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Real-time Event Signaling and Management API

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1. Introduction

1.1. Executive Summary

This standard defines the Real-time Event Signaling and Management (ESAM) API, an interface that allows a Signal Acquisition System (e.g. encoder, transcoder, packager, stream switcher, etc.) to submit signals to a Signal Decision System and receive relevant instructions for processing the signal or associated content. Furthermore, the Signal Decision System has the ability to initiate a set of instructions based on a schedule or event that is not signaled in the content.

There are several kinds of acquisition systems and the possible instruction set will vary based on the purpose and capabilities of the system. An encoder/transcoder will typically receive instructions for conditioning the content for splices or changes in content for either advertising insertion or alternative content due to blackout restriction. A linear stream switcher is responsible for managing an outbound linear stream based on content/blackout requirements for an intended audience. A packager will typically receive instructions about how to segment content and compose a manifest. All systems are eligible to receive instructions about status reporting or how to add or remove in-band signals.

Table 1 – Types of Instructions

Instruction	Encoder / Transcoder	Linear Stream Switcher	Packager
Remove original in-band signal	✓	✓	✓
Insert new in-band signal for downstream consumption	✓		✓
Receive status information regarding a given signal	✓		✓
Receive and use an endpoint for reporting status	✓	✓	✓
Condition stream for a splice (either in or out)	✓		
Switch content	✓	✓	✓
Customize an ABR manifest			✓
Perform instructions on a repeating / ongoing basis	✓		✓

A given environment may be comprised of multiple Signal Acquisition Systems (SAS) and multiple Signal Decision Systems (SDS). Multiple SAS may be employed to process different content or to redundantly process the same content as other systems. Multiple SDS may be employed to handle load of decisions or to provide redundancy.

In a linear acquisition model, the linear stream is acted on by multiple systems, which are capable of acquiring an in-band signal. The SAS extracts the signal and uses it as the basis to request instructions from the SDS (Figure 1). The SDS will respond with instructions appropriate for the particular SAS and its capabilities.

For example, a real-time transcoder acting as a SAS submits an SCTE 35 splice insert message to the SDS. The SDS may consult an SCTE 130 Placement Opportunity Information Service (POIS) to confirm the validity of the signal and return instructions to the transcoder to identify and update the start/end times of the signaled region, condition the video stream at the appropriate splice points and insert a more descriptive signal into the stream for downstream consumption.

The packager will encounter the enhanced signal that was previously confirmed at the transcoder and, again, submit the signal to the SDS. This time, the SDS could provide manifest-specific conditioning instructions. Not shown in the figure is that downstream from the CDN, the client (or a manifest