

Load Test Report

1. Test Objectives:

The Application should able to handle 100, 200 and 400 unique users per second providing the industry standard level of service in terms of response time and error rate. Average response time should be less than 3 seconds and error rate should be less than 1%.

2. Scenario:

To perform load testing on below API and generate summary report, error report and response time graph.

- 1 Status
- 2 Get all product
- 3 Get single product
- 4 Create new cart
- 5 Add item to cart
- 6 Get cart item
- 7 Get single cart
- 8 Modify item in cart
- 9 Replace item in cart
- 10 Delete item in cart
- 11 Authorization
- 12 Create new order
- 13 Get all order
- 14 Get single order

15 Update order

16 Delete order

3. Number of users:

- 100 users
- 200 users
- 400 users

4. Report: 4.1. Summary Report:

The summary report shows the throughput, average response time and error% for all the API and combined scenario. Below table describe all the values of elements.

- **Label:** It is the name/URL for the specific HTTP(s) Request.
- **Samples:** This indicates the number of virtual users per request.
- **Average:** It is the average time taken by all the samples to execute specific label.
- **Min:** The shortest time taken by a sample for specific label.
- **Max:** The longest time taken by a sample for specific label.
- **Std. Dev.:** This shows the set of exceptional cases which were deviating from the average value of sample response time.
- **Error%:** Percentage of Failed requests per Label.
- **Throughput:** Throughput is the number of requests that are processed per time unit (seconds, minutes, hours) by the server.
- **KB/Sec:** This indicates the amount of data downloaded from server during the performance test execution.

Note: Whatever the time taken by Jmeter is in milli seconds.

1. Summary report for 100 User

a. 20Sec Ramp-Up Period

Fig 1.1 Summary report for 100 users with timer (SS-from Jmeter)

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec
1 Status	100	18962	1998	35408	9198.87	0.00%	2.7/sec	1.07	0.38
2 Get all product	100	17424	956	33642	9158.88	0.00%	2.8/sec	5.82	0.40
3 Get single product	100	2433	841	9693	2133.61	0.00%	8.9/sec	4.73	1.30
4 Create new cart	100	18950	2650	34024	8886.79	0.00%	2.3/sec	0.99	0.51
5 Add item to cart	100	32226	26443	34242	1947.33	0.00%	1.5/sec	0.62	0.36
6 Get cart item	100	16422	1250	32673	9096.41	0.00%	2.5/sec	1.07	0.42
7 Get single cart	100	3007	1242	12936	2422.47	0.00%	5.2/sec	2.42	0.82
8 Modify item in cart	100	19258	2460	35432	9412.10	0.00%	2.0/sec	0.57	0.52
9 Replace item in cart	100	33741	24628	35635	2431.84	0.00%	1.4/sec	0.39	0.35
11 Authorization- Regi...	100	18021	3079	35595	9184.91	99.00%	2.2/sec	0.98	0.61
12 Create new order	100	3552	1044	8489	1537.93	99.00%	8.8/sec	3.67	2.48
13 Get all order	100	1531	948	3470	309.53	99.00%	16.7/sec	7.00	3.13
14 Get single order	100	1663	1048	2859	286.34	99.00%	20.8/sec	8.74	3.94
15 Update order	100	2228	1044	3663	572.22	99.00%	15.8/sec	6.58	4.47
16 Delete order	100	2801	377	3857	878.51	99.00%	17.8/sec	7.40	3.75
TOTAL	1500	12815	377	35635	12311.97	39.60%	7.8/sec	4.03	1.62

Fig 1.2 Statistics report for 100 users with timer (SS-from index)

Statistics														
Requests		Executions				Response Times (ms)							Throughput	
Label	#Samples	FAIL	Error %	Average	Min	Max	Median	90th pct	95th pct	99th pct	Transactions/s	Received	Sent	
Total	1500	594	39.60%	12815.12	377	35635	6474.00	33202.80	34419.65	35407.77	7.75	4.03	1.62	
1 Status	100	0	0.00%	18962.91	1998	35408	18773.00	32512.20	33922.85	35402.45	2.74	1.07	0.38	
2 Get all product	100	0	0.00%	17424.97	956	33642	17847.00	29945.30	31774.10	33635.56	2.83	5.82	0.40	
3 Get single product	100	0	0.00%	2433.88	841	9693	1847.50	6599.30	8686.45	9688.97	8.95	4.73	1.30	
4 Create new cart	100	0	0.00%	18950.02	2650	34024	18779.50	30777.30	32782.10	34019.97	2.30	0.99	0.51	
5 Add item to cart	100	0	0.00%	32226.36	26443	34242	33180.00	33632.90	33814.00	34237.85	1.49	0.62	0.36	
6 Get cart item	100	0	0.00%	16422.93	1250	32673	16387.50	29230.90	31193.10	32668.82	2.54	1.07	0.42	
7 Get single cart	100	0	0.00%	3007.23	1242	12936	1655.00	6552.50	8196.75	12933.43	5.17	2.42	0.82	
8 Modify item in cart	100	0	0.00%	19258.03	2460	35432	19354.00	32245.50	33817.50	35425.96	2.05	0.57	0.52	
9 Replace item in cart	100	0	0.00%	33741.71	24628	35635	35005.50	35446.80	35532.75	35634.69	1.41	0.39	0.35	
11 Authorization- Register new API	100	99	99.00%	18021.37	3079	35595	17723.00	31535.10	33260.60	35588.51	2.21	0.98	0.61	
12 Create new order	100	99	99.00%	3552.83	1044	8489	3282.00	6271.00	7066.05	8482.91	8.80	3.67	2.48	
13 Get all order	100	99	99.00%	1531.37	948	3470	1537.50	1846.90	2035.60	3456.03	16.74	7.00	3.13	
14 Get single order	100	99	99.00%	1663.45	1048	2859	1650.00	2063.80	2251.85	2853.01	20.83	8.74	3.94	
15 Update order	100	99	99.00%	2228.01	1044	3663	2173.00	3257.70	3266.85	3660.98	15.83	6.58	4.47	
16 Delete order	100	99	99.00%	2801.77	377	3857	3059.00	3660.70	3665.95	3855.55	17.80	7.40	3.75	

2. Summary report for 200 User

a. 20Sec Ramp-Up Period

Fig 2.1 Summary report for 200 users with timer (SS-from Jmeter)

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec
1 Status	200	39693	2742	73259	20056.54	0.50%	2.7/sec	1.04	0.37
2 Get all product	200	42309	1680	83916	22727.35	0.00%	1.4/sec	2.85	0.19
3 Get single product	200	13856	1291	89789	20054.32	0.50%	1.6/sec	0.86	0.23
4 Create new cart	200	32162	1	106002	22210.13	5.00%	1.5/sec	0.78	0.31
5 Add item to cart	200	50268	0	94336	26535.43	11.00%	1.3/sec	0.81	0.28
6 Get cart item	200	20617	0	76901	23571.39	45.50%	1.5/sec	1.83	0.13
7 Get single cart	200	7317	0	27622	8783.17	53.50%	2.5/sec	3.47	0.18
8 Modify item in cart	200	8418	0	27708	9695.47	53.00%	2.2/sec	2.87	0.26
9 Replace item in cart	200	8947	0	27718	10469.21	53.00%	2.0/sec	2.63	0.24
11 Authorization- Register new API	200	6786	0	27442	8670.01	99.50%	2.0/sec	2.76	0.26
12 Create new order	200	4526	0	14713	5690.96	99.50%	1.9/sec	2.66	0.26
13 Get all order	200	2704	0	11149	3677.89	99.50%	1.9/sec	2.59	0.17
14 Get single order	200	1177	0	7683	1544.33	99.50%	1.9/sec	2.59	0.17
15 Update order	200	924	0	2864	1118.37	99.50%	1.9/sec	2.56	0.25
16 Delete order	200	719	0	2709	971.05	99.50%	1.9/sec	2.56	0.19
TOTAL	3000	16028	0	106002	22288.65	54.60%	10.1/sec	11.81	1.29

Fig 2.2 Statistics report for 200 users with timer (SS-from index)

Statistics																
Requests		Executions				Response Times (ms)							Throughput		Network (KB/sec)	
Label	#Samples	FAIL	Error %	Average	Min	Max	Median	90th pct	95th pct	99th pct	Transactions/s	Received	Sent			
Total	3000	1638	54.60%	16028.64	0	106002	3112.50	53339.00	65397.30	83691.30	10.09	11.81	1.29			
1 Status	200	1	0.50%	39693.02	2742	73259	40409.00	66602.10	69249.15	72670.73	2.67	1.04	0.37			
2 Get all product	200	0	0.00%	42309.07	1680	83916	41256.50	74827.00	81644.90	83522.96	1.39	2.85	0.19			
3 Get single product	200	1	0.50%	13856.37	1291	89789	3117.00	54476.00	60547.30	77024.63	1.59	0.86	0.23			
4 Create new cart	200	10	5.00%	32162.74	1	106002	29694.00	56423.90	84109.15	88745.65	1.50	0.78	0.31			
5 Add item to cart	200	22	11.00%	50268.18	0	94336	52513.50	83219.10	86416.60	94190.06	1.31	0.81	0.28			
6 Get cart item	200	91	45.50%	20617.54	0	76901	9690.00	54886.70	61336.60	76681.95	1.47	1.83	0.13			
7 Get single cart	200	107	53.50%	7317.37	0	27622	1292.00	23752.60	25144.85	27363.88	2.48	3.47	0.18			
8 Modify item in cart	200	106	53.00%	8418.35	0	27708	1.00	23769.40	24731.70	27399.09	2.21	2.87	0.26			
9 Replace item in cart	200	106	53.00%	8947.79	0	27718	1.00	24038.80	24842.85	27679.21	2.02	2.63	0.24			
11 Authorization- Register new API	200	199	99.50%	6786.76	0	27442	1.00	20929.10	24968.50	27367.07	2.00	2.76	0.26			
12 Create new order	200	199	99.50%	4526.52	0	14713	1.00	13486.40	14117.95	14325.00	1.95	2.66	0.26			
13 Get all order	200	199	99.50%	2704.18	0	11149	1.00	8689.70	9091.75	9815.67	1.90	2.59	0.17			
14 Get single order	200	199	99.50%	1177.63	0	7683	1.00	3264.00	4419.80	6882.92	1.89	2.59	0.17			
15 Update order	200	199	99.50%	924.92	0	2864	1.00	2467.70	2655.00	2857.52	1.88	2.56	0.25			
16 Delete order	200	199	99.50%	719.19	0	2709	1.00	2458.00	2504.95	2664.92	1.88	2.56	0.19			

3. Summary report for 400 User

a. 20Sec Ramp-Up Period

Fig 3.1 Summary report for 400 users with timer (SS-from Jmeter)

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	Received KB/sec	Sent KB/sec	
1 Status	400	75645	4166	123426	37821.36	19.25%	3.2/sec	1.49	0.45	
2 Get all product	400	80723	19003	120992	33828.82	25.50%	1.7/sec	2.87	0.23	
3 Get single product	400	45730	2306	121193	41273.07	25.50%	1.4/sec	0.70	0.20	
4 Create new cart	400	55939	3328	120252	29448.67	0.75%	1.3/sec	0.57	0.29	
5 Add item to cart	400	73891	86	120173	20618.16	2.25%	1.1/sec	0.45	0.26	
6 Get cart item	400	61745	34	120540	37469.53	28.25%	1.1/sec	0.49	0.19	
7 Get single cart	400	43042	27	120690	34231.99	35.50%	1.3/sec	0.57	0.21	
8 Modify item in cart	400	25876	26	120273	34631.49	63.50%	2.0/sec	0.60	0.50	
9 Replace item in cart	400	5889	25	86707	19666.23	91.75%	2.8/sec	0.85	0.69	
11 Authorization- Regi...	400	446	26	85915	5761.64	99.75%	4.4/sec	1.37	1.18	
12 Create new order	400	35	27	121	7.40	100.00%	4.7/sec	1.46	1.32	
13 Get all order	400	34	25	82	4.47	100.00%	4.7/sec	1.46	0.87	
14 Get single order	400	35	25	133	8.72	100.00%	4.7/sec	1.46	0.88	
15 Update order	400	35	26	95	5.59	100.00%	4.7/sec	1.46	1.32	
16 Delete order	400	34	25	142	6.59	100.00%	4.7/sec	1.46	0.98	
TOTAL	6000	31273	25	123426	40318.40	59.47%	11.6/sec	5.32	2.42	

Fig 3.2 Statistics report for 400 users with timer (SS-from index)

Statistics														
Requests		Executions				Response Times (ms)							Throughput	
Label	#Samples	FAIL	Error %	Average	Min	Max	Median	90th pct	95th pct	99th pct	Transactions/s	Received	Sent	
Total	6000	3568	59.47%	31273.92	25	123426	81.00	96000.40	114485.65	122196.75	11.62	5.32	2.42	
1 Status	400	77	19.25%	75645.90	4166	123426	79006.00	122577.80	123008.85	123337.04	3.24	1.49	0.45	
2 Get all product	400	102	25.50%	80723.82	19003	120992	84323.50	120175.90	120284.70	120902.97	1.67	2.87	0.23	
3 Get single product	400	102	25.50%	45730.28	2306	121193	25618.50	109868.60	112466.60	120341.96	1.38	0.70	0.20	
4 Create new cart	400	3	0.75%	55939.82	3328	120252	51638.50	97926.20	108629.90	119039.35	1.34	0.57	0.29	
5 Add item to cart	400	9	2.25%	73891.48	86	120173	77083.50	98616.70	105425.95	120129.76	1.09	0.45	0.26	
6 Get cart item	400	113	28.25%	61745.20	34	120540	62603.00	118701.80	120148.80	120310.89	1.13	0.49	0.19	
7 Get single cart	400	142	35.50%	43042.30	27	120690	51322.00	86578.40	98843.45	120276.05	1.32	0.57	0.21	
8 Modify item in cart	400	254	63.50%	25876.99	26	120273	83.00	72801.30	89465.20	120099.99	2.00	0.60	0.50	
9 Replace item in cart	400	367	91.75%	5889.91	25	86707	37.00	96.00	68385.05	84706.46	2.75	0.85	0.69	
11 Authorization- Register new API	400	399	99.75%	446.73	26	85915	35.00	44.90	82.80	115.81	4.38	1.37	1.18	
12 Create new order	400	400	100.00%	35.58	27	121	35.00	40.00	41.00	69.96	4.68	1.46	1.32	
13 Get all order	400	400	100.00%	34.84	25	82	35.00	39.00	40.95	48.00	4.68	1.46	0.87	
14 Get single order	400	400	100.00%	35.65	25	133	35.00	39.00	43.00	74.81	4.68	1.46	0.88	
15 Update order	400	400	100.00%	35.35	26	95	35.00	40.00	41.95	48.99	4.68	1.46	1.32	
16 Delete order	400	400	100.00%	34.88	25	142	34.00	39.00	41.00	49.96	4.68	1.46	0.98	

4. Comparative Table for define scenario

Sr.No.	Sampler	20ms		60ms	
		Throughput (sec)	Error (%)	Throughput (sec)	Error (%)
1	100	25.4	20.04	15.36	10.02
2	200	30.36	58.05	17.39	25.36
3	400	40.23	60.56	30.58	69.01

4.2 Aggregate Report:

The aggregate report is the same as the summary report except the aggregate listener provides some additional parameters such as Median, 90% Line, 95% Line, 99% Line.

- **Median:** The median is the time in the middle (50%) of a set of results.
- **90% Line:** 90% of the samples took NO MORE THAN this time. The 10% remaining samples took at least as long as this.
- **95% Line:** 95% of the samples took NO MORE THAN this time. The 5% remaining samples took at least as long as this.
- **99% Line:** 99% of the samples took NO MORE THAN this time. The 1% remaining samples took at least as long as this.

Table 4.2.1 Aggregate report for 100 users with timer (SS-from Jmeter)

Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/sec	Sent KB/sec
1 Status	100	18962	18744	32388	33578	34853	1998	35408	0.00%	2.7/sec	1.07	0.38
2 Get all product	100	17424	17767	29390	31396	32998	956	33642	0.00%	2.8/sec	5.82	0.40
3 Get single pr...	100	2433	1847	5765	8676	9290	841	9693	0.00%	8.9/sec	4.73	1.30
4 Create new ...	100	18950	18761	30654	32195	33621	2650	34024	0.00%	2.3/sec	0.99	0.51
5 Add item to ...	100	32226	33179	33632	33814	33827	26443	34242	0.00%	1.5/sec	0.62	0.36
6 Get cart item	100	16422	16186	29068	30720	32255	1250	32673	0.00%	2.5/sec	1.07	0.42
7 Get single cart	100	3007	1654	6530	6691	12679	1242	12936	0.00%	5.2/sec	2.42	0.82
8 Modify item i...	100	19258	19237	32007	33808	34828	2460	35432	0.00%	2.0/sec	0.57	0.52
9 Replace ite...	100	33741	34998	35436	35528	35604	24628	35635	0.00%	1.4/sec	0.39	0.35
11 Authorizati...	100	18021	17463	31095	32854	34946	3079	35595	99.00%	2.2/sec	0.98	0.61
12 Create ne...	100	3552	3277	6262	6877	7880	1044	8489	99.00%	8.8/sec	3.67	2.48
13 Get all order	100	1531	1537	1828	1857	2073	948	3470	99.00%	16.7/sec	7.00	3.13
14 Get single ...	100	1663	1650	2053	2249	2260	1048	2859	99.00%	20.8/sec	8.74	3.94
15 Update order	100	2228	2101	3255	3264	3461	1044	3663	99.00%	15.8/sec	6.58	4.47
16 Delete order	100	2801	3057	3658	3665	3712	377	3857	99.00%	17.8/sec	7.40	3.75
TOTAL	1500	12815	6472	33181	34242	35385	377	35635	39.60%	7.8/sec	4.03	1.62

Table 4.2.2 Aggregate report for 200 users with timer (SS-from Jmeter)

Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/sec	Sent KB/sec
1 Status	200	39693	40353	66225	69119	70862	2742	73259	0.50%	2.7/sec	1.04	0.37
2 Get all product	200	42309	41051	73000	81491	83519	1680	83916	0.00%	1.4/sec	2.85	0.19
3 Get single pr...	200	13856	3116	54188	59698	70553	1291	89789	0.50%	1.6/sec	0.86	0.23
4 Create new ...	200	32162	29540	55991	82972	88414	1	106002	5.00%	1.5/sec	0.78	0.31
5 Add item to ...	200	50268	52513	83193	85630	92117	0	94336	11.00%	1.3/sec	0.81	0.28
6 Get cart item	200	20617	9488	54182	60968	76677	0	76901	45.50%	1.5/sec	1.83	0.13
7 Get single cart	200	7317	1085	23740	24762	27253	0	27622	53.50%	2.5/sec	3.47	0.18
8 Modify item i...	200	8418	1	23674	24631	27309	0	27708	53.00%	2.2/sec	2.87	0.26
9 Replace ite...	200	8947	1	23749	24840	27502	0	27718	53.00%	2.0/sec	2.63	0.24
11 Authorizati...	200	6786	1	20750	24769	26978	0	27442	99.50%	2.0/sec	2.76	0.26
12 Create ne...	200	4526	1	13355	14117	14325	0	14713	99.50%	1.9/sec	2.66	0.26
13 Get all order	200	2704	1	8687	9087	9486	0	11149	99.50%	1.9/sec	2.59	0.17
14 Get single ...	200	1177	1	3264	3466	6875	0	7683	99.50%	1.9/sec	2.59	0.17
15 Update order	200	924	1	2465	2655	2711	0	2864	99.50%	1.9/sec	2.56	0.25
16 Delete order	200	719	1	2458	2504	2657	0	2709	99.50%	1.9/sec	2.56	0.19
TOTAL	3000	16028	3109	53294	65346	83523	0	106002	54.60%	10.1/sec	11.81	1.29

Table 4.2.3 Aggregate report for 400 users with timer (SS-from Jmeter)

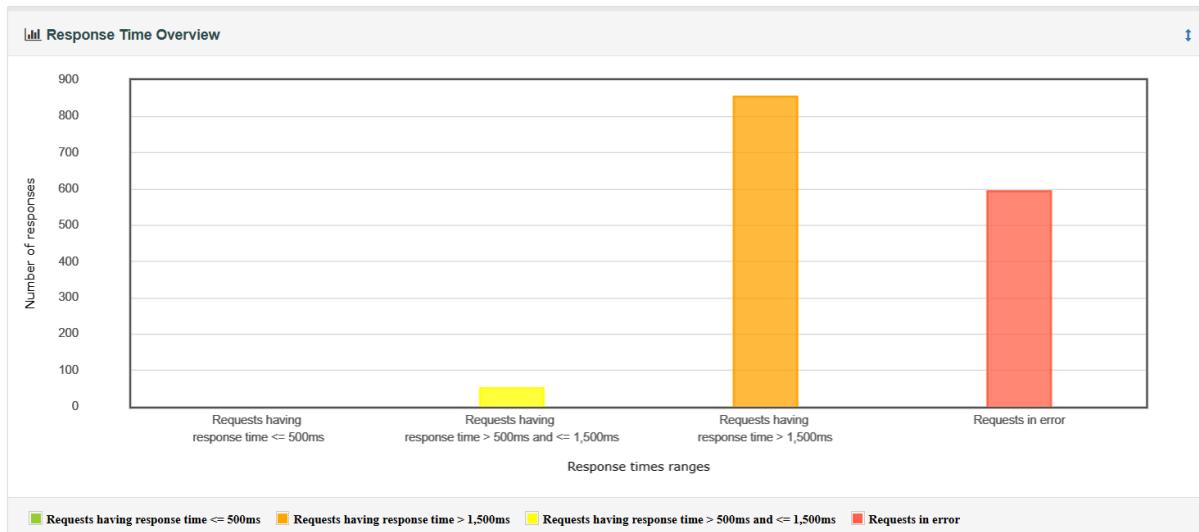
Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received KB/sec	Sent KB/sec
1 Status	400	75645	78668	122576	122987	123242	4166	123426	19.25%	3.2/sec	1.49	0.45
2 Get all product	400	80723	84288	120175	120279	120900	19003	120992	25.50%	1.7/sec	2.87	0.23
3 Get single pr...	400	45730	24814	109856	112459	120140	2306	121193	25.50%	1.4/sec	0.70	0.20
4 Create new ...	400	55939	51575	97658	108552	114124	3328	120252	0.75%	1.3/sec	0.57	0.29
5 Add item to ...	400	73891	77083	98380	105387	120106	86	120173	2.25%	1.1/sec	0.45	0.26
6 Get cart item	400	61745	62583	118673	120145	120300	34	120540	28.25%	1.1/sec	0.49	0.19
7 Get single cart	400	43042	51303	86501	98833	120182	27	120690	35.50%	1.3/sec	0.57	0.21
8 Modify item i...	400	25876	83	72624	86961	120099	26	120273	63.50%	2.0/sec	0.60	0.50
9 Replace ite...	400	5889	37	96	67208	84356	25	66707	91.75%	2.8/sec	0.85	0.69
11 Authorizati...	400	446	35	44	79	97	26	85915	99.75%	4.4/sec	1.37	1.18
12 Create ne...	400	35	35	40	41	66	27	121	100.00%	4.7/sec	1.46	1.32
13 Get all order	400	34	35	39	40	48	25	82	100.00%	4.7/sec	1.46	0.87
14 Get single ...	400	35	35	39	43	56	25	133	100.00%	4.7/sec	1.46	0.88
15 Update order	400	35	35	40	41	48	26	95	100.00%	4.7/sec	1.46	1.32
16 Delete order	400	34	34	39	41	46	25	142	100.00%	4.7/sec	1.46	0.98
TOTAL	6000	31273	81	95977	114479	122172	25	123426	59.47%	11.6/sec	5.32	2.42

- **4.3 Response Time Graph:**

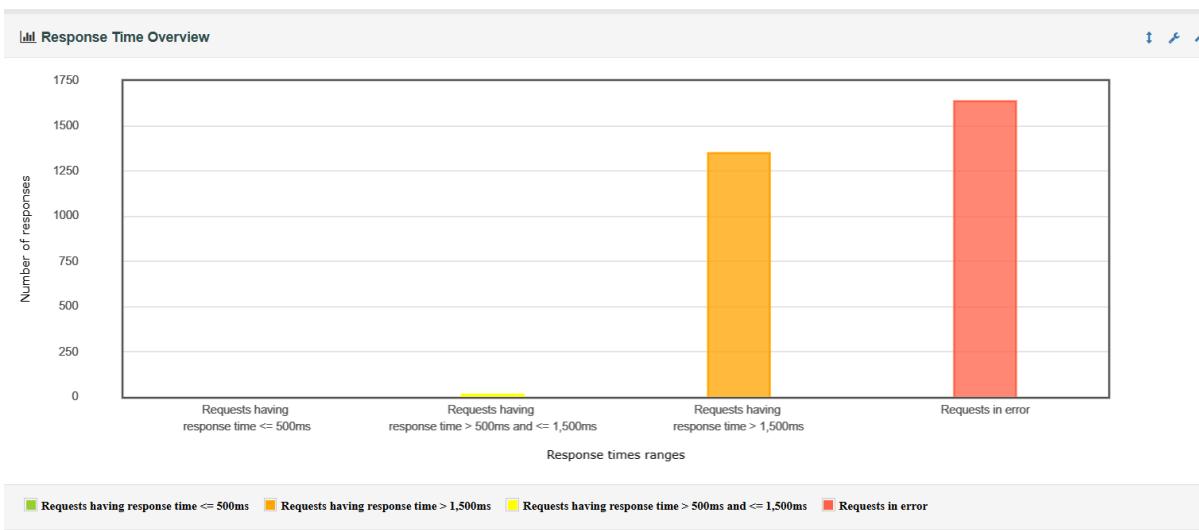
Response time graph gives a clear picture of overall time including requesting a page, processing the data, and getting the response back to the client.

The response time is calculated from the start of the first sample to the end of the last sample. This includes any intervals between samples, as it is supposed to represent the load on the server.

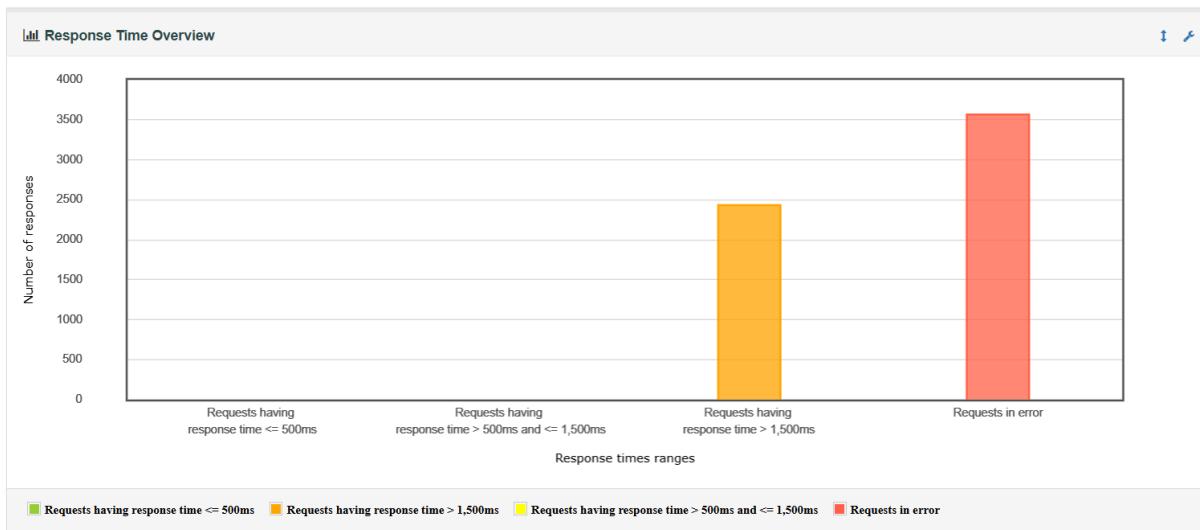
Graph 4.3.1 Response Time Graph for 100 users with Timer (SS-from index)



Graph 4.3.1 Response Time Graph for 200 users with Timer (SS-from index)



Graph 4.3.1 Response Time Graph for 400 users with Timer (SS-from index)



4.4 Errors:

4.4.1 Errors in Percentage

Fig 4.4.1 Error percentage for 100 users with timer (SS-from index)

Errors				
Type of error	Number of errors	% in errors	% in all samples	
401/Unauthorized	495	83.33%	33.00%	
409/Conflict	99	16.67%	6.60%	

Fig 4.4.2 Top 5 Error for 100 users with timer (SS-from index)

Top 5 Errors by sampler															
Sample	#Samples	#Errors	Error	#Errors	Error	#Errors	Error	#Errors	Error	#Errors	Error	#Errors	Error	#Errors	Error
Total	1500	594	401/Unauthorized	495	409/Conflict	99									
11 Authorization-Register new API	100	99	409/Conflict	99											
12 Create new order	100	99	401/Unauthorized	99											
13 Get all order	100	99	401/Unauthorized	99											
14 Get single order	100	99	401/Unauthorized	99											
15 Update order	100	99	401/Unauthorized	99											
16 Delete order	100	99	401/Unauthorized	99											

Fig 4.4.3 Error percentage for 200 users with timer (SS-from index)

Errors				
Type of error	Number of errors	% in errors	% in all samples	
Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: simple-grocery-store-api.glitch.me	1077	65.75%	35.90%	
401/Unauthorized	465	28.39%	15.50%	
409/Conflict	93	5.68%	3.10%	
Non HTTP response code: org.apache.http.conn.HttpHostConnectException/Non HTTP response message: Connect to simple-grocery-store-api.glitch.me:443 [simple-grocery-store-api.glitch.me/151.101.154.59] failed: Connection timed out: connect	1	0.06%	0.03%	
Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: No such host is known (simple-grocery-store-api.glitch.me)	1	0.06%	0.03%	
Test failed: headers expected to contain /content-type: application/json:/	1	0.06%	0.03%	

Fig 4.4.4 Top 5 Error for 200 users with timer (SS-from index)

Top 5 Errors by sampler												
Sample	# Samples	# Errors	Error	# Errors	Error	# Errors	Error	# Errors	Error	# Errors	Error	# Errors
Total	3000	1638	Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: simple-grocery-store-api.glitch.me	1077	401/Unauthorized	465	409/Conflict	93	Non HTTP response code: org.apache.http.conn.HttpHostConnectException/Non HTTP response message: Connect to simple-grocery-store-api.glitch.me:443 [simple-grocery-store-api.glitch.me/151.101.154.59] failed: Connection timed out: connect	1	Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: No such host is known (simple-grocery-store-api.glitch.me)	1
1 Status	200	1	Test failed: headers expected to contain /content-type: application/json/	1								
3 Get single product	200	1	Non HTTP response code: org.apache.http.conn.HttpHostConnectException/Non HTTP response message: Connect to simple-grocery-store-api.glitch.me:443 [simple-grocery-store-api.glitch.me/151.101.154.59] failed: Connection timed out: connect	1								
4 Create new cart	200	10	Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: simple-grocery-store-api.glitch.me	10								
5 Add item to cart	200	22	Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: simple-grocery-store-api.glitch.me	22								
6 Get cart item	200	91	Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: simple-grocery-store-api.glitch.me	90	Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: No such host is known (simple-grocery-store-api.glitch.me)	1						
7 Get single cart	200	107	Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: simple-grocery-store-api.glitch.me	107								
8 Modify item in cart	200	106	Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: simple-grocery-store-api.glitch.me	106								
9 Replace item in cart	200	106	Non HTTP response code: java.net.UnknownHostException/Non HTTP response message: simple-grocery-store-api.glitch.me	106								
11 Authorization-	200	199	Non HTTP response code: java.net.UnknownHostException/Non HTTP response	106	409/Conflict	93						

Fig 4.4.5 Error percentage for 400 users with timer (SS-from index)

Errors				
Type of error	Number of errors	% in errors	% in all samples	
495/Unknown Error	3219		90.22%	53.65%
503/Request timedout	235		6.59%	3.92%
404/Not Found	97		2.72%	1.62%
503/Service Unavailable	16		0.45%	0.27%
409/Conflict	1		0.03%	0.02%

Fig 4.4.6 Top 5 Error for 500 users with timer (SS-from index)

Top 5 Errors by sampler																
Sample	#Samples	#Errors	Error	#Errors	Error	#Errors	Error	#Errors	Error	#Errors	Error	#Errors	Error	#Errors	Error	#Errors
Total	6000	3568	495/Unknown Error	3219	503/Request timeout	235	404/Not Found	97	503/Service Unavailable	16	409/Conflict	1				
1 Status	400	77	503/Request timeout	77												
2 Get all product	400	102	503/Request timeout	102												
3 Get single product	400	102	404/Not Found	96	503/Request timeout	6										
4 Create new cart	400	3	503/Service Unavailable	3												
5 Add item to cart	400	9	503/Service Unavailable	6	495/Unknown Error	2	404/Not Found	1								
6 Get cart item	400	113	495/Unknown Error	77	503/Request timeout	36										
7 Get single cart	400	142	495/Unknown Error	128	503/Request timeout	14										
8 Modify item in cart	400	254	495/Unknown Error	247	503/Service Unavailable	7										
9 Replace item in cart	400	367	495/Unknown Error	367												
11 Authorization-Register new API	400	399	495/Unknown Error	398	409/Conflict	1										
12 Create new order	400	400	495/Unknown Error	400												
13 Get all order	400	400	495/Unknown Error	400												
14 Get single order	400	400	495/Unknown Error	400												
15 Update order	400	400	495/Unknown Error	400												
16 Delete order	400	400	495/Unknown Error	400												

5. Conclusion:

As per defined objective the error percentage is very high and throughput is also not as per the expectations. As the no of user increase the error percentage and response is also increased which need to reduce.

For achieving the desired result following approach can be followed.

1. Server Architecture needs to review.
2. Unwanted request response parameters should be removed.
3. Code needs to be optimize.