IBM Video Analytics

IBM Video Analytics Support for SureView Immix

Configuration and Enablement

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Support for SureView Immix

SureView Immix provides IBM Video Analytics with access to video from a number of Video Management Systems. (See https://sureviewsystems.com/cc-partners)

IBM Video Analytics alerts can be automatically sent to the Immix Command Center V2 API for viewing in the ImmixCC Monitoring application. Due to the extensive options and variables with regard to the alerts and alert information that can be sent to Immix, no specific procedure is documented at this time. Please contact IBM Support to request a recommendation for how to configure automated alert processing appropriate for your deployment and requirements.

NOTE: The configuration of IBM Video Analytics for SureView Immix is similar to all other supported VMS systems. See the IBM Video Analytics Knowledge Center for details.

Immix Specific Configuration

- A SureView Immix Server definition is automatically installed by the IBM Video Analytics 1.0.5 FP2 installer
    - The Server definition must be configured with:
        - The host name or IP Address of the Immix server. ***The configured value must match the Immix Server's server certificate.***
        - A User and Password
    - The Format field is pre-configured with the default settings. Optional settings can be configured in the Camera definitions on the IBM Video Analytics Admin UI Cameras tab.

- The SSE currently uses the HTTP Live Streaming (HLS) protocol to receive video from the SureView Immix server. This is a "bursty" protocol where video frames are received in batches rather than in a constant stream. The SSE implements a buffering mechanism (HLS Buffer) to ensure that a steady stream of frames at the appropriate frame rate is analyzed.
- Additional configuration parameters are often required to optimize the buffer size and frame rate. See the section on Camera Definition for an explanation of these parameters and the section on Optimizing HLS Video for a description of best practices to optimize streams using the available parameters.

- Camera Definitions
  - Cameras assigned to a SureView Immix server require the Immix device ID to be specified in the Camera's `VMS Camera ID` field
  - Additional optional parameters that can be configured are:
    - Camera Archive Parms
      - &preroll=<playback preroll in milliseconds> (default=0)
        - Video playback in the VA Operator UI will typically start after the moment that a VA Alert or Event is generated. EG if a trip wire alert is configured, the video playback should begin at the moment an object crosses the trip wire but due to the HLS buffer, it will start after the object has crossed the trip wire. The preroll parameter is used to adjust the starting time of the playback so that it correctly reflects the activity in the Alert or Event. EG if the video playback is starting 1.5 seconds after it should, setting &preroll=1500 will adjust the playback to start 1.5 seconds earlier.
    - Camera Engine Parms
      - &initBufSize=<number of frames in the video buffer> (default will be calculated based on frame rate)

        - The HLS buffer size must be optimized to eliminate jitter (i.e., "jerky" video) while minimizing latency. If the buffer is too small, noticeable jitter will be encountered, and if the buffer is too large there will be additional delay between real time and the time the analytics can analyze the stream. Latency is only an issue when near-realtime alerts are configured.

    - &FPS=<frame rate> (Optional, if frame rate can be detected from video stream it will override this setting)
    - The SSE will attempt to detect the frame rate of the video stream from the stream's metadata but this information is not available for all streams. If a frame rate is detectable and the detected frame rate is lower than the configured value, the SSE will use the detected value, overriding the configured value. If the detected frame rate is higher than the configured value the SSE will use the configured value.
    - &quality=<one of the enumerated values below> (default=Medium)
    - This setting can be used to adjust the resolution of the video stream that the SSE will analyze. The effective resolution for each of the valid values will vary depending on camera and SureView Immix server configuration.
    - Valid values: Lowest, Low, Medium, High, Highest

- Archive Video Playback
    - Only Stop and Play functions are provided
        - Clicking the Stop button will stop the video playback at the current frame
        - Clicking the Play button will restart the video playback at the beginning of the Event or Alert being viewed

For information on sending alerts to Immix CC, please contact IBM Support.

Optimizing HLS Video

The following is a best practices procedure to optimize video for analysis and video playback. This procedure assumes that the IBM Video Analytics Config Tool is being used.

1. Enable video logging
    - Set the value of the <LogToFile> node in the SSEProperties.xml file to true. This file is typically located in the /watvid/sse/ssedata/config directory.
    - An additional <LogVerbose> node can be added to the file with its value set to true to provide some additional information. It is recommended that this be set to true for frame rate discovery and set to false when monitoring the log file to determine if configuration settings are optimal.
    - When <LogToFile> is set to true, information will be logged into engine-specific files in the watvid/sse/ssedata/var/S3URLReader_Logs directory. A separate log file will be created for each engine.
    - Restart the SSE whenever changing any value in the SSEProperties.xml file.
2. Start a video preview using the Configure Analytics dialog
    - Select the Streaming Video radio button in the Configure Analytics dialog. The SSE will attempt to start a video stream and the message Connecting to video source... will be displayed below the video preview panel.
    - If the SSE is able to detect the frame rate from the video stream, video frames will start to appear in the video preview panel after a few seconds.
    - If the frame rate cannot be detected in the video stream, a message box indicating that the video stream cannot be previewed will appear (it may take up to a minute for this message box to appear)

- Inspect the /watvid/sse/ssedata/var/S3URLReader_Logs/Engine_2000000000.log file (Engine 2000000000 is a special temporary engine used by the SSE exclusively for video preview).
- The following messages indicate whether the frame rate can be detected by the SSE:

  Not Detected

  fpsRational num:den = 0:0

  !!!No frame rate in stream and none specified in configuration!!!

  liveVideo HLS unknown exception: !!!No frame rate in stream and none specified in configuration!!!, exc type St13runtime_error

  CS3SVIURLReader ***INITIALIZATION FAILED*** Exception setting up video stream No Frame Rate in stream and none configured!

  Detected

  fpsRational num:den = 10:1

  Using frame rate from stream info

  fps = 10

3. Set the FPS parameter in the Camera configuration Engine Parms field in the Video Analytics Admin UI
   - If the SSE was able to detect a frame rate, set FPS to the value indicated in the log file
   - If the SSE was not able to detect a frame rate and the configured frame rate for the camera/stream is known, set the FPS to the configured value. If it cannot be determined see the section below on Frame Rate Discovery to discover the frame rate.
4. Monitor the log file to determine if the current settings are optimal

- The following log file messages will provide information that will help to determine the correct parameter settings:
    - Only logged when LogVerbose is set to true:
        - Frames Received in last second = X will be displayed each second and will reflect the actual numbers of frames being received by the SSE
        - ++++++++++ indicates a buffer full condition
        - ---------- indicates a buffer empty condition
    - Logged whenever <LogToFile> is set to true:
        - **Buffer Size : Empty Count X : X** Indicates the buffer size and the last number of consecutive buffer empty conditions
        - **Buffer Size : Full Count X : X** Indicates the buffer size and the last number of consecutive buffer full conditions
- **NOTE:** Whenever changes to the FPS, quality, or initBufSize parameters are made in the camera definition, the changes must be retrieved by the Video Analytics Config tool by clicking the Refresh Channels button.
- After setting the FPS parameter to the expected frame rate and refreshing the channel information, open the Configure Analytics dialog again, start a video preview, and monitor the log file.
    - In an optimal configuration:
        - The Frames Received messages should indicate that the frame rate is consistent with the configured FPS. The numbers displayed should be equal to the configured FPS with an occasional variance of one frame higher or lower than the configured FPS. If this is not the case, adjust the FPS setting accordingly.

- There should not be excessive Buffer Empty conditions. If the Buffer Empty messages appear frequently and have empty buffer counts in excess of 1 or 2, then the buffer size is too low which will create jitter in the video.

- There should not be excessive Buffer Full conditions. If the Buffer Full messages appear frequently and have full buffer counts in excess of 1 or 2, then the buffer size is too large and the video will have excessive latency.

- The first setting to optimize is FPS. Once the Frames Received messages indicate a consistent frame rate that matches the configured FPS, the buffer size may or may not require optimization.

  NOTE: The SSE will set the buffer size to ~2.2 times the configured frame rate if the initBufSize parameter is not configured. This is a nominal setting but in some cases adjusting it upward or downward may improve video stream quality depending a variety of factors.

- Anectodal experience indicates that video stream quality is highest when occasional Buffer Full conditions occur and degrades when Buffer Empty conditions occur. Accordingly, buffer size should be set to the point where no Buffer Empty conditions occur and Buffer Full conditions occur infrequently or not at all.

Frame Rate Discovery

When the frame rate of a video stream cannot be discovered from the stream metadata and the frame rate of the camera is unknown, the following procedure can be used to discover the effective frame rate.

1. Set <LogToFile> and <LogVerbose> to true in the SSEProperties.xml file.
2. Set the FPS parameter for the camera to an arbitrary value (use a best guess of the expected frame rate), and set initBufSize to 3 times the FPS setting.
3. Start a video preview and monitor the Engine_2000000000.log file. The log messages will start at inaccurate values but will stabilize in a few seconds.
4. Look for Buffer Empty messages. If these appear frequently and multiple consecutive buffer empty conditions occur, the FPS setting is too high. The Frames Received messages will typically vary widely when this is the case. Adjust this setting downward until Buffer Empty conditions no longer occur and the Frames Received messages stabilize. The effective frame rate will be the highest number in the Frames Received messages.

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