

# Load & Performance Test

## Detailed and Summary Report

**Date** : 1 & 2 June, 2018

**Purpose** - To figure out the cause of error which we are encountering on production server and checking the performance of microservices till yet

**Server** - There all tests are executed on `Dev (13.250.225.149)` server.

**Procedure** - Created a `Dummy Object` which can act as out container and passing that `container` to our process pipeline.

## Detailed Report

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I have performed seven tests on detailed report and summary of them is below.

Test	Container Size	Controller	Template	Writer
1	20k	7 ms	91006 ms	6961 ms
2	40k	28 ms	87046 ms	158621 ms
3	60k	478 ms	185468 ms	272536 ms
4	80k	310 ms	258494 ms	290783 ms
5	100k	102 ms	349745 ms	367905 ms
6	200k	1186 ms	779341 ms	1281883 ms
7*	300k	1524 ms	~ ms	! ms

\* In last test, it get stuck at `Template` for `1.5 hrs` then I canceled it

## Screenshots

## 20k

```
2018-06-01T13:11:36.268Z - info: [DetailedReportFilters] SELECT `type`, `app_title`, `timestamp_start`, `duration`, `user_rate`, `username`, `email`, `user_id`, `matter_id`, `cli
ent_id`, `cost` FROM timesheet inner join matter
    on timesheet.matter_id = matter.id
    inner join user_detail on timesheet.user_id = user_detail.id
    where timesheet.matter_id IN (select matter_id from gcm_name where group_id = 11)
2018-06-01T13:11:36.268Z - info: [messages] Starting Streamer...
2018-06-01T13:11:36.269Z - info: [streamData] Pushing to container
2018-06-01T13:11:36.271Z - info: [streamData] container ready with 20000
2018-06-01T13:11:36.271Z - info: [GCM] SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 11 group by matter_id
2018-06-01T13:11:36.612Z - info: [streamData] GCM recieved
streamer: 452.770ms ←----- Time taken by Streamer
2018-06-01T13:11:36.721Z - info: [messages] Starting Controller...
controller: 7.588ms ←----- Time taken by Controller
2018-06-01T13:11:36.730Z - info: [messages] In Template...
template: 91006.955ms ←----- Time taken by Template
2018-06-01T13:13:07.737Z - info: [messages] Writing File..
writer: 0.797ms
2018-06-01T13:13:07.738Z - info: [messages] Sending Mail...
2018-06-01T13:13:14.699Z - info: [streamData] { dev: 51713,
  mode: 33204,
  nlink: 1,
  uid: 222,
  gid: 500,
  rdev: 0,
  blksize: 4096,
  ino: 397839,
  size: 383328,
  blocks: 752,
  atime: 2018-06-01T13:13:14.688Z,
  mtime: 2018-06-01T13:13:14.696Z,
  ctime: 2018-06-01T13:13:14.696Z,
  birthtime: 2018-06-01T13:13:14.696Z } 'file created'
mailer: 6961.323ms ←----- Time taken by Writer
2018-06-01T13:13:14.700Z - info: [messages] Request done...
```

```
2018-06-01T13:08:11.527Z - info: [DetailedReportFilters] SELECT `type`, `app_title`, `timestamp_start`, `duration`, `user_rate`, `username`, `email`, `user_id`, `matter_id`, `cli
ent_id`, `cost` FROM timesheet inner join matter
    on timesheet.matter_id = matter.id
    inner join user_detail on timesheet.user_id = user_detail.id
    where timesheet.matter_id IN (select matter_id from gcm_name where group_id = 11)
2018-06-01T13:08:11.528Z - info: [messages] Starting Streamer...
2018-06-01T13:08:11.529Z - info: [streamData] Pushing to container
2018-06-01T13:08:11.532Z - info: [streamData] container ready with 20000
2018-06-01T13:08:11.533Z - info: [GCM] SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 11 group by matter_id
2018-06-01T13:08:12.224Z - info: [streamData] GCM recieved
streamer: 696.544ms
2018-06-01T13:08:12.226Z - info: [messages] Starting Controller...
controller: 228.974ms
2018-06-01T13:08:12.456Z - info: [messages] In Template...
template: 119894.523ms
2018-06-01T13:10:12.352Z - info: [messages] Writing File..
writer: 236.549ms
2018-06-01T13:10:12.589Z - info: [messages] Sending Mail...
2018-06-01T13:11:27.100Z - info: [streamData] { dev: 51713,
  mode: 33204,
  nlink: 1,
  uid: 222,
  gid: 500,
  rdev: 0,
  blksize: 4096,
  ino: 397839,
  size: 383328,
  blocks: 752,
  atime: 2018-06-01T13:11:27.091Z,
  mtime: 2018-06-01T13:11:27.091Z,
  ctime: 2018-06-01T13:11:27.091Z,
  birthtime: 2018-06-01T13:11:27.091Z } 'file created'
mailer: 74511.376ms
2018-06-01T13:11:27.101Z - info: [messages] Request done...
```

## 40k

```
2018-06-01T13:17:18.787Z - info: [DetailedReportFilters] SELECT `type`, `app_title`, `timestamp_start`, `duration`, `user_rate`, `username`, `email`, `user_id`, `matter_id`, `client_id`, `cost` FROM timesheet inner join matter
    on timesheet.matter_id = matter.id
    inner join user_detail on timesheet.user_id = user_detail.id
    where timesheet.matter_id IN (select matter_id from gcm_name where group_id = 11)
2018-06-01T13:17:18.791Z - info: [messages] Starting Streamer...
2018-06-01T13:17:18.792Z - info: [streamData] Pushing to container
2018-06-01T13:17:18.795Z - info: [streamData] container ready with 40000
2018-06-01T13:17:18.797Z - info: [GCM] SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 11 group by matter_id
2018-06-01T13:17:18.852Z - info: [streamData] GCM recieved
streamer: 61.192ms
2018-06-01T13:17:18.853Z - info: [messages] Starting Controller...
controller: 28.415ms
2018-06-01T13:17:18.883Z - info: [messages] In Template....
template: 87046.068ms
2018-06-01T13:18:46.039Z - info: [messages] Writing File..
writer: 239.571ms
2018-06-01T13:18:46.279Z - info: [messages] Sending Mail...
2018-06-01T13:21:24.900Z - info: [streamData] { dev: 51713,
  mode: 33204,
  nlink: 1,
  uid: 222,
  gid: 500,
  rdev: 0,
  blksize: 4096,
  ino: 397839,
  size: 761017,
  blocks: 1488,
  atime: 2018-06-01T13:21:24.667Z,
  mtime: 2018-06-01T13:21:24.891Z,
  ctime: 2018-06-01T13:21:24.891Z,
  birthtime: 2018-06-01T13:21:24.891Z } 'file created'
mailer: 158621.507ms
2018-06-01T13:21:24.902Z - info: [messages] Request done...
```

## 60k

```
2018-06-01T13:25:08.100Z - info: [DetailedReportFilters] SELECT `type`, `app_title`, `timestamp_start`, `duration`, `user_rate`, `username`, `email`, `user_id`, `matter_id`, `client_id`, `cost` FROM timesheet inner join matter
    on timesheet.matter_id = matter.id
    inner join user_detail on timesheet.user_id = user_detail.id
    where timesheet.matter_id IN (select matter_id from gcm_name where group_id = 11)
2018-06-01T13:25:08.212Z - info: [messages] Starting Streamer...
2018-06-01T13:25:08.213Z - info: [streamData] Pushing to container
2018-06-01T13:25:08.219Z - info: [streamData] container ready with 60000
2018-06-01T13:25:08.220Z - info: [GCM] SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 11 group by matter_id
2018-06-01T13:25:08.810Z - info: [streamData] GCM recieved
streamer: 597.441ms
2018-06-01T13:25:08.811Z - info: [messages] Starting Controller...
controller: 478.785ms
2018-06-01T13:25:09.290Z - info: [messages] In Template....
template: 185468.329ms
2018-06-01T13:28:14.759Z - info: [messages] Writing File..
writer: 241.657ms
2018-06-01T13:28:15.002Z - info: [messages] Sending Mail...
2018-06-01T13:32:47.535Z - info: [streamData] { dev: 51713,
  mode: 33204,
  nlink: 1,
  uid: 222,
  gid: 500,
  rdev: 0,
  blksize: 4096,
  ino: 397839,
  size: 1138844,
  blocks: 2232,
  atime: 2018-06-01T13:32:47.228Z,
  mtime: 2018-06-01T13:32:47.252Z,
  ctime: 2018-06-01T13:32:47.252Z,
  birthtime: 2018-06-01T13:32:47.252Z } 'file created'
mailer: 272536.357ms
2018-06-01T13:32:47.541Z - info: [messages] Request done...
```

```
2018-06-01T13:38:24.208Z - info: [DetailedReportFilters] SELECT `type`, `app_title`, `timestamp_start`, `duration`, `user_rate`, `username`, `email`, `user_id`, `matter_id`, `client_id`, `cost` FROM timesheet inner join matter
    on timesheet.matter_id = matter.id
    inner join user_detail on timesheet.user_id = user_detail.id
    where timesheet.matter_id IN (select matter_id from gcm_name where group_id = 11)
2018-06-01T13:38:24.211Z - info: [messages] Starting Streamer...
2018-06-01T13:38:24.213Z - info: [streamData] Pushing to container
2018-06-01T13:38:24.805Z - info: [streamData] container ready with 60000
2018-06-01T13:38:24.806Z - info: [GCM] SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 11 group by matter_id
2018-06-01T13:38:24.866Z - info: [streamData] GCM recieved
streamer: 655.324ms
2018-06-01T13:38:24.868Z - info: [messages] Starting Controller...
controller: 125.382ms
2018-06-01T13:38:24.994Z - info: [messages] In Template....
template: 181236.664ms
2018-06-01T13:41:26.232Z - info: [messages] Writing File..
writer: 242.124ms
2018-06-01T13:41:26.475Z - info: [messages] Sending Mail...
2018-06-01T13:45:42.712Z - info: [streamData] { dev: 51713,
  mode: 33204,
  nlink: 1,
  uid: 222,
  gid: 500,
  rdev: 0,
  blksize: 4096,
  ino: 397839,
  size: 1138845,
  blocks: 2232,
  atime: 2018-06-01T13:45:42.363Z,
  mtime: 2018-06-01T13:45:42.371Z,
  ctime: 2018-06-01T13:45:42.371Z,
  birthtime: 2018-06-01T13:45:42.371Z } 'file created'
mailer: 256438.121ms
2018-06-01T13:45:42.916Z - info: [messages] Request done...
```

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## 80k

```
2018-06-01T13:50:17.591Z - info: [DetailedReportFilters] SELECT `type`, `app_title`, `timestamp_start`, `duration`, `user_rate`, `username`, `email`, `user_id`, `matter_id`, `client_id`, `cost` FROM timesheet inner join matter
    on timesheet.matter_id = matter.id
    inner join user_detail on timesheet.user_id = user_detail.id
    where timesheet.matter_id IN (select matter_id from gcm_name where group_id = 11)
2018-06-01T13:50:17.595Z - info: [messages] Starting Streamer...
2018-06-01T13:50:17.596Z - info: [streamData] Pushing to container
2018-06-01T13:50:18.413Z - info: [streamData] container ready with 80000
2018-06-01T13:50:18.414Z - info: [GCM] SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 11 group by matter_id
2018-06-01T13:50:18.480Z - info: [streamData] GCM recieved
streamer: 886.198ms
2018-06-01T13:50:18.482Z - info: [messages] Starting Controller...
controller: 310.705ms
2018-06-01T13:50:18.794Z - info: [messages] In Template....
template: 258494.369ms
2018-06-01T13:54:37.289Z - info: [messages] Writing File..
writer: 226.470ms
2018-06-01T13:54:37.516Z - info: [messages] Sending Mail...
2018-06-01T13:59:28.224Z - info: [streamData] { dev: 51713,
  mode: 33204,
  nlink: 1,
  uid: 222,
  gid: 500,
  rdev: 0,
  blksize: 4096,
  ino: 397839,
  size: 1516590,
  blocks: 2968,
  atime: 2018-06-01T13:59:28.095Z,
  mtime: 2018-06-01T13:59:28.103Z,
  ctime: 2018-06-01T13:59:28.103Z,
  birthtime: 2018-06-01T13:59:28.103Z } 'file created'
mailer: 290783.112ms
2018-06-01T13:59:28.308Z - info: [messages] Request done...
```

## 100k

```
2018-06-01T14:03:17.852Z - info: [DetailedReportFilters] SELECT `type`, `app_title`, `timestamp_start`, `duration`, `user_rate`, `username`, `email`, `user_id`, `matter_id`, `client_id`, `cost` FROM timesheet inner join matter
  on timesheet.matter_id = matter.id
  inner join user_detail on timesheet.user_id = user_detail.id
  where timesheet.matter_id IN (select matter_id from gcm_name where group_id = 11)
2018-06-01T14:03:17.855Z - info: [messages] Starting Streamer...
2018-06-01T14:03:17.857Z - info: [streamData] Pushing to container
2018-06-01T14:03:19.148Z - info: [streamData] container ready with 100000
2018-06-01T14:03:19.149Z - info: [GCM] SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 11 group by matter_id
2018-06-01T14:03:19.233Z - info: [streamData] GCM recieved
streamer: 1378.285ms
2018-06-01T14:03:19.235Z - info: [messages] Starting Controller...
controller: 102.462ms
2018-06-01T14:03:19.338Z - info: [messages] In Template....
template: 349745.777ms
2018-06-01T14:09:09.085Z - info: [messages] Writing File..
writer: 237.857ms
2018-06-01T14:09:09.324Z - info: [messages] Sending Mail...
2018-06-01T14:15:17.229Z - info: [streamData] { dev: 51713,
  mode: 33204,
  nlink: 1,
  uid: 222,
  gid: 500,
  rdev: 0,
  blksize: 4096,
  ino: 397839,
  size: 1894288,
  blocks: 3704,
  atime: 2018-06-01T14:15:17.092Z,
  mtime: 2018-06-01T14:15:17.104Z,
  ctime: 2018-06-01T14:15:17.104Z,
  birthtime: 2018-06-01T14:15:17.104Z } 'file created'
mailer: 367905.904ms
2018-06-01T14:15:17.231Z - info: [messages] Request done...
```

## 200k

```
2018-06-01T14:18:43.154Z - info: [DetailedReportFilters] SELECT `type`, `app_title`, `timestamp_start`, `duration`, `user_rate`, `username`, `email`, `user_id`, `matter_id`, `client_id`, `cost` FROM timesheet inner join matter
  on timesheet.matter_id = matter.id
  inner join user_detail on timesheet.user_id = user_detail.id
  where timesheet.matter_id IN (select matter_id from gcm_name where group_id = 11)
2018-06-01T14:18:43.157Z - info: [messages] Starting Streamer...
2018-06-01T14:18:43.158Z - info: [streamData] Pushing to container
2018-06-01T14:19:07.467Z - info: [streamData] container ready with 200000
2018-06-01T14:19:07.469Z - info: [GCM] SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 11 group by matter_id
2018-06-01T14:19:08.165Z - info: [streamData] GCM recieved
streamer: 25007.813ms
2018-06-01T14:19:08.166Z - info: [messages] Starting Controller...
controller: 1186.970ms
2018-06-01T14:19:09.354Z - info: [messages] In Template....

Message from syslogd@ip-172-31-5-190 at Jun  1 14:24:46 ...
kernel:[1894669.316758] BUG: workqueue lockup - pool cpus=0 node=0 flags=0x0 nice=0 stuck for 38s!

Message from syslogd@ip-172-31-5-190 at Jun  1 14:24:46 ...
kernel:[1894669.379799] BUG: workqueue lockup - pool cpus=0 flags=0x4 nice=0 stuck for 33s!
template: 779341.236ms
2018-06-01T14:32:08.748Z - info: [messages] Writing File..
writer: 1273.416ms
2018-06-01T14:32:10.120Z - info: [messages] Sending Mail...
2018-06-01T14:53:31.972Z - info: [streamData] { dev: 51713,
  mode: 33204,
  nlink: 1,
  uid: 222,
  gid: 500,
  rdev: 0,
  blksize: 4096,
  ino: 397839,
  size: 3795816,
  blocks: 7416,
  atime: 2018-06-01T14:53:31.316Z,
  mtime: 2018-06-01T14:53:31.356Z,
  ctime: 2018-06-01T14:53:31.356Z,
  birthtime: 2018-06-01T14:53:31.356Z } 'file created'
mailer: 1281883.355ms
2018-06-01T14:53:32.006Z - info: [messages] Request done...
```

## Container Size vs Report Size

Container Size	File Size
20k	384 KB
40k	762 KB
60k	1.1 MB
80k	1.48 MB
100k	1.85 MB
200k	3.72 MB

## Summary Report

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I have performed seven tests on detailed report and summary of them is below.

Test	Container Size	Controller	Template	Writer
1	100k	58193 <i>ms</i>	1311 <i>ms</i>	2379 <i>ms</i>
2	400k	416071 <i>ms</i>	3082 <i>ms</i>	5600 <i>ms</i>
3	1000k	1095364 <i>ms</i>	142 <i>ms</i>	247 <i>ms</i>

## Report Size

We can't use **Dummy Object** to check performance and load on `template` and `writer` in this case because we are filtering data user wise and as in **Dummy Object** we have only one user's data so it keep overwrite only one user again and again.

We will test this thing with real data soon. From these tests we can check the performance of controller only.

# Screenshots

## 100k

```
2018-06-02T05:06:40.737Z - info: select * from timesheet left outer join gcm_details
on timesheet.matter_id = gcm_details.matter_id
where timesheet.matter_id in (select matter_id from gcm_name where group_id = 226)
Starting Streamer...
Container ready with 100000
2018-06-02T05:06:42.053Z - info: SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 226 group by matter_id
streamer: 1364.660ms
Starting Controller...
2018-06-02T05:06:42.324Z - info: Concerned matters are : 1443
controller: 58193.619ms
In Template...
template: 1311.284ms
Writing File...
2018-06-02T05:07:43.992Z - info: { dev: 51713,
  mode: 33204,
  nlink: 1,
  uid: 222,
  gid: 500,
  rdev: 0,
  blksize: 4096,
  ino: 395199,
  size: 7468,
  blocks: 16,
  atime: 2018-06-02T05:07:43.983Z,
  mtime: 2018-06-02T05:07:43.983Z,
  ctime: 2018-06-02T05:07:43.983Z,
  birthtime: 2018-06-02T05:07:43.983Z } 'file created'
writer: 2379.681ms
Mailer...
2018-06-02T05:07:46.798Z - info: delete message as message sent
mailer: 2805.742ms
Request Done
```

## 400k

```
2018-06-02T05:08:47.408Z - info: select * from timesheet left outer join gcm_details
on timesheet.matter_id = gcm_details.matter_id
where timesheet.matter_id in (select matter_id from gcm_name where group_id = 226)
Starting Streamer...
Container ready with 400000
2018-06-02T05:09:35.465Z - info: SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 226 group by matter_id
streamer: 48638.969ms
Starting Controller...
2018-06-02T05:09:46.160Z - info: Concerned matters are : 1443
controller: 416071.567ms
In Template...
template: 3082.090ms
Writing File...
2018-06-02T05:16:40.809Z - info: { dev: 51713,
  mode: 33204,
  nlink: 1,
  uid: 222,
  gid: 500,
  rdev: 0,
  blksize: 4096,
  ino: 395199,
  size: 7466,
  blocks: 16,
  atime: 2018-06-02T05:16:40.675Z,
  mtime: 2018-06-02T05:16:40.727Z,
  ctime: 2018-06-02T05:16:40.727Z,
  birthtime: 2018-06-02T05:16:40.727Z } 'file created'
writer: 5600.894ms
Mailer...
2018-06-02T05:16:44.965Z - info: delete message as message sent
mailer: 4194.082ms
Request Done
```

1000k

```
2018-06-02T05:18:26.208Z - info: select * from timesheet left outer join gcm_details
on timesheet.matter_id = gcm_details.matter_id
where timesheet.matter_id in (select matter_id from gcm_name where group_id = 226)
Starting Streamer...
Container ready with 1000000
2018-06-02T05:23:15.756Z - info: SELECT matter_id, client_id, group_id, matter_name, client_name, group_name FROM gcm_name where group_id = 226 group by matter_id
streamer: 292928.370ms
Starting Controller...
2018-06-02T05:23:57.686Z - info: Concerned matters are : 1443
controller: 1095364.275ms
In Template...
template: 142.176ms
Writing File...
2018-06-02T05:41:34.905Z - info: { dev: 51713,
mode: 33204,
nlink: 1,
uid: 222,
gid: 500,
rdev: 0,
blksize: 4096,
ino: 395199,
size: 7458,
blocks: 16,
atime: 2018-06-02T05:41:34.892Z,
mtime: 2018-06-02T05:41:34.896Z,
ctime: 2018-06-02T05:41:34.896Z,
birthtime: 2018-06-02T05:41:34.896Z } 'file created'
writer: 247.189ms
Mailer...
2018-06-02T05:41:37.445Z - info: delete message as message sent
mailer: 2540.871ms
Request Done
```

## Result

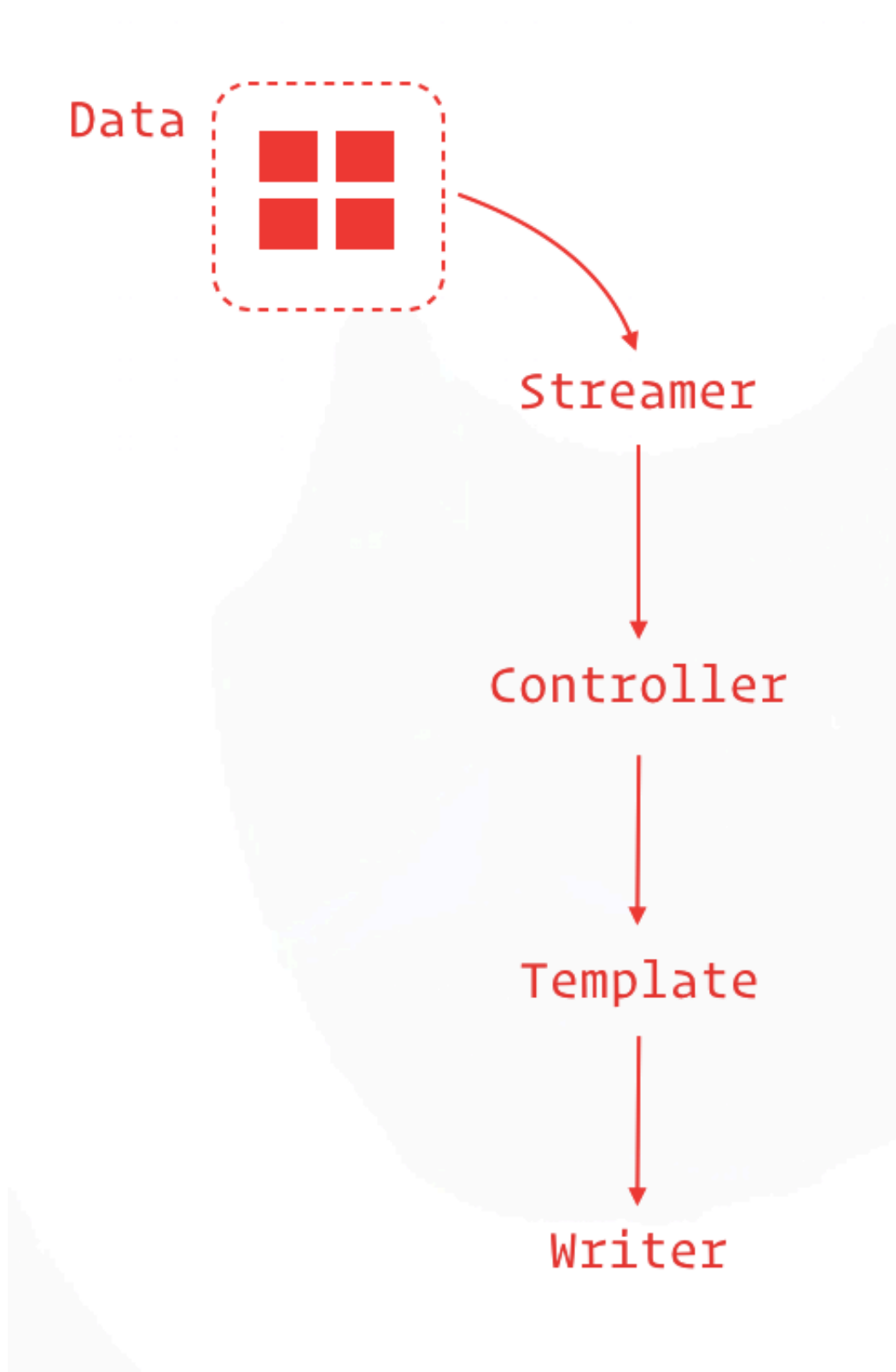
- As we can see by checking these outputs that our application can handle 1 Million of data without throwing any memory leak exception so we have to dig more onto production server. The only difference between dev and prod servers is that dev server has swap are configured. I am not sure about this but I think this can also be a reason that why dev server are behaving differently than prod
- We have to improve our detailed list template.

## Suggestions

Right now we are not using the full potential of Streamer. The current flow of data is something like this

### Current Data Flow

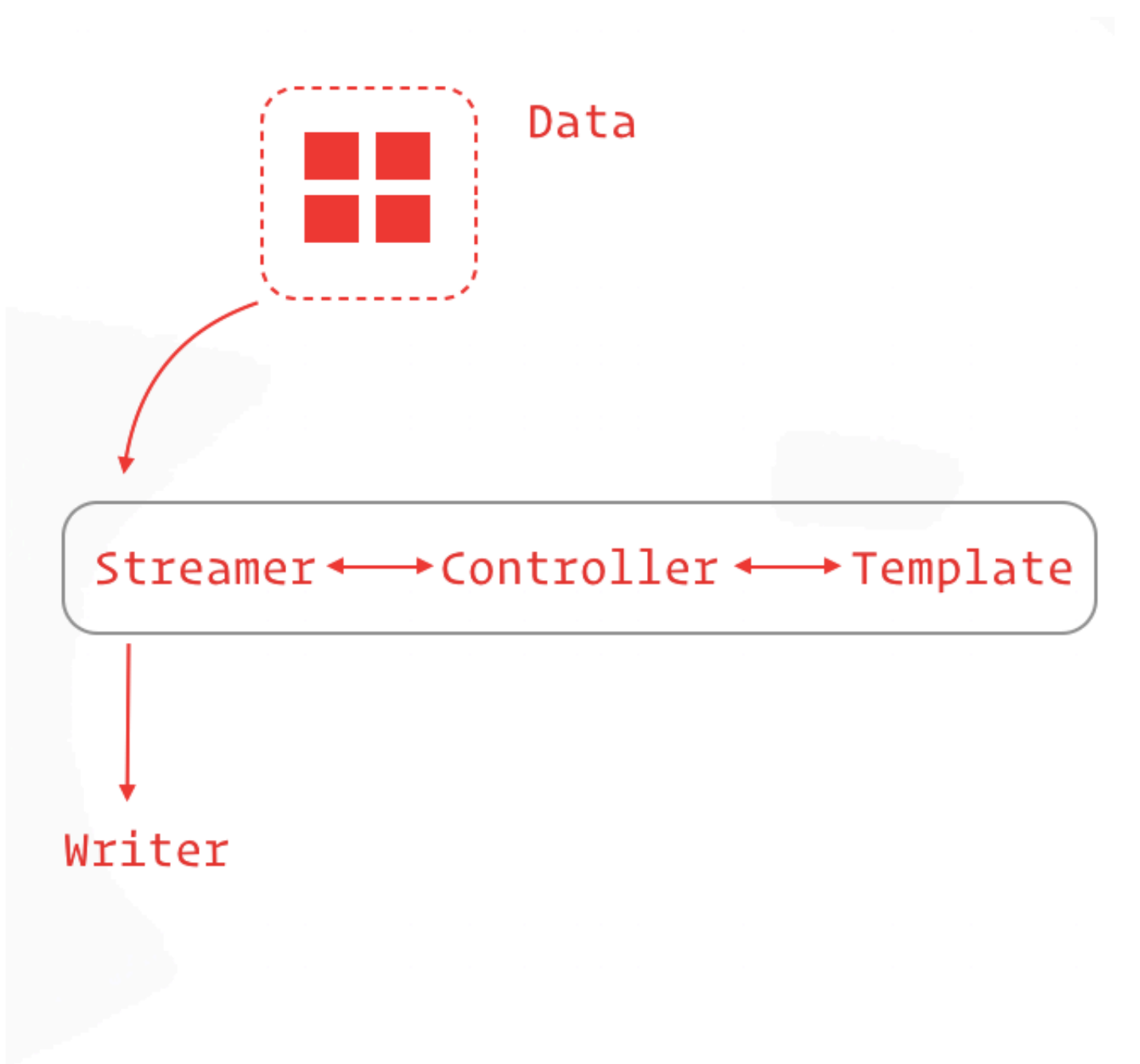




Here the streamer is working as a simple `mysql` query because we are still waiting for whole data to fetch first and then we proceed to controller

### Proposed Data Flow

We must change this flow to-



Here `Streamer` , `Controller` & `Template` will work collaboratively and prepare the final object which we will pass to `writer` and then to `mailer` . Hope this will improve the speed of this process.

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## About

Prepared By	Gaurav Mehla
Time Taken	55 min

