**Rasilient NFD Series of Products**

**ARCHITECTURE & ENGINEERING SPECIFICATION**



**Introduction**

This document provides the specifications of the Rasilient Video Surveillance NFD series of products. This series offers video surveillance optimized server and storage combo solutions to achieve the most scalable, efficient, and reliable architecture.

This series is designed for mission-critical environments. Its products ensure all video is captured over the entire recording period for the highest protection. With qualified VMS, Rasilient’s NFD technology can verify whether a single frame is lost.

NFD Series of Products include:

* NFD-125. Combination of AS70 and PS5000 for 125 HD cameras and 720Mbps.
* NFD-250. Combination of AS70(2) and PS5000 for 250 HD cameras and 1.1Gbps.
* NFD-375. Combination of AS70(3) and PS5000 for 375 HD cameras and 1.2Gbps.
* NFD-500. Combination of AS80(quad-blade) and PS5000 for 500 HD cameras and 1.6Gbps.
* NFD-1000. Combination of AS85(quad-blade) and PS5000 for 1,000 HD cameras and 2.1Gbps

**Architecture**

A product from this series is combined with a qualified VMS to form Solution, which shall:

* Ensure no frame drop received from the network with the specified data rate (up to 2Gbps).
* Verify there is no frame dropped over the 24 hours site conditions.
* Provide the management widget to confirm no frame drop with the specified data rate.

**Optimized Server & Storage for Video Surveillance**

In addition, Solution shall:

* Support scaling of server and storage independently to optimize the cost/performance ratio for video surveillance.
* Add servers based on video management software (VMS) processing and graphics requirements.
* Independently add storage capacity for write-intensive, large block, multi-camera recording.
* Be optimized based on specific VMS.
* Reduce complexity for smaller installations. Specifically, provide a simple server-to-storage direct connect configuration without a switch (via single Gigabit Ethernet).
* Be able to expand easily with the expansion chassis (JBOD).
* Be able to scale to 128 servers and 108 drives. In addition, each storage shall be able to connect to 128 servers through Ethernet switch(es).
* Support “full redundant” option.
* All VMS/servers shall have access to storage to allow VMS/server fail-over.

Regardless of the number of servers and the number of Gigabit Ethernet ports, each storage system shall be accessible via single IP address for full redundancy. The storage system shall:

* Pinpoint the potential dropping of video frames with “busy” information.
* Provide features to achieve the vision of “zero failure” by providing:
* Intelligent drive “self healing” technologies such as drive power cycle and sector remapping to reduce the frequency of drive replacement.
* Advanced and proactive remote alerts and diagnostics.

**Basic Server Configuration**

The Server shall scale from one to four physical servers, or equivalent quad-blade server. Each blade shall:

* Be hot-swappable.
* Be running independently without interfering with other blades.
* Have single or dual CPU option.

The Server shall have pre-loaded OS, VMS, and pre-configured local storage and external storage. In addition, it shall support:

* RAID-1 SSD OS drives.
* Multiple Gigabit Ethernet ports to optimize camera traffic, viewing, and external storage traffic.
* ECC protected memory.
* Hot-swappable drives.
* Dual power supply option.

**Server Operating System**

The Server shall support standard Windows. These shall include:

* Microsoft Windows 2008 64bit.
* Microsoft Windows 2012 64bit.
* Microsoft Windows 7 Pro 64bit.

**Server Management**

The Server shall provide a widget to detect and measure the number of data frames dropped in Solution after receiving at the network interface. The result shall be displaced visually. For extended information, the Server shall use native OS and VMS management information.

**Basic Storage Configuration**

The storage system shall support:

* iSCSI standard.
* RAID1, RAID5 and RAID6 for data protection.
* Both pro-active and re-active online drive replacement.

With pro-active drive replacement, the storage system shall not lose entire RAID due to additional drive failure during the replacement process, regardless of the capacity of the drive. With re-active drive replacement, Storage system shall have the ability to prioritize RAID rebuilding versus data access to ensure the performance.

In addition, the storage system shall support:

* Data protection in the cache upon power failure for 72 hours.
* Energy efficiency and be able to spin down the drives with previously recorded data. The drives shall be spin up upon traffic. All spin-down drives shall be highlighted in Storage GUI.
* Intelligent power management such as automatic fan speed control.
* Drive “self healing” technologies such as intelligent drive power cycle, and disk sectors remapping to reduce maintenance cost.
* Industry standard 19” rack.
* Minimum 6 drives per 1U density.
* Minimum 14 drives per 1U density for high-density environment.

**Storage Availability**

The storage system shall support:

* Full-redundant options (dual controllers, multiple GE ports, dual power supplies/fans).
* Hot swappable drives without data access interruption.
* Hot swappable power supply/fan without data access interruption.
* Hot swappable controller without data access interruption.
* Hot add/remove expansion chassis (JBOD) without data access interruption.
* Certified VMS/server fail-over.
* Redundant GE ports fail-over and automatic GE load balancing.
* Background data integrity check.

**Storage Scalability**

The storage system shall support:

* Single volume up to 256TB.
* Up to 864TB and up to eight expansion chassis (JBOD).

Storage capacity added shall be configurable into new volumes or added to existing volumes without the need to interrupt data access.

The storage system I/O performance shall be scalable and support:

* Advanced technologies to scale the number of concurrent video recording, and to reduce file system fragmentation.
* Scaling of performance with addition of each expansion chassis.
* Up to 2 Active/Active controllers.
* Up to 108 parallel drive access per Storage system.
* A minimum throughput of 5 Gigabits per second per controller.
* Bandwidth addition and I/O processing to be configured scaling to 50 Gigabits per second throughput.

**Storage Management**

The storage system shall provide a graphic user interface (GUI) for ease of use. It shall

* Support web-based browsers and a configuration wizard.
* Display active sessions and their real-time performance.
* Display active sessions and their performance in the past 24 hours.
* Be able to set performance thresholds and send out alarms for the events happened in past 24 hours.

The storage system shall support:

* Dynamic provisioning of volumes.
* RAID and dynamic increase of volume size without interruption of data access.
* Advanced maintenance and manageability features.
* System event logging.
* Detection and display of all physical failures graphically for drive/power supply/controller/cable/fan/temp/voltage/battery.
* Display of real-time system information like CPU/cache/I/O completion latency/I/O address.
* Warning of potential video frame drops with “busy” information.
* Background failure checking of disk drives.
* Automatic alerts, which include
* Alerts on GUI.
* Four email addresses to send system alerts.
* Alerts on failures of drives, fans, power supplies, controller, temperature, voltage, Ethernet ports, SAS ports.
* CMS (central management system) for multiple Storage systems management.
* Multi-level administrator/user security login.
* Command Line Interface.
* SNMP management support.





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