LENSEC, LLC

PERSPECTIVE VMS®

Architectural and Engineering Guide

LENSEC, LLC
Version 6.1.0

Intended Target Audience

This Architectural and Engineering Guide was created and designed as a specification resource for consultants, A&E firms and end-users that are designing and building a Request for Proposal for project bid-submission. The Guide is also a resource to assist in determining feature sets and requirements for systems and deployments of Perspective VMS.

The text of the guide has been formatted for inclusion in standards from the Construction Specifications Institute (i.e. CSI format)

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This document is instructional and intended for specification design for LENSEC direct customers, Authorized Resellers, or End-Users purchasing Perspective VMS™ from an Authorized LENSEC Reseller.

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Video Management System (VMS)

PART II: PRODUCTS

2.01   SYSTEM SUMMARY

2.01.01   The Video Management System (VMS) shall provide smart-client-based Internet Protocol (IP) Video for integrated security management.

2.01.02   The VMS shall be browser-based, allowing for the management of and viewing of any configured camera located at any facility from any network-connected computer.

2.01.03   The VMS shall also provide for viewing of any recorded video from any configured camera at any facility using any standard network-connected computer and using any standard internet browser such as, but not limited to, Google Chrome, Microsoft Edge, Firefox, Safari, etc.

2.01.04   The VMS shall leverage HTML5 standards for live video streaming, archive video playback, and general application delivery via standard web browsers.

2.01.05   The use of smart clients shall not require the installation of software code from the VMS provider company on the client viewing device and shall be an intuitive graphical system that is web based benefiting the user by facilitating quick learning of the system and reducing the training time required to become proficient in its use.

2.01.06   User access to the system shall require a single log-on credential. The system shall recognize an authentic credential and grant user access to all devices and modules he or she has permission to use regardless of the number of servers hosting those devices and modules in the security network.

2.01.07   Operation of the system shall require using either a touch screen or commonly available mouse and keyboards. The VMS client shall be fully able to access all modules and features offered by the VMS. Access and functionality shall be limited only by the permissions assigned to any given user by the system or delegated administrator(s).

2.01.08   The VMS shall offer communications and collaboration features enabling users to exchange messages and share views with others on the security network.

2.01.09   The VMS shall include a panel to display alerts from other users on the security network and from integrated devices manufactured by other companies. Some examples include, but are not limited to, video camera manufacturers, access control manufacturers, RFID manufacturers and video analytics manufacturers.

2.01.10   The VMS shall include a navigation tool bar on its client enabling users to move with a single mouse click from one module to another module.

2.02   LICENSES

2.02.01   The VMS shall be offered in appropriate editions or licensed versions. There shall be an Express version, Standard version, Professional version, and an Enterprise version. Advancement from a lesser version to a greater version shall be allowed by a simple license key adjustment.

2.03   SUBSTITUTIONS

2.03.01   All proposed substitutions must be approved by the Consultant or Architect/Engineer professional specifying a solution for this project.

2.03.02   Proposed substitutions must provide a line-by-line specification compliance document with justification for substitution by line.

2.04   VIDEO MANAGEMENT GENERAL REQUIREMENTS

2.04.01   Microsoft .NET Requirements:

Microsoft .NET Core 8.x is a Free download from Microsoft and is a requirement of the VMS System and must be installed on both the server and on all clients for proper operation.

2.04.02   Microsoft .NET Requirements:

Microsoft .NET Framework 4.x is a Free download from Microsoft and is a requirement of the VMS System and must be installed on both the server and on all clients for proper operation.

2.04.03   Database Requirements:

Microsoft SQL Server (2012, 2014, 2016, 2017, 2019 or 2022) is a requirement and must be installed on the server. Either the Microsoft SQL Server Express which may be downloaded from Microsoft at no charge or the complete version of SQL Server Standard or Enterprise may be utilized with the VMS.

2.04.04   Adobe Acrobat:

Adobe Acrobat version X or equivalent PDF reader should be installed in order to view and read the installed VMS Manuals.

2.04.05   Microsoft IIS (Internet Information Services):

Microsoft IIS version 10.0 (or greater) is a requirement and must be installed on the server for proper operation of the clients.

2.04.06   Internet Browser:

There must be a current 64-bit Internet Browser such as Google Chrome version 130 or greater, Mozilla Firefox version 95.0 or greater.

2.05   SERVER HARDWARE, STORAGE AND SERVICES REQUIREMENTS

2.05.01   Current commercially available server-grade Operating Systems (OS) shall be approved to operate the VMS server-based applications and services. Including:

2.05.01.1   The VMS Software shall be designed to operate as a server on Windows 2025 Server.

2.05.01.2   The VMS Software shall be designed to operate as a server on Windows 2022 Server.

2.05.01.3   The VMS Software shall be designed to operate as a server on Windows 2019 Server.

2.05.01.4   The VMS Software shall be designed to operate as a server on Windows 2016 Server.

2.05.01.5   The VMS Software shall be designed to operate as a server on Windows 2012 R2 Server.

2.05.01.6   The VMS Software shall be designed to operate as a server on Windows 11.

2.05.01.7   The VMS Software shall be designed to operate as a server on Windows 10.

2.05.02   The VMS System server software shall utilize a high performance, multi-threaded, application engine design. This shall allow multiple tasks to be executed at the same time and is required.

2.05.03   The VMS software shall operate consistently on stand-alone or integrated host and storage platforms from recognized IT industry suppliers. Hardware independence is a requirement.

2.05.04   The VMS System shall support multiple storage options which may consist of SATA, SCSI, iSCSI, for video storage, including:

2.05.04.1   DAS (Direct Attached Storage).

2.05.04.2   NAS (Network Attached Storage).

2.05.04.3   SAN (Storage Area Network).

2.05.05   The VMS software shall be installed by a certified VMS Integrator, or when necessary, the VMS manufacturer.

2.05.06   All services may be installed on a single stand-alone server or distributed among multiple servers.

2.06   ARCHIVE/STREAMING SERVER HARDWARE AND SOFTWARE

2.06.01   Processor: 2.4GHz, 4C/8T (x64 Processor)

Memory: Minimum 16 GB RAM

Available Disk Space: Minimum: 8 TB

OS Partition (if applicable): Minimum 1 x 500 GB SSD

Windows 2016 Server or above

Internet Information Services 10 or greater

Microsoft .NET 8.x

Microsoft SQL Database Server 2014 or above (Express/Standard/Enterprise)

2.06.02   All services may be installed on a single stand-alone server or distributed among multiple servers

2.07   DATABASE SERVER HARDWARE AND SOFTWARE

2.07.01   Processor: 2.4GHz, 4C/8T (x64 Processor)

Memory: Minimum 16 GB RAM

Available Disk Space: Minimum 500 GB

Windows 2016 Server or above

Microsoft SQL Database Server 2014 or above (Express/Standard/Enterprise)

2.07.02   All services may be installed on a single stand-alone server or distributed among multiple servers.

2.08   WEB SERVER HARDWARE AND SOFTWARE

2.08.01   Microsoft IIS 10.0 or higher is needed to host VMS as an Application.

2.08.02   All services may be installed on a single stand-alone server or distributed among multiple servers.

2.09   STORAGE – VIDEO ARCHIVES AND LONG-TERM STORAGE

2.09.01   The amount of storage space necessary is based on the desired number of days required for video storage, the format of video to be stored, resolution, image complexity, Frames Per Second (FPS), if the video to be stored will be continuous, motion or event-based, the number of events daily etc. The storage may be SAN (Storage Array Network), NAS (Network Attached Storage), DAS (Direct Attached Storage), or Fiber attached storage.

2.10   CLIENT SOFTWARE REQUIREMENTS

2.10.01   Current commercially available Operating Systems (OS) shall be approved to operate the VMS client application. Including:

2.10.01.1   The VMS Software shall be designed to operate as a browser-based client on Windows 7 Home and Professional editions.

2.10.01.2   The VMS Software shall be designed to operate as a browser-based client on Windows 8.1 Desktop edition.

2.10.01.3   The VMS Software shall be designed to operate as a browser-based client on Windows 10.

2.10.01.4   The VMS Software shall be designed to operate as a browser-based client on Windows 11.

2.10.01.5   The VMS Software shall be designed to operate as a browser-based client on Windows 2012 Server.

2.10.01.6   The VMS Software shall be designed to operate as a browser-based client on Windows 2016 Server.

2.10.01.7   The VMS Software shall be designed to operate as a browser-based client on Windows 2019 Server.

2.10.01.8   The VMS Software shall be designed to operate as a browser-based client on Windows 2022 Server.

2.10.01.9   The VMS Software shall be designed to operate as a browser-based client on Windows 2025 Server.

2.10.01.10 The VMS Software shall be designed to operate as a browser-based client on the Apple OS X operating system.

2.10.02   Microsoft .NET Requirements:

The VMS Product must incorporate the features of Microsoft .NET Core 8 or must be capable of using Microsoft .NET Core 8.x or greater is required.

2.10.03   Database Requirements:

The VMS client shall not require a database engine for operation of the VMS.

2.10.04   Adobe Acrobat:

Adobe Acrobat Reader version X or equivalent PDF reader should be installed in order to view and read the VMS product manuals.

2.11   CLIENT HARDWARE RECOMMENDATIONS.

Processor: 2.4 GHz (x64 Processor) or 1.3 GHz (Dual Core)

Memory: Minimum 8 GB RAM

Available Disk Space: Minimum 10 GB

Display: SXGA (1280 x 1024) or higher resolution

Windows 10 or 11

Mac OSX or higher

Google Chrome and Microsoft Edge

2.12   GRAPHICAL USER INTERFACE (GUI)

2.12.01   All VMS System functionality including viewing video and hearing audio files whether live or archived must be available to the user through a properly authenticated smart client (web client). A smart client will utilize an internet browser such as Microsoft edge, Firefox, or Chrome to communicate with the server or servers hosting the VMS System, its services, its functionality, its modules and its archives. The requirement of a rich client or thick client platform shall be deemed non-compliant.

2.12.02   The VMS shall have cross browser interoperability. Separate users may use different internet browsers on the same VMS System simultaneously with full functionality including sharing video and inter-application collaboration. There shall be no requirement that client software from the VMS manufacturer be installed on the client device.

2.12.03   The VMS shall operate on stand-alone or integrated host and storage platforms from recognized IT industry suppliers. The ability of a systems integrator or user to install the VMS System on commercial off-the-shelf (COTS) hardware is a requirement. The VMS software may be installed by a certified VMS Integrator, the VMS Manufacturer or a customer.

2.12.04   The VMS shall fully support drag and drop design features.

2.12.05   The VMS design shall permit the uninhibited use of touch screen technology as well as the use of traditional mouse based user interaction.

2.12.06   The VMS shall incorporate the use of a browser icon "favicon" to differentiate the application from other web/browser tabs.

2.12.07   The VMS shall provide consistency through-out by utilizing a Top Navigation Bar providing certain information and controls applicable to the system in general. The controls in the Top Navigation Bar remain constant and are available in each module.

2.12.08   The VMS shall provide an intuitive method to search globally for any content contained, User Tags, Extractions, Cameras, Maps, multi-view presets, sequences etc.

2.12.09   The VMS shall have a provision for the user to select their own default Module when logging into the VMS.

2.12.10   The VMS shall have a tool for monitoring active streaming connections within the VMS via a webpage for troubleshooting and debug purposes.

2.12.11   The VMS shall have an ability to generate a user friendly layout for browser printing (Control-P).

2.13   WELCOME AND LOGIN MODULE

2.13.01   The VMS shall upon logon authentication present the User with a Welcome screen permitting the selection of password-controlled modules to include a training module utilizing video training segments.

2.13.02   The VMS shall require all Users / Operators to be authorized and verified for login. Passwords are Case Sensitive.

2.13.03   The VMS shall have the ability to generate an authenticated pass-through login credential to access the VMS from 3rd party software or resources without requiring an additional login.

2.13.04   The VMS shall have the ability to integrate with Active Directory.

2.13.05   The VMS shall have an ability to create a custom message for users logging into the VMS. This message can be a one-time acceptance by the user, or persistent for each access attempt to the software. The message(s) may be custom tailored for each permission group and multiple messages may be prioritized or ranked for sequential viewing and acknowledgement.

2.13.06   The VMS shall have an ability for displaying the advanced notice of expiration of software maintenance.

2.14   TRAINING MODULE

2.14.01   The VMS System shall include a video and text based Training Module. The Training Module shall contain video instruction on how to operate various features and functions.

2.15   MAPS MODULE

2.15.01   The VMS shall include an interactive map module. Maps displayed in the module may display icons representing various devices integrated into the VMS. Device icons shall be responsive to mouse interactions (rollover or hover, clicking, etc.) that will display camera views or allow camera views to be acted upon in some other useful functions such as dragging them to a docking area or clicking on them to display in another module. Map locations of hosted devices shall be visually identifiable in the Map Module. In addition, the map or maps integrating the individual device shall be coordinated with and viewable from a function selection in an overlay displayed in the Camera View module enabling the user to quickly view the map or maps hosting the camera being viewed. The Map Module shall contain a user controlled pop-up overlay enabling selections for quickly navigating through map collections. It is mandatory that the selections offered in the overlay include one-click return to the last map viewed, one-click return to the top map in the map collection hierarchy, the ability to display layers, a zoom in, zoom out, pan control and user selectable display listing all maps with a search field to quickly locate a particular map. Lastly, the Map Module shall have a Camera Dock area where camera views can be dragged and dropped into for continuous display as the user navigates through various maps. Docked camera views must be able to be opened in the live Camera Viewer by clicking a button. Camera views placed in the Camera Dock shall remain there and thus viewable by the user whenever he or she returns to the Map Module or until the user clears the views by clicking a Clear button in the Camera Dock.

2.15.02   The VMS shall provide the ability to navigate multiple maps with dynamic pan and zoom on each graphic. The Maps Module shall provide an overlay navigational tool bar for navigating multiple maps. The overlay shall include a dynamic zoom capability, the ability to click buttons for getting to the last map or for quickly navigating to the top map in the collection, and a method to display layers within maps.

2.15.03   The VMS shall provide a method of easily importing standard graphics files such as BMP, JPG, and PNG for use as a map.

2.15.04   The VMS shall have a method to support multiple floors of a single building/site the Maps Module allows you to select which map you wish to view, and to easily switch among the different maps. There are two methods that may be available to you to select the map you wish to view.

2.15.05   The VMS shall have the ability to add definable layers to any map. The VMS shall allow these layers to be hidden based on user permissions.

2.15.06   The Maps Module shall provide an interface for "At a Glance Overview" of an end user's geographic footprint. In addition, maps may use symbols to represent pictorially a single site, building, building floor, or an entire enterprise system. Further, the Map Module shall offer capability to create icons that interact with cameras managed by the VMS System in a manner that provides motion alert indication and real-time pop-up views of the cameras represented by the icons.

2.15.07   The VMS shall provide the ability to globally group items across all maps to be shown as distinct layers that may be toggled on or off.

2.15.08   The VMS shall include door Icons allowing for interaction to send/issue commands to the integrated device.

2.15.09   The VMS shall include shape icon objects allowing for interaction to send/issue commands to the integrated device.

2.15.10   The VMS shall have an ability to integration to dynamic map tools showing street names and site facilities including the ability to search for sites and addresses.

2.15.11   The VMS shall have an Integration with OpenStreet Maps®.

2.15.12   The VMS shall have an Integration with Google Street Maps.

2.15.13   The VMS shall have a Camera Dock area where camera views can be dragged and dropped into for continuous display as the user navigates through various maps. Docked camera views must be able to be opened in the live Camera Viewer by clicking a button. Camera views placed in the Camera Dock shall remain there and thus viewable The Camera Dock feature shall permit a user to drag and drop cameras from one or more maps into a common area (Camera Dock) for viewing. This permits a user to have the ability to view cameras from multiple locations (buildings) on multiple subnets simultaneously.

2.15.14   The VMS shall have an ability for users to navigate to maps associated to cameras within the dock from an associated map rapid call-up button.

2.15.15   The VMS shall have an ability to load all visible cameras from a map to the camera dock.

2.15.16   The VMS shall provide every user the capability to select their own default map when logging in to the VMS.

2.15.17   The VMS shall incorporate the ability to overlay a coordinate grid for visually pinpointing an area of a map.

2.15.18   The VMS shall have an ability to load all cameras from a map with one click from the Camera Dock interface.

2.15.19   The VMS shall have the ability to measure between points and area within Live Maps (Maps Module).

2.16   CAMERA VIEWER MODULE

2.16.01   The VMS Software shall have the capability to create, save, and display a layout of cameras.

2.16.02   The VMS shall display a Camera View Header displaying the name of the camera and the date and time of the image being viewed. If viewing a Multi-View, each View in that Multi-View will have its own Camera View Header. A visual "highlight" will indicate to the user the camera has been selected for control with the Camera Viewer Control Panel or the Archive Video Control Panel. The header will also be used as the handle to drag and drop camera views to and from other containers to enhance/optimize layouts.

2.16.03   The VMS shall provide a Camera Viewer module which provides live video viewing, enabling an operator to monitor one or more live views.

2.16.04   The VMS shall have selectable multi-view layouts available as templates for viewing live video streaming. Each template can be populated using drag and drop techniques and then saved using a unique name for ease of future recall by an operator.

2.16.05   The VMS shall have the ability for the user to "Fill" or "Fit" the viewing area by not constraining video feeds to maintain defined aspect ratios.

2.16.06   The VMS shall provide the ability for custom defined multiple live streaming camera view arrangements using 4:3 or 16:9 ratios with several pre-defined templates for easy and fast viewing configurations.

2.16.07   The VMS shall allow users the capability to create, save, and display a definable layout of any set of cameras across the enterprise. The configured Multi-View

Presets may be marked as Private, indicating they may only be viewed by the user who configured it. If the Preset is not marked as Private, then it shall be considered Public and available to all users.

2.16.08   The VMS shall have the ability for selected cameras with multiple resolution attributes to stream at a size appropriate for larger and smaller container sizes, making streaming more efficient and reducing bandwidth consumption.

2.16.09   The VMS shall provide a control to allow for selecting or switching a camera field-of-view in a camera container, where an operator can switch the current camera View(s) in the Multi-View layout. The operator can change the Arrangement, and switch camera positions within the Arrangement. The user shall be able to list cameras by map location, thumbnail image or text listing which may be filtered using a search parameter.

2.16.10   The VMS shall permit Pan-Tilt-Zoom ("PTZ") cameras which can be rotated left and right ("panned") and up and down ("tilted.") The camera can also be zoomed between wide-angle and telephoto views. Placing your cursor in the PTZ Camera View screen provides you with access to the on-screen Joystick Emulator. Options for "Click to Center" where the view would be centered on a mouse click, or "Click to Zoom" whereby the view would be focused and zoomed to an area of interested defined by outlining a box on the camera view, shall be available.

2.16.11   The VMS shall display a unique interactive control for control of a PTZ camera using a sphere graph in the upper left corner of the video display.

2.16.12   The VMS shall permit the mimicking of Pan-Tilt-Zoom ("PTZ") functions on fixed cameras whereby users may digitally zoom into a Field-of-View (FOV) and then rotate the FOV left and right ("pan") and up and down ("tilt.").

2.16.13   The VMS shall have the ability to lock a PTZ in position, preventing another user from moving the PTZ without first over-riding the lock action.

2.16.14   The VMS shall have the ability to set a PTZ stop coordinate or location. This function shall apply to those PTZ cameras having the capability of having location presets and/or tour functionality.

2.16.15   The VMS shall provide a method of configuring PTZ camera presets as a Camera Tour configuration.

2.16.16   The VMS shall have the ability to set a PTZ "Home" position and set a time value for returning the PTZ to home automatically.

2.16.17   The VMS shall provide the ability to set a timeout for PTZ to return home.

2.16.18   The VMS shall have the ability to optionally set PTZ presets for configuration on the camera (at the edge).

2.16.19   The VMS shall allow PC/USB joysticks (including PlayStation and Xbox game controllers) for controlling Pan/Tilt/Zoom functionality of compatible cameras.

2.16.20   The VMS shall provide users with an intuitive method of Tagging Video from a live camera or archived view for quick follow up retrieval. Tagging will allow for private or public viewing based on permissions.

2.16.21   The VMS shall provide the user the ability to capture a digital still image (snapshot) from a single camera, from multiple cameras, or from all cameras contained within a multi-view layout.

2.16.22   The VMS shall provide a visible overlay of the analytic event's metadata via an image snapshot.

2.16.23   The VMS shall have the ability to auto focus compatible cameras from within the camera viewer container.

2.16.24   The VMS shall provide an On-Screen-Display button for manually extracting/exporting live video without motion or an external event trigger.

2.16.25   The VMS shall have an ability to create ad hoc neighboring camera views by quickly associating together all of the views from cameras in a geographical or logical association which may be recalled from any camera programmed with a one-click action.

2.16.26   The VMS shall have the ability to make any camera view container full-screen with a single-click action.

2.16.27   The VMS shall provide the ability to auto-focus compatible cameras from within the VMS.

2.16.28   The VMS shall have the ability to stream live audio with a video feed.

2.16.29   The VMS shall provide a graphical method for a User to define a view of cameras which can be displayed in a sequential manner with definable time periods for each sequence stop.

2.16.30   The VMS shall have a default camera sequence of all cameras the user has access to, enabling the user to quickly scan cameras one after another in a one-up configuration.

2.16.31   The VMS shall allow for any camera view to be opened from a live view into an archive viewer for event timeline analysis.

2.16.32   The VMS shall allow for any camera view to be opened from a live view into an administration view for configuration of the camera.

2.16.33   The VMS shall have the ability to locate the position of a camera on a map from a live view interface.

2.16.34   The VMS shall provide the ability to review video frame-by-frame both forward and reverse.

2.16.35   The VMS shall provide the ability to rewind and fast-forward control recorded video at up to 64x speeds from the Camera Viewer container of any camera.

2.16.36   The VMS shall provide the ability, while in archive playback mode within the camera viewer module, to associate cameras together in custom multi-view arrangement of a logical group for quick display of "neighbor" cameras or devices.

2.16.37   The VMS shall provide a capability within the User Interface to annotate cameras that are Out-of-Service for planned / remedy maintenance or pre-staging of future installation cameras to alert the user of a known out-of-service condition.

2.16.38   The VMS shall have an ability to view multi-view arrangements without pixel space or borders between containers.

2.16.39   The VMS shall have the ability to instantly review 10 seconds back.

2.16.40   The VMS shall provide the ability to view live events as an overlay on camera cell while streaming.

2.16.41   The VMS shall have the ability to link cameras by associating them with different block directions, enabling navigation between cameras based on their position relative to the main camera.

2.17   ARCHIVE MODULE

2.17.01   The VMS shall have an Archives module allowing an operator to quickly locate and play back archived video. The Archive module shall provide the functionality for timeline-based archive retrieval, event and archive integration, downloading and sharing archived video, and tagging archived footage.

2.17.02   The VMS shall have a streaming archive video player. The player must provide a means of quickly searching video based on timeline, specific time, and events. The Archive video player must provide speed control, virtual PTZ control as well as forensic search capability.

2.17.03   The VMS shall provide support to view live video and archived video, for cameras supporting Motion -JPEG video.

2.17.04   The VMS shall provide support to view live video and archived video, for cameras supporting MPEG-4 video as well as cameras supporting MPEG video.

2.17.05   The VMS shall provide support to view live video and to record video, using cameras supporting the H.264 video format.

2.17.06   The VMS shall provide support to view live video and to record video, using cameras supporting the H.265 video format.

2.17.07   The VMS shall have the ability to playback multiple archived or recorded video streams simultaneously.

2.17.08   The VMS shall have the ability to record or archive audio synchronized with video.

2.17.09   The VMS shall provide the ability to combine an external audio source (secondary IP source) with a camera.

2.17.10   The VMS shall have the ability to stream audio out via an on-screen control within the camera control of the VMS. The feature shall utilize the PC microphone and audio-output on selected cameras.

2.17.11   The VMS shall provide the ability to monitor Archived video in a full-screen view.

2.17.12   The VMS shall provide a visible overlay of the analytic event's metadata during playback.

2.17.13   The VMS shall have the capability for a user to make an Extract of a video clip Public or Private through the use of a check-box marked Private while creating the Extract. Private Extracts shall not be available for viewing by other Users.

2.17.14   The VMS shall maintain a list of Extracted/Exported video designating Video files that have been extracted (available for download) by users.

2.17.15   The VMS shall have the capability to download extracted video in a file format which can be viewed using the standard Microsoft Media Player or other common players such as VLC.

2.17.16   The VMS shall contain a player capable of playing recorded video, and extracted video internally to the VMS.

2.17.17   The VMS shall have an ability to download multiple camera extractions into a single playback file as a video collage.

2.17.18   The VMS shall have the capability of scanning and searching through multiple image extractions.

2.17.19   The VMS shall have a Fast Find control accessible on the Camera Overlay Bar allowing a User to define an area of the video to search motion on Motion-JPEG

recording archives. Additionally, there shall be a method to define the as being High, Medium, or Low motion.

2.17.20   The VMS shall have a Fast Find control accessible on the Camera Overlay Bar allowing a User to define an area of the video to search motion on Image recorded archives. Additionally, there shall be a method to define the as being High, Medium, or Low motion.

2.17.21   The VMS shall provide a Dynamic timeline allowing a User to dynamically modify the time-period, time interval, and displayed time for archived video being viewed.

2.17.22   The VMS shall provide the user the ability to flag or mark sections of time for exemption from the normal archive deletion routines thus locking or protecting archives within their normal storage array.

2.17.23   The VMS shall have an ability to scroll/seek the archive timeline with image previews.

2.17.24   The VMS shall have an ability to leverage WebAssembly for managing archive playback per device.

2.17.25   The VMS shall have the ability to control the archive playback of each cell independently using embedded cell timeline.

2.17.26   The VMS shall have the ability to highlight detected objects on timeline in the Archives Module.

2.18   FORENSIC SEARCH MODULE

2.18.01   The VMS shall provide a Forensic Search module that enables users to locate and investigate incidents by narrowing down their search using precise filters.

2.18.02   The VMS shall provide the ability to search for motion events across multiple cameras.

2.18.03   The VMS shall provide the ability to search for events in specific areas.

2.18.04   The VMS shall provide the ability to search for a person by their attributes.

2.18.05   The VMS shall provide the ability to search for a person by their name.

2.18.06   The VMS shall provide the ability to search for a person by their photo.

2.18.07   The VMS shall provide the ability to search for a vehicle by its body type.

2.18.08   The VMS shall provide the ability to search for a vehicle by its color.

2.18.09   The VMS shall provide the ability to search for a vehicle by its brand.

2.18.10   The VMS shall provide the ability to search for a vehicle by its plate type.

2.18.11   The VMS shall provide the ability to extract multiple events of different cameras from the Forensic search module.

2.19   DASHBOARD MODULE

2.19.01   The VMS shall provide a Dashboard that provides an at a glance system overview through multiple widgets; graphical and tabular, arranged in a single page, including system components health, top events, and storage utilization.

2.19.02   The VMS shall provide the ability to switch between multiple dashboards created.

2.19.03   The VMS shall provide the ability to create custom dashboards with custom configurations.

2.19.04   The VMS shall provide the ability to adjust the size of each widget to users' preference.

2.19.05   The VMS shall provide the ability to view camera live and playback in Dashboard Module.

2.19.06   The VMS shall provide interactive charts, bar chart and donut chart.

2.19.07   The VMS shall provide statistical charts.

2.19.08   The VMS shall provide the ability to view a map, and interact with its' components (cameras, devices) from the Dashboard Module.

2.19.09   The VMS shall provide the ability to view a list of diverse types of events in the Dashboard Module.

2.19.10   The VMS shall provide the ability to view system health widget for cameras, servers and services.

2.19.11   The VMS shall provide the ability to view store utilization in Dashboard Module.

2.19.12   The VMS shall provide the ability to view the status of remote site servers, services and cameras in the Dashboard module.

2.20   ADMINISTRATION MODULE

2.20.01   The VMS shall contain an Administration module which shall contain all configurable parameters of the VMS such as Users, Cameras, Maps, etc. The Administration module shall be password controllable, all configured parameters must be capable of being saved, as well as reported on for modifications, date and time created, as well as date created.

2.20.02   The VMS shall provide a method to copy / duplicate configurable objects listed under the Administration section. The duplicate items shall be easily identifiable and shall allow parameters to be uniquely modified.

2.20.03   The VMS shall be capable of displaying all Users currently logged on to the VMS, the client IP address, the date and the time the User logged on. Alternatively, a User's active session may be terminated by another User with the proper password control.

2.20.04   The VMS shall allow the ability to print configuration parameter tables in a variety of formats including .pdf, and .xls.

2.20.05   The VMS shall provide an intuitive Graphical User Interface for adding users. This interface shall allow an existing user to be copied with all pertinent settings to create/add a new user. The newly added user shall be clearly indicated permitting the new user to be uniquely modified and stored for future usage.

2.20.06   The VMS shall allow unlimited users to added to the system.

2.20.07   The VMS shall employ User Groups be created and multiple Users may be assigned to a group, permitting permissions to be efficiently administrated for all users assigned to a common group.

2.20.08   The VMS shall maintain a Profile for each User, the Profile shall contain customizable preferences to be utilized each time the User Logs in to the system. The preferences shall determine the user's language preference, theme, startup screen, default camera layout, camera header visibility, PTZ navigation preference, and other information.

2.20.09   The VMS shall have an ability to designate within a user profile the display of events via popup notification in a window for rapid viewing.

2.20.10   The VMS shall provide every user the capability to select their own default arrangement when logging in to the VMS.

2.20.11   The VMS shall allow each user the ability to define default timeline start time and interval.

2.20.12   The VMS shall provide a user preference option of a black empty background or a background populated by the camera image snapshot (from archives).

2.20.13   The VMS shall provide the ability to allow multiple logins by one user. Also allows for this permission to be denied to users/groups.

2.20.14   The VMS shall provide a complete audit trail report of Users, concerning their actions and history showing when the action was performed.

2.20.15   The VMS shall provide administrators with an at-a-glance "last-login" reporting and audit of users who have logged into the VMS.

2.20.16   The VMS shall have the ability to restrict users access to the VMS during selected schedules.

2.20.17   The VMS shall provide the ability to edit multiple user profiles at once (bulk edit).

2.20.18   The VMS shall allow an unlimited number of cameras to be added to the system.

2.20.19   The VMS shall provide a Graphical User Interface (GUI) for the purpose of configuring/modifying cameras for administration purposes. This Graphical User Interface must all a User to add/modify/delete cameras.

2.20.20   The VMS shall have an ability to quickly navigate to camera actions from a quick-access menu in the administrative camera list.

2.20.21   The VMS shall have an ability to address cameras via IP address or hostname.

2.20.22   The VMS shall contain a list of the World Time Zones and their Offset from GMT (Greenwich Mean Time) permitting selection of the appropriate time zone where utilized in configuration of cameras etc.

2.20.23   The VMS shall have an ability to rotate a camera stream via configuration.

2.20.24   The VMS shall provide an interface for adding select custom camera attributes for on-the-fly integration to uncommon cameras or camera features.

2.20.25   The VMS shall have an ability to Export and Import custom camera model configurations across different systems or customers.

2.20.26   The VMS shall have an ability to set a value selection for compression quality (bitrate) if allowed per camera model for streaming bandwidth regulation.

2.20.27   The VMS shall allow users to select default / preferred aspect ratio for cameras.

2.20.28   The VMS shall have an ability to support SSL connections to camera devices.

2.20.29   The VMS shall utilize the camera security credentials for viewing and administration purposes. This permits the camera credentials to be changed and the VMS made aware of the new credentials for security purposes.

2.20.30   The VMS shall have an ability to push camera passwords generated in the VMS to the camera.

2.20.31   The VMS shall allow an ability to use anonymous camera access.

2.20.32   The VMS shall provide the ability to define an alternate location should configured archive locations become inaccessible. This "Failover" location would be utilized only if no other archiving paths could be found.

2.20.33   The VMS shall have an ability to designate a primary archive storage area and a secondary archive storage area which may act independently using individual camera streams for archiving at individual parameters (FPS, Resolution) over varying storage settings.

2.20.34   The VMS shall allow the ability to set parameters for edge motion archiving for select models.

2.20.35   The VMS shall utilize a sortable list of the configured cameras in order to make it easier for a user to find a specific camera.

2.20.36   The VMS shall have the ability to export a excel template for adding and inserting new camera records in bulk.

2.20.37   The VMS shall utilize dynamic storage for archiving video to leverage available capacity across one or multiple drive volumes.

2.20.38   The VMS shall have an ability to archive a second continuous archive at a configurable frame per second on all motion-based archiving.

2.20.39   The VMS shall have the ability to directly open the camera interface from the camera setup screen. This permits direct configuration and testing of the camera without utilizing the VMS.

2.20.40   The VMS shall allow for direct snapshot capture in an installation verification screen.

2.20.41   The VMS shall have an ability inside of camera configuration to test the camera stream status.

2.20.42   The VMS shall allow the User to define an area of interest for motion detection by the display of a user definable box on the screen to assist in setting the area of interest.

2.20.43   The VMS shall have the ability to define priority levels for different motion detection zones.

2.20.44   The VMS shall have an ability to archive on motion via a server-based motion analytic for cameras using the M-JPEG codec.

2.20.45   The VMS shall have an ability to archive on motion via a server-based motion analytic for cameras using the H.264 codec.

2.20.46   The VMS shall provide the ability to leverage edge device motion detection algorithms for event archiving and alerts.

2.20.47   The VMS shall have an ability to annotate reference information for support items per each camera object.

2.20.48   The VMS shall provide administrators and systems integrators the ability to add cameras directly from the network using a discovery tool. (Applicable to cameras that are ONVIF-Profile S compliant).

2.20.49   The VMS shall have an ability to define the IP Range (subnet) for discovery.

2.20.50   The VMS shall provide the ability in configuration to customize Frames Per Second (FPS), Motion Sensitivity, and Overlay controls for any custom camera.

2.20.51   The VMS shall allow for bulk editing of multiple cameras at once.

2.20.52   The VMS shall allow for custom string handling for archive types.

2.20.53   The VMS shall provide the ability to adjust the motion sensitivity.

2.20.54   The VMS shall allow for a custom setting designation for the camera overlay height (by pixels).

2.20.55   The VMS shall allow for a custom setting designating the motion difference ratio.

2.20.56   The VMS shall provide the ability in configuration to customize Frames Per Second (FPS), and Overlay controls for cameras using a video codec.

2.20.57   The VMS shall allow for designating a clip length (by minute) for archived Video (MPEG4 or H264).

2.20.58   The VMS shall have an ability to pull/import recordings from an SD card either from the camera or directly from the SD card itself.

2.20.59   The VMS shall provide User Settings in the User Administration area, permitting startup and default settings to be applied to each User account when they sign in to the system.

2.20.60   The VMS shall maintain the recording store location for video on a per camera basis. Recording paths for manual extractions or real-time extractions will be configurable and maintained by system settings.

2.20.61   The VMS shall have an ability to automate a redistribution of archives from one location in store to remaining active locations within the archive store.

2.20.62   The VMS shall have an ability to check for unhealthy or missing files on disk.

2.20.63   The VMS shall have the ability to custom define the number of seconds to pre-buffer when performing motion detection.

2.20.64   The VMS shall have the ability to custom define the amount of time when a service recognizes a camera stream as not connected (also known as a Timeout interval).

2.20.65   The VMS shall have the ability to modify the default training URL so that a custom path and custom application may be applied if necessary.

2.20.66   The VMS shall have the ability to custom configure intervals and thresholds for health monitoring on Cameras, Servers, External Systems, and Drive Information.

2.20.67   The VMS shall have an ability to configure a connection with an IP-based video wall system.

2.20.68   The VMS shall have the ability for an SQL database backup routine to be initiated and/or scheduled from within the VMS.

2.20.69   The VMS shall provide a method of uploading, saving, applying, and displaying those custom Icons representing devices such as cameras, buildings, etc.

2.20.70   The VMS shall provide the ability to define stand alone or distributed servers and administer their respective services from any instance of the VMS.

2.20.71   The VMS shall allow the association of custom defined "Keywords" with video and events allowing search by Keywords for faster retrieval of events and video.

2.20.72   The VMS shall provide lists of Tag Keywords and Tag Categories to be defined and stored for later use to provide consistency of Keywords and Categories of Tags associated with events and video.

2.20.73   The VMS shall provide a method of uploading standard graphics files such as bmp, pcx, jpg, and dwg files for use as custom map files and to have Icons representing devices dropped on the graphic to be used as a Maps containing Camera or other device Icons.

2.20.74   The VMS shall provide an intuitive drag-and-drop interface module for layout and design adjustments to map files including desired zoom parameters and optional layer and device placement options.

2.20.75   The VMS shall provide (within the Map design tool) a snapshot preview (or live stream) of the camera as it is being placed into the map.

2.20.76   The VMS shall have an ability to utilize keyboard shortcuts to position cameras (fine-tune) on a map.

2.20.77   The VMS shall provide a predefined set of icons for use as camera icons in pre-selected colors and designs. The VMS shall have a means of importing new icons in the event those provided are not acceptable.

2.20.78   The VMS shall have the ability to add sites (or buildings) for map and camera association.

2.20.79   The VMS shall have an ability to design custom shapes for placement on a map.

2.20.80   The VMS shall allow unlimited sites and/or servers to be added to the system.

2.20.81   The VMS shall provide the ability to setup and configure globally grouped items across all maps to be shown as distinct layers that may be toggled on or off.

2.20.82   The VMS shall maintain each User and their activities while they are logged in for use to create User Audit Trail reports.

2.20.83   The VMS shall have multiple language support including: English, Arabic, Spanish, Portuguese, French and Russian.

2.20.84   The VMS shall utilize a wizard during installation. The wizard shall utilize graphical techniques to make installation user friendly.

2.20.85   The VMS shall be able to be updated or upgraded from version to version via a software wizard utility without requiring a re-installation or re-programming of existing data.

2.20.86   The VMS shall be affixed to the site or enterprise via a distinct software license. This license may be amended via the user interface based on an increase in needed functionality or scope of the project.

2.20.87   The VMS shall provide an End-User License Agreement (EULA).

2.20.88   The VMS shall provide a configuration area within administration to monitor and administer actions performed on Windows-based Services such as Starting, Stopping, and restarting these services.

2.20.89   The VMS shall have the ability to maintain an image snapshot of all events and also the ability to schedule and purge retained images of events from the database at a desired number of days.

2.20.90   The VMS shall have an ability for setting the refresh time in seconds of the snapshot reference image per camera.

2.20.91   The VMS shall allow cameras to be grouped together administratively for faster search and call-up in the selection of cameras in the camera viewer or archive modules.

2.20.92   The VMS shall provide a means of defining custom or special function PTZ controls for each camera added to the system.

2.20.93   The VMS shall allow for ONVIF PTZ standard configuration.

2.20.94   The VMS shall contain a list of cameras by brand and model which have been tested and certified for use with the VMS and shall contain a method for adding a new camera to the list. The camera model list shall be utilized for the command structure to communicate with a specific camera model while the IP address shall be configured for each specific camera added to the database.

2.20.95   The VMS shall have an ability to set pre-defined responses to alarm/alert acknowledgements.

2.20.96   The VMS shall have the ability to modify the user-interface with private labeling options.

2.20.97   The VMS shall have an ability to determine password policy qualifiers (character limit and type) for users and camera devices.

2.20.98   The VMS shall have a schedule interface tool designed for event/action parameters but that will also customize further the times to record, archive, search for motion or other items.

2.20.99   The VMS shall have an ability to configure multi-sensor / multi-channel cameras.

2.20.100   The VMS shall have an ability to schedule various parameters of recording on camera during selected schedules.

2.20.101   The VMS shall have an ability to manage imported video information within the Administration module.

2.20.102   The VMS shall have the ability to integrate and import videos from the Body Worn Camera system from Axis Communications.

2.20.103   The VMS shall have a configurable setting to allow for the auto expiration of users who have not accessed the system in "n" days.

2.20.104   The VMS shall have an ability to check and automate creation of a PowerShell script for removal of any archive location for any folders or files that are not cataloged in the database as valid archive files.

2.20.105   The VMS shall have an ability to create and manage custom event panels for organizing device or behavioral events.

2.20.106   The VMS shall have an ability to support dynamic actions panel associations where an administrator can assign devices to integration Event Panels.

2.20.107   The VMS shall provide the ability to save camera hardware information.

2.21   INTEGRATION ADMINISTRATION

2.21.01   The VMS shall have an ability within the Integrations section of Administration for naming and associating connectors (3rd-party controlling or reference objects) with devices for use in alerts and workflows.

2.21.02   The VMS shall have an ability within the Integrations section of Administration for administering types of 3rd-party controllers and connectors.

2.21.03   The VMS shall have an ability within the Integrations section of Administration for naming and associating 3rd party security devices with cameras for use in alerts and workflows.

2.21.04   The VMS shall have an ability within the Integrations section of Administration for naming and associating analytic rules with cameras for use in alerts and workflows.

2.21.05   The VMS shall have an ability within the Integrations section of Administration for naming and associating RFID Antennas with cameras for use in alerts and workflows.

2.21.06   The VMS shall have an ability to integrate with Intelligent Vehicle Undercarriage Scanner (IVUS) from Gatekeeper.

2.21.07   The VMS shall have an ability to set frequency of data synchronization for integration connectors.

2.22   INTERLINK ADMINISTRATION

2.22.01   The VMS shall have an ability to administer remote sites for control from another independent site for functional access to live and archived video and alerts.

2.22.02   The VMS shall have an ability to administer remote cameras from a separate and permission-controlled site for viewing within the same module as other cameras and devices from other sites.

2.22.03   The VMS shall support remote sites' license management.

2.23   FLEET ADMINISTRATION

2.23.01   The VMS shall have an ability to create vehicle objects for association of cameras to inputs and metadata.

2.23.02   The VMS shall have an ability to associate fleet vehicles with transmitting stations objects for organizational purposes.

2.24   **WORKFLOWS ADMINISTRATION**

2.24.01   The VMS shall have a component matrix for logical association of objects, triggers, conditions and actions that allow for integration of user actions, scheduled parameters and/or physical or logical inputs into on-screen display actions or other notification alerts.

2.24.02   The VMS shall have an ability to initiate/trigger a programmable action (via workflow routine) based a defined an event from multiple cameras selected at once.

2.24.03   The VMS shall have an ability to initiate/trigger a programmable action (via workflow routine) based a defined an event from a configured control list.

2.24.04   The VMS shall have the ability to initiate/trigger a programmable action (via workflow routine) based a defined event such as an input, video analytic, or system message.

2.24.05   The VMS shall have the ability to initiate/trigger a programmable action (via workflow routine) based on a specific or recurring time.

2.24.06   The VMS shall have an ability to initiate/trigger a programmable action (via workflow routine) based a defined an event from a camera.

2.24.07   The VMS shall have an ability to initiate/trigger a programmable action (via workflow routine) based a defined an input event from a camera.

2.24.08   The VMS shall have an ability to initiate/trigger a programmable action (via workflow routine) based a defined an event from a configured door device.

2.24.09   The VMS shall have an ability to initiate/trigger a programmable action (via workflow routine) based a defined an event from a configured behavioral analytic device.

2.24.10   The VMS shall have the ability to initiate/trigger a programmable action (via workflow routine) based on an action button.

2.24.11   The VMS shall have an ability to initiate/trigger a programmable action (via workflow routine) based an defined an event from a configured RFID device.

2.24.12   The VMS shall have the ability to initiate/trigger a programmable action (via workflow routine) based an defined an event from a Failover condition being met.

2.24.13   The VMS shall have an ability to trigger via workflow a pop-up stream of a camera as an action response.

2.24.14   The VMS shall have an ability to notify externally of the VMS (such as email) on trigger-able (alarm/alert) conditions defined in a workflow.

2.24.15   The VMS shall have an ability to notify a user or group via an audible alert as an action from a configured workflow.

2.24.16   The VMS shall have an ability for the VMS to enhance normal camera configurations (FPS and Resolution) to a changed state on trigger-able (alarm/alert) conditions defined in a workflow.

2.24.17   The VMS shall have an ability to move to a PTZ preset as a result of a workflow on trigger-able (alarm/alert) conditions defined in a workflow.

2.24.18   The VMS shall have an ability to configure device output actions as part of a workflow.

2.24.19   The VMS shall have an ability to automate a manual recording (Real-Time Extraction) for a period of defined time based upon a triggered event as part of a workflow.

2.24.20   The VMS shall have an ability to configure a user interface actions as part of a workflow. These actions may be configured for autonomous action or if desired, require user prompting.

2.24.21   The VMS shall have an ability to configure an action (of a workflow) to navigate user(s) or group(s) to the Maps module and select a desired map for immediate view.

2.24.22   The VMS shall have an ability to configure an action (of a workflow) to navigate user(s) or group(s) to the Camera Viewer module with a selected camera view/arrangement.

2.24.23   The VMS shall have an ability to configure an action (of a workflow) to navigate user(s) or group(s) to the Archive module and select a desired camera view and pre-event time parameter for viewing that camera arrangement.

2.24.24   The VMS shall have an ability to configure an action (of a workflow) to navigate user(s) or group(s) to the Welcome module.

2.24.25   The VMS shall have an ability to configure an action (of a workflow) to navigate user(s) or group(s) to an external URL in a new browser tab or window.

2.24.26   The VMS shall have an ability to configure an action (of a workflow) to navigate user(s) or group(s) to the Reports module and select a desired report for immediate view.

2.24.27   The VMS shall have an ability to configure an action (of a workflow) to navigate user(s) or group(s) to the Administration module and select a desired sub category for immediate view.

2.24.28   The VMS shall have an ability to trigger via workflow a pop-up message as an action response.

2.24.29   The VMS shall have an ability to define scheduling conditions for enabling a workflow which consists of defined triggers and customized actions.

2.25   CUSTOM ACTION BUTTON

2.25.01   The VMS shall have an ability to add user-defined buttons that can be utilized as a trigger for workflow-based actions. The button may be customized by the configuration user in both text and graphic icon.

2.26   SIDE PANEL AND EVENT VIEWER

2.26.01   The VMS shall have a Side Panel as the system's communications center. It consists of the Actions Container and the Events Container. The Actions Container enables you to Send Messages and Share Views with other users. The Events Container enables you to receive information about, view, and respond to Motion events, Door and RFID alerts, System events, Tags, Image Extractions, incoming Messages and Shared Views.

2.26.02   The VMS shall provide a collection of tools and controls providing the ability to dynamically share messages, views, and extractions with other users.

2.26.03   The VMS shall have an intuitive method for a user to "Share View" with one or more additional Users permitting quick collaboration allowing multiple Users to simultaneously view the same camera(s).

2.26.04   The VMS shall have an ability to push a share view to a user's workstation on command.

2.26.05   The VMS shall provide a means for Users to quickly send a message to another User permitting ease of joint collaboration and cooperative efforts.

2.26.06   The VMS shall have an ability to "one-click" restricted-access the video surveillance system enabling access for only select users (based on permission assignments).

2.26.07   The VMS shall have an ability to import video files (.mp4, .mov) from an external source such as a mobile phone, tablet, or web-camera. The imported videos may be associated to a selected device and managed within the archive timeline for comparison against other camera objects during an investigation or search.

2.26.08   The VMS shall provide an information panel capable of being sorted/searched/grouped by Time, Date, Object, criteria and being able to be expanded or collapsed at User discretion.

2.26.09   The VMS shall be capable of detecting motion events in a user defined area of the camera view for each camera configured and functioning on the system.

2.26.10   The VMS shall have an ability to download a snapshot of a defined event from the preview panel including the event metadata.

2.26.11   The VMS shall be able to define multiple areas of interest for motion detection.

2.26.12   The VMS shall have a pop-up window allowing a user to select for preview a Motion event, in the situation where multiple motion events are detected at or near simultaneously the user must be able to select the event to be previewed.

2.26.13   The VMS shall display System Alerts Side Panel Event Notification area. These Alerts shall notify the User of System, Camera, or Service actions and/or messages.

2.26.14   The VMS shall provide a running count of events per item type for at-a-glance display.

2.26.15   The VMS shall provide Camera Status via a visual up/down indicator in the System Events Panel.

2.26.16   The VMS shall provide Service Status via a visual up/down indicator in the System Events Panel.

2.26.17   The VMS shall have an audible alert tone which shall be capable of being turned On or Off (disabled) by User preference. Selectable via a checkbox accessible on the "Settings" menu selected on the "Navigation Bar".

2.26.18   The VMS shall have the ability to track alert acknowledgement by user/date as well as modify event to mark as active for additional follow up. Marked active event transactions are also tracked by user and date.

2.26.19   The VMS shall provide message alerts for system events for user-to-user communication.

2.26.20   The VMS shall permit a User to share his view / video with one or more additional Users dynamically and shall provide an Alert message with an optional tone to notify a User that a view / video has been shared with them. This shall all be accomplished dynamically with in the VMS.

2.26.21   The VMS shall provide an information panel to review current and past users' share views.

2.26.22   The VMS shall provide users with an intuitive method of "Tagging" video, events, or cameras. These tags shall be retrievable via global search or through a navigable information panel.

2.26.23   The VMS shall provide a quick preview of Tagged Events through a pop-up from the events panel by hovering the mouse over the Tagged Event object in the Side Panel view.

2.26.24   The VMS shall have an ability to mark / highlight an area of interest within a tagged event.

2.26.25   The VMS shall have a configurable pop-up notification for alerts.

2.26.26   The VMS shall have an adjustable pop-up viewing window for streaming camera views from any module upon workflow alert.

2.26.27   The VMS shall have an ability to schedule vehicle incident imports from fleet recorders.

2.27   BEHAVIORS

2.27.01   The VMS shall display details concerning extracted Video, such as Extraction name, Category, Keywords, Camera name, Date, Start Time, Duration, Status, Whom created the Extraction, Associated tag, and a Description.

2.27.02   The VMS shall allow for behavior-based event tracking such as video analytics.

2.27.03   The VMS shall have the ability to incorporate 3rd-party behavior-based video analytics.

2.27.04   The VMS shall provide a quick preview of integrated video analytic events through a pop-up from the events panel by hovering the mouse over the Behaviors object in the Side Panel view.

2.27.05   The VMS shall have the ability to incorporate 3rd-party video analytics from TechnoAware.

2.27.06   The VMS shall have the ability to incorporate 3rd-party behavior-based video analytics from Agent Vi.

2.27.07   The VMS shall have the ability to incorporate the Cross-Line Analytic behavior from Axis Communications.

2.27.08   The VMS shall have an ability to read license plates and convert to text data using optical character recognition.

2.27.09   The VMS shall have an ability to incorporate facial recognition results from CyberExtruder Aureus 3D Facial Recognition application.

2.27.10   The VMS shall have an ability to incorporate facial recognition results from Innovatrics SmartFace Facial Recognition platform.

2.27.11   The VMS shall have an ability to send images for analysis from Zensors enhanced analytics.

2.27.12   The VMS shall have an ability to have a map associated to a behavior event transaction table.

2.27.13   The VMS shall allow for the display of edge analytics events.

2.27.14   The VMS shall have an ability to leverage edge storage for archive (recording) synchronization when the archiving service is unavailable.

2.27.15   The VMS shall support the ability to support edge motion detection through ONVIF event listener.

2.27.16   The VMS shall have the ability to alert or trigger a workflow based upon a camera tamper condition (a global change of the camera image or field of view).

2.27.17   The VMS shall provide the ability to receive events from 6SS integration.

2.28   CAMERAS

2.28.01   The VMS shall support by default configuration camera models for the following manufacturers:

2.28.01.1 ACTi

2.28.01.2 Advidia

2.28.01.3 American Dynamics

2.28.01.4 Anson

2.28.01.5 Arecont

2.28.01.6 Avigilon

2.28.01.7 Axis Communications

2.28.01.8 Bosch

2.28.01.9 BST Security

2.28.01.10 Canon

2.28.01.11 Cisco

2.28.01.12 Dahua Technologies
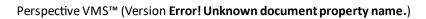
2.28.01.13 D-Max

2.28.01.14 Dynacolor

2.28.01.15 Flir

2.28.01.16 Hanwah (formerly Samsung)

2.28.01.17 HikVision

2.28.01.18 Hunt

2.28.01.19 Huawei

2.28.01.20 Ikegami

2.28.01.21 IntelliNet

2.28.01.22 Interlogix

2.28.01.23 JVC

2.28.01.24 King

2.28.01.25 LeLin

2.28.01.26 Lorex

2.28.01.27 Micropower

2.28.01.28 Mobotix

2.28.01.29 Moog

2.28.01.30 OpenEye

2.28.01.31 Panasonic

2.28.01.32 Pelco

2.28.01.33 Robotina

2.28.01.34 Siemens

2.28.01.35 Sony

2.28.01.36 Stardot

2.28.01.37 Toshiba

2.28.01.38 TruVision

2.28.01.39 Vicon (IQinVision)

2.28.01.40 Vivotek

2.28.02   The VMS shall support analog encoders for the following manufacturers:

2.28.02.1   ACTi

2.28.02.2   Axis Communications

2.28.02.3   Bosch

2.28.02.4   Hanwah

2.28.02.5   HIK Vision

2.28.02.6   Pelco

2.28.03   The VMS shall support the capability for audio streaming for the following manufacturers:

2.28.03.1   Axis Communications

2.28.03.2   BST Security

2.28.03.3   Dahua Technology

2.28.03.4   Hanwah

2.28.03.5   HIK Vision

2.28.03.6   Mobotix

2.28.03.7   Vicon (IQinVision)

2.28.04   The VMS shall support bi-directional audio streaming for the following manufacturers:

2.28.04.1   Axis Communications

2.28.04.2   BST Security

2.28.04.3   Dahua Technology

2.28.04.4   HIK Vision

2.28.04.5   Vicon (IQinVision)

2.28.05   The VMS shall support edge-archiving for the following manufacturers:

2.28.05.1   Axis Communications

2.28.05.2   BST Security

2.28.05.3   Dahua Technology

2.28.05.4   Hanwha

2.28.05.5   HIK Vision

2.28.05.6   ONVIF-based devices

2.28.06   The VMS shall support edge-based Motion Detection alerts for the following manufacturers:

2.28.06.1   Axis Communications

2.28.06.2   BST Security

2.28.06.3   Vicon (IQinVision)

2.28.06.4   Bosch

2.28.06.5   Vivotek

2.28.06.6   Hanwha

2.28.06.7   Milesight

2.28.06.8   ONVIF-based devices

2.28.07   The VMS shall support camera Input/Output alerts for the following manufacturers:

2.28.07.1   Axis Communications

2.28.07.2   Dahua Technology

2.28.07.3   HIK Vision

2.28.07.4   Hanwha

2.28.08   The VMS shall support camera GOP/GOV rate adjustments for the following manufacturers:

2.28.08.1   Axis Communications

2.28.09   The VMS shall support camera LPR or ANPR alerts for the following manufacturers:

2.28.09.1   Nedap Identification Systems

2.28.09.2   Vivotek

2.28.10   The VMS shall support camera dewarping for the following manufacturers:

2.28.10.1   Vivotek

2.29   ACCESS CONTROL

2.29.01   The VMS shall have a visual alert within the events panel, annotating an alert from a related door alarm.

2.29.02   The VMS shall have an ability to receive events from integrated Physical Access Control System (PACS) software.

2.29.03	The VMS shall have an ability to import cardholder images for cross reference to video data.
2.29.04	The VMS shall allow for video call-up integration via web interface with DNA Fusion access control from Open Options.
2.29.05	The VMS shall have an ability to pull (as events) Access Control transactions from DNA Fusion Access Control System by Open Options.
2.29.06	The VMS shall have an ability to send commands (i.e. Lock/Unlock) to devices within integrated the DNA Fusion Physical Access Control System (PACS) software from Open Options.
2.29.07	The VMS shall have an ability to import door devices into the administration configuration of PVMS from the DNA Fusion Access Control System from Open Options.
2.29.08	The VMS shall have an ability to pull (as events) Access Control transactions from S2 Enterprise Access Control System by S2 Systems.
2.29.09	The VMS shall have an ability to pull (as events) Access Control transactions from S2 Netbox Access Control System by S2 Systems.
2.29.10	The VMS shall have an ability to pull (as events) Access Control transactions from System Galaxy's Access Control System by Galaxy Control Systems.
2.29.11	The VMS shall have an ability to communicate via API for event transactions with System Galaxy by Galaxy Control Systems.
2.29.12	The VMS shall have an ability to integrate with actions and events with System Galaxy using SignalR communications.
2.29.13	The VMS shall have the ability to lock, unlock and pulse doors from System Galaxy by Galaxy Control Systems.
2.29.14	The VMS shall have an ability to import door devices into the administration configuration of PVMS from the System Galaxy Access Control database.
2.29.15	The VMS shall have an ability to import cardholder images from System Galaxy Access Control software.
2.29.16	The VMS shall have an ability to pull (as events) Access Control transactions from BadgePass Access Control Systems.
2.29.17	The VMS shall have the ability to lock, unlock and pulse doors from BadgePass Access Control Systems.
2.29.18	The VMS shall have an ability to pull events from a MorphoTrack reader.

2.29.19   The VMS shall have an ability to pull (as events) Access Control transactions from TDSI Access Control System by Time & Data Systems International Ltd.

2.29.20   The VMS shall have an ability to pull events within AccessIt! Access Control from RS2.

2.29.21   The VMS shall have an ability to control (lock, unlock, pulse) door controls within AccessIt! Access Control from RS2.

2.29.22   The VMS shall have an ability to import doors/ readers within AccessIt! Access Control from RS2.

2.29.23   The VMS shall have an ability to import cardholder images from RS2 AccessIt! Access Control software.

2.29.24   The VMS shall have an ability to pull events using WinDSX Events Cast API.

2.29.25   The VMS shall have an ability to pull events from CredoID Access Systems.

2.29.26   The VMS shall have an ability to import doors/readers from CredoID Access Systems.

2.29.27   The VMS shall have an ability for Real-time event communications using SignalR with CredoID.

2.29.28   The VMS shall have an ability to import cardholder images from CredoID Access Control software.

2.29.29   The VMS shall have an ability to control (lock, unlock) door controls within CredoID Access Control.

2.29.30   The VMS shall have an ability to send commands (i.e. Lock/Unlock) to devices within integrated the DMP Physical Access Control System (PACS) software from DMP.

2.29.31   The VMS shall have an ability to pull (as events) Access Control transactions from Suprema Face Station Access Control System by Suprema.

2.29.32   The VMS shall have an ability to send commands (i.e. Lock/Unlock) to devices within integrated the Suprema Face Station Access Control System (PACS) software from Suprema.

2.29.33   The VMS shall have an ability to pull events from ZKTeco Access Control.

2.29.34   The VMS shall have an ability to import doors/ readers from ZKTeco Access Control.

2.29.35   The VMS shall have an ability to control (open, close) door controls within ZKTeco.

2.29.36   The VMS shall pull events from Gallagher Access Control.

2.29.37   The VMS shall have an ability to import door devices into the administration configuration from Gallagher Access Control.

2.29.38   The VMS shall have an ability to control (open, close) door controls within Gallagher Access Control.

2.29.39   The VMS shall have an ability to import cardholder images from Gallagher Access Control.

2.29.40   The VMS shall have an integration with Bosch AMS.

2.30   INTRUSION DETECTION

2.30.01   The VMS shall have an ability to pull (as events) Intrusion Detection transactions from Bosch.

2.30.02   The VMS shall have an ability to pull (as events) Intrusion Detection transactions from DMP.

2.31   RFID INTEGRATION

2.31.01   The VMS shall have the ability to receive events from RFID readers.

2.31.02   The VMS shall have the ability to call-up or associate cameras in archives with an RFID event.

2.31.03   The VMS shall have an ability to receive events and alerts with Impinj RFID connectors and devices.

2.32   SPECIALITY INTEGRATION

2.32.01   The VMS shall have an ability to receive events from JVA Technologies Electric Fence.

2.32.02   The VMS shall have an ability to receive events and video from CommPort's Under Vehicle Surveillance System.

2.32.03   The VMS shall have an ability for event detection from Sicurit HyperPower Perimeter detection.

2.32.04   The VMS shall have an ability to silence Sicurit alarms.

2.32.05   The VMS shall have support for Planar Video Wall distribution events.

2.32.06   The VMS shall have an ability to add syslog connections for SNMP communication.

2.32.07   The VMS shall have an ability to receive server health alerts from Razberi appliances.

2.32.08   The VMS shall have the ability to pull events from Bosch G-Series Intrusion Detection Panels.

2.32.09   The VMS shall provide an ability to provide event detail and geo location mapping for events generated from ShotSpotter's gunshot detection analytic.

2.32.10   The VMS shall have an ability to provide event detail and camera association with Soter Vape Detection.

2.32.11   The VMS shall have an ability to redact video\audio by integrating with Equature Studio.

2.32.12   The VMS shall have an ability to provide event detail and camera association with Halo Vape Sensor.

2.32.13   The VMS shall have an ability to provide event detail and camera association with Advance Detection UVIS.

2.32.14   The VMS shall have an ability to receive events from BriefCam.

2.33   SERVER-BASED LICENSE PLATE RECOGNITION (LPR)

2.33.01   The VMS shall support server-based automated license plate recognition (APLR) with optical character recognition (OCR) for the following manufacturers:

2.33.01.1 Rekor/OpenALPR

2.33.01.2 Vaxtor

2.33.02   The VMS shall have an ability to read license plates and convert to text data using optical character recognition.

2.33.03   The VMS shall support the ability to support color recognition on the License Plate for departmental identification in select nations.

2.33.04   The VMS shall provide vehicle make events.

2.33.05   The VMS shall provide vehicle model events.

2.33.06   The VMS shall provide vehicle color events.

2.33.07   The VMS shall provide vehicle body type events.

2.33.08   The VMS shall provide vehicle country events.

2.33.09   The VMS shall provide vehicle year events.

2.33.10   The VMS shall provide vehicle plate type events.

2.34   **TAPE STORAGE INTEGRATION**

2.34.01   The VMS shall have the ability to coordinate archives with long term archive systems leveraging disk and tape solutions.

2.34.02   The VMS shall have the ability to configure archiving service settings including the ability to disable thumbnail generation when accommodating archival retrieval from tape.

2.35   **INTERLINK CONNECTIONS**

2.35.01   The VMS Shall have an ability to link multiple remote independent sites for integrated client management.

2.35.02   The VMS shall have an ability to support SSL on Interlink configuration deployments.

2.35.03   The VMS shall have an ability to view linked remote cameras from a separate and permission-controlled site for viewing within the same module as other cameras and devices from other sites.

2.35.04   The VMS shall have an ability to view linked remote events from a separate and permission-controlled site.

2.35.05   The VMS shall have the ability to view remote site events in real time as they occur at the remote site.

2.36   **FLEET MODULE**

2.36.01   The VMS shall have an ability to integrate vehicle surveillance from one or multiple video sensors into a centralized video management software.

2.36.02   The VMS shall have an ability to manage multiple fleet vehicles/devices centrally for viewing video across a timeline of events and including the ability for vehicle incident export.

2.36.03   The VMS shall have a visual display of the signals meta-data from the selected vehicle.

2.36.04   The VMS shall have an ability to track of vehicle's speed during transit route in association with video.

2.36.05   The VMS shall have a Live Maps view with vehicle path from displayed meta-data.

2.36.06   The VMS shall have an ability to mark/flag/bookmark a specified time within a recording using a physical input on the fleet vehicle.

2.36.07   The VMS shall have a visual display of the vehicle's door position when open.

2.36.08   The VMS shall have a visual display indicator of the vehicle's brake when engaged.

2.36.09   The VMS shall have a visual display indicator of the vehicle's turn signals when engaged.

2.36.10   The VMS shall have a visual display indicator of the vehicle's warning signal when active.

2.36.11   The VMS shall have a visual display indicator of the vehicle's stop arm when engaged.

2.36.12   The VMS shall have an ability to auto calculate and tag vehicle idle time in the fleet module event timeline.

2.36.13   The VMS shall have an ability to identify camera(s) from an assigned vehicle for associated event cataloging and subsequent review for playback and/or extraction with or without signals data.

2.36.14   The VMS shall have an ability to remotely turn of and detect status of a vehicle's network video recorder.

2.36.15   The VMS shall have an ability to incorporate GIS metadata and display over live mapping software for vehicle tracking.

2.36.16   The VMS shall have an ability to print a route driven over a period of time.

2.36.17   The VMS shall have an ability to extract vehicle incident video data.

2.37   REPORTING MODULE

2.37.01   The VMS shall provide the ability to launch data reports within the application.

2.37.02   The VMS shall have an ability to save custom report filters and configurations.

2.37.03   The VMS shall have an ability to run a report show all Users and their last activity.

2.37.04   The VMS shall provide exportable reports for event acknowledgement / responses by users.

2.37.05   The VMS shall have the ability to filter RFID data and run printable RFID transaction reports.

2.37.06   The VMS shall provide exportable reports for a line crossing analytic on Axis cameras.

2.37.07   The VMS shall provide the ability to run a report showing all cameras and archiving locations.

2.37.08   The VMS shall have a report to illustrate the relationship between integration connectors and devices.

2.37.09   The VMS shall have the ability to run reports illustrating associated schedules with cameras.

2.37.10   The VMS shall be able to run a report showing cameras marked as Out-of-Service.

2.37.11   The VMS shall have a printable report that shows the image snapshot of each camera in the system for assessing camera image quality, focus and field-of-view.

2.37.12   The VMS shall be able to run a report show all Groups and inherent permissions of each group for reference. This report shall be exportable to PDF or Excel formats.

2.37.13   The VMS shall provide an exportable status report of current camera status along with support reference information.

2.37.14   The VMS shall have an ability to run a report show all Users with access to a list of cameras.

2.37.15   The VMS shall have an exportable status report of all active camera's archiving statistics including: Camera Name, Model, IP Address, Archiving Server, Store Location, Oldest Archive Date, Newest Archive Date, Missing Dates, Archive Span, Archive Schedule, Archive Codec, Retention, Motion %, Storage per Day, Total Storage Used, Archive Lock Status.

2.37.16   The VMS shall provide a report showing archiving storage deficits based on archiving targets, actual archive span, and storage capacity.

2.37.17   The VMS shall have an ability for filtering of report for status changed since a selected date value.

2.37.18   The VMS shall provide an exportable status report of current server status along with support reference information.

2.37.19   The VMS shall have a report to illustrate the updated status of an integration connection via external service.

2.37.20   The VMS shall have an ability to report on statistical information in graphical format of archive storage utilization per day.

2.37.21   The VMS shall have a report showing historical transaction log of workflow events initiated by trigger with date/time.

2.37.22   The VMS shall have an area inside of the reports module for launching the fleet reports.

2.37.23   The VMS shall have an ability to generate health reports on camera health of remote fleet devices.

2.37.24   The VMS shall have a report showing the current status of vehicles configured in the Fleet Management Module.

2.37.25   The VMS shall have a report illustrating license plate image of plate and vehicle with date/time.

2.37.26   The VMS shall have the ability to filter RFID data and run printable RFID Tag Inventory reports.

2.37.27   The VMS shall have the ability to filter RFID data and run printable RFID device transaction reports.

2.37.28   The VMS shall have a report illustrating the Motion Path analytic results from Video Analytic integration.

2.37.29   The VMS shall have a report illustrating the Heat Map analytic results from Video Analytic integration.

2.37.30   The VMS shall provide the ability to run a report showing Archive Copy Progress for remote cameras.

2.37.31   The VMS shall provide the ability to run a report showing Remote Sites licenses.

2.38   **ADMINISTRATION SERVICE**

2.38.01   The VMS shall provide a service that monitors and checks drives for the right utilization; checks how much free space on the drive(s), and subsequently purges old archives or moves them to a different offsite location. It shall also be responsible for importing and ensuring user synchronization between Active Directory and the VMS.

2.38.02   The VMS shall manage archives using a service-based management tool. The management shall be based on a first-in-first-out (FIFO) routine and shall incorporate configurable parameters such as targeted archive days and minimum allowable free space for the volume/drive.

2.38.03   The VMS shall provide the ability to view events, transactions, errors from the VMS Administration Service in an event log within Microsoft's Administrative Tools.

2.38.04   The VMS shall have an ability to configure fail-over services on alternative servers for increased system redundancy.

2.39   ARCHIVING SERVICE

2.39.01   The VMS shall have an Archive Service which provides for; archiving image and video streams from system cameras, handling image extraction requests from users and create archives/extractions accordingly, as well as managing live recording requests from users to capture camera video streams and encode them using H.264/MPEG-4 codec for optimal quality/size.

2.39.02   The VMS shall have an ability to extract video from archived recordings to a segregated location on the network that will not be overwritten by the software. This video may also be downloaded externally as a copy for permissioned users.

2.39.03   The VMS shall have an ability to add metadata of a server generated overlay with camera name, date/time onto video extractions.

2.39.04   The VMS shall have an ability to edit or refine extractions via editing start and end times thereby creating a second "trimmed" extraction in addition to the original.

2.39.05   The VMS shall maintain a location on a local or shared volume for storing captured thumbnail images as a visual reference in the dynamic camera selector and in the administration of cameras user interface.

2.39.06   The VMS shall be capable of recording camera streams in a H.265 format.

2.39.07   The VMS shall be capable of recording camera streams in a H.264 format.

2.39.08   The VMS shall be capable of recording camera streams in a Motion-JPG format.

2.39.09   The VMS shall be capable of recording camera streams in a MPEG (video) format.

2.39.10   The VMS shall be capable of recording camera image frames for time-lapse or segmented recording.

2.39.11   The VMS shall be capable of creating video extraction copies from any archived video pulling a lesser number of frames thereby creating a subsequent time-lapse video from general security recordings.

2.39.12   The VMS shall have an ability to create privacy masks for video extractions.

2.39.13   The VMS shall provide the ability to view events, transactions, errors from the VMS Archiving Service in an event log within Microsoft's Administrative Tools.

2.39.14   The VMS shall have an ability that allows a user to determine the condition for removing archives (per camera) based on number of target days achieved, based on drive space limitations, or a storage maximum.

2.39.15   The VMS shall allow for remote archive management on all servers even when the network connectivity is in a degraded state preventing access to the central database.

2.39.16   The VMS shall have an ability to leverage Enhanced WebAssembly for managing archive playback per device.

2.39.17   The VMS shall store and play encrypted archives.

2.39.18   The VMS shall be able to protect downloaded video extractions with a password.

2.39.19   The VMS shall have the option to embed a standalone video player with video extraction downloads.

2.40   HEALTH MONITOR SERVICE

2.40.01   The VMS shall have a Health Monitor Service which functions to check if system cameras defined in the VMS are up and running. If not, the service will notify the user about the offline status of the camera in question. The Service will also generate health report related to cameras, servers and other system components.

2.40.02   The VMS shall provide the ability to view events, transactions, errors from the VMS Health Systems Service in an event log within Microsoft's Administrative Tools.

2.40.03   The VMS shall provide an ability for the system to detect and report via email health status exceptions such as non-responsive services, cameras offline, or excessive database size growth.

2.40.04   The VMS shall have the ability to detect and report via email when the reserve space on an archive store location is reached.

2.40.05   The VMS shall have the ability for the system to detect and report via email health status exceptions if a store location path is inaccessible.

2.40.06   The VMS shall have a configurable setting for capping memory (RAM) utilization by a managed service. Upon reaching the threshold the service will be restarted and an alert message will be logged/sent.

2.40.07   The VMS shall have an ability for the system to detect and report via email health status exceptions if network bandwidth exceeds 95%.

2.40.08   The VMS shall provide an alert on failure to copy archives in an distributed interlink configuration.

2.41 **STREAMING SERVICE**

2.41.01 The VMS shall provide a service that acts as an intermediary agent between the VMS and system cameras; it is mainly responsible for handling the streams and passing them to the system. It is also responsible for streaming the archives that are created using Archiving Service.

2.41.02 The VMS shall provide the ability to stream camera feeds from across a LAN/WAN over multiple subnets in a distributed server architecture.

2.41.03 The VMS shall designate a Streaming Server to handle a client request for live video in Motion-JPEG format when direct connection is unavailable.

2.41.04 The VMS shall designate a Streaming Server to handle a client request for live video via H.264 protocols when direct connection is unavailable.

2.41.05 The VMS shall be capable of streaming archived/recorded video to one or multiple client station by use of a streaming service.

2.41.06 The VMS shall have an ability to stream within a container supported by HTML5 compliant web browsers including Apple iOS using WebRTC.

2.41.07 The VMS shall provide the ability to view events, transactions, errors from the VMS Streaming Service in an event log within Microsoft's Administrative Tools.

2.41.08 The VMS shall support a diagnostics page for assessing streaming performance.

2.42 **EXTERNAL SERVICE**

2.42.01 The VMS shall have a service communicating independent packages from the main VMS system to act as an intermediary communication agent between the VMS and 3rd party software/hardware applications (RFID, IDS, Access Control, etc.).

2.42.02 The VMS shall provide the ability to view events, transactions, errors from the VMS External Systems Service in an event log within Microsoft's Administrative Tools.

2.42.03 The VMS shall have an ability to distribute the load of External Service over multiple servers.

2.43 **ANALYTIC SERVICE**

2.43.01 The VMS shall have a service communicating independent packages from the main VMS system to act as an intermediary communication agent between the VMS and 3rd party Video Analytic applications.

2.43.02 The VMS shall provide the ability to view events, transactions, errors from the VMS Analytic Service in an event log within Microsoft's Administrative Tools.

2.44	**WEB SERVICE**

2.44.01	The VMS web server shall run as a Window's Service. This service shall be running as long as the server is booted and has started Windows. It shall not require the user to be logged in.

2.44.02	The VMS shall provide the ability to view events, transactions, errors from the VMS Web Service in an event log within Microsoft's Administrative Tools.

2.44.03	The VMS shall support LDAP Signing.

2.44.04	The VMS shall have an ability to configure fail-over web services on alternative servers for increased system redundancy.

2.45	**SERVICE API (SDK)**

2.45.01	The VMS shall provide the ability to render live streaming or archive playback at a set date/time in a controlled browser window of the VMS based upon an application programmable interface (API) call.

2.45.02	The VMS shall have an ability to operate a 64-bit SDK service for 3rd-party interconnectivity.

2.46	**SYSTEM HELP**

2.46.01	The VMS shall have integrated Help files and by clicking the Help control the user will gain access to the VMS Help resources and documentation, and also allows the operator to view the version information for the application.

2.46.02	The VMS shall support both tool tips as well as extended tool tips to provide additional information.

2.46.03	The VMS shall list its version number and details in an About section for support reference.

2.46.04	The VMS shall provide support contact information from the User Interface.

2.47	**SQL DATABASE**

2.47.01	The VMS shall have via an SQL database the ability for information to be uploaded and viewed via the user-interface at any time in real-time.

2.47.02	The VMS Software shall be designed to operate using a Windows SQL Server 2022 database.

2.47.03	The VMS Software shall be designed to operate using a Windows SQL Server 2022 Express database with up to a 10 GB size maximum.

2.47.04   The VMS Software shall be designed to operate using a Windows SQL Server 2019 database.

2.47.05   The VMS Software shall be designed to operate using a Windows SQL Server 2019 Express database with up to a 10 GB size maximum.

2.47.06   The VMS Software shall be designed to operate using a Windows SQL Server 2012 database.

2.47.07   The VMS Software shall be designed to operate using a Windows SQL Server 2012 Express database with up to a 10 GB size maximum.

2.47.08   The VMS Software shall be designed to operate using a Windows SQL Server 2014 database.

2.47.09   The VMS Software shall be designed to operate using a Windows SQL Server 2014 Express database with up to a 10 GB size maximum.

2.47.10   The VMS shall have an ability to automatically monitor and maintain a user-defined database size so that it does not exceed a defined limitation (example: 10 GB for SQL Express Version).

2.48   VMWARE SUPPORT

2.48.01   The VMS shall have the ability for the application to be installed and maintained on a VMware instance.

2.49   MOBILE API SUPPORT

2.49.01   The VMS shall provide the ability to view camera installations on an Android powered mobile device.

2.49.02   The VMS shall provide the ability to view camera installations on an iOS powered mobile device.