PROMISE® TECHNOLOGY, INC.

Vess A2000 Series

NVR Storage Appliance

Video Insight Surveillance Solution

Version 1.0

Contents

INTRODUCTION

Overview

This document provides an overview of the Promise Vess A2000 Series NVR Storage Appliance. It includes a test case that simulate a large scale network based surveillance solution. The test case utilizes **Video Insight** VMS to determine performance results.

This document also includes key performance indicators and test results for reference and comparison.

Purpose

Purpose of this document is to demonstrate the capabilities of Vess A2000 Series platform, in optimally utilizing the resources for NVR usage.

This note gives the detailed understanding of overall Vess A2000 Series platform and Video Insight VMS based surveillance solution.

The monitor data indicates the improved performance results using same/similar hardware components.

Scope

Scope of this document is to create and test an IP camera based surveillance solution using the Promise Vess A2000 Series NVR Storage Appliance with the Promise RAID platform running a Video Insight VMS software solution.

This note limits itself within the resource intense test configurations intended to simulate a real use large scale surveillance application environment. It does not test and verify every given matrix of video and hardware variables.

Audience

Audience of this document includes design and deployment Engineers, as well as persons involved in sale and marketing of Vess A2000 Series based Video Insight solutions.

Components

Key components involved in technical note are:

- Promise Vess A2200 NVR Storage Appliance and Vess A2600 NVR Storage Appliance, hardware and Promise RAID platform.
- Video Insight video surveillance software.

Promise Vess A2000 Series System

The Vess A2000 NVR storage appliance is specially engineered for medium to large scale IP video surveillance deployment. The subsystems provide continuous recording and playback operation for networked installations of 32 to 100 High-Definition IP cameras.

The Vess A2000 Series includes the robust and market tested Promise RAID engine, Intel based server platform, industrial grade housing, smart sensors thermal and electrical enclosure protection, N+1 power redundancy, a choice of Linux or Windows operating systems, and intuitive web-based graphical user interface and command line utility for simplified system administration.

Promise Technology Inc is a longtime market leader of RAID based storage solution.

Hardware Components

This document presents two systems for testing:

• Vess A2600 NVR Storage Appliance 3U 16-Bay system that includes:

• Intel Xeon E3-1245V2 (CPU Benchmark: 8942)

• 8GB DDR3 RAM.

• Four gigabit network ports

Vess A2200 NVR Storage Appliance2U 6-Bay system that includes:

• Intel i3-3225 (CPU benchmark: 4360)

• 4GB DDR3 RAM.

• Four gigabit network ports

Operating System

• 64bit Windows Embedded Standard 7 + Service Pack 1

RAID Engine

This test utilizes all drives in single Logical Drive in a RAID 5 arrangement.

Video Insight VMS

Video Insight is a leading IP video surveillance management software used by over 25,000 customers in the financial, government, retail, and transportation sectors with a very strong presence in the education market consisting of 4,500 K-12 school/college customers. Video Insight is the easiest to use and most cost-effective enterprise VMS with support for over 2,500 camera models and integration with the top access control solutions in the market.

Test Environment

Machine Under Test (MUT) System configuration

	Vess A2600	*Vess A2200*
VMS	Video Insight	Video Insight
OS	Windows Embedded Standard 7 SP1 64bit	Windows Embedded Standard 7 SP1 64bit
CPU	Xeon E3-1245V2 CPU Benchmark: 8942	i3-3225 CPU benchmark: 4360
RAM	8GB DDR3	4GB DDR3
HDD	16SATA HDD	6SATA HDD
RAID CFG	R5 + Spare	R5
Install PKG	1.02.0000.00	1.02.0000.00
DOM	32GB	16GB

Topology

Test Topology Includes the Vess A2000 and a Virtual Video Stream feed server. All software components are installed on the Vess A2000.
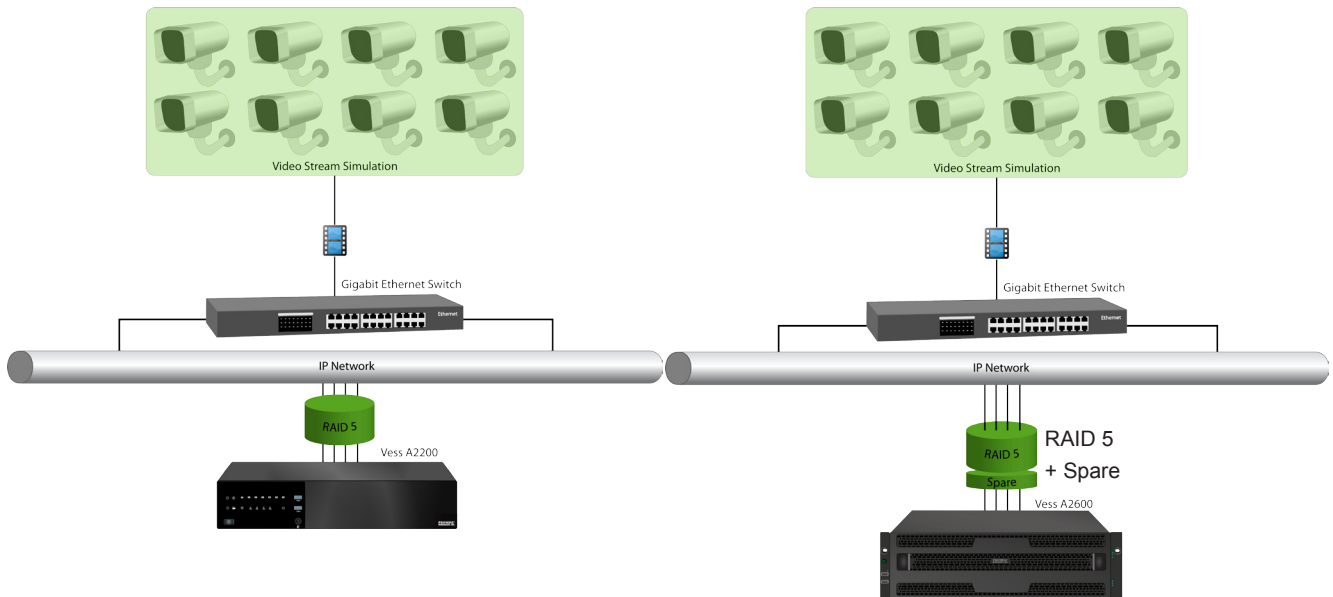
Test Matrix and Criteria

To evaluate different aspects of the solution, the test is divided into multiple parts:

Test	*Test Purpose*
Pure Recording	Platform Performance Test
Local liveview	System performance test while local live view.
Local playback	System performance test while local playback.
Remote liveview	System performance test while remote live view.
Remote playback	System performance test while remote playback.

The focus of the platform stress test is to test the system using real world user settings.

The throughput test demonstrates the capability of the Vess A2000 system in handling large volume data streams.

Conditions to obtain the results includes:

Resource	Criteria
CPU Utilization	Less than 70%
Data loss	Less than 5% Recording Data loss = (Expected throughput data) - (Disk Write data) $\div$ Expected throughput data
Disk Write latency	The average of the disk write latency is less than 200ms, and the maximum of the disk write latency is less than 1000ms.
Recording status	Recording is under over-write status.
Test duration	1 hour

Vess A2000 Platform Performance

Recording Performance Test

Overview

This test simulates real world user settings. It is intended to check the stability and performance of the Vess A2600 and Vess A2200 systems.

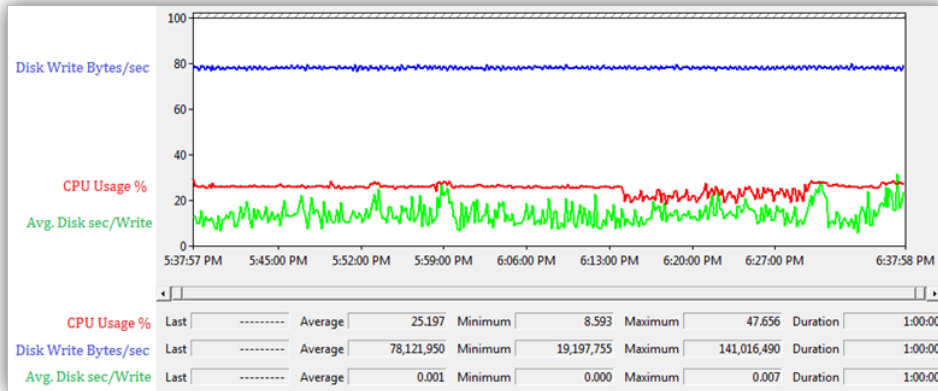Video stream configurations used in this test are:

- Codec: H.264
- Res: 640 x 480
- Bitrate: 5.4 Mbit/sec

Observation and Highlights
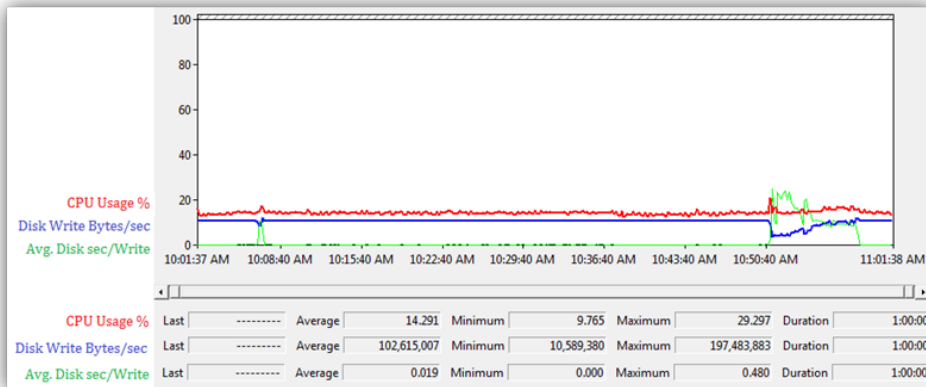
It is observed that PROMISE VessA2200 and VessA2600 system perform stable within the criteria defined.

Model	Cameras	Throughput (MB/s)	CPU Usage
Vess A2200	110	74.50	25%
Vess A2600	150	97.85	14%

Vess A2200 system performance monitor

Vess A2600 system performance monitor

HD Camera test

Video stream configurations used in this test are:

- Codec: H.264

- Res: 1280x720

- Bitrate: 17.56 Mbit/sec

Model	Cameras	Throughput (MB/s)
Vess A2200	30	65.76
Vess A2600	66	138.03

Simultaneous Recording and Live View Playback

Overview

This test evaluated the system performance and stability while recording (data in) and streaming (data out) simultaneously.

Live View and Play Back are done on same Vess A2000 system that records the video.

Video stream configurations used in this test are:

- Codec: H.264

- Res: 1280 x 720

- Bitrate: 17.56 Mbit/sec

- Stream-Out Channels: Max 36

Observation and Highlights

- There is no drop of performance in Local display of the videos.

- It was observed the playing back previously recorded videos consume more CPU usage, thus reducing overall system performance.

		Recording and Local Live View		Recording Only	
	Channels Viewed	Cameras	Throughput (MB/s)	Cameras	Throughput (MB/s)
Vess A2200	29	29	63.56	30	65.76
Vess A2600	36	66	139.08	66	138.03

		Recording and Local Playback		Recording Only	
	Channels Viewed	Cameras	Throughput (MB/s)	Cameras	Throughput (MB/s)
Vess A2200	8	8	17.54	30	65.76
Vess A2600	36	40	85.29	66	138.03

Recording and Remote Live View Playback

Overview

This test evaluated the system performance and stability while recording (data in) and streaming (data out) simultaneously.

Live View and Play Back streams are sent to remote display server.

Video stream configurations used in this test are:

- Codec: H.264

- Res: 1280x720

- Bitrates: 17.56 Mbit/sec

- Stream-Out Channels: Max 36

Observation and Highlights

Virtually no drop in performance was observed, either during remote Live View or remote playback.

		Recording and Remote Live View		*Recording Only*	
	Channels Viewed	**Cameras**	**Throughput (MB/s)**	**Cameras**	**Throughput (MB/s)**
Vess A2200	30	30	65.54	30	65.76
Vess A2600	36	66	138.04	66	138.03

		Recording and Remote Playback		*Recording Only*	
	Channels Viewed	**Cameras**	**Throughput (MB/s)**	**Cameras**	**Throughput (MB/s)**
Vess A2200	26	26	56.93	30	65.76
Vess A2600	36	66	138.71	66	138.03

Conclusion and Observation

Major requirement of Surveillance Recording Servers are:

Stability: Stability of Surveillance Recording Server is very important for critical safety and security related applications. A Surveillance Recording Server System should maintain stable operation for long periods of time.

RAID Storage Throughput: Storage data throughput is typically the first performance bottleneck encountered in Surveillance Servers. A surveillance setup generates a complex data patterns affected by three factors, number of cameras, camera frame rate (fps) and data size (resolution). With advancements in recording technology, HD format surveillance cameras are available and affordable for large scale deployments. A storage server must match the data size and complexity of HD cameras setup.

Test results show that Promise Vess A2000 Series NVR Storage Appliance operated with a high degree of stability throughout the test period.

The Vess A2000 Series also achieved high storage throughput with a reasonable level of resource usage.

Reference