Fully Integrated

milestone

IMAGUS – MILESTONE INTEGRATION INSTALLATION AND USER GUIDE

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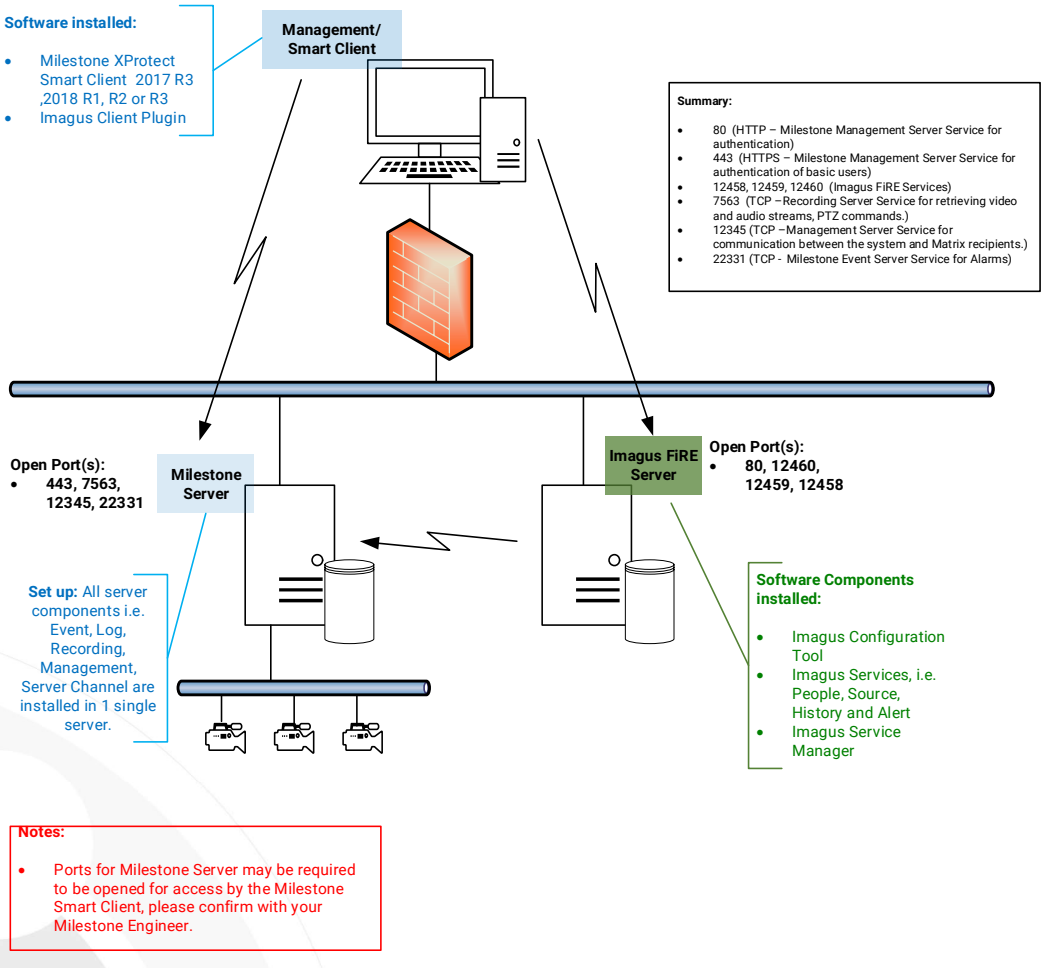
1. Introduction

Imagus has seamlessly integrated its Facial Recognition Engine with Milestone XProtect video management software. This integration enables surveillance staff to use access face recognition databases and alarms directly within the XProtect Smart Client, and also for system maintainers to configure Face Recognition through XProtect Management client without having to leave the Milestone ecosystem.

1.1 High-level Milestone XProtect VMS Product Support Matrix

Milestone XProtect VMS Products	XProtect Expert	XProtect Express+	XProtect Professional+	XProtect Corporate
Supported Version with Imagus Facial Recognition	✓	✓	✓	✓

1.2 System Set up Overview



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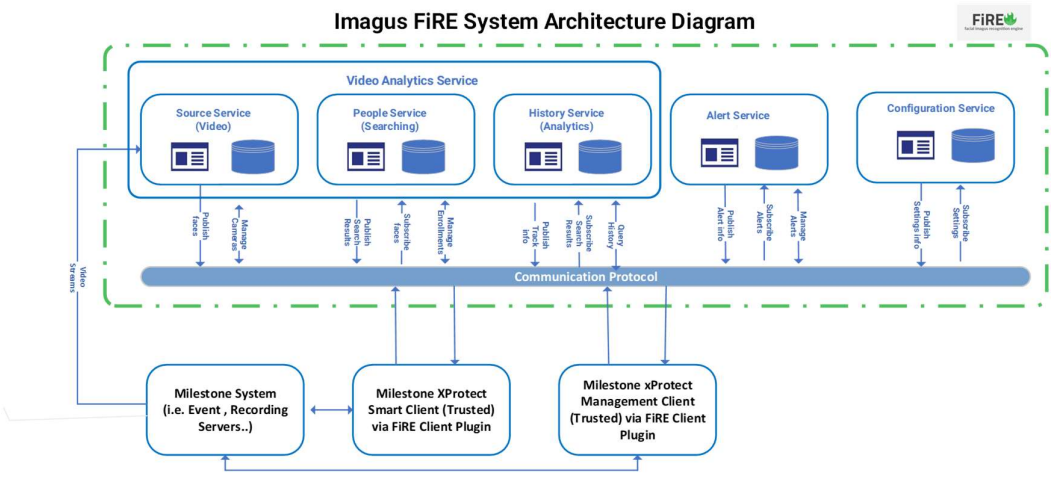
1.3 System Architecture Diagram



2. Purpose

This document provides a guide on integrating Imagus Face Recognition Engine (FiRE) with the Milestone Video Management System. This document will not address advanced features of installation such as clustering if these are needed, please contact your Imagus distributor.

3. Installing Imagus FiRE

1. Run the supplied Installation File, and the screen below will be displayed.
2. The data folder needs to be on a drive with a large amount of free space, currently approx. 1GB per camera per day stored. It all depends on the number of faces seen per day; please contact your Imagus FiRE distributor for assistance in calculating. An SSD drive is required for the Imagus FiRE installation.
3. If you are running a single Imagus FiRE server, please leave the cluster options as default otherwise contact your Imagus FiRE distributer for advance setup assistance.
4. Click on the ‘Install’ button to start the installation process.

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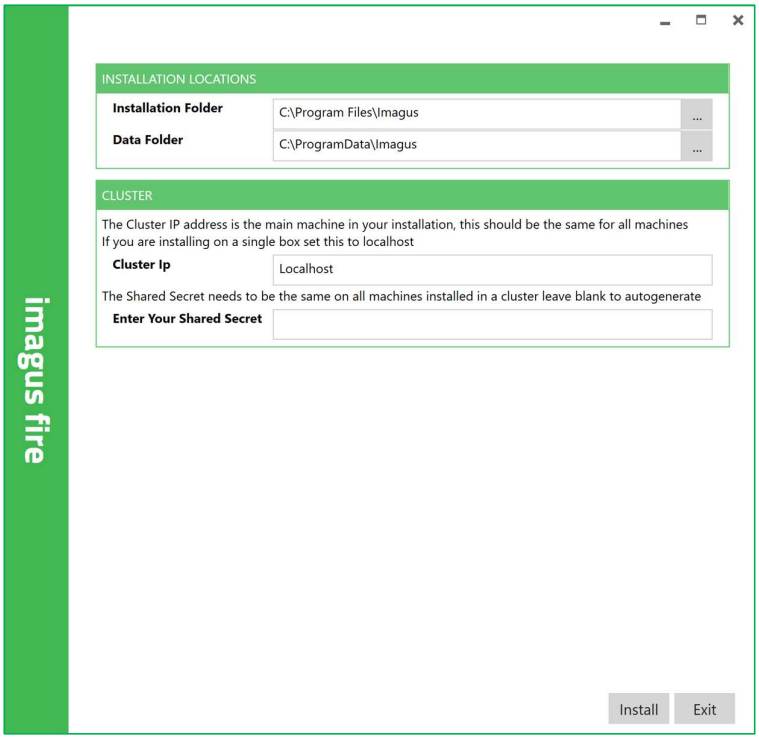

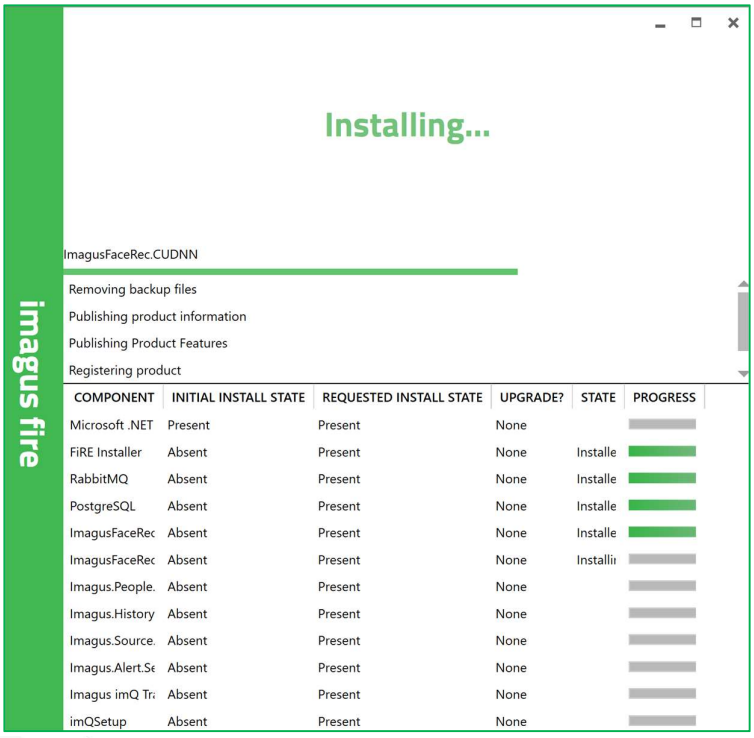

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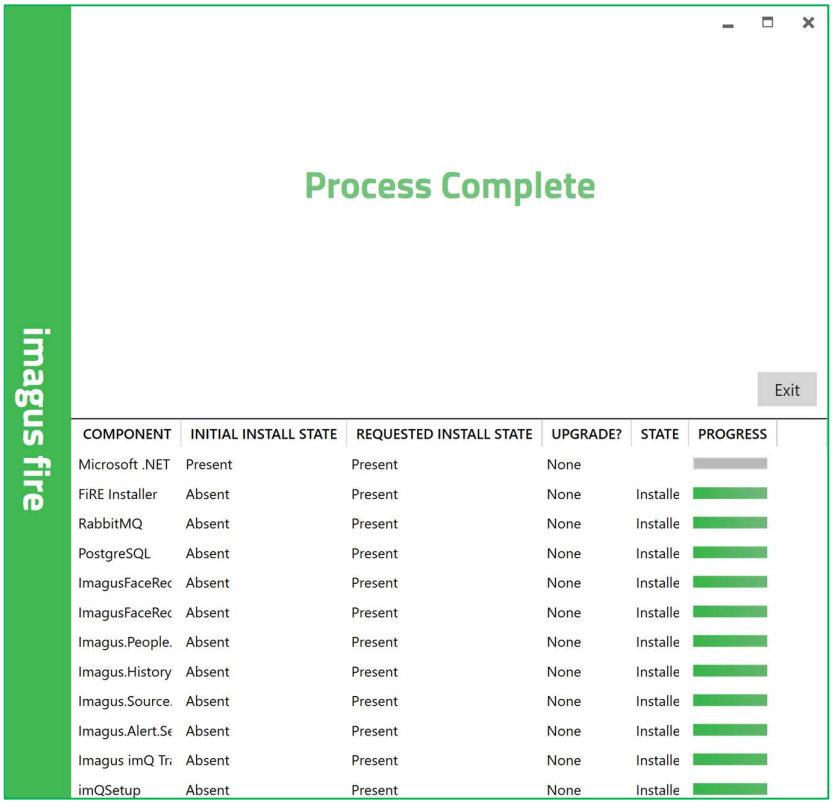

5. Click on the ‘Exit’ button when the installation is complete.

4. Installing Milestone Client Plugin

The Milestone plugin needs to be installed on all machines running the XProtect Smart Client, and also all machines where the XProtect Management Client is used.

Run the Milestone Plugin Installer, and the files will be installed to the following location *C:\Program Files\Milestone\MIPPlugins\Imagus*.

Note: Please ensure XProtect Smart Client version installed on your machine is either version 2019 R2 and above.

5. FiRE Software Configuration

- Launch the ‘Imagus FiRE Configuration’ application.

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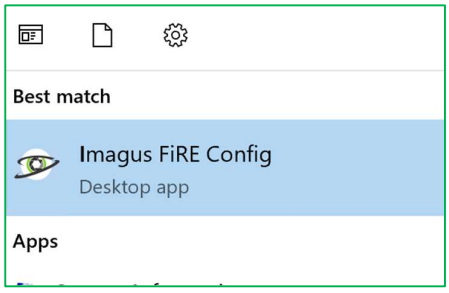
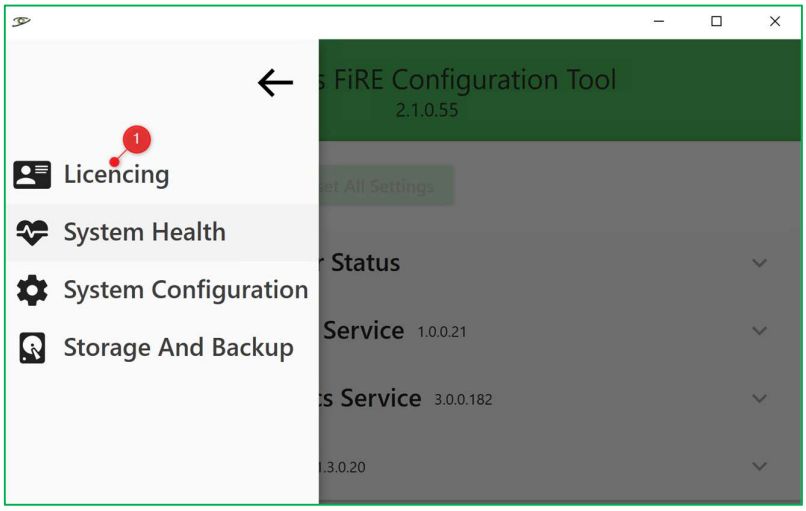


5.1 Licencing

To licence the product, please contact your Imagus FiRE distributor and supply them with the host ID displayed on the licencing page, they will provide you with an appropriate licence.

1. Select the ‘Licencing’ option.



2. Click on the ‘COPY HOSTID’ button and forward this information to Imagus to generate the licence key file.
3. Click on ‘ATTACH LICENCE’ button to attach the licence key file received from Imagus.
4. The system displays the licence number of camera streams. This figure is 0 before the application of the licence key to the system.

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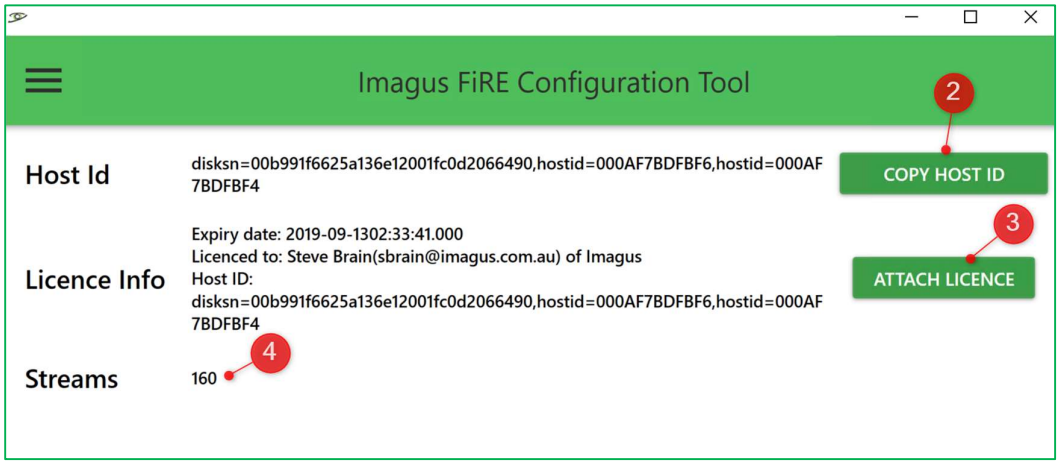
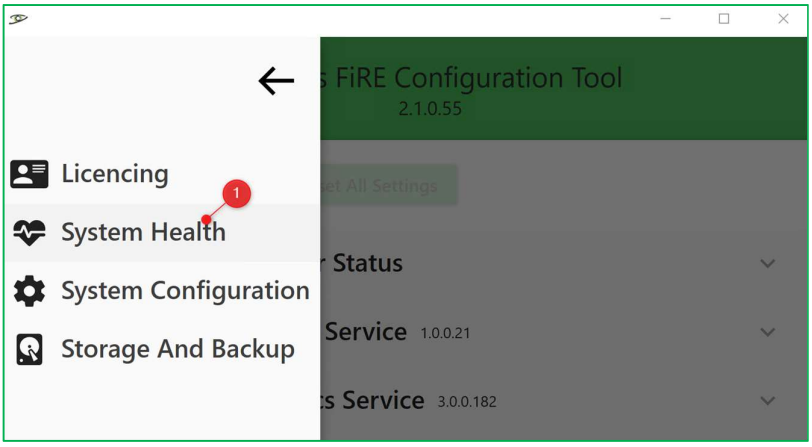


5.2 System Health

1. Select the 'System Health' option to check and ensure all Imagus FiRE Services are running.



2. After each install, all services will be stopped. Please press the play button to start them.
3. There are 2 checks next to each item, for the CUDA status, the first checkmark indicates the correct Nvidia driver is installed, the second check indicates the Imagus Facerec Engine is correctly using the driver.
4. For all other items, the first check shows the service is running, and the second check shows that it is communicating.

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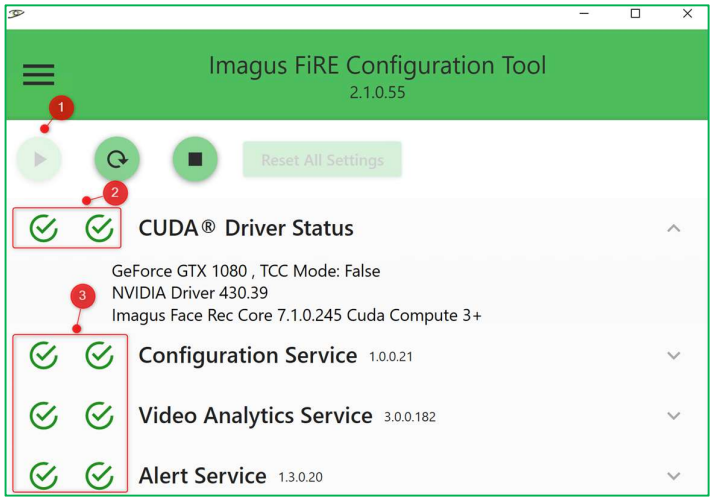
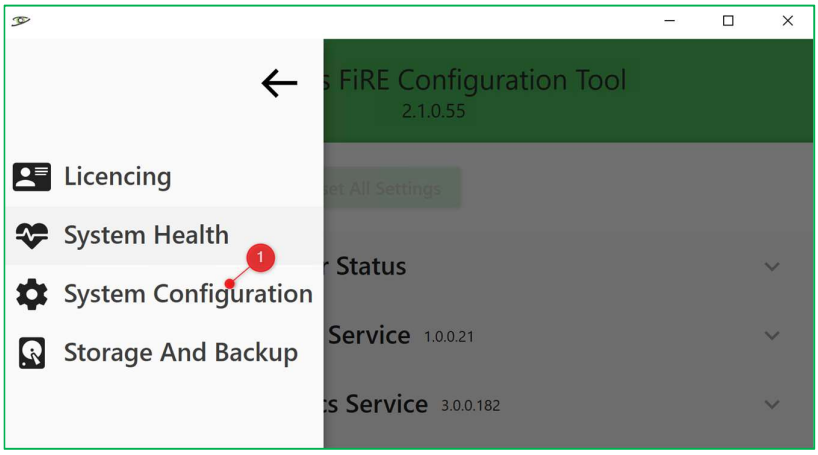


Figure 1: All services are running with NVidia Card.

5.3 System Configuration

1. Select the 'System Configuration' option.



By default, the system will be configured for a single server installation. If you are planning to have more than a single Imagus FiRE server, please contact your Imagus FiRE distributor for advanced support.

2. This is the IP address for the main Imagus FiRE server. By default, it is set to the localhost of this machine. This address is used to set up Milestone XProtect Smart Clients with the address to contact the Imagus FiRE Server. Only change this if the clients have a problem connecting.

3. Face Algorithm: Leave as the default unless instructed by your supplier.

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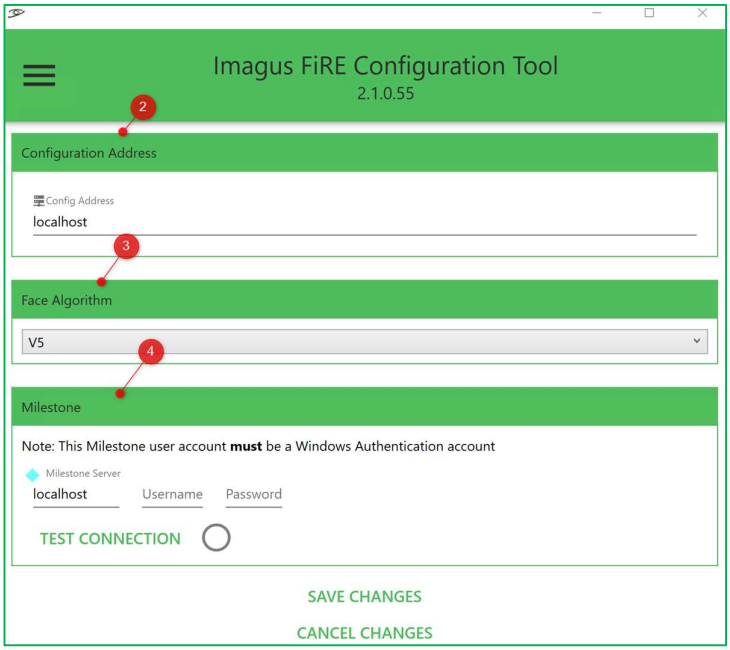
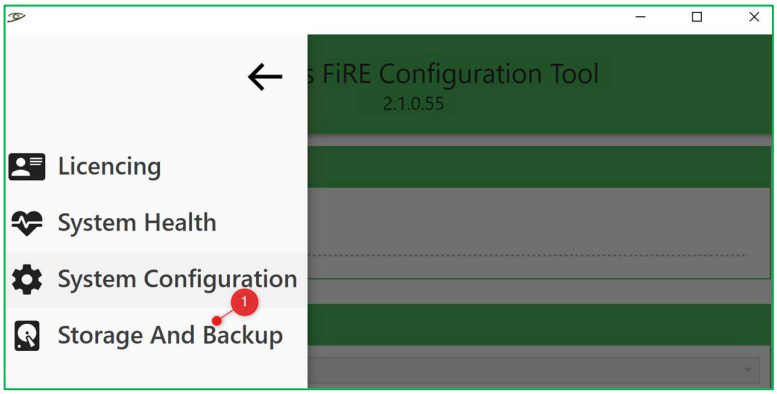
4. Milestone connections: This is the connection details for the Milestone management server. It must be a Windows account; please make sure this tests valid before saving. Once saved, the Imagus FiRE server details are entered into the Milestone configuration, and all future setup is completed in the Management Client.



5.4 Storage And Backup

1. Select the 'Storage And Backup' option.



2. Storage:
   a. Delete Metadata History: The number of days to keep history metadata online before system housekeep it. The default is 30 days.
   b. Delete Face Images: The number of days to keep face images data online before system housekeep it. The default is 20 days.

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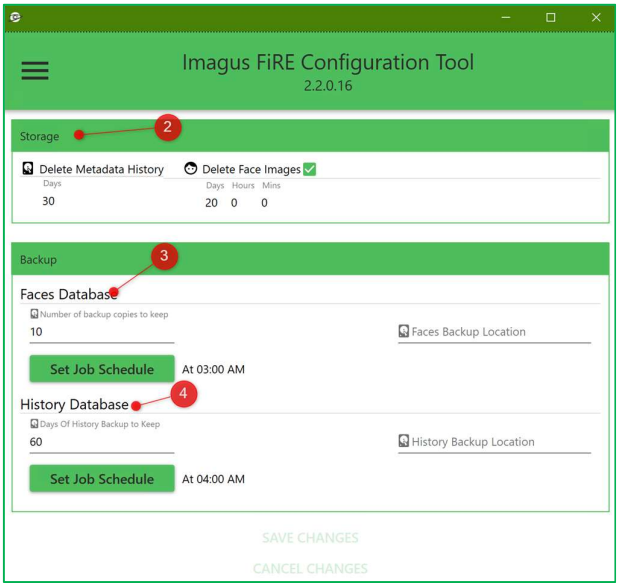
3. Backup – Face Database: The number of backup copies to keep to a specified location. The default time for the job to run is set at 03:00 AM.
4. Backup – History Database: The number of days to keep history data online before system housekeep it to a specified location. The default time for the job to run is set at 04:00 AM.



6. Milestone Management Client Software Configuration

- Launch Milestone Management Client Application.

Note: Please ensure XProtect Management Client version installed on your machine is either version 2019 R1 and above.

6.1 Setting up Video Source

1. Go to Devices → Camera to enable the Facial Recognition for a selected camera in the Milestone System.
2. Click on the 'Imagus Setup' tab.
3. Check on the 'Enable Facial Recognition' checkbox to enable facial recognition for the selected camera.
4. Select the camera stream to perform facial recognition.
5. Select the detector frame rate at which the detector will base on.
6. Change the minimum and maximum face size in pixels here to change the size of the face detected in the frame.
7. Click on 'Add Mask' button to mark region from facial recognition.
8. Click on 'Remove Mask' button to remove mark region from facial recognition.

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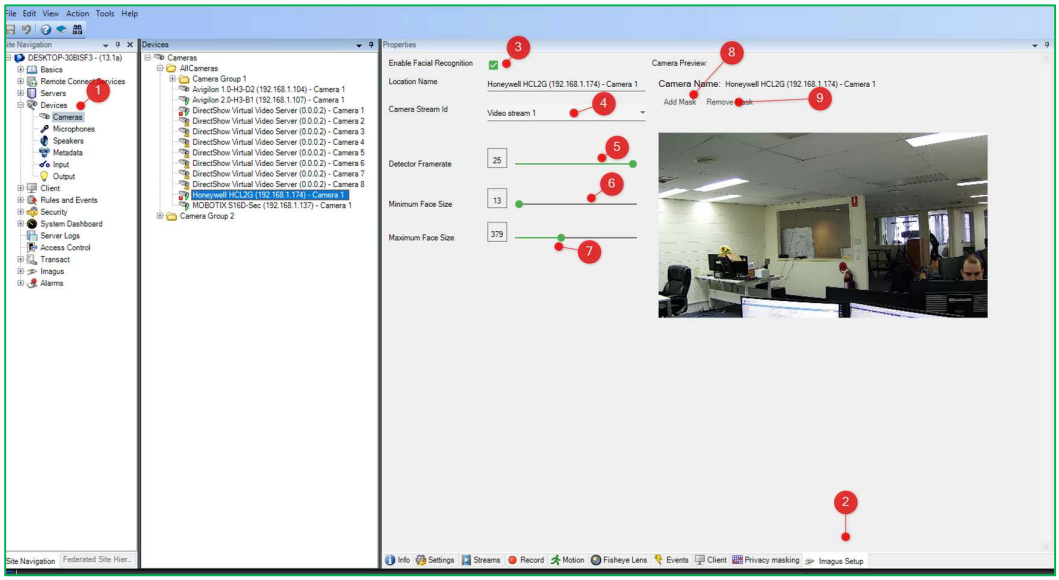
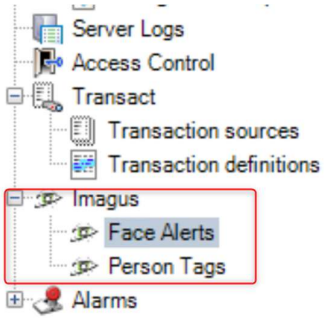


6.2 Alert Configuration



Every person in the face database can be annotated with user-defined tags. These are simple text strings. All alerts in the Imagus FiRE system are configured using these tags. A Smart client will be presented with a predefined list of tags from which they can pick.

An alert is generated when a person is recognised above a certain threshold, and they have tags that match those set up in the alert.

6.2.1 Setting up Tags

1. Go to Milestone Management Client → Imagus → Person Tags to set up tags for the alert in the Milestone System.

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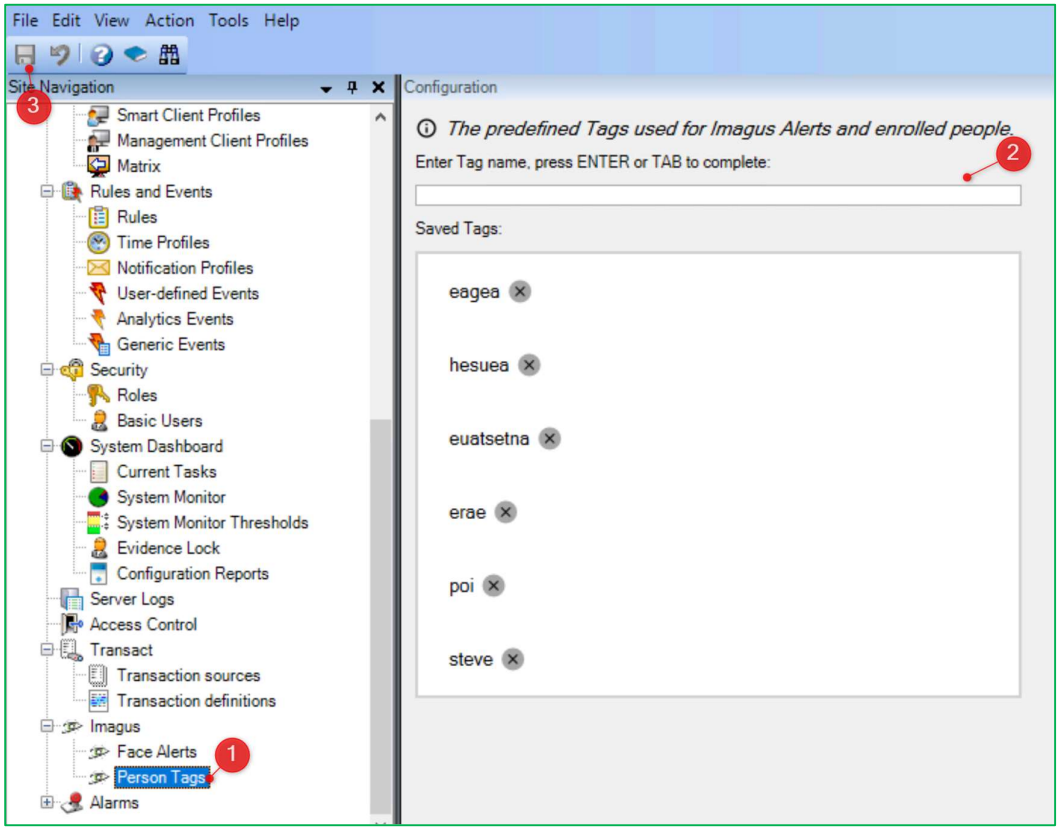
2. Enter the tags that you predefined in the Milestone Smart Client. If you entered a tag that already exists in the system. The system will prompt you an error.
3. Click on the ‘Save’ icon to save the settings.



6.2.2 Setting up Alerts

1. Go to Imagus → Face Alerts to set up alerts in the Milestone System.
2. Right-click on the Face Alerts and choose the option ‘Add New’ to add a new alert.

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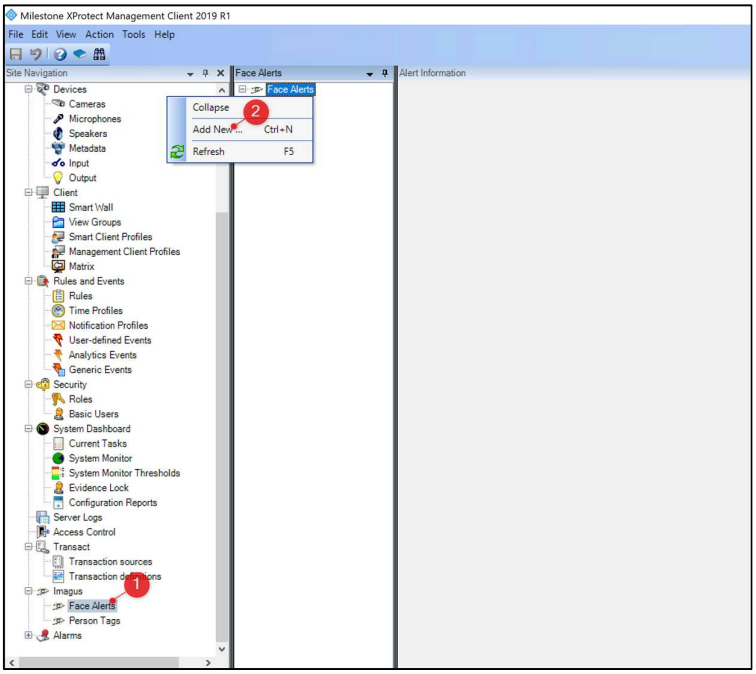
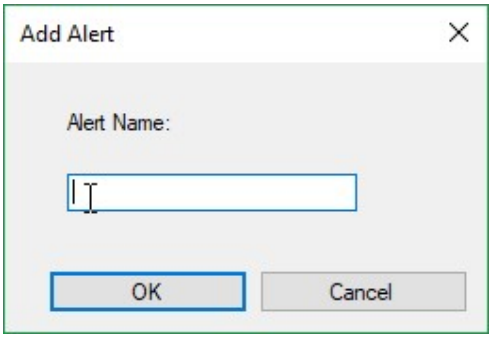


3. You will be prompted with the below pop-up message box. Enter the name of the new alert, e.g. 'POI' and click on the 'OK' button to proceed to the next step. Otherwise, click on the 'Cancel' button to close the message box.



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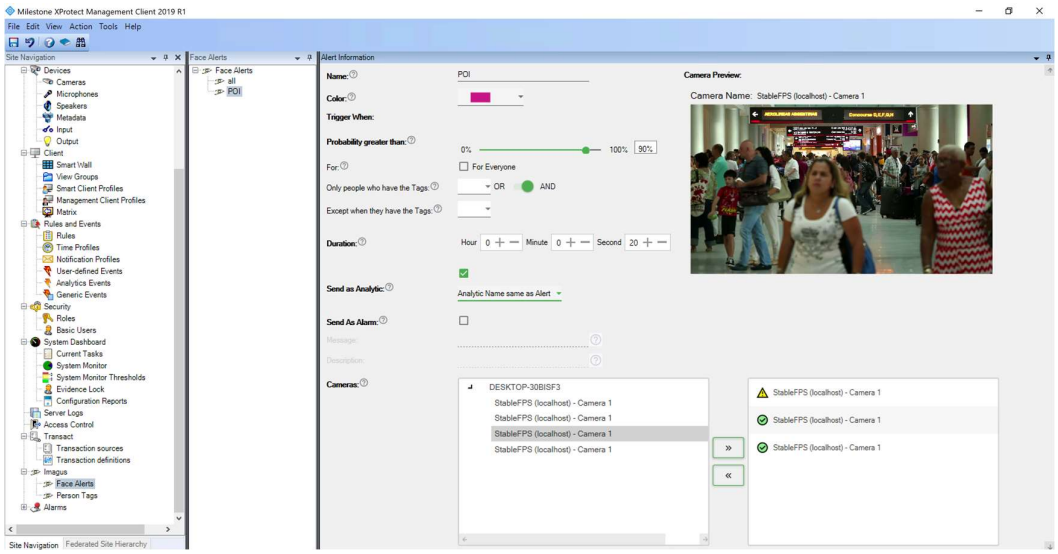
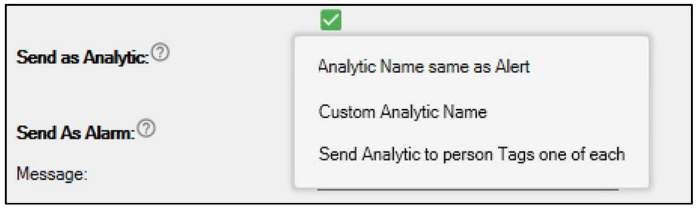


4. Enter the information below for the new alert:
    - Name – The alert name specified, e.g. ‘POI’;
    - Colour – The colour of the alarm border to be displayed.
    - Trigger when:
        - ***Probability greater than*** - Default is 90%. The % of how similar/close the face is to the face that you want to match with;
        - ***For*** - If ‘For Everyone’ option is checked then alert will be triggered for everyone who is seen by the camera;
        - ***Only people who have tags*** – Specify the tags to be alerted. This option is enabled when the ‘For Everyone’ option is not checked;
        - ***Except when they have the tags*** – Specify the tags to be excluded.
        - ***Duration*** – The time-lapse between alerts reoccurring;
        - ***Send an analytic*** – This option allows you to create a Milestone Analytics Event. However, you are required to specify the rules for the event in the Milestone System. Below are the available options:



        - *Analytic Name same as Alert* – The analytic will have the same name as the Alert, i.e. POI;

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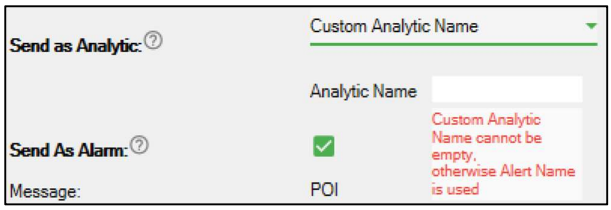
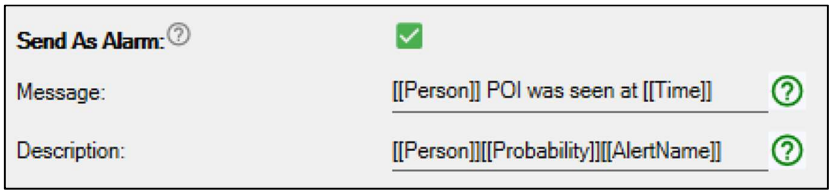
- *Custom Analytic Name* – You can specify a custom name such as 'Violent', 'Theft' etc. It cannot be left blank. Otherwise, it will be default with the Alert Name.



- *Send Analytic to person Tags one of each* – If this option is selected and there is a face match, the system will send the corresponding analytic events based on the number of tags that a person has. For example, if this person has three tags,
- namely 'Theft', 'Violent', 'Blacklist', then the system will trigger three analytic events with the name as such.

- ***Send an alarm*** – Check this box if you want to trigger this alarm as a Milestone Alarm. Enter the below information with the system provided parameters:



- Message – A message that you can configure with the below system parameters that will be displayed in the Alarm Manager Tab under the Alarm List's field 'message'.
  - [[Person]] – Person identified that raised the alert;
  - [[Time]] – Timestamp of when the alert is raised;
  - [[AlertName]] – Alert Name;
  - [[Probability]] – Probability of match in %;
- Description – You can compose an instruction using the above-provided system parameters. This instruction will be displayed under the Alarm Manager Tab by double-clicking on the Alarm list.
- For more details, please refer to Section 16.

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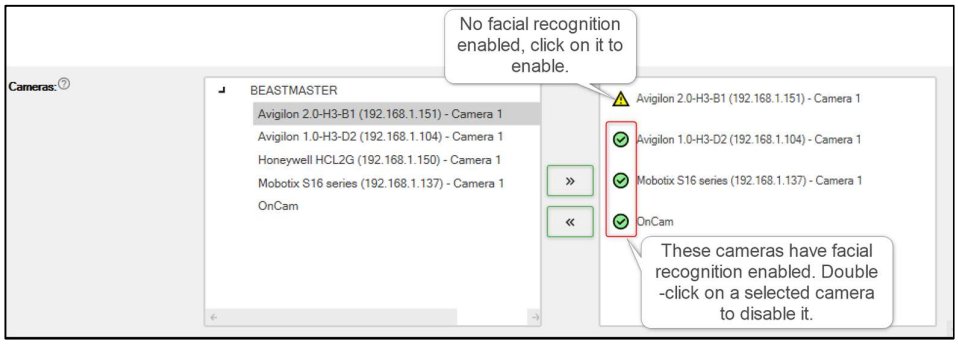
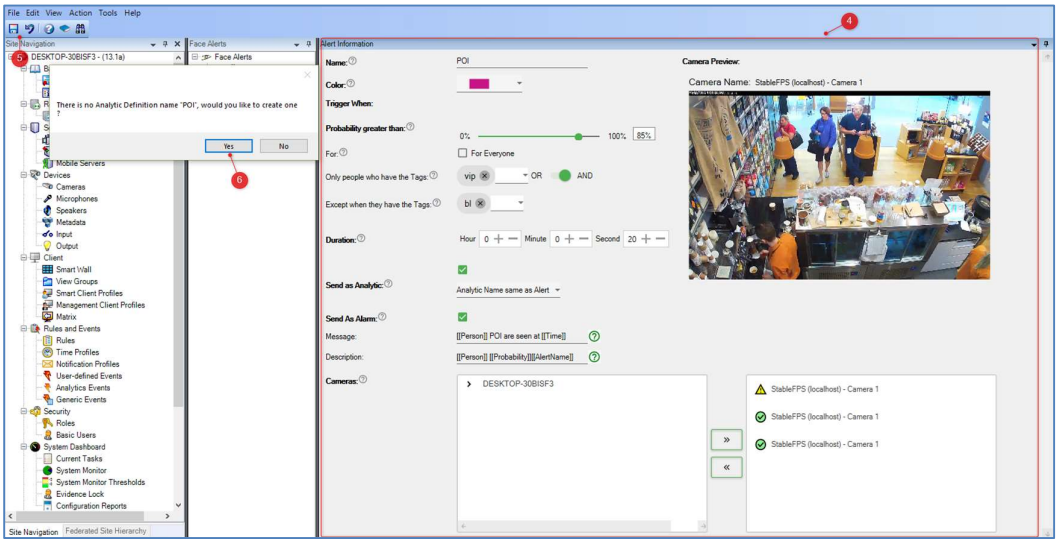
- ***Camera*** **–** select a list of cameras from an available list for facial recognition;



5. Click on the ‘Save’ icon to save the settings.
6. The system will prompt you a message and click on ‘Yes’ button to create the alert.



6.3 User Access Control

System Administrators have an option to restrict Imagus facial recognition functionality access rights to specified users.

6.3.1 Create a basic user account

1. Go to Security → Basic User → Create Basic User option to create a basic user account with specified Imagus facial recognition functionality access rights.

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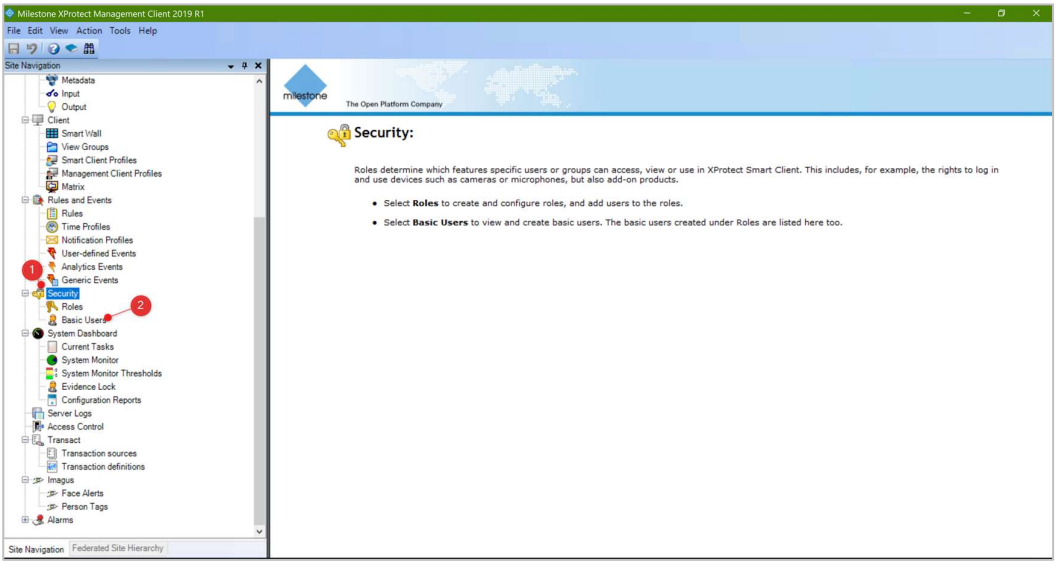
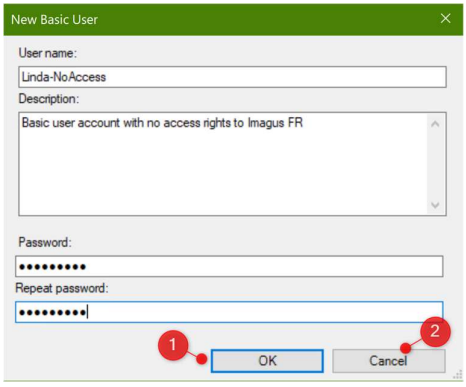


2. The below screen will be displayed. Enter the below information and click the ‘OK’ button to save the details or ‘Cancel’ button to exit.

   - User name – Basic user account name;
   - Description – Description of the user account to be created;
   - Password – Set a password to access the Milestone System;
   - Repeat password – Repeated password for verification;



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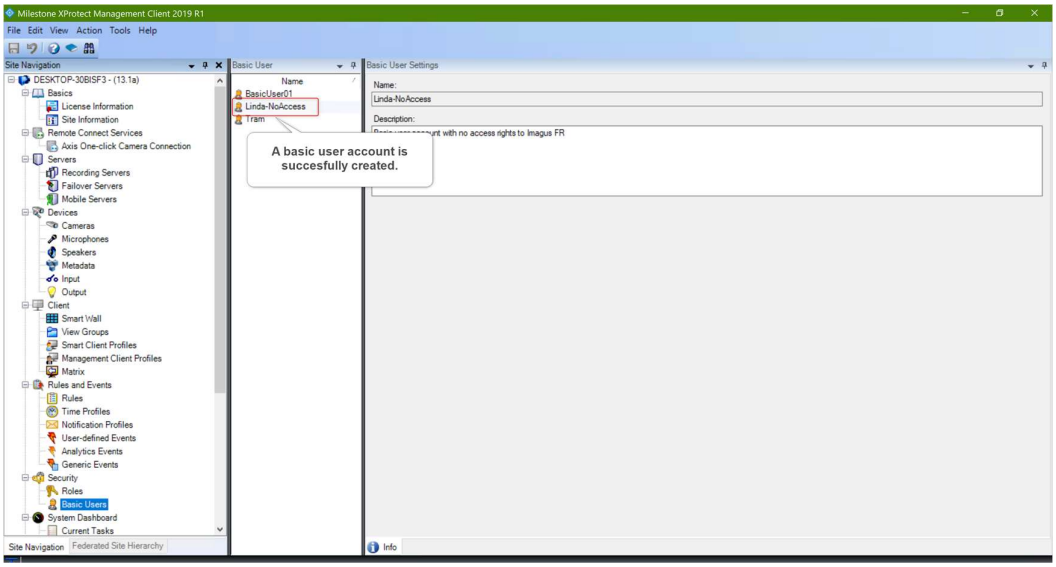

6.3.2 Set security/access rights to a role

1. Go to Security → Roles and select a role e.g. BasicUser (Basic User with limited access)
2. Click on the ‘Overall Security’ or ‘MIP’ Tab, navigate to select ‘Imagus’ security group option under Role Settings.
3. Below security options will be displayed for access right settings:

    - Full Control - Ability to edit, view people database, view history as well as managing security;
    - Edit people database – Ability to make changes to people enrolment records in people database;
    - Show people database - Ability to view people enrolment records in people database;
    - View History - Ability to view and search historical data;
    - Manage Security - Ability to manage security;

4. Select/Check on the security options that this role group can perform and click on the ‘Save’ option to save the settings.

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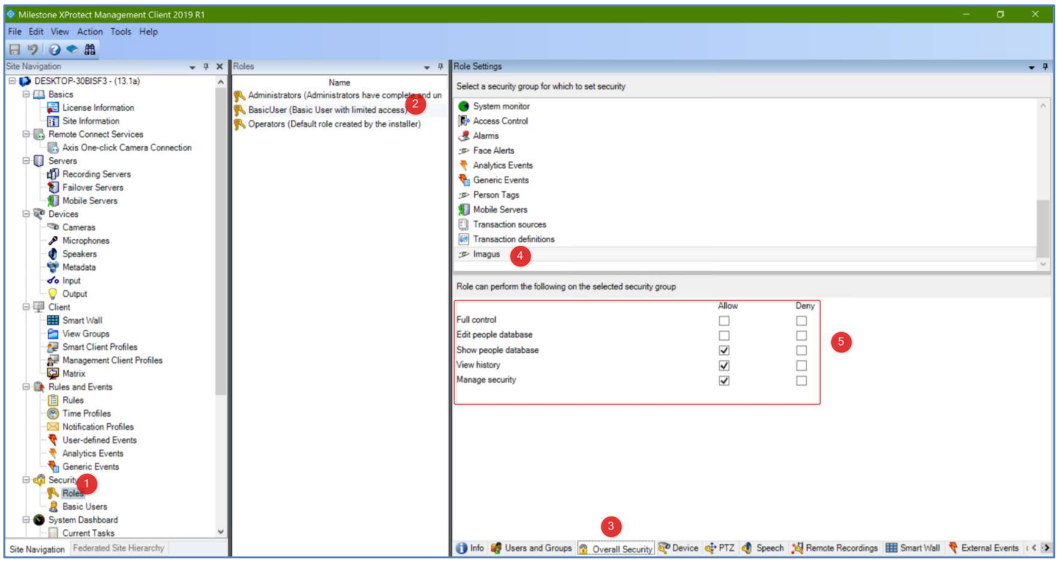

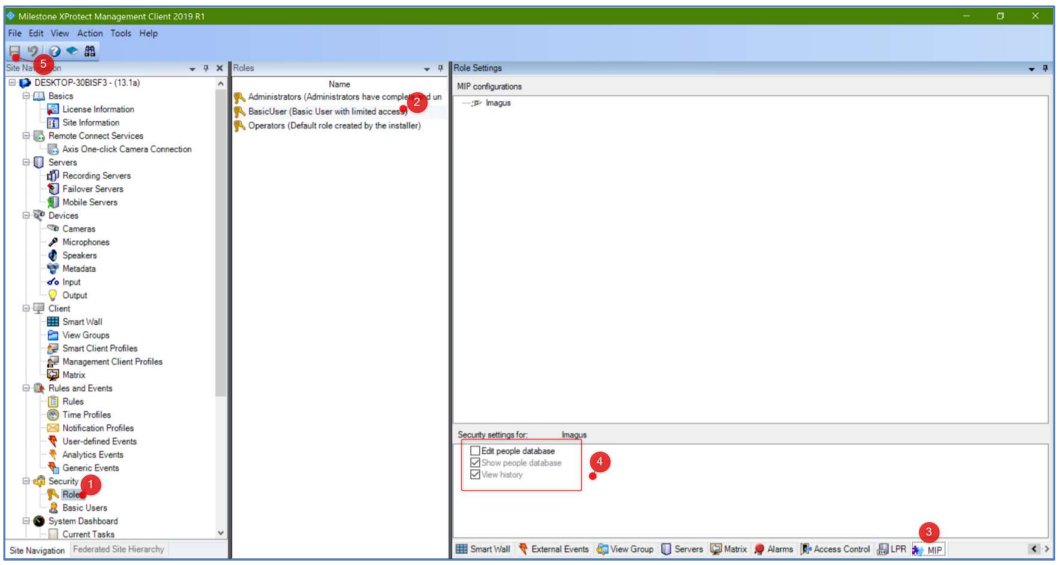

6.3.3 Add a user to a role

1. Go to Security → Roles and select a role e.g. BasicUser (Basic User with limited access)
2. Click on the ‘Users and Groups’ Tab and click on ‘Add’ button and select the ‘Basic user’ option.

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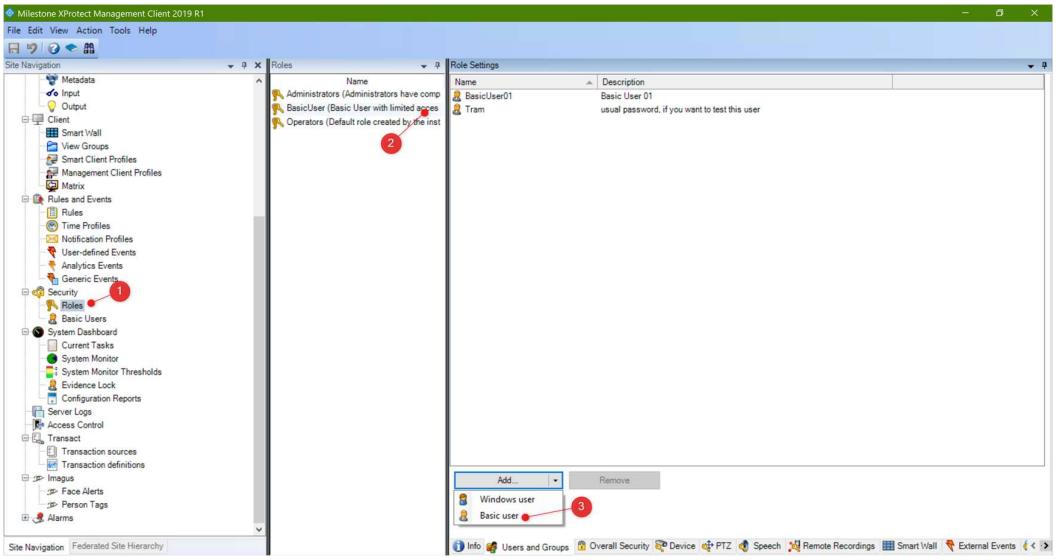
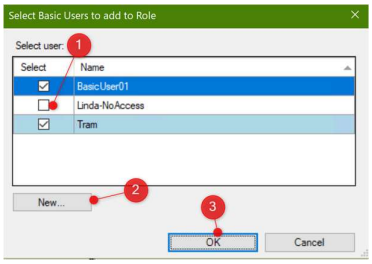
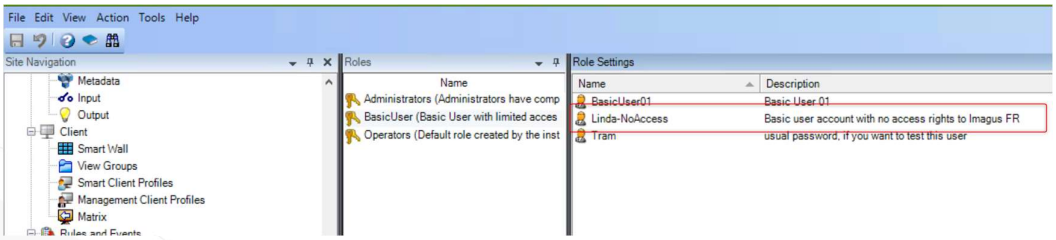


3. The below pop-up screen will be displayed and check/select the new basic user account that is created in the section 6.3.1.



4. The below pop-up screen will be displayed and check/select the new basic user account that is created in the section 6.3.1.



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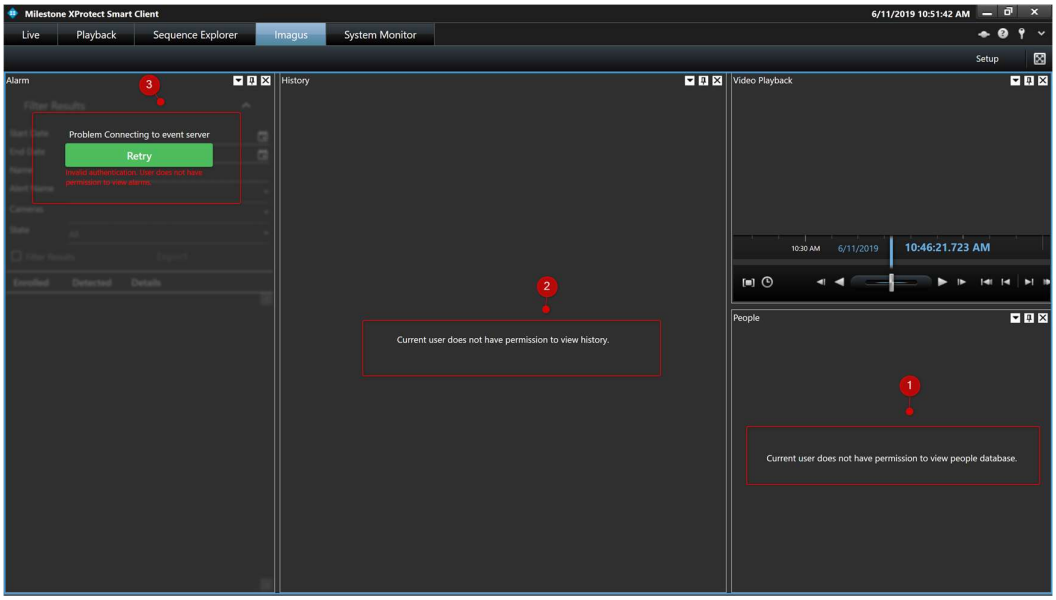
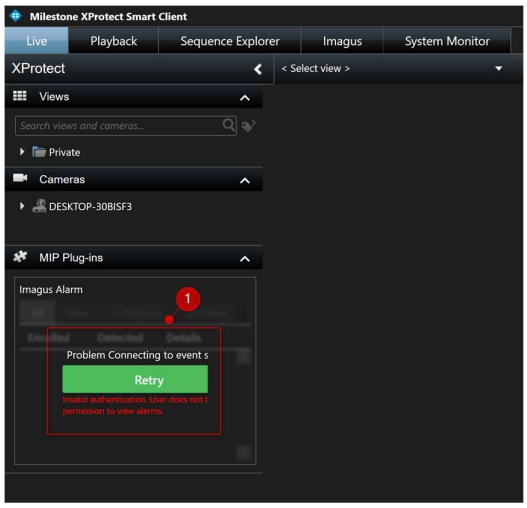
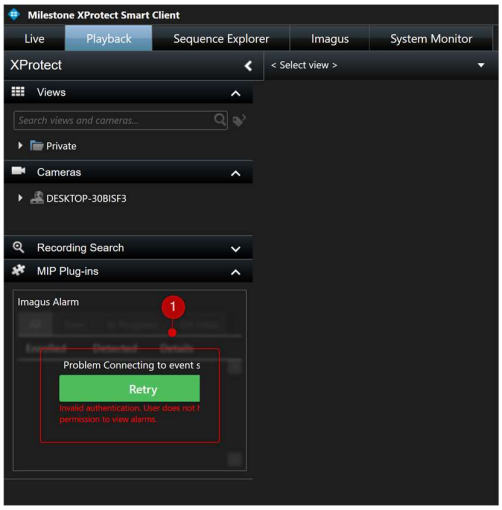
For example: The below shown a basic user with a role with no access to Imagus Tab's functionalities. The user will be prompted with an appropriate message on the access level.







7. Milestone Smart Client Software Configuration

The milestone client settings are set up by the FiRE Config tool above, only change these settings if the connection status cloud is not green.

1. Run Milestone Smart Client.
2. Click on 'Settings' button and the pop-up screen below will be displayed.

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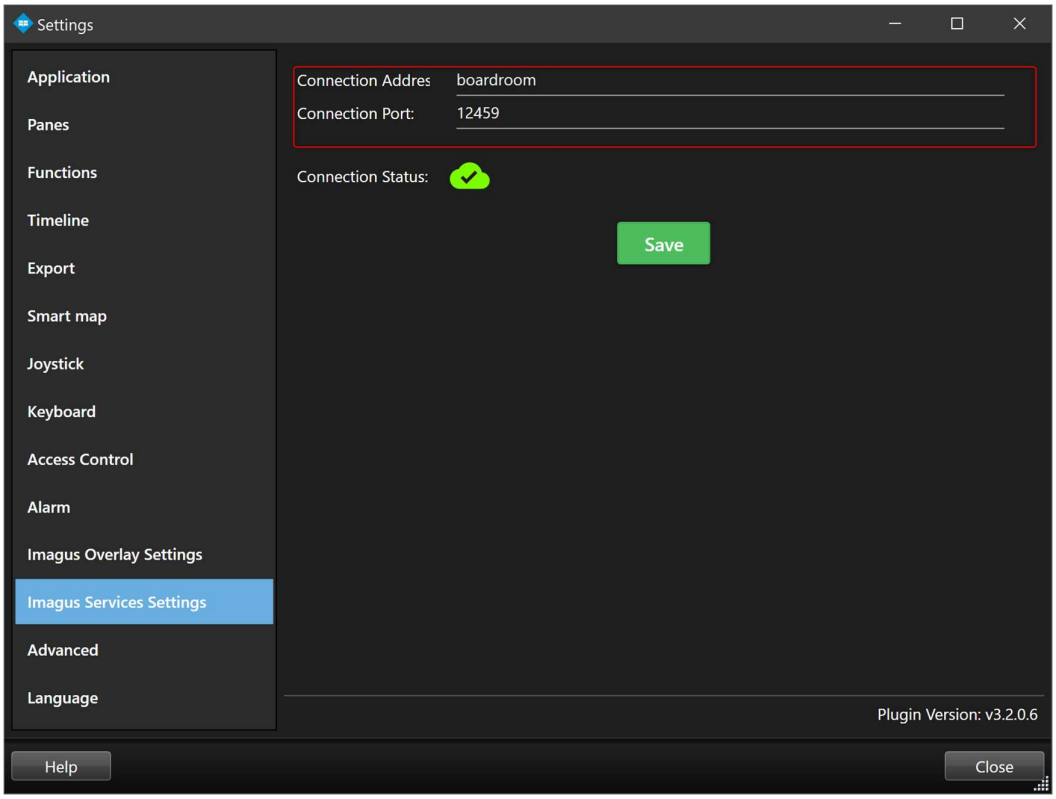

3. Select the “Imagus Services Settings” option.
4. The Connection Address and Port are set during the installation.
5. The Connection details points to the Imagus Server; it will be either IP address or hostname and come in the form “192.168.1.1” or “boardroom”.
6. Click on the 'Save' button to save the information.

7.1 Imagus’ Tab Screen Layout Configuration and Control

One size does not fit all. As every business is different, we’ve made it very easy for the user to modify the layout of the screens within the Milestone Smart Client accordingly to your preference.

1. Click on the ‘Setup’ button to configure the Imagus Tab layout according to your preference.
2. Check on one or more of the below to enable screen layout auto-hide and reposition feature.

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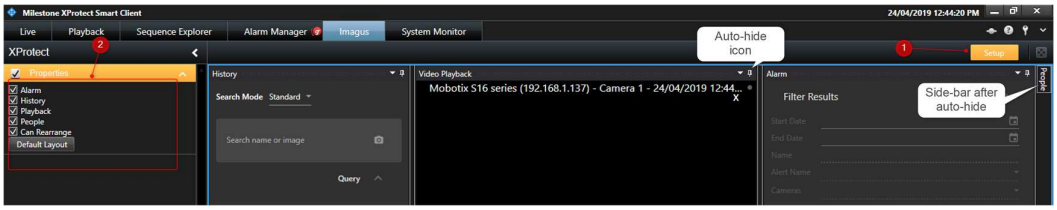
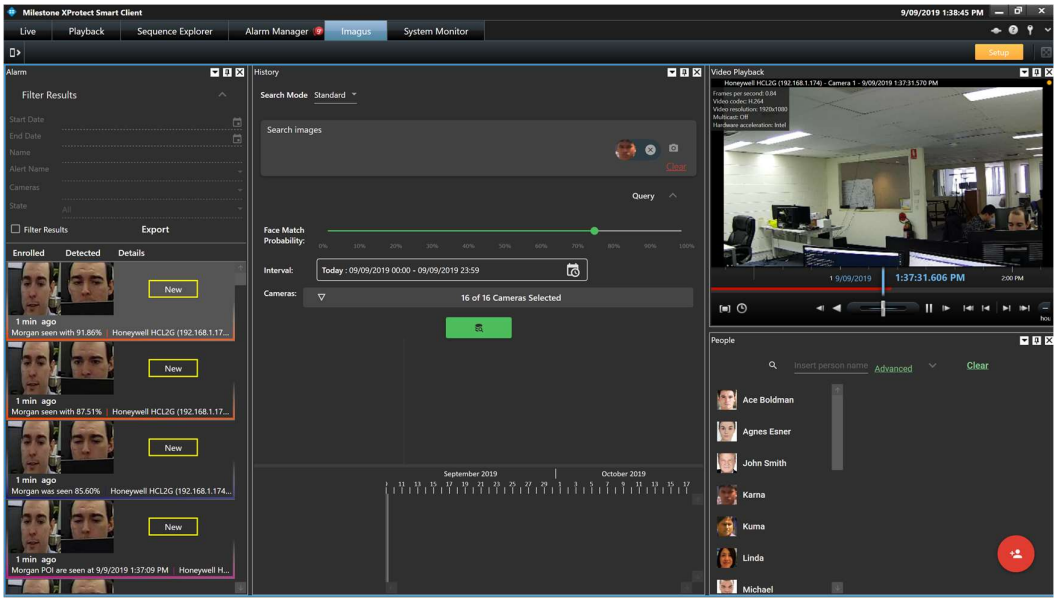
- Alarm
- History
- Playback
- People
- Can Rearrange



3. You can auto-resize or drag the individual sub-tab within the Imagus Tab.
4. To have a default layout, click on the ‘Default Layout’ button.



8. View Alarms, Faces and People in Milestone Smart Client using Imagus Plugin

1. Run Milestone Smart Client and go to the Imagus tab.
2. To view alerts, go to the Alarms Tab, enrolled image and first detected image shown.
3. To replay the video from 5 seconds before the detection, click on the ‘Face’.
4. To export the alarms, click on ‘Export’ button.
5. To update the alarm ‘State’ status, right-click on the ‘New’ button to select the option.
6. To view all detections, click on the History tab.
7. To view a list of people in the connected database, click on the People Tab in Milestone.

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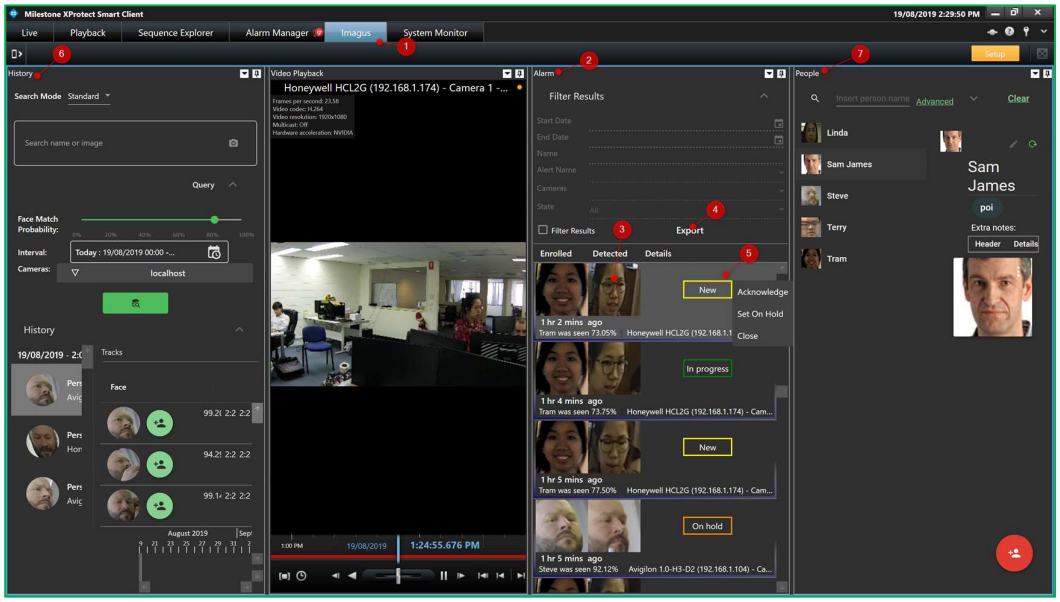
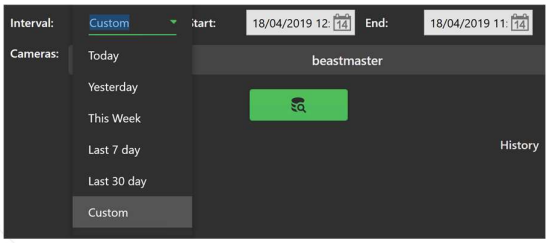


9. Perform Standard Historical Search using images within the Milestone System

In a scenario where you need to perform a historical search for anyone that has passed a facial recognition camera, you can follow the below steps:

1. Specify the Search mode as ‘Standard’, drag any images from History or People Tab and enter the filter criteria.
2. Click on the ‘Camera’ icon to select a stored image from outside of the Milestone System.
3. Specify the below search criteria:
    - Probability (0% - 100%) – The % of how similar/close the face is to the face that you search on;
    - Interval (Start and End Date) – A picklist of a time interval that the person is detected;



    - Camera – The camera that you’re interested in.
4. Click on the ‘Search’ button to perform the Standard Historical Search.
5. The system will display the results as well as the timeline.
6. Click on the ‘Face’ to replay the video from 5 seconds before the detection.
7. Click on the ‘Enrol this Face’ button to enrol the face into the People database. Refer to section 11 for more details.

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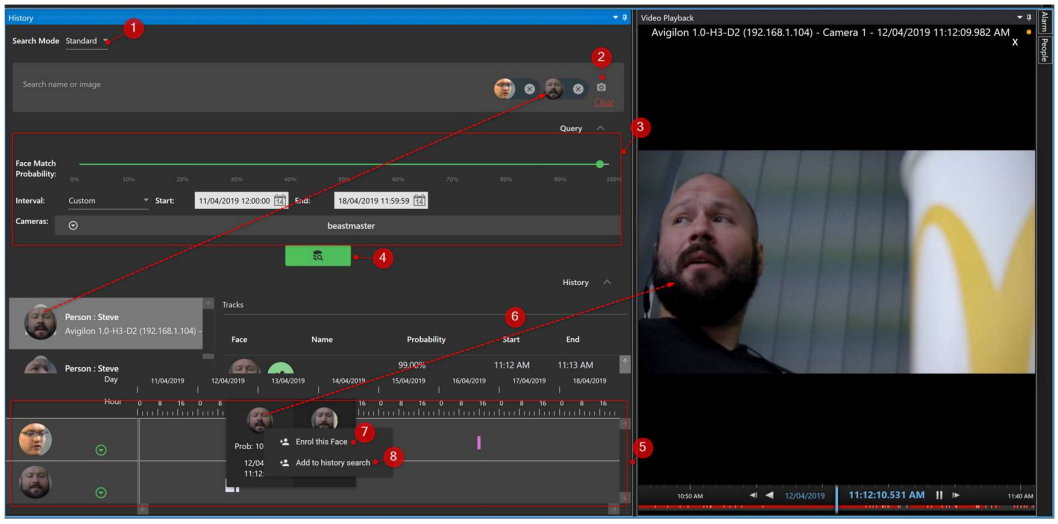
8. Click on the ‘Add to history Search’ button to add this image to search criteria.



10. Perform Forensic Historical Search using images within the Milestone System

10.1 Search for a relationship between two specified persons

This function allows forensic historical searching for multiple people who may be seen in the same vicinity within a set period.

It can also show “unknown” people that may be associated with these people and create a timeline of people who may be connected.

Below are the steps:

1. Specify the Search mode as ‘Forensic’ and select at most two images which can be dragged from People Tab or externally stored images.
2. Specify the search criteria below and click on the ‘Search’ button to find all those associated with the two within the specified timeframe.

    1. Target Faces – Specify precisely two images. Images can be dragged from People Tab or external sources outside from Milestone System;
    2. Face Match Probability – The % of how similar/close the face is to the face that you search on;
    3. Interval (i.e. Date Range) – A picklist of a time interval that the person is detected;
    4. Within timeframe – The time interval that the persons are identified;
    5. Camera - The camera you’re interested in.

3. Click on the green arrow icon to view the camera locations. The cameras are differentiated with a different colour.

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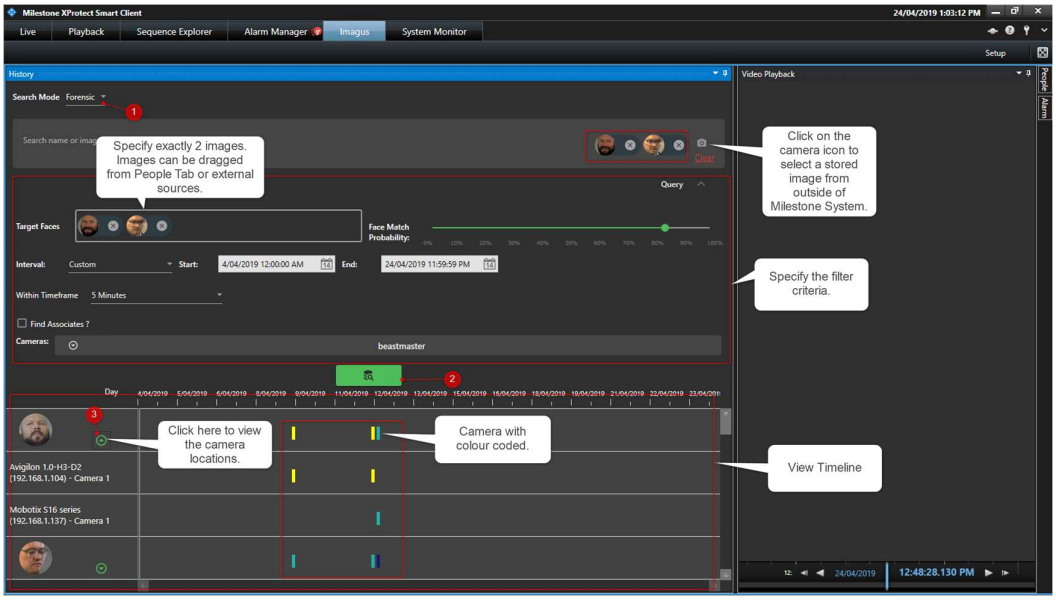
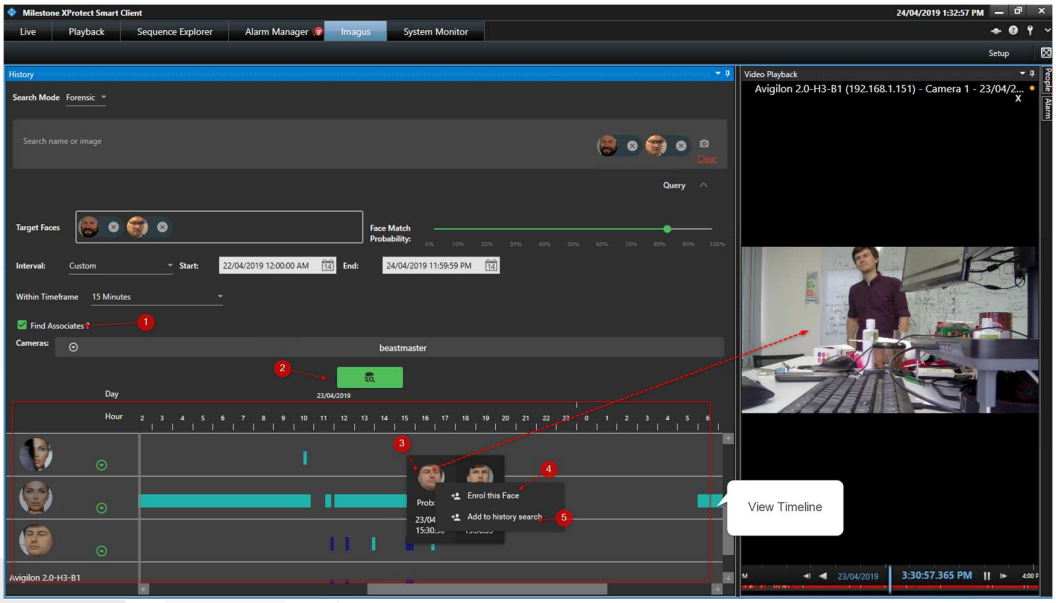


10.2 Search for associates between two specified persons

1. Check on the option ‘Find Associates?’ to find the associates that you are looking for.
2. Click on the ‘Search’ button and the system will display the results in the timeline.
3. Click on the ‘Face’ to replay the video from 5 seconds before the detection.
4. Click on the ‘Enrol this Face’ button to enrol the face into the People database. Refer to section 11 for more details.
5. Click on the ‘Add to history Search’ button to add this image to search criteria.



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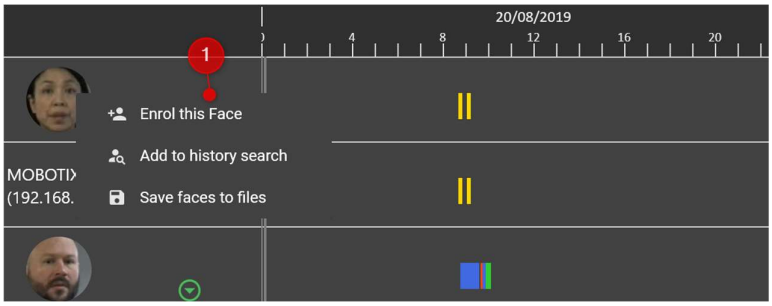
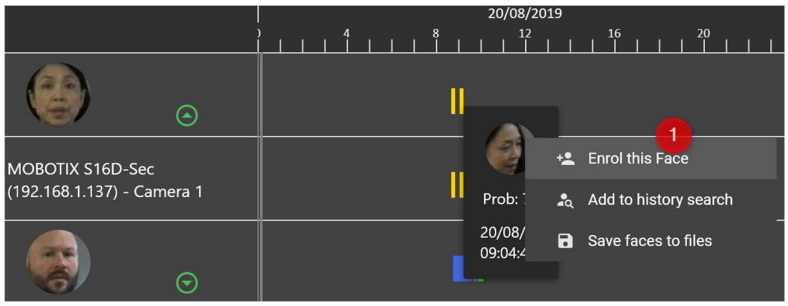
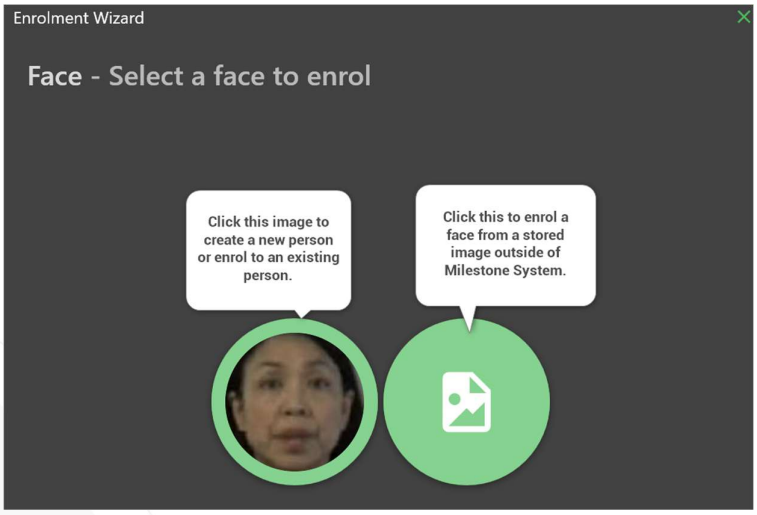
11. Enrol faces from History Tab under Timeline

1. Faces in the ‘History’ tab can be enrolled by clicking on ‘Enrol This Face’ button under Timeline.





2. An Enrolment Wizard pops up which provides options to create a new enrolment or to add faces to an existing person or enrol faces from a stored image from outside of the Milestone System.



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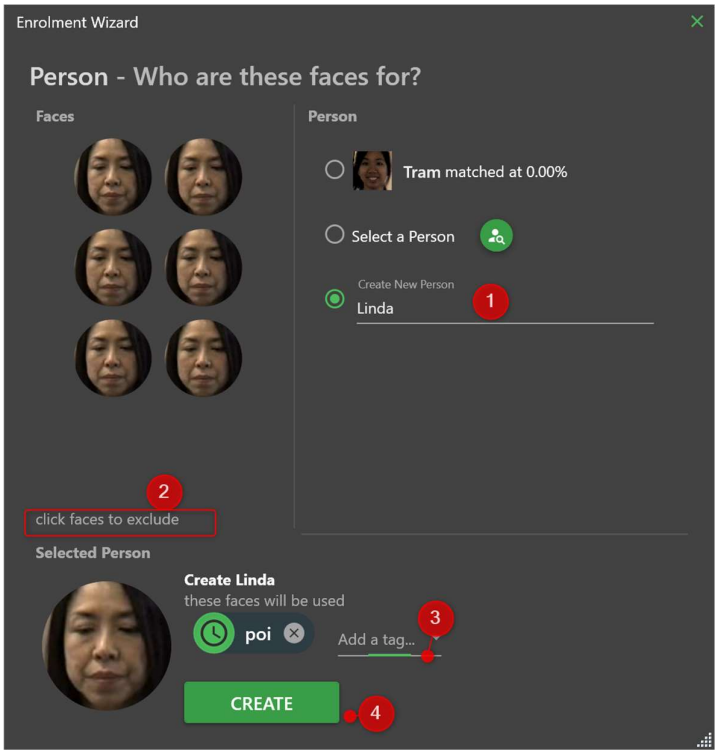
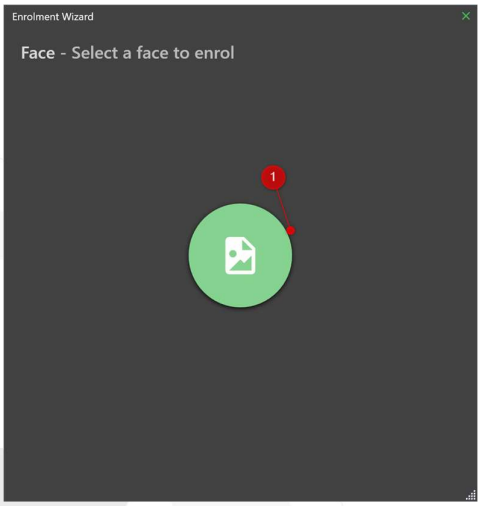
12. Enrol a new person using detected faces

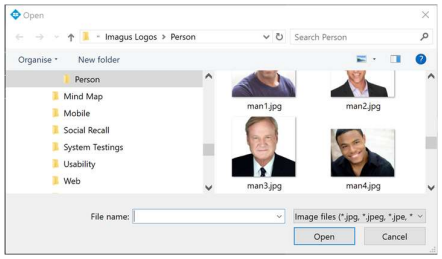
1. Enter a New Person Name.
2. To exclude faces from the enrolment, click this slide bar.
3. Add in a tag for the person.
4. Click on the 'CREATE' button to create an enrolment.



13. Enrol from a stored image outside of Milestone System

1. Click this to enrol faces from a stored image.





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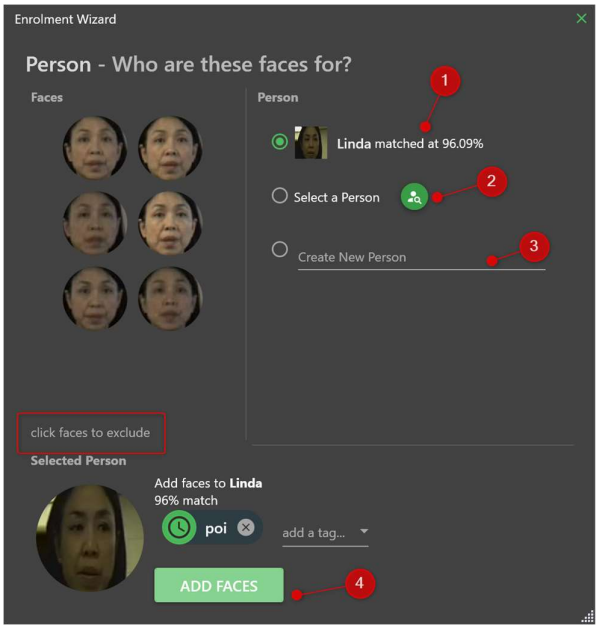
14. Adding images to an existing person

1. Select the closest person to add an image.
2. Alternatively, select a person from a dropdown list to add an image or create a new person.
3. To exclude faces from the enrolment, click this slide bar.
4. Click ‘ADD FACES’ to add faces to the selected person.



15. Delete an enrolment from a Person under People Tab

1. Run the Milestone Smart Client and go to People Tab.
2. Select the person from the people list that you want to delete.
3. Click on the delete icon to delete the selected image to be deleted from the person.
4. Click this trash bin icon to delete the person record.

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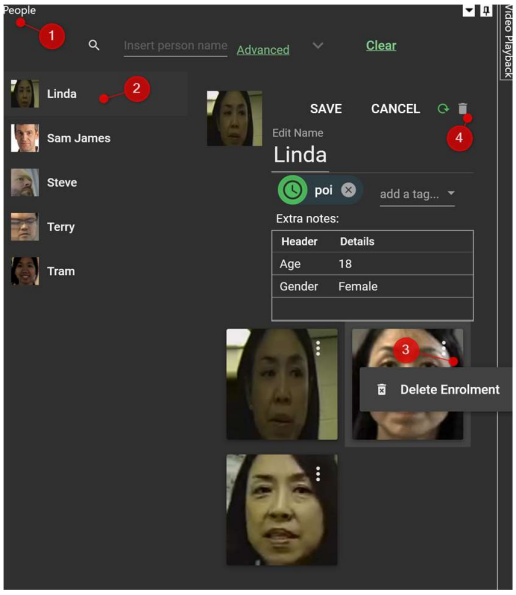
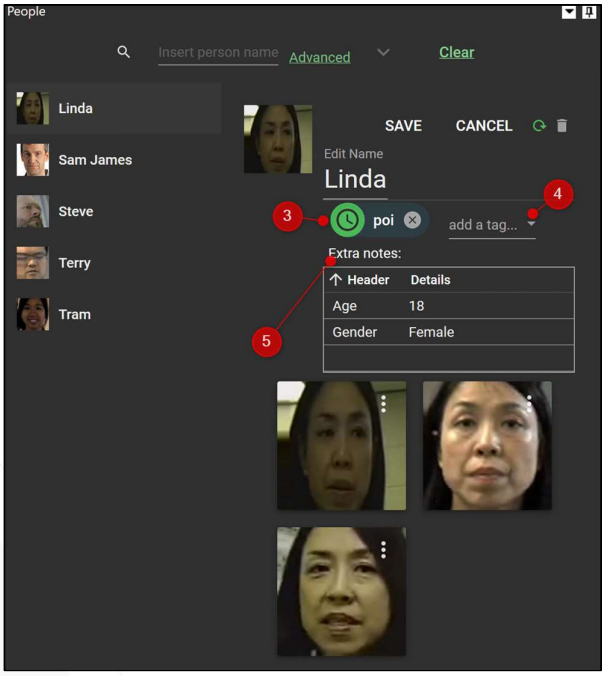


16. Add Extra information for a Person under People Tab

1. Run the Milestone Smart Client and go to People Tab.
2. Select the person from the people list and click on the edit icon.
3. Click on the clock icon to set the expiry of the selected tag.
4. Select additional new tags from the pre-defined list set up at xProtect Management Client.
5. Click on the ‘Extra notes’ section to add any extra information such as age, gender, remark etc.



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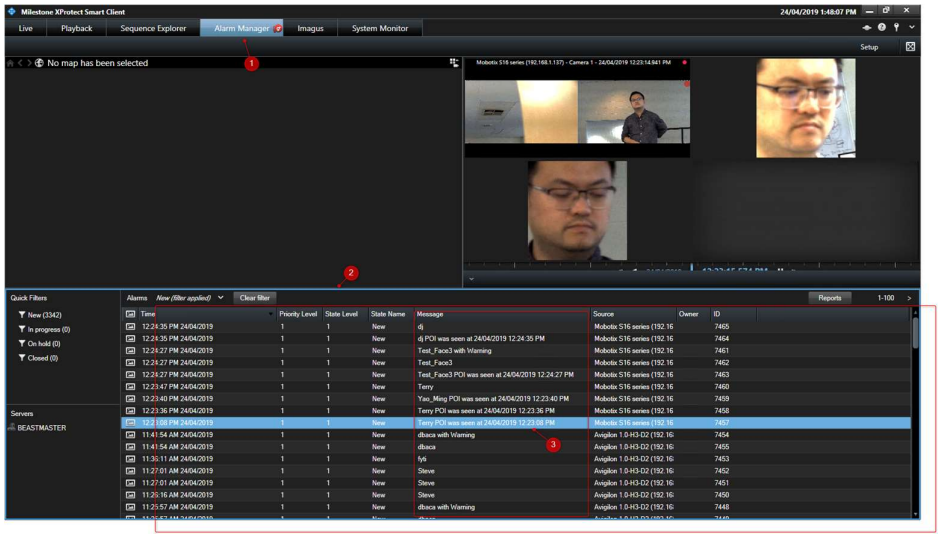
17. View Alarms and Faces in Milestone Smart Client using Alarm Manager

1. Run Milestone Smart Client and go to the Alarm Manager Tab.
2. Click on Alarm from the list to view the Faces and Video.
3. Under the 'Message' column, the message is displayed as *"Terry POI was seen at 24/04/2019 12:23:08 PM'*. The format of the message is configured at Milestone Management Client having the format of ***[[Person]]*** POI was seen at ***[[Time]]***.



4. Double-clicked an alarm from the alarm list, the system will display the below pop-up message box.

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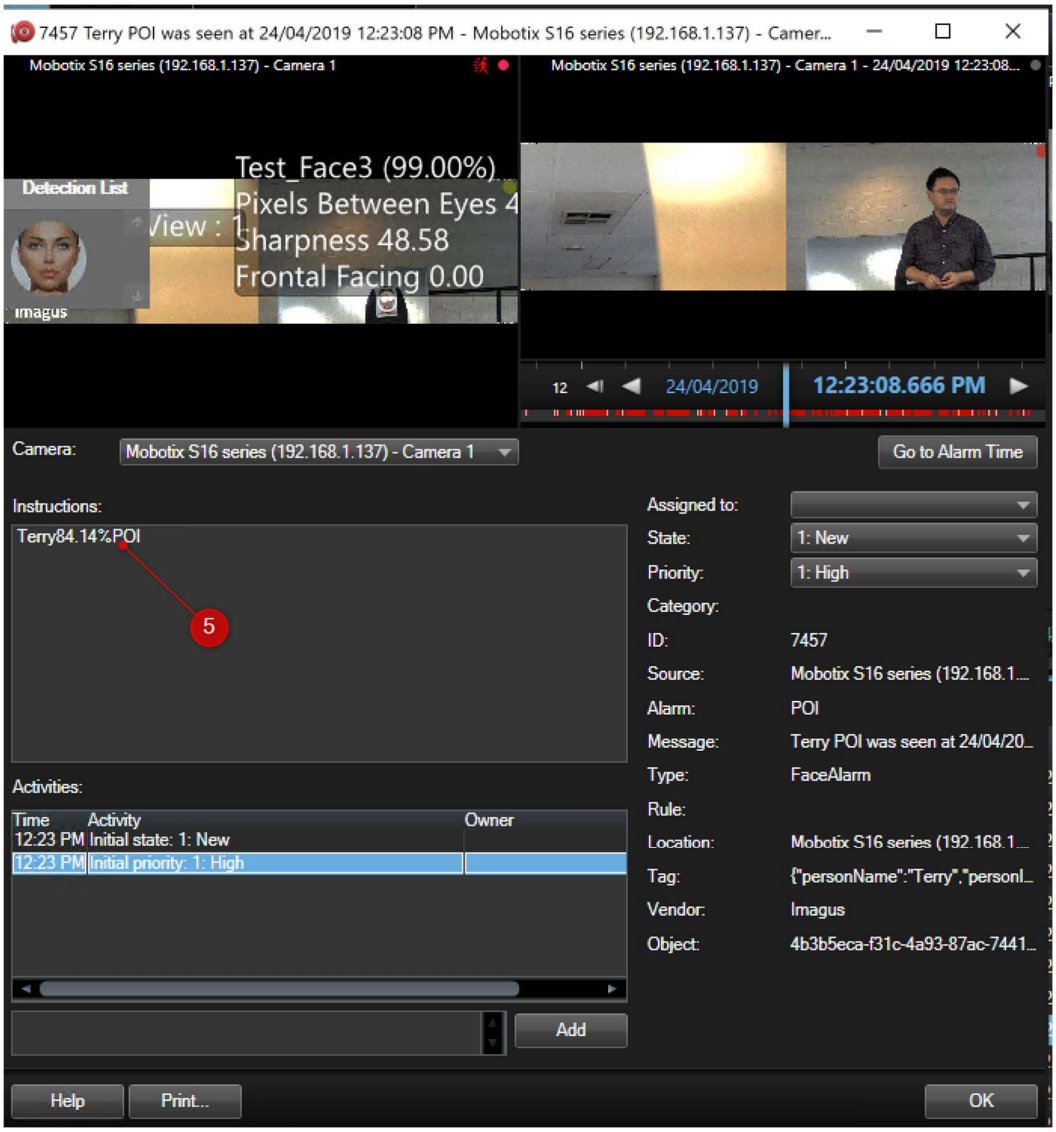

5. The message displayed in the instruction box is configured at Milestone Management Client having the format of ***[[Person]][[Probability]][[AlertName]]*** which has the value of 'Terry84.14%POI'.

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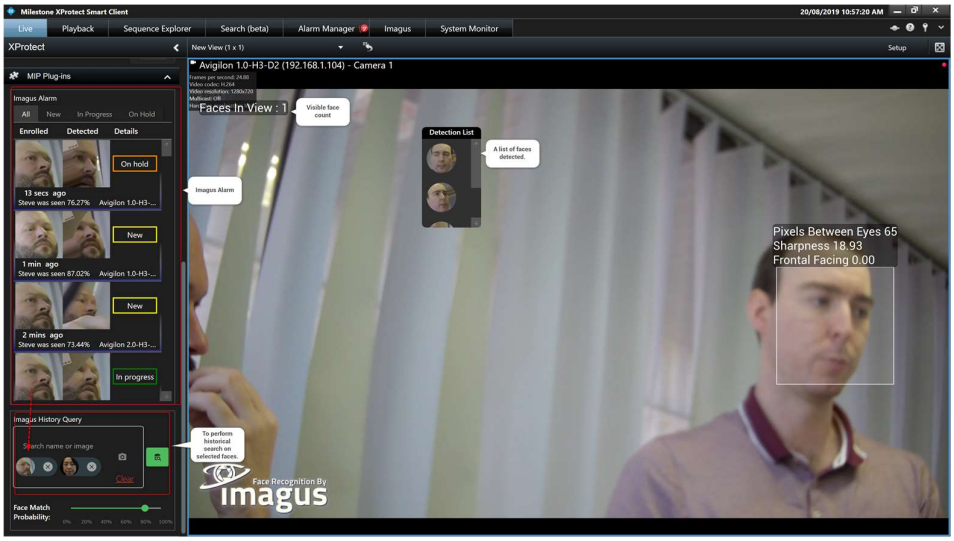
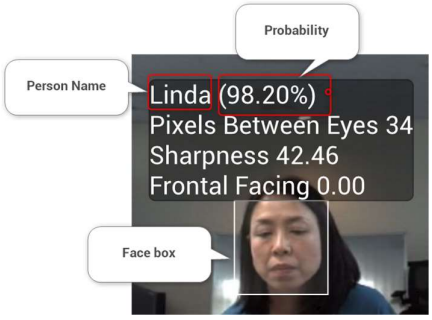
18. Display Live Faces in Milestone Using Imagus

18.1 Viewing Faces in 'Live Tab' and replay video clips in 'Playback' Tab

1. Run Milestone Smart Client.
2. Navigate to 'Live' tab.
3. Drag in a Camera (which it has been added to perform face recognition).



4. You can Observe boxes on faces, as shown above. Please note that if the person as above does not have a close match in the face database, the system will not display the person name and probability %. Below shown a person with a close match to a person, Linda, with a probability of 98.20%.



5. Right-clicked on any face in the detection list, you will have the options to either enrol the face, add this face to the search history query or save faces to file.

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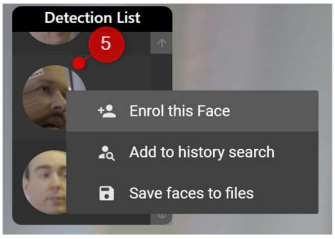
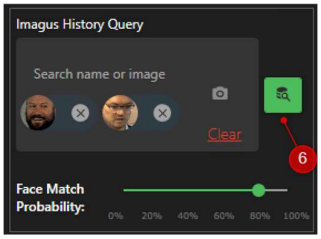
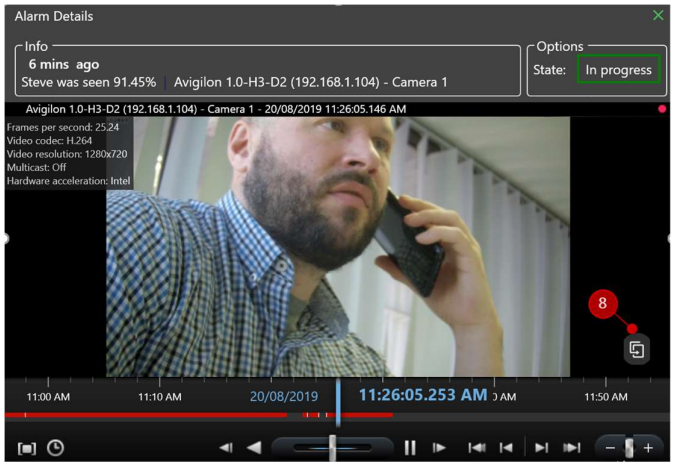




6. Click on the ‘Search button’ under ‘Imagus History Query’ to perform the historical search on the faces selected. System navigates to ‘Playback’ tab to replay the video from 5 seconds before the detection.
7. Right-click on the detected faces in the ‘Imagus Alarm’ section to view alarm and playback video at Live Tab.



8. To export the video clips, click on this Open button to access the playback in a new Live and Playback window.

18.2 Detect faces and Search for them in the ‘Playback’ Tab

1. Run Milestone Smart Client.
2. Navigate to ‘Playback’ tab.
3. Drag in a Camera (which it has been added to perform face recognition).
4. Click on the ‘eye’ icon to detect faces from the selected playback video.
5. Right-click on the detected faces to enrol, search it in history or save the faces to a file.

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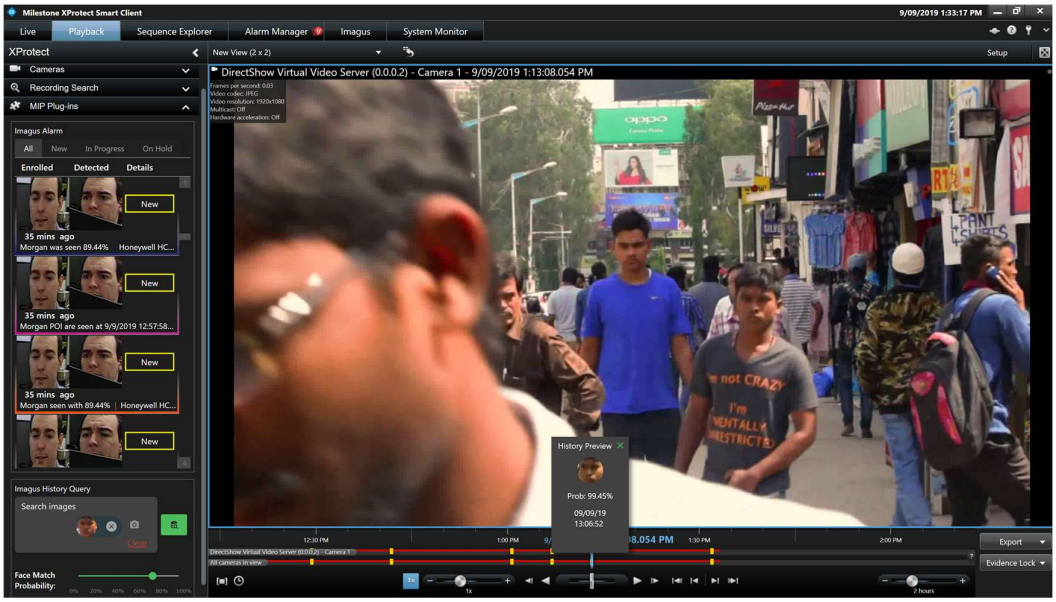
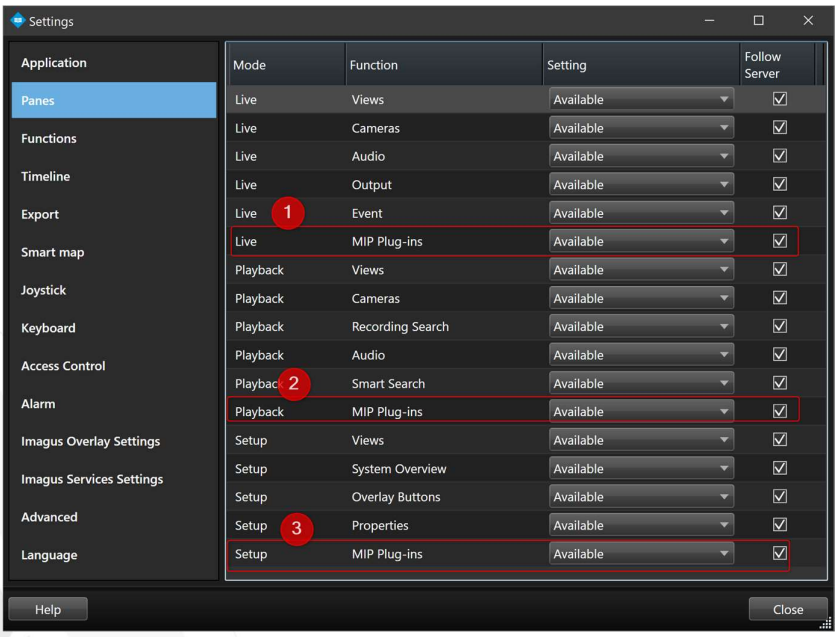
M



18.3 Displaying of MIP Plugin in Setup button, 'Live' and Playback Tab

- Run Milestone Smart Client and navigate to the 'Settings' Tab and click on Panes.
- Enter the below information:

1. Live -> MIP Plugin – Available/Unavailable
2. Playback -> MIP Plugin – Available/Unavailable
3. Setup -> MIP Plugin – Available/Unavailable



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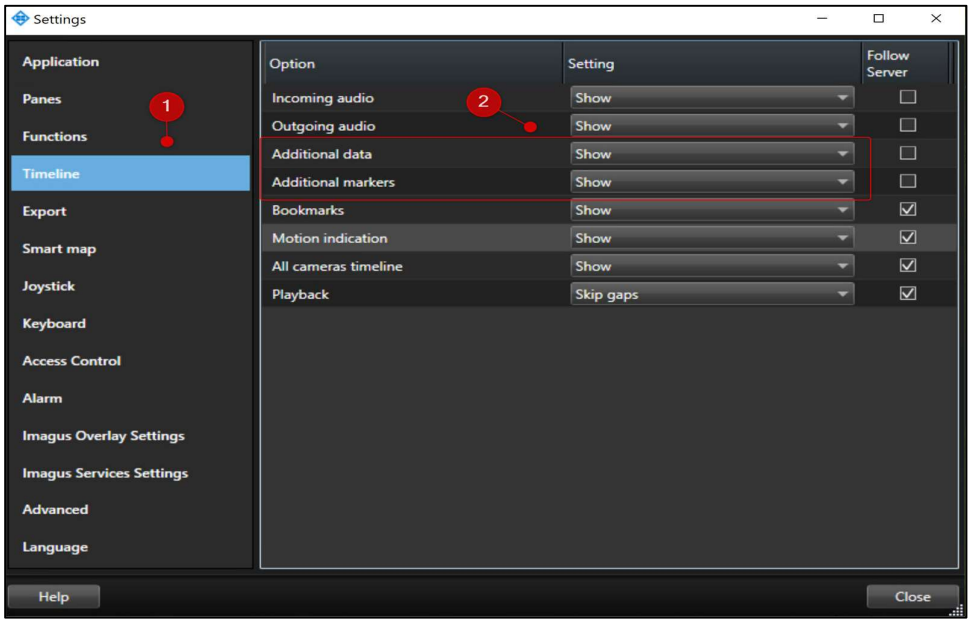
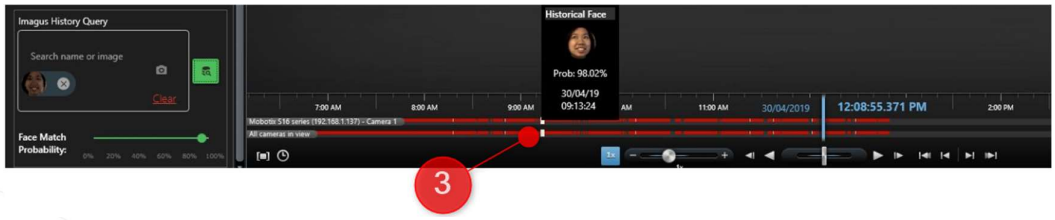
18.4 Historical Timeline display in 'Playback' Tab

1. Run Milestone Smart Client and navigate to the 'Settings' Tab and click on Timeline.
2. Enter the below information:

   - Additional data – Show/Hide
   - Additional markers - Show/Hide



3. If the above two fields are set to 'Show', you will be able to click on the timeline to playback the video.



18.5 Label Definitions

Detected Face list

The list of detected faces.

Visible Face Count

The number of faces in view.

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Pixels Between Eyes

The distance between the eyes on a face measured in a number of pixels on the camera.

Frontal Facing

A measure of how close the face is to a passport-style photo. The higher the number, the more suitable it is for face recognition. The scale is from 0 to 2, to be considered an excellent CCTV capture.

Sharpness

A measure of the clarity of the pixels. A low number means the image is blurry; a high number indicates the image is sharp. A number lower than ten (10) is unsuitable for face recognition. A number higher than 40 is preferred. *Please note that it is possible to inflate this number by using image processing artificially. But it does not help face recognition, as it is making up details, which do not necessarily exist.*

Raw

A display of raw distance for the system used.

Probability (%)

A measure in the percentage of how likely a face belongs to a person. The default value is set at 80%

Faces

The face boxes with eye locations.

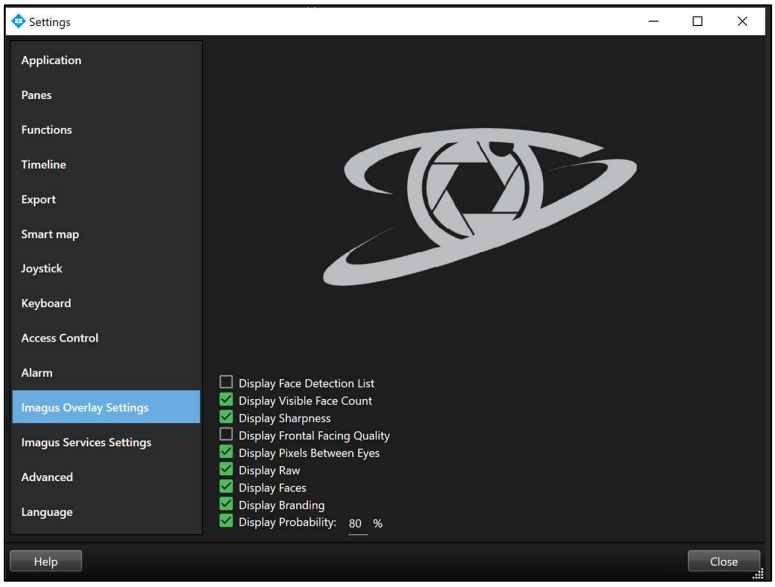
Branding

Display of Imagus Face Recognition Logo.

18.6 Label Configuration

All information displayed over faces inside the Smart Client is configurable.

To change settings:

1. Click Settings under the Overflow Menu in the top right corner of Smart Client
2. In the Settings Dialog, select "Imagus Overlay Settings" from the left-hand tabs
3. Toggle the checkbox to enable or disable the User Interface (UI) Element.

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