

STANDARDISATION EFFORTS

The TV industry has already developed technical standards that are maintained and promoted by standards organisations like CableLabs and Europe’s Digital Video Broadcasting Project (DVB). As a relatively new technology category, IPTV is still characterised by a variety of proprietary approaches and a lack of standards.

However, this situation is beginning to change, as IPTV deployments become more widespread and technology suppliers agree upon how IPTV services are to be delivered. Vendors are also beginning to make their various systems interoperable with one another.

Several initiatives are underway to develop internationally accepted technical and architectural standards for IPTV, and these efforts will have an impact on the hardware and software architectures associated with IPTV set-top boxes.

Not only is the DVB involved in these standards: organisations like ATIS (the Alliance for Telecommunications Industry Standardization), the DSL Forum and others within the telecommunications industry are formulating standards as well. Over time, these standardisation initiatives are likely to intersect and transform into a single set of widely-accepted standards and best practices focused specifically on IPTV.

ADVANCING SOFTWARE AND PRE-INTEGRATION

Complementing the hardware options and software trends detailed above are significant efforts towards hardware and software pre-integration. For example, ADB recently teamed with Minerva Networks, a provider of IPTV middleware, and Envivio, an MPEG-4 headend provider, to offer a pre-integrated IPTV solution. In fact, operators can select from a variety of set-top box options with IPTV middleware, TV browsers and application execution environments pre-integrated within the set-top box and ready for operator test and deployment.

IPTV satellite transporter SES AMERICOM has certified Amino’s AmiNET 130 as part of its own pre-certified end-to-end IPTV delivery platform. This pre-integration trend is not limited to telco IPTV. Helius, an Enterprise IP video platform provider has pre-integrated its system with Tilgin’s MOOD 300 and Apple Macintosh Mini. Another significant software-related trend is the fact that the three leading IPTV browser software suppliers, ANT, Oregon Networks and Espial, not to mention set-top suppliers like Softier and Amino, are offering interactive TV software development environments for use by operators and independent developers in creating customised interactive TV applications.

There also is increased support for non-MPEG rich media content formats, such as Macromedia Flash. In addition, software-based video codecs/decoders and software-based content protection clients that manage user authentication, content licensing and Digital Rights Management, decryption and watermarking/fingerprinting may be downloaded to the set-top box and centrally managed by the service provider. This eliminates the need for field service and thereby significantly reduces operational costs.

These advancements have allowed set-top vendors to move away from customised deployment-by-deployment software. They are porting towards integration within end-to-end service-oriented architectures. This trend is making it easier to integrate and deploy not only the delivery infrastructure and the enterprise IT systems that support it, but also the IPTV set-top box.

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PTV makes CA (Conditional Access) easier to enforce, because two-way communication allows the identity of the set-top box (STB) and, in principle, other network attached devices to be established. But the greater exposure of digital video during transmission and storage brings a corresponding increase in the piracy threat, which is why many content houses have been reticent about this new digital TV platform.

The advent of high-definition TV may elevate the piracy threat further by allowing acceptable video copies to be taken with camcorders after the content has been decrypted and converted from digital and analogue. By then it is beyond the realm of traditional content protection systems.

These trends are leading to CA becoming part of a broader security solution encompassing DRM (Digital Rights Management) and content protection (like digital watermarking), rather than just a point product. In fact, CA can also act as an enabler for additional products and services, involving a variety of home network or mobile devices when combined with STB software and IPTV middleware. Operators therefore need to consider CA, DRM and content protection in the context of their whole IPTV package.

So far though, the IPTV CA debate has focused largely on the role and nature of hardware, given that two-way communication means that the STB is no longer solely
responsible for preventing unpaid access to content.

For satellite, terrestrial and traditional one-way cable services, the smartcard emerged as the dominant mechanism for controlling access because it allowed the system to be changed by issuing new cards without having to swap the set-top box. The problem with this was that the vulnerable part of the system, i.e. the smartcard in the STB, was outside the operator’s domain. There was no way of detecting attempts to crack the security. It only took one smartcard to be reverse-engineered and the whole system was then wide open to fraudulent access through distribution of fake copies of the card.

Only when – and indeed if – this came to light could the operator restore control by issuing new cards to subscribers. This has been a particular problem for satellite services.

Yet the main motive for avoiding smartcards in IPTV deployments has been to save the costs of distribution and having to manage an additional component on the customer premise. There is a broad – although not quite universal – consensus among operators and vendors that the IPTV CA client in the set-top should be capable of being managed and upgraded remotely, whether or not any additional hardware is involved.

Indeed, the ability to renew the client on-demand to provide pirates with a moving target, as well as to cope with breaches, is regarded as essential by the content owners, according to Barbara Leavitt, Marketing Director at Widevine Technologies, one of the most successful of the new breed of CA vendor focusing on cardless solutions for IPTV.

Most vendors of cardless solutions, whether or not they also offer a smartcard product, do not rely totally on software for security in the STB, but require some dedicated hardware as well. In this camp are Widevine and Verimatrix, which both offer cardless products only, along with Nagravision and NDS, which have older roots in the cable TV and satellite market and built their businesses on smartcard-based solutions.

These vendors all believe that the set-top box cannot be made secure without some dedicated hardware, and that ‘software CA’ is a contradiction in terms. “There is really no such thing as software based CA,” claims Leavitt.

Most vendors of cardless solutions, whether or not they also offer a smartcard product, do not rely totally on software for security in the STB, but require some dedicated hardware as well.
Nagravision takes a similar line. “If you have a software-only solution; if people manage to open the box and manipulate it, there is no way back,” according to Holger Ippach, Global Head of IPTV Business at NagraVision. Ippach dismisses the argument that software-only solutions are secure because of the easy ability to download new keys to the STBs, on the grounds that once the system has been compromised its fundamental mechanisms are then known, making it easier to repeat the attack.

But some security vendors, such as Irdeto, contend that a software-only approach is sufficiently secure, although this company also offers a smartcard solution.

To unpick these arguments and explain the differences of opinion, it is helpful to consider the approaches adopted by the various vendors. Widevine’s Cypher is based on the well-established EMM/ECM (Entertainment Management Message; Entitlement Control Message) encryption system. This works well for broadcast content in particular, because the EMM provides a list of Pay TV channels to which the owner of the STB has subscribed, while the ECM comprises the algorithm needed to decrypt the content. Although this facilitates powerful encryption allied to the specific access privileges of each subscriber, it does mean the STB contains the secrets needed to get at the content.

For this reason it is vital to keep the ECM, or equivalent, firmly locked up. “Certain secrets must never get out into the main memory,” points out Ippach at Nagravision.

Vendors taking this approach therefore work with the chipset vendors to embed the relevant CA logic into hardware in such a way that it is not accessible to the rest of the set-top box system. Indeed, the major CA suppliers are leading the chip and STB vendors towards stronger security, according to Ippach. “We can have influence over what some STB vendors do by virtue of our size and influence, certifying the hardware and helping them develop it in a secure way,” he says.

But Irdeto uses a different approach, based on PKI (Public Key Infrastructure) technology. Under this method, the actual decryption key is never stored directly on the set-top box. Instead the STB holds a private key, which is used to decrypt a session key sent to it upon request via the network, typically from some security server. At this stage, various integrity and security checks can be performed by the network on the STB to make sure it is not an impostor. Then the decrypted session key is used in turn to decrypt the video stream.

With this system there is still the possibility of breaking the security by getting access to the private keys stored on the set-top box, but the two-way communication and the other checks that can be applied reduce the risk. These checks may be based on unique identifiers associated with each set-top, and there is also the possibility of detecting any compromise these advantages compensate for the additional costs of a smartcard system.

**TELECOM ITALIA’S SMARTCARD CHOICE**

At least one major operator has gone against the grain and deployed smartcards for IPTV, Telecom Italia having taken this route for its IPTV service in Germany, called HanseNet. “They have gone for smartcards even though the technical environment is right for a cardless solution,” explains Holger Ippach, Global Head of IPTV Business at NagraVision, supplier of the HanseNet CA system (HanseNet declined to comment at this stage).

According to Ippach, the smartcard still has some advantages as a marketing tool, such as the ability to act as an electronic voucher: “They can come pre-loaded with credit,” he points out. “In doing so, you allow people to pay for some content in a totally anonymous way so that you don’t receive an invoice afterwards.”

Ippach is referring to adult content that some people like to watch without any record. At any rate, HanseNet has decided these advantages compensate for the additional costs of a smartcard system.

**Increasing role for watermarking**

Digital watermarking figures ever more prominently in content protection for IPTV. Watermarking can be applied in two ways, either on a server basis for the lifetime of the content, or on a session basis while the content is being downloaded or viewed. It acts as a deterrent to pirates by marking the content indelibly so that its origin can be identified.

Verimatrix has introduced session-based watermarking in which the marks are inserted at the latest possible point in the distribution chain, which has the advantage of identifying not just the source of the content, but also the time and place where it was last downloaded or viewed.

“What we do is extract information from, or about, the STB, and create a watermark in real-time, and insert it in the video,” says Robert Payne, Managing Director and EMEA VP at Verimatrix. “It would contain unique information about the set-top box and playing device - date and time stamped.”

There are certainly advantages in having a software-only solution, if the security is sufficient. It means the CA can be applied to any STB without hardware modification, reducing both cost and time to deployment.
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unusual activity that might be associated with fraudulent access.

At any rate, Irdeto deems this software security adequate for large-scale IPTV deployments. And as Product Marketing Manager Ron Stehouwer points out, the company’s approach has been endorsed by the independent security firm Nerdan Group as being suitable for end-to-end IPTV deployment.

There are certainly advantages in having a software-only solution, if the security is sufficient. It means the CA can be applied to any STB without hardware modification, reducing both cost and time to deployment. These factors have led France Telecom in this direction for its MaLigne IPTV service (now Orange TV), which uses PKI based CA technology called Purple Box, developed by its own subsidiary Viaccess.

When France Telecom launched its TV-over-DSL service in 2003 only smartcard-based CA was available, but future deployments will be cardless, with the CA function distributed between the network and the set-top box and one software on the latter.

"We have to treat that either card-based or cardless network-centric security, where CA is distributed between STBs and dedicated security servers, represents the best CA for IPTV deployments," says Benjamin Schwarz, France Telecom Orange’s International IPTV Projects Manager.

However, under the new Orange brand, France Telecom IPTV has made the ability to upgrade security rapidly, and at low cost, a prime requirement. This is largely to ensure that as the IPTV service scales up to large subscriber numbers, it is possible to refresh security regularly to cope with the growing threat that is anticipated, without costs escalating out of control. It is argued that only a cardless solution meets these requirements.

There is another interesting consideration concerning IPTV’s scaling. Distribution via DSL brings the possibility of having one-to-one relationships with STBs on the basis of their physical connection as well as some hardware or software identifier, making unauthorised access much easier to guard against. But this would require multiple servers as well as probably a significant modification to the DSLAMs where the DSL lines terminate. As Schwarz notes, this presents significant scaling issues and Orange decided to adopt a solution bypassing the DSLAMs that should also reduce the number of security servers needed to support large numbers of subscribers.

In any case, linking the CA to specific DSL lines could prove unduly restrictive and inflexible, given that its future, operators may want to allow subscribers to access IPTV services from wherever they happen to be, such as a hotel room or mobile device. In that case the CA will have to cope with a variety of locations and device types without the luxury of knowing where the set-top box is.

The view that PKI based CA systems can operate safely without some form of dedicated STB hardware is not universal. The VCAS (Video Content Authority System) from Verimatrix is based primarily on PKI using X.509 certificates, but also incorporates hardware.

"Verimatrix has partnered with most of the major chip vendors and we’re completely embedded into the design of the chip," explains Verimatrix’s Managing Director and EMEA VP, Robert Payne.

But as with the other cardless systems involving hardware, this is quite different from the concept of a smartcard, with the security in the network rather than in the set-top box. “We put security in the headend and leverage the two-way security inherent in an IP network, both of which obviate the need for smartcards,” says Payne.

The problem for cardless solutions that have found their way into the Pay TV market through Greenfield IPTV launches is that until the pirates move in they will remain largely unproven. And professional pirates tend not to concern themselves with low-scale deployments because of the limited market opportunity for their products.

There is still a fair argument that smartcard-less solutions have yet to be tested in battle. Only when they are will we be able to tell whether cardless CA is a long-term solution that could eventually replace smartcards, and what works best from hardware and software-centric solutions.
IP is now a viable mechanism for distributing real-time professional video, helped by MPLS and VLAN technology. As Philip Hunter reports, some commentators are even predicting the unmanaged public Internet could be harnessed soon.
IP protocol has come into play for video and TV distribution far faster than most operators anticipated, with many of the quality issues having been resolved and telecoms service providers deploying services rapidly. A few operators are even transporting TV services over the public Internet, although that is not yet an option for mainstream services, as the QoS (Quality of Service) is, generally, still too inconsistent.

This is all happening not because IP is a wonderful protocol for distributing video, but because it has become the de facto standard for all forms of digital electronic transmission, yielding economies of scale.

However, lingering concerns over quality for video distribution have been largely dissipated by several successful trials, such as one in April 2006 involving the global Internet exchange Packet Exchange, the US ISP Pacific Northwest, and the video transport equipment vendor Pleora. In the trial, two-way high-definition TV was transmitted over a dedicated long-haul Ethernet VLAN (Virtual LAN) between one of Packet Exchange’s London nodes and Pacific NorthWest’s site in Seattle, using Pleora’s EtherCast Video IP engines.

No packets were lost at all and the total round-trip delay was an acceptable 0.5 seconds. However, this was achieved by bypassing the public Internet and, as with all such trials, did not entirely prove how well IP networks in general, and VLANs in particular, would perform in anger after, say, large scale IPTV deployment. There is mounting evidence that the IP/VLAN combination now represents the best video transport option for many operators.

IP was designed to transport non real-time data requiring guaranteed delivery but with no strict timing requirements, so that bandwidth could be variable and any dropped packets re-sent. But for live television programming, bandwidth has to be guaranteed, and dropped packets recovered almost instantly. Furthermore the round-trip delay must be kept low, particularly for interactive services and also editing during contribution.

The challenge was to meet these new service requirements without ditching the major advantage of IP - its ability to combine multiple services over a single physical and network infrastructure.

Initially, the problem for real-time traffic was tackled for voice (primarily), via mechanisms such as DiffServ that, in effect, allow dedicated bandwidth to be carved off for services that require real-time delivery. Such prioritisation schemes tended to work, at least in early versions, only where the proportion of real-time traffic to ‘best effort’ data was relatively low. This balance holds true for voice, but emphatically not for video, which can easily swamp a data network.

A further handicap was that IP networks usually comprise multiple hops, each of which has a router computing the next path to be taken. This imposes a delay that increases with the scale of the network as the router population grows. Multiple hops also increase the incidence of dropped packets, which tends to occur at a rate between one-in-10,000 and one-in-a-million over a typical IP network.

Such a level of dropped packets is easily manageable for data, but for an HDTV stream encoded in H.264 (AVC/MPEG-4 Part 10) and transmitted at 8Mbps, this rate of packet loss could cause an artefact such as a picture freeze or pixelation at least once a minute, which is clearly unacceptable.

This led to the development of a standard called Code of Practice (COP) 3 from the Pro-MPEG Forum, an association of programme makers, broadcasters and vendors. This is a Forward Error Correction (FEC) scheme, whereby additional encoded information is used to reconstruct most of the lost packets, reducing the packet drop rate by several hundred-fold. Now the same artefact on an HD picture would occur, on average, every 10 hours or more, which is more in line with the expectations of a high quality television service.

However, even this ratio of improvement is insufficient to deliver high quality pictures over the public Internet, where packet loss rates can be 100 times greater still. The US vendor of IP video transport products, Path 1 Network Technologies, took this deficiency in the Internet as an opportunity to carve out an early niche in low-cost IP video distribution.

The company’s ClearPath Pro technology builds on COP3 to deliver a further 60-fold reduction in packet loss. As more packets are dropped over the Internet, the effect is to bring...
this down to an acceptable level, sufficient, in fact, for several global video providers to deliver broadcast services. Among these are RTVI, a Russian language TV network that uses Path 1 equipment to reach up to 50 million viewers worldwide via the Internet, saving 90 per cent of the cost of satellite transmission.

At present, use of the public Internet for professional television distribution is still largely confined to cost-conscious global operators working to a tight budget. This reflects the fact that although packet drops can be reduced sufficiently, at present it is generally impossible to guarantee the low latency or consistent high bandwidth required for HDTV or even standard-definition pictures at the quality viewers expect.

Path 1 equipment can cope with the variation in delay over the Internet, but only at the expense of overall latency. The latency may be acceptable for foreign language or niche programming for global distribution, but it is not sufficiently robust to support functions such as rapid channel switching, let alone trick-play functions (like rewind and fast-forward of video streams).

Despite this, the public Internet's time may come sooner than some people expect. Some experts in the field, like Denis Vergnaud, Co-Founder of French IP video company Mediatvcom, believe the Internet is only one or two years away from being ready for transmission of mainstream TV programming. Indeed, it is argued that for operators wanting to transmit between locations close to Internet points of presence (PoPs), typically in major cities such as Paris, New York and London, the Internet will do the job now. "There is a lot of over-provisioning at those sites, so you will have no problem," claims Vergnaud.

For remote sites, though, the Internet would not work yet because of delay and lack of guaranteed bandwidth. In any case, as Vergnaud points out, the Internet is not always the cheapest option for video when accessed remotely, because you would need a pipe into it anyway, and it would often cost less to use a transport operator to carry your video traffic all the way to its destination via an IP Virtual Private Network (VPN) or VLAN.

VPNs or VLANs are the two principal options for IP video transport today. Both have their roots in the IP data networks of the 1990s and have evolved to provide the QoS required first for voice and then video. Apart from the packet loss already mentioned, the problems are delay, caused largely by the number of hops in a traditional routed network, and lack of guaranteed bandwidth. The lack of bandwidth guarantees is because IP networks are shared between multiple services and do not offer constant bit rate pipes that emulate leased circuits, as operators enjoyed with SDH/Sonet or ATM services.

One solution is to distribute servers to bring the content closer to the edge, reducing both bandwidth and the number of hops. This only really makes sense if it can also be justified by the volume of local programming that would otherwise consume core bandwidth. Operators would rather distribute servers for economic reasons than because IP cannot cope otherwise.

MPLS (Multiprotocol Label Switching) emerged as the first mainstream technical solution by allowing end-to-end paths to be configured through the IP routers, avoiding the need to compute each hop on the fly. This greatly reduces the hop-by-hop delay and relinquishes the end-to-end path for other data as soon as it is no longer needed for a particular video stream. Yet MPLS retains the Layer Three path calculation abilities of routers, and this makes the solution ideal for transport between one source and many variable destinations.

VLANs, on the other hand, avoid routing, providing low latency connections between fixed locations. This makes them ideally suited for distribution between locations that do not tend to change often, and operators are increasingly leaning this way, according to Vergnaud.

This favours IP video transport vendors such as Pleora, which have established themselves in the VLAN camp. "MPLS is good if it is a studio set-up and it is spread across many sites," says Pleora's Co-Founder and VP of R&D, Alain Rivard. "But if it is really for distribution; that's where layer two VLANs really shine. If you want to insert a feed somewhere, say with five destinations, it is very easy to set-up and build this small VLAN for distribution."

Increasingly, VLAN services are becoming available to tap into, both in Europe and the US, and this is helping VLANs gain greater traction than MPLS for distribution, particularly within single operator domains lacking more complex transport requirements.

This does mean, though, that operators are reliant on third party delivery. "The quality of the layer two VLAN is really dependent on the service provider and on which core infrastructure they have access to," admits Rivard. The point is that with VLANs, the QoS depends not just on having enough bandwidth available, but also on the ability of the equipment to protect against and recover from faults. Pleora scores well on this latter count, having, in effect, video-enabled but otherwise standard Ethernet switches. Not all VLAN equipment is equally resilient.

Another option is to bypass the IP network altogether for linear traffic – in other words, for traditional broadcast and multicast services distributed from a central point to many or all subscribers.

The Swedish vendor of multiservice network equipment, Net Insight, has grown rapidly in IP transmission by adopting a hybrid approach whereby multicast traffic is offloaded to
dedicated optical channels, while the IP network handles only VOD (Video on Demand) and PVR (Personal Video Recorder) traffic that requires its routing abilities. “This guarantees zero congestion, low latency and fast protection (for the linear traffic),” explains Net Insight’s founder, Per Lindgren. However to ensure that such low latency also applies to the VOD/PVR traffic, the IP network has to be scaled for the peak times when everyone comes home from work and starts zapping through the channels at once, Lindgren adds.

Net Insight’s great achievement lies in the efficiency with which it can pack video into optical channels. “We typically load a wavelength or fibre with up to three times more traffic than other solutions in a video-centric network,” said Lindgren.

Operators face some other technical issues beyond Quality of Service and utilisation when migrating to IP. The most notable issue is the growing number of formats that operators have to address for final delivery, with receive devices ranging from PCs, fixed television and mobile devices, the AVC /H.264 codec joining MPEG-2 as a mainstream encoding tool, and the need for both SD and HD resolution. This has an impact on distribution because the operator has to decide whether to carry each format separately, consuming extra bandwidth, or to carry it all as a single stream and break it down at, or near, the network edge. Once the video has been compressed into its final format and bit rate it cannot then be redeployed for other devices.

According to Johny Dolvik, CEO of T-VIPS, the Norwegian vendor of IP transport systems for both video contribution and distribution, there is a new trend towards carrying video in just one sufficiently high resolution format, using JPEG2000 compression.

Having been developed for still images, JPEG compression works purely within each frame [i.e. a picture that, when added to other pictures (frames) at a rate of x frames per second makes up a video sequence]. Unlike the MPEG compression standards, it does not exploit movement between successive frames to reduce overall bit rate. [MPEG relies on one full frame encode called an I-frame, and then uses the data in that picture as the basis for subsequent frames, transmitting the changes to the picture, rather than the whole picture again, until another I-frame comes along].

This makes JPEG ideal for performing generic compression on edited video before cutting it down with AVC or some other inter-frame algorithm for final delivery. “This is particularly interesting for HD, although also for SD,” says Dolvik. “We can put this into JPEG and send it out to a satellite uplink, and edit or add a commentary on the way. If you perform compression too early, you then have to carry several qualities.”

Typically, an HD stream would be carried at 50-100Mbps, JPEG2000 having brought this down from the raw studio rate of 1.5Gbps. At this level of compression, JPEG2000 yields better quality than alternative compression schemes, including MPEG-2 or AVC. Although it consumes more bandwidth than, say, MPEG-2 HD streams at 18Mbps, depending on the precise level of compression employed, there is just one clean video stream to work with to feed all downstream formats.

Furthermore, this method avoids introducing the latency associated with MPEG compression during backbone distribution. To an extent JPEG2000 is a halfway-house between contribution and distribution.

It is clear then, that while IP represents the only way forward for distribution, this still leaves several important technology choices for operators to make, and these will depend to some extent on the locations and traffic profiles involved.
The market for broadcast mobile TV is getting more complex with multiple competing standards, the proliferation of DVB-H options to include S-band, and the emergence of broadcast cellular solutions. WiFi and WiMAX are just starting to enter the equation too. John Moulding reports
worldwide) but since 2004 it has become obvious that there could be a range of delivery solutions.

DAB-IP has emerged as a potential solution, ahead of T-DMB thanks to its use in the UK’s first commercial broadcast mobile TV deployment, the four channel service from Virgin Mobile that is operated by the mobile TV service provider, BT Movio. Qualcomm also shook up the nascent market with its FLO specification, which has been adopted for the MediaFLO USA terrestrial network and wholesale broadcast TV service in the United States. FLO is being standardised via the FLO Forum and is being taken seriously in Europe – witness BSkyB’s trial of MediaFLO technology.

Meanwhile, the DVB-H market itself has started to fragment into different scenarios, mainly driven by the need to work around scarcity of UHF spectrum preceding analogue switch-off. DVB-H using L-Band and Band III have both been considered by terrestrial network owner/operators trying to determine the performance of DVB-H in different frequencies and the cost of building networks using this standard.

Most recently, DVB-H in S-band has emerged as a very realistic possibility thanks to the notable backing of Alcatel (using its subsidiary Alcatel Mobile Broadcast) and the decision by satellite operators SES GLOBAL and Eutelsat to launch a joint-venture company that will offer S-band
capacity for mobile phone operators, Pay TV platforms or broadcasters who want to target key European markets with mobile multimedia services (including television).

As you can read in more detail on page nine, Eutelsat and SES GLOBAL are backing Alcatel’s vision for a hybrid S-band infrastructure that uses satellite transmission into S-band terrestrial repeaters to deliver up to 45 channels of mobile TV to users in urban areas. Outside the reach of the complementary terrestrial network, users can expect up to 10 channels direct off the satellite into their phones.

This kind of satellite/terrestrial broadcast hybrid architecture has already been commercialised in South Korea for the TU Media service from SK Telecom. The notable difference is that the TU Media service uses the Korean-inspired S-DMB standard (another derivative of DAB technology).

The S-band solution being driven by Alcatel, Eutelsat and SES GLOBAL (with Sagem, Samsung and ARCHOS committed to delivering compatible handsets/portable media players) requires a new version of DVB-H that makes it work for S-band and also takes account of the complexities presented when you have direct-to-phone transmission combined with S-band terrestrial transmission that is a redistributed signal taken off satellite. The necessary standards work is being conducted via the DVB-SSP (Satellite Services for Portable Devices) ad-hoc group at the DVB.

At IBC, the DVB muddied the water further with an announcement that it was starting work on DVB-H2, the successor to DVB-H, barely two years after the first standard was ratified by ETSI. The digital TV standards creating body wants to develop the next-generation of DVB-T; the European standard for digital terrestrial TV that has had considerable worldwide success, and believes that since DVB-H is based on DVB-T and can use the same spectrum (optimised for UHF), it makes sense to develop the next generation of DVB-H at the same time.

As you can read on page ten, the DVB hopes to improve modulation efficiency by 30 per cent and upwards for the new DVB-T2 and DVB-H2 standards, since considerable improvements are required to make the standards effort worthwhile. Behind this ambition lies the commercial requirement to maximise the use of UHF spectrum when it finally does become available after analogue switch-off, because that spectrum is likely to cost network operators, mobile phone operators, broadcasters or Pay TV operators (or anyone else) a lot of money.

The most dramatic development in terrestrial mobile TV broadcasting during the last two years is probably the introduction of FLO, developed by Qualcomm and marketed by its subsidiary MediaFLO. This technology is spectrum band independent but like DVB-H, works best in UHF and therefore presents potential users with a similar challenge when finding spectrum. But despite this, and the fact that it has yet to deliver a full suite of standards components (including an ESG - Electronic Service Guide), FLO is being taken seriously.

The FLO Air Interface Specification is now an official standard, ratified by the TIA Telecommunications Industry Association, a leading trade body for the U.S. ICT (Information Communications Technology) industries. According to MaryBeth Selby, CFO and Secretary at the FLO Forum, there is other work being carried out in the TIA for further specifications that the FLO Forum has approved, including those related to receive devices and transmitters, while the FLO Forum has now ratified systems information related technologies for the ESG, among other things.

Selby says, ‘The way the FLO Forum has grown is a key indicator to operators that other people will be building FLO solutions and that there will be multiple vendors.’ She adds that once the organisation has streamlined its specification-to-standards process it will put FLO technologies into other standards organisations besides the TIA.

ALL MARKETS OPEN TO FLO

Jeff Brown, Director of Business Development at MediaFLO believes that with the exception of Finland (the home of Nokia and set for a commercial DVB-H roll-out with Digita shortly), there is no European market where FLO or MediaFLO are out of the game. ‘They are all maintaining technology neutrality,’ he says, adding that he believes MediaFLO and DVB-H are the only two main standards players in the mobile TV market.

Despite the interest shown by BSkyB in MediaFLO with its technical trial, the first big strikes in Europe have gone to DAB-IP with Virgin/BT Movio and DVB-H, which was deployed commercially with both 3 Italia and Telecom Italia earlier this year. With Digita set to deploy on DVB-H too, this standard is getting the foothold most observers expected and there is still the sense that the DVB is going to take the largest slice of the European market.

Even in the U.S., where MediaFLO is set to launch its nationwide broadcast mobile TV network imminently, DVB-H is in a good position, with Crown Castle International Corp’s competing Modeo network based on this standard, and the proposed Hiwire/SES AMERICOM delivery solution also using DVB-H.

There is a real possibility now that the mobile TV market will be characterised by competing services using different terrestrial technologies, especially as spectrum becomes available for mobile phone operators or Pay TV platforms to purchase their own frequencies. They can then launch vertical operations that do not rely on a ‘wholesale’ service provider that owns spectrum.
The annual DVB World conference has now become a must for all involved in digital television. It’s the place to be for the latest information on developments in this rapidly expanding field.

Topics will include MPEG 2&4, DVB-S2, HDTV, IPTV, DVB-H, Home Networking, Advanced Modulation for DVB-T and the controversial subject of DRM.

Programme and registration details at www.dvbworld.eu. Further information from seminar@iab.ch

www.dvbworld.eu

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that is made available for a common bouquet of channels offered to all ‘retailers’ (like mobile phone operators).

Jeff Brown believes MediaFLO can provide the solution of choice to such vertical network operators, inferring that free-to-air, horizontal platforms will develop in each territory that rely on DAB or DVB-H instead.

While free-to-air platforms would surely use the established standards like he suggests, the big question is whether European Pay TV operators will really turn their back on the DVB option, given the DVB’s impressive record for generating widely backed and deployed standards that continue to be supported over time and generate strong vendor competition and proven economies of scale. However, DVB standards are not unbeatable; the DVB-RCC (Return Channel for Cable) being a notable example (overtaken by the US-backed DOCSIS for the data-over-cable market).

**CELLULAR FOR ON-DEMAND VIDEO**

Whichever terrestrial mobile broadcast standard is used in a territory, it is almost certainly going to have to work in harmony with 3G cellular. The likelihood is that mobile phone operators will use cellular for on-demand streams, while terrestrial infrastructure will be used to deliver live broadcast TV. MobiTV, which has helped pioneer the mobile TV market with its content aggregation and delivery services for cellular operators, has already announced support for DVB-H and DMB as part of a unified delivery solution that can integrate broadcast and unicast video services.

A look at the delivery technologies MobiTV is now ready to work with emphasises the increasing diversity in this market: DVB-H, DMB, MBMS, BCMCS, TDtv, WiMAX, WiFi, GSM, GPRS, EDGE, UMTS, CDMA, 1XRTT and 1X EVDO. TDtv is adding the latest complication. Several mobile phone operators including Vodafone, 3UK, Orange and Telefonica are conducting a technical trial of TDtv in Bristol, UK. TDtv is a cellular technology that introduces one-to-many broadcast capabilities on cellular networks, based on the UMTS TD-CDMA 3GPP Multimedia Broadcast & Multimedia Services (MBMS) standard. In theory this could make terrestrial overlays redundant but it is not thought the technology will be ready in time to offset the need for terrestrial mobile broadcasting.

The other delivery technology that has entered the equation recently is broadband wireless in the form of both WiFi and WiMAX. MobiTV has agreed a deal this year with AT&T to make its mobile TV service available to AT&T customers via wireless hot-spots and this could open up a market for mobile TV to non-cellphone devices like laptops and PDAs. During September the company also demonstrated live HDTV to mobile as well as fixed receive devices inside homes, using a pre-mobile WiMAX network.

The limited coverage for WiFi hot-spots and uncertainty around WiMAX standards is likely to limit this application to shopping centres and airports etc., but it is yet another example of how the mobile multimedia business opportunity is generating an array of delivery options. In most cases, the driving forces that will determine technology choices will be availability of spectrum and the existence, or otherwise, of a healthy standards ecosystem including cheap phones.
IPTV providers can treat in-home WiFi as an extension of network

Providers can remotely view, manage and diagnose subscriber wireless problems without having to incur the expense of dispatching technicians. There are significant implications for delivering Pay TV using wireless technology.

Ruckus Wireless has made a significant enhancement to its wireless home distribution technology that will allow triple-play service providers to remotely manage the performance of the in-home WiFi-based network, including the ability to see and diagnose problems in real-time. The implications are significant: many IPTV providers want to use wireless home networking to enable multi-room TV without the cost of professional wiring, but they need to be able to guarantee the customer experience if they want to charge for Pay TV services delivered in this way.

Ruckus Wireless has developed a powerful transmission solution (called MediaFlex) that has convinced some of the world’s leading IPTV providers that video can, indeed, be transmitted around a home reliably using wireless technology. Belgacom in Belgium and Hong Kong’s PCCW are among its customers and Teléfonica O2 Czech Republic has just decided to back the system.

MORE FLEXIBILITY
Now the company has introduced MediaFlex NG, claiming it is the first in-home wireless platform to support multiple virtual APs (SSIDs) and extensive remote management capabilities. “It gives service providers unprecedented flexibility, security, visibility and control over subscribers’ WiFi environments,” the company adds.

The Ruckus MediaFlex (and MediaFlex NG systems) are based on standard 802.11 WiFi but use proprietary elements to extend range, increase capacity and enable more predictable performance for data transmission. They use an “industrial-strength” smart WiFi system that automatically adapts to the changing RF characteristics within the home. It is the dramatically improved reliability that enables premium television and VOD to be distributed wirelessly.

CONTROLLING SERVICES
Using MediaFlex NG, service providers can securely deploy and control services delivered over a subscriber’s home wireless LAN (Local Area Network) while allowing consumers to use the same network for interconnecting home WiFi devices and accessing the Internet. Providers can remotely view, manage and diagnose subscriber wireless problems without having to incur the time and expense of dispatching technicians.

Thomson’s HD PVR/voice platform to TV Cabo in 2007

Cable version of the set-top box features an integrated flash player that will enable the operator to run its existing interactive services and develop new ones like VOD

TV Cabo, the Portuguese Pay TV operator (cable and satellite platforms) will deploy HD cable set-tops with PVR functionality and a wireless voice-enabled cable modem in the first half of next year, using Thomson’s DCI8200. The company will become Thomson’s first customer for this product. The satellite version of the set-top (DSI8200), without modem, will be rolled out around the same time.

PORTUGAL’S FIRST HDTV
TV Cabo (a subsidiary of PT Multimedia) has 1.4 million subscribers. According to the company’s CEO, Zeinal Bava, “We are already leading the way towards mass adoption of digital TV services in Portugal: the introduction of HD, PVR and other digital functionalities will enhance our customers’ viewing experience and allow them to customise the product according to their individual preferences. Thomson’s STBs will allow us to efficiently and cost-effectively deliver Portugal’s first HDTV service in 2007.”

The Thomson set-tops feature a 250Gb hard drive to cope with high-definition content and a wireless EMTA (Voice over IP capable) cable modem for high-speed Internet access, Internet telephony and interactive services. There are twin tuners (watch one, record one or record two programmes at the same time while watching a previous recording).

MULTIPLE MIDDLEWARE
A key feature of the DCI8000 series is its support for multiple middleware and Conditional Access solutions, ensuring that the product can work with the existing systems used by operators. The cable set-top box features an integrated flash player that will enable TV Cabo to run its existing interactive services on the new receivers and also develop new interactive services, such as Video on Demand, that take advantage of the powerful processing and storage on the DCI8200.

Frédéric Kurkjian, representing EMEA satellite and worldwide cable at Thomson, says: “High definition TV is key to the future success of both Thomson and our customers and we are pleased to be able to not only announce a cutting-edge, new product for cable operators looking to deploy HD services, but also the first customer for the product.

“By integrating features such as PVR and broadband modems, Thomson’s HD platforms are designed to help broadcasters and operators exploit the opportunities that developments such as HDTV and triple-play services bring, and we are experiencing unprecedented demand for related products and services.”

More news at www.newvideotechnology.net
More than 30 world IPTV providers share their thoughts at IPTV World Forum 2007

Telefonica, PCCW, Belgacom, BT, SaskTel, Deutsche Telekom, Telstra, T-Online France, NetCologne, Telekom Austria, FASTWEB, AT&T and Orange are among the companies speaking at this year’s London event. The conference and exhibition is co-located with TV-over-Net and The Connected Home to maximise the value of delegates’ time.

The IPTV World Forum returns in March with its third annual conference and exhibition, having established itself as the world’s leading event for the IPTV sector. The organisers are predicting over 5,000 delegates and 200 exhibitors and they will be able to hear speakers from over 30 leading IPTV providers including Telefonica, PCCW, Belgacom, BT, SaskTel, Deutsche Telekom AG/T-Com, Telstra, T-Online France, NetCologne, Telekom Austria, FASTWEB, Orange and Bharti Airtel Ltd and AT&T.

SERVICE DEMONSTRATIONS
As in previous years, there will be an ‘IPTV showcase’ area where 25 leading IPTV operators demonstrate their video services as seen by consumers. New for 2007 is the IPTV World Series Awards, which make their debut at the show and which are supported by this magazine as an official awards partner (more about the new awards on page 41).

The IPTV World Forum, held at Olympia in London between March 5-7, will be co-located with The Connected Home exhibition and TV-over-Net in an effort to cater for the obvious overlaps in interest between IPTV, the customer premise experience and the use of the unmanaged public Internet to deliver free and paid-for television/VOD services. A look at the World Forum conference programme for 2007 also reveals an increasing emphasis on television-over-IP generally, reflecting the growing interest among satellite operators in broadband as part of a triple-play and in particular the potential for delivering on-demand video services over private IP networks as part of a hybrid satellite/IP network architecture.

Highlights from this year’s conference programme are AT&T talking about ‘Project Light Speed, an evolution in IPTV Services’; Belgacom discussing ‘Customer acquisition, behaviour and spending’; and SaskTel looking at ‘How TV drives broadband customer acquisition’.

Other notable conference sessions are T-Home, Deutsche Telekom on ‘Does IPTV work in Germany?’, Telekom Austria looking at ‘Localisation and user-driven content’ and FASTWEB addressing ‘Internet VOD and the ultimate long-tail’.

There are panel discussions on Marketing strategies for IPTV, ‘Is IPTV going to plan?, ‘Revenue generators and killer applications’ and ‘Making the most of on-demand and iTV’. Reflecting the growing interest among IPTV operators in media portability (e.g. giving subscribers access to content from outside the home) there is also a panel discussion on ‘The prospects for mobile media’.

LEADERSHIP POSITION
This conference has carved out a leadership position in IPTV events on the back of its A-list speakers taken from the service providers driving IPTV worldwide and the line-up for 2007 is unlikely to disappoint. Speakers include: Bernard Ghillebaert, CEO, Orange UK; Mary Turner, CEO, Tiscali; Ashley Highfield, Director of Future Media & Technology, BBC; Helmut Leopold, Director, Platform and Technology Management, Telekom Austria; Jeff Weber, VP Product & Strategy, AT&T; and Jean Charles De Keyser, Chairman, Belgacom Skynet. Marc Schroeder, Senior Vice President T-Home, Deutsche Telekom AG/T-Com, is also speaking at the event.

WORLDWIDE SPEAKERS
Also speaking are: Paul Berriman, Head of Strategic Market Development, PCCW; Paolo Agostinelli, Head of Media & TV, FASTWEB; Marc Watson, Commercial Director, BT Vision; Antonio Schuh, Director for Content Planning, Telefonica; Diana Milenkovic, Senior VP Marketing & Mobility, SaskTel; and Rajiv Chaudhuri, Edge Architecture Manager, Network Technology, Telstra Operations, plus many others.

IPTV WORLD FORUM
When: March 5-7, 2007
Where: Olympia, London
Information: www.iptv-forum.com
Registration: +44 (0)117 3116 222

New Video Technology magazine is an official media partner for IPTV World Forum 2007.
CONAX CAS7 SECURITY FOR TEO’S GALA IPTV LAUNCH
The Lithuanian telecoms operator TEO LT AB has selected the CAST7 Conditional Access solution from Conax to protect its IPTV service, which launched in October.

GALA TV is expected to reach 40,000 subscribers by the end of this year and according to Nerijus Ivanaukis, director of the marketing department of TEO: “We needed a strong and proven Conditional Access technology that could be flexible in growth and easily adaptable to new technology. After evaluating several brands in the market, Conax’s solution was found to be the most secure and future-proof for providing our services.”

TEO is a leading provider of Internet, data communication and fixed-line telephony in Lithuania and its GALA television offering is being rolled out nationwide. The service will make use of digital terrestrial television signals as well as video delivered over a private IP network, relying on hybrid IP/DVB-T boxes. The operator is currently using its own middleware, developed in-house.

TURNER BROADCASTING WANTS SCIENTIFIC ATLANTA’S D9034 ENCODERS FOR IPTV FEEDS
Turner Broadcasting System Inc. (TBS, Inc.) is going to use Scientific Atlanta’s D9034 standard-definition encoder to provide MPEG-4 Part 10 (AVC/H.264) signals for telecom companies. It is thought the company will become the first US linear programmer to provide its own AVC signal for delivery over IPTV networks.

Scientific Atlanta’s standard-definition systems will be installed at Turner Broadcasting’s Techwood campus and CNN Center in Atlanta to provide signals for CNN, CNN Headline News, TBS, TNT, Cartoon Network and Turner Classic Movies.

“By the end of the year, Turner Broadcasting will be able to provide five of our popular cable television networks to licensed operators in an IPTV-compatible format,” explains Mike DeHart, Vice President of Domestic Distribution for Turner Network Sales (TNS).

SATELLITE DEPLOYMENT
The company designed a turnkey solution for Milenyum TV in Turkey in 2004 for a (one-way) satellite network but this year’s IBC exhibition provided the launchpad for a one-way software CA as a defined, marketable product. It is called BCAS (Broadcast Conditional Access System) and, according to Andy Mathieson, a director at Latens, “We are going after the pure DTH (direct-to-home satellite) market and digital terrestrial (DTT). There are analogue cable systems where we could deploy one-way solutions as well.”

This new technology would also be suitable for use on hybrid broadcast/IP networks, Latens says.

The vendor is not willing to discuss in any detail how the system works, but it seems to be based on the customer providing essential identifying information from time-to-time so that the set-top box remains authorised to receive the appropriate content.

INFORMATION EXCHANGE
On a two-way system this exchange of information would be performed via the network but Latens has been working on mechanisms that do not require a physical return path from the set-top box. It could be that the company is going to utilise some form of automated process using the Internet or text messaging as the medium of exchange, for example, which amounts to an intermittent return path by other means.

Mathieson provided some clues at IBC, namely: the company is using new techniques that have become available on silicon and set-top boxes during the last 18 months; the silicon in question is off-the-shelf and there are no special Latens-defined secure chips; and the system could be made to work on set-top boxes that are up to two years old, but the complications of retrofitting a client device mean it is really an application for new set-top boxes. He also said there is a small amount of code that has to go into the set-top box and this can be added prior to shipping or via a software upgrade, downloaded into the box once it is in the field.

Mathieson suggests a broadcast platform operator could simulcrypt so that Latens BCAS can be used on new set-top boxes as they are deployed while the legacy CA solution remains on the existing receiver population.

Latens launches software-based CA for one-way video networks, targeting DTH

While there is growing support for software-based CA on two-way networks, Latens is pushing the boundaries again

Latens Systems, one of the pioneers of software-based Conditional Access, hopes to shake up the content security market again with the introduction of a solution aimed at one-way broadcast systems, which, of course, includes satellite television.

There is growing support for the concept of software-based content security on two-way networks (although debate about whether it should be anchored in hardware) but Latens is almost a lone voice claiming that smartcard-less security, and especially the software-only variety, can work on a one-way network.

“"We are going after the pure DTH (direct-to-home satellite) market and digital terrestrial (DTT)"

ANDY MATHIESON, DIRECTOR, LATENS SYSTEMS
Verimatrix targets hybrid broadcast/IP networks with its DVB cardless security

Software-based CA specialist is targeting satellite, cable or terrestrial operators who want to harness IP broadband networks for interactive services like VOD. VCAS for DVB will work with other CA systems, giving operators the option to deploy new IP-enabled set-top boxes with their legacy CA for broadcast services, but use VCAS for interactive IP services

Verimatrix, a content security supplier that has built its reputation in the IPTV market using a software-based, smartcard-less Conditional Access, has introduced a CA system for hybrid broadcast/IP networks. The company claims the avoidance of smartcards reduces security management costs for operators and also enables Pay TV companies to select lower cost set-top boxes. The new solution is being pitched directly at satellite, cable or terrestrial operators who want to harness IP broadband networks for interactive services (like VOD).

According to Stephen Christian, Director of Marketing at Verimatrix: “The most important element is to be able to intercept operators who already have incumbent CA vendors for DVB broadcast services and offer them a way to reduce the cost of the set-top boxes they are deploying and offer value-added services to new subscribers, but without disrupting the installed base.”

HYBRID ARCHITECTURES
Latens Systems, one of Verimatrix’s rivals in the smartcard-less market, has also announced a DVB broadcast CA solution (see separate story) but an important difference is that Latens is targeting pure broadcast networks (one-way satellite, for example) as well as hybrids with its new Latens BCAS product, whereas Verimatrix is eager to emphasise that its new ‘VCAS for DVB’ security system is aimed only at hybrid network architectures.

“Right now, our system technology does not support periodic connectivity,” explains Christian. He adds that the always-on connection has to be broadband today - although he would not rule out the possibility that Verimatrix will develop the system to work with dial-up return paths.

VCAS for DVB will work with other CA systems so operators have the option to deploy new IP-enabled set-tops with their legacy CA for broadcast services and Verimatrix for the interactive IP services, or use Verimatrix for both broadcast and IP-enabled services on the new population of set-top boxes, while still using the legacy CA on the existing population of one-way receivers.

“We are enabling operators to buy boxes that do not require smartcards or hardware associated with cards.”

STEPHEN CHRISTIAN, DIRECTOR OF MARKETING, VERIMATRIX

ELEGANT SOLUTION
Verimatrix claims that its solution for hybrid one-way/two-way network architectures is more elegant, technologically, than those available from ‘traditional’ smartcard-based CA vendors who have introduced IPTV-centric security that can be added to broadcast systems for hybrid networks.

“We started with a software-based solution oriented towards broadband and by adding a relatively small amount of technology to the simulcrypt interface, we have found that the headend does not require much modification,” claims Christian. “We can talk to existing DVB multiplexers that have simulcrypt interfaces and don’t disturb the transport stream very much, so it is easy to add to the headend. At the set-top box, we are enabling operators to buy boxes that do not require smartcards or hardware associated with smartcards, yet offer highly renewable security from a client that knows about both broadcast and interactive content and manages them using the same key system.”

The new Verimatrix VCAS (Video Content Authority System) for DVB system is based on proven, mature Internet cryptographic technologies, the company says. It uses Verimatrix MultiCAS technology to provide a single content security management approach for DVB-C, DVB-S or DVB-T in conjunction with a VCAS secured IPTV network. To extend the ‘security perimeter’ of the entire system, VCAS for DVB also includes patent-pending QuantumID, which Verimatrix describes as a “perfect clone detection technology that addresses theft of service challenges for operators”.

ENCRYPTED DATA
VCAS is built on the principle of PKI (Public Key Infrastructure) using X.509 digital certificates to identify each component in the system as well as the means to securely encrypt data using public/private keys. In the hybrid system the company adds some Verimatrix format ECMs (Entitlement Control Messages) to the broadcast stream in addition to the ECM stream from the legacy CA the operator is running. This means that the legacy and new CA could be used to secure different set-top boxes in the field.

The migration towards hybrid networks (like satellite with an IP broadband connection) could be a disruptive moment for the video security market, since new set-top boxes must be deployed with Ethernet or USB connections to provide the broadband connection.
Kudelski acquires a controlling interest in iTV specialist OpenTV

Company says clients increasingly want turnkey solutions. Deal means it can align Nagravision security and systems integration know-how with OpenTV’s middleware and emerging interactive advertising solutions

The Kudelski Group has acquired a near-27 per cent stake in interactive TV company OpenTV Corporation, taking 75 per cent of the voting interest of OpenTV’s ordinary shares so that it has a controlling ownership interest. The stock purchase was made from Liberty Media Corporation.

SOFTWARE LEADER
San Francisco-based OpenTV is a market leader in digital TV software including middleware and interactive applications. Its set-top box middleware is found on 73 million receivers worldwide across cable, satellite and IPTV. Customers include EchoStar, Time Warner and Bell ExpressVu (for middleware and interactive applications), and Comcast, Charter and Cox for interactive advertising. European customers include BSkyB and TPS.

Kudelski owns Nagravision, whose main business is content security but also includes the Lysis content management portfolio. The company also owns Quative, a new entrant into the IPTV platform market. According to the company’s chairman and CEO, André Kudelski: “Clients increasingly demand turnkey solutions. With this transaction we can more closely align Kudelski’s Nagravision systems integration know-how and security with OpenTV’s scalable and market proven middleware and their emerging interactive advertising solutions.

“The transaction allows us to be more responsive to clients that want either combined systems solutions or only parts of the system, such as only Conditional Access or middleware, providing them with a better choice and service. Meanwhile, both OpenTV and Nagravision will continue to support respectively other third-party Conditional Access systems and middleware when specified by their customers.”

ADDED VALUE
Kudelski expects the transaction to add value to both companies by accelerating and extending OpenTV’s product development, opening up new markets to OpenTV’s product suite and creating a strong combined ecosystem of products.

After closing (expected by the end of Q1, 2007) directors designated by the Kudelski Group will comprise the majority of the Board of Directors of OpenTV. André Kudelski will become chairman of the board.

ioko and Sun’s converged digital delivery platform
North European operators offered chance to deliver services across multiple channels to multiple devices via one platform. Service bundling will be made easier

In an alliance of ioko, Sun Microsystems and Vignette is promising North European telcos, ISPs and media and entertainment companies the opportunity to deliver services across multiple channels, to multiple devices (such as PC, digital set-top boxes, mobile phones and other portable devices) via one platform. This convergent delivery platform will combine Vignette’s next-generation Web solutions, ioko’s expertise in the delivery of media solutions and platform management services, and Sun hardware, Web infrastructure, security solutions and services.

CONVERGENCE TECHNOLOGIES
“Until now, companies looking to take advantage of emerging convergence technologies to create and deliver multimedia content to customers have done so in a piecemeal fashion and crucially, have not been able to use their existing website infrastructures,” the three companies state. “The consolidated platform will help reduce content delivery costs and make it much easier for companies to identify consumer demands and trends through reporting and analytical tools.

“This will enable them [service providers] to respond to market trends faster and offer compelling new content at an earlier stage. By providing insight into content consumption and having the opportunity to market targeted personalised content, companies can increase revenues through up-selling and by offering service bundles.”

CROSS-PLATFORM EXPERIENCES
The companies say the requirement for a convergent delivery platform is being driven by consumer expectations for uniform cross-platform experiences. “The reality of ‘Digital Convergence’ has only emerged in the past 12 months or so, mainly due to the rapidly increasing capacity of broadband and mobile networks,” they say. “Consumers are now expecting the same rich user experiences using a computer at home or a mobile device as they have traditionally had with broadcast television.

“Companies can now use the same platform to manage the content on their primary dot com domains, deliver video to Personal Computers and mobile devices, provide store fronts for consumers to purchase and download music, games and ringtones, and interact with each other in a Web 2.0 rich environment.”

ioko says most of its business over the coming 18 months will be focused on assisting telecoms and media companies with convergence. John Griffin, Sales and Marketing Director, comments: “With our history of large-scale platform development for media companies around the globe, this next phase of digital expansion is one in which ioko is enthusiastic and confident about applying our genuine expertise.”
The IPTV World Series Awards 2007: a showcase for IPTV technology innovation

The commercial requirements of IPTV providers have driven much of the technology innovation in digital TV over the last few years and this sector now has an awards that recognise the best solutions for television-over-IP. Hosted at the IPTV World Forum event in London next March, they are supported by New Video Technology as an official partner.

The IPTV market is the source of great innovation in terms of Pay TV business models, consumer services, content and go-to-market strategies. It is also fuelling technologies that revolutionise television and rapidly move into other digital Pay TV markets – the most obvious being the use of two-way, switched IP networks. And as broadband providers launch and build their video services over the next few years, there will be a constant stream of new challenges, opportunities and with them, technology solutions.

DEBUT AWARDS
This maturing market deserves an annual awards event to call its own and now it has one: The IPTV World Series Awards 2007. The debut awards, hosted at the IPTV World Forum in London next March, will provide a much-needed showcase for the most important technologies and the finest talent in today’s IPTV industry. They are being supported by New Video Technology and IPTV News Analyst magazines and by the IPTV News website and newsletter (all Digital Media Publishing titles).

IPTV World Forum is the world’s leading television-over-IP conference and exhibition and is expected to attract over 5,000 visitors and nearly 200 exhibitors in its third annual event, which is being held at Olympia in London between March 5-7, 2007.

The awards categories for 2007 cover the core technology requirements for IPTV from platform management and the headend through the network and into the customer home. The judges announced so far are: Steve Hawley, Editor, IPTV News Analyst and respected IPTV consultant/analyst, Stephen McClelland, Editor-in-Chief, Telecommunications, Stuart Thomson, Editor, Cable and Satellite Europe, and John Moulding, Editor, New Video Technology. These four publications are all official awards supporters.

Any organisation can enter the IPTV World Series Awards including technology vendors and service suppliers, IPTV operators and other network owner/operators. You do not have to exhibit at IPTV World Forum. There is no entry fee for entering and companies can enter a maximum of ten entries across all categories.

The deadline for awards entries is Friday, January 5th, 2007.

OFFICIAL SUPPORTER
As an official supporter of the IPTV World Series Awards 2007, New Video Technology magazine will be previewing the shortlisted entries in our regular email newsletter during February, then profiling the shortlists and winning technologies in our May/June 2007 printed edition.

Shortlists will also be previewed on IPTV News (website and newsletter) at www.iptv-news.com, which has a subscriber base of over 6,000.

John Moulding, Editor of New Video Technology says: “The emergence of IPTV has fuelled a digital TV technology boom and much of the innovation in television today emanates from that sector. There is certainly a place for an awards like this. As a technology-focused magazine covering all the major digital TV platforms, we are delighted to support The IPTV World Series Awards 2007.”

MORE INFORMATION
Full details about the awards can be found on our website, including the judging criteria and how to enter. All enquiries about the awards, both marketing and administrative, should be directed to Justin Lebbon at jlebbon@junction-group.com

AWARDS DATE: March 5, 2007
ENTRY DEADLINE: January 5, 2007
MORE: www.newvideotechnology.net

AWARDS CATEGORIES

1. Best IPTV platform management/middleware/application solution
2. Best IPTV distribution/transport/delivery solution
3. Best IPTV headend & video processing technology
4. Best IPTV customer premise equipment technology
5. Best IPTV content protection/rights management solution
New Zealand's Freeview Opt for MHEG-5 for 2007

The consortium of New Zealand free-to-air broadcasters known as FreeView has ordered a complete end-to-end MHEG-5 based interactive TV solution from Strategy & Technology Limited (S&T). This represents the first full-scale deployment of MHEG-5 technology outside the UK.

FreeView is a digital television service planned for New Zealand in 2007 that will use both satellite (DBS-S) and terrestrial transmitters (DVB-T).

The order is for S&T's TS Broadcaster and TSPlayer systems and an EPG application for the FreeView DTH service. This follows the successful completion of a proof-of-concept trial hosted by TVNZ using sample MHEG-5 applications and set-top boxes. The system will give all the FreeView broadcasters a fully redundant playout platform for interactive applications as well as a FreeView EPG that will provide consistent appearance and behaviour on FreeView-certified receivers and set-top boxes.

Seamless Experience

In addition to this, many platform operators want to develop seamless links between the Pay TV experience and Internet sites they either own or work with, giving viewers the option to watch movie previews or download video, for example, including so-called 'long-tail' VOD, the niche movie and programme files that cannot be stored economically in a private network.

OpenTV's approach has been to create menu bars that can appear on all sides of the main viewing area, and which lead the viewer deeper into the functions they are interested in. In the IBC demonstration, PVR was flagged up as a series of scenes that ran along the bottom of the main picture, providing a DVD chapter style approach to scene selection. When viewing a PVR service, recommendations were offered for other content that matched the current programming and these recommendations could be cross-platform: if you are watching football highlights it might recommend football from a sports-based Internet site, for example.

Matthew Huntington, VP Product Marketing at OpenTV, believes that to keep the eyeballs of the connected generation, service providers need to 'open up' the television experience, utilising all devices in the home – including the set-top box, PC and mobile phone – in the content discovery process.

"If you lose eyeballs to the PC it will be hard to get them back," he declares. "If you provide the long-tail content through the TV, you can provide reminders to draw them back to your experience as a Pay TV operator.”
Ovum: most telcos will have to cooperate for IPTV or deliver wholesale services

The consulting company is warning that while IPTV will succeed, telcos need to view video as a long-term project. The company believes telcos that deliver end-to-end TV platforms, controlling the content acquisition themselves, will be the exception rather than the rule, with many trying but later turning to content owners and Pay TV platforms for help.

Ovum, the analyst and consulting company, is predicting that the majority of incumbent telecoms operators launching IPTV services will eventually end up as wholesale network providers who support third-party television offers over their networks, or working in a cooperative relationship with companies who acquire and aggregate television content for transmission over their networks.

Ovum believes that those telcos who deliver end-to-end television platforms, controlling the content acquisition and rights management themselves, will be the exception rather than the rule.

The company believes IPTV can succeed but has to be viewed as a long-term project by telcos. “Working with partners on a joint go-to-market strategy with co-marketing and co-branding will be the best approach for many operators, and we expect a large number of those partners to come from the traditional TV sector,” reveals Annelise Berendt, Senior Analyst.

In its latest research on the IPTV market, released mid-October, Ovum defines three positions that a major telecoms operator can adopt in the entertainment marketplace.

These are:

1. LEADING STAR
   The ‘Leading star’ is where the telecom operator takes the lead in delivering television content, including licensing and aggregating the content. The advantages are that they have full control of the IPTV service and take all the revenues, but it also carries a high risk since the telco incurs all the costs itself.

   According to Ovum’s Berendt, “If successful in this role, the operator starts to look like a broadcaster rather than just a telco.” Ovum points to Belgacom in Belgium and PCCW in Hong Kong as examples of ‘Leading stars’, although there are few players operating this model.

2. SUPPORTING CAST
   ‘Supporting cast’ is where the telecom operator partners with one or more content providers to deliver IPTV, co-brands the service and co-markets it. This avoids the high risk aspects like content licensing but requires the formulation of a good partnership and does not maximise revenues. A good example is France Telecom, which went to market in a collaboration with France’s two satellite operators [CANALSAT and TPS], who provided all the broadcast TV content that was available then on Maligne TV (now Orange TV).

3. PRODUCTION CREW
   ‘Production crew’ is where the telecom operator opens its network to third-parties who want to deliver television services, taking a backseat role that is not seen by the consumer. This model ranges from providing a basic wholesale transport service to being an intelligent facilitator of services.

   The ‘Production crew’ business model involves minimum risk but the rewards are also less: limited revenues and thinner margins. Ovum expects some telcos who already deliver communications wholesale services to add ‘white label’ IPTV solutions. The company even points to the possibility of a supermarket offering branded TV services via this route.

   Berendt says: “We believe a few players will be successful as ‘leading stars’ but not many. A lot will try to get to that position but we think that in time they will fall back to the position of ‘supporting cast’ and ‘production crew’. These are the two positions where we believe telcos should play.”

IPTV DIFFERENTIATORS
Ovum identifies exclusive content, user-generated services, integrated communications [like telephony via the TV] and cross-platform services [like IPTV and mobile TV] as potential differentiators for IPTV services. It warns, however, that eventually, a differentiator becomes a ‘must-have’.

Ovum sees targeted advertising - and even the possibility that consumers will opt-in to view certain kinds of adverts - as an area IPTV providers can pursue, although not as a differentiator for consumers.

At a press conference in London to unveil the research results, Annelise Berendt pointed to Verizon and its FiOS service in the U.S. as an example of how telcos can seek to differentiate themselves through price as well. Using price competition as a differentiator requires a significant investment but as Berendt points out, so does the acquisition of exclusive premium content, the strategy used by companies like Belgacom (Belgian football rights) and PCCW – where the company prized big international brands from the local cable competitor.

“Working with partners on a joint go-to-market strategy and co-branding will be the best approach for many operators”

ANNELISE BERENDT, SENIOR ANALYST, OVUM, SPEAKING IN OCTOBER

ONLINE
O2 and Arqiva will start Dublin DVB-H trial in December. Nokia is supplying its N92 handsets to 400 consumers. www.newvideotechnology.net
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Mary Turner
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