

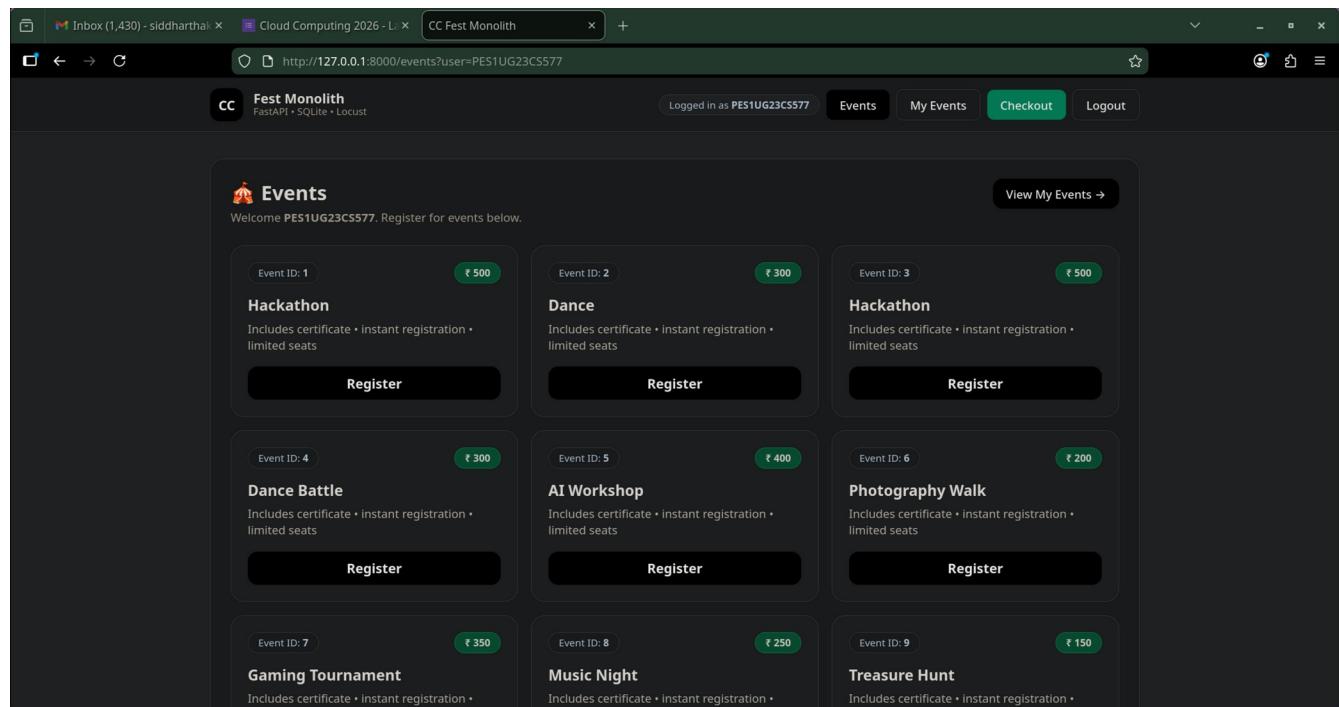
Cloud Computing

Lab 2

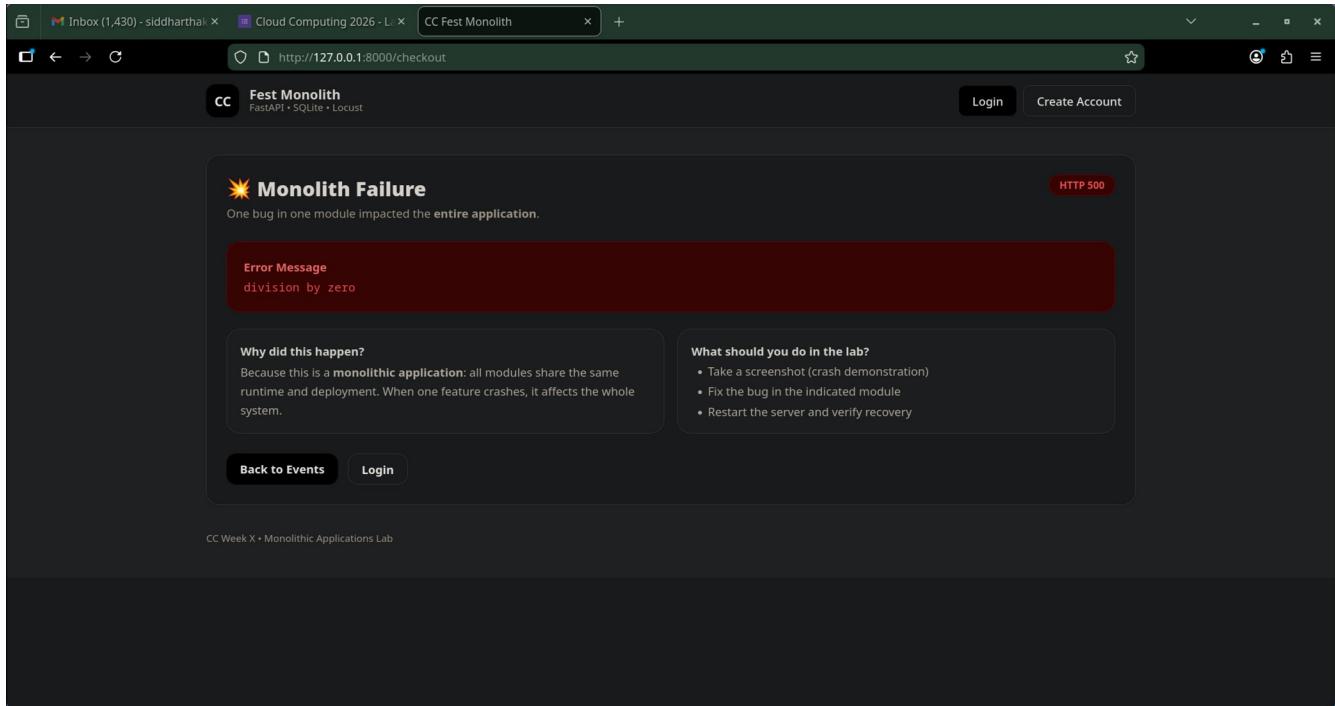
Monolithic Architecture

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Section J

ss1

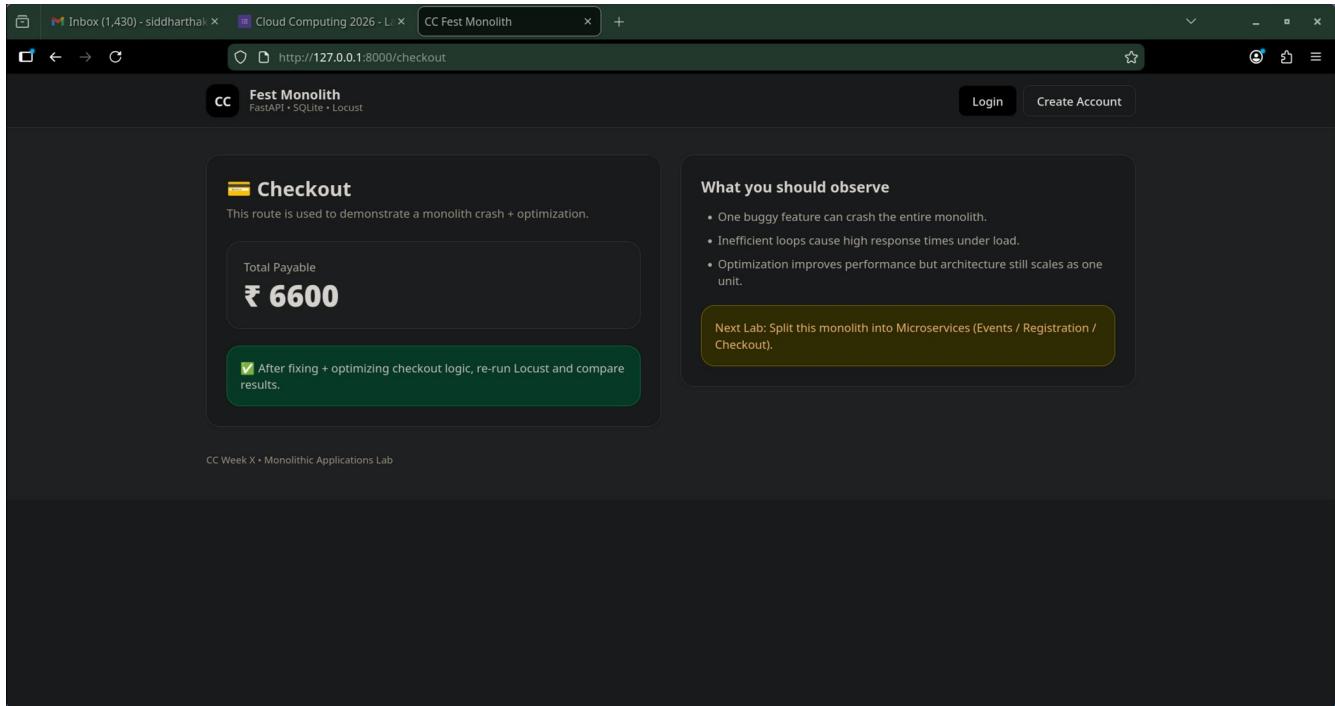


ss2



```
WARNING: StatReload detected changes in 'checkout/__init__.py'. Reloading...
INFO: Shutting down
INFO: Waiting for application shutdown.
INFO: Application shutdown complete.
INFO: Finished server process [44086]
INFO: Started server process [48322]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: 127.0.0.1:59816 - "GET /checkout HTTP/1.1" 500 Internal Server Error
ERROR: Exception in ASGI application
Traceback (most recent call last):
  File "/home/sid/CC/PESIUG23C5577/CC Lab-2/.venv/lib/python3.14/site-packages/uvicorn/protocols/http/h11_impl.py", line 410, in run_asgi
    result = await app( # type: ignore[func-returns-value]
               ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
               self.scope, self.receive, self.send
               ^^^^^^^^^^^^^^^^^^^^^^^^^^
```

ss3



```
WARNING: StatReload detected changes in 'checkout/__init__.py'. Reloading...
INFO: Shutting down
INFO: Waiting for application shutdown.
INFO: Application shutdown complete.
INFO: Finished server process [48322]
INFO: Started server process [49183]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: 127.0.0.1:58328 - "GET /checkout HTTP/1.1" 200 OK
```

ss4 unable to take side by side but its the same in 2 diff

The screenshot shows the Locust web interface at <http://127.0.0.1:8089>. The interface has tabs for STATISTICS, CHARTS, FAILURES, EXCEPTIONS, CURRENT RATIO, DOWNLOAD DATA, and LOGS. The STATISTICS tab is selected. The host is listed as <http://127.0.0.1:8000> with a status of STOPPED, RPS of 0.6, and 0% failures. There are buttons for NEW and RESET. The main table displays two rows of data:

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/checkout	20	0	5	8	8	5.2	2	8	2797	0.6	0
	Aggregated	20	0	5	8	8	5.2	2	8	2797	0.6	0

At the bottom right of the interface is an 'ABOUT' link.

```
Type      Name      50%    66%    75%    80%    90%    95%    98%    99%    99.9% 99.99% 100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
> locust -f Locust/checkout_locustfile.py
[2026-01-29 14:57:46,304] archlinux/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 14:57:46,305] archlinux/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 14:58:39,184] archlinux/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 14:58:39,184] archlinux/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T09:29:33Z
[2026-01-29 14:59:33,497] archlinux/INFO/locust.main: Shutting down (exit code 0)
Type      Name      # reqs     # fails | Avg      Min      Max      Med | req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /checkout   20       0(0.00%) | 5        2        8        5 | 0.68     0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          20       0(0.00%) | 5        2        8        5 | 0.68     0.00

Response time percentiles (approximated)
Type      Name      50%    66%    75%    80%    90%    95%    98%    99%    99.9% 99.99% 100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /checkout   6       8       8       8       8       8       8       8       8       8       8       8       20
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          6       8       8       8       8       8       8       8       8       8       8       8       20

~/CC/PES1UG623CS577/CC Lab-2 1m 47s CC Lab-2 > 02:59:33 PM
```

ss5

The screenshot shows the Locust web interface for a performance test on the 'CC Fest Monolith' application. The top navigation bar includes tabs for 'Inbox (1,430) - siddharthalk x', 'Cloud Computing 2026 - L x', 'CC Fest Monolith x', and 'Locust x'. The URL is http://127.0.0.1:8089.

The main dashboard displays various metrics:

- Host:** http://127.0.0.1:8000
- Status:** STOPPED
- RPS:** 0.7
- Failures:** 0%

Buttons for 'NEW' and 'RESET' are visible.

The navigation menu includes links for STATISTICS (highlighted), CHARTS, FAILURES, EXCEPTIONS, CURRENT RATIO, DOWNLOAD DATA, and LOGS.

A legend icon in the top right corner indicates three bars.

The data table below shows the results for two requests:

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/checkout	21	0	6	7	8	5.15	2	8	2797	0.7	0
Aggregated												
		21	0	6	7	8	5.15	2	8	2797	0.7	0

previously it was 5.2 now it is 5.15 showing increase under same load

number of requests also increased by 1 in the same time after optimization

rps increased by 0.1 0.6->0.7

ss6

Host: http://127.0.0.1:8089 | Status: STOPPED | RPS: 0.6 | Failures: 0%

NEW RESET

STATISTICS CHARTS FAILURES EXCEPTIONS CURRENT RATIO DOWNLOAD DATA LOGS

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/events?user=locust_user	19	0	83	110	110	84.01	74	105	21138	0.6	0
Aggregated												
		19	0	83	110	110	84.01	74	105	21138	0.6	0

```
Response time percentiles (approximated)
Type      Name      50%    66%    75%    80%    90%    95%    98%    99%    99.9% 99.99% 100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET     /checkout      6       7
> locust -f Locust/events_locustfile.py
[2026-01-29 15:14:23,915] archlinux/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 15:14:23,915] archlinux/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 15:15:04,321] archlinux/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:15:04,322] archlinux/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T09:45:54Z
[2026-01-29 15:15:04,725] archlinux/INFO/locust.main: Shutting down (exit code 0)
Type      Name      # reqs   # fails | Avg      Min      Max      Med | req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET     /events?user=locust_user 19  0(0.00%) | 84      74      105     83 | 0.67      0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated 19  0(0.00%) | 84      74      105     83 | 0.67      0.00

Response time percentiles (approximated)
Type      Name      50%    66%    75%    80%    90%    95%    98%    99%    99.9% 99.99% 100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET     /events?user=locust_user 83   86    87    88    90    110    110    110    110    110    110    110    19
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated 83   86    87    88    90    110    110    110    110    110    110    110    19

~/CC/PES1UG23CS577/CC Lab-2 1m 31s CC Lab-2 > 03:15:54 PM
```

ss7

The screenshot shows the Locust web interface for a performance test. The top navigation bar includes tabs for 'Inbox (1,430) - siddharthak', 'Cloud Computing 2026 - L', 'CC Fest Monolith', and 'Locust'. The main title 'LOCUST' is displayed with a green 'NEW' button and an orange 'RESET' button. The interface has tabs for 'STATISTICS' (selected), 'CHARTS', 'FAILURES', 'EXCEPTIONS', 'CURRENT RATIO', 'DOWNLOAD DATA', and 'LOGS'. A summary table at the bottom provides detailed metrics for a single request type.

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/events?user=locust_user	21	0	7	8	8	5.75	2	8	21138	0.7	0
Aggregated		21	0	7	8	8	5.75	2	8	21138	0.7	0

The main bottleneck was the intentional loops in /events loop running 3,000,000 iterations

```
waste = 0  
for i in range(3000000):  
    waste += i % 3
```

removed these lines

Performance improved because:

The server no longer wastes CPU time

Requests complete faster

Response time dropped because only useful work is executed

ss8

The screenshot shows the Locust web interface for a performance test. The top navigation bar includes tabs for 'Inbox (1,431) - siddharthak', 'Cloud Computing 2026 - L...', 'CC Fest Monolith', 'Locust', and a '+' button. The URL is http://127.0.0.1:8089.

The main header features the Locust logo and navigation buttons for 'NEW' and 'RESET'. Below the header, there are tabs for 'STATISTICS' (which is selected), 'CHARTS', 'FAILURES', 'EXCEPTIONS', 'CURRENT RATIO', 'DOWNLOAD DATA', and 'LOGS'. A 'More' button is located on the right side of the header.

The 'STATISTICS' section displays performance metrics for a single test scenario:

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/my-events?user=locust_user	21	0	43	51	54	42.81	35	54	3144	0.8	0
Aggregated		21	0	43	51	54	42.81	35	54	3144	0.8	0

At the bottom right, there are 'ABOUT' and 'CONTACT' links.

```

> locust -f Locust/myevents_locustfile.py
[2026-01-29 15:43:48,064] archlinux/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 15:43:48,065] archlinux/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 15:45:02,719] archlinux/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:45:02,719] archlinux/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T10:16:05Z
[2026-01-29 15:46:05,270] archlinux/INFO/locust.main: Shutting down (exit code 0)
Type      Name           # reqs     # fails |   Avg    Min    Max    Med | req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /my-events?user=Locust_user          21      0(0.00%) | 42     34    54    43 | 0.71      0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated                         21      0(0.00%) | 42     34    54    43 | 0.71      0.00

Response time percentiles (approximated)
Type      Name           50%   66%   75%   80%   90%   95%   98%   99%   99.9% 99.99%
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
%      100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-----+-----+
GET      /my-events?user=Locust_user          43     44    46    46    50    51    54    54    54    54    5
4      54    21
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-----+-----+
Aggregated                         43     44    46    46    50    51    54    54    54    54    5
4      54    21

~/CC/PES1UG23CS577/CC Lab-2 2m 17s CC Lab-2 > 03:46:05 PM

```

ss9

The screenshot shows the Locust web interface at <http://127.0.0.1:8089>. The top bar displays tabs for 'Inbox (1,431) - siddhartha', 'Cloud Computing 2026 - L...', 'CC Fest Monolith', and 'Locust'. The Locust interface has tabs for 'STATISTICS' (selected), 'CHARTS', 'FAILURES', 'EXCEPTIONS', 'CURRENT RATIO', 'DOWNLOAD DATA', and 'LOGS'. The 'Host' is set to <http://127.0.0.1:8000>, 'Status' is 'STOPPED', 'RPS' is 0.7, and 'Failures' is 0%. Buttons for 'NEW' and 'RESET' are visible. The main table provides detailed statistics for a single request type:

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s	
GET	/my-events?user=locust_user	21	0	6	8	16	5.85	2	16	3144	0.7	0
Aggregated		21	0	6	8	16	5.85	2	16	3144	0.7	0

```
> locust -f Locust/myevents_locustfile.py
[2026-01-29 15:48:22,370] archlinux/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 15:48:22,370] archlinux/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 15:48:34,099] archlinux/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:48:34,099] archlinux/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T0:19:20Z
[2026-01-29 15:49:20,723] archlinux/INFO/locust.main: Shutting down (exit code 0)
Type      Name           # reqs | # fails | Avg | Min | Max | Med | req/s | failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /my-events?user=locust_user    21  |  0(0.00%) |  5  |  2  | 15  |  6  |  0.70 |  0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+
          Aggregated      21  |  0(0.00%) |  5  |  2  | 15  |  6  |  0.70 |  0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+
Response time percentiles (approximated)
Type      Name           50% | 66% | 75% | 80% | 90% | 95% | 98% | 99% | 99.9% | 99.99%
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
% 100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-----+-----+
GET      /my-events?user=locust_user    6  |  7  |  7  |  7  |  8  |  8  |  16  |  16  |  16  |  1
6   16  21
-----+-----+
          Aggregated      6  |  7  |  7  |  7  |  8  |  8  |  16  |  16  |  16  |  1
6   16  21
~/CC/PE51UG23CS577/CC Lab-2 59s CC Lab-2 > | 03:49:20 PM
```

bottleneck was caused by these lines in /my-events
it ran 1,500,000 iterations

```
dummy = 0
for _ in range(1500000): dummy += 1
```

removed these lines

Performance improved because of the same reasons as above:

The server no longer wastes CPU time

Requests complete faster

Response time dropped because only useful work is executed