



## WHITEPAPER

# Above us only sky:

## How broadcasters can determine TCO in the cloud



### Abstract

There is no such thing as a standard broadcast workflow.

The rapid development of broadcast technology and accessible connectivity has enabled broadcasters all over the world to introduce more flexibility, automation and distributed production. The old one-size-fits-all approach has been replaced by hybrid models that can adapt to meet the changing demands of individual productions, and the cloud is playing a big role in this evolution.

The cloud has the potential to deliver even greater flexibility to dynamically scale resources, and broadcasters are working with cloud providers and technology suppliers to introduce more flexible cloud resources into their workflows.

Every one of these workflows is just as flexible as the benefits they promise to deliver. Processing can be accessed on prem, on hardware hosted in the cloud, or even in cloud-native environments; it can automate processes to save time; it can outsource manual systems to fill more channels and develop new markets. It

promises so many efficiencies that the move to cloud is never simple and it can never be linear.

It is as much a cultural shift as it is a technical one, and as broadcasters develop the best mix of resources to meet their needs on a case-by-case basis, calculating the Total Cost of Ownership (TCO) of the cloud is a constant and ongoing assessment. Keeping track of the costs requires a complex series of calculations across multiple cost centers, with unorthodox shifts from Capital Expenditure (CapEx) to Operational Expenditure (OpEx).

The days of buying big and under-utilizing resources may be over, but the adoption of cloud affects the whole organization. This paper looks at the practical implications of developing cloud workflows in a broadcast environment as well as above-the-line and hidden costs, and it invites broadcasters like Sky, NEP and Sinclair Broadcast Group to share their own experiences of embracing the cloud.

### Introduction

Broadcasting in the cloud is not a new thing. Companies like NEP and Sinclair have both been using cloud for media asset management, channel insertion, streaming and playout for years. Using cloud-native solutions like Grass Valley® AMPP®, they were creating limited-scale productions with these technologies long before the pandemic forced everyone's hand.

Meanwhile, Sky is using cloud extensively, running virtual control rooms in the cloud that handle vision, audio mixing, talkback, graphics and production. It leans into

cloud production for its F1 Battle Channel, women's football and netball, as well as content for Sky News and VAR for rugby league. More recently Sky launched Sky Sports+, a fully cloud-produced, managed and distributed service that delivers 50% more content – everything, from ingest to processing and distribution, is done exclusively in the cloud.

Grass Valley has worked alongside broadcasters on this journey since it introduced the AMPP platform as part of its GV Media Universe in 2020. The first cloud-native SaaS



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Mike Kralec, SVP, Chief Technology Officer,  
Sinclair Broadcast Group

platform to leverage elastic computing technologies, the goal of AMPP is to meet customers' needs where they are now while providing the ability to shift in the future. It is deployable both on prem as well as in the cloud, and its platform approach means it can evolve as users' needs evolve.

Providing a mix of flexible, microservice-focused workflows, as well as traditional hardware, enables broadcasters to design hybrid workflows that can be adapted to individual projects, and the scope to further evolve those workflows in the future. But there is a fundamental difference in these two approaches.

## Scope and usage

Many advocates of broadcasting in the cloud talk about the shift from CapEx to OpEx expenditure, boasting huge potential savings of on prem hardware, reducing installation costs, maintenance and staffing. They claim that working in cloud environments can speed up workflows, create more content, automate processes, reduce travel costs, make better use of existing equipment and encourage remote collaboration.

All these things are true.

But the real picture is more nuanced because calculating TCO of the cloud isn't just about the savings, it's a two-way street, and a busy one at that. Pricing calculators from the likes of AWS and Azure that calculate resources like CPU, storage and network usage, aren't nearly sufficient enough to cater for broadcasters' unique requirements. The likes of Sky, NEP and Sinclair have implemented their own metrics and calculations to account for their ongoing flexibility of cloud implementations.

The rate of these implementations and how they are being utilized also makes a huge difference.

Mike Kralec, SVP, Chief Technology Officer at Sinclair, says broadcasters don't always recognize potential efficiencies until cloud workflows are in place. Sinclair's initial costing focus was on building an operating model based on "reasonable assumptions" to get the cloud migration program approved. Only later did the broadcaster recognize other savings and opportunities that were possible by being in the cloud.

"What is very clear is that you're going to be able to do more, and it's not going to cost you as much as it would have if you weren't already in the cloud," he says. "The ability to innovate is dramatically improved, but the ability to quantify the value of innovation in the early stages is incredibly difficult."

So, what should broadcasters be looking for?

## Hidden costs

Historically, broadcasters have trusted on prem hardware. The accepted approach was to budget equipment capable of delivering the biggest productions of the year, knowing that it has the capacity to meet them.

While the physicality of having the kit on site is reassuring, it results in an overcapacity for most of the year. As broadcasters edge closer to cloud-microservices that can scale to meet or exceed these requirements, many opt for private cloud networks, which use on prem hardware, as opposed to fully cloud-native environments like AWS, Azure and Google.

It's not as simple as saying that private cloud has high CapEx and lower OpEx, and public cloud has low CapEx and higher OpEx — this doesn't even scratch the surface. Having had experience of both, Dave Travis, Group Director of Content, Broadcast & Platforms at Sky, says they are incomparable.

“This is where TCO is the major component because everybody overlooks the true costs,” he says. “When you run a private cloud on prem you have to account for the building costs, AC, the generator, support contracts and UPS, and that’s before you calculate reinvestment in the equipment when it comes to the end of its lifecycle. There are upgrades to factor in, as well as the upkeep of ancillary equipment.

“This baseline infrastructure is inescapable in our business and is already a significant investment, but on top of that are the hidden facility costs: the mechanical engineers to manage the AC and the power, the network engineers to support it and the cost to train them, the security guard to ensure that the building is protected, and car parking, toilets and canteen costs for all of them. These are overheads in their own right before any equipment is installed.”

## Economies of scale

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Cloud providers like AWS have all the same costs, but with 100,000s of customers – the economies of scale don’t compare. “If you compare cloud compute costs with a server cost, the server cost will always win hands down, because the hyperscaler has to consider all these associated costs,” says Travis.

But he says it is important to acknowledge that on prem servers have to account for these costs too – and this is where many costs are overlooked.

Scott Rothenberg, SVP of Technology & Capital Planning at NEP Group, treats both public and private cloud separately. NEP uses public cloud for burst capacity and scalability, particularly for its media asset management system, and private cloud for applications like playout and ingest, which gives the company more control over the costs.

“At the beginning, part of the challenge is that nobody can predict accurate overheads because of the egress costs of public cloud,” he says. “We would get into discussions around public versus private cloud, and there were stories about people who left the faucet on and ended up with a big AWS bill. This unpredictability makes it difficult to provide accurate quotes to clients because those clients don’t want a range, they want a figure.”

## Hidden benefits

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US broadcaster Sinclair has been all-in on public cloud since day one, determining that public cloud was more flexible and scalable than any private cloud options. It began working with cloud-based playout and closed captioning in 2017. It has since used cloud to centralize processing and distribution and is still working through the comprehensive cloud planning and modeling roadmap it put in place in 2022.

When planning its TCO, the broadcaster works closely with a range of departments including Finance, Operations and Technical teams to develop business cases and operating models.

“It’s not just about using servers in the cloud, or networks in the cloud, or storage in the cloud,” says Sinclair’s Kralec. “It is about the operational processes inside the business and whether or not that particular process, when reconfigured to work with cloud architecture, is more cost-effective than it would be to go through a capital cycle every seven to 10 years.

“It is making some assumptions that all teams can agree to inside the business, and leveraging those assumptions to build a business model that says you’ll either be cost-neutral on OpEx and positive on CapEx, or positive on both. In reality, you’re probably not going to increase CapEx costs no matter what and those savings can be enough to make it worthwhile in the short term.”

Kralec says that there is an inevitable initial period where the costs of cloud migration will ramp up faster than the realized business value, and that there is an “inflection point” where the costs come down and the business value increases to become net positive.

Although more benefits continue to emerge over time, streamlining workflows and reducing manual effort across the organization has already led to significant cost savings. For example, giving access to all of its 185 Owned or Operated Stations to centralized content directly in AWS not only simplifies Sinclair’s digital distribution, but saves money: “When everything is assembled at the station, transported into the cloud and then encoded, we can just hand it off to the digital team for our digital properties, apps and websites to access directly from the cloud. It saves us over a million dollars a year.”

## Buy in

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Working collaboratively with other teams to ascertain TCO is crucial to achieve buy in across the board, especially when it comes to staying the course beyond that inflexion point. Sinclair works with its internal Finance Business Development Group from the start to help document those initial assumptions, understand the operating model, and work closely with the technology team on cloud migration, and both NEP and Sky have established FinOps teams to help justify the business case.

Working with the deployment engineers to ensure transparency and traceability of cloud costs, Sky’s FinOps team is part of Travis’ infrastructure and cloud group rather than being in the broader Sky organization.

“We have a very mature position in terms of FinOps, which is vital because finance teams have very short memories,” says Travis. “It is essential to have a constant communication loop with full traceability and transparency to justify what you’re doing in the cloud.



“The FinOps team is a technical engineering team who operate an approval process for taking on additional capacity in the cloud, and also provide checks and balances on cloud spending by ensuring that we are tagging and flagging everything we do. It means that when we do the analytics around the financial components, we know what that proposition is costing us at any given moment. Everything is allocated to a particular proposition and department so we can assess how that department is trending against its forecast and its budget. It gives us all kinds of analytic data.”

## External conversations and SLAs

NEP has also been expanding its FinOps team to be more involved in analyzing TCO and the shift from CapEx to OpEx models, although Rothenberg says it goes much further. Educating its sales teams and having more open conversations with vendors about pricing models and how to best align costs with usage is an important part of TCO.

“When using more cloud resources, you’re doing more with procurement and less with production people, so FinOps naturally comes into it, but we’re also having conversations with manufacturers because there are so many different pricing models out there,” he says. “There are burn down credits that you spend as you use them, but also agreements based on SLAs where you can use a credit as many times as you want, you just can’t use multiple credits simultaneously.

“It can get really complicated because nobody has enough knowledge of how the technology is going to work in a particular workflow, so getting guidance from the Finance team can be difficult. We do a lot of work

with our salespeople to assess whether an SLA with a vendor matches our requirements. We ensure we have open and transparent communication with vendors too, because wherever you get terms and conditions, it usually ends up with lawyers, whereas you really need to communicate to technical people what you’re agreeing to, and penalties involved, right at the start.”

Building relationships with vendors can create cost savings in other areas. Since broadcasters are looking for specialist talent and have to compete with the broader IT industry, including companies like Google and Amazon, developing strong working relationships with vendors’ and cloud providers’ technical teams provides an opportunity to tap into an abundant and cost-effective talent pool.

In addition to working closely with those same cloud providers, Sinclair’s Kralec also found value in the supply chain to support its cloud migration: “We only have a few cloud engineers, and we leverage our vendors a lot like our cloud partners. They have those specialist resources as well, and in conjunction with AWS we get a lot of what we need: people that understand how everything connects together.”

## Real time

Rothenberg says that the “increased cost of SLAs, of how you monitor how they are performing and ensuring that the vendors are living up to what you’re paying for” has been an unexpected cost of cloud implementation.

Once again, this highlights the need for real-time assessment of service use.



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NEP makes use of its Total Facility Control (TFC) app to “monitor our usage of licenses on things it controls and orchestrates.” TFC is a proprietary NEP software that manages, monitors, controls, and networks IP/2110 equipment and systems.

But both Sky’s and Sinclair’s well-established FinOps teams work in conjunction with cloud providers to build out detailed models.

## Conclusion

Cloud implementation for broadcast is incredibly nuanced, and determining TCO for cloud is a long-term project that has to be continuously assessed. Getting company buy-in on the initial business case is crucial, but the key to staying current is much bigger than just looking at the raw cloud infrastructure costs.

The adoption of cloud servers alone is not cheaper than on prem, but it enables broadcasters to streamline workflows and eliminate human processes across a number of departments, such as Ad Operations, Master Control and Engineering. Finance teams must work closely with all these operational teams from the very start to document assumptions and understand how the operating model changes in order to quantify potential savings. “If the program doesn’t do that,” says Kralec from Sinclair, “I don’t see how anyone is going to achieve any savings.”

Costs are always going to be higher than traditional on prem infrastructures, especially during the early stages, but while cost efficiencies might be slow to appear, incorporating the cloud into broadcast workflows is already paying dividends for companies like Sky, Sinclair and NEP. All three broadcasters are committed for the

“Our FinOps team understands the AWS tagging side,” says Kralec. “They understand the costs associated with the media management component and the cost of the distribution and playout software. We can build a model today that documents the individual cost components of building a playout channel, and that has been a huge benefit to our organization because it lets us talk to the business in terms of real cost for new initiatives.”

long haul, and the efficiencies they are experiencing are likely to increase.

“There is no cloud provider that has ever increased the cost of compute in the public cloud; it has always come down,” says Sky’s Travis. “A point which is often massively overlooked is the management of capacity of private cloud vs public cloud. When we built a private cloud, we wanted the flexibility to spin up and spin down, so we needed excess capacity built in from the start. The management of that excess capacity was an overhead in its own right. Sky’s baseline costs are based on the cost today, and we never factor in Moore’s laws or cloud cost reduction.”

The simple view is that cloud is an agile, SaaS deployment that means broadcasters can spend less on processing up front by leaning on operational expenditure as and when it is needed instead.

The truth is that it’s much more nuanced. There really is no such thing as a standard broadcast workflow, and detailed planning is essential to ensure accurate TCO.

## Ten TCO Takeaways

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- 1.** Cloud transformation is different for everyone, but it should always start with a solid business case built on reasonable assumptions.
- 2.** Cloud is not necessarily cheaper, especially in the early stages of implementation, but when taking a long-term approach, and considering ALL related costs, cloud may deliver meaningful savings. Importantly, it also gives broadcasters the opportunity to experiment and innovate, which can pay dividends later on, as well as scale resources when required to maximize ROI.
- 3.** Comparing private (on prem) vs. cloud costs is not a simple comparison, with hidden on prem costs that are often overlooked and go beyond simple compute costs when building a business case for cloud. This especially applies to the hidden costs of private cloud such as infrastructure-related costs (data centers, power, cooling, generators and backup systems for resilience), facility costs like security and HR, and the cost of recycling on prem hardware. It also covers operational costs like IT support and maintenance staff, change management and training for employees, monitoring and observability tools, and security and compliance management.
- 4.** Not all costs are easy to quantify. Opportunity costs and the cost of not innovating as fast as your competitors are impossible to judge, especially when cost efficiencies are only apparent post-transition.
- 5.** Broadcasters have worked in the same way for decades – operational change will be substantial. Expect and plan for change management across every team in the business.
- 6.** Engage finance teams early in the process and work closely with them to understand operations and model costs. Work with cloud suppliers, leverage tagging, and capture accurate data to ensure detailed ongoing cost analysis and forecasting.
- 7.** FinOps teams can play a crucial role in managing cloud costs and providing guidance, but it is important to involve other cross-functional stakeholders. Teams like HR, IT and Communications should be part of the discussion from the very beginning to ensure the cloud migration is aligned with the overall business.
- 8.** Collaborate with technical partners and educate internal teams on OpEx pricing models and cost levers used by vendors to manage cloud costs. Ensure SLAs match internal requirements and monitor vendor performance against them.
- 9.** Consider the talent and skills gap. The transition to IP-, cloud- and microservices-based workflows has created a skills gap that broadcasters need to address. Competing with the broader IT industry for talent is a cost factor, and leveraging the expertise of cloud providers like AWS can be advantageous.
- 10.** The key to achieving cost savings and efficiencies is to focus on finding a better operational model and workflow optimizations; not just moving to the cloud for its own sake. Focus on optimizing operations and workflows rather than just moving workloads.

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WP-PUB-3-1072A-EN

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