Integration Services

„Anwenden u. Erweitern der SSIS CatalogDB für ein Logging Framework“

Alexander Karl

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PASS SQL saturday

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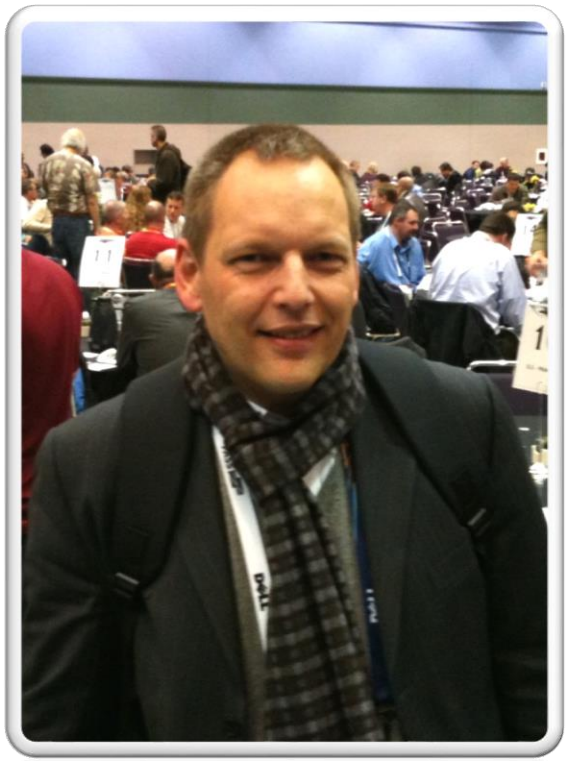

Alexander Karl

.net - CDE

SQL + BI Consultant

Microsoft CERTIFIED Trainer

Microsoft CERTIFIED IT Professional

Database Administrator 2008
Server Administrator on Windows Server® 2008
Database Administrator on SQL Server® 2005

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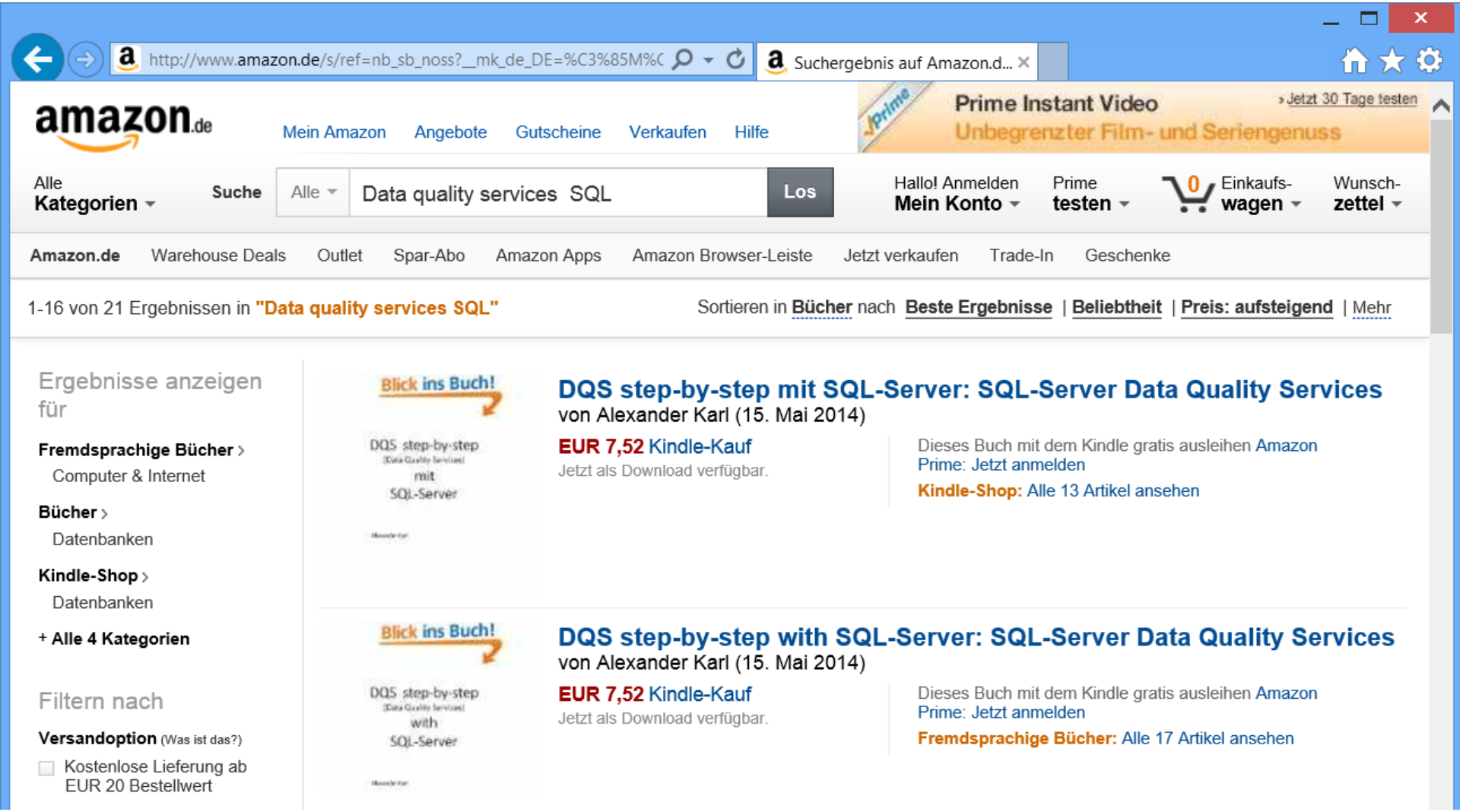
SQL Server Integration Services – Grundlagen

Überblick und technischer Einstieg in den ETL-Prozess

Wenn Daten aus mehreren Datenquellen in eine Zieldatenbank, insbesondere in einem Datawarehouse zusammengeführt werden, nennt man diesen Prozess Extract-Transform-Load (ETL). Dafür gibt es im Microsoft SQL Server die Integration Services. Der Datenbank-Consultant und SQL-Entwickler Alexander Karl erläutert Ihnen in diesem Video-Training die Zusammenhänge und zeigt am Beispiel, wie Sie die SQL Server Integration Services (SSIS) erfolgreich einsetzen.

Ihr(e) Trainer: **Alexander Karl**
Erscheinungsdatum: **27.09.2013**
Laufzeit: **4 Std. 0 min**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Suche
Alle
Data quality services SQL
Los
Hallo! Anmelden Mein Konto
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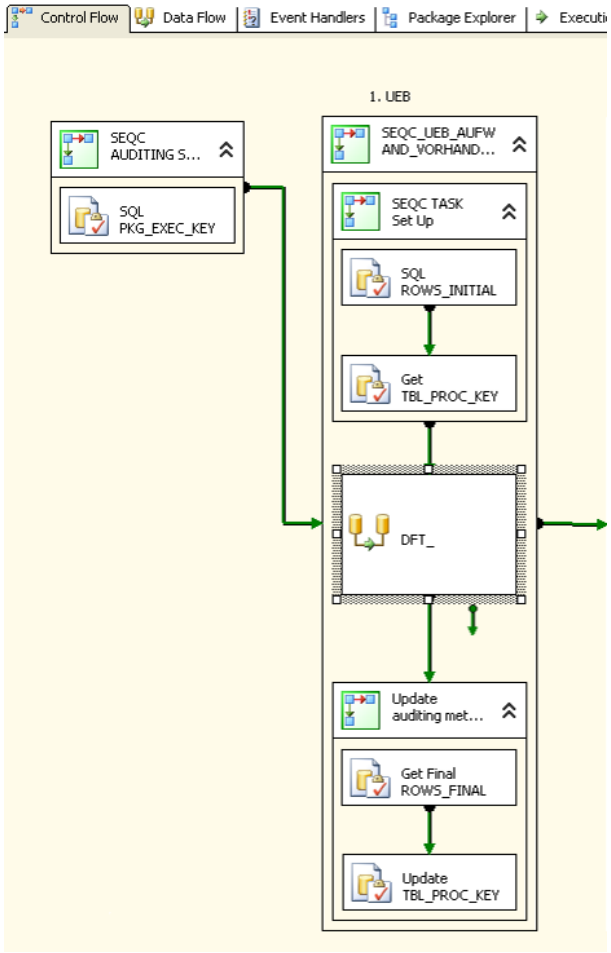
3 Schritte zum Logging Framework

- Internal Logging
- add. Queries
- custom Reports für die SSIS DB

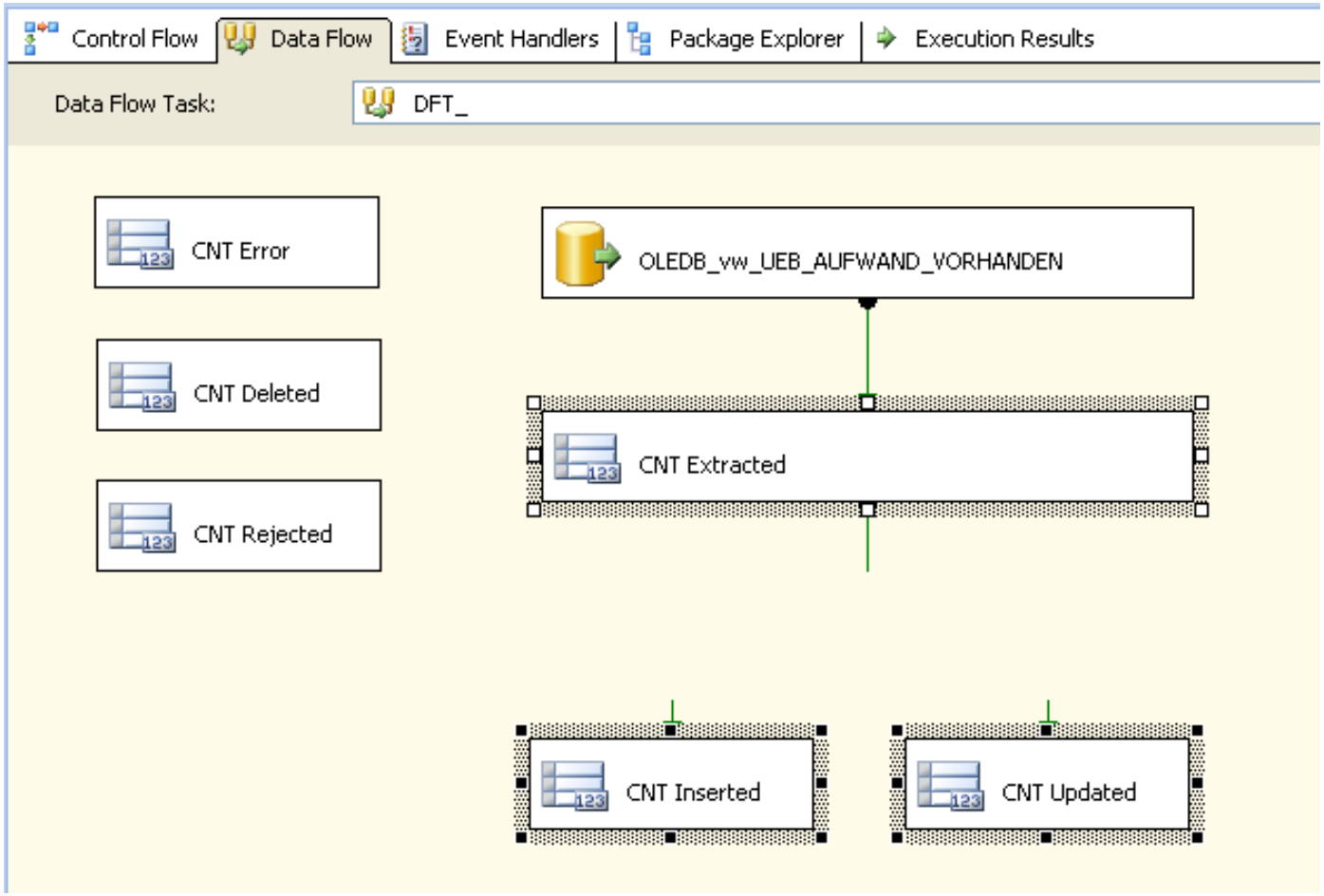
optional

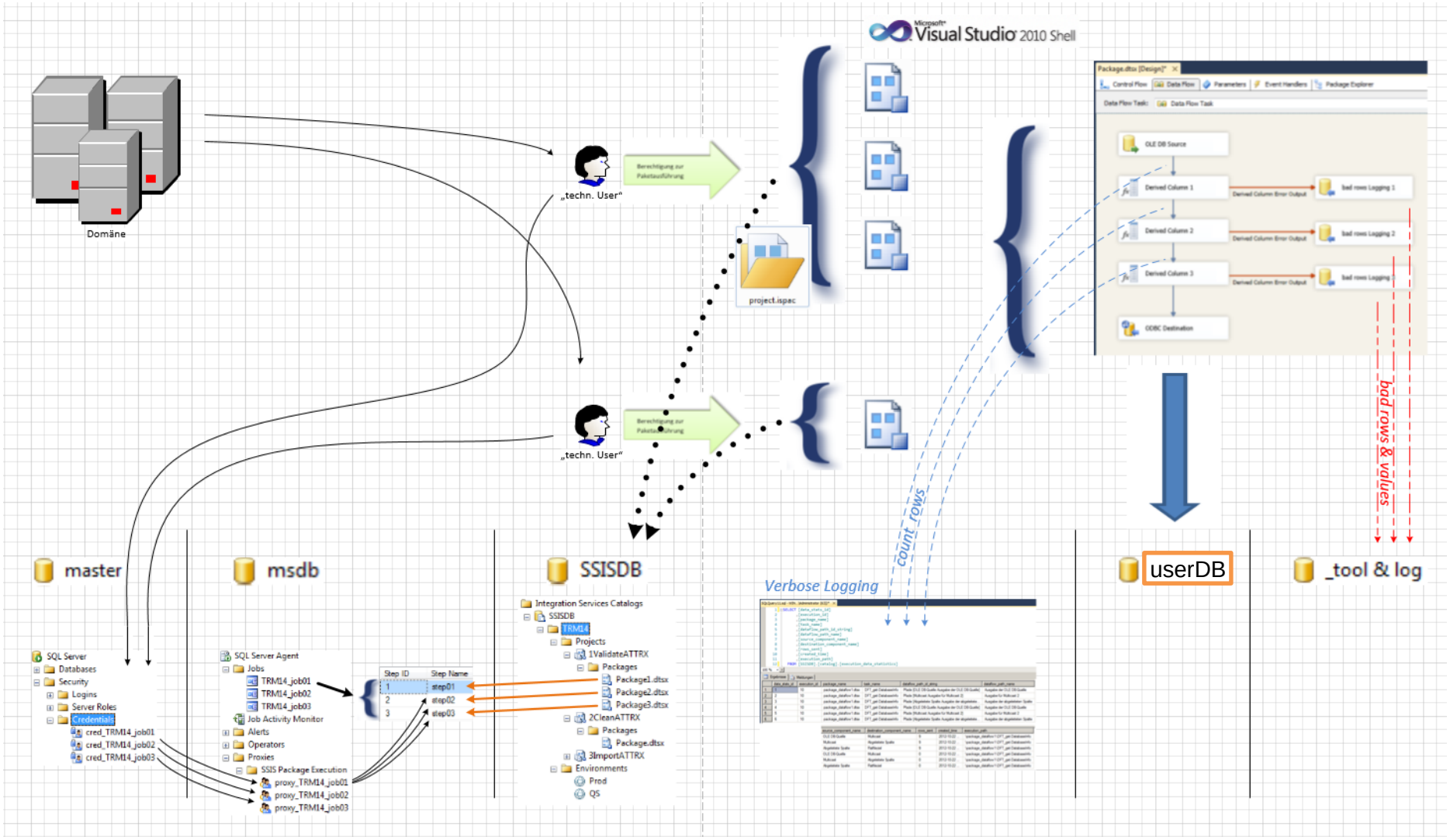
- Admin-check for SSIS Schema changes
- Blick ins Paket

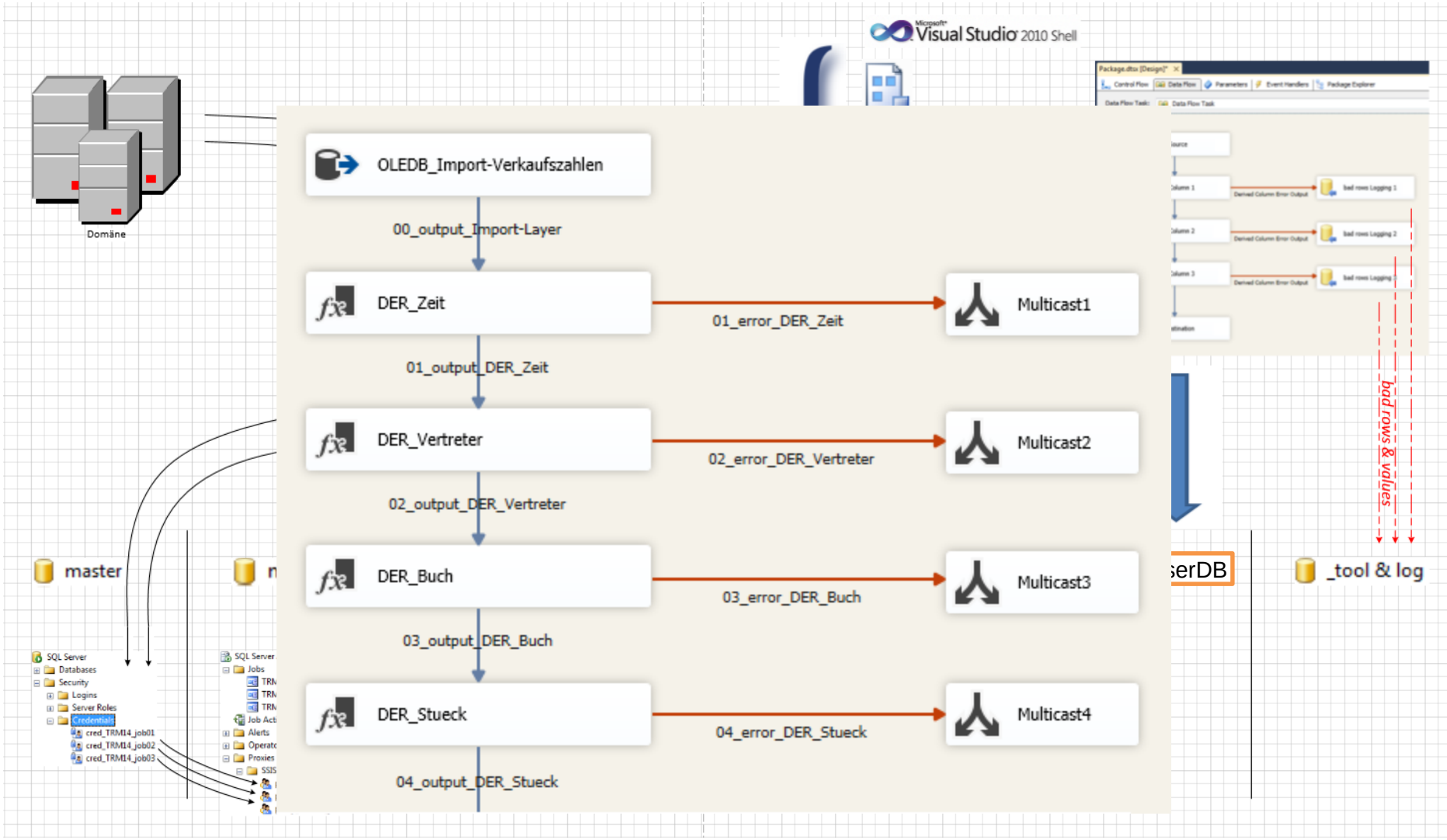
Logging Frameworks (2008)

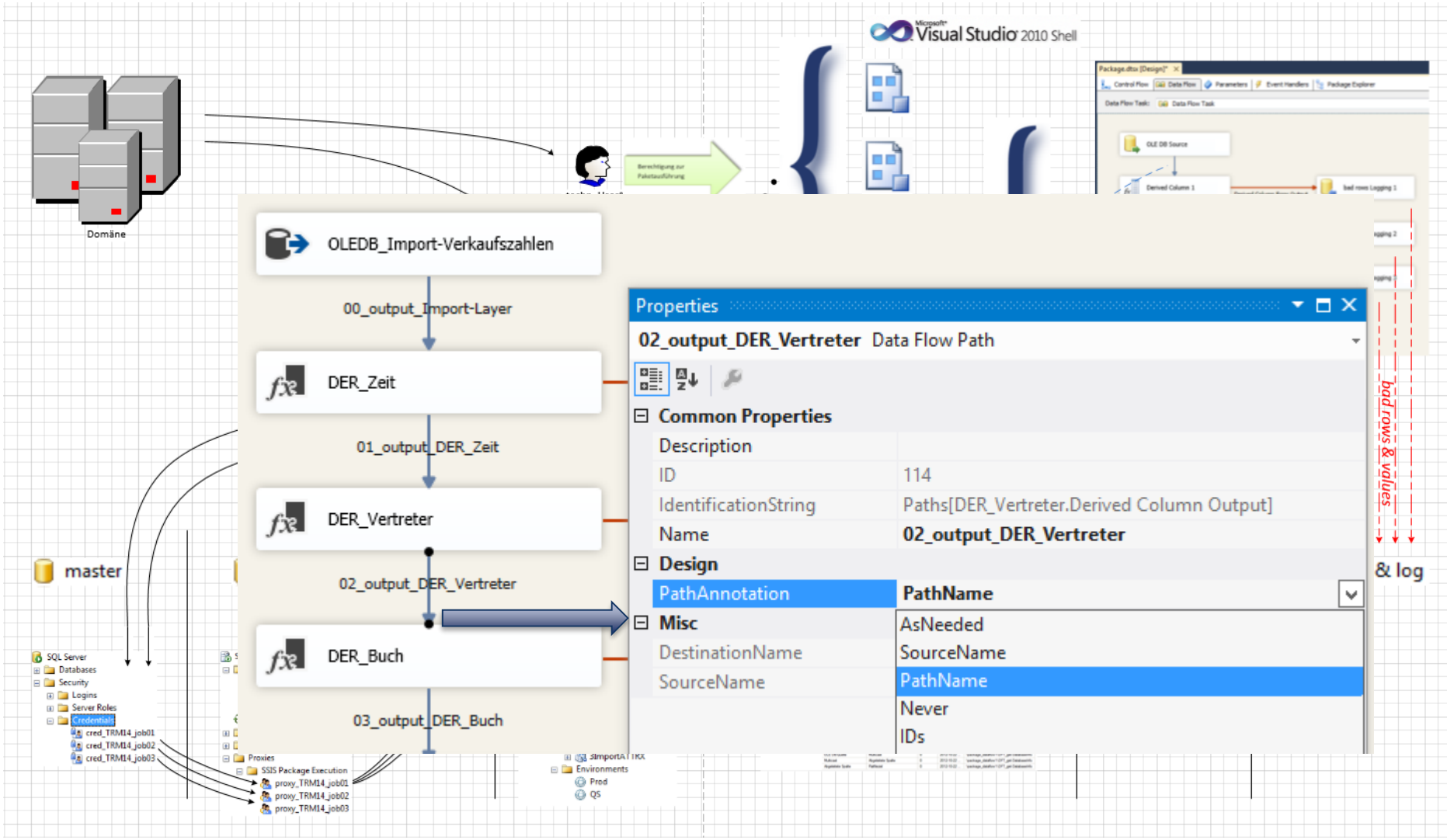


Logging Frameworks (2008)




Domäne
„techn. User"
„techn. User"
Visual Studio 2010 Shell
project.ispac
count rows
bad rows & values
master
msdb
SSISDB
userDB
_tool & log
Verbose Logging
SQL Server
Databases
Security
Logins
Server Roles
Credentials
cred_TRM14_job01
cred_TRM14_job02
cred_TRM14_job03
SQL Server Agent
Jobs
TRM14_job01
TRM14_job02
TRM14_job03
Job Activity Monitor
Alerts
Operators
Proxies
SSIS Package Execution
proxy_TRM14_job01
proxy_TRM14_job02
proxy_TRM14_job03
Step ID
Step Name
1
step01
2
step02
3
step03
Integration Services Catalogs
SSISDB
TRM14
Projects
1ValidateATTRX
Packages
Package1.dtsx
Package2.dtsx
Package3.dtsx
2CleanATTRX
Packages
Package.dtsx
3ImportATTRX
Environments
Prod
QS


Visual Studio 2010 Shell
Domäne
OLEDB_Import-Verkaufszahlen
00_output_Import-Layer
DER_Zeit
01_error_DER_Zeit
Multicast1
01_output_DER_Zeit
DER_Vertreter
02_error_DER_Vertreter
Multicast2
02_output_DER_Vertreter
DER_Buch
03_error_DER_Buch
Multicast3
03_output_DER_Buch
DER_Stueck
04_error_DER_Stueck
Multicast4
04_output_DER_Stueck
bad rows & values
master
serDB
_tool & log
SQL Server
Databases
Security
Logins
Server Roles
Credentials
cred_TRM14_job01
cred_TRM14_job02
cred_TRM14_job03
Jobs
Alerts
Proxies


Domäne
Visual Studio 2010 Shell
OLEDB_Import-Verkaufszahlen
00_output_Import-Layer
DER_Zeit
01_output_DER_Zeit
DER_Vertreter
02_output_DER_Vertreter
DER_Buch
03_output_DER_Buch
Properties
02_output_DER_Vertreter Data Flow Path
Common Properties
Description
ID
114
IdentificationString
Paths[DER_Vertreter.Derived Column Output]
Name
02_output_DER_Vertreter
Design
PathAnnotation
PathName
Misc
DestinationName
SourceName
AsNeeded
SourceName
PathName
Never
IDs
bad rows & values
& log
master
SQL Server
Databases
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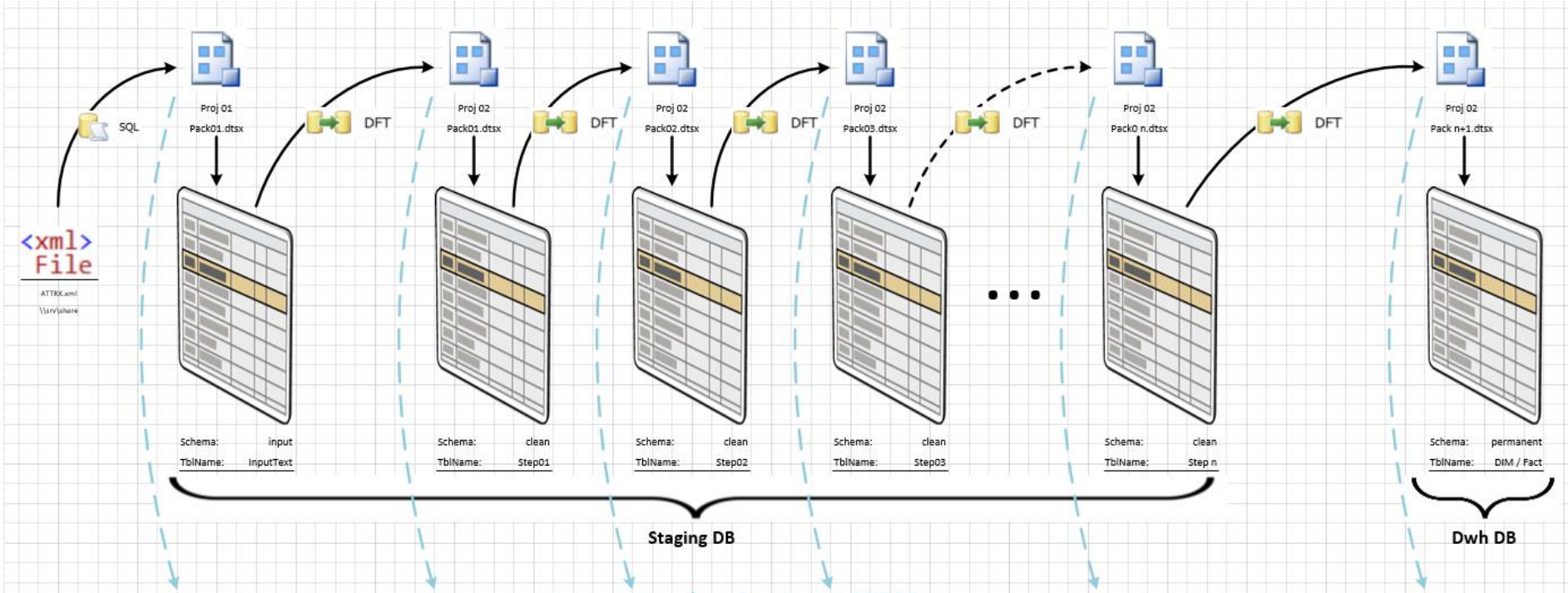
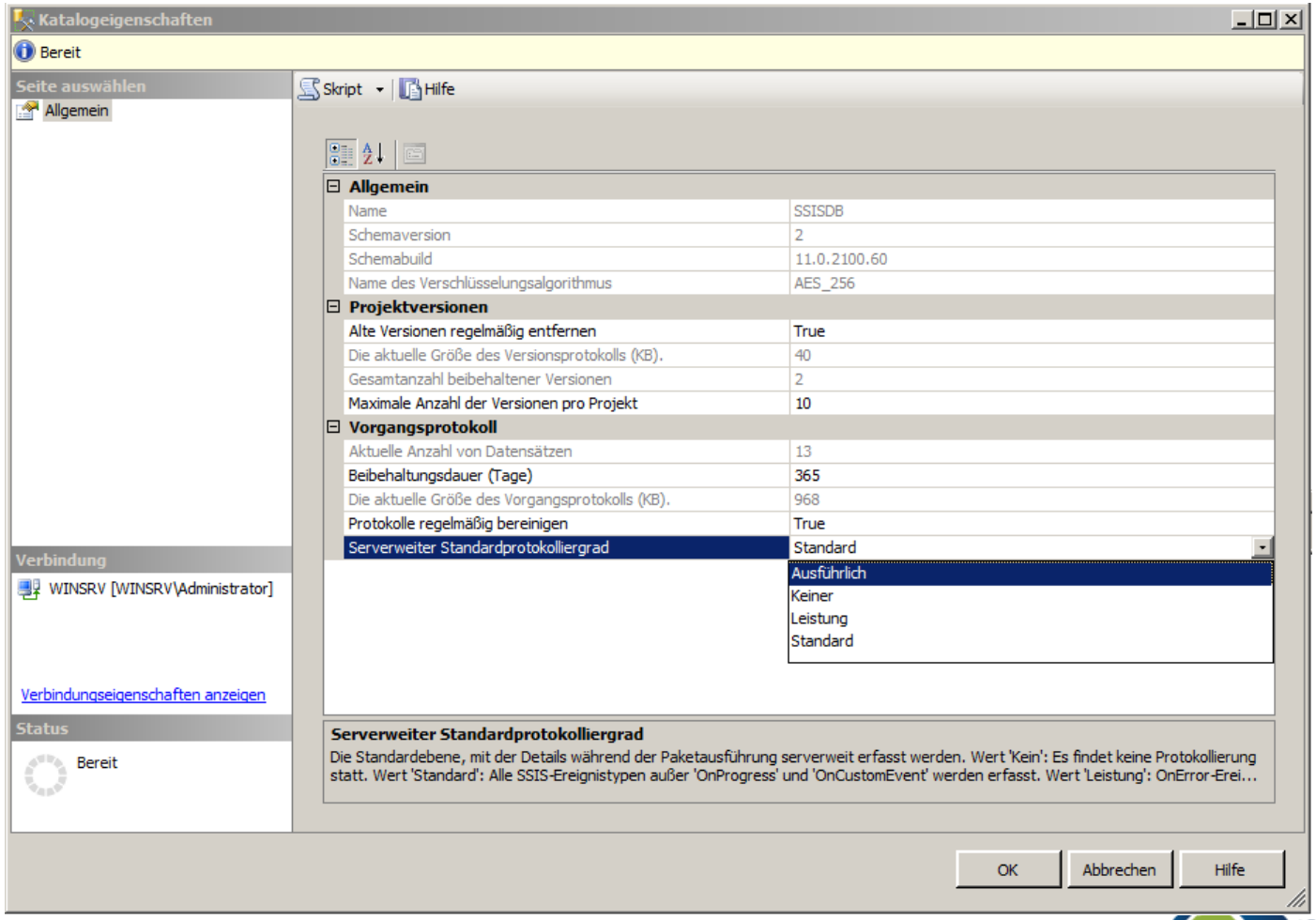
Logins
Server Roles
Credentials
cred_TRM14_job01
cred_TRM14_job02
cred_TRM14_job03
Proxies
SSIS Package Execution
proxy_TRM14_job01
proxy_TRM14_job02
proxy_TRM14_job03
Environments
Prod
QS



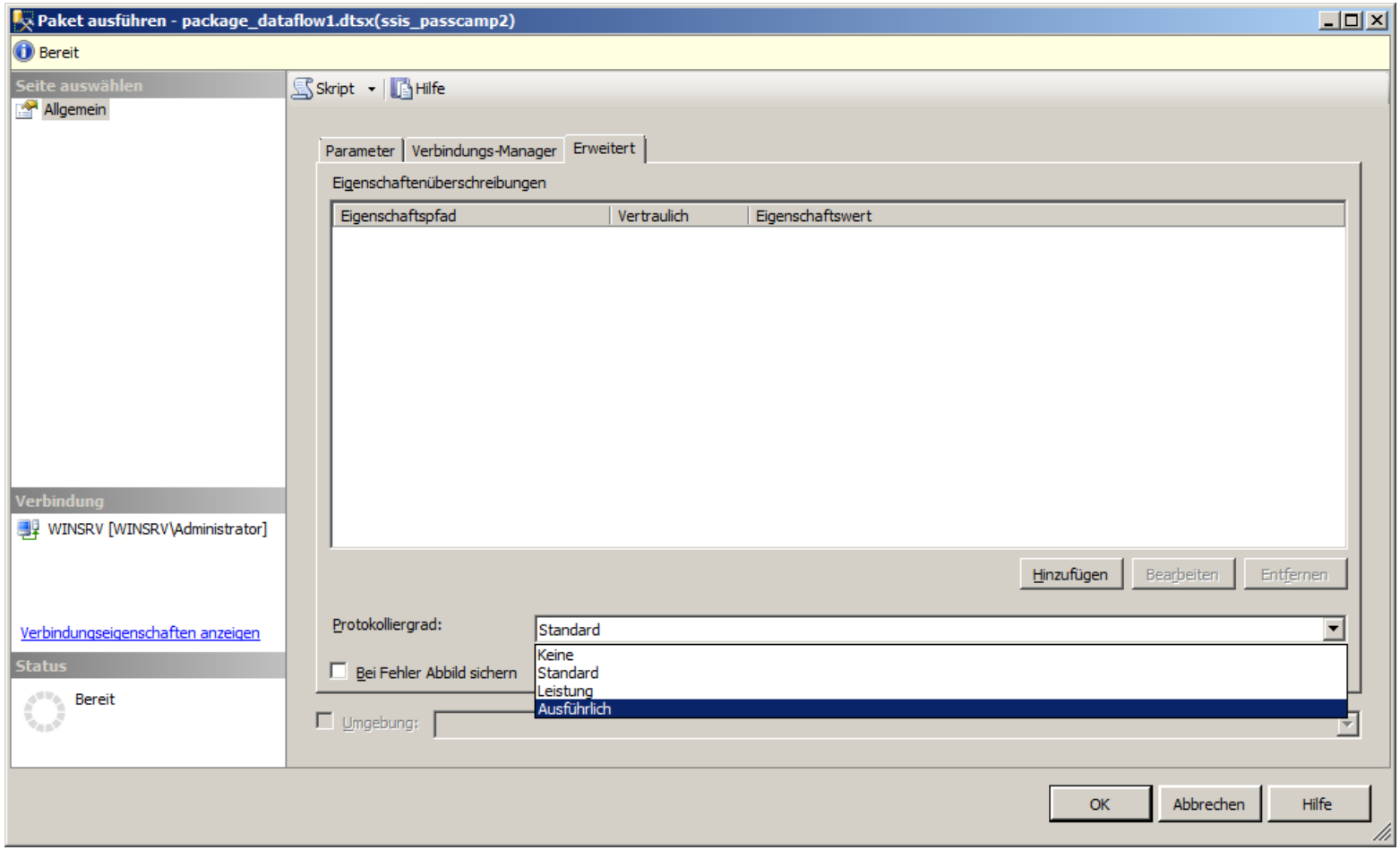
	execution_id	package_name	task_name	dataflow_path_name	rows_sent
1	828	Pack01	SQL Task	import_from_<xml>	50,000
2	829	Pack02	DFT Task	01output_Source	50,000
3	830	Pack02	DFT Task	02output_DER_col1	50,000
4	831	Pack02	DFT Task	03output_DER_col2	50,000
5	832	Pack02	DFT Task	04error_DER_col3	10
6	833	Pack02	DFT Task	04output_DER_col3	49,990
7	834	Pack02	DFT Task	05input_Destination	49,990
8	835	...	...	...	
9	836	...	...	...	
10	837	Pack n	DFT Task	01output_Source	49,990
11	838	Pack n	DFT Task	02input_Destination	49,990

DEMO

Logging-Level (Server)



Logging-Level (Package)



Paket-Ausführung mit TSQL

```
1  Declare @execution_id bigint
2
3  EXEC [SSISDB].[catalog].[create_execution]
4                    @package_name=N'package_dataflow1.dtsx'
5                  , @execution_id=@execution_id OUTPUT
6                  , @folder_name=N'passcamp_demo2'
7                  , @project_name=N'ssis_passcamp2'
8                  , @use32bitruntime=False
9                  , @reference_id=Null
10
11 Select @execution_id
12
13 DECLARE @var0 smallint = 3 -- VERBOSE / Ausführlich
14
15 EXEC [SSISDB].[catalog].[set_execution_parameter_value]
16                         @execution_id
17                       , @object_type=50
18                       , @parameter_name=N'LOGGING_LEVEL'
19                       , @parameter_value=@var0
20
21 EXEC [SSISDB].[catalog].[start_execution] @execution_id
22 GO
```

Result DFT execution

SQLQuery11.sql - WIN...\Administrator (63))*

```
SELECT [data_stats_id]
      ,[execution_id]
      ,[package_name]
      ,[task_name]
      ,[dataflow_path_id_string]
      ,[dataflow_path_name]
      ,[source_component_name]
      ,[destination_component_name]
      ,[rows_sent]
      ,[created_time]
      ,[execution_path]
  FROM [SSISDB].[catalog].[execution_data_statistics]
```

100 %

Ergebnisse | Meldungen

	data_stats_id	execution_id	package_name	task_name	dataflow_path_id_string	dataflow_path_name
1	1	10	package_dataflow1.dtsx	DFT_get-DatabaseInfo	Pfade [OLE DB-Quelle.Ausgabe der OLE DB-Quelle]	Ausgabe der OLE DB-Quelle
2	2	10	package_dataflow1.dtsx	DFT_get-DatabaseInfo	Pfade [Multicast.Ausgabe für Multicast 2]	Ausgabe für Multicast 2
3	3	10	package_dataflow1.dtsx	DFT_get-DatabaseInfo	Pfade [Abgeleitete Spalte.Ausgabe der abgeleitete...	Ausgabe der abgeleiteten Spalte
4	4	10	package_dataflow1.dtsx	DFT_get-DatabaseInfo	Pfade [OLE DB-Quelle.Ausgabe der OLE DB-Quelle]	Ausgabe der OLE DB-Quelle
5	5	10	package_dataflow1.dtsx	DFT_get-DatabaseInfo	Pfade [Multicast.Ausgabe für Multicast 2]	Ausgabe für Multicast 2
6	6	10	package_dataflow1.dtsx	DFT_get-DatabaseInfo	Pfade [Abgeleitete Spalte.Ausgabe der abgeleitete...	Ausgabe der abgeleiteten Spalte

source_component_name	destination_component_name	rows_sent	created_time	execution_path
OLE DB-Quelle	Multicast	9	2012-10-22 ...	\package_dataflow1\DFT_get-DatabaseInfo
Multicast	Abgeleitete Spalte	9	2012-10-22 ...	\package_dataflow1\DFT_get-DatabaseInfo
Abgeleitete Spalte	Flatfileziel	9	2012-10-22 ...	\package_dataflow1\DFT_get-DatabaseInfo
OLE DB-Quelle	Multicast	0	2012-10-22 ...	\package_dataflow1\DFT_get-DatabaseInfo
Multicast	Abgeleitete Spalte	0	2012-10-22 ...	\package_dataflow1\DFT_get-DatabaseInfo
Abgeleitete Spalte	Flatfileziel	0	2012-10-22 ...	\package_dataflow1\DFT_get-DatabaseInfo

SQL execution

```
1  Declare @file    varChar(255)
2  Set     @file = 'C:\__demo\1start\Buecher_2009.xml'
3
4  Declare @sqlCmd  varChar(400)
5        , @xmlVar  xml
6
7  Declare @tmpTable Table (col1 varchar(max))
8  Set @sqlCmd  = ' Select * From OPENROWSET ( BULK ''' + @file + ''', SINGLE_BLOB ) AS x ';
9
10 Insert Into @tmpTable
11 exec( @sqlCmd )
12
13 Set  @xmlVar = ( select Top(1) col1 from @tmpTable );
14 select @xmlVar
15 ----
16
17 Declare @i int;  -- idoc
18 Execute sp_xml_preparedocument @i OutPut , @xmlVar
19
20 INSERT INTO DWH_staging.Import.Buecher
21 SELECT *
22 FROM   OpenXML ( @i, '/Buecherliste/Buch' )
23 WITH  ( Buch_ID         nvarChar(100)  '@ID'
24       , Buchtitel       nvarChar(100)  'Buchtitel'
25       , Autor           nvarChar(100)  'Autor'
26       , Reihe           nvarChar(100)  'Reihe'
27       , ISBN            nvarChar(100)  'ISBN'
28       , Preis           nvarChar(100)  'Preis'
29       )
30
31 Execute sp_xml_removedocument @i
32
33 SELECT @@ROWCOUNT as 'xmlRows'
34 -- http://technet.microsoft.com/en-us/library/ms187316.aspx
35
36 --  end
```

Log SQL execution

```
1  Declare @pack_name        sysname = ?
2  Declare @task_name        sysname = ?
3  Declare @exec_id          int     = ?
4
5  Declare @created_time     nvarchar(40)
6  Declare @rows_sent        int
7
8  Set     @created_time    = Convert( nvarchar(40) , GetDate(), 120) + ' +01:00'
9
10 Set     @rows_sent       = ( select COUNT(*)
11                              from   DWH_Staging.Import.Buecher )
12
13 Select @created_time, @exec_id, @rows_sent
14
15 exec SSISDB.internal.append_execution_data_statistics
16      @execution_id                = @exec_id
17     ,@package_name                = @pack_name
18     ,@package_location_type       = N'project'     --fix
19     ,@package_path_full           = N'project:pack_name.dtsx'
20     ,@task_name                   = @task_name
21     ,@execution_path              = N'\Package\SQL_Task'
22     ,@dataflow_path_id_string     = N'path_id'
23     ,@dataflow_path_name          = N'00_SQL_Insert-Into'
24     ,@source_component_name       = N'< source >'       ----<<
25     ,@destination_component_name  = N'< destination >'  ----<<
26     ,@created_time                = @created_time
27     ,@rows_sent                   = @rows_sent
28 ------------------------------------------------------------
```

Admin „Tools“

- tfn_execution_data_statistics
- sfn_maxExecID_from_sysjobhistory
- sfn_maxExecID_from_CatalogExecutions

- Execution:
  internal.append_execution_data_statistics

tfn_execution_data_statistics

```sql
CREATE FUNCTION dbo.tfn_SSISDB_execution_data_statistics
(
    @execution_id   bigint = null
)
RETURNS
@RETURN_execution_data_statistics TABLE
(
    execution_id         bigint
  , package_name         nvarchar(260)
  , task_name            nvarchar(4000)
  , dataflow_path_name   nvarchar(4000)
  , rows_sent            bigint
)
AS
BEGIN
    IF  @execution_id IS NOT NULL
        INSERT  @RETURN_execution_data_statistics
        SELECT  execution_id, package_name, task_name, dataflow_path_name, SUM(rows_sent) as 'rows_sent'
        FROM    SSISDB.catalog.execution_data_statistics
        WHERE   execution_id = @execution_id
        GROUP   By execution_id, package_name, task_name, dataflow_path_name
        ORDER   By execution_id, package_name, task_name, dataflow_path_name
    ELSE
        INSERT  @RETURN_execution_data_statistics
        SELECT  execution_id, package_name, task_name, dataflow_path_name, SUM(rows_sent) as 'rows_sent'
        FROM    SSISDB.catalog.execution_data_statistics
        GROUP   By execution_id, package_name, task_name, dataflow_path_name
        ORDER   By execution_id, package_name, task_name, dataflow_path_name

    ------
    RETURN
END   -- end Function
```

sfn_maxExecID_from_sysjobhistory

```
1  CREATE FUNCTION [dbo].[sfn_max_ExecutionID_from_sysjobhistory]()
2
3  RETURNS Int
4  AS
5  BEGIN
6      Declare @maxExecutionID Int
7      Set @maxExecutionID =
8  ( Select CAST( SubString( [message]
9                          , (Patindex('%Execution ID:%', [message]) + 14)
10                         , (Patindex('%.  To view the details for the execution%', [message])
11                         - (Patindex('%Execution ID:%', [message]) + 14))
12                         )
13         as Int )
14 From   msdb.dbo.sysjobhistory
15 Where  [message] like '%Execution ID:%'
16     and  instance_id = ( select max(instance_id)
17                          from   msdb.dbo.sysjobhistory
18                          where  [message] like '%Execution ID:%'
19                              and  [message] like '%To view the details for the execution%')
20 )
21
22     -- Return the result of the function
23     RETURN @maxExecutionID
24
25 END  -- end Function
```

sfn_maxExecID_from_CatalogExecutions

```
CREATE FUNCTION [dbo].[sfn_max_ExecutionID_from_CatalogExecutions](
                    @folder_name    sysname         = null
                  , @project_name   sysname         = null
                  , @package_name   nvarchar(260)   = null
                  )
RETURNS BigINT

AS
BEGIN
    DECLARE @max_exec_id BigINT

    IF (   @folder_name   is Null
       or  @project_name  is Null
       or  @package_name  is NUll )
        SET @max_exec_id = ( SELECT max(execution_id)
                             FROM   SSISDB.catalog.executions )
    ELSE
        SET @max_exec_id = ( SELECT max(execution_id)
                             FROM   SSISDB.catalog.executions
                             WHERE  folder_name  = @folder_name
                               AND  project_name = @project_name
                               AND  package_name = @package_name )
    -- END IF

    ---- Return the result of the function
    RETURN @max_exec_id

END  -- end FUNCTION
---- http://technet.microsoft.com/de-de/library/ff878089.aspx
```

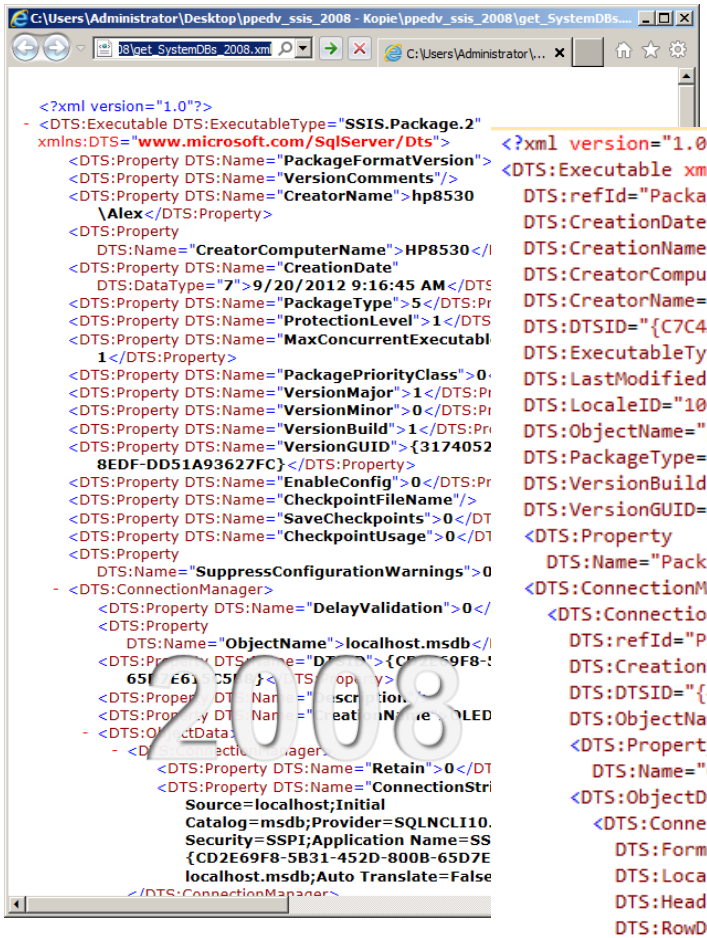
Report_JobHistory

Job Name	step name	step	date	start	sec	rows sent
⊟ **DWH_staging_01_Import**			**2014-04-29**		**4**	
⊟ **DWH_staging_01_Import**			**2014-04-29**		**4**	
	01_Pack_Import_Verkaufszahlen	1		16:12:41	4	26
⊞ **DWH_staging_01_Import**			**2014-04-29**		**48**	
⊞ **DWH_staging_02_Clean**			**2014-04-29**		**15**	
⊟ **DWH_staging_01_Import**			**2014-04-29**		**11**	
	01_Pack_Import_Verkaufszahlen	1		16:27:01	7	4,163
	02_Pack_Import_Buecher	2		16:27:08	4	26
	start_next_Job	3		16:27:12	0	
⊟ **DWH_staging_02_Clean**			**2014-04-29**		**22**	
	11_Pack_Clean_Verkaufszahlen	1		16:27:12	11	4,163
	12_Pack_Clean_Buecher	2		16:27:23	11	26
⊞ **DWH_staging_01_Import**			**2014-04-29**		**12**	
⊞ **DWH_staging_02_Clean**			**2014-04-29**		**15**	

Report_JobHistory_details

project name	package name	task name	dataflow path name	rows	start time	sec
ssis_DWH_staging						
	01_Pack_Import_Verkaufszahlen.dtsx				4/29/2014 10:32:53 AM +02:00	4
		DFT_Import-Verkaufszahlen	00_output_FlatFile	4,163		
		DFT_Import-Verkaufszahlen	99_input_Import-Layer	4,163		
ssis_DWH_staging						
	11_Pack_Clean_Verkaufszahlen.dtsx				4/29/2014 10:33:35 AM +02:00	7
		DFT_Clean-Verkaufszahlen	00_output_Import-Layer	4,163		
		DFT_Clean-Verkaufszahlen	01_output_DER_Zeit	4,163		
		DFT_Clean-Verkaufszahlen	02_output_DER_Vertreter	4,163		
		DFT_Clean-Verkaufszahlen	03_output_DER_Buch	4,163		
		DFT_Clean-Verkaufszahlen	04_output_DER_Stueck	4,163		
		DFT_Clean-Verkaufszahlen	99_input_Clean-Layer	4,163		
ssis_DWH_staging						
	02_Pack_Import_Buecher				4/29/2014 10:39:04 AM +02:00	2
		SQL_SQL_Import-Buecher_dataRows	T-SQL Insert Into	26		
		SQL_SSISDB_exec_data_statistics	T-SQL Insert Into	26		
	02_Pack_Import_Buecher.dtsx				4/29/2014 10:39:04 AM +02:00	2
		SQL_Task	T-SQL Insert Into	26		
ssis_DWH_staging						
	01_Pack_Import_Verkaufszahlen.dtsx				4/29/2014 11:07:17 AM +02:00	2
		DFT_Import-Verkaufszahlen	00_output_FlatFile	4,163		
		DFT_Import-Verkaufszahlen	99_input_Import-Layer	4,163		
ssis_DWH_staging						
	11_Pack_Clean_Verkaufszahlen.dtsx				4/29/2014 11:07:31 AM +02:00	3
		DFT_Clean-Verkaufszahlen	00_output_Import-Layer	4,163		
		DFT_Clean-Verkaufszahlen	01_output_DER_Zeit	4,163		
		DFT_Clean-Verkaufszahlen	02_output_DER_Vertreter	4,163		
		DFT_Clean-Verkaufszahlen	03_output_DER_Buch	4,163		
		DFT_Clean-Verkaufszahlen	04_output_DER_Stueck	4,163		
		DFT_Clean-Verkaufszahlen	99_input_Clean-Layer	4,163		

Vereinfachtes <xml>

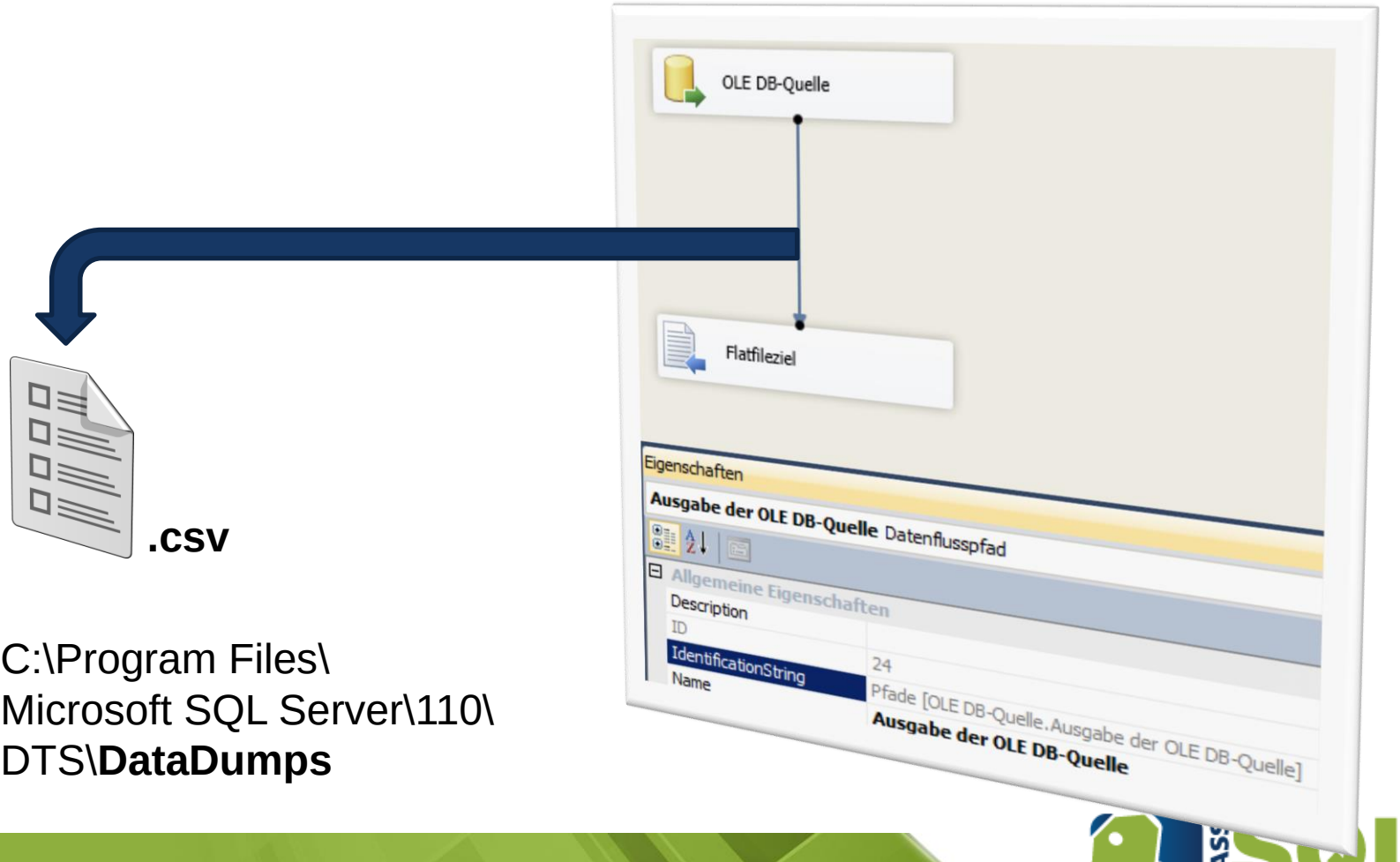


„Blick ins Paket“

- From OpenRowSet
- From OpenXML

>> admin_get_SSIS…

Data Tab >> Datenziel



.csv

C:\Program Files\
Microsoft SQL Server\110\
DTS**DataDumps**

Admin: check for Changes SSISDB

- catalog Schema well known
  and documented
- internal Schema not documented
- check for changes in
  catalog.catalog_properties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