



MENTORA GROUP

Performance Test Workbook

Version: 2.0 4/1/2006

This workbook presents a consolidated view of the project, with Requirements on blue sheets and the Results of all test session on red sheets

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Customer Contact

Name:

Title:

Company name:

Project name:

Phone number:

E-mail address:

Approvals:

This Test Plan Workbook is hereby accepted

by:

Signature:

Title:

Date:

Load Test Results

ABC Company

1/2/2006

Key: Blue = Entered requirement Green = Actual (measured counted) Red = Computed
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Test Session: Full Load on Test and Production Environments

Test Date/Times: 31/01/06 14:19 to 15:28 (8:19am to 9:28 am ET)

Duration of Tests: Approximately 66 minutes

Objective: Determine system scalability and performance prior to public rollout.

Test Environment: 1 Web/App servers, 1 clustered Oracle database server (see Environment)

http 500 errors are observed from the beginning of the test, in small numbers; these errors increase sharply as load ramps from 125 to 250

Target Load: 250 users split across 4 test cases as shown on Processes sheet

Think Times: As shown on Processes sheet, detailed tables

Load Drivers: Load was delivered by 1 load servers distributed as follows

Machine Name	Role	# users	Make/Model	Configuration
Load5	Master	250	Dell 6650	4x1.5Ghz Xeon HT/3.6GB
Total		250		

Load Ramp:	Ramp Event	Ramp Rate	Ramp Duration
	0 to 125 users or	12 users/minute 1.0 user /5 seconds	About 12 minutes
	Remain at 125 for	20 minutes	
	125 to 250 users or	12 users/minute 1.0 user /5 seconds	About 12 minutes
	Remain at 250 for	20 minutes	

Key Observations:

- 1 All four processes scale well to about 230 users; above that level, performance on all but Kolb Map degrades sharply, to 3x at full load
- 2 http 500 errors are observed from the beginning of the test, in small numbers; these errors increase sharply as load ramps from 125 to 250
- 3 Database cpu rises quickly to 88% within 6 minutes, stabilizes at 125 user load, then essentially saturates at 97% above 130 users
- 4 Web cpu climbs gradually to 32% at 125 users, then increases more quickly during the second ramp wave, to a maximum of 81%
- 5 Bandwidth climbs at a steady rate to about 100 users, plateaus at about 5 Megabits per second as the 125 user load is reached
It then rises to a peak of 6.8 Mbps during the second ramp wave, before falling sharply at 230 users to less than 1 Mbps

Conclusions:

- 1 The system scalability range with reasonable performance is 230 users; a system bottleneck emerges above that level
- 2 The system bottleneck appears to be the database server, as evidenced by high cpu utilization and high load average

End-to-End Process Times over Load

ABC Company

Sheet Objective: Depict application scalability by graphing the time to complete each process over load

Key:
Blue = Entered requirement
Green = Actual (measured | counted)
Red = Computed

Instructions:

- 1 Enter the observations based on analysis of results
- 2 Enter conclusions derived from these observations

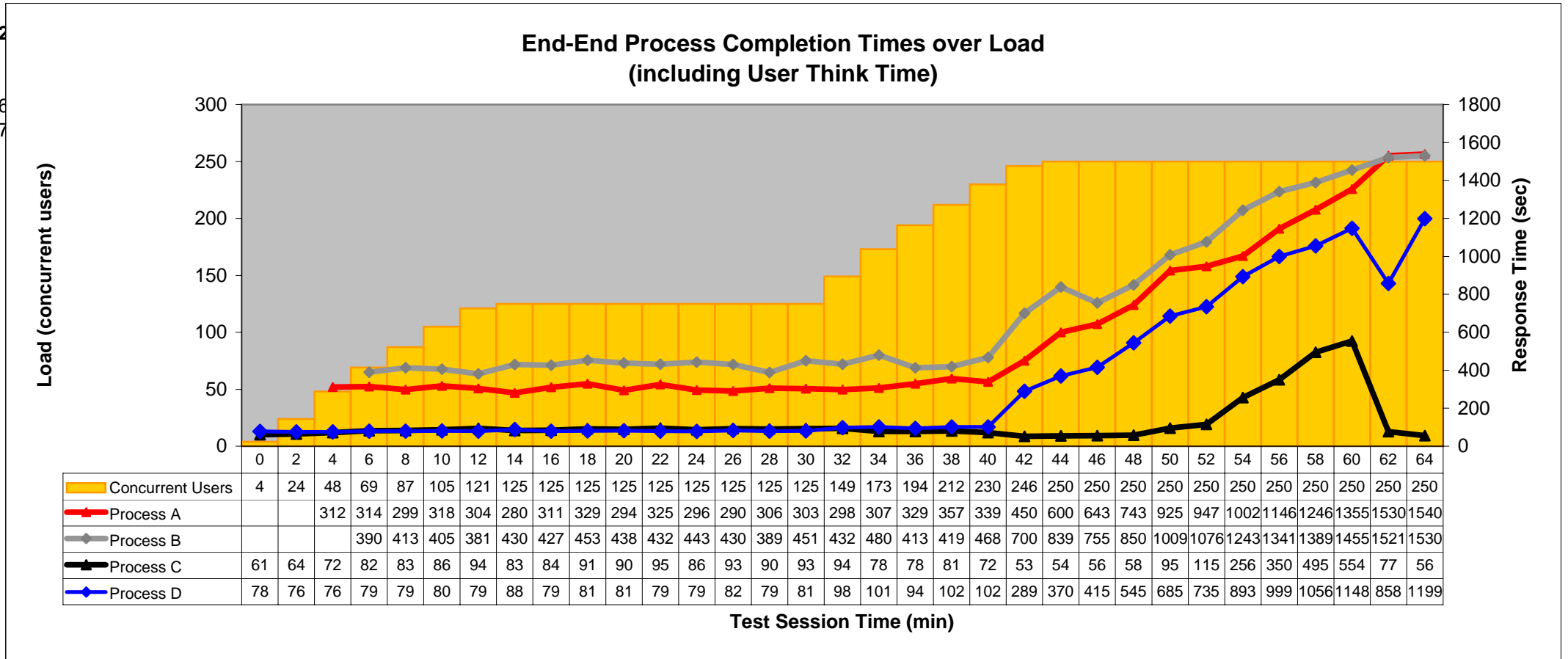
Observations:

- Test Environment: All four processes scale well to about 230 users; above that level, performance on all but Kolb Map degrades sharply, to 3x at full load
- 2 http 500 errors are observed from the beginning of the test, in small numbers; these errors increase sharply as load ramps from 125 to 250
 - 3

Conclusions:

- 1 The system scalability range with reasonable performance is 230 users; a system bottleneck emerges above that level
- 2

Concurrent Users 4 2
 Process A
 Process B
 Process C 61 6
 Process D 78 7
 Time 0



Page Presentation Times by Process Over Load

ABC Company

Sheet Objective: Identify slowest pages/actions in each process by graphing the time to complete each page / action

Instructions:

- 1 Enter the observations based on analysis of results
- 2 Enter conclusions derived from these observations

Test Environment:

- 1 http 500 errors are observed from the beginning of the test, in small numbers; these errors increase sharply as load ramps from 125 to 250
- 2

Conclusions:

- 1 A system bottleneck emerges above 230 users

Key:

Blue = Entered requirement

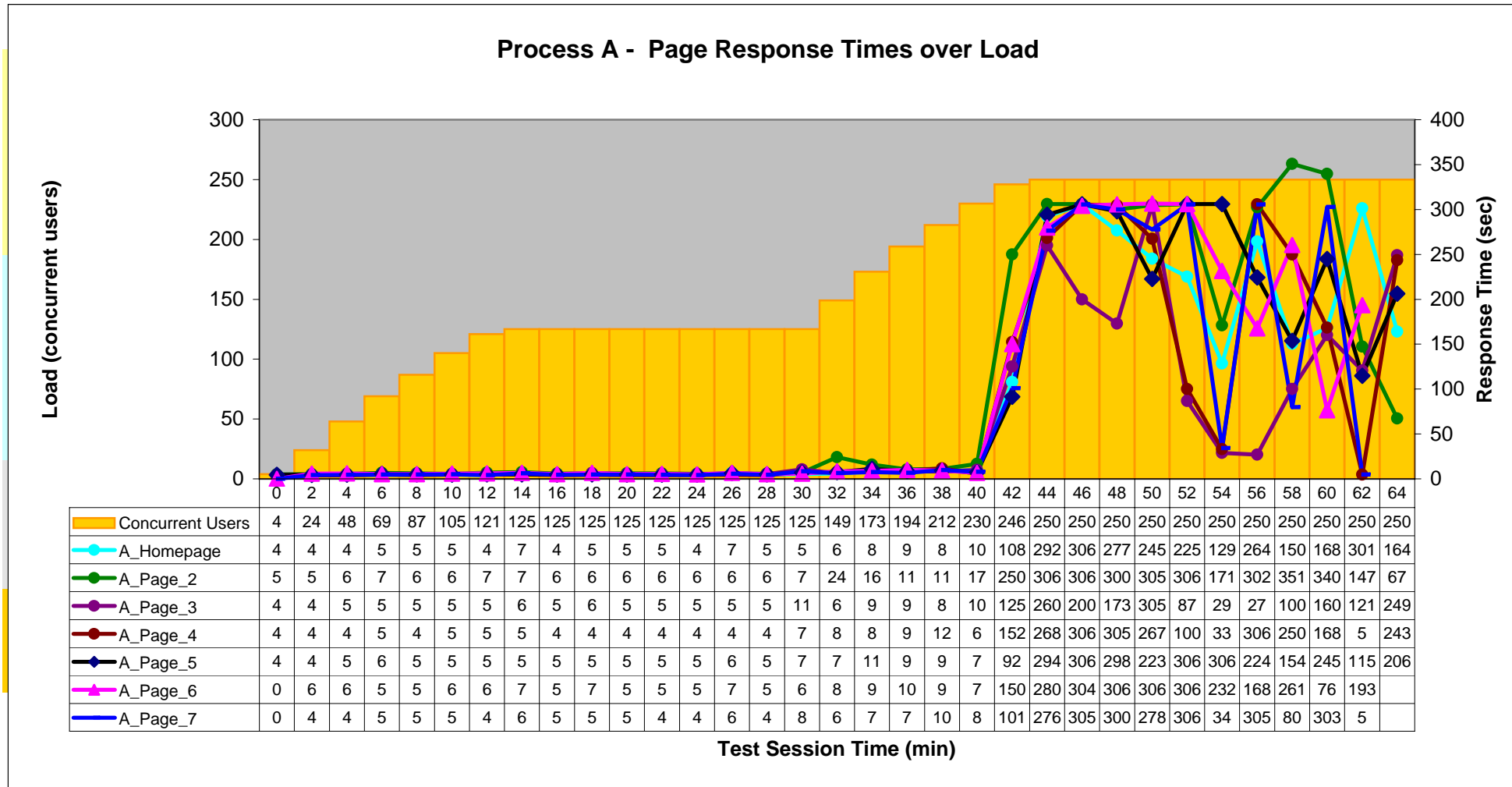
Green = Actual (measured | counted)

Red = Computed

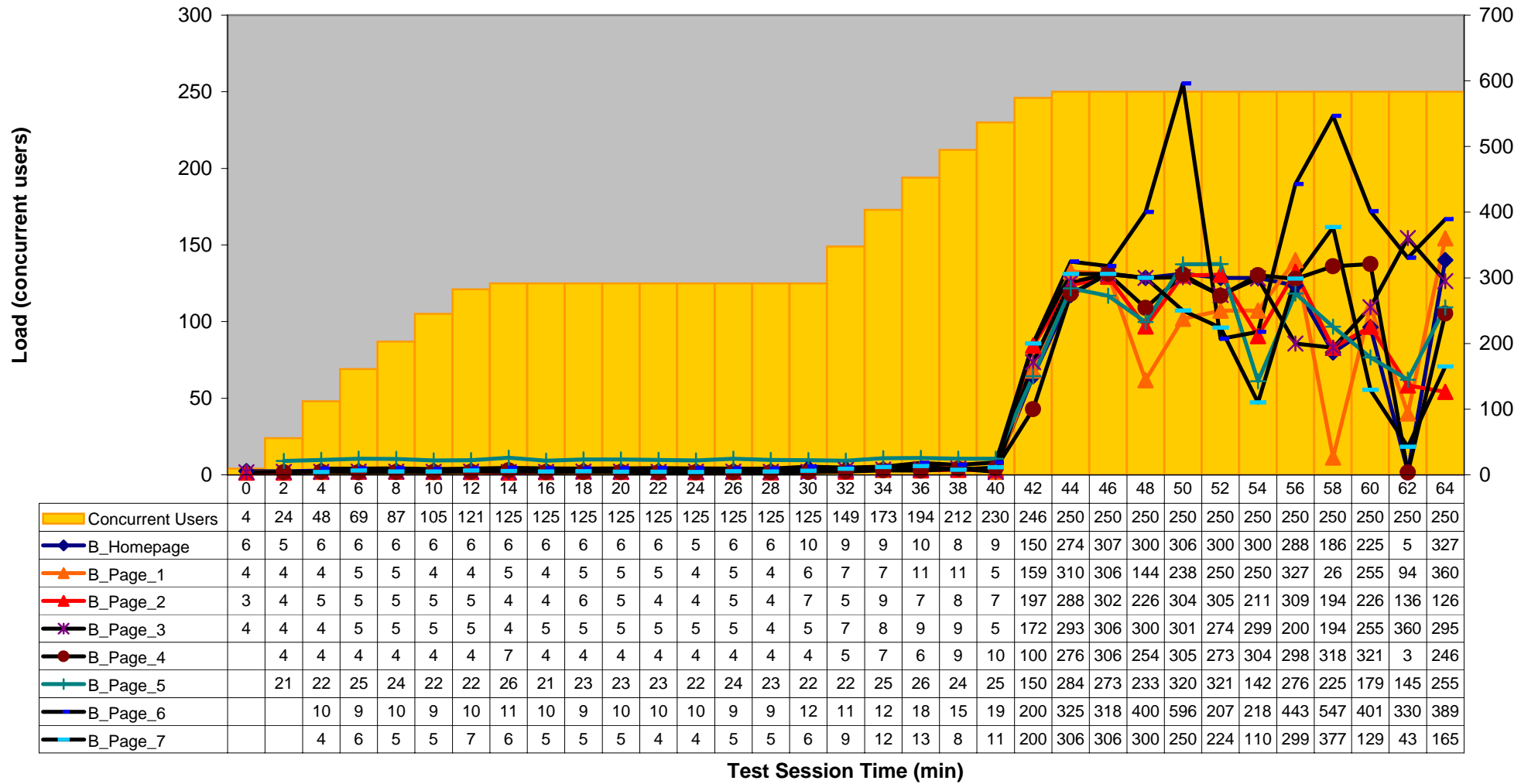
Concurrent Users

- A_Homepage
- A_Page_1
- A_Page_2
- A_Page_3
- A_Page_4
- A_Page_5
- A_Page_6
- A_Page_7
- B_Homepage
- B_Page_1
- B_Page_2
- B_Page_3
- B_Page_4
- B_Page_5
- B_Page_6
- B_Page_7
- C_Homepage
- C_Page_1
- C_Page_2
- C_Page_3
- C_Page_4
- D_Homepage
- D_Page_1
- D_Page_2
- D_Page_3

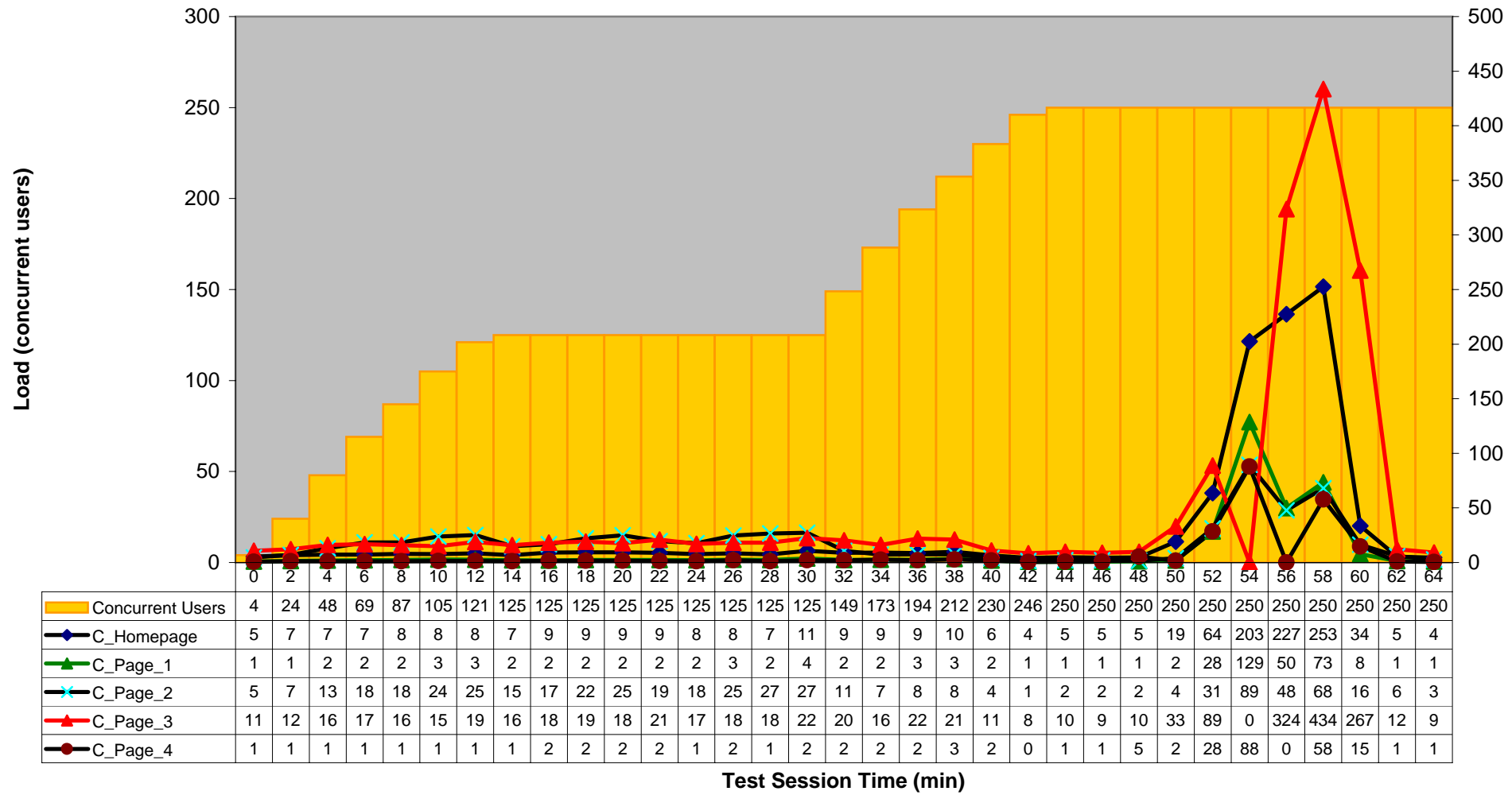
Time



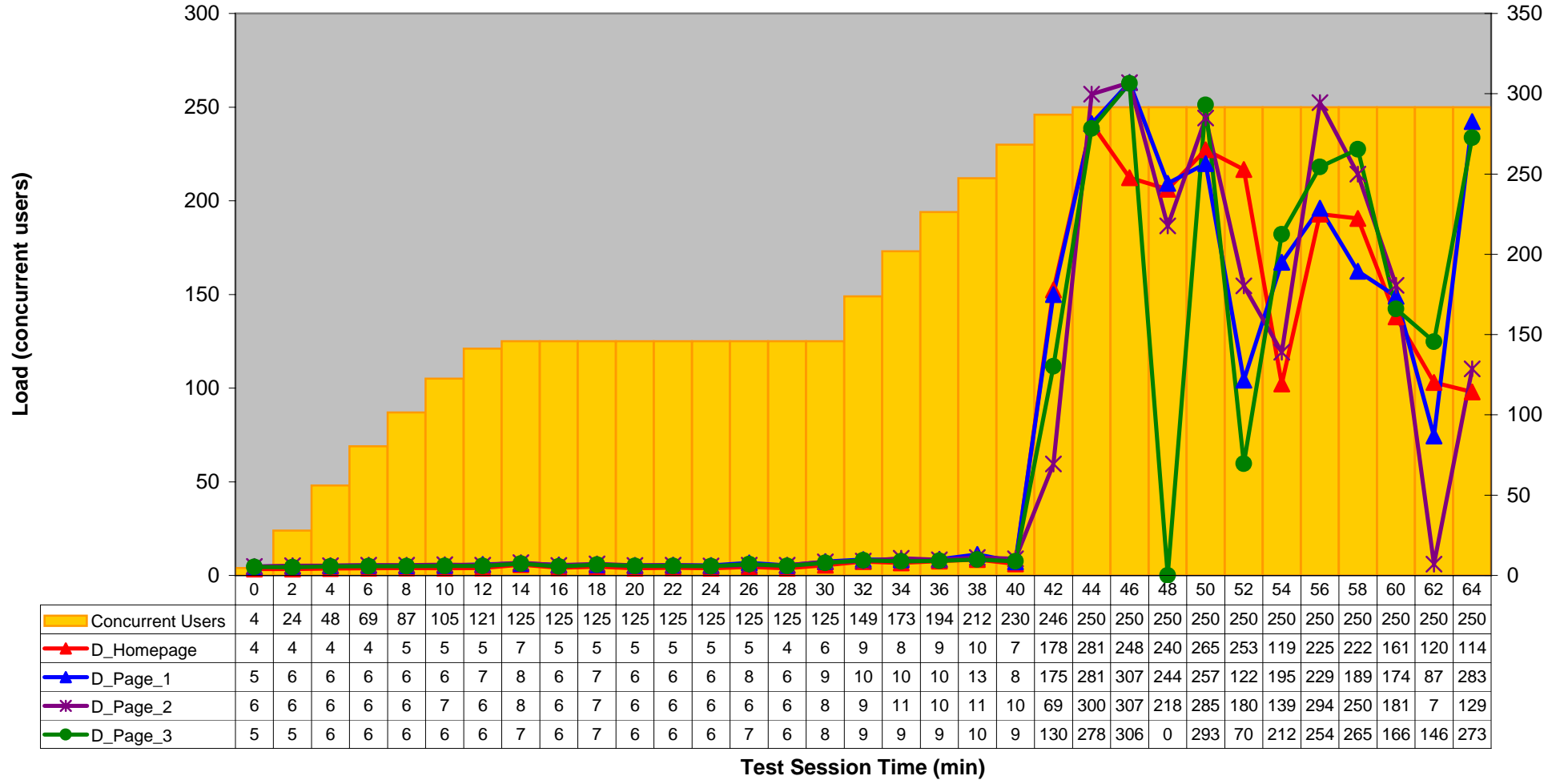
Process B - Page Response Times over Load



Process C - Response Times over Load



Process D - Response Times over Load



Application Errors

ABC Company

Sheet Objective: Determine validity of results by displating http and timeout errors over load, and if error rate is reasonably low, accept results as valid and use these errors to identify potential pplication bottlenecks requiring investigation

Instructions:

- 1 Enter the observations based on analysis of results
- 2 Enter conclusions derived from these observations

Test Environment:

- 1 http 500 errors are observed from the beginning of the test, in small numbers; these errors increase sharply as load ramps from 125 to 250
- 2

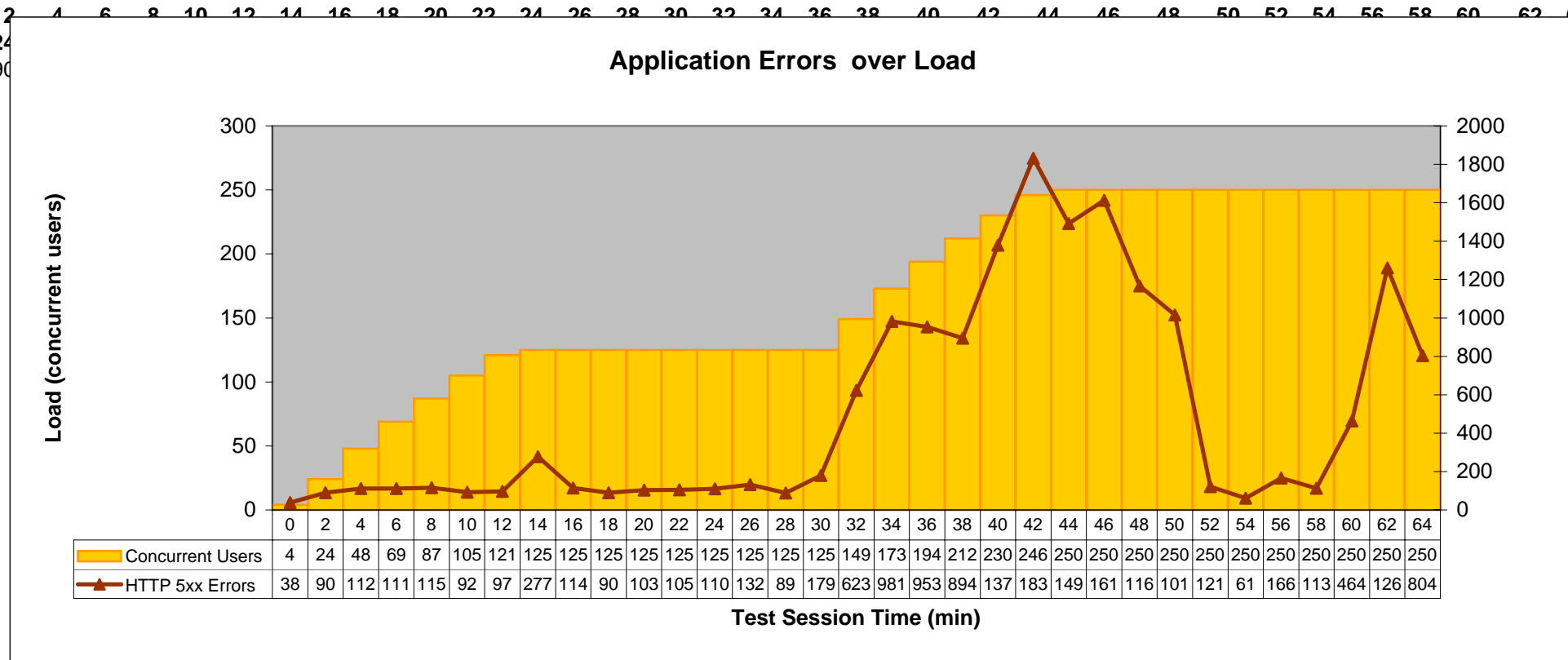
Conclusions:

- 1 Initial errors were diagnosed as due to a test script cookie problem
- 2 Above 125 users, the dsharp increase indicates a system saturation condition

Key:
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 Red = Computed

Time	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	
Concurrent Users	4	24	48	69	87	105	121	125	125	125	125	125	125	125	125	125	125	125	125	125	149	173	194	212	230	246	250	250	250	250	250	250	250	250
HTTP 5xx Errors	38	90	112	111	115	92	97	277	114	90	103	105	110	132	89	179	623	981	953	894	137	183	149	161	116	101	121	61	166	113	464	126	804	

Total
 16790



Server Resources

ABC Company

Below are selected graphs of the Production Server resources

Key:
Blue = Entered requirement
Green = Actual (measured | counted)
Red = Computed

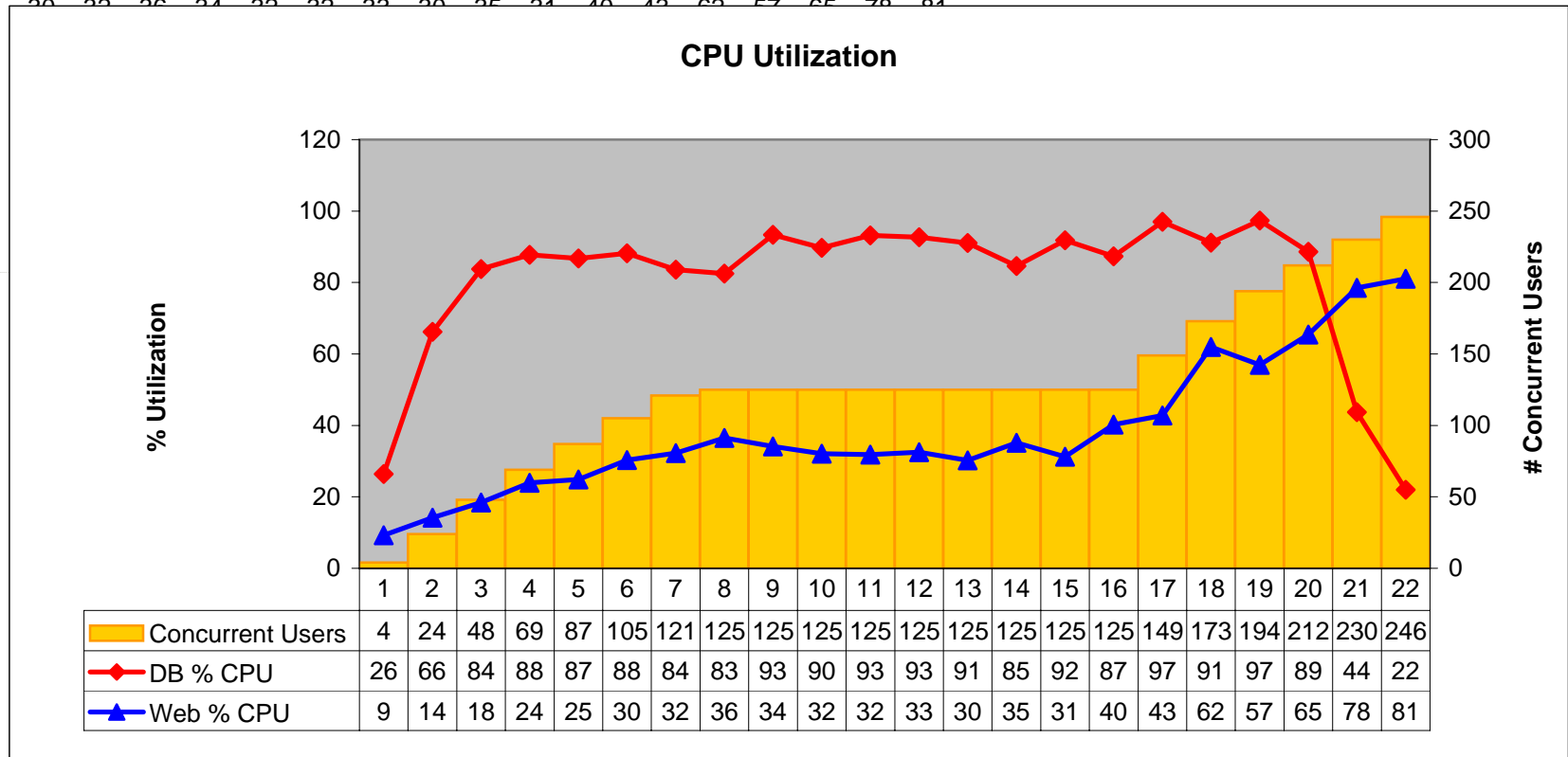
Observations:

- 1 Database cpu rises quickly to 88% within 6 minutes, stabilizes at 125 user load, then essentially saturates at 97% above 130 users
- 2 The database load average rises sharply, stayingng in the 10-12 range throughout the load range
- 3 Web cpu climbs gradually to 32% at 125 users, then increases more quickly during the second ramp wave, to a maximum of 81%

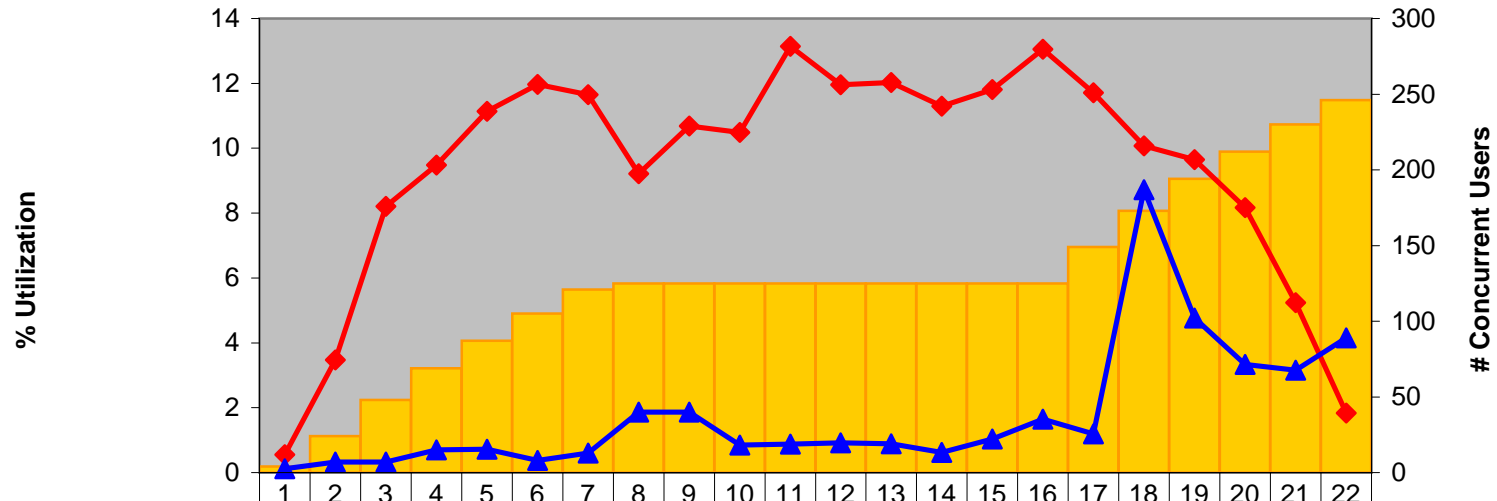
Conclusions:




- Test Environment: The system bottleneck appears to be the database server, as evidenced by high cpu utilization and high load average
- 2 http 500 errors are observed from the beginning of the test, in small numbers; these errors increase sharply as load ramps from 125 to 250

Time	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64
Concurrent Users	4	24	48	69	87	105	121	125	125	125	125	125	125	125	125	125	149	173	194	212	230	246	250	250	250	250	250	250	250	250	250	250	
DB % CPU	26	66	84	88	87	88	84	83	93	90	93	93	91	85	92	87	97	91	97	89	44	22											
DB Load Average	1	3	8	9	11	12	12	9	11	10	13	12	12	11	12	13	12	10	10	8	5	2											
DB dev8 blks/sec	171	186	180	246	234	404	199	238	420	448	393	159	341	383	310	293	244	578	238	569	270	254											
DB dev8 tps/sec	13	13	11	16	14	28	10	10	29	29	27	9	22	24	21	16	9	34	9	33	13	13											
Web % CPU	9	14	18	24	25	30	32	32	36	34	32	32	33	30	35	31	40	43	62	57	65	78	81										
Web % Memory Use	89	90	92	95	94																												
Web Load Average	0	0	0	1	1																												



Load Average



 Concurrent Users	4	24	48	69	87	105	121	125	125	125	125	125	125	125	125	149	173	194	212	230	246	
 DB Load Average	1	3	8	9	11	12	12	9	11	10	13	12	12	11	12	13	12	10	10	8	5	2
 Web Load Average	0	0	0	1	1	0	1	2	2	1	1	1	1	1	1	2	1	9	5	3	3	4