Using Proper Solution in Multi-Division Layout

Application Notes

Version <1.0>

Preface

Surveon VMS provides several layouts to display the camera live video, such 1*1, 3*3, 1+3, and 2+8. Each different layout will divide the screen into several divisions, and display the camera live video in the division.

By Surveon VMS default configuration, in order to make the live video be smooth and less CPU-oriented, multi-division view will utilize stream2 (SD) to display the video. But some customer will try to switch the all the camera video to stream1 (HD) to get better video quality.

However, in some Surveon SMB/professional/Enterprise models, sometimes customers found the CPU usage increase rapidly, and the system become slower. This is because the most of CPU resource is put to decode the high-resolution video. System is busy to decode and display the video, and has no free resource the handle the requests.

However, this case can be handled, and no need to extend any hardware. The key point to solve this case is "Using the proper the solution to each division." When you use multi-division layout, you don't need always use the highest resolution to display the camera live video. You should use "Proper" resolution. Proper solution not only help to save the CPU resource, but the image quality can be kept as well.

In this application note, you will find:
1. The reasons that why we use SD by default in multi-division view.
2. The comparison of different resolution in the same small size division.
3. The side effect when using improper resolution.
4. The recommend resolution when using different monitors.

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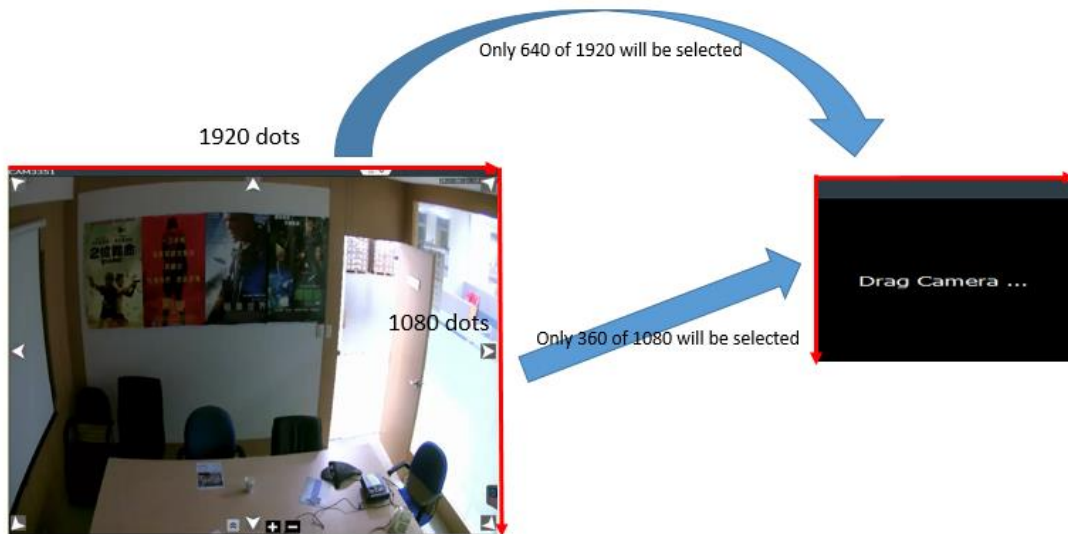
Using Proper resolution.

Using proper resolution is very important to keep your VMS system in stable state. Since the decoding will consume lots of CPU resource, if the CPU is always busy to decode the video, the system must be slow down. So, with proper resolution, you can utilize the CPU effective, see the smooth video, and whole system work in a steady pace.

So, what it the proper resolution? Assuming the resolution of your monitor is 1920*1080. And you use 3*3 layout which is divided into 9 divisions, and the entire screen is fully for displaying the live video of cameras. Each division is displayed under the size of "640*360".
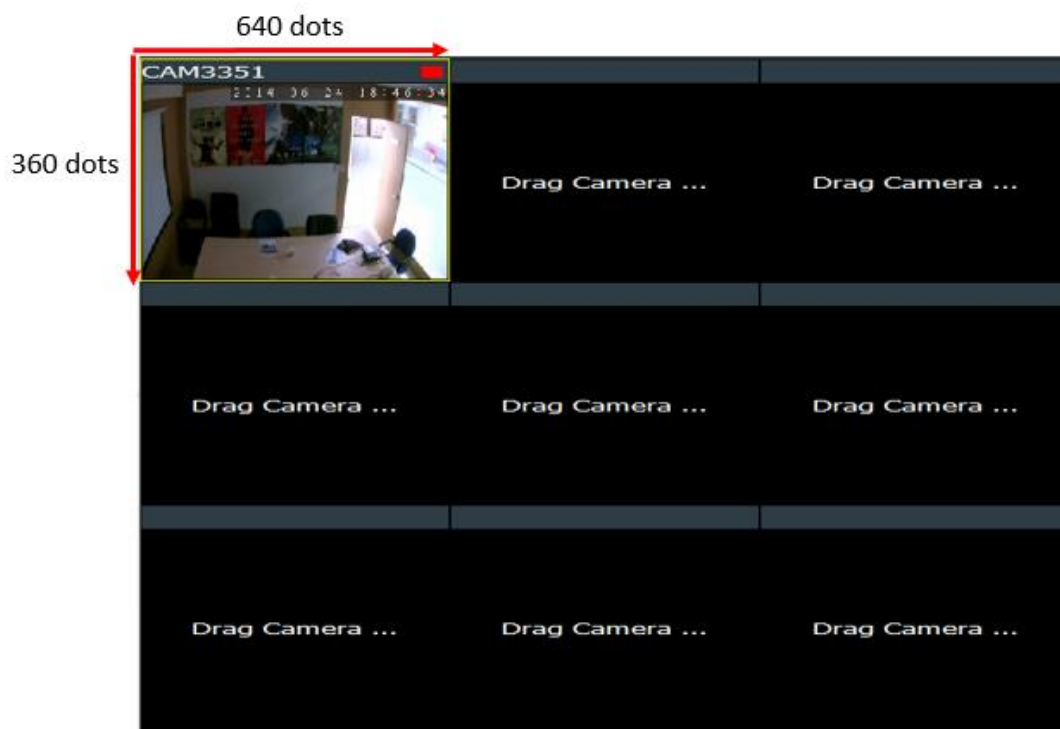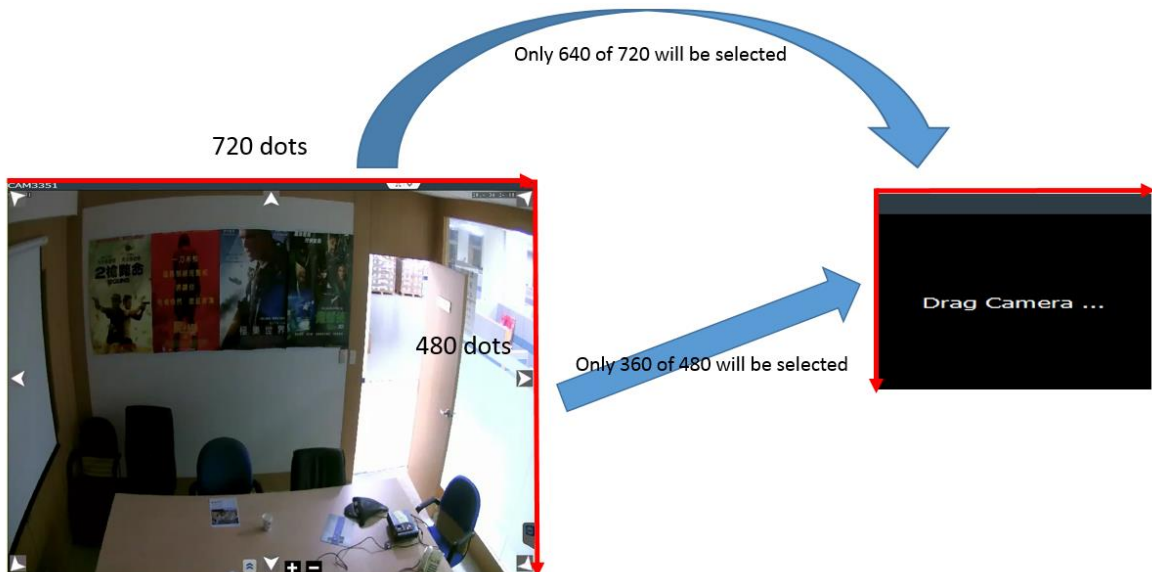

When the video resolution is larger than 640*360, there will only part of the pixels be displayed in such division. The reason is because each division can only display 640 dots in horizontal, and 360 dots in vertical. The total number of dots in one division is fixed. You can't put more dots into a fixed-size division.

For example, customers put a 1920*1080 (2M) in the division, there only 640/1920 will be display in horizontal and 360/1080 in vertical. It has no difference when you use a normal stream2 (640*360).

Only 640 of 1920 will be selected

1920 dots

Only 360 of 1080 will be selected

1080 dots

Drag Camera ...

You might ask "What if I use less quality, I use VGA (720*480)". The case is identical. There is almost no difference. No matter what size you choose, once the video source has higher resolution video than the division size, the result is always the same – Only part of dots will be displayed.

Only 640 of 720 will be selected

720 dots

Only 360 of 480 will be selected

480 dots

Drag Camera ...

Comparison of different resolution.

We utilize different resolution stream in the same size division. Here we use 3M, 1080P, 720P, VGA, and QVGA. The screen is divided into 9 divisions (3*3). All the image is captured from the same camera but different resolution streams. The image below is the original screen capture from the VMS screen, and it has not been resized or post-process. We will compare the detail of the posters which is marked in red.

You can find the result of comparison show that: Except the QVGA, there is almost no difference in 1536P/1080P/720P/VGA. So, we can have a conclusion that using higher resolution in small sized division will not have much clearer image.

Resolution	Real Image(Enlarge view for the posters)
1536P (3M)	
1080P (2M)	
720P	
VGA	
QVGA	

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Side Effect

We know there is no much difference. But what if I use higher resolution in the small divisions? As we know, all video needs to be decoded. Decoding is the main factor of CPU consumption. If you use high quality video resource, no matter you put the video in proper division size, or smaller size. It always consumes the same and pretty high CPU resource. If the total number of channel increases, the decoding task will give lots of stress to CPU.

This tells that when you use improper resolution for displaying, the cost is always high. You need spend lots of CPU to decode a high quality video, but there is almost no difference to the quality.

Besides, when the division size is small, the detail is hard to recognize. So there is no need to use a high resolution video source. This is also the main reason why we use Stream2 in small size divisions by default.

Conclusion

Please always use the proper resolution for displaying. There is no need to use too high resolution video in a small size division. In general, Stream1 is for checking the detail in the scene, and Stream2 is for daily monitoring. Using proper resolution not only helps to keep the CPU usage lower and much stable but saves the power.

According to this policy, Surveon VMS use Stream1 in 1*1 or 2*2. Such the size of a single camera live-view is large enough to recognize the detail. The others are used Stream2 by default, to save the CPU resource and extend more channels for displaying and recording.

Appendix

We provide a recommend resolution in different layout and resolution. The primary product in the market, the 1920*1080 and 2560*1600 are best-sale and popular. So please check the following table for more detail to proper resolution within different monitor resolution.

2K - Monitor SPEC

ITEM	SPEC
Diagonal Viewing Size	24" (60.96 cm)
Aspect Ratio	16:10
Optimal Resolution	1920 x 1200 at 60 Hz
Pixel Pitch	0.27 mm

2K - Recommend Resolution

Layout	Maximum Resolution per division	Recommend resolution
1*1	1920 * 1200	Stream 1 (1080P)
2*2	960 * 540	Stream 1 (SXGA or 720P)
3*3	640 * 360	Stream 2 (D1 or VGA)
4*3	480 * 360	Stream 2 (VGA or QVGA)
4*4	480 * 270	Stream 2 (VGA or QVGA)
5*5	384 * 216	Stream 2 (QVGA)
6*6	320 * 180	Stream 2 (QVGA)

4K - Monitor SPEC

ITEM	SPEC
Diagonal Viewing Size	75.6 cm / 29.8 inches (30-inch wide)
Aspect Ratio	16:10
Optimal Resolution	2560 x 1600 at 60 Hz
Pixel Pitch	0.25 mm

4K - Recommend Resolution

Layout	Maximum Resolution per division	Recommend resolution
1*1	2560*1600	Stream 1 (1536P)
2*2	1280 * 800	Stream 1 (1080P or SXGA)
3*3	854 * 533	Stream 2 (720P or D1)
4*3	640 *533	Stream 2 (D1 or VGA)
4*4	640 * 400	Stream 2 (D1 or VGA)
5*5	512 * 320	Stream 2 (VGA or QVGA)
6*6	427 * 267	Stream 2 (VGA or QVGA)

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