

# Upgrading and Migrating BI Features

for SQL Server 2014 and 2016



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# Paul Turley Bio

Paul is a Mentor with SolidQ and a Microsoft Data Platform MVP. He consults, writes, speaks, teaches & blogs about business intelligence and reporting solutions. He works with companies around the world to visualize and deliver critical information to make informed business decisions. He is a Director of the Oregon SQL PASS chapter & user group, the lead author of Professional SQL Server 2016 Reporting Services and 14 other titles from Wrox, Packt & Microsoft Press.



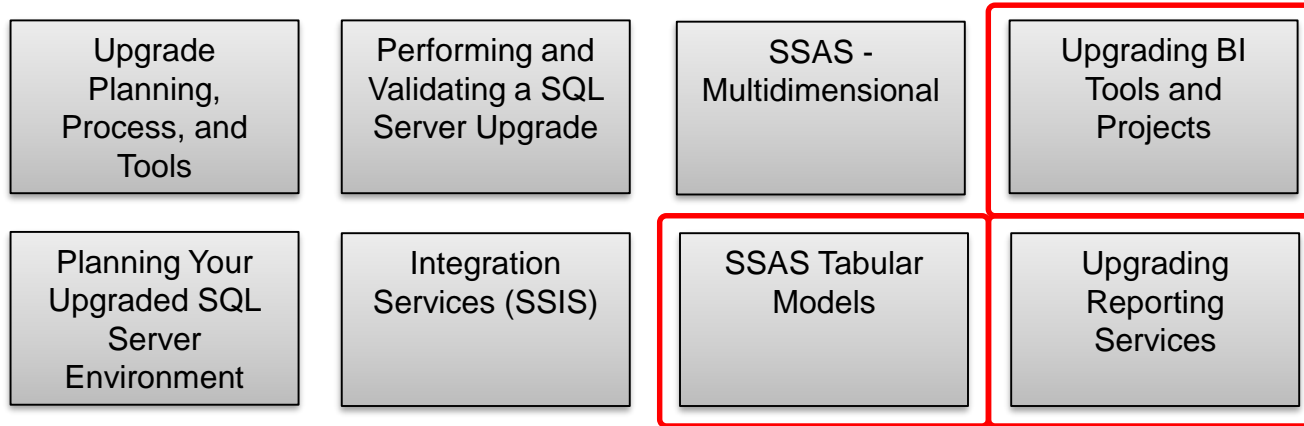
@paul\_turley



sqlserverbiblog.com

# Additional Presentations

- Microsoft Virtual Academy, [mva.microsoft.com](http://mva.microsoft.com)  
**“Upgrading to Microsoft SQL Server 2014”**
- 2015 PASS Global Summit preconference:  
**“Upgrade and Migration Planning for SQL Server 2014 and 2016”**  
Tim Chapman, Ron Talmage, Richard Waymire, Jim Miller & Paul Turley



# What Does This Presentation Cover?

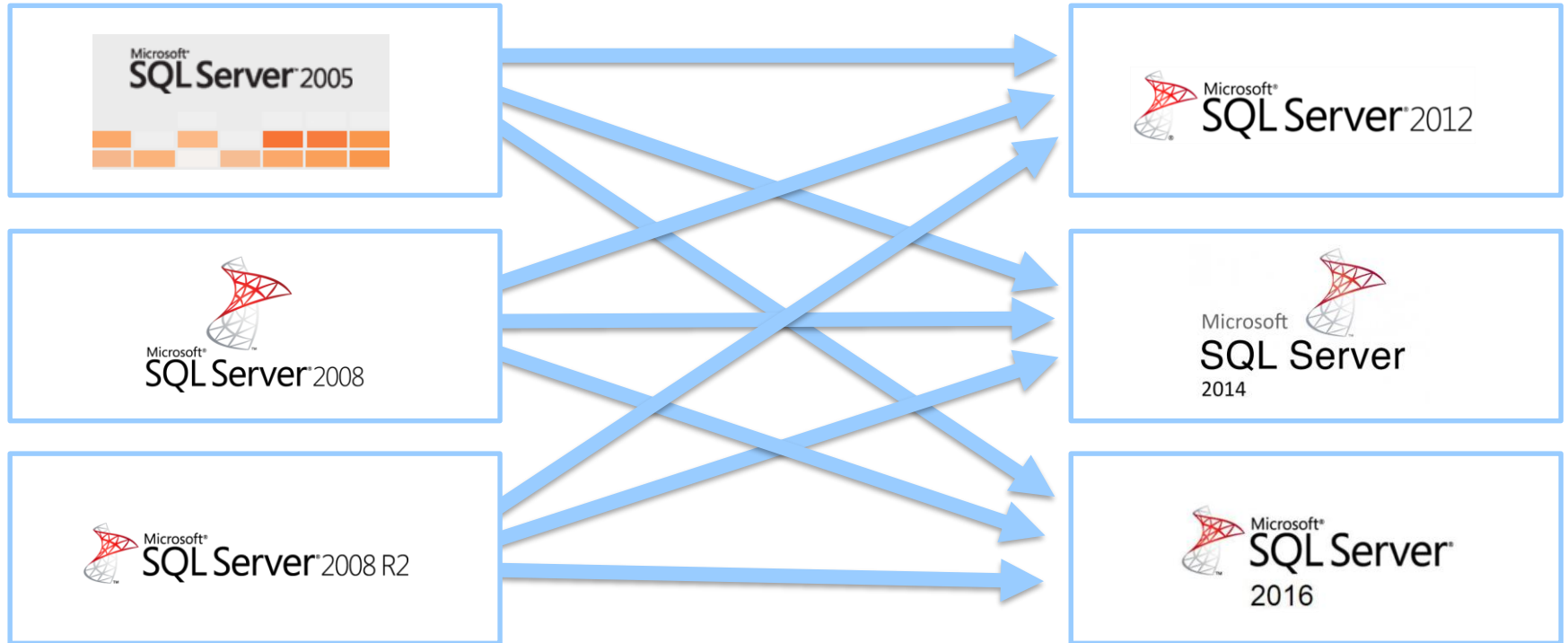
## SQL Server 2014

Best practices and advice about upgrading to SQL Server 2014

## SQL Server 2016

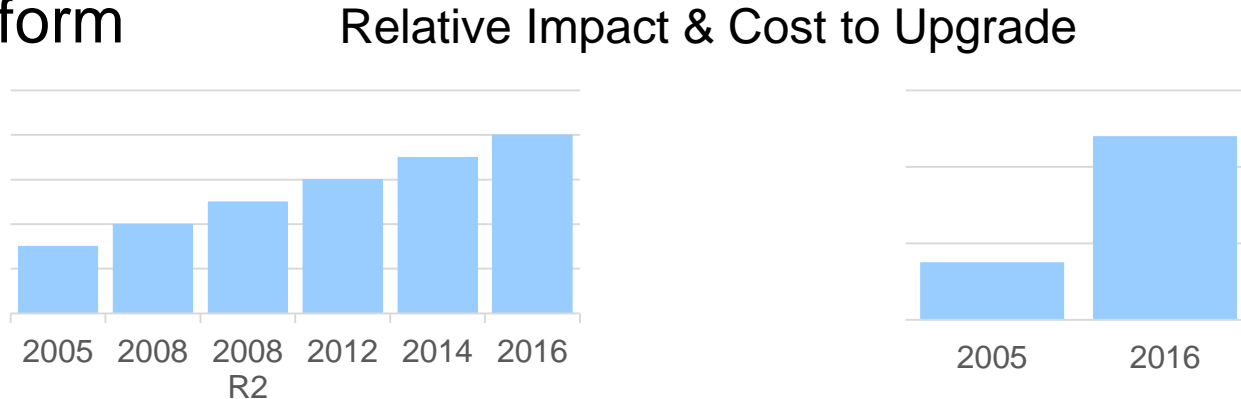
New features & capabilities in SQL Server 2016

# Upgrade Versions



# Why Upgrade?

- The purpose of this presentation is not to convince you to upgrade but to help you know what to expect when you do
- Reality: At some point you **MUST** upgrade your database platform



# When To Upgrade?

- Business value > cost of upgrade
- Support is ending
- Improved:
  - Performance
  - Security
  - Scalability
  - Maintainability
  - Capabilities
- Staying current  
(if not now then when?)

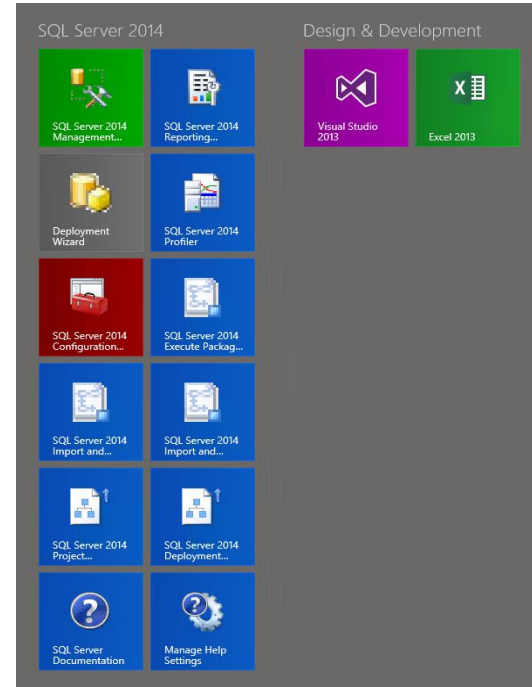


The SQL Server feature Train

# Business Intelligence Tools

2016  
2014

- SQL Server Management Studio
- SQL Server Data Tools
- Analysis Services  
Multidimensional
- Analysis Services Tabular
- Reporting Services
  - Report Portal
  - Mobile dashboards & KPIs
  - Power BI integration





# SQL Server Data Tools Visual Studio

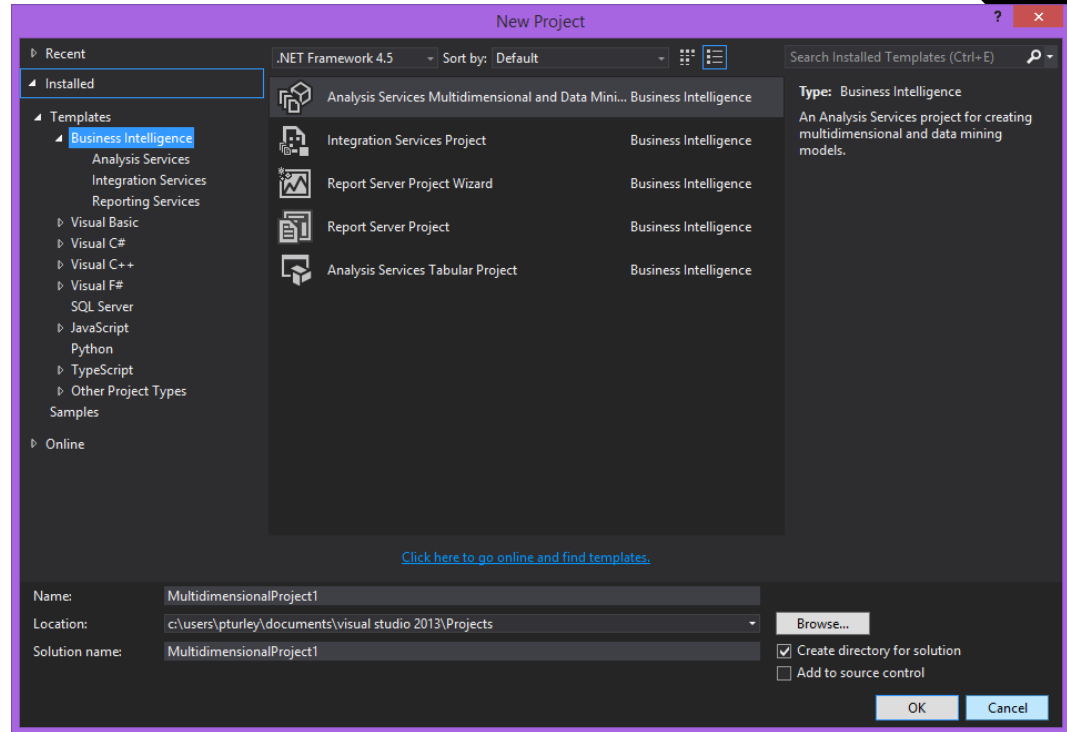
2014  
2012

- In SQL Server 2014, “SQL Server Data Tools” is the database project template add-in for Visual Studio
- SQL Server 2014 installs the Visual Studio 2012 shell
- SQL Server Data Tools (SSDT) and SQL Server Data Tools for Business Intelligence (SSDT-BI) are now separate downloads & add-ins for Visual Studio 2012 or Visual Studio 2013

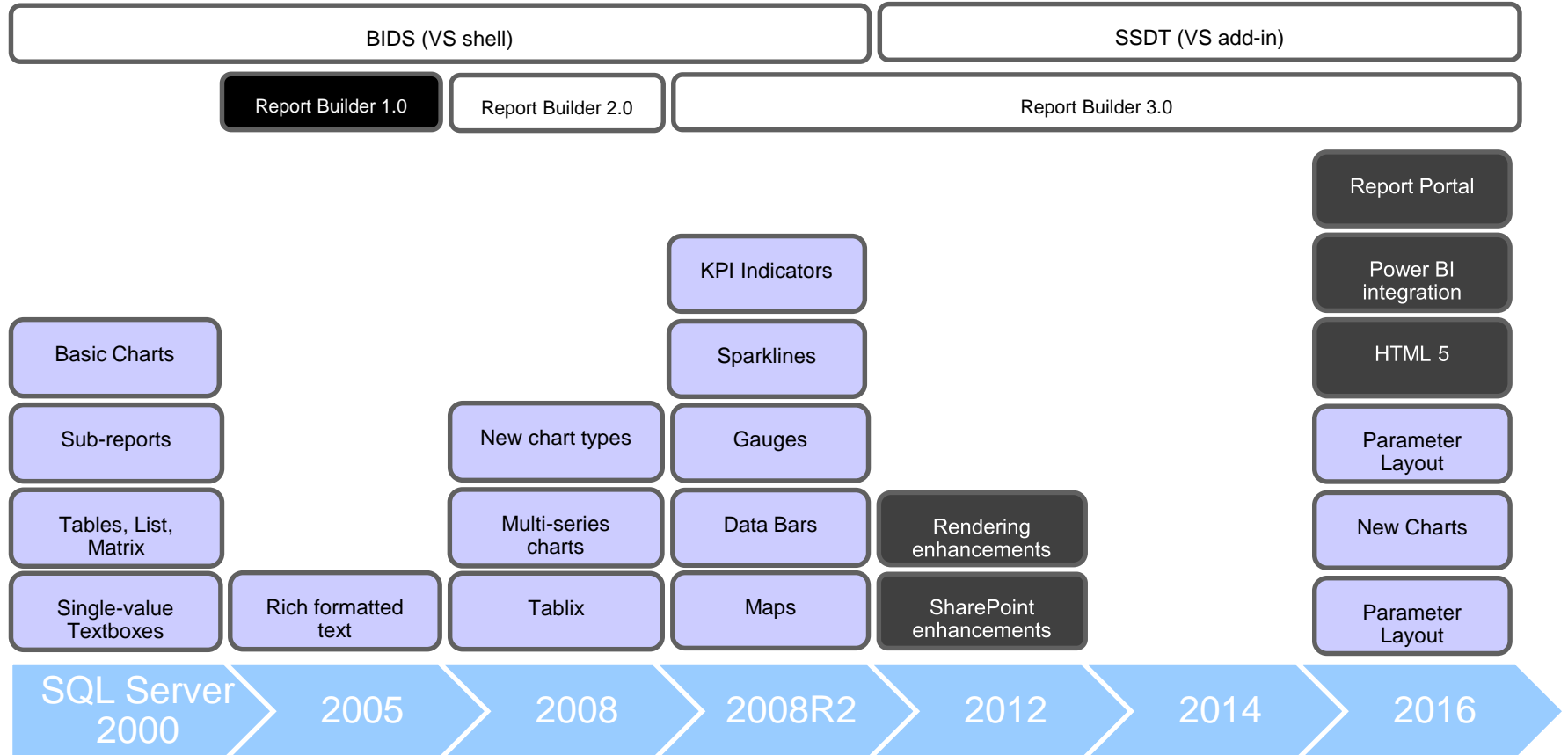
# SQL Server Data Tools for BI

2014  
2012

- Add-in for Visual Studio (multiple versions)
- Adds BI project templates for:
  - Database
  - SSIS, SSAS, SSRS



# Reporting Services Feature Waves

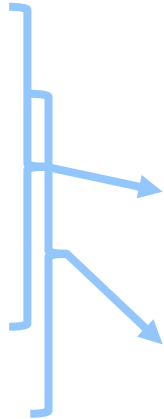


# SSRS Upgrade Scenarios

## Choose In-Place Upgrade or Side-by-Side Upgrade

You can upgrade:

- ✓ SSRS 2005 (SP 4)
- ✓ SSRS 2008
- ✓ SSRS 2008 R2
- ✓ SSRS 2012
- ✓ SSRS 2014



...in either native or SharePoint integrated mode using either the in-place or side-by-side method

SQL Server 2014

SQL Server 2016

# Migrating From SSRS 2005

2014  
2012

- Report server was IIS
- now http.sys in native mode
- No cross-platform migration (32 bit or 64 bit)
- Configuration settings (config files)
- Report models & Report Builder 1.0 reports are deprecated

# Backup and Rollback Plan

## Configuration Files

- Rsreportserver.config
- Rswebapplication.config
- Rssvrpolicy.config
- Rsmgrpolicy.config
- Reportingservice.exe.config
- Web.config (for both the report server and Report Manager ASP.NET applications)
- Machine.config (for ASP.NET if you modified it for report server operations)

- Back up symmetric key
- Back up report server database(s):  
ReportServer contains all server content  
ReportServerTempDB contains no persistent objects & can be re-created

**PLAN**  
**B**

# Troubleshooting a Failed Upgrade

When looking for errors in the detail log, search for the following phrases:

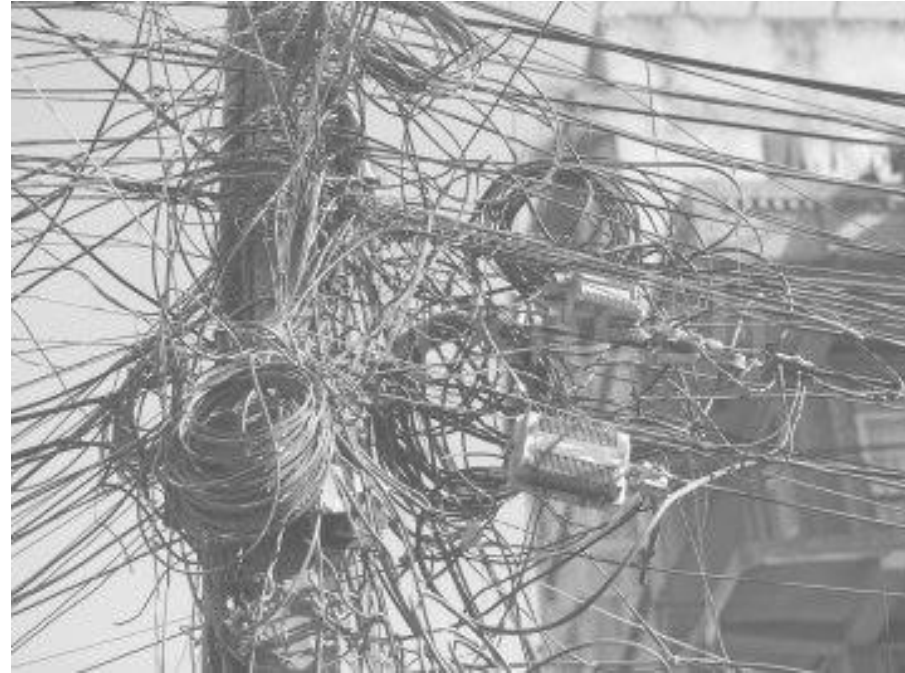
- Watson bucket
- Error: Exception has been

A typical Setup request goes through three execution phases:

- Global rules check
  - Component update
  - User-requested action
- Each of these phases will generate detail and summary logs, with additional log files being generated as appropriate.

Setup is called at least three times per user-requested Setup action.  
Typical log files generated are:

- Detail\_GlobalRules.txt
- Detail\_ComponentUpdate.txt
- Detail.txt



# Deprecated Features in SSRS 2012 & 2014

## Reporting Services 2012 & 2014 Deprecated Features

Report Models & Report Builder 1.0 reports

Rendering extension device information (ActionScript, ActiveXControls, GetImageOnlyVisibleStyles, ReplacementRoot, ResourceStreamRoot, StreamRoot, UsePx, Zoom)

Methods in the Web Service Endpoint ( GetProperties(String, Property[]), IsSSLRequired() )

Word and Excel 1997-2003 Rendering  
These extensions are installed & disabled by default

SQL Server 2005 and earlier Custom Report Items

Reporting Services Snapshots 2005 and earlier

## SQL Server 2008 R2 Reporting Services Deprecated Features

Report Server Web Service Endpoints

ReportingService2005 & ReportingService2006 endpoints have been replaced by ReportingService2010



# Summary

2014

Upgrade from SSRS 2005 SP4+ to SSRS 2012 or 2014

In-place or side-by-side upgrade option

Backup SSRS content database, configuration files & symmetric key

Run the SQL Server Upgrade Advisor for potential issues

Upgrade SSRS project using Visual Studio

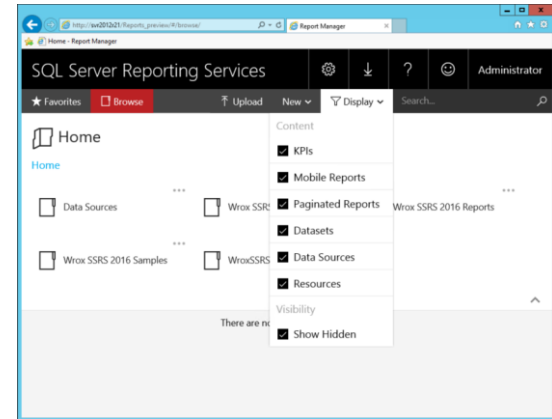
Upgrade SSRS instance using SQL Server setup upgrade option



# Reporting Services Additions

2016

- Parameter UI
- New charts
- Modern themes
- Report Builder updates
- Modern browser rendering
  - HTML 5 standards mode, no longer emulating
  - IE 10+ optimized



- Performance improvements for:
  - Distinct count
  - Unnatural & unbalanced hierarchies
- Extended Events for SSAS

<http://blogs.msdn.com/b/analysisservices/archive/2015/09/22/using-extended-events-with-sql-server-analysis-services-2016-cpt-2-3.aspx>

# Analysis Services Tabular Project

- Introduced in SQL Server 2012
- Significant updates in SQL Server 2016
- Foundational technology in Power BI & Power Pivot
- Runs entirely in-memory
- Uses column-store compression
- Calculations defined using DAX
- Can be consumed as tabular or multidimensional model from Excel & most reporting tools

The screenshot shows the Microsoft Visual Studio interface for an Analysis Services Tabular Project. The main window displays a data table with columns for Product, Date, Sales, and Proportion. The bottom pane shows a list of measures, including 'Reseller Current Quarter Sales Performance'.

Product	Date	Sales	Proportion
349	2010.12.29	20110.110	20110.105
350	2010.12.29	20110.110	20110.105
351	2010.12.29	20110.110	20110.105
344	2010.12.29	20110.110	20110.105
345	2010.12.29	20110.110	20110.105
346	2010.12.29	20110.110	20110.105
347	2010.12.29	20110.110	20110.105
229	2010.12.29	20110.110	20110.105
235	2010.12.29	20110.110	20110.105
218	2010.12.29	20110.110	20110.105
223	2010.12.29	20110.110	20110.105
220	2010.12.29	20110.110	20110.105
326	2010.12.29	20110.110	20110.105
319	2010.12.29	20110.110	20110.105

The bottom pane shows a list of measures, including 'Reseller Current Quarter Sales Performance'.

Measure Name	Formula
Reseller Current Quarter Sales Performance	IFERROR((Reseller Current Quarter Sales)/(Reseller Previous Quarter Sales Proportion to ...))

# Upgrade to Tabular?

- No migration path from multidimensional
- Power Pivot (Excel) model can be migrated to tabular server model
- Versions: 2012 (1100), 2012 SP1 (1103), 2016 (1200)

Paper: ***An Analysis Services Case Study: Using Tabular Models in a Large-scale Commercial Solution***  
A. Ferrari

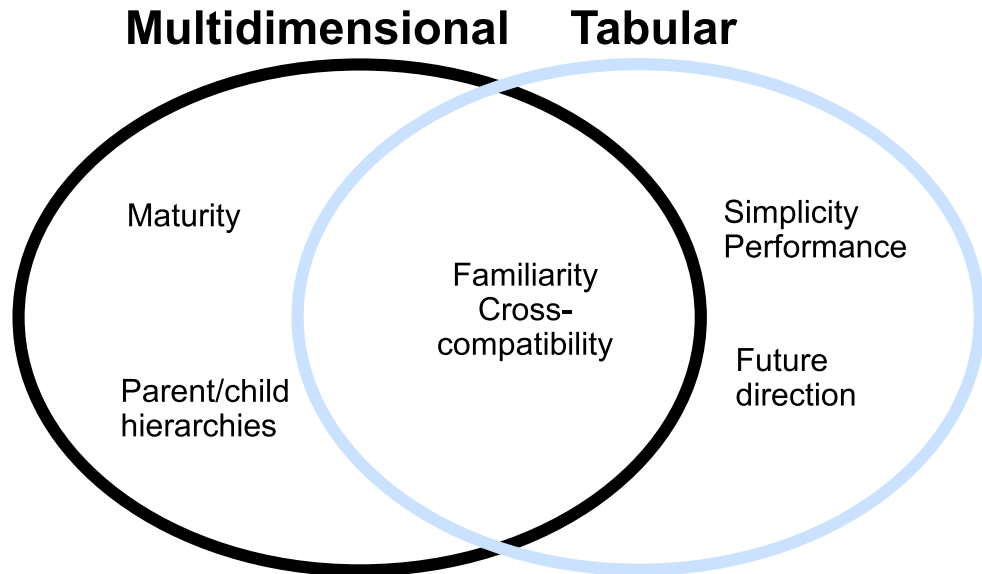
# Multidimensional or Tabular?

- **Multidimensional**

- Leverage existing MDX expression & query skills
- Rich feature set addresses complex business reporting

- **Tabular**

- Models are generally easier to design
- Requires little or no performance tuning
- Simple and cost-effective to deploy
- Can be consumed with all tools that work with SSAS multidimensional & MDX
- DAX language is actively enhanced & supported



Article: ***Choosing a Tabular or Multidimensional Modeling Experience in SQL Server 2012 Analysis Services;***  
Vitt, Cameron



# SQL Server 2016 - The Next Train

- SQL Server Data Tools
- SSAS Tabular Additions
- SSAS multidimensional enhancements
- Mobile Dashboards & KPIs
- Reporting Services improvements
- Power BI integration



The SQL Server 2016 feature Train



# Analysis Services Tabular Additions - 1

2016

- Bi-directional relationships (many-to-many support)
- New DAX functions
- DAX Variables
- Parallel partition processing
- xEvents support (instead of Profiler)
- DirectQuery (super DAX)

ADDMISSINGITEMS  
CALENDAR  
CALENDARAUTO  
CONCATENATEX  
DATEDIFF  
GEOMEAN  
GEOMEANX  
GROUPBY  
ISEMPTY  
ISONORAFTER  
MEDIAN  
MEDIANX  
NATURALINNERJOIN

NATURALLEFTOUTERJOIN  
PERCENTILE.EXC  
PERCENTILE.INC  
PERCENTILEX.EXC  
PERCENTILEX.INC  
PRODUCT  
PRODUCTX  
SUBSTITUTEWITHINDEX  
SUMMARIZECOLUMNS  
UNION  
XIRR  
XNPV

# Analysis Services Tabular Additions - 2

2016

- Advanced modeling  
(many-to-many & bi-directional cross filtering)
- Query performance improvements
- Development environment performance improvements  
(DDL & metadata management)

# SQL Server Data Tools 2016

2016

- Former “SSDT” and SSDT-BI” are combined into one tool
- Add-in will be installed with SQL Server
- Available for multiple versions of Visual Studio
- Updates available online

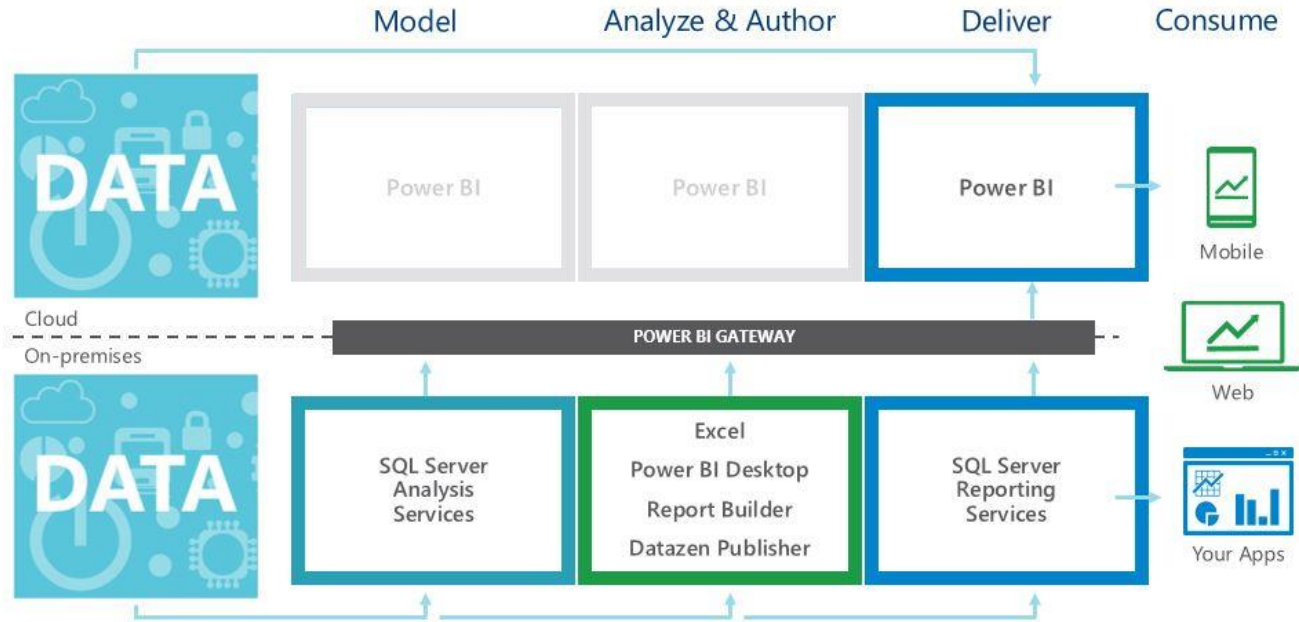
# SQL Server 2016 Mobile dashboards

2016

- Based on acquisition of Datazen
- Now part of Reporting Services
- Simple by design
- Development scenarios:
  - IT develops data sources & queries, IT designs & deploys dashboards, business uses dashboards & KPIs
  - IT develops data sources & queries, business designs & deploys dashboards, business uses dashboards & KPIs

# SQL Server 2014 and 2016 Reporting Services Demonstrations

# Updated BI Roadmap



Future direction:

More integration across platforms, products and devices

# SolidQ BI SQL Modernization Assessment

- Microsoft will sponsor \$2000 towards SQL Modernization Assessment in your organization
- Email [PTurley@solidq.com](mailto:PTurley@solidq.com) to learn more

Visit [SolidQ.com](https://SolidQ.com) to learn more about upgrade and cloud strategies



Questions?



Thank You for  
Attending

# SSRS Upgrade Resources

SQL Server 2014 Upgrade Technical Guide

[http://download.microsoft.com/download/7/1/5/715BDFA7-51B6-4D7B-AF17-61E78C7E538F/SQL Server 2014 Upgrade technical guide.pdf](http://download.microsoft.com/download/7/1/5/715BDFA7-51B6-4D7B-AF17-61E78C7E538F/SQL_Server_2014_Upgrade_technical_guide.pdf)

Supported Version and Edition Upgrades

[http://msdn.microsoft.com/en-us/library/ms143393\(v=SQL.120\).aspx](http://msdn.microsoft.com/en-us/library/ms143393(v=SQL.120).aspx)

Migrate a Reporting Services Native Mode Installation

[http://technet.microsoft.com/en-us/library/ms143724\(v=sql.120\).aspx](http://technet.microsoft.com/en-us/library/ms143724(v=sql.120).aspx)

Upgrade and Migrate Reporting Services

[http://msdn.microsoft.com/en-us/library/ms143747\(v=sql.120\).aspx](http://msdn.microsoft.com/en-us/library/ms143747(v=sql.120).aspx)

Upgrade Reports

[http://msdn.microsoft.com/en-us/library/ms143674\(v=sql.120\).aspx](http://msdn.microsoft.com/en-us/library/ms143674(v=sql.120).aspx)

Upgrade a Report Server Database

[http://msdn.microsoft.com/en-us/library/ms403392\(v=sql.120\).aspx](http://msdn.microsoft.com/en-us/library/ms403392(v=sql.120).aspx)

# SSAS Upgrade Resources

Choosing a Tabular or Multidimensional Modeling Experience in SQL Server 2012 Analysis Services

<http://msdn.microsoft.com/en-us/library/hh994774.aspx>

An Analysis Services Case Study: Using Tabular Models in a Large-scale Solution

<http://msdn.microsoft.com/en-us/library/dn751533.aspx>

Comparing Tabular and Multidimensional Solutions (SSAS)

<http://msdn.microsoft.com/en-us/library/hh212940.aspx>

Decisions: PowerPivot, SSAS Tabular, or SSAS Multidimensional Model in SQL Server 2012 (Melissa Coates aka SQLChick)

<http://www.sqlchick.com/entries/2012/3/4/decisions-powerpivot-ssas-tabular-or-ssas-multidimensional-m.html>

SQL Server 2012: Multidimensional vs Tabular (James Serra)

<http://www.jamesserra.com/archive/2012/04/sql-server-2012-multidimensional-vs-tabular>

Performance Tuning of Tabular Models in SQL Server 2012 Analysis Services

<http://msdn.microsoft.com/en-us/library/dn393915.aspx>