

Milestone Concept.

Smart Client Dewarp Plug-in.

What is dewarping?

Many cameras can today be delivered with fisheye lenses, 360 degrees lenses, and panoramic lenses. The names are many. The lens is formed so that the camera takes a picture of the surroundings. The image is of course still a 2 dimensional flat image. The picture will because it is a flat representation of a 3-d room not be dimensionally stable, straight lines will be curved and similar. You say you get a warped image. By doing image manipulation you can take sections of the image and make it look true; make straight lines straight, this process is then the dewarping.



In this article we will show how to use the MIP SDK and a specific sample to implement dewarping, but to that end it is a pre-requisite that you have, or will make, a dewarp library/function, there is no help for developing the core dewarp routines in this document. The scope for this document is that you have a dewarp routine and in this document gets a guideline for implementing it in an XProtect® Smart Client Plug-in.

Smart Client Plug-in

Using the Milestone Integration Platform software development kit (MIP SDK) you can make plugins that can execute within the Smart Client. The plug-in becomes a natural part of the Smart Client and integrates with other control native to the Smart Client. As an example, you can use the built-in *time navigation* features of the Smart Client when getting image data in play back mode.

The plug-in will execute within the Smart Client and performance will depend on the effectiveness of the routines in the plugin sharing CPU and other resources with the decoding and rendering in the Smart Client in general.

Smart Client concepts

The XProtect Smart Client window



- | | | |
|----------------------------------|--|--|
| 1. Title bar | 2. Workspace toolbar (see "Task buttons" on page 27) | 3. Application toolbar |
| 4. View (see "Views" on page 26) | 5. Position in a view (see "Views" on page 26) | 6. Tabs (on page 26) |
| 7. Panes (on page 25) | 8. Application buttons (on page 27) | 9. Timeline (see "The timeline" on page 112) |

Figure 1: Illustration from Smart Client User's Manual (2013 version, page 25.).

In the Smart Client you have views that consist of one or multiple viewitems (positions (#5 on the illustration)). A view item can be an imageview showing the cameras of the XProtect system, specialized camera views like hotspot or carousel, special views like maps, the possibilities are many, and you can extend the possibilities by making a viewitem plug-in.

MIP SDK sample “RGBVideoEnhancement”

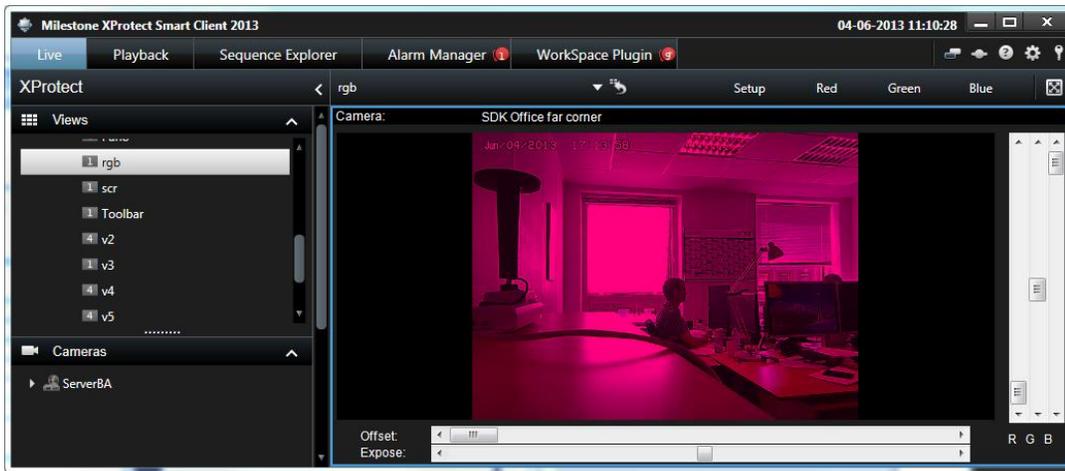


Figure 2 Smart Client, Showing a view with only one position or viewitem. The viewitem is the RGBVideoEnhancement sample.

This sample gets images from the XProtect server using a *BitmapVideoSource*, which for some kind of image manipulation or image analysis is the simplest format to use. It is possible to use *JPEGVideoSource* and *RawVideoSource* as alternatives.

The route for the data is that the recording server records the images, or GOPs, unmodified. When the recording server is asked for the data in Bitmap format it will decode the data, transforming the images to bitmap format and the send it to the clients that have requested the data. Note that these video sources can be shared among multiple clients without costing extra server processing power when the clients are getting live image data.

The sample uses an RGBEnhancement toolkit, which is also part of the samples, to transform the images. In the sample this is a very basic color manipulation. This must of course be replaced by functionality that does the dewarping. As mentioned in the start of this document you must implement the dewarp, there is no help for this in the sample, in this document or in SDK Support.

The resulting images are presented in a standard *PictureBox* control; it can be replaced by other ways of displaying images.

How to start the developing

There are two ways of going about developing your dewarp plug-in.

In general it is recommended to start a new plug-in development as described in the SDK document: *Plug-in Development - Getting Started*. This means using the template “*MIPPluginAIIVS2010*”, doing this you will get a good skeleton for the dewarp plug-in, you can then copy and paste code from the *RGBVideoEnhancement* sample. You will need to remove classes not used before you release or deploy your plug-in.

Another option is to copy the *RGBVideoEnhancement* sample, rename the sample namespace/classes, a global search and replace should do it, replace the GUIDs of the sample with new ones. If the GUIDs are not replaced your plug-in will not work if a user has the SDK (or has a plug-in where somebody else did not replace the GUIDs). The GUIDs to replace are all near the top of the *RGBVideoEnhancementDefinition.cs*. If your plug-in does only dewarping, and does not use additional elements of the XProtect Smart Client than the sample does, this is an easier way to get started and quickly be “half done”.

Your plug-in will consist as a minimum of a dll file and a plugin.def file. These files must be put in

- C:\Program Files (x86)\Milestone\MIPPlugins (using a 32 bit Smart Client in a 64 bit Windows environment)
- C:\Program Files\Milestone\MIPPlugins (all other deployments)

(%PROGRAMFILES%\Milestone\MIPPlugins\“your-plug-in-name”\)

You should consider doing a small installer for this.