SureStream

CLIENT PERFORMANCE

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Document Revision

Version	Date	Remarks
1.0	10/21	For SureStream Release 7.0.0.5

Introduction

The SureStream plugin fetches real-time video directly from cameras and renders this in the XProtect Smart Client. Because of direct streaming, these video streams are not lost even during a catastrophic XProtect server failure.

This document presents SureStream performance numbers, measured in terms of Smart Client CPU usage at various stream resolutions, frame rates, and parallel streams.

Measurement Platform

- XProtect 2021 R1 from Milestone Systems.
- Smart Client Machine specifications:
  - Windows 10 Professional. 10.0.19043 build 19043
  - Intel Core i7-4720HQ @ 2.6 GHz
  - Physical Memory (RAM) 8.00 GB
  - Graphics: NVIDIA GeForce GTX 960 M
- Camera used for measurement: Pelco D6230L
  - Resolutions 1920x1080, 1280x720, 640x480
  - Frame Rates 5 fps, 30 fps
  - H.264 High Profile
  - Quality 69
  - Maximum bit rate 450 kbps
- The encoder profile, quality, bit rate, and other parameters are held constant for a single camera while measuring performance across different resolutions and frame rates to enable a fair comparison.
- Camera View: Static/Low movement.

Measurement Method

At each resolution and frame rate combination:
1. Add a single SureStream window into the Smart Client.
2. Pick camera 'X' from within this window.
3. Wait until video renders.
4. Note CPU utilization.
5. Add one more SureStream window with the earlier window still streaming video. Repeat steps (2), (3), (4). The same camera is chosen, resulting in the same stream displaying in both windows.
6. Repeat step (5).
7. Stop when the SureStream window warns about high CPU usage.
8. Repeat across different resolutions and frame rates.

Performance Numbers

Note:

- The idle CPU usage was 4%.
- The idle RAM consumption was 5.8 GB.
- An increase in memory consumption even for the highest resolution numbers at the highest frame rates below was 300MB at most.
- The peak Nvidia GPU usage measured was 50% across the tests below.
- SureStream refuses to start new streams when it measures a CPU utilization of 80% or higher.

In the figures below, the number of concurrent streams is on the x-axis and the CPU utilization (%) is on the y-axis.
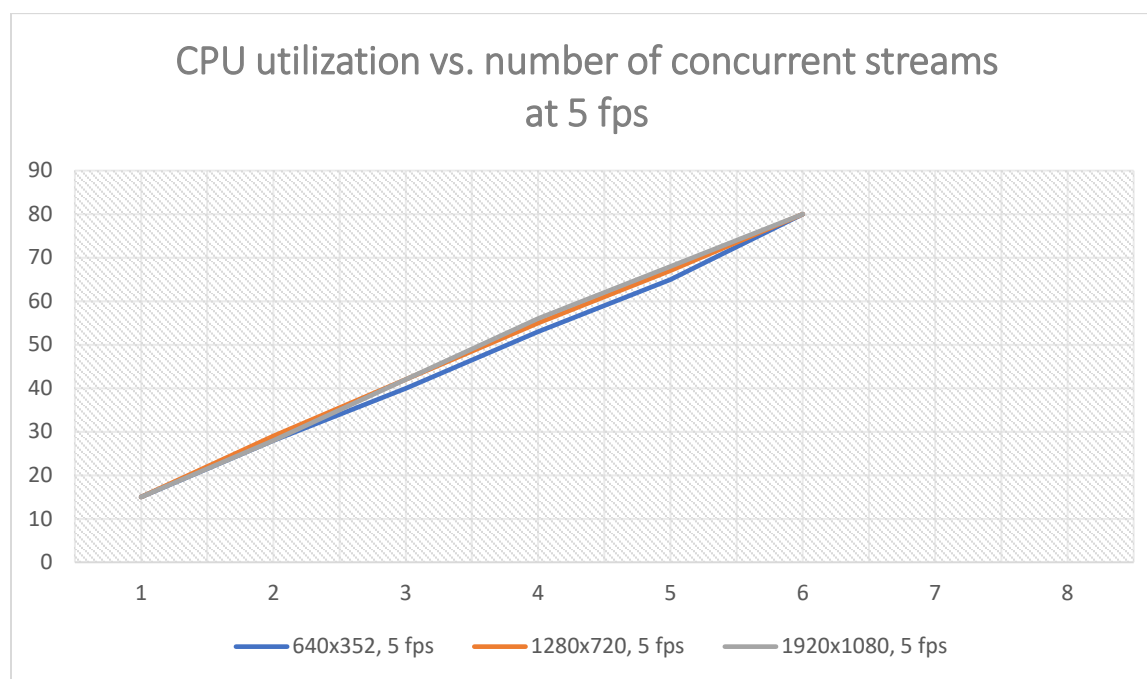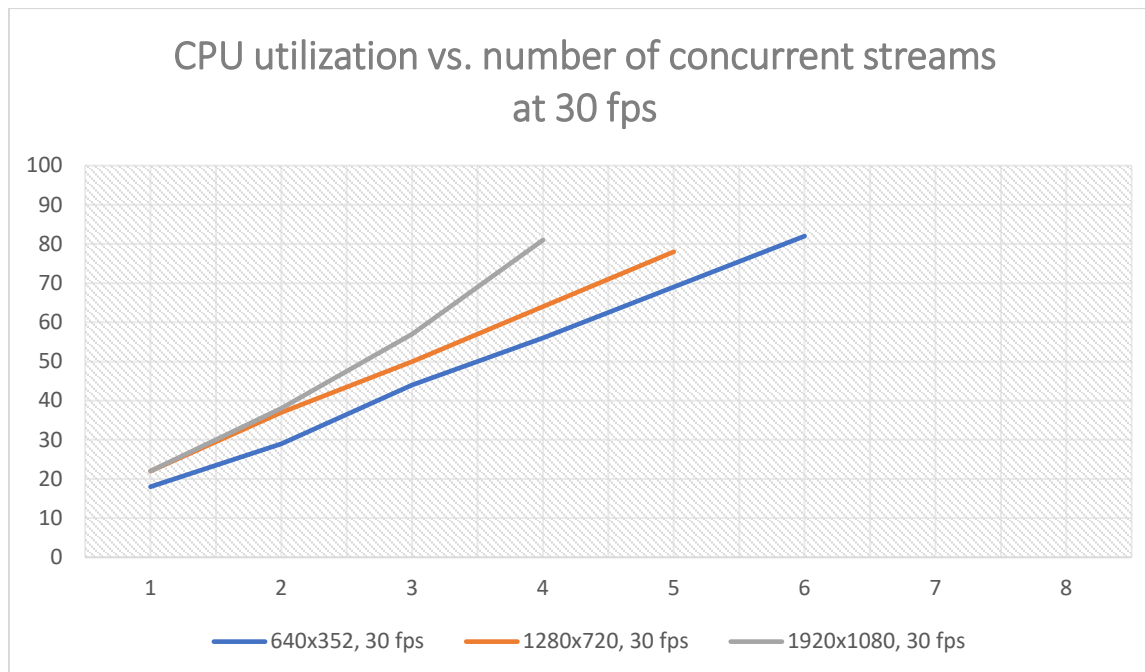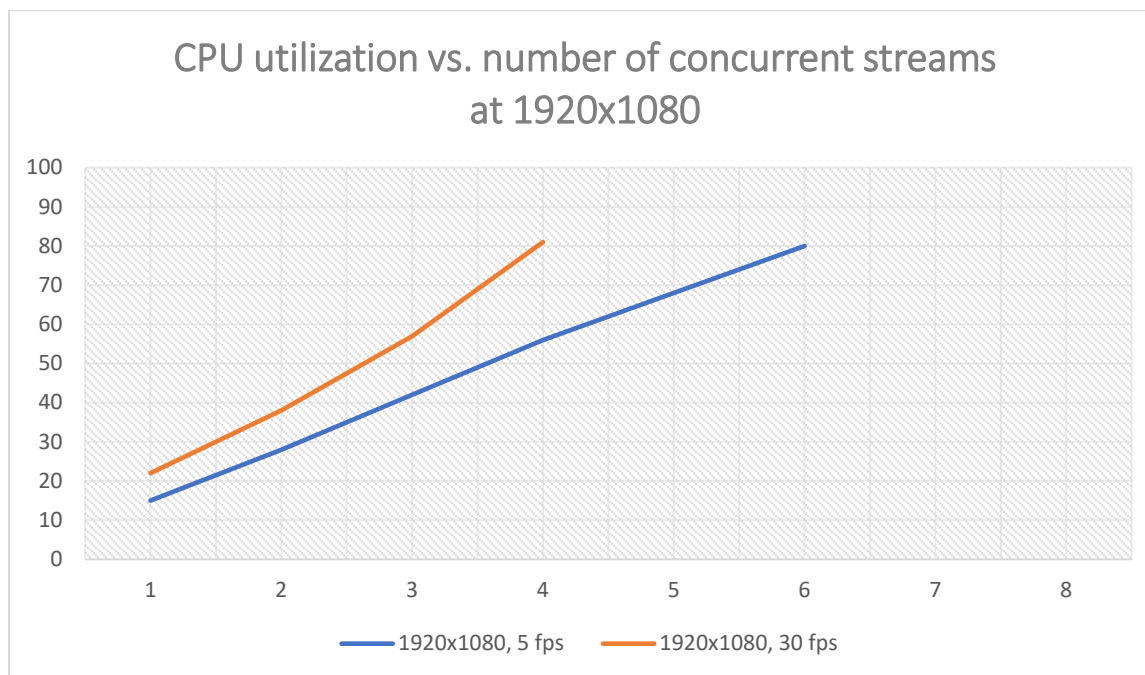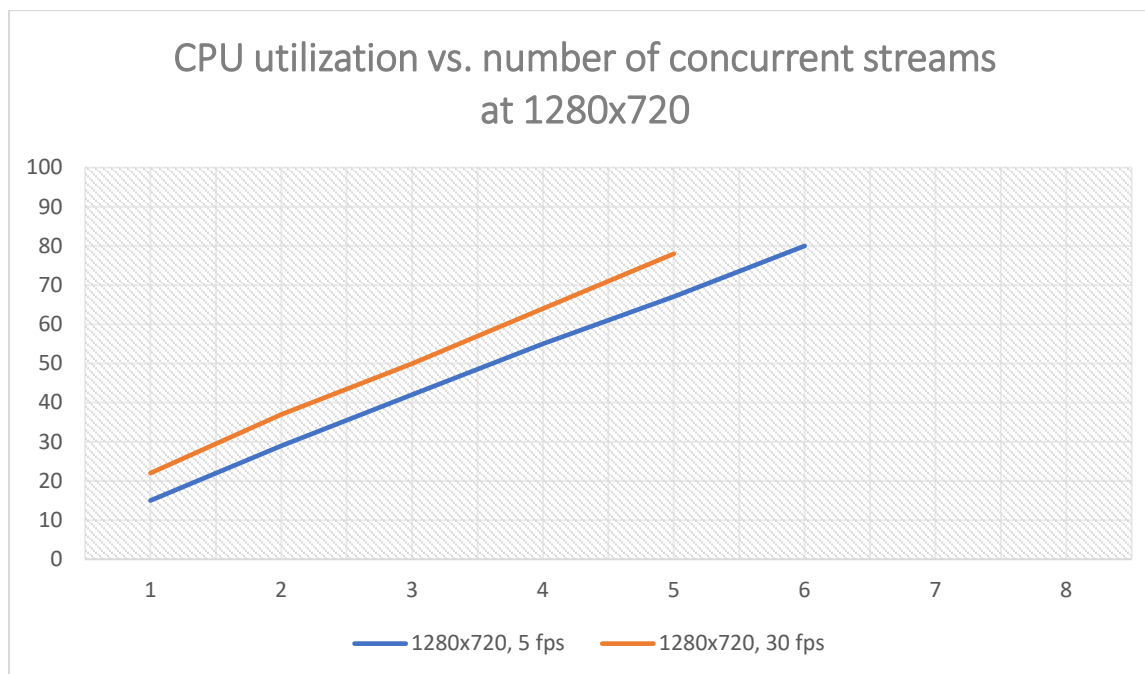

Figure 1: 5 fps

Figure 2: 30 fps

Figure 3: 1920x1280

CPU utilization vs. number of concurrent streams at 1280x720

Figure 4: 1280x720

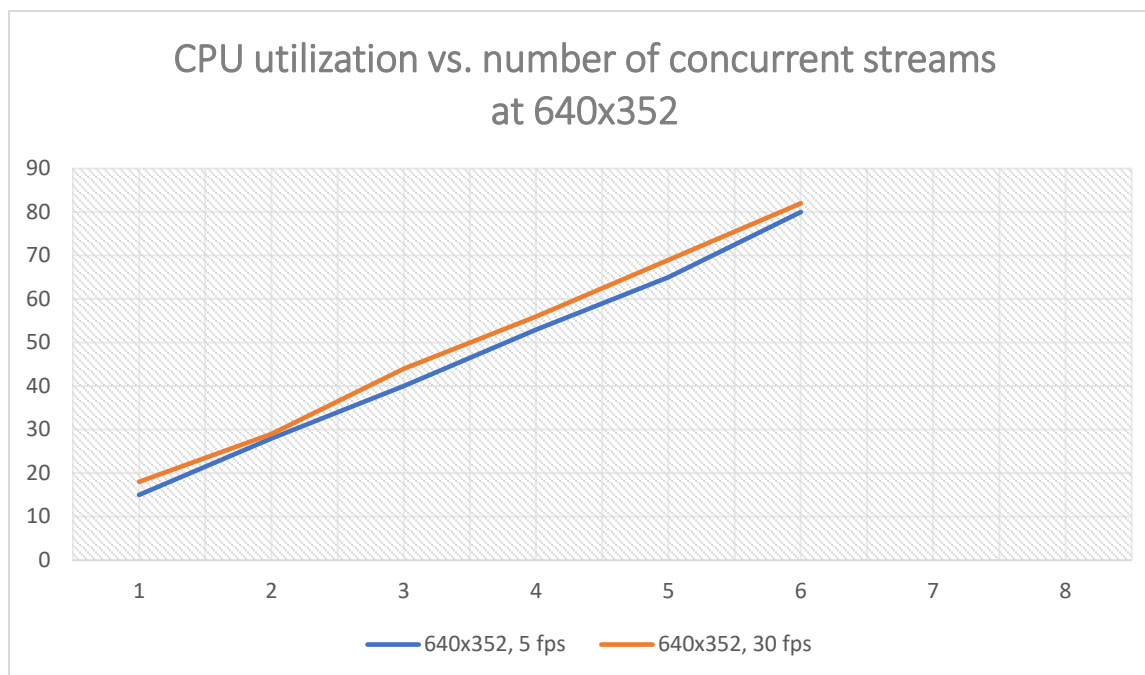CPU utilization vs. number of concurrent streams at 640x352

Figure 5: 640x352

Summary

The results presented are conditioned on stream encoding settings and will vary at different encoding set points. So, the results presented are indicative.

At present, Milestone XProtect Smart client operators use a native view matrix during regular operation. However, they switch to a preconfigured SureStream view matrix during catastrophic server failure episodes. Because a SureStream view window consumes more CPU than a native Smart-Client view window, the user will likely need to configure more than one SureStream view matrix for each native view matrix.

In the SureStream 7.0.0.5 release and earlier, video decode is performed in the CPU while video rendering is on the GPU. Future SureStream releases will move video decode to the GPU, offload the CPU, and support more live streams to enable a one-to-one view matrix map.