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EBOOK

## Cloud/IP-Based Content Creation & Delivery

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FUTURE  
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# What we learned about cloud from gamers

Giambo: “You can localize mixing fairly close to most major markets”

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ominic Giambo is the manager of technology for [Wheatstone Corp.](#), maker of the WheatNet-IP audio network.



**Where do you see the role of cloud in the broadcast studio?**

**Dominic Giambo:** We view it as an extension of the AoIP network. We’re using all the same interfaces and similar, if not the same, networking architecture for our [Layers software suite](#) for mixing, streaming and FM processing in the cloud, but the difference is that we’re now on the worldwide cloud.

If a cloud server in New York goes down, we can automatically load balance everything over to an Amazon server in Los Angeles. We can’t do that as easily or

affordably with broadcast facilities. We could build 10 data centers and fail between them, but it would require a lot of infrastructure, whereas Amazon has the data centers sitting there waiting to run whatever you need, whether it’s mixing, audio processing or stream provisioning.

We are now able to direct a stream from anywhere in the world as a cloud instance that can be brought up in a second and torn down in a second, and the best part is that you don’t have to pay for it until, or if, you use it.



**How far along are we in the studio migration to cloud?**

**Giambo:** We’re already there as far as technology is concerned. Mixing, FM/HD processing and streaming in the cloud is available now, even if that “cloud” is a server in your own facility. It just so happens that key broadcast functions now live in software and are easily ported from broadcast-specific hardware to commodity servers, as is the case with our Layers software suite.

The mix engines for our console surfaces, for example, are built on Linux, which runs on the DSPs in our mixing Blades just as readily as on a Dell or Hewlett Packard server. One server can run multiple Layers mixing instances for several consoles throughout your facility, plus serve Layers FM audio processing instances with full 192 kHz MPX out to the transmitter, as well as provisioning and metadata for multiple streams out to the CDN provider. And of course, once you have all that as instances in a server, you can move some or all offsite to be managed by a cloud provider via virtualization software like [VMWare](#) or container software like [Docker](#).

Applications like streaming are natural fits for this. Not only is streaming less latency sensitive than, say, mixing, CDNs are already in the cloud and it just makes sense that processing for streaming would be there too.



**What would you say is the most significant issue that broadcasters face as they move over to cloud operations?**

**Giambo:** There are going to be tradeoffs with latency and buffering for packet loss, something we’re very familiar with as an AoIP manufacturer. But we are getting so much better at making those tradeoffs, and specifically, mitigating packet loss using protocols like, for example, [SRT](#), which is a UDP protocol used in



Wheatstone's Blade 4 fourth-generation I/O WheatNet access units.

If we want transport reliability, we're going to need redundancy and protocols like SRT that support redundant streams. We've had a lot of experience with these protocols and these issues over the 20 years we've been developing AoIP.

**RW** What about centralizing audio processing and, specifically, getting the FM multiplex signal from a data center to the transmitter site?

**Giambo:** As an audio processor manufacturer, we see some real potential in centralizing processing. So many of our customers have one or two guys in charge of processing for the entire group, and by having a cloud product like Layers FM/HD processing, they can make setting changes from anywhere.

Our biggest challenge is getting good, quality audio from the data center to the transmitter, but there's already sufficient fiber bandwidth at many transmitters now. And especially with Starlink and 5G, there's a real possibility that many won't need a compressed pipeline for the MPX from an Amazon data center to the transmitter.

There will always be some sites that you will have to

force it through a straw, and there are options available for that. But we anticipate many of our customers will be able to get full 192 kHz sampled MPX across to the transmitter from an Amazon data center if not now, very soon.

**RW** What can you tell us about mixing in the cloud, which gets a little more complicated, in part because of latency due to the transmit distance between the studio or transmitter and a data center?

**Giambo:** Mixing live is latency sensitive, and for this reason, many broadcasters prefer to mix local talk shows on-premise. But if we look into the future, which is what we are doing here, all those local cloud data centers that are cropping up in cities could change this. Amazon now has hundreds of different data centers, so you can localize mixing fairly close to most major markets.

We're seeing gamers play video games through Amazon data centers without the Xbox, and latency there doesn't seem to be much of an issue. Can we do something similar with mixing? Absolutely, but it would require your data center to be very close to your mixing. For now, even putting all mixing engines in a server in your rack room will save you racks of hardware and the associated engineering, electrical and real estate space. **RW**

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