# SSIS

1. Ensure the source and destination systems are tuned
2. To run perfmon must be local admin on server

## Perfmon

1. Average Disk sec/Transfer - \_Total
   1. Want this below .010
2. % Processor Time \_Total
   1. Don’t want it pegged
3. Buffers Spooled
   1. Want it at 0
4. Buffer Memory
5. Buffers in Use
6. Private Buffer Memory
7. Private Buffers in Use

May have leaks if Buffers in use, Flat buffers or private buffers don’t reset to 0.

# SSAS

1. Do we have memory issues in SQL Server?
   1. Perfmon Counters:
      1. MSAS12:Memory
         1. Memory Limit Hard
         2. Memory Limit High
         3. Memory Limit Low
         4. Memory Usage KB
      2. Process cube and see what happens to the memory usage.
2. How do we know about query problems?
   1. Someone complains! We get an email saying something is slow.
   2. Find the problem query from the report.
   3. Test the query by itself to isolate it from everything.
   4. Determine issue source: Formula engine or Storage Engine (the query itself or the design of the cube)
3. Identify the query:
   1. Pull it from the SSRS report
   2. Run a trace in profiler
      1. Add Query Subcube Verbose
      2. Add Get Data From Aggregation
      3. Add Get Data From Cache
   3. Show how to find the query that was run. Useful for finding the excel query. Find the Query End Event.
4. Be sure to always clear the cache

### Run query 1.

1. Find Query End event, find duration column. Show how long it took.
2. Find the partitions read.
3. If hitting several it denotes we may need a slicer.
4. Look for aggregations.
5. Find a “Query Subcube verbose”.
6. Show how it shows the data being returned.
7. When you see a 0, it means the default value being returned. One 0 for each attribute. Scrolling to right shows each attribute individually.
8. If you see a number, that is a specific member of the attribute. Scroll to right to see the member.
9. Product Bikes might be a good example.
10. If you see a \* it means ALL members from the attribute hierarchy are being returned.
11. If you see a + sign, it means more than one member is being returned, but not all members.
12. A ? represents a member whose attribute hierarchy enabled is set to false.
13. The number is NOT the SK for the member, it is the Data ID from the cube. Meaningless to us, should not rely on it.

Put the data out to a table.

If FE is drastically larger then look at the formula engine, aka, look at the query. If this comes from Excel that may be an issue since we can’t really modify the query.

Performance Testing Techniques for Forumla Engine

* + - 1. Execute parts of the query individually.
      2. Remove calculated members from the query
      3. Add calculations back in one at a time
      4. Remove all but one measure
      5. Break complex calculations into smaller pieces
         1. Could be one part of a calculation rather than the whole calculation
      6. Remove design features like many to many and see what happens
      7. Move calculations back to the ETL

Performance Storage Engine

1. Partitions setup properly? Is my cube partitioned enough or not enough.
   1. Ensure if you are running a query for 2012 it is not also hitting the 2011 partition.
2. If no aggregations are being used set up aggregations or UBO (show setting up UBO here)
3. Avoid features that cause SSAS to do cell by cell evaluation.

# T-SQL Queries for Trace

SELECT \*

, (

CONVERT(DECIMAL, x.[Total Time in Storage Engine])

/ CONVERT(DECIMAL, x.[Total Query Duration])

) \* 100 AS 'Percent Time in SE'

, (

CONVERT(DECIMAL, x.[Total Time in Formula Engine])

/ CONVERT(DECIMAL, x.[Total Query Duration])

) \* 100 AS 'Percent Time in FE'

FROM (

SELECT (SELECT SUM(duration)

FROM [dbo].[TraceTable]

WHERE [EventClass] = 10

) AS 'Total Query Duration'

, (SELECT SUM(duration)

FROM [dbo].[TraceTable]

WHERE [EventClass] = 11

) AS 'Total Time in Storage Engine'

,

(SELECT SUM(duration)

FROM [dbo].[TraceTable]

WHERE [EventClass] = 10

)

- (SELECT SUM(duration)

FROM [dbo].[TraceTable]

WHERE [EventClass] = 11

)

AS 'Total Time in Formula Engine'

) x

select x.ConnectionID, x.QueryID, x.QueryDuration, p.SEDuration,

case

when p.SEDuration > x.QueryDuration then NULL

else x.QueryDuration - p.SEDuration

end

as FEDuration,

y.[Number of SE Queries],

y.[Thread Duration of SE Queries],

w.[Aggregations Read],

x.TextData

from (

/\* Determine number of Queries \*/

select a.ConnectionID, a.Duration as QueryDuration, a.TextData, cast(HashBytes('SHA1', cast(reverse(cast(TextData as varchar(max))) as nvarchar(4000))) as int) as QueryID

from TraceTable a

where a.EventClass = 10 -- Query End Event

) x

left outer join (

/\* Determine Query Subcube Verbose of Non-cache data \*/

select ConnectionID, COUNT(\*) as [Number of SE Queries], SUM(Duration) as [Thread Duration of SE Queries]

from TraceTable

where EventClass = 12 -- Query Subcube Verbose

and EventSubclass = 22 -- Non-cache data

group by ConnectionID

) y

on y.ConnectionID = x.ConnectionID

left outer join (

/\* Determine Aggregations that are ready from \*/

select ConnectionID, COUNT(\*) as [Aggregations Read]

from TraceTable

where EventClass = 60 -- Read from Aggregations

group by ConnectionID

) w

on w.ConnectionID = x.ConnectionID

left outer join (

/\* Determine SE time \*/

select ConnectionID, SUM(Duration) as SEDuration

from TraceTable

where EventClass = 11 -- Query SubCube

group by ConnectionID

) p

on p.ConnectionID = x.ConnectionID