# Performance Test Report

# For

# Execution of

# Registration Processor – 2000 packets

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## Summary

This report presents the observations and findings of the load test conducted by uploading 2000 registration packets to registration processor hosted in sandbox preprod environment (preprod.southindia.cloudapp.azure.com).

Below are the scenario details:

| | |
|---|---|
| **Script/Report Name** | Registration Processor packet upload<br>( 2000 packets) |
| **Run Time Period** | 2020-07-15 06:42:05.82 to 2020-07-15 08:16:58.008 |
| **Number of concurrent users** | 10 Vert.x worker threads in each stage |
| **Ramp up** | NA |
| **Ramp down** | NA |

## Pods Configuration (Replication):

Below pods are replicated as mentioned along with for the current run:

1)kernel-keymanager-service -(Replication factor =4)
2)kernel-auditmanager-service -(Replication factor =2)
3)regproc-packet-validator-stage -(Replication factor =4)
4)regproc-message-sender-stage - (Replication factor =2)
5)regproc-bio-dedupe-service -(replication factor =3)
6)regproc-abis-handler-stage-(replication factor =2)
7)regproc-abis-middleware-stage-(replication factor =2)

Remaining pods have  a replication of one (1) instance each for kernel, reg processor, idrepo and IDA modules.

## Packet Processing Times (Stage wise):

| **Activities** | **AVERAGE TIME (Sec)** |
|---|---|
| SECUREZONE_NOTIFICATION | 1.982039559 |
| UPLOAD_PACKET | 2.926892339 |
| VALIDATE_PACKET | **356.4799224** |
| QUALITY_CHECK | 3.000130195 |
| OSI_VALIDATE | 6.178829745 |
| EXTERNAL_INTEGRATION | 0.583952929 |
| DEMOGRAPHIC_VERIFICATION | 269.6333135 |
| BIOGRAPHIC_VERIFICATION | **2598.488896** |
| UIN_GENERATOR | 24.89963924 |
| PRINT_SERVICE | 1.705097181 |
| PRINT_POSTAL_SERVICE | 1.565055386 |
| NOTIFICATION | 96.82181111 |

## Packet Processing Rate (Throughput):

Total number of packets = 1998

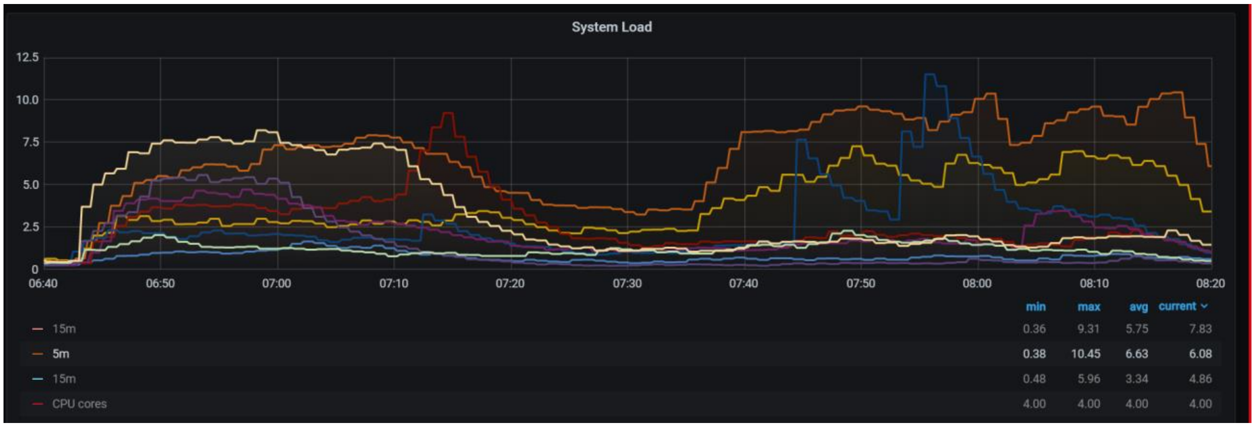
Total Processing Time = 1 hours 34 mins 52.188 secs i.e. 94.698 min

Throughput = 21.098 packets per minute / **1265.9 packets per hour**

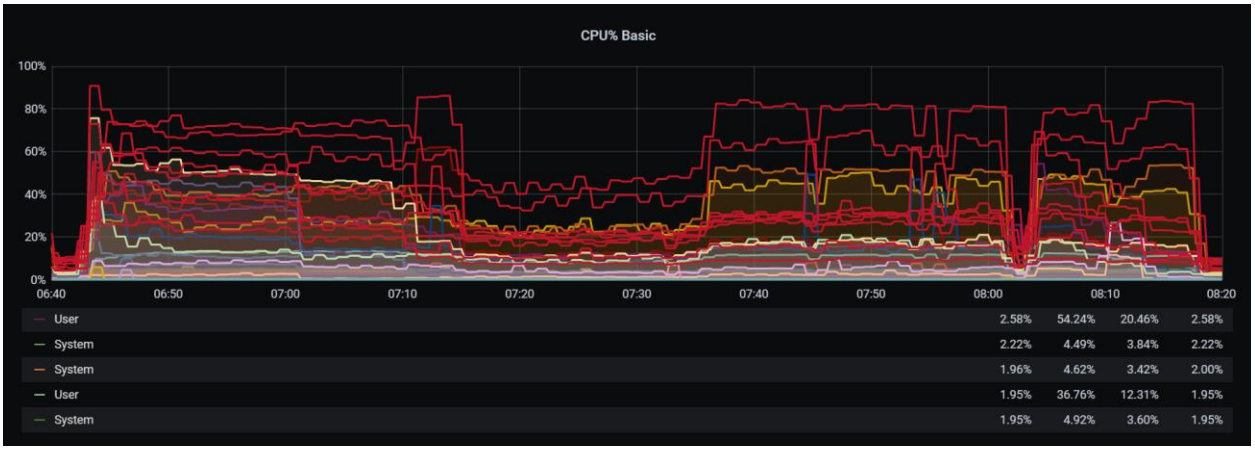
## Resource Usage:

Resource utilization can be found by the link: https://preprod.southindia.cloudapp.azure.com/mz-grafana/dashboard/snapshot/R2FSpKS7ZMfYEiBWcL9YlrrqQ3fojQ63

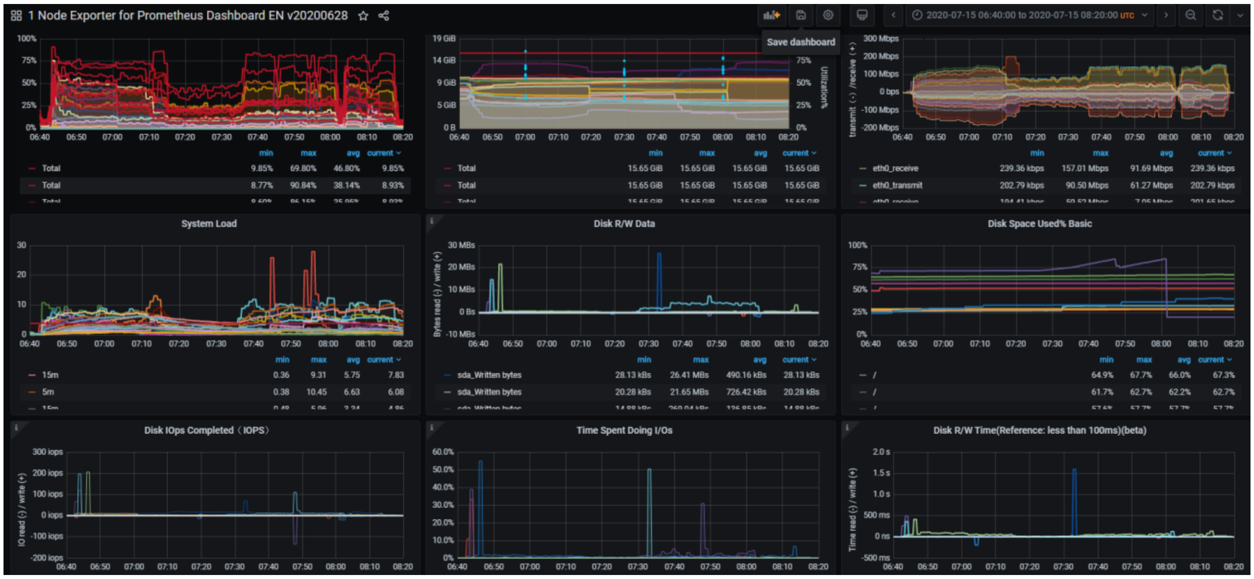
System load has gone high for the nodes having instances of keymanager, bio dedup service, message sender and packet validator services.



| | min | max | avg | current ⌄ |
|---|---|---|---|---|
| — 15m | 0.36 | 9.31 | 5.75 | 7.83 |
| — 5m | 0.38 | 10.45 | 6.63 | 6.08 |
| — 15m | 0.48 | 5.96 | 3.34 | 4.86 |
| — CPU cores | 4.00 | 4.00 | 4.00 | 4.00 |



| | | | | |
|---|---|---|---|---|
| — User | 2.58% | 54.24% | 20.46% | 2.58% |
| — System | 2.22% | 4.49% | 3.84% | 2.22% |
| — System | 1.96% | 4.62% | 3.42% | 2.00% |
| — User | 1.95% | 36.76% | 12.31% | 1.95% |
| — System | 1.95% | 4.92% | 3.60% | 1.95% |


1 Node Exporter for Prometheus Dashboard EN v20200628
2020-07-15 06:40:00 to 2020-07-15 08:20:00 UTC
Save dashboard
System Load
Disk R/W Data
Disk Space Used% Basic
Disk IOps Completed（IOPS）
Time Spent Doing I/Os
Disk R/W Time(Reference: less than 100ms)(beta)
Utilization%
transmit (-) /receive (+)
Bytes read (-) / write (+)
IO read (-) / write (+)
Time read (-) / write (+)
06:40
06:50
07:00
07:10
07:20
07:30
07:40
07:50
08:00
08:10
08:20

| | min | max | avg | current |
|---|---|---|---|---|
| Total | 9.85% | 69.80% | 46.80% | 9.85% |
| Total | 8.77% | 90.84% | 38.14% | 8.93% |

| | min | max | avg | current |
|---|---|---|---|---|
| Total | 15.65 GiB | 15.65 GiB | 15.65 GiB | 15.65 GiB |
| Total | 15.65 GiB | 15.65 GiB | 15.65 GiB | 15.65 GiB |

| | min | max | avg | current |
|---|---|---|---|---|
| eth0_receive | 239.36 kbps | 157.01 Mbps | 91.69 Mbps | 239.36 kbps |
| eth0_transmit | 202.79 kbps | 90.50 Mbps | 61.27 Mbps | 202.79 kbps |

| | min | max | avg | current |
|---|---|---|---|---|
| 15m | 0.36 | 9.31 | 5.75 | 7.83 |
| 5m | 0.38 | 10.45 | 6.63 | 6.08 |

| | min | max | avg | current |
|---|---|---|---|---|
| sda_Written bytes | 28.13 kBs | 26.41 MBs | 490.16 kBs | 28.13 kBs |
| sda_Written bytes | 20.28 kBs | 21.65 MBs | 726.42 kBs | 20.28 kBs |

| | min | max | avg | current |
|---|---|---|---|---|
| / | 64.9% | 67.7% | 66.0% | 67.3% |
| / | 61.7% | 62.7% | 62.2% | 62.7% |

## Conclusion and Next Steps:

Below points are observed for the registration processor packet processing:

i) Registration processor BIOGRAPHIC_VERIFICATION stage is taking high average time

( ~ 40 min) due to long time spent in biodedup service and slow keymanager API and as per trace file many times packet is picked from HDFS - https://mosip.atlassian.net/browse/MOSIP-8131

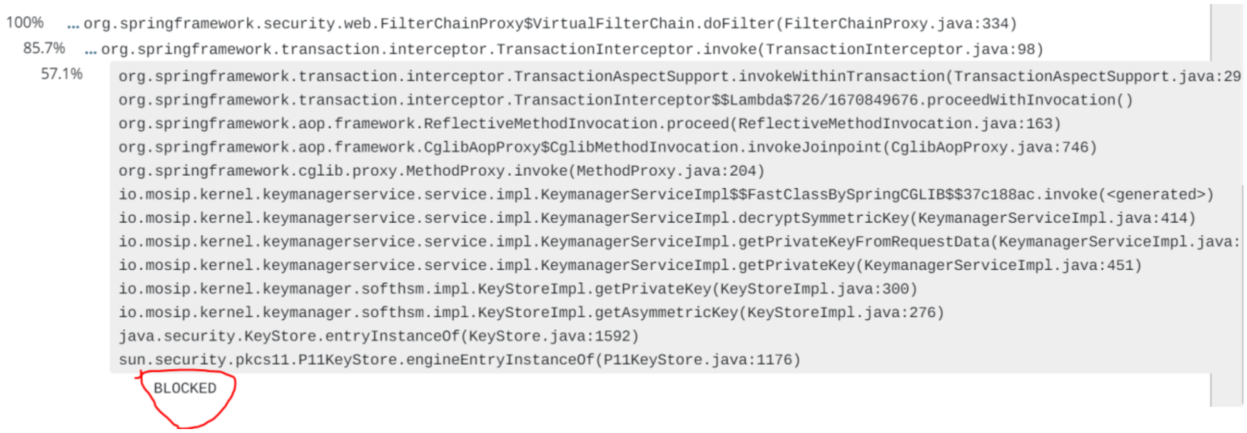
Please find below the Glowroot links for regprocessor bio dedup: http://52.172.24.126:4000/transaction/traces?agent-id=registration-processor-bio-dedupe-service&transaction-type=Web&from=1594794660000&to=1594797480000&modal-agent-id=registration-processor-bio-dedupe-service&modal-trace-id=01735146895b761b1c926ebcec9f0a43

Kernel Keymanager:

http://52.172.24.126:4000/transaction/traces?agent-id=kernel-keymanager-service&transaction-type=Web&from=1594794660000&to=1594797480000&modal-agent-id=kernel-keymanager-service&modal-trace-id=01735136ee8b5ceab3b2b34be841773e

ii)First 30 min CPU and average system load is going high and after 30 min for next 20 min average system load came down drastically ,Again the system load increase

iii)For Keymanager, high response time is observed due to blocking of softhsm related threads. Below screenshot of thread profile from Glowroot shows blocked thread.



```
100%   ... org.springframework.security.web.FilterChainProxy$VirtualFilterChain.doFilter(FilterChainProxy.java:334)
  85.7%   ... org.springframework.transaction.interceptor.TransactionInterceptor.invoke(TransactionInterceptor.java:98)
    57.1%     org.springframework.transaction.interceptor.TransactionAspectSupport.invokeWithinTransaction(TransactionAspectSupport.java:29
              org.springframework.transaction.interceptor.TransactionInterceptor$$Lambda$726/1670849676.proceedWithInvocation()
              org.springframework.aop.framework.ReflectiveMethodInvocation.proceed(ReflectiveMethodInvocation.java:163)
              org.springframework.aop.framework.CglibAopProxy$CglibMethodInvocation.invokeJoinpoint(CglibAopProxy.java:746)
              org.springframework.cglib.proxy.MethodProxy.invoke(MethodProxy.java:204)
              io.mosip.kernel.keymanagerservice.service.impl.KeymanagerServiceImpl$$FastClassBySpringCGLIB$$37c188ac.invoke(<generated>)
              io.mosip.kernel.keymanagerservice.service.impl.KeymanagerServiceImpl.decryptSymmetricKey(KeymanagerServiceImpl.java:414)
              io.mosip.kernel.keymanagerservice.service.impl.KeymanagerServiceImpl.getPrivateKeyFromRequestData(KeymanagerServiceImpl.java:
              io.mosip.kernel.keymanagerservice.service.impl.KeymanagerServiceImpl.getPrivateKey(KeymanagerServiceImpl.java:451)
              io.mosip.kernel.keymanager.softhsm.impl.KeyStoreImpl.getPrivateKey(KeyStoreImpl.java:300)
              io.mosip.kernel.keymanager.softhsm.impl.KeyStoreImpl.getAsymmetricKey(KeyStoreImpl.java:276)
              java.security.KeyStore.entryInstanceOf(KeyStore.java:1592)
              sun.security.pkcs11.P11KeyStore.engineEntryInstanceOf(P11KeyStore.java:1176)
                BLOCKED
```

As next step we can try if HSM can be pulled out and,  postgres and hdfs can run on a separate node/ external cluster; keeping above replication factor.

JIRA issues are raised for related issues and will follow up with dev team.