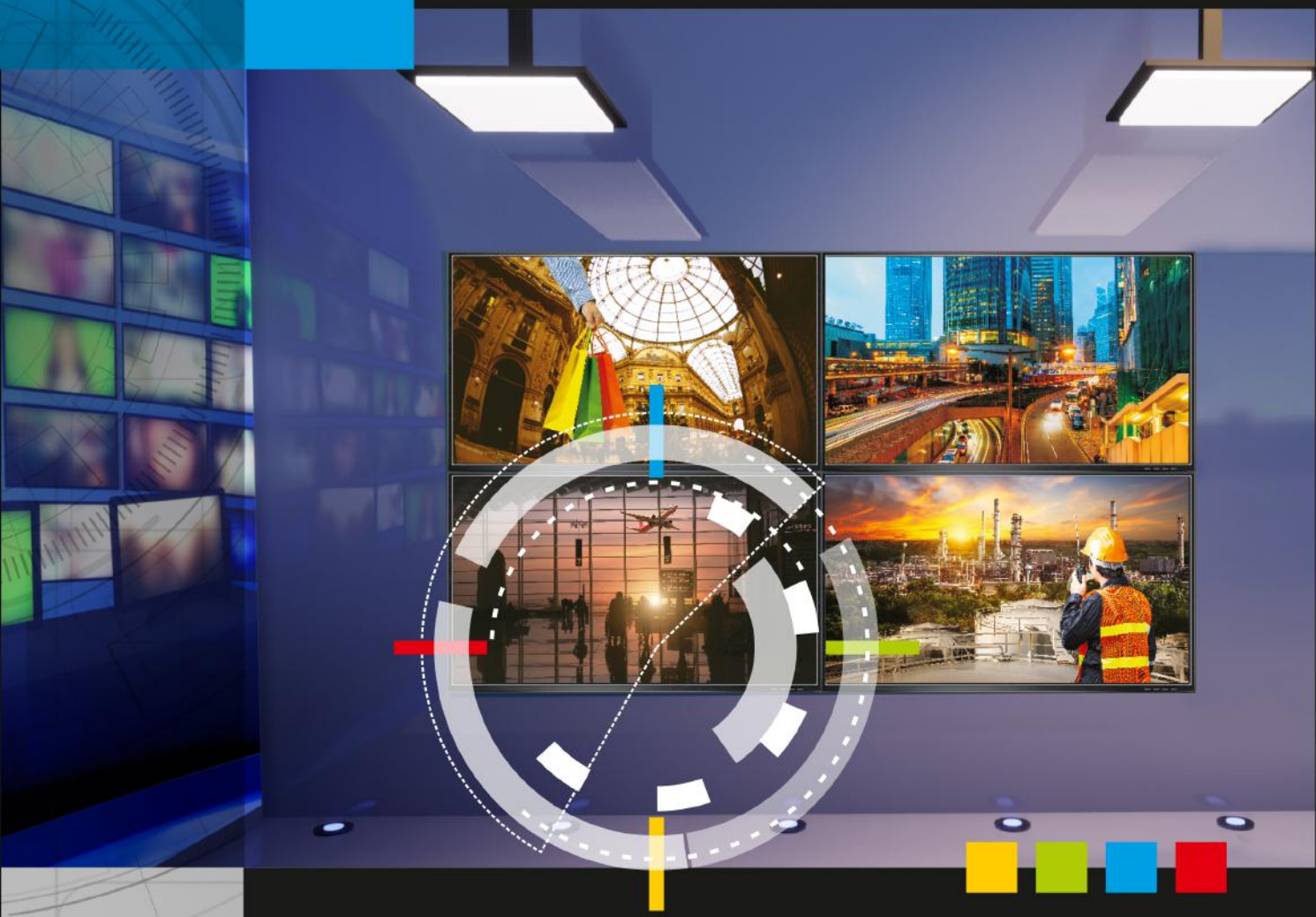
Videonetics
Look Deeper

Intelligent VMS 3.0

NEW

2021 Release

Powered by DeeperLook™ AI & DL Framework



INTELLIGENT VIDEO MANAGEMENT SOFTWARE

IVMS 3.0 (2021 Release)

Videonetics Intelligent Video Management Software (IVMS 3.0) represents a paradigm shift from what market has witnessed over the last two decades. With the widespread use of video surveillance using multi-megapixel IP cameras, video management today demands in-built intelligence in handling videos and generating actionable information from that, before they are archived and distributed. A unified, homogenous, scalable, efficient and cost-effective computing platform, which also addresses cybersecurity threats, is the need of the day.

The new Intelligent VMS is a product of insightful analysis of video contents, experience with adverse demographic and infrastructure conditions, decade-long R&D efforts in the domain of video computing, computer vision, and advanced artificial intelligence and machine learning techniques. IVMS 3.0 encompasses multiple video computing services in a unified, homogenous software architecture platform, and goes beyond mere 'capture-record-display' generation of video management. It analyses the attributes of servers, storage, network communication and other associated devices, with its AI algorithms in real time, and intelligently uses the capability of those devices to offer a fault-tolerant, fail-safe, responsive and rugged system for video management. It handles cybersecurity threats with its multi-pronged security measures to ensure users' data privacy, security, and data integrity.

The software is operating system agnostic and modular in design. It follows open standards so that many other devices and applications can be integrated with it, thus providing a unified interface for your surveillance needs.

IVMS 3.0 is powered by an in-built video analytics framework – DeeperLook™ - to integrate various video analytics applications within a single unified video computing platform. This means that both VMS and video analytics applications use common resources and objects - database, storage devices, data formats, thus reducing the overall IT infrastructure cost, besides ensuring data integrity, data interoperability, easy upgrades, and fast customisations.

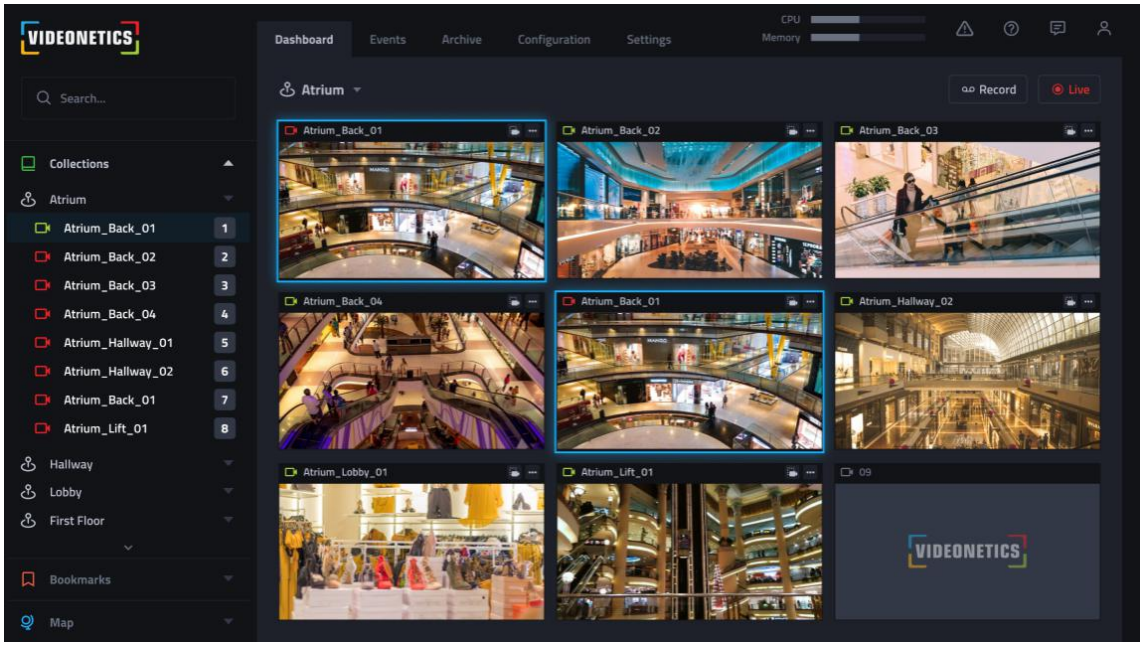
Key Highlights

■ **User-friendly interface:** IVMS 3.0 provides an intuitive, responsive, adaptive and friendly user interface. The interface supports user-specific camera layouts, and hierarchical camera groups to enable the user to multitask and improve operational efficiency. It supports all standard web browsers and provides mobile apps for both iOS and Android platforms.

■ **Smart navigation:** Users enjoy a smart video viewing experience, both live and archived . Multiple view panels can be correlated with the help of features such as Sync Replay, Google Map View, GIS Maps, OpenStreetMap, Camera Tracks and Surrounding Views. Simultaneous viewing of live and recorded video on the same display panel helps them quickly investigate activities in history, without losing sight of the current events. The software provides the Video Cart to select multiple video clips together and download them at one go, along with an Excel report with links to the video clips for easy sharing.

■ **Collaborative vigilance:** Operators get a collaborative surveillance platform to use for exchanging messages and sharing observations. The software offers features such as sharing of camera views, importing of operator screens and chat room for discussions.

■ **Geo situational awareness:** IVMS 3.0 offers multi-layer, hyperlinked sitemaps for clear view of cameras spread across the site geography. It integrates with online map services such as Google Maps, OpenStreetMap etc. to provide drag-and-drop of the cameras for alerts, archived and live video feeds. The in-built pencil tool helps in associating the cameras on the map for a quick geo-situational awareness.



■ **Integration of multiple on-premises Video Management Systems:** IVMS 3.0 can integrate and aggregate various autonomous VMS systems for unified central monitoring.

■ **Flexible platform selection:** It works across various operating systems such as Windows, Linux, UNIX and macOS, and database platforms such as MS-SQL, MySQL, PostgreSQL, Oracle and MongoDB, giving flexibility to the users. It also supports all the leading virtualisation platforms.

- **Secure data handling:** IVMS 3.0 ensures that your data is safe and accessible only to the authorised personnel with security protection. It supports Google sign-in, Single Sign-on and integration with LDAP/ Active directory services. And offers various security measures such as multi-factor authentication, encryption of data at rest, video watermarking, distributed storage management for critical data, and secured channel communication.

- **Multi-layered storage:** The software supports multi-layer storage architecture where video data is stored at multiple levels depending on the criticality and the required ageing of data. Thus giving high ROI and choice to the customer to select from various types of storage devices including cloud storage. Critical video data can be stored at multiple storage locations to safeguard against disasters - natural or man-made.

- **Architecture redundancy:** Servers responsible for video handling can be configured for 1:1, N:1, N:N and N:0 redundancy. In case of N:0, no server hardware is kept idle to take over the task of a failed server. Instead, the computing load of one or more failed servers is distributed across all other active servers, based on their spare computing power.

- **Business continuity:** The DC-DR architecture of IVMS 3.0 is built keeping in mind the complexities of vast amounts of video data generated from a large number of cameras in the field. This video data needs to be protected against loss or corruption by transferring it to another location. The DC-DR framework addresses these challenges through a practical, flexible and service-oriented architecture. It ensures business continuity with least service disruption.

- **Network adaptive:** The software follows distributed computing architecture and is deployable over a wide range of network communication systems. It offers a smooth video experience over heterogeneous communication infrastructure due to its bandwidth adaptive video streaming technology. It supports both unicast and multicast communications.

- **Scalable and cloud-ready:** IVMS 3.0 comes with easy and unlimited scalability, thanks to its architecture design. The computing nodes can be provisioned as and when required, and they auto-register themselves to the system with minimum configuration. This makes it easily deployable on cloud as well.

- **Integrated video analytics:** Video management and video analytics applications are integrated in the software, with a unified artificial intelligence framework called DeeperLook™. It enables multiple classes of video analytics and provides a configurable Deep Neural Network (DNN) framework. This framework can be deployed at a central server, on-premise or on-cloud. It also supports porting various modules on Edge devices, making it a perfect fit for video IoT applications. DeeperLook™ offers a plethora of analytics-related use cases for various verticals and applications.

- **Easy integration:** The Application Programming Interface (API) of IVMS 3.0 allows easy integration with third-party applications and devices. The API is platform-agnostic and can be used by external applications to receive data stored in the system over a secure, encrypted channel.

- **ONVIF compliance:** IVMS 3.0 is ONVIF-compliant and supports ONVIF profiles S, G, T and Q.

- **Notification and alarm management:** The software handles alerts from video analytics applications, as also cameras, servers and storage, providing an efficient mechanism to act swiftly. The system also receives alerts from software applications such as face recognition system, access control system, PIDS etc. besides IoT devices. Its alert handling workflow tracks users' actions and escalation of alerts.

- **System administration:** Users enjoy highly configurable system administration functions, be it adding cameras automatically, or configuring different server components, or granular control of adding multiple recording and analytics schedules. All these functions can be achieved from a single client with role-based access control.

- **User management:** IVMS 3.0 provides flexibility to create an unlimited number of users and supports multiple levels of user roles, offering role-based access control for granular functionalities. Camera viewing precedence can be configured to transfer PTZ camera control from an operator to the supervisor. System security questionnaire can be set during new user creation and configuration.

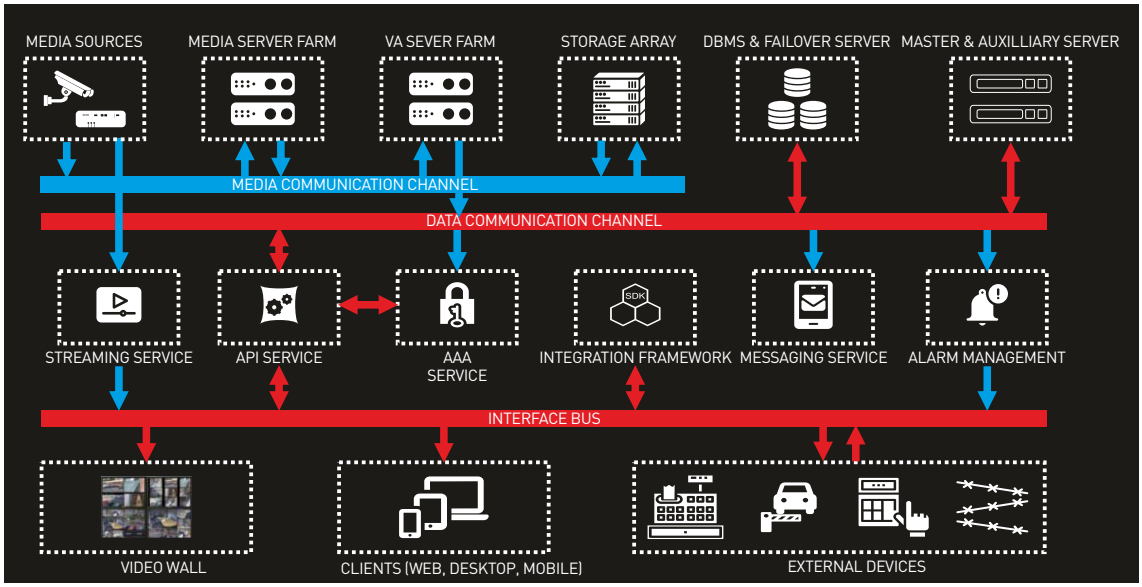
- **Health monitoring:** Users can monitor server components with audio visual alerts, and use charts and SLA reports to track the performance of components such as cameras, servers, network, local storage, etc. They also get full audit-trail to monitor user activities in the system.

- **Camera support:** The software supports ONVIF-compliant cameras out of the box, and also specialised cameras through SDK integration. Different types of cameras can be added easily, such as fisheye, multi-sensor, thermal imaging, ultra-high-resolution, body-worn, drone-based and pinhole cameras.

- **Multi-camera decode:** It allows smooth rendering of high resolution video from a higher number of cameras, as it auto-detects hardware accelerators such as NVIDIA GPU, Intel iGPU (QuickSync) and uses them efficiently.

- **Search and help:** IVMS 3.0 comes with an in-built user manual, with a search function for help on any topic related to the system operations. The operator can raise a support ticket from the same interface, with an ability to attach the screenshot, in case further technical assistance is required.

Architecture Overview



The multi-tier architecture of IVMS 3.0 has the following major components:

- **Media sources and media server farm:** Connects and manages the cameras/ encoders, record video, stream live and archived video on demand in a clustered, fail-safe manner, using the in-built streaming service.
- **Video analytics server farm:** Hosts video analytics applications which analyse video streams received from cameras, or any other external media sources.
- **Storage array:** Provides unified access mechanism for all types of storage – DAS, NAS, SAN and object storage.
- **DBMS and fail-over server:** Stores multiple types of configuration data, audit trails, system health status, and metadata corresponding to Alerts and Events.
- **Master and auxiliary master server:** Offers service gateway and interface of the system flow.
- **Streaming service:** Provides and manages media streaming to the end-client interfaces.
- **API service:** Provides interface for external applications for the purpose of integration.
- **Authorisation and authentication services:** Provides authentication, authorisation and other APIs to users. Also supports multi-factor authentication, OAuth2.0, LDAP integration.
- **Integration framework:** Provides two-way integration support with external software and devices, to exchange data with the software.
- **Messaging service:** Provides integration with various notification services, such as SMS, emails, chat etc.
- **Alarm management:** Provides alarm handling workflow to process various incidents, events and automated actions.
- **User interface clients**: Offers a wide variety of user-interface clients on desktop, web, and mobile app to interact with the system.

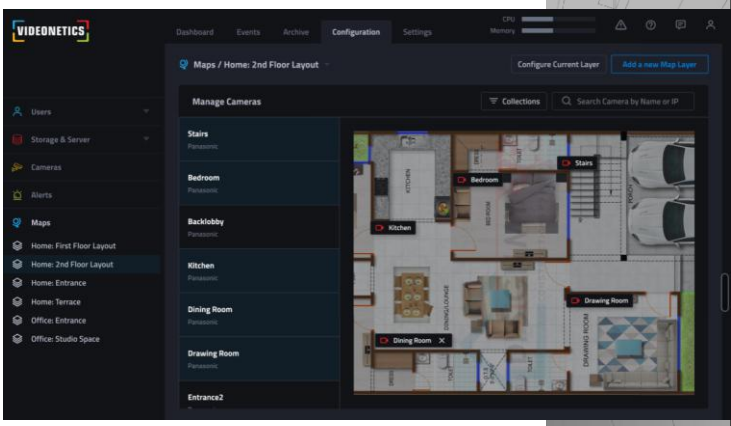
Features

Architecture and Platform

- Single site and federated deployment architectures
- Unlimited cameras for recording and monitoring
- Unlimited number of concurrent users and client workstations
- Supports multiple operating systems – Windows, Linux and macOS
- Virtual computing platforms in Windows and Linux environments
- Multiple databases such as MS-SQL, MySQL, PostgreSQL, Oracle and MongoDB
- Supports Commercially Off-The-Shelf (COTS) hardware and is storage solutions agnostic
- ONVIF-compliant for profile S, G, T and Q
- Supports hardware decoders such as NVIDIA, Intel HD Graphics and QuickSync
- Supports NVIDIA GPU and Intel Graphics at the same time and automatically load balances the request for optimal performance
- Time synchronisation with NTP
- Failover, failsafe and HA features for management, recorder, storage and database servers
- Recorder failover support with N+0, N+1, N+N redundancy
- Dynamic load balancing of cameras
- Persists with system configuration, even after unplanned outages

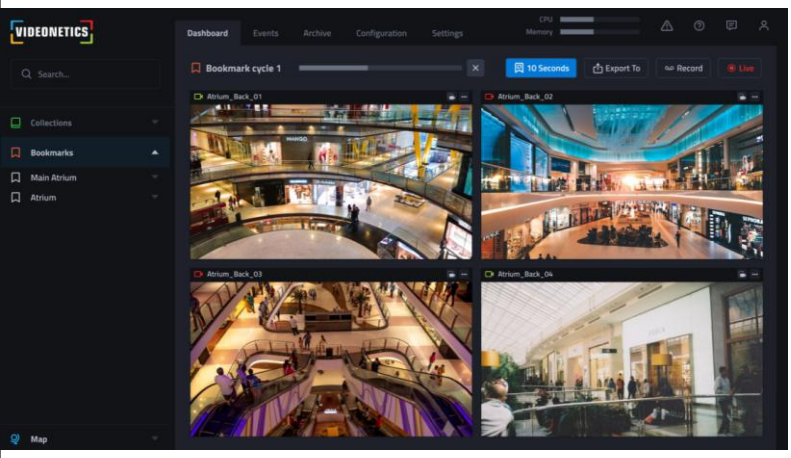
Monitoring

- Supports web browsers such as Firefox, Chrome, Safari, Internet Explorer, Microsoft Edge, Opera
- Apps for Android and iOS platforms
- Camera tree to view a list of available cameras, with specific camera icons
- Create and manage virtual groups and locations, from available cameras
- Enable and disable cameras from the user interface
- Update existing camera or group details
- Create zone alert for specific camera
- Search by camera name or group name
- Supports real-time simultaneous view of 1x1, 2x1, 2x2, 5+1, 7+1, 9+1, 3x3, 12+1, 4x4, 16+1, 5x5, 6x6, 8x8, 10x10 etc. multi-screen video display
- Video wall support



- Multi-monitor support
- Integration with multi-layer sitemaps
- Integration with online maps such as Google Maps, OpenStreetMap
- API based integration framework for other GIS maps
- Camera setting using the pencil tool for easy navigation and settings
- Camera live view on map
- View camera event notification on the map
- Link related cameras on the map
- Drag and drop camera on the map
- Display map separately on different monitor
- Supports multiple streams from a single IP camera or encoder, for both live and recorded video
- Bandwidth adaptive streaming
- Multiple streams and multi-casting
- Supports transcoding
- Assign each stream for recording, playback, network transmission
- Bookmark favorite layout, with operators' personal space

- Matrix switching among available bookmarks, with pre-determined time

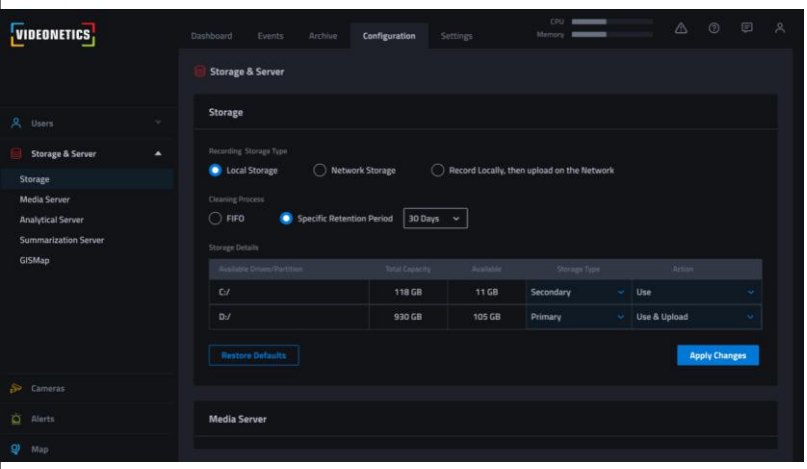


duration
- Simultaneous live viewing and replay view options in the camera
- Speed up and slow down archive video playback with configurable speed of up to 32x
- Multi-channel video weaving, in any direction – horizontal, vertical and overlay to provide a single overlaid view
- Video digging and multi-channel synchronised replay
- Magnifying glass for region-of-interest magnification
- Digital zoom for live and recorded video
- Instant snapshot from the live camera view
- PTZ controller and PTZ tracking
- Access hierarchy based PTZ control
- Integrated archive player within the client
- Export video in multiple formats (MP4, MJPG, AVF, AVI) with the flexibility to select desired frame rate (full/half), timestamp, digital zoom
- Export single frame of the video in BMP, GIF, TIF, JPG and PNG formats
- Encryption support while exporting video in the proprietary format
- MJPEG, H.264, H.265, H.265+, Zipstream video compression support
- Video cart to download multiple archive video clips
- Report on the downloaded video
- Colour and activity search in archive video
- Timeline to indicate the availability of recording, motion or event
- Critical video bookmarking and retention
- Video watermarking
- Actionable dashboard to view a list of recorded videos, and to view a video by clicking on the record
- Export recording details in a spreadsheet, with details of each of the video segments
- Video enhancement for live and recorded view
- Operator screen recording
- Area of interest selection with intelligent grid for searching smart motion search by time, sensitivity and interval
- Automatic or manual selection of hardware/ software accelerator decoder
- Print surveillance report with a snap and specific information including camera name, capture time, print time, user details and user notes
- Supports transcoding on the fly for bandwidth adaptive streaming
- Thumbnail search, to review and identify a part of the recorded video
- Camera shake cancellation – object detection even when the camera is swaying

Storage and Recording

- A mix of multiple storage technologies such as local storage/ DAS/ SAN/ NAS or hybrid
- Supports storage on cloud (object storage)
- Multi-layered storage with definable duration
- Storage synchronisation in novel DC-DR architecture
- Supports 6 service groups of DC-DR categories providing backup for event metadata, event clips, recorded video, database etc. against catastrophes
- Designed based on a novel video DC-DR architecture principle
- Create and change recording schedules on

the fly. Assign any recording schedule to a single camera or a group of cameras or all cameras with different video settings
- Manage recording schedules on an hourly basis
- Start/ stop recording for a specific camera
- Configure minimum and maximum days of



video retention per camera
- Customise recording profile by selecting multiple available video streams
- Independent storage configurations at each media server
- Select single camera or a group of cameras for edge recording
- Supports Automatic Network Replenishment (ANR) with controlled recording on an hourly basis
- Supports data purging on FIFO or retention duration basis
- Independent retention policy on per camera basis
- Motion-based recording
- High resolution snap embedded in video recording
- Storage fail-safe feature
- Customisable keyboard shortcuts
- All video resolution, frame rate, and bitrate available in the camera
- Alert when storage space reaches a pre-defined threshold
- Intelligent storage management - uploads only key frames of the video to tertiary storage, and transcoded video with configurable compression, resolution, frame rate, for longer retention of critical video
- Enable and disable video camera for recording
- Automatic synchronisation of failover server with primary recording server, post downtime

Users and Role Management

- In-built role-based access control, with multiple user categories
- Flexibility to modify access rights for specific system roles
- Create an unlimited number of users with appropriate role mapping
- Control access rights of a user to a hardware
- Configure security questions for the first-time login
- System user can reset password if needed
- Co-operators or system users can communicate via in-built operator messaging tool
- Operator screen can be imported for supervision by supervisor
- Standard Operational Procedure (SOP) workflow for the ease of the operator

Notifications and Alarm Management

- Send notification alert through SMS, WhatsApp, or Email
- Create recipient groups including one or more recipient email IDs and names
- Create notification rules, and assign priority
- Transfer or escalate event alert to an administrator or another registered user in the system
- Operator can trigger and create incidents on recorded video
- Alert notification with sound and pre-recorded voice messages, along with audio

and video annunciator integration

System Administration

- Wizard-driven installation and configuration
- Each component can be administered independently, without being tightly coupled
- Modify or configure settings after initial setup
- ONVIF device discovery

Health Monitoring

- Displays an indicator of health status for components such as database, media server, local workstation, storage system and camera
- Different level status indication for warnings and errors
- Reports camera uptime availability, camera recording percentage and status, critical events, incident video, camera performance data with resolution, frame rate and network usage
- Allows operator to raise a support ticket from the interface console, attaching screenshot and details of the issue
- Dynamic visual indication on the camera icon to display camera status – live, recording, disconnected, active video analytics events
- Full audit trail of user activities in the system searchable by multiple filters such as level, source and event type
- Help section for the operator to search on specific topics
- Notification through sound alert, in case of system malfunction

External Integration

- Open to any IP camera, analog camera and encoder integration
- Supports 360-degree camera, multi-sensor camera, ultra-high-resolution camera, thermal camera etc.
- Two-way audio integration
- Relays audio messages to a single camera, or a group of cameras, or all the cameras
- Integration support with integrated command and control centre application, to send live video, recording, events
- Integration support with access control, perimeter intrusion detection, physical access control barriers, SCADA, BMS, TAS
- DVR and NVR integration support
- Integration with ANPR, RLVD and e-challan systems
- Open API standards (REST and WEBSOCKET) for integration with external systems
- Supports USB, joystick, surveillance keyboard

Security and Encryption

- Integration with multiple directory access protocols, for single sign-on
- Multi-factor authentication
- Secured SSL-TCP based protocol for communication between server and client
- Video watermarking and encryption support for video recording
- Secured HTTPS protocol for integration with external systems through API
- Strict licensing policy to prevent misuse of the platform
- VAPT (Vulnerability Assessment and Penetration Test) certified
- Encrypted passwords for the system users
- Secured RTSP protocol support for video data in transit, while streaming live or recorded video
- Send live, or archive video streams, through RTSP protocol
- Support for multiple cyphers, such as 56-bit DES, 128-bit AES, 256-bit AES

Videonetics's Unified Video Computing Platform™ helps you make sense of surveillance, by providing you with an end-to-end solution for a wide range of applications. The platform is powered by our Artificial Intelligence and Deep Learning engine, which is trained on humongous data sets, making our solutions incredibly robust and smart. All our products and solutions are integrated yet modular, ONVIF compliant, OS and hardware agnostic, scalable and interoperable.

Videonetics has been ranked #1 Video Management Software provider in India, and among the top 5 in Asia (OMDIA Informa Tech 2021). We remain driven by innovation, and committed to making the world a safer, smarter, happier place.

Providing an end-to-end solution for a wide range of applications

- Intelligent VMS
- AI Enabled Video Analytics
- Facial Recognition
- Intelligent Traffic Management System
- VCPaaS™ Video Computing Platform as a Service

Technology leader across verticals, in different parts of the world

- CITIES & NATION
- AVIATION & TRANSPORTATION
- COMMERCIAL BUILDINGS
- INDUSTRIAL
- FINANCIAL & LEGAL
- EDUCATION
- CRITICAL INFRASTRUCTURE

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