ESSBASE HYBRID AGGREGATION MODE

North Texas Hyperion User Group - November 13, 2014

AGENDA

- Introduction to Essbase Storage Options
- Hybrid Aggregation Mode
  - Benefits of Hybrid Aggregation Mode
  - Enabling Hybrid Aggregation Mode
  - Current Limitations
  - How to Avoid Disaster
  - Demo **(RedBox Retail Locations)**
- Q&A

ESSBASE STORAGE OPTIONS

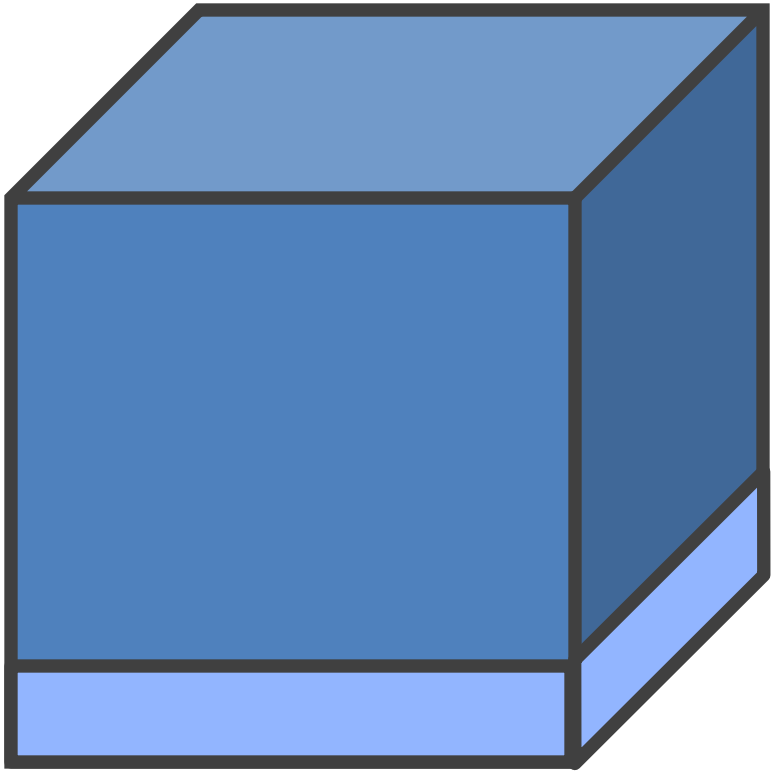
- Block Storage Option (BSO)
  - The “original” Essbase storage option
  - Supports advanced procedural calculations
  - Supports sending data to parent levels
  - Limited support for cubes with many or very large dimensions

- Aggregate Storage Option (ASO)
  - Introduced in Essbase version 7.1.2
  - Supports cubes with many large dimensions
  - Less mature support for complex procedural calculations
  - Does not support sending data to parent levels

ESSBASE STORAGE OPTIONS

- Hybrid Aggregation Mode
  - Introduced with Essbase 11.1.2.3.500 with limited functionality
  - Optional feature applied to Block Storage (BSO) cubes
  - BSO cube with ASO style calculations
  - Attempts calculations using Hybrid, but if the conditions aren't just right, defaults back to Block Storage mode
  - Supports sending data to parent levels, as long as they aren't dynamic
  - Supports advanced procedural calculations
  - Not to be confused with "Hybrid Analysis"

HYBRID AGGREGATION MODE



ASO–Style

✓ Dynamic Sparse Members

BSO

✓ Stored Sparse Members

** Which engine calculates dynamic dense members?

BENEFITS OF HYBRID AGGREGATION MODE

- Reduces the need to calculate and store certain data during batch calculations resulting in (as compared to BSO):
  - Faster Batch Times
  - Lower Disk Space Requirements
  - Faster Database Restructures
  - Increased Application Availability
  - Instantly Aggregated Data

DOWNSIDES

- Brand New Technology
- Documentation Limited to .500 Patch Readme File
- Significant Calculation Limitations
- Calc scripts that reference data from dynamic sparse member combinations can be very slow.
- Calculations that fail to meet the Hybrid engine's requirements default to Block Storage mode and can be very slow.
- Necessitates the use of query governors

ENABLING HYBRID AGGREGATION MODE

- Three Key Steps:
  1) Build BSO Cube
  2) Modify Essbase Config File
  3) Make Sparse Members Dynamic
- Load . . . Calculate . . . Retrieve
- Test

ENABLING HYBRID AGGREGATION MODE

Requires a setting in the Essbase.cfg file.

Essbase config settings (essbase.cfg)

```
; The following entry specifies the full path to JVM.DLL
; JvmModuleLocation  $J(EPM_ORACLE_HOME)\..\jdk160_35\jre\bin\server\jvm.dll
BPM_Oracle_DriverDescriptor "DataDirect 7.0 Oracle Wire Protocol"
BPM_DB2_DriverDescriptor "DataDirect 7.0 DB2 Wire Protocol"
BPM_SQLServer_DriverDescriptor "DataDirect 7.0 SQL Server Native Wire Protocol"
;BPM_SQLServer_DriverDescriptor "SQL Server"
;BPM_Netezza_DriverDescriptor "NetezzaSQL"
BPM_Teradata_DriverDescriptor "Teradata"
;BPM_ORACLEBI_DriverDescriptor "Oracle BI Server 11g_OHXXXX"
;BPM_ORACLEBI_DriverDescriptor "Oracle BI Server"
BPM_MySQL_DriverDescriptor "DataDirect 7.0 MySQL Wire Protocol

AuthenticationModule CSS
AGENTPORT 1423
SERVERPORTBEGIN 32768
SERVERPORTEND 33768
AGENTDESC hypservice

ASODYNAMICAGGINBSO HYB_RB PARTIAL
```

ENABLING HYBRID AGGREGATION MODE

ASODYNAMICAGGINBSO [*app* [*db*]] NONE | PARTIAL | FULL

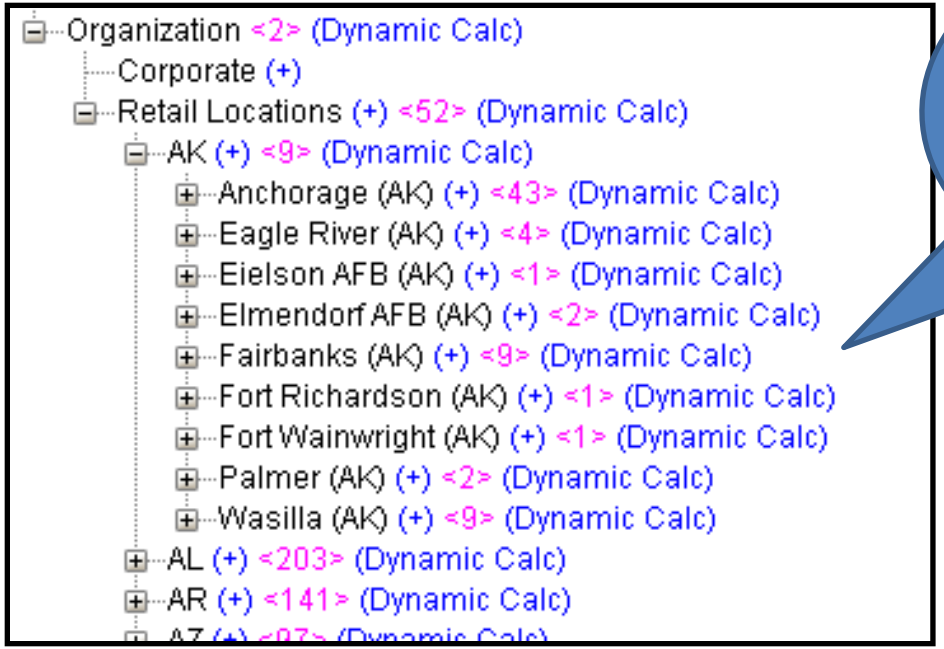
- Can be enabled or disabled for specific applications
- Can be enabled or disabled for specific databases within applications
- Can be disabled for the entire server
- Can be enabled in **Partial** or **Full** mode

ENABLING HYBRID AGGREGATION MODE

SETTING	DESCRIPTION
None	Disables Hybrid Aggregation Mode (default).
Partial	Enables Hybrid Aggregation Mode, but only for certain outline aggregations (+, -, ~). Everything else fires in Block Storage Mode.
Full	Enables Hybrid Aggregation Mode for simple outline aggregations and formulas (many limitations apply).

ENABLING HYBRID AGGREGATION MODE

- Make Upper-Level **Sparse** Members **Dynamic**



Generally regarded as a bad idea with BSO . . . but required for Hybrid.

CURRENT LIMITATIONS

- There are many circumstances in which calculations will not leverage Hybrid Aggregation Mode.
- Essbase will attempt to execute the calculation in **Hybrid Aggregation Mode**, and if it can't, it will default back to **Block Storage Mode**.
- If Essbase tries to execute a large dynamic calculation on a sparse dimension in Block Storage Mode . . . uh-oh.
- It is important to understand the limitations, but also understand that they will change over time with newer releases.

CURRENT LIMITATIONS

- The following functions are supported when using the **Full** mode setting in the Essbase.cfg file **(as of version 11.1.2.3.500)**:

  - @CHILDREN
  - @EXP
  - @INT
  - @ISMBR
  - @MIN
  - @MINSRANGE
  - @MOD
  - @MODE
  - @NOTEQUAL
  - @POWER
  - @RANGE
  - @REMAINDER
  - @ROUND
  - @VAR
  - @VARIANCEP
  - @VARPER

CURRENT LIMITATIONS

- Other Key Items Not Currently Supported:
  - Time Balance Tags
  - Attribute Calculations
  - Cross-Dims in Formulas
  - Dynamic Calc Members with Formulas that are Target of Transparent Partitions
  - Queries with Two-Pass and One Pass Calcs from Same Dimension
  - XOLAP

CURRENT LIMITATIONS

- What works?
  - Sparse Member with Formula . . . Only References Sparse Members
  - Dense Member with Formula . . . Only References Dense Members
  - Sparse Member with Formula . . . References Mixed Members
    (But Dense Members are Stored)

CURRENT LIMITATIONS

- What conclusions can we draw as of version 11.1.2.3.500?
  - Hybrid Aggregation Mode shows a lot of promise, but should not be used in a production environment (yet).
  - **Partial** mode makes more sense than **Full** mode given the limitations.
  - Start working with Hybrid Aggregation Mode in a Sandbox environment.

ADDITIONAL CONSIDERATIONS

- The limitations previously described do not apply to calc scripts that are run in the BSO region of the cube.
- Developers are free to write complex calc scripts that make full use of all BSO functions provided they reference stored sparse member combinations only.

HOW TO AVOID DISASTER

QRYGOVEXECBLK [appname [dbname]] n

- Sets max number of blocks query can retrieve before being terminated

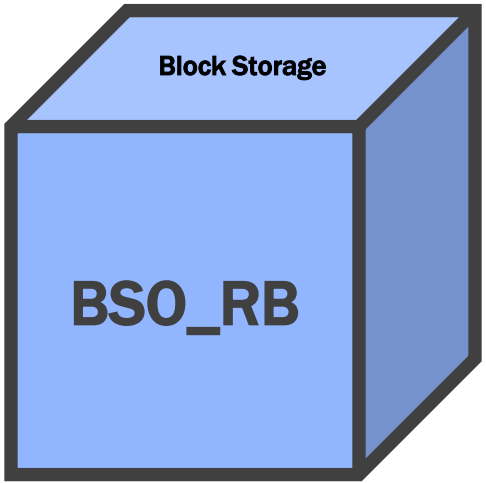
QRYGOVEXECTIME [appname [dbname]] n

- Sets max amount of time a query can execute before being terminated
- Measured in seconds

DEMO

- BSO Cube vs Hybrid Cube
- Both Cubes Include All Domestic RedBox Locations
- Driver Based Calculation + Aggregation
- 439 Distributors
- 40,624 Retail Locations
- 100% Fake Data

DEMO

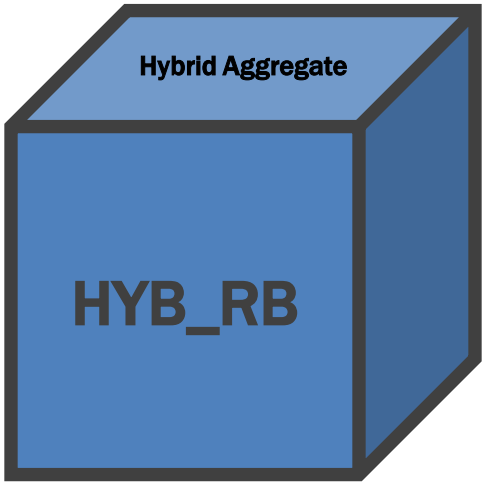


← Same Dimensions →

← Same Members →

← Same Caches →

← Same Data →

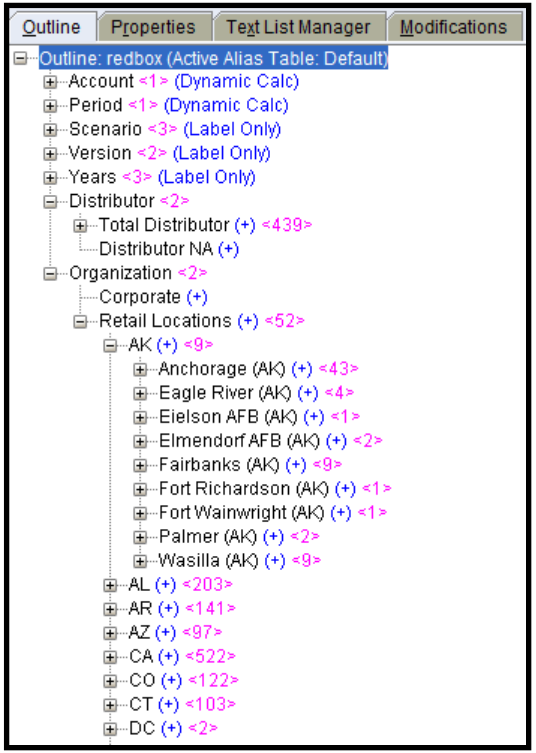


1) Seed Budget w/ Actual Data
2) Trend Out Projected Revenue
3) Aggregate
4) Retrieve

1) Seed Budget w/ Actual Data
2) Trend Out Projected Revenue
3) Retrieve

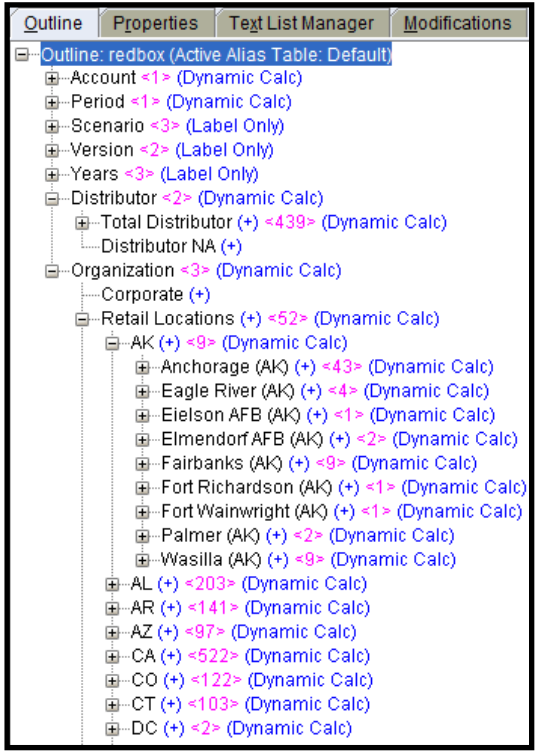
DEMO

Block Storage Mode



Upper Levels Stored

Hybrid Aggregate Mode



Upper Levels Dynamic

BLOCK STORAGE MODE vs HYBRID AGGREGATION MODE

RESULTS	BSO	HYBRID
Level 0 Blocks	203,120	203,120
Upper-Level Blocks	560,800	0
Seed Budget Time (seconds)	647	632
Trend Revenue (One Location)	0.265	0.264
Aggregation Time (seconds)	13	0
Retrieve Time (seconds)	0.001	0.960
Dense Restructure Time (seconds)	20	5

ENSURING SUCCESS

- Review the logs to ensure calculations are leveraging Hybrid Aggregation Mode.
- Success looks like this:

```
[Thu Nov 13 10:47:31 2014]Local/HYB_RB/redbox/admin@Native Directory/7468/Info(1204002)
Hybrid Aggregation Mode enabled.

[Thu Nov 13 10:47:32 2014]Local/HYB_RB/redbox/admin@Native Directory/7468/Info(1020055)
Spreadsheet Extractor Elapsed Time : [0.807] seconds
```

ENSURING SUCCESS

- Review the logs to ensure calculations are leveraging Hybrid Aggregation Mode.
- Defaulting back to Block Storage Mode looks like this:

```
[Thu Nov 13 10:57:27 2014]Local/HYB_RB/redbox/admin@Native Directory/3136/Info(1204001)
Hybrid Aggregation Mode disabled for [Bad Account] due to [formulas are disabled by ASODYNAMICAGGINBSO tag].

[Thu Nov 13 10:58:05 2014]Local/HYB_RB/redbox/admin@Native Directory/3136/Info(1020055)
Spreadsheet Extractor Elapsed Time : [37.413] seconds
```

QUESTIONS?

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