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# 1 Introduction

The purpose of this document is to provide a definitive set of benchmarks related to the hardware and software factors that impact the performance of Oracle's Hyperion Essbase database engine. The goal of this document is to assist both implementers and administrators of Essbase with decisions related to hardware and software selection. As an example, it's known that Essbase performs better on physical hardware than virtual hardware, but concrete testing of like applications isn't readily available. This document will change that.

#### 1.1 Application Description

The EssBench application is an Essbase BSO application creating using fictional meta-data and data. The application is intended to mimic a multi-billion dollar retail chain with many stores and many products. This produces two large sparse dimensions. With only Income Statement data in the cube, the account dimension is reasonably sized. The full statistics are shown in the table below:

Dimension	Туре	Members in Dimension	Members Stored
Account	Dense	1025	838
Period	Dense	19	14
Years	Sparse	6	6
Scenario	Sparse	3	3
Version	Sparse	4	4
Currency	Sparse	3	3
Entity	Sparse	8767	8709
Product	Sparse	8639	8639
EntityCurrency	Sparse (Attribute)	76	0

#### 1.2 Requirements

The EssBench application is designed to utilize systems of many sizes. As a result, the settings are not designed for maximum performance, but instead for maximum compatibility. The hardware and software requirements for EssBench are found in the table below:

Item	Requirement
CPU	8 Logical Cores
Memory	16GB
Disk Space	20GB
Essbase Version	11.1.2.4+



### 1.3 Essbase Artifacts

In addition to the outline file, EssBench also includes one data load rule and four calculation scripts. The details of these artifacts are found in the table below:

Artifact	Туре	Description
dtOPEX	Load Rule	Used for loading a CSV file containing OPEX data.
AggAct	Calculation Script	Used to aggregate the product and entity dimensions.
AggAlloc	Calculation Script	Used to aggregate the specific allocation account for the product and entity dimensions.
AllocP	Calculation Script	Used to allocate high-level values to the product and entity dimensions using a FIXPARALLEL statement.
Curr	Calculation Script	Used to convert USD back to local currency.

#### 1.4 Data Artifacts

EssBench includes standard data sets along with the included Essbase artifacts. The details of these artifacts are found in the table below:

Artifact	Description
dtOPEX.csv	Comma separated values containing operating expenses for the fictional retailer. Used in conjunction with the data load rule <b>dtOEPX</b> .
EssBenchL0_*	Eight native Essbase format files containing level 0 data. Loaded directly without the need of a data load rule.

## 1.5 Automation Artifacts

The final component included with EssBench is the automation of the benchmark itself. This benchmark is performed using a PowerShell script and an MaxL script. The details of these artifacts are found in the table below:

Artifact	Description
EssBench.ps1	PowerShell script used to define variables necessary for the MaxL execution along with the execution and logging of the benchmark.
EssBench.msh	MaxL script used to execute the specific tests included with the benchmark.



## 2 Installation

The installation of EssBench is a manual process. There are two main parts to the installation. First, the creation of the Essbase application. Second, the creation of the automation process. Each part of the installation is provided in a ZIP file.

#### 2.1 Essbase Configuration

Ensure that the Essbase.cfg is configured to include the following (modify for your preferences):

```
WORKERTHREADS 50
SERVERTHREADS 100
AGENTTHREADS 25
CALCPARALLEL 16
RESTRUCTURETHREADS 16
EXPORTTHREADS 16
```

Other settings in the config could throw off the test results for certain tests, so if you can remove other settings for testing purposes, that would be best. When submitting results, please note any other settings in the config file so that we can note that in the result set.

### 2.2 Essbase Creation

1. Create a new block storage application:





2. The application can be named anything:



3. Create a new database:





4. Name the database **Essbench**:



5. Stop the application:

🖃 🗐 Enterprise View			
🖨 🖗 Administration Se	rvers		
🗄 📲 hyperionss24	10080 Connected		
🖻 🔋 Essbase Servers			
🕀 🕖 EssbaseClus	ter-1		
🕀 🕖 EssbaseClus	ter-PT		
🖨 🛿 EssbaseClus	ter-VT		
🖨 🛄 Application	IS		
🕀 🖳 🖳 ASOsa	mp		
⊡ Demo			
	<u>S</u> tart	▶	1
⊞∎ Samn	Sto <u>p</u>	•	Application
⊞ 🔄 Samp	Refresh	•	All <u>d</u> atabases 😽
🗊 📃 Sampl	Status for all databases		
🕀 🖳 Samp	<u>C</u> opy		
🕀 🔤 Security	Re <u>n</u> ame		
🗄 🛛 🕖 HyperionES.h	Delete	•	
🗄 🛛 🕖 Provider Servers	Create database		
	View	•	
	Generate log chart		
	<u>E</u> dit properties		
	User/group access		
	Expand all		
	Collapse all		
	<u>R</u> egister		
	<u>A</u> dd to	•	



#### 6. Copy the files included in the Essbase artifacts ZIP file:

Name	Date modified	Туре	Size
Magact.csc	6/13/2017 10:28 A	CSC File	1 KB
Magalloc.csc	6/13/2017 10:28 A	CSC File	1 KB
MIOCP.csc	6/13/2017 10:28 A	CSC File	1 KB
W Curr.csc	6/13/2017 10:28 A	CSC File	1 KB
dtOpex.rul	6/13/2017 10:28 A	RUL File	2 KB
EssBench.otl	6/13/2017 6:41 PM	OTL File	1,165 KB

#### 7. Paste the files into the database directory on the Essbase server:

📜   ⊋ 📜 = I		Essbench				_ □	x
File Home Share	View						~ <b>?</b>
🗲 🍥 🔹 🕆 👢 « Es	sbaseV → EssbaseServer → essbaseserver1 → app	► EssBch03 ► Essbe	nch 🕨	~ C	Search Essbench		2
★ Favorites	Name	Date modified	Туре	Size			
Desktop	🐌 trig	6/14/2017 11:33 PM	File folder				
🔈 Downloads	Essbench	6/14/2017 11:33 PM	Data Base File		1 KB		
laces 😓 Recent places	Essbench.dbb	6/14/2017 11:33 PM	DBB File		1 KB		
	Essbench.esm	6/14/2017 11:33 PM	ESM File		2 KB		
ika This PC	Essbench.otl	6/14/2017 11:33 PM	OTL File		1 KB		
Network	Essbench.tct	6/14/2017 11:33 PM	TCT File		1 KB		
6 items							



#### 8. The folder should look like this:

10 L L L L L L L L L L L L L L L L L L L	₹			Essbench				
File H	lome Share	View						``````````````````````````````````````
€ 🕘 •	🔹 ↑ 📜 « Ess	baseV 🕨 EssbaseSer	ver ▶ essbaseserver1 ▶	app 🕨 EssBch03 🕨 Essbe	ench 🕨	~ ¢	Search Essbench	)
👉 Favorit	tes	Name	<b>A</b>	Date modified	Туре	Size		
Desk	top	tria		6/14/2017 11·33 DM	File folder			
🐌 Dow	nloads	AggAct.csc		6/13/2017 10:28 A	CSC File		1 KB	
😓 Rece	ent places	AggAlloc.csc		6/13/2017 10:28 A	CSC File		1 KB	
		AllocP.csc		6/13/2017 10:28 A	CSC File		1 KB	
💐 This PC	С	Curr.csc		6/13/2017 10:28 A	CSC File		1 KB	
		dtOpex.rul		6/13/2017 10:28 A	RUL File		2 KB	
🔃 Netwo	ork	Ssbench		6/15/2017 5:29 PM	Data Base File		2 KB	
		Essbench.dbb		6/15/2017 5:29 PM	DBB File		2 KB	
		Essbench.esm		6/16/2017 12:46 A	ESM File		2 KB	
		Essbench.otl		6/16/2017 12:11 A	OTL File	1,1	165 KB	
		Essbench.tct		6/16/2017 12:46 A	TCT File		33 KB	
11 34-11-1								85
TTittems								8=
Modify t	he prope	erties of the	Essbench data	abase in FAS:				
Sampeas Sample	<u>Start</u> Sto <u>p</u>							
Essbranding     Samples     Sample_     Sample_     Samppar     urity     nES.hype     nES24VT ervers	Start         Stop         Set         Clear         Refresh         Execute ca         Load data         Export         Restructur         Archive Da         Restore D         Display Tra         Replay Tra         Copy         Rename	Iculation  tabase ansactions insaction						
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Essbar     Sampeas     Sample     Sample_     Samppar urity INES.hype INES24VT ervers	Start         Stop         Set         Clear         Refresh         Execute ca         Load data         Export         Restructur         Archive Da         Restore D         Display Tra         Copy         Replay Tra         Copy         Rename         Delete         Edit	Iculation  tabase ansactions insaction	Prop <u>e</u> rties					
Sampeas Sample Sample_ Samppar urity nES.hype nES24VT ervers	Start         Stop         Set         Clear         Refresh         Execute ca         Load data.         Export         Restructur         Archive Da         Restore D         Display Tra         Copy         Replay Tra         Delete         Edit         Create	Iculation  tabase ansactions insaction	Prop <u>e</u> rties	25				
Essbar Sampeas Sample Sample_ Samppar urity INES.hype INES24VT ervers	Start         Stop         Set         Clear         Refresh         Execute ca         Load data.         Export         Restructur         Archive Da         Restore D         Display Tra         Copy         Rename         Delete         Edit         Create         User/group	Iculation  tabase ansactions insaction	Prop <u>erties</u> Location aliase Iriggers	25				
Essbar Sampeas Sample Sample_ Samppar urity INES.hype INES24VT ervers	Start         Stop         Set         Clear         Refresh         Execute ca         Load data.         Export         Restructur         Archive Da         Restore D         Display Tra         Copy         Rename         Delete         Edit         Create         User/group         Expand all	Iculation  tabase atabase ansactions insaction	Prop <u>erties</u> Location aliase Triggers View <u>s</u> pool file:	25 S				
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Essbrand	Start         Stop         Set         Clear         Refresh         Execute ca         Load data         Export         Restructur         Archive Da         Restore D         Display Tra         Copy         Rename         Delete         Edit         Create         User/group         Expand all         Collapse a	Iculation  e tabase atabase ansactions insaction p access all to	Prop <u>erties</u> Location aliase Triggers View <u>s</u> pool files Eilters Drill through de	es s efinitions				



10. Update the cache values (1024000 and 8192000):

😡 Database Properties: [EssbaseCluster-VT.EssBch03.Essbench] 📈 🗹 🗵											
Database: EssbaseCluster-VT.EssBch03.Essbench Status: Loaded											
General Dimensions Statistics Caches Transactions Storage Currency Modifications											
<mark>⊟</mark> ⊷ Caches											
Cache memory loc	king										
🖻 Cache sizes											
Index cache setting	(KB) <u>1024</u>	000									
Index cache current	value (KB)	) <u>1024000</u>									
Data file cache setti	ng (KB) <mark>Q_</mark>										
Data file cache curre	ent value (	KB) <u>0</u>									
Data cache setting (	(KB) <u>8192(</u>	000									
Data cache current	value (KB)	<u>8191960</u>									
Index page setting (KB)	8										
Index page current value	Index page current value (KB) 8										
	Apply	Refres	h <u>H</u> elp	Close							

11. Apply the settings and restart the Essbase application.

#### 2.3 Automation Creation

1. Copy the contents of the EssBench automation ZIP file to a directory on Essbase server:

	l de la companya de l	EssBench					_ □	X
File Home Share	View							~ <b>?</b>
( → · ↑ ) + T	his PC → Local Disk (E:) → Data → EssBench →			~ ¢	Search EssE	Bench		P
☆ Favorites	Name	Date modified	Туре	Size				
Desktop	👢 Log	6/15/2017 11:19 PM	File folder					
🐌 Downloads	dtOPEX.csv	6/13/2017 2:45 AM	CSV File	395,4	62 KB			
laces 🐉 Recent places	📄 EssBch03	6/15/2017 11:18 PM	Windows PowerSh		2 KB			
	EssBench.msh	6/15/2017 10:48 PM	MSH File		1 KB			
i This PC	EssBenchL0_1	6/15/2017 11:13 PM	Text Document	488,7	99 KB			
	EssBenchL0_2	6/15/2017 11:13 PM	Text Document	489,4	70 KB			
C Network	EssBenchL0_3	6/15/2017 11:13 PM	Text Document	488,5	38 KB			
	EssBenchL0_4	6/15/2017 11:13 PM	Text Document	488,5	62 KB			
	EssBenchL0_5	6/15/2017 11:13 PM	Text Document	488,5	46 KB			
	EssBenchL0_6	6/15/2017 11:13 PM	Text Document	488,6	65 KB			
	EssBenchL0_7	6/15/2017 11:13 PM	Text Document	489,1	35 KB			
	EssBenchL0_8	6/15/2017 11:13 PM	Text Document	489,4	89 KB			
							_	
12 items								:



2. Update the variable assignment section of the PowerShell file:

```
Brian Marshall
   #Created Bv:
   #Created Date: 6/1/2017
   #Purpose:
           Essbase Performance Benchmark (EssBench)
4
5
   6
  8
  #Variable Assignment
9
  $LogPath = "E:\Data\EssBench\Log\"
  $MaxLPath = "E:\Oracle\Middleware\user_projects\EssbaseV\EssbaseServer\essbaseserver1\bin"
13
  $MaxLUsername = "admin"
  $MaxLPassword = "
14
  $MaxLServer = "hyperiones24vt.hyperion.local"
  $EssbaseApp = "EssBch03"
16
17
  $FilePath = "e:\\data\\EssBench\\"
  STimeStamp = Get-Date -format "yyyyMMddHHmm"
18
  $LogFileName = $LogPath + $EssbaseApp + $TimeStamp + ".log"
19
20
  Start-Transcript -path $LogFileName
22
  23
24
  #MaxL Execution - Pass 1
  26
  & $MaxLPath\StartMaxL.bat EssBench.msh $MaxLUsername $MaxLPassword $MaxLServer $EssbaseApp $FilePath
28
29
   30
   #MaxL Execution - Pass 2
  & $MaxLPath\StartMaxL.bat EssBench.msh $MaxLUsername $MaxLPassword $MaxLServer $EssbaseApp $FilePath
34
  36
   #MaxL Execution - Pass 3
37
   & $MaxLPath\StartMaxL.bat EssBench.msh $MaxLUsername $MaxLPassword $MaxLServer $EssbaseApp $FilePath
40
41
   Stop-Transcript
```



## 3 Benchmark

Now that everything is configured, the benchmark can be executed. Simply start the PowerShell script. Before we can actually execute a PowerShell script, we need to allow for remote signed scripts. Open up Windows PowerShell as an administrator and execute this command:

#### Set-ExecutionPolicy RemoteSigned

It should look something like this:





Once this command has executed successfully, there are then two options to execute the benchmark:

### 3.1 Option 1

Open Windows PowerShell and change to the directory containing the benchmark. Execute the benchmark:

	Administrator: Windows PowerShell	_ □	x
PS E:\Data\EssBench> .\EssBch03.ps1_			^
			~

## 3.2 Option 2

Right-click and run with PowerShell:

