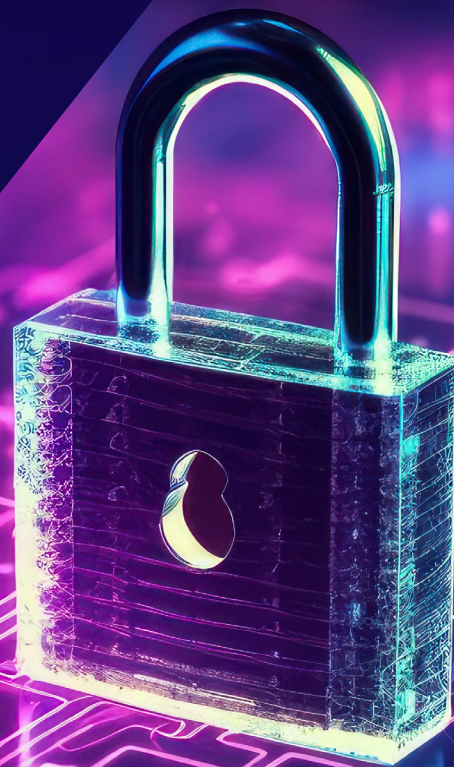# Seamless Failover Captioning Using a Disaster Recovery Server

INTRODUCTION

Amidst the relentless demands placed upon broadcasters to uphold uninterrupted captioning services, AI-Media stands as the indispensable ally in navigating these pressures. Recognizing the critical importance of maintaining captioning uptime in today's regulated media environment, AI-Media leverages its advanced technologies to ensure continuous accessibility for diverse audiences. With a steadfast commitment to reliability and efficiency, the company's innovative solutions not only meet but exceed the stringent requirements of broadcasters worldwide.

Empowering broadcasters to deliver content inclusively and without interruption, AI-Media alleviates the burdens associated with captioning uptime, enabling them to focus on delivering exceptional viewer experiences.

AI-Media is proud to announce its latest offering, LEXI DR (Disaster Recovery), a revolutionary Disaster Recovery solution for live, automatic captioning workflows. LEXI DR offers peace of mind around the clock, providing a seamless captioning fail-over to an on-premises backup server when access to the automatic LEXI Cloud captioning service is compromised.

This means that when things don't go as planned and you lose connectivity, live captions are not at risk and will continue uninterrupted.

> With LEXI DR as your failover solution, you can rest assured that your live content will maintain captioning and be in line with accessibility compliance requirements 99.99% of the time.

This white paper delves into the business problems LEXI DR resolves, how LEXI DR operates and functions. It discusses how to seamlessly integrate LEXI DR with your existing captioning workflows and add consistency across your broadcast channels. This white paper also reviews the DR process for each of these workflows.

AUDIENCE

This white paper is geared towards broadcasters who would like the peace of mind that comes from knowing that cloud or network connectivity issues will not disrupt their live captions. These connectivity issues are the primary causes of such captioning interruptions; therefore, broadcasters can rest assured that they will remain in compliance with government-mandated accessibility requirements.

This paper's intended audience includes executives, directors, and technical managers within the broadcast industry who have a hand in delivering a captioning solution for live content, such as sports, news, events, or television specials. It provides valuable insights into the benefits and implementation details of LEXI DR for decision-makers overseeing accessibility initiatives and media production workflows. Additionally, architects responsible for designing and integrating technology solutions within their sectors will find guidance on how to go about setting up the solution, with the aim of ensuring that captions remain intact during live broadcasts, with minimal interruption.

BUSINESS CHALLENGE

In today's broadcasting market, providing closed captions is no longer just an option but a necessity. Regulations now mandate 100% caption uptime in various regions, with compliance carefully monitored. Because of this, ensuring uninterrupted caption delivery is paramount, yet challenges persist. Despite the best intentions, sometimes things don't go according to plan, and captioning downtime occurs. In such cases, near-immediate response times and flawless delivery of captions is critical.

Why is Live Automatic Captioning Coming from the Cloud?

There has been a dramatic shift of late from human captioning workflows to automatic captioning. This has come about for a number of reasons the most important of which has been the spectacular increase in the accuracy of automated captions relative to human captions. In fact, automated captions such as AI-Media's LEXI captions achieve accuracy on par with human workflows… but at a fraction of the cost. Live closed captioning is nearly always delivered remotely into the broadcast studio, but why specifically is the automatic workflow coming from the cloud? Primarily for the following reasons:

Caption Quality and Accuracy

Very large language models are available in the cloud which allow for frequent updates to vocabulary and usage thereby increasing accuracy.

Rapidly Improving Technology

Cloud users are less likely to be committing to a fixed technology product that may appear outdated in as little as 1 year.

Scalability of Automatic Solutions

Very attractive per-hour rates are enabled through shared infrastructure. There is also no commitment to fixed costs in hardware and licensing, which is especially beneficial for infrequent use or pop-up channels.

Outsourced Operations

Having the caption vendor manage custom models allows for the switch from human captioning models without introducing new responsibilities to internal broadcast operations staff.

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The Challenge of Live-to-Air Captioning

Due to the nature of live broadcasts, particularly those that deliver closed captioning straight to air, there is limited option for quality control. So why go direct to air? Low latency between audio and captions is critical. Live closed captioning is regulated for quality, latency, and completeness, arguably more than video or audio!

In this scenario, it is difficult for broadcasters to react to cases where there is a loss of closed captioning and resolve them within a timely manner. A speedy response is essential to remain properly complaint with government mandates. The primary culprits for captioning downtime are outbound network connectivity issues and cloud service reliability. Neither of these are fully reliable mechanisms. Master control attentiveness to captioning may also vary, meaning it could be several minutes before a problem is even recognized.

Despite the risks, there are few mitigation measures in a typical workflow.

Once the issue is known, it may often require system restarts or extensive debugging, potentially resulting in extensive periods without captioning. Not to mention the time and resource investment spent on resolving such issues that could be more valuable spent elsewhere. These issues, along with dealing with associated viewer complaints, and the legal consequences of compliance violations due to delays in meeting accessibility guidelines, could present a significant burden to broadcasters.

Additionally, merely being confronted with the risk of captioning loss under these circumstances likely involves a daily resource investment for the monitoring of captions and network stability in order to catch any issues that arise.

This could also result in heightened maintenance costs, and general uneasiness regarding the prospect of potential disruptions.
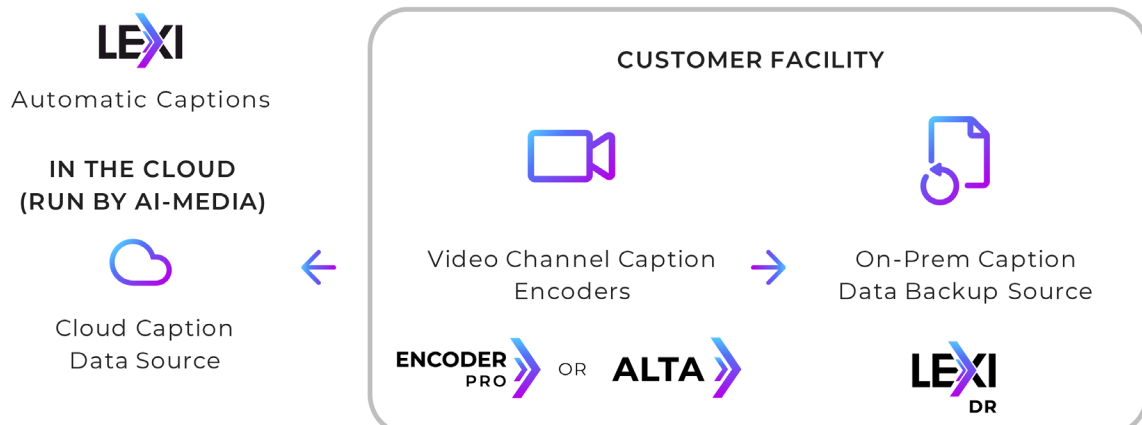
THE SOLUTION: PAIR CLOUD AND ON-PREM FOR MAXIMUM RESILIENCY

The ideal broadcast workflow has a number of key requirements:

- ✓ Fast as possible automatic detection of the broadest possible range of problems

- ✓ Rapid switching – definitely NO manual re-configuration of components

- ✓ Use preferred system as much as possible to maximize quality and minimize costs

- ✓ Probably wind up using preferred system 99.9% of time!

- ✓ Ability to health check both systems even in large spans of time between outages

This ideal workflow can be achieved through a Hybrid Cloud set up that leverages the benefits of both on-prem and remote cloud workflows.

AI-Media has created such a solution using a combination of either their SDI or IP caption encoders, LEXI Automatic Captioning, plus the newly released LEXI DR Disaster Recovery solution. This set up is shown in the simplified drawing below where LEXI Live Automated captions would be run in the cloud.

LEXI
Automatic Captions

IN THE CLOUD (RUN BY AI-MEDIA)

Cloud Caption Data Source

CUSTOMER FACILITY

Video Channel Caption Encoders

ENCODER PRO OR ALTA

On-Prem Caption Data Backup Source

LEXI DR

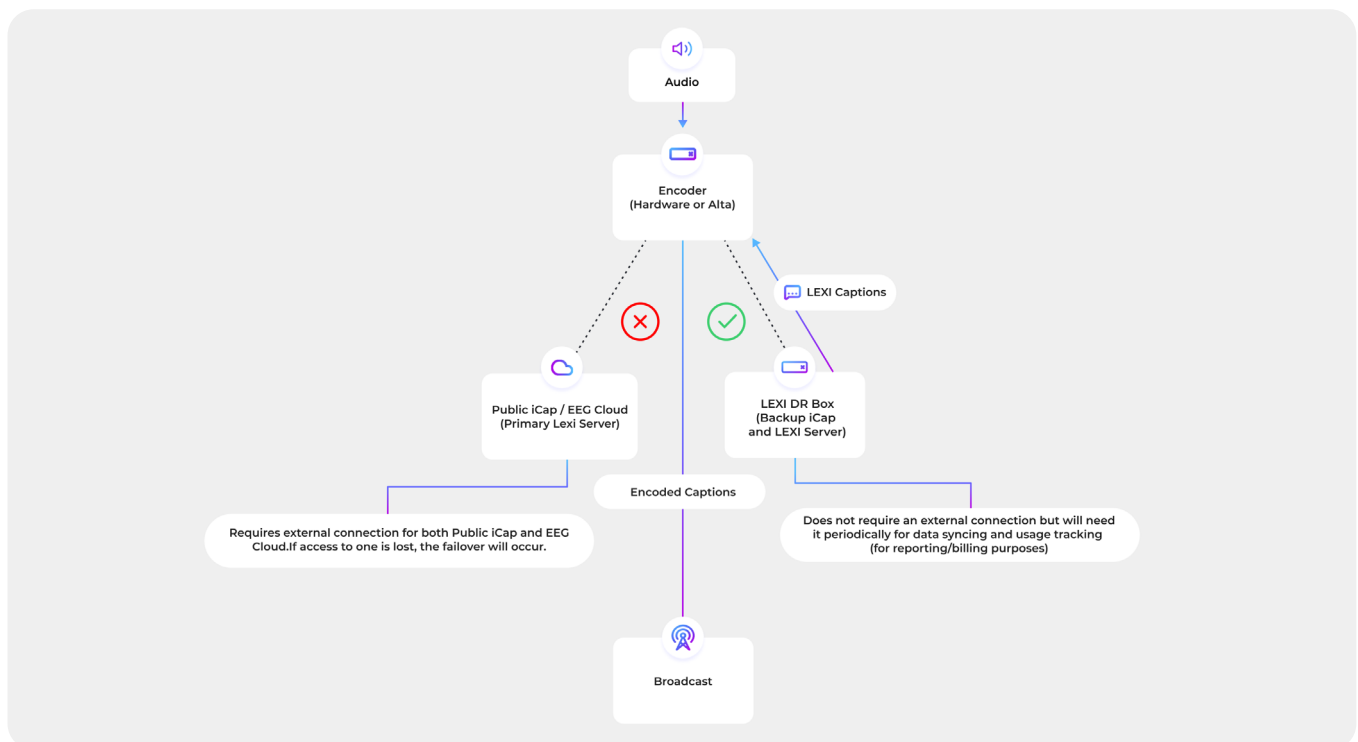# AI-Media's Hybrid Captioning Workflow
– How It Works

AI-Media Hybrid Captioning workflow contains two major components:

1. **Primary Mode:** Made up of LEXI Live Automatic Captioning delivered over an IP or SDI caption encoder and across the AI-Media iCAP Captioning Network PLUS

2. **DR (Disaster Recovery) Mode:** Includes the installation of LEXI DR as the on-premise caption server

In the Hybrid captioning workflow, the Primary Cloud Mode is still the primary captioning source, however if the encoder loses connection to the Cloud server for any reason, it will automatically and quickly failover to the backup DR server for captioning. This ensures nearly 99.99% caption uptime, with no human intervention required.

Instead of needing to fully rely on an external connection to AI-Media's EEG Cloud and Cloud iCap services for LEXI automated captioning, LEXI DR allows for a simultaneous SDI or IP encoder connection to a localized and backup DR captioning server. Users can deploy these as either a 2RU on-premises server, a virtualized machine, or AMI in AWS.

A benefit of AI-Media's Hybrid captioning workflow is that when the encoder regains connection to the Cloud server (both EEG Cloud and Cloud iCap), the workflow will automatically switch back to using the Cloud server as the active and primary captioning source. This process is demonstrated via the

It is important to note that failover to LEXI DR will happen only when the encoder loses connection to AI-Media's EEG Cloud or Cloud iCap services.

BENEFITS OF LEXI DR AND AI-MEDIA'S HYBRID CAPTIONING WORKFLOW

There are several benefits of setting up a captioning disaster recovery solution using AI-Media's Hybrid Captioning Workflow:

CONTINUOUS CAPTIONING WORKFLOW

The primary benefit of LEXI DR is that it ensures continuous captioning service for your live programming, with no manual intervention required in the case of any connection issues. The encoder fails over to the backup DR server, regardless of your workflow.

99.99% CAPTION UPTIME

Achieve peace of mind that captioning workflows will not be interrupted 99.99% of the time; maintaining compliance with government regulations for accessibility. This will also help save internal resources and free up maintenance costs that can be better spent on more productive items.

FLEXIBLE SET-UP OPTIONS

LEXI DR offers flexible options for deployment and implementation. Deployment options include setting up the system on an on-premise 2RU hardware server, a Virtual Machine, or AWS AMI.

SCALABLE

The solution is scalable, with up to 10 simultaneous LEXI instances able to run on each LEXI DR unit.

SECURE NETWORK

Prioritizing your content's confidentiality, LEXI DR employs robust encryption and advanced security measures to safeguard against cyber security threats.

AFFORDABLE PRICING

Pricing is also straightforward and affordable, making it a cost-effective and scalable solution for your captioning needs.

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IMPLEMENTATION DETAILS

Setting up LEXI DR is quick and easy.

1. First configure all of the Primary server information, for Cloud iCap and EEG Cloud Lexi.

2. Next, populate the DR server information on the 'Disaster Recovery' page of the encoder website. Pay special attention to your login credentials and failover preferences.

3. Finally, enable the DR function on the LEXI DR server's Disaster Recovery page.

DR Process for Captioning Workflows

Failover to the backup DR captioning server is supported for all workflows of controlling AI-Media's automatic LEXI captioning service, including:

•   Scheduling LEXI events through the calendar setting

•   Encoder control of LEXI through HTTP API, physical GPI, SCTE-104/SCTE-35 messages, or the interface

•   EEG Cloud control of LEXI captioning through HTTP API or the interface.
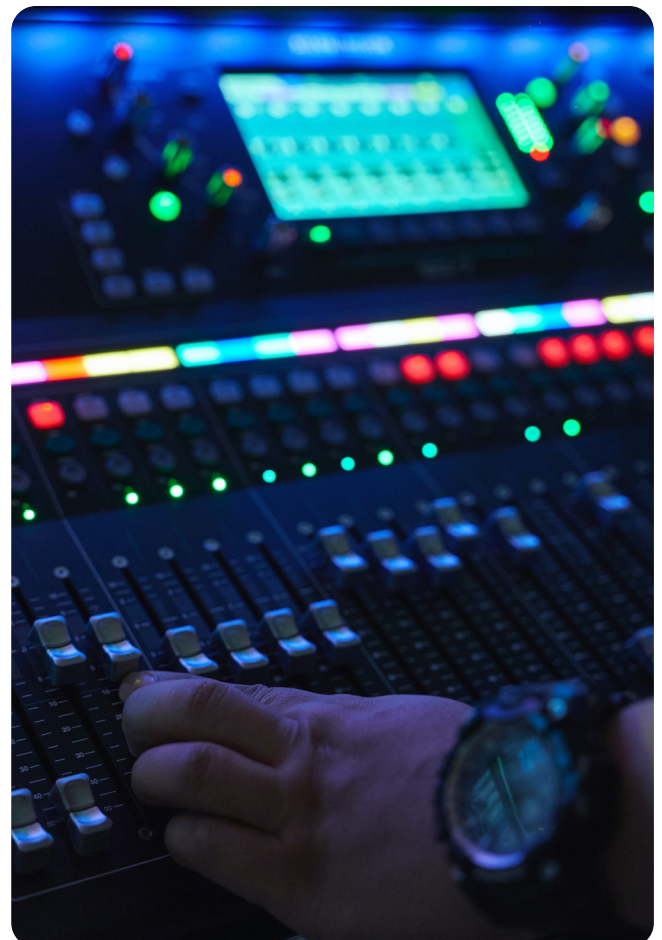

It is important to note that although the LEXI DR server does not need to be connected to the Internet for failover captioning to occur, an outbound internet connection is periodically necessary for the above data syncing to occur. A connection is also necessary for reporting LEXI usage within the DR server. This reporting is necessary for billing purposes.
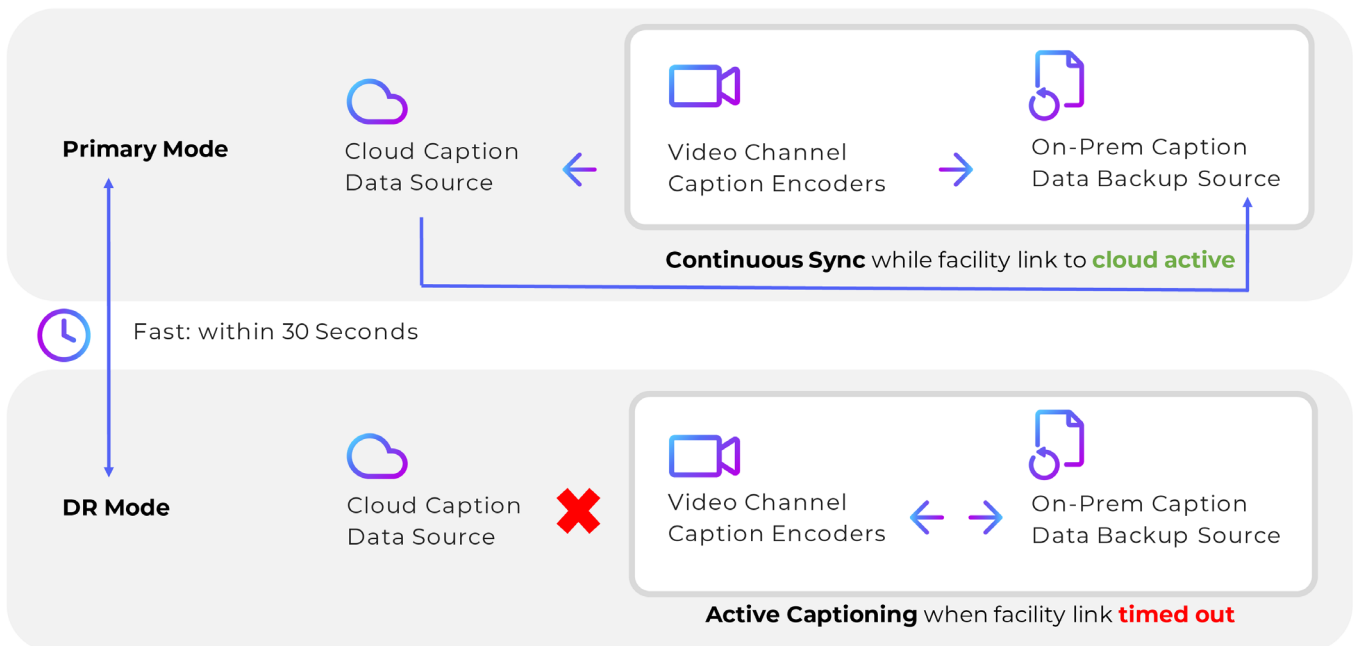
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In these workflows, if LEXI was actively captioning prior to the failover to the DR server and then failover occurs, captioning restarts automatically, within 30 seconds or less. If LEXI was inactive at the time of failover, it will remain inactive after failover, unless manually initiated. The same is true in the reverse scenario as well, when the active server switches back from DR to the Primary Cloud server, after it regains connection.

The only caveat being that if controlling LEXI through either EEG Cloud HTTP API or interface, and LEXI was inactive at the time of failover, you must either send HTTP API to the LEXI DR server or use the LEXI DR interface to activate LEXI.

## AI-MEDIA LEXI DR: HYBRID CLOUD APPROACH FOR CAPTIONING

Primary Mode

Cloud Caption Data Source ← Video Channel Caption Encoders → On-Prem Caption Data Backup Source

Continuous Sync while facility link to **cloud active**

Fast: within 30 Seconds

DR Mode

Cloud Caption Data Source ❌ Video Channel Caption Encoders ← → On-Prem Caption Data Backup Source

Active Captioning when facility link **timed out**

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TECHNICAL SPECIFICATION

LEXI DR (Disaster Recovery)

Deployment options	• 2RU hardware • Virtual machine • AMI in AWS w
Supported encoders	• EEG SDI hardware encoders • Alta (IP-based encoder)
Max LEXI instances per LEXI DR server	• 10
Supported LEXI control options	• Encoder control: Through HTTP API, physical GPI, SCTE-104/SCTE-35 messages, or the encoder web interface • EEG Cloud control: Through HTTP API, the interface, or scheduling events through the calendar setting
Captioning downtime during failover transition	• 10-30 seconds, depending on DR settings
Synced data (from the Cloud to LEXI DR)	• Cloud iCap: iCap Devices and access codes • EEG Cloud: LEXI scheduling data, topic models, instances
Data syncing frequency	• Every 10 minutes or manual syncs at any time
VM resource requirements	• Disk space: 75 GB • CPU: 2 cores base; 1 additional core for each additional simultaneous running instance, • Enhanced transcription model: CPU architecture on the underlying system must support the AVX512-VNNI instruction. • Memory: 8 GB base; 5 additional GB for each additional simultaneous running instance • Networking bandwidth: • SDI encoders: 2.5 Mbps per encoder • Alta TS: 800 kbps per channel • Alta 2110: 330 kbps per channel
Instances of failover	• Currently, failover to Lexi DR occurs when the encoder loses connection to either EEG Cloud or Cloud iCap. • Please note however, that as of the latest version, failover does not occur for other situations where captioning normally happens, but is not. This includes cases where the encoder's audio is experiencing complications or issues within the encoder software or hardware. Accounting for these instances is best addressed by using redundant caption encoding channels.

AI-Media's hybrid workflow, combining cloud-based LEXI Automatic Captioning with the LEXI DR on-premises server, ensures nearly continuous captioning uptime without manual intervention, maintaining compliance and reducing operational burdens. This setup allows rapid detection and switching between systems, utilizing the cloud primarily but falling back on the local server during outages, thus providing a robust and scalable solution for broadcasters.

To learn more about AI-Media's captioning Disaster Recovery solution contact sales@AI-Media.tv
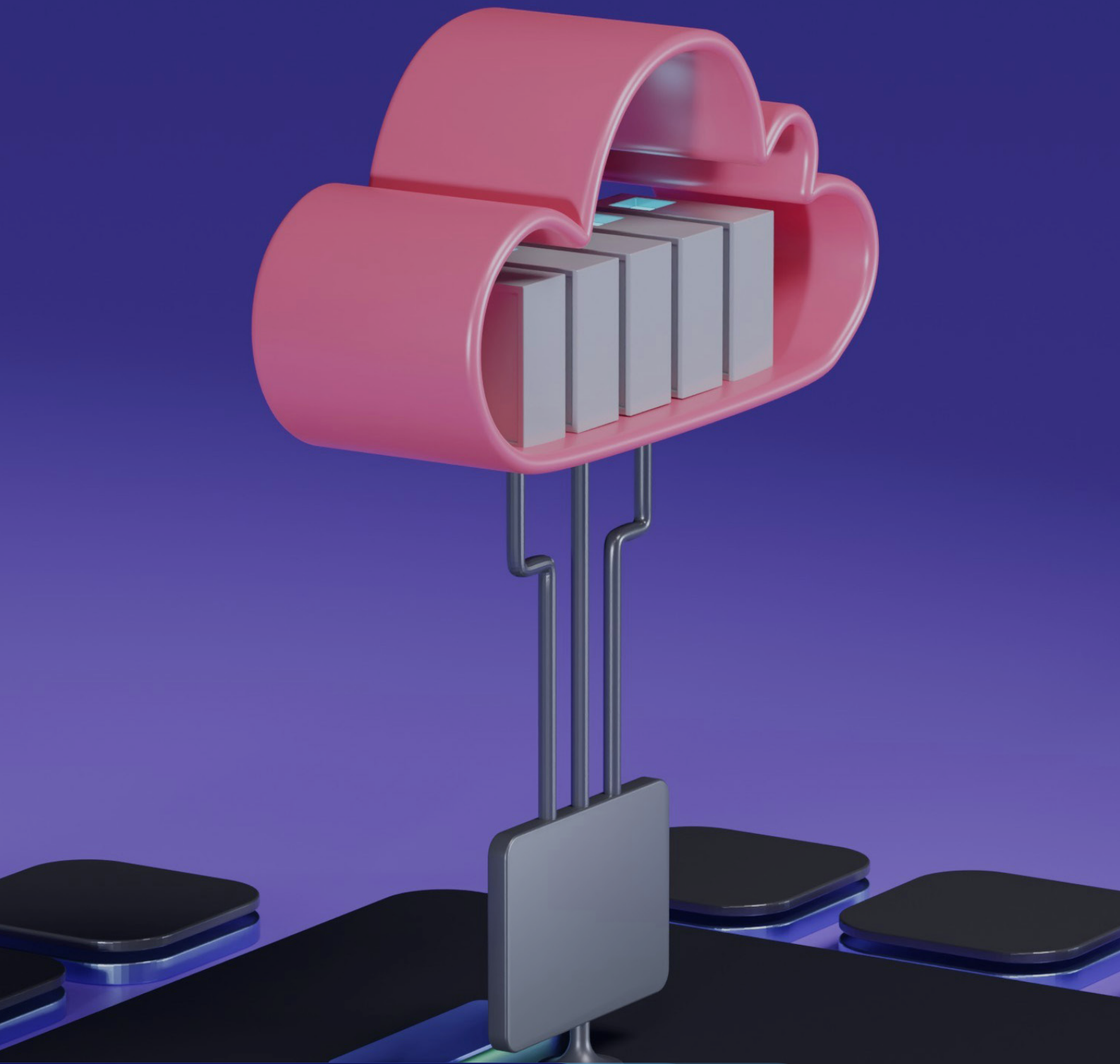
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Find out more about AI-Media's
captioning solutions at AI-MEDIA.TV
or contact SALES@AI-MEDIA.TV