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# SQL DATA Relay



Kamil Nowinski

Maintenance of a DB project and Continuous Delivery using SSDT



# ABOUT ME

Kamil Nowinski



**Microsoft**  
**CERTIFIED**  
*IT Professional*



**Microsoft**  
**CERTIFIED**  
Solutions Associate  
SQL Server 2012

Speaker, blogger, data enthusiast

Data Engineer at ASOS ([www.asos.com](http://www.asos.com))

13+ yrs experience as DEV/DBA

Member of the Data Community PL

Project member of „SCD Merge Wizard” (GitHub)

Founder of blog SQLPlayer ([www.SQLplayer.net](http://www.SQLplayer.net))

SQL Server Certificates:

MCITP, MCP, MCTS, MCSA, MCSE Data Platform,

MCSE Data Management & Analytics

Moreover: Bicycle, Running, Digital photography

@NowinskiK, @SQLPlayer



BRAND NEW BLOG

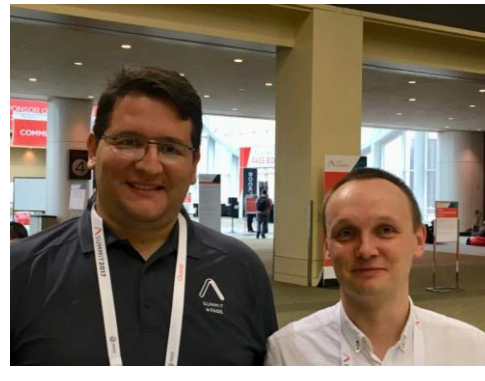
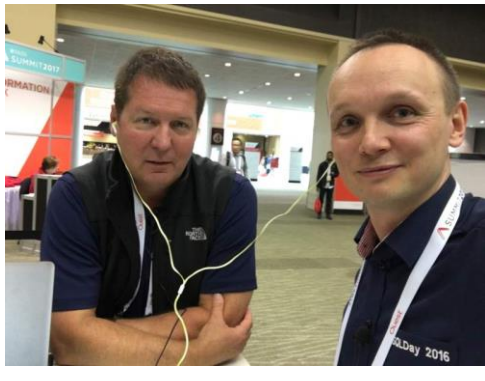
**INTERVIEWS**  
 **SQLPlayer**  
Play with data & have fun!

[www.SQLPlayer.net](http://www.SQLPlayer.net)





# PODCAST – interviews with...



# AGENDA

- What is the SSDT?
- Do I need it?
- How to start with DACPAC's?
- (Well) known issues
- Deploy/Publish database to target server
- Circular dependencies!



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# What is the SSDT?

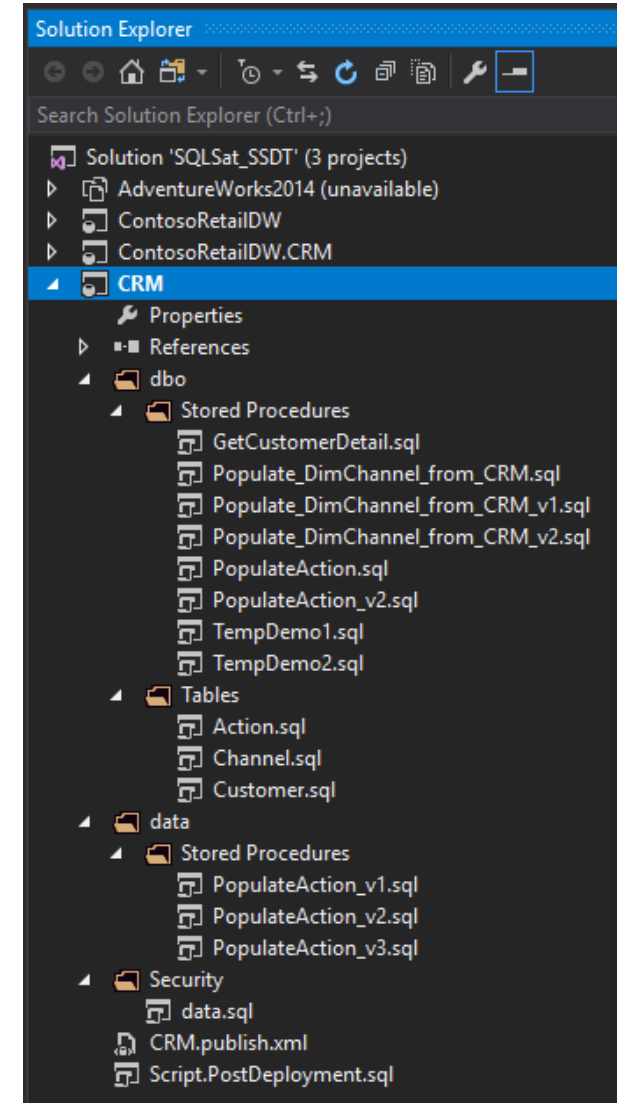
- SQL Server Data Tools
- Now, it's a part of Visual Studio
- Free!
- Database project, including:
  - Schema, Stored Procedures, Functions,
  - Tables, Views, Security, CLR
  - ... and much more!



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# How to start with database project?

- Install SSDT
- Create new db project and import:
  - From script
  - Directly from SQL server
  - Data-Tier Application (DACPAC)





# DEMO #1

- Create first database project (CRM)
- Import database from server



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# (Well) known issues



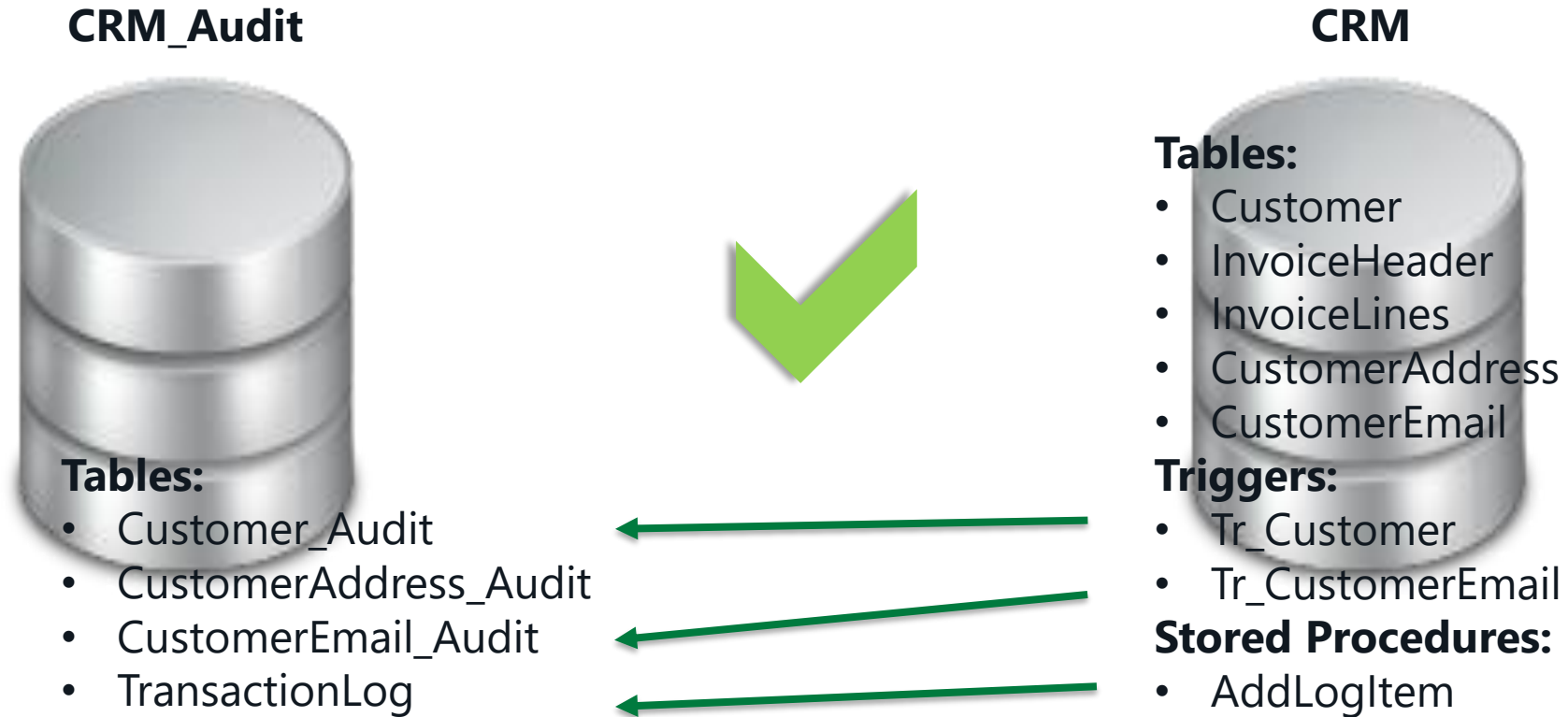
# (Well) known issues

- Circular references/dependencies
- Invisible temp tables
- Disable/Enable trigger across databases
- How to manage of data?
- Can I deploy SQL Jobs?

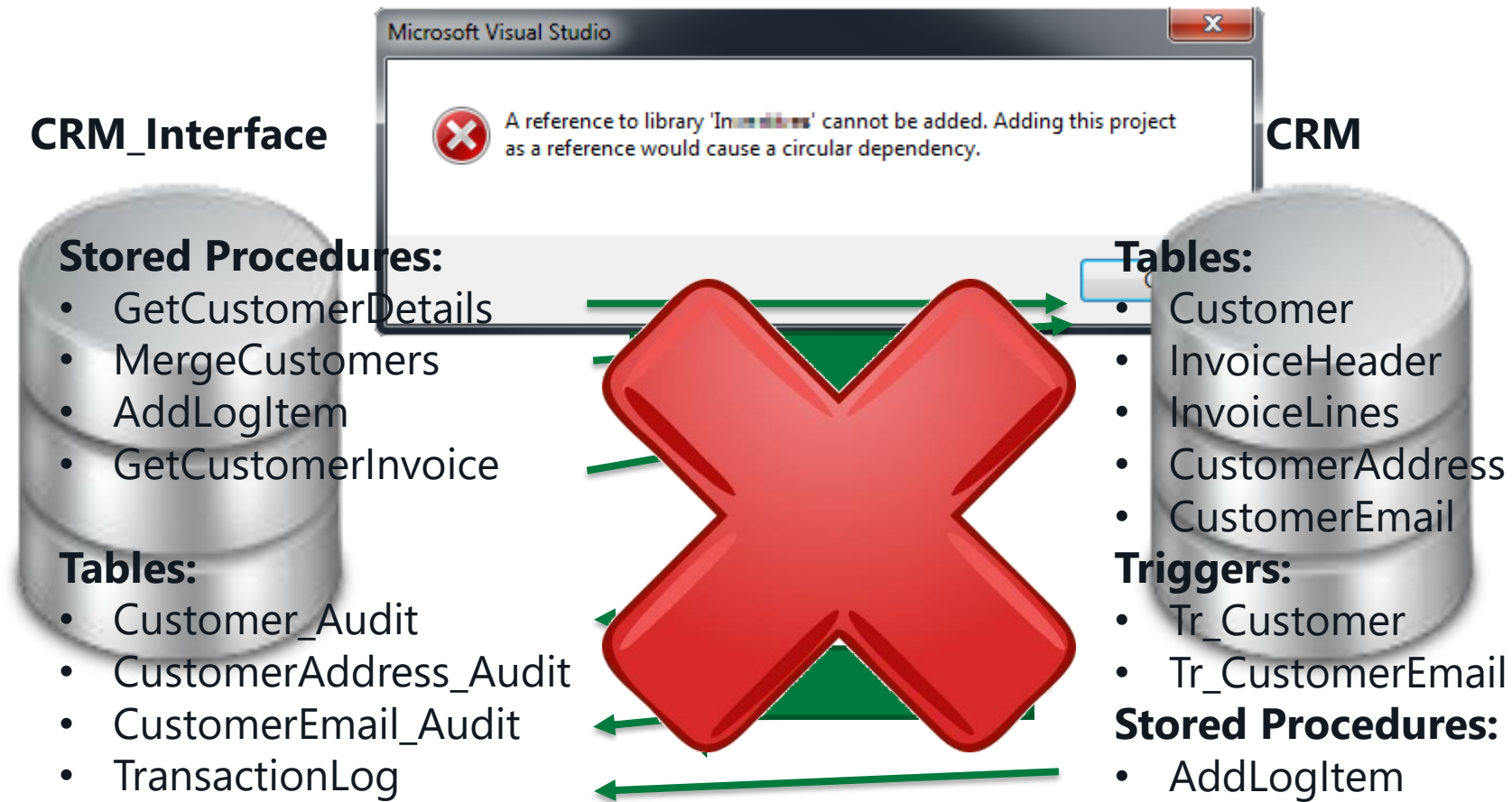


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# Database dependencies & references



# Circular dependencies





# Circular dependencies

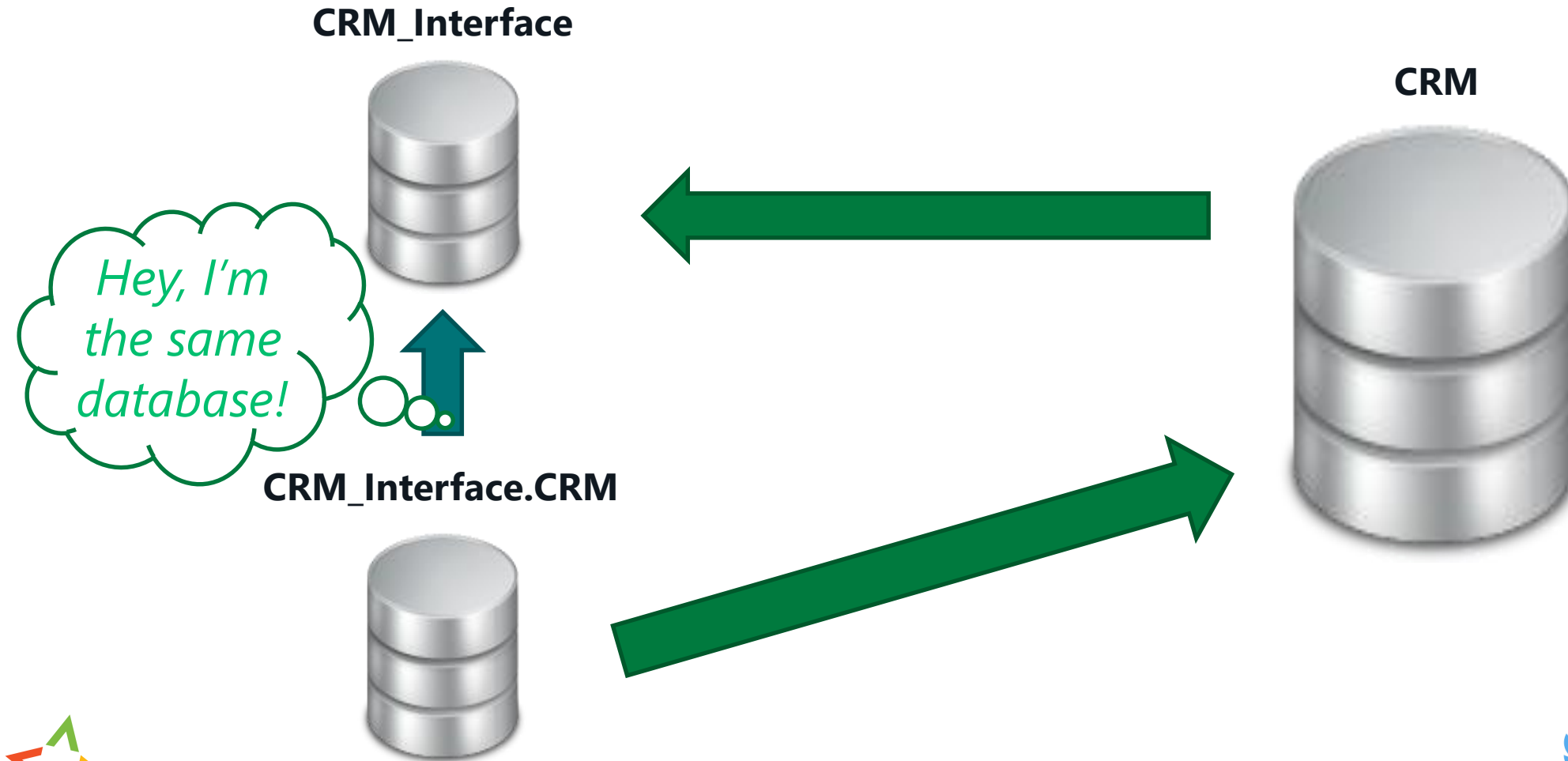
**CRM\_Interface**



**CRM**



# Circular dependencies



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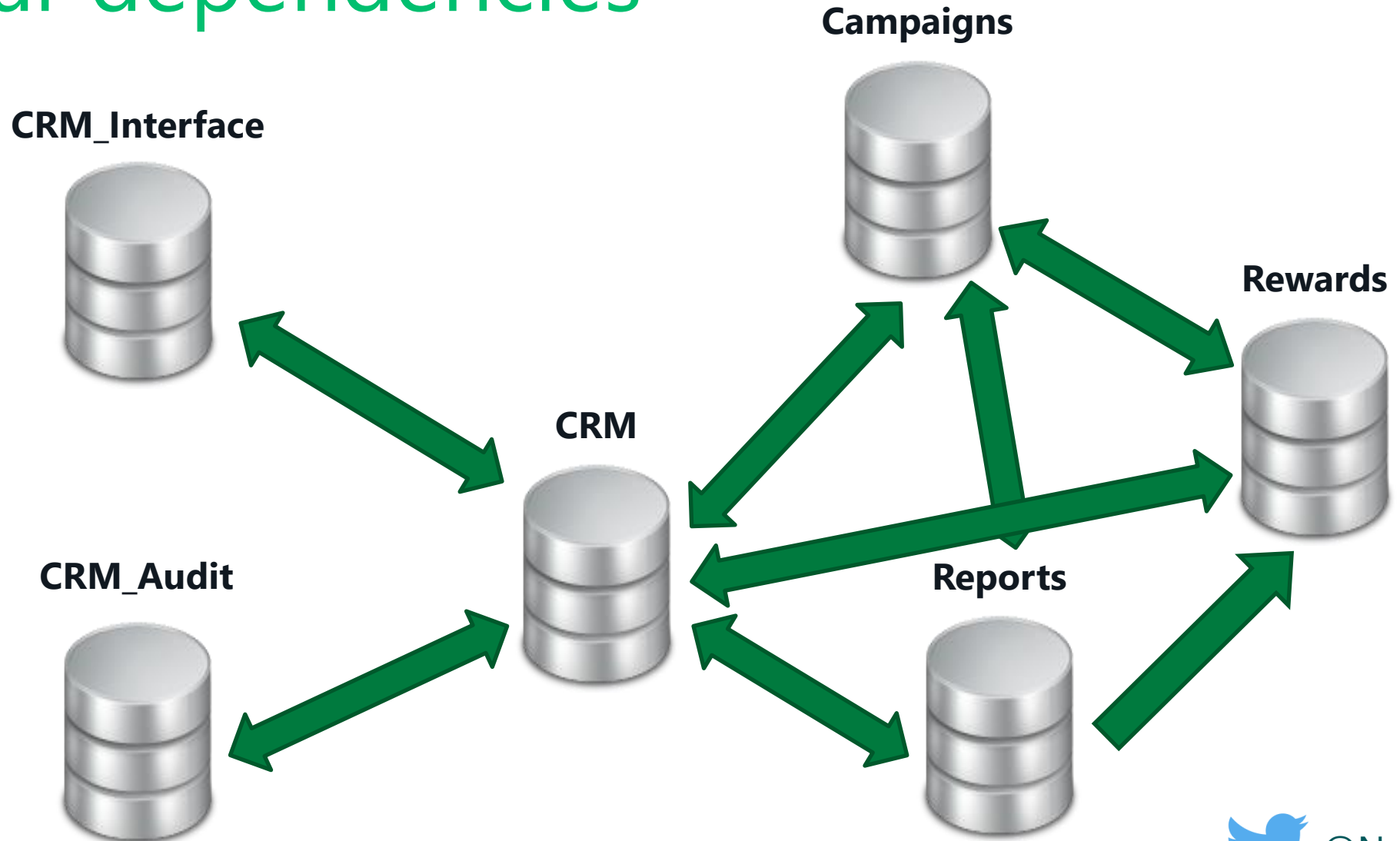
# DEMO #2

- Create second database project
- Import database from server
- Create references & variables
- Resolve circular references
- Create publish profile
- Deploy manually



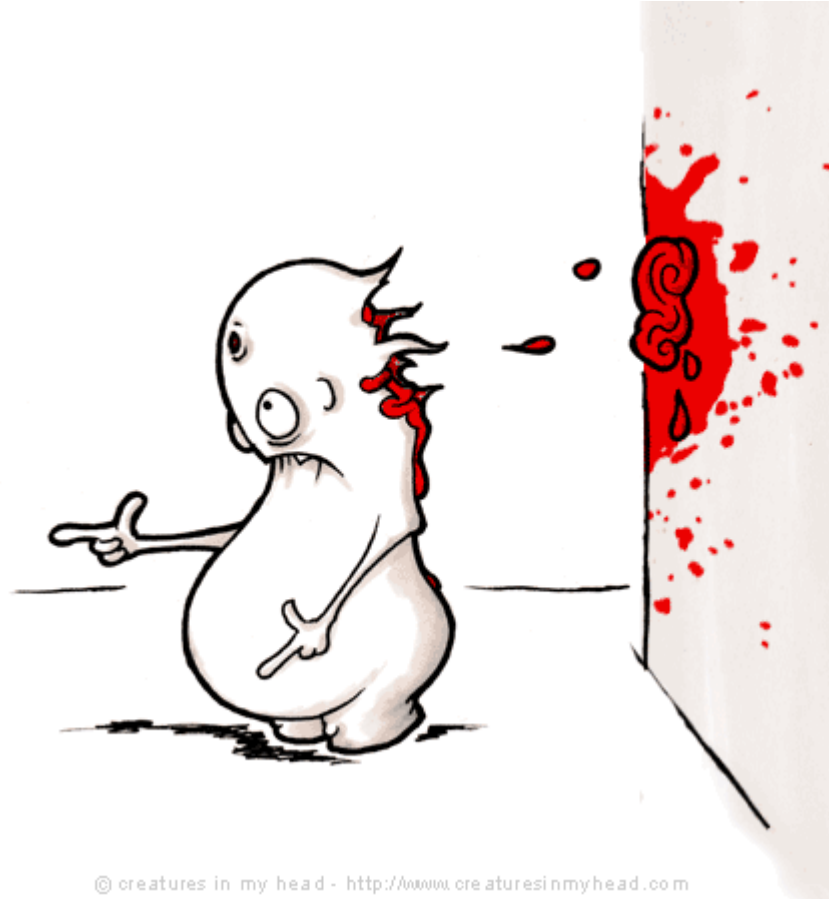
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# Circular dependencies



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# Circular dependencies



© creatures in my head - <http://www.creaturesinmyhead.com>





# Know issue: temp table

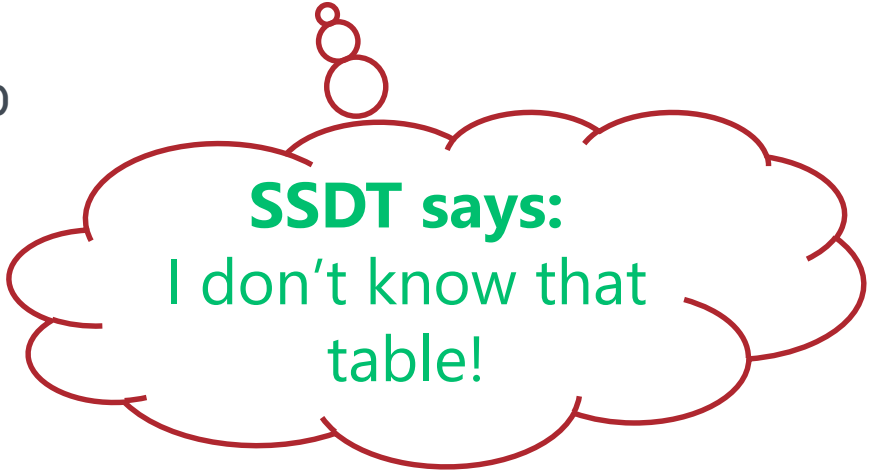
```
CREATE PROCEDURE [dbo].[TempDemo1]  
AS
```

```
CREATE TABLE #TempTable (Id INT);  
EXEC TempDemo2;
```

```
CREATE PROCEDURE [dbo].[TempDemo2]  
AS
```

```
SELECT * FROM #TempTable;
```

```
RETURN 0
```



**SSDT says:**  
I don't know that  
table!



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# Know issue: temp table

```
CREATE PROCEDURE [dbo].[TempDemo1]
AS
```

```
CREATE TABLE #TempTable (Id INT);
EXEC TempDemo2;
```

```
CREATE PROCEDURE [dbo].[TempDemo2]
AS
```

```
IF 0=1
    CREATE TABLE #TempTable (ID int);
```

```
SELECT * FROM #TempTable;
```

```
RETURN 0
```



# Know issue: Disable/Enable trigger #1

- Disable/Enable trigger from other database

```
ALTER TABLE [$(ContosoRetailDW)].dbo.DimChannel  
DISABLE TRIGGER [Trigger_DimChannel];
```

	Code	Description
✖		SQL71502: Procedure: [dbo].[Populate_DimChannel_from_CRM] has an unresolved reference to object [dbo].[Trigger_DimChannel].



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# Know issue: Disable/Enable trigger #2

- Alternative #1:
  - Use dynamic SQL (not recommended)

```
--Alternative solution in SSDT:  
EXEC sp_executeSQL N'ALTER TABLE [$(ContosoRetailDW)].dbo.DimChannel  
    DISABLE TRIGGER [Trigger_DimChannel];  
'
```



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# Know issue: Disable/Enable trigger #3

- Alternative #2:
  - Create SP in the second database (locally for the trigger)
  - Call that SP from 'Remote' database

```
CREATE PROCEDURE [dbo].[Toggle_Trigger_DimChannel]
    @enable BIT
AS
    IF @enable = 1
        ENABLE TRIGGER dbo.[Trigger_DimChannel] ON dbo.DimChannel;
    ELSE
        DISABLE TRIGGER dbo.[Trigger_DimChannel] ON dbo.DimChannel;

RETURN 0
```



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# How to include **data** in a database project?

- SSDT has no built-in solution for including data
- Use Post-Deployment script to populate table
- Wrap the scripts into stored procedures
- Make sure the order of referenced tables



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# How to include **data** in a database project?

- Scenario #1: initial values only
  - For the very first time (run) only
  - Target table is empty
  - INSERT
  - Example script



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# How to include **data** in a database project?

- Scenario #2: User has NO access to data
  - Full MERGE statement
  - Include DELETE clause
  - Example script



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# How to include **data** in a database project?

- Scenario #3: users CAN add values from app
  - MERGE statement
  - Exclude DELETE clause
  - Example script



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# DEMO #4

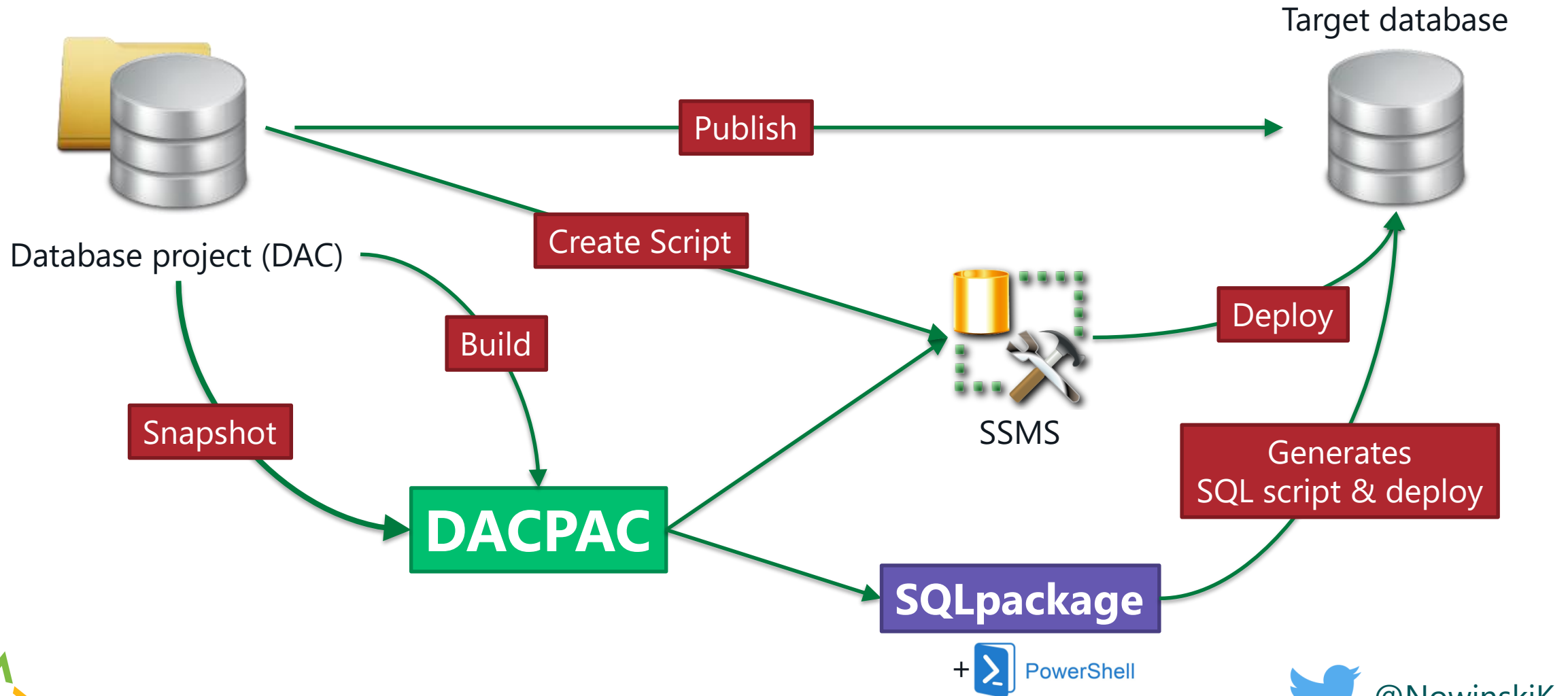
- Data script in Stored Procedure
- Post-Deployment script
- How to change data & deploy it



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# SSDT Deployment Pipeline



# Deployment methods

- The **sqlpackage** application can:
  - create script
  - create report
  - create script + report & deploy at the same time
- The libraries (DAC) do exactly the same
  - Microsoft.SqlServer.Dac.DacServices.dll
  - Microsoft.SqlServer.TransactSql.ScriptDom.dll



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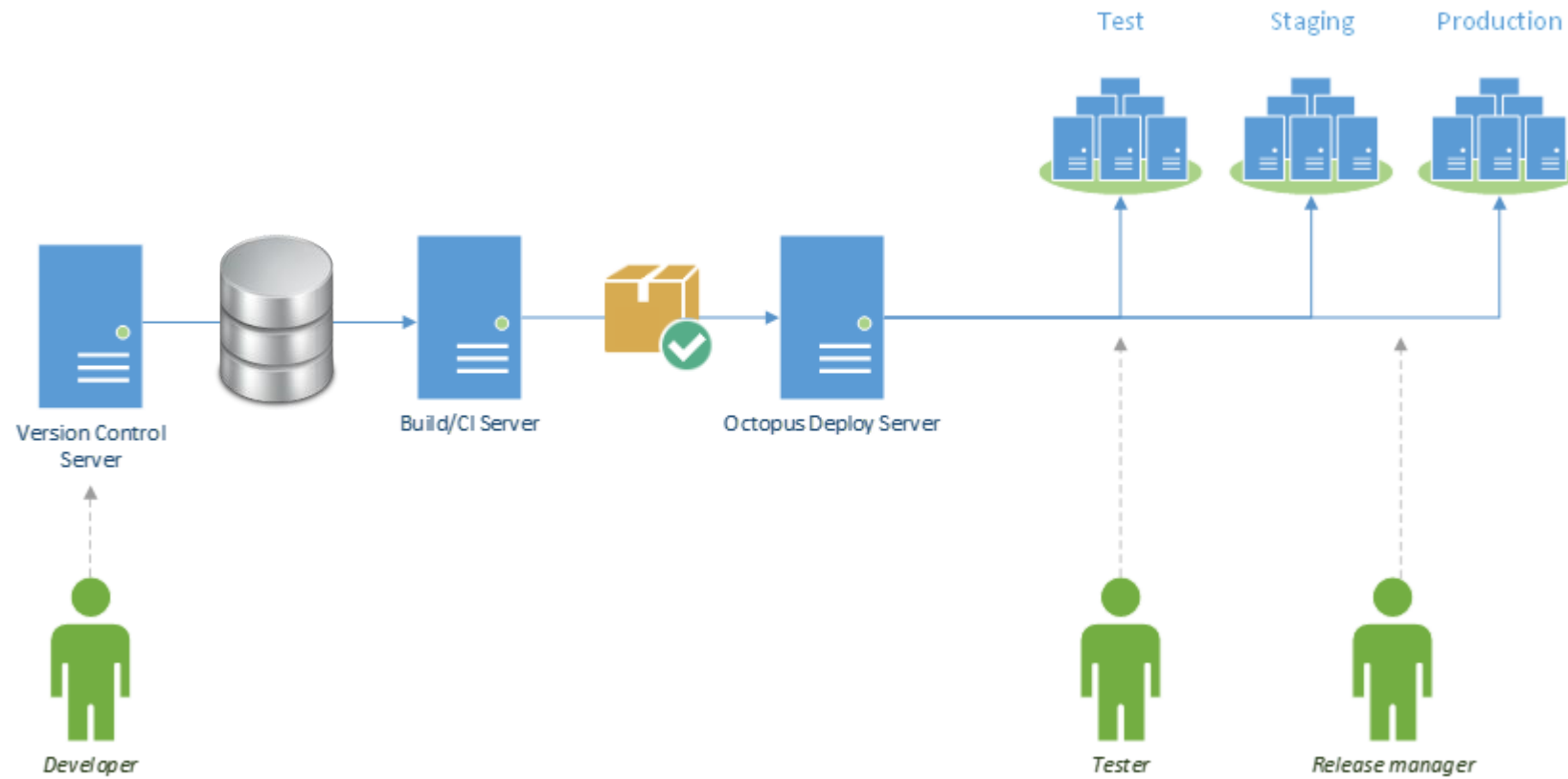
# DEMO #5

- Database changes
- Deployment with PowerShell script
  - Report
  - Script
  - Publish action



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# Deployment process with Octopus



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# SQL Jobs in database project

- Facts:
  - DACPAC is a database level project
  - SQLJobs are on server-level
- How to cope with:
  - Add separate database project
  - Only T-SQL scripts
  - Pre/Post deployment script to include above
  - Use PowerShell and [SALT](#) module from Sabin.io



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# Summary

- Import database
- Avoid creating #temp tables in different SP
- Script data into SP and use MERGE
- Pre/Post-deployment can be only one
- Create many publish profiles (i.e. per environment)
- Automate your deployment with PowerShell



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# Resources

- [SQL Server Data Tools \(MSDN\)](#)
- [SQLPackage.exe \(MSDN\)](#)
- [Data-tier Application Framework \(DACFx\)](#)
- [Microsoft SQL Server Data Tools Team Blog](#)
- [Octopus](#)
- [Continuous Delivery and the Database \(Redgate\)](#)
- [Alex Yates - model vs mig](#)
- [SQLPlayer.net](#) blog



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Thank you



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MCSE Data Platform

MCSE Data Management and Analytics



Please give us your feedback:

[sqlrelay.co.uk/feedback](https://sqlrelay.co.uk/feedback)

Thank you



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***DATA***   
***RELAY***