Milestone Solution Partner IT Infrastructure Components Certification Report

Razberi Technologies

March 2014

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About **Razberi Technologies:**

[Razberi Technologies](#) is developer and manufacturer of network video solutions for professional video surveillance and security applications. The company is an innovator in providing ground-breaking solutions designed for simplicity and ease-of-use. Razberi Technologies offers a full range of plug-and-play network recorders, IP cameras and installation tools. The company's flagship product is the patent-pending Razberi ServerSwitch that combines the functions of a network video recorder and Ethernet Smart Switch into a single compact appliance.

About Milestone Systems:

Milestone Systems is the world's leading provider of open platform IP video surveillance software. Milestone has provided easy-to-use, powerful video management software in more than 100,000 installations worldwide.

Milestone XProtect® products are designed with open architecture and are compatible with more IP cameras, encoders and digital video recorders than any other manufacturer. Because Milestone provides an open platform, you can integrate today's best business solutions and expand what's possible with future innovations. Visit www.milestonesys.com for more.

Executive Summary:

Abstract

This report highlights the certification results performed on RAZ-MPRO ServerSwitch appliance, while acting as a video recording server within an Milestone XProtect®environment. The ServerSwitch is a hybrid appliance that performs multiple functions based on PoE, Smart / Managed switch technologies. Designed and engineered for network video, the Razberi ServerSwitch works as a PoE switch, server, storage and HD work station. When combined with Milestone's award winning XProtect® video management software, the RAZ-MPRO provides a powerful yet simple alternative to traditional network video solutions.

In this report we will highlight some simple configurations for distributed and stand alone systems, in addition to providing performance guidelines based on models of the RAZ-MPRO series. Also, this document outlines the approach used to determine the performance parameters of the Milestone XProtect Corporate Software v6.0A (2013) while running on Razberi Server/Switch hardware.

Certified Products

The Razberi ServerSwitch appliances are offered in different models, which are based on number of ports, processor type , storage and software suite (Arcus / Pro).

| RAZ | - | MPRO8 | - | i3 | - | 2T |
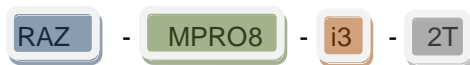
Razberi ServerSwitch

Model & Port Configuration

Processor Type

Internal Storage Capacity

An online tool is available to help determine which appliance is best suited for your application. Specific certified products included in this test are as follows

- RAZ-MPRO4

- RAZ-MPRO8-i3-xT

- RAZ-MPRO16-i3-xT

- RAZ-MPRO24-i7-xT

- Milestone XProtect Corporate 2013 R2.

Performance of the solution may vary if different XProtect products and/or other system components not listed in the test details are included.

Key Findings

The results from each test case were determined the overall megapixel "capacity for each Razberi ServerSwitch device, while it is hosting an XProtect Recording Server. The capacity is defined as a measure of megapixel-frames per-second (MP/FPS).

Based on multiple trips the overall capacity of each device is the following:

Razberi Platform	Recording Capacity (MP/FPS)	MJPEG Video Rendering Capacity (MP/FPS)
MPRO4	480	0
MPRO8-i3	960	120
MPRO16-i3	960	120
MPRO24-i7	1,440	960

The Razberi MPRO series of ServerSwitch appliances are certified for use with Milestone XProtect VMS products.

Topology

The system topology included four different Razberi ServerSwitch products, each hosting an XProtect Recording Server as part of one XProtect Corporate surveillance system. The network and all of the NICs on the servers and the storage systems supported 1 Gigabit Ethernet. The XProtect Management Server, XProtect Management Client, XProtect Smart Client application, and all of the Virtual Camera Simulator Servers used in the test were hosted on separate physical machines in the network. The test topology is shown below:
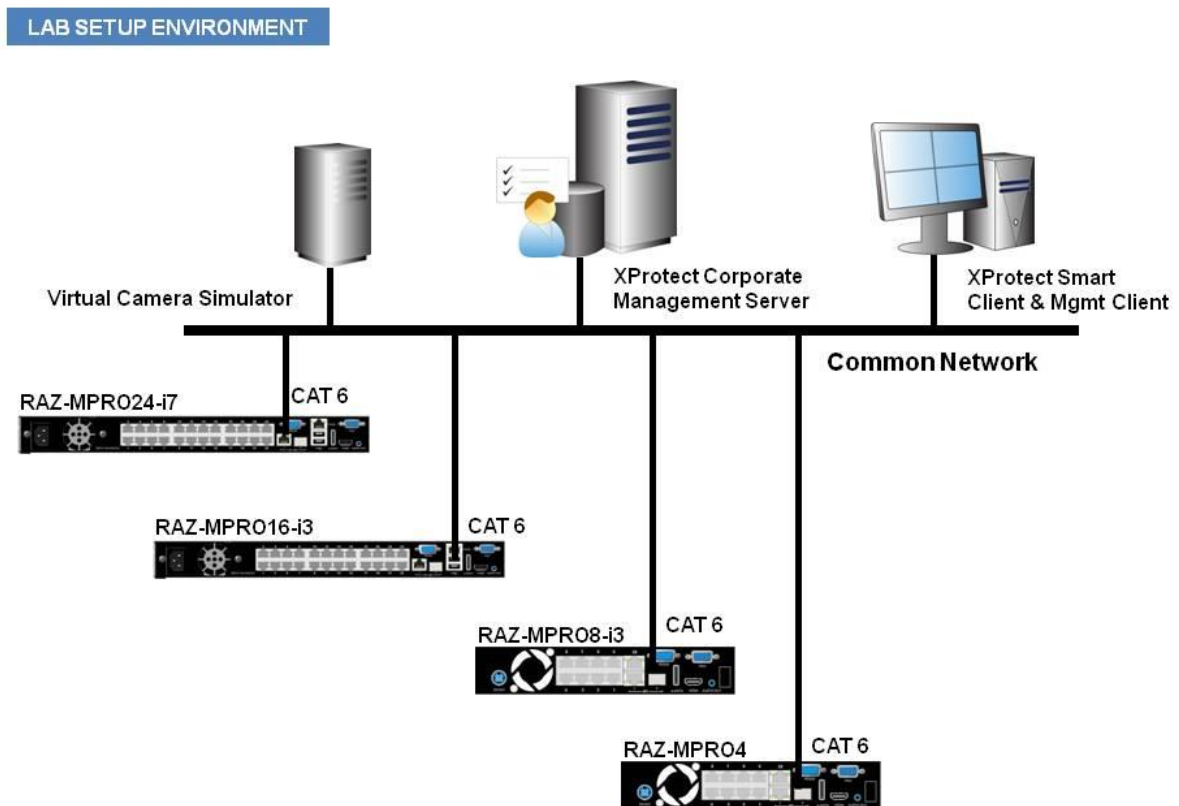
Test Process

The objective of the test cases is to confirm that each of the selected Razberi hardware platforms can support a full load of cameras / video streams at a specified frame rate and resolution.

A fully loaded system is defined as one that has a camera streaming to each Razberi PoE port. For example the MPRO8 is fully loaded with 8 cameras, the MPRO16 is fully loaded with 16 cameras and the MPRO24 is fully loaded with 24 cameras.

In addition to streaming on all PoE ports, each test case will be configured to support the following simultaneous camera streams:

- All cameras recording at H.264 on motion detection

- All cameras in a Live (MJPEG) and Recorded Playback (H.264) viewed from the XProtect client hosted by the Razberi Hardware
- All cameras in a Live (MJPEG) and Recorded Playback (H.264) viewed from the XProtect client hosted by independent client station

The following camera resolutions will be tested:

Milestone Camera Resolution	Maximum Frame Rate	Bit Rate
2.0	30 Frames per second	5 Mbps
3.0	20 Frames per second	4.3 Mbps
5.0	12 Frames per second	4.4 Mbps

Performance measures and observations will be captured over a sustained period of at least 15 minutes for each test case.

Razberi ServerSwitch Platforms

A set of test cases will be applied to each of these platforms:
- MPRO4: 4 PoE port ServerSwitch with Atom processor
- MPRO8-i3: 8 PoE port ServerSwitch with Core i3 processor
- MPRO16-i3: 16 PoE port ServerSwitch with Core i3 processor
- MPRO24-i7: 24 PoE port ServerSwitch with Core i7 processor

Supplied By Milestone
- 24 x 5 MP Cameras / Video Streams (Virtual Camera Simulator)
- 24 x 3 MP Cameras / Video Streams (Virtual Camera Simulator)
- 24 x 2 MP Cameras / Video Streams (Virtual Camera Simulator)
- XProtect Software and licenses for 4 Servers

Supplied by Razberi
- MPRO4
- MPRO8-i3
- MPRO16-i3
- MPRO24-i7
- Remote Client PC / Laptop

Performance Measurements
The following performance measurements will be captured for each test case using Microsoft Performance Monitor:
- CPU Utilization
- Memory Utilization

The average measurement will be recorded for a period of at least 15 minutes for each test case.

Performance Observations
The following observations will be taken for test cases involving video rendering:
- Presence of Compression Artifacts (Live View)
- Presence of Compression Artifacts (Recorded View)

Performance Results

MPRO4 (Atom D525) Test Scenarios:

Recording Parameters				
Test Case	Resolution (megapixels)	Camera Count	Frame Rate	Megapixel FPS
1	2.0	16	30	480
2	3.0	12	20	240
3	5.0	12	5	60

Display Parameters					
Local Client Video Out (MJPEG)		Remote Client (H.264)		Mobile Client (H.264)	
Live	Playback	Live	Playback	Live	Playback
N/A		16	16	N/A	
		12	12		
		12	12		

Results:

Host OS Performance			Video Artifacts					
Test Case	CPU %	Memory Consumption %	Video Out		Remote Client		Mobile Client	
			Live	Playback	Live	Playback	Live	Playback
1	50	55	N/A		None	None	N/A	
2	50	55			None	None		
3	50	55			None	None		

MPRO8-i3 (Core i3-3220) Test Scenarios:

Recording Parameters				
Test Case	Resolution (megapixels)	Camera Count	Frame Rate	Megapixel FPS
1	2.0	32	30	960
2	3.0	32	20	640
3	5.0	24	12	288

Display Parameters								
Local Client Video Out (MJPEG)			Remote Client (H.264)		Mobile Client (H.264)		
Live	Playback	IPS	Live	Playback	Live	Playback	IPS
16	16	7.5	32	32	8	8	7.5
8	8	7.5	32	32	4	4	7.5
4	4	12	24	24	2	2	12

Results:

Recording Parameters								
Test Case	CPU %	Memory Consumption %	Video Out		Remote Client		Mobile Client	
			Live	Playback	Live	Playback	Live	Playback
1	50	55	None	None	None	None	None	None
2	50	55	None	None	None	None	None	None
3	50	55	None	None	None	None	None	None

MPRO16-i3 (Core i3-3220) Test Scenarios:

Recording Parameters				
Test Case	Resolution (megapixels)	Camera Count	Frame Rate	Megapixel FPS
1	2.0	32	30	960
2	3.0	32	20	640
3	5.0	24	12	288

Display Parameters								
Local Client Video Out (MJPEG)			Remote Client (H.264)		Mobile Client (H.264)			
Live	Playback	IPS	Live	Playback	Live	Playback	IPS
16	16	7.5	32	32	8	8	7.5
8	8	7.5	32	32	4	4	7.5
4	4	12	24	24	2	2	12

Results:

Recording Parameters									
Test Case	CPU %	Memory Consumption %	Video Out		Remote Client		Mobile Client		
			Live	Playback	Live	Playback	Live	Playback	
1	50	55	None	None	None	None	None	None	
2	50	55	None	None	None	None	None	None	
3	50	55	None	None	None	None	None	None	

MPRO24-i7 (Core i7-3770) Test Scenarios:

Recording Parameters				
Test Case	Resolution (megapixels)	Camera Count	Frame Rate	Megapixel FPS
1	2.0	48	30	1,440
2	3.0	48	20	960
3	5.0	48	12	576

Display Parameters								
Local Client Video Out (MJPEG)			Remote Client (H.264)		Mobile Client (H.264)			
Live	Playback	IPS	Live	Playback	Live	Playback	IPS
32	32	30	48	48	16	16	7.5
16	61	20	48	48	10	10	7.5
8	8	12	48	48	3	3	12

Results:

Recording Parameters									
Test Case	CPU %	Memory Consumption %	Video Out		Remote Client		Mobile Client		
			Live	Playback	Live	Playback	Live	Playback	
1	50	55	None	None	None	None	None	None	
2	50	55	None	None	None	None	None	None	
3	50	55	None	None	None	None	None	None	

Conclusion:

The results from each test case were used in a regression analysis which determines the overall megapixel "capacity for each Razberi ServerSwitch device, while it is hosting an XProtect Recording Server. The capacity is defined as a measure of megapixel-frames per-second (MP/FPS).

Based on multiple trips the overall capacity of each device is the following:

Razberi Platform	Recording Capacity (MP/FPS)	MJPEG Video Rendering Capacity (MP/FPS)
MPRO4	480	0
MPRO8-i3	960	120
MPRO16-i3	960	120
MPRO24-i7	1,440	960

A recording capacity of 1,440 megapixel frames/second indicates the hardware's ability to record a total of 1,440 frames per second while simultaneously supporting 1 on-board client, 1 remote client, and 1 mobile client as described in the test scenarios. A video rendering capacity of 960 megapixel frames/second indicates the onboard client can render and display a total of 960 frames per second from the HDMI video out port, while simultaneously supporting recording, 1 remote client and 1 mobile client as described above.

The total capacity can be achieved in various combinations as displayed through the use of three different test cases used across all four of the different Razberi ServerSwitch products included in this test. The Razberi MPRO series of ServerSwitch appliances are certified for use with Milestone XProtect VMS products.