

# **BSM 9.22**

## **APM Load Testing Results**



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# 1. Introduction

This guide describes performance tests that have been conducted in HP performance labs for BSM 9.22 APM Basic and APM Advanced Certified Deployment models.

The results of these tests are affected by many factors. We have tried to include all relevant factors that lead to the results published in these tests. However, if some of the factors in your environment differ from what has been tested in HP labs, the outcome can vary from what is published in this document. If your performance is unexpectedly worse than expected based on what is published in this document, we recommend that you contact HP Software Support.

## 1.1. Executive Summary

The purpose of the scenario was to test the performance of the **APM Basic** and **APM Advanced** Certified Deployments on BSM 9.22.

The deployment was tested with the following load:

	APM Basic	APM Advanced
Monitored applications	26	1110
Concurrent active sessions of connected users working in parallel on EUM reports, SLM reports, and Service Health (360 view).	26	140
Incoming rate EPS (Events Per Second)	151 EPS as follows: <ul style="list-style-type: none"><li>• ~100 from RUM</li><li>• 1 from BPM</li><li>• 50 from SiteScope</li></ul>	1210 EPS as follows: <ul style="list-style-type: none"><li>• ~400 from RUM</li><li>• 210 from BPM</li><li>• 600 from SiteScope</li></ul>
Total Calculated CIs	2066	181500
Configuration Items	106276	2108753

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	APM Basic	APM Advanced
Managed Relations	117903	2795974

**Results:**

	APM Basic	APM Advanced
Response Time	90% of transactions completed in less than 8 sec (average 1.25).	90% of transactions completed in less than 3 seconds (average 2.2).
CPU	The scenario consumed less than 86.5% of the CPU.	The scenario consumed less than 40% of the CPU.
Consumed Memory	One Machine (GW and DPS): 15 GB RAM	Gateway Sever (GW): 10.3 GB RAM Data Processing Server (DPS): 18.0 GB
Consistency	The response times were consistent and no major differences occurred when the performance tests were repeated.	The response times were consistent and no major differences occurred when the performance tests were repeated.

## 2. Environment Settings

The following hardware, software, and configuration settings were used during the performance tests.

### 2.1. Hardware

The BSM hardware profile used for these performance tests was a distributed environment including 1 BSM one-machine server including both the Gateway and Data Processing servers, and 1 Database Server. The details are described in the tables below.

#### BSM Servers

BSM Deployment Model	Server Type	Machine	RAM	Processor	# of Cores	OS	Disk size
APM Basic	GW/DPS on same server	ProLiant BL460c G7	16GB	Intel(R) Xeon(R) CPU X5650 @ 2.67GHz	4 Core(s)	Red Hat Enterprise Linux Server release 5.5 (Tikanga)	136GB
APM Advanced	GW	HP ProLiant BL460 G7	32GB	Intel(R) Xeon(R) CPU X5650 @ 2.67GHz	4 Core(s), 8 Logical Processor(s)	Windows Server 2008 R2 Enterprise SP1	136GB
	DPS	HP ProLiant BL460 G7	32GB	Intel(R) Xeon(R) CPU X5650 @ 2.67GHz	4 Core(s), 8 Logical Processor(s)	Windows Server 2008 R2 Enterprise SP1	136GB

#### Database Server

BSM Deployment Model	DB type	Machine	RAM	Processor	# of Cores	OS	Disk size
APM Basic	Oracle 11.2.0.2.0 Enterprise Edition	HP ProLiant BL460C G7	32G	Intel(R) Xeon(R) CPU X5650 @ 2.67GHz	12 Core(s), 24 Logical Processor(s)	Red Hat Enterprise Linux Server release 5.7 (Tikanga)	136GB 2TB on DAS

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BSM Deployment Model	DB type	Machine	RAM	Processor	# of Cores	OS	Disk size
APM Advanced	Oracle 11.2.0.2.0 Enterprise Edition	HP ProLiant DL380 G7	32G	Intel(R) Xeon(R) CPU X5650 @ 2.67GHz	12 Core(s), 24 Logical Processor(s)	Red Hat Enterprise Linux Server release 5.8 (Tikanga)	300GB + 3TB DAS

## 2.2. BSM Environment and Population Settings

This section contains the details of the BSM environment that was used during the performance tests. The settings correspond to the definition of the APM basic certified deployment.

Entity	APM Basic	APM Advanced
Configuration Items (Total CI's in the model including calculated CI)	224179	2109000
Relations	117903	2795000
Locations (with agents):	88	11140
Nodes	670	17360
BPM Agents	13	1002
BPM Applications	23	1001
Business Transaction Flow	57	2520
BPM Transactions	100	5230
BPM Transactions-Locations	500	
RUM Applications	5	101
RUM Transactions	150	5000
SiteScope Monitors:	1009	114500
SiteScope Groups	203	25690
Running Software	4719	120450
KPI	6494	318300
Users (Admin, Super User, Modifier, Viewer)	150	1000
Calculated CIs (CI's that has HI and/or MPHI and/or KPI assigned to it and are part of Marble calculation cycle)	2050	181500
SLA	10	400
UCMDB Active TQLs:	543	3856
UCMDB Persistent TQLs	149	142

### 3. Scenario Detailed & Test Environment

#### 3.1. Scenario Scope

The performance tests were executed using a simulated load. This load was created using HP LoadRunner scripts, simulated data and simulated alerts designed to be as similar as possible to a real BSM environment. This section provides more details about each of these items.

#### 3.2. LoadRunner Scripts

Number of concurrent LoadRunner users and scripts were used to simulate various user actions:

	Numbers of concurrent users on BSM			
	EUM reports	MyBSM view	SLM reports	Total users
APM Basic	10	11	5	26
APM Advanced	55	60	25	140

#### 3.3. Data Samples

The samples came from different data collectors:

Sample Type	Samples per Second	
	APM Basic	APM Advanced
BPM	1	210
SIS	~50	~600
RUM	~100	~400
Total	~151	~1200

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## 4. Test Results

The following table shows the average **network Throughput** (Megabits per Second) per server during the load.

Network Throughput						
	APM Basic			APM Advanced		
	Received Mbit/sec	Sent Mbit/sec	Total Mbit/sec	Received Mbit/sec	Sent Mbit/sec	Total Mbit/sec
GW/DPS	3.23	5.78	9.01	28.65	16.41	45.05
DPS	-	-	-	16.04	12.61	28.65
DB Server	0.61	0.57	1.19	5.05	6.11	11.16

### 4.1. Capacity of database machine under load

	APM Basic	APM Advanced
Max <b>MBPS</b> (megabyte per second)	36	111
Max <b>IOPS</b> ( I/O operations per second)	1793	2983



## 4.2. BSM Data and OS Disk space usage

The following table shows disk space usage per components:

	APM Basic			APM Advanced		
	Folder name	Disk space usage	Operating System	Folder name	Disk space usage	Operating System
GW/DPS	/opt/HP/BSM	12Gb	Linux 5.5	C:/HPBSM	20.1Gb	Windows2008
DPS	-	-	-	C:/HPBSM	15.5Gb	Windows2008
DB Server	Oradata Oralog	279 Gb 3.1Gb	Linux 5.9	Oradata Oralog	834Gb 3.0Gb	Linux 5.8

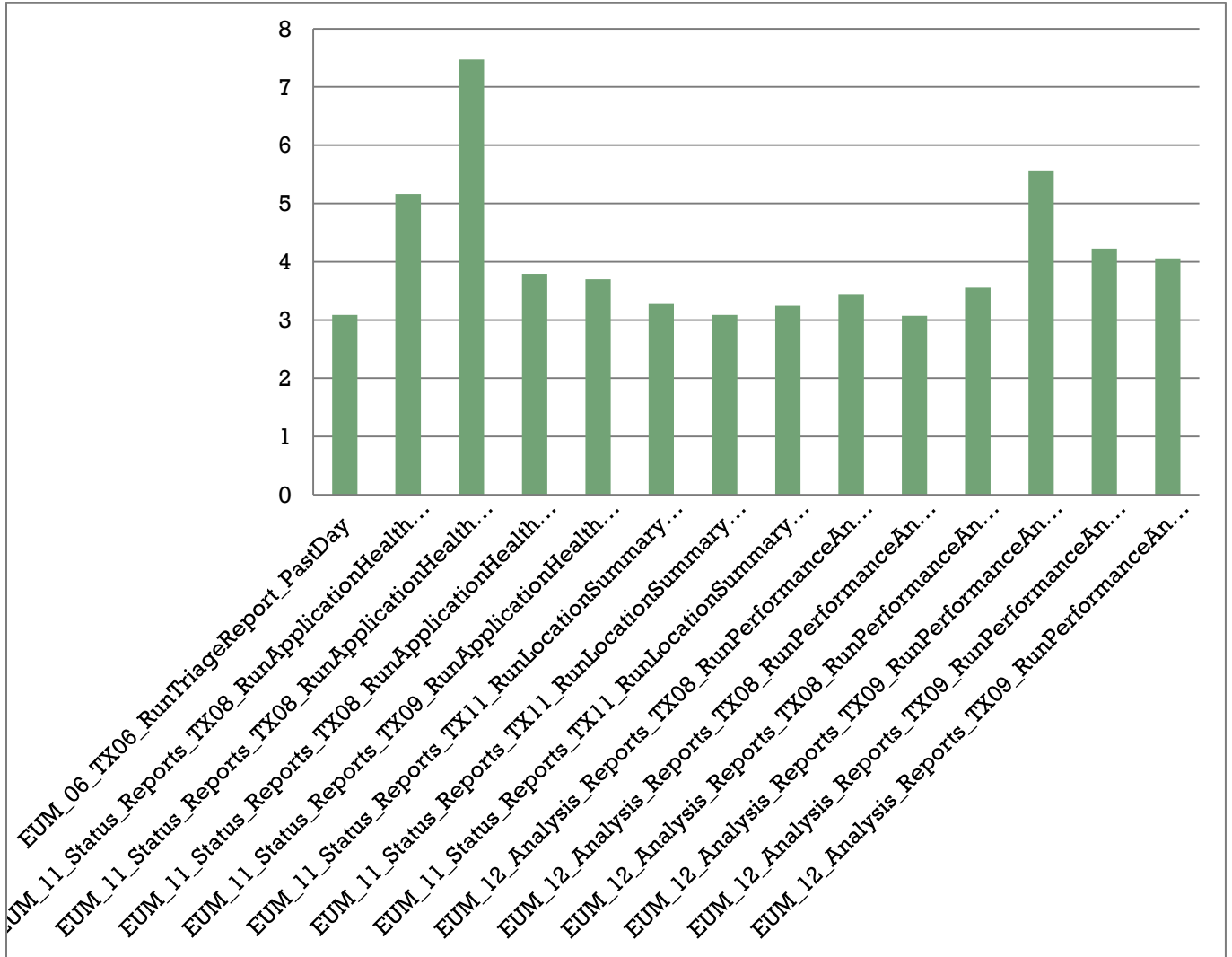
## 4.3. CPU Utilization

The following table shows the total CPU utilization on the BSM and DB server during the performance test. The maximum value for each server is 100%.

CPU Utilization		
	APM Basic	APM Advanced
GW	52.79%	36.38%
DPS	-	36.59%
DB	1.12%	8.58%

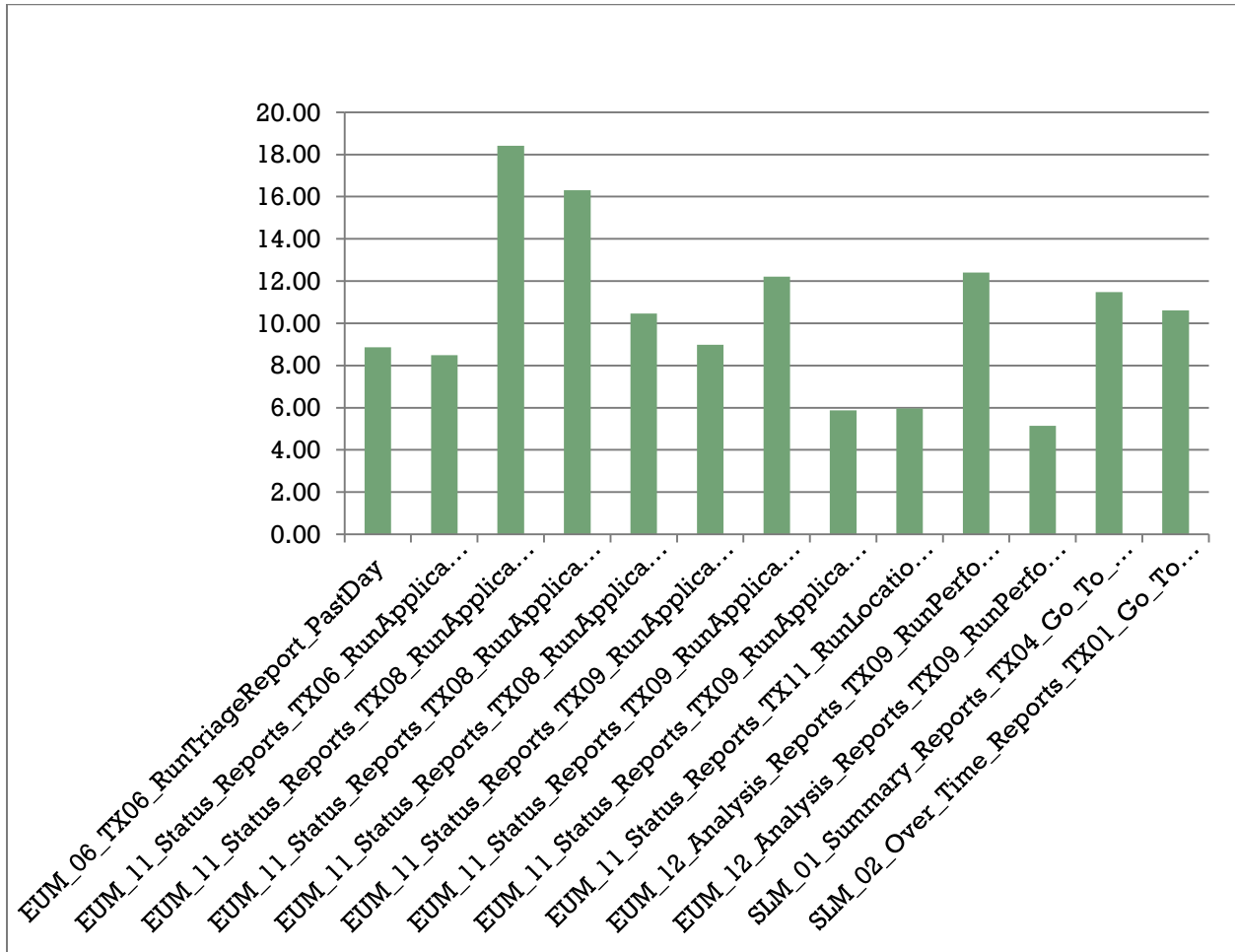
#### 4.4. Transaction response time for APM Basic deployment

The following graph contains the Response Time of top largest Transaction for APM Basic model.



## 4.5. Transaction response time for APM Advanced deployment

The following graph contains the Response Time of top largest Transaction for APM Advanced model.



## 4.6. Memory Usage

The following table shows the amount of physical memory used (BSM + OS) during the load test.

RAM Memory Usage		
	APM Basic	APM Advanced
One Machine (GW and DPS)	8677 MB	-
GW	-	10485 MB
DPS	-	17367 MB

## 5. Certified deployment and capacities

Deployment Name	APM Basic	APM Advanced		
HW Summary	One Machine	GW	DPS	
	Recommended	8 GB	8 GB	19 GB
		4 CPU	8 CPU	8 CPU
	Minimum	4 GB	8 GB	19 GB
4 CPU		8 CPU	8 CPU	
Capacity	CI Count	20000	400000	
	KPI	100000	2000000	
	HI	200000	4000000	
	Locations	50	10000	
	Logged In Users	25	150	
	Service Health Users	10	60	

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## 5.1 Detailed Capacities:

Category	Metrics	Application	APM Basic	APM Advanced
ODB Capacity	CIs and relationships	Model	200000	5000000
	Active Views	Model	85	500
	Active TQLs	Model	350	1000
APM Alerts	Event Alert Definitions	MetricData	100	2500
	CI with Alert Status Definitions	MetricData	50	2500
	Daily Notifications	MetricData	500	12000
Model Size	Managed Nodes	OMI	1000	20000
	CIs	Model	20000	400000
	KPIS	Model	100000	2000000
	HIs	Model	200000	4000000
Data	PMDB Metrics Per Second	Analytics	200	7000
	WDE Data Per Second	MetricData	100	1200
	OMi Event EPS (Sustained) (Subset of WDE Data )	MetricData	10	30
	Max EPS Per Type Per DB (SQL Server)	MetricData	100	130
	Max EPS Per Type Per DB (Oracle)	MetricData	100	300
General	Locations in Manager	Model	50	10000
	CIs with Downtimes	Model	600	150000
Users	Logged In Users	Users	25	150
	Service Health Users	Users	10	60
	Event Console Users	Users	17	90
	Defined Users	Users	150	1000
User Actions (per Minute)	Reports	Users	6	27
	Event Console	Users	32	132
	Health Views	Users	15	80
	MyBSM Components - Other	Users	35	200
Scheduled Reports	Per Hour	Users	20	300
	Total	Users	20	700
SLM	SLAs	SLM	10	400
	Total CIs	SLM	2000	17000
	Total Objectives	SLM	120000	1020000

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Category	Metrics	Application	APM Basic	APM Advanced
	Number of CIs in largest SLA	SLM	250	2500
BPM	Applications	MetricData	20	1000
	Transactions	MetricData	100	5000
	Locations	MetricData	10	1000
	Trx-Loc Combinations	MetricData	500	200000
	Max EPS	MetricData	1	220
RUM	Applications	MetricData	5	100
	Transactions	MetricData	150	5000
	End User Groups	MetricData	100	10000
	Locations	MetricData	50	10000
	Servers	MetricData	5	100
	Events	MetricData	10	100
	Trx-Loc Combinations	MetricData	2000	200000
	Max EPS	MetricData	100	900
SiteScope	Monitors	SAM	1000	100000
	Measurements	SAM	4000	400000
	Monitored CIs (Hosts + Software Elements)	SAM	150	10000
	Max EPS	SAM	50	1000

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