



Viana™ by meldCX Performance and Validation on Intel® Architecture Processors

Report

January 2024



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Revision History

Date	Revision	Description
January 2024	1.0	Initial release.

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1.0 Overview

This document provides an overview and the initial performance results for validation of Viana™ by MeldCX running on Intel® Architecture Processors.

Video Analytics can be performed either on CPU, on the integrated GPU, or with a dedicated GPU. The testing employed an RTSP server app that simulated the RTSP feed from the camera. The focus of this report will be to identify the boundary per server and the number of cameras it will be able to support.

1.1 Objective

The objective of the validation process is to:

- i. Validate and size the system configuration for concurrent multi-stream video analytics.
- ii. Confirm CPU/RAM usage at maximum video analytics channel density.
- iii. For Video analytics, channels are added till total output frames continue to be above 90% of input frames**.
- iv. Confirm that overall software/hardware solution is steady and operates without fail(s) for at least 24 hours.
- v. Measure and log key system running parameters:
 - Overall system CPU and memory load
 - Video analytic inference, performance in frames per second.

1.2 Intel® Distribution of OpenVINO™ toolkit

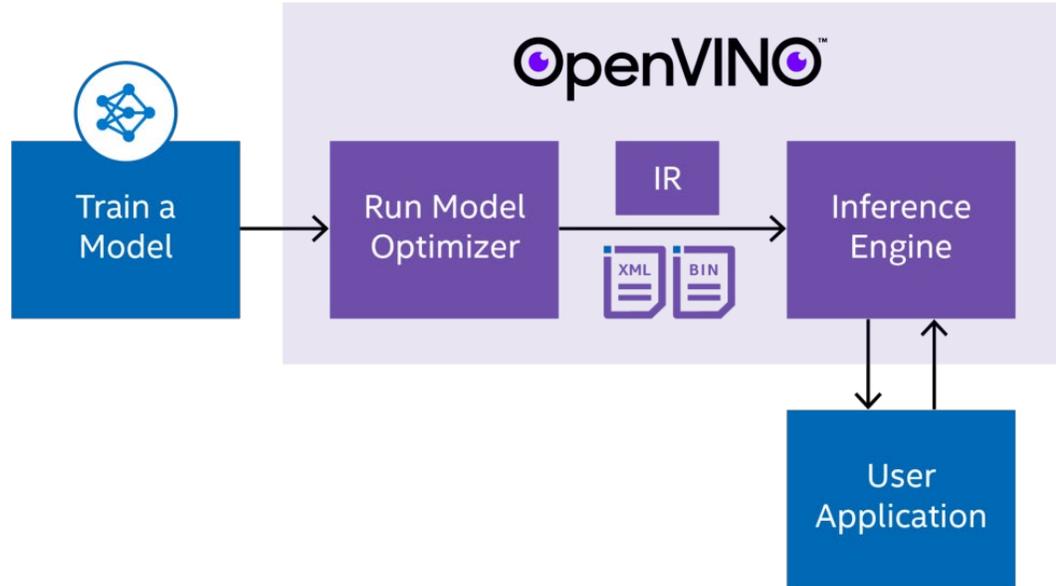
The Intel® Distribution of OpenVINO™ toolkit helps developers run inference on a range of compute devices. This toolkit is designed to accelerate the development of machine learning solutions. Based on convolutional neural networks (CNNs), the Intel® Distribution of OpenVINO™ toolkit shares workloads across Intel® hardware (including accelerators) to maximize performance.

The Intel® Distribution of OpenVINO™ toolkit includes:

- A model optimizer to convert models from popular frameworks such as Caffe*, TensorFlow*, Open Neural Network Exchange (ONNX*), and Kaldi.
- An inference engine that supports heterogeneous execution across computer vision accelerators from Intel, including CPUs, GPUs, FPGAs, and the Intel® Neural Compute Stick 2 (Intel® NCS2).

- Common API for heterogeneous Intel® hardware.

Basic workflow:



1.3 Viana™ by meldCX Vision Analytics Solution

Viana™ by meldCX is a vision analytics solution that combines IoT hardware and machine learning at the edge, with vision AI at its core. This platform enables organizations to harness the power of machine vision and artificial intelligence data without the need for developers.

With Viana™, the collection of anonymous audience data is facilitated through high-performance face mapping without keeping identifiable information - respecting audience privacy.

Through Viana™, users are able to anonymously measure how people work, shop, learn and play in physical and digital spaces; telling meaningful data stories about their customers, and empowering teams to make insightful and data-driven business decisions.

Viana™ has a variety of built-in applications, including:

- Anonymous Audience Measurement - Capture anonymous information such as age, gender, mood, and amount of time spent inside a space.
- Zone Engagement - Measure human activity in specific zones within your spaces to know how people move and engage, and capture engagement (dwell times) to better understand behaviors of different audience personas.

- People Counting - Track how people move within a defined space, measuring data such as entries and exits and visit duration, as well as audience demographics.

Figure 1. Viana™ Solution Architecture

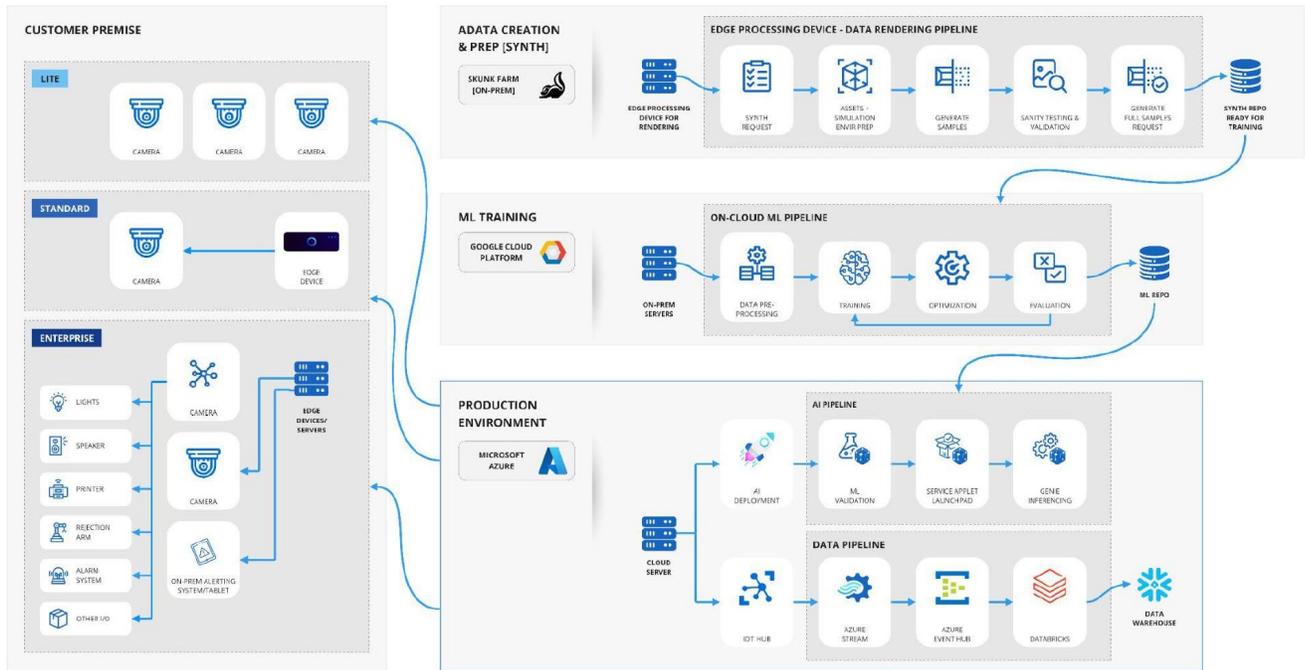
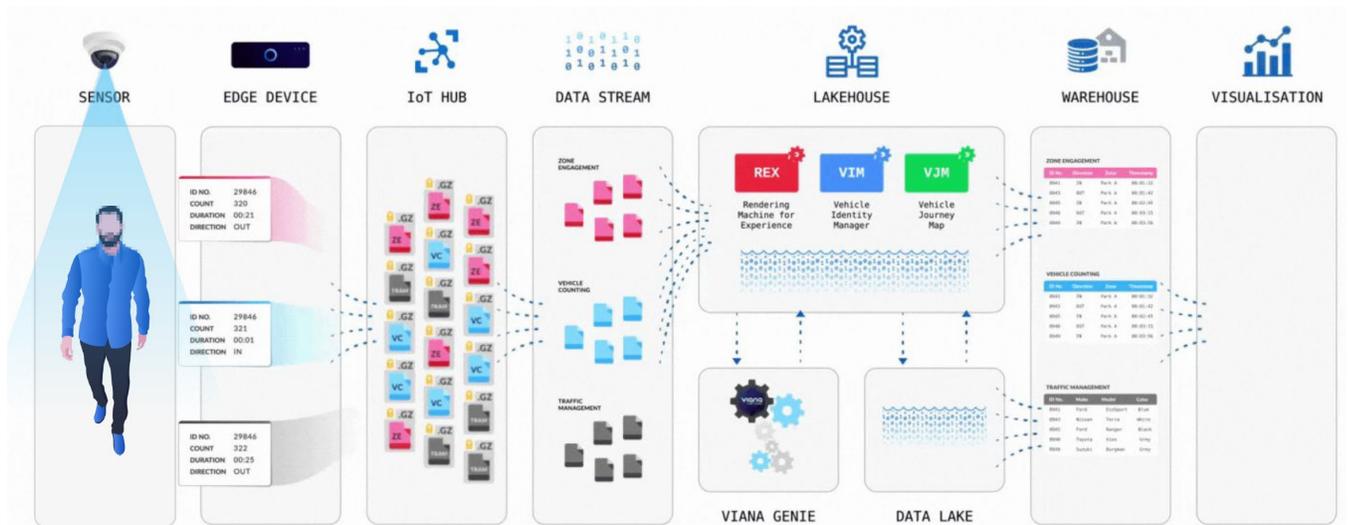


Figure 2. Viana™ Data Infrastructure



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2.0 System Configuration

Table 1. System Configuration

Hardware				
Server	Model	Processor	Base Frequency	Number of Cameras (per testing)
MS11 Zone Engagement	Intel® NUC 11 Extreme Kit	Intel® Core™ i9-11900KB Processor	3.30GHz	Up to 9 cameras (RTSP streams)
MS5 People Counting	Dell PowerEdge R650	Intel® Xeon® Gold 6338N Processor	2.20GHz	Up to 60 cameras (RTSP streams)
MS2 Anonymous Audience Measurement	Dell PowerEdge R650 with Intel® Data Center GPU Flex 140	Intel® Xeon® Gold 6338N Processor Intel® Data Center GPU Flex 140	2.20GHz	Up to 59 cameras (RTSP streams)
Software				
Operating System	Ubuntu 22.04 LTS			
RTSP Server	Used to simulate the total number of cameras that can be loaded into the Viana Software.			
Viana Edge App	The app that does the local inference of the RTSP cameras (using RTSP server as dummy cameras).			

Table 2. Detailed Hardware Specifications

Intel® NUC 11 Extreme Kit (Beast Canyon)	
Processor	Intel® Core™ i9-11900KB Processor (24M Cache, up to 4.90 GHz)
GPU	1x Intel® Arc™ A770
Memory	32GB SODIMM DDR4 3200
Storage	512GB SSD Storage or higher

Dell PowerEdge R650	
Processor	2x Intel® Xeon® Gold 6338N Processor (2.2GHz, 32 Core Processor, 32C/64T, 11.2GT/s, 48M Cache, Turbo, HT (185W) DDR4-2666)
GPU	none
Memory	16x 16GB RDIMM
Storage	10x 1.92TB SSD

Dell PowerEdge R650 with Intel® Data Center GPU Flex 140	
Processor	2x Intel® Xeon® Gold 6338N Processor (2.2GHz, 32 Core Processor, 32C/64T, 11.2GT/s, 48M Cache, Turbo, HT (185W) DDR4-2666)
GPU	2x Intel® Data Center GPU Flex 140
Memory	16x 16GB RDIMM
Storage	10x 1.92TB SSD

2.1 Video Stream Configuration

Component	Settings	Comments
Video Analytic Input Video Stream Parameters	1920x1080@25fps (1080p) 1280x720@25fps (720p) 640x480@25fps (480p)	FHD, HD, and SD video streams
Number of Input Video Streams for Analytics (Virtual cameras)	1-n	Each virtual camera stream has high-resolution and low-resolution videos



2.2 Video Analytics Algorithm Description and Parameters

Item	Person Detection
Description	Model for Person Detection – Angled FOV
Detection CNN Architecture	YOLOv5
Service Name	Person-detection-angled
Version	2023100500
Date	05 Oct 2023

§

3.0 Profiling

3.1 Validation Steps

1. Deploy and Configure systems under test (SUTs)
2. Install Ubuntu* Operating System and Analytics Platform with Testing Criteria.
 - a. Set up maximum virtual video streams with specified video sources for high-resolution streams.
 - b. Set up MeldCX VAS video analytics to process the virtual video streams.
3. Run the profiler tools to record hardware usage and other metrics over a given period of time.
4. Process results to generate tabulated data using multiple readings.
5. Analyze results and report.

3.2 Checklist for Results Validation

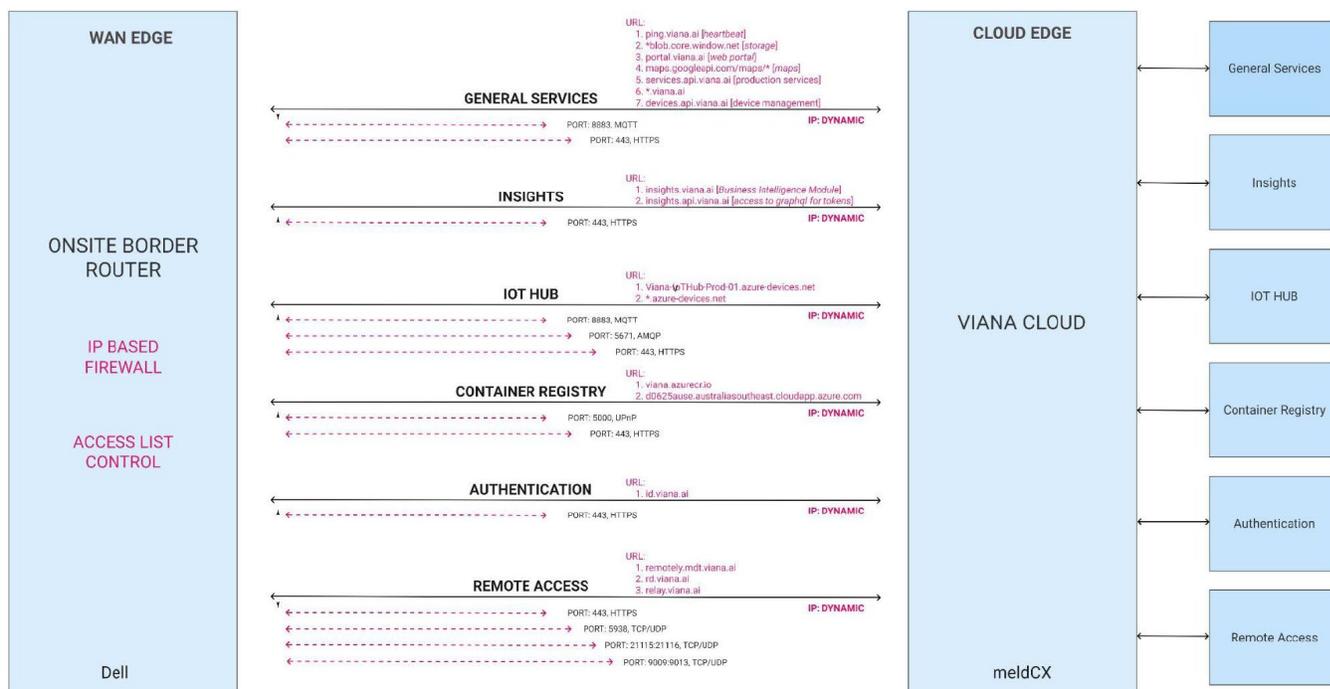
- i. MeldCX VAS is utilizing the optimum amount of CPU/iGPU/dGPU without compromising the system accuracy.
- ii. Processing frame rate is matching the expectations (>90% of input).
- iii. CPU usage and Memory consumption values are consistent during the test.

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4.0 Access List Requirements

4.1 WAN Connection Diagram

Figure 3. Connection Diagram Including Ports and Services



4.2 Viana™ Access Lists

4.2.1 Ports and Services for Whitelisting

Source of access: Your Network

FQDN	Ports	Protocol	Direction	Description
portal.viana.ai	443	TCP/UDP/ICMP	Outbound	General Services. Viana Portal
maps.googleapi.com/maps/*	443	TCP/UDP	Outbound	General Services. Google Maps API
ping.viana.ai	443	TCP/UDP	Inbound/Outbound	General Services. Device Heartbeat

*blob.core.window.net	443	TCP/UDP	Inbound/ Outbound	General Services. Blob Storage
services.api.viana.ai	443, 8883	TCP/UDP	Inbound/ Outbound	General Services. Production Services
*.viana.ai	443	TCP/UDP	Inbound/ Outbound	General Services. Viana Wildcard
devices.api.viana.ai	443	TCP/UDP	Inbound/ Outbound	General Services. Device Management
-	8000,8003	TCP/UDP	Inbound	General Services. Viana Inference
insights.viana.ai	443	TCP/UDP	Inbound/ Outbound	Insights. Business Intelligence Module
insights.api.viana.ai	443	TCP/UDP	Inbound/ Outbound	Insights. Access to GraphQL for Tokens
Viana-IoTHub-Prod-01.azure-devices.net	5671	TCP/UDP	Inbound/ Outbound	IoT Hub. Azure IoT Hub endpoints
*.azure-devices.net	443, 5671, 8883	TCP/UDP/MQTT	Inbound/ Outbound	IoT Hub. Azure IoT Hub endpoints
viana.azurecr.io	443, 5000	TCP/UDP	Inbound/ Outbound	Azure Container Registry
d0625ause.australiasoutheast.cloudapp.azure.com	443	TCP/UDP	Inbound/ Outbound	Container Registry. Azure Domain
id.viana.ai	443	TCP/UDP	Inbound/ Outbound	Authentication. Viana authenticator
remotely.mdt.viana.ai	443	TCP/UDP	Inbound/ Outbound	Remote Access
rd.viana.ai	21115:21119	TCP/UDP	Inbound/ Outbound	Remote Access
relay.viana.ai	9009:9013	TCP/UDP	Inbound/ Outbound	Remote Access. File Transfer



4.2.2 Ports and Services for Whitelisting – Common Ports

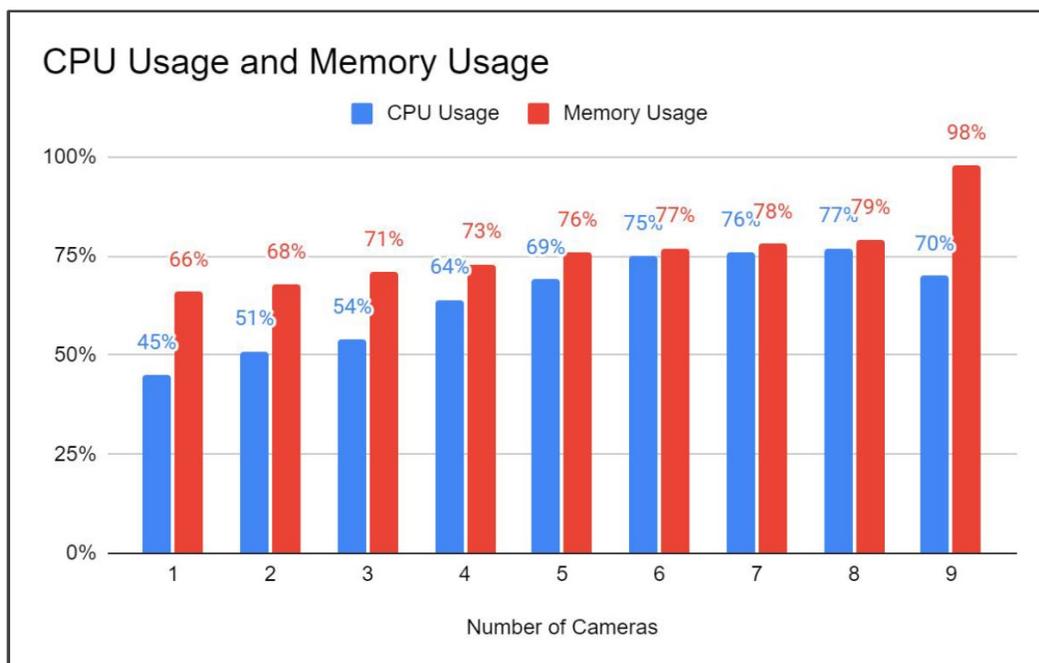
Common Ports	Description	Viana™ Use
80	Hypertext Transfer Protocol (HTTP). HTTP is the protocol that makes the World Wide Web possible.	No longer in use
449	HTTP Secure (HTTPS). HTTPS is the secure and encrypted version of HTTP. All HTTPS web traffic goes to port 443. Network services that use HTTPS for encryption, such as DNS over HTTPS, also connect at this port.	For Viana Cloud Software
5000	This TCP port is opened and used by Universal Plug N' Play (UPnP) devices to accept incoming connections from other UPnP devices. UPnP devices connect to each other using TCP protocol over port 5000.	For Viana Azure Hub
5671	Advanced Message Queuing Protocol (AMQP)[246] over TLS. Azure Service Bus always requires the use of TLS (Transport Layer Security). It supports connections over TCP port 5671. It requires the port 5671(default port used by AMQP) to be enabled in the network of the sender or receiver local system. Connection to Azure Service Bus will fail if this port is disabled.	For Viana Azure Services
8000, 8002, 8003	Container ports where Triton listens for HTTP requests (port 8000), listens for GRPC requests (port 8001), and reports Prometheus metrics (port 8002).	For Viana Inference Services
8883	Secure MQTT (MQTT over TLS. TCP/IP port 1883 is reserved with IANA for use with MQTT. TCP/IP port 8883 is also registered, for using MQTT over SSL.	For Viana MQTT Broker
9009, 9010, 9011, 9012, 9013	QuickTime Streaming Server.	For File Transfer
21115, 21116, 21117, 21118, 21119	Unassigned port that supports TCP and UDP Protocols.	For Remote Management (i.e., RustDesk)

5.0 Performance Test Results

5.1 MS11 - Zone Engagement

5.1.1 Intel® NUC 11 Extreme Kit

5.1.1.1 AI Validation Initial Result



Architecture	x86_64
CPU op-mode(s)	32-bit, 64-bit
Address sizes	39 bits physical, 48 bits virtual
Byte Order	Little Endian
CPU(s)	16
On-line CPU(s) list	0-15
Vendor ID	GenuineIntel
Model name	11th Gen Intel® Core™ i9-11900KB @ 3.30GHz

CPU family	6
Model	141
Thread(s) per core:	2
Core(s) per socket	8
Socket(s)	1
Stepping	1
CPU max MHz	5000.0000
CPU min MHz	800.0000
BogoMIPS	6604.80

5.1.1.2 Utilization Before Adding Any Sensors

```

root@mtl:~/mcpmadia x + -
0[|] 3.2% 0[|] 100.0% 8[|] 3.2%
1[|] 0.7% 0[|] 3.3% 1[|] 0.7%
2[|] 2.0% 0[|] 0.7% 2[|] 2.0%
3[|] 0.7% 0[|] 2.0% 3[|] 0.7%
Mem[|] 1.90G/30.4G 4[|] 100.0%
Swap[|] 3.58M/8.68M 5[|] 3.3%
8[|] 0.7%
7[|] 1.3%
8[|] 0.7%
9[|] 0.8%
10[|] 0.7%
11[|] 0.8%
12[|] 1.3%
13[|] 0.7%
14[|] 0.7%
15[|] 0.8%
8[|] 1.3% 12[|] 1.3%
9[|] 0.7% 11[|] 0.7%
10[|] 0.8% 14[|] 0.7%
11[|] 0.7% 15[|] 0.8%
Tasks: 185, 887 tkg; 2 running
Load average: 1.09 2.49 7.92
Uptime: 23 days, 11:49:45
Avg[|] 7.4%

Setup      left column      right column      Available meters
Meters     CPU (1/2/4) [Bar]  CPU (1/1) [Bar]   CPU (1/2): first half of list
Display options Memory [Bar]      CPU (3/4/4) [Bar] CPU (2/2): second half of list
Colors     Swap [Bar]        Task counter [Text] CPU (1/2/2): first half in 2 shorter columns
Columns    Load average [Text] CPU (3/4/4): second half in 2 shorter columns
           Uptime [Text]     CPU (1-4/8): first half in 4 shorter columns
           CPU [Bar]         CPU (5-8/8): second half in 4 shorter columns
           CPU (1-8/16): first half in 8 shorter columns
           CPU (9-16/16): second half in 8 shorter columns
           Blank
           Pressure Stall Information, some cpu
           Pressure Stall Information, some io
           Pressure Stall Information, full io
           Pressure Stall Information, some memory
    
```

5.1.1.3 CPU Average: 9 Sensors Running for 4 Days

```

root@ms11: /home/pmatria
0[|||||71.8%] 4[|||||100.0%] 8[|||||63.6%] 12[|||||55.7%]
1[|||||76.0%] 5[|||||98.7%] 9[|||||61.1%] 13[|||||57.6%]
2[|||||72.8%] 6[|||||75.2%] 10[|||||60.8%] 14[|||||64.9%]
3[|||||71.6%] 7[|||||74.0%] 11[|||||58.7%] 15[|||||59.1%]
Mem[|||||17.4G/30.9G] Tasks: 190, 1344 thr; 6 running
Swp[|||||18.8M/8.00G] Load average: 11.70 13.63 14.31
Uptime: 27 days, 10:20:41
Avg[|||||70.2%]

  PID USER      PRI  NI  VIRT   RES   SHR  S  CPU%  MEM%  TIME+  Command
 298374 root        20   0 15.5G 10.7G 74876 R 125. 34.1 122h python3 app.py
 298176 root        20   0 4003M 630M 9696 S 113.  2.0 103h python3 app.py
446022 root        20   0 564M 32524 16568 S 101.  0.1 17h45:28 /usr/local/bin/vianad
446188 root        20   0 564M 32524 16568 R 101.  0.1 17h37:20 /usr/local/bin/vianad
296507 root        20   0 3687M 92896 9572 S 66.1  0.3 58h30:25 python3 app.py
298264 root        20   0 2756M 198M 10356 S 61.5  0.6 53h14:05 python3 app.py
298275 root        20   0 4003M 630M 9696 R 55.5  2.0 48h09:08 python3 app.py
298364 root        20   0 3864M 409M 60436 S 51.6  1.3 26h13:32 python3 app.py
302924 root        20   0 3364M 450M 20020 S 50.2  1.4 42h45:11 python3 app.py
296356 root        20   0 3474M 370M 10388 S 48.3  1.2 44h09:39 python3 app.py
302920 root        20   0 3364M 446M 20016 S 48.3  1.4 42h07:15 python3 app.py
302950 root        20   0 3364M 443M 20032 S 48.3  1.4 42h01:48 python3 app.py
302970 root        20   0 3364M 447M 19952 S 48.3  1.4 41h58:25 python3 app.py
302994 root        20   0 3365M 445M 19984 S 48.3  1.4 41h59:01 python3 app.py
302990 root        20   0 3365M 447M 20028 S 47.6  1.4 41h57:28 python3 app.py
302921 root        20   0 3364M 441M 20080 S 46.9  1.4 41h56:45 python3 app.py
302960 root        20   0 3364M 446M 19960 S 46.9  1.4 41h55:34 python3 app.py
302980 root        20   0 3365M 441M 19980 S 46.9  1.4 42h03:31 python3 app.py
  
```

ms11
Skunks NewDe1 Cafe
S117
18 Sep 2023 ● Online

ms11

Serial Number:
bc17739b-c98e-6327-5dea-1c697ad5b876

9 Sensor(s) Connected

Viana Version	10.0.0
Model	—
OS	Ubuntu 22043 LTS
IP Address	—
MAC Address	—

Device Health

CPU	65%
Memory	95%
Storage	29% (28 GB / 97 GB)

Last active: 22/09/2023 10:26 AM

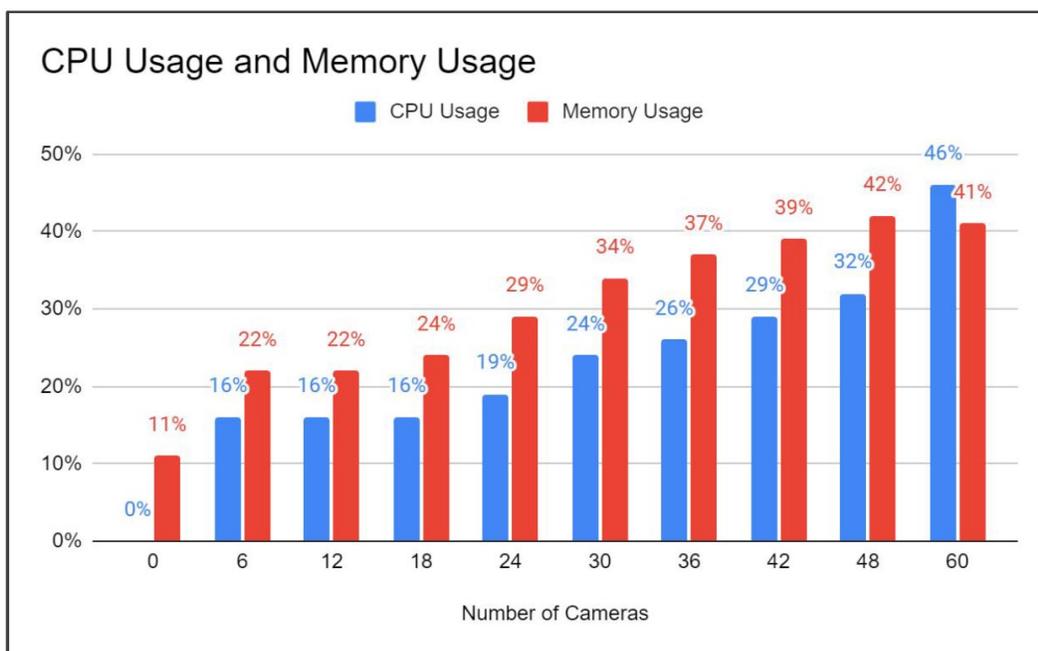
Today's Key Insights

Zone Engagement COMING SOON

5.2 MS5 - People Counting

5.2.1 Dell PowerEdge R650

5.2.1.1 AI Validation Initial Result



Architecture	x86_64
CPU op-mode(s)	32-bit, 64-bit
Address sizes	46 bits physical, 57 bits virtual
Byte Order	Little Endian
CPU(s)	128
On-line CPU(s) list	0-127
Vendor ID	GenuineIntel
Model name	Intel® Xeon® Gold 6338N CPU @ 2.20GHz
CPU family	6
Model	106

Thread(s) per core:	2
Core(s) per socket	32
Socket(s)	2
Stepping	6
BogoMIPS	4400.00

5.2.1.2 Utilization Before Adding Any Sensors

```

root@ms5: ~/home/pmadria
0[0] 8[0] 16[0] 24[0] 32[0] 40[0] 48[0] 56[0] 64[0] 72[0] 80[0] 88[0] 96[0] 104[0] 112[0] 120[0]
1[1] 9[0] 17[0] 25[0] 33[0] 41[0] 49[0] 57[0] 65[0] 73[0] 81[1] 89[0] 97[0] 105[0] 113[0] 121[0]
2[2] 10[0] 18[0] 26[0] 34[0] 42[0] 50[0] 58[0] 66[0] 74[0] 82[0] 90[0] 98[0] 106[0] 114[0] 122[0]
3[1] 11[1] 19[0] 27[0] 35[0] 43[0] 51[0] 59[0] 67[0] 75[0] 83[0] 91[0] 99[0] 107[0] 115[0] 123[0]
4[1] 12[0] 20[1] 28[0] 36[0] 44[0] 52[0] 60[0] 68[0] 76[0] 84[0] 92[0] 100[0] 108[0] 116[0] 124[0]
5[0] 13[0] 21[0] 29[0] 37[0] 45[0] 53[0] 61[0] 69[0] 77[0] 85[0] 93[0] 101[1] 109[0] 117[0] 125[1]
6[0] 14[0] 22[0] 30[0] 38[0] 46[0] 54[0] 62[0] 70[0] 78[0] 86[0] 94[0] 102[0] 110[0] 118[0] 126[0]
7[0] 15[0] 23[0] 31[0] 39[0] 47[0] 55[0] 63[1] 71[0] 79[0] 87[0] 95[0] 103[0] 111[0] 119[0] 127[0]
Mem[|||||] 10.9G/251G Tasks: 169, 1685 thr; 2 running
Swp[ ] 0K/8.00G Load average: 1.11 1.49 4.52
Uptime: 23 days, 13:52:25
Avg[||] 1.1%

Setup      Left column      Right column      Available meters
Meters     CPUs (1-8/16) [Bar] CPUs (9-16/16) [Bar] Pressure Stall Information, some memory
Display options Memory [Bar]      Task counter [Text] Pressure Stall Information, full memory
Colors     Swap [Bar]        Load average [Text] ZFS ARC
Columns    Uptime [Text]     Uptime [Text]     ZFS CARC: Compressed ARC statistics
                                                    Zram
                                                    Disk IO
                                                    Network IO
                                                    SELinux state overview
                                                    Systemd system state and unit overview
                                                    CPU average
                                                    CPU 0
                                                    CPU 1
                                                    CPU 2
                                                    CPU 3

SpaceStyle EnterLock UpUp DnDown <-Left ->Right DelDeleteF10Done
  
```

The screenshot shows the Viana web interface for device 'ms5'. The top navigation bar includes the device name 'ms5', user 'Armscor:Inc', 'BanShee S&W', and status '26 minutes ago' and 'Online'. The main content area is divided into three sections:

- Device Health:** Shows CPU at 0%, Memory at 11%, and Storage at 26% (26 GB / 97 GB).
- Today's Key Insights:** A section with a 'COMING SOON' badge for 'People Counting'.
- Device Details:** Lists serial number, Viana version (10.0.0), OS (Ubuntu 22043 LTS), IP address, and MAC address.

5.2.1.3 CPU Average: Up to 60 Cameras (RTSP Streams)

```

root@ms5: /home/jmadrida
0[153.6%] 8[147.2%] 16[152.3%] 24[147.6%] 32[145.7%] 40[145.5%] 48[146.3%] 56[147.6%] 64[142.6%] 72[142.1%] 80[162.0%] 88[139.7%] 96[140.2%] 104[140.6%] 112[143.0%] 120[141.7%]
1[141.5%] 9[147.4%] 17[149.8%] 25[144.5%] 33[147.3%] 41[144.3%] 49[146.9%] 57[148.0%] 65[139.9%] 73[149.0%] 81[143.3%] 89[139.2%] 97[140.6%] 105[135.3%] 113[137.2%] 121[140.8%]
2[158.2%] 10[149.2%] 18[148.5%] 26[148.0%] 34[149.8%] 42[146.2%] 50[148.9%] 58[148.0%] 66[142.9%] 74[142.8%] 82[141.0%] 90[142.4%] 98[143.1%] 106[141.0%] 114[143.4%] 122[137.8%]
3[148.8%] 11[146.2%] 19[146.7%] 27[148.0%] 35[148.7%] 43[148.5%] 51[148.9%] 59[148.0%] 67[140.0%] 75[138.4%] 83[139.4%] 91[139.4%] 99[142.0%] 107[136.8%] 115[141.3%] 123[141.0%]
4[152.4%] 12[149.0%] 20[149.0%] 28[145.7%] 36[147.6%] 44[148.1%] 52[148.0%] 60[147.5%] 68[142.3%] 76[141.2%] 84[142.2%] 92[140.7%] 100[139.8%] 108[139.3%] 116[140.3%] 124[136.6%]
5[146.5%] 13[146.8%] 21[146.3%] 29[145.0%] 37[145.1%] 45[148.2%] 53[147.6%] 61[144.0%] 69[140.9%] 77[140.1%] 85[139.0%] 93[141.2%] 101[137.1%] 109[136.0%] 117[136.1%] 125[139.6%]
6[148.4%] 14[147.1%] 22[147.5%] 30[146.1%] 38[148.2%] 46[147.3%] 54[146.9%] 62[148.0%] 70[136.9%] 78[140.1%] 86[141.9%] 94[143.0%] 102[138.5%] 110[138.5%] 118[140.7%] 126[138.6%]
7[148.0%] 15[147.2%] 23[145.4%] 31[147.0%] 39[142.2%] 47[141.9%] 55[146.2%] 63[147.0%] 71[140.0%] 79[135.0%] 87[139.0%] 95[136.7%] 103[139.6%] 111[142.3%] 119[141.4%] 127[141.0%]
Mem[|||||] 79.86/251G Tasks: 286, 19747 thr; 87 running
Swap[|||||] 8K/8.08G Load average: 39.04 56.75 61.16
uptime: 31 days, 10:23:04
Avg[|||||] 44.2%

```

PID	USER	PRI	NI	VIRT	RES	SHR	CPU%	MEM%	TIME	Command
1209859	root	20	0	27.96	522K	75808	5	1107	0.2	7:02:21 python3 app.py
1289041	root	20	0	14.46	423K	69228	5	254	0.2	2:35:37 python3 app.py
1289611	root	20	0	11.16	1439K	9972	5	121	0.6	45:48:46 python3 app.py
301479	root	20	0	780K	64244	13469	5	104	0.0	7:38:16 /rtsp-simple-server
304091	root	20	0	1948K	561K	21828	5	100	0.2	1:00 /usr/local/bin/vianad
305011	root	20	0	1948K	561K	23028	5	99	0.2	1:00 /usr/local/bin/vianad
1332335	root	20	0	14.66	1214K	20464	5	63	0.5	8:28:47 python3 app.py
1332430	root	20	0	14.66	1220K	20508	5	62	0.5	8:31:48 python3 app.py
1332338	root	20	0	14.66	1214K	20528	5	62	0.5	8:11:60 python3 app.py
1332188	root	20	0	14.66	1217K	20528	5	61	0.5	8:23:56 python3 app.py

ms5
Armscor.Inc
BanShee S&W

ms5

Serial Number:
4c4c4544-0037-3910-8059-c8c04f575033

60 Sensor(s) Connected

Viana Version: 10.0.0

Model: —

OS: Ubuntu 22043 LTS

IP Address: —

MAC Address: —

Device Health

CPU: 43%

Memory: 40%

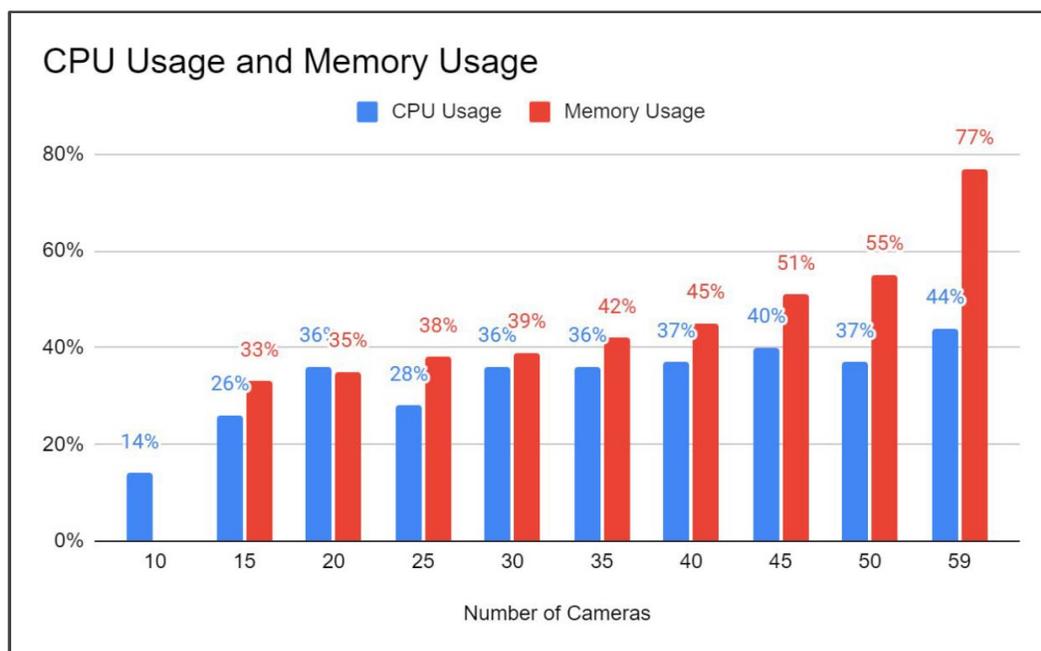
Storage: 31% (30 GB / 97 GB)

Last active: 26/09/2023 10:27 AM

5.3 MS2 - Anonymous Audience Measurement

5.3.1 Dell PowerEdge R650 with Intel® Data Center GPU Flex 140

5.3.1.1 AI Validation Initial Result



Architecture	x86_64
CPU op-mode(s)	32-bit, 64-bit
Address sizes	46 bits physical, 57 bits virtual
Byte Order	Little Endian
CPU(s)	128
On-line CPU(s) list	0-127
Vendor ID	GenuineIntel
Model name	Intel® Xeon® Gold 6338N CPU @ 2.20GHz
CPU family	6
Model	106



Thread(s) per core:	2
Core(s) per socket	32
Socket(s)	2
Stepping	6
BogoMIPS	4400.00

5.3.1.2 CPU Average: Up to 59 Cameras (RTSP Streams) with Storage 95%+

```

root@ms2: /home/jmadria x + -
0 [40.6%] 8 [37.2%] 16 [36.8%] 24 [39.9%] 32 [38.0%] 40 [69.4%] 48 [38.6%] 56 [40.1%] 64 [42.6%] 72 [39.4%] 80 [41.1%] 88 [44.3%] 96 [38.1%] 104 [36.1%] 112 [39.4%] 120 [39.6%]
1 [40.8%] 9 [40.6%] 17 [38.2%] 25 [37.6%] 33 [39.0%] 41 [99.1%] 49 [38.2%] 57 [41.1%] 65 [43.6%] 73 [42.1%] 81 [38.0%] 89 [37.8%] 97 [39.1%] 105 [35.6%] 113 [40.3%] 121 [40.2%]
2 [42.8%] 10 [39.9%] 18 [38.9%] 26 [37.5%] 34 [39.6%] 42 [37.8%] 50 [39.1%] 58 [37.7%] 66 [40.8%] 74 [41.1%] 82 [39.2%] 90 [40.8%] 98 [40.2%] 106 [39.6%] 114 [37.2%] 122 [40.8%]
3 [41.3%] 11 [38.7%] 19 [39.6%] 27 [39.2%] 35 [37.7%] 43 [38.6%] 51 [38.6%] 59 [35.2%] 67 [39.6%] 75 [41.4%] 83 [40.2%] 91 [38.9%] 99 [41.2%] 107 [40.6%] 115 [40.6%] 123 [37.6%]
4 [40.6%] 12 [39.8%] 20 [38.2%] 28 [39.2%] 36 [42.6%] 44 [38.6%] 52 [38.8%] 60 [38.4%] 68 [39.6%] 76 [40.3%] 84 [40.6%] 92 [43.6%] 100 [39.7%] 108 [38.8%] 116 [38.8%] 124 [39.4%]
5 [38.8%] 13 [37.8%] 21 [40.2%] 29 [38.1%] 37 [39.0%] 45 [39.6%] 53 [37.8%] 61 [38.0%] 69 [40.7%] 77 [38.6%] 85 [39.1%] 93 [39.7%] 101 [37.6%] 109 [39.1%] 117 [38.0%] 125 [38.2%]
6 [39.9%] 14 [38.6%] 22 [40.5%] 30 [37.8%] 38 [37.6%] 46 [43.6%] 54 [38.9%] 62 [40.5%] 70 [39.9%] 78 [40.6%] 86 [40.5%] 94 [39.7%] 102 [40.9%] 110 [39.4%] 118 [38.6%] 126 [40.8%]
7 [38.6%] 15 [37.2%] 23 [38.2%] 31 [36.7%] 39 [37.4%] 47 [39.8%] 55 [38.2%] 63 [38.6%] 71 [42.3%] 79 [37.8%] 87 [40.9%] 95 [41.1%] 103 [40.8%] 111 [40.1%] 119 [39.6%] 127 [41.6%]
Mem [|||||] Tasks: 315, 10783 thr; 27 running
Swap [|||||] 1216/2616 Load average: 40.69 53.15 53.63
Avg [|||||] Uptime: 17 days, 05:56:13
40.4%

PID USER PRU NI VIRT RES SHR %CPU %MEM TIME+ Command
2210586 root 20 0 37.8G 9498M 75552 B 374. 3.7 257h python3 app.py
2210493 root 20 0 18.8G 457M 60888 S 346. 0.2 178h python3 app.py
2216211 root 20 0 18.9G 1591M 9792 S 121. 0.6 79h05:30 python3 app.py
1719521 root 20 0 1688M 328M 23048 S 99.4 0.1 11h /usr/local/bin/vianad
1718974 root 20 0 1684M 328M 23048 S 98.9 0.1 11h /usr/local/bin/vianad
241554 root 20 0 854M 54572 13264 S 75.2 0.0 103h /rtsp-simple-server
2252661 root 20 0 14.7G 1648M 28348 S 60.4 0.6 39h19:42 python3 app.py
2252611 root 20 0 14.7G 1622M 28348 S 60.5 0.6 39h14:19 python3 app.py
2252984 root 20 0 14.7G 1607M 28372 S 67.5 0.6 39h29:50 python3 app.py
2252781 root 20 0 14.7G 1610M 28356 S 67.0 0.6 39h31:19 python3 app.py
2252877 root 20 0 14.7G 1613M 28376 S 67.0 0.6 39h27:10 python3 app.py
2252944 root 20 0 14.6G 1603M 28320 S 67.0 0.6 39h40:53 python3 app.py
2252696 root 20 0 14.7G 1638M 28488 S 66.6 0.6 39h43:12 python3 app.py
2252716 root 20 0 14.6G 1607M 28352 S 66.6 0.6 38h57:21 python3 app.py
2252901 root 20 0 14.7G 1627M 28348 S 66.6 0.6 38h57:53 python3 app.py
    
```

ms2
Armscor, Inc
Banshee S&W
12 Sep 2023 ● Online

ms2

Serial Number: 4c4c4544-0037-3910-8059-c4c04f575033

59 Sensor(s) Connected

Viana Version: 10.0.0

Model: —

OS: Ubuntu 22043 LTS

IP Address: 192.168.47.4

MAC Address: 40:a-6-b7-8-4-f3-0-7

Device Health

CPU: 34%

Memory: 77%

Storage: 95% (93 GB / 97 GB)

Last active: 25/09/2023 09:09 AM

Today's Key Insights

^ Audience Measurement CC

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6.0 Conclusion

MS2: Audience Measurement

MS5: People Counting

MS11: Zone Engagement

Edge Device / Server	Processor	Number of Cameras (per testing)
MS11 Intel® NUC 11 Extreme Kit	Intel® Core™ i9-11900KB Processor @ 3.30GHz	Up to 9 cameras (RTSP streams)
MS5 Dell PowerEdge R650	Intel® Xeon® Gold 6338N Processor @ 2.20GHz	Up to 60 cameras (RTSP streams)
MS2 Dell PowerEdge R650 with Intel® Data Center GPU Flex 140	Intel® Xeon® Gold 6338N Processor @ 2.20GHz Intel® Data Center GPU Flex 140	Up to 59 cameras (RTSP streams)

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