

# ROC Watch User Manual

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## The System

ROC Watch has three modules, each with a different purpose:

- **ROC Watch Matching Service (Matching Service):** processes received templates to create identities. Additionally, the Matching Service sends Milestone Analytics events for specific groups of identities when it encounters those groups.
- **ROC Watch Enrollment Service (Enrollment Service):** processes Milestone camera frames to find faces and encodes those faces as templates. The Enrollment Service sends those templates to the Matching Service.
- **ROC Watch Plugin:** provides a user interface for the operator to view existing identities and groups in the database and manage them.

Please take a moment to read through the following to get started with the ROC Watch plugin for Milestone.

## Installation

The way these modules are installed depends on the configuration of your Milestone system. There should be one Enrollment Service for each Milestone XProtect Recording Server. Therefore, there will always be at least one, but possibly more Enrollment Services. There should always be only one Matching Service. There should be one Plugin installed for each installed Milestone XProtect

Smart Client. Therefore, there will always be at least one, but possibly more Plugins. ROC Watch will be installed in Milestone systems configured to match one of the following two scenarios.

## Scenario A: Single Machine Milestone Installation

*You are installing ROC Watch on an all-in-one Milestone installation (Recording Server and Management Server are on the same computer).*

1. Run the setup file, "RocWatchMatchingServiceSetup.exe". Accept the license agreement, provide the installer with a ROC.lic license file, and click through the default settings. If you do not have a ROC.lic license file, finish the installation and proceed to Step 4.
2. Run the setup file, "RocWatchEnrollmentServiceSetup.exe". Accept the license agreement, provide the installer with a ROC.lic license file, and click through the default settings. If you do not have a ROC.lic license file, finish the installation and proceed to Step 4.
3. Run the setup file, "RocWatchPluginSetup.exe". Accept the license agreement, provide the installer with a ROC.lic license file, and click through the default settings. If you do not have a ROC.lic license file, finish the installation and proceed to Step 4.
4. *(Optional)* If you do not have a ROC.lic license file on your computer while installing one of the three ROC Watch modules, finish the installation, and find the generated "roc-host-id.json" on your desktop. Email the file to [support@rankone.io](mailto:support@rankone.io). You will receive a ROC.lic license file. Provide that ROC.lic license file to the Matching Service, Enrollment Service, or Plugin when prompted during startup.

*Note: The modules must be running as admin when you provide them the ROC.lic license file location. If they cannot be run as admin, manually copy the license file to the "ROC Watch Matching Service" folder, the "ROC Watch*



Enrollment Service” folder, and the “Milestone” folder. **The same ROC.lic license file can be used for all three modules.**

## Scenario B: Distributed Milestone Installation

*You are installing ROC Watch on a distributed Milestone installation (Management Server is on its own computer, and one or more Recording Servers are each on their own computer).*

1. Run the setup file, “RocWatchMatchingServiceSetup.exe” on the Milestone XProtect Management Server computer. Accept the license agreement, provide the installer with a ROC.lic license file, and click through the default settings. If you do not have a ROC.lic license file, finish the installation and proceed to Step 4.
2. Run the setup file, “RocWatchEnrollmentServiceSetup.exe” on each Milestone XProtect Recording Server computer. Accept the license agreement, provide the installer with a ROC.lic license file, and click through the default settings. If you do not have a ROC.lic license file, finish the installation and proceed to Step 4.
3. Run the setup file, “RocWatchPluginSetup.exe” on each Milestone XProtect Smart Client computer. Accept the license agreement, provide the installer with a ROC.lic license file, and click through the default settings. If you do not have a ROC.lic license file, finish the installation and proceed to Step 4.
4. *(Optional)* If you do not have a ROC.lic license file on your computer while installing one of the three ROC Watch modules, finish the installation, and find the generated “roc-host-id.json” on your desktop. Email the file to [support@rankone.io](mailto:support@rankone.io). You will receive a ROC.lic license file. Provide that ROC.lic license file to the Matching Service, Enrollment Service, or Plugin when prompted during startup.



*Note: The modules must be running as admin when you provide them the ROC.lic license file location. If they cannot be run as admin, manually copy the license file to the “ROC Watch Matching Service” folder, the “ROC Watch Enrollment Service” folder, and the “Milestone” folder. **The same ROC.lic license file can be used for all three modules.***

5. Start the Matching Service. Record the hosted ports shown on the Matching Service application, and record the IP address of the Matching Service computer. For each Enrollment Service you installed:
    - a. Start the Enrollment Service. You will see an error message indicating the Enrollment Service was unable to connect to the Matching Service. Click OK.
    - b. On the Enrollment Service, select the purple gear icon. On the settings page, update the ports and IP addresses using the recorded information from the Matching Service. Click Accept. Close the Enrollment Service for the new settings to take effect.
  
  6. For each Plugin you installed:
    - a. Start the Milestone XProtect Smart Client. You will see an error message indicating the Plugin was unable to connect to the Matching Service. Click OK.
    - b. On the Smart Client, navigate to the Settings page (down arrow in top right corner). Navigate to the ROC Watch Plugin area. Update the ports and IP addresses using the recorded information from the Matching Service. Click Save. Close the Smart Client for the new settings to take effect.
-

# Usage

The Matching Service must always run before any Enrollment Service or Plugin starts. If an Enrollment Service or Plugin (via the Smart Client) fails to connect to the Matching Service, ensure the Matching Service is running, verify the IP addresses and ports for the Enrollment Service and Plugin are configured correctly, and restart the Enrollment Service or Smart Client.

## ROC Watch Matching Service

The Matching Service creates identities from templates. The Matching Service has a limited user interface. The configurable settings on the Matching Service include:

- **Port Settings:** Change these settings to change how the Enrollment Service and Plugin connect to the Matching Service. Recommend using the default settings if possible.
- **Minimum Search Similarity:** This is the minimum score for the Matching Service to consider two templates to be the same identity. Setting this value higher will result in fewer templates being erroneously assigned to the same identity, at the cost of more templates being erroneously determined to be from separate identities. This setting greatly depends on the quality of your cameras as well as their positioning and lighting.
- **Minimum Time Separation Group Hit (Minutes):** This is the minimum amount of time between Group Events being sent via Milestone Analytics Events. The first time an identity is seen by a camera, a Group Event will be sent for every group that identity is a member of. Another Group Event will



not be sent for the same identity, for the same camera, for the same group, for the amount of time (in minutes) specified by this setting.

ROC Watch - Matching Service

The ROC Watch Matching Service is currently **running**

The Matching Service is responsible for storing and managing templates, identities, and groups for the Smart Client. This must be running in order to successfully log your data.

### ROC Algorithm Settings

**Minimum Template Similarity: 0.65**

This threshold determines how similar a template has to be to another in order to be deemed a match. The higher this value, the less false positives you will get. If you are getting high quality images from your feeds, then you can use a higher similarity threshold.

*We recommend you use a value between 0.6 and 0.7*

**Notification Separation: 5**

This delay will help you avoid multiple alerts for someone lingering in front of a single camera. Tailor this to reflect your security needs and the traffic patterns of your space.

*We recommend at least 5 mins separation.*

**Store Captured Templates: ON**

With this setting on, you will be collecting templates and logging encounters from everyone captured by your FR cameras. Please consider your security needs and privacy concerns when deciding whether or not to store templates.

### Network Settings

Be sure your enrollment servers are pointing to the below. This is the location of the ROC Database.

**Template Pipe Server Port: 8889**

**Gallery Port: 8888**

**Identities DB Port: 9010**

**Groups DB Port: 9011**

**Images DB Port: 9012**

**Camera Settings DB Port: 9013**

# ROC Watch Enrollment Service

The Enrollment Service provides an interface for the user to add cameras for facial recognition (FR) processing. There will likely be multiple Enrollment Services in a ROC Watch/Milestone installation. Each camera can only be registered as an FR camera with one Enrollment Service at a time.

Use the Milestone XProtect Management Client to define camera groups specific to each Enrollment Service (such as a common Milestone XProtect Recording Server), and then register those cameras via the “Add to FR Cameras” button. A camera can be registered by right-clicking the camera icon and choosing “Add

The screenshot displays the ROC Watch Enrollment Service interface. At the top, a status bar indicates "The ROC Watch Enrollment Service is current running". Below this, a message states: "The Enrollment Service is responsible for running your video feeds through the ROC algorithm to generate face templates. These are then passed through to your Matching Service."

The interface is divided into several sections:

- Database Settings:**
  - Identities DB Location: 127.0.0.1:9010
  - Images DB Location: 127.0.0.1:9012
  - Groups DB Location: 127.0.0.1:9011
  - Camera Settings DB Location: 127.0.0.1:9013
- Template Pipe Settings:**
  - Template Pipe Server Location: 127.0.0.1:8889
- Cameras:** A tree view showing a hierarchy of camera groups. Under "Default Group", there is an "AXIS M1065-L Network Camera (192.168.0.20) - Camera 1" and a selected "StableFPS (localhost) - Camera 1 - Oscars".
- Camera Settings:** A detailed view for the selected camera, showing:
  - FQID:** FQID Kind: 5135ba21f1dc-4321-806a-6ce2017343c0 (Camera), FQID.ServerId.ServerType: XPCORS, FQID.ServerId.Id: 80c01a78-2b23-4416-b094-841edbed8225, FQID.ServerId.ServerHostname: desktop-41pbtso, FQID.ServerId.Serverport: 7563, FQID.ParentId: 80c01a78-2b23-4416-b094-841edbed8225, FQID.ObjectId: 7369aaf3-97c8-4ff5-9163-305f3d46ab12, FQID.ObjectIdString, FQID.FolderType: No.
  - Fields:** HasRelated: No, HasChildren: No, PositioningInformation: Latitude=0, longitude=0, PositioningInformation: CoverageDirection=0, PositioningInformation: CoverageDepth=0, PositioningInformation: CoverageFieldOfView=0.
  - Properties:** PTZ = No, Ipix = No, PanoramicLens = No, ShortCut =, EdgeSupported = Yes, Channel = 0.
  - FR Settings:** Not enabled as FR camera, Related.



to FR Cameras". A registered FR camera can be removed by right-clicking and choosing "Remove from FR Cameras". Each camera added as an FR camera will process the default video stream set in the Milestone XProtect Management Client.

Camera FR settings can be configured for a registered FR camera by right-clicking the "FR Settings" field in the "Camera Settings" window pane and choosing "Edit FR Settings". The configurable settings for each registered FR camera include:

- **Minimum Quality:** This setting is the minimum quality template a camera will send to the Matching Service. A higher setting means the Matching Service will receive higher quality templates at the cost of missing low-quality face captures.
- **False Detection Rate:** This setting controls the frequency non-faces will be sent to the Matching Service as templates. A lower setting means the Matching Service will receive fewer non-face templates at the cost of missing more valid templates.
- **Relative Minimum Size:** This setting controls the minimum size face that can be detected in proportion to the size of the image received from the camera. A higher setting will result in faster processing at the cost of missing more small faces. Note that while the ROC SDK can detect small faces, not all small faces are useful for facial recognition.
- **K Value Max Faces:** The number of faces to detect in each camera frame. If fewer faces than the K value are found in an image, the highest quality face will be used.
- **Max Time Separation:** The amount of time in milliseconds after which a person leaving the camera view will be considered to have left the area.

- **Minimum Detection Overlap:** The minimum amount of a person's face that must overlap in consecutive camera frames for that person to be considered the same. Recommend keeping set to zero for most situations.
- **Minimum Tracking Similarity:** The minimum similarity between faces in consecutive camera frames for those faces to be considered the same person.
- **Thumbnail Width:** The width of the generated template thumbnails sent to the Matching Service. These thumbnails are used to show faces on the Smart Client.
- **Thumbnail Height:** The height of the generated template thumbnails sent to the Matching Service.
- **Thumbnail Scale:** The scale of generated thumbnails sent to the Matching Service. A higher value will result in thumbnails being more tightly cropped around the face.
- **Thumbnail Quality:** The quality of generated thumbnails sent to the Matching Service. A higher setting will result in higher quality thumbnails at the cost of more storage space.
- **Media Quality:** The quality of images saved to the ROC database for each face encounter. A higher setting will result in higher quality images at the cost of more storage space.
- **Frames per Second:** The desired frame rate for processing camera frames. The ROC SDK will make a "best-effort" to process frames at the rate specified.

The Enrollment Service also has port and IP address settings which can be modified by clicking the purple gear button. The port settings should match the same port settings on the Matching Service for the Enrollment Service to successfully connect.



# ROC Watch Plugin

## Smart Client

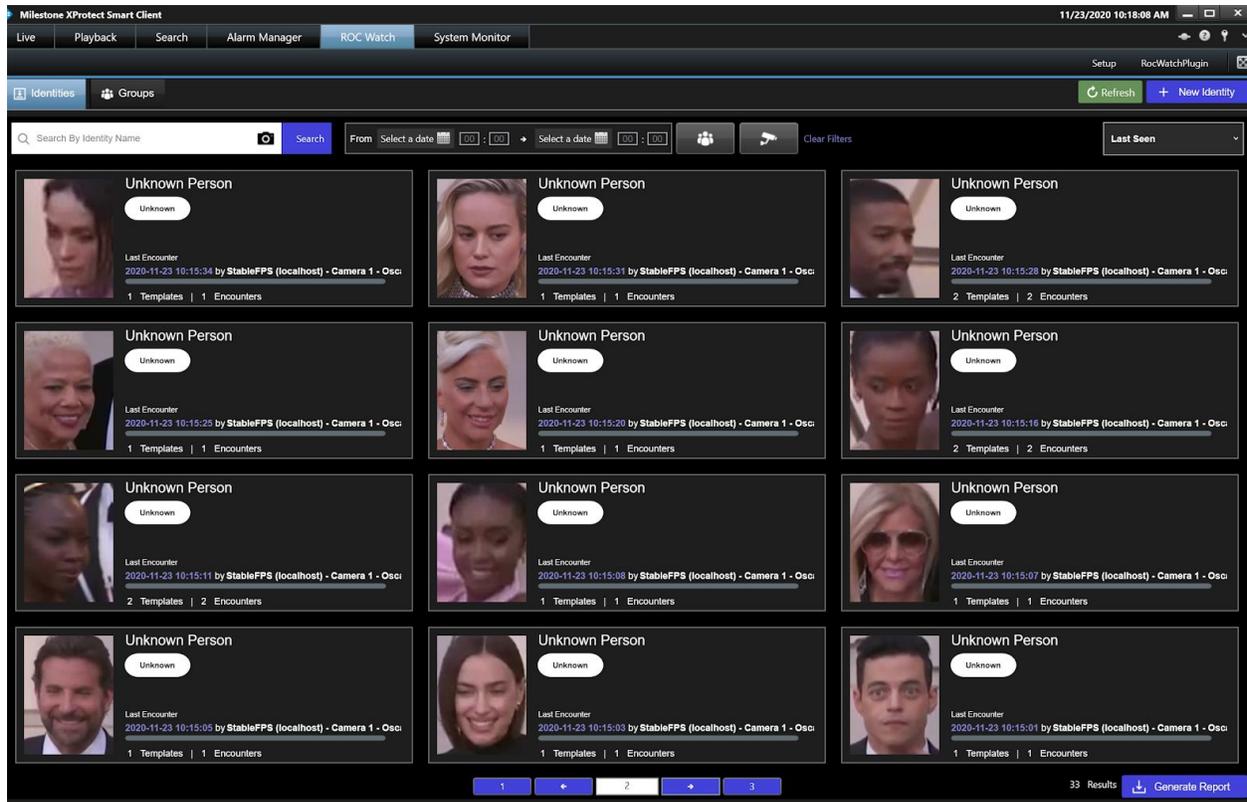
The Smart Client provides a user interface for managing identities and groups.

The following features are available in the Smart Client:

- Add an Identity
- Add a Group
- Merge Two Identities
- Reassign an Identity's Templates
- Reassign an Identity's Groups
- Reassign a Group's Members
- Change Identity Metadata
- Change Group Metadata
- Delete a Template, Identity, or Group
- View Identity Details
- View Group Details
- Search Using a Probe Image
- Export a Report

The user can perform those features in the following views:

# Identity Browser Tab



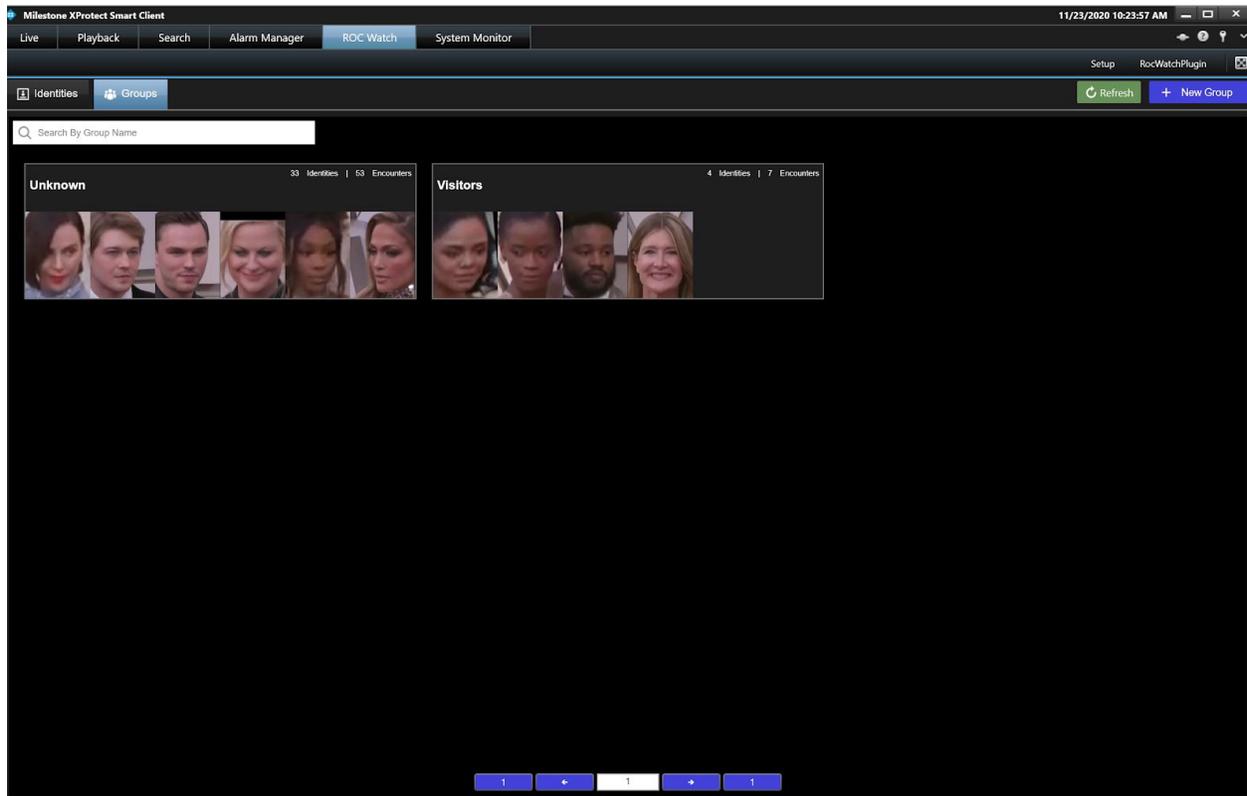
From this view the user can:

- **Add an Identity:** Click the “New Identity” button in the top right corner. You will be prompted to upload a face image. Recommend using a high-quality PNG image. Choose the desired face from the image for creating a new identity. Click “Create New Identity”.
- **View Identity Details:** Click on an identity card (one of the faces on the screen). Use the back button in the top left-hand corner to navigate back to the identity browser.
- **Search Using a Probe Image:** Select the camera icon in the top-left search bar. You will be prompted to upload an image. Recommend using a high-quality PNG image. Choose the desired face from the image. Click “Search”.



- **Export a Report:** Click the “Generate Report” button in the bottom right corner. A search report will be exported to the “My Documents” folder.

## Group Browser Tab



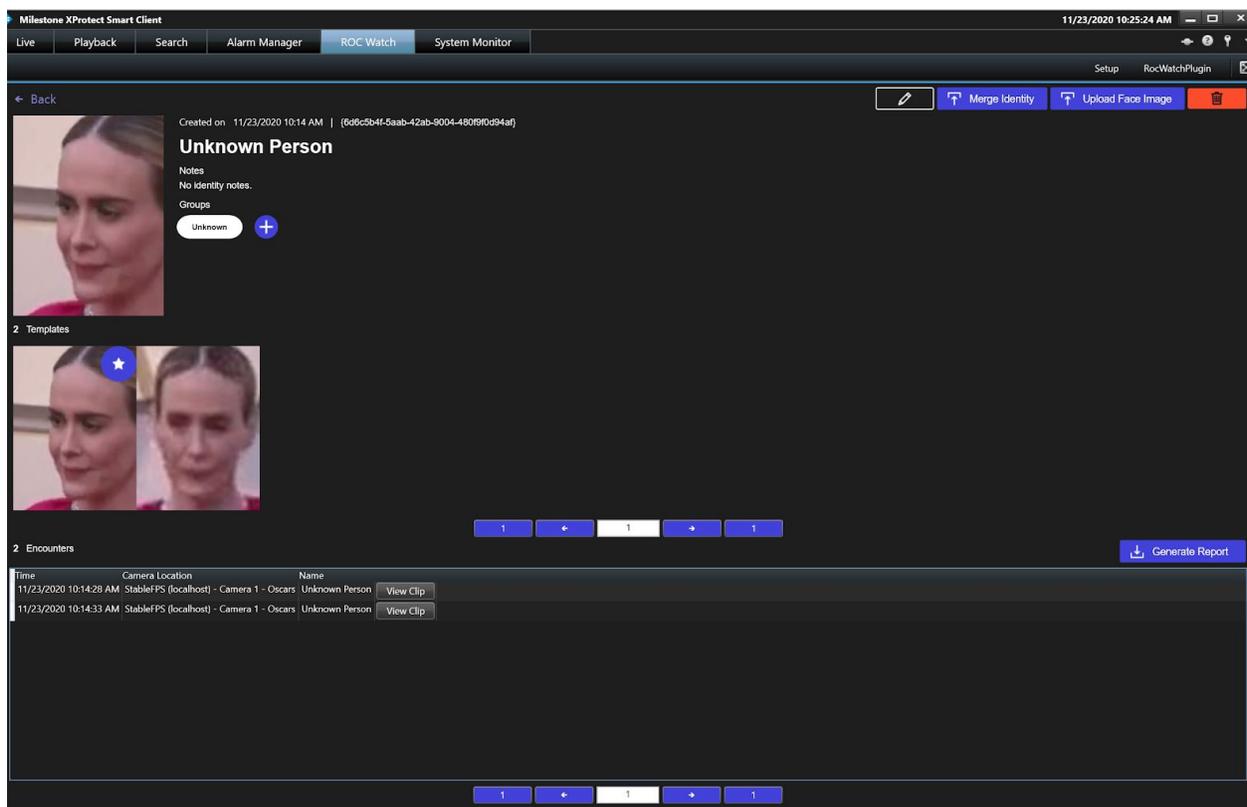
From this view the user can:

- **Add a Group:** Click the “New Group” button in the top right corner. You will be taken to the Group Details page for the newly created group. Note whenever a new group is added or removed, ROC Watch creates a new Milestone Analytics Event in the Milestone XProtect Management Client. The new Analytics Event is specific to that group and is generated whenever a member of that group is encountered.

- **View Group Details:** Click on a group card (one of the group names on the screen). Use the back button in the top left-hand corner to navigate back to the identity browser.

*Note: The “Unknown” group is a special group that ROC Watch makes sure always exists. New identities are automatically added to this group when encountered by a camera. Do not ever delete the Unknown group. If you delete it accidentally, simply restart the Matching Service.*

## Identity Details View



From this view the user can:



- **Merge Two Identities:** Click the “Merge Identity” button in the top right corner. You will be presented with a list of suggested identities. You can also search for an identity by name. Select an identity and click “Continue”. You now choose which identity’s metadata will remain – metadata from the unselected identity will be deleted. Click “Merge”.
- **Reassign an Identity’s Groups:** Select the purple plus icon under the identity name. Check or uncheck any groups to reassign the identity. Click “Save Groups”.
- **Reassign an Identity’s Templates:** Click one of the identity’s templates. Click “Reassign”. You will be presented with a list of suggested identities. You can also search for an identity by name. Select an identity and click “Reassign”.
- **Change Identity Metadata:** Click the pencil icon in the top right corner. You can change the identity’s name and notes. Click “Save Changes”.
- **Delete a Template:** Click one of the identity’s templates. Click the “Delete Template” button.
- **Delete an Identity:** Click the orange garbage can icon in the top right corner.

## Group Details View

The screenshot shows the Milestone XProtect Smart Client interface. At the top, there are navigation tabs: Live, Playback, Search, Alarm Manager, ROC Watch (selected), and System Monitor. The window title is 'Milestone XProtect Smart Client' and the date/time is '11/23/2020 10:26:24 AM'. Below the navigation, there are buttons for 'Setup', 'RocWatchPlugin', 'Back', 'Add Identity', and a trash icon. The main content area is titled 'Unknown' and includes a 'Notes' section with 'No group notes.' and a grid of 33 'Identities', each represented by a small portrait photo and the text 'Unknown Person'. Below the identities is a 'Generate Report' button. At the bottom, there is a table of 'Encounters' with columns for Time, Camera Location, and Name. The table contains 16 rows of encounter data, all for 'Unknown Person' from 'Camera 1 - Oscars'.

Time	Camera Location	Name	Action
11/23/2020 10:11:48 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip
11/23/2020 10:11:53 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip
11/23/2020 10:11:54 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip
11/23/2020 10:11:58 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip
11/23/2020 10:12:03 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip
11/23/2020 10:12:06 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip
11/23/2020 10:12:08 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip
11/23/2020 10:12:18 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip
11/23/2020 10:12:21 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip
11/23/2020 10:12:26 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip
11/23/2020 10:13:28 AM	StableFPS (localhost) - Camera 1 - Oscars	Unknown Person	View Clip

From this view the user can:

- **Reassign a Group's Members:**
  - **Remove a Member:** Click one of the identities in the group. Click "Remove Identity from Group"
  - **Add a Member:** Click the "Add Identity" button in the top right corner. Select one or more identities. Click "Add Identities".
- **Change Group Metadata:** Click the pencil icon in the top right corner. You can change the group's name and notes. Click "Save Changes".
- **Delete a Group:** Click the orange garbage can icon in the top right corner.



## Management Client

In the Management Client, ROC Watch supplies the user with additional Milestone Analytics Events for each group when a group is created. Analytics events specific to each group are generated whenever the Matching Service encounters a member of that group. The user can set up an XProtect Rule to “Trigger a ROC Alert” when a defined event trigger is received.

To set up a ROC Alert, perform the following steps:

1. In the Management Client under Rules and Events, select “Rules”.
2. Right-click in the Rules, and select “Add Rule...”
3. Click the event hyperlink, and find the desired group name under Analytics Event. Select the event.
4. Select the desired cameras and times.
5. In the Actions to Perform window pane, find and select “Trigger ROC Alert”.
6. On the Group hyperlink, select “All ROC Watch Plugins”.
7. Click Finish

## Additional Questions?

Please feel free to reach out to [support@rankone.io](mailto:support@rankone.io) with any questions or confusion you might still have.

