

DIGITAL



May/June 2017

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Age of disruption

This issue of *Digital TV Europe* takes a look at some innovations in technology that could profoundly disrupt the current TV business, from content creation via distribution to the point of delivery.

First we look at a key development that could have a serious impact on the kind of content that is created and consumed over the next few years: virtual reality.

VR as an enabler of entertainment experiences is still in its infancy, but its obvious application in gaming may foreshadow the 'gamification' of content more generally. In addition the development over the next few years of augmented and mixed reality experiences could see a deeper shift in the kind of entertainment experiences people seek out. In this issue of *Digital TV Europe* we survey four of the companies that are leading the latest wave of innovation in audiovisual entertainment.

VR is an extreme example of the trend towards personalisation of content (though it also has an emerging shared social dimension). That personalisation has been enabled by the application of cloud technology to distribute video to end-users. Initially used to support the emergence of OTT and multiscreen services, cloud technology is now being applied to the delivery of live and linear TV as well.

Also in this issue, we look at some of the choices facing service providers as they look to apply cloud technology to make the delivery of TV more efficient and scalable. In addition to enabling operators to reduce capex in favour of opex by enabling the virtualisation of headend infrastructure, cloud technology is also opening up new end user applications such as cloud DVR, targeted advertising, and rapid innovation in the user experience.

The large-scale adoption by operators of cloud-based IP video is, of course, only possible if bandwidth is available to deliver it to end users. Ahead of ANGA COM, this issue of *Digital TV Europe* will look at the ways cable operators are expanding the bandwidth available to them and extending the life of their coaxial plant further – by implementing DOCSIS 3.1 and, in the near future, Full Duplex DOCSIS – in order to deliver ultra-fast broadband services and compete head on with fibre-to-the-home.

Finally in this issue, we also look at some of the technologies that will be showcased at ANGA COM and look in detail at some of the top industry and technology news of the last month. ●



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Q&A: Asaf Matatyaou, Harmonic

Asaf Matatyaou, vice-president of solutions and product management for the cable edge business at Harmonic, talks about the virtualised headend.

What is the virtualised CCAP and how can it help the cable industry achieve its business objectives?

A software-based, or virtualised, CCAP disaggregates the software from the underlying hardware to provide operators with the advantages associated with IT economics. It eliminates the need to purchase space-consuming and expensive hardware-based CMTS platforms, and breaks the cycle of needing to upgrade hardware every three years or so to accommodate capacity growth requirements. Equally important, virtualisation provides greater operational elasticity and orchestration.

How close are cable operators to moving towards a virtualised headend architecture and what challenges do they face in managing that migration?

It's already happening. Our Harmonic virtualised CableOS solution is deployed and in trials at select cable operators globally, and is having a direct, positive impact on their ability to deliver high-speed data, video and voice services to their customers.

The migration to a virtualised CCAP is not as difficult as it may seem. In fact, a virtualised CCAP has familiar usability, configuration and management similar to traditional integrated CCAPs. Additionally, CableOS complies with industry Remote PHY standards to provide a common method of connectivity from CableOS CMTS servers to PHY shelves and Remote PHY devices, assuring full RF spectrum coverage and extending network capacity.

What are the respective advantages and disadvantages of centralised and distributed architectures and what do operators need to think about in making a choice?

The tradeoffs and decision on whether to deploy a distributed or centralised architecture depends on the amount of segmentation in the network. With a heavily segmented network, leveraging the deployed nodes is more effective with a centralised CCAP deployment. Alternatively, continued traditional HFC segmentation or a fibre deep plan is more advantageous with a distributed CCAP deployment. Operators can realise space and power cost savings of up to 75% in a centralised CCAP deployment, and up to 90% in a distributed deployment. For example, a hardware-based CCAP typically requires

nine racks of equipment to support 80 service groups. In a centralised CableOS architecture, more than 250 service groups can be supported in just four racks – a 7x density difference.

In addition to the space and power savings associated with moving RF components out of the headend and into the field, decoupling the CCAP core from the PHY shelf in a Remote PHY architecture leverages the benefits of digital fibre, such as signal transport over much longer distances and more wavelengths.

What are the main elements of a Remote PHY architecture and how can it benefit operators?

A Remote PHY architecture maintains the data and video cores in the headend but moves the RF deep into the field, so it requires either a high-density centralised PHY shelf or high-capacity nodes with the ability to handle high data throughput. The benefits are fast deployment of IP-based data, video and voice services, sustainable capacity growth, and the ability to resolve space and power constraints in the headend and hub.

What are the key elements of Harmonic's own approach to enabling cable operators to move to a next-generation broadband architecture?

The CableOS solution is built from a suite of products that work together to deliver data, video and voice services over existing cable infrastructure. All CableOS components are standards-based and interoperable with other compliant Remote PHY products. These include:

- CableOS Core software, which runs on Intel x86 servers and performs all CMTS functions, including control, management and data processing of IP traffic across the cable access network.
- NSG™ Pro, which can serve as either a PHY shelf in a centralised CableOS deployment or as the video core in a distributed deployment.
- CableOS Ripple-1 Remote PHY Node, a hardened outdoor enclosure for networks tasked with delivering video, data and voice services over coax.
- CableOS Pebble-1 Remote PHY Device, a module for the Ripple-1 node that interfaces with the CableOS CMTS to support existing HFC infrastructure and evolving fibre deep deployments with high-speed video and data traffic.

News digest

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Fries: Liberty 'not interested' in ITV, quad-play remains unproven

By Stuart Thomson >

ITV's valuation and the premium that would be required to buy it means that the commercial broadcaster is "not interesting" as an acquisition target to Liberty Global, according to president and CEO Mike Fries.

Answering an analyst question on ITV, in which Liberty Global holds a 9.9% stake, after the cable giant reported less than stellar first quarter financials, Fries said: "If ITV was trading at a much lower multiple it might be interesting, but with where it is trading today and the premium that would be required, it is not interesting." He said that "there is no change" in Liberty's position. Fries said that departing chief executive Adam Crozier had been "a great CEO", but that his departure had no impact on Liberty Global's view of the company as a target.

Fries said that the company was focused on opportunities that are "accretive...and not dilutive", even if it occasionally looked at opportunities purely

from a strategic point of view.

Crozier's departure from the UK's leading commercial broadcaster, combined with the Brexit-related decline in the value of sterling, has fuelled renewed speculation that ITV could be subject to a takeover attempt by a larger media group.

Fries also said that combining fixed and mobile assets and marketing quad-play services has so far failed to deliver significant synergies and the mobile business remains under pressure globally. He said that he hadn't "yet seen what the real advantages are from combining fixed and mobile" and added that Liberty had yet to see "real synergies" realised from putting fixed and mobile businesses together in Belgium and the Netherlands, where it operates a joint venture with mobile giant Vodafone.

Fries said that Liberty was still "at the starting gate when it comes to quad-play" in markets including the Netherlands, Belgium and the UK, where it has recently started marketing mobile services more aggressively.



Fries: acquisition doesn't make sense at current valuation.

"We haven't yet converged them to the point where we can start showing you the benefits of quad-play," he said, adding that the mobile business remained in "a transition phase" for Liberty.

While there is plenty of room for ARPU growth in European markets for the fixed business, Fries said the mobile business faced significant structural challenges globally. He said the mobile business was highly competitive and could come under pressure quickly and unpredictably.

Liberty Global's financials were hit by poor performance in mobile in its largest markets in the first quarter, with mobile revenues across the group down 5%, despite post-paid growth.

In a critical assessment of the

company's Q1 performance, Fries said that "recent operational and commercial challenges" had contributed to the poorer than expected financials.

"I'm not happy about it and neither is anyone else from Liberty on this call," he said.

Liberty Global added 253,000 next-generation TV subscribers in Q1, and said the UK and Germany contributed to its best first quarter video performance in the last 10 years.

This was in spite of an 18% year-on-year decline in European operating income at US\$431 million (€387 million), with "challenging" mobile results in the UK and Belgium and "softer than planned" cable ARPU from Virgin Media impacting on revenues in the region.

Liberty said that its next-generation TV subscriber base reached 6.9 million in the first quarter, representing 39% of its total video base in Europe – excluding DTH. This was split across its Horizon TV, Horizon-Lite, TiVo, EOS (V6) and Yelo TV platforms.

Belgium

IPTV > Proximus football

Proximus has struck a deal with the country's Pro League to secure broadcasting rights to Jupiler Pro League D1A football for the three seasons to 2020. The new deal complements Proximus's grip on second-tier football – the Proximus

League or D1B, meaning that Proximus customers will be able to watch Jupiler pro League matches along with exclusive coverage of the Proximus League and Champions League. The deal follows agreements between the League and rival service providers Telenet and Voo, which will also air the Jupiler League games on a non-exclusive basis. Telenet additionally

has exclusive internet rights to the matches, and holds the rights to the live broadcast of the country's Super Cup for the next three years.

Cyprus

IPTV > MTN launches

MTN has launched a TV service in Cyprus with channels from the

BBC, NBCUniversal and Scripps among others. The South African telco operates a Cyprus network and its new TV service in the country. The TV line-up includes BBC Earth and BBC Entertainment from BBC Worldwide; E! Entertainment from NBCUniversal; and Sundance and CFBS Reality from AMC's international channels arm. There are kids channels from Disney as well

as the pre-school JimJam service. The unscripted line-up includes History Channel and DNI's Discovery Channel and Discovery ID. There are news channels from Sky, the BBC, Al Jazeera, France 24 and Euronews. The international channels packages starts at €29. The basic MTN TV pack is €9.90. UK-based consultancy 3Vision helped MTN with source and secure the international channels.

France

SAT > Canal+ turnaround

Canal+ subscriber additions outnumbered cancellations for the first time in many quarters in the three months to March, and the pay TV outfit's parent company Vivendi said it expected a reversal of the downward trend in EBITA

in the second half of this year. In a call with investors, Vivendi's CEO Arnaud de Puyfontaine said that the transformation strategy for Canal+ was "starting to bear fruit", with the number of new pay TV subscriptions offsetting the number of cancellations. De Puyfontaine said that Vivendi now had a "sustainable business model for Canal+" that allows subscribers to pay "the right price" for what they want. Subscriber numbers in France remained flat overall, and the pay TV outfit lost 401,000 in the course of last year, leaving it 5.145 million customers in France, despite what the company described as a significant improvement in its performance following the launch of the new offerings. Domestic pay TV revenues were down 7.8% in the three months to March compared with the first quarter

of last year. The domestic decline was partially offset by international growth. The African subscriber base grew by 649,000 in the year to March, leaving the group as a whole with a base of 14.7 million, up 3.2 million year-on-year, including the 2.9 million Free and Orange customers gained as part of the new distribution agreements with the service providers that allow them to supply the Canal+ service as part of their own bundled offerings. International revenues grew by 8%. Overall Canal+ revenues for the quarter were €1.278 billion, down 3.8%. Production outfit StudioCanal's revenues tumbled by 10.1% to €95 million for the quarter, due to lower video sales. Canal+ Group operational income was €51 million, down from €164 million, while EBITA was €57 million, down from €169 million.

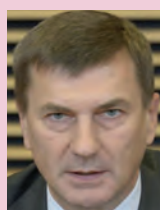
EC calls for finalisation of Digital Single Market

By Andy McDonald >

The European Commission has urged the European Parliament and member states to finalise key legislation and complete its Digital Single Market strategy by 2018. In its mid-term review of the 2015 Digital Single Market plan, the EC said that "good progress has been made" overall, and that it has delivered 16 key measures – which adds up to 35 proposals and policy initiatives in total.

However, it outlined three main areas where further EU action is needed: to develop the European Data Economy to its full potential; to protect Europe by tackling cybersecurity challenges; and to promote online platforms as responsible players of a fair internet ecosystem.

"The commission has lived up to its promise and presented all main initiatives for building



Ansip: EC has lived up to its promise.

a Digital Single Market. Now, the European Parliament and member states need to adopt these proposals as soon as possible, for new jobs, business and innovation to take off across Europe," said VP for the Digital Single Market, Andrus Ansip.

"Two years on, we propose to update our strategy to reflect new challenges and technologies. We need cyber-secure infrastructure across all parts of the EU so that everyone – everywhere – can enjoy high-speed connectivity safely.

"We have already agreed on strong EU rules for personal data protection; we now need

to make sure that non-personal data can flow freely to assist connected cars and eHealth services. We need high-performance computing along with a digitally skilled workforce to make the most out of the data economy. All these areas are essential for Europe's digital future."

The EU has already reached important agreements to end mobile roaming charges on June 15, 2017 for all travellers in the EU; to release the 700MHz band for the development of 5G and new online services; and to allow portability of content by as early as 2018, so that Europeans can travel with the films, music, video games or e-books they have subscribed to at home.

The EC claims that a "fully functional Digital Single Market" could contribute €415 billion per year to the EU's economy and create hundreds of thousands of new jobs.

Events

ANGA COM

Date: 30 May - 1 June

Venue: Köln Messe, Cologne, Germany

W: www.angacom.de

Mediatech 360

Date: 7 - 8 June

Venue: Millennium Mayfair, London, UK

W: www.nbmevents.uk/mediatech360summit

New Europe Market

Date: 12 - 15 June

Venue: Dubrovnik Palace Hotel, Dubrovnik, Croatia

W: neweumarket.com

TechXLR8

Date: 13 - 15 June

Venue: ExCeL, London, UK

W: tmt.knect365.com/techxlr8

VR & AR World

Date: 13 - 15 June

Venue: ExCeL, London, UK

W: tmt.knect365.com/vr-ar-world

Futuresource New Content Horizons

Date: 15 June

Venue: Ham Yard Hotel, London, UK

W: futuresource-consulting.com/Futuresource-Event-New-Content-Horizons-2017

IBC 2017

Date: 14 - 19 September

Venue: Rai, Amsterdam, The Netherlands

W: www.ibc.org

Digital TV Central & Eastern Europe

Date: 11 - 12 October

Venue: Kempinski Hotel, Budapest, Hungary

W: tmt.knect365.com/digital-tv-cee/

Global Wrap

The global number of pay TV subscribers will rise by 134 million between 2016-22 driven by gains in Asia Pacific, according to **Digital TV Research**. The research claims that the total number of pay TV subscribers will climb from 959 million in 2016 to 1.09 billion in 2022, after passing the one billion mark in 2018. The Asia Pacific region is tipped to add 92 million subscribers between 2016 and 2022. **SNL Kagan's** First Quarter US Multichannel Subscriber report said that US pay TV subscriber numbers declined by 802,000 in Q1, a traditionally strong three-month period for the industry. The research estimated that total traditional multichannel subscriptions fell to 97 million in the quarter to the end of March. US over-the-top TV service **Pluto TV** has launched a free video on demand offering consisting of thousands of movies and TV shows. The VOD collection includes content from Lionsgate, **Metro-Goldwyn-Mayer** and **Warner Bros** and will be available alongside the 100-plus streamed TV channels that Pluto TV already offers. **PCCW Media** has launched its Viu OTT TV service in Thailand, marking its 15th market launch to date. Asian content with Thai subtitles - including current dramas and variety shows from Korea and Japan - will be delivered via the Viu mobile app and website after their local telecast. **Netflix** has commissioned its first original series out of Australia, placing it head-to-head with SVOD rival **Stan**. Production will start next year in Queensland on *Tidelands*, marking Netflix's move into original programming in Australia.

CAB > SFR wins League

Alice-owned SFR has secured the rights to Champions League and Europa League football, dealing a blow to pay TV leader Canal+ and BeIN Sports, which currently share rights to the competition. SFR has secured all rights to both tournaments for the 2018-21 seasons, reportedly for close to €350 million a year, a considerable increase on the previous deals. SFR's first quarter adjusted EBITDA fell by 5.1% to €820 million with a reduced margin, down 1.8 points to 30.3%, in large part as a consequence of its investment in content and in costs associated with voluntary redundancies. The operator reported revenues of €2.705 billion, up 0.6%, with consumer revenue growing only marginally to €1.77 billion. SFR said that its content strategy was

paying off, with its subscription video-on-demand service doubling its audience by 50%. SFR is continuing to lose customers, 111,000 down on the same period last year.

OTT > France.tv launches

France Télévisions has launched a new online video portal combining all live, catch-up and paid for online video content and replacing the former Pluzz catch-up and video-on-demand services. The launch of the new site, france.tv, is the first major step towards the launch of a wider SVOD offering in later this year designed to provide an alternative to Netflix in France. France.tv offers about 500 programmes daily, combining seven-day catch-up content from the public broadcaster's six terrestrial TV channels with pay VOD and exclusive internet content. As part

of the launch, France Télévisions has shortened the time taken to make catch-up content available to 30 minutes, down from about four hours with Pluzz. Users must also register to use the service, allowing them to receive personal recommendations and helping France Télévisions build up a useful database of viewers. France.tv will be extended in September to include content from other thematic portals - Culturebox, youth-oriented Ludo and Zouzous, francetveduction and francetvsport. France Télévisions director-general Delphine Ernotte-Cunci recently confirmed that the planned SVOD service would launch in September. She told financial daily *Les Echos* in March that the pubcaster had agreements in principle with production companies based on revenue-share arrangements.

Vodafone: buy exclusive content 'if necessary'

By Stuart Thomson >

Vodafone will invest in exclusive content "if we need to" despite having a preference for non-exclusive deals, and plans to expand its presence and the reach of its TV services in "marginal markets", according to Nick Read, the company's CFO and executive director.

Speaking to analysts after the company announced its year-end results, Read said that TV was important to Vodafone "because it makes converged offerings more appealing" and helped reduce churn.

Read said that premium content was "important to our offer" but that the company preferred non-exclusive deals where possible because "we don't believe that exclusivity creates a lot of value for telcos in the long run".

However, he said, "If we need to bid for exclusivity in order to



get it, we will, as we have done in a couple of markets".

He said that Vodafone was "very happy" with its cloud-based TV platform, which is currently available in a number of markets.

In Spain and Germany the operator has large legacy cable networks that use alternative TV systems. In Germany it recently launched the advanced GigaTV service for cable users.

Read said the cloud-based Vodafone TV platform was the company's "most modern" TV service, offering cloud-based functionality and multiscreen availability of content.

He said this could be launched "in marginal markets" at lower cost because it was a shared platform across the group.

Despite being weighed down by the write-down of its Indian business and problems in the UK, Vodafone has posted solid year-end numbers.

It was boosted by the success of its convergent offerings, and has raised its guidance for underlying profit growth.

Vodafone had 9.8 million TV customers at the end of its financial year, rising to 13.8 million if its Dutch JV with Liberty Global, VodafoneZiggo, is included.

Vodafone now has 14.7 million fixed broadband customers, or 17.9 million including VodafoneZiggo, with 1.5 million new broadband customers added in the year. Of these, 7.7 million take a high-speed service over fibre or cable.



Q&A: Matthias Greve, ABOX42

ABOX42's CEO Matthias Greve talks about the role service providers can play in enabling the smart home

How significant is the smart home market likely to be and what types of industry players are looking for a share of the market?

According to a latest market research from Strategy Analytics, the global Smart Home market will reach US\$130 billion revenue by 2020. It is divided between US\$68 billion in retail and US\$62 in the operator market. The retail market will be mainly served by big tech companies like Apple, Samsung, Google, Amazon, Philips etc. and many smaller device manufacturers, trying to get market share. The huge opportunity for operators is in the other half of the market – this US\$62 billion can be addressed by services operators in their local markets. We call this the 'Operator Smart Home' market in contrast to Retail Smart Home.

What role can service providers or operators play in enabling the smart home for their subscribers and what opportunity is there for them in this market?

Service providers can offer new Operator Smart Home Services as a subscription to their existing customer base e.g. broadband subscribers or even mobile subscribers, since the service is not bound to a dedicated internet connection. In differentiation to Retail Smart Home, the service provider can subsidise the hardware (or sell it at a low margin) and offer a subscription service. This is a well-known model in internet or mobile, where modems, routers and mobile phone are part of the subscription service. For the end user, the advantage is that the cost of hardware is paid with the subscription and he has a support contact for his complete installation and service management. For the operator, the good thing is that the focus is on subscription revenues and not on hardware sales, like the retail market.

On the business side these services will increase the ARPU [revenue], drive new customers and reduces churn within the existing subscriber base through bundled packages. This is especially important nowadays, since the margins in internet, telephony and TV are shrinking and everybody is looking for a fourth major revenue stream.

What are the challenges facing operators looking to enter the smart home market and what do they need to think about before taking the plunge?

The operators should take a careful look at the business model and the lifetime value of the customer. Typical retail products come with expensive hardware, are complex to support in operation and installation. Additionally the services and products need to have a clear benefit, which is appealing to most of the customers and not only the 5% of 'techies' within the customer base of the provider.

What are the basic technology requirements for operators looking to enter the smart home market? What kind of investment is required of operators and consumers respectively?

For a fully functional platform the operators need a home gateway, certified sensors, the big data cloud for data processing and storage, as well as mobile apps (for Android and iOS). Additionally the operator needs a team to integrate, operate and enhance the system in the future. To have a competitive solution the investment easily can go into the millions for development and annual operation and extension of the services. He can either do it on his own or look for a platform/complete solution.

With our ABOX42 dotIO Operator Smart Home platform we offer the operator a complete solution, with sensors, gateways, the cloud services and mobile apps as the end-user interface to interact with the service. More important, we also provide a set of ready-made business models that are focusing on clearly defined use cases. Over time we will add more products serving additional use cases to the service, so the operator can create additional subscription services for its user base.

How big a concern is security and privacy in building the smart home and why should subscribers trust operators to ensure that their smart home systems are safe?

Security and Privacy are the key elements to the Operator Smart Home solution. The good thing is that the subscribers already trust operators with their internet and telephony. The operator needs to focus on a system that provides advanced end-to-end security with secure gateway and sensor hardware, encrypted communication and secure cloud processing. Additionally, the solution needs to have a clear view on data privacy so the customers do not feel that somebody can enter the privacy of the home.

What kinds of smart home applications make sense to consumers and what are they likely to be willing to pay for?

With our ABOX42 dotIO Operator Smart Home solution we focus on very simple use cases, which are easy to market and attractive to a broad audience. A simple to use monitoring service like our 'Home OK' solution allows the user to check their home at any point in time. On pricing, for example the operator can offer US\$10 per month subscription for the complete service which includes the gateway and around 10 sensors. A comparable retail price for the hardware alone would be up to US\$700.

Germany

IPTV > Telekom edges up

Deutsche Telekom had 2.955 million pay TV customers in Germany at the end of the first quarter, up 2.6% year-on-year, giving substance to its claim to be the only IPTV service that was growing in the country. The Entertain TV service gained 76,000 subscribers in the quarter, described by the operator as "substantially stronger" than in preceding quarters. Telekom attributed growth in broadband lines and TV in the domestic market to its new strategy of focusing on market-

ing integrated offerings. Broadband numbers grew by 67,000 in the quarter. In Europe outside Germany, Telekom's IPTV, satellite and cable TV base amounted to 4.1 million, up 1.3%. Internationally, the biggest growth in TV was in Slovakia and Hungary. International TV revenue grew by 7.3% to €123 million.

Italy

PROG > Mediaset bounce

Mediaset has bounced back into the black in the first quarter following its €294.5 million loss last year, which the company blamed

squarely on "the turbulence" caused by French media giant Vivendi reneging on its deal with the Italian broadcaster. Mediaset's success in clawing its way back to profit is due to its campaign of cost-cutting. Operating costs were down to €537.7 million from €549.8 million last year, giving the company a positive EBIT of €76.6 million and net profit of €15.9 million, compared with a net loss of €18.2 million for the same period last year. Revenues for the quarter were €889.3 million, down €22.7 million on the same period last year, driven lower by the performance of Mediaset Italy, which posted sales

of €649.3 million, down from €682 million. Mediaset Spain saw its revenues rise by €9.7 million to €240.4 million. Mediaset said it expects advertising sales to remain positive for the rest of this year. It also plans to put an aggressive share repurchase programme before its annual shareholders' meeting, giving directors the power to buy up to a maximum of 10% of the company's share capital. Mediaset currently owns 3.795% of its capital. The broadcaster's biggest shareholder Fininvest currently holds 39.8% of the company's voting rights, while Vivendi currently holds 29.9% of the voting rights.

Viaplay chief: presence on set-tops 'not necessary' for SVOD

By Stuart Thomson >

Modern Times Group (MTG)-owned OTT subscription video-on-demand service Viaplay does not need to be available on set-top boxes to succeed, and will continue to be a complement to MTG's mainstream pay TV service rather than a replacement for it, according to Jonas Karlén, Viaplay's CEO.

Speaking at the Connected TV World Summit in London, Karlén said Viaplay, which is now present on over 90% of all connected devices in the Nordic market, had no need for a presence on pay TV set-top boxes.

"We don't want to be on devices that can't use our key features, so we are not present on any set-top boxes in the Nordics. They are not good enough for a good user experience. Developing apps [for each box] was not worth the price and very few customers in the Nordic markets are asking for it," he said.

He said it is "too cumbersome" to develop native apps and then upgrade them regular-



Karlén:
Viaplay will only be on devices that support key features.

ly for each and every set-top box in the market.

Karlén said that Viaplay is available on TV screens through devices such as Chromecast. He said "a transformation is happening" in the way consumers use video, and that maintaining a high-quality user experience is more important than, for example, being available on every device.

However, he said that the development of Android set-tops could provide an opening as Android offered a standard way of providing services that could support all the features that Viaplay offers.

Karlén admitted that he personally did "not have a traditional package" any longer, relying on OTT TV services including Viaplay for his TV viewing.

However, asked by *Digital*

TV Europe whether MTG's increasing focus on digital content such as eSports and the sale of free-to-air and pay TV assets outside the Nordic markets means that Viaplay would ultimately become the company's only pay TV offering, he said that MTG remained committed to traditional mainstream pay TV for the foreseeable future.

Karlén said that the company would increasingly focus on distributing pay TV through open fibre networks in the Nordic markets, which he said made a compelling service as part of a bundle with high-speed broadband.

However, he said that satellite-delivered pay TV would also continue to play a significant role in reaching consumers in rural areas.

Karlén told Connected TV World Summit attendees that Viaplay and Netflix are now far ahead of all other Nordic SVOD services in terms of ratings on iOS and Android devices. Viaplay has quadrupled subscribers and increased revenue fivefold since 2013, he said.

Key to the company's success in matching Netflix has been its move into originals a year ago, offering shows with local relevance such as *Hassel*, *Swedish Dicks* and *Veni Vidi Vici*.

"There are so many great stories coming from the Nordics," said Karlén. "This means we now have a mixed content portfolio of local stuff together with acquired titles."

The Viaplay originals have often been more successful than the most popular US acquired content, he said, citing the popularity of *The Great Escape*, *Black Widows*, *Black Lake* and *Swedish Dicks*.

Viaplay launched as an SVOD service in 2011, replacing Viasat On Demand. Offline viewing was launched in 2012, and over 95% of content is now downloadable.

In 2016, the service launched the first Viaplay original, and a month ago Viaplay became one of the first such services to broadcast sports content in 4K UHD. "We are seeing how we can take that even further on," said Karlén.

Poland

OTT > Showmax launch

Naspers-owned video-on-demand service Showmax has partnered with Polish mobile operator Play. All new and existing Play contract customers will get free access to Showmax, which launched its internet TV offering in Poland in February. The agreement will make Showmax available to some eight million Play customers and is part of Showmax's plan to accelerate the rollout of the service in Poland. Showmax offers a localised offering in Poland that includes Polish short films and series. The firm has offices in Warsaw and former Google executive Maciej Sojka leads its local operations. Showmax first launched in August 2015 in South Africa.

Spain

IPTV > Telefónica dips

Telefónica's global pay TV base dipped slightly during the first three months of this year, dropping 1.7% to 8.2 million. The company's DTH satellite base dropped by 8% to 4.2 million. In Spain, pay TV numbers declined by 3% thanks to a decline in the satellite base offset to some extent by growth in IPTV. The company said that its Movistar Fusión converged base grew by 4% and now represents 84% of the broadband base and 77% of the company's mobile contract base, with Movistar Fusión's penetration of pay TV rising significantly. Telefónica España's pay TV base overall at the end of the period was 3.616 million, of which 2.97 million were Fusión customers, up 7.3%

year-on-year. On the downside, the Spanish operation's supplier costs increased by 3.6% in the quarter, in part driven by increased TV content costs. Elsewhere, in Brazil, Telefónica saw its pay TV base slide by 7% to 1.7 million despite growth in IPTV subscribers. In Spanish-speaking America, the pay TV base rose 3% to 2.9 million. Overall, Telefónica posted first quarter revenues of €13.1 billion, up 5%, and operating income before depreciation and amortisation of €1 billion, up 4.8%.

UK

IPTV > BT 360° football

BT is to provide coverage of the Champions League football final in 360° video for the first time. The telco will make 360° coverage of the match available on YouTube

and the new BT Sport Virtual Reality App, allowing viewers to choose between a 360°-produced programme with commentary and graphics, or select their own camera viewpoint. The final will also be available in 4K UHD on YouTube on BT TV in 4K UHD with Dolby Atmos. BT has committed to make the Champions League and Europa League finals available for free on YouTube, the BT website, BT Sport channels and the app. BT added 11,000 TV customers to its TV base in the first three months of this year, taking its overall TV base to 1.7 million in a quarter that was generally disappointing for the UK telco. BT also said that its new YouView user interface was now in 1.3 million homes. Consumer revenue for the quarter was £1.195 billion (€1.393 billion). However, consumer EBITDA was down 18%.

Euskaltel acquires Zegona's Telecable in €700 million deal

By Stuart Thomson

Spanish regional operator Euskaltel has struck a deal with UK-based Zegona Communications to acquire Telecable in a deal that values the Asturias operator at €686 million.

The move paves the way to create a single operator across the Basque Country, Asturias and Galicia regions of northern Spain.

Euskaltel will take 100% control of Telecable for €686 million including an estimated €245 million in debt in a deal that will see Zegona become a 15% shareholder in the Basque operator, with one seat on the board. Euskaltel may make an additional payment of €15 million dependent on the future performance of Telecable.

Zegona will receive €186 million in cash along with €255 million worth of Euskaltel shares at

a price of €9.50. The balance of the transaction is comprised on debt. Overall, the deal values Telecable at about 10.5 times 2016 EBITDA before synergies are taken into account.

The pair have estimated that the deal will realise €245 million in synergies, mostly from operational expenses. Currently, Telecable uses mobile capacity from Telefónica while Euskaltel is supplied by Orange.

For Zegona the deal represents a premium of 41% on its share price and gives a return of 42% to shareholders on their initial investment in the company.

Zegona will have one seat on the board. The combined operator will also create a new strategy committee comprising one representative each from Zegona, Kutxabank and Corporación Financiera Alba, the company's main shareholders. The combination of Euskaltel, R and



Erauzkin:
intends to
maintain
the separate
companies'
values.

Telecable will give the company a market of six million people, an increase of 20% on Euskaltel and R's previously addressable market, and a combined subscriber base of about 800,000. The operators had consolidated revenues of €701 million and EBITDA of 346 million, with free cash-flow of €224 million.

Euskaltel Group chairman Alberto García Erauzkin said that the group's "intention is to maintain each of the companies' values, such as the trademarks and the people's talent, as they are the key of their success". Erauzkin said that "this transaction completes the full cable

consolidation in the north of the State. Euskaltel, and R and Telecable, are leaders in our markets and the addition of the three great north operators makes as leaders in the State".

Eamonn O'Hare, Zegona's chairman and CEO, said: "When we acquired Telecable in 2015, we identified the potential for substantial value creation through the combination of the three independent Northern Spanish cablecos. This transaction turns that vision into reality and provides the opportunity for significant value gain through delivering the high level of synergies available and from the increased strength of the combined business. Being the leading regional operator in Spain, Euskaltel is very sensitive to the local needs in Asturias and we know will provide great support to the Telecable business and team. fix-sell' strategy."

Virtual revolution

The nascent virtual reality market is slowly coming of age, with a new crop of VR production companies helping to define what immersive content looks like today. Andy McDonald finds out more.



While it is still early days for virtual reality, a flurry of recent activity hints at how far this space still has to grow. In the past month alone, Google announced its first standalone Daydream VR headsets, VR technology company Improbable raised US\$502 million (€450 million) in a Series B funding round led by SoftBank, and Facebook unveiled a new VR app for communicating with friends, called Facebook Spaces.

Market predictions for the space have also been bullish. IDC predicts that total VR headset device shipments will grow almost tenfold from 10.1 million units in 2016 to 99.4 million units in 2021. Greenlight Insights believes that total virtual reality revenues will reach US\$7.2 billion globally by the end of

2017, while CCS Insight claims that the total VR device market – both smartphone VR and dedicated VR – will be worth US\$1.5 billion in 2017, rising to US\$9.1 billion by 2021.

On the content side of things, some of the more established players in this still young space, like St Albans-based Rewind, are involved in all aspects of VR – from interactive games-engine driven work, to mixed reality, and 360° video. However, there is also an emerging trend of talent passing from the traditional TV world over to VR. The people behind production outfits Parable VR, VR City and Mandt VR are all examples of TV experts turning their hands to immersive content. For the most part, their focus so far has been on narrative-led 360° video.

Digital TV Europe spoke to some of these

players to find out how the content they are making is helping to define the VR industry today.

Rewind

While many VR companies operating today are rooted in 360° video, UK-based Rewind takes a more holistic view of the virtual reality market. Rewind founder and CEO Sol Rogers describes a space that ranges from desktop browser-based 360° video, delivered through YouTube and Facebook, at one end of the scale, to game-engine driven, fully interactive and fully immersive VR delivered through high-end devices like the HTC Vive or Oculus Rift at the other.

Rewind created a multi-platform VR experience for recent film *Ghost in the Shell*.



"We're one of the few companies globally that fit the full umbrella of content," says Rogers. "When we start working with clients and brands, we are not selling them [on the idea that], 'we've got a box full of these things, so they're going to be the answer for everything'. We're going 'well what are you trying to get out of this?'"

A look at some of Rewind's recent projects gives you an indication of the scope its work. It recently produced a cross-platform VR experience for Hollywood movie *Ghost in the Shell* in partnership with Oculus, Paramount, Dreamworks and US-based VR studio Here Be Dragons. Made in just seven weeks, the experience was available on Rift as a "super interactive", high-end VR experience; as a semi-interactive experience for Gear VR; and

as a 360° video version that lives on Facebook. Describing the work, Rogers says: "It's not the film, it's not a trailer, it's something which gives you a glimpse into the universe and it's stand-alone."

"The first thing that we do with a client is we try to work out what they want first and foremost," says Rogers. "What type of content you want to create and really try and work out what the measure of success is."

A recent project for Jaguar saw Rewind produce a social VR experience at last year's LA Auto Show for the launch of its all-electric I-PACE concept car. "They wanted it to be a launch event to communicate to 250 journalists this amazing product in an amazing way," said Rogers, explaining the choice of high-end, real-time, interactive VR. "The value came from doing it that way."

While only a relatively small number of people saw the Jaguar VR experience, the journalists who wrote about it gave the project a wider reach. "If they [Jaguar] produced a 360° video, they could have got a lot of users, a lot of people seeing it on Facebook and YouTube. But it actually wouldn't have been much different from producing just a highly polished 2D film," says Rogers.

Thinking about the development of the VR industry to date, he claims that companies have already had to take a change of tack. "Brands and agencies were enjoying their free PR push that they got about being the world's first VR something – 'insert brand', 'insert product'. That all went away last summer. Now it's more about quality of returns."

While the number of eyeballs watching a video is still important, Rogers says that the transformative effect of experiencing high-end VR communicates a message in more powerful way than by watching something on TV or via YouTube. "For me 360° video is something as a necessary transition, because it's fantastic for mobile," says Rogers. "There are 1.9 billion smartphones in the world, all of them can access 360 video and you don't have to have a headset to view it." However, he claims that this is a "pale comparison" to a full VR headset experience.

"The real-time stuff on the Rift, the Vive, the Playstation VR – game-engine driven, where you have control, where you are part of the world and have interactivity – that's new and that's a lot slower for the uptake. But once you've tried it, you understand that it's a different medium, a different art form, which

is fundamentally going to change everything," says Rogers.

"Sadly, it takes a little bit of expensive hardware – headsets and PCs – to get us there, so that route is a lot slower than we expected. But it is the one that will win in the long-run."

Mandt VR

TV industry veteran Neil Mandt remembers a point roughly three years ago when he felt there was "a real problem going on in the industry", a sense that the "can-do attitude" of the television sector was starting to disappear. It was this instinct that led Mandt to flip his entire TV production company to focus on VR – a medium that, at the time was still only "on the distant horizon".

"If you'd asked me a decade ago where my career would go, I would have said, 'TV: that's what they're going to put on my tombstone'," says Mandt. However, what he perceived as a shift in the industry – where deals were getting harder to close and more work and edits were being demanded for commissioned projects – gave him pause for thought.

"At the time, I didn't know that this whole problem was because of the cord-cutting. Nobody knew it. It was like being in a recession, but you don't know until you're six months into it," says Mandt. Looking to the early-stage VR market, where the content was "not just bad, it was almost unwatchable," he decided to be among the first clutch of companies to compete in this space.

Mandt's roots in TV stretch back to his university days, when winning a College Emmy at 19 landed him a job as an NBC reporter aged 20. His career after that point included producing the OJ Simpson criminal trial for ABC News, producing the Sydney Olympics for NBC and creating what he estimates to be around 3,000 episodes of television though his 2001-established production company, Mandt Bros.

His Mandt Bros. credits include ESPN series *Jim Rome is Burning*, Syfy Channel series *Destination Truth*, and Food Network series *The Shed*. Along the way he has also produced a handful of films – including the 2014 Walt Disney Pictures feature *Million Dollar Arm*, and most recently a Burt Reynolds movie called *Dog Years*, which played at this year's Tribeca Film festival.

Leaving TV behind and setting up Mandt

VR was no small undertaking. Mandt invested in new cameras, new computers and new editing systems for the post-facility at his existing studios in Hollywood. He also had to learn a new production language for 360° content – covering camera placement, sound design and editing techniques.

“There’s storytelling that exists within 2D media, whether it’s on a mobile phone or a computer, where I can tell your brain, without even sound, exactly what’s happening,” says



“If you’d asked me a decade ago where my career would go, I would have said: ‘TV: that’s what they’ll put on my tombstone.’”

Neil Mandt, Mandt VR

Mandt. “That storytelling is impossible to tell in VR because you can’t cut like that. You can’t push in and zoom. So there is whole new storytelling that needs to happen.”

After doing a handful of videos, Mandt and his partner Gordon Whitener last year raised US\$10 million with plans to up their production rate. “We brought in producers who were from traditional television and started training them and making shows. We did a show with [comedian] Tom Green, we did some travel shows and some sports shows – a variety of different things. That then led us to contract work for some big brands like the Pittsburgh Steelers and Disney,” says Mandt.

He soon realised that to make money in this space, the key would be to replicate the old TV model by making “volume VR” – something that could be achieved through 360° video. “Everyone has a smartphone in their pocket. There’s two billion of them in the world. So we said ‘alright, what 360° video can we make that we can make inexpensively that works within the limitations of both VR and 360°?’”

What followed was a deal with US podcasting company PodcastOne, which will soon see the launch of a PodcastOne VR platform that will house 1,000 pieces of content. Mandt claims this will represent “the most serialised VR 360° content anywhere”. To achieve this, his team built a custom camera rig at the PodcastOne studios that they could access remotely and developed live stitching capabilities for the content. “Necessity is the mother of invention,” says Mandt. “We call

the camera the Medusa because it literally has cables coming out of it all over it.”

Looking ahead, Mandt believes that the VR industry is two to five years away from going mainstream. In two years he predicts VR will be a “cool thing” that people will be aware of, but only those in the know will really use. In five years, he predicts it will be the equivalent of where we are today with the smartphone. “I don’t see anything slowing it down at this point.”

Parable VR

Launched in March this year, London-based Parable VR was born out of the combined television and commercial experience of its founders, and has attracted solid industry backing. The company was set up by Nicholas Minter-Green, the former president of Economist Films, and David Wise, the former director of programmes at The Garden Productions – the company behind shows like *24 Hours in A&E*. Channel 4 invested in the business through its Independent Growth Fund. *The Economist* also backed the firm, as did TV industry veteran and Studio Lambert CEO, Stephen Lambert.

Speaking to *Digital TV Europe* at Parable’s shared office space in London’s Kings Cross, Wise explains that the decision to form the business came about last January after a Minter-Green, while still at *The Economist*, went on a trip to the West Coast of the US and the main talking point among all the tech companies there was VR – despite a limited pool of compelling VR content.

“We weren’t the first to spot it, but we felt, when we looked what was out there, there was a lot of good content but it was lacking narrative,” says Wise of their thinking at the time. “Our belief, in the worlds that we came from, was that you need narrative and

engagement in order to sustain audience interest. There was some of that coming through, but not much. That’s why we decided to do it at that point. We felt like this was the beginning of a genuine new phase – of a new medium and it was an opportunity to get in early and we felt excited enough to be willing to abandon our previous careers and transfer our skills across.”

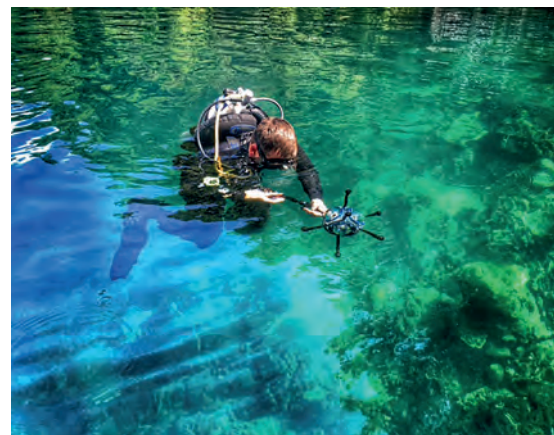
Between January and the summer of 2016 Wise and Minter-Green worked out a business plan and began seeking investment, holding talks with a range of companies and individuals between October and January 2017. Wise says that ultimately they believed “we’d be in a stronger position with organisations who also create and commission content, and have an understanding of content”.

Parable’s first work was *Ocean: Mystery Corals*, a 360° tour of the corals of Palau in the Western Pacific that was made for *The Economist* with brand support from Swiss watch company Blancpain.

The company has also recently worked on a brand-funded project, shot in Bermuda, focused on the America’s Cup yacht race. This produced three immersive ‘mini documentaries’, which Minter-Green says point to “all the things that make this medium really exciting, because it allows privileged access, geographic transformation, some speed and sensation.”

Next up is a broadcaster-funded piece, which Wise describes as “pure computer-generated VR”. Talks are also ongoing with broadcasters and established on-screen talent.

“Every single broadcaster I would want to be working with are either thinking about, or are already, commissioning VR,” says Wise. “It will come down to how audiences engage – do viewers come to it in significant numbers



Parable’s first work was a 360-degree tour of the corals of Palau in the Western Pacific.



Q&A: Sylvain Thevenot, Netgem

Netgem CEO Sylvain Thevenot talks about the key elements of a TV service and learnings from the company's entry into the German market.

What features do telecom operators now regard as the essential elements of an advanced TV service, and how is this changing?

Telecom Operators have now started to understand how essential an integrated multiscreen, live, time-shifted and OTT experience is whilst continuing to offer to their customers a telco-grade TV service in terms of Quality of Experience. But with the very dynamic nature of the content landscape, with more OTT content providers appearing faster than before, telecom operators also need to have a platform that allows them to easily integrate any new content partner whilst offering a simple discovery experience when growing the content catalogue: flexibility and simplicity of experience are paramount.

What are the principal applications being provided by Purtel, your first German partner?

Purtel has historically been providing VOIP and billing services to small and local telcos. By now having a triple-play offering they will ensure that their customers provide their end-users with a multiscreen IPTV and OTT service, which also allows them to access SVOD, TVOD, pay TV and, more importantly, the German Mediatheken. This will be offered as a white-labeled platform – provided by Netgem as a 'TV-as-a-service' solution.

In addition to this, Purtel will also offer the local ISP the possibility to provide local channels to their community. By doing this Purtel ensures that the local ISP gets the opportunity to push content through the platform which is only relevant to its local customers – whilst leveraging the national and international content available across all Purtel ISP partners.

How do you expect the market for advanced TV service to develop in Germany generally, and what specific requirements are there for this market?

We expect the market for advanced TV Service to grow rapidly. A fast growing number of millennials is pushing the IPTV market forward in Germany. Their needs are going towards more cord-cutting, more OTT, more on-demand and more non-linear content. This obviously creates a challenge to traditional cable operators as well as a challenge to traditional ISP which are struggling to be ready to satisfy those evolving needs. Various aspects can be challenging in this environment (operational

set-up, content rights, network infrastructure, relevant proposition, content security). With its TVaaS proposition tailored to the German market, Netgem is really helping those operators which are willing to take advantage of the opportunity to secure additional revenues and customers in this challenging market.

What particular needs do small and medium-sized service providers have and what technology solutions are they adopting to get advanced TV services up and running?

One of the main challenges faced by small and medium-sized ISPs is that they need support in order to launch (or re-launch) a compelling, current and innovative TV proposition. The move into triple or quad-play is key to them since their market is small and end-user churn is not easily replaced. Small and medium sized telcos are not in a switchers market in Germany. IPTV and multicast solutions are what they are most likely to adopt. This is due to the bandwidth savings and the related economies of scale that a multicast architecture brings with itself.

On the solution delivery side, those operators would find the Netgem TVaaS solution very attractive, given that Netgem can guarantee a very quick time-to-market, a great user interface, and a flexible and scalable cloud-based solution that embraces the challenges posed by a multicast, OTT, and hybrid environments combined.

How far and how fast are smaller service providers embracing cloud-based delivery of TV and what benefits does this bring?

The adoption rate has been high for medium ISP in Germany in 2016, with a few regional launches. 2017 is the year of the local ISPs and they are taking the time to make sure they are making the right choice. While a few regional telcos are still digesting the learnings from the early adopters from last year (and associated large investments made on bespoke implementations). We at Netgem expect the pace to accelerate across a territory of more than 40 million households and we will be supporting the delivery of a cloud-based TV service which brings excellent customer benefits (multiple ways of ingesting secured content) together with great business savings for the small ISPs (no set-up cost, bandwidth savings, enhanced customer proposition, increased customer loyalty, ongoing Innovation).

VR City's second immersive doc, Indefinite, looks at the UK's detention of immigrants.

and do the broadcasters find a way to make the content available to people in significant numbers?"

Wise says that commercial and public broadcasters alike see VR as a way to engage viewers, particularly hard-to-reach younger audiences. The commercial broadcasters also know that the advertisers who spend money with them are interested in VR, which is in turn helping to fuel their interest in the medium.

"Having come from TV, it's been amazing to see in the last 10 years the change in the nature of viewing habits and how fragmented the audience has become," says Wise. "It's so hard to keep hold of viewers and find an audience. When you have something that by its very nature has all of your attention, that is unbelievably powerful."

The level of enthusiasm and openness in the nascent VR space is what's so exciting about it, says Wise. "Anything is possible; that's a really invigorating thing to be a part of." He says that Parable's aim is to create partnerships and help companies to achieve compelling results. "We want to make commercially successful content, which engages a wide audience and which proves that this can have a life beyond isolated bits of content."

"The question about how sustainable it is as an entertainment medium will come down to the backing it gets and the content that's created," says Wise. "You have to trust that the tech companies know what they're doing. They haven't done all of this just for fun – they've done it because they believe in it as well."

VR City

VR City started life in 2014 after co-founder Ashley Cowan received a call from an old colleague asking if he knew how to make virtual reality films. "Honestly back then I didn't, I had no idea," says Cowan. However, two early pieces of VR content that he had experienced had a tremendous impact on him and spurred him to make steps into that space.

"The first thing I watched was a piece of content called *Catatonic*. It still lives with me to this day," says Cowan, describing the Here



Be Dragons-produced immersive journey through an insane asylum. "It was genuinely terrifying and I was exhilarated by it." A second project by the same company, called *Clouds over Sidra*, which was set in a refugee camp in Jordan, had a similarly big impact.

Cowan's first piece of VR work was for that former colleague and was an immersive health and safety training video for Pearson Education. This would be the starting point for VR City, which has since gone on to do 360° video work for broadcasters like ITV, the BBC and MTV, and brands like Lexus and Lagavulin.

"I thought, as a medium, it's got legs," says Cowan. "Even if it doesn't make it into peoples' homes, it can be in classrooms and in training and that's why our relationship with Pearson was important at the beginning and still is to this day."

Cowan started his career in TV by working on music and live entertainment shows for MTV, Channel 4 and ITV before setting up London-based East City Films with co-founder Darren Emerson. East City was set up to produce youth-focused entertainment content for brands and international broadcasters, while VR City, the pair's second production endeavour, has taken them down new roads.

"Very quickly I rediscovered the passion that I used to have in creating content," says Cowan, describing the genesis of VR City. "I found branded content and youth television wasn't giving me what I wanted anymore. I didn't feel like I was being challenged or excited, and I enjoyed the idea of being able to be one of the first. I think that was key. Setting up my production company [East City Films], we were walking into a 100-year old industry,

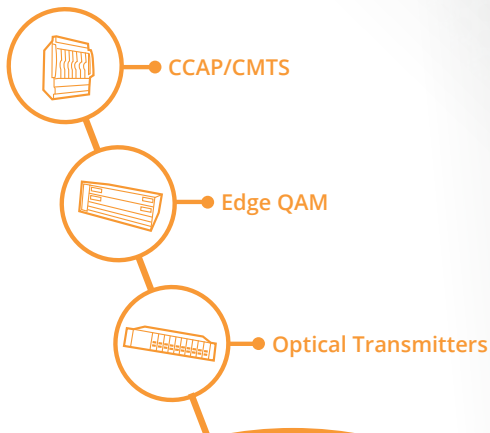
along with thousands of others. Whereas in VR we were walking into a one year old industry along with tens. So there was a lot to be said on a personal level for that. But also from a business point of view, it seemed to make sense at the time."

To date VR City has made two immersive documentaries: *Witness 360: 7/7*, which tells the story of Jacqui Putnam, a survivor of the London 7/7 bombing attacks; and *Indefinite*, about imprisoned immigrants facing deportation from the UK and the detention system that keeps them locked up.

While the latter was a commission from Sheffield Doc Fest, with a small amount of money also coming from the Arts Council, Cowan says that brands are where its most lucrative work comes from at the moment, "because they can see in the main it's experiential marketing and there's reasonably large budgets."

"That has been our main source of revenue – brands. The slower burn, and very, very interesting to us is to work with people like the BBC, Channel 4, ITV, Sky and BT Sports," says Cowan. "Everyone's trying to figure out how it can be funded, because at the moment there is no revenue stream based on people having headsets."

While Cowan says that there are not yet enough VR headsets in homes, the potential for growth is there to be seen. "The iPhone's year-one sales were 6.2 million. VR headsets across Oculus, HTC Vive, Google Daydream, Samsung VR are 6.3 million after one year, so it can be spun any number of ways," he says. "It's an exciting road to be on, we just need people to continue to invest in it and it will get there." ●



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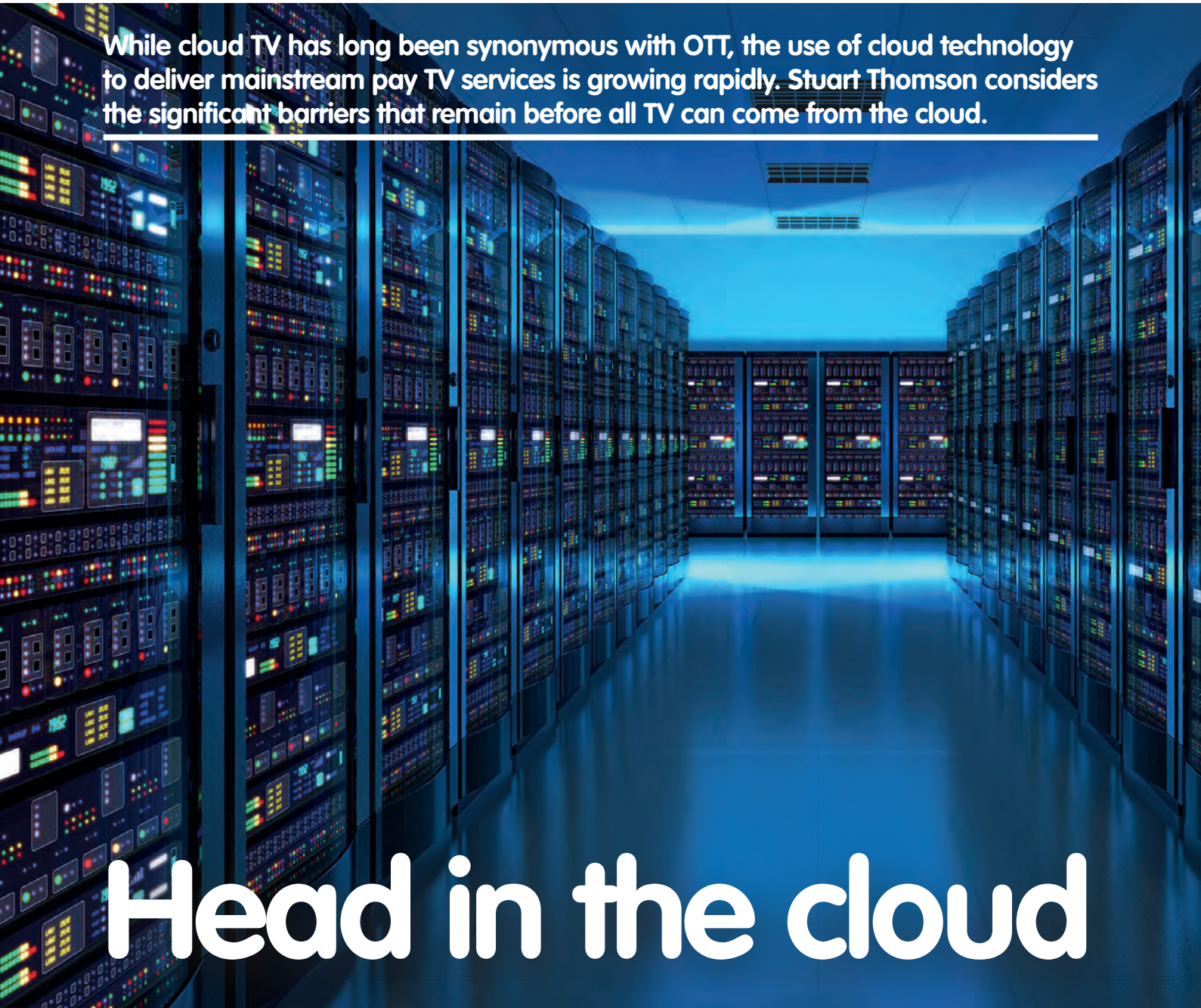
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While cloud TV has long been synonymous with OTT, the use of cloud technology to deliver mainstream pay TV services is growing rapidly. Stuart Thomson considers the significant barriers that remain before all TV can come from the cloud.

Head in the cloud

Cloud TV is now a familiar term in technology circles, but until recently the cloud was largely the province of OTT TV services, which were 'cloud native', in industry parlance, from launch. Increasingly, however, mainstream pay TV operators are looking to the cloud to provide solutions to some the challenges they face in an increasingly competitive environment.

"Two parallel trends have made the cloud a viable and preferable location for many video processing tasks. First the vendor community has embraced virtualisation, and

now containerisation, to allow their products to operate and become optimised for cloud based infrastructure," says Steve Plunkett, CTO, broadcast and media services at Ericsson. "At the same time, cloud infrastructure providers have introduced better support for media workloads with more deterministic performance, GPU support and most recently FPGA support. A period of experimentation and validation of the technology is now giving way to large scale usage."

For pay TV operators – and over-the-air broadcasters – delivery of multiscreen services is

an obvious starting point for cloud technology. Using cloud infrastructure to deliver IP video to tablets and smartphones is increasingly seen as an essential part of delivering any kind of multiscreen video service.

Beyond that, however, broadcasters and pay TV operators are beginning to embrace cloud technology to deliver mainstream pay TV services to set-top boxes and TV screens.

"What we are seeing now is a strong push from some large service providers to reduce cost and have more flexibility and a more IT-centric headend, and also to leverage virtualisation



Cloud technology means headends can be located in large data centres.

associated with moving away from legacy infrastructure. One such opportunity is to deliver more content to users by integrating OTT TV services with mainstream TV offerings. Another is to deliver personalised advertising to consumers – something that has captured the imagination of service providers in the US, where cable advertising has always been big business.

Public versus private cloud

Service providers face a number of important choices. One is whether to make the leap to an ‘all-cloud’ delivery architecture in one go or to make the transition in stages, adopting a hybrid approach that combines broadcast technology with cloud-based delivery of multiscreen and on-demand services. Another is whether to build their own ‘private cloud’ or use public cloud infrastructure.

David Grubb, chief technology officer of cloud business at TV distribution and broadband technology provider Arris, says that major operators are increasingly looking to build their own private cloud infrastructure to deliver their TV services.

“We see a lot of adoption of the cloud as a technology platform by large service providers, meaning that they build their own cloud. There are benefits from adopting the cloud-as-technology-platform approach,” says Grubb. “For live video in particular, the amount of traffic you are moving is very large so it tends to make sense to have the processing happen inside your own network.”

Grubb says that the choice is not based on a simple calculation of the relative cost of buying or renting server space, but on a range of elements including the cost of interconnect arrangements and the amount of traffic that operators are looking to move. As a result, he says that Arris has not seen much adoption of third-party cloud infrastructure by its service provider customers, although the costs of connectivity are going down over time.

While many service providers are looking to build their own private infrastructure, Grub does see a move, especially in the US, for third-party providers to build data centres closer to the edge of access networks. He cites the example of edge data centre provider

EdgeConneX, a US based provider that also has a point of presence in Amsterdam.

“What that means is that they are targeting the service providers as anchor tenants. If you have a cable TV system in a mid-size city it is one thing doing video processing in the cloud and having to locate your infrastructure 500km away. But if there is a data centre [nearby] and you have rack space there, and a cloud provider is renting rack space in that same facility, and you are moving data from your network to the public cloud and back, at that point it gets very interesting to look at using public cloud infrastructure,” he says. Grubb says that as companies like EdgeConneX build out these facilities, operators can combine using them with a public cloud provider like Microsoft or AWS or Google Cloud.

“In the world of VOD, with offline processing, you need to be able to transcode into multiple formats to create an asset to deliver to subscribers and that is perfect for the public cloud. You need to spin up a lot [of processing capability] to do the transcoding and then that gives you a catalogue of videos for the month,” he says.

For live video, on the other hand, the amount of traffic operators are moving is very large so it tends to make sense to have the processing happen inside their own network.

“Private cloud can seem like an attractive option and a comfortable first step for organisations that have concerns about public cloud. The compromise is that with private cloud, a lot of the benefits of cloud migration are limited or not applicable. Companies will see the benefits of virtualised computing, but miss out on a truly pay-as-you-go model and the massive economies of scale that cloud providers such as AWS can offer,” says Kiran Patel, solution marketing manager, cloud and delivery products, AWS Elemental.

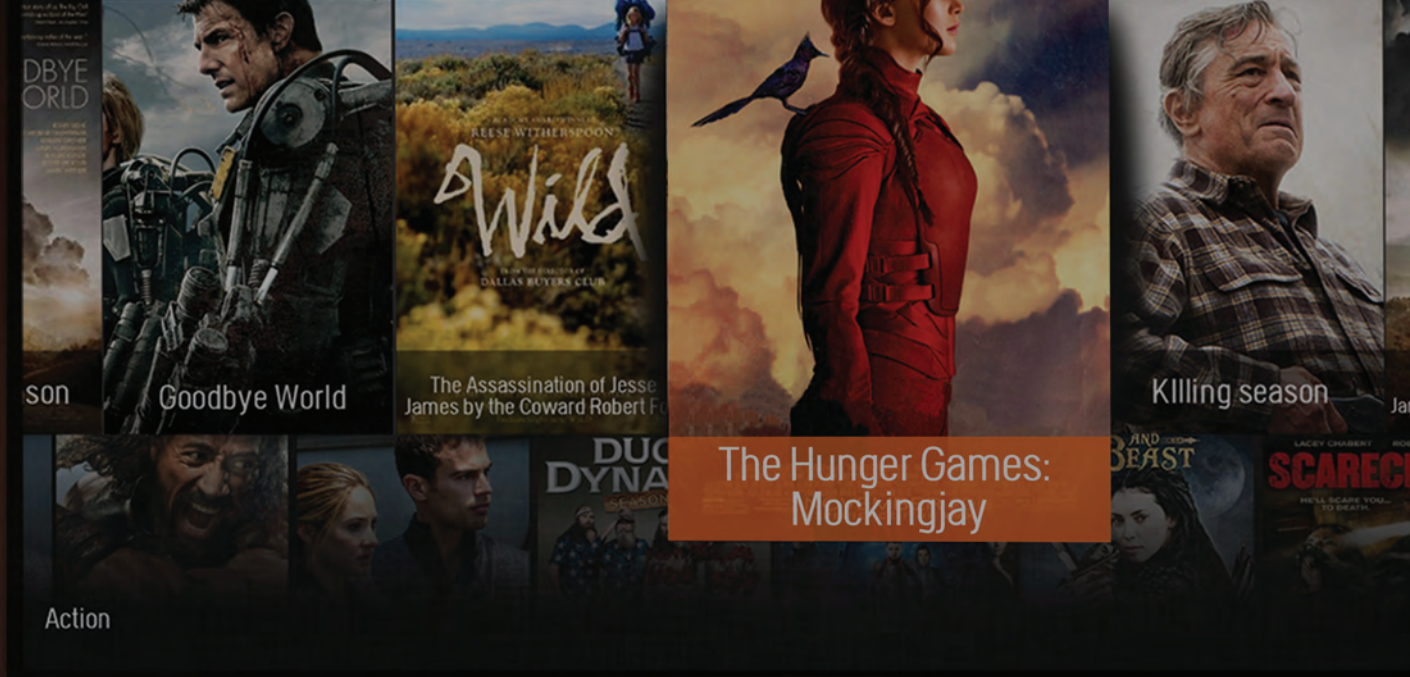
Nagra’s Trudelle says that for larger players the transition to cloud-based processing is likely to involve building their own data centre, embracing capital expenditure to create a wholly-owned asset rather than operational expenditure to rent space from a third-party. Operators can then use these facilities to deliver broadcast channels or IP unicast streams.

“One of the benefits of public cloud like AWS and other smaller regional players is that they have managed to tie together all the key stacks that make it possible to take a service up to speed rapidly,” says Trudelle. “That is attractive in terms of time to market and reliability. For

and more software-defined functionality,” says Simon Trudelle, of TV technology provider Nagra. For Trudelle, the push to embrace the cloud comes first from a desire to control costs more efficiently – especially at a time when pay TV providers are under pressure from those ‘cloud-native’ OTT TV providers.

There are also supply side factors at work. Vendors – including Nagra – are also looking to embrace cloud technology and virtualisation.

While the desire to reduce costs is a key factor in driving uptake of cloud technology, there is also potential for business opportunities



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Q&A: Charles Dawes, TiVo

Charles Dawes, senior director, international marketing at TiVo, talks about the future of content discovery and unveils findings from the company's latest consumer research.

It's now one year since the combination of Rovi and TiVo was announced to create the new TiVo. What has changed in terms of the company's overall proposition in that time?

It's been a year since we announced we were bringing the two companies together and just over eight months since we started the integration to form one of the world's leading entertainment technology providers. From a proposition side, you can see a continued focus on the product side of our business, bringing together best-in-class solutions from both companies to better serve our customers.

Since the start of the year, we've seen some key launches here in Europe, including Vodafone Spain rolling out the latest TiVo User Experience with Network DVR and supporting access to 4k content. We also launched our new Studio, Broadcast and Network Metadata Packages and announced Turner EMEA going live as the first commercial customer.

What principles underlie your recently launched Metadata Packages for Studios, Broadcasters and Networks and how can they make TV shows and movies more easily discoverable?

The companies that produce and distribute content are facing an ever more complex set of challenges as they look to both distribute their content to multiple endpoints to how that content is discovered once it is delivered. At TiVo, we have many years of experience with managing and distributing complex metadata to multiple endpoints so it makes sense for broadcasters to leverage those skills.

We're also finding that companies want to monetise their back catalogue, but this can be challenging if the metadata associated to the programming doesn't have all the attributes that a modern search and recommendation system requires. Again, TiVo can use its vast experience to provide a modern level of coverage for the back catalogue too.

What impact are you seeing from voice-enabled search and the application of artificial intelligence to content discovery?

2017 really is the year that voice-enabled search has come of age. With European operators like Sky deploying the latest generation of semantic, natural language based voice search as a key function of its premium

platform, we can be sure that mass adoption in the entertainment discovery space is on the way. Our research shows that users doing four or more voice searches per week are growing whereas those doing less than four are falling, indicating consumers are starting to embrace it as a great way to search.

Key to having a successful deployment of voice search that moves beyond a simple title or actor-based query is that the solution has access to a system like TiVo's Knowledge Graph. With TiVo's Knowledge Graph, consumers are able to gain access to a service based on a real-time understanding of the way content is related to other content, taking into account various aspects, such as celebrities, place, locations, the news and what's relevant and trending right now. All of this works together to deliver an exceptional, intuitive user experience that today's consumers expect.

What key trends are highlighted by your most recent TiVo consumer research and how will that feed into your own product development?

TiVo spends a lot of time doing research so that it can really understand how the consumer is changing with relation to content discovery as their environment changes and new services are launched. In the last year, we've uncovered the alarming new trend of 'show dumping', where consumers give up on shows they love because it becomes too costly or difficult to continue to watch them. We observed a global average of 37% of people in our study having experienced this.

We've also seen some interesting results in our latest quarterly survey of North American pay TV customers. One of these is around sports discovery. TiVo has launched sports metadata packages that are aimed at helping the consumer discover content. However, in the realm of actually viewing content, we saw an interesting new dynamic emerge around viewership for American Football. In a season where the media heavily reported a downturn in viewing, we found that 18.2% of people said they were watching less NFL. When asked about why they watched less, almost 50% of people who answered 'other' cited 'politics' as their reason. Had this been a category of its own, it would have been the fifth most cited reason – showing people really like sports for the sports and not necessarily anything else.



Vendors including Nagra are enabling cloud delivery to support multiscreen TV.

will itself evolve, and he says that broadcasters are already embracing the concept of the virtualised headend.

"If you look at our encoder partners they have embraced the cloud clearly and are migrating broadcast headends to the cloud so that they benefit from virtualisation. It is part of the transition," he says.

The advantages of cloud-based headends are well-documented. "Traditionally, headend infrastructure did not change very fast and that was OK as broadcast and video consumption did not change very fast either," says Patel. "Over the past 10 years, the growth and diversity of devices and the faster pace of improvement in technology as well as completely new technology mean that installing a traditional inflexible headend with a seven to 10 year expectation to get a return on investment is not feasible anymore. Software and cloud-based architecture allows operators to maintain the high availability and resiliency that is essential for broadcast and add scale and flexibility to ensure they keep up with the market."

Tom Munro, CEO of content security outfit Verimatrix, says that hosting headend infrastructure in the cloud "enables you to scale and turn up capabilities for events such as the Olympics" and provides helpful failover and redundancy capabilities. He adds that using the cloud does have security implications. "You

those who don't have a lot of cloud expertise it makes sense. For larger service providers and those that have footprint and an appetite for capex the question is more about whether or not you want to write a cheque to Google or Amazon or someone else. Those operators are more likely to consider building their own data centre and virtualised infrastructure, while making sure at the same time that they can also use public cloud providers at peak times of demand for content."

Other vendors have observed that, as cloud-based delivery of TV services moves to centre stage, services providers are also increasingly building their own content delivery networks rather than relying on third-party providers.

"Our customers are building their own CDNs – by their nature some are very large companies and some are a lot smaller," says Richard Brandon, chief marketing officer at CDN technology outfit Edgeware. "They are doing it for quality reasons, because they want to reduce buffering and latency for live sports. Live has become more important. Companies spend so much on sports content."

However, as sports coverage moves to higher resolution video, including HD and ultimately 4K, latency issues associated with cloud delivery and adaptive bit-rate processing are only going to get worse. Migrating channel line-ups from SD to HD online means that service bills are likely to increase. "4K is scaring people who may need to quadruple their CDN service bill," says Brandon.

Arris's Grubb agrees that building their own CDN makes sense for access network service providers. "When you get to the delivery to the devices people want to use their own networks for that delivery function. It is about cost. The reality is that service providers are in the

high-speed data business. They are building high-speed distribution networks and it makes sense to carry their own traffic on that network. In general service providers are building CDNs on their own internal networks, whether for live or on demand. They can also now offer CDN services to the OTT providers," he says.

The headend

Nagra's Trudelle says that some operators have decided to take the leap and migrate their entire delivery infrastructure to the cloud, while others have decided to make the shift in a more evolutionary way.

"You have some larger cable or satellite operators that see the benefits of the cloud, but



"For live video in particular, the amount of traffic you are moving is very large so it tends to make sense to have the processing happen inside your own network."

David Grubb, Arris

sell a lot of linear TV that people appreciate. They say 'we have great broadcast infrastructure in place that can be upgraded to support 4K and new formats and that is a smarter approach'. It is about integrating the best that the cloud and IP can deliver while taking advantage of the existing broadcast infrastructure and using that to deliver linear channels," he says. "For the vast majority of players, especially large cable operators, it will be done step-by-step."

Trudelle says that "this doesn't mean that broadcast will be static". Broadcast technology

need additional security wrapping. We have moved antipiracy detection tools to the cloud."

Munro says that operators that 'go cloud' are to some extent choosing operational over capital expenditure. They also need to consider the cost of storage in the cloud and the cost of delivering content over CDNs. "Things are tilting in favour of the cloud but it's not the general answer to every problem," he says.

While 'going cloud' can mean pushing costs away from capex to opex, the technology can also help reduce operating expenses. Arris's

Grubb believes that, while operators want to move away from buying dedicated equipment to a software-centric world where delivery software can be deployed in a virtual headend, they nevertheless want to retain control of their own virtual infrastructure. The real cost savings for operators are, he says, operational rather than in terms of capital expenditure. "If I have three headends and I need a dozen different appliances for each, and then all the spares for each of those, [compare that with] a private cloud model where you have two or three data centres with the same hardware," he says. "When one thing fails you can put in a new one and you don't need to worry about having the right kind of appliance for this type of building. Also you need less training."

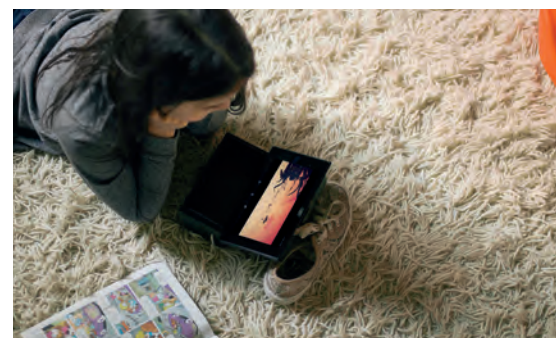
While the cloud-based headend can help operators become more efficient, at least in theory, the cloud can also play a key role in

Cloud technology has initially been used for OTT services.

enabling operators to develop sophisticated consumer-facing applications much more easily and flexibly than has hitherto been the case. Such applications include targeted advertising, network DVR and delivering elements of the user interface from the cloud, among others.

Applications

"Operators are building parallel networks. You have a broadcast network and people want to consume video on other devices. You build a network that supports multiscreen. There are new features you could turn on like network DVR, time-shift or advertising capabilities.



The nice thing about the IP CDN model is that each client session, even for live TV, is unicast so you can advertise targeted to individuals in that world," says Grubb, who believes that advertising will be a key application in driving adoption of the technology – at least in the US.

Cloud delivery can radically simplify the process of inserting adverts into streams, removing the need for expensive MPEG-aware video splicers. And in the US, targeted advertising is seen a potential goldmine for operators and broadcasters alike. The ability to deliver targeted advertising is a key objective of the ATSC 3.0 standard for advanced over-the-air TV services.

The need to deliver personalised or targeted advertising has yet to gain as much importance outside the US, but it could do so in the future, particularly as consumption patterns – especially among the young – begin to shift ever more rapidly and traditional advertising revenues decline.

"Recent market research reports that 40% of consumers prefer ads related to products and services that cater to their interests and about the same percentage are blocking ads altogether. Personalising ads can increase the value of the overall video streaming experience. And getting them to the user can allow for more efficient monetisation," says Patel.

Nevertheless, little has happened so far to convince European operators in particular that there is a big business opportunity in advertising. That could of course change as service providers become more prominent players in delivering a sophisticated user experience around linear channels.

"I do think it has the potential to be a much more powerful driver because it is a new revenue source. Every service provider has the same challenge of getting new subscriber dollars. Content costs are going up, and video service providers are seeing their margins squeezed," says Grubb.

Cable & IPTV operators look to the cloud

Broadcast technology has been around a long time, with good reason. It remains the most straightforward and cost-effective way to reach a mass audience. For all the talk of the advantages of the cloud, it may take some time to persuade sitting providers to put their trust in anything other than dedicated hardware.

In assessing the future of cloud-based delivery and the timetable for the decline of traditional broadcast, Shan Eisenberg, commercial director at France-based cloud TV technology provider Netgem, believes a clear distinction should be drawn between the various legacy distribution technologies – digital-terrestrial broadcast, satellite broadcast, cable and IPTV.

"What we see, at least in the large digital-terrestrial broadcast markets, is that there is no cost-effective way of using the cloud to replace cost-effective broadcast technology for major broadcasters such as the BBC," says Eisenberg.

In the case of cable, on the other hand, larger players are likely to continue to use traditional cable broadcast technology and look to deliver video-on-demand over IP. However, smaller operators may move directly from traditional analogue cable to delivering video services over OTT TV. "A lot of operators are considering using cloud IP-based delivery.

They provide high-speed DOCSIS connectivity to homes, and it is more cost-effective to have an OTT TV headend that enables them to quickly add more channels," says Eisenberg.

IPTV providers are also inclined to move straight to OTT TV – particularly, he says, to reach potential subscribers that are out of the reach of managed network video delivery. Some operators are using OTT TV technology to deliver a service to low-bandwidth legacy ADSL networks, or to extend their reach to potential subscribers on third-party networks.

"It is much easier to justify a new investment for a new opportunity rather than replace an existing investment," says Eisenberg.

However, he says, established IPTV players are also using cloud delivery to enhance rather than replace their offering. This is true, for example in the case of hybrid deployments combining OTT TV delivery of some services with digital-terrestrial broadcast channels. The use of cloud technology can enable operators to more easily provide services such as enhanced search and recommendation, as well as varying the user interface according to region and preference. The cloud also enables operators to gather deep data how their customers are viewing and using content.

While advertising has yet to make its case in Europe, cloud DVR is a key application.

"DVR is an excellent use case for the cloud. Set-top box storage is more expensive to deploy, maintain and upgrade for platform operators, and consumers who are used to having multi-device access to catch-up and VOD content become frustrated by the lack of remote access to local DVR storage. Deploying the DVR

using a shared infrastructure such as the public cloud," says Plunkett. "However, the cloud does provide flexibility and usage based pricing that makes experimentation, event based channels and disaster recovery more viable and affordable. To fully embrace the cloud for live linear requires a different approach to schedule management, workflow and the use of compressed unicast transport."



"Our feeling is the driver will be how consumers access content and what they expect from different screens."

Simon Trudelle, Nagra

functionality solves both of these problems simultaneously by storing user recordings in cloud storage where remote access can be more easily and securely provisioned," says Ericsson's Plunkett.

One of the hurdles to implementation of cloud DVR is the regulatory restriction in some markets on shared copies of programmes. This is a major issue in the US, but is also a problem to a greater or lesser degree in other markets. There are technologies emerging that help make applications such as private copy cloud DVR more economic, such as 'skim storage' from Nokia, incorporating 'just-in-time' packaging and transcoding. However, allowing operators to share copies of programmes between multiple users would have a dramatic impact on the cost of delivering a service.

In addition to advertising and DVR, the cloud will also help service providers understand what, where and how their customers consume content. "You will better understand what people consume and what their preferences are, which will become more and more important and will be used in rights negotiations," says Trudelle. "Operators will be able to negotiate deals with an understanding of what people like and watch."

The use of the cloud to enable key applications is progressing. However the wholesale replacement of existing broadcast infrastructure and the delivery of all video via the cloud is something for the future. "Unlike file based, non-linear content processing and delivery, live linear TV is a relatively steady state 24/7 application. This significantly reduces the savings and other benefits that can be derived

Live experience

Delivering a compelling live experience via the cloud also remains challenging, especially in the case of time-critical content such as live sport. Paul Larbey, head of the video business unit at Nokia, says that implementing adaptive bit-rate-based live TV creates a significant lag between live broadcast and the ABR 'near live' stream, which is particularly problematic for live sports events and other time-sensitive programmes. "It is a huge lag, if you are in a MDU, you can hear what's happening in neighbours' homes," he says. Nokia has focused on reducing latency through "taking a holistic view [and] fine-tuning the CDN from beginning to end", he says. The goal is not only to reduce the latency of live broadcasts but to solve the problem of slow start-up time and channel change associated with ABR streams.

The use of multicast technology could improve the live ABR experience, and Nagra's Trudelle says that the technology to enable this is moving closer to becoming reality. "As the technology evolves, we are not that far from IP multicast streams, and efficient delivery of live events to large audiences that can also feed into better catch-up and VOD services," he says. "I think there is appetite for doing more and more live events. I would say that unicast ABR makes it possible, with some latency issues."

Beyond the ability to deliver specific live TV services from the cloud is that ultimate goal of moving the entire video delivery system to the cloud. Could the use of ABR technology enable all video to be cloud-delivered ultimately?

Significant challenges remain.

For Arris' Grubb, migration to an all-cloud infrastructure is likely to be relatively slow.

"The wholesale replacement of the TV with unicast requires a very large amount of bandwidth. It is not something you could do overnight in terms of provisioning that amount of capacity on the network," he says. "The things that cause it to take time are network capacity and also the other challenge is the legacy set-tops in people's homes today. They tend to have a long useful life and service providers tend not to want to disrupt happy customers. If you are happy with how things work and the service provider comes along and says it needs to put a new box in your house, that is an opportunity for the consumer to churn."

For Grubb, the often-mentioned goal of enabling operators to dispense with set-tops comes with a serious health warning for operators. "What you find at the end of the day is that, if service providers provide a set-top, they have a known delivery environment for their experiences, whether the user interface is cloud-rendered or in the box. You can guarantee the quality that comes out. The other thing is that the set-top box detaches service innovation from consumer buying cycles for TV sets. You wouldn't want to launch a service that means consumers have to buy a new TV. There is friction involved in box-less delivery that doesn't really make sense," he says.

For now, both marketing knowledge and raw economic facts seem to play against a wholesale switch to the cloud for all applications in all circumstances.

"There's the cost of CDN infrastructure, that, if not properly optimised, could be an issue. Operators are very pragmatic in the short term. They know they have to deliver live capabilities. The big question that comes up is whether or not it makes sense to go fully ABR either with unicast, or multicast plus unicast," says Trudelle. "Is there a tipping point? We are conducting research to see if there is an economic driver that would justify a big switch or if it's something that will happen step by step. It is hard to predict and not black and white. There's no magic shift that could change the dynamics. The cost of CDNs is going down 10-15% a year, potentially making it more attractive. Some content delivered over broadcast could shift to IP and consumers wouldn't see a difference. Our feeling is the driver will be how consumers access content and what they expect from different screens." ●

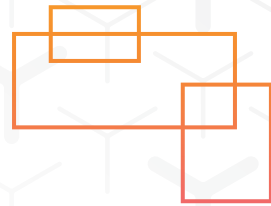
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DOCSIS 3.1

Full speed ahead

Advances in DOCSIS technology can help cable squeeze more life out of HFC networks, but how do the costs and benefits stack up for operators? Adrian Pennington reports.

With global IP traffic expected to grow at a rate of 22% to 2020, to effectively accommodate ever-growing bandwidth demands cable operators are investing heavily in their existing hybrid fibre coaxial (HFC) networks and in new fibre networks.

The Data Over Cable Service Interface Specification is the industry's long-term initiative aimed at incrementally increasing data carriage capabilities over coax. Version 3.1's core promise is to provide 10Gbps downstream (10 times faster than the previous version) and 1Gbps upstream.

Although multi-service operators can develop networks based on optical fibre to the premises (FTTP), the majority are currently focused on deploying DOCSIS 3.1.

"This requires minimal investment and works with proven technology such as CMTS,

amplifiers and cable modems, which are already available," says Nik Dimitrakopoulos, market segment manager audio and video, Rohde & Schwarz. "Furthermore, DOCSIS 3.1 utilises the frequency spectrum much more efficiently than its predecessors thus reducing the cost per-bit transmitted in the households."

Several MSOs are beginning to deploy DOCSIS 3.1 in earnest. These include Cox Communications, Rogers Communications, Liberty Global, Charter Communications and Shaw at various stages of planning, testing or in commercial deployment.

For Swedish operator Com Hem it is a "high priority". Following its CCAP (Converged Cable Access Platform) rollout, the Swedish MSO is testing DOCSIS 3.1 to a few thousand customers and will begin a "massive scale" rollout by end of the year for completion in

2018, according to CTO Thomas Helbo.

Helbo intimates that the operator doesn't see much consumer demand for even higher speeds, but fibre providers have been ramping up their advertising to boast of greater speeds, and that has forced their cable competitor's hand.

"The bandwidth that customers are actually using and that which the market is asking for are two very different requirements," he says. "We currently have 1Gbps downstream on DOCSIS 3.1. It's not very high profile and not something we've promoted to customers but it is available for when we need it."

Liberty Global meanwhile plans to have DOCSIS 3.1 up and running by the end of the year. Virgin Media in the UK, for example, has already begun its DOCSIS 3.1 rollout. It's worth noting that Virgin Media's £3 billion (€3.5 billion) Project Lightning network

expansion, which aims to cover around 60-65% of UK homes and businesses by the end of 2019, includes about two million premises that will be covered via FTTP technology. Virgin Media will maintain compatibility with DOCSIS by using the Radio Frequency over Glass/RFoG technology developed to enable operators to roll out fibre while providing broadband from a unified headend infrastructure.

"We'll do most of the networks in 2018 and that will come with the first 1Gbps services in the majority of our markets," Colin Buechner, managing director at Liberty's Access Network division told Cable Congress in March.

One of those markets is Germany, where Liberty Global subsidiary Unitymedia has begun a DOCSIS 3.1 rollout starting in the city of Bochum. However, Liberty Global SVP and CTO Balan Nair has said that the firm will initially target higher-end customers with the service, due to the current high costs of DOCSIS 3.1-based consumer premises equipment (CPE).

Stefan Vanhastel, head of marketing for fixed networks at Nokia also says that upgrades involve hidden costs. "DOCSIS 3.1 requires many components to get to 10Gbps, including spectrum availability or frequency extensions up to 204MHz upstream and 1.2GHz for the downstream channel – with further possible expansion to 1.8 GHz in some cases – as well as potentially substantial infrastructure upgrades to realise the highest coding efficiencies. As a result, we see many cases of gradual introduction and maybe the full benefits will require a move to a different architecture."

At the RF layer there is a major shift to OFDM (Orthogonal Frequency Division Multiplexing) signal technology on both the upstream and downstream frequencies and multiple profile support within a single downstream channel.

"These changes bring new testing requirements across the whole eco-chain of DOCSIS 3.1 from network operators, to CATV amplifier makers as well as cable modem and chipset manufacturers," says Dimitrakopoulos, all of which is adding cost.

Arris disagrees with this analysis, however. "The economics of migration are not driven by the economics of the kit itself but the cost of construction and replacement of cable if required to dig it up and replace with fibre. That cost can be astronomical in Europe

where most cables are buried," says Cornel Ciocirlan, CTO EMEA at Arris.

"It's not a forklift upgrade," says Belal Hamzeh, VP of wireless technologies at cable industry technology standards organisation CableLabs. "We developed the technology to be backwards-compatible so that MSOs can pre-seed a network, with DOCSIS 3.1 modems which will operate with 3.0. Right now, operators are focused on 3.1."

Arris' SB8200 modem, (which Comcast and Cox have approved), for example, will support both DOCSIS 3.0 and 3.1, enabling MSOs to build momentum by deploying them in existing networks.

"For many operators, the shift from 3.0 to 3.1 represents a change not only in the protocol



"DOCSIS 3.1 utilises the frequency spectrum much more efficiently than its predecessors."

Nik Dimitrakopoulos, Rohde & Schwarz

itself, but in the approach to architecting their entire DOCSIS delivery chain – from the headend to the outside plant and home gateway components," says Ciocirlan.

Operators are choosing from a number of new approaches based on the nature of their deepening fibre deployments and their desire to make more efficient use of headend facilities. Arris claims to have a unique perspective on the aggregate decisions that these operators face, due to its work in DOCSIS 3.1 deployments and the success of its E6000 CCAP platform.

Network evolution

"Our operator customers look to us for evolutionary pathways that enable them to make full use of their HFC plant and fibre deployments, while building on their installed base of E6000s and their outside plant," says Ciocirlan. "One of the biggest challenges we see is that there is no one decision path to choose from that is expected to reach the market in the next few years."

In other words, operators will choose different approaches, including HFC with Node+o splits (fibre deep HFC networks that

don't put any amplifiers between the node and the home), Remote PHY or Remote MAC PHY, Remote PHY shelf, RFoG, Node PON, EPON and GPON, and so on.

According to Ciocirlan, MSOs will pace their rollout based on how subscriber usage evolves and the availability of capital investment. Some operators plan to spend as much as US\$1 billion (€900 million) in each of the next few years to address the demand they are experiencing, Arris suggests.

Arris highlights a number of pressing factors impacting MSO decision-making. These include headend capacity – where space, power and other facility considerations constrain the ability to add more equipment, operators have two choices: seek denser more

power efficient solutions or move capabilities and functionality into the outside plant. This is one of the cases for Remote PHY.

Economics is also a factor. Capex and opex costs come into play as operators replace old equipment (nodes, amplifiers, and headend equipment) and move to support 1.2GHz and 85MHz return expansion. Where this requires new equipment and truck rolls, it creates an imperative to minimise the number of times outside plant has to be accessed while making service groups smaller to cope with the increased bandwidth demands.

In the case of greenfield rollouts, it makes economic sense to put in FTTH from day one, especially as replacing coax to a home with fibre can cost as much as €900 per home passed. PON becomes the logical choice here, especially when the system can still support DPOE (the DOCSIS spec for cable modem provisioning at the headend). Similarly, for urban multi-dwelling units where fibre can be pulled past a high density of subscriber dwelling units, PON may be more efficient from a capacity and cost perspective.

Depending on the socio-economics of neighbourhoods, pulling the intelligent, expensive components back into the secured environments and using lower-cost

outside plant systems can allow operators to manage failures and loss while offering similar traffic and service level performance. Operators' range of approaches will also be impacted by silicon availability, finalisation of specifications, and levels of testing required to verify deployment capabilities.

"In many cases, the transition from one stage to the next can be accomplished with simple software upgrades, permitting the operator to activate the change in a convenient, cost-effective fashion," says Ciocirlan. "This enables operators to select their ideal architecture as they look to support multi-gigabit data services and migrate from

investment to operators."

Part of that equation will be based on value for money, not just the number of Gigabits, which has recently dominated network investments.

"Service quality is becoming a competitive advantage for operators in addition to sufficient transmission speeds," says Narjus. "To achieve better service quality, operators need to deploy solutions that will improve network operation overall. Such solutions include proactive network maintenance and devices using intelligent HFC technology."



"Cable operators can continue to invest in technology that extends the life of their existing network."

Asaf Matatyau, Harmonic

QAM to IP video services without having to make massive changes to their provisioning and headend systems."

The fundamentals of technology deployments may not have changed. FTTP still means high investment costs, but is economically competitive for new networks. Cable upgrades offer lower deployment costs in areas with completed infrastructure, and arguably their capacity potential make them competitive for years to come.

In certain countries, a pending analogue TV shutdown may also increase the capacity of existing DOCSIS networks and this has already made some operators postpone their network upgrades, according to network solutions provider Teleste. "On the other hand, many consumers may still be willing to pay for services like FM radio," says SVP of network products, Hanno Narjus. "Fibre is the future of networks in the long run, and fibre networks can also carry DVB-C based TV delivery. However, operators need to consider how to provide their customers with reliable, high-performing broadband services today. The investments will be determined by which services customers are willing to pay and how much they are willing to pay. Eventually, consumers will decide which services they want, and those decisions will affect which technologies will bring reasonable returns on

Remote PHY

"In practice, the only real options for fixed broadband networks today are fibre [FTTP] and cable [including DOCSIS 3.1 and Remote PHY], and it is difficult to see how supporting multiple technologies simultaneously would be a rational path to take for the majority of operators," says Narjus. "However, the situation changes when we are talking about the last mile of the network. In future, we will see networks with a fibre backbone and, for example, the last mile in coax. We will also see versatile options and technologies for last mile network implementations."

Remote PHY is one option in the spectrum of functionality an operator can put into remote nodes. It pushes more intelligence deeper into the network while a central CCAP platform performs the higher layer processing. CCAP and R-PHY both have the benefits of lowering capex and opex for operators and making the network more efficient.

"While DOCSIS 3.1 allows cable operators to better compete [with rival operators] on speed, it lives up to its true potential when complemented by a remote PHY deployment," says Asaf Matatyau, VP of solutions and product management for the cable edge business at Harmonic. "Cable

operators can continue to invest in technology that extends the life of their existing network and simultaneously prioritize the deployment of technologies like DOCSIS 3.1 and R-PHY based on where they're feeling the most pressure from customers or other providers."

Harmonic's software-based CableOS solution addresses these challenges "by enabling the migration to gigabit capacity while also providing the benefits associated with distributed access architecture, in addition to immediate virtualisation advantages for centralised deployments", says Matatyau.

Arris, Cisco and other vendors will want to continue selling CCAP equipment but there is an alternative to R-PHY. This is to use a virtual CCAP device that is also designed to push many of the functions of a DOCSIS-powered cable network closer to the network edge. The goal is to miniaturise and virtualise the functions of a CCAP chassis so that more of the cable network can be software-controlled, and operators can save both space and power in the headend.

Nokia is pursuing this approach via Gainspeed, a US start-up it acquired last year. "We have a strong believe that the economics are not sustainable based on a centralised architecture and that cable operators will require a move to distributed architectures," says Vanhastel. "We are working hard with the standards committee at CableLabs toward standards which we think will be ready end of year with potential to trial early 2018."

Nokia's unified cable access solution leverages Software Defined Networking (SDN) techniques to virtualise the CCAP, completely eliminating what it terms 'Big Iron' hardware from the headend and delivering a sevenfold reduction in rack space and an eightfold reduction in power consumption.

The solution also replaces legacy analogue optical transmission with 10Gbps Ethernet and supports both last mile access for both cable and fibre.

Nokia says Gainspeed's cable access products are designed from the ground up to support DOCSIS 3.0 and DOCSIS 3.1 and the approach is "particularly well suited" to implementing Full-Duplex DOCSIS.

Moreover, Nokia Bell Labs has already demonstrated, via a proof of concept in 2016, that providing 10Gbps symmetrical services over HFC networks is a real possibility for operators.



Rohde & Schwarz provides equipment to test DOCSIS systems.

yet seem to be important to consumers today.

"We see growth downstream of 40-50% a year and below 10% in upstream traffic," notes Com Hem's Helbo. "While services don't yet require it there is a need in the market to claim you have symmetrical speed so you can be ready when demand does come."

Com Hem will begin the first phase of installing FDX in 2018. Virgin Media reportedly has this timeframe in mind too.

Rather than requiring a cable system to separate spectrum dedicated to the downstream and the upstream with a traditional 'split,' FDX will enable dual-use bands for traffic that runs in both directions. FDX will also require an N+0, passive network, which fits in with the plans of some operators to pull fibre deeper and remove the active amplifiers present between the node and the home.

"Today, there is no critical need for a symmetric tier since traffic is much heavier on the downstream than upstream but MSOs

looking to the future for a symmetric service tier will be able to offer it," says Hamzeh.

DOCSIS 3.1 and Full Duplex DOCSIS hold out the promise of keeping cable competitive, but there are alternative broadband technologies – not least 5G, which could serve as a fixed-line substitute.

"MSOs will have to make a judgement about the merits of fibre, cable and 5G when it comes to bandwidth and quality of service in different cases. 5G can give you faster time to market, since you don't have to dig up the street, but fixed may well give you an order of magnitude in terms of speed," says Hans Slabbinck, product line manager, MSO access, Nokia.

While 5G will probably emerge as a substitute for fixed line access in rural areas, it will also require backhaul over fibre, and as CableLabs' Hamzeh points out, wireless can still be subject to bad weather and obstructions.

"You have to keep in mind it's not like fibre or wireline is standing still," says Hamzeh. "We are still developing and pushing higher capacity to the end user." ●

Full Duplex

DOCSIS 3.1 is considered a necessary first step toward bringing data-hungry technologies such as augmented reality, UHD 4K television, 'tele-existence', medical imaging and advanced gaming systems to cable customers.

The evolution of this, Full Duplex DOCSIS (FDX) is a bit further away and will require a total rework of network topology. Development of Full Duplex is also slowed down by the fact that symmetrical transmission speeds don't

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ANGACOM
Hall 7, Stand A11



ANGA COM 2017: the preview

The ANGA COM exhibition and conference takes place in Cologne from May 30-June 2. *Digital TV Europe* takes a look at some of the technologies that will be on show.

ATX

STAND 7.A11



WHAT'S NEW?

1.2GHz RF management, IP to PAL mini-headend, satellite/TV/radio offerings

WHAT DO THEY DO?

ATX is highlighting several new products and is also participating in a panel discussion covering "DOCSIS 3.1 Performance Utilising Hybrid Analogue DWDM Transmitters". ATX is offering a host of optical transport solutions (powered by InnoTrans) focused on enabling operators to deliver more capacity into their existing HFC-based fibre infrastructure, while delivering performance levels capable of supporting DOCSIS 3.1. The product offering is suited for long haul multi-wavelength transmission, hub collapses, node aggregation and backhaul and RFoG/PON deployments, the company says. ATX is also highlighting its new ChromaFlex II chassis which integrates RF management into the modular optical chassis to minimise rack space in the headend. 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. MAXNET II is an ultra-dense, MCX connector-based RF management solution with SNMP/web remote control/monitoring, while SignalOn is a high-density,

F/BNC connector-based solution with patented make-before-break attenuation feature. ATX's UCrypt IP to PAL (IP2PAL) mini headend is designed for conversion of IP video streams to PAL in a space-efficient and cost-effective manner, according to the company. This device can ingest up to 60 MPEG-2/H.264, HD/SD video streams and convert them to PAL. ATX recently acquired Pico Digital, a manufacturer of solutions for TV and radio including video encoders, satellite to cable, satellite to IP, and mini CMTS. The Condor Headend system is an all-digital CATV solution consisting of a set-top box platform and headend broadcast system. ATX is also displaying Pico Digital's PD1600 mini headend. The PD1600 device is capable of interfacing with DVB-C, DVB-S/S2, ATSC or DVB-T/T2 operators in order to ingest, decrypt, transcode (optional) and re-transmit video content via IP, QAM, DVB-T, ISDB-T, NTSC or MPEG-DASH/HLS. The PD1600 device includes content protection.

CONTACT www.atxnetworks.com

Broadpeak

STAND 7.E74

WHAT'S NEW?

nanoCDN demo; cloud PVR;

WHAT DO THEY DO?

Broadpeak will highlight zero-latency for live video streaming and HTTP delivery via satellite at ANGA COM. The company will demonstrate new capabilities of its nanoCDN multicast ABR technology. nanoCDN

multicast ABR makes live HTTP video delivery to any device scalable by turning broadband gateways, cable modems, Wi-Fi routers, or STBs into active components of an operator's content delivery infrastructure, says the company. Leveraging home networks, operators can manage the consumption peaks of live multiscreen services for millions of simultaneous viewers using only a few Mbps, according to Broadpeak. The company will show 'zero latency' for live streaming. The solution delivers the same latency experienced in IPTV to live multiscreen ABR streaming, according to Broadpeak. With nanoCDN multicast ABR, operators can also deliver live HTTP TV services via satellite. nanoCDN allows satellite operators to deliver live and on-demand services to tablets, smartphones, connected TVs, and other OTT devices via the end-user's STB. Broadpeak will demonstrate how its cloud PVR solution enables end-users to launch multiple recordings on various channels simultaneously. Broadpeak offers all scenarios for shared copy and private copy Cloud PVR, the company says. Using Cloud PVR, operators can deliver a broad range of services, including start-over, time-shift, and catch-up TV, as well as impulsive recording, while only storing content once in cases where shared copy is allowed. Thanks to Broadpeak's on-the-fly packaging capability, recorded content can be processed on demand to be viewed on any device type, the company says.

CONTACT www.broadpeak.tv

iWedia

STAND 8.S72

WHAT'S NEW?

Upgrade of Teatro CI host software

WHAT DOES IT DO?

iWedia has upgraded its Teatro CI Host Software towards CI Plus 1.4 compliance. With CI Plus 1.4.2, pay TV operators can now offer a Conditional Access Module (CAM) on which the operator can store its own HbbTV 2 User Interface and application, and which supports delivery of video services over IP (unicast OTT or multicast managed IPTV), and multi-stream management for dual tuner configurations. In its version giving support to 1.3, Teatro CI Host Software has been integrated and deployed within TV sets and set-top boxes. It has been upgraded to give full support to 1.4.2 (for both the mandatory and optional features) and has been pre-certified on a reference platform using the official test suite and test materials. It is a standalone software component designed and documented to be integrated within the software of the target device. This component may be complemented by other software components of iWedia's product portfolio and especially with the Teatro TV Browser that gives support to HbbTV 2 and with which it is pre-integrated. "CI Plus 1.4.2 is a breakthrough for pay TV operators as the enhancements it brings allow them to get from a CAM the same benefits they used to get from a STB," said Hervé Creff, VP marketing at iWedia.

"The specification will become mandatory in September this year and device makers shall get ready for that date. Integrating Teatro CI Host Software, a robust, reliable, and pre certified software component is definitely a secure way to achieve this objective."

CONTACT www.iwedia.com

Teleste

STAND 7.G31



WHAT'S NEW?

AC9100 Neo

WHAT DOES IT DO?

Teleste will focus on the next steps of cable network evolution after 1.2GHz network upgrades and the opportunities and

challenges the migration offers to operators. The company will talk about deployment of DOCSIS 3.1 Remote PHY devices, taking intelligence deeper into broadband networks, and how operators can utilise technology to improve services. It will also showcase a wide setting of product launches and updates for HFC networks and headends as well as last mile and connected home. The Remote PHY technology will offer operators a way to increase capacity by enabling more advanced modulation methods. However, legacy platforms will co-exist with the new technologies for years to come, says Teleste, and the challenge for operators is to make sure that legacy platforms continue to offer returns on investment. Teleste will introduce its new DOCSIS 3.1 Remote PHY-compliant node, the AC9100 Neo.

This high-performing node can be turned into a Remote PHY device by replacing its cover, according to the company. The node allows operators to adopt DOCSIS 3.1 frequencies and later migrate to a distributed network when further capacity increase is needed. The node features intelligent functionalities, which enable operators to improve the quality of their services regardless of the chosen network architecture, according to Teleste. Teleste will also use ANGA COM to address customer churn factors. At the beginning of 2017, it conducted a comprehensive research on churn and the events preceding it. The research offers insight into what happens before customers decide to churn and what could be done to build up loyal customers. It also provides useful managerial guidelines for cable television executives operating

in an uncertain and rapidly changing marketplace. At the show the company will highlight the AC9100 Neo and AC9100 Neo RPD. The AC9100 Neo is an updated version of its intelligent, 1.2GHz optical node, the AC9100. It offers the same performance and supports future migration to Remote PHY technology. It will also showcase the DAN200. This was designed in co-operation with Casa Systems, and is a DOCSIS 3.1-compliant Remote PHY node that supports interoperability with Casa Systems CCAP CMTS. The E3 is the first member of Teleste's new, 1.2 GHz product range, the E series, and will also be introduced at the show. Teleste will also show DuraAplus+ flyleads and a wide range of other HFC products as well as solutions for network management, headends and professional network services.

CONTACT www.teleste.com

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more info



Technology in focus

Infrastructure, equipment and product news for digital media distribution

In Brief

Samsung approves You.i

Samsung has approved the You.i Engine video app platform as an app development option for the Tizen TV operating system. The announcement was made in conjunction with the 2017 Tizen Developer Conference where Allan Isfan, director of business development for You.i TV, demonstrated how the You.i Engine can provide for creators of Tizen TV apps. Apps for Samsung Tizen TV are generally developed using web technologies like JavaScript and Samsung also supports Native Client (NaCl) - a technology introduced by Google to enable C++ applications to run in a standard browser.

Monaco taps Hubee

Monaco Telecom has tapped Hubee to develop its Replay catch-up application in HTML5 Javascript. Monaco Telecom recently launched Replay as a new offering on its LaBox Monaco Telecom service. The application includes features such as most-watched content along with theme and date filters and parental control. LaBox Monaco Telecom will use Hubee's Huge platform catch-up CMS module to improve catalogue management and for alert and status monitoring tools, according to Hubee. Separately, Arte France has teamed with Hubee to upgrade its ArteVOD application in QML for Iliad Telecom's Freebox Révolution platform.

ABOX42 showcases smart home bundle

Set-top provider ABOX42 used its presence at last month's NAB Show in Las Vegas to highlight a new range of smart home solutions that it believes will enable operators to market relatively simple bundles to subscribers for a modest fee.

The ABOX42 dotIO operator smart home solution takes the form of a white-label managed service including gateways, sensors with various use cases, a big data cloud service and mobile applications.

Speaking to *Digital TV Europe* in Las Vegas, ABOX42 CEO Matthias Greve said that the company had discussed plans to develop additional revenue streams with operators.

"It's a turnkey solution where the operator can offer subscription smart home services," said Greve. "Some want to combine a set-top box and gateway, others want a



Greve:
operators
do not want
complex
systems.

separate gateway."

Greve said that operators "do not want complex systems" with support for diverse retail products.

"We deliver the package - operators prefer end-to-end solutions," he said, adding that operators found the smart home market challenging because of the complexity of integrating retail products and competition from other players in the market.

What ABOX42 offers is a complete system including sensors, a camera, and motion and smoke detectors that can support applications such as monitoring children

or elderly parents with assisted living requirements.

"You can create over time different use cases that can be sold as separate subscriptions."

He said that operators could subsidise the equipment and make money from an ongoing subscription. Starter packs could be priced at €49 with subscriptions from €10 a month, he said, compared with retail prices in the range of €400-500 for the same equipment.

Greve said the ABOX42 platform was "100% secure" and that the company had "solved all the security and privacy issues" associated with this type of deployment, adding that its expertise in pay TV was crucial here. "For the set-top to be secure is always required for pay TV. WiFi routers were never built with [high level] security, but for the smart home you need that," he said.

Accenture: viewing popular on non-TV devices

More people now prefer to watch TV shows on internet connected devices than on traditional TV sets, according to new research by Accenture.

The company's Digital Consumer Survey found that the percentage of consumers who said they prefer watching TV shows on television sets plummeted by 55% over the past year - from 52% to 23%. At the same time, the proportion that said they would rather view TV shows on a laptop or desktop climbed from 32% last year to 42% this year.

Some 13% also said they prefer watching TV shows on their smartphones, compared with 10% last year. "The dominance of the TV set as the undisputed go-to entertainment device is ending," said Gavin Mann, global managing director for Accenture's broadcast business.

The report notes a four-year trend in the decline in TV viewing and said that as recently as 2014 some 65% of consumers preferred the TV set for viewing TV shows. In India there was a "particularly steep decline" in the

percentage of consumers who prefer to watch TV shows on a TV set - dropping from 47% to 10%. In the US the proportion fell from 59% to 25% and in the UK it dropped from 56% to 25%.

The study also found that some 41% of consumers said they would rather view short video clips on their mobile phone, up from 28% last year. By contrast, just 5% said they would rather watch short clips on a TV set.

The research results are based on an online survey of 26,000 consumers in 26 countries.

Altice USA to launch next-generation set-top box

Altice USA is to roll out a higher-powered, updated version of the single combined set-top, cable modem and WiFi router it has already deployed in France via SFR.

Speaking at the NAB Show in Las Vegas, Dexter Goei, president of Altice and chairman of Altice USA, said that the box, described as a single communications hub, could "deliver the most effective performance of any WiFi router today" supporting speeds of up to 1Gbps.

"It is something that will drive less clutter in the home, [and provide] a much more powerful user experience," said Goei, who revealed that the device is currently being tested by Altice Labs in Portugal.

"We are relying on a group technology effort to bring a new product to this market," he said, claiming that no other provider is currently bringing such a product to the US market.

Goei told *Digital TV Europe* that the box would be a higher-powered version of the La Box device already deployed in Europe and would include additional features such as an improved UI and voice control.

He told *DTVE* that Altice's plan is "to go fully IP" with this device in the second half of next year, but declined to give a specific timeline for the rollout of the box itself.

Goei told NAB Show attendees that Altice saw an opportunity to bring its technology and investment know-how to the US, adding that US network infrastructure had seen less investment than other markets.

Goei said that fibre "remains the most robust and reliable technology" and that Altice is a big believer in investing in fibre now. "We know we'll be at competitive advantage relative to some of our peers," he said. "We think it is a good return on capital in the

long term, and we are a long term player."

The Altice USA chief said that he expected further changes in the US cable market, including further consolidation. However, he said that while Altice would weigh further opportunities carefully, it was nevertheless "happy" with its current scale in the market.

"We are very focused on our existing operations. We are doing an IPO to be ready for any type of combinations... but we may not have to use it [for that]."

He said that Altice would continue to look at opportunities but that M&A deals are more about making strategic sense rather than achieving scale for its own sake. Goei said that he was "cautiously optimistic" about the new regulatory environment in the US and that new FCC chairman Ajit Pai had helped clear up some of the issues impacting on the industry.

In Brief

Sappa partners Magine

Swedish broadband and TV provider Sappa has partnered with OTT TV technology platform and service provider Magine to launch a TV everywhere service for its customers. Sappa becomes the first business-to-business customer use Magine's full end-to-end solution in its home market of Sweden. Sappa said the deal will address the multi-platform needs of its existing customers.

Improbable funding

London-based virtual reality technology company Improbable has raised US\$502 million (€452 million) in a Series B funding round led by SoftBank. Improbable said it will invest the cash in developing its technology - including its SpatialOS distributed operating system. It also plans to up recruitment at its London and San Francisco offices. Improbable uses cloud computing to allow the creation of 'virtual worlds', which can be used in games and large-scale simulations of the real world. Its first product, SpatialOS, is a distributed operating system for massive-scale simulations. It integrates with major game engines and has been in live beta trial since March this year. As part of the new funding round, Softbank managing director Deep Nishar will join the Improbable board, and the VR company said it will explore and identify ways to form "mutually beneficial relationships" with SoftBank, its partners and portfolio companies. Existing investors, Andreessen Horowitz and Horizons Ventures also made follow-on investments as part of the new funding round, in addition to Softbank.

Quickline taps Broadpeak for OTT TV service

Swiss cable operator Quickline has tapped Broadpeak to provide the underlying technology for its Quickline TV service, which delivers over 400 channels of live and on-demand content, as well as cloud DVR, to IPTV and OTT TV users.

Quickline is using Broadpeak's BkS300, BkS400, and BkS100 video servers, BkM100 CDN manager and BkA100 video delivery analytics to deliver the service.

Using Broadpeak's BkM100 CDN manager, Quickline can manage load balancing and failover tasks for clients. The BkM100 system monitors the popularity of content based on subscriber usage patterns to deliver live and VOD content more efficiently, according to Broadpeak.



Broadpeak's BkA100 analytics system is connected to the workflow, allowing Quickline to gather data about video delivery, generate statistics about content popularity, and provide feedback on what is going on within the delivery system.

"When launching advanced video services in the multiscreen environment, efficiency and performance are critical in a CDN and video server solution - given the large number of media assets that are being delivered. Broad-

peak enables us to support a broad range of formats and devices, making it easy to manage the user experience and gain insight into the QoE perceived by end-users. The flexibility and deployment experience that Broadpeak offers makes them a solid technology partner for the long term," said Remond Krebs, CTO at Quickline.

"Being involved in the OTT world gives Quickline a competitive edge in the pay-TV marketplace," said Jacques Le Mancq, CEO, Broadpeak.

In addition to Broadpeak, Quickline is using SeaChange to provide support for multiplatform content management and delivery, monetisation and the subscriber experience, including RDK-V-based set-top box software.

In Brief

Meo launches live VR

Altice-owned Portuguese telecom operator Portugal Telecom/Meo has laid claim to have become the first operator in Europe to offer live TV channels in a virtual reality environment through Samsung Gear VR headsets powered by Oculus. Meo has launched the VR service as part of Meo Go, its multiscreen TV offering. The new Meo Go VR application enables users to follow series and soap operas as well as live experiences such as jumping from a helicopter or snowboarding, and a visit to the Cristo Redentor statue in Rio de Janeiro. The content has been developed via partnerships between Meo and Portuguese broadcaster SIC, fashion channel FTV, Syfy, History and Clubbing TV. The app also takes users to a virtual, technologically advanced living room where viewers can watch live TV channels on a giant screen, as well as viewing the available 360° content, according to the telco. The app was developed by Altice Labs, the Altice Group's Portugal-based R&D arm, and Gema Digital, a specialist in the creation of VR, augmented reality, holographic and interactive experiences. The launch of the new service has been timed to coincide with the launch in Portugal of the new Galaxy S8 smartphone by Portugal Telecom. The application is available for download at the Oculus Store, while Samsung Gear VR glasses can be used with Samsung Galaxy S8, S8+, S7, S7 edge, S6, S6 edge and S6 edge+ equipment, available at Meo stores, to view the content.. The Meo Go service is available to all Meo TV and home internet customers.

Ericsson strikes deal for pay TV in China

Ericsson used the NAB Show in Las Vegas to announce a new partnership with local technology provider Inspur to deploy pay TV services in China.

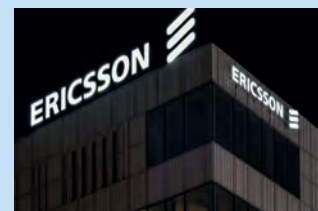
Inspur will provide set tops and servers and the first service provider client is Shandong Cable. The new service will deliver live and on-demand TV content to 20 million subscribers in 17 cities across the Shandong Province.

Ericsson also launched a new recommendation system, bringing together TV and movie data sources with analytics capability. It said that this would bring together data sets including

images and poster art, clips and trailers, ratings, cast and crew information, series and episodic data. It will also offer a package of applications including recommendations, universal search, deep linking, rights management and analytics to enable personalised viewing experiences.

Thorsten Sauer, VP and head of broadcast and media services, said that current implementations of content discovery is very complex. "We want to make it much faster to the market by establishing an ecosystem," he said.

Sauer said that Ericsson is working with partners to bring



recommendation capabilities to market and integrate them with the data Ericsson already has.

He added that speech recognition is becoming more important, not only as a way to enable recommendation but, in the future, as something that could enable voice triggered control of the smart home in the future.

Conax, Evolution take IP video to new markets

US cable technology outfit Evolution Digital and content security specialist Conax plan to launch their eVUE IP VOD set-tops and hybrid IP delivery platform in new markets.

The companies used the NAB Show to highlight their existing solution for operators in the US market and said that they have ambitions to roll it out internationally in multiple markets.

Brent Smith, president and CTO of Evolution Digital, said that the company's hybrid box, the eBOX, is now being deployed by a number of US operators - providing TiVo-enabled DVR from the network as well as OTT TV services for operators that have struggled to break free of legacy QAM-only infrastructures in a way that makes economic sense.

Traditionally, IP video has meant finding encoder providers, DRM providers, packaging suppliers and CDN providers - a process that Evolution Digital has sought to simplify and make more practical for the country's numerous small and medium operators, according

to Smith. "This has been holding up [the] transition to IP. It is expensive and complicated," said Smith, adding that eVUE TV provides an end-to-

end solution, including encoding, DRM, packaging and CDN. "This is a platform that manages all components. There is IP VOD, IP linear and network DVR. Our customers and currently providing IP VOD but there is a [path] to provide IP linear and network DVR too."

Smith said that operators are under pressure from OTT TV providers and offering IP video quickly would enable them to provide similar services quickly.

While Evolution Digital has deployed its technology in Mexico and the Caribbean, Smith said the partners would also develop their joint solution into a pre-integrated solution for DVB operators outside the US market. "We want to create a common platform so Conax customers can have a more simplified way to do [IP video]. We are trying



Conax and Evolution Digital unveiled their plans at NAB.

to create a nice packaged solution for Conax customers."

Tom Jahr, EVP of products and marketing at Conax, said: "We are trying to find ways to take this international and we are working out ways to do it."

In terms of US market deployments, currently still the primary target for the collaboration, Smith said that rival OTT devices suffered from the constraint of being IP-only.

However, he added that operators have built their systems around QAM so a hybrid box would be a better device to enable IP migration, as the box still receives cable channels through QAM.

eVUE also enables multicast IP services, allowing operators to deliver IP services to a wider base than rival unicast platforms.

Finland's DNA to launch Android 4K set-top box

Finnish telco DNA is to become the first operator in the country to launch an Android-based open ecosystem 4K-enabled box, the DNA TV-hubi.

The device, which will be launched in the spring, will enable users to bring online video services to the TV as well as to watch mainstream TV channels.

DNA TV-hubi's use of the Android operating system is compatible with the applications of Finland's three biggest TV channels, Katsomo, Yle Areena and Ruutu, along with YouTube, Netflix and Viaplay. Subscribers can download applications from the Google Play store.

Other services without Android apps can be streamed to the TV via the box's Google Cast functionality.

The box can be used to watch linear TV channels from DNA's cable network and the Finnish digital-terrestrial network. It comes equipped with two HD tun-



ers, which enables simultaneous viewing and recording. The device includes software-based encryption for pay TV channels.

The Sagemcom-manufactured DNA TV-hubi has Bluetooth support for wireless game controllers, and it can be connected to an external hard drive for recording content and be controlled with an application on smart phones, tablets or smart watches. The device also includes voice recognition support.

"People are accustomed to accessing content and services flexibly with any device, and DNA TV-hubi is now making this possible with televisions as well," said Mikko Saarentaus, director at DNA

entertainment business.

"This device is for anyone who wants to watch diverse television content with minimal hassle. Thanks to DNA TV-hubi, watching and using online programmes and content on your TV is now just as easy as using apps on your smart phone."

Separately, DNA has moved to switch the remaining DVB-T pay TV services in its digital-terrestrial platform. The switch to DVB-T2 was scheduled to take place on May 17.

The majority of terrestrial-network pay TV and all high-definition channels were already being broadcast in the newer format. Following the change, 85% of the Finnish population will live within the coverage of all terrestrial-network pay TV channels. Customers outside the coverage area can still watch the channels over a broadband connection with the DNA TV application or with the DNA TV-hubi device.

In Brief

Oculus closes VR studio

Facebook-owned virtual reality company Oculus has announced plans to "wind down" its VR content arm, Story Studio. In a company blog post, Oculus' vice-president of content, Jason Rubin, said that the company had decided to shift its focus away from internal content creation to "support more external production". Last year Facebook committed an additional US\$250 million (€225 million) to fund VR content from developers around the world. Rubin said that Oculus is going to use US\$50 million of that to fund non-gaming, experiential VR content.

Euskaltel 4K Android box

Spanish cable operator Euskaltel's CEO Francisco Arteché used the company's first quarter presentation to confirm that the operator would launch a new 4K-enabled Android box along with a new set of services. In a conference call following Euskaltel's quarterly results, Arteché said the services would be available to new and existing customers. "This will be very attractive to consumers," he said. The company will offer a new bundled offer focusing on an offer of "more for more" to drive up ARPU, while maintaining a certain level of choice to customers.

Molotov taps castLabs

French live and catch-up TV streaming service Molotov has agreed a DRM deal with castLabs. Molotov has selected the multi-DRM solution from castLabs, which delivers FairPlay Streaming by Apple, Microsoft PlayReady, Google Widevine and licensing through a single integration.

Freeview Play revamp due to roll out this year

A new Freeview Play interface with a revamped electronic programming guide is currently in development and is due to launch later this year.

During a panel session on 'innovation in broadcast' at the recent DTG Summit, Digital UK CEO Jonathan Thompson showed a picture and gave details of the in-development offering.

He said it would provide a "richer, more content-focused guide to Freeview content" with direct routes to different player applications and universal search across all apps available via the hybrid Freeview Play platform.

Thompson also revealed that there will be more programme images compared to the normal

Freeview EPG, and the new design will introduce genre-based recommendations.

"Our goal is to evolve the TV model for those who love broadcast TV but want the added benefits that IP-connected TV allows," said Thompson.

While he claimed that none of the updates are "revolutionary", enhancing the service will help serve people who want "the best of free and a route to pay; that's absolutely the focus of what we're trying to do."

"With Freeview Play we are trying to bring many of the philosophical elements that made Freeview a success to the hybrid market – simplicity, universality, lack of contract, choice, and

Thompson: a richer, more content-focused guide.



easy navigation to content," said Thompson. "I think hybrid is an over-used word, but that is the future of television delivery for the foreseeable future. We want to make broadcast TV better by using connectivity to the internet as a way of improving the choice, flexibility and functionality that viewers are offering."

Digital UK meanwhile has said that the Freeview TV guide will be updated and expanded in August.

On the move

Russian pay TV leader Tricolor TV has named **Olga Molostvova** as programming director in charge of the operator's own channel portfolio. In this new post, Molostvova will be charged with overseeing the activities of the pay TV group's wholly-owned channels, including programming, analysis of the competitive environment and the needs of subscribers. Prior to joining Tricolor TV, Molostvova served in a number of programming roles, including programming director of 7tv, which she rebranded, growing its audience fourfold, as deputy CEO for research at TV group YUTV Holding, and as programming director of music channel Muz-TV. She has also headed up the working group on the TV audit panel for TNS Russia.

Peter Flamman

has landed a new role at Viacom and will oversee MTV and Nickelodeon across a large part of Europe as well as in Africa and the Middle East. Based in Madrid, he will oversee development and production, acquisitions, scheduling and operations across the channels and their digital services. Flamman replaces **Laura Abril**, who is now the senior VP editorial, Iberia, covering Comedy Central, MTV, Nickelodeon and Paramount Channel. Flamman joined Viacom in late 2015, having been at Turner in London for almost 15 years in a variety of leadership roles. Separately, Nickelodeon UK & Ireland has hired a Scripps Networks international VP of programming. As of July 3, **Katharina Feistauer**



will be VP of programming at Nick UK, reporting to UK and Ireland general manager Alison Bakunowich. She was previously VP of programming for the UK and EMEA at Scripps.

OTT and TV everywhere technology specialist Xstream has named **Jacob Barlebo** as global sales and marketing director. In his new role, Barlebo will be responsible for managing Xstream's international sales teams, extending the firm's partner network and marketing. Barlebo has worked in a number of sales and marketing roles, most recently as international business development manager for IT security and consulting firm FortConsult and as head of global sales and business development at I-New, a mobile virtual network enabler.

The managing director of BT Sport and BT TV, **Delia Bushell**, has announced plans to step down following a three-year stint at the UK telecoms operator. Bushell will stay at BT until the start of June to oversee a handover of responsibilities and is due to announce her future plans "in the coming weeks". Bushell joined BT in 2014 and has helped to drive growth in revenues and TV subscribers, overseeing the launch of BT's European football coverage, its BT Sports app and its 4K Ultra HD services.



France Télévisions has appointed pay TV veteran **Julien Verley** as its new director of commercial development, charged with

overseeing the French public broadcaster's commercial units and production activities. Verley, succeeds **Laetitia Recayte**, who has occupied the role since August 2015. The role involves supervision of the broadcaster's three commercial units – France Télévisions Distribution, France Télévisions Publicité and Multimédia France Productions.

Ooyala has appointed the former CEO of software-as-a-service company Syncplicity,

Jonathan Huberman, as its new chief executive. Huberman took up the role effective April 18 and will focus on the future growth of Ooyala and strengthening its market leadership. Former CEO **Ramesh Srinivasan** joined hospitality software and solutions firm Agilysys in January having exited Ooyala after less than a year.



Szymon

Karbowski, research and development director at Polish cable operator Toya, has left the company to become business development director at technology outfit Vector. Karbowski has been replaced at Toya by his long-standing deputy, **Michał Domański**.



Satellite operator Eutelsat has named **Yohann Leroy** as deputy CEO in addition to his current role as chief technical officer. Leroy will serve alongside co-deputy CEO Michel Azibert, who is also

Eutelsat's chief commercial and development officer. Leroy joined Eutelsat in 2010 as director of strategy before assuming the role of director of engineering in 2013 and chief technical officer in 2014.

AMC Networks' **Joel Stillerman** is joining streaming service Hulu as chief content officer. The new role will see the exec driving overall content strategy, overseeing acquisitions, expansion of the originals slate, development and content partner management teams. Current content chief **Craig Erwich** will remain as senior VP and head of content, focusing on original programming after Stillerman joins later this summer.

History chief **Jana Bennett** is to leave A+E Networks to create a London and New York-based



production company. A+E CEO Nancy Dubuc told staff Bennett had informed her of the plan to launch a new business earlier this spring. Former BBC Worldwide channels chief Bennett has been with History parent A+E for nearly four years, initially relocating from London to New York to launch the female-skewed FYI cable channel. She also ran the LMN network before moving to lead flagship channel History to replace Dirk Hoogstra. A+E is searching for a replacement, but in the meantime, History executive VP and head of programming Paul Cabana and his team will report into A+E Networks Portfolio and A+E Studios president Paul Buccieri. ●

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"In the new world where Netflix and Amazon Prime Video are taking share and direct-to-consumer offerings are proliferating, traditional media companies are having to get into the game too or risk being left behind."

Discovery's German venture

You can tell the TV world is changing when one of the biggest players there is – Discovery Communications – announces a massive new digital partnership with one of the biggest free-to-air broadcasters in Europe, Germany's ProSiebenSat.1.

The deal is specifically for what the two companies call a "next generation OTT/mobile service" that Discovery CEO David Zaslav says could be rolled out in other European markets and possibly around the world.

Up to now, these two players have had little in common, much less considered working together on a venture that is critical to both companies' future growth and continued relevance to consumers. But in the new world where Netflix and Amazon Prime Video are taking share and direct-to-consumer offerings are proliferating, traditional media companies are having to get into the game too or risk being left behind.

Unveiled in May, the joint venture is a direct-to-consumer play, providing consumers with access to the free-to-air services from Discovery Germany and ProSiebenSat.1 under the current 7TV app, with the ambition to add pay services in the not-too-distant future. The deal "strengthens our all-screen strategy," says Zaslav. For free-to-air broadcasters it is also no longer enough to rely on the linear broadcast business. Catch-up and on-demand are what consumers want, on multiple devices and screens. OTT 'bundles' are a logical next step. Indeed, Discovery is working on a number of direct-to-consumer offerings in Asia and already has its Eurosport app.

Mike Lang, president, international development, digital and Discovery Nordics, says that because Germany is not a "robust" pay TV market, launching an OTT, ad-supported

service there will help Discovery leverage its two German free-to-air channels, DMAX and TLC, within a bigger offering. The two companies' ad sales houses will work together to provide advertisers a cross-platform ad buy.

The ambition is to turn 7TV into a true skinny bundle competitor in Germany and, when subscription services are added on, beat Netflix and Amazon at their own game. Such an offer would also create competition to Sky Germany and other pay TV players.

Think of the Discovery-ProSiebenSat.1 deal as a Hulu for Europe. Lang and JB Perrette, who heads up all of Discovery's international business, have form here: both helped create Hulu in the US. "From my experience at Hulu 10 years ago, I know that you need a great product but also a tech experience that works for consumers," said Lang. "Like Hulu, we are starting with a free-to-air offer, but over time it will expand to paid subscription offers as add-ons."

ProSieben's SVOD service Maxdome will remain separate from 7TV for the time being, as will the Eurosport OTT app, but both will likely be added later. Discovery has a lot of financial skin in the German sports game. Not only does it have the Olympics rights from next year, but also Bundesliga rights for the next four years.

Discovery's tie-up late last year with Major League Baseball's digital business arm MLB Advanced Media to form BAMTech Europe is a key differentiator. The streaming video joint venture based in London will provide broadcasters and content owners, including Discovery's own channels, with the tools to create robust direct-to-consumer services.

By late summer the Eurosport app will use BAMTech to offer tailored services, so for ex-

ample, a cycling enthusiast can buy a season pass for cycling events only. It's about catering to what Zaslav calls "super fan groups".

Not long ago, companies like Discovery, NBCUniversal and Disney relied on affiliates to sell their channels. The battles were about what carriage fees could be extracted and how to "window" content between the ad-supported broadcasters and pay TV. The new game is additive, but it is also very different: it is about getting to know your end customer a lot better than you ever did – or needed to – before.

Zaslav describes direct-to-consumer moves as part of the company's "pivot" from a focus on channels to a focus on intellectual property. Not only is Discovery spending much more on creating original long-form content but last year it invested a whopping US\$100 million in the millennial-focused venture Group Nine, a network of digital media sites including The Dodo and Thrillist, devoted, respectively, to animals and male-targeted subjects. The move to create more digital-first content includes working with Snapchat developing shows for its Discover platform as well as creating a Snapchat channel for Eurosport with plans to include content around the Winter Olympics next year.

So will apps edge out TV viewing? Lang believes that the new TV and video landscape is not a zero sum game, and that "demand is going to go up" to match supply. Reed Hastings said recently that Netflix's competitor is sleep. At some point it will be time to switch the TV off. The question is: when they wake up, what app will consumers turn on? ●

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