Load Test Report

This document explains the various activities performed as part of the Testing of the ‘Punjab Vidhan Sabha Election 2022’ project.

Overview:

VMukti media-server is a high-performance media streaming server publishing high-quality video, used for surveillance activities. Here multiple reports are generated and attached with the document about server capacity and performance of the server for optimum handling of camera feeds.

Scope of Testing:

- Server CPU Utilization.
- Server Network Utilization.
- Server Connectivity.
- Storage of recorded feeds.
- Camera Status Service.
- Concurrent user for the web portal.

Environment:

- The load-testing environment used here has below mentioned parameters.
  - 30 servers
  - Each server has below mentioned server configuration:
    - Operating System: Linux (ubuntu-pro-xenial 16.04)
    - Processor : Intel(R) Xeon(R) Platinum 8272CL CPU @ 2.60GHz
    - Octa-Core Processor (8 vcpus)
    - RAM: 32 GB
    - Availability: 24*7
    - OS Disk: Premium SSD
    - Max IOPS: 12800
    - Max cached and temp storage throughput: IOPS/MBps (cache size in GiB): 16000/128 (200)
    - Burst cached and temp storage throughput: IOPS/MBps: 16000/400
    - Uncached disk throughput: IOPS/MBps: 12800/192
    - Burst uncached disk throughput: IOPS/MBps: 16000/400
  - 1000 cameras each server
  - 1 Gbps network provided to every server.

Media-server Capacity:

The media-server Capacity Analysis calculates how many cameras the media-server can handle based on the configured performance goals. See the User Capacity section for a more detailed analysis.

Estimated Optimum media-server capacity: 1000 Cameras
Estimated Maximum media-server capacity: 1500 Cameras

1. CPU Utilization:

1.1. The average CPU utilization was 46 % according to the metrics.
1.2. Max CPU utilization recorded during the testing period was 52% for 1000 cameras
1.3. Please check the figure below for detailed information
1.4. The different color here in the graph indicates different virtual machines.
1.5. The timeline for this test run was 10:30 PM to 4:00 AM.

Figure 1

- This graph shows the CPU percentage of all the virtual servers.
- Different color dictates different servers.
- As we can see in the figure as the server gets bombarded with streams the CPU percentage steadily increases to 40 to 50%.
- In idle mode server does not have any background activity, it stays at a minimum level.

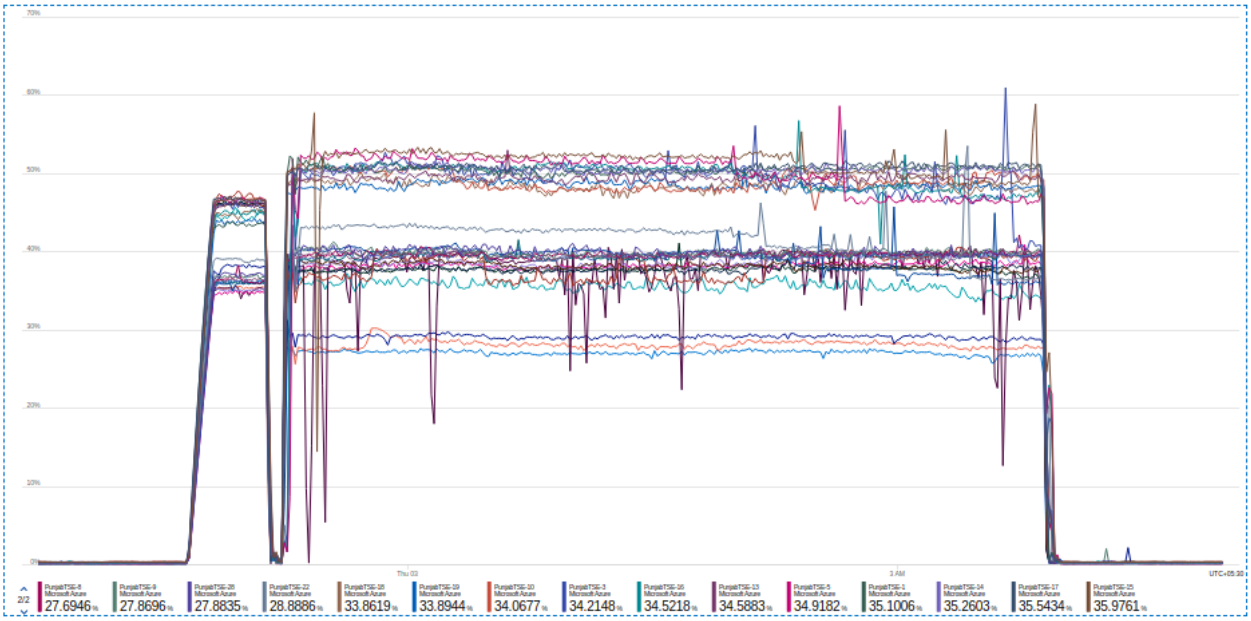
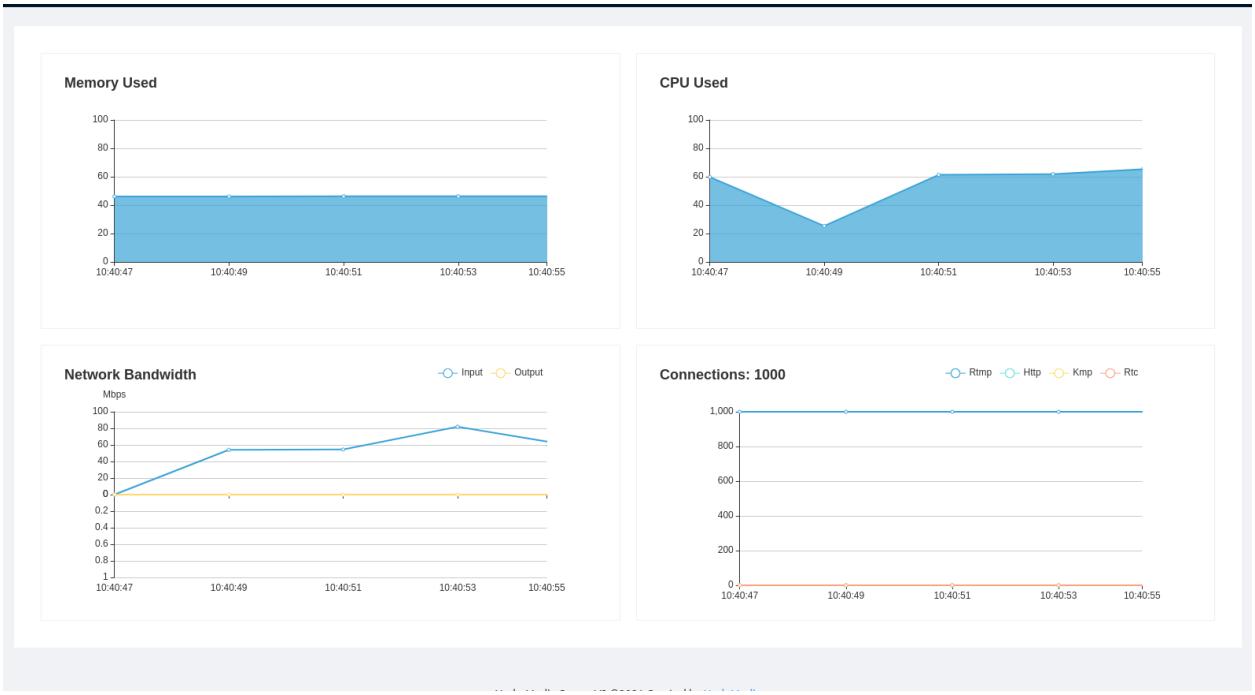


Figure 2

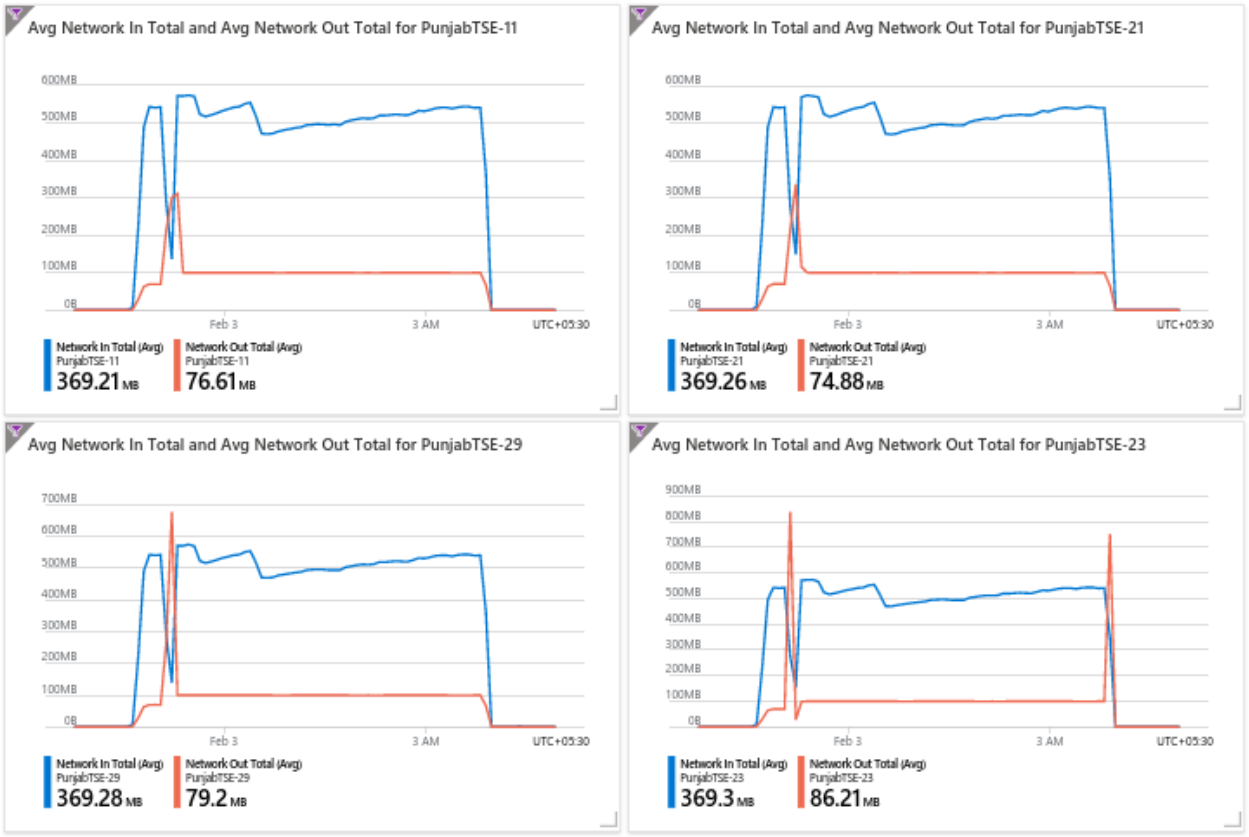
- This is an image from a single media server which is going to be the same for the 30 media servers we are having.
- Please look at the image below for charts we can see in media server stats.



- We have a thousand stable streams as we can see the stable graph and
- Average CPU usage falls down between 50-55% and RAM usage fall down between 46-60 %.

2. Server Network Utilization:

2.1. The figure below indicates the avg network in/out.



- As we can see in the image the average incoming traffic for a machine is 369 MB and network output falls down between 74 MB to 86 MB.
- Here we can see stats for 4 random machines which are the same for a total of 30 machines.

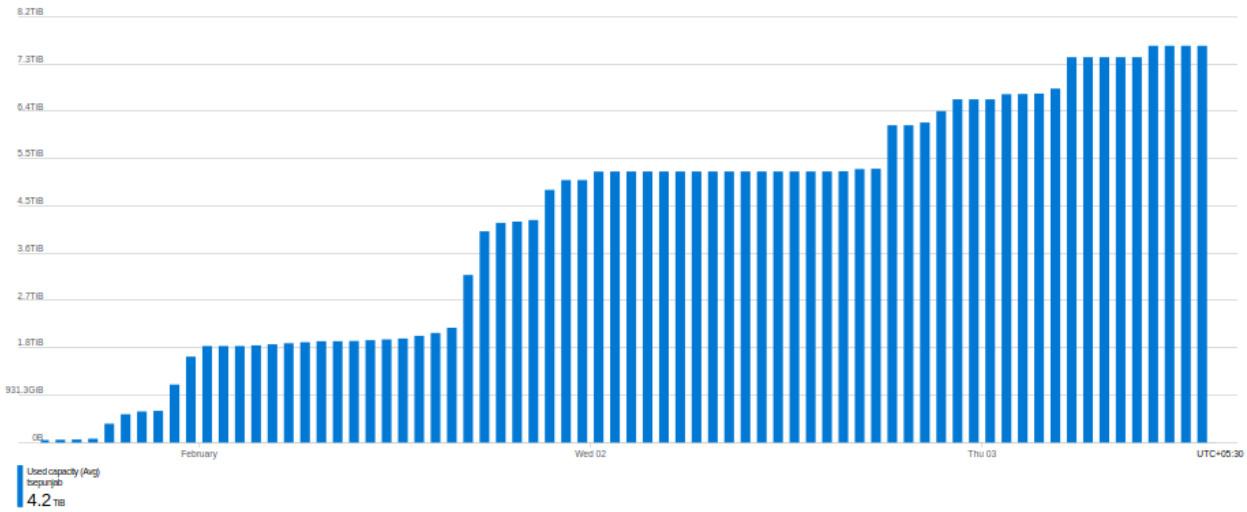
3. Server Connectivity:

3.1. The servers have 24x7 network connectivity and uptime. In the event that a server is down, a new server is automatically created and deployed.

4. Storage Capacity

4.1. We have used a cloud storage account having 10 TB of storage capacity which is connected to every machine, has zero downtime, standard performance tier.

4.2. Please check the graph below for storage account operations.



- This graph shows the storage account usage at a time for a single storage account.
- This is accumulated data stored for every server.
- For every server, we will have a single storage account associated with it.

5. Camera Status Service

5.1. The camera status on the portal is updated in real-time on the portal and works perfectly for more than 30,000 cameras.

5.2. We have tested it for 30,000 cameras and it updates on the portal in real-time.

5.3. Updating camera status in real-time is crucial information that is why we have deployed machine of configuration as below.

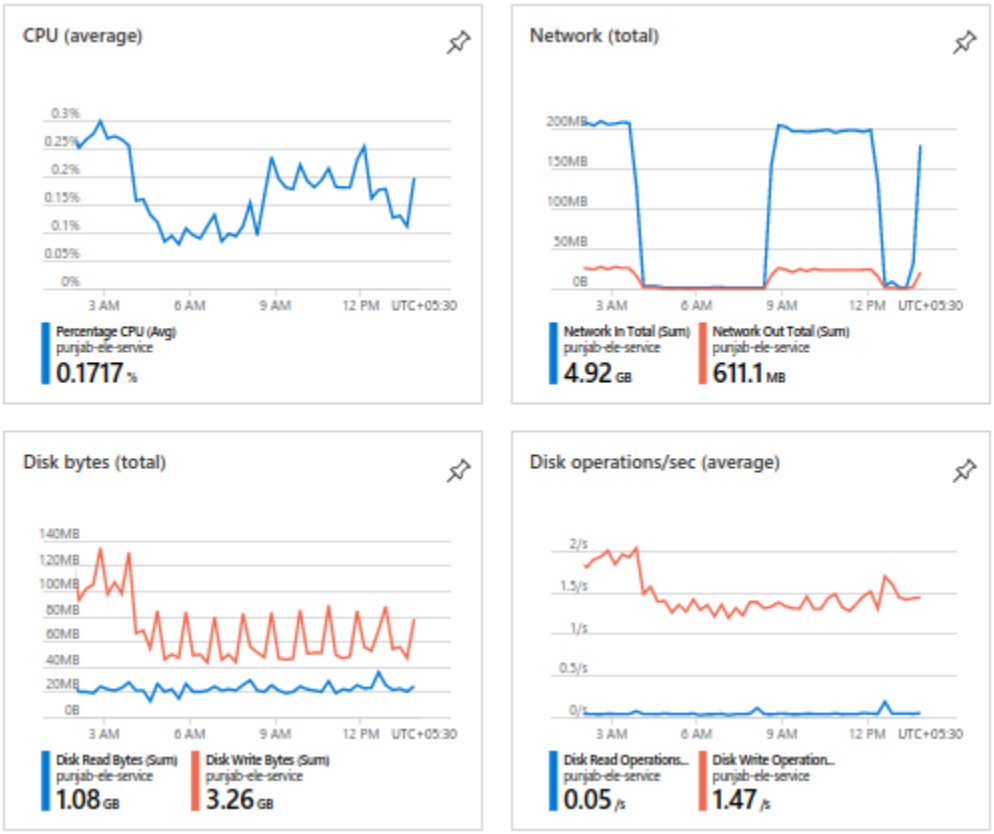
5.3.1. 16 Core (16 VCPUs)

5.3.2. 64 GB Ram

5.3.3. 1 Gbps Internet Connectivity

5.3.4. Premium SSD as OS DIsk.

5.4. The chart below dictates the overall performance of the service machine before, after, and during the test period.

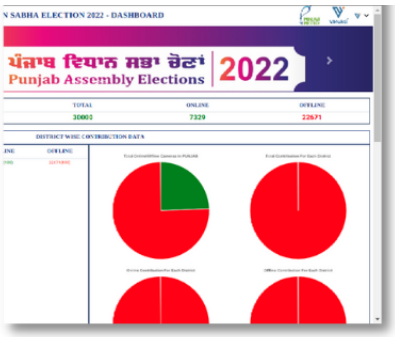


- Here we can see that during the stress test the maximum CPU percentage was 0.62 %.

5.5. Adding an image for service updating the number of live cameras count during the test.

5.5.1. These images indicate the steady increase in camera count updated by camera status service.

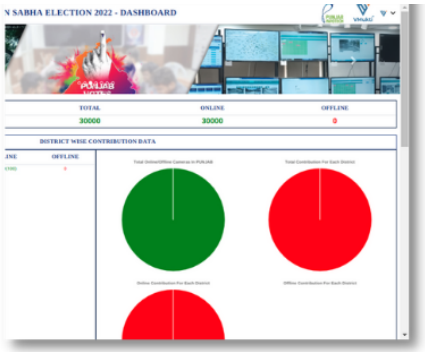
ONLINE : 0
OFFLINE: 30000



ONLINE: 7329
OFFLINE: 22671

ONLINE: 15825
OFFLINE: 14175

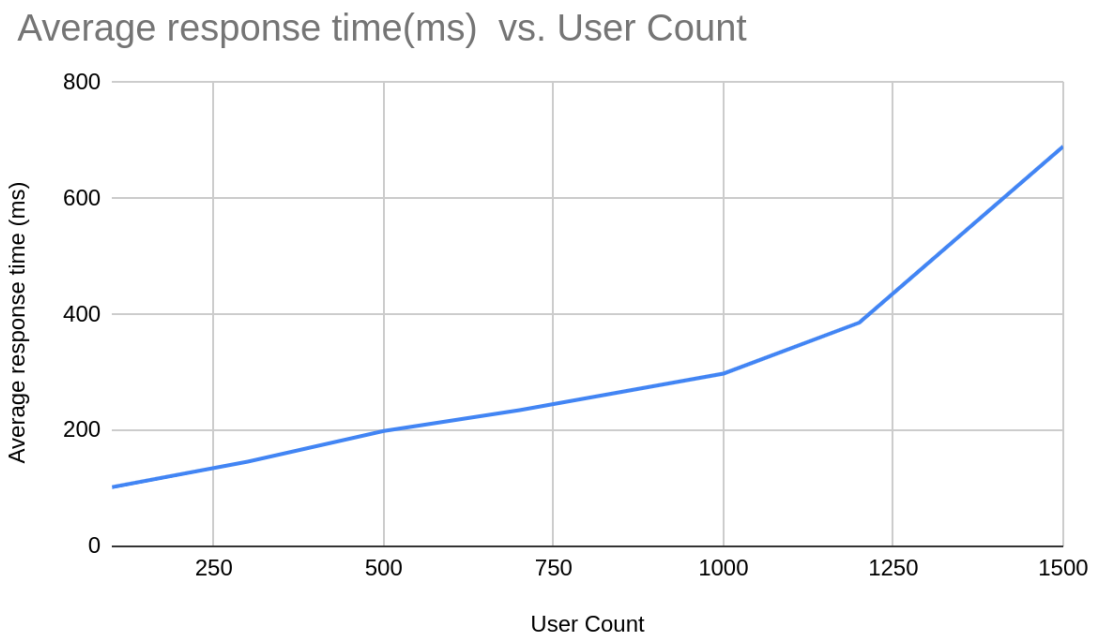
ONLINE: 24016
OFFLINE: 5984



ONLINE: 30000
OFFLINE: 0

6.Concurrent user for the web portal.

- Talking about the concurrent users using the portal we have tested the average response time for every time the number of users increases and here is the chart to showcase the result.



- We can see here that the chart web portal is ready to handle more than 1000 viewers.
- The average response time for the web portal for 1000 users is around 300 ms.
- Additionally, there is zero drop in response from the server-side connection.

Conclusion:

Thus looking at the stress test environment and performance matric we can conclude that these servers are a perfect fit for handling 30000 cameras with storage, network, and services as well.