Multitrack Video Integration API Reference

Amazon IVS

Amazon IVS: Multitrack Video Integration API Reference

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Welcome

The Amazon Interactive Video Service (IVS) broadcast software integration API is intended for software developers who want to implement client support for multitrack video. The API is REST compatible, using a standard HTTP API. JSON is used for both requests and responses, including errors.

Key Concepts

- **Capabilities** — Client characteristics such as hardware and software features.
- **Ingest endpoints** — Endpoints for communicating with IVS using the RTMP protocol.
- **Limits** — Limits imposed by client software or IVS; for example, maximum number of audio tracks.
- **Preferences** — Preferences set by the user; for example, output resolution or frame rate.
- **Service** — A video service or platform like IVS.

For more information about IVS support for multitrack video, also see Multitrack Broadcast Software Integration Guide.

Actions

The following actions are supported:

- the section called “GetClientConfiguration”
- the section called “FindIngest”

GetClientConfiguration

Returns video and audio configurations that optimize the viewing experience based on the client’s hardware and software configuration, user preferences, and limits of the video service.

Request Syntax

```
POST /GetClientConfiguration
https://ingest.contribute.live-video.net/api/v3/GetClientConfiguration HTTP/1.1
Content-type: application/json
{
   "authentication": "string",
   "capabilities": {
      "cpu": {
         "logical_cores": number,
         "name": "string",
         "physical_cores": number,
         "speed": number
      },
      "gaming_features": {
         "game_dvr_enabled": boolean,
         "hags_enabled": boolean
      },
      "gpu": [
         {
            "dedicated_video_memory": number,
            "device_id": number,
            "driver_version": "string",
            "luid": "string",
            "model": string,
            "shared_system_memory": number,
            "vendor_id": number
         }
```

```
      ],
      "memory": {
         "free": number,
         "total": number
      },
      "system": {
         "arm": boolean,
         "arm_emulation": boolean,
         "bits": number,
         "build": number,
         "name": "string",
         "release": "string",
         "revision": "string",
         "version": "string"
      }
   },
   "client": {
      "name": "string",
      "version": "string",
      "supported_codecs": [ "string" ]
   },
   "preferences": {
      "canvas_height": number,
      "canvas_width": number,
      "composition_gpu_index": number,
      "framerate": {
        "denominator": number,
        "numerator": number
      },
      "height": number,
      "maximum_streaming_bandwidth": number,
      "maximum_resolution": "string",
      "maximum_video_tracks": number,
      "vod_track_audio": boolean,
      "width": number
   },
   "schema_version": "string",
   "service": "string",
   "stream_attempt_start_time": "string"
}
```

URI Request Parameters

The request does not use any URI parameters.

Request Body

The request accepts the following data in JSON format.

authentication

Stream key associated with the channel.

Type: String

Required: Yes

capabilities

Description of the client's capabilities.

Type: the section called "CapabilitiesDescription" object

Required: Yes

client

Client software characteristics.

Type: the section called "Client" object

Required: Yes

preferences

Preferences configured on the client.

Type: the section called "PreferencesDescription" object

Required: No

service

Name of the video service.

Type: String

Valid Values: `IVS`

Required: Yes

schema_version

Schema version supported by the client. The schema version format is `YYYY-MM-DD`.

Type: String

Valid Values: `2024-06-04`

Required: Yes

stream_attempt_start_time

Attempted stream start time, in the RFC3339 format.

Type: String

Required: Yes

Response Syntax

```
HTTP/1.1 200
Content-type: application/json
{
   "audio_configurations": {
      "live": [
         {
            "channels": number,
            "codec": "string",
            "settings": [
               "bitrate": number
            ],
            "track_id": number
         }
      ],
      "vod": [
         {
            "channels": number,
            "codec": "string",
            "settings": [
               "bitrate": number
            ],
            "track_id": number
         }
      ]
   },
   "encoder_configurations": [
      {
         "bitrate_interpolation_points": [ number ],
         "framerate": {
            "denominator": number,
            "numerator": number
```

```
         },
         "gpu_scale_type": "string",
         "height": number,
         "settings": {
            "bf": number,
            "bitrate": number,
            "keyint_sec": number,
            "lookahead": boolean,
            "preset2": "string",
            "profile": "string",
            "psycho_aq": boolean,
            "rate_control": "string",
            "tune": "string"
         },
         "type": "string",
         "width": number
      },
   ],
   "ingest_endpoints": [
      {
         "authentication": "string",
         "protocol": "string",
         "url_template": "string"
      }
   ],
   "meta": {
      "config_id": "string",
      "schema_version": "string",
      "service": "string"
   },
   "status": {
      "html_en_us": "string",
      "result": "string"
   }
}
```

Response Elements

If the action is successful, the service sends back an HTTP 200 response.

The following data is returned in JSON format by the service.

audio_configurations

Audio configurations for the live stream and for video on demand based on the client configuration and preferences.

Type: the section called “AudioConfiguration” object

Required: Yes

encoder_configurations

Encoder configurations that the client should use based on the client configuration and preferences.

Type: Array of the section called “EncoderConfiguration” objects

Required: Yes

ingest_endpoints

Available ingest endpoints based on the client configuration and preferences.

Type: Array of the section called “IngestEndpoint” objects

Required: Yes

meta

Information identifying the configuration.

Type: the section called “ConfigurationMetadata” object

Required: Yes

status

Error or warning information to be exposed to the broadcaster.

Type: the section called “ClientConfigurationStatus” object

Required: No

FindIngest

Returns a list of available ingest endpoints.

Request Syntax

```
GET https://ingest.contribute.live-video.net/api/v2/FindIngest
HTTP/1.1
```

URI Request Parameters

The request does not use any URI parameters.

Response Syntax

```
HTTP/1.1 200
Content-type: application/json
{
  "ingests": [
    {
      "_id": number,
      "availability": number,
      "default": boolean,
      "name": "string",
      "priority": number,
      "url_template": "string",
      "url_template_secure": "string"
    }
  ]
}
```

Response Elements

If the action is successful, the service sends back an HTTP 200 response.

The following data is returned in JSON format by the service.

ingests

Available ingest endpoints.

Type: Array of the section called “Ingest” objects

Required: Yes

Data Types

The IVS Multitrack Video Broadcast Integration API contains several data types that various actions use. This section doescribes each data type in detail.

Note: The order of each element in a data type structure is not guaranteed. Applications should not assume a particular order.

The following data types are supported:

AudioConfiguration

Complex type specifying the stream’s audio configuration to be used by the encoder.

Contents

live

Audio-track configurations for the live stream.

Type: Array of the section called “AudioTrackConfiguration” objects

Required: Yes

vod

Audio-track configurations for video on demand. Returned only when audio-track configurations are requested for video on demand, by setting `vod_track_audio` to `true` in the section called “PreferencesDescription”.

Type: Array of the section called “AudioTrackConfiguration” objects

Required: No

AudioTrackConfiguration

Complex type specifying an audio track configuration to be used by the encoder.

Contents

channels

Number of audio channels.

Type: Integer

Valid Values: 2

Required: Yes

codec

Codec used for the audio encoding.

Type: String

Valid Values: `aac`

Required: Yes

settings

Audio encoder settings.

Type: the section called “AudioTrackSettings” object

track_id

Track index as defined in the Enhanced Audio section of the E-RTMP specification. Track 0 is the primary audio track and should be encoded as standard RTMP audio unless the codec being used does not allow it.

Type: Integer

Required: Yes

AudioTrackSettings

Object specifying encoder-specific settings.

Contents

bitrate

The expected audio bitrate in kilobits per second.

Type: Integer

Valid Range: Minimum value of 32. Maximum value of 256.

Required: Yes

CapabilitiesDescription

Complex type specifying client hardware and software characteristics.

Contents

cpu

Client CPU characteristics.

Type: the section called “CpuDescription” object

Required: Yes

gaming_features

Client gaming features.

Type: the section called “GamingFeaturesDescription” object

Required: Yes

gpu

Client GPU characteristics.

Type: Array of the section called “GpuDescription” objects

Required: Yes

memory

Client memory characteristics.

Type: the section called “MemoryDescription” object

Required: Yes

system

Client system characteristics.

Type: the section called “SystemDescription” object

Required: Yes

Client

Object specifying the client software.

Contents

client

Client software characteristics.

Type: the section called “ClientDescription” object

Required: Yes

ClientConfigurationStatus

Object specifying errors or warnings to be exposed to the broadcaster. Refer to Handling Warnings and Errors for more information.

Contents

html_en_us

HTML informational text to render and display to the user.

Type: String

Length Constraints: Minimum length of 1. Maximum length of 4096.

Required: Yes

result

Severity of the information.

Type: String

Valid Values: `error` | `warning`

Required: Yes

ClientDescription

Complex type specifying client software and configuration.

Contents

name

Name of the client software.

Type: String

Length Constraints: Minimum length of 1. Maximum length of 128.

Required: Yes

supported_codecs

List of codecs that the client explicitly supports. Default: `["h264"]`.

Type: Array of strings

Valid Element Values: h264 | h265

Required: No

version

Version of the client software.

Type: String

Length Constraints: Minimum length of 1. Maximum length of 128.

Required: Yes

ConfigurationMetadata

Object specifying the metadata for the configuration returned by the section called "GetClientConfiguration".

Contents

config_id

Configuration ID uniquely identifying this response.

Type: String

Required: Yes

schema_version

Schema version of the configuration based on the schema version specified in the request. The schema version format is `YYYY-MM-DD`.

Type: String

Valid Value: `2024-06-04`

Required: Yes

service

Name of the video service.

Type: String

Valid Values: `IVS`

Required: Yes

CpuDescription

Object specifying client CPU characteristics

Contents

logical_cores

Number of logical cores.

Type: Integer

Valid Range: Minimum value of 1.

Unit: Count

Required: No

name

Vendor and descriptive model name.

Type: String

Length Constraints: Minimum length of 1. Maximum length of 4096.

Required: Yes

physical_cores

Number of physical cores.

Type: Integer

Valid Range: Minimum value of 1.

Unit: Count

Required: No

speed

CPU clock frequency. Intel CPUs support base, minimum, and maximum frequency; please report the base frequency. AMD CPUs support minimum and maximum frequency; please report the maximum frequency.

Type: Integer

Valid Range: Minimum value of 1.

Unit: MHz

Required: No

EncoderConfiguration

Complex type specifying the stream’s video configuration to be used by the encoder.

Contents

bitrate_interpolation_points

List of possible bitrates in kilobits per second providing interpolation points, to allow graceful bitrate degradation. The last value in the list must be the same as `bitrate`. The number of points can vary with the encoder. Each encoder's length of `bitrate_interpolation_points` must be the same for all configurations.

Type: Array of integers

Required: Yes

framerate

Framerate.

Type: the section called “Framerate” object

Required: Yes

gpu_scale_type

Scaling algorithm used to scale from canvas dimensions to output dimensions. Default: `OBS_SCALE_BICUBIC`.

Type: String

Valid Values: `OBS_SCALE_AREA` | `OBS_SCALE_BICUBIC` | `OBS_SCALE_BILINEAR` | `OBS_SCALE_LANCZOS` | `OBS_SCALE_POINT`

Required: No

height

Resolution height in pixels.

Type: Integer

Valid Range: Minimum value of 64.

Required: Yes

settings

Encoder-specific settings.

Type: the section called “VideoTrackSettings” object

type

Type of encoder configuration.

Type: String

Valid Values: `jim_hevc_nvenc` | `jim_nvenc`

Required: No

width

Resolution width in pixels.

Type: Integer

Valid Range: Minimum value of 64.

Required: Yes

Framerate

Object specifying a framerate.

Contents

denominator

Number of seconds for the calculation of frames per second.

Type: Integer

Valid Values: 1

Required: Yes

numerator

Number of frames for the calculation of frames per second.

Type: Integer

Valid Values: `24 | 25 | 30 | 48 | 50 | 60`

Required: Yes

GamingFeaturesDescription

Object specifying the gaming features of the client.

Contents

game_dvr_allowed

Game DVR allowed. Default: `false` (game DVR not allowed).

Type: Boolean

Required: No

hags_enabled

Hardware-Assisted GPU Scheduling (HAGS) enabled. Default: `false` (HAGS not enabled).

Type: Boolean

Required: No

GpuDescription

Object specifying client GPU characteristics.

Contents

dedicated_video_memory

Size of the dedicated GPU memory in bytes. Providing a value allows IVS to better assess system capabilities, but it is not required.

Type: Integer

Valid Range: Minimum value of 1.

Required: No

device_id

The GPU's driver-provided device ID, expressed as a decimal integer. For example, the NVIDIA RTX 4080 uses PCIe device ID (0x2704), which is decimal 9988.

Type: Integer

Required: Yes

driver_version

Version of the GPU driver.

Type: String

Length Constraints: Minimum length of 1. Maximum length of 128.

Required: Yes

luid

Uniquely identifies a GPU on a system with multiple GPUs. The value can be any local identifier used on the system to identify GPUs.

Type: String

Required: No

model

Model name of the GPU. It must exactly match the full name provided by the GPU's manufacturer. Otherwise, the GPU may not be recognized by IVS.

Type: String

Length Constraints: Minimum length of 1. Maximum length of 4096.

Required: Yes

shared_system_memory

Size of the shared GPU memory in bytes. Providing a value allows IVS to better assess system capabilities, but it is not required.

Type: Integer

Valid Range: Minimum value of 1.

Required: No

vendor_id

The GPU's driver-provided vendor ID, expressed as a decimal integer. For example, the NVIDIA RTX 4080 uses PCIe vendor ID (0x10DE), which is decimal 4318.

Type: Integer

Required: Yes

Ingest

Object specifying ingest endpoints returned by the section called "FindIngest".

Contents

_id

Sequential index of the ingest endpoint.

Type: Integer

Required: Yes

availability

Indicates whether the ingest endpoint is available. The ingest endpoint is available If `availability` is `1.0`. It is unavailable if `availability` is `0`. Availability may change over time.

Type: Integer

Valid Values: `0` | `1.0`

Required: Yes

default

Identifies the default ingest endpoint for auto-selection. Only one ingest endpoint in the response will have `default` set to `true`. The ingest endpoint with `default` set to `true` should be auto-selected as long as its `availability` is `1.0`.

Type: Boolean

Required: Yes

name

Name of the ingest endpoint.

Type: String

Required: Yes

priority

Priority of the ingest endpoint. Servers with the lowest priority should be used first.

Type: Integer

Required: Yes

url_template

URL template using the RTMP protocol. Insert a stream key to create a URL from the template.

Type: String

Required: Yes

url_template_secure

URL template using the RTMPS protocol. Insert a stream key to create a URL from the template.

Type: String

Required: Yes

IngestEndpoint

Object specifying ingest endpoints returned by the section called “GetClientConfiguration”.

Contents

authentication

Stream key associated with the ingest endpoint.

Type: String

Required: Yes

protocol

Protocol for ingest.

Type: String

Valid Values: `RTMP` | `RTMPS`

Required: Yes

url_template

Template for the endpoint URL. Insert the stream key returned in `authentication` to create a URL from this template.

Type: String

Required: Yes

MemoryDescription

Object specifying client memory characteristics.

Contents

free

Size of available system memory in bytes.

Type: Integer

Valid Range: Minimum value of 1.

Required: Yes

total

Size of total system memory in bytes.

Type: Integer

Valid Range: Minimum value of 1.

Required: Yes

PreferencesDescription

Complex type specifying preferences configured on the client.

Note: The configuration that is returned takes into account user preferences. If the preference name starts with `maximum_`, it is considered a limit set by the user. However, user preferences may be overridden by the limitations of the service. For example, if the user sets

`maximum_video_tracks` to 4 but the service only supports 3, the returned configuration contains only 3 video tracks.

Contents

canvas_height

The height in pixels of the canvas being encoded.

Type: Integer

Required: Yes

canvas_width

The width in pixels of the canvas being encoded.

Type: Integer

Required: Yes

composition_gpu_index

An index (zero-based) specifying which the section called "GpuDescription" object the client is using for graphics composition and streaming.

Type: Integer

Required: No

framerate

Requested framerate.

Type: the section called "Framerate" object

Required: Yes

height

Requested output resolution height in pixels. Must be less or equal to `canvas_height`.

Type: Integer

Required: Yes

maximum_streaming_bandwidth

Maximum bandwidth in kilobits per second that the user allocated for streaming. Default: null (no user preference).

Type: Integer

Required: No

maximum_resolution

Maximum resolution of the highest quality video track. Default: null (no user preference).

Type: String

Valid Values: `SD` | `HD` | `FULL_HD`

Required: No

maximum_video_tracks

Maximum number of video tracks that the user allocates for multitrack video streaming. Default: null (no user preference).

Type: Integer

Required: No

vod_track_audio

Whether an audio track will be created for video on demand, separate from the live stream. Default: `false` (no separate audio track for video on demand).

Note: This parameter is ignored if the stream key provided in the `authentication` field of the request does not start with `live_`.

Type: Boolean

Required: No

width

Requested output resolution width in pixels. Must be less or equal to `canvas_width`.

Type: Integer

Required: Yes

SystemDescription

Object specifying client system characteristics.

Contents

arm

Indicates that system architecture is ARM based. Default: `false` (not based on ARM).

Type: Boolean

Required: No

arm_emulation

Indicates that the system can emulate ARM architecture. Default: `false` (emulation not available).

Type: Boolean

Required: No

bits

Indicates 32-bit or 64-bit operating system. Providing a value allows IVS to better assess system capabilities, but it is not required.

Type: Integer

Valid Values: 32 | 64

Required: No

build

Build of the operating system.

Type: Integer

Required: Yes

name

Name of the operating system.

Type: String

Valid Value: `Windows`

Required: Yes

release

Release of the operating system.

Type: String

Required: Yes

revision

Revision of the operating system.

Type: String

Required: Yes

version

Version of the operating system.

Type: String

Length Constraints: Minimum length of 1. Maximum length of 128.

Required: Yes

VideoTrackSettings

Object specifying encoder-specific settings.

Contents

bf

Number of consecutive bframes. Default: 0.

Type: Integer

Valid Range: Minimum value of 0.

Required: No

bitrate

Target bitrate in kilobits per second.

Type: Integer

Valid Range: Minimum value of 1.

Required: Yes

keyint_sec

Number of seconds between keyframes. 0 indicates that the encoder should decide.

Type: Integer

Valid Range: Minimum value of 0. Maximum value of 10.

Required: Yes

lookahead

Enables lookahead. Default: `false` (disabled).

Type: Boolean

Required: No

preset2

The desired balance between the speed and the quality of encoding using presets specific to the GPU card manufacturer. For example, NVIDIA uses values of p1 through p7, with p1 indicating faster encoding with lower quality and p7 indicating slower encoding with higher quality.

Type: String

Required: Yes

profile

Profile of the codec. Not all values may be valid for each codec. For the HEVC codec, `profile` must be set to `main`.

Type: String

Valid Values: `baseline` | `main` | `high`

Required: Yes

psycho_aq

Enables Psycho Visual Adaptive Quantization Tuning to increase perceived visual quality. Default: `false` (disabled).

Type: Boolean

Required: No

rate_control

Rate control.

Type: String

Valid Values: CBR

Required: Yes

tune

Tuning parameter returned only for NVIDIA GPUs.

Type: String

Valid Values: hq | `ll` | `ul`

Required: No