

# What's new in Analysis Services 2016



Gerhard Brueckl



#546 | OPORTO 2016

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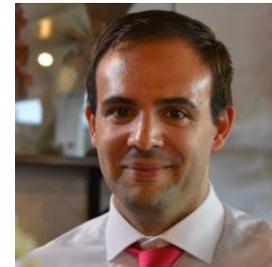
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- Because they are crazy. 😊
- Because they want **YOU**  
to learn from the BEST IN THE WORLD.



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# Sponsor Sessions at 15:05

- Don't miss them, they might be distributing some awesome prizes!



Auditório Magno

*Exciting certification changes with SQL Server 2016*



Auditório 1

Culto de BI  
Successful projects

# About Me



## Gerhard Brueckl

From Austria 

Working with Microsoft BI since 2006

Mainly focused on Analytics and Reporting

Analysis Services / Power BI

Microsoft Azure



**SSAS**  
MAESTRO  
by Microsoft



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# What's new in Analysis Services 2016

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- SSAS Multidimensional
  - Deprecated/Removed Features
  - New Features
- SSAS Tabular
  - Engine
  - Administrator
  - Developer
  - SSDT



# SSAS 2016 Multidimensional

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## Removed Features:

- `NON_EMPTY_BEHAVIOR`
- COM assemblies
- `CalculationCurrentPass()`  
`CalculationPassValue()`



# SSAS 2016 Multidimensional

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## Now Deprecated Features:

- Session Cubes (Excel Groupings)
- Local Cubes
- SQL Server Profiler for SSAS
- Dimension Writeback
- [Remote] Linked Dimensions
- Remote Partitions



# SSAS 2016 Multidimensional

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## What's New:

- Improvements for Excel Queries
- ROLAP Distinct Count Improvements
- DBCC
- Changes to Analysis Services Management Objects (AMO)



# SSAS 2016 Tabular

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## What's New in the Engine:

- New Compatibility Level 120
- Parallel Processing of Partitions
- General Performance Improvements
- DBCC
- HeapType



# SSAS 2016 Tabular

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## Parallel Processing:

- Partitions of same Table
- Huge load on RDBMS
- Set MaxParallelism

# SSAS 2016 Tabular

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## What's New for the Administrator:

- Tabular Model Scripting Language (TMSL)
- Extended Events
- DBCC
- Editions
- Upgrade to 2016



# SSAS 2016 Tabular

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## Tabular Model Scripting Language:

- JSON – user-readable
- For DDL and DML
- Specific to Tabular Object
- Object Names instead of IDs



# SSAS 2016 Tabular

## Extended Events:

- Management via SSMS

Object Explorer

Connect

- localhost (SQL Server 13.0.1711.0 - PMONE\gbrueckl)
- localhost\TAB2016 (Microsoft Analysis Server 13.0.160)
- Databases
- Management
  - Extended Events
    - Sessions
      - SQLSat 546
        - event\_stream

SQLSat 546: Live Data | XMLAQuery2.xml... (PMONE\gbrueckl)\*

Displaying 22 Events

|   | name     | timestamp                   | EndTime                     |
|---|----------|-----------------------------|-----------------------------|
|   | QueryEnd | 2016-09-30 14:13:27.9373638 | 2016-09-30 14:13:27.9373638 |
|   | QueryEnd | 2016-09-30 14:13:28.7059658 | 2016-09-30 14:13:28.7059658 |
|   | QueryEnd | 2016-09-30 14:13:29.2701457 | 2016-09-30 14:13:29.2701457 |
|   | QueryEnd | 2016-09-30 14:13:29.5209464 | 2016-09-30 14:13:29.5209464 |
| ▶ | QueryEnd | 2016-09-30 14:13:29.7970142 | 2016-09-30 14:13:29.7970142 |
|   | QueryEnd | 2016-09-30 14:13:30.0316200 | 2016-09-30 14:13:30.0316200 |
|   | QueryEnd | 2016-09-30 14:13:30.3124577 | 2016-09-30 14:13:30.3124577 |

# SSAS 2016 Tabular

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## DBCC:

- DB Consistency Check
- As during Restore
- TAB and MD
  
- Output via Profiler / XEvents
  - Progress Report Current



# SSAS 2016 Tabular

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## Editions:

- Standard
  - 4 sockets / 24 cores
  - Max 16 GB memory
- Enterprise
  - OS limit
  - OS limit
- No BI Edition

Partitions  
Perspectives  
DirectQuery

# SSAS 2016 Tabular

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## Upgrade to 2016:

- Instance Upgrade
- Database Upgrade
  - In-Memory
  - Direct Query



# SSAS 2016 Tabular

## Upgrade to 2016:

- Supported Compatibility Levels

| Mode             | Level | Version                        |
|------------------|-------|--------------------------------|
| Multidimensional | 1050  | SQL Server 2005, 2008, 2008 R2 |
| Multidimensional | 1100  | SQL Server 2012, or later      |
| Tabular          | 1100  | SQL Server 2012                |
| Tabular          | 1103  | SQL Server 2014                |
| Tabular          | 1200  | SQL Server 2016                |



# SSAS 2016 Tabular

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## What's New for the Developer:

- New Compatibility Level 120
  - Bidirectional Filtering
  - Display Folders
  - Translations
  - New DAX Functions
  - Calculated Tables
  - DAX Variables

# SSAS 2016 Tabular



## Bidirectional Filtering:

- “Many-to-Many”
- Caution
  - Business Impact
  - Performance
- CROSSFILTER()
- SSDT – “Default Filter Direction”



# SSAS 2016 Tabular

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## DisplayFolders:

- Measures and Attributes
- Nested
- Duplications

## Translations:

- Metadata only
- Import / Export
- JSON



# SSAS 2016 Tabular

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## New DAX Functions:

- CROSSFILTER()
- MEDIAN[X]()
- PRODUCT[X]() / CONCATENATEX()
- INTERSECT() / UNION()
- DATEDIFF()
- CALENDAR[AUTO]()
- 50+ more ...



# SSAS 2016 Tabular

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## Calculated Tables:

- CALENDAR[AUTO]()
- Aggregated Tables

## Variables:

- Readability
- Usability
- Performance



# SSAS 2016 Tabular

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## DirectQuery:

- Works with MDX
- Sample-View
- Performance Improvements
- Limitations
  - Calc Columns on same row
  - RLS
- Referential Integrity



# SSAS 2016 Tabular

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## SSDT Improvements:

- Integrated Workspace Mode
- Tabular Object Explorer
- VS Configurations
- Delta Deployment
- Proper IntelliSense
- Autofix Measures
- Comments in DAX

# SSAS 2016 Tabular



## Integrated Workspace Mode:

- Hosts a separate SSAS Instance

| Properties                       |   |
|----------------------------------|---|
| <b>Model.bim</b> File Properties |   |
| Advanced                         |   |
| Build Action                     | Compile                                 |
| Copy To Output Directory         | Do not copy                             |
| Misc                             |   |
| Collation                        |   |
| Compatibility Level              | SQL Server 2016 RTM (1200)              |
| Data Backup                      | Do not back up to disk                  |
| Default filter direction         | Single direction                        |
| DirectQuery Mode                 | Off                                     |
| File Name                        | Model.bim                               |
| Full Path                        | d:\OneDrive\Dokumente\Conferences\2016- |
| Integrated Workspace Mode        | True                                    |
| Language                         | English (United States)                 |
| Workspace Database               | TAB2016_IntegratedWorkspace_gbrueckl    |
| Workspace Retention              | Unload from memory                      |
| Workspace Server                 | localhost:24094                         |

# SSAS 2016 Tabular

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## Tabular Object Explorer:

- Compatibility Level 1200 and above
- Perform Basic Operations
- Change Properties

# SSAS 2016 Tabular



## Delta Deployment:

- XMLA

```
<Alter AllowCreate="true" ObjectExpansion="ExpandFu
<Object>
  <DatabaseID>TAB2014_Workspace_gbrueck1</Databas
  <CubeID>Model</CubeID>
  <MdxScriptID>MdxScript</MdxScriptID>
</Object>
<ObjectDefinition>
  <MdxScript xmlns:xsd="http://www.w3.org/2001/XM
  <ID>MdxScript</ID>
  <Name>MdxScript</Name>
  <Commands>
    <Command>
      <Text>CALCULATE;
CREATE MEMBER CURRENTCUBE.Measures.[__No measures d
ALTER CUBE CURRENTCUBE UPDATE DIMENSION Measures, D
    </Command>
    <Command>
      <Text>-----
-- PowerPivot measures command (do not modify manua
-----
```

```
<Batch Transaction="true" xmlns="http://schemas.micro
<Alter xmlns="http://schemas.microsoft.com/analysis
  <DatabaseID>TAB2014_Workspace_gbrueck1</DatabaseID>
  <Measures>
    <xs:schema xmlns:xs="http://www.w3.org/2001/XM
      <xs:element>
        <xs:complexType>
          <xs:sequence>
            <xs:element type="row"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:complexType name="row">
        <xs:sequence>
          <xs:element name="ID" type="xs:unsignedL
          <xs:element name="ID.Table" type="xs:str
          <xs:element name="ID.Measure" type="xs:s
          <xs:element name="Name" type="xs:string"
          <xs:element name="Description" type="xs:
          <xs:element name="Expression" type="xs:s
          <xs:element name="FormatString" type="xs
```

# SSAS 2016 Tabular

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## DAX Authoring:

- IntelliSense
- AutoFix
  - Dependencies
  - Missing Brackets
- Comments
- Indention



# SSAS 2016 Tabular

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## “Open Issues”:

- Multi-User Development
  - Single File
- Defer Update during Development
- Tabular Editor by *Daniel Otykier*

# SSAS 2016 Virtual Lab

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<https://vlabs.holsystems.com/vlabs/technet?eng=VLabs&auth=none&src=vlabs&altadd=true&abid=23110&lod=true>



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# Thank You

## Any Questions?



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