

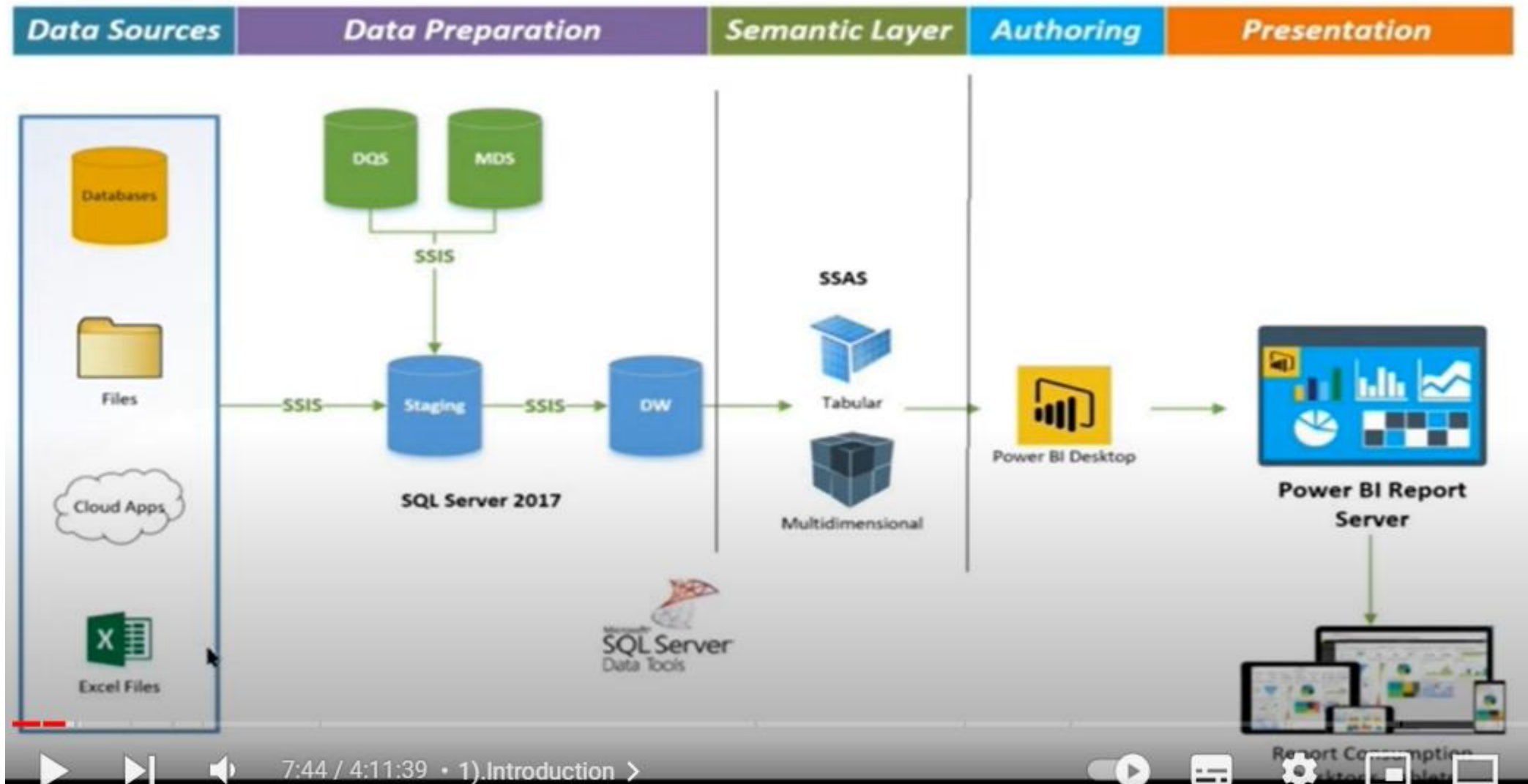


# SSIS

## SQL SERVER INTEGRATION



# BI Architecture



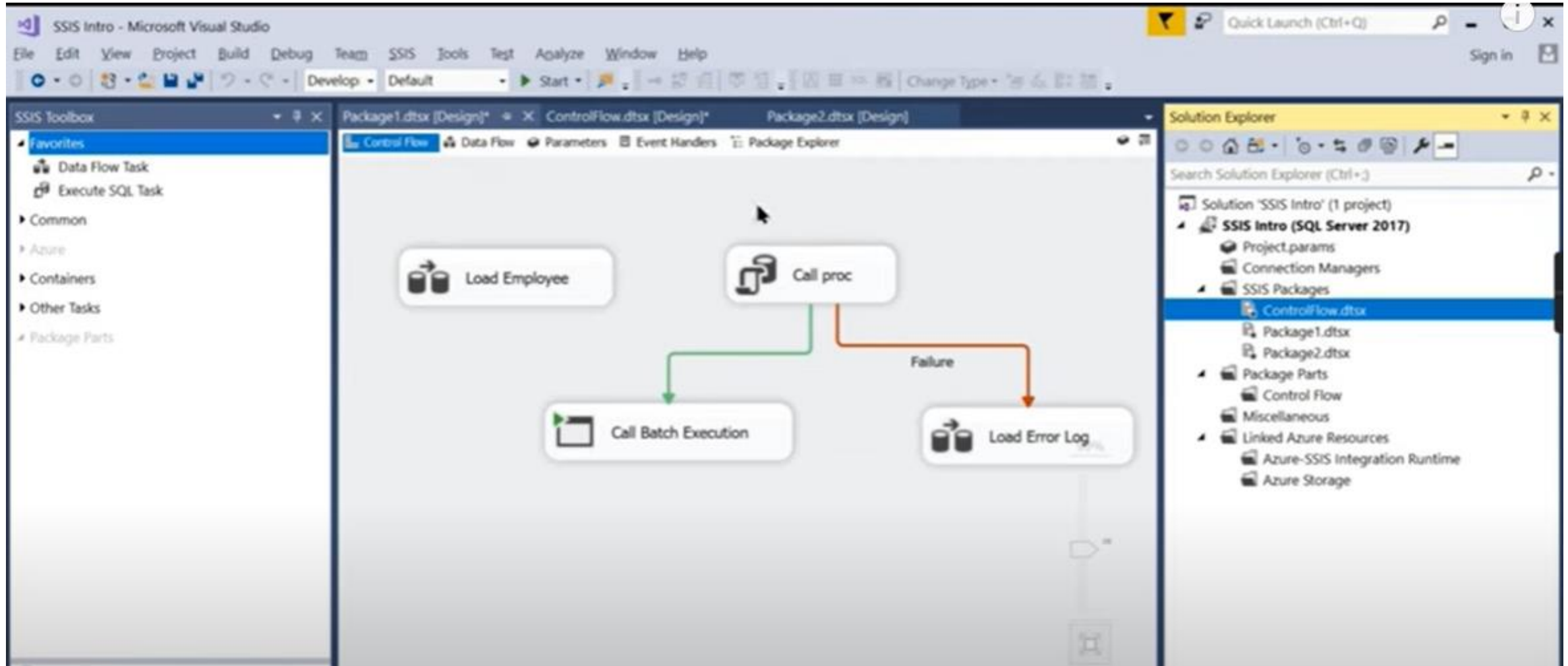
# SQL Server Integration Services

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Control Flow



# SQL Server Integration Services - Control Flow



# SQL Server Integration Services - Control Flow

- **Control Flow Tasks:**

- Control Flow Tasks are the core building blocks in SQL Server Integration Services (SSIS) that perform specific operations within ETL processes.
- Common tasks include Execute SQL Task, File System Task, Data Flow Task, and Script Task.
- They control the sequence and flow of tasks within an SSIS package.

- **Containers:**

- Containers are used to group and organize tasks within SSIS packages.
- Examples of containers include Sequence Container, For Loop Container, and Foreach Loop Container.
- Containers help in managing the scope and execution of tasks, enhancing package organization.

- **Precedence Constraints:**

- Precedence Constraints define the order of execution for tasks within an SSIS package.
- They specify the conditions that must be met for a task to run.
- Constraints ensure that tasks are executed in the desired sequence.

- **Significance of Control Flow:**

- Control Flow is a fundamental component of SSIS, governing the logical flow of ETL operations.
- Understanding Control Flow elements is essential for orchestrating data integration processes effectively.



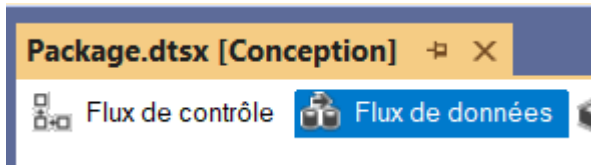
# SQL Server Integration Services

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*Data Flows*

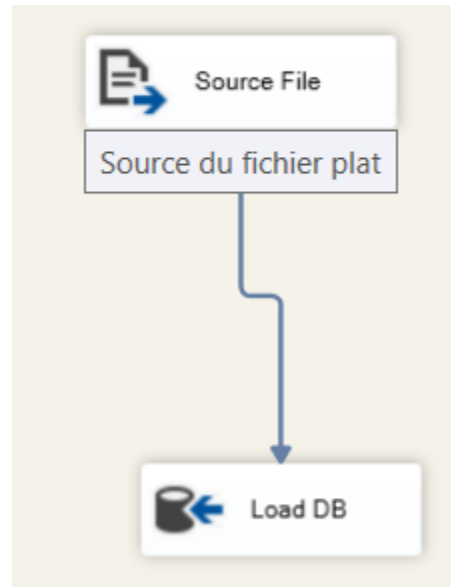
## I.2 - SQL Server Integration Services - Control Flow

1



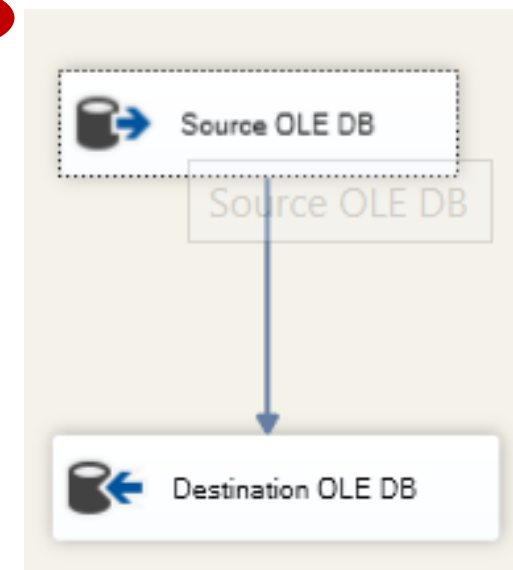
- We have modelled all the actions in the 'Data Flows' section

1.1



- Data was loaded from a flat file to a database

1.2

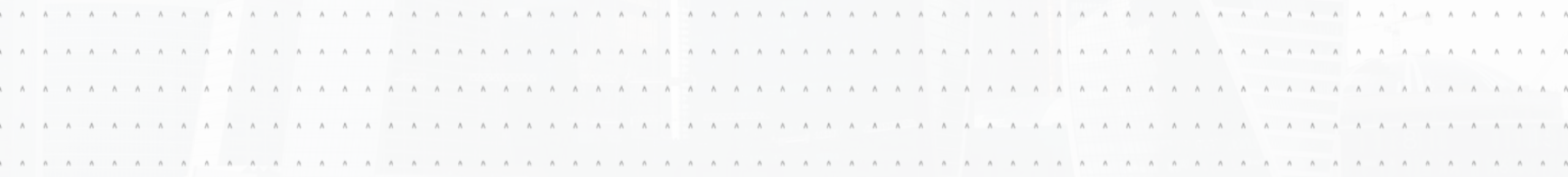


- Data from one database was transferred to another database

# SQL Server Integration Services

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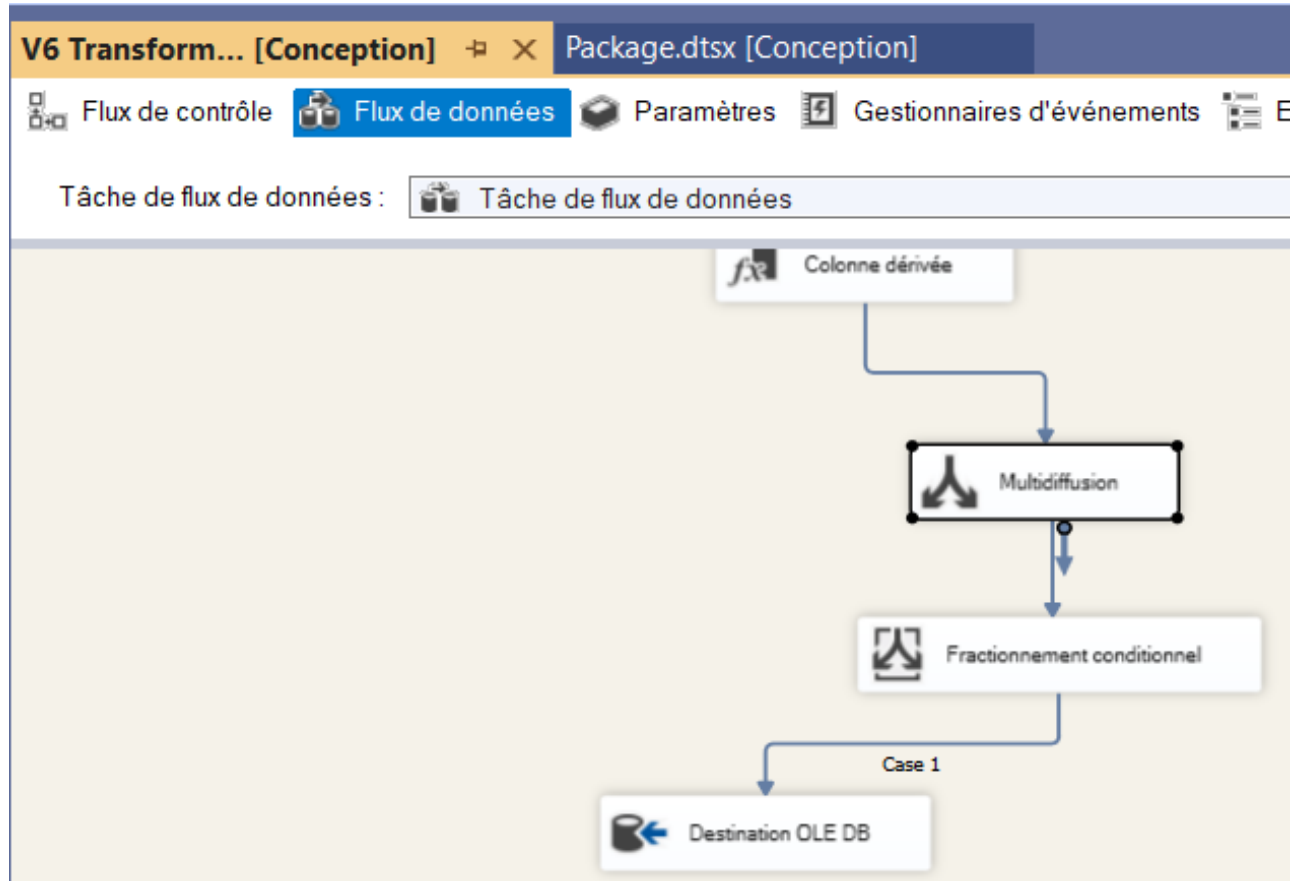
## *1.3 ) SSIS Main Transformations*





## I.3 - SQL Server Integration Services – SSIS Main Transformations

- **Multi-Diffusion and Conditional Separation**



- **Multi-Diffusion**

Multicast transformation allows you to redistribute your input to one or more outputs

- **Conditional Separation**

The conditional separation transformation allows its input to be redistributed to one or more outputs according to certain established conditions

## I.3 - SQL Server Integration Services – SSIS Main Transformations

- Merge and Union

V6 Transform... [Conception] Package.dtsx [Conception]

Flux de contrôle Flux de données Paramètres Gestionnaires d'événements Explorateur de packa... Progression

Tâche de flux de données : Tâche de flux de données 1

```
graph TD; S1[Source du fichier plat] -- 5 lignes --> T1[Trier]; S2[Source du fichier plat 1] -- 5 lignes --> T2[Trier 1]; T1 -- 5 lignes --> F[Fusionner]; T2 -- 5 lignes --> F; F -- 10 lignes --> D[Destination OLE DB];
```

Gestionnaires de connexions

(localdb)\AdvWork\_Server.SSISDemo (localdb)\AdvWork\_Server.SSISDemo2 file1 file2

Visionneuse de données Fusionner sortie 1 à Tâche de flux de données 1

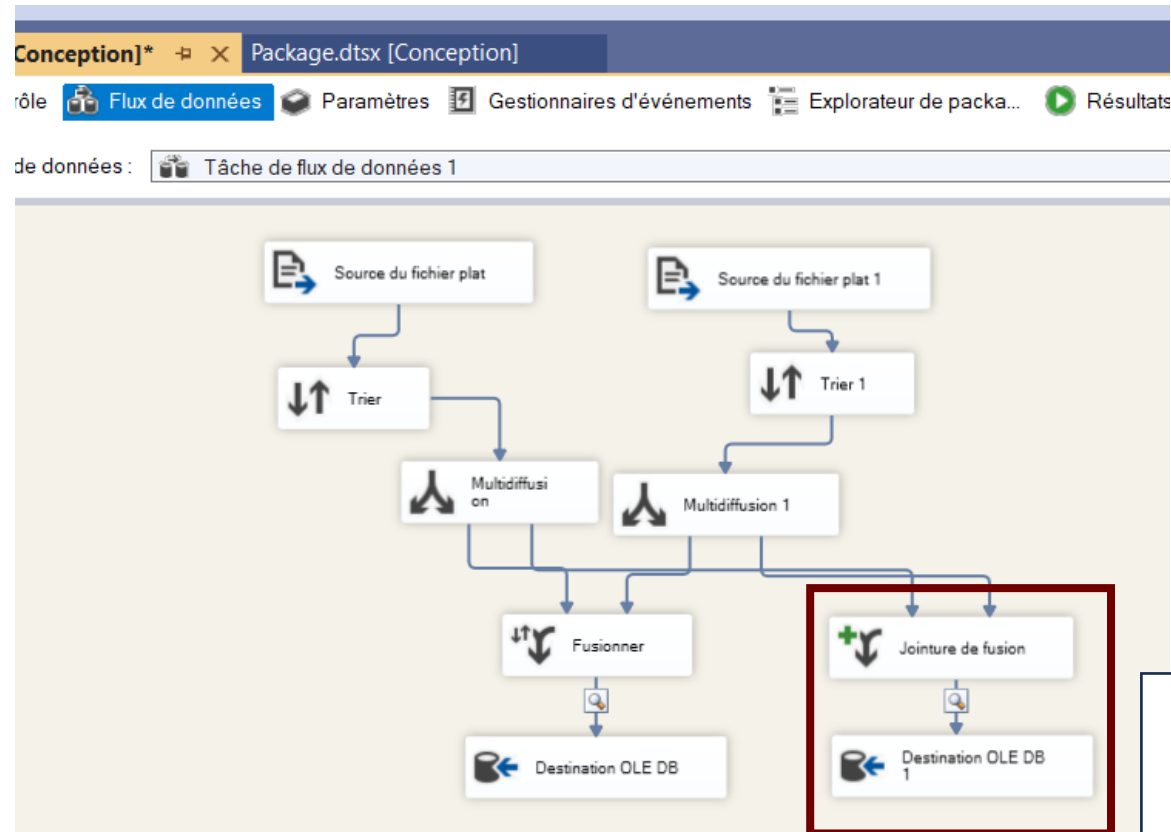
Détacher Copier les données

id	name	pseudo
1	Makan	MK
1	Makan	MK
10	Anabelle	Anna
100	Anabelle0	Anna
11	Marc	Mc
110	Marc0	Mc
2	Jimmy	Jim
20	Jimmy0	Jim
7	Yousra	Youss
70	Yousra0	Youss

Attaché Total lignes : 0, tampons : 0 Lignes affichées = 10

## I.3 - SQL Server Integration Services – SSIS Main Transformations

- Merge and Union



Visionneuse de données Sortie de jointure de fusion à Tâche de flux de données 1

Détacher Copier les données

id	name	pseudo
1	Makan	MK
100	Anabelle0	Anna
110	Marc0	Mc
20	Jimmmy0	Jim
70	Yousra0	Youss

Lignes affichées = 5

Here a merge join has been made using the "id" column (left join)

# SQL Server Integration Services

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## *1.4 ) Control Flow Task*



## I.4) SQL Server Integration Services - Control Flow Task

- **File System Task** and Execute Process Task

The screenshot displays the SSDT interface with a control flow diagram and a configuration window for the File System Task.

**Control Flow Diagram:** A task named "Tâche de système de fichiers" (File System Task) is shown on the design surface. It has a green arrow pointing downwards from its bottom center, indicating a flow connection.

**Configuration Window (Tâche de système de fichiers):**

Les opérations nécessaires à la réalisation des opérations portant sur le système de fichiers, par exemple le déplacement ou la suppression de fichiers ou de répertoires.

▼ <b>Connexion source</b>	
IsSourcePathVariable	False
SourceConnection	corbeille
▼ <b>Général</b>	
Name	Tâche de système de fichiers
Description	Tâche de système de fichiers
▼ <b>Opération</b>	
Operation	Supprimer le contenu du répertoire

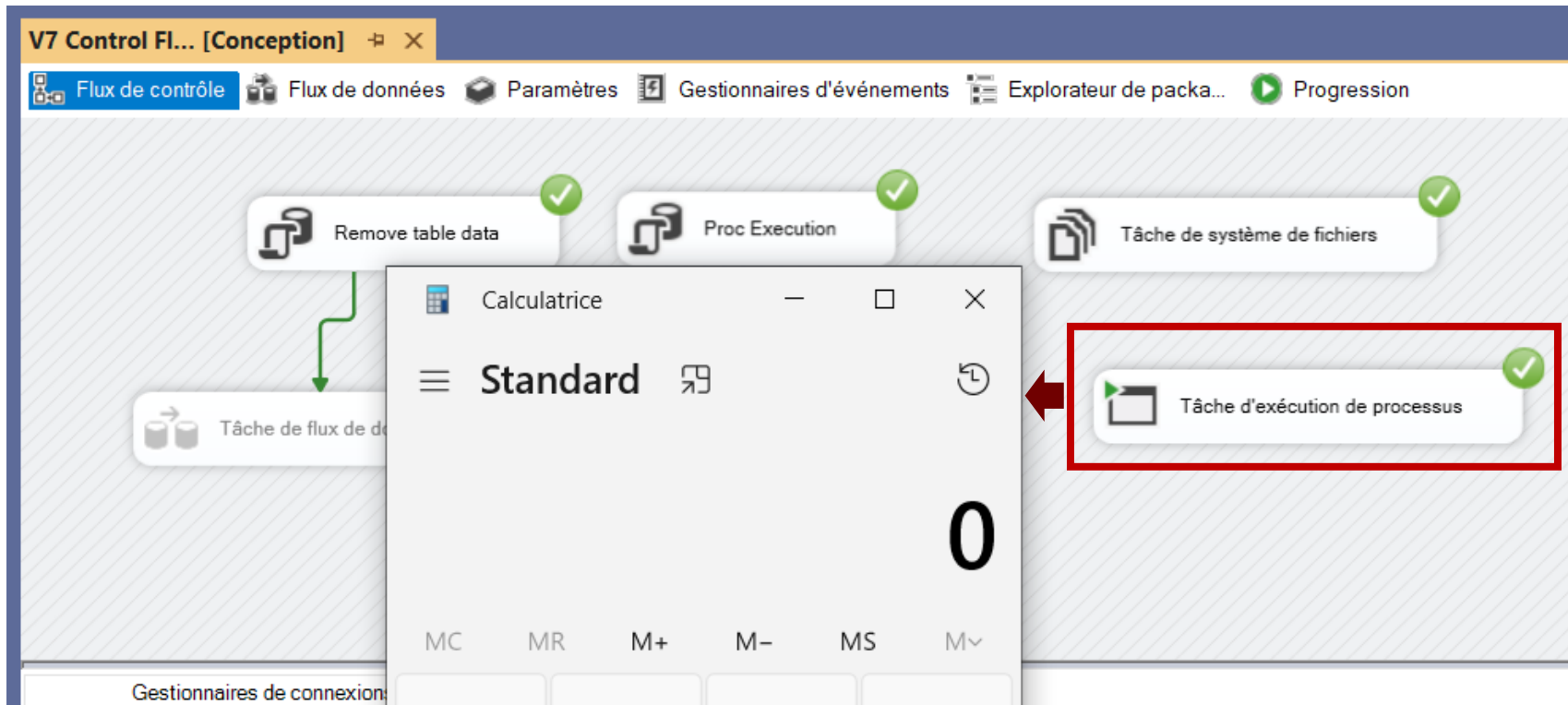
At the bottom of the window, a file explorer view shows a folder named "file2" containing a sub-folder named "corbeille".

### File System Task

The SSIS File System Task simplifies file management in ETL workflows, allowing for operations like copying, moving, deleting, and creating files and directories.

## I.4) SQL Server Integration Services - *Control Flow Task*

- File System Task and **Execute Process Task**

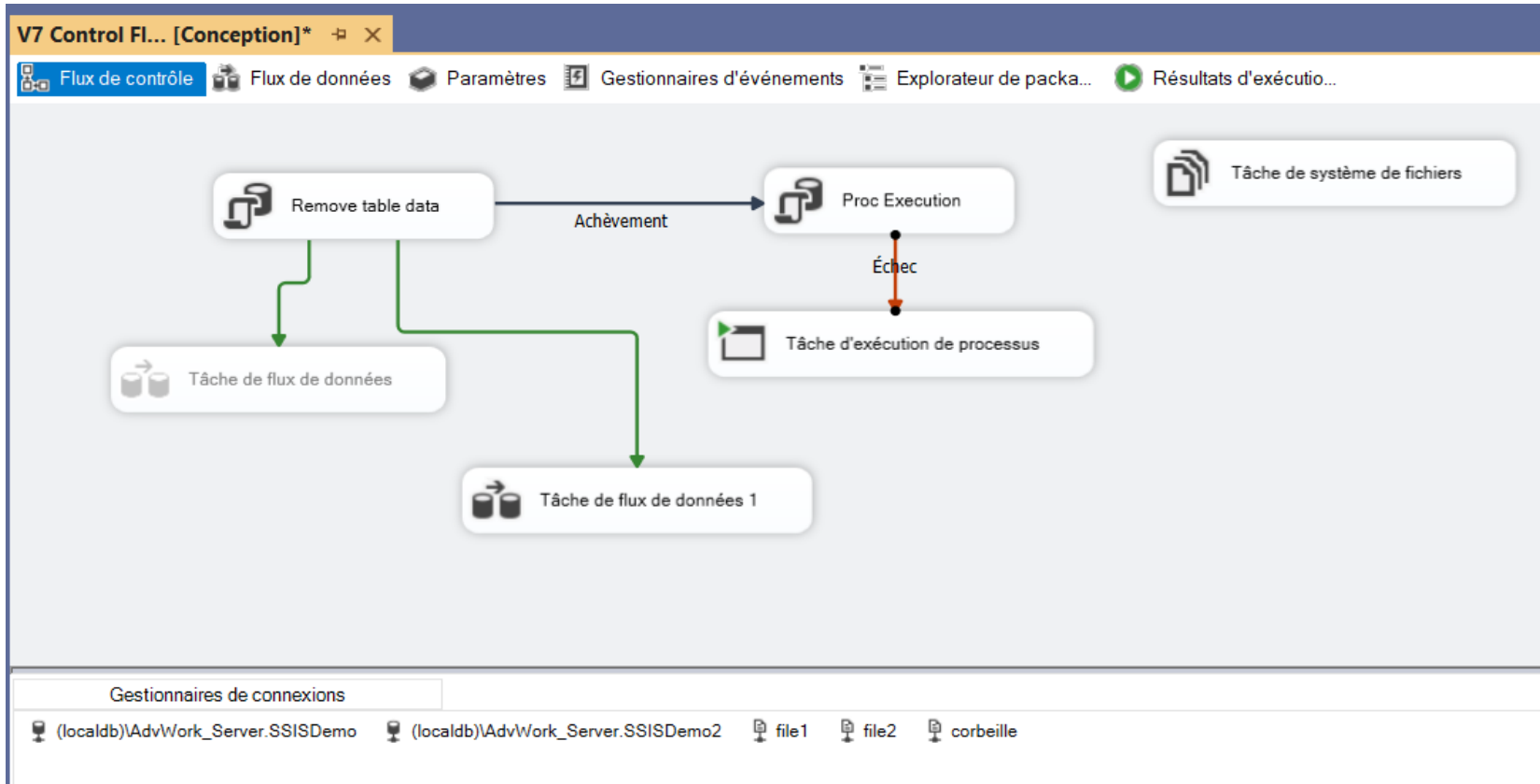


### Execute Process Task

The Execute Process Task in SSIS allows you to run external processes or programs as part of your ETL workflow, providing flexibility in integrating third-party applications and custom scripts.

## I.4) SQL Server Integration Services - Control Flow Task

- Precedence constraint



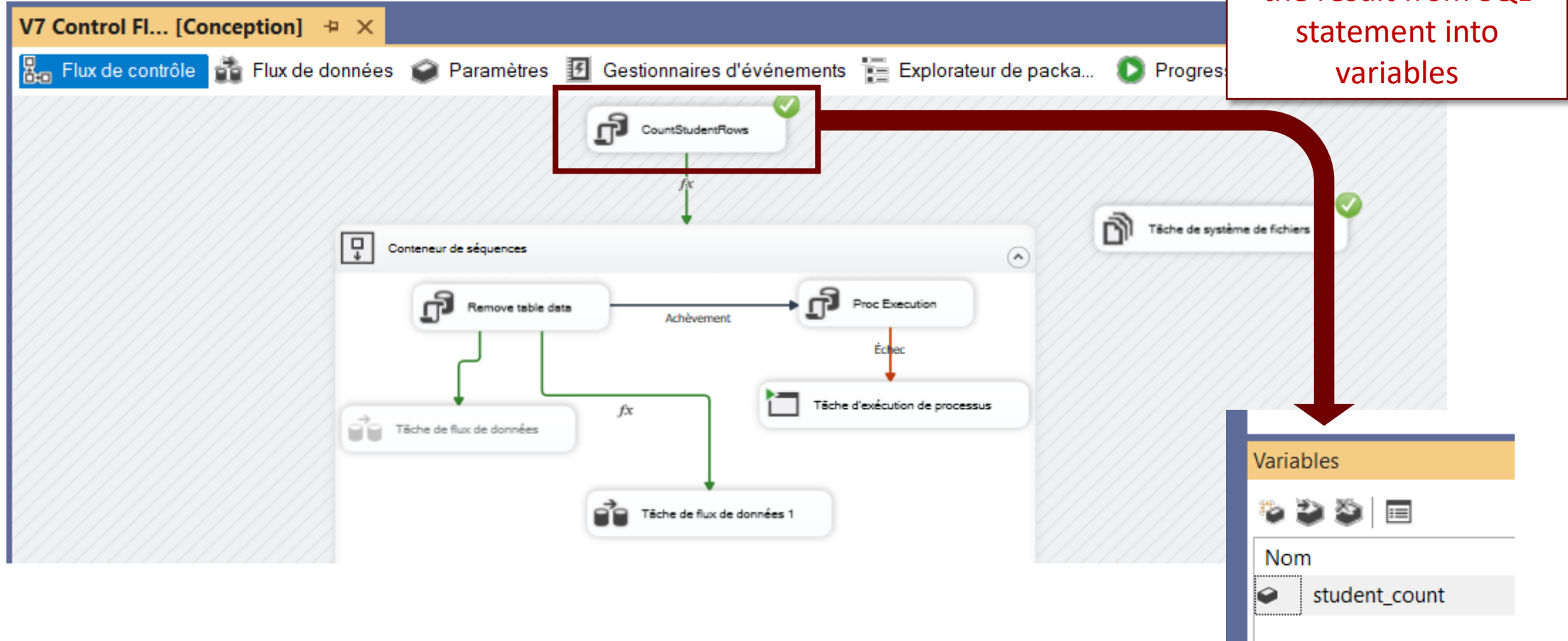
### Precedence constraint

Precedence constraints in SSIS define the order of execution between tasks, ensuring that certain tasks are executed only when specific conditions are met.

*Ex : Proc Execution is waiting for the Remove table data to end before making any changes*

## I.4) SQL Server Integration Services - Control Flow Task

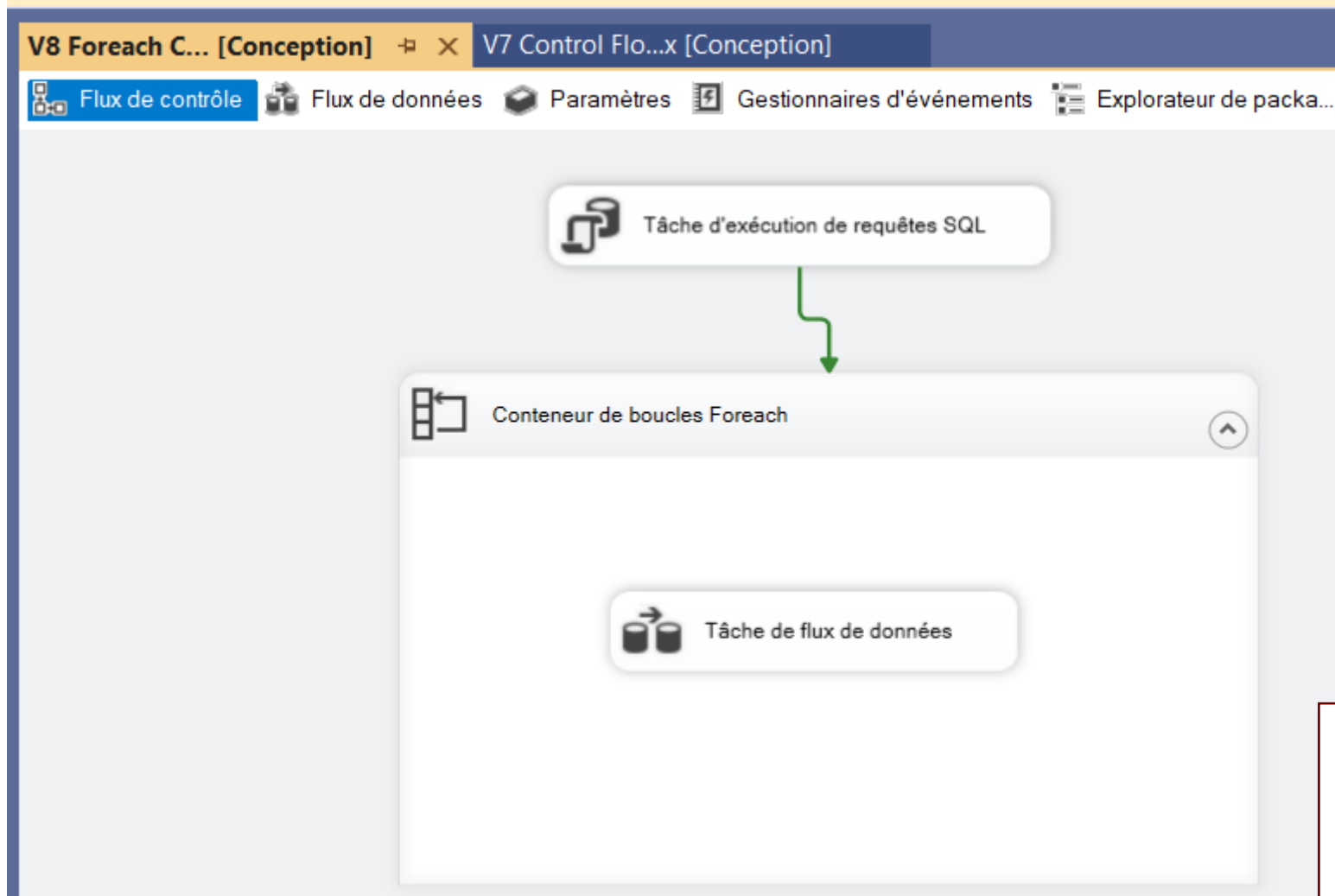
- Variables





## I.4) SQL Server Integration Services - Control Flow Task

- Variables, Expression and Precedence constraint



100 %

Results

Messages

	id	name	pseudo	fromfile
1	1	Makan	MK	students_20231030.txt
2	2	Jimmmy	Jim	students_20231030.txt
3	7	Yousra	Youss	students_20231030.txt
4	10	Anabelle	Anna	students_20231030.txt
5	11	Marc	Mc	students_20231030.txt
6	1	Makan	MK	students_20231031.txt
7	2	Jimmmy	Jim	students_20231031.txt
8	7	Yousra	Youss	students_20231031.txt
9	10	Anabelle	Anna	students_20231031.txt
10	11	Marc	Mc	students_20231031.txt

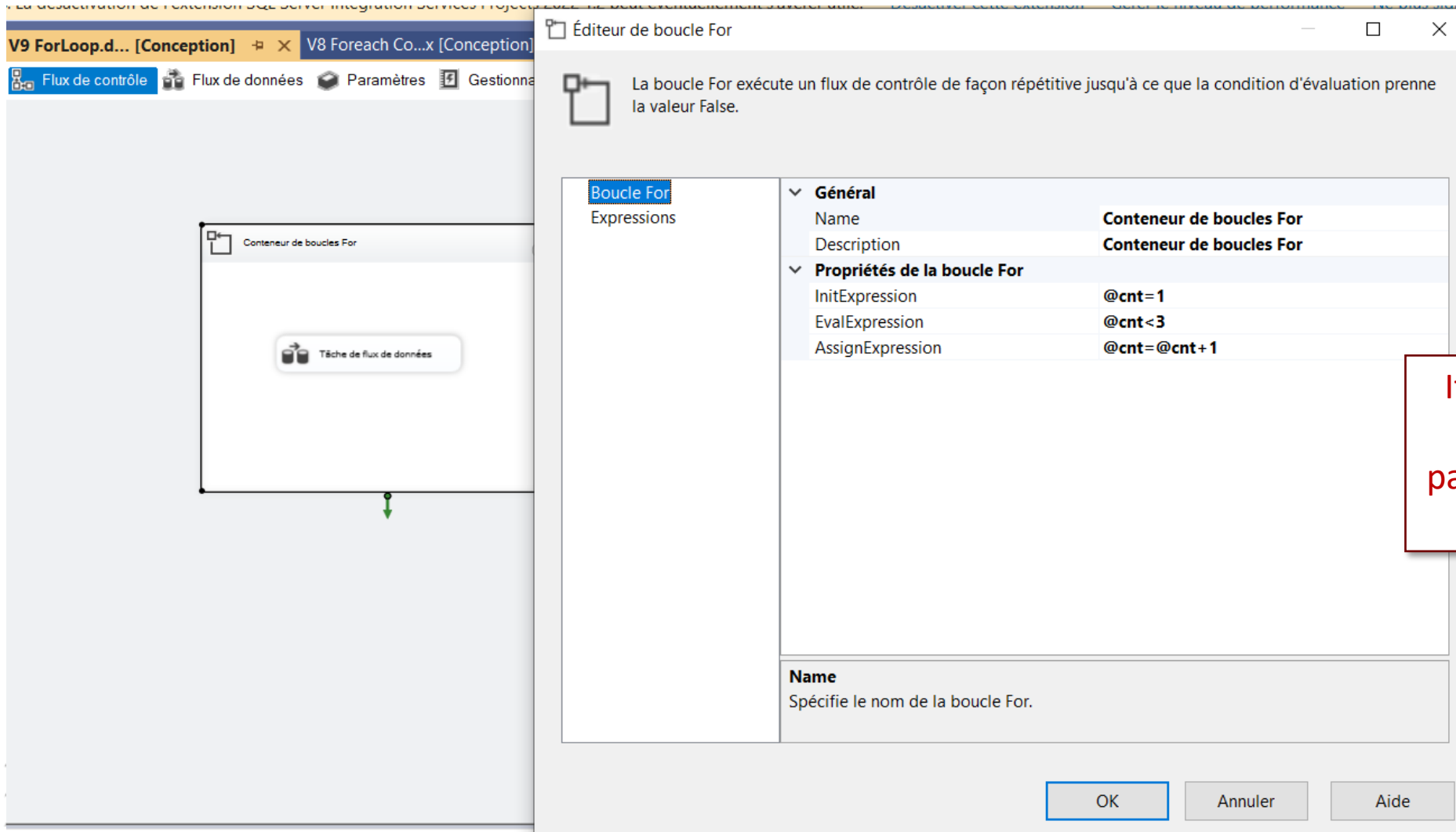
1<sup>st</sup> loop

2<sup>nd</sup> loop

It is possible to use loop in order to read files from a single folder in an easy way

## I.4) SQL Server Integration Services - Control Flow Task

- Variables, Expression and Precedence constraint



It is also possible to use loop until a particular condition is met



## I.5) Other functionalities

- Event handlers
- Blocking/non-blocking/Semi-Blocking
- Execute Package Task
- SQL Server Agent (Schedule Jobs)

