



## **Project and Portfolio Management Center**

Software Version 9.50

## **DM Benchmark Result Document**

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# 1 Introduction

## 1.1 Purpose and Scope

This document provides a benchmark that characterizes the performance of PPM version 9.50. It provides contextual data regarding the data environment within which a specific functional workload is applied representing the benchmark workload. Test results for a benchmark run within PPM Performance Labs are provided for reference purposes.

LoadRunner version 12.53 was used to simulate the workload for the benchmark test run. Additionally the document provides instructions with respect to setup and execution the benchmark in a customized environment.

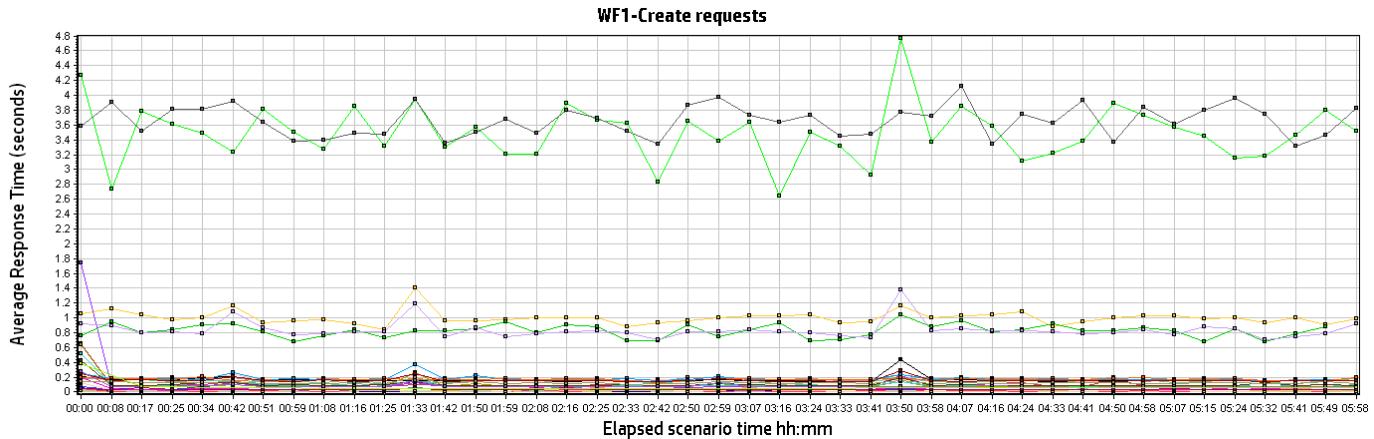
## 1.2 Terms and Definitions

Term	Definition
Vuser	Simulation of real user performing the actions on the product through LR scripts
Injector Host/Load Generator (LG)	The client machine from which the Vusers will run from and activate the different scripts and scenarios.
LoadRunner Controller (LC)	The LoadRunner controller is used to create and run scenarios. When running a scenario, the controller coordinates all the vusers in terms of scheduling and pacing and captures correlated resource utilization for subsequent analysis
Transaction	An end-to-end (browser-to backend-to browser) measurement of one or more user actions that has a tangible business value to the end-user. This is also termed as a “Business Process”.
Transaction Throughput	Number of successful Transaction instances running through the product within a specified period of time
Transaction Response Time	The time measured by LoadRunner generator as the response time of the transaction. This is defined by LoadRunner as the time taken for all web requests belonging to the transaction, to return the responses. This is also termed as “Transaction Latency”
Think-Time	Delay provided between HTTP requests while simulating users (Vusers) through LoadRunner scripts, in order to simulate real world delays between various user actions while using the product
Concurrent users	Users that execute the same step in the same business process at the same time instance
Connected users	Users that logged into the system, but not necessarily execute any business process at this time
Active users	Connected users that execute activity at this moment, can be concurrent (but not necessarily so)

## 2 Benchmark Scenario Run

The following section provided results from a benchmark in PPM Performance Labs divided by WFs.

### 2.1 WF1-Create requests Average Transaction Response Time

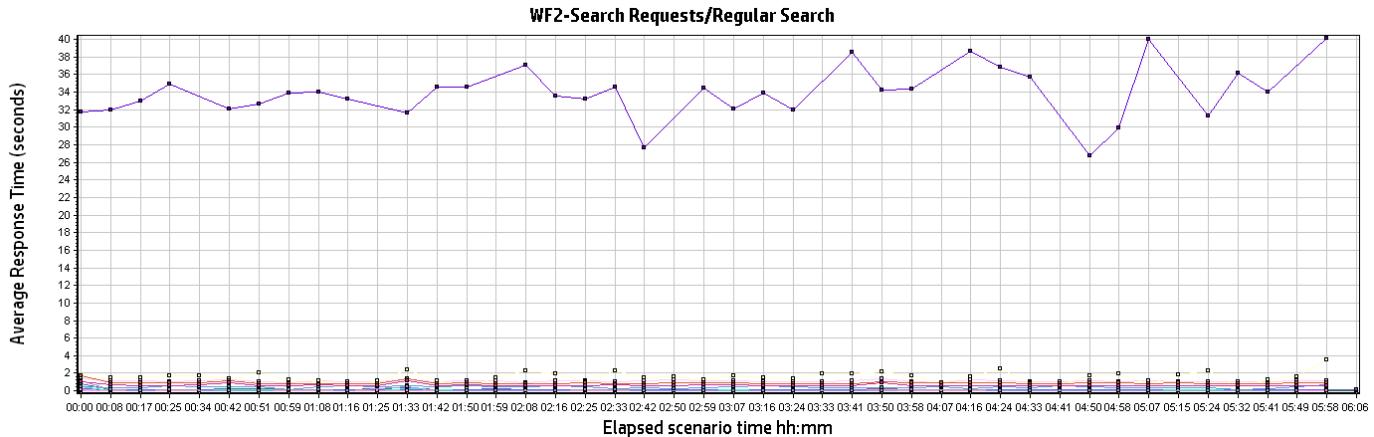


<b>Color</b>	<b>Scale</b>	<b>Measurement</b>	<b>Minimum</b>	<b>Average</b>	<b>Maximum</b>	<b>Std. Deviation</b>
Red	1	DMBM_01_TX_01_SelectRequest_RT_1	0.064	0.109	1.914	0.170
Yellow	1	DMBM_01_TX_02_SelectContactName_RT_1	0.638	1.000	2.741	0.201
Dark Blue	1	DMBM_01_TX_03_OpenScheduledStartDate_RT_1	0.006	0.012	0.453	0.028
Cyan	1	DMBM_01_TX_04_SelectScheduledStartDate_RT_1	0.005	0.012	0.500	0.038
Brown	1	DMBM_01_TX_05_OpenScheduledFinishDate_RT_1	0.025	0.034	0.179	0.012
Orange	1	DMBM_01_TX_06_SelectSkill_RT_1	0.022	0.035	0.411	0.027
Light Green	1	DMBM_01_TX_07_SelectDate_RT_1	0.009	0.015	0.225	0.012
Pink	1	DMBM_01_TX_08_SubmitRequest_RT_1	0.124	0.162	0.708	0.035
Purple	1	DMBM_02_TX_01_SelectRequest_RT_4	0.061	0.134	3.857	0.435
Green	1	DMBM_02_TX_02_ClickAssignToMultiVal_RT_4	2.258	3.494	5.973	0.561
Teal	1	DMBM_02_TX_03_ClickFind_AssignToMultiVal_RT_4	0.087	0.144	0.405	0.035
Red	1	DMBM_02_TX_04_ChooseDate_RT_4	0.010	0.016	0.102	0.012
Grey	1	DMBM_02_TX_05_ClickTab_ShortContact_RT_4	0.102	0.173	0.283	0.028
Green	1	DMBM_02_TX_06_ShowAll_ShortContacts_RT_4	0.541	0.819	1.261	0.126
Black	1	DMBM_02_TX_07_Submit_RT_4	0.130	0.166	0.708	0.056
Yellow	1	DMBM_03_TX_01_SelectRequest_RT_5	0.053	0.100	2.085	0.177
Teal	1	DMBM_03_TX_02_ChooseApplication_RT_5	0.022	0.035	0.499	0.028
Blue	1	DMBM_03_TX_03_ChoseRequestGroup_RT_5	0.021	0.033	0.312	0.023
Cyan	1	DMBM_03_TX_04_NewReferenceAttachment_RT_5	0.065	0.106	2.583	0.162
Orange	1	DMBM_03_TX_05_ChooseDate_RT_5	0.009	0.021	0.737	0.052
Blue	1	DMBM_03_TX_06_Submit_RT_5	0.128	0.182	0.862	0.075
Brown	1	DMBM_04_TX_01_SelectRequest_RT_6	0.071	0.106	2.093	0.119
Pink	1	DMBM_04_TX_02_ClickTabOnNonExistentContactName_RT_6	0.028	0.045	0.499	0.048
Purple	1	DMBM_04_TX_03_ClickShowAll_RT_6	0.521	0.831	2.874	0.229
Orange	1	DMBM_04_TX_04_ClickFindContact_RT_6	0.098	0.169	0.583	0.041
Dark Red	1	DMBM_04_TX_05_Submit_RT_6	0.117	0.161	0.720	0.059
Purple	1	DMBM_05_TX_01_SelectRequest_RT_7	0.052	0.084	1.154	0.070

1	DMBM_05_TX_02_AssignToMultiSelect_RT_7	2.290	3.648	6.562	0.507
1	DMBM_05_TX_03_ChooseRequestGroup_RT_7	0.021	0.034	0.332	0.023
1	DMBM_05_TX_04_Submit_RT_7	0.087	0.126	0.421	0.034

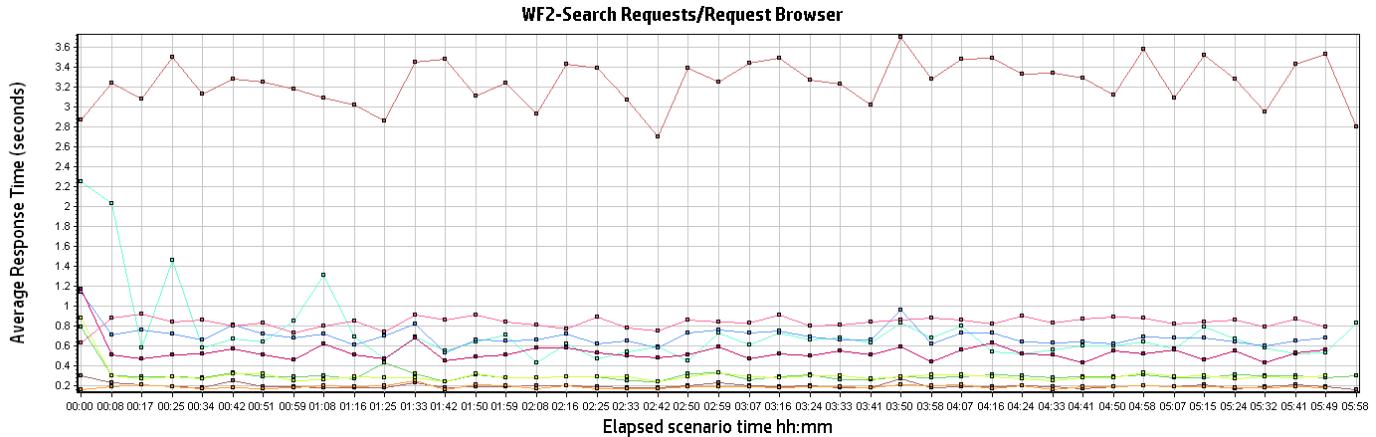
## 2.2 WF2 – Search requests, Average Transaction Response Time

### 2.2.1 Regular Searches



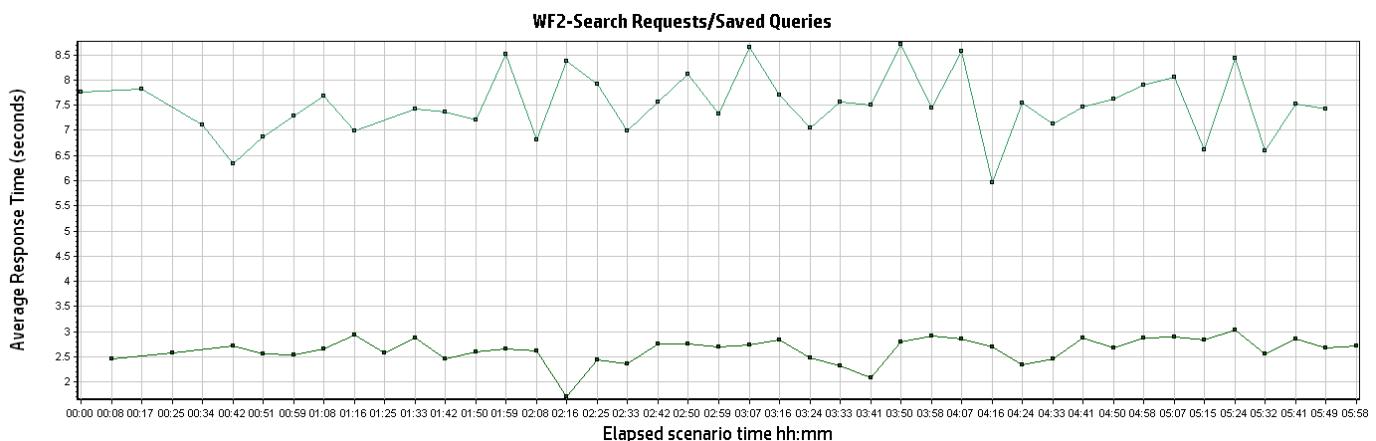
Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
Dark Teal	1	DMBM_06_TX_01_OpenSearchMenu	0.053	0.082	3.435	0.113
Dark Purple	1	DMBM_06_TX_02_Submit	0.118	0.193	4.030	0.222
Cyan	1	DMBM_07_TX_01_OpenSearchMenu	0.048	0.082	1.465	0.075
Pink	1	DMBM_07_TX_02_Submit	0.349	1.122	2.218	0.338
Cyan	1	DMBM_08_TX_01_OpenSearchMenu	0.054	0.086	1.604	0.115
Pink	1	DMBM_08_TX_02_ClickTabOnRequestType	0.015	0.022	0.303	0.020
Blue	1	DMBM_08_TX_03_ClickAdvancedSearch	0.072	0.100	0.634	0.057
Purple	1	DMBM_08_TX_04_ClickPriority	0.026	0.042	0.418	0.030
Yellow	1	DMBM_08_TX_05_Submit	0.103	1.540	5.398	1.640
Cyan	1	DMBM_09_TX_01_OpenSearchMenu	0.051	0.088	1.327	0.095
Grey	1	DMBM_09_TX_02_selectRT	0.014	0.024	0.786	0.038
Cyan	1	DMBM_09_TX_03_selectPriority	0.026	0.041	0.649	0.043
Pink	1	DMBM_09_TX_04_ChOOSEWorkflow	0.031	0.048	0.428	0.035
Blue	1	DMBM_09_TX_05_ClickSearch	0.089	0.418	1.337	0.355
Grey	1	DMBM_10_TX_01_OpenSearchMenu	0.054	0.110	1.098	0.183
Purple	1	DMBM_10_TX_02_ClickSearch	26.763	33.910	40.111	2.926
Brown	1	DMBM_18_TX_01_ChOOSEPortlet	0.587	0.907	10.104	0.481
Pink	1	DMBM_18_TX_02_ChOOSERequest	0.496	0.658	4.847	0.324

## 2.2.2 Request Browser



Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
Green	1	DMBM_21_OnlySearchRequestBrowser_TX01_Choose_Req_Browser	0.179	0.750	6.920	0.755
Blue	1	DMBM_22_Request_Browser_Saved_Set_1_TX01_Click_Saved_Set_1	0.442	0.702	1.965	0.154
Green	1	DMBM_22_Request_Browser_Saved_Set_1_TX02_Click_Tree_Level_1	0.191	0.312	1.803	0.144
Brown	1	DMBM_22_Request_Browser_Saved_Set_1_TX03_Click_Tree_Level_2	0.150	0.202	0.434	0.041
Red	1	DMBM_22_Request_Browser_Saved_Set_1_TX04_Click_Link	2.233	3.237	4.006	0.376
Magenta	1	DMBM_23_Request_Browser_Saved_Set_2_TX01_Push_Saved_Set_2	0.326	0.542	2.484	0.205
Yellow	1	DMBM_23_Request_Browser_Saved_Set_2_TX02_Click_1st_Level	0.183	0.307	1.831	0.155
Orange	1	DMBM_23_Request_Browser_Saved_Set_2_TX03_Click_2nd_Level	0.128	0.192	0.340	0.030
Pink	1	DMBM_23_Request_Browser_Saved_Set_2_TX04_Click_Link	0.556	0.837	1.075	0.104

## 2.2.3 Run from Saved queries



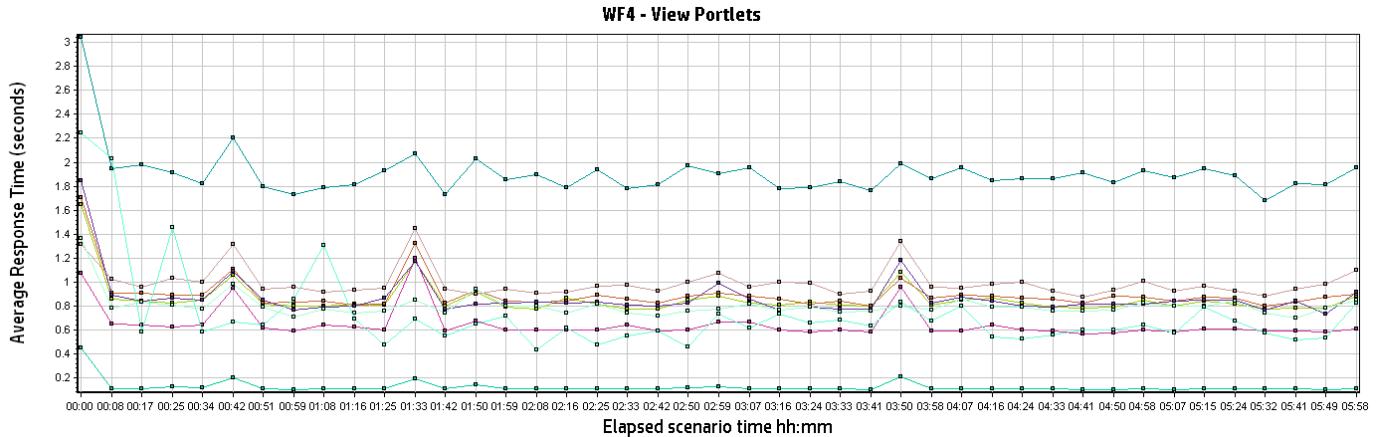
Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1	DMBM_24_Run_Questions_FromSaved_Query_Builder_Chose_Query_1	1.710	2.630	3.629	0.311
	1	DMBM_24_Run_Questions_FromSaved_Query_Builder_Chose_Query_2	5.607	7.538	10.095	0.832

### 2.3 WF3 - process request Average Transaction Response Time



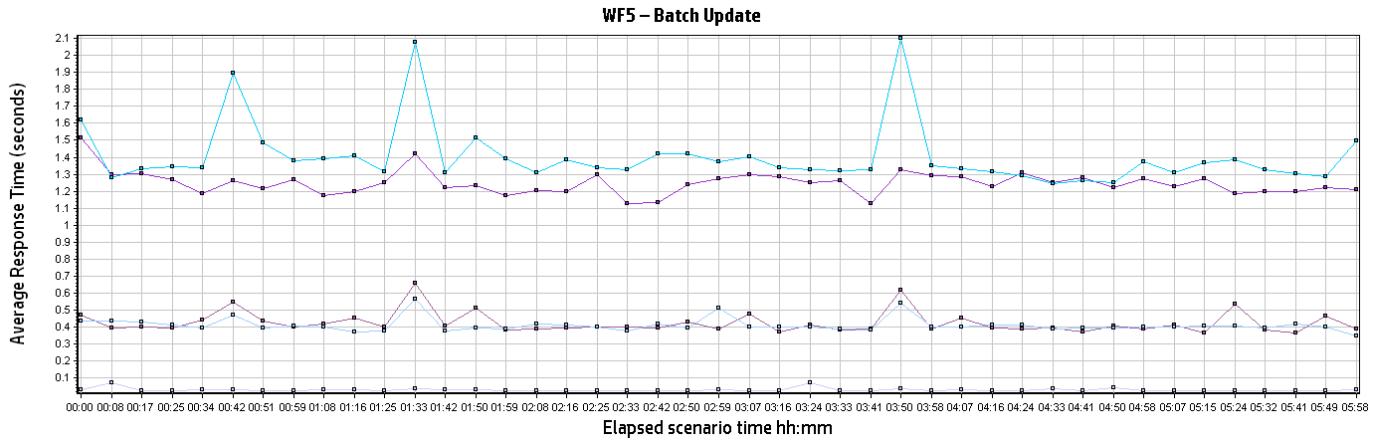
Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1	DMBM_11_TX_01_OpenSearchMenu	0.050	0.077	1.806	0.078
	1	DMBM_11_TX_02_SearchRequestID	0.106	0.199	3.014	0.187
	1	DMBM_11_TX_03_ClickAssign_RT_1	0.247	0.426	6.095	0.494
	1	DMBM_11_TX_03_ClickAssign_RT_6	0.311	0.439	6.958	0.336
	1	DMBM_11_TX_03_ClickAssign_RT_7	0.231	0.359	1.369	0.142
	1	DMBM_12_TX_01_OpenSearchMenu	0.046	0.074	3.444	0.065
	1	DMBM_12_TX_02_SearchRequestID	0.070	0.115	3.631	0.086
	1	DMBM_12_TX_03_ClickAssign_RT5	0.211	0.326	1.782	0.104
	1	DMBM_13_TX_01_OpenSearchMenu	0.019	0.038	1.093	0.080
	1	DMBM_13_TX_02_SearchRequestID	0.068	0.146	2.159	0.165
	1	DMBM_13_TX_03_ShowGraphicalView	0.095	0.164	2.591	0.176
	1	DMBM_14_TX_01_OpenSearchMenu	0.058	0.096	1.418	0.114
	1	DMBM_14_TX_02_SearchRequestID	0.106	0.206	3.042	0.248
	1	DMBM_14_TX_03_ShowApprovalDetails	0.104	0.155	0.670	0.055
	1	DMBM_15_TX_01_OpenSearchMenu	0.053	0.081	1.038	0.083
	1	DMBM_15_TX_02_SearchRequestID	0.112	0.194	4.579	0.261
	1	DMBM_15_TX_03_ShowTransactionalDetails	0.014	0.028	0.609	0.036
	1	DMBM_16_TX_01_OpenSearchMenu	0.045	0.082	1.703	0.104
	1	DMBM_16_TX_02_SearchRequestID	0.103	0.169	3.435	0.209
	1	DMBM_16_TX_03_openAttachment	0.006	0.024	1.268	0.045

## 2.4 WF4 - View Portlets



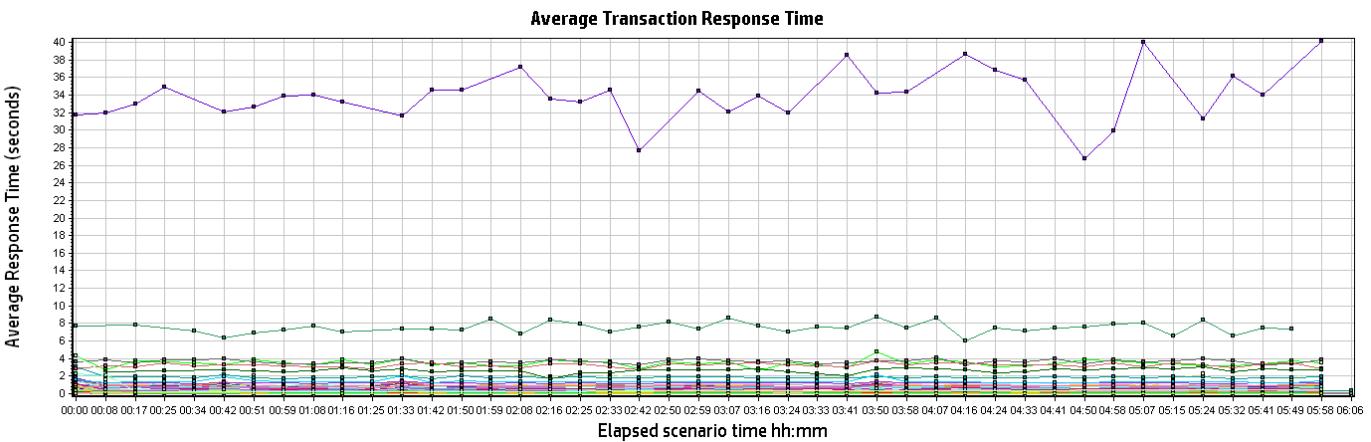
Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
Green	1	DMBM_17_TX_01_ChoosePortlet	0.556	0.864	10.553	0.460
Orange	1	DMBM_18_TX_01_ChoosePortlet	0.587	0.907	10.104	0.481
Purple	1	DMBM_18_TX_02_ChooseRequest	0.496	0.658	4.847	0.324
Dark Blue	1	DMBM_20_TX_01_ViewPortlet_With_Bar_And_Pie_Chart	1.263	1.916	7.378	0.441
Cyan	1	DMBM_20_TX_02_ClickOnPieChart	0.524	0.805	6.376	0.276

## 2.5 WF5 – Batch update



Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
Dark Purple	1	DMBM_25_PPM_BatchUpdate_TX01_SearchRequests	0.151	0.423	1.983	0.198
Purple	1	DMBM_25_PPM_BatchUpdate_TX02_Search75Req	0.771	1.247	3.502	0.197
Light Blue	1	DMBM_25_PPM_BatchUpdate_TX03_ClickMassUpdate	0.271	0.409	1.312	0.089
Light Purple	1	DMBM_25_PPM_BatchUpdate_TX04_ClickDone	0.013	0.026	0.834	0.039
Cyan	1	DMBM_25_PPM_BatchUpdate_TX05_ClickContinue	0.720	1.403	6.638	0.505

## 2.6 Average Transaction Response Time-Total TRT's

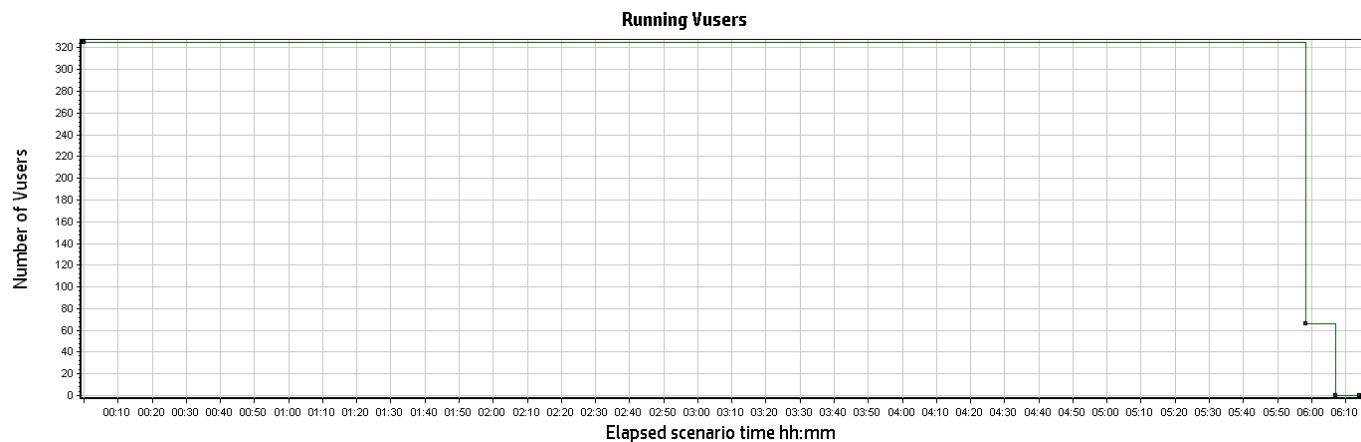


<b>Color</b>	<b>Scale</b>	<b>Measurement</b>	<b>Minimum</b>	<b>Average</b>	<b>Maximum</b>	<b>Std. Deviation</b>
1	1	DMBM_01_TX_01_SelectRequest_RT_1	0.064	0.109	1.914	0.170
1	1	DMBM_01_TX_02_SelectContactName_RT_1	0.638	1.000	2.741	0.201
1	1	DMBM_01_TX_03_OpenScheduledStartDate_RT_1	0.006	0.012	0.453	0.028
1	1	DMBM_01_TX_04_SelectScheduledStartDate_RT_1	0.005	0.012	0.500	0.038
1	1	DMBM_01_TX_05_OpenScheduledFinishDate_RT_1	0.025	0.034	0.179	0.012
1	1	DMBM_01_TX_06_SelectSkill_RT_1	0.022	0.035	0.411	0.027
1	1	DMBM_01_TX_07_SelectDate_RT_1	0.009	0.015	0.225	0.012
1	1	DMBM_01_TX_08_SubmitRequest_RT_1	0.124	0.162	0.708	0.035
1	1	DMBM_02_TX_01_SelectRequest_RT_4	0.061	0.134	3.857	0.435
1	1	DMBM_02_TX_02_ClickAssignToMultiVal_RT_4	2.258	3.494	5.973	0.561
1	1	DMBM_02_TX_03_ClickFind_AssignToMultiVal_RT_4	0.087	0.144	0.405	0.035
1	1	DMBM_02_TX_04_ChooseDate_RT_4	0.010	0.016	0.102	0.012
1	1	DMBM_02_TX_05_ClickTab_ShortContact_RT_4	0.102	0.173	0.283	0.028
1	1	DMBM_02_TX_06_ShowAll_ShortContacts_RT_4	0.541	0.819	1.261	0.126
1	1	DMBM_02_TX_07_Submit_RT_4	0.130	0.166	0.708	0.056
1	1	DMBM_03_TX_01_SelectRequest_RT_5	0.053	0.100	2.085	0.177
1	1	DMBM_03_TX_02_ChooseApplication_RT_5	0.022	0.035	0.499	0.028
1	1	DMBM_03_TX_03_ChooseRequestGroup_RT_5	0.021	0.033	0.312	0.023
1	1	DMBM_03_TX_04_NewReferenceAttachment_RT_5	0.065	0.106	2.583	0.162
1	1	DMBM_03_TX_05_ChooseDate_RT_5	0.009	0.021	0.737	0.052
1	1	DMBM_03_TX_06_Submit_RT_5	0.128	0.182	0.862	0.075
1	1	DMBM_04_TX_01_SelectRequest_RT_6	0.071	0.106	2.093	0.119
1	1	DMBM_04_TX_02_ClickTabOnNonExistentContactName_RT_6	0.028	0.045	0.499	0.048
1	1	DMBM_04_TX_03_ClickShowAll_RT_6	0.521	0.831	2.874	0.229
1	1	DMBM_04_TX_04_ClickFindContact_RT_6	0.098	0.169	0.583	0.041
1	1	DMBM_04_TX_05_Submit_RT_6	0.117	0.161	0.720	0.059
1	1	DMBM_05_TX_01_SelectRequest_RT_7	0.052	0.084	1.154	0.070
1	1	DMBM_05_TX_02_AssignToMultiSelect_RT_7	2.290	3.648	6.562	0.507
1	1	DMBM_05_TX_03_ChooseRequestGroup_RT_7	0.021	0.034	0.332	0.023

	1	DMBM_05_TX_04_Submit_RT_7	0.087	0.126	0.421	0.034
	1	DMBM_06_TX_01_OpenSearchMenu	0.053	0.082	3.435	0.113
	1	DMBM_06_TX_02_Submit	0.118	0.193	4.030	0.222
	1	DMBM_07_TX_01_OpenSearchMenu	0.048	0.082	1.465	0.075
	1	DMBM_07_TX_02_Submit	0.349	1.122	2.218	0.338
	1	DMBM_08_TX_01_OpenSearchMenu	0.054	0.086	1.604	0.115
	1	DMBM_08_TX_02_ClickTabOnRequestType	0.015	0.022	0.303	0.020
	1	DMBM_08_TX_03_ClickAdvancedSearch	0.072	0.100	0.634	0.057
	1	DMBM_08_TX_04_ClickPriority	0.026	0.042	0.418	0.030
	1	DMBM_08_TX_05_Submit	0.103	1.540	5.398	1.640
	1	DMBM_09_TX_01_OpenSearchMenu	0.051	0.088	1.327	0.095
	1	DMBM_09_TX_02_selectRT	0.014	0.024	0.786	0.038
	1	DMBM_09_TX_03_selectPriority	0.026	0.041	0.649	0.043
	1	DMBM_09_TX_04_ChooseWorkflow	0.031	0.048	0.428	0.035
	1	DMBM_09_TX_05_ClickSearch	0.089	0.418	1.337	0.355
	1	DMBM_10_TX_01_OpenSearchMenu	0.054	0.110	1.098	0.183
	1	DMBM_10_TX_02_ClickSearch	26.763	33.910	40.111	2.926
	1	DMBM_11_TX_01_OpenSearchMenu	0.050	0.077	1.806	0.078
	1	DMBM_11_TX_02_SearchRequestID	0.106	0.199	3.014	0.187
	1	DMBM_11_TX_03_ClickAssign_RT_1	0.247	0.426	6.095	0.494
	1	DMBM_11_TX_03_ClickAssign_RT_6	0.311	0.439	6.958	0.336
	1	DMBM_11_TX_03_ClickAssign_RT_7	0.231	0.359	1.369	0.142
	1	DMBM_12_TX_01_OpenSearchMenu	0.046	0.074	3.444	0.065
	1	DMBM_12_TX_02_SearchRequestID	0.070	0.115	3.631	0.086
	1	DMBM_12_TX_03_ClickAssign_RT5	0.211	0.326	1.782	0.104
	1	DMBM_13_TX_01_OpenSearchMenu	0.019	0.038	1.093	0.080
	1	DMBM_13_TX_02_SearchRequestID	0.068	0.146	2.159	0.165
	1	DMBM_13_TX_03_ShowGraphicalView	0.095	0.164	2.591	0.176
	1	DMBM_14_TX_01_OpenSearchMenu	0.058	0.096	1.418	0.114
	1	DMBM_14_TX_02_SearchRequestID	0.106	0.206	3.042	0.248
	1	DMBM_14_TX_03_ShowApprovalDetails	0.104	0.155	0.670	0.055
	1	DMBM_15_TX_01_OpenSearchMenu	0.053	0.081	1.038	0.083
	1	DMBM_15_TX_02_SearchRequestID	0.112	0.194	4.579	0.261
	1	DMBM_15_TX_03_ShowTransactionalDetails	0.014	0.028	0.609	0.036
	1	DMBM_16_TX_01_OpenSearchMenu	0.045	0.082	1.703	0.104
	1	DMBM_16_TX_02_SearchRequestID	0.103	0.169	3.435	0.209
	1	DMBM_16_TX_03_openAttachment	0.006	0.024	1.268	0.045
	1	DMBM_17_TX_01_ChoosePortlet	0.556	0.864	10.553	0.460
	1	DMBM_18_TX_01_ChOOSEPORTLET	0.587	0.907	10.104	0.481
	1	DMBM_18_TX_02_ChOOSEREQUEST	0.496	0.658	4.847	0.324
	1	DMBM_19_TX_01_ChOOSEPORTLET	0.573	0.883	8.592	0.487
	1	DMBM_19_TX_02_EditPortlet	0.086	0.129	2.176	0.132
	1	DMBM_19_TX_03_ChangeRequestListFilter	0.655	0.993	3.706	0.264

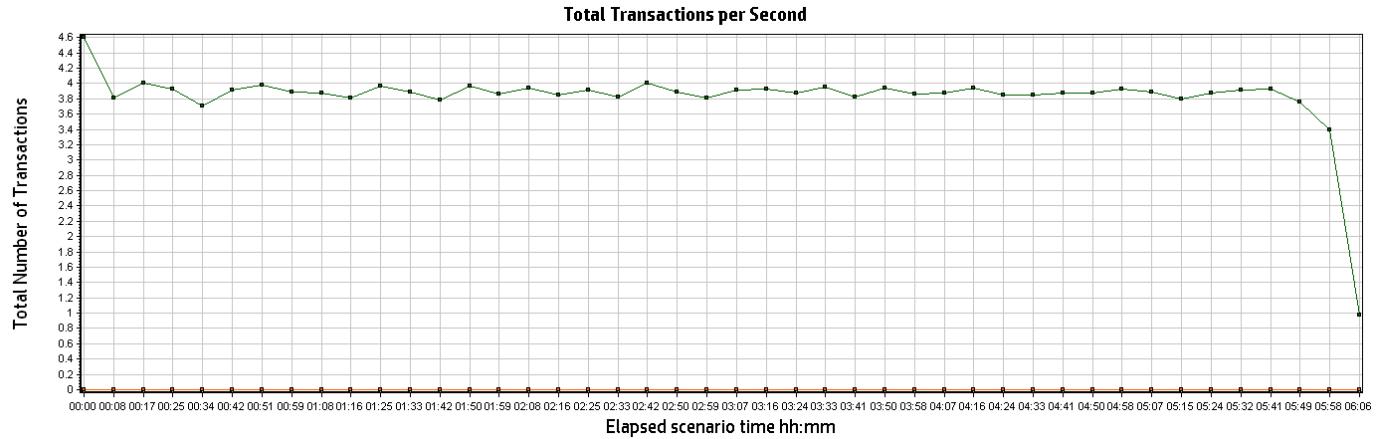
1	DMBM_20_TX_01_ViewPortlet_With_Bar_And_Pie_Chart	1.263	1.916	7.378	0.441
1	DMBM_20_TX_02_ClickOnPieChart	0.524	0.805	6.376	0.276
1	DMBM_21_OnlySearchRequestBrowser_TX01_ChOOSE_Req_Browser	0.179	0.750	6.920	0.755
1	DMBM_22_Request_Browser_Saved_Set_1_TX01_Click_Saved_Set_1	0.442	0.702	1.965	0.154
1	DMBM_22_Request_Browser_Saved_Set_1_TX02_Click_Tree_Level_1	0.191	0.312	1.803	0.144
1	DMBM_22_Request_Browser_Saved_Set_1_TX03_Click_Tree_Level_2	0.150	0.202	0.434	0.041
1	DMBM_22_Request_Browser_Saved_Set_1_TX04_Click_Link	2.233	3.237	4.006	0.376
1	DMBM_23_Request_Browser_Saved_Set_2_TX01_Push_Saved_Set_2	0.326	0.542	2.484	0.205
1	DMBM_23_Request_Browser_Saved_Set_2_TX02_Click_1st_Level	0.183	0.307	1.831	0.155
1	DMBM_23_Request_Browser_Saved_Set_2_TX03_Click_2nd_Level	0.128	0.192	0.340	0.030
1	DMBM_23_Request_Browser_Saved_Set_2_TX04_Click_Link	0.556	0.837	1.075	0.104
1	DMBM_24_Run_Questions_FromSaved_Query_Builder_ChOOSE_Query_1	1.710	2.630	3.269	0.311
1	DMBM_24_Run_Questions_FromSaved_Query_Builder_ChOOSE_Query_2	5.607	7.538	10.095	0.832
1	DMBM_25_PPM_BatchUpdate_TX01_SearchRequests	0.151	0.423	1.983	0.198
1	DMBM_25_PPM_BatchUpdate_TX02_Search75Req	0.771	1.247	3.502	0.197
1	DMBM_25_PPM_BatchUpdate_TX03_ClickMassUpdate	0.271	0.409	1.312	0.089
1	DMBM_25_PPM_BatchUpdate_TX04_ClickDone	0.013	0.026	0.834	0.039
1	DMBM_25_PPM_BatchUpdate_TX05_ClickContinue	0.720	1.403	6.638	0.505
1	Login	0.258	4.314	9.240	2.363
1	Logout	0.008	0.019	1.404	0.077
1	OpenRequestsMenu	0.054	0.358	2.047	0.447

## 2.7 Total Running Vusers



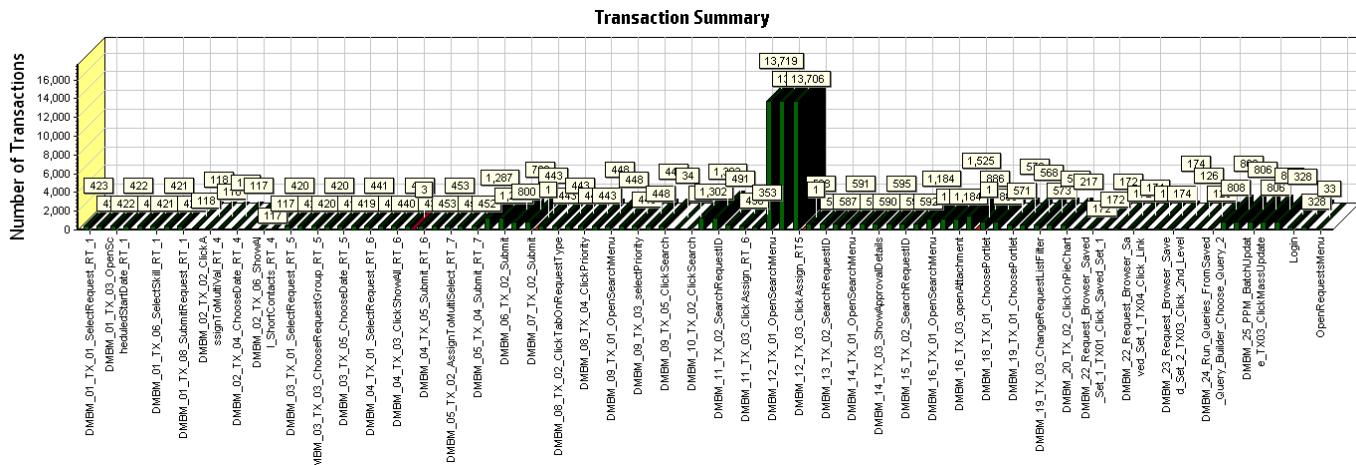
Color	Scale	Measurement	Graph Minimum	Graph Average	Graph Maximum	Graph Median	Graph Std. Deviation
Green	1	Run	0.000	97.750	325.000	66.000	133.941

## 2.8 Total Transaction per Second



Color	Scale	Measurement	Graph Minimum	Average	Graph Maximum	Graph Median	Graph Std. Deviation
Red	1	Fail	0.000	0.000	0.002	0.000	0.000
Green	1	Pass	0.981	3.834	4.604	3.885	0.457
Orange	1	Stop	0.000	0.000	0.005	0.000	0.001

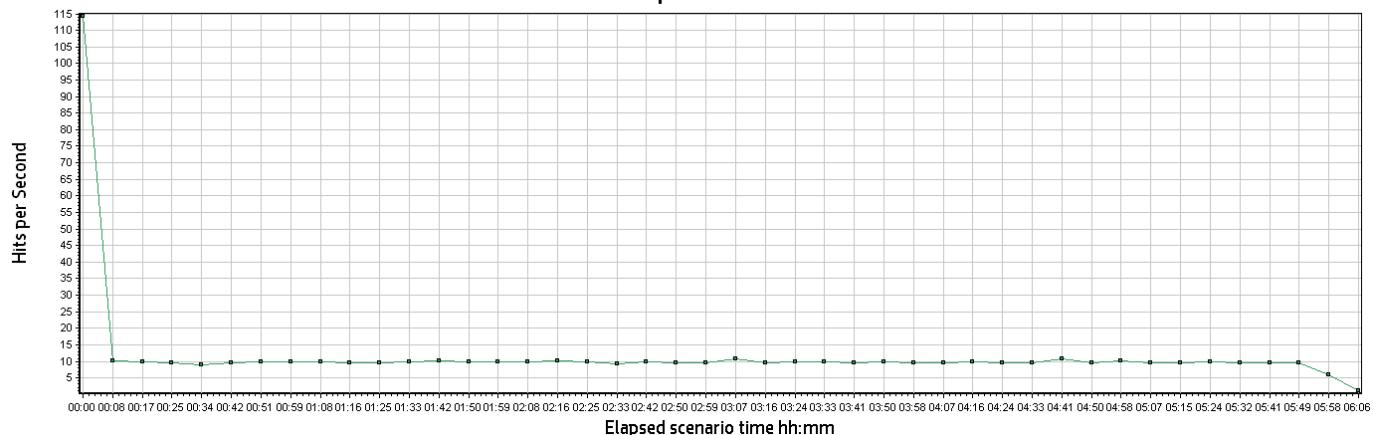
## 2.9 Transaction Summary



Color	Scale	Measurement
Green	1	Pass
Pink	1	Fail
Orange	1	Stop

## 2.10 Hits per Second

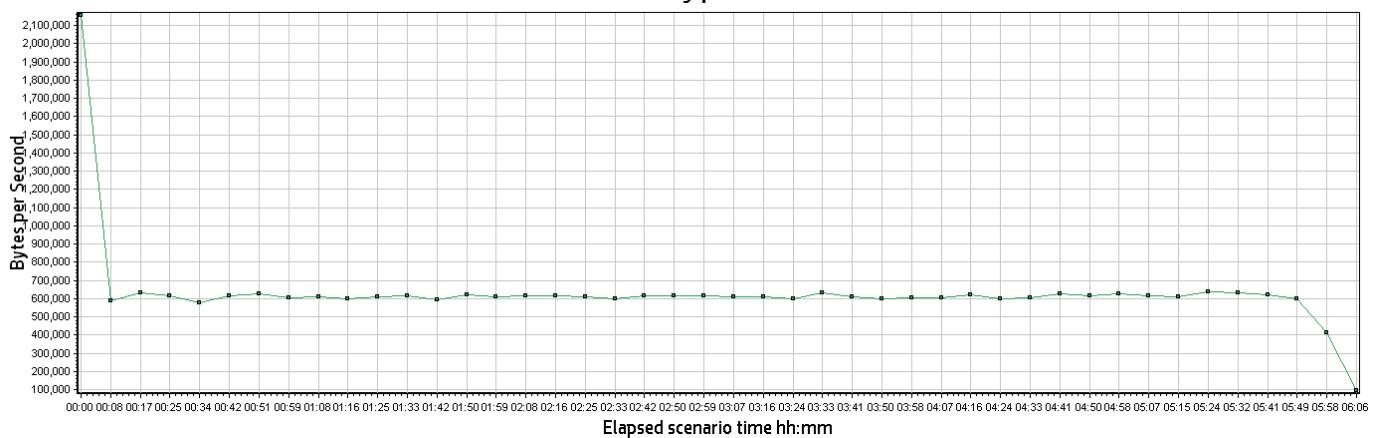
Hits per Second



Color	Scale	Measurement	Graph Minimum	Average	Graph Maximum	Graph Median	Graph Std. Deviation
Green	1	Hits	1.124	11.874	114.256	9.750	15.685

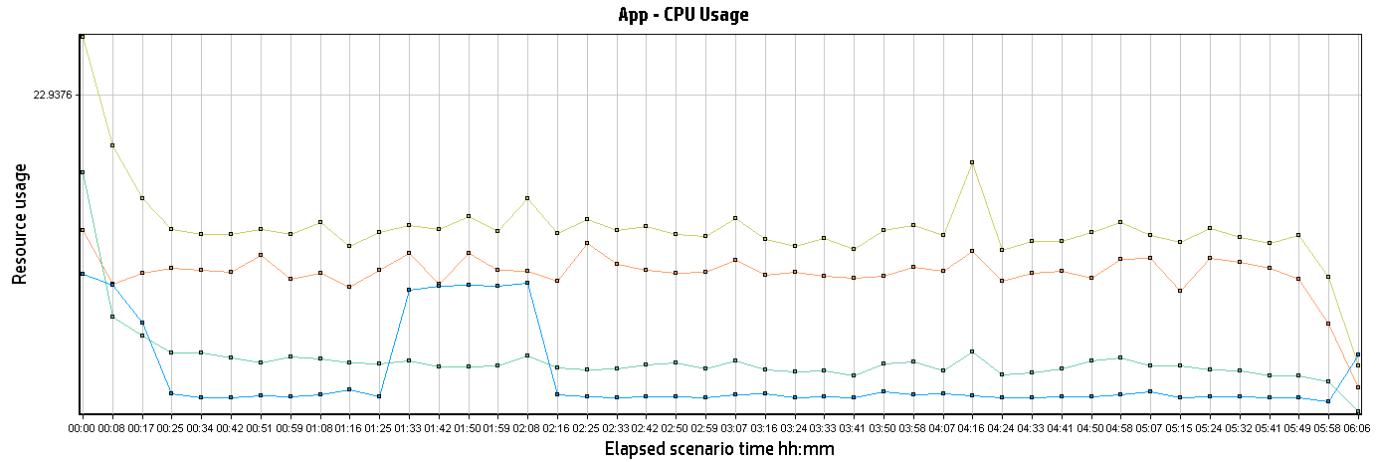
## 2.11 Network Throughput

Throughput



Color	Scale	Measurement	Graph Minimum	Average	Graph Maximum	Graph Median	Graph Std. Deviation
Green	1	Throughput	96,662.841	632,485.042	2,155,054.490	612,399.900	246,799.988

## 2.12 PPM Application Servers CPU Usage

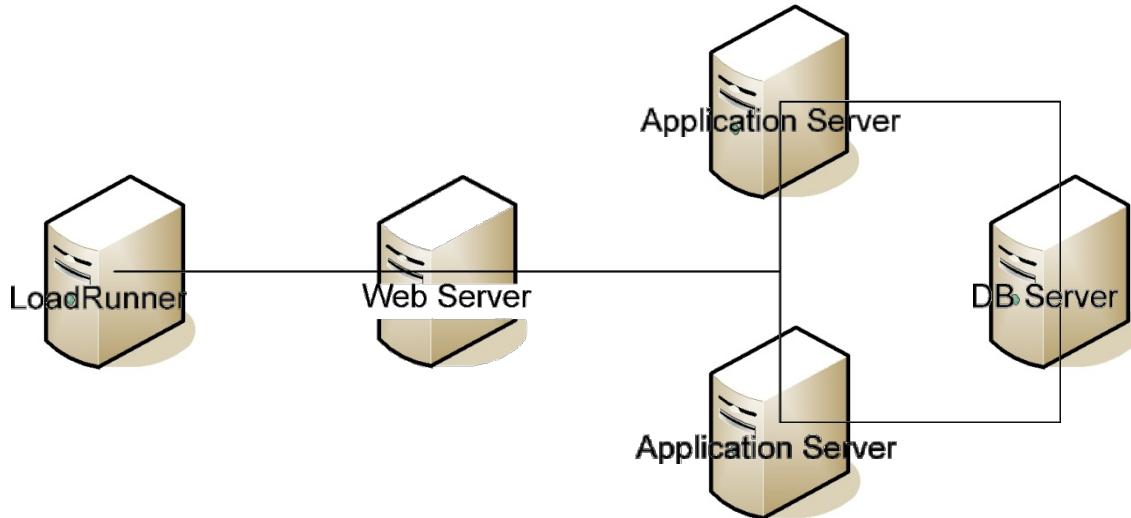


<b>Color</b>	<b>Scale</b>	<b>Measurement</b>	<b>Minimum</b>	<b>Average</b>	<b>Maximum</b>	<b>Std. Deviation</b>
Orange	100	% Interrupt Time (Processor _Total):16.186.76.172	0.000	0.107	0.781	0.098
Yellow	10	% Privileged Time (Processor _Total):16.186.76.172	0.000	1.386	11.987	1.044
Green	1	% Processor Time (Processor _Total):16.186.76.172	0.000	4.723	100.000	5.193
Blue	0.001	Interrupts/sec (Processor _Total):16.186.76.172	690.128	3,664.419	43,141.647	3,340.489

## APPENDIX A – Benchmark Environment

### Benchmark Test Environment

The environment created for the benchmarking effort is illustrated in the figure below.



- **Web Server.** Microsoft IIS server which balances the load between across the PPMC nodes handling user requests on the application server hosts. The Web server communicates with the HPE PPMC application container using the AJP13 protocol. The web server host has the following characteristics:
  - Linux version 2.6.18-231.el5
  - 1 Intel(R) Xeon(R) CPU L5640 @ 2.27GHz
  - 800 MB of RAM
  - Red Hat Enterprise Linux Server release 5.6 Beta (Tikanga)
- **Application Servers.** The environment consists of 2 clustered Application Server machines with PPM nodes, designated "Application Server 1" and "Application Server 2". Each server has a PPMC node for handling incoming user requests. One of the servers has an additional node for handling background services. The application servers have the following characteristics:
  - 8 Core 2.27 GHZ Intel Xeon(R) L5640
  - 16 GB of RAM
  - Microsoft Windows 2008 R2 Enterprise Service Pack 1
- **Database Server.** The database runs on a dedicated host machine and communicates with both PPMC application servers using the JDBC protocol. The database server has the following characteristics:
  - 40 Intel(R) Xeon(R) CPU E7-4820 v3 @ 1.90GHz
  - 256 GB of RAM
  - Linux version 3.10.0-327.10.1.el7.x86\_64
  - Oracle version 12.1.0.2.0
  - Gigabit Ethernet adapter
- **Client Browser** settings are consistent with the default settings of Microsoft Internet Explorer 11.0, and the simulation assumes that the browser:
  - Has caching turned on
  - Supports GZIP encoding, where the application server compresses HTTP replies and thereby reduces network bandwidth utilization.

## Hardware Configuration Table

Purpose	CPU	Memory	Software	OS
Web Server / Load Balancer	1 x 2.27 Ghz	8GB	Apache 2.2	Red Hat Linux version 5.6 Beta (Tikanga)
App Server #1	8 x 2.27 Ghz	16GB	PPM 9.42	Windows 2008 R2 SE
App Server #2	8 x 2.27 Ghz	16GB	PPM 9.42	Windows 2008 R2 SE
DB Server	40 x 1.90 Ghz	256GB	Oracle 12.1.0.2.0	RH Linux version 7.2 (Maipo)

## LoadRunner Run Time Detail Settings

Tool	LoadRunner Controller
Logging	Enable logging; Send message only when error occurs
Additional Attributes	N/A
Miscellaneous	Generate snapshot on error Run Vuser as thread
Speed Simulation	Use maximum bandwidth
Browser Emulation	User Agent: Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 1.1.4322; .NET CLR 2.0.50727) Simulate browser cache; cache URLs requiring content (HTMLs) Download non-HTML resources Simulate a new user on each iteration Clear cache on each iteration
Internet Protocol Preferences	Hits per second and HTTP codes Response bytes per second File and line in automatic transaction names Non-critical resource errors as warnings Save snapshot resources locally
Internet Protocol Content Check	Enable content check during replay