

## 10 users

```
chuanhuihe@chuanhuis-MacBook-Air e1 % python -m locust -f locustfile.py \
--host=http://localhost:8080 \
--users 10 \
--spawn-rate 5 \
--run-time 10s \
--headless
[2025-11-12 09:47:23,633] chuanhuis-MacBook-Air/INFO/locust.main: Starting Locust 2.34.0
[2025-11-12 09:47:23,633] chuanhuis-MacBook-Air/WARNING/locust.main: Python 3.9 support is deprecated and will be removed soon
[2025-11-12 09:47:23,633] chuanhuis-MacBook-Air/INFO/locust.main: Run time limit set to 10 seconds
Type      Name    # reqs     # fails |   Avg     Min     Max     Med |   req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          0    0(0.00%) |    0     0     0     0 |    0.00     0.00

=====
🔥 Load test started!
=====
Target host: http://localhost:8080
User count: 10
=====

[2025-11-12 09:47:23,634] chuanhuis-MacBook-Air/INFO/locust.runners: Ramping to 10 users at a rate of 5.00 per second
● User user_3427 online
● User user_2371 online
● User user_9631 online
● User user_5848 online
● User user_4725 online
[2025-11-12 09:47:24,634] chuanhuis-MacBook-Air/INFO/locust.runners: All users spawned: {"CouponGrabUser": 10} (10 total users)
● User user_868 online
● User user_7937 online
● User user_6039 online
● User user_8361 online
● User user_9516 online
Type      Name    # reqs     # fails |   Avg     Min     Max     Med |   req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET    /admin/stats    249    0(0.00%) |    1     0     13     2 |    0.00     0.00
POST   /api/coupon/grab 1218    0(0.00%) |    1     0     19     1 |    0.00     0.00
POST   /api/like       699    0(0.00%) |    1     0     18     1 |    0.00     0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          2166    0(0.00%) |    1     0     19     1 |    0.00     0.00

Type      Name    # reqs     # fails |   Avg     Min     Max     Med |   req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET    /admin/stats    551    0(0.00%) |    1     0     19     2 |    74.00     0.00
POST   /api/coupon/grab 2860    0(0.00%) |    1     0     19     1 |   349.50     0.00
POST   /api/like       1690    0(0.00%) |    1     0     19     1 |   198.00     0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          5101    0(0.00%) |    1     0     19     1 |   621.50     0.00

Type      Name    # reqs     # fails |   Avg     Min     Max     Med |   req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET    /admin/stats    885    0(0.00%) |    1     0     19     1 |   115.25     0.00
POST   /api/coupon/grab 4455    0(0.00%) |    1     0     19     1 |   584.50     0.00
POST   /api/like       2712    0(0.00%) |    1     0     19     1 |   345.00     0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          8052    0(0.00%) |    1     0     19     1 |   1044.75    0.00

Type      Name    # reqs     # fails |   Avg     Min     Max     Med |   req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET    /admin/stats   1228    0(0.00%) |    1     0     19     1 |   130.17     0.00
POST   /api/coupon/grab 6061    0(0.00%) |    1     0     19     1 |   659.67     0.00
POST   /api/like       3703    0(0.00%) |    1     0     19     1 |   396.67     0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          10992   0(0.00%) |    1     0     19     1 |   1186.50    0.00

[2025-11-12 09:47:33,517] chuanhuis-MacBook-Air/INFO/locust.main: --run-time limit reached, shutting down
=====
✅ Load test completed!
=====
```

## Experiment Design

### Objective

Determine whether event filtering reduces queue buildup and worker load without impacting system reliability or user-facing performance.

### Test Configuration

- **Concurrent Users:** 500 virtual users
- **Test Duration:** 2 minutes per configuration
- **Services:** Coupon grab events and Like interaction events
- **Target Load:** ~2,400 requests/second
- **Infrastructure:** FastAPI backend, RabbitMQ message queue, Locust load testing

```
Total requests: 13780
Failures: 0
Failure rate: 0.00%
Average response time: 1.12 ms
P95 response time: 2.00 ms
P99 response time: 4.00 ms
RPS (requests per second): 1394.34
=====
[2025-11-12 09:47:33,536] chuanhuis-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
Type      Name    # reqs     # fails |   Avg     Min     Max   Med |  req/s failures/s
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
GET      /admin/stats  1521    0(0.00%) |   1     0     19    1 | 153.90      0.00
POST     /api/coupon/grab 7631    0(0.00%) |   1     0     20    1 | 772.15      0.00
POST     /api/like       4628    0(0.00%) |   1     0     19    1 | 468.29      0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
                           Aggregated  13780  0(0.00%) |   1     0     20    1 | 1394.34      0.00
Response time percentiles (approximated)
Type      Name    50%    66%    75%    80%    90%    95%    98%    99%  99.9% 99.99% 100% # reqs
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
GET      /admin/stats   1     2     2     2     2     3     4     5     18    19    19    1521
POST     /api/coupon/grab 1     1     1     1     1     2     2     4     18    20    20    7631
POST     /api/like       1     1     1     1     1     2     2     4     17    19    19    4628
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
                           Aggregated   1     1     1     1     2     2     3     4     18    19    20   13780
chuanhuihe@chuanhuis-MacBook-Air e1 %
```

### 500 users: no filter

```
● chuanhuihe@chuanhuis-MacBook-Air e1 % docker exec rabbitmq rabbitmqctl list_queues
Timeout: 60.0 seconds ...
Listing queues for vhost / ...
name      messages
event_queue    257898
=====
```

Total requests: 289952

Failures: 0

Failure rate: 0.00%

Average response time: 171.40 ms

P95 response time: 230.00 ms

P99 response time: 340.00 ms

RPS (requests per second): 2415.04

=====

[2025-11-12 16:56:58,553] chuanhuis-MacBook-Air/INFO/locust.main: writing html report to file: report\_no\_filter.html

[2025-11-12 16:56:58,555] chuanhuis-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)

Type	Name	# reqs	# fails	Avg	Min	Max	Med	req/s	failures/s
GET	/admin/stats	32264	0(0.00%)	171	8	759	170	268.73	0.00
POST	/api/coupon/grab	161148	0(0.00%)	171	16	888	170	1342.22	0.00
POST	/api/like	96540	0(0.00%)	171	8	887	170	804.09	0.00
----- ----- ----- ----- ----- ----- ----- ----- ----- -----									
Aggregated									
		289952	0(0.00%)	171	8	888	170	2415.04	0.00

#### Response time percentiles (approximated)

Type	Name	50%	66%	75%	80%	90%	95%	98%	99%	99.9%	99.99%	100%	# reqs
GET	/admin/stats	170	180	180	190	200	230	290	350	570	670	760	32264
POST	/api/coupon/grab	170	180	180	190	200	230	290	340	560	670	890	161148
POST	/api/like	170	180	180	190	200	230	290	350	560	650	890	96540

Aggregated 170 180 180 190 200 230 290 340 560 670 890 289952

## 500 users: with filter

```
chuanhuihe@chuanhuis-MacBook-Air e1 % docker exec rabbitmq rabbitmqctl list_queues  
Timeout: 60.0 seconds ...  
Listing queues for vhost / ...  
name      messages  
event queue    100351
```

Total requests: 290257

Failures: 0

Failure rate: 0.00%

Average response time: 171.28 ms

P95 response time: 220.00 ms

P99 response time: 320.00 ms

RPS (requests per second): 2414.19

[2025-11-12 17:12:00,666] chuanhuis-MacBook-Air/INFO/locust.main: writing html report to file: report\_with\_filter.html

[2025-11-12 17:12:00,668] chuanhuis-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)

Type	Name	# reqs	# fails	Avg	Min	Max	Med	req/s	failures/s
------	------	--------	---------	-----	-----	-----	-----	-------	------------

-----|-----|-----|-----|-----|-----|-----|-----|-----

GET /admin/stats 32182 0(0.00%) | 171 18 654 170 | 267.67 0.00

POST /api/coupon/grab 161533 0(0.00%) | 171 7 946 170 | 1343.54 0.00

POST /api/like 96542 0(0.00%) | 171 16 945 170 | 802.98 0.00

-----|-----|-----|-----|-----|-----|-----|-----|-----

Aggregated 290257 0(0.00%) | 171 7 946 170 | 2414.19 0.00

Response time percentiles (approximated)

Type	Name	50%	66%	75%	80%	90%	95%	98%	99%	99.9%	99.99%	100%	# reqs
GET	/admin/stats	170	180	190	190	210	220	280	320	460	610	650	32182
POST	/api/coupon/grab	170	180	190	190	210	220	280	320	460	760	950	161533
POST	/api/like	170	180	190	190	210	220	280	320	460	700	950	96542
----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----													
Aggregated													
		170	180	190	190	210	220	280	320	460	700	950	290257

**Summary:**

While the latency remains similar, only successful coupons are enqueued, thereby reducing memory consumption.