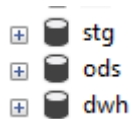Для базы данных по схеме "Звезда" со второго урока, настройте ETL-процессы между базой данных Adventure Works и вашей базой данных,

с использованием промежуточных баз данных stg и ods.

Пример: https://youtu.be/enahePzYT6E

Создаем базы данных **stg, ods, dwh**

- stg
- ods
- dwh

База данных **stg**

```sql
USE [stg]
GO

/****** Object:  Table [Person].[Person]    Script Date: 24.09.2021 14:18:07 ******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [Product](
	[ProductID] [int] IDENTITY(1,1) NOT NULL,
	[Name] [nvarchar](50) NOT NULL,
	[ProductNumber] [nvarchar](25) NOT NULL,
	[MakeFlag] [bit] NOT NULL,
	[FinishedGoodsFlag] [bit] NOT NULL,
	[Color] [nvarchar](15) NULL,
	[SafetyStockLevel] [smallint] NOT NULL,
	[ReorderPoint] [smallint] NOT NULL,
	[StandardCost] [money] NOT NULL,
	[ListPrice] [money] NOT NULL,
	[Size] [nvarchar](5) NULL,
	[SizeUnitMeasureCode] [nchar](3) NULL,
	[WeightUnitMeasureCode] [nchar](3) NULL,
	[Weight] [decimal](8, 2) NULL,
	[DaysToManufacture] [int] NOT NULL,
	[ProductLine] [nchar](2) NULL,
	[Class] [nchar](2) NULL,
	[Style] [nchar](2) NULL,
	[ProductSubcategoryID] [int] NULL,
	[ProductModelID] [int] NULL,
	[SellStartDate] [datetime] NOT NULL,
	[SellEndDate] [datetime] NULL,
	[DiscontinuedDate] [datetime] NULL,
	[ModifiedDate] [datetime] NOT NULL)
```

```sql
USE [stg]

CREATE TABLE [SalesOrderDetail](
    [SalesOrderID] [int] NOT NULL,
    [SalesOrderDetailID] [int] NOT NULL,
    [CarrierTrackingNumber] [nvarchar](25) NULL,
    [OrderQty] [smallint] NOT NULL,
    [ProductID] [int] NOT NULL,
    [SpecialOfferID] [int] NOT NULL,
    [UnitPrice] [money] NOT NULL,
    [UnitPriceDiscount] [money] NOT NULL,
    [LineTotal]  AS (isnull(([UnitPrice]*((1.0)-
[UnitPriceDiscount]))*[OrderQty],(0.0))),
    [ModifiedDate] [datetime] NOT NULL)




USE [stg]
GO

/****** Object:  Table [Sales].[SalesOrderHeader]    Script Date: 24.09.2021 14:25:32
******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [SalesOrderHeader](
    [SalesOrderID] [int] NOT NULL,
    [RevisionNumber] [tinyint] NOT NULL,
    [OrderDate] [datetime] NOT NULL,
    [DueDate] [datetime] NOT NULL,
    [ShipDate] [datetime] NULL,
    [Status] [tinyint] NOT NULL,
    [OnlineOrderFlag] [bit] NOT NULL,
    [SalesOrderNumber]  AS (isnull(N'SO'+CONVERT([nvarchar](23),[SalesOrderID]),N'***
ERROR ***')),
    [PurchaseOrderNumber] [varchar](25) NULL,
    [AccountNumber] [varchar](25) NULL,
    [CustomerID] [int] NOT NULL,
    [SalesPersonID] [int] NULL,
    [TerritoryID] [int] NULL,
    [BillToAddressID] [int] NOT NULL,
    [ShipToAddressID] [int] NOT NULL,
    [ShipMethodID] [int] NOT NULL,
    [CreditCardID] [int] NULL,
    [CreditCardApprovalCode] [varchar](15) NULL,
    [CurrencyRateID] [int] NULL,
    [SubTotal] [money] NOT NULL,
    [TaxAmt] [money] NOT NULL,
    [Freight] [money] NOT NULL,
    [TotalDue]  AS (isnull(([SubTotal]+[TaxAmt])+[Freight],(0))),
    [Comment] [nvarchar](128) NULL,
    [ModifiedDate] [datetime] NOT NULL)
```

Вставляем данные в таблицы.

```sql
INSERT INTO [stg].dbo.SalesOrderDetail
           ([SalesOrderID]
           ,[SalesOrderDetailID]
           ,[CarrierTrackingNumber]
           ,[OrderQty]
           ,[ProductID]
           ,[SpecialOfferID]
           ,[UnitPrice]
           ,[UnitPriceDiscount]
           ,[ModifiedDate])
SELECT [SalesOrderID]
           ,[SalesOrderDetailID]
           ,[CarrierTrackingNumber]
           ,[OrderQty]
           ,[ProductID]
           ,[SpecialOfferID]
           ,[UnitPrice]
           ,[UnitPriceDiscount]
           ,[ModifiedDate] FROM [AdventureWorks2019].[Sales].[SalesOrderDetail]
WHERE      ModifiedDate        =        (SELECT        max(ModifiedDate)        FROM
[AdventureWorks2019].[Sales].[SalesOrderDetail])


INSERT INTO [stg].dbo.[SalesOrderHeader]
           ([SalesOrderID]
           ,[RevisionNumber]
           ,[OrderDate]
           ,[DueDate]
           ,[ShipDate]
           ,[Status]
           ,[OnlineOrderFlag]
           ,[PurchaseOrderNumber]
           ,[AccountNumber]
           ,[CustomerID]
           ,[SalesPersonID]
           ,[TerritoryID]
           ,[BillToAddressID]
           ,[ShipToAddressID]
           ,[ShipMethodID]
           ,[CreditCardID]
           ,[CreditCardApprovalCode]
           ,[CurrencyRateID]
           ,[SubTotal]
           ,[TaxAmt]
           ,[Freight]
           ,[Comment]
           ,[ModifiedDate])
SELECT [SalesOrderID]
           ,[RevisionNumber]
           ,[OrderDate]
           ,[DueDate]
           ,[ShipDate]
           ,[Status]
           ,[OnlineOrderFlag]
           ,[PurchaseOrderNumber]
           ,[AccountNumber]
           ,[CustomerID]
           ,[SalesPersonID]
           ,[TerritoryID]
           ,[BillToAddressID]
           ,[ShipToAddressID]
```

```sql
          ,[ShipMethodID]
          ,[CreditCardID]
          ,[CreditCardApprovalCode]
          ,[CurrencyRateID]
          ,[SubTotal]
          ,[TaxAmt]
          ,[Freight]
          ,[Comment]
          ,[ModifiedDate] FROM [AdventureWorks2019].[Sales].[SalesOrderHeader]
WHERE       ModifiedDate        =       (SELECT        max(ModifiedDate)       FROM
[AdventureWorks2019].[Sales].[SalesOrderHeader])




INSERT INTO [stg].dbo.[Product]
          ([Name]
          ,[ProductNumber]
          ,[MakeFlag]
          ,[FinishedGoodsFlag]
          ,[Color]
          ,[SafetyStockLevel]
          ,[ReorderPoint]
          ,[StandardCost]
          ,[ListPrice]
          ,[Size]
          ,[SizeUnitMeasureCode]
          ,[WeightUnitMeasureCode]
          ,[Weight]
          ,[DaysToManufacture]
          ,[ProductLine]
          ,[Class]
          ,[Style]
          ,[ProductSubcategoryID]
          ,[ProductModelID]
          ,[SellStartDate]
          ,[SellEndDate]
          ,[DiscontinuedDate]
          ,[ModifiedDate])
SELECT [Name]
          ,[ProductNumber]
          ,[MakeFlag]
          ,[FinishedGoodsFlag]
          ,[Color]
          ,[SafetyStockLevel]
          ,[ReorderPoint]
          ,[StandardCost]
          ,[ListPrice]
          ,[Size]
          ,[SizeUnitMeasureCode]
          ,[WeightUnitMeasureCode]
          ,[Weight]
          ,[DaysToManufacture]
          ,[ProductLine]
          ,[Class]
          ,[Style]
          ,[ProductSubcategoryID]
          ,[ProductModelID]
          ,[SellStartDate]
          ,[SellEndDate]
          ,[DiscontinuedDate]
          ,[ModifiedDate] FROM [AdventureWorks2019].[Production].[Product]
WHERE       ModifiedDate        =       (SELECT        max(ModifiedDate)       FROM
[AdventureWorks2019].[Production].[Product])
```

Настройка jobs и расписания их запуска

Job Step Properties - insert stg table SalesOrderDetail

Select a page
- General
- Advanced

Script ▾ | ❓ Help

Step name:
```
Insert stg table SalesOrderDetail
```

Type:
```
Transact-SQL script (T-SQL)
```

Run as:

Database: master

Command:

```
INSERT INTO [stg].dbo.SalesOrderDetail
        ([SalesOrderID]
        ,[SalesOrderDetailID]
        ,[CarrierTrackingNumber]
        ,[OrderQty]
        ,[ProductID]
        ,[SpecialOfferID]
        ,[UnitPrice]
        ,[UnitPriceDiscount]
        ,[ModifiedDate])
SELECT [SalesOrderID]
        ,[SalesOrderDetailID]
        ,[CarrierTrackingNumber]
        ,[OrderQty]
        ,[ProductID]
        ,[SpecialOfferID]
        ,[UnitPrice]
        ,[UnitPriceDiscount]
        ,[ModifiedDate] FROM [AdventureWorks2019].[Sales].[SalesOrderDetail]
WHERE ModifiedDate = (SELECT max(ModifiedDate) FROM [AdventureWorks2019].[Sales].[SalesOrderDetail])
```

Buttons: Open... | Select All | Copy | Paste | Parse

Connection

Server:
PROTECTOR-DIMA

Connection:
Protector-Dima\Protector

View connection properties

Progress

Ready

Previous | Next | OK | Cancel

New Job Schedule

Name:	run_data_migration

Jobs in Schedule

Schedule type:	Recurring	☑ Enabled

One-time occurrence

Date:	24.09.2021	Time:	22:53:21

Frequency

Occurs: Daily

Recurs every: 1 day(s)

Daily frequency

◉ Occurs once at: 22:00:00

○ Occurs every: 1 hour(s)   Starting at: 0:00:00   Ending at: 23:59:59

Duration

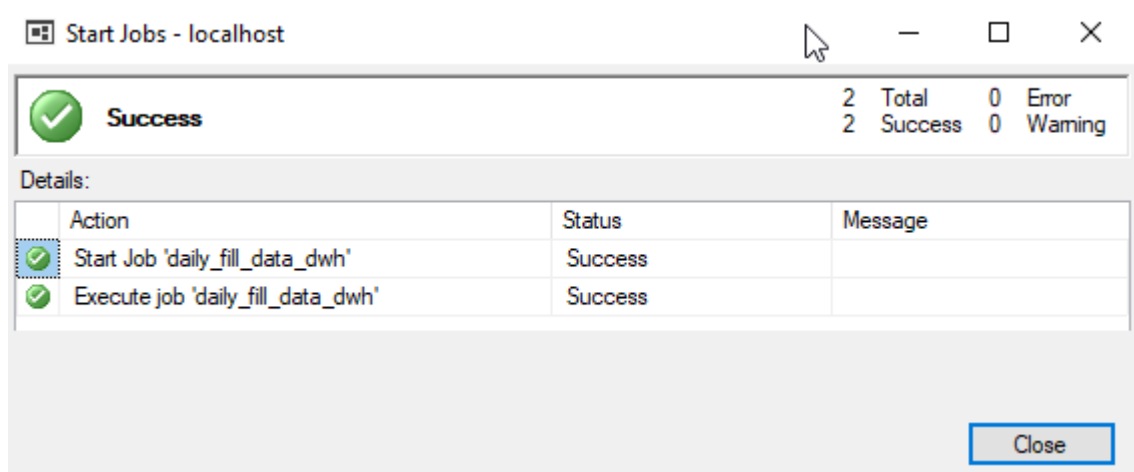Start date: 24.09.2021   ○ End date: 24.09.2021   ◉ No end date:

Summary

Description:
Occurs every day at 22:00:00. Schedule will be used starting on 24.09.2021.

OK | Cancel | Help

| | | 2 Total | 0 Error |
| Success | | 2 Success | 0 Warning |

Details:

	Action	Status	Message
✓	Start Job 'daily_fill_data_dwh'	Success	
✓	Execute job 'daily_fill_data_dwh'	Success	

Close

База данных **ods**

```sql
SELECT d.ProductID,
       d.SalesOrderID,
       d.OrderQty,
       d.UnitPrice,
       d.ModifiedDate
           into ods.[dbo].[FctSales]
from [stg].[dbo].[SalesOrderDetail] d

INSERT INTO ods.[dbo].[FctSales]
                  ([ProductID],
                   [SalesOrderID],
                   [OrderQty],
                   [UnitPrice],
                   [ModifiedDate])
SELECT d.ProductID,
       d.SalesOrderID,
       d.OrderQty,
       d.UnitPrice,
       d.ModifiedDate
from [stg].[dbo].[SalesOrderDetail] d
```

```sql
CREATE TABLE [ods].[dbo].[DmnOrder](
      [SalesOrderID] [int] NOT NULL,
      [SalesOrderNumber] [nvarchar](25) NOT NULL,
      [AccountNumber] [nvarchar](15) NULL,
      [CreditCardID] [int] NULL,
      [OrderDate] [datetime] NOT NULL,
      [ModifiedDate] [datetime] NOT NULL
)

INSERT INTO [ods].[dbo].[DmnOrder]
```

```sql
            ([SalesOrderID]
            ,[SalesOrderNumber]
            ,[AccountNumber]
            ,[CreditCardID]
            ,[OrderDate]
            ,[ModifiedDate])
SELECT SalesOrderID
            ,SalesOrderNumber
            ,AccountNumber
            ,CreditCardID
            ,OrderDate
            ,ModifiedDate
FROM [stg].[dbo].[SalesOrderHeader]




CREATE TABLE [ods].[dbo].[DmnProduct](
        [ProductID] [int] NOT NULL,
        [Name] [nvarchar](50) NOT NULL,
        [ProductNumber] [nvarchar](25) NULL,
        [ModifiedDate] [datetime] NOT NULL
)

INSERT INTO [ods].[dbo].[DmnProduct]
            ([ProductID]
            ,[Name]
            ,[ProductNumber]
            ,[ModifiedDate])
SELECT ProductID
            ,Name
            ,ProductNumber
            ,ModifiedDate
FROM [stg].[dbo].[Product]




CREATE TABLE [ods].[dbo].[DmnDate](
        [OrderDate] [datetime] NOT NULL,
        [DueDate] [datetime] NOT NULL,
        [ShipDate] [datetime] NULL,
        [Status] [tinyint] NOT NULL,
        [SalesOrderNumber] [nvarchar](50) NOT NULL,
        [TerritoryID] [int] NULL,
        [ModifiedDate] [datetime] NOT NULL
)


INSERT INTO [ods].[dbo].[DmnDate]
            ([OrderDate]
            ,[DueDate]
            ,[ShipDate]
            ,[Status]
            ,[SalesOrderNumber]
            ,[TerritoryID]
            ,[ModifiedDate])
SELECT [OrderDate]
            ,[DueDate]
            ,[ShipDate]
            ,[Status]
            ,[SalesOrderNumber]
```

```sql
      ,[TerritoryID]
      ,[ModifiedDate]
FROM [stg].[dbo].[SalesOrderHeader]
```

Job Properties - daily_fill_data_dwh

Select a page
- General
- Steps
- Schedules
- Alerts
- Notifications
- Targets

Script ▾ ❷ Help

Job step list:

St...	Name	Type	On Success	On Failure
1	truncate stg table SalesOrderDetail	Transact-...	Go to the ...	Quit the job...
2	insert stg table SalesOrderDetail	Transact-...	Go to the ...	Quit the job...
3	truncate stg table Product	Transact-...	Go to the ...	Quit the job...
4	insert stg table Product	Transact-...	Go to the ...	Quit the job...
5	truncate stg table SalesOrderHeader	Transact-...	Go to the ...	Quit the job...
6	insert stg table SalesOrderHeader	Transact-...	Go to the ...	Quit the job...
7	ods_truncate_fct_sales	Transact-...	Go to the ...	Quit the job...
8	ods_insert_fct_sales	Transact-...	Go to the ...	Quit the job...
9	ods_truncate_dmn_order	Transact-...	Go to the ...	Quit the job...
10	ods_insert_dmn_order	Transact-...	Go to the ...	Quit the job...
11	ods_truncate_table_dmn_product	Transact-...	Go to the ...	Quit the job...
12	ods_insert_dmn_product	Transact-...	Go to the ...	Quit the job...
13	ods_truncate_dmn_date	Transact-...	Go to the ...	Quit the job...
14	ods_insert_dmn_date	Transact-...	Go to the ...	Quit the job...

Connection

Server:
PROTECTOR-DIMA

Connection:
Protector-Dima\Protector

⚡ View connection properties

Progress

Ready

Move step:
⬆ ⬇

Start step:
1:truncate stg table SalesOrderDetail

New... | Insert... | Edit | Delete

OK | Cancel

Start Jobs - localhost

✅ **Success**

2 Total   0 Error
2 Success 0 Warning

Details:

	Action	Status	Message
✓	Start Job 'daily_fill_data_dwh'	Success	
✓	Execute job 'daily_fill_data_dwh'	Success	

Close

База данных **dwh**

```sql
select ProductID, f.SalesOrderID, h.OrderDate, sum(f.OrderQty * f.UnitPrice) as Sum
into dwh.dbo.FctSales
from [ods].[dbo].[FctSales] f
inner join [ods].[dbo].DmnOrder h on h.SalesOrderID = f.SalesOrderID
where 1=2
group by ProductID, f.SalesOrderID, OrderDate



MERGE dwh.dbo.FctSales AS TARGET
USING (
 select ProductID, f.SalesOrderID, h.OrderDate, sum(f.OrderQty * f.UnitPrice) as Sum
 from [ods].[dbo].[FctSales] f
 inner join [ods].[dbo].DmnOrder h on h.SalesOrderID = f.SalesOrderID
 group by ProductID, f.SalesOrderID, OrderDate) AS SOURCE
ON (TARGET.ProductID = SOURCE.ProductID and
        TARGET.SalesOrderID = SOURCE.SalesOrderID and
        TARGET.OrderDate = SOURCE.OrderDate)
WHEN MATCHED THEN
        UPDATE SET TARGET.Sum = SOURCE.Sum
WHEN NOT MATCHED THEN
                INSERT (ProductID, SalesOrderID, OrderDate, Sum)
                VALUES  (   SOURCE.ProductID,   SOURCE.SalesOrderID,   SOURCE.OrderDate,
SOURCE.Sum);




select SalesOrderID,
            SalesOrderNumber,
            AccountNumber,
            CreditCardID
 into dwh.dbo.DmnOrder
 from ods.dbo.DmnOrder
 where 1=2


MERGE dwh.dbo.DmnOrder AS TARGET
USING (
 select SalesOrderID,
            SalesOrderNumber,
            AccountNumber,
            CreditCardID
 from ods.dbo.DmnOrder) AS SOURCE
ON (TARGET.SalesOrderID = SOURCE.SalesOrderID)
WHEN MATCHED THEN
        UPDATE SET TARGET.SalesOrderNumber = SOURCE.SalesOrderNumber,
                        TARGET.AccountNumber = SOURCE.AccountNumber,
                        TARGET.CreditCardID = SOURCE.CreditCardID
WHEN NOT MATCHED THEN
                INSERT (SalesOrderID, SalesOrderNumber, AccountNumber, CreditCardID)
                VALUES      (      SOURCE.SalesOrderID,      SOURCE.SalesOrderNumber,
SOURCE.AccountNumber, SOURCE.CreditCardID);
```

```sql
select ProductID, Name, ProductNumber
 into dwh.dbo.[DmnProduct]
 from [ods].[dbo].[DmnProduct]
 where 1=2


MERGE dwh.dbo.[DmnProduct] AS TARGET
USING (
 select ProductID, Name, ProductNumber
 from [ods].[dbo].[DmnProduct]) AS SOURCE
ON (TARGET.ProductID = SOURCE.ProductID)
WHEN MATCHED THEN
       UPDATE SET TARGET.Name = SOURCE.Name,
                        TARGET.ProductNumber = SOURCE.ProductNumber
WHEN NOT MATCHED THEN
             INSERT (ProductID, Name, ProductNumber)
             VALUES ( SOURCE.ProductID, SOURCE.Name, SOURCE.ProductNumber);




select OrderDate
          ,DueDate
          ,ShipDate
          ,Status
          ,SalesOrderNumber
          ,TerritoryID
into dwh.dbo.[DmnDate]
 from [ods].[dbo].[ DmnDate]
 where 1=2


MERGE dwh.dbo.[DmnDate] AS TARGET
USING (
 select OrderDate
          ,DueDate
          ,ShipDate
          ,Status
          ,SalesOrderNumber
          ,TerritoryID
 from [ods].[dbo].[DmnDate]) AS SOURCE
ON (TARGET.OrderDate = SOURCE.OrderDate)
WHEN MATCHED THEN
       UPDATE SET TARGET.DueDate = SOURCE.DueDate,
                        TARGET.ShipDate = SOURCE.ShipDate,
                        TARGET.Status = SOURCE.Status,
                        TARGET.SalesOrderNumber = SOURCE.SalesOrderNumber,
                        TARGET.TerritoryID = SOURCE.TerritoryID
WHEN NOT MATCHED THEN
             INSERT (OrderDate, DueDate, ShipDate, Status, SalesOrderNumber,
TerritoryID)
             VALUES ( SOURCE.OrderDate, SOURCE.DueDate, SOURCE.ShipDate, SOURCE.Status,
SOURCE.SalesOrderNumber, SOURCE.TerritoryID);
```

Job Properties - daily_fill_data_dwh

Select a page
- General
- Steps
- Schedules
- Alerts
- Notifications
- Targets

Script ▼ ❓ Help

Job step list:

Step	Name	Type	On Success	On Failure
1	truncate stg table SalesOrderDetail	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
2	insert stg table SalesOrderDetail	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
3	truncate stg table Product	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
4	insert stg table Product	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
5	truncate stg table SalesOrderHeader	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
6	insert stg table SalesOrderHeader	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
7	ods_truncate_fct_sales	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
8	ods_insert_fct_sales	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
9	ods_truncate_dmn_order	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
10	ods_insert_dmn_order	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
11	ods_truncate_table_dmn_product	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
12	ods_insert_dmn_product	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
13	ods_truncate_dmn_date	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
14	ods_insert_dmn_date	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
15	dwh_merge_FctSales	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
16	dwh_merge_DmnOrder	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
17	dwh_merge_DmnProduct	Transact-SQL ...	Go to the next ...	Quit the job reporting fail...
18	dwh_merge_DmnDate	Transact-SQL ...	Quit the job rep...	Quit the job reporting fail...

Connection

Server:
PROTECTOR-DIMA

Start Jobs - localhost

✓ **Success**

2 Total   0 Error
2 Success   0 Warning

Details:

	Action	Status	Message
✓	Start Job 'daily_fill_data_dwh'	Success	
✓	Execute job 'daily_fill_data_dwh'	Success	

Close