Case Study:

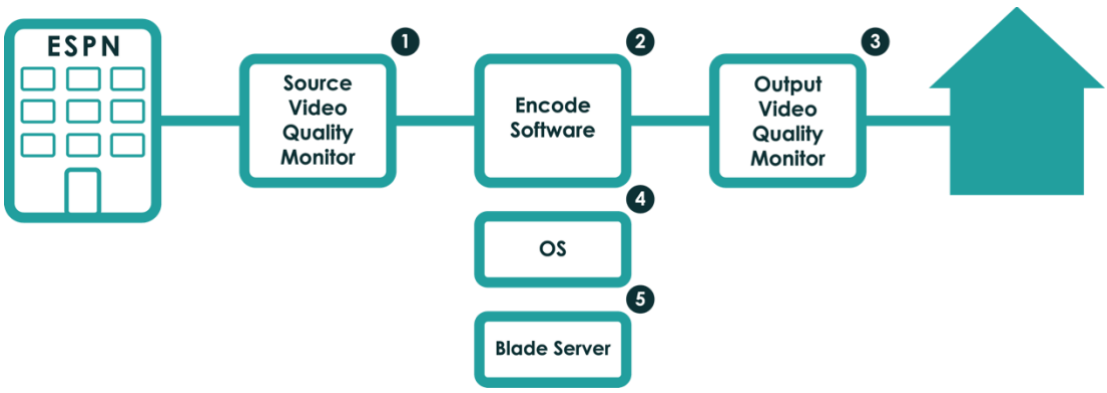
Top US MSO Video Operations

Sea Street's Solution for Encoding Autonomous Operations

Using its StratOS platform, Sea Street operates video encoding services for one of today's top US MSO providers. Sea Street's StratOS provides the MSO with deployment automation, service-level assurance and healing, failover, optimization and automated upgrades, as well
as maintenance for the entire encode suite. Decisions and corrective actions are fully autonomous and taken based on telemetry received from all of the system components. This includes actual analysis of the video and audio stream quality. Previously, the MSO used scripts, several monitoring systems, and manual operation teams to successfully run these services. Today, however, StratOS masterfully automates 1,600 channels of main screen television content, and is slated to expand to handle an additional 3,000 channels of second screen content—all without any need for manual intervention.

The MSO functions on a divided master configuration; there are 1600 video services split up between two locations in a 2N+1 redundancy scheme. 800 services originate on the East Coast, while the other 800 come from the West Coast. The purpose of this separation is in the event that a complication pops up in one stream, the system can seamlessly flip over to the other. Both locations are fully up-and-running; although, one is in an active state while the other is passive, on standby should errors arise. Moreover, the division allows issues to be identified and rectified faster: if something faults, the system can check to see if the issue has also affected its sister—easily answering the question: is this directly the MSO's problem, or the content providers'?

These video services are delivered by either satellite or dedicated IP connections, and pass through, a video quality device that analyzes content before arriving at an encoder. On the outbound side of the encoder, video quality is examined a second time, and the telemetry from all of these elements is converged by StratOS for channel by channel assurance. This process is illustrated in the below diagram:



All of the hardware and software elements are managed by StratOS, including the encoder itself. Management includes the full life cycle: deployment, licensing, configuration, assurance, healing, optimization, upgrade/maintenance, and compliance.

One of the main goals is to transcode and StatMux the source content into the correct format for the final delivery to the customer's screen. It also contains specific licensing for an amount of HD and SD streams. A pool of secondary encoders is on reserve at all times, should the need for backup occur.

StratOS deploys the encoder software on either a bare metal or virtualized server, which includes installing and licensing the software, and configuring video streams. It does this across the MSO's entire 1600 services in a mere 45 minutes. By comparison, it takes an average of six months to complete this evolution manually.

In addition, Sea Street ensures that service health is never overlooked. StratOS constantly collects telemetry from video quality monitors, encoders, and its own infrastructure to oversee the well-being of each encoder and each channel as a service. StratOS manages all of the active resources and the pool of spares to ensure continuous operations. For example, StratOS might receive an alarm from Device #1—a notification that CNN-HD has no audio. There are two approaches in solving this problem:

1. If the "No Audio" alarm only appears on the distribution monitor (downstream of the encoder), the system will try to restart the encoder; if that does not clear the alarm, it will failover to a ready backup encoder.
2. If the "No Audio" alarm is on the contribution monitor (upstream of the encoder), StratOS will check the other datacenter's identical feed to determine if the problem is either a.) localized to one datacenter, or b.) an issue originating from the service provider. If the latter, StratOS will alert the operator, but take no further action.

StratOS autonomously solves unexpected complications using a variety of methods such as toggling the encoder input, restarting the system, or failing over to a backup encoder. It can detect any failure, take corrective actions—such as a failover to another encoder—and even log the actions in a trouble ticket all in under 20 seconds. In fact, because StratOS possesses the full operating recipe for the service and all the current telemetry, it can usually provide a complete root cause analysis (RCA) in the trouble ticket. This is a faster reaction and resolution than any human operator could ever achieve, even just to create the trouble ticket, let alone wholly fix it and document the RCA.

Furthermore, StratOS facilitates maintenance on both the encoder software and its underlying infrastructure. StratOS can deploy either upgrades or patches to either encoders or infrastructure systems by way of an organized migration (e.g. failing over to backup encoders, upgrading the encoder, and validating output). Optionally, the system can also shift services and/or encoders to an isolated state where StratOS will take no action, instead allowing for manual maintenance (if needed).

StratOS also provides for continuous improvement. As the MSO discovers new failure patterns and new remediation cases, they are added to the AI models and are installed without any interruption to the running system. Service delivery will not be hindered. New operational business logs and/or data can also be installed at this time. For instance, handling logic for new errors from the Tektronix video quality server might be added gradually.

The upshot of this is that the MSO now has fully autonomous, lights-out operations for video. The platform has been running without fail since 2016, and issues are resolved 10x faster than they were with human operators. The MSO has seen OPEX savings for these services of more than 30% per year.

It is also worth noting that while this was a greenfield deployment, StratOS works equally well on brownfield operations, and this solution could be adjusted to handle any encode/transcode/content prep operation as well as to work with any set of infrastructure resources.

In true testament to the power of Sea Street's StratOS platform, other departments in the MSO are now adopting the platform for use with virtual networking, telephony, and even access network operations.

If you would like to know more about StratOS or this case, would like to see a demo, or learn about using StratOS to manage your operational challenges, please contact us at:

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End of Case Study