CAMIO Render Server Guide V5.5.2

May 2025

SINCE DAY ONE.

Chyron CAMIO Render Server User Guide V5.5.2 December 2024]. This document is distributed by Chyron in online (electronic) form only, and is not available for purchase in printed form.

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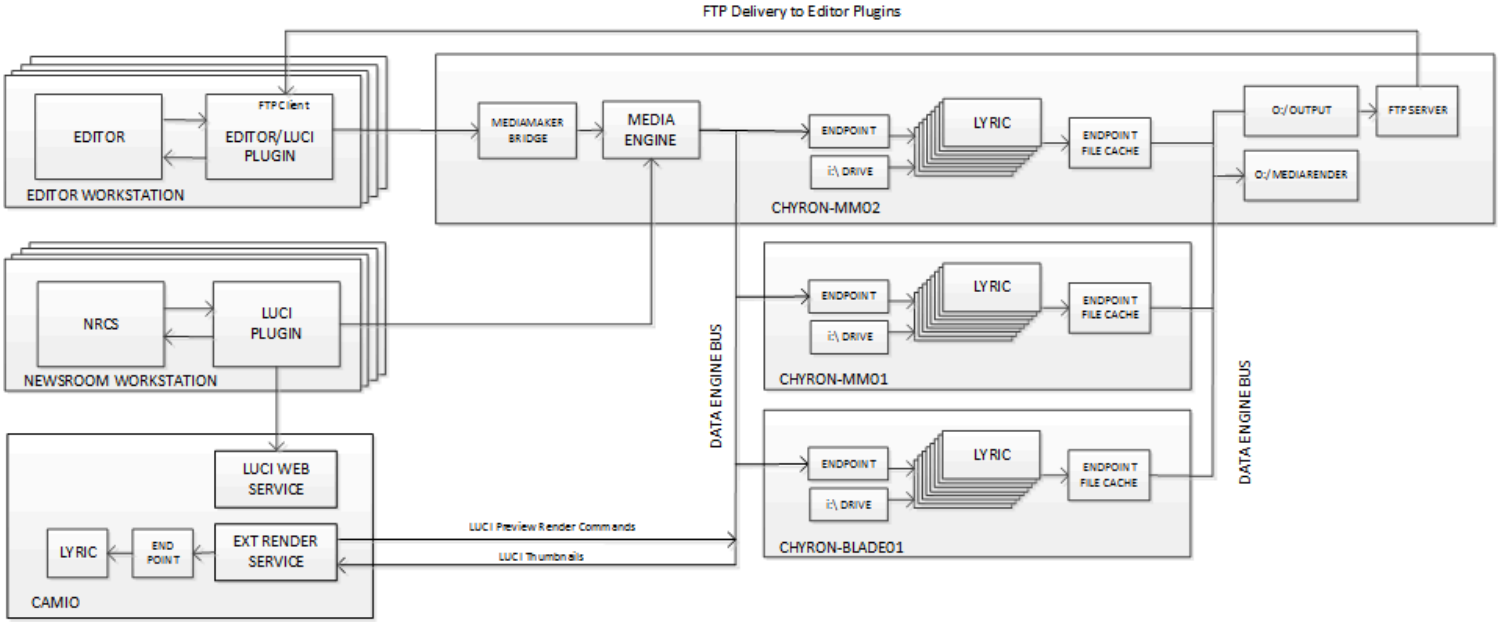
OVERVIEW

The CAMIO Render server is a building block for ChyronHego's very powerful and scalable rendering architecture.

- Each CR can run multiple instances of Lyric and/or Prime to render preview thumbnails. Includes offline licenses for Lyric and/or Prime.
- Up to 6 CR's can be installed in parallel to provide additional rendering bandwidth and redundancy*.
- CR is available as a turnkey system or as software-only product to be installed on customer provided hardware. Hardware specifications and instructions are available in the **CAMIO VM/CPH Installation Guide**.
- CAMIO Render Engine Configurations
    - Base **CAMIO Render** system can generate preview thumbnails for Lyric and Prime, including full resolution png's with alpha.
    - **Media Engine Option** enables rendering of full resolution animations with alpha for use with NLE Plugins, Folder Watcher. License required
    - **External License Manager** option allows the CR to act as the license manager for a CAMIO VM system. Two CR's can be fitted with External License Manager to provide redundancy. License required,



*** Old diagram needs update ***

THEORY OF OPERATION

The rendering system consists of CAMIO and one or more CAMIO Render servers (CR) communicating using the proprietary Data Engine message bus. Up to 6 CR's can be connected to a CAMIO to provide redundancy and increased rendering throughput.

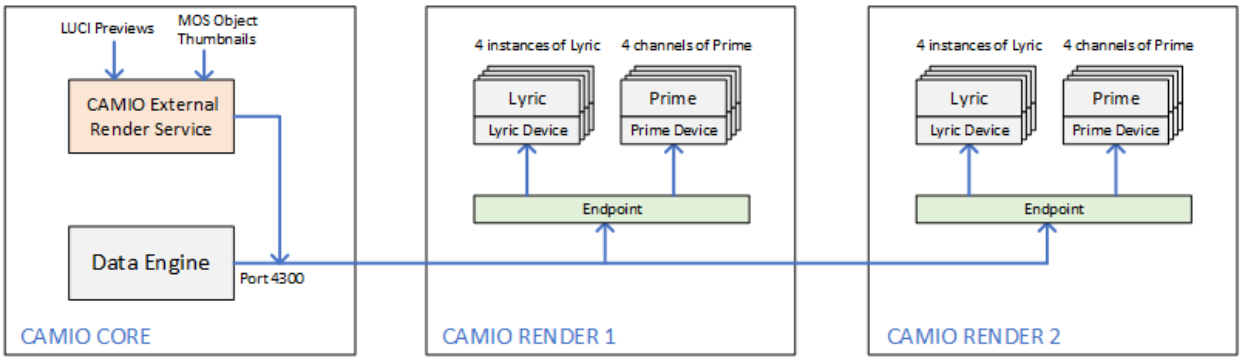
Preview Rendering refers to still image thumbnails rendered for LUCI Previews and for MOS Object thumbnails used in various places, including full resolution PNG images with alpha. Preview rendering is a standard feature of all CR's.

Media Rendering refers to animated movie renders. These can be full resolution for use in editor plugins, low resolution proxies for animated previews or custom resolutions for LUCI Publishing. Media Rendering is a license enabled option.

Data Engine is a web service that runs on many Chyron systems on port 4300. Data Engine stores JSON data and messages in containers called buckets where they are available to any process that connects to that port. Data Engine is often used as a message bus to share information between different Chyron applications, but can be used for many different purposes. This document will focus only on the functionality needed for rendering previews and media.

Preview Rendering

The simplified block diagram below shows the signal path for preview renders. The sample system has one CAMIO and two CR's. There are 4 instances of Lyric and 4 channels of Prime running on each CR. The number of instances on a deployed system will vary..



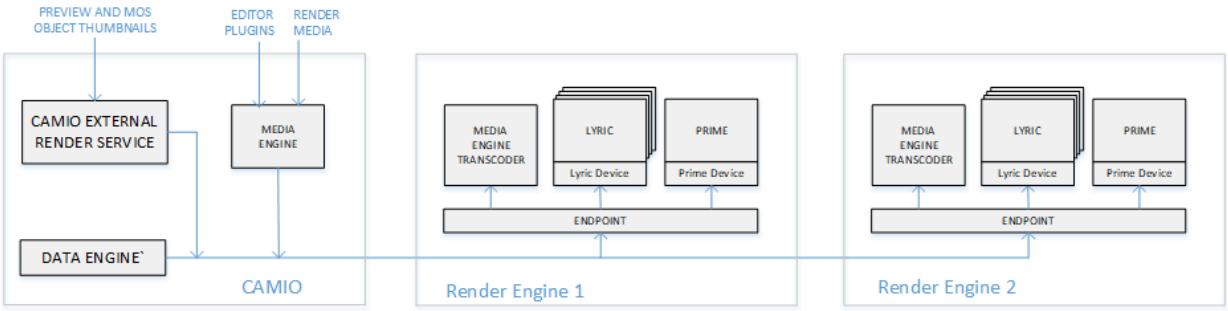
The CAMIO External Render Service gets a request for a LUCI Preview or a MOS Object thumbnail and puts a JSON render request into the Data Engine bucket **messaging.compcon.bn.camio.preview.jobs**. There are two Endpoints monitoring that bucket. If the request is for a Lyric render, each endpoint will check to see if it has an available Lyric renderer. The first Endpoint to grab the render request will remove it from the bucket.

The term ‘compcon’ in the bucket name is short for ‘competing consumer’. The endpoints compete to see who can grab the render request first. This provides redundancy and load balancing for preview rendering.

Each rendering service (Lyric and Prime) is interfaced to the Endpoint with a software component called the Device. The Lyric Device is a Lyric plugin that is installed by the CR installer. The Prime Device is built into Prime.

Media Rendering

The second block diagram shows the signal paths for animated media renders. This sample system has the same CAMIO and two CR’s. Note that the same Lyric and Prime renderers are used for both preview and media rendering.



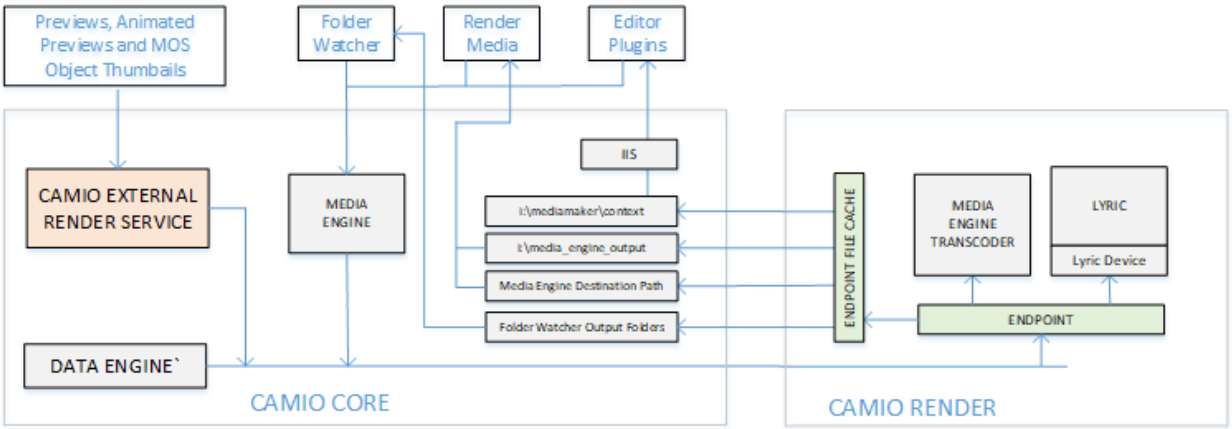
Media Engine processes a render request from NLE Plugin, Folder Watcher. Render Media, LUCI Publishing or Media Central via a REST API. Media Engine generates a JSON media render request and puts it in the Data Engine bucket **messaging.compcon.bn.camio.render.jobs**. Just as before, the Endpoints compete to pull the render request off the Media Engine queue. The same renderer will render an entire animation, renderers do not work in parallel on a media render job.

How Many Renderers Can I Have?

Up to 6 external CR’s can be connected to one CAMIO Server. Each CR can have multiple channels of Lyric and Prime. The total number of Render Channels per CR must not exceed the number of Logical Cores in the CPU.

Rendered File Delivery

The image and movie files rendered by CR are delivered in various ways depending on which system requested it. The delivery paths use Data Engine, IIS and/or shared folders.



Preview Images

Standard still image previews are delivered back to CAMIO by the Endpoint using HTTP Post to the ‘destination’ specified in the JSON render request (i.e. {"destination":"/previews/upload.ashx? id=epadnpqa.ydj", "format": "PNG", "width": 1280. "height": 720, “ "previewOnly": true}) The External Render Service will take that image and deliver it to the appropriate location.

Rendered Media Files

Rendered Media Animations take several steps to get to their final destination. The path depends on which rendering service requested the animation.

1) They are first rendered and placed in an endpoint file cache on the CR system in which they are created.
2) If necessary, the file format is transcoded to the required format
3) The local Endpoint then moves the file to one of several output folders located on the CAMIO Core server.
    a) Animated Previews are moved using HTTP Post to destinations specified in the JSON Render Request.
    b) NLE Plugins: the output folder is at the root of an IIS virtual folder (/mediamaker) where the file can be downloaded by the NLE Plugins using http..
    c) LUCI Render Media (Save to Disk): output folder is defined in Admin Tools > Media Engine Presets > Destination Path

d) LUCI Render Media (Save to LUCI):output folder is defined in Admin Tools > Media Engine Configuration > Output Folder
e) Folder Watcher: uses shared folders defined in the Folder Watcher Configuration.

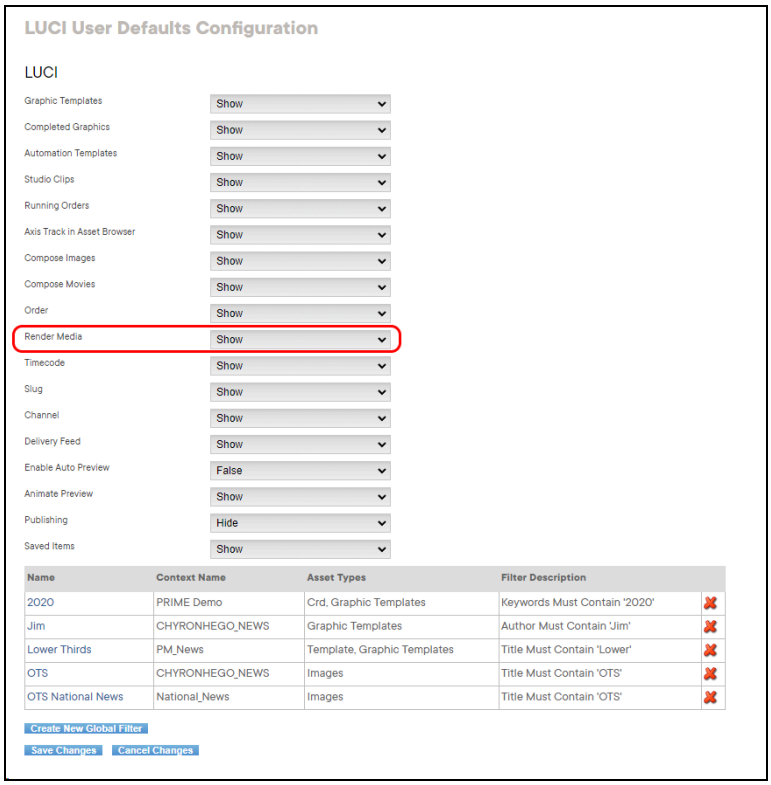
SETUP AND CONFIGURATION

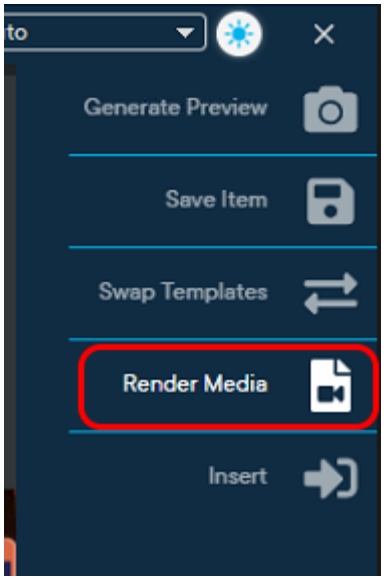
LUCI Render Media - ‘Save to Disk’ and ‘Save to LUCI’

LUCI Render Media is a feature that renders the animation to a file. It has two modes.

- Save to Disk which renders an animation of the selected template to the folder specified in the CAMIO Admin Tools > Media Renderer Configuration > Output Folder.
- Save to LUCI saves that animation back to Asset Manager in the Context and Subfolder selected. The animation can then be selected in LUCI to be inserted into an appropriate template for playback.

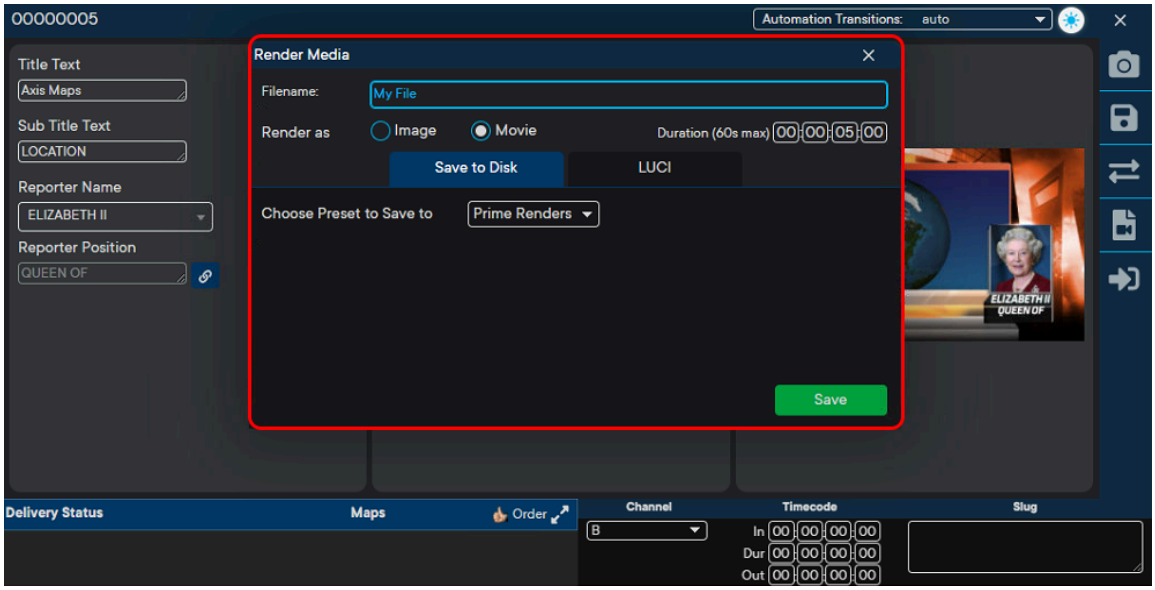
NOTE: Enable the Render Media button in LUCI by setting Admin Tools > LUCI User Defaults Configuration > Render Media = SHOW.

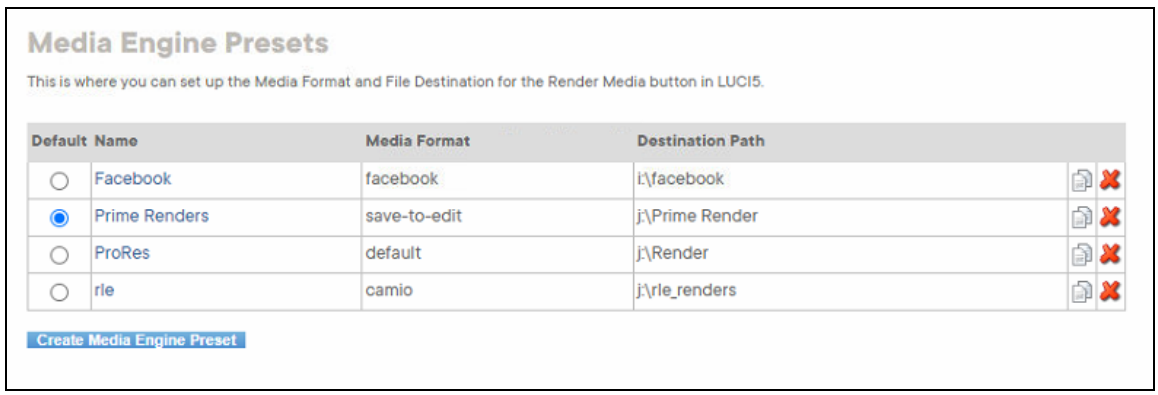




Save to Disk

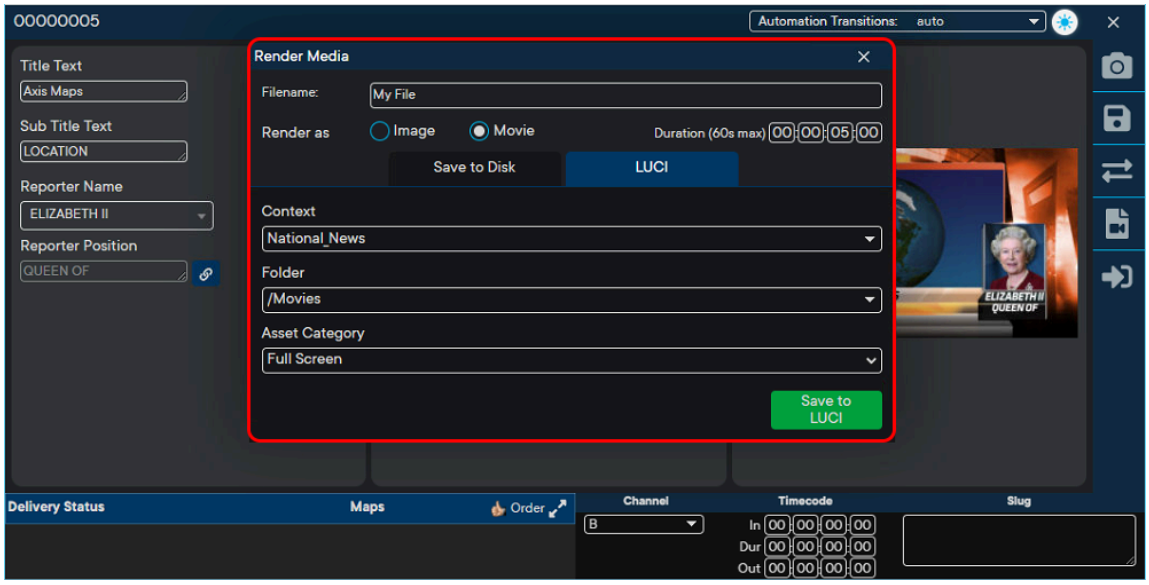
Press Render Media button and select Save to Disk tab. Enter a filename, select animation length (5 sec. default) and select a Media Engine Preset. Rendered file will be saved to the Output Folder defined in Admin Tools > Media Engine Presets > Destination Path based on the Media Engine Preset selected.





Save to LUCI

Press Render Media button and select Save to LUCI tab..Enter a filename and select animation length (5 sec. default). Select a Context name and subfolder to save the rendered file to. A filename and animation length must be entered.



NLE Plugins

Rendered animations requested by the NLE Plugins are delivered to an IIS Virtual Directory where the NLE Plugin can download using http.

More information about the NLE Plugins can be found in the **CAMIO NLE Plugins User Guide**.

Folder Watcher

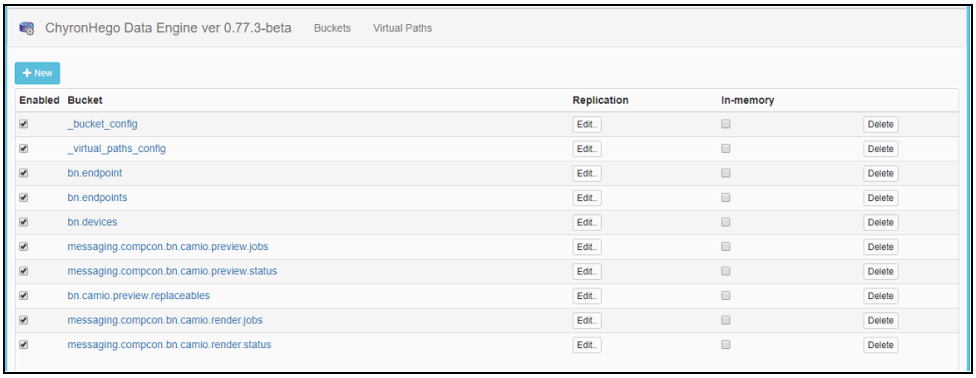
Folder Watcher (FW) is used to automate the rendering of Lyric/Prime animations in Mediamaker. It was planned to be replaced by the LUCI Render Media workflow but many users prefer the Folder Watcher workflow after becoming accustomed to it so it is still supported in current versions of CAMIO5. .

More information about the Folder Watcher can be found in the **CAMIO5 Folder Watcher User Guide**

TROUBLESHOOTING

Data Engine Primer

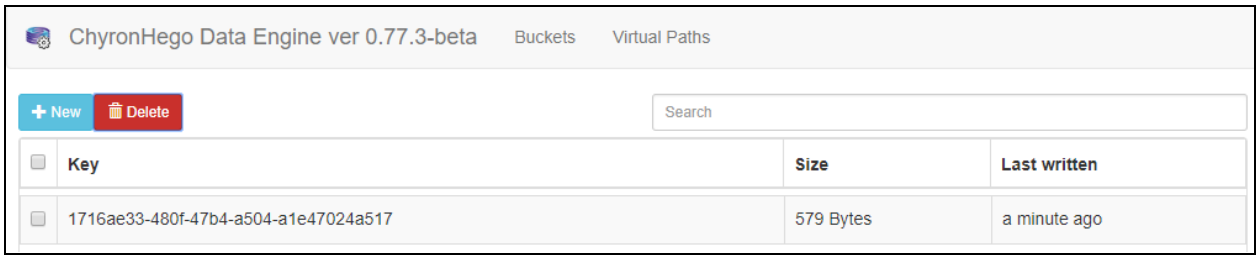
For troubleshooting the Render Engine system it is useful to understand how the Data Engine works and what information can be found in it. The CAMIO's Data Engine buckets can be viewed in a Chrome browser by pointing to http://*camioserver*:4300



Render requests are placed in two buckets on the CAMIO Server's Data Engine.

- **messaging.compcon.bn.camio.preview.jobs**
  messaging.compcon.bn.camio.render.jobs

The buckets will normally be empty since the render requests are immediately pulled out by one of the Endpoints. If you stop the Endpoint services and generate a preview request from LUCI you will find that request in the preview.jobs bucket and would look like the following example. It has a GUID filename.



Clicking on the filename will show the JSON render request such as this example for a 1 line lower third.


```
{
  "version": "1",
  "type": "preview",
  "id": "e21d88c8-b556-45d7-b823-ad2f42f17889",
  "output": {
    "destination": "/previews/upload.ashx?id=epadnpqa.ydj",
    "format": "PNG",
    "width": 1280,
    "height": 720,
    "previewOnly": true,
    "type": null
  },
  "templateData": {
    "template": "/Assets/PRIME/Scenes/L3 - Lower Third.crd",
    "templateHash": "34884057e0b6844c61377a942301a195",
    "templateType": "prime-graphics",
    "replaceables": [
      {
        "id": "TextBox1 Text",
        "name": "TextBox1 Text",
        "type": "text",
        "value": "Top Line Text",
        "hash": null
      },
    ]
  }
}
```


Type - Preview Render Request
ID - filename to be used when the preview thumbnail is returned.

Output
Destination - Location on the CAMIO Server for the rendered thumbnail should be
Format/Height/Width - standard thumbnail properties Thumbnail is always created as a 1280x720 PNG with Alpha. CAMIO will convert this to various size jpeg thumbnails for use in LUCI and ISQ.
Preview Only - whether to render with preview-only images

Template Hash of base template is provided to check if the version changed since the last time this template was downloaded from CAMIO.
Template Type - this is a Prime-Graphics template

Replaceables - itemize all replaceable information

The Media Engine works in a similar way, with the media render request being placed in the render.jobs bucket. The movie render requires more descriptive information such as codec format, frame rate and duration.


```
{
  "id": "31990000-d1b0-11e8-9a2d-139ab5879821",
  "type": "render",
  "version": "1",
  "output": {
    "destination": "serve://local",
    "type": "video",
    "format": "mov",
    "quality": "lossless",
    "video": {
      "name": "save-to-edit",
      "description": "Default preset used for save-to-edit in LUCI 5.",
      "class": "lossless",
      "container": "mov",
      "codec": "prores",
      "fps": 59.94,
      "id": "save-to-edit",
      "startTime": 0,
      "endTime": 5,
      "noTranscode": false
    }
  },
  "templateData": {
    "template": "/Assets/PM_News/Messages/jim.lyr",
    "templateType": "lyric",
    "replaceables": [
      {
        "id": "E48C984A-EE72-48D3-B71B-F54A54FA6557",
        "name": "Top Line",
        "type": "text",
        "value": "TOP LINE TEXT"
      },
    ]
```


Type - Render = Media Render Request
ID - filename to be used when the preview thumbnail is returned.

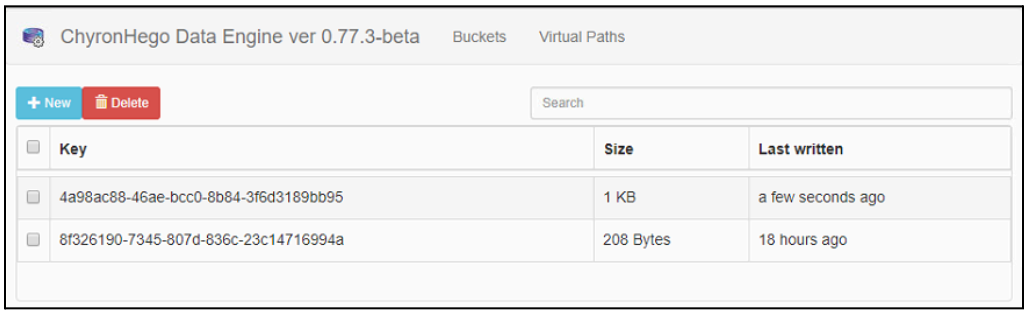
Output
Destination - local file defined in CAMIO admin tools.
Format/Video - specifies the codec properties.
start/end time - duration of movie

Template - filename of the Lyric or Prime template.
Template Type - this is a Lyric Graphics template
Replaceables - itemize all replaceable information

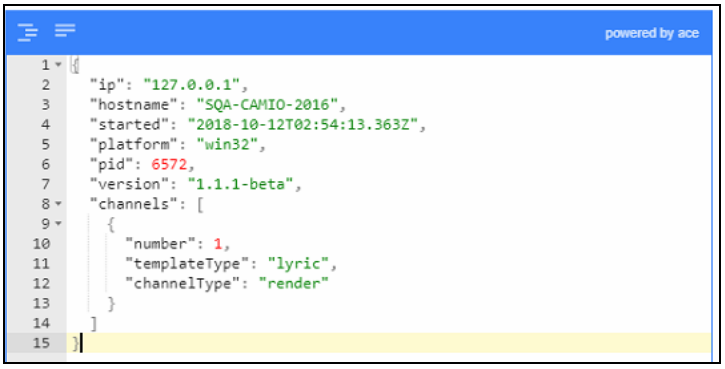
```
 }
}
```

Note that if a render request is not fulfilled in one minute it becomes stale and will stay in the bucket until it is manually deleted. There is no way to reactivate this render request. So if there is a rendering problem and previews are not being generated you may find the preview.jobs or render.jobs bucket full of stale render requests. These should be deleted manually.

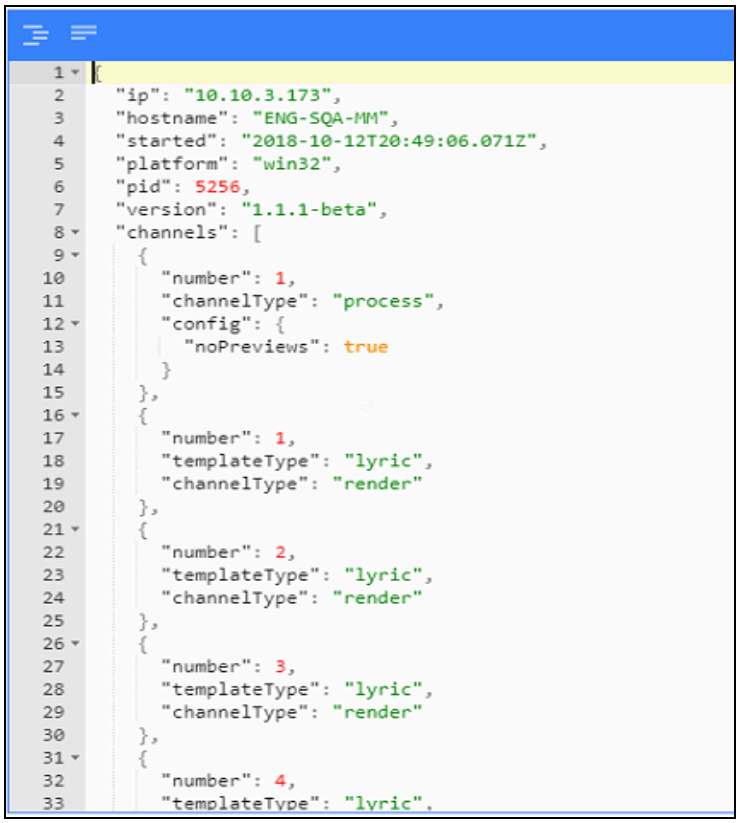
Bn.endpoints - this bucket contains a list of all the endpoints connected to CAMIO. In this example there are two endpoints, one on the CAMIO Server and one on an external CR. Clicking on the keys will open a JSON file which gives the hostname/ip of the system the endpoint is running on.and a list of the rendering channels that the endpoint is connected to.



This is the endpoint running on the CAMIO. It is connected to one instance of Lyric.

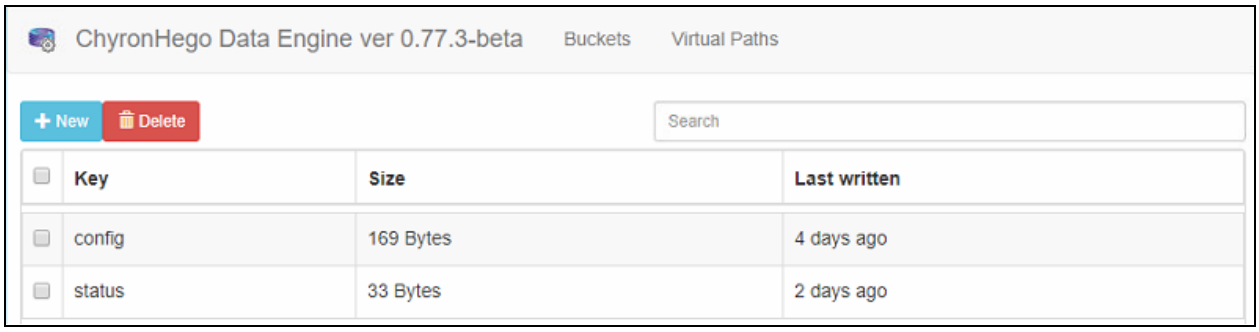


The other endpoint is running on an external CR. It is connected to 8 instances of Lyric, though only 4 are showing in this screen grab. The item ‘channelType = process’ refers to the Media Engine component which is running on this CR. It does not count as a rendering channel.

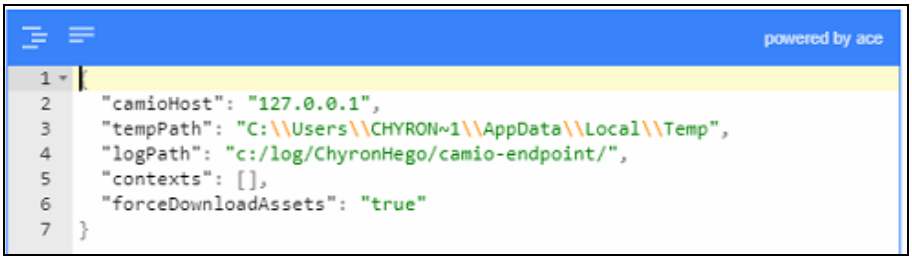



```
{
  "ip": "10.10.3.173",
  "hostname": "ENG-SQA-MM",
  "started": "2018-10-12T20:49:06.071Z",
  "platform": "win32",
  "pid": 5256,
  "version": "1.1.1-beta",
  "channels": [
    {
      "number": 1,
      "channelType": "process",
      "config": {
        "noPreviews": true
      }
    },
    {
      "number": 1,
      "templateType": "lyric",
      "channelType": "render"
    },
    {
      "number": 2,
      "templateType": "lyric",
      "channelType": "render"
    },
    {
      "number": 3,
      "templateType": "lyric",
      "channelType": "render"
    },
    {
      "number": 4,
      "templateType": "lyric",
```

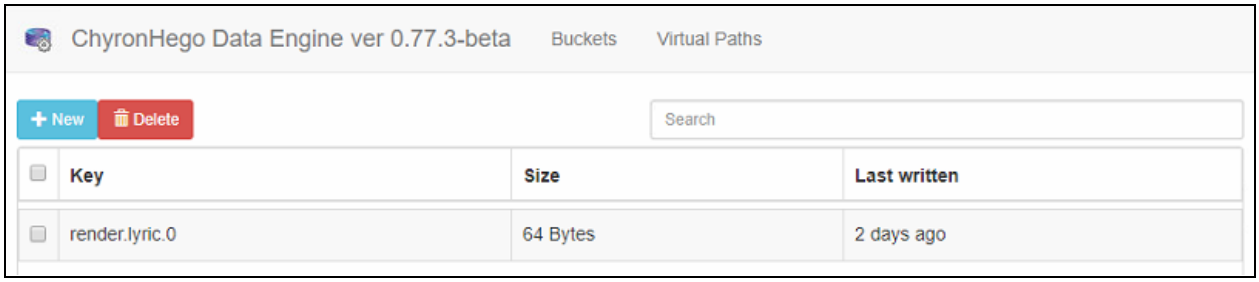
Bn.endpoint - Note the name endpoint vs endpoints...this is specifically the endpoint running on the CAMIO Server. The status bucket basically tells you that it is running. The config bucket may or may not be showing here. It is only used on Linux servers.



On Windows servers, the config file is stored at C:\Program Files\ChyronHego\ChyronHego CAMIO Endpoint Beta\config.json. The screen grab below shows the config file and is self explanatory.

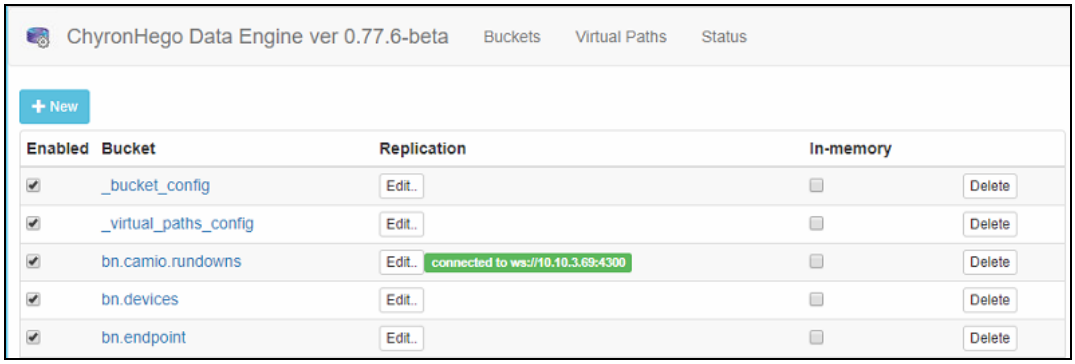


Bn.devices - this bucket lists the properties of all render devices which are located on the CAMIO Server. In this case there is one instance of Lyric available, and it is called render.Lyric.0.



The properties of that item tell you that it can be used to render Lyric Templates, it is available, and that it is a renderer not a playout device. .

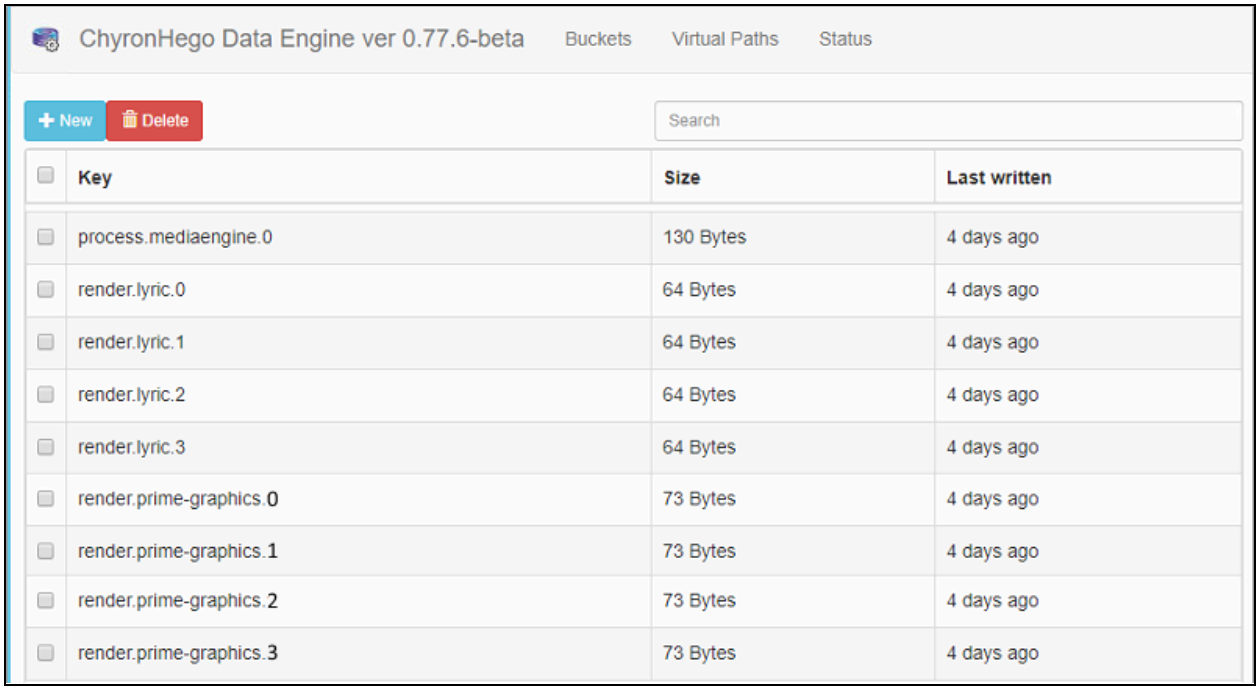
There is also a Data Engine running on the CR's. You can view it with a Chrome browser point to http://*camiorenderengine*:4300



Bn.camio.rundowns - worth mentioning that this bucket is synchronized to the same bucket on the CAMIO Server but that it not required on a render device. It is only required on a playout device which needs a rundown.

Bn.endpoint - the endpoint running on this CR.

Bn. devices - the list of rendering devices active on the CR. The first item 'process.mediaengine.0' represents the media renderer. Then there are 4 instances of Lyric and 4 channels of Prime-graphics.



Log Files

CAMIO Endpoint Log Files

- C:\log\ChyronHego\camio-endpoint
- Each log file is numbered ‘camio-endpoint.##.txt’ where ## is that day of the month. Logs from the same date on different months are merged together. Sort the files in data/time order to find the latest log file.

Lyric Device Log Files

- C:\Program Files (x86)\ChyronHego\Lyric Device
- Logs are sorted in subfolders that correspond to rendering instances.
- Lyric Device Logs will list jobs being processed and elapsed times

Mediamaker Bridge Log Files

- C:\Program Files (x86)\ChyronHego\MediaMaker\Logs

Media Engine Logs

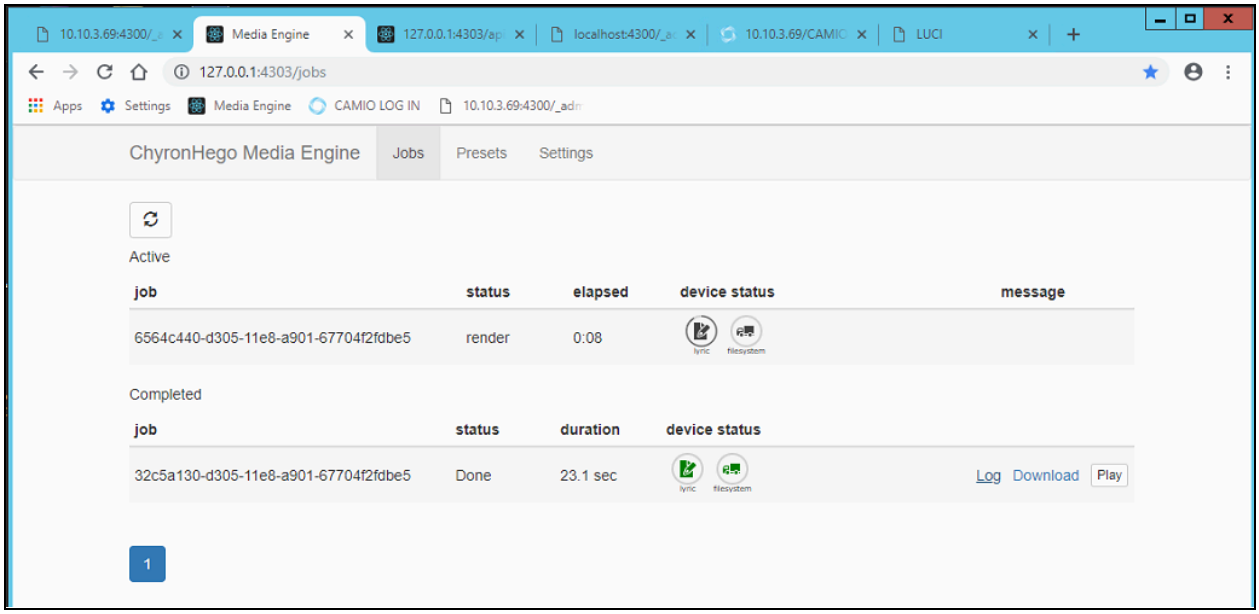
- http://localhost:4303/jobs
- Shows real time activity of each render job.

Social Media API Logs

- C:/log/chyronhego/sm-api

Media Engine UI

Media Engine is a web service that runs on the primary CR. It has a user interface using Chrome browser at http://mediaengine:4303.



Jobs

Jobs tab shows active and completed render jobs. This is a convenient place to check the status and health of the Media Engine.

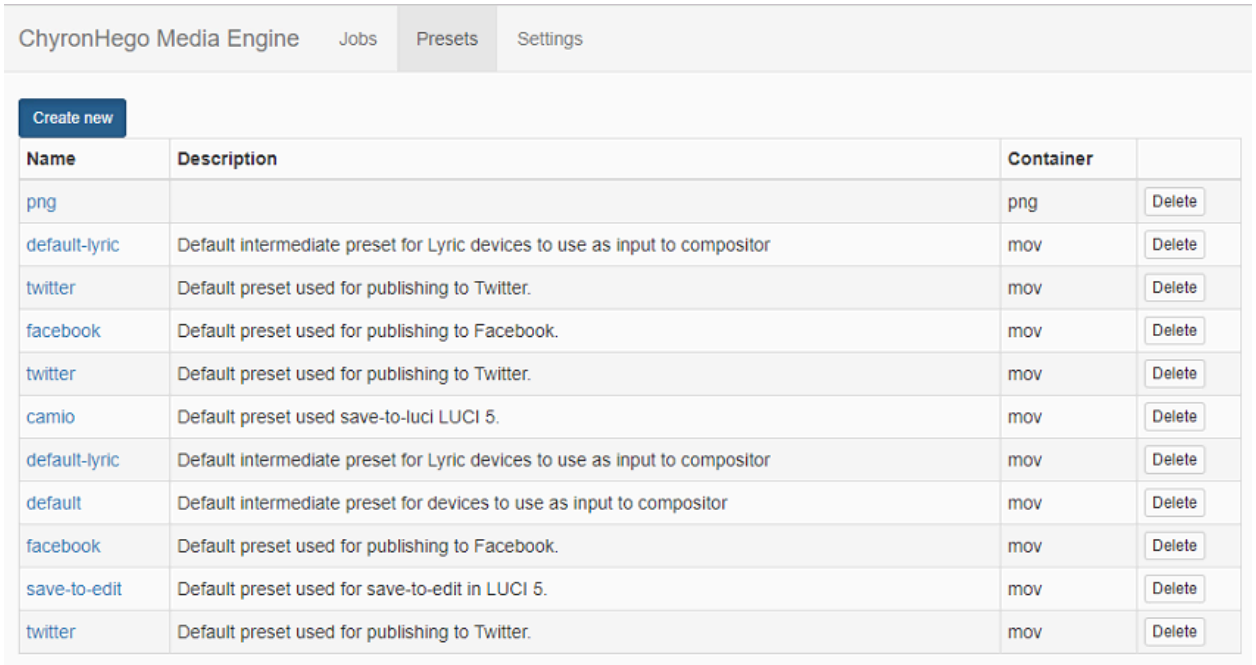
In this screen grab above, two render jobs are seen

- One is **Active** and has been rendering for 8 seconds at the time the screen grab was taken.
- The second is successfully **Completed** and took 23 seconds (to render a 5 second animation.)
- The completed file can be **Downloaded** from the link on the side.
- A **Log** for the render can be downloaded from the link at the right. Note the log time is kept in UTC.
- The **Play** button will play a proxy of the file but only if it was rendered in h.264 format.

The completed render jobs list is cleared when the Media Engine service is restarted.

Presets

Presets is a list of encoder formats used for various purposes. These are configured by the installer and should not normally need to be modified.



Name	Description	Container	
png		png	Delete
default-lyric	Default intermediate preset for Lyric devices to use as input to compositor	mov	Delete
twitter	Default preset used for publishing to Twitter.	mov	Delete
facebook	Default preset used for publishing to Facebook.	mov	Delete
twitter	Default preset used for publishing to Twitter.	mov	Delete
camio	Default preset used save-to-luci LUCI 5.	mov	Delete
default-lyric	Default intermediate preset for Lyric devices to use as input to compositor	mov	Delete
default	Default intermediate preset for devices to use as input to compositor	mov	Delete
facebook	Default preset used for publishing to Facebook.	mov	Delete
save-to-edit	Default preset used for save-to-edit in LUCI 5.	mov	Delete
twitter	Default preset used for publishing to Twitter.	mov	Delete

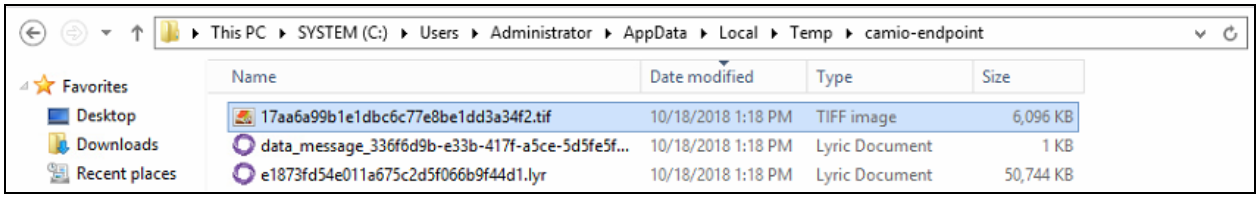
Settings

Date Engine Host for Job Queue =
CAMIO Server hostname or IP

Shared Path for Media =
Not used, will be removed from a future version

Replaceables Files

Replaceables are the templates, template data messages, images and movie files which are delivered by CAMIO to the CR for rendering using Data Engine. In legacy CAMIO operation these files were delivered to i:\CAMIO4\contextname directory. With Data Engine they are delivered to the location specified in the render request which is %TEMP%/camio-endpoint. This example shows an OTS Template, along with a replaceable TIF image and the Template Data Message.



ABOUT US

Chyron is ushering in the next generation of storytelling in the digital age. Founded in 1966, the company pioneered broadcast titling and graphics systems. With a strong foundation built on over 50 years of innovation and efficiency, the name Chyron is synonymous with broadcast graphics. Chyron continues that legacy as a global leader focused on customer-centric broadcast solutions. Today, the company offers production professionals the industry's most comprehensive software portfolio for designing, sharing, and playing live graphics to air with ease. Chyron products are increasingly deployed to empower OTA & OTT workflows and deliver richer, more immersive experiences for audiences and sports fans in the arena, at home, or on the go.

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