DIGITAL TV EUROPE

August 2017

MULTISCREEN & OTT PART 4

Q&A: Mikael Dahlgren, Agama Technologies

Agama Technologies CEO Mikael Dahlgren talks about the challenges faced by OTT TV service provider in matching the quality of broadcast services.

What are the main challenges that OTT TV service providers face in providing services that can match broadcast for the quality of experience they provide?

The fundamental OTT technology as such is really not a problem. Although the increased complexity with active clients and dynamic codec rates can make understanding the quality of experience more complicated, this is manageable.

From an operational viewpoint, the biggest challenge for OTT providers is their lack of control over the entire delivery chain. Third party ISPs and CDN providers, as well as a wide variety of unmanaged devices, make it very hard to manage the overall quality of experience.

What do service providers need to put in place to ensure that quality requirements are met?

As for any requirement, the first order of business to ensure quality is to understand how well you are performing. It is crucial that you collect the right data in the right places to get a clear picture of your entire service output.

Many monitoring solutions for OTT often focus on client-side monitoring. This is an important part of the process, but the service creation must also be monitored if you are to get a comprehensive understanding of the consumers' quality of experience.

Another sometimes overlooked area is active testing. This is required to proactively assess the availability and the quality of your OTT service.

Finally, to turn the wealth of monitoring data pouring in from across your OTT solution into useful insights, you need a powerful analytics solution to help you understand service performance, both from a consumer and from a technical and operational view point.

How big a challenge is presented to quality of experience by several suppliers being involved in building an OTT TV service?

This can be a major headache. Working with third-party service providers is always a challenge, particularly when it comes to service level agreements and metrics for quality of service. Many SLAs are vague and focus on specific QoS metrics, rather than on the end customers' service experience. Producing objective and accepted metrics on how third-party providers contribute to QoE of the service can be very testing. This is complicated further where, for the internet access part of the equation, you may not have a contractual relationship with the customer's ISP and you could even be competing with them.

Does it make sense for service providers to adopt a single end-to-end technology solution or to use a mix of different technologies, and why?

As the value of a service assurance solution is really in the overview you get and the conclusions you can draw, and not in the monitoring data itself, you must make sure that you can really consolidate information from across your delivery chain. One way of achieving this is, of course, to go with a single vendor, such as Agama, capable of providing an end-to-end solution. If you do integrate a solution from multiple vendors you need to make sure that you not only collect data from the different parts, but that you understand how to put it all together. This can be harder than it first seems if the semantics of different data sources are different.

What are the key differences between cloud-delivered TV and traditional broadcast TV? Can cloud TV match broadcast for quality and what advantage, if any, does cloud TV bring that broadcast TV can't equal?

The key difference between cloud-delivered TV and broadcast TV is that when it comes to cloud-delivered TV, each experience is unique, the entire solution is adaptive and organised around consumer 'pull', rather than on broadcaster 'push'. This adds a level of complexity to the cloud experience, making it a bit harder to understand and manage quality, but it also adds flexibility.

If you expand your notion of quality of experience from a narrow technical scope to also include availability, maybe at a lower quality level, then clearly OTT adds reach to the experience in a way that broadcast can not. The global reach of the internet also enables more niche content to reach its audience in a viable way. This is clearly a quality of OTT services that broadcasters will find difficult to match.

Cloud cover

***Digital TV Europe* recently hosted a cloud TV roundtable in partnership with AWS Elemental, where leading executives from broadcasters and technology providers looked at the challenges and opportunities of implementing workflows and delivering services from the cloud. Stuart Thomson reports.**

The use of cloud technology promises to transform video delivery. But while OTT TV and cloud TV are more or less synonymous, the migration of broadcasting workflow and the provision of mainstream TV services to the cloud remains a contentious area, meeting responses ranging from outright enthusiasm to hostility.

For large broadcasters, the use of the cloud to distribute TV channels and on-demand services offers the prospect of launching new services quickly and delivering them to a growing base of users without the need to make large upfront investments in infrastructure.

Digital TV Europe recently organised a roundtable event on cloud TV, bringing together leading service providers, media services companies and technology vendors to discuss some of the opportunities and challenges of delivering services from the cloud.

Cloud advantages

For Kiran Patel, solution marketing manager, cloud and delivery products at AWS Elemental, and formerly an executive product manager of media services at the BBC, the ability to deliver services quickly to large numbers of users and the option to develop new services easily make moving from on-premises infrastructure to the cloud highly worthwhile.

"One of the biggest advantages I found as we made the change from on-premises [at the BBC] is that the cloud gave us the ability to forget about limits because you could scale elastically," Patel said at the *Digital TV Europe* roundtable. "Development was easy. Testing was straightforward rather than requiring a six-week lead-time to get hardware in."

Patel said that the BBC's existing workflow was improved when it was moved to the cloud, in part because this enabled the broadcaster to dispense with the use of older-generation hardware. "The cloud made adding new features much easier. The problems we used to have with test environments being non-representative, and the idea that if you tried to deploy something new it would almost certainly fail the first time you did it because you had no idea how it would turn out – that all went away with the cloud because you have completely representative test environments."

Patel said that the cloud means that broadcasters are able to move from implementing workflow updates every three months to deploying new features every week.

While the benefits of 'going to the cloud' are widely recognised, not all players in the broadcast space are convinced that migrating quickly is possible, or even desirable.

Also speaking at the round-table, Norbert Grill, technical director at Austrian broadcast

infrastructure provider ORS, said that in the case of broadcast services – as opposed to OTT and multiscreen video services – a number of factors are likely to slow down migration away from the use of on-premises equipment.

"We are under no pressure at the moment to move classical services to the cloud. We have heavily invested over the years and everything is in place and running smoothly. We will look at how the market is developing over the next years and follow the market, but we won't be a first-mover in the case of the classical business," he said. "For new IP based businesses, we are going in a completely different direction, looking for services that can be deployed directly in the cloud if possible."

Among the issues that play into resistance to the cloud is the difficulty broadcasters face in negotiating service-level agreements with cloud services providers, and the reluctance of their vendors to move to the cloud.

For OTT delivery, on the other hand, the cloud is a no-brainer. Nevertheless, some broadcasters prefer to opt for a hybrid solution when delivering streaming services, using on-premises equipment in tandem with cloud-based delivery of services that can be scaled up at times when big events require it. ORS for example has implemented hybrid cloud delivery of live events including skiing, serving up to 150,000 concurrent users.

While established linear broadcast services are likely to continue to rely on on-premises technology for now, this may not be the case when they add new services – for example UHD TV channels – to their existing portfolio of offerings. There are also cases where established broadcasters have used cloud delivery to expand the reach of services in a way that would not be possible if they needed to build their own infrastructure.

At the roundtable, Bernard Hafenscher, managing partner at Vju, which provides the Streemfire cloud TV platform for enabling broadcasters and media groups to launch linear channels at low cost, said that his company was seeing a lot of demand from emerging markets "where cost pressures are very different from what we are used to".

One example is Rwanda broadcaster Tele 10, which decided to leverage cloud technology to launch two channels on top of the four classic linear services it already provided, servicing the Rwandan diaspora as well as a local audience. Vju was able to help Tele 10 deliver the cloud-based service from Amsterdam back to Rwanda for onward distribution from a physical playout centre at very low cost. "This is where we see the market completely changing – for new companies and players – and less for migration [of existing services]," he said.

While arguments can be put for wholesale migration to the cloud, for large service providers, in practice, the change will be phased. Deutsche Telekom began developing cloud-based services in 2013 when it launched a cloud user interface project, but Thomas Staneker, head of the TV technical service centre at Deutsche Telekom/Magyar Telekom, pointed out that using the cloud to cut the cost of deploying set-top boxes is not so simple. Using cloud technology to eliminate the box is a good idea in theory but removing the box means that processing power has to be provided somewhere else in the network.

Telekom is building its own OpenStack-based cloud infrastructure to serve its networks across Europe. "The important thing in 'cloudification' is to know the right roadmap – what you put where and when – because we come from a legacy situation," said Staneker.

For Staneker, the best place to start is with functions that are "not mission-critical", including elements of the user interface.

"As a second step, all the on-demand services including VOD are likely to be 'cloudifiable'. We would touch linear services last, and then there are some elements you cannot touch at all," he said.

Using the cloud to provide redundancy for disaster recovery is a possibility, but the wholesale migration of linear TV channels to the cloud is something that broadcasters and service providers still see as unlikely to happen any time soon.

Cloudification in other areas also has its limits however. Delivering a cloud UI means that elements are processed in the cloud and delivered to the set-top box as a stream, enabling operators to extend the life of older set-top boxes. However, creating the UI in a data centre on standard hardware could have limits, Staneker said. Rendering a sophisticated UI could require graphical processing unit capabilities, possibly leading to a need for the reintroduction of dedicated hardware.

For customer-facing services, using the cloud can cause complications. Rights have to be cleared, which can be problematic in the case of cloud DVR. There may also be a problem in the case of services delivered via a cloud that cross national borders.

There are also concerns that are more closely related to the way organisations are run and the way they account for costs. It is sometimes said that one of the advantages of migrating to the cloud is that organisations can avoid the need for big upfront capital investment and move to a way to working that involves costs being treated as operating expenses instead.

However, a move from capex to opex may not meet the needs of all organisations in practice. In the case of trans-national companies, for example operating units in individual counties could have the power to make local purchasing

Bayerischer Rundfunk's Martin Hafner, Vju's Bernard Hafenscher & Norbert Grill of ORS.

Q&A: Keith Wymbs, AWS Elemental

AWS Elemental chief marketing officer Keith Wymbs talks about the opportunities opened up for broadcasters and TV service providers by cloud technology

What are the principal benefits that a cloud-based architecture brings to broadcasters and service providers?

Cloud provides the technology and services platform to build agile, digital businesses that have the capacity to allow the constant innovation demanded by broadcasters, and pay TV service providers if they are to continually delight end viewers with fresh experiences, and the most relevant content.

The combination of the power of the Amazon Web Services (AWS), combined with AWS Elemental's video expertise, has enabled customers such as Amazon Video, the BBC, BT, Comcast, Sky, Telefónica, and others to deliver truly innovative experiences for their audiences.

What new commercial opportunities does the cloud open up for broadcasters that would be difficult or impossible to achieve with traditional infrastructure?

Cloud-based software services and video infrastructure allows broadcasters and pay TV providers to more quickly test and deploy new services, freed from the requirement to manage infrastructure, low-level technology and burdened with very long release cycles for new features. Premium content providers are able to focus on creating the best content and targeting the most relevant experiences, including advertising and specific content bundles.

Building media workflows on top of AWS cloud with AWS Elemental video expertise gives the media industry the greatest chance of transforming to continue to deliver their brand promises of content and trust, while allowing commercial opportunities to be identified and explored daily.

What are the main challenges facing broadcasters in moving operations to the cloud and how can these be overcome?

Many broadcasters already utilise cloud for their internet video services. The remaining challenge for the media industry is migrating the established media workflows that create, manage, distribute, and deliver the most valuable video to televisions and set-top-boxes via current broadcast networks. We see a clear goal from our customers towards unifying their workflow solutions to bring scale, performance and efficiency. AWS Elemental's expertise in video processing, combined with the scale and experience of AWS cloud are creating the solutions to enable migration.

How far can the use of cloud technology help deliver a better user experience for end consumers, and what end-user applications are likely to be migrated to the cloud first?

A good example was the first-ever live 4K Ultra-HD stream from the International Space Station (ISS) to viewers on multiscreen devices around the world. This cloud-facilitated transmission, which was a collaboration between AWS and the US National Aeronautics and Space Administration (NASA), enabled a first-time the experience could be "just like being there" for the viewer.

These internet video services built on cloud-native technology have already transformed the end-viewer experience, and consequently their expectations of accessing their most favoured content.

The innovation enabled by cloud is just beginning and we see many more examples where cloud can enable better end-viewing experiences as well as higher performing businesses. These include; deep consumer analytics for richer insights, artificial intelligence-based content recommendation, intelligently targeted user interfaces, and specifically targeted content inclusive of advertising.

AWS cloud services provide the elastic-scaling for any workload, and the sheer power to leverage tools such as machine learning to build an increasingly intelligent digital platform for delighting end viewers.

What are the advantages of adopting an 'all-in' cloud strategy versus a staged, hybrid approach? How far and how fast do you see broadcasters and service providers moving their infrastructure to the cloud in practice?

There are many considerations in making the transition to the cloud. One of the most prominent is determining if the shift will be "all in" or a hybrid of cloud and on-premises. All of the essential video encoding, transcoding, packaging and delivery functions that are often managed on-premises can also be achieved in the cloud, helping them mitigate CapEx costs.

Since AWS Elemental solutions are infrastructure-agnostic, the features, GUIs and APIs are exactly the same whether software is installed on-premises or in the cloud. We're also seeing some companies opt for a hybrid workflow and others migrate to cloud only. From an AWS Elemental perspective, we're focused on what will satisfy a particular customer's need, whether on-premises or in the cloud.

AWS Elemental's expertise in video processing, combined with the scale of AWS cloud are enabling many content providers to make this shift. In addition, many other vendor technology partners across the typical workflows are all driving towards cloud-native services. Together we are creating cloud-native, agile customer solutions that will enable the migration of technology and service platforms to the cloud, while simultaneously motivating operations and development teams in customers to realise the benefits of continued innovation.

Axel Meiling of Mücke Sturm & Thomas Staneker of Deutsche Telekom.

decisions and may be reluctant to see that centralised and treated as group-wide operating expenditure. Some organisations simply prefer to account for the cost of launching new services upfront as a capital expense.

A move to the cloud also has an impact on the internal organisation of companies, with engineering teams that are habituated to looking after dedicated hardware suddenly forced to become 'dev opps' teams tasked with very different sets of responsibilities.

While cultural factors may certainly play a role in slowing down the wholesale migration of services to the cloud, the business case for making the move appears to be strong, at least in the view of participants at the *Digital TV Europe* roundtable.

Using the cloud means that broadcasters and operators don't need a crystal ball to see how their plans work out before investing in new projects. Making detailed plans upfront, on the other hand, can lead to overprovisioning or under-provisioning of infrastructure, leading to additional costs in both cases.

Using cloud technology, said Patel at the roundtable, "is the safer way to fail". With a need to invest in on-premises equipment, broadcasters and service providers are in danger of investing large sums in projects that ultimately underperform. Conversely, they might under-invest in a project that turns out to be a wild success, only to find they are unable to get new hardware in place quickly enough to capitalise on the unexpectedly high demand.

Live channels

Migration of broadcast and video service infrastructure to the cloud is a big project. For many organisations in the video space, it has made sense to focus in the near term on how cloud technology can enhance the consumer experience instead of planning the wholesale move of an entire infrastructure to the cloud.

The benefits of cloud technology to deliver DVR services – enabling TV service providers to avoid investing in costly and liable-to-fail hard drives in set-top boxes – have been widely discussed, although a wholesale migration of recording to the cloud has been stymied to some extent by rights issues, legal restrictions and, in some cases, insufficient bandwidth.

More recently, the use of the cloud to deliver live video and the potential of cloud technology to enable personalised advertising has been widely discussed.

Live streaming of channels is becoming a preoccupation for many OTT TV players, as some services transition to become more akin to rounded pay TV offerings in their own right.

Amazon recently launched its Amazon Channels offering in Europe, having previously debuted the service in the US. The Amazon Channels offering was "built fully in the cloud", according to Patel (the service was created prior to Amazon's acquisition of Elemental). Amazon has created a "full dual-region linear workflow" for the service, which includes channels such as Starz, HBO and Showtime.

In the case of Amazon Channels, creating a fully cloud-based workflow has not been at the cost of broadcast-level reliability, however. "They have gone for broadcast grade… as if [the channels are] being broadcast over cable or satellite. They are not going to have any outages. They are going to make sure they keep things upgraded," said Patel.

TV streaming specialist Zattoo has been focused since its inception on delivering live linear channels, adding DVR and catch-up TV functionality later.

"The main challenge for linear is that you have these high peaks during big sports events and so on," said Nick Bambring, CEO of Zattoo. "The Euros last year peaked at close to 190,000 concurrent users and that went well. We have a system that we now think can handle 300,000 concurrent users. We can easily scale it up and we think we are quite well prepared."

Latency remains an issue for the delivery of live services from the cloud. The often-cited scenario is of an open window and hearing a championship goal scored from a neighbour's TV before it appears on the viewer's own. While the latency associated with adaptive bit-rate OTT TV is reducing as the technology improves, it is not likely to close the gap with broadcast for the foreseeable future.

For AWS Elemental's Patel, latency has been built in to ensure the robustness of the service, and for most viewers the extent to which they value this overrides their concerns about being a few seconds behind the broadcast signal. "Would you rather have the stream a few seconds behind or have it buffer and fail? Most customers, given the choice, would rather have it not buffer," he said.

Advertising

For Deutsche Telekom's Staneker, synchronising cloud-delivered streams with live broadcast signals would be more valuable than eliminating latency on the former.

"It is maybe more interesting to be able to synchronise the OTT with the live stream, so that they arrive at the same time, because if you want to do contextual advertising that pops up on the screen at the same time, or have different angles for people to look at on different devices… you would need simultaneous delivery of the OTT stream and

Magine

Q&A: Rahl Puri, Magine

Rahul Puri, general manager of Magine Digital Media and CTO at Magine, talks about the key requirements of getting an OTT TV service up and running.

What are the key elements needed to build a fully-functioning OTT TV service?

A fully functioning OTT TV service should actively engage customers with high-quality content, strong user experiences and attractive pricing models – i.e. subscription, PPV etc. Services also need to meet the expectations and demands of today's user and provide high-quality video streams that can be watched anytime, anywhere. Magine's media platform is built to accommodate all of these requirements in an integrated way, in addition to offering deep analytics that can inform decisions relating to the content acquisition, user engagement and monetisation. Our full end-to-end solutions make it easy for operators and content owners to get up and running with an OTT service that has the ability to attract, engage and successfully monetize its users.

What are the key challenges OTT providers face in getting services up and running?

The biggest challenge we see in the industry relates to the acquisition of content. From a technical perspective, the challenges arise from choosing either best-of-breed point products or a solution that integrates the entire value chain, from ingestion of content to user experience and monetization. Magine's approach is based on the need to adapt quickly, without having to deal with integration challenges that can arise with best of breed point products. Agility in Magine's cloud offering enables our partners to adapt to the changing environment they compete in.

What are the advantages to OTT service providers of outsourcing their platform requirements to a third-party online video platform provider?

Service providers must concentrate on their core business – acquiring the right content and customers for growth. Magine views its relationships as a partnership – not as an outsourcer. This mindset enables us to best serve our partners, ensuring they grow while at the same time continuing to advance the capabilities of the platform based on real market needs.

How significant an advantage is it for OTT providers to be able to reach a global audience and how big do you think the market is for services with global reach?

The world is a large place with a lot of people, and the growth of multi-platform and on-demand content consumption has advanced the demand for high-quality cloud streaming. An OTT provider who can offer this on a global scale does have an advantage, but for many OTT providers, going global is more than just opening up a platform for all to use. OTT providers looking to scale globally should focus on acquiring content that attracts their target audience in each market. Magine's analytics platform provides near real-time feedback for operators that perform in a global setting, enabling our partners to understand their audience, demographics and geographies and most importantly who is watching what content, when and where. Our partners that decide to go global are at a significant competitive advantage.

What are the key lessons that Magine has learnt from owning and operating its own direct-to-consumer business?

Magine has six years' experience operating direct-to-consumer businesses in Scandinavia and Germany. Thanks to this we have a deep understanding and close relations to both the content industry and the consumers. The real key to success is offering an integrated platform that provides deep analytics. Analytics are at the core of Magine's direct-to-consumer business and informs every decision to be taken, from the content acquired to user experiences, to whether or not to invest in more infrastructure in another part of the world. Data generated by our analytics platform also ensures the continuous and rapid development of our partner's services, alongside learnings we take from our in-market consumer services.

Left to right: Kiran Patel, Stuart Thomson, Axel Meiling & Thomas Staneker.

what is on the big screen," said Staneker.

The other major cloud TV application discussed at the roundtable was cloud-based targeted advertising.

"Advertising is definitely a huge opportunity," said Staneker, who identified this as a key application for delivery from the cloud, alongside the user interface and content recommendation. "If it is contextual and it hits the right target group, and we do this advertising in the breaks or when we change the channel, and it is targeted, this is a huge opportunity," said Staneker. "Definitely a cloud-based solution is the right thing to do."

Zattoo's Bambring also saw "huge potential in the future" for cloud-based targeted advertising. He said that the first step is to deliver targeted advertising, as Zattoo has done for Sport 1 in Germany. Further down the road, service providers could deliver interactive advertising in the cloud, giving viewers the option of clicking to gain access to more in-depth information about a particular product or service. Delivering all content from a server would remove the problem of synchronising with content stored on a client device.

The main hurdle, however, is the way advertising is traditionally sold. Axel Meiling, head of the competence centre new TV at consultancy group Mücke Sturm, pointed out at the *Digital TV Europe* roundtable that interactive advertising has its challenges. If people leave the live stream that means they will not see further adverts that are streamed to them.

Vju's Hafenscher pointed out that the advertising industry is not prepared for the kind of innovation that cloud TV enables. The industry has no way of measuring or costing sophisticated interactive campaigns. Targeting can also be counter-productive if the premium commanded by a targeted ad is not sufficient to offset the loss of revenue from targeting a smaller overall number of consumers.

"You can think of innovative, sophisticated ways of doing advertising in a cloud-based service but the CPMs that will [recognise] that level of sophistication are not there," he said. "You can tell people you will target a very specific demography or interest group but they won't pay you three times as much as before. But this is what you need because the audience has become so much smaller that you need more [money] per thousand viewers. The market mechanism is not there. The advertising industry is still focused on mass reach. This is what needs to change if you want to make serious money from advertising."

Zattoo's Bambring is however optimistic that targeted advertising will have a significant market. While interactive may be challenging, he says that advertisers "do pay" for targeting, even though online viewing in countries such as Germany is not properly measured. He is confident that this will change and argues that targeted adverts ultimately offer better value.

The all-in cloud strategy

The roundtable also touched on the issue of whether it makes sense to migrate to the cloud in a phased way, involving a hybrid infrastructure, or to adopt an 'all-in' strategy.

For most of the participants at the roundtable, a 'big bang' approach to cloud migration has been discounted, particularly if that includes delivering live linear services from the cloud.

For AWS Elemental's Patel, it remains the case that deploying cloud and on-premises infrastructure side-by-side carries with it a certain amount of inefficiency. It makes sense to plan for migration of an entire broadcast workflow rather than to adopt a piecemeal approach that itself carries a degree of risk.

"I think going step-by-step is the right way because it is almost impossible to just dive in – especially for the linear services where it is felt to be just too risky. Transitioning slowly makes the most sense for just about every broadcaster. You have hardware you want some return on, and you know how that works. You don't want to take a risk on your premium channels," said Patel. "But the big benefits you can get from a cloud based architecture – such as flexibility, speed, and also some of the cultural changes from having your operations team retrained and capex moving to opex – and some of the big economies of scale you can get really start coming in when you've got your entire workflow, or as much as you can [in the cloud]."

According to Patel, while there is a "step-by-step process" to migrating to the cloud, broadcasters and service providers need to move there "as wholly as possible" to reap the benefits.

"It is harder in the broadcast industry because there are a lot of people who are invested and trained in a certain way of doing things," he said.

Nevertheless, without a commitment to adopting cloud technology, service providers can become involved in managing parallel infrastructures and can lose out on some of the benefits that attracted them to cloud technologies in the first place.

Once the decision to migrate to cloud-based infrastructure has been taken and a proper roadmap worked out, said Patel, the benefits will follow. The cloud is the future.

Q&A: Simon Trudelle, NAGRA

Simon Trudelle, senior director, product marketing at NAGRA, talks about the opportunities and threats to service providers in the age of cloud TV.

What are the main opportunities and threats that are likely to drive innovation in the TV experience over the next couple of years?

The pay-TV industry is under growing pressure from competitive OTT services and content piracy. Our 2017 Pay-TV Innovation Forum research program identified innovation as a top priority for pay-TV industry executives across the world, citing the launch of new products and services as critical drivers to growth. By developing new packaging and pricing options for consumers, accelerating data-driven business transformation and building strategic partnerships with content providers, best-in-class providers should be well positioned to grow despite a challenging market environment.

What do service providers need to prioritise to deliver a TV experience across a broad range of retail IP devices as well as traditional TVs?

Today, virtually all TV service providers and broadcasters have adopted OTT distribution services – and for good reason: consumers have a growing appetite for IP video streaming and a growing customer segment is embracing video streaming, and its benefits, now more than ever.

Service providers have to consider an upgrade to their end-to-end infrastructure to eliminate backend silos and integrate features such as cloud DVR, ABR just-in-time packaging, CDN and device management, and now addressable advertising. Smartly transitioning from broadcast to IP is all about being pragmatic in offering the best consumer experience while optimising costs.

What benefits can cloud technology bring to next-generation TV delivery, and what are the limitations of the cloud?

Scalability, elasticity and flexibility on the operation side, and convenience, personalisation and ubiquity on the consumer side are often the top benefits that are mentioned. Because in a future where more choice means more flexibility to consume content, cloud technology promises to give viewers a better, more personalised TV experience, resulting in better perceived value and customer loyalty over time.

While cloud technology can reduce infrastructure costs through virtualisation and dynamic elasticity, adapting backend infrastructure to the cloud model can be complex. For DVR functions for instance, providers have to scale their recording, storage and streaming capabilities in line with subscriber numbers. This requires new investments.

What are the principal challenges that retail devices and the cloud pose to revenue security for operators?

First and foremost, the objective for pay-TV services providers is managing complexity in an IP-based multiscreen world. The variety of devices that a back-end platform can deliver to is mind-boggling! This is a huge opportunity for service providers to re-rationalize siloed first-generation IP-based content distribution systems.

Service providers need to manage complexity of multiple platform DRMs – DRMs built into devices and browsers from Apple (FairPlay), Microsoft (PlayReady) and Google/Android (Widevine). These are used instead of downloadable DRMs wherever possible as they are tied into the device hardware (hardware root of trust) and provide a higher level of security, required for the most premium content. In addition, providers also have to address new IP-enabled STBs, some of which don't belong to the aforementioned ecosystems, and their own hybrid STBs, also supported by the platform to ensure simplified and consistent service management.

What tools are available to operators to overcome these challenges?

Service providers need to preferably address these challenges with a single 'Security Services Platform' that is network and device agnostic, as well as cloud-ready for deployment on internal virtualised infrastructure or through a public cloud service. This platform then turns business logic (i.e. content packages) into the commands that all the different subsystems and devices can understand, tying them all together into one efficient system.

In addition, for high-value content like sports and early-release movies, IP streaming piracy is a growing risk. To address the issue, server-based watermarking must be used in order to trace pirated content back to its source. Together with anti-piracy services that trace illegally redistributed content, service providers are able to shut off infringing content at the source.

How is consumer data likely to change the way TV is delivered and what do service providers need to prioritise to benefit from this to the maximum possible extent?

As TV service providers face a business transformation challenge with the rise of 'digital native' OTT providers, they need to drive their business using more relevant data. But they often don't have that data, as legacy TV systems are not always two-way connected. In fact, social platforms and other external systems can offer extensive sources of data that will rapidly fill the gap.

The use of anonymised unstructured and structured data, coming from multiple sources, combined with configurable data science algorithms, allows for the development of powerful prediction engines that bring a revolution to the way TV is delivered and packaged for viewers. The resulting KPI-based action loops of a data analytics platform empower internal teams to better drive business operations in areas such as consumer value optimisation, content management, service operations and advertising management.

Straight from the cloud

Can the application of cloud technology enable pay TV operators to ditch the set-top box? Will the cloud free up content rights holders from the 'shelf-space' restrictions of managed TV services? Does broadcast infrastructure have a future? Stuart Thomson distils the views of some key technology players.

Does the ability of service providers to deliver linear channels and the user interface of a service direct from the cloud signal the end of the managed network and the set-top box?

For Sylvain Thevenot, managing director of OTT TV specialist Netgem, cloud TV encompasses three areas: delivering the TV experience and 'virtualising' the set-top box; replacing traditional broadcast infrastructure with an OTT architecture; and opening up the TV experience to multiple sources of content delivered to any device.

Hardware requirement

As far as virtualisation of the box and 'cloudification' of the end user experience is concerned, Thevenot believes that ultimately some hardware will be required to render a premium TV experience.

Thevenot says that traditional set-top boxes are likely to become physically smaller and more simple in terms of what they actually do, with a growing part of the TV experience delivered from the cloud. DVR is an obvious candidate for 'cloudification' if rights issues can be sorted out. Multiscreen delivery of content is obviously best achieved from the cloud.

However, says Thevenot, this does not mean the end of the set-top box. While eliminating devices in the home could provide cost savings for TV operators, in practice the box provides a valuable function by giving service providers greater control over the end user's experience.

"It could be a false saving," says Thevenot, pointing out that a few avoidable calls to a service provider's customer care operation will soon outweigh the relatively low outlay it has to make for a box.

For Thevenot, advances in cloud technology do not mean that operators will deliver services without hardware in the home. However, the type of hardware deployed could evolve. He cites the example of Netgem's own integration of its software in a TV soundbar. "This will be provided by someone other than Netgem so in effect it is a virtual set-top box," he says.

Removing the box entirely by integrating as an app in a smart TV carries the problem that it requires operators to guarantee an experience on devices that they don't control in a world where apps are constantly being upgraded. Delivering a service to devices that are sold at retail is inherently challenging because an operator-delivered service implies an ongoing relationship with a subscriber whereas the sale of a retail device means that no money changes hands after the sale has gone through.

Simon Trudelle, senior product marketing director at Nagra, agrees that the case for dedicated hardware in the home is strong. While there is a need to deliver an advanced user experience to retail devices such as smart TVs and streaming boxes, some of which "are quite advanced and powerful", service providers prefer to have a box in the home. A box, he says, is best placed to ensure the best compression and to ensure that animations and transitions are smooth.

In practice, says Trudelle, there is also a need for hybrid systems to make the best use of legacy linear broadcast platforms. "In the cable space there is a need to leverage existing linear broadcast capabilities. Many systems we see coming to market are still hybrid and that will be the case for a number of years," he says.

While it makes sense to deliver DVR services from the cloud, this is still not always practical, says Trudelle, because of legal restrictions and lack of available bandwidth. "In some cases, there are markets where broadband is not a given and service providers still need to put a DVR in the box. There is still demand for that kind of offering. As broadband becomes more available... that will move to the cloud," he says.

Fast channel change is also more easily achieved with a set-top box, says Trudelle. In fact, he says, demand for more sophisticated functionality not only mean that boxes are still necessary, but that in some respects they are becoming more sophisticated.

Nagra believes that multiscreen will drive migration of functions to the cloud.

Q&A: Gernot Jaeger, Zattoo

Gernot Jaeger, chief officer B2B TV solutions at Zattoo, talks about the benefits of a hosted IPTV platform

What is a hosted IPTV solution?

Zattoo covers the entire technical platform that makes a state of the art TV and entertainment experience happen. The platform covers everything from the ingest of signals to encoding and transcoding, including digital rights management, all the way through to the middleware and the frontend applications. This includes applications for set-top boxes, Apple TV, Fire TV, Smart TVs, iOS and Android devices. For all this, we leverage our own, proprietary end-to-end platform that has been built over 10 years serving more millions of customers today.

We bring together linear and non-linear content to any device everywhere. Our customers benefit from an individual and customised TV entertainment service under their own brand across multiple devices. Thereby they can respond to the increasing demand for innovative features from their customers such as live pause, restart, network PVR, catch-up TV and video on demand.

How do you make a hosted IPTV solution for network operators manageable?

An IPTV solution that's externally hosted and managed by a provider like Zattoo is very convenient. But there is sometimes the perception that this approach also comes with having less grip on the product for your customers. How do you deal with this?

When setting up an IPTV solution, we work closely with the operator, fitting everything to their needs. But yes, we are aware of these concerns. A fully hosted and managed TV service can potentially be a bit like a black box. And to address this concern, we are opening this black box more and more to the operators and their teams.

This mission resulted in the BRIDGE, our 'cockpit tool'. This tool is all about giving the operators insights into the quality of service and into live usage data in order to help them with their customer support. We continue to invest heavily in this tool and of course it can be customized to specific operator needs, thus giving them truly their own BRIDGE, their own centre of command and control for their TV service.

Why does it make sense for service providers to adopt this?

Stability and availability is for sure one core reason here: service providers benefit from a maximum operational stability of the Zattoo platform. As part of our service we guarantee ongoing further developments of the entire IPTV solution – the 'Evergreening Roadmap'.

The second reason is reduced complexity and shorter time to market: For the operator there is no complex project of setting up systems or integrating various vendor solutions into one end-to-end solution. This factor, combined with our vast experience in setting up IPTV or OTT services makes it easy to implement and deliver top-notch products with a very short time to market.

The third reason is certainly cost reduction: there is no huge investment in hardware, software or team. And at the same time an operator benefits very directly from the economies of scale that come with a big platform serving dozens of tenants and millions of end customers.

What functionality does Zattoo's solution provide and how do you plan to evolve this?

Obviously, features such as cloud PVR, restart or rewind, catch-up TV or content discovery are a given. These are things that have been very successful for our B2B customers for years. Additionally, the scope of devices is crucial – here we added Apple TV and Amazon Fire TV, two up and coming devices that increasingly play an important role in many projects alongside the classical set-top box.

On top of this very strong base, we continuously work on enriching our IPTV solution by news features and functions. One highlight is the integration of SKY and Netflix, which is nearing completion. We are as well working to further improve content discovery. And we look at the devices of tomorrow – for example we have a prototype ready on the Microsoft hololens.

What types of service providers are you targeting and how much growth do you foresee in this segment?

Our target group are mainly network providers, FTTH operators, internet service providers, media companies, and VOD providers, where we foresee substantial worldwide growth.

"Our view is that the box can't just be a very simple low-cost device. We think the market wants more functionality with linear – in a sense the requirements for an OTT box have gone up in terms of the processing power and intelligence required," he says. On the other hand, the cost of processing is going down, so service providers are getting more functionality than previously for the same price.

Full service

If operators still on the whole prefer to deploy hardware in the home, what of the network over which the content reaches the box?

Delivering a full service, including linear channels, via the internet is possible provided there is sufficient bandwidth.

Thevenot says that there has been "significant movement" over the last year and a half in the use of OTT technology to deliver mainstream TV services. He says that using broadcast technology to deliver linear channels is "a very expensive way to go, beyond the five most popular channels". In the case of IP delivery, it means maintaining an expensive managed IPTV infrastructure.

For Thevenot, it simply makes sense to migrate niche-interest channels to OTT rather than rely on expensive broadcast infrastructure to deliver them to people who may never watch them. "It is much cheaper and it also gives you more flexibility because the same stream is available for other devices," he says. As viewing on mobile devices grows, it makes more economic sense to dispense with broadcast and use adaptive bit-rate encoding to deliver the bulk of services over IP.

"We are paying a huge amount of money to broadcast a secondary channel over a managed network when, with smart caching of OTT streams at the end of the network, you can do the same job with more flexibility because the same stream is available on other devices," says Thevenot.

Thevenot admits that in some markets such as the UK, it still may make sense to use the strong digital-terrestrial platform to expand the reach of a service. In this case, he says, hybrid platforms make sense. What doesn't really make sense any longer is managed IPTV, which is fast becoming yesterday's technology.

Some pure OTT players go much further of course. Netflix boss Reed Hastings' views on broadcast TV are well known. And for Ambuj Goyal, CEO of cloud platform provider Magine, the only real obstacle to full cloudification of TV is that content providers are not yet ready to take the leap.

"The technology exists but the content guys are not ready to do it yet," he says. Where WiFi attached to a fixed network is not available, mobile technology is filling the gap, says Goyal. The problem, he says, is that content rights are either not available or are priced at a premium to traditional broadcast or cable distribution.

According to Goyal, this does consumers a disservice. People can't easily transport their cable services to holiday homes. Managed services have limited shelf space compared to the wide world of OTT, meaning that choice is restricted, he says. "There exists a monopoly for the local cable company which doesn't have enough shelf space," he says. "It is nothing to do with the technology and everything to do with the control of content. [Content rights-holders] are paid so much by cable and satellite operators to push stuff to people who may not be watching it."

> **"OTT is much cheaper and it also gives you more flexibility because the same stream is available for other devices."**
>
> **Sylvain Thevenot, Netgem**

At the same time, says Goyal, niche content is deprived of a distribution channel. He believes that the desire of rights-holders to find new markets, combined with the desire of the consumer to view content while on the move, will force things to be freed up.

OTT networks can cope with live content, including popular live sports events, says Goyal. If there is a bottleneck, it is the authentication process, which can prevent prospective viewers from accessing the content they want because the sign-up process works too slowly.

For Goyal, devices are "only for authentication". The kind of channel surfing people are habituated to via a set-top can easily be replicated via the cloud – if they still want that. As for bandwidth issues, Goyal says that OTT can deliver what most people want to watch, and argues that 4K UHD TV will only appeal to a small minority, because it is next to impossible to discern the difference from HD on a normal-sized TV.

Goyal's view that it is only habit and ingrained commercial interests that is holding back the wholesale migration of TV to the cloud is not shared by everyone, but industry participants do believe that a number of long-term factors play in favour of the cloudification of TV, at least in part. Set-tops may remain, but increasingly content from multiple sources will be delivered to them via the web, because it makes commercial sense to deliver all but the most widely viewed channels in this way. Not only is it less costly than broadcast, it enables content providers to deliver to multiple devices via a single stream. (In addition, viewers increasingly want access to pure OTT content from the likes of Netflix and others.)

Beyond these factors, cloud technology can deliver new functionality more efficiently and effectively than legacy broadcast. For Trudelle, where the cloud really comes into its own is in supercharging service intelligence through analysis of customer data.

"Obviously there are a number of functions – search and discovery, and recommendation and promotion – that are clearly best driven from the back-end, from voice search to smart recommendation based on behaviour," he says. "Powerful cloud APIs can be leveraged in the back-end and discovery of content becomes a lot more powerful. It is easy to use and customers will use it and trust it."

Analysis of data can also enable service providers to improve their content acquisition strategy, and place a revenue-related value on the content they acquire, says Trudelle.

He also believes that delivering content to multiple devices will drive migration of functionality to the cloud. "What we have seen in the past is that service providers had two platforms with a TV-centric platform and a multiscreen platform. Some faced rights issues [on multiscreen] and there were also concerns about security on multiscreen devices. What we are seeing now is a need to have everything in one place, with one security platform that simplifies the rights issue quite a lot." ●

13TH ANNUAL

Digital TV Central & Eastern Europe

11-12 October 2017
Kempinski Hotel Corvinus, Budapest, Hungary

LEAD THE CHARGE IN DIGITAL TV TRANSFORMATION

MEET 40+ INDUSTRY LEADING EXPERTS INCLUDING:

ANDREY KOLODYUK
FOUNDER OF DIVAN.TV AND MANAGING DIRECTOR
ADVENTURE CAPITAL

DAVID BLUNCK
CEO
INVITEL

JUSTYNA TROSZCYNSKA
CEO
CDA.PL

RICHARD BRESKOVIC
MARKETING DIRECTOR
T- HRVATSKI TELEKOM

WOJCIECH KOWALCZYK
DEPUTY DIRECTOR – PRODUCT AND INTERNET STRATEGY
TVP

EXCLUSIVE DISCOUNT
SAVE €200
Use Code: DIGTV200

BACKED BY THE INDUSTRY: OUR 2017 PARTNERS

Gold Sponsors:

Event Guide Sponsor:

Coffee Break:

Silver Sponsors:

Exhibitors

tmt.knect365.com/digital-tv-cee
TV CONNECT SERIES #DIGITALTVCEE in TV CONNECT SERIES

Delivered by KNect365 TMT

Register Now!

Conference 14-18 September 2017
Exhibition 15-19 September 2017

IBC2017

The World's Leading Media, Entertainment & Technology Show

Join over 1,700 exhibitors showcasing the latest technological innovations, 400+ speakers delivering the latest industry insights and 55,000+ attendees providing unlimited networking opportunities at IBC's 50th annual conference and exhibition.

Register at show.ibc.org
#IBCShow