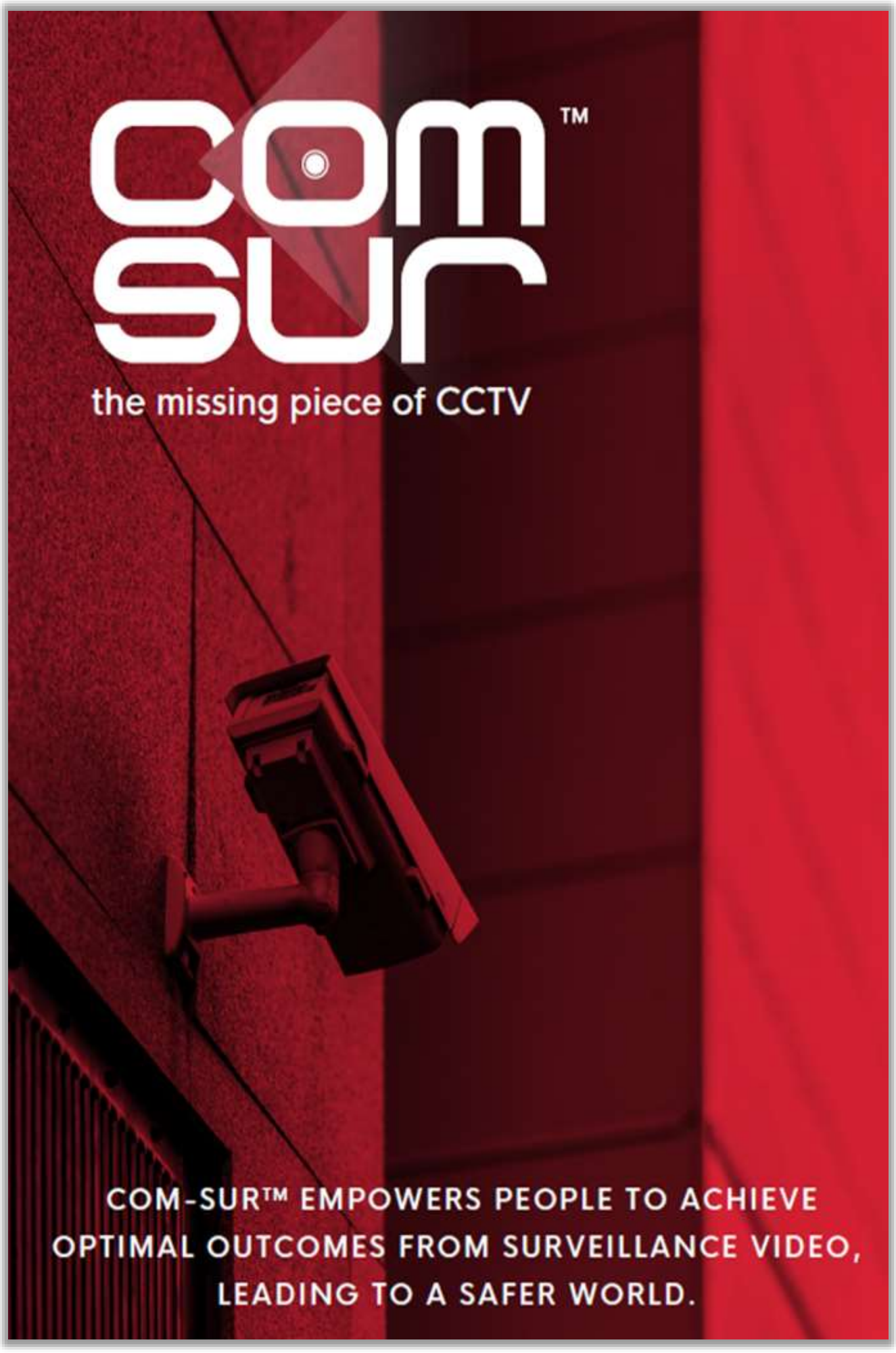
COM SUR™
the missing piece of CCTV
COM-SUR™ EMPOWERS PEOPLE TO ACHIEVE
OPTIMAL OUTCOMES FROM SURVEILLANCE VIDEO,
LEADING TO A SAFER WORLD.

Overview

It is the essence of COM-SUR to convert live or recorded video feeds from multiple cameras into screenshots at every 'one' second to reduce the volume of the 'video' to be audited (in the form of screenshots) as well as to reduce the data size of the 'video'. To achieve this, COM-SUR captures the 'moment' of 'that' one second, which is a consolidation of multiple frames (e.g., 25, 30, 60, etc.) coming together in 'that' one second. Doing so, reduces the amount of data to be reviewed, without losing any significant or substantive fidelity. While the time interval between each screenshot is generally recommended to be one second, COM-SUR allows complete flexibility for the user to determine the time interval between two screenshots, depending on the criticality of the location of where the cameras are placed, or the time of the day and/or the activity in the cameras.

For COM-SUR to take screenshots of a live/recorded video feed, the same needs to be displayed (live stream or recorded) on the monitor of the computer where COM-SUR is installed. This is done using a Video Management System (VMS)/Web browser. Essentially, since COM-SUR captures screenshots of the 'Window' (see explanation of a 'Window' ahead in this document) of the VMS/Web browser in which the video feed is displayed, if 16 cameras are displayed in a 'Window', COM-SUR will capture screenshots of those 16 cameras as a single image.

The wonderful part about COM-SUR is that just as it converts video into images, on demand, it can reconvert the images into video. This results in huge bandwidth and storage savings because now one can store the video in the form of images rather than video, at least beyond the number of mandated days for storage of video, and for the purpose of disaster recovery. Also, while video is always streamed and stored per channel, screenshots taken by COM-SUR display multiple cameras, making disaster recovery very cost-effective.

Bandwidth requirements

Bandwidth requirements: The average size of each screenshot of a 'Window' captured by COM-SUR is approximately in the range of 175 - 300 KB depending on the number of cameras captured in a screenshot. For this document, the size per screenshot has been considered to be 300 KB. While the table below provides a fair estimate of the size of the screenshots per 'Window', conditions such as image complexity, screen resolution, etc. may affect the size of a screenshot, i.e., the size may exceed 300 KB.

Number of 'Windows': As can be seen from Table 'A' and from the explanation of a 'Window', COM-SUR can capture a maximum of EIGHT 'Windows' on one computer. Thus, for EIGHT 'Windows', COM-SUR will capture EIGHT screenshots per second. Consequently, for the screenshots to be transferred in near real-time (per second) via the internet to a remote location, the upload bandwidth needed will be as shown in Table 'B'.

Table 'A'

No. of 'Windows'	Total size of screenshots
1	300 KB for 1 screenshot
2	600 KB for 2 screenshots
3	900 KB for 3 screenshots
4	1.2 MB for 4 screenshots
5	1.5 MB for 5 screenshots
6	1.8 MB for 6 screenshots
7	2.1 MB for 7 screenshots
8	2.4 MB for 8 screenshots

Table 'B'

No. of 'Windows'	No. of screenshots to be transferred per second	Total size of screenshots	Upload bandwidth required for transferring screenshots in 1 second
1	1	300 KB	2.4 Mbps
2	2	600 KB	4.8 Mbps
3	3	900 KB	7.2 Mbps
4	4	1.2 MB	9.6 Mbps
5	5	1.5 MB	12.0 Mbps
6	6	1.8 MB	14.4 Mbps
7	7	2.1 MB	16.8 Mbps
8	8	2.4 MB	19.2 Mbps

How the upload bandwidth has been calculated

The upload bandwidth as listed in the above table has been calculated and verified using the following calculator (from the section titled 'Download/Upload Time Calculator'):

https://www.calculator.net/bandwidth-calculator.html?downloadsize2=200&downloadsize2unit=KB&bandwidth2=1.6&bandwidth2unit=mb&ctype=2&x=89&y=22#download-time

Considering the size of a screenshot to be 300 KB, which is 0.3 MB (300/1000 = 0.3 MB since 1 MB = 1000 KB) the bandwidth needed to upload 0.3 MB in 1 second will be 0.3 x 8 Mbps = 2.4 Mbps. In this manner, for uploading screenshots captured from multiple 'Windows', the upload bandwidth will be calculated as 2.4 Mbps x the number of 'Windows'. For example, for 2 'Windows' the bandwidth requirement with be 4.8 Mbps, for 3 'Windows' it will be 2.4 Mbps x 3 = 7.2 Mbps, and so on.

Thumb rule: To upload a file of size of 1 MB in 1 second, a network bandwidth of 8 Mbps is required.

Download bandwidth

Just as there will be a bandwidth requirement from where screenshots are uploaded, there will be a similar bandwidth requirement where the screenshots are to be downloaded. As an example, if there are five locations which are uploading screenshots from 8 'Windows' per location to a central location, then the download bandwidth needed at the central location would be 19.2 Mbps x 5 = 96 Mbps.

EXPLAINING A 'WINDOW'

A 'Window' is essentially the display input that brings forth, and shows the user the video feed on a monitor.
A 'Window' can be that of a VMS/Browser/Media Player.
The number of cameras per 'Window' are user-defined; for example: 1, 4, 9, 16, 25, 32

TYPICAL SET UP

Typically, operators view diverse cameras using 3 to 4 monitors.