

JET  STREAM

Maelstrom



Transcoder, Packager, Origin, Edge



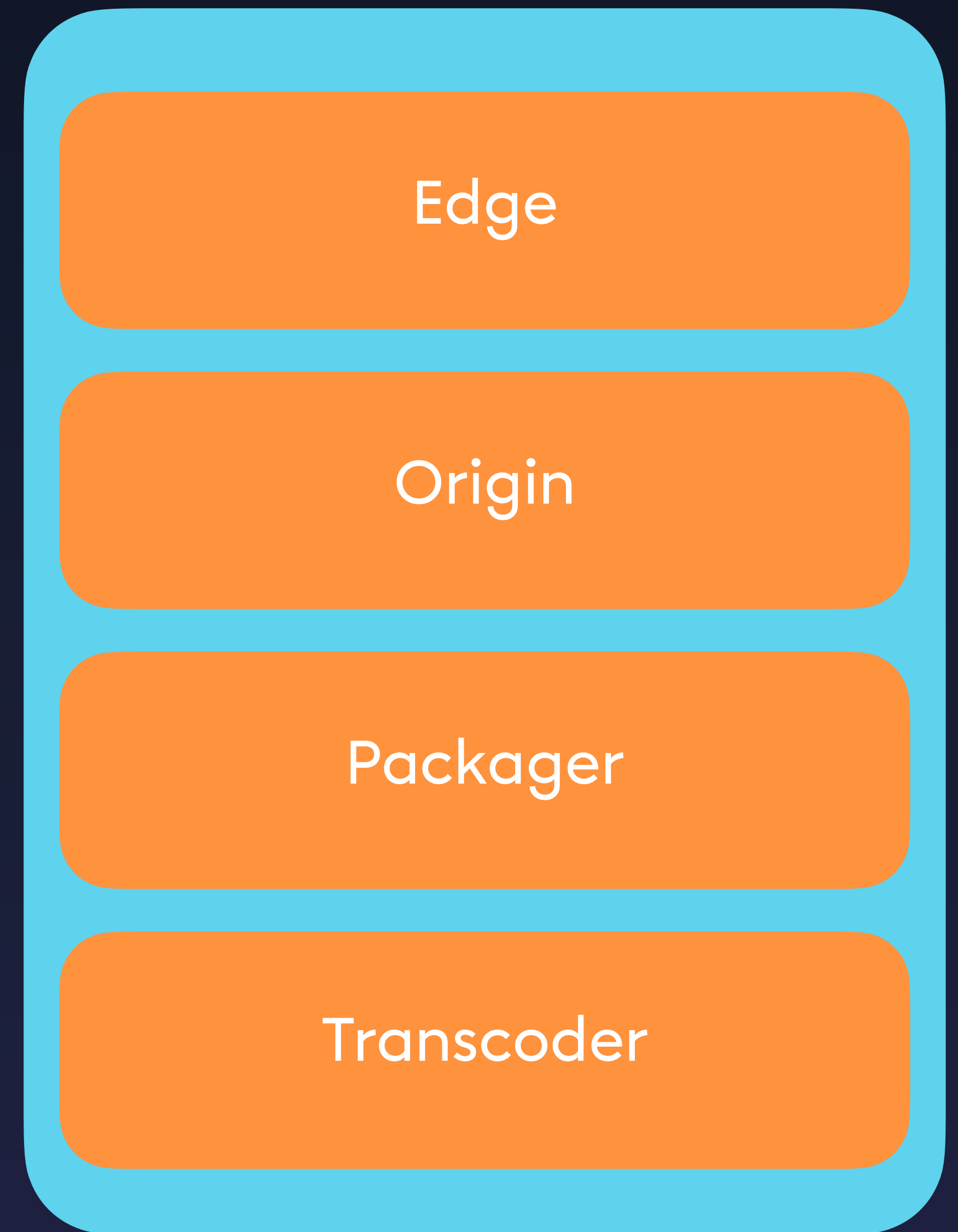
Key benefits

1) All-in-one solution

MaelStrom is an all-in-one solution, with built-in transcoding, transmuxing, origin and edge services.

It is a micro-cloud, isolating processes and automatically restoring services for high reliability.

You don't need to buy, integrate, and operate additional origin and edge servers.



2) Ultra high quality video

Tuned hardware H.264 and H.265 transcoders guarantee beyond broadcast grade quality streams up to 8K ultra high-definition resolution. AV1 encoding support is optional.

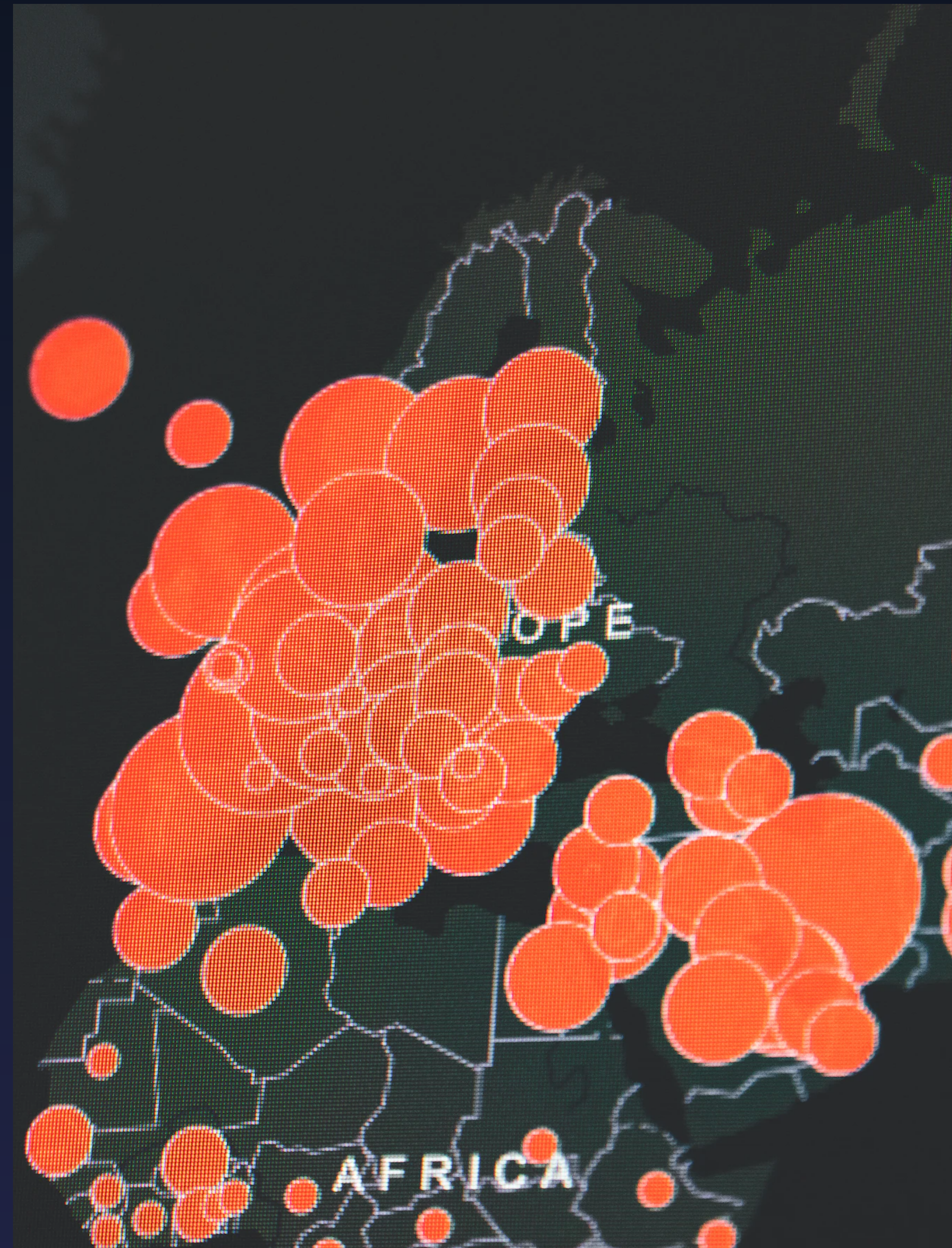
MaelStrom brings higher efficiency and quality compared to CPU and GPU encoding.



3) Scales

MaelStrom automatically scales channels and viewers across its resources.

Multiple MaelStrom servers cluster into a high-availability cloud to scale to thousands streams and ten thousands viewers.



4) Runs everywhere

MaelStrom does not need internet access.

It can run on-premises, in secured, local networks.

It is a robust solution for broadcasters, headends, military, hospitality, government, education, gated communities, compounds, and health care.



5) Integrates

Inputs:

Easily connect SRT, RTSP, RTMP, MPEG2, MPEG4 transport stream, HLS and DASH sources.

To the world:

Easily integrate edges, CDNs, portals, apps, monitors, and security services.



6) The green option

Transcode 80 Full HD channels in one 1U server at just 220watts.

Save 90% in energy footprint and costs.

Software
encoding

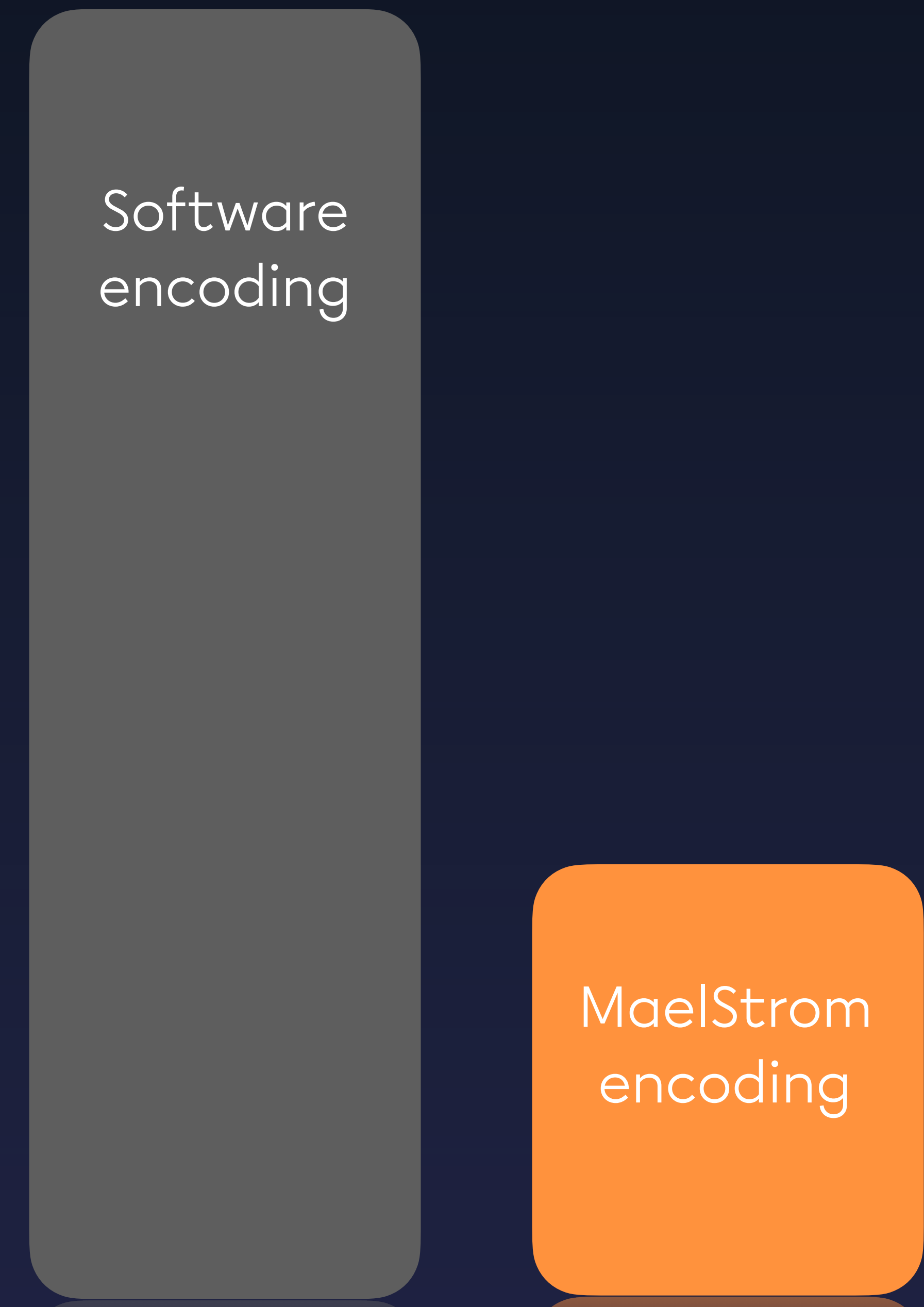
2800w

MaelStrom

220w

7) Lowest TCO

- + High efficiency hardware and affordable licenses save CAPEX.
- + Optimised footprint saves rack space.
- + Robust autonomous operation saves operational hours.
- + 90% energy costs savings.
- + Easy interfaces save time.



Software
encoding

MaelStrom
encoding

>80

Concurrent
1080p30 channels

1U

Ultra dense
footprint

>10k

Concurrent
HLS/DASH viewers

220_w

90% energy
saving

Cloud

Modern tech
stack

8K

H.264 /H.265
UHD encoding

Interfaces

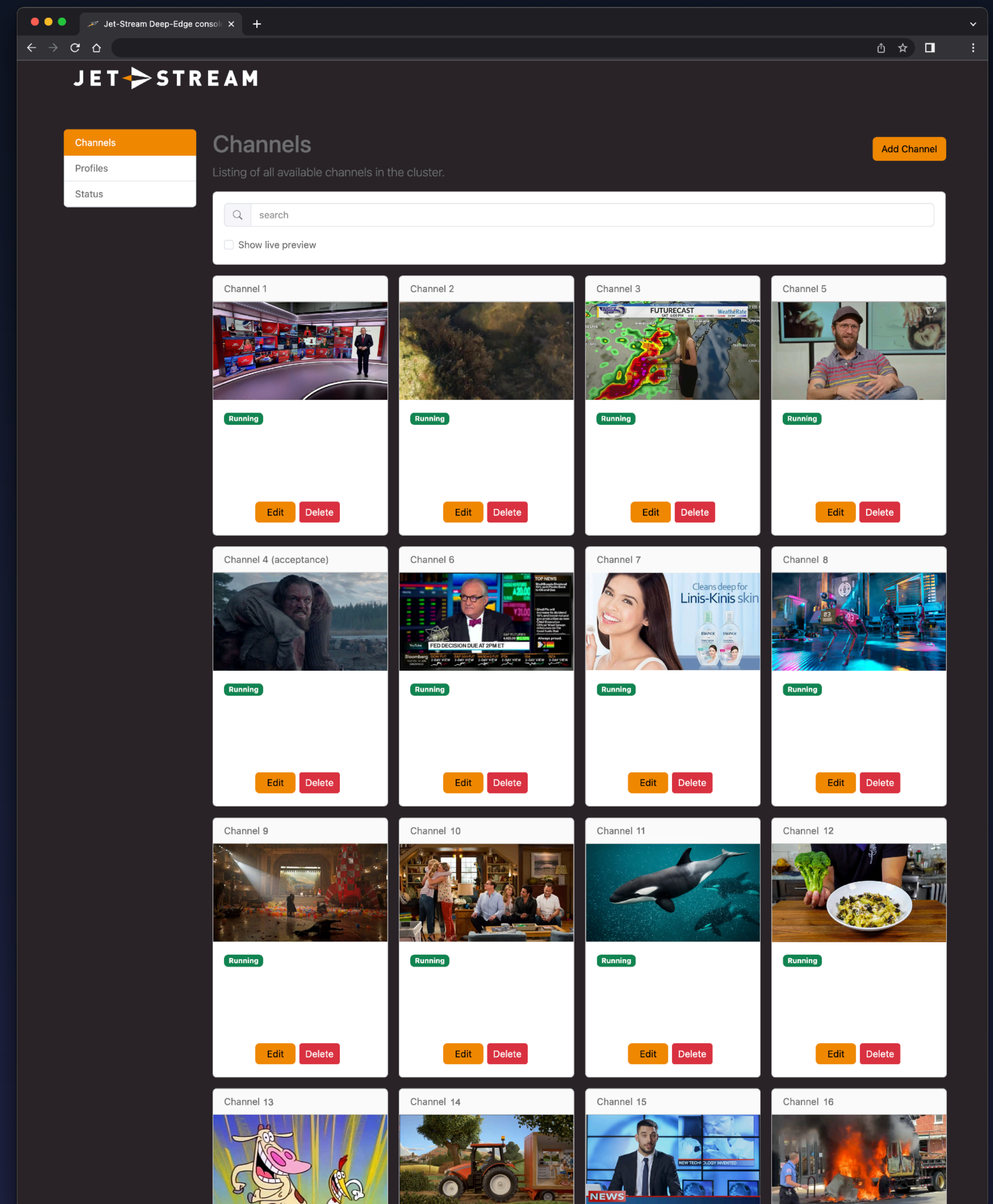
The built-in API and web interfaces let you easily create channels, configure transcoding profiles, and monitor performance and health.

Easiest solution

- 1) Switch on.
- 2) configure channels.
- 3) you are live.

There's no need to integrate with origins, edges, portals, and players: it's all built in.

The management interfaces are the easiest in the industry.

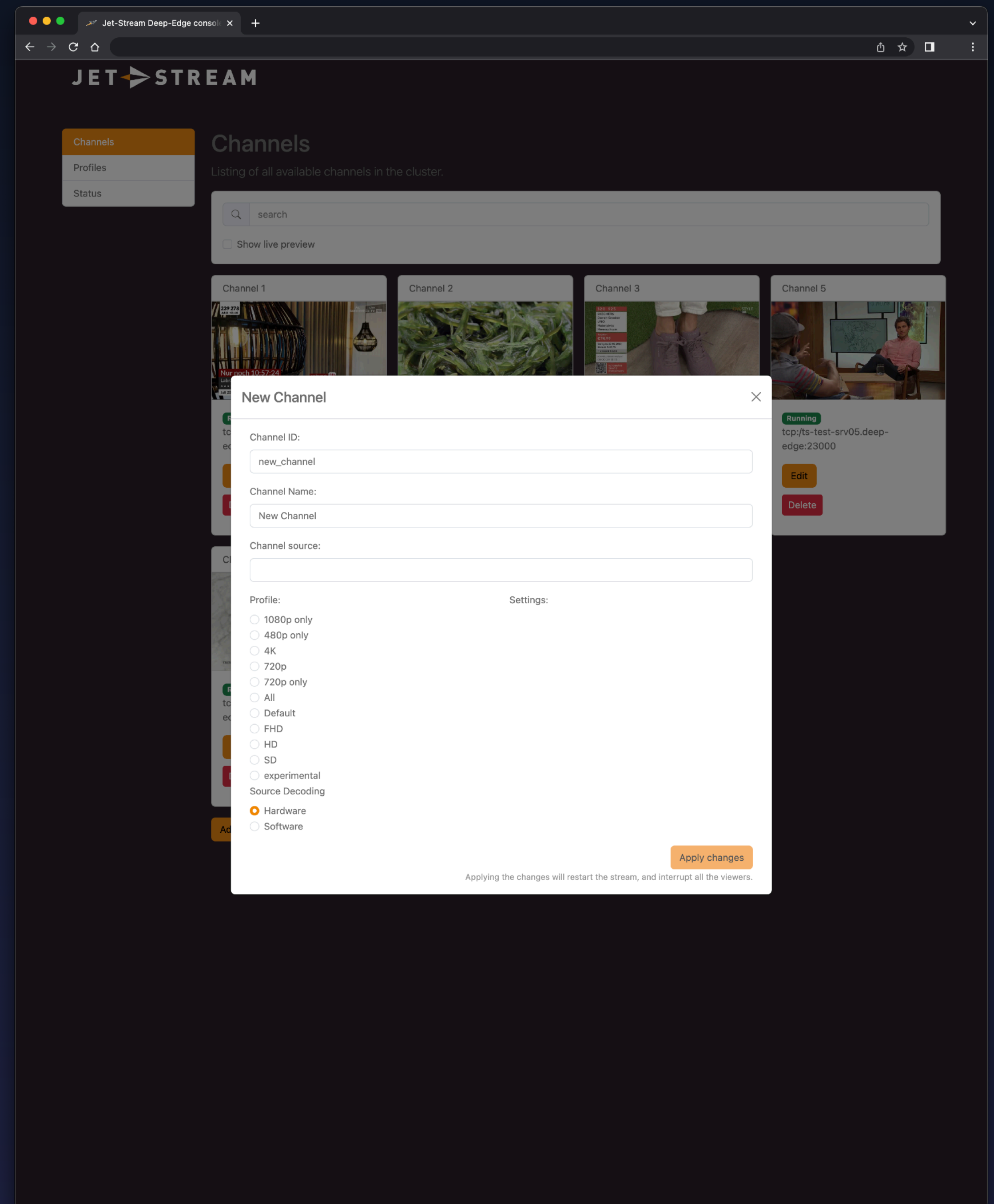


Easy installation

MaelStrom is a plug and play appliance:
Switch on. Configure the channels.
There is no step 3.

The built-in portal automatically
publishes your streams.

There's no need to install software,
integrate origins and edges or create
portals.

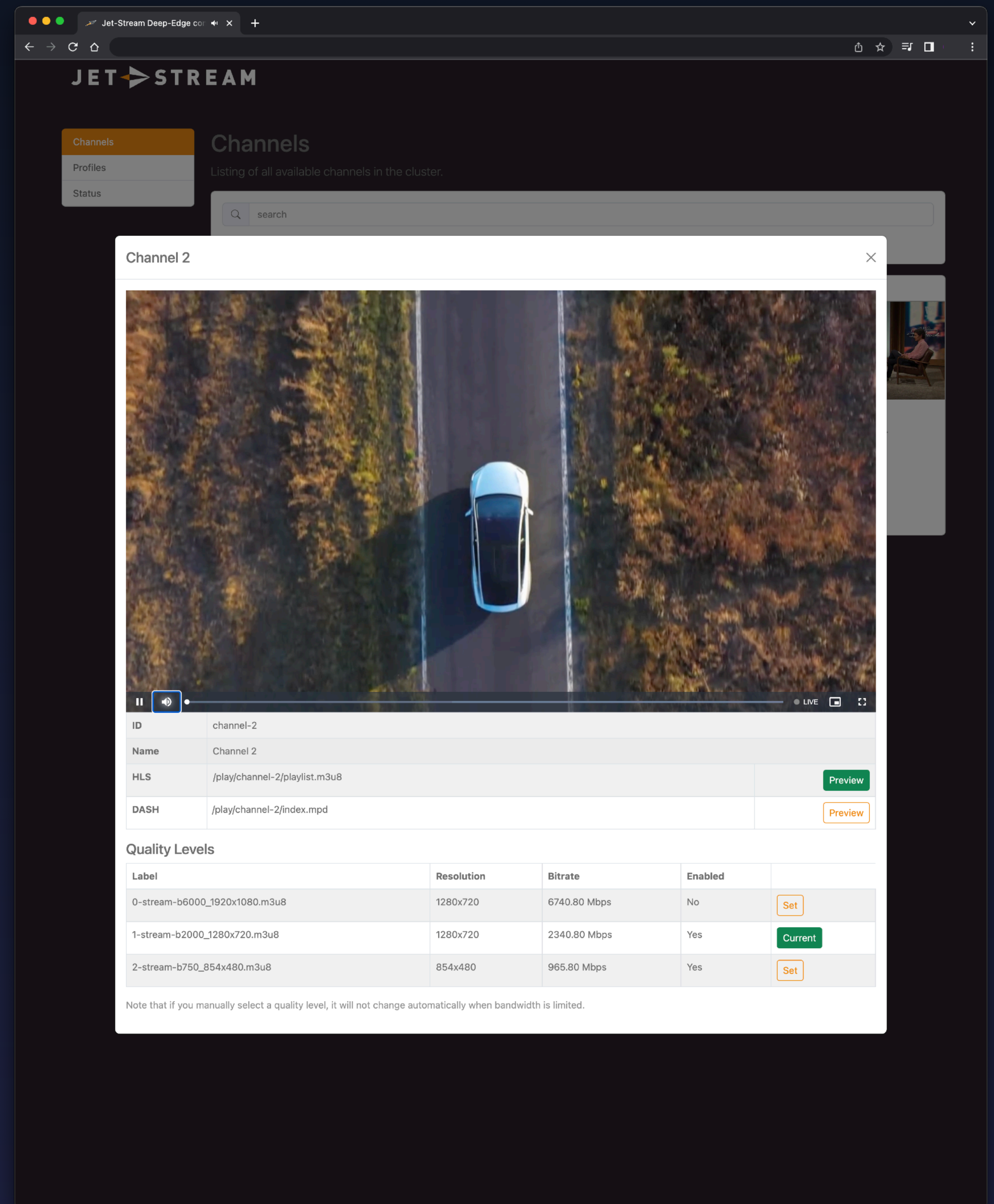


Easy operation

MaelStrom's user-friendly web interface lets you create, order and live preview channels.

Overview the status and health of your streams in real-time.

For automated management at scale there are APIs and configurations.



Easy tuning

Select per channel which transcoding profile you wish to use.

Create custom transcoding profiles with multi bit rate adaptive streams in HLS and DASH with TS or CMAF.

Manage DVR windows per individual channel.

The screenshot displays the Jet-Stream Deep-Edge console interface. On the left, a sidebar contains three menu items: 'Channels', 'Profiles' (which is highlighted in orange), and 'Status'. The main content area is titled 'Profiles' and includes a subtitle 'Listing of all available profiles of this system.' Below this, a table lists five predefined profiles: SD, HD, FHD, 4K, and All. Each profile is associated with a set of resolutions and bitrates, and a list of supported muxers (DASH and HLS). A 'Delete' button is provided for each profile. At the bottom of the table, there is an 'Add new profile' button.

Profile	Resolutions and bitrates	Muxers	
SD	160x90 320x180 640x360	1 Mbps, H264 2 Mbps, H264 2 Mbps, H264	DASH, HLS Delete
HD	320x180 640x360 1280x720	2 Mbps, H264 2 Mbps, H264 2 Mbps, H264	DASH, HLS Delete
FHD	640x360 1280x720 1920x1080	2 Mbps, H264 4 Mbps, H264 4 Mbps, H264	DASH, HLS Delete
4K	640x360 1280x720 1920x1080 3840x2160	2 Mbps, H264 4 Mbps, H264 8 Mbps, H264 16 Mbps, H264	DASH, HLS Delete
All	160x90 320x180 640x360 1280x720 1920x1080 3840x2160	1 Mbps, H264 1 Mbps, H264 1 Mbps, H264 2 Mbps, H264 4 Mbps, H264 16 Mbps, H264	DASH, HLS Delete

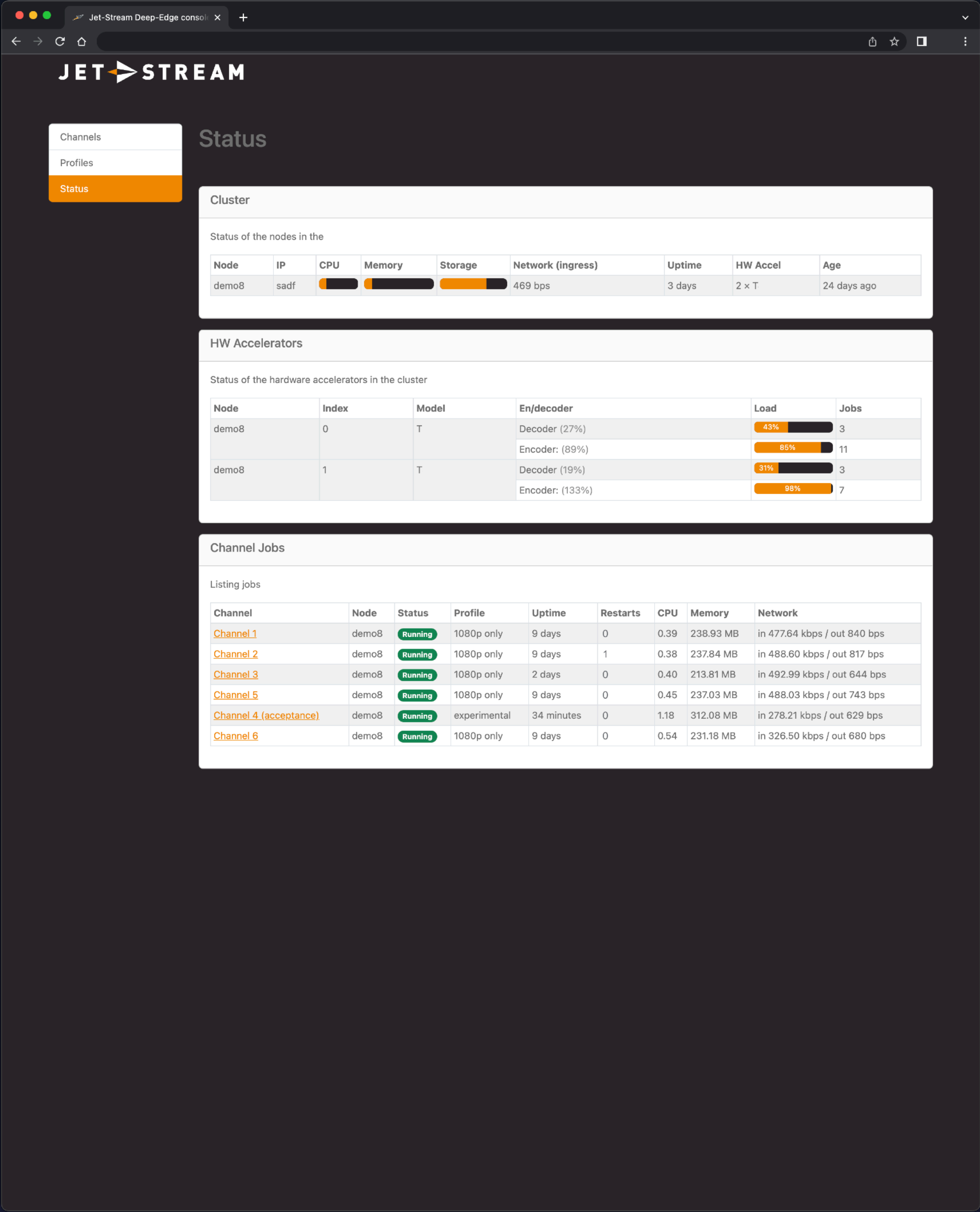
[Add new profile](#)

Easy monitoring

Overview in one screen all key performance data.

Monitor server load, transcoding capacity per accelerator, channels uptime, and output data load per channel.

The built-in API lets you manage, and automate.



Transcoding

Hybrid software-hardware transcoding solution to generate ultra-high quality adaptive bit rate streams.

Inputs

Input SRT, RTSP, RTMP, HLS and DASH streams from the web.

Input MPEG-4 and MPEG-2 transport streams from IP, satellite, and cable sources.

SRT

RTMP

HLS

DASH

CABLE

SAT

Filters

Apply filters to scale and convert interlaced TV-based signals to deinterlaced streaming content.



Smoother Quality of Experience

Create custom encoding profiles with much more bit rates in the ladder while still saving on energy and load, offering your audience a higher quality and smoother Quality of Experience at lower costs.

8K

4K

QHD

FHD high

FHD low

HD high

HD low

SD

Mobile

One frame ultra-low latency

Thanks to hardware acceleration, transcoding latency can be tuned down to frames instead of seconds, great for sports and interactive broadcasts.



Scaling

Qualities, channels and viewers.

2400 channels in one rack

Per 32amp rack you can stack
MaelStrom to transcode up to 2400
concurrent live Full-HD channels.

Compare this to just 200 channels per
rack with CPU encoding.

10000 viewers per server

MaelStrom's built-in edge cache supports up to 10,000 concurrent streams.

With each additional server, this automatically scales up linearly.

Add a CDN to scale up globally.

Add Jet-Stream Multi CDN to scale to the extreme.

Automatic scaling

Thanks to built-in cloud technologies, MaelStrom autonomously load balances deinterlacing, decoding, encoding and audiences over its pool of resources.

Multiple servers form a high-availability cluster, automatically load balancing all services over the active pool of resources.



Easy to integrate and automate

Integrate MaelStrom with your origin, edge and CDN servers.

Automate channel provisioning, transcoding profiles, and monitoring thanks to its APIs and configuration files for multi-site automated remote management.



CDN Edge & Analytics

MaelStrom is integrated with Jet-Stream Cloud. It can act as a deep edge server inside your network.

MaelStrom access logs can be streamed to Jet-Stream Cloud for real-time viewing analysis.



Origin Server

The built-in origin server guarantees high performance live stream origin services.

Configure DVR windows per stream in the unified interface or through the configuration.

Edge Server

The built-in edge server delivers your adaptive bit rate streams in high performance to large scale audiences.

Alternatively, the edge server also acts as a high performance origin for third party CDNs or Jet-Stream's multi-CDN cloud service.

How to buy

On-Premises or Hosted

1) On-premises MaelStrom Appliance

MaelStrom is a Turnkey chassis, including accelerator cards and perpetual license.

Buy, install, cluster, and run it in your network, on-premises.

Optionally you can get an SLA from Jet-Stream.

2) Managed hosting

Hosted appliance cluster within Jet-Stream Cloud, as a dedicated distributed and scalable transcoding cloud.

Can be fully integrated with Jet-Stream Cloud's multi-CDN, access control, players, log processing, analytics, and media workflow orchestration tools.

Three key technologies

- + Hardware accelerated transcoding
- + Cloud Orchestration
- + Easy interfaces

Architecture

Jet-Stream Deep Edge API & GUI

Jet-Stream Edge Cache

Jet-Stream MaelStrom transcoders

OS & Kubernetes

ASIC

ASIC

ASIC

ASIC

ASIC

ASIC

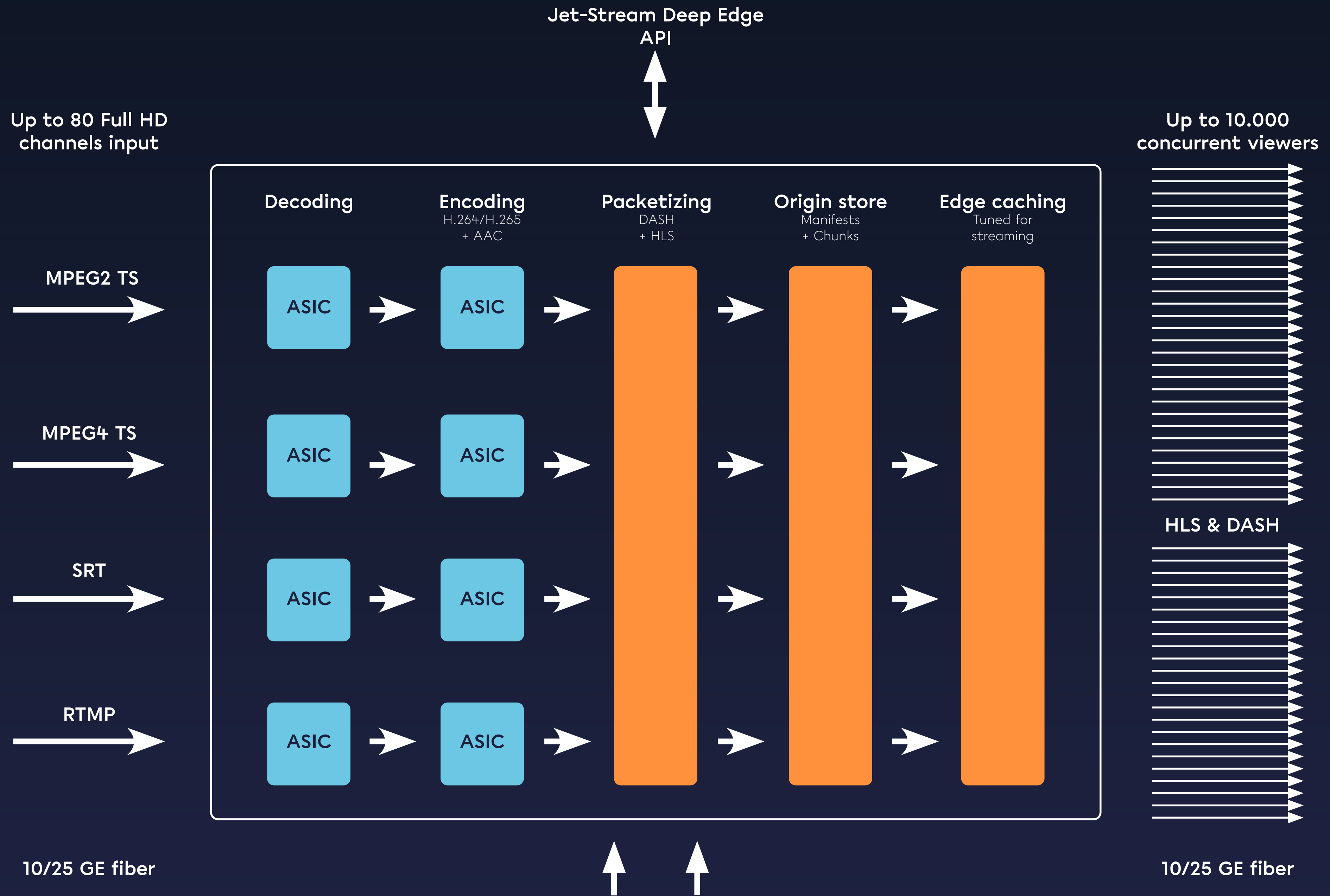
ASIC

ASIC

ASIC

ASIC

x86 industrial chassis





Technical specifications

- + Rack mounted, 1U height enterprise class chassis.
- + 230v 450w redundant power supply.
- + 10x ASICs transcoding accelerator.
- + 24 core (48 thread) CPU.
- + 128 GB RAM.
- + 2x 10/GE Ethernet, SFP+ optional.

Transcoding specifications

- + Input formats: MPEG2 TS & MPEG4 TS multicast, SRT, RTMP, HLS, DASH.
- + Input qualities possible: SD, HD, 4K.
- + Asics transcoding acceleration.
- + Transcoding up to 80 Full HD channels in parallel.
- + Output qualities possible: Mobile, SD, HD, FHD, QHD, 4K.
- + Output codecs: H.264 video, H.265 (HEVC), AAC audio.
- + Processing: deinterlacing.
- + Ultra-low latency: 3 frames.
- + Isolated transcoding container per channel.

Transmuxing specifications

- + Packetizer output formats: HLS, DASH.
- + Single and Multi Bit Rate HTTP adaptive live streaming.
- + Configurable chunk sizes.
- + Caching optimization for manifests and chunks.

Caching specifications

- + Built-in high-performance streaming cache.
- + Anti-thundering-herd live stream caching protection.
- + HTTP and HTTPS supported.
- + Can act as origin for third party cache or CDN.

Software specifications

- + Jet-Stream MaelStrom v2

*Specifications may change

Modern engineering

MaelStrom is a micro cloud in a box, designed with proven and reliable technologies, used by Cloud giants and OTT giants. Intelligent software and hardware hybrid transcoding with ASICs hardware accelerators guarantee high-quality encoding at just a few watts per channel and delivers 24/7 reliable streams that run for years without a hiccup.

Modern engineering (2)

The modern Kubernetes and container-based architecture isolates individual channels and automatically instantly restarts channels in the rare case of an error. Channels and viewers are automatically load balanced of its internal pool of resources, and multiple MaelStrom servers form a high availability cluster. Modern APIs and great designed web interfaces are easy to use.

JET STREAM

jet-stream.com

