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Published By:

KNect365 TMT
Maple House
149 Tottenham Court Road
London W1T 7AD
Tel: +44 (0) 20 7017 5000
Fax: +44 (0) 20 7017 4953
Website: www.digitaltveurope.net

Editor Stuart Thomson

Tel: +44 (0) 20 7017 5314
Email: stuart.thomson@knect365.com

Deputy Editor Andy McDonald

Tel: +44 (0) 20 7017 5293
Email: andrew.mcdonald@knect365.com

Contributing Editor

Stewart Clarke

Contributors

Kate Bulkley, Andy Fry, Adrian Pennington,
Adam Thomas, Anna Tobin, Jesse Whittock

Correspondents

France: Julien Alliot; Germany: Dieter
Brockmeyer; Italy: Branislav Pekic

Sales Director Patricia Arescy

Tel: +44 (0) 20 7017 5320
Email: patricia.arescy@knect365.com

Art Director Matthew Humberstone**Publisher** Tim Banham**Printing** Wyndeham Grange, West Sussex

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daily email newsletter please visit
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Hub of the home

Pay TV operators' investment in equipment that sits in the home has always accounted for a huge part of their overall expenditure. It is simply extremely costly to invest in the set-top boxes and gateways that are needed to deliver video and broadband services to their subscribers.

At the same time, residential hardware remains the key touch-point in operators' relationships with their customers, and few are ready to relinquish their role as the provider of the box – or boxes – in the home.

This month we look in detail at operators' involvement in the home and the various technology-related choices they face in delivering an ever growing array of services to multiple devices.

First, to what extent does it make sense for operators to continue to use the set-top box as a key tool in differentiating their services from those of competitors? Does the branded consumer premises device have a value in itself as well as enabling operators to provide a measurable and guarantee-able quality of service?

This issue of *Digital TV Europe* will look in some detail at the evolution of TV operators' thoughts about the set-top box, including plans to invest in next-generation devices and to deliver services via a wider range of low-cost streaming boxes.

Delivering content to a single set-top box is no longer enough to satisfy consumers who increasingly also want to view TV shows on their smartphones and tablets. This month we also look at the issue of service providers' involvement in consumer premises WiFi as a means of delivering content around the home.

As demand for the ability to consume content everywhere in the home grows, operators are expected to ensure that high-bandwidth services like 4K UHD video and virtual reality gaming can reach multiple devices wirelessly. We look at how they are tackling the need to deliver high-bandwidth in-home connectivity for multiple applications – including but not limited to video.

An alternative to investing in expensive new set-top boxes or gateways is to try to deliver as much as possible from the cloud. In this issue of *Digital TV Europe* we also assess the growing importance of cloud technology in delivering mainstream TV services, focusing on three key applications: cloud-based DVR, targeted advertising and the overall user experience.

Also in this issue we look at all the recent key industry and technology news, preview some of the technologies and conference highlights of the forthcoming ANGA COM show in Cologne, and look ahead to Cable Congress in Warsaw at the end of June. ●



Stuart Thomson, Editor
stuart.thomson@knect365.com



Q&A: Tor Helge Kristiansen, EVP, Principal Architect, Conax

Tor Helge Kristiansen, EVP Principal Architect, Conax, talks about the evolution of multi-device, UHD and OTT TV content security.

What key challenges and new requirements are emerging in cable operators' content security requirements?

The biggest challenge is still related to the complexity of the ecosystem due to a heterogeneous device market. To satisfy device and content-hungry consumers, today operators are expected to provide a consistent and rich user experience on any device selected by the consumer. Smartphones, tablets and browsers are increasingly vertically integrated into vendor ecosystems, while in order for an operator to successfully deliver OTT content to such devices he needs to cope with variances in video encoding formats, streaming formats and DRM technologies. Balancing the need for security and convenience of use in such a complex ecosystem is a tremendous task for any operator.

What do multi-play operators need to do to secure their content and ensure customers can view it inside and outside the home?

As open consumer devices are increasingly vertically integrated into vendor ecosystems, they also come with pre-embedded platform DRMs such as Widevine, PlayReady and FairPlay Streaming. Deeply integrated into the devices with decent security levels, they provide operators with a good means for securely delivering OTT content to these devices. It does however force operators into using multiple DRM systems in their back-end systems, creating significant complexity in the overall security management of the system when ensuring customers are able to view content in and out of the home.

When using platform DRMs, the operator has little to no control of the security level of each device being used and platform DRM options differ in terms of the business features offered, making it harder for operators to set up consistent service across a multitude of devices. Since the number of attack points in these complex ecosystems is increasing, it is very important to invest in a security solution that ensures holistic protection of the both the content and the service.

To what extent are security issued around UHD TV content resolved?

Hollywood studios have, through the MovieLabs consortium, issued a set of recommendations called Enhanced Content Protection. These recommendations are now gradually becoming mandatory requirements for 4K and UHD as well as early release window VOD content. The MovieLabs 'ECPs' describe security mechanisms covering a holistic security approach and mandate use of hardware based security, Secure Media Pipelines and forensic watermarking, amongst others. Complying with these stringent requirements means basing devices on a new type of security architecture with significant more hardware security backing than historically used. The industry is

rapidly working towards meeting these requirements, and particularly on the STB and TV, we now see a dramatic improvement in security levels through the introduction of new chipset designs. There is still a long way to go for open devices, as they currently do not provide many hardware security mechanisms that can be employed to implement a Secure Media Pipeline. MovieLabs' ECP is a very clear signal from Hollywood that security is to be taken very seriously going forward, and more important than ever for operators to choose a security provider that can handle security from a holistic standpoint. Clearly, you need a lot more than just a DRM!

How much investment should operators need to make in the area of security?

Good content protection security is still the most important element in ensuring healthy revenue streams for operators of any size. The ability to collect payment from consumers accessing your service and eliminating non-paying consumers' access to the content or service is vital. While availability of good platform DRM clients limits the necessary investment on the device side, it is increasingly important to invest in strong, scalable security back-end solutions to cope with the complexity of addressing multiple devices with multiple DRM options. There are an increasing number of secure and flexible solutions available from experienced security providers such as Conax that enable operators of all sizes and varying levels of resources to start a secure and more advanced services operation to satisfy the growing demands of content and device-savvy consumers.

To what extent do the security requirements of pure OTT services differ from broadcast and pay TV?

We've seen different policies evolve within the content industry regarding security requirements for OTT content, changing quite a bit over the last years. Six to seven years ago, many studios were quite reluctant to embrace pure over-the-top content, as the market, business models and choice of technology were still quite immature.

With OTT/multiscreen content consumption increasingly more common, the industry has become more commercially and technically mature and most operators offer TV Everywhere services. Security requirements have become more standardised and we're in a transition where the latest technology trends are driven by OTT and streaming services, like 4K and virtual reality. However, as the business grows, the market for hackers is also becoming more appealing. Thus, the industry is far stricter on 4K requirements and hardware regarding security, adding a new level of security requirements compared to traditional broadcast and pay-TV solutions.

News digest

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EC to enable content levy to be imposed on Netflix-type services

By Stewart Clarke & Stuart Thomson >

The European Commission has confirmed that it will oblige on-demand services such as Netflix and Amazon Prime Instant Video to ensure there is at least a 20% share of European content in their catalogues. The EC has also said that EU member states will be able to ask on-demand services to contribute financially to European content creation.

The EC in May published its revised Audiovisual Media Services Directive, which contains the new proposals.

The revised directive calls for on-demand services to “reserve at least 20% share for European works in their catalogues and to ensure adequate prominence of such works”.

In addition, member states will be authorised to impose financial contributions in the form of direct investments or levies allocated to national film funds to on-demand services in their jurisdictions – and also, in certain circumstances, to those



“established in a different Member State but targeting their national audiences”.

Netflix, whose European operations are based in the Netherlands, could therefore potentially be obliged to contribute to domestic production in, for example, France.

The EC made it clear that the obligations on promotion of European works would not apply to players with “no significant presence on the market” and in particular, to “companies with a low turnover”. In addition, states may waive obligations on some services where imposing them would be “impracticable or unjustified by reason of the nature or theme of the on-demand audiovisual media services”.

The wording of the revised directive indicates that where

contributions are imposed on services based outside the targeted state, these will be levied only on revenues raised in that targeted state.

Netflix responded to the Audiovisual Media Service Directive proposals by saying that it already invests in European content, and that a European programming quota will not boost production in the region.

“Our members around the world love European programming, that’s why our investment in European programming, including Netflix original titles created in Europe, is growing,” Netflix said. “We appreciate the Commission’s objective to have European production flourish. However the proposed measures won’t actually achieve that.”

The subscription video-on-demand giant has started making a select number of originals out of Europe and noted that it is “actively looking for additional projects”.

The European Commission’s plans attracted mixed reactions elsewhere.

John Enser, a partner at media law firm Olswang said the introduction of a quota for on-demand content will be controversial: “In an on-demand environment, the prominence obligation is likely to prove highly controversial and subjective – it will be interesting to see how this is enforced, and whether a ‘European works’ genre in a list of genres will be enough.”

The directive also calls for a loosening up of advertising restrictions placed on TV broadcasters, which was welcomed by industry groups representing linear channels and advertisers.

Jan Isenbart, president of sales house industry body EGTA said the proposals “delivered some much needed flexibility”, but do not go far enough.

“There are still too many specific rules that only apply to linear broadcasters,” he said. “We believe that more ambition could still ensure a more level playing field, enabling the sustainable production and financing of original, premium European content.”

France

CAB > SFR media plan

Altice-owned telecom and cable operator SFR has completed the acquisition of Altice Media Group France, which owns print titles L’Express and Libération as well as a 49% stake in NextRadioTV, owner of TV channels BFM TV,

BFM Business and RMC. Altice acquired its stake in NextRadioTV last year for €670 million through a partnership with the group’s founder Alan Weill, who will retain a 51% stake in the group until 2019. SFR plans to build on the acquisition to create a convergent media and telecoms company. The group announced plans for the launch of five media services -

SFR Presse, SFR Sport, SFR News, SFR Play and SFR Family - in April. SFR Sport, an anchor TV service comprising five channels, will be the vehicle for SFR’s coverage of the English Premier League. SFR News will include the existing BFM TV, BFM Business and Israeli i24 channels, as well as two new services - BFM TV Sport, which will launch in time for the Euro

2016 football championship, and BFM TV Paris, which will launch in October. i24 will become an HD channel. SFR Play is a live and on-demand service built around SVoD offering Zive. Separately SFR saw its revenues drop by 6.1% in the first quarter to €2.57 billion, with its residential revenues hit by discounting. SFR’s EBITDA also dropped by 9% to €851 million.

SFR managed to grow its fibre base by 66,000 thanks in part to migration from DSL, but its fibre and DSL base combined dropped by 61,000 thanks to a DSL box shortage that the company said had now been resolved. SFR's fixed customer base dropped from 6.52 million to 6.29 million year-on-year, with ARPU dropping from €34.30 to €33.90. Its fibre base increased from 1.6 million to 1.88 million. Mobile subscribers dropped from 18.14 million to 16.98 million year-on-year.

SAT > Canal+ losses mount

Canal+ France lost 183,000 subscriptions in the first quarter, taking its domestic total to 8.276 million. The ongoing problems experienced by the group in France were partly offset by a strong international performance. Overall the group added 170,000 subscriptions in the quarter, thanks to its strong showing in Africa, taking its total to 15.4 million. The group's revenues totalled €1.328 billion for the quarter, down 3.1% despite a slight increase in ARPU in France. The pay TV unit posted an operating loss of €59 million for the quarter. Free-to-air channels in the domestic market performed better, with advertising revenues growing by 11.5% year-on-year thanks to strong audiences for DB and D17. International pay TV revenues increased, thanks to the group adding 500,000 subscribers in Africa in the year to March.

Vivendi also revealed that Vivendi Content's new mobile-targeted offering Studio+, will be available in Latin America "in a few months" thanks to a deal with Telefónica. Vivendi holds a 0.95% stake in the Spanish operator, which it views as a strategic investment that will enable it to expand its content distribution network, particularly in Latin America. Studio+ will have 25 mobile-specific original series available when it launches. Increased losses at Canal+ have pulled down parent group Vivendi's quarterly results. Vivendi revenue was more or less flat at €2.491 billion, down 1.4% in constant currency terms. EBIT was down 3.6% in constant currency terms to €213 million, while net income fell down by 27.3% to €99 million thanks to an unfavourable tax impact following the settlement of litigation with Liberty Media.

Germany

CAB > Tele Columbus up

In its first results since the acquisition of Pepcom, German cable operator Tele Columbus has increased its revenues by 5% in the first quarter on a like-for-like basis to €116.1 million. EBITDA increased by 9.5% to €56.5 million. The company added 12,000 internet revenue generating units and 14,000 telephony RGUs in the quar-

ter. The company had 3.6 million homes connected, serving 2.43 million customers, which translates into 2.45 million cable TV RGUs and 424,000 premium TV RGUs, it said. Internet RGUs amounted to 475,000 and telephony RGUs to 441,000. The company aims to keep the number of connected homes stable over the year and to achieve mid-single digit revenue growth and high single-digit EBITDA growth for the year.

Ghana

SAT > SES in JV with K-Net

Satellite operator SES's media services arm, SES Platform Services, has formed a joint venture with Ghanaian communications technology provider and telecom operator K-Net to bring content to Ghanaian homes via DTH satellite TV and digital-terrestrial TV. The partnership, which will contract capacity from SES at 28.2° East to bring DTH and DTT services to the country, builds on an existing relationship between SES Platform Services and K-Net. The joint venture will use SES's satellite capacity, K-Net's teleport services and SES Platform Services' video platform services to offer a unified bouquet of free-to-air and free-to-view channels from across West Africa, as well as some international channels, to viewers in the region.

Events

NEM-New Europe Market

Date: 14-16 June

Venue: Hotel Dubrovnik Palace, Dubrovnik, Croatia

W: www.neweumarket.com

Natpe Budapest

Date: 27-30 June

Venue: InterContinental Hotel, Budapest, Hungary

W: www.natpe.com/budapest

Cable Congress

Date: 28-30 June

Venue: Double Tree Hotel, Warsaw, Poland

W: www.cablecongress.com

IBC 2016

Date: 9-13 September

Venue: Rai Exhibition Centre, Amsterdam, The Netherlands

W: www.ibc.org

Content Innovation Awards

Date: 16 October

Venue: Carlton Hotel, Grand Salon, Cannes, France

W: contentinnovationawards.com

MIPCOM

Date: 17-20 October

Venue: Palais des Festivals, Cannes, France

W: www.mipcom.com

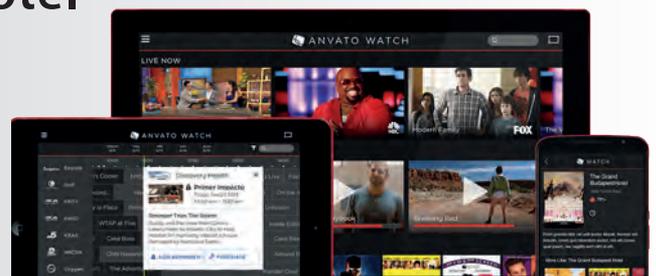
OTT TV – THE NEXT PHASE

June 8, 4.45pm, Cologne Dorint Hotel
Conference Room London C

Anvato Chief Evangelist Matt Smith in conversation
with *Digital TV Europe* Editor Stuart Thomson.

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Global Wrap

US cable association the NCTA and leading operator **Comcast** have launched an all-out assault on regulator the FCC's plans to force cable providers to open up their set-top boxes to competitors. The NCTA described the FCC's set-top box mandate plans as "complicated and backwards-looking" at a time when the TV world was moving away from a hardware-centric world to one that relied on apps and IP delivery. According to projections from **Digital TV Research**, OTT TV and video revenues in the Asia Pacific region are set to rocket to US\$18.4 billion (€16.5 billion) over the next five years, up from only US\$5.7 billion last year. Advertising will be the key revenue source for OTT services, bringing in over US\$8.7 billion by 2021, a US\$6 billion increase on the figure for last year, according to the research outfit. International cable outfit **Liberty Global** has completed the acquisition of Caribbean operator **Cable & Wireless Communications**, combining it with its existing **LiLAC** group to create what the company describes as the leading TV, broadband and telecoms firm in Latin America and the Caribbean. The integration of Cable & Wireless Communications means that LiLAC now serves 10 million video, voice, broadband and mobile customers in over 20 countries. **Discovery** has taken a majority stake in **FoodFood**, the Indian culinary network. The deal sees Discovery join forces with Indian foodie star Sanjeev Kapoor, who will be a minority shareholder in the channel and stay on as a presenter and ambassador.

Poland

SAT > Polsat growth

Pay TV operator Cyfrowy Polsat had 16.532 million revenue-generating units at the end of March, with 5.893 million customers, the group reported. The operator grew its total base of contract services by 2.8% year-on-year, with its mobile internet base growing by 14.7% and pay TV RGUs increasing by 3.5% thanks to strong multiroom sales and strong OTT sales. Multiroom customers grew by 9.8% to 957,952 out of a total pay TV base of 4,560,267. Cyfrowy Polsat said that 18%, or 1.09 million, of its base were now multi-play customers. Cyfrowy Polsat's revenue grew by 1.3% during the first quarter to PLN2.284 billion (€0.5 billion), with stronger ad sales, equipment sales

and broadband revenue offsetting decreased voice revenues. Group EBITDA was PLN865 million, up 3.6%. The group posted a net profit of PLN179 million.

Portugal

IPTV > PT launches 4K box

Portugal Telecom has launched a new 4K Ultra HD set-top box and has unveiled plans to offer a wide range of 4K sport content as well as other 4K channels and on-demand content. The Altice-owned operator, which provides services under the Meo brand, has launched the MEOBox4K, enabling its fibre customers to view a range of sports and lifestyle content, the operator said. The box is based on a Broadcom chipset and has a 1TB hard drive. According to Meo

chief technology officer Alexandre Fonseca, cited by local press, it is the first 4K box to be certified by Mediaroom, the Microsoft-originated operating system now owned by Ericsson that is used for the Meo service. Meo said customers will also be able to access 4K content spanning nature, culture and other genres available via the Hispasat satellite position. Meo customers will have access to a dedicated 4K channel to watch the Euro2016 football championship, including the opening match between France and Hungary, as well as the quarter-finals, semi-finals and final, in 4K. The operator will also offer the Champions League final between Real Madrid and Atletico Madrid from Sport TV in 4K. Meo is offering on-demand nature, fashion and other content on-demand via its fibre network.

Vodafone sees progress in converged services

By Stuart Thomson >

Vodafone had 9.4 million TV customers at the end of its financial full year, out of a total of 13.4 million fixed broadband customers.

Just over half (51%) of the company's customers took a high-speed broadband service at the end of March.

Vodafone said that 1.5 million customers had subscribed to its Vodafone One converged offering in Spain, which combines mobile telephony with broadband and TV on the former Ono network, at the end of the quarter. The company said that, combining the Ono network with its fibre joint build-out with Orange, it now reached 8.5 million premises in Spain with fibre or cable.

Vodafone's equivalent offering in Germany – Vodafone Red One – combining mobile te-



lephony with high-speed broadband and TV on the former Kabel Deutschland cable network, which was launched in November, had attracted 54,000 customers by the end of the period.

Overall, Vodafone added 414,000 fixed broadband customers in the course of the year, and added 426,000 to its next-generation broadband networks. Some 21% of the company's revenues now come from its fixed network activities.

Vodafone said its long-delayed UK TV offering was in "field trials" with "plans to launch later in the current calendar year".

Vodafone plans to launch the cloud-based TV service in the UK and Italy this year and has designed it so that it can be ported to multiple markets.

The company is also planning to ensure that mobile video services are available wherever it offers mobile voice, according to chief technology officer Johan Wibergh.

Speaking on an analyst call on the results, Wibergh said that Vodafone would deliver TV from its private cloud to low-cost boxes. He said that the product could be deployed once and then subsequently sold "in many markets".

Referring to video plans for Vodafone's mobile business, Wibergh said that the company's goal was to have video available everywhere it is present that voice is available, with a "continuous experience" of around 10Mbps.

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CAB > Rights sharing deal

Service providers Nos and Vodafone have struck a deal to share their national and international sports content. The deal is designed to ensure that football matches based on rights held by each company, as well as distribution rights to sports channels and football club channels. The agreement will take effect from next season, ensuring that all customers of both operators will have access to Benfica Channel and Benfica home matches, regardless of the channel that transmits the matches. The pair said that their agreement could be extended to other operators in Portugal. Nos CEO Miguel Almeida

said that the agreement was a key step in ensuring that sports content was available to all operators. Vodafone Portugal CEO Mário Vaz said that the deal represented a “very important and decisive” step for the company as it allowed to “fulfill the promise to bring our customers the content they value”. Nos secured the rights to Benfica’s matches at the end of last year in a €400 million deal, beating competition from Portugal Telecom/Meo. Portugal has experienced ongoing problems in reciprocity of sports rights. In February, Meo pulled Porto Canal, the channel of the FC Port club, from Nos’s platform after the pair failed

to strike a deal. The Portuguese football championship is broadcast on the Sport TV channel owned by Nos and Portuguese businessman Joaquin Oliveira, although Benfica home matches have been exclusive to the Benfica TV channel.

deal leaves MTG with no further interest in CTC or its operations. The sale will result in MTG provisioning for a total negative non-cash impact of SEK1 billion (€0.1 billion) in its second quarter financials, mostly due to accumulated currency changes and an adjustment to the fair value of the holding when compared with the value on the balance sheet as of the end of the first quarter. MTG said it would use the proceeds of the deal to reduce its borrowing levels and fund the development of its business. The sale was forced on it by Russia’s media law that restricted foreign ownership of domestic media assets to a 20% ceiling.

Russia**PROG > CTC sale complete**

Modern Times Group (MTG) has completed the sale of its 38% stake in Russia’s CTC Media. The Swedish-based free and pay TV group received a total of US\$123 million (€110 million) for the stake, and the

Google Daydream virtual reality platform to launch this autumn**By Andy McDonald >**

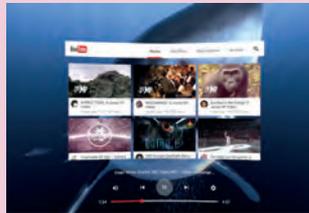
Internet giant Google is set to launch a mobile VR platform this autumn that will encompass smartphones, a reference design for a headset and controller, and apps.

Announcing the plans at the Google I/O developers conference in Mountain View, California in May, Google’s vice-president of virtual reality Clay Bavor said that Daydream will include “all the ingredients you need to create incredible, immersive VR experiences”.

“Over time Daydream will encompass VR devices in many shapes and sizes. But today is about how Daydream will enable high quality VR on Android smartphones,” said Bavor.

The latest version of Google’s mobile operating system, Android N, will include ‘VR Mode’, a development that is designed to offer high-quality virtual reality performance along with low latency.

Google has also created a set of phone specifications for virtual reality called ‘Daydream-ready’.



These specs include a high performance sensor for accurate head tracking, displays with a fast response time to minimise blur, and powerful mobile processors.

“There are going to be a lot of Daydream-ready phones,” said Bavor.

“In fact Samsung, Alcatel, Asus, Huawei, HTC, LG, Xiaomi, and ZTE all will have smartphones that are compatible with the Daydream-ready spec. Several will be available this fall.”

Google has developed a reference design and is working with partners across the ecosystem to develop headsets that will “work seamlessly with Daydream-ready phones” – several of which will also be available this autumn, said Bavor.

The controller that will work alongside these headsets will

have an ‘orientation centre’ built in and touch controls – a demonstration video of which was played to I/O attendees.

In terms of apps, Bavor named a number of partners that will bring immersive applications to Daydream, including *The New York Times*, *Wall Street Journal* and CNN – “so you will be able to experience the world’s news like you’re actually there.”

The Google exec added that: “Hulu, Netflix, HBO, even IMAX are bringing their libraries to Daydream so you’ll be able to watch shows and movies in a virtual cinema, or an immersive 3D film in a virtual IMAX theatre.”

The plans are set to build on the early gains Google has made with its Cardboard VR headset, which it launched at Google I/O two years ago.

“Cardboard has done some pretty amazing things. There are millions of them out there in the world in all shapes and sizes. We’ve enabled thousands of developers to build their first VR app and users have installed more than 50 million VR-ena-

bled apps,” said Bavor.

“But we knew it was just a start, because there’s a limit to how much you can do, how immersive an experience you can create with some cardboard and with phones that were really only meant to be phones. We wanted to create something that has the best attributes of Cardboard but is also comfortable, richly interactive and far more immersive.”

Commenting on Google’s announcement, analyst group CCS Insight’s vice-president, Americas, Geoff Blaber described Daydream as “phase two” in Google’s mobile virtual reality ambitions and said “the scale of Android coupled with content, service, computer vision and AI assets puts Google in a strong position to become a leading force in virtual reality.”

“Google has learned a lot from the more than five million Google Cardboard devices that have been shipped so far. It will be hoping its new Daydream reference design will help its Android partners go head-to-head with Samsung’s Gear VR.”



Q&A: Dr Neale Foster, ACCESS Europe

Dr Neale Foster, COO and VP Global Sales, ACCESS Europe talks about multiscreen TV, appealing to the right audience and the value of data.

To what extent have pay TV operators overcome the challenges posed by seamless multiscreen TV service delivery and what do they still need to do?

The emergence of web-based content has transformed the TV industry into a multiscreen world as consumers increasingly realised the appeal and flexibility of TV Everywhere. Most Pay TV operators have responded by integrating scalable, high-performance solutions to enhance the traditional content offering, drive profitability and fight churn through the support for new consumption models and today's sophisticated display devices.

The next step is optimisation. In order to deliver a satisfying consumer experience, pay TV operators should focus their efforts on these four key actions: harmonising the user experience across all supported devices; integrating enhanced measurement offerings; driving usage, ROI and profitability and reducing operational overheads.

How far are TV operators able to differentiate their service primarily around the user experience and gain new subscribers?

The proliferation of connected devices, most notably mobile, has fashioned a culture of constant connectivity and changed the way consumers think about content consumption. Now, it all comes down to universal access to personalised services, as personalisation contributes to an enhanced user experience and more consumption, translating into higher customer satisfaction. To achieve this, operators need to focus on analysing the right data to accurately understand consumer viewing habits and trends and apply these insights accordingly to tailor their offerings to secure customer loyalty and attract new subscribers.

For instance, by deducing from data aggregation that OTT viewers would watch more content if their favourite programming was automatically synced with their mobile, providers could use automation services to satisfy consumers and upsell additional complementary services.

What are the challenges posed to operators by younger audiences turning to social media networks and other digital platforms and how can pay TV operators adjust?

Factors like viewing location and type of device are undergoing a dramatic shift. With broadband penetration reaching over 80% in Europe and 60% in the Americas, the plethora of personal device options capable of delivering video content is moulding consumption habits, most notably among younger audiences as 11 to 15-year olds watch half the amount of live TV per day as adults, according to a 2014 research by the UK TV regulator Ofcom.

Social media has grown to become an important source of video entertainment, prompting pay TV operators to look at alternate avenues

to reach these captive social audiences and alternate revenue streams beyond the traditional TV subscription and advertising models. Players within the media and entertainment sectors are experimenting with practices that include targeted advertising and using social media to increase skinny bundle subscriptions.

What do operators need to make sense of the vast amount of data potentially available to them from digital distribution?

There is a vast amount of data that operators could collect, but what creates the most value for them lies in aggregating and analyzing the right set of data to obtain actionable insights. Information about consumers' viewing habits, the devices used to access services and other personal data that would provide relevant information to help operators develop personalised content catalogues, services and offerings are key deliverables in enhancing the user experience.

The "Privacy by Design" debate is alive and well, so operators need to be very careful in their data collection and analysis to avoid becoming intrusive. ACCESS Twine enables the TV industry to aggregate data on consumer habits and device usage, as well as facilitate the deployment of highly targeted content catalogues, personalised search and discovery options while respecting consumer privacy.

Employing a standardised measurement system ensures operators can use familiar metrics throughout their business – an important step in optimising and personalising services. This is complex to achieve in-house, so employing a measurement partner to flexibly pre-integrate measurement capabilities into offered solutions is the preferred option of many operators.

What should operators prioritise in applying this data to practical uses and why?

Operators should prioritise applying data towards generating an enjoyable multiscreen user experience. The proliferation of connected devices and systems used to access content is driving an increased tendency for consumer 'switch screening' with over 70% of online adults in the UK using another screen while watching TV, according to a recent IAB UK study. While the active presence of these other devices creates risks of distracting consumers away from TV content, there too are opportunities to extend viewer engagement, and a seamless multiplatform interface is the key to giving consumers a flexible, on-demand option that can be optimised across all connected devices.

Additionally, it's particularly important that the user experience is personalised on smaller screens. With fewer content and service options able to be featured on smaller screens, it's critical that those that are highlighted are the ones likely to be chosen by the consumer.

Slovakia

CAB > New Horizon

Liberty Global-owned UPC Slovakia has launched the group's advanced TV offering Horizon. The service will offer a new user interface, internet TV services, seven-day catch-up TV and the MyPrime video-on-demand service with 1,600 titles available. UPC Slovakia already offers the mobile version of Horizon, Horizon Go, which has been available in the country since May last year.

Spain

CAB > HBO to launch

HBO has struck a deal with Vodafone in Spain for the launch of its planned streaming video-on-demand service in the country, to be

called HBO España. HBO said its Spanish service would launch with an extensive catalogue of premium content including current series such as *Game of Thrones*, *True Detective*, *Veep*, *Silicon Valley* and a variety of HBO movies, documentaries and other series. HBO España will also offer new series from other TV series providers. Vodafone customers will be able to access HBO España from their Vodafone TV service and also via mobile devices, tablets and computers.

Sweden

SAT > Sports for MTG

Modern Times Group (MTG) will launch a new premium sports channel in Sweden. The Viasat Sport Premium channel will have

English Premier League games and those from the Champions League. There will also be coverage of football from Spain and Italy. With sports rights - and notably Premier League rights - increasingly expensive, MTG has segmented its offering across free and pay TV. TV3 Sport HD launched earlier this year and MTG also has a dedicated e-sports channel, eSportsTV. Separately, MTG is to launch the first Ultra HD channel in the Nordic market. Viasat Ultra HD will be a premium sports offering that will launch in time for the autumn sports season, according to the group. MTG has teamed up with satellite operator SES and electronics giant Samsung to launch the channel, which will be broadcast via satellite in Sweden, Norway, Denmark and Finland. SES will broadcast the channel via the

SES-5 satellite at 5° East.

Viasat will also be launching a new Ultra HD set-top box from Samsung, as well as a conditional access module enabling customers with an Ultra HD TV to see the channel. The channel will initially be available to all Viasat satellite customers with sports channels in their package. Viasat Ultra HD will feature selected live sport events from the UEFA Champions League and other MTG sports rights specially produced in Ultra HD.

Switzerland

CAB > UPC drops Cablecom

Liberty Global's Swiss unit UPC Cablecom is dropping the name Cablecom from its brand. The company said that the name change reflected its switch from being

BBC iPlayer loophole to close, scope to trial pay services

By Stuart Thomson
& Jesse Whittock >

The UK government has committed to retaining the current Licence Fee model of financing the BBC for the coming 11-year Charter period, while pointing to a number of areas where a subscription model could be trialled, according to the White Paper published in May.

The government has said it will "modernise the current licence fee system to make it fairer" including closing the 'iPlayer loophole', introducing more flexible payment terms for lower income households and enabling the BBC to make its content portable so that UK licence fee payers can access iPlayer while travelling to other EU member states.

The changes proposed by the government could include the ability to charge international

viewers to watch iPlayer content through user verification.

"The government thinks there is a case for iPlayer to require verification - i.e. access should be conditional upon verification of licence fee payment - so that individuals in other countries, and those in the UK not paying the fee, cannot access licence fee funded content for free. The government will discuss verification and other options with the BBC and look at the best way of implementing this, including through regulations if needed. It will be up to the BBC to determine whether this is an appropriate means of charging international viewers," it said.

While rejecting a subscription model, the government said it welcomed "the BBC's commitment to develop and test some form of additional subscription services during the first part



of the next Charter period, and to consider whether elements of subscription could provide a more sustainable funding model in the longer term". It said subscription would be introduced "for additional services only", and that the "BBC may therefore lead further developments, pilots and exploration of elements of subscription in the second part of the Charter period, if justified and required, in order to inform the next Charter Review process and for potential wider roll-out in the next Charter."

The licence fee will be increased in line with inflation for

five years from 2017-18.

Other key measures in the White Paper, many leaked in advance of publication, include the creation of a unitary board to replace the BBC Governors and the BBC Trust. The BBC will be responsible for appointing "at least half" of the board members.

The White Paper also calls for Ofcom to be made the external independent regulator for the BBC, while the National Audit Office will become the BBC's financial auditor. The remuneration for BBC talent that is paid over £450,000 will be made public.

The BBC Executive will set strategy and deliver services, while Ofcom will issue licences and regulator editorial standards as well as regulating commercial activity and market impact and will monitor and review performance.

solely a cable operator to a provider of converged services including mobile entertainment communications. The operator will henceforth be known as UPC in both Switzerland and Austria. Liberty Global combined both country subsidiaries under a single management team led by Eric Tvetter at the end of 2014. Separately, UPC is launching a new infotainment programme, UPC News TV, in Switzerland. The magazine presented by Sandra Zotti has already existed for nine years in Austria and will now be broadcast weekly in both countries.

IPTV > Sports rights fine

Swisscom has said it will appeal a fine imposed on it by the Swiss competition regulator for allegedly prohibiting the fair marketing of sports content via pay TV in the country. COMCO has imposed a fine of CHF71.8 million (€65 million) on Swisscom and Swiss-

com-backed Cinetrade/Teleclub for failing to offer rights to football and ice hockey competitions to rival TV platforms at non-discriminatory terms. Swisscom and Cinetrade say they comply with the law and that the high levels of investment they have made in sports justify the creation of an expanded sports offering via the Swisscom TV platform. The operator said it would study the judgment and would appeal the fine with the Federal Administrative Court and, if necessary, the country's Supreme Court.

Tunisia

SAT > New platform

Tunisian state broadcaster the ONT has struck a multi-year deal with satellite operator Eutelsat to broadcast a new subscription-free TV platform across North and West Africa via the Eutelsat 7 West A

satellite. The ONT is consolidating about 10 Tunisian channels in a single package aired from the 7/8° West position. Nôomên Elfehri, Tunisia's minister of communication technologies and digital economy, said: "The launch of this national project is a vehicle for Tunisia's sovereignty in the field of broadcasting. Viewers will be able to enjoy a diversified and quality line-up of Tunisian content."

UK

OTT > ITV takes Cirkus

ITV has taken a majority stake in Cirkus, the best-of-British on-demand service. The UK broadcaster was already a minority shareholder, but has now upped its ownership level in the streaming service. Martin Goswami, ITV director of pay and distribution, said: "Cirkus is an important part of ITV's internation-

al pay television distribution strategy. We look forward to accelerating the growth of the business through investment in exclusive content rights and supporting its development as it expands into new territories." Cirkus launched in 2013, and ITV's initial investment was made a year after. Cirkus has launched with Boxer and Com Hem in the Nordic region, and has branched out from drama to factual with the launch of the Curio brand.

IPTV > TalkTalk down

TalkTalk lost 14,000 TV customers in the fourth fiscal quarter, despite bouncing back in overall revenue-generating unit additions from the cyber attack and data leak last October. The company added 148,000 RGUs in the quarter to March. On-net customer additions were flat over the quarter, but TalkTalk reported its lowest ever quarterly churn at 1.3%.

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More information



Ultra HD, voice control, smart home functionality and the ability to monitor your blood pressure. The leading lights of the set-top box industry tell Andy McDonald what the next advances in STB technology will bring.

Thinking outside the box



The set-top box market is at a pivotal point in its history with shifts in technology posing existential questions about what role these devices will play in years to come.

The rise of the streaming device market has led some to hint at a light-touch, cloud-focused future where the set-top will be reduced to a dongle hidden behind the TV. Others claim that the advent of IoT and smart home technology will start to change the basic role of the set-top box.

However, against a backdrop of continued consolidation amongst the set-top box makers themselves, recent moves by some of the biggest operators in the TV space hint at the continuation of high-end, sophisticated device deployments.

Sky's next-generation entertainment service, Sky Q, represents a ground-up rebuild of Sky's set-top offering. Meanwhile, Liberty Global CEO Mike Fries announced on the company's Q1 earnings that its next-generation set-top platform, dubbed 'project Eos', would be "faster" and "provide more functionality than today's Horizon box" – all for a cheaper price.

But away from these headline-grabbing developments, what are the broader future trends that are taking hold of this space and what changes should we expect in the long-term?

Over-the-top and into 4K

Many of the developments that we are seeing in the set-top box market today rest around cloud functionality, the integration of over-the-top services, sophisticated search and discovery features, and the addition of 4K.

According to Ovum, 4K Ultra HD set-top adoption in Europe will climb rapidly in the coming years as a proportion of overall DTT, DTH, IPTV and cable set-top box sales. In 2015, 4K UHD capability was present in just 1.02% of the 39.36 million set-tops sold in Europe. This will rise to 27.62% of 41.70 million units sold in 2020, according to the research firm.

"I think we're seeing a lot of changes around 4K. Now a lot of pay TV operators are pushing 4K set-top boxes, so there's a new generation of boxes coming in since the beginning of the year or the end of last year, especially in Europe," says Ovum practice leader, consumer technology, Ronan de Renesse.

"What's interesting is that most of them tend to be on IPTV – so IPTV-type set-top boxes or hybrid IPTV set-top boxes rather than maybe satellite or cable," he adds, acknowledging Sky Q with its 4K functionality as an exception.

Recent launch news seems to bear this theory out. In May Portugal Telecom launched a new 4K Ultra HD set-top box, the MEOBox4K, for fibre customers. In March, Vodafone Spain officially launched a new 4K UHD set-top aimed at its XDSL base, while a month earlier

IPTV operator Post Luxembourg announced it would launch a 4K set-top from Netgem, the STB N7900. Last year, France's SFR also launched La Box Fibre Zive de SFR, a 4K Ultra HD gateway that runs on its fibre network.

"4K is being used as a way to market the services and the boxes, and get people onto premium packages, but there isn't actually a lot of 4K content out there, especially for linear broadcast," says de Renesse.

Technicolor's chief technology officer, connected home, Jon Walkenhorst agrees that while there is 4K awareness among its customers, there is not "radical adoption" of the technology yet. He puts this down to a lack of original content and the bandwidth requirements needed to deliver Ultra HD.

"These technologies tend to be more IP video-based and less QAM-based. DSL today is typically not enough bandwidth to deliver those. So I think we're going to see 4K and Ultra HD become more ubiquitous as IP delivery becomes more ubiquitous," says Walkenhorst.

Technicolor works with major operators including Telefónica and in France it provides Canal+ Group's compact, 4K-compatible, over-the-top box, the Cube S. "We're seeing our skipper box and our zapper boxes become smaller, almost to the point of the size of a deck of cards," says Walkenhorst.

He claims that, informed by devices like Roku and Google's Chromecast, customers are now looking for little boxes that will slot easily



into the TV, with the value-add coming from the addition of features like apps.

“If we look at a traditional MSO, they’re looking at boxes that they can place [in] numerous [places] around the house. For example, if you have a consumer with three TVs in North America, versus a consumer with one TV in Europe, you’re more concerned with how do I get those boxes to connect.”

He says that the “much broader question” that certain operators are looking at is how to apply multi-node, multi-repeater technologies and how to extend wireless connectivity. He also foresees a move to more immersive, interaction-based experiences. “If you can walk into a room and say ‘turn on the TV’ or ‘tell me what the temperature is’... that could come from the box [with] the box as an IoT hub or controller.”

An Arris design (left), Sky Q (above) and Amazon Echo (right) represent new directions for CPE devices.

The advent of IoT

The evolution of the Internet of Things (IoT) is something that promises to take the traditional set-top box into new territory – though this is territory that is already being explored by major tech companies like Amazon.

The e-retailer’s Echo hands-free speaker and Alexa Voice Service technology already let consumers in the US play music, access news and weather reports, order a pizza or even turn on lights as part of a smart home system. Apple is reportedly looking to develop a similar device using its Siri voice assistant technology, and the potential has not been lost on traditional set-top makers.

“We’ve all seen what Amazon’s trying to do with Echo, initially in the States. We see that type of technology

taking off in set-top boxes. Why do you have to use a remote control? Sometimes for just flipping up through channels, it’s the easiest way,” says Humax commercial director, Graham North.

Humax is a global set-top box provider and its customers include DirecTV in the US. In the UK it makes boxes for the Freeview and Freesat platforms, as well as a 4K-compatible YouView box that it provides as the high-end TV option for operator BT. Discussing the firm’s current strategy, North says “we used to just be [about the] set-top box but now we have gateway teams and we have teams looking at new technology like IoT, so we’re moving into new areas.”

At recent trade events the firm has demonstrated a complete IoT service, with cameras and apps. “We can offer a complete white label package to an operator,” says North, describing a cloud-hosted IoT solution that “works quite seamlessly with the set-top-box”.

Describing the real-world implications of this kind of offering, North gives the example of someone ringing the doorbell while you are watching TV. “It pauses your TV, brings up a picture of someone on the doorstep.” Another



application is using the camera and TV link-up as a sophisticated baby monitor, he says.

Arris' chief technology officer, customer premises equipment, Charles Cheevers, agrees that connectivity is key to the future of the set-top box. "I have a 10-year view that the set-top doesn't disappear all together, because it's never going to disappear. But one thing that could happen is that every room has a wireless device in it, and the wireless device could be something as unobtrusive as possible."

With better WiFi and Bluetooth connectivity, Cheevers sees the potential of the set-top box as an "IoT hub" that could have implications that extend into health, wellbeing and medical applications. [If] someone is sent home from hospital he is typically sitting in front of the TV," says Cheevers, explaining that a set-top could interact with the sensor on medical devices to do tasks like monitor blood pressure.

Gateway to the future

For many industry-watchers it is the gateway, not the set-top box that will take centre stage in this brave new world of smart-home capabilities. For Technicolor's Walkenhorst, as intelligence moves toward the gateway, a certain level of commoditisation will take place in the set-top box space.

"What we're seeing more [of] is requests to enhance the gateway and less to enhance the set-top box," he says. "We're seeing set-top boxes becoming less and less advanced and we're seeing our gateways becoming more advanced – more radios, more capabilities, more memory, more CPU capabilities."

At the recent TV Connect conference, Deutsche Telekom's UK head of business development, Jon Carter, predicted that IoT will disrupt "where value is, how it's captured and the relationship you have with your customer" and said that from later this year its Speedport router will have smart home capabilities built in – paving the way for its use in applications like energy management and security.

"Our view is actually it's the router [that] is the most natural and most obvious place in terms of providing the level of quality of service in terms of consistency of experience for the customer," said Carter, who dismissed the smart TV as not having enough "headroom" to be used as a smart hub.

The increased promise of the gateway can be seen elsewhere in the development path

of the Reference Design Kit (RDK). Originally conceived as a common framework for operators to power set-top boxes, the focus of the software bundle has since broadened out.

Driven by a roadmap determined by a community of more than 275 companies, the initial RDK-V (video) software for STBs has recently been supplemented with a new RDK software solution available for broadband gateways called RDK-B (broadband).

"We focused on set-tops, next was RDK Broadband and now that community is trying to figure out the software profile for the next connected devices in the home. That's the multi-year journey," says Steve Heeb, president and general manager of RDK Management.

While RDK for the set-top has won big backing from the likes of Comcast and Liberty Global, Heeb says it is RDK-B deployments, rather than RDK-V, that are tracking ahead

Roku's Now TV box reflects industry shifts

Sky is gearing up to launch a new Roku-powered Now TV box later summer that will give users access to live linear TV channels for the first time, alongside on-demand content.

The new device, which the companies first announced back in January, will further a partnership that dates back to 2013 – when Sky launched its first Now TV box and inadvertently kick-started Roku's operator partnership programme.

Roku's vice-president of pay TV, Andrew Ferrone, says that the new Now TV box marks an evolution of the product, which was last upgraded in 2015, offering a revamped user interface and a "leap forwards" in terms of search and discovery.

Adding in linear channels also recognises the "importance of free-to-air in the UK market", and the "positioning of the Now TV service as a viable pay TV option", according to Ferrone.

Since the launch of its standalone over-the-top offering, Sky has been keen to stress that Now TV is not cannibalistic to its core business. At the recent TV Connect conference in London, Sky's director of business development and partnerships, Emma Lloyd, said that 90% of Now TV users had never considered a Sky service before – a statistic also cited by Ferrone.

However, by bringing together linear free-to-air channels – watched, if research is to be believed, by an ageing viewing population – with the on-demand Roku channels favoured by millennial viewers, Sky is likely to appeal to a wider audience with its new box.

"I don't know if I can quite comment on shifting demographics, but certainly we think that it will have an appeal to a broader

market, as well as bring increased appeal to the current Now TV market," says Ferrone.

The new iteration of Now TV box speaks to the continued evolution of viewing habits – a wave of change that Roku will also continue to benefit from in markets outside of the UK.

"Broadcast standards are quite geographically specific. This will be a box designed for the UK market but there are several other markets that use standards and technologies not so dissimilar from the UK," says Ferrone. "Roku is a globally scalable platform, so certainly it's been designed with that in mind."

Indeed, the US-based company is already making in-roads in markets like Australia, where Telstra partnered with Roku last year to offer its streaming service and player, Telstra TV, to consumers.

In the US, Time Warner Cable started trialling TWC TV in late 2015, offering its pay TV service, unbundled from its traditional set-top box, through Roku streaming devices. Charter and Comcast have since followed suit with Roku apps for their respective Spectrum and Xfinity TV services.

"Consumer behaviour is undeniable. Roku streamed 5.5 billion hours last year – that was up from three billion hours the year before and so with change comes challenges, but with change comes opportunities as well," says Ferrone. "The market never stops changing. What we try to do is enable operators to bridge that gap to this new streaming world by providing them with the platform for distribution, driving engagement and ultimately driving monetisation through advanced services."

**Roku's box for Now TV
addresses changing
viewer habits.**





Q&A: Charles Dawes, Rovi

Charles Dawes, Senior Director, International Marketing, Rovi talks about the importance of metadata in content discovery and the role of voice technology.

What are the key challenges faced by broadcasters and TV operators in enabling content discovery and how 'fit for purpose' typically is the metadata that is available from various sources?

In today's entertainment discovery environment the consumer expects to have a visually rich discovery experience. This can present a challenge to both the broadcaster and the operator as they need to provide a level of information that is over and above a simple set of time, title and synopsis. For example, many user interfaces are now displaying series content using thumbnail images. This means that the TV operators require all broadcasters to provide episodic images for their content, something that can be challenging. Companies like Rovi not only aggregate and standardise the information for thousands of channels but also enhance it with deep, dynamic, and descriptive metadata to meet TV operators' increasing needs for next-generation guidance experiences. Companies like Rovi are best placed to provide this type of information as they can standardise the delivery across multiple channels to ensure the operator gets the metadata they require.

How important is international scale in supporting broadcasters with the metadata they need to provide content discovery tools to their customers and to how rich is the metadata available across different international markets?

In today's market we see more and more industry consolidation. This in turn leads to more international deployments of discovery tools. Operators are looking to be as efficient as possible and minimise their integration points as well as ensuring a consistently high-quality experience in each country in which they operate. Working with a company like Rovi that provides rich standardised metadata across more than 70 countries is one way to ensure that you meet that requirement. You don't need to go through multiple integrations with multiple suppliers who might not all have the same level of information available.

What combination of automated processing and manual intervention is best-suited to generate a truly comprehensive set of metadata for programming services?

At the base level, editorially curated metadata forms a core foundation, however in today's world we need to move above and beyond this 'static' set of information. Advanced discovery solutions need to have metadata that is aware of how content relationships change dynamically based

on multiple factors, for instance what's trending in the news. Rovi uses our patented Knowledge Graph technology to achieve this, looking at over 100,000 sources to generate 100 million smart tags, 20 million key word assignments and 545,000 sub genres. Something that wouldn't be possible with just our human editors.

What are the specific metadata requirements for advanced search and recommendation features such as voice-based discovery?

As I intimated in the last answer, the key to providing the answers for advanced search, discovery and conversation is the Rovi Knowledge Graph. This ensures that results are continually updated and sorted by relevance and popularity using a cross-section of sources, while driving a deep understanding of relationships and intersections. We also employ a natural language-understanding engine that can comprehend negation, timing and context to ensure that the results you're looking for will appear first.

What are the other key challenges in delivering effective voice-based discovery and how might they be overcome?

One of the largest challenges doesn't come from the technology itself, but rather humans and their experience of voice interaction in the past. Previous systems that are what I'd term 'command-based' haven't allowed you to interact in a 'conversational' way and move naturally from one query to the next as you would when you talk with your partner or friends, and people haven't experienced voice-based discovery as they should have. I'm a firm believer that the 'conversation revolution' is upon us. ComScore has predicted that 50% of all searches will be voice-based by 2020 and, as you use a system like Rovi Conversation services that just works, you return to it as the natural way to find your content. After all, what's simpler than sitting on your sofa at the end of a long day and saying 'show me some classic British comedy that I haven't watched in a while ...' and your entertainment provider finds you those classics from across all your entertainment sources.

To find out more about how Rovi's solutions can help you deliver the most engaging content discovery experience please contact us at getconnected@rovi.com or visit our website at www.rovicorp.com

of expectations. In May RDK Management revealed that more than 15 million devices running the RDK have now been deployed by operators worldwide with RDK-B now in use by SoC and CPE suppliers, including integration in Intel's Puma chipsets, and is "making its way onto software roadmaps of operators around the globe."

Arris already supplies Comcast's RDK-V-supported Xi set-top box, but for Cheevers RDK-B promises to give RDK uptake a boost owing to compelling features such as support for IoT, support for IP video and better WiFi capabilities.

"The broadband piece now is coming up on an inflection point," he says, with cable operators in particular making a bigger push into IP. "Within RDK Broadband there's a move to support video. So the gateway itself becomes a video multiplex. Its job is not only to send HSD [high speed data] but also now to treat and improve IP video in a way that makes it much more viable to work in the home."



"We focused on set-tops, next was RDK Broadband and now that community is trying to figure out the software profile for the next connected devices in the home."

Steve Heeb, RDK

STB: here to stay

Unsurprisingly those working in this space are keen to stress the ongoing significance of the trusty set-top box. "We get this story year in, year out, that the set-top box is dead – it hasn't died yet in the 20 years that I've been in the industry," says Nagra's senior director, product marketing, Anthony Smith-Chaigneau.

From a practical point of view, Smith-Chaigneau says that set-top box functionality cannot migrate entirely to smart TVs and the cloud because of the lack of accountability should apps and services no longer be supported on certain devices: "There are some people that consider the set-top box to be fundamental for their business, because they own the customer, they own the device. If the device goes wrong, they're responsible for it."

Apple TV's latest iteration runs on the iOS-based tvOS platform.

Nagra's IntuiTV is designed to address changing user behaviour.

In line with this thinking, Nagra recently introduced IntuiTV – a set-top box and cloud-based platform that can be configured with a line-up of content and TV services including live TV, VoD and SVoD. As Smith-Chaigneau puts it, "[it is] our concept of how we think a very advanced, user-focused, consumer-focused offering would be."

Humax's North predicts that "some form of PVR in the home" will be around for a long time as a "lot of people still like to keep their favourite programmes stored ready to watch on a local drive" – despite the rise of catch-up TV. "I don't think the simple, tiny set-top box is ready yet and won't be for some time. Even when you get to the point where there's more in the cloud, I think there will be a lot more sophisticated equipment in the home that will enable you to do more things – it will just become a different kind of proposition,"



generation off the ability of the leading games console. So when old games go to retire off the leading games console, they retire to the set-top box," says Cheevers. He draws parallels to the latest version of Apple TV, which now runs on the iOS-based tvOS operating system, allowing iOS developers to create new apps and games for the device.

The RDK's Steve Heeb agrees with the notion that the set-top box "will probably get higher functionality [and] will probably shrink in size" over time. "Things will expand with applications. I think the set-top boxes will get more powerful, slimlined and they'll also get, I think, better looking."

However, like his industry confreres he doesn't see the box disappearing. "The set-top box has a very powerful role and a lot of time it is with security – whether it's DRM, whether it's conditional access – and I think that is [going to be] around for quite some time."

As the set-top box industry continues to evolve, it is important to note that an ever-smaller pool of companies will determine the changes that will shape it from here out.

Technicolor completed its buyout of Cisco's set-top box division for US\$600 million last year and Arris closed its £1.4 billion (€1.9 billion) acquisition of Pace this January. In the last couple of months, Rovi has also agreed to buy TiVo for US\$1.1 billion.

Announcing the Rovi-TiVo acquisition, Rovi CEO Tom Carson said that the combined firm, which will be called TiVo, will offer services "across platforms" to a customer base that includes "traditional, over-the-top and emerging players."

The comments heavily suggest that TiVo will continue to move away from its roots as a pure DVR provider, and serve as a timely reminder of a set-top box market that is in a state of flux. ●

says North. "Now someone has one set-top box in the lounge and maybe a second room. The difference in the future might be several devices around the home, so there will be multiple devices all communicating and sharing content."

For Arris' Cheevers, there is potential to move in other directions in terms of set-top capabilities. Developments in the smartphone and tablet space in recent years point at the increasingly sophisticated processing and graphics capabilities of small chips, and he believes that these could be used to incorporate IP-delivered gaming into the set-top.

"I've often recommended that we make the set-top box one





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Wireless world

Growth in devices that can play back video means that more demands than ever are being placed on domestic WiFi networks. With 4K UHD TV and VR on the way, the problem is only going to get worse. Stuart Thomson looks at possible solutions.

Fixed-line multi-play operators have long supported in-home WiFi as part of their broadband offering and, more recently, in-home WiFi has been used to deliver TV everywhere services. Now, with the launch of advanced TV offerings, including complete line-ups of HD – and increasingly also 4K Ultra

HD – channels, supplied to an ever-expanding number of devices in the home, the burden on WiFi is becoming greater.

The issue is particularly pressing for service providers as problems with WiFi connectivity account for a huge proportion of calls to their customer care centres and ultimately for people churning from their services.

Charles Cheevers, chief technology officer, customer premises equipment, at technology provider Arris, says that operators must build in-home networks that can cope with the expected growth in bandwidth consumption driven by the proliferation of connected devices and the popularity of ultra-high-bandwidth applications such as virtual reality gaming.



Technology providers are addressing the challenges posed by increased use of WiFi.

The other two tipping points relate to HD and UHD virtual reality applications. The addition of HD virtual reality could require 350Mbps while full UHD virtual reality could lead to bandwidth demand over 10 times that required today for IP video – perhaps 675Mbps.

Growth in demand for these high-bandwidth applications will go hand-in-hand with growth in the number of connected devices – tablets, smartphones, wireless cameras, and other devices – all of them consuming video wirelessly.

WiFi architecture

With a growing need to move beyond best-effort WiFi and support the delivery of multiple streams of video to multiple devices, operators are still working out how to deliver quality assurance for in-home video distribution.

For Bülent Çelebi, CEO of wireless networking specialist AirTies, operators have to move beyond straightforward solutions such as deploying modems that work in both 2.4GHz and 5GHz bands – the latter is able to deliver higher throughput and is less prone to interference, but is effective only over shorter distances – which he says is “not good enough” to solve the problem. Deploying higher-specification devices such as DOCSIS gateways with 8x8 channel configurations will be insufficient, he says.

“Operators are investigating what path to go down,” says Çelebi. However, until now few operators have deployed advanced WiFi systems. Single access points situated under the staircase or out of sight in a cupboard remain the most common basis for delivering in-home connectivity – a situation that technologists in the field believe will ultimately be unsustainable.

Brick walls inside homes immediately compromise the bandwidth available from WiFi. In the US, where houses are often made of wood, this is less of a problem, but even in areas where wood construction is predominant, tiling in bathrooms and heavier exterior walls can present challenges. In Europe, where brick and concrete are more widely used, the challenges are even more pronounced.

The situation in the US is also exacerbated, says Çelebi, by the proliferation in the number

of devices now being used to consume video within the home. “OTT streaming is not that big in Europe yet but it is in the US,” he says.

Taking a basic mobile device upstairs in a home will reduce the performance of that device in playing back video.

The only clear solution, says Çelebi, is to build multiple access points in the home. “In particular, you have mobile devices and people moving around inside the house, away from the main WiFi access points – this creates a perfect storm,” he says. To solve the problem operators are now deploying a minimum of two access points and often as many as six, he says. “The good news is you can keep on adding them until you get coverage everywhere,” he says. For Sky’s advanced TV deployment, Sky Q, in which AirTies was involved, the UK pay TV operator “turned all its set-top boxes to smart access points” enabling homes with multiple TVs to distribute video around the home wirelessly.

While delivering the in-home network fully through wireless is the most cost-efficient way to go, some operators have successfully passed the cost of connecting access points via hybrid deployments, using Powerline or Multimedia over Cable Access (MoCA) as an in-home backbone, to their consumers. “You have cable operators in the US charging US\$10 a month for premium WiFi, so they are making incremental money from it,” says Çelebi. Operators can also provide an in-home network to subscribers who trade up to higher broadband offerings as an incentive to do so.

Hybrid solutions

Çelebi says that a ‘pure WiFi’ solution can currently provide about 200Mbps around the house, which, he says, “at this point is more than good enough for multiple UHD streams”. Further down the line, there may be a more pressing need for hybrid solutions, he says. However, not all of these are equal. While plumbing in Ethernet cabling is clearly the best solution available, relying on Powerline is much less reliable, he claims, because of the huge variations in bandwidth available from different sockets and the difficulty of predicting available bandwidth. For this reason, he says, Powerline is best used as a complementary backbone solution to wireless, adding in capacity to what is already available.

For Çelebi, using a combination of the

different technologies available should enable operators to stay ahead of the development of the broadband pipe into the home and changes in consumer expectations about available bandwidth.

Wireless technology itself will get smarter and will make more use of available spectrum to improve bandwidth and performance, says Çelebi. “The next wave of innovation will focus on making use of available spectrum,” he says. The 802.11ax standard represents the next generation of the WiFi standard and will help 802.11ax make use of time division multiplexing techniques to ensure optimal use of the available spectrum, delivering a likely fourfold improvement in bandwidth compared with the current 802.11ac standard. Use of this technology can go hand in hand with technical innovations such as AirTies’ client steering, says Çelebi, enabling slower client devices to be kept out of various bands so that they don’t drive down the speed of the network.

Most agree that operators will have to invest significantly in their in-home networks. Arris’ Cheevers postulates a typical current home network based on a single WiFi access point using 2.4GHz spectrum, probably poorly located and which does not connect to low-power Internet of Things devices.

Cheevers says that the ‘Gigabit home’ could involve a primary gateway – possibly an 8x8 device, and 4x4 extenders to enhance coverage, using both 2.4GHz and 5GHz spectrum. The in-home backbone could be wireless, or wired, based on Ethernet or MoCA.

The need to connect IoT devices will lead to the addition of low-power radios, possibly based on the Zigbee/Thread protocol. There is also potential in the future for the use of 60GHz spectrum – part of what is known as millimetre wave band – which can deliver very high bandwidth over very short distances.

To feed the network, the backbone could be built on a hybrid solution involving existing cabling, new cabling or via a pure wireless solution, says Cheevers.

“We try to leverage what we have. There is coax which is more prevalent in the US. You could have a 10Gbps coax network that could feed these [extenders] without having to rewire,” he says. “Powerline is another option but it struggles to give you multi-Gigabit speeds due to interference and so on. Structured cabling is another option.” Regarding the latter, Cheevers says that there is considerable interest in the effort to create a standard, dubbed 802.3bz,

that would deliver speeds over Ethernet cabling of 2.5Gbps to 5Gbps, requiring a less heavy investment than 10GbE. An alternative, he says, is to use a pure wireless solution, perhaps based on the 802.11ax standard delivered over a Mesh or 60GHz network.

The future in-home network may require

bandwidth delivered to the home is generally more of a bottleneck than the WiFi network itself. Within the home, he says, the capability of technologies such as Ruckus’ own Beamflex enables the wireless signal to be focused, permitting more devices to be connected, generally without the need for additional access

“Nothing frightens an operator more than moving everything to WiFi because [poor quality WiFi] is the thing that can make customers churn fastest.”

Charles Cheevers, Arris



creativity from service providers in persuading customers to pay extra for services and to position gateway devices more centrally in the home. The two things are not unconnected. Operators have been busy working on designs that consumers would be happier to display in the open rather than hide under the staircase, but, as Cheevers points out, “the cost is not insubstantial”.

For Steve Johnson, regional director for northern Europe at WiFi technology specialist Ruckus Wireless, service providers have typically sought to deploy WiFi using low-cost consumer technology platforms that provide best-effort coverage and bandwidth, with many areas within the home not covered. The use of multiple devices simultaneously is causing problems and this is only going to get worse as more consumers use more devices at the same time. “That is leading to a requirement for enterprise-class technology as against consumer-level technology,” says Johnson. “Operators are willing to invest.”

For Johnson, the shared nature of WiFi means that growth in the number of internet-connected devices in the home is the key challenge. He says security of WiFi is also becoming increasingly important.

Number of devices

In-home networks are also increasingly having to cope with applications that require huge bandwidth and bandwidth at irregular intervals, but for Johnson this is less of an issue than the number of devices.

“However, the biggest challenge is operator bandwidth,” he says, arguing that the

points in small-to-average sized homes.

“Nothing frightens an operator more than moving everything to WiFi because [poor quality WiFi] is the thing that can make customers churn fastest,” says Cheevers. Video transmission requires a very high degree of reliability. The general rule, he says, is that you need to provide four times the bandwidth to the home that you want to guarantee for a particular service such as 4K UHD TV. He says that operators may try to persuade consumers to pay, directly or indirectly, for differentiated bandwidth, with premium services being privileged over other services.

“If you buy a pay-per-view event and your kids are doing whatever they want elsewhere, then nothing will stop the pay-per-view because you are paying for that to be the priority and the other [uses] can be throttled a bit,” he says. “Free VoD will have a lower priority than paid for VoD – we think there are dynamics in the market that will allow us to prioritise services.”

The delivery of data to an ever-growing number of devices in the home is not without its challenges. “When you start adding different applications together you have the equivalent of an enterprise network in the home,” says AirTies’ Çelebi. “However consumers don’t have their own IT department and they do have size and cost constraints.”

Çelebi says that AirTies is involved in field trials that feature 25-30 devices feeding off the same network. As the Internet of Things begins to take off, things are “only going to get worse”, he says. In addition to the proliferation of devices, consumers are also becoming more interested in ultra-bandwidth-hungry applications such as virtual reality gaming, requiring huge amounts of capacity.

While a number of technologists believe the time has come for operators to seriously consider investing more heavily in multiple in-home access points and extenders, others argue that there is still a lot that could be done to make existing deployments work better.

Alan Marks, senior solutions marketing manager at Nokia, says that changing the physical architecture of the WiFi network only makes sense if operators know what is going on inside the network. To enable a better understanding of the in-home network, cable operators have for the last couple of years been deploying TR-069-enabled devices. TR-069 is a technical specification that enables remote management of end-user devices. More recently, operators have also started deploying TR-181, a data model-enabling specification that works in conjunction with more recent TR-069-enabled devices.

“WiFi-related home networking issues are the top drivers of calls to customer care centres. What we’ve seen in the cable segment is an adoption of TR-069 remote management capabilities. Operators have been rolling out TR-069-enabled gateways that give them a

more robust data model and better remote management on the LAN side of things,” says Marks. “Another thing they do after that is look more closely at the data collection and analytics piece – how to use analytics capabilities across the whole infrastructure.”

Marks concedes that there is a cost associated with putting TR-181 capability in gateways but points out that this will enable operators to configure the in-home network more efficiently, including by showing subscribers how to optimise their networks without the need for an expensive truck roll. Analytics can help the operator and subscriber figure out what needs to be done, including whether there is a need for a physical reconfiguration of the network he says.

Meanwhile, Jonathan Nevo Junowicz, business development manager for the Residential Clean Air project at Cisco, maintains that currently “no-one is optimising in-home WiFi”, which accounts for the vast bulk of calls to care centres. Typically these calls, which are already expensive to the operator and frustrating to the customer, result in a router being (expensively) replaced by the operator.

According to Nevo Junowicz, three out of five routers returned for refurbishment are found to be in perfect condition. The problem is interference of the signal, with neighbouring WiFi clouds and indoor and outdoor units causing each other problems. The problem is even greater, he says, in the 5GHz spectrum than in the 2.4GHz range.

According to Cisco’s own analysis, over half of installed residential gateways are tuned to a non-optimal channel both in the 2.4GHz and the 5GHz spectrum ranges. One in 10 gateways are transmitting on too much power, leading them to interfere with a further 15% of gateways located nearby. Overall, the density of residential gateways, small-to-medium business WiFi installations and outdoor access points are contributing to the problem.

For Nevo Junowicz, operators would do well to more effectively manage their indoor networks to minimise the interference problem rather than invest in new hardware.

To help solve this problem, Cisco has proposed what it describes as a Residential Clean Air cloud-based offering, designed to manage the in-home network remotely to



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AirTies' client-steering technology is designed to improve WiFi performance.

reality and IP video services. The problem is when you mix 802.11ax with 802.11ac. It is not quite as inefficient as 'all 802.11ac' but there will be collisions." This is a problem that will only be worked out over time as 802.11ac devices are phased out.

Cellular technologies could also potentially cause problems, although the extent to which this is likely to be true is contentious. In the US, the telecoms regulator, the FCC, has allowed operators to use unlicensed 5GHz spectrum for LTE as LTE-Unlicensed (LTE-U), which has given rise to concerns that it could seriously compromise the efficiency of WiFi networks using the same spectrum. In Europe, where regulators have insisted on a 'listen-before-talk' protocol to avoid this issue, the 3GPP Group has created 'Licence Assisted Access', whereby LTE signals will only use the spectrum in time slots when the WiFi traffic is not using it.

avoid interference issues arising. He says that trials have shown that once a network was properly configured, traffic across that network increased by 30%.

"The service provider, without changing the architecture of these networks, with a small client [download] can deliver the correct configuration for any given consumer premises equipment," he says. "The 'last meter' problem has not been solved and optimised and most vendors have not taken care of it." Nevo Junowicz claims that Cisco will be able to differentiate between homes that simply need a reconfiguration of their existing equipment and those that require additional extenders and access points to deliver the desired bandwidth. "This is the first time that the service provider has been able to see inside the home."

For Nevo Junowicz, cellular technologies contribute to the problems, with Bluetooth and microwave technologies active in the 2.4GHz range and LTE-U promising to colonise large sections of the 5GHz spectrum. He says that the crunch facing operators as they look to a future involving more devices hanging on the WiFi network, consuming every greater amounts of bandwidth, could be deferred significantly by solving the interference problems that exist in the home today.

Arris' Cheevers points out that legacy networks could also pose problems. He says that 802.11ax's ability to deliver a step change in in-home bandwidth could be compromised to some extent if it has to coexist with 802.11ac. "802.11ax is four times as efficient as 802.11ac. That's great. It gives you 400Mbps instead of 100Mbps so you have plenty of room for virtual

Cellular technology

While cellular technology could theoretically compromise WiFi performance, the fact that the same companies that operate cellular networks generally also support WiFi makes this less likely in practice.

There seems to be a consensus that cellular will not emerge as a substitute for WiFi. Further down the line there is ultra high-bandwidth 5G mobile to look forward to. For in-home networking, however, WiFi is likely to reign supreme and there will be no place for current or future cellular technologies in delivering in-home connectivity.

AirTies' Çelebi thinks WiFi will be able to provide the capacity necessary to support the emerging range of devices and applications that consumers are likely to want, and does not believe that cellular technology will have a significant role in delivering connectivity in the home. Operators will be able to manage the WiFi-based in-home network to support the devices that rely on it, he says: "The capability is there so why bring in another standard and technology? I don't see any reason for that."

For Ruckus's Johnson, WiFi is only going to become more, rather than less, important, with cellular technologies continuing to be challenged to provide effective in-building coverage.

Implementing a major role for WiFi outside the home is more challenging. Cable operators in particular have investigated a 'WiFi first' approach to delivering mobile data – and voice – to their subscribers, both inside and outside the home. WiFi First can mean a number of things, however. The use of in-home networks to deliver wider public access through partitioning and multiple SSIDs has been widely discussed and implemented by a number of operators, but it meets with mixed reactions from technologists.

Çelebi, for example, is extremely sceptical about the wider potential of the use of partitioned home networks to deliver public WiFi. "The first problem is that these access points are in poor places [for public WiFi] such as the study or garage. The WiFi signal has to cut across an exterior wall which might be concrete, and then someone has to walk in front of the house and make a connection – and it could be a poor connection," he says. Such a solution will, he says, only be effective if operators use multiple frequencies and client steering with multiple access points close to the street.

With over 50% of mobile traffic estimated to originate from inside the home, it could make more sense to focus on ensuring seamless roaming between cellular and WiFi networks once people go inside.

In any case, while mobile companies have been effective in pressing for more and more spectrum for wireless networks, WiFi has emerged as the clear technology of choice for most things that consumers want to do in the digital home.

"The World – led by Apple and Google – is going 'WiFi First'," says Nevo Junowicz, who adds that, just as SMS revenues were decimated by the arrival of the iPhone and all that followed, so video revenues are now running towards Netflix and voice revenues are heading to Facebook.

WiFi is clearly the technology of choice to enable the digital home to reach its full potential. But this means that the fixed-line broadband service operators that provide that network as part of their overall offering of multiplay services – including TV – are going to have their work cut out to make sure that the coming wave of high bandwidth applications using these networks does not result in their call centres being swamped by angry customers, leading to a dramatic shift upwards in churn. ●

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Cloud cover



As operators recognise the limitations of traditional in-home service provision we are starting to see a steady rise in cloud technology adoption. Adrian Pennington looks at the development of three key cloud TV applications.

In order to match the heightened consumer expectation for TV everywhere, all service providers have cloud technologies on their roadmap. Rollout is hampered in many cases by existing investments in legacy on-premises equipment, copyright and legislative issues and some technical nuts that have yet to be cracked.

The benefits, though, of a shift to the cloud are widely understood. As John Carlucci, president and chief technology officer, Alticast, says: "What's important about cloud is how it helps operators to break free from the bounds

of the set-top box and use DevOps models and ubiquitous IT tools like HTML5 and JavaScript for app development."

It's also worth observing that cloud tech promises to revolutionise business models even further. "The next big step is providing events-based channels and disaster recovery capability and ultimately doing full linear playout of sophisticated channels in the cloud," says James Gilbert, co-founder, Pixel Power. "In that light, cloud DVR and ad insertion are good tests of the infrastructure, but in terms of the future, the cloud is about much more."

Cloud DVR

Some reflection of this shift in thinking is in the terminology which, in relation to DVR services, has shifted from RS-DVR to nDVR to cDVR. However, while cloud-based DVR is being deployed, "there's no big bang shift in behaviour" according to Accedo's EMEA vice-president Adam Nightingale.

Accedo expect over 50% of cDVR penetration to have occurred by 2022, roughly the timeframe that Ericsson also forecasts. Parks

Associates research predicts cDVR subscribers worldwide will total 2.4 million by 2018.

Nokia, which recently took over Alcatel Lucent, says it has nine deployments for cDVR including Liberty Global, Telefónica, Numericable and Vodafone Portugal.

South Korea's KT Skylife is among those using software specialist Alticast's solutions to deliver either cDVR or hybrid systems that leverage the set-top box and cloud. Spanish cable service provider Euskaltel meanwhile launched cDVR last year using a Nagra solution to offer a multiscreen service on legacy set-top boxes and OTT to connected devices.

The upsides are numerous. For end users, content deployed in the cloud enables multiscreen access and recording of multiple simultaneous shows. Without the limit of a 500GB hard disk, storage capacity is dynamically allocated. In addition, the relatively high failure rate of set-top disks and the consequent loss of personalised content can be mitigated. Customers can also retain recordings when they upgrade to new devices.

For the service provider there are capital savings from using shared and scalable storage, and theoretically fewer service issue call outs. Ericsson says a typical truck roll costs US\$75 (€67) per subscriber. This was the main driver for the deployment of cDVR by operators such as Cablevision in the US and KPN in the Netherlands, it suggests. "Associated costs quickly add up given that approximately 5% of hard drives fail per year and new features and upgrades require hardware replacement," says Itai Tomer, head of cloud DVR, Ericsson. "A centralised network is more reliable than distributed drives."

More importantly, cDVR delivers a greater degree of control over content for customer, service provider and advertiser alike.

"A content provider can assign rules around which content can be recorded and for what period," says Roland Mestric, Nokia's head of video marketing. "Such data can be used by advertisers who can place relevant ads around content when it is actually watched. You can also ensure the ads aren't skipped."

However, technical and licensing challenges are still hampering rapid advancement of this kind of service. Negotiated rights vary from programme to programme and country to country, with the pivotal issue being whether

a unique copy is required for every subscriber. Each deployment has its own challenges and operators must ultimately decide between a private, shared, or hybrid architecture.

"In the US for instance, the landmark [2008] Cablevision decision deemed a unique copy saved per user as the standard, although we are still seeing MSOs looking to redress that decision independently," says Tomer. "In

This plays into the three main technical challenges: scalability, flexibility and reliability. Regarding the first, says Mestric, "We need storage that can scale from a few TB to tens of petabytes. We need to ensure the platform can ramp from start to full deployment."

More flexibility in the system is vital to make sure the service is optimised based on service or use case requirements. "With cDVR you

"The always-on nature of the cable network enables the cloud to be harnessed so that operators can deliver advanced user experiences."

John Carlucci, Alticast



Europe it varies according to region with issues ranging from high costs [of deploying a private copy solution], to securing the rights to content and consolidating within a variety of regions with different regulations."

Matters are evolving, at least in some markets. For example, new legislation before the French Senate should provide a legal framework encouraging the deployment of cDVR solutions in France.

Private copy deployments are extremely costly. Tomer says, "A private copy system requires a unique copy of a programme to be saved for every subscriber that requests it, meaning recordings cannot be shared. Each single, unique copy of the programme has to be saved for each user, which requires a huge, growing volume of storage, very high recording and playout concurrency and that can be problematic to sustain."

can deploy a number of end user services like live restart or catch-up," says Mestric. "The characteristics of a system for live are, however, not the same as for VoD or catch-up, so based on the requirements of operators a system has to have the flexibility to be optimised. Moreover, if an operator starts with catch-up they need to be able to add full cDVR as it negotiates rights with content providers." Platform robustness ensures consumers have access to content and don't lose it. "If a hard disk fails it needs to be recovered very quickly. Performance and speed is the key criteria," he says.

At the network level the technology is now available from streaming and content delivery network vendors such as Harmonic or Edgeware, enabling robust solutions to be deployed. Of course, 'cloud' in cDVR doesn't mean a 'public' cloud. "Operators are, for the most part, still skittish about public cloud due



Nagra's intuiTV UI: the company believes delivering UIs from the cloud is challenging.

to concerns about security, quality of service, and control. So these cDVR deployments are happening on private clouds," says Yuval Fisher, CTO, MVPD, Imagine Communications. "The general view is that a cloud is an infinitely scalable and fungible collection of resources. But the reality for cDVR is that this doesn't scale. As a result, cDVR deployments require specialised clouds, and this is something the industry is just now digesting."

The verdict on cDVR is that it confers benefits to operators and users by enabling the delivery of content to multiple screens. "Rights holders are also starting to realise that cDVR actually offers new opportunities to monetise content with services that appeal to a new generation of multiscreen TV viewers that value convenience and flexibility more than any other market segment before," says Simon Trudelle, senior director, product marketing, Nagra.

However, says Tomer, "cDVR isn't a trivial deployment and legal issues, storage concerns and performance requirements must be considered."

Cloud ad insertion

Ad insertion has long been seen as another central application of cloud technology. However, generally speaking, operators are yet to fully embrace the cloud to deliver ad insertion across live and on-demand services.

According to Thinkbox, citing 2015 figures, linear still accounts for 81% of all TV broadcaster viewing in an advanced market like the UK. As overall cloud-based on-demand TV consumption increases, the value in managing addressable ads delivered to personalised,

connected screens will become more transparent to broadcasters, brand advertisers, and measurement firms.

"The deployment of next generation fully connected set-top boxes, complemented by other screens, is clearly the enabler that will drive demand," says Trudelle.

While early adopters are beginning to implement ad insertion technologies, others are in wait and see mode. "It's early days," says Tomer. "One thing is clear: operators agree that changing viewing habits combined with OTT video and innovation in cDVR technology have changed the game for advertising."

The promise of cloud-based delivery in

benefit as much as a mitigation of the extra cost associated with deploying full targeting capability. More important, new ad insertion mechanisms are based on software, and that brings significant operational simplicity."

Cloud ad insertion also overcomes key problems with ad blockers, so operators can increase revenue from ads, although it won't totally eradicate blocking.

"Generally the user experience is better with cloud ad insertions but probably the most important advantage is that an operator is in control of the ads, rather than having to rely on the platform owner," says Accedo's Nightingale.

"The general view is that a cloud is an infinitely scalable and fungible collection of resources. But the reality for cDVR is that this doesn't scale."

Yuval Fisher, Imagine Communications



relation to advertising is that it can help enable a much more effective and deeper degree of targeting than has hitherto been possible.

"The real value of the cloud here is targeting," says Imagine's Fisher. "A different way to look at this is that as advertising moves towards impression-based targeting, it is also moving toward software and cloud deployment as a natural evolution in how solutions are packaged."

Cloud enables scaling – the ability to utilise more ad insertion resources when needed, such as at prime time. This is "basically a cost saving feature" for Fisher. "So it's not really a

Whether server-side or client side, ad insertion is now well defined from a technology standpoint. Client side solutions include using one player to play the main content while a second is used to play ads. Nightingale says this solution "permits the app to initialise the players ahead of playing the content and then switches players [brings a player to the foreground] when required." He says the customer doesn't see any buffering or delays between the main content and ads. "This solution generally works well but it does require a lot more memory on the client device."

Alternatively, client-stitching applications make use of one player, and while playing either the ad or the main content, are able to buffer the other content for the next item ready to be played when required. "No buffering is seen by the customer and the UX is seamless," he says. The player can also be given a playlist of assets that play sequentially one after another.

Dynamic stream stitching, sometimes called manifest manipulation, is performed on the server side and requires very little customisation of the client side player.

Nightingale says: "The client tells the server what content the customer wants to play and any ad requirements and the server makes the



ActiveVideo has specialised in delivering UIs from the cloud.



Q&A : Roland Mestric, Nokia

Roland Mestric, head of IP video marketing, Nokia, talks about the benefits of cloud technology to deliver advanced TV services.

What new service opportunities does cloud technology offer to service providers?

We all know the cloud offers cost reduction and faster time-to-market, but it also enables service providers to offer a wealth of new video services to their subscribers. For example cloud DVR allows them to deliver time-shifted TV services on any device. The cloud breaks the limitations of the home-based DVR in terms of tuners and capacity, since end users can now record as many programs as they want, even simultaneously if they like.

Does this translate into additional revenue for service providers?

Potentially, yes. These new cloud-based services can be monetised. For example, the extra DVR capacity above one terabyte can bring in a few euros from the end user.

The shift to on-demand video services, and unicast streaming in particular, also opens new revenue opportunities. With unicast the service provider can not only personalise the content delivered to each user but also can personalise ads delivered as well. The service providers can make ads more relevant to their subscribers, for example, ensuring they don't get Christmas promotions during summertime if they are watching a content they have recorded six months earlier.

This shift to unicast you mention, isn't it creating challenges for service providers?

Definitely. The shift to unicast translates into more traffic. Fortunately we have some solutions to limit its impact, by caching content closer to the consumers. Content delivery networks (CDN) are widely used now in combination with cloud DVR.

We know video traffic can go up dramatically at certain times of the day if it's unicast. How can service providers handle this?

We've all heard about failures of OTT services to deliver popular live sport events. One solution is to dimension the network to handle those traffic peaks. This is very costly and is a waste of capacity since 99% of the time the capacity needed is hundred times below the peak capacity requirements.

Another solution is to leverage the cloud technology by deploying an elastic CDN on virtual machines, which allows to dynamically spin up and down the capacity as needed.

Do you see other challenges remaining, for cloud DVR in particular?

Scalability is the biggest challenge. Don't expect all the subscribers to

intensively use the new services from day one, but ultimately the usage can be massive. This is what happens: some subscribers will try the new services. Once they see the value and get used to it, they use it more. They spread the word and new subscribers get on board. The ramp up can take time but it is inevitable and steady. In the end, it means that the system needs to scale in a cost-effective way, from a few hundred terabytes of storage capacity to tens of petabytes.

The failure rate of the hard disk is known to be an issue with home-based DVR. Does cloud DVR solve this?

Many of us have had the annoying experience of losing our recordings due to hard disk failure. Availability of the content is a key promise of cloud DVR. You can easily duplicate the content into the cloud. The challenge is to do it in an economical way, with performance: consumers don't want to wait a day or two before their content is recovered after a failure in the server.

Is content rights still slowing the adoption of cloud DVR technology?

Looking at the economical equation only, the private copy model has always been a blocking factor for cloud DVR. However, things are moving and many service providers today have obtained the rights with some content providers to deploy a shared copy model, which improves the business model.

But you need to balance this against the benefits of cloud DVR for the consumer, the service provider and the content provider. Today we have reached a point where service providers see the payback of deploying cloud DVR despite the remaining content rights issues.

How do service providers deploy cloud DVR and is there an impact on its characteristics?

A cloud DVR platform has to adapt to the service provider needs, now and in the future. We are currently deploying cloud DVR with a mix of private and shared copies, but the platform has the ability to migrate into a fully-shared copy model in the future.

We also have customers who start with a subset of services, for example live TV with pause and restart, and are planning to introduce catch-up and network PVR services later.

The end user service directly impacts the system characteristics: live TV will require a high throughput while video on demand will require more storage. We can dimension these two characteristics independently from each other and evolve them smoothly over time as the demand evolves.

calls to the ad server. The ads are stitched into the main content and delivered to the client.”

While cloud ad insertion requires greater pre-processing of ad content in terms of the use of adaptive bit-rate, video quality, sound codecs and so on, the challenge service providers face is often more on the business front.

“With the exception of the US market, where MVPDs actively manage some of the advertising space on behalf of broadcast networks, demand for addressable ad insertion remains low as the ad space is managed by broadcasters,” says Trudelle.

For scenarios where set-top box connectivity and interactivity are not guaranteed or are limited to a subset of the subscriber base, the cloud may not achieve value in the short-term.

“It really means that service providers should have a plan to go ‘fully connected’ before envisioning deploying cloud ad insertion,” says Tomer. “Those who can move fast will clearly reap the benefits of this new technology.”

Cloud TV UX

Transplanting user experiences to the cloud offer many of the same advantages to operators, notably the ability to change the UX rapidly and at scale, rather than rewriting UXs for every make and model of set-top box, and enabling an operator to tailor personalised UIs.

“The always-on nature of the cable network enables the cloud to be harnessed so that operators can deliver advanced user experiences – such as Millennial navigation, kids’ modes and sports zones – that are not capable of being supported by the set-top box alone,” says Alticast’s Carlucci. “Since UXs no longer need to be resident on the set-top box, operators – and customers – can have an infinite number of UX variations.”

With Accedo AppGrid, users can update applications in real-time across platforms and control it per user, country or time of day without redeploying and submitting applications. “Being cloud-based means providers can easily engage with viewers, for example through in-app notifications,” says Nightingale.

UXs delivered as streams to every set-top box enable operators efficiently to deploy services “that are equal to – or better than – experiences that run on the box itself,” says Murali Nemani, CMO, product management and marketing, ActiveVideo.

There are a number of instances illustrating how Cloud UIs can bring a diversity of advanced UXs to existing set-top boxes: VoD and catch-up services with Ziggo in the Netherlands; trend-driven UIs with multiple tiles of live video on single tuner set-tops with Liberty Puerto Rico; and the complete YouTube experience to upwards of 500,000 existing STBs at UPC Hungary – all of which are ActiveVideo deployments. Similar innovation is taking place in the US, where Cablevision was the first to make the full Hulu experience available on all its current-generation boxes.

Cloud-based and set-top strategies are not mutually exclusive. “You’ll see the industry continue to use the cloud to deliver TV UXs

However, some industry participants express caution. While agreeing that cloud UXs can tap “virtually unlimited back-office CPU power” Nagra believes this is “driving the industry to a position of compromise” because the functionality of a native UI/UX “cannot be replicated with today’s cloud UI offering.”

Anthony Smith-Chaigneau, senior director, product marketing at Nagra, says: “Cloud UX deployment has its share of technology challenges. These include the latency of the remote control, as each action of the remote has to be transmitted to the cloud for processing. If network resources are limited it is difficult to anticipate the actual load of the network. This is the case in particular for live/linear services

“Generally the user experience is better with cloud ad insertions but probably the most important advantage is that an operator is in control of the ads.”

Adam Nightingale, Accedo



even as boxes become more capable,” says Carlucci. “We will leverage what the improved STB can do but we also will continue to see the cloud and the network evolve.”

There’s a similar strategy at ActiveVideo which offers GuideCast and StreamCast products to ensure that next-generation services can be delivered at scale to set-top boxes already in customer homes, as well as to new devices coming to market.

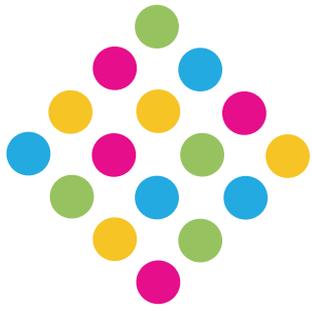
“Some [operators] are streaming the entire UX from the cloud; some are using cloud resources to complement a next-gen device strategy,” says Nemani.

US cable company Charter has moved to stream its entire UX from the cloud beginning with its Spectrum Guide. Tom Rutledge, Charter president and CEO, speaking at CES last year, said: “We’re taking the intelligence out of the box and putting it into the network and making the box a thin client box so that the processing power of the box is no longer a relevant issue; the processing power moves to the network. That’s a breakthrough.”

Craig Moffett, partner and senior analyst at MoffettNathanson Research, estimates that Charter will spend US\$2 billion (€1.8 billion) over five years for its cloud-based guide build compared to US\$8.4 billion for IP-enabled boxes – a 77% capex saving.

where each video stream is unicast.” There’s a real question about the simplicity of the set-top/CPE client, he suggests. “Both video and audio still need to be decoded, taking into account the numerous compression and transport formats, this requires a variety of computing power requirements.” Smith-Chaigneau also asks how providers like Netflix or YouTube will react to being “proxied” by a cloud infrastructure. Currently they have their UI implemented in the client device.

“Ironically TV everywhere is addressing laptops, smartphones and tablets that have enormous computing power,” he says. “So with a cloud UI-UX are we just talking about the issue of ‘incapable’ set-top boxes/CPEs in the field? Is that the problem that we are addressing with this solution?” He answers his own question: “It may well be that the cloud UX is the solution for small and medium operators that want to deploy advanced services and an advanced UX without having to bear the cost of implementing a middleware in the client set-top box/CPE. It could at least support a middleware that provides mainly the video and audio rendering without a PVR, video gateway or home network. Network bandwidth still remains a challenge, but there might be fewer problems as these operators have to serve smaller number of clients.” ●



Cable Congress

2016

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ANGA COM 2016: the preview

With ANGA COM due to kick off at the Köln Messe in Cologne on June 7, *Digital TV Europe* highlights some of the new innovations that will be on display.

Arris

HALL 10.2, STAND E21

WHAT'S NEW?

Gigabit services demos; video-over-WiFi; next-generation set-tops

WHAT DO THEY DO?

Arris will demonstrate delivering gigabit broadband to the home, including DOCSIS 3.1, Remote PHY/DAA, 1.2GHz access networks and PON solutions (EPON, NG-PON2 and RFoG). The technology company says it will also demonstrate reliable video delivery over Wi-Fi around the home and beyond. In addition, Arris will showcase its next-generation set-tops, software platforms and set-top function virtualisation, as well as optimisation of all-IP video delivery including the converged video headend delivering video over mABR enabled networks. Arris's Bruce McClelland, president, network and cloud and services, will be speaking at the International Television & Broadband Summit, and Cornel Ciocirlan, CTO EMEA, will be sharing how Arris is getting ready for IP video over DOCSIS.

CONTACT

www.arris.com

ATX Networks

HALL 10.2, STAND J18



WHAT'S NEW?

MAXNET II; SignalOn; VidiPlay; DigiVu II; VersActivePro

WHAT DO THEY DO?

ATX Networks is highlighting five new product lines and is also participating in a panel discussion covering "Considerations for Extending the Lifespan of HFC Networks with DOCSIS 3.1 and 1.2 GHz Bandwidth Enhancement" at ANGA COM. ATX's CCAP-compliant MAXNET II and SignalOn modular RF management platforms have been expanded to 1.218GHz bandwidth in order to support the complete frequency range of DOCSIS 3.1 specifications. MAXNET II is described by the company as an ultra-dense, MCX/F connector-based RF solution with SNMP/web remote control/monitoring. SignalOn is a high density, F/BNC connector-based

RF/L-Band solution. ATX's next generation UCrypt IP-to-PAL (IP-2PAL) mini-headend is designed for conversion of IP video streams to PAL in a space-efficient and cost-effective manner, according to ATX Networks. This device can ingest up to 60 MPEG-2/H.264, HD/SD video streams and convert them to PAL. VidiPlay middleware is a part of ATX's end-to-end IPTV solutions. The system can include IP 'set-back' boxes and smart TV clients to deliver IP video to large format displays as well as clients for PCs, tablets and mobile devices. VidiPlay also manages client authentication and access control, provides client UI customisation and supports features such as an interactive programme guide, VoD, nDVR, digital signage and more. The DigiVu II Micro broadcast quality encoder is designed to enable local insertion

and backhaul applications. Video inputs include HD/SD-SDI, CVBS, HDMI, and Component. Outputs include MPEG-2/H.264, SD/HD, and multiple output profile encoding. It features optional integrated Zixi Feeder or VideoFlow DVP technologies for reliable video delivery over the Internet, according to the company. ATX's VersActivePro licence-free transcoding platform was designed to be the most budget-friendly solution in the professional quality transcoder market, according to ATX Networks. A software-only version is also available to run on off-the-shelf hardware for operators preferring to leverage existing servers for their transcoding requirements, according to the company.

CONTACT

www.atxnetworks.com

Anvato in conversation with DTVE at ANGA COM

OTT TV is evolving. Growing interest in live services, the need to make money from services through targeted advertising, and the emergence of new formats such as 360° video, are just some of the developments that are placing additional demands on OTT video delivery infrastructure.

At ANGA COM on June 8, attendees are invited to a special event featuring Matt Smith, chief evangelist at online video provider and a pioneer in live streaming, OTT monetisation and live-to-VoD workflows Anvato, in conversation with Digital TV Europe editor Stuart

Smith: will discuss key developments in OTT TV.



Thomson. This free event, to be held in the Dorint Hotel opposite the conference centre on June 8 at 16:45, will look at the changing needs of video consumers and OTT providers in an ever-more competitive world.

The pair will discuss some of the key developments in OTT video over the last year - such as a growing interest in live TV, new formats, and the growing

pressure on OTT providers to make money - as well as the challenges in delivering a mix of live and on-demand content economically, the challenges in delivering formats such as UHD TV and 360° video over OTT networks, how far along OTT providers are in realising the full advertising revenue potential of the content they publish, how TV operators can most effectively deliver TV Everywhere OTT services to complement their mainstream pay TV offerings and more. To register your interest contact Patricia Arescy (patricia.arescy@KNect365.com).

SES Platform Services

HALL 10.2, STAND E15



WHAT'S NEW?

Fluid MAM; Lucid OVP

WHAT DO THEY DO?

SES Platform Services will demo Fluid MAM, which combines services for the processing and distribution of all media content with a secure, managed media archive in SES Platform Services' private cloud. According to SES Platform Services, the platform provides easier management of metadata and the efficient delivery to VoD platforms such as Netflix, Google Play, UPC or Amazon Prime. Lucid OVP is an online platform for broadcasters, operators and OTT players that SES Platform Services says allows it to quickly build its customers their own online video services in addition to direct-to-home services. SES Platform Services will also demo Ultra HD broadcasting at the show.

CONTACT

www.ses-ps.com

WISI

HALL 10.2, STAND E9



WHAT'S NEW?

Fibre termination platform LR 10; Micro headends OM 10 and OM 20; OL: Optical distribution

WHAT DO THEY DO?

WISI will demo new systems and solutions for SMATV and FTTH networks at ANGA COM. The fibre termination platform LR 10 handles fibre in the residence. The new system offers options to network operators to adapt to installation situations ranging from passive splice and tray and optical filter accommodation to different active connecting systems. The modular platform offers flexibility for further expansion of networks, and the new platform can provide various services such as distribution of TV signals and Ethernet for any kind of network operator, according to WISI. LR 10 is a complement to WISI's optical access platform Optopus and is used for the build-up of RF overlay networks. Operators of

TV distribution systems want to enable channel multiplexing from different transponders, central decryption of pay TV channels and static channel assignment to the TV sets to avoid frequent retuning, according to WISI. To meet these requirements, the company is providing micro headends OM 10 and OM 20. OM 10 can receive six DVB-S/DVB-S2 satellite transponders and convert them in eight COFDM channels for TV sets with integrated DVB-T/T2 tuners. OM 20 converts six DVB-S/DVB-S2 transponders into eight QAM channels. Both micro headends can be programmed via a web browser and are equipped with four CI slots for central decryption. The multiplex function before and after the CI slots reduces the number of required CAMs and necessary output channels. Additional features are an integrated DHCP server, NIT and LCN functions. WISI's new OL-series is a SAT-FTTH and FTTB solution, providing optical distribution of digital satellite and terrestrial DTT, DAB and FM signals. According to WISI, even large-scale structures with an unlimited number of subscribers can be supplied via fibre without incurring any signal or quality losses. Fibre cabling provides space savings in ducts and comes at a more favourable

price than comparable coaxial cable installations, according to the company. Moreover, optical distribution systems are less sensitive to interference. OL-series consists of a full suite of products including optical LNBS, converters, switchblades, optical splitters, pre-connectorised fibre cable for indoor and outdoor use, as well as adapters and optical measuring devices. OH16 SC is designed for satellite TV reception and distribution in small CATV networks, condominiums and hospitality networks. The transmodulator converts 16 DVB-S/S2 transponders into 16 QAM channels. It provides a common NIT and LCN functions for rapid tuning and operator-determined channel sequence as well as PID filtering. The headend comes in a box with dimensions 440mm x 44mm x 260mm for rack and wall-mount. OH16 SC provides four integrated input switching matrices which support facility input splitting, loop-through and operation with external 17 path multi-switches. Additionally, OH16 SC provides a DHCP server that supports remote maintenance and programming via the web browser without any additional software.

CONTACT

www.wisi.de

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ANGA COM

Hall 10.2, Stand #J18



Patent pending

ATX

Q&A: Peter Charissé, ANGA COM

Peter Charissé, managing director of ANGA COM, talks to Digital TV Europe about new features at this year's event and the challenges facing service providers in the German market and internationally.

What would you identify as the main highlights of ANGA COM this year?

With 450 exhibitors from 36 countries we have already reached the same booking level as in the previous year. Several leading exhibitors, including Eutelsat, Huawei, and Deutsche Telekom, will significantly expand their presence.

Let us look at the conference track: for the first time the CEOs of Vodafone Germany and RTL will join the opening session. One highlight of the international congress track, with 13 panels in English, will be the upgraded International Television & Broadband Summit. The speakers include Michel Azibert, CCO and deputy CEO, Eutelsat, Wilhelm Dresselhaus, spokesperson of the management board, Nokia Solutions and Networks, Bruce McClelland, president, network and cloud and global services, Arris, Xinbing Tang, CTO of Huawei fixed network product line, Dirk Wierzbitzki, EVP products and marketing, Swisscom, and Dr. Dirk Wössner, president, consumer business unit from Canada, Rogers Communications, from Canada.

The international highlight of the second day will be a keynote of the European Commissioner for Digital Economy and Society. Günther Oettinger will speak about broadband investments and connectivity in the Gigabit Society. The European Commissioner's speech is open for all visitors and exhibitors even without a congress ticket.

What key themes do you think will feature at the ANGA COM conference sessions?

Several panels will focus on new TV features and OTT: Personalised TV: Recommendation Engines and NetPVR; TV goes App: Multiscreen and TV Everywhere; and New TV Advertising and Big Data. Another

"We are facing more and more competition to our linear TV offerings from OTT operators."

Peter Charissé, ANGA COM



top-class panel deals with the competition between mobile TV and the next generation of terrestrial television – DVB-T2 – which will begin operating in Germany one week before the opening of ANGA COM.

A further international highlight is the new ANGA Overseas Panel. Here, experts will give a market overview and speak about TV distribution in the Middle East, India and Africa. This panel will take place in the Speakers' Corner which is located directly in the exhibition hall 10.1 and can be attended by all exhibition visitors and congress attendees. No additional registration is required.

How significant is ANGA COM's partnership with the ISBE and SCTE in the US and what are your goals?

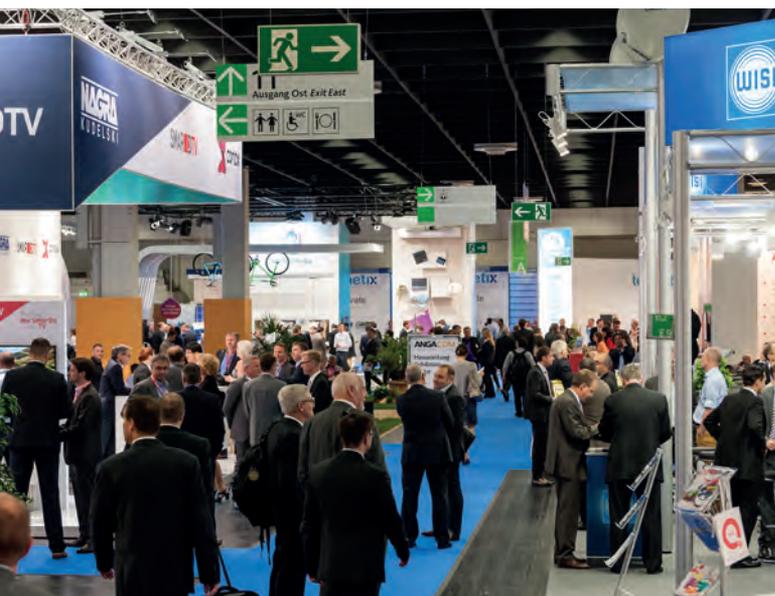
The globalisation of our industry has created a growing need for an exchange of technical skills across borders. The SCTE/ISBE with its high expertise is the perfect transatlantic partner for us. We highly appreciate the exchange of know-how, topics and speakers, as this will surely make our event more international than ever.

What would you identify as the key priorities for the cable industry in Germany and internationally this year?

We are facing more and more competition to our linear TV offerings from OTT operators. Therefore it is a big challenge to improve our cable access products with new interactive features like replay TV, multiscreen and app TV.

What are the main regulatory and commercial challenges facing the cable industry currently? What solutions are emerging?

The legal framework for media offerings has not kept pace with technological development. We still lack a level playing field, especially in the copyright law where there is a growing need for an extension of the licensing rules for cable television to time-shifted TV functionality. In essence, it is just a matter of adapting copyright law in line with the changing usage in the digital world. Therefore it would be enough to extend the scope of the Satellite and Cable Directive of the European Union to new TV forms. There is no reason why the usage of digital video recorders in set-top boxes is permitted but not a similar network-based service, where rights-holders and broadcasters would continuously receive a share of the usage fees. ●



Cable Congress 2016: the preview

DTVE looks ahead at some of the highlights of this year's Cable Congress in Warsaw.

Cable Congress hits Warsaw this year and returns with a stellar line-up of some of the best minds in the cable industry, who will take the stage to discuss the biggest topics facing the industry today.

As viewing habits continue to evolve, particularly among younger viewers, speakers will try to define the future of television, identify where both disruption and growth opportunities lie and look at the implications of policy changes on a Europe-wide level.

Day one features an interview session in the morning with Liberty Global president and CEO Mike Fries. A 30-year veteran of the cable and media industry, Fries has spent most of his career building international distribution and programming businesses and today claims to lead the largest international cable company in the world.

Joining him is AMC Networks president and CEO Josh Sapan, another veteran leader who oversees a number of award-winning cable TV networks including AMC, IFC, SundanceTV, and BBC America, which is operated through a joint venture with BBC Worldwide. Having held the chief executive role for more than 20 years, his brands have produced much-loved shows including AMC's *The Walking Dead* and *Mad Men* and Sundance's *Rectify*.

Day two will feature a keynote from Liberty Global's chief technology officer, Balan Nair, who will discuss both fixed and mobile opportunities for connecting consumers, with a particular eye on technological developments. CableLabs president and CEO Phil McKinney will also speak in the morning about innovation in the industry.

Day three's keynotes include a talk about keeping up with consumer behaviour from Charles Dawes, senior director international marketing, Rovi. His appearance comes hot on the heels of Rovi's agreed buyout of TiVo in a cash and stock deal worth roughly US\$1.1 billion (€961 million), which is expected to close in the third quarter.

Discovery Networks CEEMEA's president

and managing director, Kasia Kieli, will talk before lunch about how to 'engage locally to succeed globally' in the context of Discovery's overall expansion efforts. This comes a year on from Discovery's move to take full ownership of European sports channel Eurosport, after it agreed to pay France's TF1 Group €491 million for the 49% of the company it didn't already own.

Elsewhere, IHS's vice president, consumer, media, telecoms and displays, Ben Keen, is due to present some of the research firm's latest cable industry statistics.

Across the three days numerous panels sessions, sub-divided into different streams, will cover various aspects of the industry. Day one highlights include a 'trends watch' panel on the rise of the social media strategist. This will include participation from Virgin Media, Viacom, and US-based boutique agency Tiny Horse.

A panel titled 'What Would It Mean if Apps Really Are the Future of TV?' will feature debate from executives at Discovery, Vectra and Telenet. Meanwhile a session on the European Commission's digital single market strategy will feature Cable Europe managing director Caroline van Weede alongside Georg Serentschy, senior advisor at Brussels-based law firm and public policy practice Squire Patton Boggs. Polish copyright specialist Krystyna Szczepanowska-Kozłowska will also

sit on this panel.

Day two will feature panels about both virtual reality panel and capacity issues. The latter, titled 'Capacity Tsunami' will look at whether the trend for more bandwidth will ever abate and will feature discussion from representatives of Arris, Ampere Analysis and Cisco Systems.

The 'Born in the EU' panel on day two will bring together leading EU startup incubators who will share their thoughts on the development process and how to create breakthrough ideas. Innovate UK, HardGamma Ventures, D-RAFT and StartUp42 will all be represented.

Following the penultimate day's gala party at Warsaw Castle, day three will feature a morning panel about programmatic advertising and how technology continues to re-architect the ad industry. This will feature the likes of majority RTL-owned online ad company SpotX, video platform and monetisation specialist Ooyala and billings and customer management provider Amdocs.

Finally, the conference close will close in the afternoon with a 'View from the Top' session featuring Liberty Global, Telenet, Virgin Media and Tele Columbus. ●

Cable Congress will run from June 28-30 at the Double Tree Hilton, Warsaw.



Last year's Cable Congress was held in Brussels; this year it heads to Warsaw.

Technology in focus

Infrastructure equipment and product news for digital media distribution

In Brief

Polaroid goes with Google

Iconic camera brand Polaroid is making a push into the smart TV space, unveiling its first line of Google-powered 4K TV models. The Ultra HD LED TVs will start shipping this summer and will incorporate Google's Cast technology, allowing viewers to 'cast' entertainment, movies and music from their phone, tablet or laptop to the TV. Polaroid, which announced its partnership with Google at the internet firm's I/O developer conference, said that Google Cast's system offers more apps and frequent updates than many dedicated smart TV systems. The Polaroid 4K UHD connected line will come in sizes ranging from 43-inches to 65-inches, priced at between US\$500 (€450) and US\$1,000. A 75-inch screen model is due to launch in Q4 and will be priced at roughly US\$1,900.

4K STBs to quadruple

The 4K set-top box market will quadruple this year, despite an overall decline in the STB space, according to ABI Research. The new forecast claims that the 4K STB market will grow from less than 2 million units in 2015 to more than 7 million in 2016 and will then grow by 46% annually through 2021. At the same time, ABI predicts that the overall set-top box market will drop by about 9% in 2016 to less than US\$16 billion (€14 billion) in revenue, with both pay TV and free-to-air boxes losing value.

Liberty Global to create single set-top for all Europe

Liberty Global is to consolidate its next-generation set-top platforms, including ultimately that of Virgin Media in the UK, as part of a project dubbed 'Eos' by the company.

Eos is in turn part of the wider strategic plan that will see the company reduce costs across the board through, among other things, common technology platforms, and build revenue through marketing advanced services.

Speaking to analysts at Liberty Global reported strong Q1 results, president and CEO Mike Fries described Eos as "a set-top we plan to roll out everywhere at some point, including in that market [the UK]".

Virgin Media previously announced that it planned to roll out a new 4K-ready box that will be based on its existing TiVo platform. Speaking on the analyst call, Liberty's chief technology officer



Nair: Liberty Global's goal is to deploy Horizon across Europe.

Balan Nair said that this would be a "pretty high-powered box that will get a refreshed TiVo UI on it later this year" but added that "our goal is to get Horizon across all of Europe" ultimately, referring to the advanced set-top platform already in use in multiple Liberty Global markets. He said that Eos would be the "engine for next generation video" for the company.

Virgin Media CEO Tom Mockridge, also on the call, said that the TiVo-based box would "give us a lot more functionality for our customers" and enable the operator to

remain competitive with Sky. The latter has recently launched its own high-end box, Sky Q. Mockridge said that Eos would be "a big part" of the company's plan to improve its TV offering in the future.

Fries described Eos as a "project name for our cloud-based set-top box" that would be "trialing later this year" and would be "faster, cheaper and provide more functionality than today's Horizon box".

He also said that Liberty's new WiFi router, the Connect Box, which is now available in multiple European markets, "sets us even further apart from the competition" by providing up to 1Gbps across in-home networks. "This is a big issue," he said. "When you've driven average customer speeds up to 100Mbps but you don't control the in-home WiFi router, customers complain."

SeaChange acquires DCC Labs

Video technology provider SeaChange has acquired Warsaw-based set-top and multiscreen device software developer and integrator DCC Labs.

According to SeaChange, the acquisition will take forwards its set-top, multiscreen subscriber device and application strategies.

The deal, which closed on May 6 but was announced later in the same month, sees SeaChange pay approximately US\$8 million (€7 million) in cash and shares for the Polish company.

DCC Labs, which employs over 70 engineers, has deployed

projects supporting millions of set-tops, mobile devices and smart TVs, with deployments based on the Reference Design Kit (RDK) as well as Android and Linux operating systems.

SeaChange last year turned to DCC Labs to support a major European cable set-top project, the company said, using DCC Labs for the deployment of a user interface and an RDK 2.1-based home video gateway for field trial tests.

SeaChange has also used DCC Labs to help improve quality for another European cable operator's deployed home video gateway.

DCC Labs CEO Marek Kielcowski, who has led the company since 2009, has been named as senior vice-president of consumer premises equipment software and will lead SeaChange In Home.

The company was previously owned by 7bulls.com, a private group of software development and integration companies focused on delivering advanced technologies and IT solutions for large enterprises throughout the Americas, Asia and Europe across industries spanning finance, automotive, retail and media.

Nokia Bell Labs demos 10Gbps over DOCSIS 3.1

Nokia Bell Labs has achieved what it says is the world's first 10Gbps symmetrical data speed over a traditional cable access network using DOCSIS 3.1 technology.

The company said that the proof of concept of the technology, dubbed XG-CABLE, demonstrates feasibility of Full Duplex DOCSIS 3.1 laid out by CableLabs.

The XG-CABLE test used point-to-point cable topologies to deliver 10Gbps symmetric data speeds over coaxial cable using 1.2Ghz of spectrum.

According to Nokia Bell Labs, the technology can easily integrate into the CableLabs new Full Duplex DOCSIS 3.1 concept, which is focused on providing cable operators with technology innovations that can transform the industry.

By using this technology, operators can effectively use existing HFC cables over the last 200 metres to provide hitherto unrealisable upstream speeds, according to the company.

Federico Guillén, president of fixed networks, Nokia, said: "The XG-CABLE proof of concept is a great example of our ongoing effort and commitment to provide the cable industry with the latest innovations and technology needed to effectively address the growing demand for gigabit services. The proof of concept demonstrates that providing 10Gbps symmetrical services over HFC networks is a real possibility for operators; it is an important achievement that will define the future capabilities and ultra-broadband services cable

Guillén: providing 10Gbps symmetrical services is possible.



providers are able to deliver."

Robert Howald, vice-president, network architecture at Comcast, said: "While it is still early in the development of full duplex, Nokia's XG Cable proof of concept shows that multi-gigabit symmetrical speeds over HFC, as targeted in the CableLabs FDX initiative, are achievable. As we continue our DOCSIS 3.1 deployments, this development illustrates the power and flexibility of the DOCSIS 3.1 as a tool to deliver next-generation broadband performance."

Google to launch dedicated YouTube VR app

Google is due to launch a dedicated YouTube VR app later this year for its forthcoming mobile virtual reality platform, Daydream.

Announcing the launch at its I/O developer conference in Mountain View, California, Google said it is creating the YouTube VR app to provide an "easier, more immersive way to find and experience virtual reality content on YouTube".

The new app will give users access to all of YouTube's content - including 16x9 videos, 360-degree footage and VR experiences in "full 3D".

YouTube is collaborating with partners like the NBA, BuzzFeed and Tastemade to "explore new ways of storytelling in virtual environments", according to Kurt Wilms, senior product manager, YouTube Virtual Reality.

It is also working with camera partners such as GoPro to help make the production of virtual



reality video more accessible to content creators.

GoPro Odyssey cameras are compatible with Google's VR Jump camera rig - which consists of 16 camera modules in a circular array - and YouTube plans to roll out its Jump programme to all its YouTube Space creator studios around the world, starting with Los Angeles and New York.

Speaking at Google I/O in May, Google's vice-president of virtual reality, Clay Bavor, said: "We've rebuilt YouTube from the ground up for VR. In it is voice search, discovery, your favourite playlists - all in VR.

"We've added spatial audio, improved VR video streaming so

you'll be able to step inside the world's largest collection of VR videos and experience places and concerts and events like you're actually there. And by the way, you'll also be able to watch every single standard video currently on YouTube, but in a very different way."

Discussing Google's other virtual reality app developments, Bavor said that Google Play Movies is coming to Daydream, with high definition DRM video support.

"That means you'll be able to watch movies and TV shows from Play, but in a virtual movie theatre," he said.

He said that Google Street View is coming to Daydream, "so you'll be able to walk the streets of the world without having to fly around the world."

Bavor also revealed that Google Photos will support virtual reality, "so you can step inside and re-live favourite moments."

In Brief

Roku still most popular

Roku is still the most popular streaming media player in the US, accounting for 30% of players sold in the year to March, according to figures compiled by Parks Associates. The research, which was unveiled at INTX in May, said that Amazon is now running in equal second place with Google, each with 22% of the market, followed by Apple with a 20% share. Together the big four providers of streaming media devices account for 94% of the market, up from 86% in 2014. Apple TV saw the largest increase in unit sales - 50% - over the year, thanks primarily to the launch of the new version of the product. Amazon also saw strong sales growth. Amazon and Apple have made the biggest strides since 2014, when Amazon Fire TV accounted for 16% of US sales and Apple TV accounted for 13%, with Roku accounting for 34% and Google Chromecast accounting for 23%. According to Parks Associates, 86 million streaming media players will be sold globally in 2019.

Netgem signs global OTT deals with Wuaki, Hopster

Netgem has agreed global deals with Wuaki and Hopster, offering the over-the-top services to telecoms operators as part of its network of channels and content. With the agreements, consumers will be able to rent or buy films and TV shows through Wuaki.tv on a pay-as-you-go basis via Netgem's telco TV offering. The deal with kids OTT service Hopster marks an extension of its partnership with Netgem, which will now be able to supply the Hopster programme globally.

In Brief

Kudelski and Yahoo settle patent dispute

Kudelski Group and Yahoo have settled all pending patent litigation between the pair. The two companies have entered into a patent licence agreement whereby Yahoo will make a one-time upfront license fee payment to Kudelski. Kudelski-owned OpenTV filed a patent infringement counter-suit against Yahoo in the US in April in the District Court for the Northern District of California. The group alleged that Yahoo infringed 10 US patents owned by OpenTV. OpenTV's filing responded to a complaint for declaratory judgment filed by Yahoo on January 21. In that filing, Yahoo, following receipt of a letter sent to it by OpenTV, said that it did not infringe seven OpenTV patents. In its suit, Yahoo also attempted to partially invalidate one of the patents.

Kaltura launches service

Kaltura has launched the Kaltura Video Platform as a Service (VPaaS), which it describes as "the world's first specialised cloud video service, enabling organisations to build and rapidly deploy any video application, workflow and experience". According to Kaltura, VPaaS lets software-as-a-service providers, integrators, in-house teams in large organisations and developers to quickly add video capabilities and integrate video as a native data type into existing platforms and workflows by using the Kaltura APIs, SDKs and developer tools for their specific needs. The company says that VPaaS is infrastructure-agnostic and is available immediately as a public, private or hybrid cloud deployment.

Piksel acquires metadata innovator LingoSpot

Online video platform provider Piksel has acquired metadata extraction specialist LingoSpot to enhance its expertise in machine learning and artificial intelligence for video.

The acquisition adds LingoSpot's metadata extraction services to the Piksel Palette. According to Piksel, LingoSpot's technology will strengthen Piksel Fuse Metadata, a product that consolidates and enriches metadata while sharing it across both broadcast and OTT workflows.

LingoSpot's patented and patent-pending natural language processing, semantic search, image analysis, and machine-learning technologies will be used in the Palette to create proprietary metadata on a scene-by-scene basis. Piksel president Fabrice Hamaide told *Digital TV Europe* that "everyone is trying to work on recommendation and user profiles based on the usual engines" but that this resulted in the classic



Hamaide: LingoSpot can extract metadata from "inside the asset".

problem of only 20% of available content in catalogues being viewed by 80% of the available audience.

"To solve that you can work on search and discovery from the asset side," he said.

Hamaide said that LingoSpot's technology enabled the extraction of metadata from "inside the asset" in a way that is "scalable". If a mobile video viewer only wants to view a small part of an asset - for example a football match - it will be useful to be able to search based on "fine-grained metadata that allows you to immediately watch what you want". LingoSpot's metadata extraction capabilities enable the identifica-

tion of the particular timeslot of a goal by a particular player, for example.

Hamaide said that LingoSpot's technology complemented its core product with artificial intelligence-based techniques and will have a particular application for mobile video, where users typically do not want to view a long-form asset from beginning to end.

"Broadcasters look at the numbers and see that consumption is growing through the roof on mobile but content is not mobile ready," he said.

LingoSpot technology generates metadata based on a range of techniques including frame-by-frame analysis and face recognition.

"Some of the technology is patented and the rest is patent-pending. None of it is in use in video today, but some of it is used in bookselling by the likes of Amazon, such as plot analysis," said Hamaide.

IMAX unveils VR plans, signs deal with games

IMAX Corporation has announced a major virtual reality push, which includes a joint venture agreement with Swedish games studio and VR content and hardware creator Starbreeze.

IMAX said it will develop a premium, location-based virtual reality offering that includes entertainment content and games - delivered to multiplexes, malls and other commercial destinations.

Through its deal with Starbreeze, IMAX will create a virtual reality experience that will use the Swedish firm's StarVR headset technology. Starbreeze's library of virtual reality entertainment content and games will be made available to consumers, while IMAX said it will look to establish new

VR content partnerships through its existing Hollywood filmmaker and studio relationships.

"As technology and entertainment options evolve, we continue to innovate and find new platforms to extend The IMAX Experience," said IMAX CEO Richard Gelfond. "We believe VR is an area that holds tremendous promise and is a natural progression for IMAX given our established worldwide brand presence, our immersive entertainment technology know-how, and strong industry relationships with filmmakers, studios and exhibitors."

IMAX said that a test site for the first IMAX VR location has been selected, and that it plans to launch "up to six sites this year in



both domestic and international markets". If successful, the concept will then roll out globally.

Last week, IMAX also used Google's I/O developer conference to announce that it is working with Google to develop a "cinema-grade virtual reality (VR) camera". The IMAX VR camera will be designed "from the ground up" by IMAX engineers and camera specialists, in partnership with Google.

Rovi agrees US\$1.1 billion TiVo buyout

Rovi Corporation has agreed to buy TiVo in a cash and stock deal worth roughly US\$1.1 billion (€961 million).

Rovi CEO Tom Carson will lead the combined firm, which will “adopt the iconic TiVo brand” as the new company name.

Announcing the deal, Rovi said that combining the two companies would provide them with complementary products, services, and intellectual property.

Carson said that the TiVo deal “strengthens Rovi’s position as a global leader in media discovery, metadata, analytics, and IP licensing” with the arrangement coming at a time of “significant evolution” in the entertainment landscape.

“The combined capabilities of TiVo and Rovi place us in a tremendous position to extend services across platforms and to a

Carson: Rovi and TiVo will revolutionise how consumers experience media.



customer base that includes traditional, over-the-top and emerging players across the globe,” said Carson. “By working together, Rovi and TiVo will revolutionise how consumers experience media and entertainment and at the same time build value for our stockholders.”

TiVo’s interim CEO and chief financial officer Naveen Chopra described the deal as the “logical next step for TiVo” and said that the combined company will be a “more influential global player” that is “incredibly well positioned

to redefine television”.

“In joining forces with Rovi, our customers, employees and stockholders will benefit from being part of a more diversified industry leader with significantly greater market opportunities,” he said.

The deal will combine TiVo’s experience in traditional TV, OTT and on-demand UX and content discovery with Rovi’s strength in guides, personalisation, advertising, analytics and cloud services.

The new TiVo will serve nearly 500 service providers across countries, adding Rovi’s current base of approximately 18 million households using Rovi guides to more than 10 million TiVo-served households.

The expanded company will also have a combined IP portfolio of more than 6,000 issued patents and pending applications.

AT&T acquires Quickplay

US telecom giant AT&T has acquired OTT and TV Everywhere video technology specialist Quickplay Media from Madison Dearborn Partners.

AT&T has previously tapped Quickplay to provide the platform for its U-verse TV Everywhere offering and the company’s technology is being used to support new streaming services from AT&T-owned DirecTV - DirecTV Now, DirecTV Mobile and DirecTV Preview - that will be launched later this year. The telco said it would retain Quickplay’s more than 350 employees and contractors.

The pair expect to close the deal in mid-2016, subject to regulatory approval.

“Our strategy is to deliver video content however, whenever and wherever. Quickplay’s multitenant IP distribution infrastructure, combined with AT&T’s leading scale in

IP connected end points, will allow us to host and distribute all forms of video traffic. We intend to scale and operate an industry-leading video distribution platform, and viewers will get the high-quality online video viewing experience they desire,” said John Stankey, CEO, AT&T Entertainment Group.

Wayne Purboo, CEO, Quickplay said: “We’ve spent more than a decade developing an advanced technology and service platform that can deliver premium video content to any device and over any network. Our solution is highly automated and scalable. With AT&T, we’ll have the resources we need to further scale, grow the business, and continuously enhance that platform. Our team is proud of what we’ve built so far and excited to join the AT&T family. This will help us power the next generation of video services.”

Vestel-Opera HbbTV pact

TV software provider Opera and manufacturer Vestel are teaming up to deliver HbbTV-enabled smart TV services. Opera TV’s software will be incorporated in new Vestel TVs, to provide customers with Ultra HD content and interactive services based on the HbbTV 2.0 specification.

According to the pair, viewers will have harmonised access to linear and on-demand content, as well as interactive red button applications such as in-context-based advertising, personalisation, voting, games, social networking, and other multimedia apps. Since 2012, Opera TV SDK and Opera’s HbbTV technology have been deployed in Vestel manufactured smart TVs and set-top boxes, but this is the first time the pair have collaborated to deliver HbbTV 2.0-based devices.

In Brief

Cisco video revenues boosted by China

Cisco’s service provider video business turned in an 18% increase in revenues in the company’s fiscal third quarter, contributing to an overall increase in revenue of 3% to US\$12 billion (€11 billion). The figure excluded the service provider’s video consumer premises equipment business that Cisco sold to Technicolor, with that deal closing in the second quarter. On a conference call following the company’s results, chief financial officer Kelly Kramer said that the growth in the remaining service provider video business reflected ongoing strength in the Chinese market.

Arris upbeat about 2016 targets, despite net loss

Arris said it is “increasingly confident” it will meet full year targets after getting off to “a good start” in 2016, despite reporting a massive first quarter net loss. Announcing results for the three months ending March 31, Arris reported revenues of US\$1.61 billion (€1.44 billion), up 33% from US\$1.22 billion a year earlier. However, Arris also said it made a US\$202.6 million net loss for the quarter, compared to US\$19.1 million in profit a year earlier. Arris closed its acquisition of set-top box rival Pace on January 4 and said that US\$40 million of its net loss was due to integration and other deal costs, and US\$30 was due to revaluing Pace’s inventory from “historical cost to fair market value as required in purchase accounting”. Restructuring costs of US\$51 million and a US\$55 million tax withholding were also contributors to the net loss, according to the firm.

On the move

TV **Casey Bloys** is to fill **Michael Lombardo's** shoes at HBO after the president of programming announced his exit after a 33-year stint at the premium programmer. Bloy was given a wider role at HBO earlier this year, adding drama to his comedy brief, in the wake of **Michael Ellenberg's** departure. He has now been upped again. Lombardo, meanwhile, will have a producer deal with HBO after his handover to Bloys is complete.

A+E Networks has named a new general manager for Africa.

Yusuf Nabee will take up the newly-created role on June 1, charged with securing new distribution for A+E's regional channels portfolio and creating new commercial opportunities. Nabee joins from ReelAfrican, an aggregator that makes African content available around the world, where he was CEO.



Romanian public broadcaster TVR has named **Irina Radu** as its new director-general. Radu was acting director-general between September 2015 and April 2016 and has served as director of programmes at the broadcaster since 2013.

UK broadcaster Channel 4 has named **Gill Pritchard** as director of audience technologies and insight. **Keith Underwood**, Channel 4 head of strategy, will now take overall responsibility for strategy and **Glyn Isherwood**, Channel 4 director of finance, will take on corporate development. Prior to joining Channel 4

Pritchard held a number of senior positions at BBC Worldwide including director of Children's and head of strategy

Vodafone's group chief commercial operations and strategy officer **Paolo Bertoluzzo** is leaving the group to take up the post of CEO of ICBPI, a financial and payment services company in Italy. Bertoluzzo joined the company in 1999 as strategy and business development director and was appointed to his current position in 2013. Vodafone said his successor would be announced in due course.

Serge Nedjar has been appointed chief of Canal+ news channel iTele. The new iTele chief is close to Vincent Bolloré, the president of Canal+ owner Vivendi. Prior to taking the new role, Nedjar has been running the Direct Matin newspaper and regional division of Bolloré Média. Previously he launched the Direct 8 DTT channel and has worked at various publishing groups. At iTele he replaces **Cécilia Ragueneau**, who has left the channel.

Mariam Zamaray has left channel operator Tern (Television Entertainment Reality



Network) by mutual consent. Zamaray has been at UHD channel operator Tern for 18 months and will be replaced, on an interim basis, by **Rian Bester**, company COO.

Interactive TV technology provider Hubee has named **Jean Sebastien Petit** as its

new CEO. Petit was previously chief operating officer at TDF Group-owned Arkena. At Hubee he will work closely with Frédéric Pie, chairman and founder of the company, to strengthen its business development and operational activities globally.

Middle East pay TV operator OSN has named **Emad Morcos** to the new position of chief content



officer. Morcos was previously senior vice-president, media partners and digital at OSN. He has been part of the group's senior management team since 2007 and was responsible for the launch of digital platforms OSN Play and Go.

Manuel Alduy, the head of Canal OTT at French pay TV broadcaster Canal+ has left his post. Alduy's sphere of responsibility at Canal+ encompassed SVoD service Canalplay and mobile TV app-based service MyCanal. Alduy joined Canal+ as director of strategy and development for thematic channels in 2001, and became head of movie acquisitions in 2005 and head of cinema for Canal+ in 2008 before taking over as chief of Canal OTT in 2014. His most recent new responsibility was as chief of mobile offering Studio+ alongside producer Gilles Gallud.

Fernando Ojeda, the CEO of Spanish Basque Country cable operator Euskaltel, which also owns Galician operator R, has resigned, and the company's board has appointed former

Microsoft executive **Francisco Arteché** in his place. Ojeda's departure has been accompanied by significant changes in the make-up of the company's board, with independent directors **Richard Alden** and **Bridget Cosgrave** also departing. Alden and Cosgrave will be replaced by **Elisabetta Castiglioni** and **Miguel Angel Lujua**. Arteché was previously head of consumer channels at Microsoft Iberia and also served as director of entertainment and devices for central and southern Europe. Castiglioni, who replaces Cosgrave, has worked in senior roles for MCI Worldcom and Siemens, and as a consultant to companies including Telekom Austria, the BBC, ITV, New York Times, Rai, BSKyB, and Cox. Ángel Lujua, who replaces Alden, has served, among other roles, as president of Basque Country employers organisation Confebask and as a director of Spanish employers organisation CEOE.

Swedish cable operator Com Hem has named **Thomas Helbo** as its new chief technology officer. Helbo



was previously CTO of Danish operator Stofa and serves as chairman of the Danish Consumer Electronics Association. Com Hem's previous technology chief, **Henri Caddeo**, was in December named as the new CTO of Bonnier Broadcasting, the restructured umbrella company for TV4 Group, pay TV unit C More and newspaper Nyhetsbolaget. ●

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“The live streaming era is certainly upon us, led by Facebook and YouTube but including many others like Twitter and its streaming app Periscope which hosted 200 million live broadcasts in April 2016 alone.”

Broadcasters' social lives

For a few years now, there has been a big question mark over whether SVoD services like Netflix are good or bad news for pay TV. But it seems that just as pay TV operators are adjusting to life with SVoD, there's something else that could disrupt TV: live streaming on social media websites. So, are there parallels to be drawn? And if so, what can be learned?

Clearly SVoD services are compelling. They are racking up subscribers. According to Ampere Analysis, SVoD net additions now outstrip pay TV subscriptions in the EU. And about a third of people in the major European countries think they won't 'use' broadcast TV in five years' time. That's pretty sobering.

Not only do European SVoD homes rank linear channels lower in terms of appreciation, but SVoD homes also watch linear TV less and the level of linear viewing falls even more with younger viewers. These younger people are building their own "next-generation" TV bundles, typically with a Netflix or Amazon Prime subscription at the centre, perhaps adding Spotify for music and a catch-up broadcast TV app like BBC iPlayer on top.

Interestingly, when you add up the cost of creating a next-gen bundle of apps, it totals up to a pretty large monthly fee, so cost doesn't seem to be the issue. My feeling is that for these younger viewers in particular, the killer app is about access to what they want in the way they want.

So given this trend to build your own 'next-generation' bundle and binge on on-demand viewing, how important is it that live TV is also showing up on platforms like Facebook and YouTube? First of all, in the era of growing demand for SVoD services and on-demand content, does live TV still have a

chance? Or is live, so to speak, dead?

The answer is no. First, there is still a big appetite for linear and live TV, especially around live sports and big entertainment shows and breaking news. Until now live TV has been seen as the one thing that TV still has as a differentiator. But here's the thing: TV no longer holds the live monopoly.

Netflix doesn't offer live content – at least not yet – but social media platforms are embracing live video in a big way. And just as TV incumbents risk losing access to their audiences in an on-demand app-based TV world, those same incumbents risk losing the live battle to social media platforms.

The live streaming era is certainly upon us, led by Facebook and YouTube but including many others like Twitter and its streaming app Periscope, which hosted 200 million live broadcasts in April 2016 alone.

YouTube has done live for a while now, 'broadcasting' everything from Felix Baumgartner's live jump from space for Red Bull in 2012 to live coverage of the 2012 Olympics in a whopping 65 countries where the local TV broadcaster did not own all the rights. More recently YouTube has begun live streaming 360° video, including a series on refugees made by Sky News in the UK. YouTube also live-streamed the finals of the Europa and Champions League for BT Sport.

In recent months Facebook has also been making moves. In March it announced a 'visibility boost' to any live videos on its platform, basically telling content owners that their videos would be kept at the top by the Facebook algorithm and therefore featured on users' news feeds. Indeed, Facebook offered to cover the costs for some news outlets of 'broadcasting' live video on the platform rather

than putting the video on their own websites where they can sell advertising.

The drive to live is because Facebook knows that people watch live streams three times longer than on-demand ones. The changes to the news feed mean that users are more likely to land on a Facebook video while it is still live and the comments that they leave will also be live, and their shares with friends will be live, too, driving tune-in by others in their network. Live video stimulates 10 times more comments than recorded video.

For TV folks, posting live video on these social media platforms offers opportunities to reach a different, typically younger, audience. Sky Sports has used Facebook Live to post bespoke content in the run up to big events, for example recently going live on Facebook with heavyweight boxers Anthony Joshua and Charles Martin before their fight on Sky pay per view. "It's a different way for our audiences to interact with superstar talent," says Dave Gibbs, digital director at Sky News and Sky Sports. "It also allows us to extend our coverage and showcase our big events in ways that are authentic for that audience."

That all sounds good, but as with SVoD services, the traditional TV players have to make sure they don't give away all their live ammunition to the social media platforms. Offering an expensive football match live on YouTube may be a good marketing and promotion tool but making a habit of it devalues the paid-for product and that raises a strategic business model question that goes beyond winning over hard-to-attract audiences. ●

Kate Bulkley is a broadcaster and writer specialising in media and telecommunications. tellkatenow@aol.com

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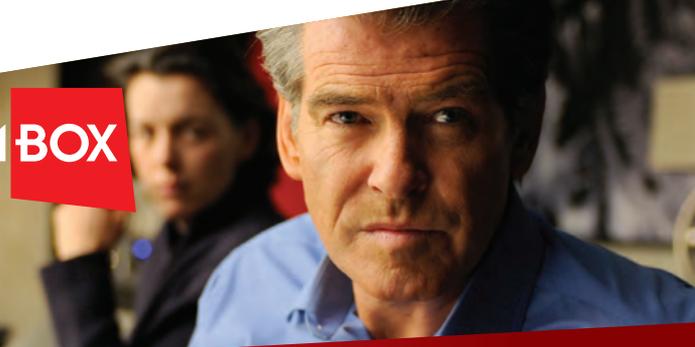
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