TECHNICAL SPECIFICATIONS SECURITY SYSTEM

DIVISION – 28 ELECTRONIC SAFETY AND SECURITY

LEVEL 1\_\_28 20 00 ELECTRONIC SURVEILLANCE

LEVEL 2\_\_28 23 00 VIDEO SURVEILLANCE

LEVEL 3\_\_28 23 19 NETWORK VIDEO RECORDERS

**VIDEO STORAGE PLATFORM FOR PHYSICAL SECURITY & VIDEO SURVEILLANCE**

**SHALL BE APPLIANCE STOR SERIES PURPOSE BUILT SERVER / STORAGE / ANALYTIC (or Approved Equal)**

1.0 **GENERAL**

1.1 The video server / storage platform **shall** be a simple, affordable and ready-to-run video recording, anomaly based analytics and storage device as part of its overall technology deliverable.

1.2 The video storage platform **shall** provide scalable, shared and purpose built video-optimized NFD (No Frame Drop) storage to eliminate the need for commodity storage.

1.3 The video storage platform **shall** be designed for physical security requirements, tested and proven in supporting new all-IP surveillance and analytic needs, and/or in upgrading existing CCTV DVR implementations, for future-proof security installations.

1.4 All equipment and materials used in the video storage platform **shall** be standard components that are regularly manufactured and used in the manufacturer’s system.

1.5 **Shall** utilize all major components and disk drives and shall be enterprise- or server-grade devices, and not commodity- or PC-grade, ensuring improved performance and reliability.

2.0 **VIDEO SURVEILLANCE OPTIMIZATION TECHNOLOGY**

2.1 The video storage platform shall feature video surveillance optimization technology, designed specifically for physical security and video surveillance needs, rather than generic servers and storage designed for IT workloads, to ensure maximum reliability and performance. The video storage platform **shall** be utilizing the **Rasilient PS5000 Series NFD technology.**

2.1.1 **Shall** Leverage video storage optimization technology that supports write intensive, non-sequential, large block recording to the video storage platform’s storage capacity without fragmenting the recorded video over long periods of use.

2.1.1.1 Technology **shall** eliminate the risk of storage performance degradation and eventual failure with continued use.

2.1.2 **Shall** Provide an easy, quick installation process to be up and recording in minutes.

2.1.3 **Shall** Provide a physical security-oriented graphical user interface (GUI) tool, a set of management & information screens, for ongoing management of the video storage platform and its storage capacity.

2.1.3.1 The GUI interface **shall** include a functional (set) to be based on familiar physical security terminology, instead of requiring extensive IT storage knowledge, support and retraining.

2.1.4 Provide an advanced, physical security-proven, and shared underlying IP storage technology to support preloaded VMS applications.

2.1.4.1 Additional devices, including NVRs, servers or other IP connected physical security devices **shall** also be supported, if needed.

2.1.4.2 This technology **shall** eliminate the need for less capable for video storage needs solutions [direct attached storage (DAS) or network attached storage (NAS) systems] commonly used for general IT and not optimized for video surveillance workloads.

2.1.5 Allow modular recording capacity growth to the base appliance, without halting recording operations.

2.1.6 Eliminate the risk of lost video through advanced RAID (Redundant Array of Independent Disk) protection.

2.1.7 Eliminate the risk of halted recording and playback, by leveraging hot-swap disk drives.

2.2 The video storage platform **shall** be designed to extending the life, increasing the reliability, and upgrading the features and capacity of the IP based Video Surveillance systems. **It shall:**

2.2.1 Be proven in customer NVR upgrades, with provided examples.

2.2.2 Demonstrate connectivity with leading professional NVR and server platforms, validated by recognized technology lab certification.

2.2.3 Support live recording from the NVRs where desired, and/or support archival operations for recorded video utilizing NFD No Frame Drop technology.

2.2.4 Enable continued use of typical DVRs, analog cameras and cabling rather than forcing replacement.

2.2.5 Increase recording capacity, without requiring additional fixed, captive storage to be added to existing individual NVRs, internally or externally, but instead supporting multiple device recording via the purpose built NFD video storage platform.

2.2.6 Support multiple NVRs and or purpose built Servers simultaneously.

2.2.7 Enable the addition of IP devices, if desired, to also leverage the video storage platform capacity.

2.3.0 The video storage platform shall be designed for all-IP surveillance needs with video surveillance applications and other physical security products. It shall:

2.3.1 Be proven in customer all-IP surveillance installations, with provided examples.

2.3.2 Demonstrate a successful physical security design, by recognized technology lab certification with IP cameras, megapixel cameras, and IP based applications including VMS, PSIM, access control, infrastructure providers, video analytics, physical security utilities, authentication, biometrics and technology vendors.

2.3.3 Support standard IP surveillance and megapixel cameras.

2.3.4 Reduce power consumption, heating and cooling, equipment needs and rack space, by providing shared recording capacity with increased storage efficiency and utilization, eliminating the need for commodity storage and reducing other equipment needs.

3.0 **ADMINISTRATION AND MANAGEMENT**

3.1 Video Surveillance Management Tool

The video storage platform **shall** be managed through a video surveillance oriented graphical user interface (GUI), a set of management and information screens, for simplicity and ease of use.

3.1.1 The security operator can provision virtually any number of storage volumes of any size within the available capacity of the purpose built video storage platform.

3.1.2 The addition of volumes to the installed system happens in real time with zero down time of the system and the recording of video to the storage is not interrupted during the process.

3.1.3 This tool shall not require extensive IT storage knowledge, but instead use common camera terminology such as desired resolution, compression, frame size, frame rate, number of cameras, days of retention, percentage of motion, etc., just as in common camera sizing and storage estimation tools.

3.1.4 The output of this setup and management tool shall be able to automatically add and configure the underlying storage capacity within the video storage platform.

3.2 Web Based Access The video storage platform shall provide web-based browser access for administration and management.

3.3 Support for Unattended Operation

The purpose built video video server and storage platform **shall** support unattended operation for at least multiple weeks to months, and shall also:

3.3.1 Not require frequent monitoring or adjustment for normal operations.

3.3.2 Be able to perform without shutting down for regular system maintenance.

3.3.3 Be able to operate unattended without operator supervision.

3.3.4 Be able to operate without requiring shutdown or significantly degraded performance for disk defragmentation and cloning processes and maintenance.

3.3.5 Be able to maintain recording performance in 24x7x365 environments, without system throughput and recording/playback performance degradation.

3.3.6 Provide automated alerting and event notification of system issues via email and messaging to designated personnel, and via SMTP interfaces with management frameworks in environments so equipped.

3.4 Automated Alerts

The video storage platform **shall** provide user-settable automated alerting.

3.4.1 Automated alerting **shall** be supported via the graphical user interface, which can receive system and user-determined alerting.

3.4.2 Email alerting capabilities **shall** be provided.

3.4.3 Alerting through the SNMP protocol to management frameworks for environments so equipped is provided.

3.4.4 At a minimum, alerts **shall** be issued by the video storage platform for

3.4.4.1 System failures.

3.4.4.2 Component failures.

3.4.4.3 Failing conditions.

3.4.4.4 Threshold maximums.

3.4.4.5 Pre-set conditions, including available space, performance, unexpected loss of video feeds from the cameras, Server’s or NVRs, and factors impacting overall retention.

3.5 Reporting

The purpose built video storage platform shall provide visual reporting for routine metrics including capacity utilization, CPU utilization, storage volume configurations, disk groups, etc., that the security operator can use to easily understand storage system status and operating health.

3.6 Growing or Expanding the Size of Storage Volumes

The video storage platform shall be able to increase space utilization by growing the size of the storage volume “on the fly”.

3.6.1 Growing volumes to accommodate an increase storage demand from a set of cameras, new Server’s or NVRs, etc., shall be supported by the system in real time. This methodology shall allow the user to only use the space immediately required instead of forcing the purchase and allocation of excess capacity in advance that remains unused.

3.7 Cloning Storage Volumes

For upgrades, technology refresh, backup, or disaster recovery operations, the video storage platform shall support storage volume cloning, and enable the creation of a full copy of the volume in real time.

3.8 Recording Latency

Any frame loss due to recording latency shall be measurable on a statistical basis with provided tools.

3.8.1 The video storage platform shall support No Frame Drop (NFD) operations.

3.8.2 The purpose built video storage platform shall provide a toolset to analyze and estimate the necessary number of disk drives or enclosures to ensure a tolerable frame loss ratio as defined by the specific application environment or the security operator.

3.9 Remote Boot

The video storage platform shall support remote boot functionality for servers, NVRs and other devices.

3.9.1 Remote reboot to be launched using only the video storage platform, eliminating the need for such devices to have local disk drives.

3.9.1.1 This reduces cost, improves system reliability and decreases administrative burden on the security operator.

3.9.2 The video storage platform shall support booting several servers, or NVRs simultaneously without any downtime for the whole system.

3.10 Disk Groups

The video storage platform shall support disk groups of multiple sizes and numbers of disk drives, allocated to individual storage enclosures.

3.10.1 A disk group can be made to appear to a VMS or NVR as a single drive letter or volume (e.g. Drive E:), yet actually is composed of multiple disk drives in a single enclosure or multiple enclosures.

3.11.0 Video Surveillance-class

3.12.0 Shall utilize Single or dual active-active controllers

3.13.0 Shall support RAID 10, 5, 50, 6, 60

3.14.0 Shall support Disk Group concatenation

3.15.0 Shall support Redundant OS, cooling & power

3.16.0 Shall support Mirrored/persistent cache

3.17.0 Shall support WB, WT or Mirrored cache (per LUN)

3.18.0 Shall support 5 x 1GbE and optional 2x 10GbE ports

3.19.0 Shall support Multi-path IO (MPIO)

3.20.0 Shall support 1-2 24Gbps SAS 2.0 ports

3.21.0 Shall support Auto/global drive sparing

3.22.0 Shall support Online Software Upgrades

3.23.0 Shall support Powerful remote management software

3.24.0 Shall support Intelligent Power Management (IPM) and MAID (System and drive power management)

3.25.0 Shall support Drive Self-Healing

3.26.0 Shall support Bad sector reconstruction

3.27.0 Shall support Scheduled drive inspection

3.28.0 Shall support Web-based management utility, Telnet, Serial console management, SNMP management (Enterprise MIB), iSNS

4.0 **CONNECTIVITY**

The video storage platform shall provide support of 1GbE (1 Gigabit Ethernet IP Network) infrastructure, with 2 or more 1GbE connections.

5.0 **VIDEO RECORDING STANDARDS**

The purpose built video storage platform shall support seamlessly various common standards, as supported by attached servers, NVRs, and cameras.

5.1 These may include H.264, H.265,CIF, 2CIF, QCIF, 4CIF and 8CIF compression and standard graphics file formats including JPEG, MJPEG, MPEG-1,-2,-4 & BMP in multiple real time/time lapse formats.

5.2 CCTV still, motion, full motion, time lapse, pan/tilt/zoom day/night/infrared digital and analog camera feeds with multiple FPS and resolution rates shall also be supported.

6.0 **STORAGE STANDARDS & OPERATING SYSTEM SUPPORT**

The video storage platform shall provide standard IP connectivity.

6.1 The (IP) storage “target” is the recording/playback device, while the “client” is the NVR or server platform.

6.2 The video storage platform shall support standard Linux and Windows initiators commonly used by non-proprietary operating system based servers and NVR systems.

7.0 **PURPOSE BUILT VIDEO STORAGE PLATFORM CAPACITY**

7.1 The video storage platform shall be able to start with a small recording capacity, and grow modularly to meet the physical security environment’s changing needs.

7.2 The video storage platform base shall offer a minimum raw capacity of 2TB, 4TB, 8TB, 10TB and 12TB of RAID protected, hot-swap disk capacity in a 12 drive bay enclosure.

7.3 The video storage platform shall be modularly upgradable, and capable of being increased with an additional 12 drives in a single expansion module for an additional 120TB (with 12 10TB drives) of RAID protected, hot-swap disk raw capacity with SATA and or SAS disk technology.

7.4 The video storage platform shall support connection of up to 3 expansion modules for additional capacity.

7.5 The video storage platform base shall not need to be shut down, or recording and playback halted, to add additional capacity in the form of the modular upgrade.

7.6 The video storage platform base shall not need to be re-cabled and devices physically changed or reassigned to add additional capacity through the modular upgrade.

8.0 **VIDEO STORAGE SYSTEM AVAILABLITY**

8.1 The video storage platform shall be available in standard configurations for typical physical security environments.

8.2 Standard configurations shall include hot-swap disk drives for non-stop recording and playback operations.

8.3 The video storage platform shall offer advanced RAID protection to ensure a failed disk drive does not result in lost video or halted recording/playback operations.

8.3.1 The video recording system shall support at a minimum RAID level 5 and 6 in 12 drive expansion modules.

8.4 After any disk failure:

8.4.1 The video storage platform shall continue to operate without interfering with the video streams or any attached servers, VMS, or NVR systems.

8.4.2 Video channels or recording streams shall not typically be forced offline and frames are not dropped/lost during a RAID rebuild to recover lost video from a failed drive.

8.5 All video storage platform drives must deliver a Mean Time Between Failure (MBTF) average of at least 1,000,000 (1 million) operational hours.

8.6 The video storage platform shall use SATA-II, low energy/high capacity disk drives with, at a minimum per drive.

8.7 The video storage platform shall provide optional redundant controllers to offer maximum protection against equipment failure and video and data loss.

9.0 **SYSTEM ARCHITECTURE**

9.1 The video storage platform shall support physical footprints in standard 19” rack mounting.

9.2 Base systems shall be no more than 3U in form factor with 12 drives.

9.3 Expansion storage enclosures shall be no more than 3U in form factor with 12 disk drives.

9.4 Each base system shall support 2 inbound 1GbE connections.

9.5.Performance, Modularity & Serviceability

9.6 Shall support SMART diagnostics

9.7 Shall support Complete Modular Design

9.8 Shall support all major components Redundant & Serviceable

10.0 **ENVIRONMENTAL REQUIREMENTS & CERTIFICATIONS**

10.1 The video storage platform shall operate within standard environmental conditions common for physical security systems, including security operations centers, command centers, wiring closets, and similar environments.

10.2 Operating temperature range shall be 10 to 35°C (50 to 104°F).

10.3 Operating humidity range shall be 8% to 90% non-condensing.

10.4 Standard equipment certifications shall be applicable to the video storage platform, including RoHS compliant 5/6, UL (USA), CUL (Canada), TUV (Germany) EN 6095/IEC 60950 Compliant, CB Report, CCC Certification.

11.0 **ANOMOLY BASED ANALYTICS CAPABILITIES**

11.1 **Shall** be (Rasilient Vision) or approved equal.

Rasilient Vision is an AI-assisted video surveillance solution designed to automatically identify anomalous actions in real-time. It **shall** be a non-rules based technology uses machine learning and artificial intelligence to help supplement and empower security operators. Rasilient Vision shall learn and filter out routine motion, showing only anomalous or unusual behavior. It **shall** eliminate cognitive overload, letting operators respond in real-time to precursor activities and real-time incidents, or allowing highly efficient review of archived footage. Rasilinet Vision **shall** leverage existing surveillance infrastructure, people and assets to achieve  meaningful results.

* 11.3 **Shall** **Identify precursor events**, allowing for timely intervention before situations escalate.
* 11.4 **Shall Scale** to suit size of video surveillance operation
* 11.5 **Shall** **Detect abnormal precursor events** and a wide range if incidents in real-time
* 11.6 **Shall be Able to** **work with a wide range of ip cameras** and purpose built servers servers
* 11.7 **Shall** **Learn and adapt automatically** using patented technology – no rules to setup or maintain
* 11.8 **Shall Include LiveWall™** – shows only events that need further investigation (1% of total video), reducing operator fatigue and missed events
* 11.9 **Shall be** **Rapidly capable to review historical video** – 24 hours in 30 minutes
* 11.10 **Shall utilize a Reporting system that allows tagging of anomalies and easy extraction of reports**
* 11.11 **Shall Support a wide range of fixed view ip cameras**
* 11.12 **Shall have** **Easy integration** with existing video management systems such as Vivotek VAST 2.

12.0 **WARRANTY AND SUPPORT**

12.1 All video storage platforms and components shall be supported through a comprehensive three year manufacturer’s hardware warranty, and with one year of included software updates, including major, minor and maintenance releases. Shall also include options for 5 year warranty.

12.2 Coverage shall include telephone, web and email access to technical support, with web reporting and online incident tracking.

12.3 Coverage shall include next business day spares replacement.

12.4 Available upgrades shall included extended coverage, same day advanced spare replacement, and onsite assistance options.