

HP Executive Scorecard

For the Windows[®] **Operating System**

Software Version: 9.50

Performance Benchmark Document
(Typical Configuration)

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Table of Contents

1.	Introduction	3
1.1	Purpose and Scope.....	3
1.2	Environment Setup	3
1.3	Utilities in Use	3
2.	Scenarios	4
2.1	DWH – ETL Initial Load	4
2.2	DWH – ETL Delta Load	5
2.3	UI – Page Viewing and Exploring	7
3.	Conclusion.....	10

Introduction

Purpose and Scope

This document outlines the performance of a typical configuration installation of Executive Scorecard (v9.50). You usually use the typical configuration for POCs or demos.

The objective of this performance benchmark is to ensure that:

1. The underlying ETL engine is capable of processing at least one million data rows.
2. The web portal can support small groups of concurrent users doing page viewing and exploring all types of operations with reasonable performance.

All the tests covered in this document are run within HP performance labs.

Environment Setup

The following table lists the properties of the machines:

	Model	Processors	Memory	Storage	Network	OS
Standalone XS Server	Virtual Machine	4 cores 2.67 Ghz	16 GB	Local, 120 GB	1 GB	Windows 2008 R2

Utilities in Use

The following tools are used to run and monitor this performance benchmark:

- HP Loadrunner v11.52
- Windows perfmon
- jConsole (JDK 1.7.0_51)

Scenarios

DWH – ETL Initial Load

In this scenario, we perform the ETL initial load of a typical SM database.

The details of the data source are shown below:

Table Names	Data Rows		
	6 Months	12 Months	24 Months
ASSIGNMENTM1	237	473	945
BIZSERVICEM1	11	25	52
COMPANYM1	3	3	3
CONTACTSM1	78318	156635	313266
DEPTM1	6070	12139	24277
DEVICE2M1	13059	26118	52235
INCIDENTSM1	280931	561861	1123722
MODELM1	627	627	627
PROBSUMMARY	288649	577297	1154593
SLAM1	0	0	0
SLAMONTHLYM1	0	0	0
SLARESPONSEM1	0	0	0
SMCM3RM1	5906	11812	23624
SMLOCATION	1874	3748	7495
SMSLAOUTAGE	0	0	0
VENDORM1	413	413	413

The details of the corresponding target data are shown below:

Table Names	Data Rows		
	6 months	12 Months	24 Months
APPLICATION_DIM	323	640	1254
ASSET_DIM	2	2	2
CFGITEM_DIM	2	2	2
CHANGE_DIM	5908	11814	23626
CI_DIM	9905	19813	39649
INCIDENT_DIM	288651	577299	1154595
INTERACTION_DIM	280933	561863	1123724
LOCATION_DIM	1876	3750	7497
MODEL_DIM	366	366	366
NODE_DIM	7464	14897	29774
ORG_DIM	6264	11281	19424
PERSON_DIM	77862	155702	311356
SERVICE_DIM	13	27	54

SLA_DIM	2	2	2
ASSET_FACT	0	0	0
CHANGE_FACT	5906	11812	23624
INCIDENT_FACT	288649	577297	1154593
INTERACTION_FACT	280931	561861	1123722
SLAOUTAGE_FACT	0	0	0
SLASTATUS_FACT	0	0	0

The durations of the corresponding ETL processes are shown below:

* Duration (s)			Avg. CPU (%)		
6 months	12 Months	24 Months	6 months	12 Months	24 Months
4188	6930	12719	40	40	40

* The duration includes the interval time resulting from the following DWH ABC Streams Management Settings:
 Scheduler for Stream: Upstream -> Run-Steps Scheduler -> Interval (mins): 1

Note that generally a single ETL process includes about 19 Run-Steps.

The 12-months scenario represents the acceptance line: more than a million data rows processed in less than two hours.

The 24-months scenario represents the upper boundary: more than two millions data rows processed in less than four hours.

However, with the requirement of processing more data rows, the end user needs to add more physical disk space, 120 GB is not enough.

DWH – ETL Delta Load

In this scenario, we perform an ETL delta load of the SM database used in previous section. It is based on the 24 months initial load.

The details of the data source are shown below:

Table Names	Delta Data Rows
ASSIGNMENTM1	0
BIZSERVICEM1	0
COMPANYM1	0
CONTACTSM1	799
DEPTM1	99
DEVICE2M1	100
INCIDENTSM1	9950
MODELM1	0
PROBSUMMARY	12280

SLAM1	0
SLAMONTHLYM1	0
SLARESPONSEM1	0
SMCM3RM1	199
SMLOCATION	100
SMSLAOUTAGE	0
VENDORM1	0

The details of the corresponding target data are shown below:

Table Names	Data Rows
APPLICATION_DIM	1254
ASSET_DIM	2
CFGITEM_DIM	2
CHANGE_DIM	23626
CI_DIM	39649
INCIDENT_DIM	1166875
INTERACTION_DIM	1133674
LOCATION_DIM	7497
MODEL_DIM	366
NODE_DIM	29774
ORG_DIM	19424
PERSON_DIM	311356
SERVICE_DIM	54
SLA_DIM	2
ASSET_FACT	0
CHANGE_FACT	23624
INCIDENT_FACT	1166873
INTERACTION_FACT	1133672
SLAOUTAGE_FACT	0
SLASTATUS_FACT	0

The durations of the corresponding ETL processes are shown below:

* Duration (s)	Avg. CPU (%)
3331	40

** The duration includes the interval time resulting from the following DWH ABC Streams Management Settings:
Scheduler for Stream: Upstream -> Run-Steps Scheduler -> Interval (mins): 1*

Note that just like for the initial load, the duration includes the Run-Steps intervals.

UI – Page Viewing and Exploring

In this scenario, we simulate different numbers of concurrent users viewing pages and exploring the web portal.

The following table presents the workflow transactions, weight in percentage, and the corresponding simulated steps:

Transaction Names	Weight (%)	Simulated Steps
TX_addAnnotation	8%	Add an annotation while viewing the KPI details in the Dashboard Page
TX_clickDataSet	8%	Click the Data Set button in Explorer
TX_clickGoalMap	8%	Click the Goal Map button in Explorer
TX_clickPrediction	8%	Click the Forecast button in Explorer
TX_openExplorer	16%	Click the shortcut link of a KPI in a page to open Explorer
TX_openMoreCompPage	4%	Open a page with eight components: 1) Scorecard 2) KPI View (including 4 KPIs) 3) Historical View (including 3 KPIs) 4) KPI Rolodex (including 8KPIs) 5) KPI List (including 7 KPIs), 6) Historical Metric View (including 1 metric), 7) Pie Chart View (including two KPIs) 8) KPI View (including 7 KPIs)
TX_openMoreEntitiesPage	4%	Open a page with four components: 1) Scorecard 2) KPI View (including 8 KPIs) 3) Historical View (including 3 KPIs) 4) KPI Rolodex (including 15KPIs)
TX_openNormalPage	4%	Open a page with four components: 1) Scorecard 2) KPI View (including 5 KPIs) 3) Historical View (including 1 KPI) 4) KPI Rolodex (including 6KPIs)
TX_openReportPage	4%	Open a page with five components: 1) Scorecard 2) KPI View (including 4 KPIs) 3) Historical View (including 2 KPI) 4) KPI Rolodex (including 8KPIs), 5) Web Intelligence report
TX_refreshPage	4%	Click the Refresh button on the page
TX_viewLink	32%	Simulate the user action that displays the information while setting the cursor on the shortcut of a KPI or Objective

Five tests are conducted, each runs for one hour. The following table shows the summary of the results:

Transactions Per Second	Transactions Passed	Transactions Failed	Concurrent Users*	CPU (%)	Think Time (s)
0.880	3222	0	10	46	10
1.257	4643	0	15	54	10
1.222	4535	0	20	53	15
1.189	4447	0	25	55	20
1.204	4539	0	30	61	20

* Concurrent Users represents the number of users currently logged in the system. Note that it may be inactive due to the think time setting.

* User ramp-up settings: 2 every 00:00:05 (HH:MM:SS)

* User ramp-down setting: 2 every 00:00:05 (HH:MM:SS)

With 10s think time, this installation can support a total of 15 users.

With 15s think time, this installation can support a total of 20 users.

With 20s think time, this installation can support a total of 25 users.

Can we add more users without changing to a larger think time, the answer is NO. For example, with 20s think time, 25 total users is the maximum number of users we can support; going for 30 or more will result in transaction average response time piling up significantly. Therefore, in order to scale up, the end user needs to install Executive Scorecard on more powerful machines.

Transaction average response time breakdown 1: 10 total users, 10s think time:

Transaction Name	Minimum	Average	Maximum	Std. Deviation	90 Percent	Pass	Fail	Stop
TX_addAnnotation	0.195	0.561	4.443	0.404	1.095	228	0	0
TX_clickDataSet	0.752	1.189	2.752	0.313	1.548	255	0	0
TX_clickGoalMap	0.318	0.866	3.675	0.473	1.47	275	0	0
TX_clickPrediction	0.37	0.798	2.324	0.281	1.125	262	0	0
TX_openExplorer	3.052	5.705	22.994	1.985	8.317	537	0	0
TX_openMoreCompPage	1.455	2.708	12.374	1.242	3.819	98	0	0
TX_openMoreEntitiesPage	0.713	1.622	3.021	0.429	2.241	135	0	0
TX_openNormalPage	0.573	1.595	3.852	0.697	2.768	123	0	0
TX_openReportPage	1.587	3.22	17.936	1.711	3.998	127	0	0
TX_refreshPage	0.304	1.266	3.245	0.581	2.157	121	0	0
TX_viewLink	0.874	2.388	19.963	1.615	3.899	1,041	0	0

Transaction average response time breakdown 2: 15 total users, 10s think time:

Transaction Name	Minimum	Average	Maximum	Std. Deviation	90 Percent	Pass	Fail	Stop
TX_addAnnotation	0.185	0.716	3.72	0.606	1.507	364	0	0
TX_clickDataSet	0.727	1.512	14.681	1.175	2.489	371	0	0
TX_clickGoalMap	0.322	1.203	5.415	0.975	2.721	357	0	0
TX_clickPrediction	0.381	0.906	3.865	0.514	1.652	381	0	0
TX_openExplorer	3.004	6.839	35.313	3.935	12.485	729	0	0
TX_openMoreCompPage	1.395	3.226	8.628	1.674	5.561	196	0	0
TX_openMoreEntitiesPage	0.676	1.783	6.41	0.796	2.801	174	0	0
TX_openNormalPage	0.517	2.009	7.314	1.388	4.268	184	0	0
TX_openReportPage	1.815	3.589	9.503	1.623	6.101	169	0	0
TX_refreshPage	0.285	1.574	6.864	1.185	3.326	210	0	0
TX_viewLink	0.703	3.273	26.954	2.909	7.225	1,478	0	0

Transaction average response time breakdown 3: 20 total users, 15s think time:

Transaction Name	Minimum	Average	Maximum	Std. Deviation	90 Percent	Pass	Fail	Stop
TX_addAnnotation	0.202	0.614	3.16	0.45	1.16	332	0	0
TX_clickDataSet	0.69	1.228	4.987	0.454	1.746	380	0	0
TX_clickGoalMap	0.309	0.971	12.335	0.877	1.733	354	0	0
TX_clickPrediction	0.378	0.746	2.914	0.348	1.151	355	0	0
TX_openExplorer	3.126	7.017	19.776	3.36	11.84	781	0	0
TX_openMoreCompPage	1.614	3.005	7.24	1.245	4.827	174	0	0
TX_openMoreEntitiesPage	0.66	1.457	3.092	0.323	1.895	178	0	0
TX_openNormalPage	0.481	1.687	7.01	0.886	3.042	184	0	0
TX_openReportPage	1.484	3.059	10.079	1.39	4.614	175	0	0
TX_refreshPage	0.265	1.403	12.021	1.103	2.374	181	0	0
TX_viewLink	0.812	2.76	15.895	1.98	5.219	1,401	0	0

Transaction average response time breakdown 4: 25 total users, 20s think time:

Transaction Name	Minimum	Average	Maximum	Std. Deviation	90 Percent	Pass	Fail	Stop
TX_addAnnotation	0.17	0.6	2.929	0.448	1.264	355	0	0
TX_clickDataSet	0.652	1.2	8.388	0.591	1.77	361	0	0
TX_clickGoalMap	0.269	0.971	8.645	0.854	1.901	327	0	0
TX_clickPrediction	0.3	0.717	4.851	0.431	1.08	313	0	0
TX_openExplorer	2.968	7.428	26.897	4.385	12.463	731	0	0
TX_openMoreCompPage	1.279	2.74	7.827	1.098	4.022	181	0	0
TX_openMoreEntitiesPage	0.648	1.472	8.271	0.643	1.885	173	0	0
TX_openNormalPage	0.489	1.586	6.982	0.921	2.599	171	0	0
TX_openReportPage	1.568	3.273	11.364	1.501	5.943	173	0	0
TX_refreshPage	0.31	1.447	5.242	0.934	2.978	183	0	0
TX_viewLink	0.629	2.768	17.846	2.163	5.47	1,429	0	0

Transaction average response time breakdown 5: 30 total users, 20s think time:

Transaction Name	Minimum	Average	Maximum	Std. Deviation	90 Percent	Pass	Fail	Stop
TX_addAnnotation	0.207	1.66	7.999	1.839	4.646	285	0	0
TX_clickDataSet	0.726	2.433	10.562	2.087	5.628	362	0	0
TX_clickGoalMap	0.302	2.703	13.066	2.938	7.914	391	0	0
TX_clickPrediction	0.379	1.702	9.161	1.546	3.816	364	0	0
TX_openExplorer	3.914	19.618	64.896	17.823	51.519	693	0	0
TX_openMoreCompPage	1.551	5.493	21.766	4.814	15.144	207	0	0
TX_openMoreEntitiesPage	0.796	2.444	9.315	1.587	4.853	185	0	0
TX_openNormalPage	0.722	3.868	15.102	3.736	9.996	178	0	0
TX_openReportPage	1.746	5.846	20.187	4.701	13.395	163	0	0
TX_refreshPage	0.322	3.534	16.14	3.722	9.397	189	0	0
TX_viewLink	0.837	7.337	32.264	7.886	21.268	1,462	0	0

Conclusion

The numbers collected in this benchmark show that the typical configuration installation of Executive Scorecard (v9.50) can extract, transform and load more than two millions data rows in less than four hours, and can support up to 25 concurrent users doing analytical types of operations through the web portal. It is sufficient for **POC and demo** purposes.