SQL SATURDAY - SALT LAKE CITY - 2020

SQL LOGIN DATA WAREHOUSE

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ANSWER MY LOGIN QUESTION:

- Who
- How Often
- Server
- Database
- Client/Host
- Application
- When

PIECES OF THE SOLUTION

- Extended Event Sessions
- Powershell XE Importer
- OLTP Relational Database
- OLAP Star Schema Database
- SSAS Tabular Database
- SQL Agent Jobs – Data Collectors/Aggregators
- Excel Pivot Table as Front-End

EXTENDED EVENT SESSION

- Collects only the XE Login Event to file
- Collects only successful logins
- XE is very lightweight
- Even with fast-polling apps (50 logins/sec)
- XE Sessions automatically start when SQL Starts
- Logging 9M+ Events a day for one server
- The XEL trace files are copied up to a Central Server for ETL and reporting

POWERSHELL EXTENDED EVENTS IMPORTER

- MS Recommends
  - https://docs.microsoft.com/en-us/sql/relational-databases/system-functions/sys-fn-xe-file-target-read-file-transact-sql?view=sql-server-2017
  - 11 Hours on 9M+ Trace file
- Dan Guzman – SQL MVP – (QueryableXEventData)
  - https://dba.stackexchange.com/questions/206863/what-is-the-right-tool-to-process-big-xel-files-sql-server-extended-events-log
  - 11 Minutes on 9M+ Trace file
- Load 2 Standard SQL Server Assemblies
  - C:\Program Files\Microsoft SQL Server\150\Shared\Microsoft.SqlServer.XEvent.Linq.dll
  - C:\Program Files\Microsoft SQL Server\150\Shared\Microsoft.SqlServer.XE.Core.dll

OLTP RELATIONAL DATABASE

- Used to Bulk-Load the XE session files from all Servers into SQL
  - Aggregate these Metrics:
    - Server
    - Database
    - Host
    - Application String
    - User/Login
    - Hour of Day
    - Connection Count per Hour
  - ETL Errors go to Errors Table for inspection during QA Pass

OLAP STAR SCHEMA DATABASE

- Typical Star-Schema Database
  - Used to feed both the SSAS Tabular Model
    - Date Dimension
    - Server Dimension
    - Database Dimension
    - Host Dimension
    - Application Dimension
    - Login/User Dimension
    - Single Fact Table Measure: Logins per Hour

ORIGINAL WAS SSAS MD CUBE

- Why Multidimensional?
  - Project Started in 2014
  - My First Data Warehouse
  - Tabular still 1.0-ish in 2014
  - Didn't have enough $$$ Memory on Server for Tabular
  - Didn't have Enterprise Edition
  - Learned Data Warehousing using MD and MDX
- Not showing you how to build the Cube today
  - Takes too Long
  - Download the ABF and Restore it from my Github repo
  - MOLAP Cube (ROLAP/Clustered ColumnStore an Option)

SQL AGENT JOBS

- Jobs on each Monitored Server
  - XE Session Target Filename changes at Midnight
  - XE Session Target Filename matches Day of Week
- Jobs On Central Database
  - Copies up XE Session files from above servers
  - Import and Clean all XE Session Files
  - ETL loads OLTP and OLAP Databases
  - Process Tabular Model

EXCEL FRONT-END

- Why Excel and Not Power BI?
  - Pivot Tables fit better
  - Easier Drill-Down
  - Easier Filtering

OPERATIONAL STATISTICS

- Running since 2015
  - 20 Servers
  - 275 Databases
  - 7500 Hosts
  - 680 Application Strings
  - 8300 User/Logins
  - Fact Table 30M+ Rows
  - 15 Billion Logins
- Cube is only 350MB
- Entire Daily Import Process takes 16 Minutes

DEMO

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THANK YOU!

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