



# **DVMS System Gateway & SDK Functionality Overview**

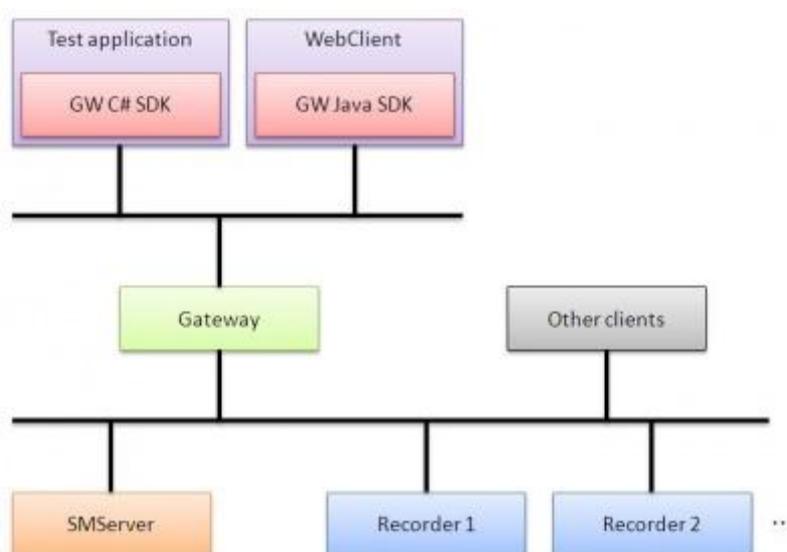
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# 1 Gateway

## 1.1 Introduction



*Figure 1 Gateway in NVR system*

DVMS System Gateway is a server application developed in C#, but it also uses several C++ plugin libraries for audio and image handling. The Gateway allows client applications to interface to the DVMS recording system over Internet networks and protocols. The Gateway runs as a Windows service and consists of two different servers build in it:

- **A web server** (default port 9999) that distributes the WebClient applet .jar files to clients (i.e. web browsers)
- **A streaming server** (default port 9000) that Gateway clients can communicate with over the Promesa protocol.

It is possible to integrate third party client applications to the Gateway using Gateway SDK. Gateway SDK is currently available in two different languages: C# and Java. The official Gateway client "WebClient" is a Java applet application that uses the Gateway Java SDK.

## 1.2 Basic information

### 1.2.1 Gateway main functionalities

Gateway main functionalities are:

- Communication with the DVMS System Management version 5.0 or higher
- Communication with the DVMS recorders version 4.8 or higher
- Communication with Gateway client using Promesa protocol.
- WebClient can be downloaded from Gateway using Gateway web service

In version 5.11.3, Gateway provides the following features to all its clients using Promesa protocol version 3.0:

- Backward compatible with 5.10 clients (Promesa version 2)
- Connection
  - TCP packet loss recovery (in WLAN environments)
  - Loopback client ping requests
- Access control
  - Log on/off the DVMS system
  - Change user account password
- Profile handling
  - User profile list
  - Profile data
  - Profile change events
  - Device status events
- Real-time video streaming
  - Maximum of 16 simultaneous real-time streams per client session by default
  - Video streaming can be set to full-rate or motion-based
  - Video streaming output can be set to JPEG or the native format from the recorder
  - Video JPEG output supports 3 size types: normal, medium (normal / 4) and small (normal / 16)
- Playback video streaming
  - Maximum of one playback stream per client session by default
  - Video streaming output can be set to JPEG or the native format from the recorder.
  - Video JPEG output supports 3 size types: normal, medium (normal / 4) and small (normal / 16)
  - Time search
- Activity search
  - UTC time based
  - Hourly, daily, monthly, yearly number of recorded frames
- Ptz control
  - Dome properties (what dome properties does the dome support)
  - Open, force open, close, automatic close
  - Move to 8 directions
  - Center (if supported by dome camera model)
  - Zoom in and out
  - Area zoom (if supported by dome camera model)
  - Unzoom (if supported by dome camera model)

- Focus near and far
  - Iris open and close
  - Select dome preset positions
  - Start and stop dome camera tours
- Digital I/O
  - Output state toggle
  - Output pulse
- Recorder events
  - I/O state
  - Camera state
  - Video motion
- Alarms (5.12)
  - Alarm event subscription
  - Alarm start and stop events
  - Alarm configuration information
  - Alarm acknowledgement
- WebClient
  - Brand support (5.10.7)
  - Language support (5.11.4)
  - Real-time and playback native video streaming (5.12.3)
  - Embedded applet or standalone application (5.12.3)

## 1.2.2 Supported Windows versions

The following Windows versions have been fully tested:

- Windows XP (32 and 64bit)
- Windows Vista (32 and 64bit)
- Windows 7 (32 and 64bit)
- Windows 2008 Server (32 and 64bit)

## 1.2.3 Installation

Gateway has its own installation program: it installs the Gateway server applications, the WebClient and DirectX. The following information is required when installing the Gateway:

- Installation directory (the default folder is C:\Program Files\DVMS\Gateway)
- System Management Server address

The Gateway configuration file contains additional parameters that can be modified by authorized users (see Gateway configuration for more details).

Gateway installer details:

- The unchanged upgrade GUID for installer is {1F4EC4CC-DFB6-48AA-B583-E901884AD565}
- Starting on from version 5.10.3 the Gateway installer is upgradable
- The installer supports XP, 2003, Vista, and Windows 7 operating systems
- Only SM server IP address is user assignable, other parameter settings were removed from the installer dialogs

- Other parameters such as ports can be configured by manually editing the *ServiceLauncher.exe* configuration file and restarting the service
- Gateway installer queries the following registry key to determine if .NET prerequisite is met:

```
.NET 3.5 SP 1: HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\NET Framework Setup\NDP\v3.5\Version
```

## 1.2.4 Configuration

During the Gateway installation, user is prompted to set the System Management server address. Other Gateway configuration parameters such as the web port 9999 and Promesa server port 9000 can be changed in the configuration file. In addition, a listening IP's can be set for the web server and Promesa server respectively. The default value 0.0.0.0 binds the listening sockets to all available network interfaces in the computer. In addition, there is a possibility to configure the Gateway address by Gateway clients. This option is provided for network environments that use NAT.

Gateway supports 16 simultaneous real-time streams and 1 playback stream for a single user by default. These values can be changed in the Gateway configuration file.

The following table shows all the Gateway specific parameters that can be changed in the *ServiceLauncher.exe.config* file. The Gateway configuration file is located in the Gateway installation directory.

**ServiceLauncher.exe.config**

Key	Default Value	Comments
MaximumNativeMemoryMB	1024	Native image handling memory maximum limit. Minimum is 256MB and default 512MB.
DVRRemotingHostProtocol	gtcp://	Used communication protocol
RegistrationState	4	0 is Remote WS, 1 is Local WS, 2 is SM, 3 is Old Gateway, 4 is GatewayServer
MaximumEventQueueCount	100	Maximum event count in communication event queue
MaximumLoad	95	Realtime stream balancing maximum load value. Skipping is started when highest CPU core load 5s average is higher than this limit.
MinimumLoad	85	Realtime stream balancing minimum load value. Skipping is ended when highest CPU core load 5s average is lower than this value.
SkippingDownPercentage	5	Realtime stream balancing percentage decrease on image skipping: value that is decreased from maximum load value after first camera has started skipping.
ForceStreamSeconds	1	Realtime stream skipping seconds: How many second are skipped before next image.
MaximumRealtimeStreams	50	Maximum number of allowed realtime streams to

		all recorders.
LimitierDebug	False	Is realtime stream balancing debugging on
PerformanceMonitoring	False	Are performance counters used
ClientLoginTimeout	30000	Time span when a valid login command must be sent from the client.
JPEGEncodeQuality	80	JPEG encoding quality 1-100
SMServerIP	127.0.0.1	Address of the System Management server.
SMServerPort	5008	System Management server port. Notice that this parameter should never be changed.
GatewayServerIP	0.0.0.0	IP address of the Gateway Promesa protocol server. 0.0.0.0 is the default address and binds to all configured network interfaces of the local machine.
GatewayServerPort	9000	Port which Gateway Promesa protocol server listens.
HTTPServerIP	0.0.0.0	IP address of the Gateway web server. 0.0.0.0 is the default address and binds to all configured network interfaces of the local machine
HTTPServerPort	9999	Port which Gateway web server listens.
ClientSettingsProvider.ServiceUri		
MaxRealtimeStreamsPerSession	16	Hidden value of maximum number of realtime streams for single user. 16 is the maximum value that can be set.
MaxPlaybackStreamsPerSession	1	Hidden value of maximum number of playback streams for single user. 4 is the maximum value that can be set.

**Note:** It is recommended to keep the same IP addresses for the Gateway server and the HTTP Web server because browser applets run within a security sandbox that restrict them from contacting any other server than the one it was downloaded from. However if there is a need to have different IP-addresses, it is possible to define the Gateway server address and port in the WebClient applet parameters. But for that to work, the WebClient applet needs to be digitally signed. The other alternative is port forwarding.

### 1.2.5 Logging with Log4Net

The Gateway uses Log4Net API for its Logging services. The Gateway application generates two sets of log files in its logs subfolder:

- The Audit logs (GatewayAuditLog.txt) list details about the user actions

Example of an audit trail:

```
Audit Trail Data:
UtcTime: 20.1.2010 11:08:50
LocalTime: 20.1.2010 13:08:50
UserName: Admin
ApplicationName: Gateway 5.10.4 / DEVELOPMENT
```

```

EventCode: ReleaseDomeCameraControl
EventStatus: EventOk
ObjectName: Camera 17
RecorderAddress: 10.99.100.184
RecorderName: Local recorder

```

In the default configuration, audit logs are backed up when they reach 1MB in size. The maximum number of backup files that are kept before the oldest is erased is 10.

Gateway logs (GatewayLog.txt) list details about the Gateway application execution

A typical entry contains the date/time, log level, method name, thread name and an application message.

In the default configuration, application logs are backed up when they reach 1MB in size. The maximum number of backup files that are kept before the oldest is erased is 10.

For performance reasons, it is recommended to keep the log level to Info in production, however for development or error investigation purposes it is more useful to set it to Debug.

More detailed information about Log4Net configuration is available at [Apache Log4Net](#)

## 1.2.6 Audit trail support

Gateway writes audit trail events from Gateway user actions. Functionality is similar that in other DVMS clients like Workstation. Supported audit trail events in Gateway can be found from [here](#).

## 1.2.7 Performance Counters

Performance counters can be turned on for the Gateway in ServiceLauncher.exe configuration file by setting the "PerformanceMonitoring" key to value "True".

<b>General</b>	
<b>Counter name</b>	<b>Description</b>
Number of active user sessions	The number of active Gateway sessions
Number of image conversions / second	The number of images converted to JPEG.
Number of images sent over the network / second	The number of JPEG images sent to all clients

<b>Realtime video streaming</b>	
<b>Counter name</b>	<b>Description</b>
Image realtime stream count	The number of realtime video streams opened in the Gateway.
Image realtime stream on skipping state count	The number of realtime video streams that are currently skipping images.
Number of images received from network / second	The number of realtime images received by the Gateway from the recorders.
Number of images received and skipped from network / second	The number of realtime images received and skipped by the Gateway.

<b>Memory</b>	
<b>Counter name</b>	<b>Description</b>
Number of buffers in use	How many memory buffers are currently in use.
Number of available buffers	How many memory buffers are currently in reserve.

### 1.2.8 Brand support

As of v5.10.7, the Gateway fetches the license information from SMServer at startup. The license information includes the brand code that is used to distribute to end users the WebClient with the supported look and feel or with the default look.

Branding is also supported in earlier versions of the SMServer, however it requires that a WebClient user logs in first in order to collect the license information. This means that the first user that logs in to the Gateway will get the default branded WebClient, whereas all the subsequent users will get the expected look and feel.

### 1.2.9 Language Support

The language is an option available for all user accounts and can be changed in the System Manager application or the WorkStation. As of version 5.11.4, the WebClient application has been translated to the following languages:

- Arabic
- Chinese Simplified in 5.11.6
- Danish
- Dutch
- English
- Estonian
- Finnish
- French
- German
- Hungarian
- Icelandic
- Italian
- Norwegian

- Polish
- Portuguese
- Russian
- Spanish
- Swedish
- Thai

## 1.3 Gateway SDK

Gateway SDK can be used to integrate 3rd party applications to the DVMS system. Currently there are two versions of Gateway SDK available:

- C# SDK
- Java SDK

## 1.4 Gateway Client-Server Version Compatibility Matrix

The following table shows the current (as of v5.11) and future compatibility between different versions of the Gateway SDK client and server.

Compatibility Matrix		
SDK Version	Gateway Version	Compatibility
5.10	5.10	Yes
5.10	5.11	Yes
5.10	>5.11	Yes
5.11	5.10	No
5.11	5.11	Yes
5.11	>5.11	Yes
>5.11	5.10	No
>5.11	5.11	Yes
>5.11	>5.11	Yes

Version 5.10 supports Promesa version 2, whereas version 5.11 supports Promesa version 3

## 1.5 Change log

### 1.5.1 Version 5.12.3

- Native streaming in WebClient

### 1.5.2 Version 5.12.2

- Alarm support.

### 1.5.3 Version 5.11.4

- Language support
- TCP packet loss recovery (in WLAN environments)
- Loopback of client ping requests

### 1.5.4 Version 5.11.3

- Promesa Protocol Version increased to 3.0
- Fixed backward compatibility with 5.10 clients (Promesa version 2.0)
- Real-time video streaming can be set to full-rate or motion-based.
- Real-time and playback video streaming can be set to JPEG or native format from the recorder.

### 1.5.5 Version 5.11.2

- Recording activity search from a playback video stream or camera profile
- Major performance improvements

### 1.5.6 Version 5.11.1

- Refactored recorder event handling and added new event VideoMotion

### 1.5.7 Version 5.10.7

- Support for license-based branding of WebClient applications
- WebClient UI finalized for dome camera control and PTZ actions
- Playback image export in WebClient

### 1.5.8 Version 5.10.6

- Support for simultaneous real-time and playback video streams.
- WebClient UI finalized for Digital I/O

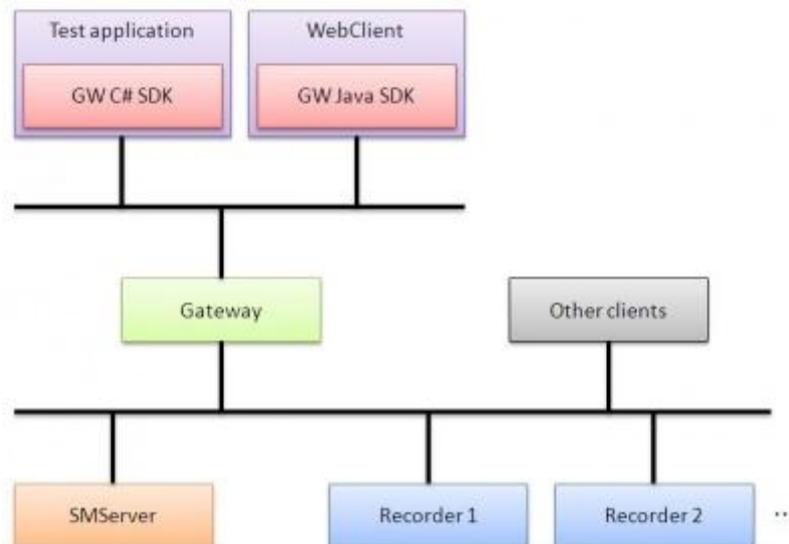
### 1.5.9 Version 5.10.5

- Base level of the new Gateway reached
  - C# and Java SDKs ready
  - WebClient basic functionalities ready
    - Log on and off
    - Profile update handling
    - Realtime streaming
    - Playback operations and streaming
    - General WebClient layout
  - Features to be finalized before release
    - Digital input
    - Digital output
    - Dome control
    - Language support

- Skinning
- Changing user password
- Image export

## 2 Gateway SDK

### 2.1 General



*Gateway SDK in the DVMS system.*

Current Promesa protocol version number is 3.0.

The Gateway SDK enables third party applications to integrate with the DVMS system through the Gateway server. The Gateway SDK communicates with the Gateway server using a TCP-based protocol: the Promesa protocol. The Gateway SDK is currently available in two programming languages: Java and C#. Both SDK versions have the same Object-Oriented design.

### 2.2 Gateway SDK package content

Gateway SDK includes following:

- Documentation
  - Release notes (ReleaseNotes.txt)
  - Promesa protocol document (PromesaProtocol.pdf)
  - JavaSDK
    - Gateway Java SDK html documentation generated from Gateway Java SDK source code comments using JavaDocs
  - CSharpSDK
    - Gateway C# SDK html documentation generated from Gateway C# SDK source code comments using Doxygen
- Bin

- Compiled Gateway Java SDK jar (GatewaySDK.jar)
- Compiled Gateway C# SDK dll (GatewaySDK.dll)
- Compiled Gateway C# SDK test application (TestSDKApplication.exe)

## 2.3 Gateway TestBench Application

The Gateway TestBench is a Java application that can run different test scenarios and collect performance metrics. There are currently 3 tests available to measure real-time streaming, playback streaming or both real-time and playback concurrently.

## 3 WebClient Application

The WebClient is a digitally signed Java applet built on the top of the Gateway Java SDK that uses the Gateway server to access Viper system functionalities. The WebClient communicates with the Gateway server using the Promesa protocol version 3.1. The WebClient is downloaded from the Gateway service through default port 9999.

### 3.1 Main functionalities

The WebClient currently offers the following main functionalities to the user:

- Access control
  - Log on to Viper system
  - Log off from Viper system
  - Get list of user profiles
  - Browse user profile data
  - Reload automatically current profile on update
  - See profile device statuses
  - Change user password
- View real-time video streams (By default 16 at the same time)
  - Full screen
  - Activity indicator
  - Motion-based JPEG video streaming by default
  - Motion-based native video streaming
- View playback video streams (By default 1)
  - JPEG video streaming by default
  - Native video streaming
  - Play
  - Stop
  - Single image forward and backward
  - Fast forward and backward at different speeds
  - Time search
  - Full screen
  - Export current image (v5.10.7)
- Digital input current state
- Digital output
  - Current state
  - Toggle state
  - Pulse state
- Dome camera control
  - Open, take over, close, automatic close
  - Supported dome properties
  - Move to 8 directions
  - Center
  - Iris open and close
  - Focus near and far

- Zoom in and out
- Unzoom
- Area zoom
- Select dome preset positions
- Start and stop dome camera tours
- Look and feel
  - Support custom look and feel for official brands (v5.10.7)
- Multiple language support

## 3.2 WebClient details

### 3.2.1 Supported browsers

The following web browsers are fully supported:

- IE7
- IE8

### 3.2.2 Starting the WebClient

As a prerequisite, Java Runtime Environment v 1.6 or higher must be installed for the WebClient to work properly. In the case Java is not installed, a message is shown to the user with a link to the latest Java Runtime Environment download page. In the case the installed Java version is lower than the recommended one, a warning message is displayed in the WebClient login page. However, the WebClient lets the user proceed with the session if necessary.

Version 5.12.3 of the WebClient application introduces several new features that are available via different URL paths or parameters:

- Embedded applet or standalone application
- Native or JPEG video streaming
- Debug/performance monitoring mode

The WebClient URLs are:

- Default embedded applet streaming realtime and playback JPEG video:

```
http://GatewayAddress:9999
```

- Embedded applet streaming realtime and playback native video:

```
http://GatewayAddress:9999?video=native
```

- Standalone application streaming realtime and playback JPEG video:

```
http://GatewayAddress:9999/standalone
```

- Standalone application streaming real-time and playback native video:

```
http://GatewayAddress:9999/standalone?video=native
```

- Debug/performance mode can be activated by adding HTTP request parameter **debug** with value **true**:

```
http://GatewayAddress:9999/standalone?video=native&debug=true
```

Supported values of the **debug** request parameter:

- true
- false (the default)

Supported values of the **video** request parameter:

- jpeg (the default)
- native

The WebClient application consists of multiple files described in the table below:

WebClient Files	
File name	File Description
webclient.jar	Obfuscated java classes and translation files (Signed by Verisign)
webclient_dll.jar	Image conversion libraries for native video streaming (Signed by Verisign)
webclient_skin.jar	The default application look and feel (Signed by Verisign)
webclient_skin*.jar	Custom look and feel archives (Signed by Verisign)
webclient_applet_jpeg.html	Index HTML file for embedded applet supporting JPEG video streaming
webclient_applet_native.html	Index HTML file for embedded applet supporting native video streaming
webclient_applet_native.jnlp	JNLP definition file for embedded applet supporting native video streaming
webclient_standalone_jpeg.jnlp	JNLP definition file for standalone application supporting JPEG video streaming
webclient_standalone_native.jnlp	JNLP definition file for standalone application supporting native video streaming

### 3.2.3 Language Support

All the translation files for supported languages are bundled with the WebClient application. At startup, the WebClient reads the system locale of the client machine and loads the appropriate translations if supported or English as the default. After the user logs in, the language code is read from the session information and new translations are loaded if the session language is different from the locale. The language is an option available for all user accounts and can be changed in the System Manager application or the WorkStation. If the language is modified for a user having an active session in the WebClient, the application automatically updates all texts without interfering.

## 3.3 User interface

### 3.3.1 UI layouts

On WebClient startup, the user is taken to the Log On screen which displays credential fields for authenticating the session. The Log On page is shown again on failed attempts with an error message describing the reason. On successful login, the user is taken to the main workspace.

The workspace is divided into two areas separated by a draggable split bar: The profile tree on the left side and the streaming area on the right side. A toolbar appears at the top of the streaming area with menu buttons on the right side to change some user settings and to log out from the WebClient. Two tabs are available on the left side of the toolbar to switch between realtime and playback mode. The profile tree is shown in both modes with contextual profile selection. Users can drag the split bar to show more of the profile tree or streaming area, and hide either of the areas by clicking on the appropriate split bar arrow. Playback and realtime modes are almost the same except in playback mode there are controls for playback and time search.

### 3.3.2 Video Streaming

Video streaming can be started in realtime and playback modes by double clicking on a camera node in the profile tree or by dragging the node to the streaming area. It is also possible to drag a site folder to the streaming area in order to stream from all the cameras underneath the site folder. Several conditions must be met in order to start streaming video from a camera:

- The camera must be active (Connection state must be OK in real-time mode, or OK and NoSignal in playback mode).
- The user must have permission to view playback or real-time video from the corresponding camera.
- Only one video stream is allowed per camera in each mode.
- The number of maximum real-time/playback streams per session has not been reached.

Double click and drag and drop is disabled on a camera node that cannot start video streaming.

#### Video Stream Panel Title Bar

All video stream panels have a dedicated title bar that features an activity indicator, the camera name and a set of control buttons for the following operations:

- Start the full screen mode. The selected camera images fill up the whole WebClient workspace. All other streams are paused during this mode.
- Stop the full screen mode. All cameras resume streaming.
- Close a video stream panel.

### Smart Layout

The WebClient lays out the stream panels in an  $N \times N$  square grid where all grid cells have the same size and fill up all the available space. The grid cell sizes are automatically adjusted when resizing the applet (or browser window) or the profile tree.

A simple flow mechanism is in place to position new stream panels in a systematic way: the new panel is added to the next empty grid cell to the right of the last panel or to the next grid row. If there are not any available slots, the grid expands with an extra row and column (2x2 -> 3x3 -> 4x4). In addition, this works the other way around, as the grid shrinks when individual panels are closed.

### Real-time Mode

In order to watch real-time video, the user must first select the Real-time View tab at the top of the WebClient. Real-time video streaming starts when adding a camera to the streaming area. Streaming information, such as localized date and time or error messages, is displayed in the top left corner of each panel. Some cameras that allow PTZ control have a toolbar displayed at the bottom left part of the panel.

### Playback Mode

In order to watch synchronized playback video, the user must first select the Playback View tab at the top of the WebClient. The Playback View consists of the streaming area where the camera video panels are added and a player widget component at the bottom that will orchestrate the playback of all subscribed cameras. Streaming information, such as localized date and time or error messages, is displayed in the top left corner of each panel. A toolbar with channel-specific playback actions is displayed at the bottom left part of each panel. The toolbar is also available in full screen mode.

The player actions:

- Play: The user must press the Play button in order to start the synchronized video streaming of all the subscribed cameras. Playback resumes at the timestamp of the image received last. It is possible to add or remove cameras from the player during playback.
- Stop: The user must press again the Play button in order to stop the playback.
- Single image forward and backward: The user can request the next or previous image by clicking on the corresponding button. These actions stop the current playback.
- Fast forward and rewind: The user can fast forward or rewind video with the slider widget. Dragging the slider knob to the left rewinds the video whereas sliding it to the right forwards it. Releasing the knob ends the fast search action. The slider features several +/- increment values (2, 4, 8, 16) that are used for setting the speed of the fast search. Considering that images are streamed at a frame rate of 1 per second during fast search, the speed value represents the number of seconds to skip for the next image. Speed values are displayed in the label component at the right side of the slider.
- Time search: The Time Search button allows the user to define any playback start date and time in a calendar dialog box. The dialog includes a button to set the calendar to the current date and time. The calendar always displays the date and

time of the image received last. The playback starts at the specified date and time after the user has pressed Ok in the calendar dialog. If there is no material available at the specified date and time, the playback proceeds until recorded material is found and starts playing from that new date and time.

### Image Export

Image exporting is only available in playback mode. Users save the current image of any video panel by clicking on the "Save Image" button located in the video panel toolbar. This action opens a Save dialog, in which the user can select the target folder and change the name of the exported image if necessary. The default image name is a concatenation of the camera name and playback timestamp formatted as "yyyy-MM-dd, hh-mm-ss-SSS". The format of the image is always JPEG and cannot be changed to any other formats. Because the size of the exported image depends on the dimensions of the display panel, it is recommended to export images in full screen mode to get a higher resolution of the image. For usability reasons, the playback always stops when exporting an image and the Save dialog remembers the folder selected last for the whole session.

### 3.3.3 Digital I/O

The digital inputs are displayed in the profile tree:

- The text of the profile row is the name of the device. The device name can be changed in System Manager Profile Settings.
- The icon of the profile row shows the device state (on / off / unknown) and the connection state. Even though users can define custom icons in System Manager Profile Settings, they are not available in the WebClient application which always uses the default icons.
- The tooltip of the profile row shows the description if it exists or the name of the device.

The digital outputs are displayed and controlled in the profile tree:

- The text of the profile row is the name of the device. The device name can be changed in System Manager Profile Settings.
- The icon of the profile row shows the device state (on / off / unknown) and the connection state. Even though users can define custom icons in System Manager Profile Settings, they are not available in the WebClient application which always uses the default icons.
- The control check box offers a quick and interactive way to execute the primary action for this device profile. The primary action can be "Change State (switch on/off)" or "Pulse" and it can be specified in System Manager Profile Settings.
- The tooltip of the profile row shows the description if it exists or the name of the device. The primary action is added at the end of the tooltip box: it can be "Change State" or "Pulse (delay in seconds)".
- Double-clicking on the profile row opens a dialog box with all the available digital output actions. Actions "Switch state" and "Pulse" can be executed by clicking on their dedicated icon buttons. The pulse action shows an error message when the delay value is not in the range [1 ... 240] or is not a number.

### 3.3.4 Dome Camera Control

The WebClient application supports the same controlling methods as the Workstation. Here are all the dome camera control features supported in the WebClient, and how to access them:

- **Open dome control:** When a user has the permission to start a dome control session, a small dome camera icon and arrow button are displayed at the bottom left of the corresponding real-time video streaming panel. The button is disabled until the first image is received. Clicking on the button gives the user the exclusivity to operate the dome camera unless another user has reserved it. Upon getting control, a small menu bar opens showing all the PTZ functions available for the dome camera.
- **Take over dome control:** In a situation where the dome camera is in use by another user, the user requesting the control will receive a notification message that it is already reserved. An additional button is added for users with the proper permission that allows them to seize the control from the other user. The user that has lost the control receives a notification message with the name of the user that took over and a button for closing the dome control menu bar. This behaves similarly when the camera is reserved or requested by a WorkStation user.
- **Close dome control:** The user can close a dome control session by clicking on the arrow button at the bottom left of the streaming panel.
- **Automatic dome release:** A dome control session automatically closes when the user has remained inactive for a certain period of time. The countdown for the last 15 seconds is displayed at the bottom left replacing the dome camera icon. The countdown is reset to its original value and hidden on operating the dome camera. The automatic dome release value can be changed in System Manager Profile Settings.
- **Movement to 8 directions:** In order to move the dome camera, the user must press the left mouse button on top of the arrow image at the center of the video. While pressing the button, the user can drag the mouse pointer to one of the visible quadrant for the desired direction and speed. It is possible to stop the motion while dragging by placing the mouse pointer back to the center or simply by releasing the mouse button.
- **Centering:** The user can click anywhere on the image in order to set the center to a different location. This function is only available on some dome camera models.
- **Area zoom:** The user can draw a rectangular area with the mouse to zoom into the image. Typically the user must first select the top-left corner and drag the mouse pointer to the bottom right corner to draw an area to zoom into. The selected rectangle always keeps the same aspect ratio as the video. This function is only available on some dome camera models.
- **Zoom:** A menu entry is added to the dome control menu bar when the Zoom function is available in a dome camera. Clicking on the Zoom menu button opens a contextual popup panel that features a slider for controlling the zoom. Moving the slider handle up zooms in whereas moving the handle down zooms out. The slider handle must be released in order to stop the current zoom action. The Zoom menu can also include the Unzoom action if it is supported by the dome camera model. Unzooming cancels the current zoom.
- **Iris:** A menu entry is added to the dome control menu bar when the Iris function is available in a dome camera. Clicking on the Iris menu button opens a contextual popup panel that features a slider for controlling the iris. Moving the slider handle up opens the iris whereas moving the handle down closes the iris. The slider handle must be released in order to stop the current iris action.
- **Focus:** A menu entry is added to the dome control menu bar when the Focus function is available in a dome camera. Clicking on the Focus menu button opens a contextual popup panel that features a slider for controlling the focus. Moving the slider handle up focuses far whereas moving the handle down focuses near. The slider handle must be released in order to stop the current focus action.
- **Preset Positions:** The list of preset positions is shown in a contextual popup when clicking on the Presets menu button. The user can select a new position by clicking

on its name. The current preset name is marked with a tick. The creation of preset positions is not supported in the WebClient, it is only available in the WorkStation.

- **Camera Tours:** The list of camera tours is shown in a contextual popup when clicking on the Camera Tour menu button. The user can start a new tour by clicking on its name and stop it by also clicking on the name. The current camera tour name is marked with a tick. The creation of camera tours is not supported in the WebClient, it is only available in the WorkStation.

### 3.3.5 User Settings

User can change settings such as the login password in the WebClient application. Clicking on the Settings button in the top menu opens a dialog box in which the user must enter the current password and the new password twice for confirmation. The new password is accepted and saved on the server only when:

- The current password is correct
- The new passwords match
- The new password does not contain unsupported characters
- The new and current passwords are different

The user that successfully changed the password can proceed with the current session whereas all other users logged in with the same account will be prompted to enter the new credentials.

## 3.4 Help

### 3.4.1 WebClient Applet Parameters

Several configurable parameters are available in the WebClient:

- *GatewayAddress:* Gateway server address
- *GatewayPort:* Gateway server port
- *Debug:* Debug/Performance mode enabled when set to true.
- *Video:* Real-time/playback video streaming format (values are jpeg or native, jpeg is the default)

*GatewayAddress* and *GatewayPort* parameters are useful in different situations:

- When the WebClient is run outside a browser environment like in an AppletViewer.
- In a browser environment, when the Gateway server is at a different address than the server the applet was downloaded from.

### 3.4.2 WebClient Debugging

There are several ways to display or log debug information for the WebClient:

- Several Java debug settings are located in Java Control Panel/Advanced/Settings/Debugging.
- Application tracing in the WebClient can be enabled via an applet parameter:

```

<applet>
  <param name="Debug" value="true">
</applet>

```

Up to version 5.12.3, debug mode includes network activity monitoring such as frame and data rate information that is collected for each streaming channel and displayed in their corresponding video stream panel.

Debug mode in version 5.12.3 has been refactored to include more advanced performance monitoring features. When debug mode is active, a modeless dialog is shown with a table of performance counters constantly updating totals, counts per second and average values of critical parameters related to memory pooling, image conversion and display...:

<b>Performance Monitoring</b>	
<b>Keys</b>	<b>Description</b>
MemoryBufferUseCount	The total number of memory buffers currently in use
MemoryBufferAvailableCount	The total number of memory buffers available in the memory pool
ImageDecodingsPerSecond	The number of images decoded per second
ImageDecodingSkippedPerSecond	The number of images that skipped decoding per second
ImageDrawingsPerSecond	The number of images displayed to the screen per second
ImageDrawingSkippedPerSecond	The number of decoded images that were not displayed to the screen per second
ImageReceivedPerSecond	The number of video images received per second
BandwidthUsedPerSecond	The bandwidth used per second

In version 5.12.3, some debug information is displayed in each individual streaming panel:

- \* Video resolution
- \* Video Codec

### 3.4.3 JVM Tuning

The default heap settings in browsers are too low (typically 64MB) to properly handle video streaming from multiple channels. It is highly recommended to increase the Java heap:

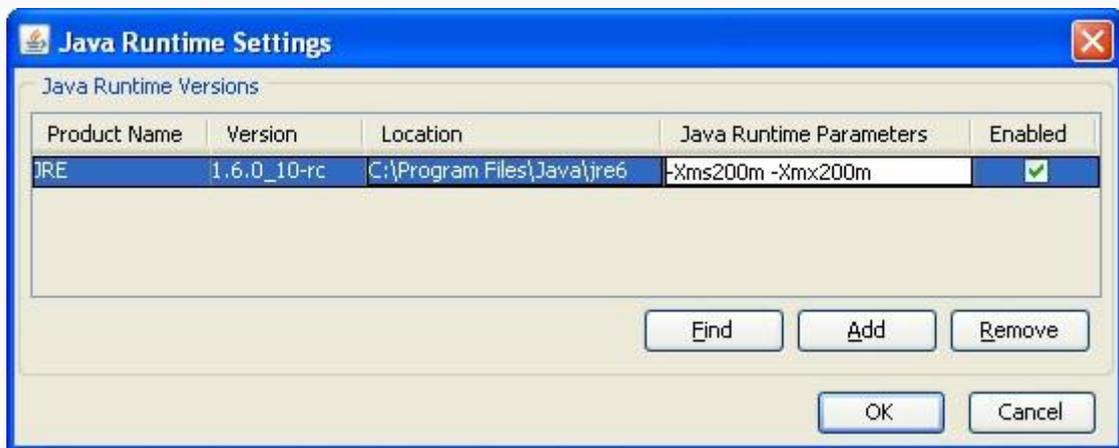
- In Java Control Panel (JCP)

This is a manual operation that should be valid for all JRE or browser versions.

Go To Java Control Panel / Java / Java Applet Runtime Settings

Set the following Java Runtime Parameters for the heap:

```
-Xms<size>m sets the initial Java heap size in MBytes
-Xmx<size>m sets the maximum Java heap size in MBytes
```



Heap settings in Java Control Panel

Note that the heap parameters do not just apply to the WebClient. All other Java applications/applets executed by the Java plugin will be affected by this setting.

- As Applet parameter

From JRE1.6u10 onwards, it is possible to pass JVM arguments to a reserved applet parameter.

```
<applet>
  <param name="separate_jvm" value="true">
  <param name="java_arguments" value="-Xms200m -Xmx200m">
</applet>
```

This is the current solution in place, users that do not have the latest JRE installed will need to manually enter the heap settings in JCP. These applet parameters work since IE 7 and Firefox 3, they do not work in Firefox 2.

### 3.4.4 Downloading latest version of the WebClient

After a license or Gateway upgrade, users need to download the latest WebClient application from the Gateway server rather than the local browser cache, which is the default behavior. Users must go to Java Control Panel from Windows Control Panel or the system tray to clear the cache of any old WebClient versions and hence forcing the browser to request the WebClient from the Gateway server. The actions necessary to clear the java cache in Java Control Panel are:

#### Go to Java Control Panel/Tab General/Section Temporary Internet Files/Button Settings/Button Delete Files

Inside **Delete Temporary Files** dialog box, users must check that **Applications and Applets** is selected and then press OK.

Users can then load the WebClient after the cache has been cleared.

Another quicker alternative available in FireFox and IE is to first load the (old) WebClient in the browser and press CONTROL F5 to refresh it. The hard refresh shortcut ensures that the WebClient is not loaded from the local cache. It is also possible to achieve the same by clicking on the Refresh/Reload icon while holding the CONTROL key.

### 3.4.5 Known Issues

- Applet objects are rather subtle to dimension and locate in browsers using CSS. The WebClient comes with a default HTML page that contains the applet as the only piece of content, and stretches it to cover all the available content area of the browser. This can be achieved via CSS by setting the applet width and height to 100% and locating it to an absolute position of 0 px from the top. However IE and Firefox each exhibited different annoying malfunctions such as blank screen on startup or a fixed maximum applet height of 200px.

In this scenario, we recommended to wrap the Applet in a block-level DIV container and to apply the CSS styling to the DIV tag:

```
<head>
  <style type="text/css">
    <!--
      #webclient { position: absolute; top: 0px; width: 100%; height:
100%; }
      applet { width: 100%; height: 100%; }
    -->
  </style>
</head>
<body>
  <div id="webclient">
    <applet>...</applet>
  </div>
</body>
```

This has been successfully tested in IE 7 and Firefox 2.0.

- The WebClient freezes with Java JRE 1.6.0\_19 on XP and Vista in all tested browsers (IE 8 and FireFox). The browser, the WebClient and the Java console always freeze at the same point when displaying the loaded profile in the JTree component. Unsigned versions of the WebClient applet can proceed beyond the crash point, which could pinpoint the problem down to the signing. All other past and recent versions of the JRE work fine.