

# IT314 - SOFTWARE ENGINEERING



## Non-Functional Testing

**Group ID: 6**

**Topic: Online Blogging Platform**

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**Under Guidance of :  
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## Load Testing:

### Tool: Apache jMeter

- **Number of Threads (users):** Specifies the number of simulated users or threads in the test.
- **Ramp-up period (seconds):** The time taken to start all the threads gradually.
- **Loop count:** Defines how many times each thread executes the test scenario.

### First Test:

Number of Threads(users)	50
Ramp-up period(seconds)	20
Loop count	1

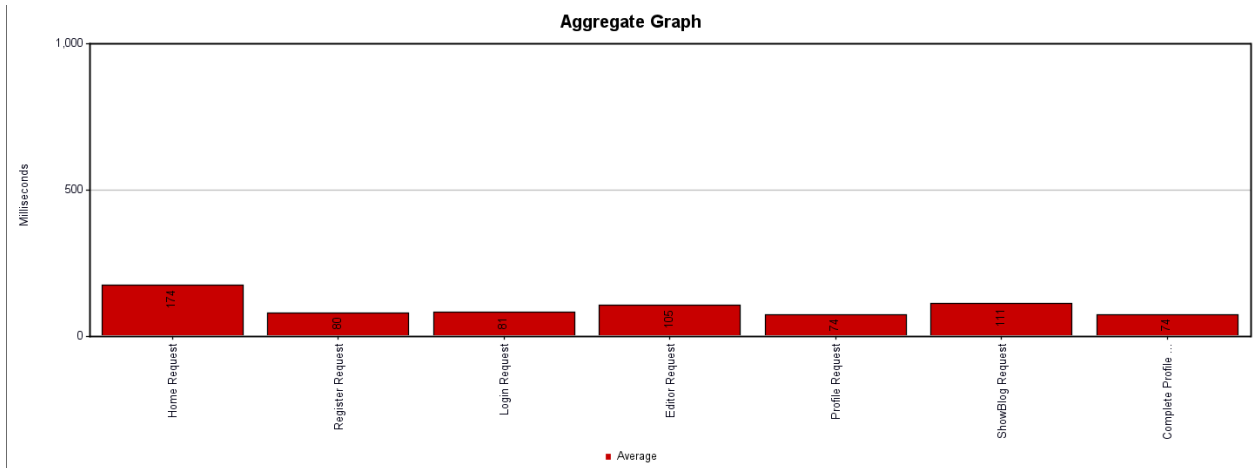
### Summary Report:

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	Avg. Bytes
Home Request	50	174	87	1121	202.29	0.00%	2.5/sec	16.87	0.70	6882.0
Register Request	50	80	52	349	42.42	0.00%	2.5/sec	16.98	0.89	6860.0
Login Request	50	81	51	294	46.08	0.00%	2.5/sec	16.92	0.73	6842.0
Editor Request	50	105	53	721	110.64	0.00%	2.5/sec	18.97	0.74	7786.3
Profile Request	50	74	55	178	21.22	0.00%	2.5/sec	16.83	0.72	6924.0
ShowBlog Reque...	50	111	53	1010	143.08	0.00%	2.5/sec	21.07	0.81	8694.7
Complete Profile...	50	74	53	137	17.67	0.00%	2.5/sec	25.95	0.77	10719.0
TOTAL	350	100	51	1121	110.88	0.00%	16.8/sec	128.58	5.15	7815.4

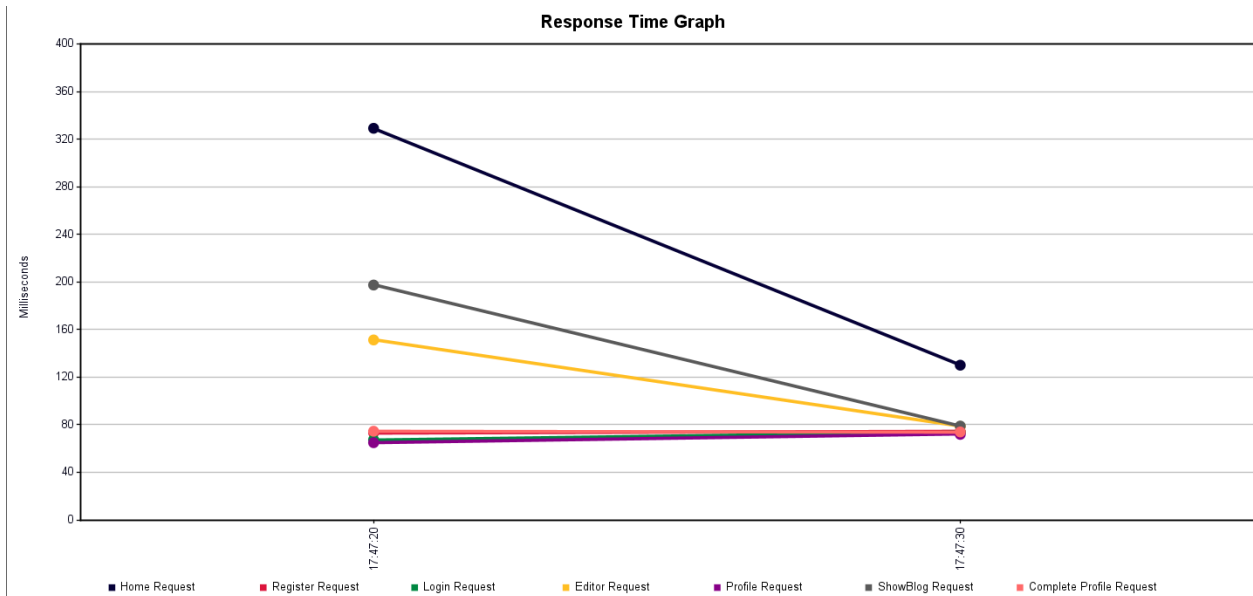
### Aggregate Report:

Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/...	Sent KB/sec
Home Reque...	50	174	118	196	339	1121	87	1121	0.00%	2.5/sec	16.87	0.70
Register Req...	50	80	69	105	116	349	52	349	0.00%	2.5/sec	16.98	0.89
Login Request	50	81	70	90	104	294	51	294	0.00%	2.5/sec	16.92	0.73
Editor Reque...	50	105	71	127	296	721	53	721	0.00%	2.5/sec	18.97	0.74
Profile Reque...	50	74	69	92	108	178	55	178	0.00%	2.5/sec	16.83	0.72
ShowBlog Re...	50	111	70	147	277	1010	53	1010	0.00%	2.5/sec	21.07	0.81
Complete Pro...	50	74	69	93	114	137	53	137	0.00%	2.5/sec	25.95	0.77
TOTAL	350	100	74	127	194	721	51	1121	0.00%	16.8/sec	128.58	5.15

## Aggregate Graph:



## Response time Graph:



## Successful Request

Thread Name:NFT Group 1-67  
Sample Start:2024-12-01 18:10:44 IST  
Load time:99  
Connect Time:3  
Latency:37  
Size in bytes:6882  
Sent bytes:284  
Headers size in bytes:832  
Body size in bytes:6050  
Sample Count:1  
Error Count:0  
Data type ("text"|"bin"|""):text  
Response code:200  
Response message:OK

HTTPSampleResult fields:

ContentType: text/html; charset=utf-8  
DataEncoding: utf-8

## Unsuccessful Request

Thread Name:NFT Group 1-110  
Sample Start:2024-12-01 18:27:04 IST  
Load time:15488  
Connect Time:3  
Latency:15466  
Size in bytes:74496  
Sent bytes:144  
Headers size in bytes:238  
Body size in bytes:74258  
Sample Count:1  
Error Count:1  
Data type ("text"|"bin"|""):text  
**Response code:502**  
Response message:Connection refused

HTTPSampleResult fields:

ContentType: text/html; charset="UTF-8"  
DataEncoding: UTF-8

## Second Test:

Number of Threads(users)	100
Ramp-up period(seconds)	25
Loop count	2

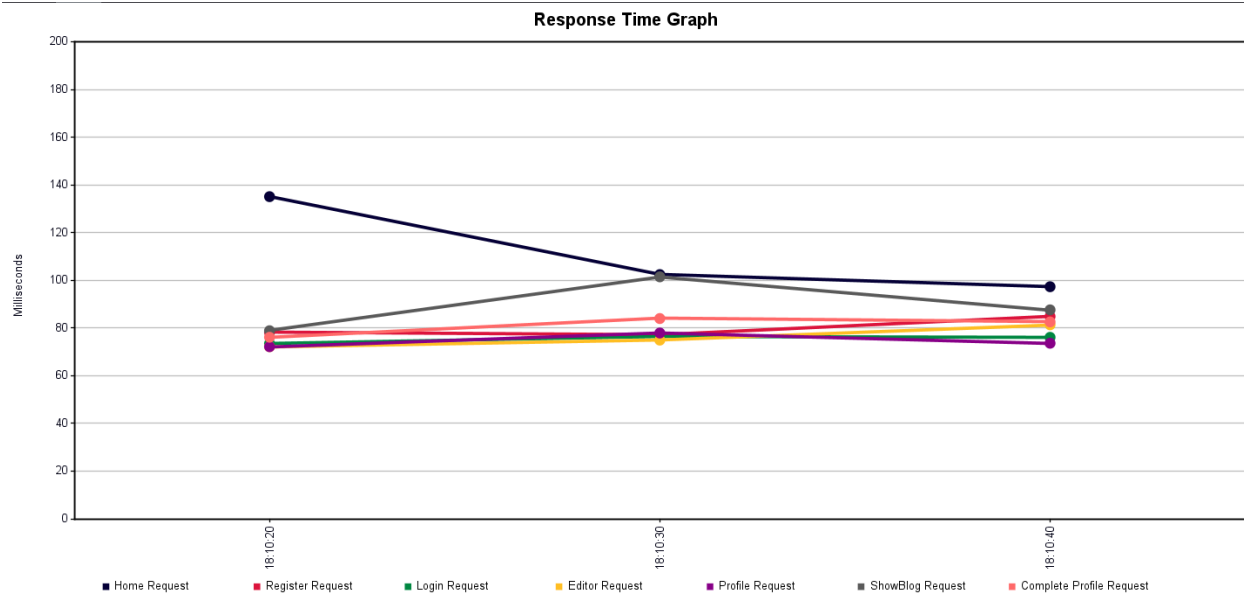
## Summary Report:

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	Avg. Bytes
Home Request	200	102	52	422	45.93	0.00%	7.9/sec	52.83	2.18	6882.0
Register Request	200	79	49	1078	75.24	0.00%	8.0/sec	53.36	2.81	6860.0
Login Request	200	75	48	349	29.66	0.00%	8.0/sec	53.25	2.29	6842.0
Editor Request	200	76	50	1078	72.79	0.00%	8.0/sec	60.56	2.36	7787.1
Profile Request	200	74	52	315	28.47	0.00%	8.0/sec	53.79	2.31	6924.0
ShowBlog Requ...	200	90	50	371	59.41	0.00%	7.9/sec	67.50	2.59	8695.0
Complete Profile...	200	80	52	458	43.62	0.00%	8.0/sec	83.37	2.46	10719.0
TOTAL	1400	82	48	1078	54.53	0.00%	54.0/sec	412.31	16.51	7815.6

## Aggregate Report:

Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/...	Sent KB/sec
Home Reque...	200	102	96	149	170	285	52	422	0.00%	7.9/sec	52.83	2.18
Register Req...	200	79	68	90	106	195	49	1078	0.00%	8.0/sec	53.36	2.81
Login Request	200	75	68	96	110	160	48	349	0.00%	8.0/sec	53.25	2.29
Editor Reque...	200	76	67	90	107	142	50	1078	0.00%	8.0/sec	60.56	2.36
Profile Reque...	200	74	68	93	106	160	52	315	0.00%	8.0/sec	53.79	2.31
ShowBlog Re...	200	90	73	111	275	331	50	371	0.00%	7.9/sec	67.50	2.59
Complete Pro...	200	80	70	105	127	327	52	458	0.00%	8.0/sec	83.37	2.46
TOTAL	1400	82	70	111	135	295	48	1078	0.00%	54.0/sec	412.31	16.51

## Response time Graph



## Third Test:

Number of Threads(users)	150
Ramp-up period(seconds)	40
Loop count	2

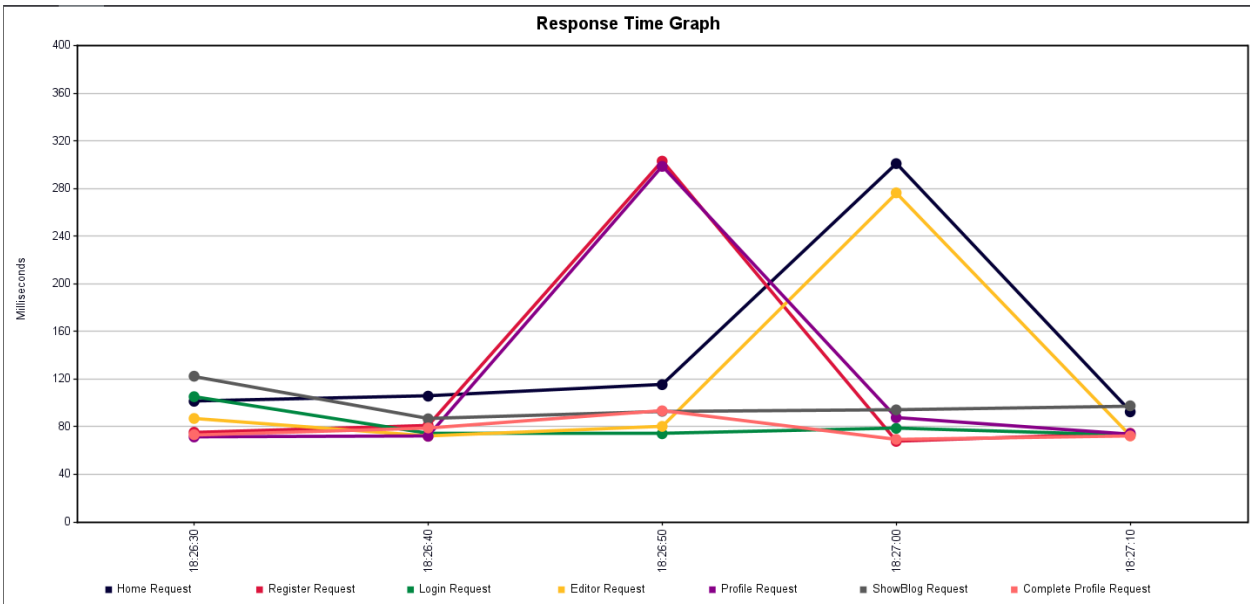
Summary Report:

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	Avg. Bytes
Home Request	300	356	52	60762	3604.45	0.67%	3.0/sec	20.60	0.82	7085.3
Register Request	300	131	50	15412	886.45	0.33%	3.0/sec	20.61	1.05	7085.5
Login Request	300	279	51	60483	3482.72	0.33%	3.0/sec	19.84	0.85	6820.1
Editor Request	300	329	47	61054	3619.99	0.67%	3.0/sec	23.06	0.88	7984.5
Profile Request	300	328	48	60251	3576.89	0.67%	3.0/sec	20.58	0.86	7127.0
ShowBlog Reque...	300	98	50	864	91.58	0.00%	3.0/sec	25.05	0.96	8694.9
Complete Profile...	300	78	49	1074	63.94	0.00%	3.0/sec	30.89	0.91	10719.0
TOTAL	2100	228	47	61054	2723.08	0.38%	20.5/sec	159.10	6.27	7930.9

Aggregate Report:

Label	# Samples ↑	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/...	Sent KB/sec
Home Reque...	300	356	98	149	184	380	52	60762	0.67%	3.0/sec	20.60	0.82
Register Req...	300	131	67	96	110	361	50	15412	0.33%	3.0/sec	20.61	1.05
Login Request	300	279	65	93	110	276	51	60483	0.33%	3.0/sec	19.84	0.85
Editor Reque...	300	329	67	93	117	315	47	61054	0.67%	3.0/sec	23.06	0.88
Profile Reque...	300	328	66	93	114	307	48	60251	0.67%	3.0/sec	20.58	0.86
ShowBlog Re...	300	98	70	137	292	377	50	864	0.00%	3.0/sec	25.05	0.96
Complete Pro...	300	78	67	98	114	196	49	1074	0.00%	3.0/sec	30.89	0.91
TOTAL	2100	228	69	110	151	361	47	61054	0.38%	20.5/sec	159.10	6.27

Response time Graph:



## Fourth Test:

Number of Threads(users)	150
Ramp-up period(seconds)	30
Loop count	2

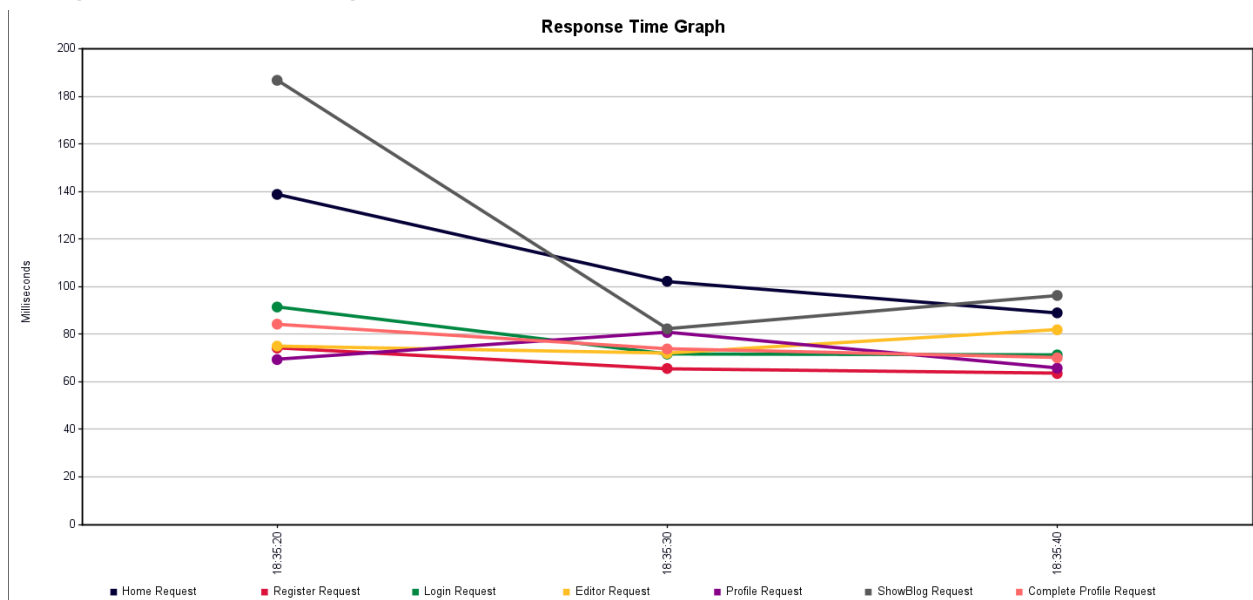
## Summary Report:

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	Avg. Bytes
Home Request	300	99	49	521	58.93	0.00%	9.9/sec	66.47	2.74	6882.0
Register Request	300	66	48	109	12.43	0.00%	10.0/sec	66.81	3.52	6860.0
Login Request	300	75	48	1079	66.89	0.00%	10.0/sec	66.67	2.86	6842.0
Editor Request	300	77	48	1091	85.80	0.00%	10.0/sec	75.82	2.96	7787.1
Profile Request	300	71	50	1115	62.29	0.00%	10.0/sec	67.39	2.90	6924.0
ShowBlog Requ...	300	91	50	1095	87.99	0.00%	10.0/sec	84.55	3.25	8694.6
Complete Profile...	300	70	48	290	26.04	0.00%	10.1/sec	105.37	3.11	10719.0
TOTAL	2100	78	48	1115	63.97	0.00%	68.2/sec	520.56	20.85	7815.5

## Aggregate Report:

Label	# Samples ↑	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/...	Sent KB/sec
Home Reque...	300	99	90	141	160	350	49	521	0.00%	9.9/sec	66.47	2.74
Register Req...	300	66	63	85	92	99	48	109	0.00%	10.0/sec	66.81	3.52
Login Request	300	75	64	89	102	288	48	1079	0.00%	10.0/sec	66.67	2.86
Editor Reque...	300	77	65	89	96	275	48	1091	0.00%	10.0/sec	75.82	2.96
Profile Reque...	300	71	65	86	96	141	50	1115	0.00%	10.0/sec	67.39	2.90
ShowBlog Re...	300	91	66	113	284	362	50	1095	0.00%	10.0/sec	84.55	3.25
Complete Pro...	300	70	65	87	95	157	48	290	0.00%	10.1/sec	105.37	3.11
TOTAL	2100	78	66	98	126	313	48	1115	0.00%	68.2/sec	520.56	20.85

## Response time Graph:



Fifth Test:

Number of Threads(users)	160
Ramp-up period(seconds)	30
Loop count	2

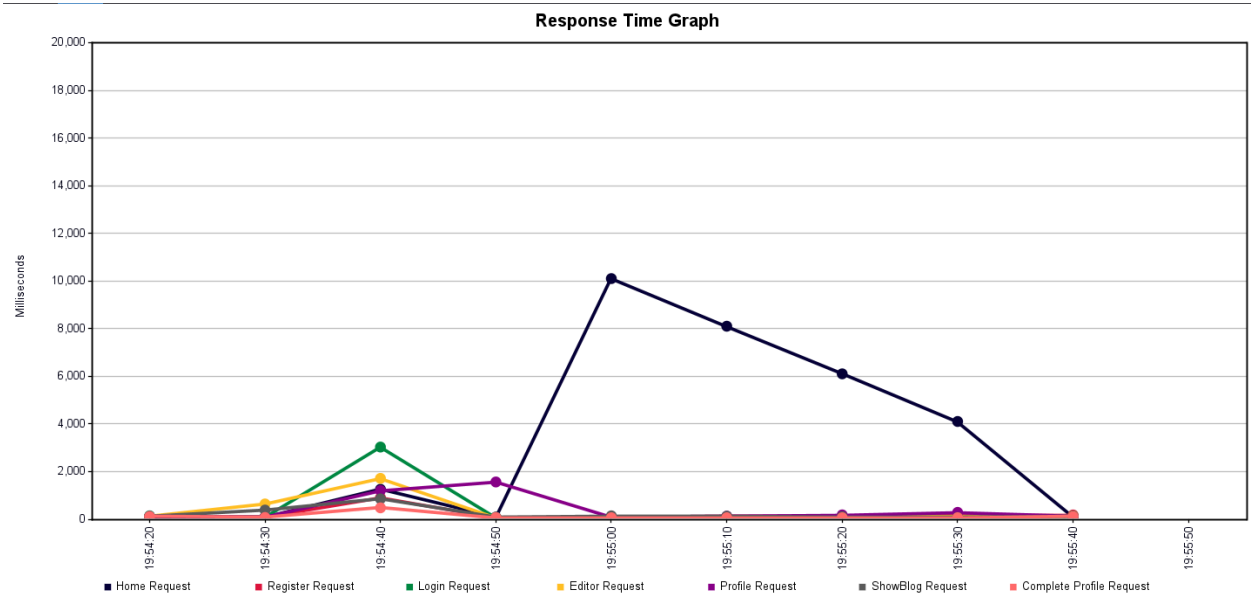
Summary Report:

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	Avg. Bytes
Home Request	320	627	49	64073	5099.89	1.25%	3.2/sec	22.62	0.88	7275.1
Register Request	320	309	50	60110	3455.43	0.62%	3.2/sec	21.97	1.12	7050.8
Login Request	320	880	51	61008	6774.79	1.56%	3.2/sec	21.73	0.91	6971.2
Editor Request	320	690	50	61066	5881.08	1.25%	3.2/sec	24.70	0.94	7925.2
Profile Request	320	555	51	61048	4929.17	1.25%	3.2/sec	22.77	0.92	7304.7
ShowBlog Reque...	320	378	51	60548	3577.86	0.94%	3.2/sec	28.25	1.03	9080.0
Complete Profile...	320	170	49	15454	1209.97	0.62%	3.2/sec	34.67	0.98	11117.7
TOTAL	2240	516	49	64073	4741.21	1.07%	22.2/sec	175.34	6.74	8103.5

Aggregate Report:

Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/...	Sent KB/sec
Home Reque...	320	627	93	145	180	15295	49	64073	1.25%	3.2/sec	22.62	0.88
Register Req...	320	309	66	94	131	221	50	60110	0.62%	3.2/sec	21.97	1.12
Login Request	320	880	66	98	161	60285	51	61008	1.56%	3.2/sec	21.73	0.91
Editor Reque...	320	690	66	103	150	15400	50	61066	1.25%	3.2/sec	24.70	0.94
Profile Reque...	320	555	66	100	172	15656	51	61048	1.25%	3.2/sec	22.77	0.92
ShowBlog Re...	320	378	68	167	279	883	51	60548	0.94%	3.2/sec	28.25	1.03
Complete Pro...	320	170	66	94	124	286	49	15454	0.62%	3.2/sec	34.67	0.98
TOTAL	2240	516	68	123	168	15303	49	64073	1.07%	22.2/sec	175.34	6.74

Response time Graph:





Sixth Test:

Number of Threads(users)	250
Ramp-up period(seconds)	30
Loop count	1

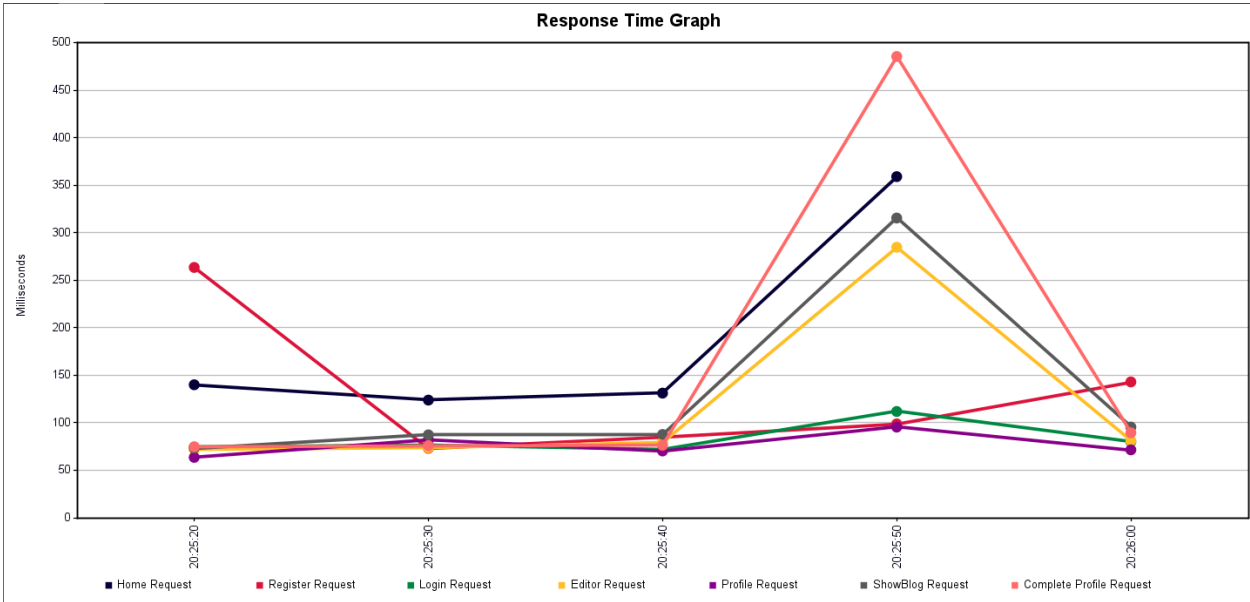
Summary Report:

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	Avg. Bytes
Home Request	250	304	85	15493	1660.73	1.20%	8.3/sec	60.39	2.30	7411.7
Register Request	250	309	50	60175	3793.86	0.40%	3.2/sec	21.50	0.94	6833.7
Login Request	250	69	51	235	19.40	0.00%	3.2/sec	21.50	0.92	6842.1
Editor Request	250	133	50	15308	962.29	0.40%	3.2/sec	25.33	0.95	8054.1
Profile Request	250	73	52	1094	66.91	0.00%	3.2/sec	21.78	0.94	6924.0
ShowBlog Reque...	250	91	50	1066	112.27	0.00%	3.2/sec	28.38	1.05	9027.9
Complete Profile...	250	313	51	60999	3845.82	0.40%	3.2/sec	33.35	0.98	10677.2
TOTAL	1750	185	50	60999	2170.21	0.34%	22.2/sec	172.97	6.60	7967.2

Aggregate Report:

Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/...	Sent KB/sec
Home Reque...	250	304	111	159	181	15283	85	15493	1.20%	8.3/sec	60.39	2.30
Register Req...	250	309	65	89	97	137	50	60175	0.40%	3.2/sec	21.50	0.94
Login Request	250	69	65	84	96	178	51	235	0.00%	3.2/sec	21.50	0.92
Editor Reque...	250	133	64	89	100	289	50	15308	0.40%	3.2/sec	25.33	0.95
Profile Reque...	250	73	64	90	97	175	52	1094	0.00%	3.2/sec	21.78	0.94
ShowBlog Re...	250	91	67	91	278	868	50	1066	0.00%	3.2/sec	28.38	1.05
Complete Pro...	250	313	66	87	93	179	51	60999	0.40%	3.2/sec	33.35	0.98
TOTAL	1750	185	68	112	138	294	50	60999	0.34%	22.2/sec	172.97	6.60

Response time Graph:



Seventh Test:

Number of Threads(users)	290
Ramp-up period(seconds)	30
Loop count	1

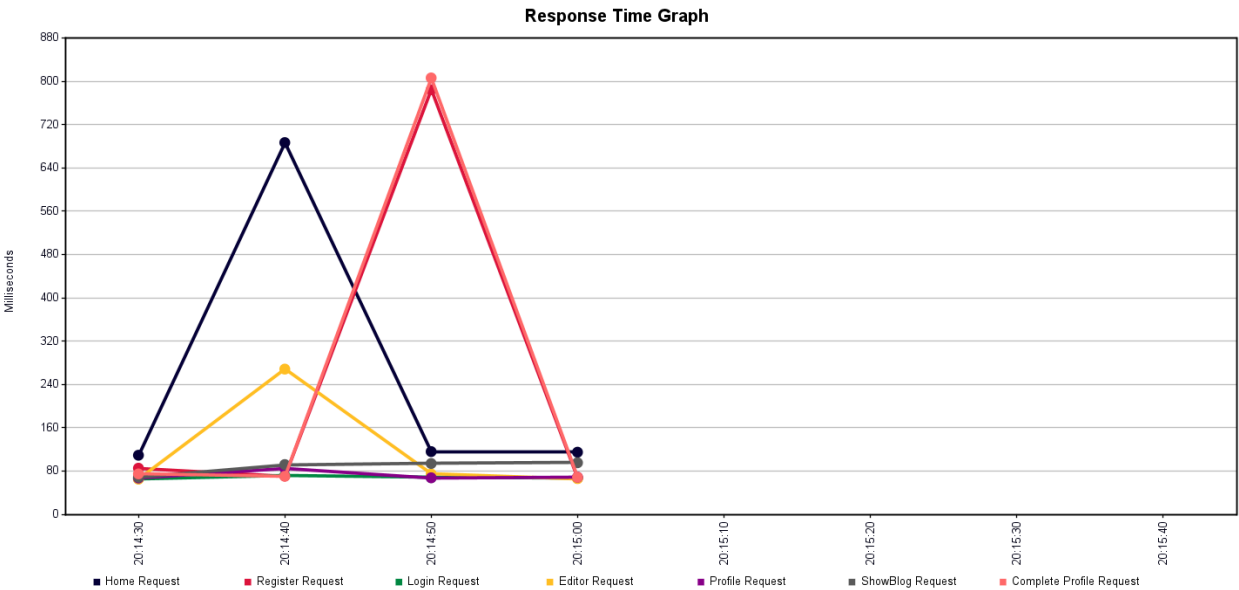
Summary Report:

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	Avg. Bytes
Home Request	290	191	84	15311	892.85	0.34%	7.5/sec	50.18	2.07	6872.3
Register Request	290	84	50	1098	71.10	0.00%	7.5/sec	50.10	2.19	6860.1
Login Request	290	84	52	1091	70.81	0.00%	7.5/sec	49.95	2.15	6842.1
Editor Request	290	133	49	15499	906.40	0.34%	7.5/sec	58.51	2.21	8017.0
Profile Request	290	80	49	1090	68.68	0.00%	7.5/sec	50.53	2.17	6924.0
ShowBlog Requ...	290	149	49	15478	906.15	0.34%	6.5/sec	58.87	2.12	9253.3
Complete Profile...	290	189	50	15450	1266.32	0.69%	6.5/sec	70.98	2.00	11159.0
TOTAL	2030	130	49	15499	762.74	0.25%	45.1/sec	351.69	13.38	7989.7

Aggregate Report:

Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/...	Sent KB/sec
Home Reque...	290	191	117	204	247	385	84	15311	0.34%	7.5/sec	50.18	2.07
Register Req...	290	84	67	143	169	268	50	1098	0.00%	7.5/sec	50.10	2.19
Login Request	290	84	67	140	175	280	52	1091	0.00%	7.5/sec	49.95	2.15
Editor Reque...	290	133	65	114	167	280	49	15499	0.34%	7.5/sec	58.51	2.21
Profile Reque...	290	80	66	111	169	214	49	1090	0.00%	7.5/sec	50.53	2.17
ShowBlog Re...	290	149	69	182	275	397	49	15478	0.34%	6.5/sec	58.87	2.12
Complete Pro...	290	189	67	156	181	299	50	15450	0.69%	6.5/sec	70.98	2.00
TOTAL	2030	130	70	161	195	324	49	15499	0.25%	45.1/sec	351.69	13.38

Response time Graph:



Eighth Test:

Number of Threads(users)	300
Ramp-up period(seconds)	30
Loop count	1

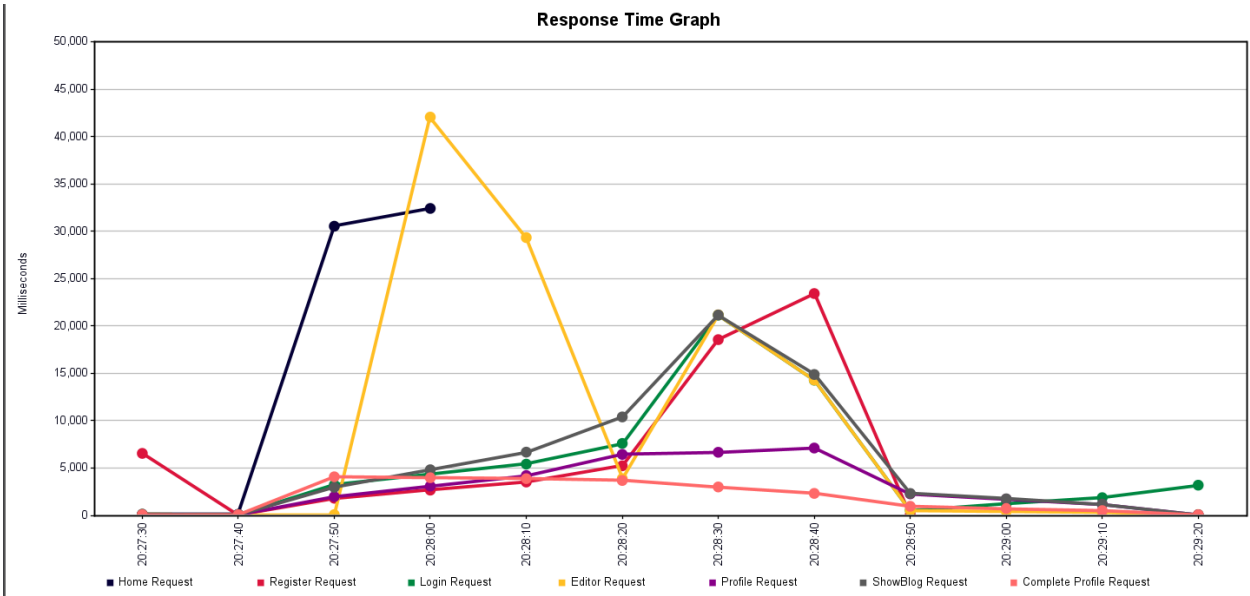
Summary Report:

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	Avg. Bytes
Home Request	300	13486	86	64260	18699.68	25.67%	3.5/sec	20.58	0.72	6053.1
Register Request	300	5860	51	42074	10487.64	3.00%	2.6/sec	17.34	0.75	6735.9
Login Request	300	1195	50	42059	5826.19	1.00%	2.5/sec	17.45	0.70	7279.4
Editor Request	300	792	50	42068	5073.83	0.67%	2.5/sec	18.59	0.72	7753.3
Profile Request	300	1219	50	42035	6295.14	0.33%	2.5/sec	16.56	0.71	6910.0
ShowBlog Reque...	300	1455	51	60934	7158.29	0.33%	2.5/sec	21.55	0.80	8998.4
Complete Profile...	300	716	51	42076	4936.37	0.67%	2.5/sec	25.59	0.75	10665.7
TOTAL	2100	3532	50	64260	10485.80	4.52%	17.1/sec	129.66	4.86	7770.8

Aggregate Report:

Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/...	Sent KB/sec
Home Reque...	300	13486	128	42081	42086	42102	86	64260	25.67%	3.5/sec	20.58	0.72
Register Req...	300	5860	75	21150	21197	42074	51	42074	3.00%	2.6/sec	17.34	0.75
Login Request	300	1195	67	108	3132	36136	50	42059	1.00%	2.5/sec	17.45	0.70
Editor Reque...	300	792	68	103	137	36149	50	42068	0.67%	2.5/sec	18.59	0.72
Profile Reque...	300	1219	66	94	128	36183	50	42035	0.33%	2.5/sec	16.56	0.71
ShowBlog Re...	300	1455	68	284	310	36371	51	60934	0.33%	2.5/sec	21.55	0.80
Complete Pro...	300	716	67	94	108	36161	51	42076	0.67%	2.5/sec	25.59	0.75
TOTAL	2100	3532	72	15137	36177	42085	50	64260	4.52%	17.1/sec	129.66	4.86

Response time Graph:



## Ninth Test:

Number of Threads(users)	310
Ramp-up period(seconds)	30
Loop count	1

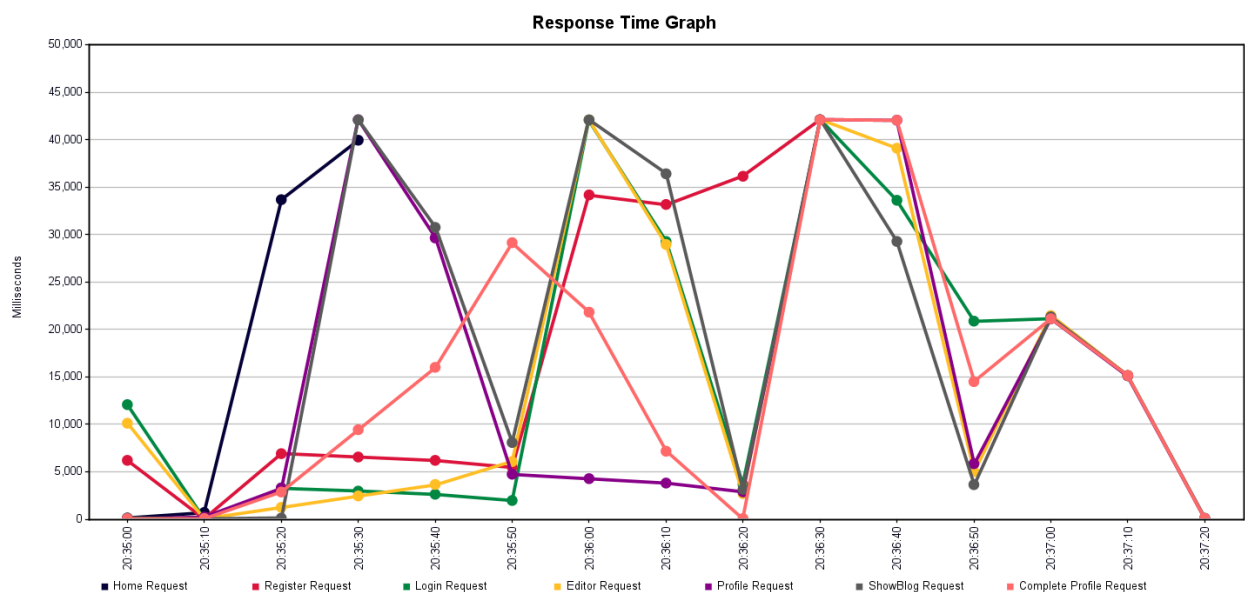
## Summary Report:

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	Avg. Bytes
Home Request	310	20077	86	70180	20553.21	42.26%	3.5/sec	19.28	0.58	5587.5
Register Request	310	15115	50	60713	19220.14	30.65%	2.4/sec	13.59	0.49	5818.1
Login Request	310	9158	50	43211	15572.20	8.06%	2.1/sec	13.52	0.56	6509.6
Editor Request	310	2143	49	42093	8343.78	2.90%	2.1/sec	16.34	0.61	7871.7
Profile Request	310	2131	51	42107	8593.36	3.55%	2.1/sec	14.54	0.60	7006.4
ShowBlog Requ...	310	1964	49	42105	8089.85	2.90%	2.1/sec	18.37	0.67	8844.7
Complete Profile...	310	3159	51	42093	10403.67	4.52%	2.1/sec	21.51	0.63	10357.8
TOTAL	2170	7678	49	70180	15479.04	13.55%	14.8/sec	107.55	3.84	7428.2

## Aggregate Report:

Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/sec	Sent KB/sec
Home Reque...	310	20077	15152	42088	42095	60824	86	70180	42.26%	3.5/sec	19.28	0.58
Register Req...	310	15115	89	42085	42087	42095	50	60713	30.65%	2.4/sec	13.59	0.49
Login Request	310	9158	74	36197	42057	42090	50	43211	8.06%	2.1/sec	13.52	0.56
Editor Reque...	310	2143	66	128	15501	42074	49	42093	2.90%	2.1/sec	16.34	0.61
Profile Reque...	310	2131	69	124	15499	42091	51	42107	3.55%	2.1/sec	14.54	0.60
ShowBlog Re...	310	1964	71	292	15127	42089	49	42105	2.90%	2.1/sec	18.37	0.67
Complete Pro...	310	3159	69	144	36159	42083	51	42093	4.52%	2.1/sec	10.51	0.63
TOTAL	2170	7678	78	42669	42081	42097	49	70180	13.55%	14.8/sec	107.55	3.84

### Response time Graph:



- At **300** user threads, the system shows a manageable error rate of **4.52%**, but at **310** user threads, the error rate rises significantly to **13.55%**, indicating the system's stress limit is near **300 users**. This suggests the system begins to struggle under increasing load beyond this point, compromising its performance.
- **Conclusion:** Non-functional testing, such as stress testing, helps identify a system's performance limits and its stability under heavy loads. Observing error rates and response times ensures the system meets scalability and reliability requirements. By finding the stress limit, we can optimize resource allocation and plan for improvements to handle future demands.