

# Cloud video transformation

Produced by

DIGITAL **TV** EUROPE

In partnership with

**VEN-UE**  
Sony DADC NEW MEDIA SOLUTIONS

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## Introduction

Cloud TV is steadily transforming the way content is distributed and the trend towards the 'cloudification' of content distribution is likely to accelerate in the future as content service providers look to simplify their workflow, cater to changing viewing habits and give themselves the flexibility to launch new services quickly.

Many organisations see huge benefits in migrating their content distribution infrastructure to the cloud, but there are also significant obstacles that stand in their way.

Companies are also concerned about following a viable roadmap to 'cloudify' their infrastructure in a way that doesn't threaten or disrupt their existing way of doing things.

*DTVE* recently surveyed a sample of senior industry figures from over 40 countries, including IPTV providers, cable and satellite pay TV operators, OTT service providers, broadcasters and other players in the value chain to share their views on how far they have progressed with cloud migration so far, what they expect to happen in the future, what they think the key applications of cloud technology are, how they plan to manage the migration, and how they view the main opportunities and challenges.

The survey revealed that:

- Cloud technology will play a major role in content distribution, with a majority of respondents believing that most elements of content distribution will be cloud-based within five years. However, only a small minority of respondents currently operates a completely cloud-based infrastructure.
- Industry players are more convinced of the case to deliver non-linear services from the cloud than live linear TV channels, and believe that cloud technology will have a bigger impact here than elsewhere. However broadcasters and service providers are already using cloud technology, often in combination with on-premises infrastructure, across a wide range of services.
- Migrating to cloud infrastructure carries risks, but in the view of our survey respondents those risks are worth taking, on the whole.

Respondents also believe that outsourcing the majority of technical functions to third-party providers makes sense, although a significant minority is sceptical of the benefits of outsourcing. Our survey sample is broadly in favour of taking a cautious approach to cloud migration, maintaining some functions on-premises for the long haul. However, a significant minority – about two in five of our respondents – believes in a more assertive migration strategy, favouring either as fast a migration as possible with on-premises infrastructure retained only for a transitional phase, or a single-step migration, getting rid of on-premises equipment entirely.

- The biggest advantage of cloud migration, in the view of our survey respondents, is that it allows broadcasters and service providers to scale their operations according to fluctuations in demand, without the need to make big upfront investments. However the biggest challenge in the view of our sample is that migrating to the cloud means changing the way costs are accounted for – for example involving a shift from upfront capital expenditure to ongoing operational expenditure.

# Experience and expectations

Cloud technology is set to have a major impact on content distribution. The use of cloud technology has progressed hand-in-hand with a growing belief that it offers more cost-efficient, scalable and flexible way to distribute video content, enabling broadcasters, service providers, OTT companies and others in the video distribution chain to optimise their investment in infrastructure and match what they spend with the size of the audience they actually reach.

The power of the cloud to change the video distribution landscape is widely recognised among respondents to our survey. Some 26.8% of respondents believe that cloud technology will completely transform all aspects of content distribution, while a further 44.3% believe it will have a significant impact on all aspects, meaning that over seven in 10 think cloud technology will have a major impact on all aspects of the distribution process.

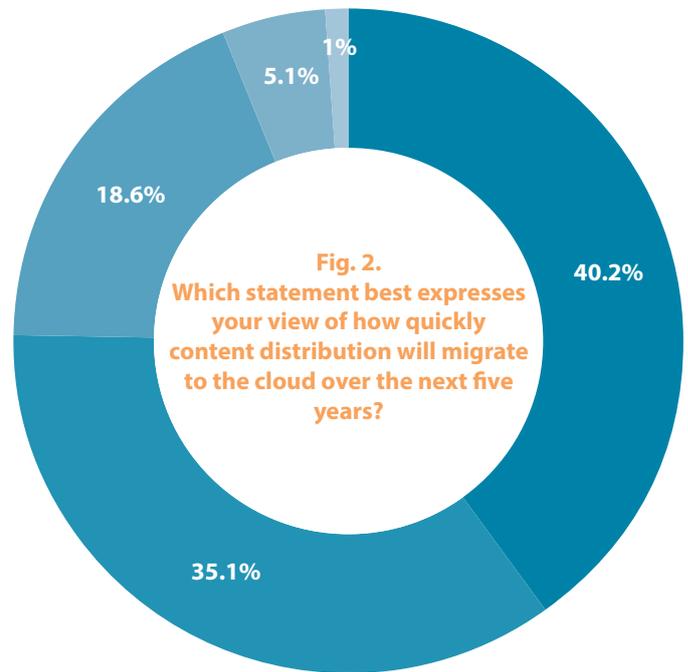
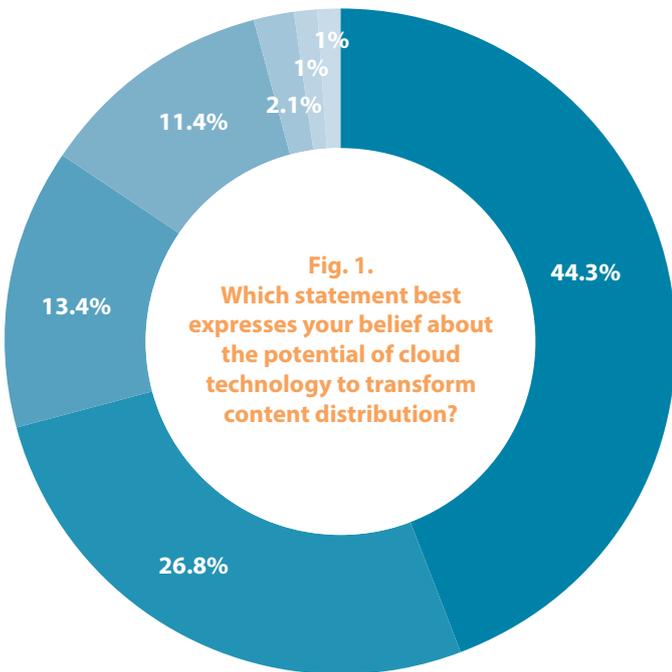
Of the remainder of respondents, 13.4% believe that cloud technology will completely transform some aspects of distribution but not others, while 11.3% believe it will have a significant impact on some aspects but not others.

A negligible proportion of respondents believe that cloud technology will have only a minor impact on the content distribution landscape. (fig.1)

While survey respondents are united in viewing cloud technology as of growing importance, there is some variation in their views on how fast the change will take place.

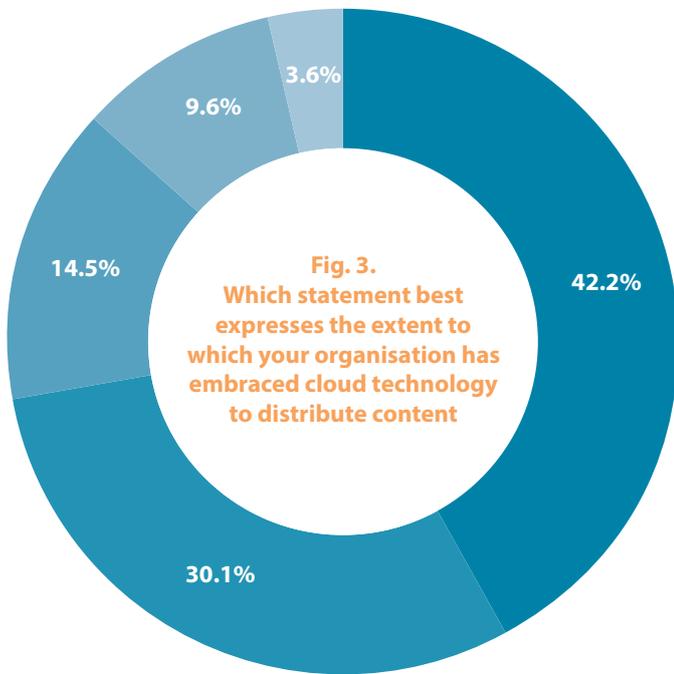
Asked how far they expected cloud migration to have progressed within the next five years, the vast majority of respondents agree that most elements of content distribution will be cloud-based. Only 18.6% believe that all elements of the distribution chain will be cloud-based, but a larger proportion – 40.2% – believe that the majority of elements of content distribution will be cloud-based in five years’ time. A further 35% believe that there will be more or less a 50:50 split between the use of cloud and on-premises technology in the distribution chain. Only 6.1% believe that the majority of elements will still be on-premises. (fig.2)

When it comes to how far their own businesses have made the switch to



- Cloud technology will have a significant impact on all aspects of content distribution
- Cloud technology will completely transform all aspects of content distribution
- Cloud technology will transform some aspects of content distribution but not others
- I don't know what cloud technology for TV service creation/distribution means
- Cloud technology will have a relatively minor impact on all aspects of content distribution
- Cloud technology will have little or no impact on any aspect of content distribution

- The majority of elements of content distribution will be cloud-based within five years
- Content distribution in five years will employ a more or less 50:50 mix of cloud and on-premises technologies
- All elements of content distribution will be cloud-based
- Some elements of content distribution will be cloud-based in five years’ time, but the majority of elements will still be based on-premises
- The vast majority of elements of content distribution will still be based on-premises in five years’ time



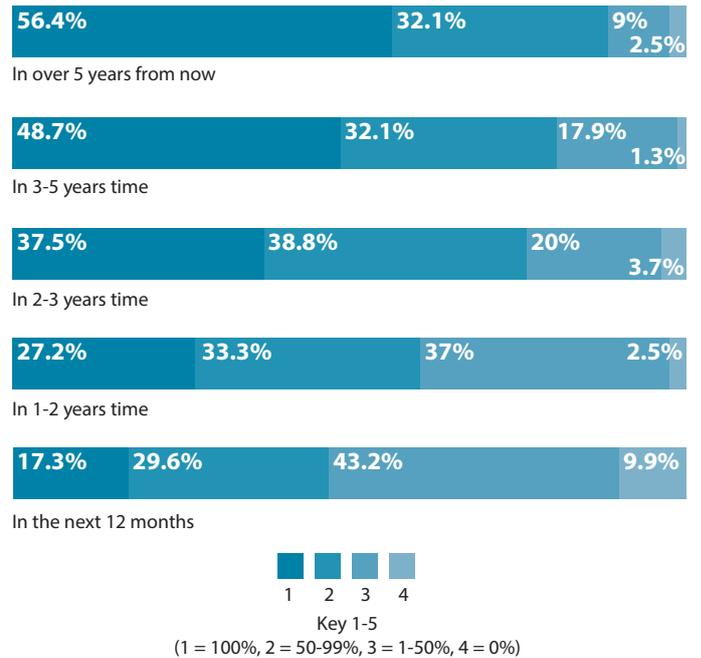
- The content distribution workflow of my organisation is under 50% cloud-based, but it has some cloud-based elements
- The content distribution workflow of my organisation is over 50% cloud-based, but it has some on-premises elements
- The content distribution workflow of my organisation is now 100% cloud-based
- The content distribution workflow of my organisation is 100% based on on-premises infrastructure, with zero cloud-based elements
- I don't know the extent to which my organisation uses cloud technology

date, the picture is more mixed – with evidence that there is still room for improvement.

Of those respondents to our survey for whom the question is relevant, 14.5% say that their content distribution workflow is now 100% cloud-based, with a further 30.1% claiming that over 50% of their distribution workflow is currently cloud-based, although some on-premises elements remain.

A majority of respondents nevertheless say that less than 50% of their workflow is cloud-based now. Some 42.2% say that less than half is cloud-based, although their workflow does have some cloud-based elements, while 9.6% say their workflow is currently 100% based on on-premises infrastructure. Some 3.6% of respondents do not know the extent to which their organization uses cloud technology. (fig.3)

**Fig. 4. To what extent do you believe your organisation will embrace cloud technology to distribute content in the following timescale?**



We also asked respondents to estimate how quickly their organisation would migrate to cloud technology to distribute content. Of those who expressed a view, some 56.4% believe that their workflow will be 100% cloud-based in over five years' time, compared with 17.3% who believe they will be 100% cloud-based within a year. Only 9.9% believe they will have no cloud-based elements in their workflow at the end of the next 12 months, and only 2.5% they will have no cloud-based elements in over five years' time.

Between those extremes, there is an expectation that steady progress will be made towards cloud infrastructure over the next five years. Some 43.2% believe their workflow will be under 50% cloud-based, though with some cloud elements at the end of 12 months, falling to 17.9% in three-to-five years' time and 9% after five years. Some 29.6% believe their workflow will be over 50% cloud-based in 12 months with some on-premises elements still in place, rising to 38.8% for over 50% cloud-based in three to five years and then falling away after that, as organisations migrate to a 100% cloud architecture. (fig.4)

# Uses of cloud technology

Media companies looking to migrate to cloud technology to distribute content face a number of issues, including whether to switch to a cloud-based infrastructure in a single step, or migrate in a phased way using a mix of on-premises and cloud infrastructure.

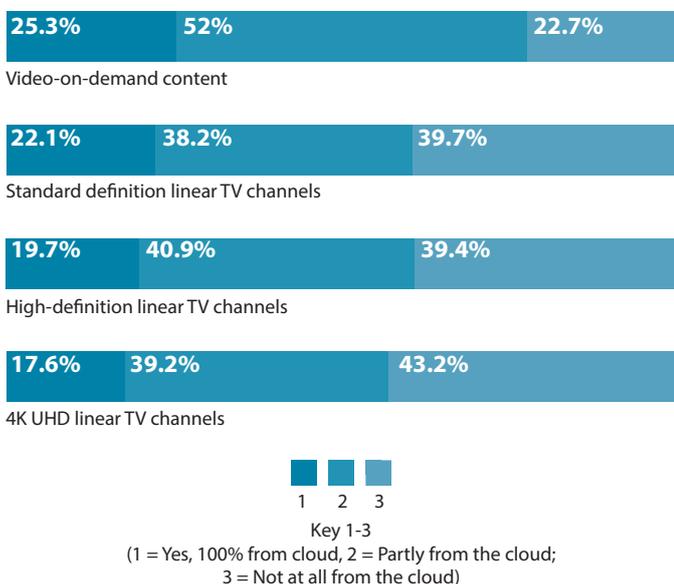
The case for using cloud technology to distribute new OTT services – notably video-on-demand – is relatively straightforward, but broadcasters are more reluctant to take the plunge when it comes to established linear channels delivered over traditional broadcast infrastructure.

Cloud technology has already been widely adopted, at least for part of content distributors' workflows. There is considerable variation in the range of services offered by different respondents and some variations in the use of cloud technology to deliver them. Over three in four respondents claim to offer video-on-demand services, while over two thirds offer HD linear TV channels. A smaller number claim to offer linear 4K UHD TV channels.

We asked our survey sample to tell us the extent to which they use cloud technology to deliver standard-definition linear channels, HD linear channels, 4K UHD linear channels and video-on-demand respectively.

Some 22.1% of respondents for whom the question is relevant – or who knew – said they deliver SD linear channels 100% from the cloud, while 38.2% said they deliver such services partly from the cloud. However the largest proportion – 39.7% - said they do not use cloud technology to deliver such services.

**Fig. 5. Does your organisation use cloud technology to distribute the following type of content**



For linear HD channels, some 19.7% of respondents are 100% cloud-based compared with 40.9% who are partly cloud-based and 39.4% who are not at all cloud-based.

The proportions for 4K UHD services are similar, from a smaller base.

For video-on-demand content, the proportion of respondents delivering services completely or partly from the cloud is higher, and the overall base is higher. Some 25.3% of respondents for whom the delivery of VOD services is a relevant category said they deliver such services 100% from the cloud. A further 52% said they deliver VOD partly from the cloud, while 22.7% claim not to use cloud technology to deliver such services. (fig.5)

We also asked respondents where they believe cloud technology will have the greatest impact in the content distribution chain in the future across content capture and editing, post-production, storage, creation and playout of linear channels, distribution of channels to the end user and distribution of non-linear services such as VOD and DVR.

In the view of survey respondents, the distribution of non-linear services to the end user will see the biggest impact, with 71.1% of respondents endorsing the view that cloud will have a 'very big impact' on this, and a further 20.6% saying it will have a moderate impact.

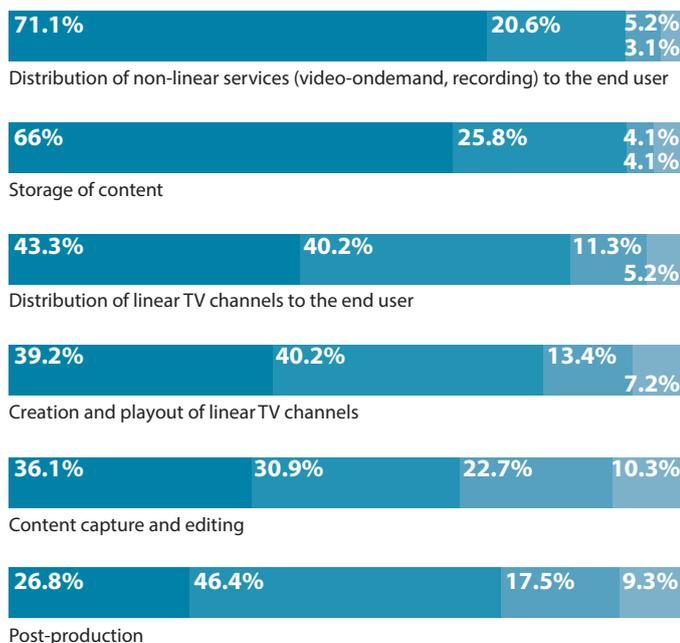
Storage of content is the next part of the content journey most likely to see a big impact from cloud technology. Some 66% of survey respondents believe cloud technology will have a very big impact here, with a further 25.8% believing it will have a moderate impact.

Trailing some way behind but still significant in terms of the perceived impact of cloud technology is the distribution of linear channels to the end user. While the application of cloud technology to deliver on-demand streams seems clear, the application of cloud technology to linear channels is likely to involve a more complex calculation of costs and benefits. In terms of distribution to the end user, cloud technology is associated with unicast distribution over CDNs, and there is a perception that traditional on-premises broadcast technology still has the edge here, particularly in relation to mainstream channels with a big concurrent audience.

There is a perception that upstream parts of the content deliver chain are relatively less likely to 'go cloud' in the immediate future. However, the use of cloud technology is still likely to be important, even if not quite as important as for distribution to the end user.

In relation to the impact of cloud technology on the creation and playout of linear TV channels, some 39.2% believe it will have a very big impact, while a further 40.2% believe it will have a moderate impact and 16.5% believe that either it will not have a very big impact or that it will have little or no impact.

**Fig 6. Cloud technology will have the greatest impact on which of the following elements of the content distribution chain?**



Key 1-4

(1 = Very big impact, 2 = Moderate impact  
3 = Not very big impact, 4 = Little or no impact)

As far as content capture and editing is concerned, opinions are divided. Some 36% believe cloud technology will have a very big impact while 30.9% believe it will have a moderate impact. Some 33% believe either that it will have not a very big impact or that will have little or no impact. For post-production, the balance of opinion is more in favour of cloud technology having a moderate impact, with 46.4% of respondents favouring this option. (fig.6)

# Cloud migration strategy

How quickly content distribution companies adopt cloud technology will depend in part on a calculation of the benefits, but any decision is likely also to be influenced by perception of the risks and by cultural factors, and the attachment of business chiefs to attributing costs either to operating or capital expenditure.

Adopting a new way of working certainly carries risks. Costs of migration can quickly spiral, while benefits may take longer to be realised. Taking a phased approach to cloud migration and adopting hybrid infrastructure may mitigate some of the risks, but may also add to costs while preventing companies from realising the full benefits that cloud technology can provide.

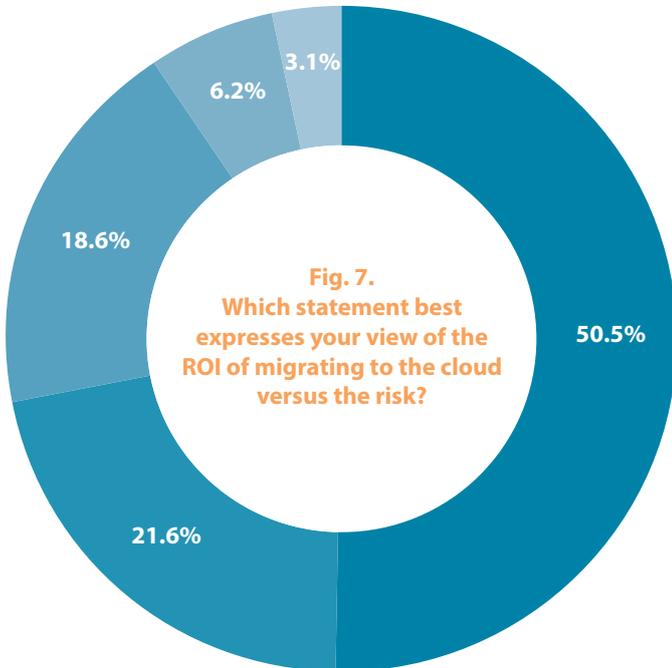
We asked our survey respondents to give their views on how potential returns on investment weigh up against the risks. The balance of opinion

held that the risks of going cloud are worth it, but with a significant minority holding to the view that risks and potential returns are more or less equal.

A minority – 18.6% – endorse the view that migrating to the cloud carries a minimal risk that is far outweighed by the potential return on investment. However, an absolute majority – 50.5% – said that migrating to the cloud carries a moderate risk that will probably be outweighed by the potential return.

A significant minority – 21.6% – is more pessimistic however, holding to the view that migration to a cloud-based infrastructure carries a significant risk that will more or less be equal to the potential return.

About one in 10 survey respondents – 9.3% – believe either that cloud



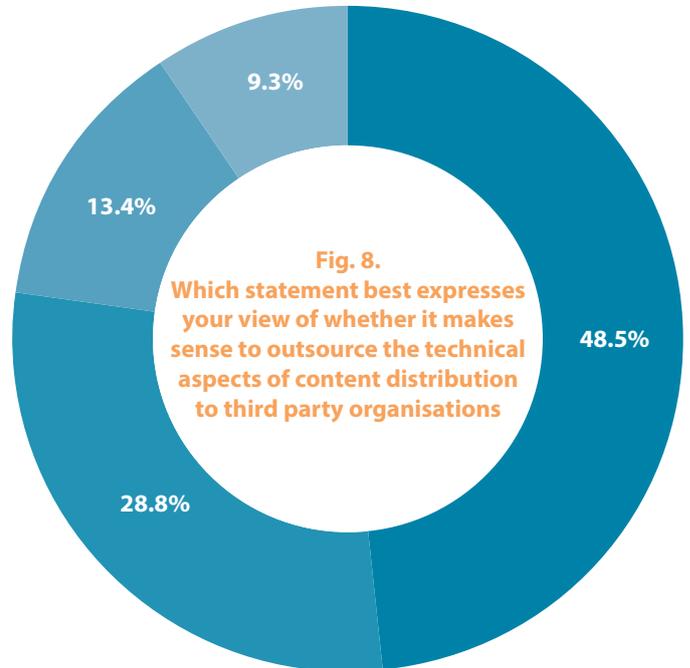
- Migrating to the cloud carries a moderate risk that will probably be outweighed by the potential ROI
- Migrating to the cloud carries a significant risk that will more or less be equal to the potential ROI
- Migrating to the cloud carries a minimal risk that is far outweighed by the potential ROI
- Migrating to the cloud carries a large risk that will probably outweigh any potential ROI
- Migrating to the cloud is highly risky, and this risk far outweighs the potential ROI

migration carries a large risk that will probably outweigh any potential return or that cloud migration is so risky that the risk far outweighs the potential return. (fig.7)

The calculation of potential return versus risk is one part of working out if, when and how to migrate to a cloud-based workflow. Once a decision to migrate to the cloud has been taken, the next step is to decide how to make the move. Content distribution companies must decide how much of the process to undertake in-house and how much to outsource. We asked survey respondents to express their thought about how far it makes sense to outsource the technical aspects of content distribution workflow to third-party organisations.

Some 13.4% of respondents believe it makes sense to outsource all technical aspects of content distribution in all cases, while a very large proportion – 48.5% – believe it makes sense to outsource the majority of technical aspects while keeping some elements in-house.

Nevertheless, over a third of respondents are more sceptical to some



- It makes sense to outsource most technical aspects of content distribution, but some elements should be kept in-house
- It makes sense to outsource some technical aspects of content distribution, but most elements should be kept in-house
- It makes sense to outsource all technical aspects of content distribution in all cases
- It makes no sense to outsource any aspects of content distribution, as keeping all elements in-house will ensure better control and accountability.

extent of the benefits of outsourcing. Some 28.8% of respondents believe that while it makes sense to outsource some technical aspects, most elements should be kept in-house, while 9.3% believe it makes strictly no sense to outsource any aspects of content distribution because keeping all elements in-house will ensure better control and accountability. (fig.8)

Those looking to migrate to cloud technology also need to consider whether it makes sense to move to the cloud in a single all-in-one step or to allow cloud and on-premises technologies to coexist, for example by migrating certain applications to the cloud while leaving others on-premises.

Asked to express their views on how cloud migration could be managed, our survey sample was split between those who think it is best to manage the migration as quickly as possible and those who believe that on-premises infrastructure should be maintained for the long haul.

Close to half of respondents – 48.4% – believe that it makes sense to

## Cloud video transformation survey

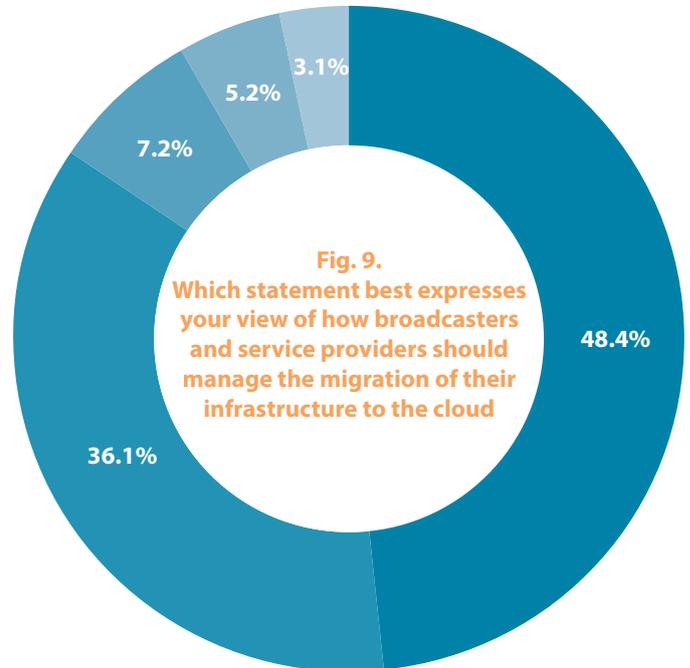
migrate workflow to the cloud in a phased way while maintaining on-premises infrastructure indefinitely, as some function can be done more efficiently on-premises.

Some 36.1%, on the other hand, take the contrary view that it makes more sense to migrate the entire workflow to the cloud as quickly as possible – while taking care to ensure on-premises infrastructure is maintained for a transitional phase to ensure continuity.

Some 5.2% of respondents endorse the view that it makes sense to migrate the entire workflow to the cloud in a single step as running on-premises infrastructure alongside cloud-based technology is inherently inefficient.

Conversely, 7.2% of respondents said it only makes sense to migrate some limited elements of workflow to the cloud, with on-premises equipment likely to play a major role far into the future.

A minority of respondents adopts a more extreme anti-cloud position. Some 3.1% of our sample says that it makes very little sense to migrate any elements of workflow to the cloud as on-premises equipment is plain superior. (fig.9)



● It makes sense to migrate workflow to the cloud in a phased way while maintaining on-premises infrastructure indefinitely, as some things still either require this or are done more efficiently on-premises

● It makes sense to migrate the entire workflow to the cloud as quickly as possible while taking care to ensure service continuity by maintaining on-premises infrastructure for a transitional phase

● It makes sense to migrate some limited elements of workflow to the cloud but on-premises equipment is likely to play a major role far into the future

● It makes sense to migrate the entire workflow to the cloud in a single step as running on-premises infrastructure alongside cloud-based technology is inherently inefficient

● It makes very little sense to migrate any elements of workflow to the cloud as on-premises equipment is plain superior

# Opportunities & challenges

The use of cloud technology is now widely seen to confer multiple benefits on content distributors, despite challenges in managing the migration and a lingering degree of distrust of the cloud. The use of shared cloud infrastructure can potentially free up content companies to focus on their core creative and marketing expertise rather than technology, accelerate the pace of innovation, make it easier to scale up operations to cater to a growing customer base, and cut costs.

We asked our survey respondents to rate these perceived advantages on a sliding scale, from 'very important' to 'not at all important'.

The most compelling advantage of migrating to the cloud, in the view of our sample, is that it allows broadcasters and service providers to scale their operations according to fluctuations in usage, rather than being forced to make big upfront investments. Over two thirds of respondents rate this as very important and a further one in four rate it as moderately important.

Survey respondents were also attracted to idea that cloud technology enables more and faster innovation than on-premises infrastructure, with 58.8% rating this as very important and a further 32% rating it as moderately important.

The scale advantages of the cloud are also compelling to most respondents. The idea that cloud technology enables the scaling up of services without big upfront investment, enabling broadcasters and operators to grow quickly, is very attractive to a majority of our sample. Some 60% rate this as very important, with a further 26.8% rating it as moderately important. However, a dissenting 13.4% believed either that this is either not very important or not at all important.

There is a slight rise in scepticism in relation to other perceived advantages of cloud migration. Some 45.4% said that it is very important that cloud technology is inherently less expensive than on-premises infrastructure, for example because it means using off-the-shelf hardware and enables single versions of content to be delivered to multiple destinations, with a further 43.3% believing this to be moderately important.

The idea that cloud technology can free up broadcasters and service providers to focus on content creation and marketing rather than technology is seen as very important by 44.3% of respondents and moderately important by 41.3%, with some 14.4% believing it to be either not very important or not at all important. (fig.10)

Survey respondents were also asked to rate the major challenges of making the transition to cloud infrastructure in terms of their relative importance.

The most significant challenges in the view of our sample are in fact not strictly related to technology at all.

Accounting changes are top of the list. Some 49.5% of respondents

believe the fact that migrating to the cloud means broadcasters and services providers have to change the way their costs are managed, for example by transferring costs previously counted as capital expenditure to operational expenses, is a very significant challenge. A further 33% believe this is to be a moderately important challenge.

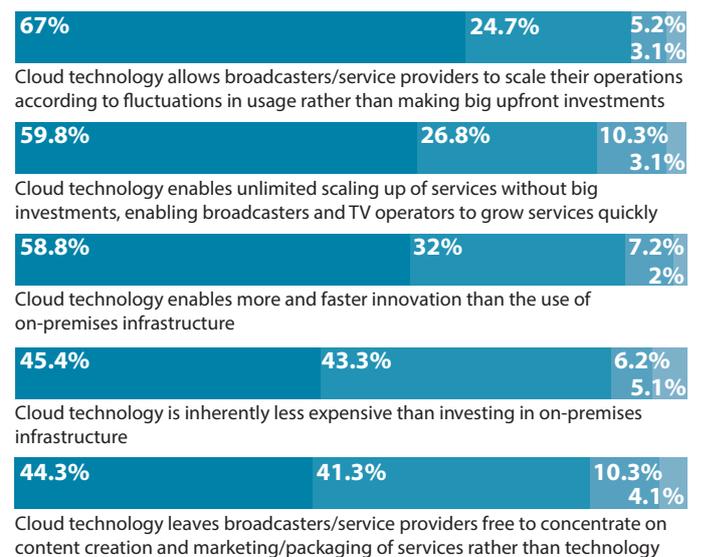
The second most important challenge in the view of respondents is that migrating to the cloud means the broadcaster or service provider will become more reliant on third-party organisations than was previously the case. Some 47.4% of our sample rate this as very important, with a further 40.2% rating it as moderately important.

Related to this, perceived loss of control and the need to implement complex organisational changes are also seen as important.

For 32% of survey respondents, the idea that migrating to the cloud means that broadcasters or service provider have less ability to ensure quality control day-to-day is seen as very important, with 48.5% seeing this as moderately important.

The notion that migrating to the cloud means the broadcaster or service provider has to undergo complex organisational changes that can take up time and effort is seen as an important challenge by 29.9% or respondents and as moderately important by 44.3%. However, there

**Fig 10. What are the advantages of migrating content distribution to the cloud?**



Key 1-4

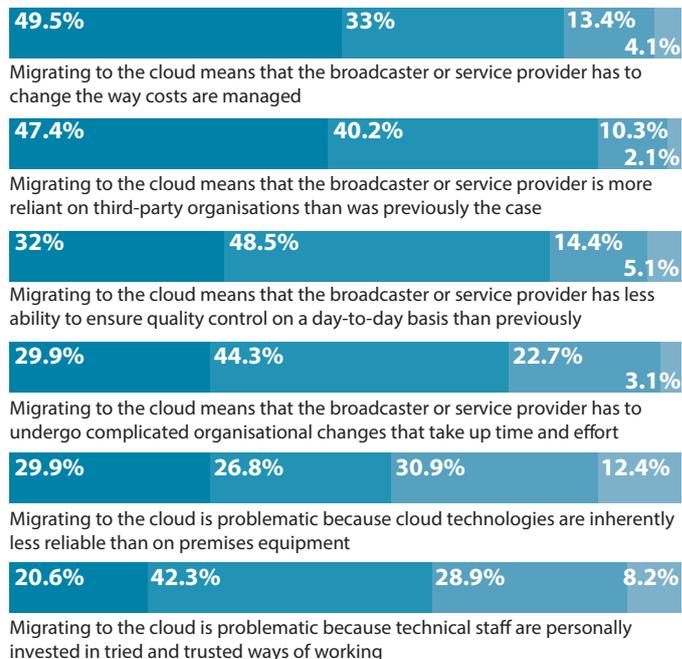
(1 = Very important, 2 = Moderately important  
3 = Not very important, 4 = Not at all important)

is also some scepticism about this, with 25.8% believing it to be either not very important or not at all important.

A related challenge is the need to retrain staff, or convince them to adapt their working practices. Some 20.6% of respondents believe that technical staff being personally invested in legacy working practices is a serious challenge, with a further 42.3% believing this to be moderately important.

There is also a lingering suspicion that cloud technology is less reliable than on-premises infrastructure. Some 29.9% believe that it is important that cloud technologies are inherently less reliable than on-premises equipment, with 26.8% believing this to be moderately important. Some 30.9% think that this is not very important, while 12.4% believe it is not at all important. The two figures taken together still represent a minority overall, indicating that evangelists for cloud technology still have some work to do to convince people that content delivery from the cloud is a safe option. (fig.11)

**Fig 11. What are the challenges to migrating content distribution to the cloud?**



Key 1-4  
 (1 = Very important, 2 = Moderately important  
 3 = Not very important, 4 = Not at all important)

# Conclusion

Cloud technology is already having a major impact on the way content is distributed, and the trend towards adopting cloud-based infrastructure is set to continue.

The vast majority of respondents to our survey believe that cloud technology will transform or have a significant impact on all aspects of content distribution. The majority of our sample also believes that most elements of content distribution will be cloud-based within five years.

Despite their expectation that the cloud is set to change the content distribution landscape radically, a majority of survey respondents claim that under 50% of their existing workflow is cloud-based now, although they expect that to change.

For those currently using cloud technology to distribute content, the technology is applicable in varying degrees across linear SD, HD and UHD channels and non-linear services, but is most immediately applicable to non-linear services. Our survey respondents believe that cloud technology will have the greatest impact on the distribution of non-linear services to the end user as the technology becomes more widely adopted, with a significant impact also on the storage of content.

While expecting cloud technology to have a major impact, survey respondents perceive significant risks in migrating to the cloud, although on balance a majority believes that the risk will probably be outweighed by the return. A majority also believes that it makes sense to outsource some or all of the technical aspects of distribution, possibly to mitigate this risk.

Survey respondents are also cautious about adopting too ambitious a cloud migration strategy. A majority believes that it makes sense to maintain at least some on-premises infrastructure indefinitely, with a minority preferring a more assertive approach.

The mix of views on how – and how quickly – to migrate to the cloud is reflected in the fact that survey respondents associate a number of opportunities and challenges with cloud technology.

Survey respondents believe above all that cloud technology will allow broadcasters and service providers to scale their operations according to demand, avoiding the need for big upfront investments. Paradoxically however, they also think that one of the biggest challenges in making the move is the need to change the way costs are managed, for example by transferring costs previously counted as capital expenditure to operational expenses.

In summary, the cloud offers huge potential advantages and new possibilities to broadcasters and service providers. While there is still some apprehension and uncertainty about how to make the move, a majority of respondents are fully behind the adoption of cloud technology, and aware that the cloud will be key to the future competitiveness of the industry.

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