

# NETRA-X

## AI Enabled Video Surveillance/Management System

Version 1.7.0



## NETRA-X VMS: Secure, Smart, Scalable.

In today's enterprise environments, managing security-critical video data demands robust video management software (VMS). This software must process massive volumes of footage, safeguard against cyber threats, and ensure seamless operations during unexpected incidents.

The rise of multi-megapixel IP cameras has transformed video surveillance. Modern VMS delivers built-in intelligence for handling high-bandwidth streams, real-time analytics, and actionable insights—while enabling secure archiving and distribution.

Leverage distributed computing with edge devices and cloud-based compute/storage for optimal performance. This architecture provides cost-effective, geo-secure access to classified data across locations, maximizing the advantages of scalable networks and communication infrastructure.

WARRIS: “WATCH, ANALYZE, RECORD, REPLAY, IMPLIMENT, SECURE” within a physical boundary hardly meets current expectations from a Video Management System.

## We Knows the Video Surveillance System: OUR VMS LOOKS DEEPER

**NETRA-X** brings its AI-powered Video Management System, a one-stop, modular video management solution pre-integrated with AI and machine learning framework that opens a whole new dimension to holistic situational awareness and generates opulent actionable information.

**NETRA-X** VMS gives the power to simplify the complexities of handling vast amounts of video data, metadata, and video computing services in a unified and homogenous software architecture platform that avoids data replication and ensures data integrity and interoperability. Challenges faced by different enterprises or users are not the same, therefore **NETRA-X** VMS provides flexibility to personalize the system as per user requirements.

## Artificial Intelligence at the Prime

**NETRA-X VMS** is a product of insightful analysis of video metadata, trained with massive datasets of adverse demographic conditions, and decade-long R&D efforts in computer vision, video computing, advanced artificial intelligence, and machine learning techniques.

**NETRA-X** built-in AI-enabled Video Analytics (VA) engine extracts, analyses, and generates actionable information from a humongous amount of video or image metadata. It is designed to serve as an intelligent decision support system for VMS users.

**Unmatched Precision** A patented and award-winning technology, our AI and DL-powered VA engine ensures the highest level of accuracy by detecting various patterns, features, intrinsic, object attributes, activities, actions, behaviours, and events using a novel continuous and self-learning mechanism. It provides accurate and timely alerts for detecting anomalies with highly optimised computing resources.

**Customizable AI Engine** Our video analytics engine is highly customizable, compute-efficient, and compatible with on-premise, edge, cloud, and hybrid deployment scenarios. It uses a collection of indigenously designed AI and DL engines, each computationally optimised for a specific set of tasks. The framework is reconfigurable with the interconnection of these engines and hence suitable for

domain-specific, customised video analytics application development.

**Rugged and Tolerant** AI algorithms of VMS analyze the attributes of deployed servers, storage, network communication bandwidth, and other integrated devices to intelligently assess the capability of those devices and services to offer a fault-tolerant, fail-safe, responsive, and rugged system for intelligent video management.

**Data Safety, Security, Privacy** Data encryption and its transmission over secured channels ensure data security at rest, on the move, or when in use. Our trained AI engines are also encrypted to protect them from tampering. **NETRA-X VMS** handles cybersecurity threats with multi-pronged security measures to ensure user data privacy, security, and integrity when data is at rest, in motion, or in use.

**Tested for Vulnerabilities** NETRA-X software applications are certified for OWASP compliance, and its client applications are continuously tested for any vulnerability. All communications amongst different servers and between servers and clients take place over encrypted channels and are authenticated by exchange of certificates.

## NETRA-X VMS – Built to Scale-up with Your Business Needs

NETRA-X VMS is engineered with a highly scalable and modular architecture that grows seamlessly alongside your business requirements. Whether you start with a small deployment or expand to a large multi-site surveillance ecosystem, the system adapts without requiring major infrastructure changes.

The platform supports **horizontal and vertical scalability**, allowing you to add cameras, users, storage, and analytics capabilities on-demand without performance degradation. Its distributed architecture ensures optimal resource utilization by dynamically balancing workloads across servers, edge devices, and cloud environments.

With support for **on-premise, cloud, and hybrid deployments**, NETRA-X VMS provides complete flexibility to scale operations across multiple locations while maintaining centralized control. Advanced features like **failover, redundancy, and disaster recovery** ensure uninterrupted operation as your system grows.

👉 **NETRA-X VMS empowers organizations to start small, expand smart, and scale infinitely—** without compromising on performance, security, or reliability.

## Not Just WATCH, RECORD, REPLAY

Video surveillance has evolved and now goes beyond mere ‘WATCH. RECORD. REPLAY’ generation of video management.

**Forensics & Investigation** Do not feel helpless when you identify a person in live view or recorded video and want to track the person across many cameras. **NETRA-X VMS’s** integrated attribute search engine can extract attributes of a person selected by you and then search for the person across other cameras. When accompanied by **NETRA-X Face Recognition System**, you can extract the face of the person and match it against stored faces in the database.

**A Platform that OPEN for Collaboration** **NETRA-X VMS** has a rich set of APIs to share data with other applications. External systems can use the API for fetching video streams, event data, system health data, and many more over the standard RESTful API. Besides, VMS can also share data with other applications over ONVIF.

## Transform Your Monitoring with Our VMS

**Video Summarization** Video feeds are analysed to detect occurrences of activities in the scene, and segments of video involving those activities are packed in a spatiotemporal way to create video files of much smaller duration. You can watch this video file to monitor all the activities in a scene that took place over a few hours by spending only a few minutes.

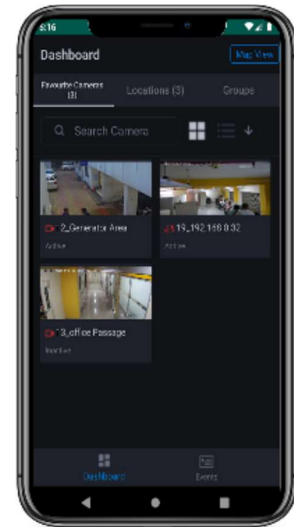
**Aggregation of View and Data** **NETRA-X VMS** enables monitoring multiple locations from a central command and control center. Events, alerts, critical segments of videos, and other classified data are automatically fetched from centrally located storage and database to ensure they are never lost and are readily available with proper access control.

## Monitor and Manage from Anywhere

Doesn't matter if you are at home, at work or on the go, you have the access to VMS with our Clients.

### Mobile

- Get alerts and alarms on the move
- Watch live view of cameras in grid view with low latency
- Watch recorded video
- View event statistics along timeline
- Locate other mobile users nearby and start communicating with them for collaboration
- Uploading of images and video to command centre
- Available for iOS and Android devices



### Web

- Low latency live feed and smooth PTZ control
- Agnostic to browsers and operating systems
- Receive alerts from video analytics applications
- Search events and alerts
- Replay and download recorded video
- Visualization dashboard
- View, monitor and control VMS, end-to-end
- Intuitive user interface
- Same interface for System configuration, video analytics configuration and operator console
- Dig deep into recorded video for forensics and investigation
- Multi-monitor feature allows viewing of multiple screens with a single workstation
- Realtime notification of Events and Alerts while watching live view
- System health monitoring: server, storage, database, cameras
- Video wall support



## Easy. Intuitive. Smart.

**User-Friendly Interface** NETRA-X VMS provides an intuitive, responsive, adaptive, and friendly user interface that supports user-specific camera view layouts and hierarchical camera groups to enable users to multitask and improve operational efficiency. The **NETRA-X** VMS application supports all standard web browsers and provides mobile apps for iOS and Android platforms.

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

**Collaborative Vigilance** Users get a collaborative surveillance platform for exchanging events of interest, alarms, and live-view panels besides messages amongst themselves using an inbuilt chat engine. A supervisor can compose live camera layouts and instruct the user to monitor a set of cameras. User screens can be closely monitored by the supervisor to keep a tab.

## Future-Ready, Scalable & Open.

**Flexible Platform Selection** NETRA-X VMS 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 a user's flexibility. It also supports all the leading virtualisation platforms such as VMware, KVM, QEMU, VirtualBox, etc.

**Conforms to latest ONVIF Protocols** From the start, we are committed to the cause of standardization and interoperability between IP-based physical security products, and that is substantiated with our decade-long association by ONVIF and its mission. **NETRA-X** VMS is ONVIF conformant and supports all ONVIF profiles.

**Edge Analytics** NETRA-X VMS can receive the metadata of edge analytics streamed by a camera on the ONVIF Profile M protocol. It can analyse the images further based on the metadata and thereby provides a two-stage distributed video analytics application framework. It enriches the existing edge analytics of the cameras and can cater to varied domain-specific use cases.

**Network Adaptive** NETRA-X VMS follows a distributed computing architecture and is deployable over numerous 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. A separate streaming server can be added as a pluggable module to add transcoding services and streaming in various protocols to different recipients over different networks.

## Specifications

<b>OS &amp; Hardware Supported</b>	<ul style="list-style-type: none"> <li>• Windows, Linux</li> <li>• Containerization and virtual machine supported, both in Windows and Linux</li> <li>• MS-SQL, MySQL, PostgreSQL, Oracle databases</li> <li>• Supports Commercially Off-The-Shelf (COTS) hardware and storage</li> <li>• Firefox, Chrome, Safari, Internet Explorer, Microsoft Edge, Opera</li> <li>• NVIDIA, Intel HD Graphics and QuickSync hardware decoders.</li> <li>• Android and iOS Mobile Apps</li> </ul>
<b>Architecture and Platform</b>	<ul style="list-style-type: none"> <li>• Standalone and federated architecture</li> <li>• Simultaneous multi-site monitoring</li> <li>• Back-up multi-sites data to central location</li> <li>• Failover, fail-safe, and High Availability (HA) features</li> <li>• Flexible and scalable Disaster Recovery (DR) system</li> <li>• Direct interface to S3 object storage of cloud</li> <li>• Unique master-master configuration of two systems with data synchronization</li> <li>• Time synchronisation with NTP</li> </ul>
<b>Deployment Capabilities</b>	<ul style="list-style-type: none"> <li>• Single site on -premise, on-cloud, hybrid</li> <li>• Multi-site with central command centre at cloud/data center/hybrid</li> </ul>
<b>Security and Encryption</b>	<ul style="list-style-type: none"> <li>• Multi-factor authentication</li> <li>• Integration with multiple directory access protocols, for single sign-on</li> <li>• Secured TLS 1.3 protocol for server-client communication</li> <li>• Video watermarking and encryption support for video recording</li> <li>• Secured HTTPS protocol for integration with external systems through API</li> <li>• Encryption of video files, critical system information and AI models to prevent tampering</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>• Unlimited cameras</li> <li>• Unlimited Users</li> <li>• Supports WebRTC and HLS (for mobile and web app)</li> <li>• Sequence view, matrix switching with configurable dwell time</li> <li>• Video-wall support</li> <li>• Supports multiple monitors, each one with different camera matrix</li> <li>• Multi-camera time synchronized replay for better situational awareness</li> <li>• Supports multiple streams from a single IP camera or encoder</li> <li>• Bandwidth adaptive streaming with or without transcoding</li> <li>• Multicast support</li> </ul>

	<ul style="list-style-type: none"> <li>• Matrix switching among bookmarks, with pre-determined time</li> <li>• Variable playback speed</li> <li>• Digital zoom function</li> <li>• Instant snapshot from the live camera view</li> <li>• Access right hierarchy based PTZ control</li> <li>• Integrated archive player within the client</li> <li>• Export video in multiple formats (MP4, MJPG, AVF, AVI), frame rate (full/half) and encryption</li> <li>• Export single frame of the video in BMP, GIF, TIF, JPG and PNG formats.</li> <li>• Video Compression - MJPEG, H.264, H.265, H.265+, ZipStream</li> <li>• Report on the downloaded video</li> <li>• Timeline to indicate the availability of recording, motion or event</li> <li>• Export recording details in a spreadsheet, with details of each of the video segments</li> <li>• Print surveillance report with a snap and camera specific information and user notes</li> <li>• Supports transcoding for bandwidth adaptive streaming</li> <li>• Region selection with intelligent grid for smart motion search by time, sensitivity and interval</li> <li>• Colour and activity search in archive video</li> </ul>
<b>Storage, Recording, data protection, Disaster recovery</b>	<ul style="list-style-type: none"> <li>• Supports local storage/DAS/SAN/NAS</li> <li>• Hierarchical storage deployment, with independent data retention at different layers</li> <li>• DC-DR architecture for data replication and flexible business continuity options.</li> <li>• Supports multiple recording schedule configurations</li> <li>• Start/stop parallel recording for any specific camera</li> <li>• Supports configurable video retention policy for every camera</li> <li>• Supports data purging on FIFO or retention basis</li> <li>• Supports motion activated and Event activated recording</li> <li>• Alert when storage space reaches a pre-defined threshold</li> </ul>
<b>User Management</b>	<ul style="list-style-type: none"> <li>• Role-based access control, with multiple user categories</li> <li>• Flexibility to modify access rights for specific system roles</li> <li>• Restricted access to cameras for selected users</li> <li>• Locking user access from designated devices only- specific mobile phone or workstation</li> <li>• Co-operators or system users can communicate via in-built operator messaging tool</li> <li>• Operator screen can be recorded and imported for supervision by supervisor</li> <li>• Standard Operational Procedure (SOP) workflow for the ease of the operator</li> <li>• User activity audit trail</li> </ul>

<p><b>Video analytics</b></p>	<ul style="list-style-type: none"> <li>• Integrated video analytics framework within the same platform</li> <li><u>Intelligent Recognition Analytics</u> <ul style="list-style-type: none"> <li>➤ License Plate Recognition (ANPR)</li> <li>➤ Face Detection &amp; Face Recognition</li> <li>➤ Gun / Weapon Detection</li> </ul> </li> <li><u>Human Behaviour &amp; Safety Analytics</u> <ul style="list-style-type: none"> <li>➤ Fight / Violence Detection</li> <li>➤ Fall Detection</li> <li>➤ Loitering Detection</li> <li>➤ Crowd Density Analysis (Advanced)</li> <li>➤ Queue Management (Advanced)</li> </ul> </li> <li><u>Safety &amp; Hazard Detection</u> <ul style="list-style-type: none"> <li>➤ Fire Detection</li> <li>➤ Smoke Detection</li> </ul> </li> <li><u>Object-Based Intelligence</u> <ul style="list-style-type: none"> <li>➤ Left / Abandoned Object Detection</li> <li>➤ Object Removal Detection</li> </ul> </li> <li><u>Motion &amp; Presence Detection</u> <ul style="list-style-type: none"> <li>➤ Motion Detection</li> <li>➤ Human Detection</li> <li>➤ Vehicle Detection</li> </ul> </li> <li><u>Wild Life Detection</u> <ul style="list-style-type: none"> <li>➤ Normal Animal Detection</li> <li>➤ Special Animal Detection (Ex: Lion, Leopard, Tiger, Nilgai Etc..)</li> </ul> </li> <li><u>Perimeter Protection Analytics</u> <ul style="list-style-type: none"> <li>➤ Intrusion Detection</li> <li>➤ Line Crossing Detection</li> <li>➤ Area Entry / Exit Detection</li> <li>➤ Wrong Direction Detection</li> </ul> </li> <li><u>Traffic &amp; Compliance Monitoring</u> <ul style="list-style-type: none"> <li>➤ Speed Detection</li> <li>➤ Parking Violation Detection (Basic)</li> </ul> </li> <li><u>Compliance &amp; PPE Monitoring</u> <ul style="list-style-type: none"> <li>➤ Mask Detection</li> <li>➤ Helmet Detection</li> <li>➤ PPE Detection</li> </ul> </li> <li><u>People Intelligence</u> <ul style="list-style-type: none"> <li>➤ People Counting</li> <li>➤ Heatmap Analytics</li> </ul> </li> </ul>
<p><b>Notifications &amp; Alarm Management</b></p>	<ul style="list-style-type: none"> <li>• Send alerts via SMS, WhatsApp, or Email</li> <li>• Create recipient group email IDs and phone numbers</li> <li>• Transfer or escalate event alerts to administrator</li> <li>• Trigger and create incidents on recorded or live video</li> <li>• Alert notification with sound and pre-recorded voice messages, along with audio and video annunciator integration</li> </ul>

<p><b>System Health Monitoring</b></p>	<ul style="list-style-type: none"> <li>• Health status monitoring and display for all components</li> <li>• Reports camera uptime availability, camera recording percentage and status, critical events, incident video, camera performance data with resolution, frame rate and network usage</li> <li>• Allows operator to raise a support ticket from the interface console, attaching screenshot and details of the issue</li> <li>• Dynamic visual indication on the camera icon to display camera status</li> </ul>
<p><b>External device Integration</b></p>	<ul style="list-style-type: none"> <li>• Universal device integration framework- both PUSH and PULL modes</li> <li>• Open to any IP camera, encoder integration</li> <li>• IP speaker, two-way audio integration with cameras</li> <li>• Integration support with command-and-control centre application to share live video, recorded video clips, alarms and alerts with timestamp and source information</li> <li>• Integration support with access control, perimeter intrusion detection, physical access control barriers, SCADA, BMS, TAS, POS devices, DI/Dos, etc.</li> <li>• DVR, NVR and multi-lens camera integration support</li> <li>• Supports open API standards (REST and WEBSOCKET)</li> <li>• Supports USB, joystick, surveillance keyboard</li> </ul>

For elaborate specifications, please contact  
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