Here is another popular lab from Hands-On-Lab library: Slowly Changing Dimensions in SSIS.A dimension is considered to be a Slowly Changing Dimensions in SSIS when the attributes change over a period of time. The SCD are categorized based on the methodology of historical records maintenance. Slowly Changing Dimensions in SSIS transformation helps in achieving the maintenance of the history of the records based on the type of SCD. In this lab, we will learn about the different types of Slowly Changing Dimensions in SSISs and how to handle them. We will learn about SCD types in coming examples.Exercise 1: Slowly Changing Dimensions in SSIS Type 1 (Changing Attribute) Exercise 2: Slowly Changing Dimensions in SSIS Type 2 (Historical Attribute) Exercise 3: Slowly Changing Dimensions in SSIS Fixed AttributeSQLMaestros Hands-On-Labs enables the practical way of learning. Each lab document consists of multiple exercises and each exercise consists of multiple tasks. Apart from step-by-step instructions, the HOL document contains images, explanations, observations, notes, tips & tricks to ensure a great learning experience. With each lab, you can practice a specific concept step-by-step. With our HOL documents, you will get hands-on with hundreds of topics in SQL Server & Microsoft Data Platform. Learn More.Get weekly learning resources from SQLMaestros, right in your inbox. Subscribe to our Bulletins. The SSIS Slowly Changing Dimension transformation coordinates the inserting and updating of records in data warehouse dimension tables. This transformation supports four types of changes, and in this article, we will explain SSIS Slowly Changing Dimension Type 2 (also called SCD Historical attribute or SCD 2). SSIS Slowly Changing Dimension Type 2 (SCD 2): If you want to maintain the historical data of a column, then mark them as Historical attributes. If your Dimension table members (or Columns) are marked as Historical attributes, it will maintain the current record. And on top of that, it will create a new record with changing details. In real-time, the type of change provided by this SCD 2 or SSIS Slowly Changing Dimension Type 2 is beneficial. For example, if we want to maintain the Employees previous and current city or the Employees prior department and current department, we can mark these columns as Historical attributes. Before entering the example, let us see the data inside our Employees Dimension table. NOTE: Since SSIS Slowly Changing Dimension Type 2 is maintaining historical data, as the data grows, SCD will be challenging to maintain the data. The following screenshot will show you the data inside our [Employees] table. We will use this data for this SSIS SCD 2 or Slowly Changing Dimension Type 2 demo. You can get the same data by selecting the TOP 10 records from the [DimEmployee] table in the [AdventureWorksDW2014] database. The image below shows the data in the [EmployeeSource] table, we will update or insert these two records into the [Employees] table. If you observe the above screenshot, the Department Name of the EmployeeId (253022876) is different from the original value. It has changed from Marketing to Sales, We have a new record with EmployeeId 253022870. Our task is to insert the new record and update the Department Name of the second record. STEP 1: Open BIDS and Drag and drop the data flow task from the toolbox to control flow and name it SSIS Slowly Changing Dimension Type 2. Double-click on it will open the data flow tab. STEP 2: Drag and drop OLE DB Source, Slowly Changing Dimension from SSIS toolbox to data flow region STEP 3: Double-click on the OLE DB source in the data flow region. It will open the connection manager settings and provide space to write our statement. Here, we use the already created OLE DB Connection Manager and EmployeeSource table as the Source table. If you find any difficulty configuring, please refer to the OLE DB Source. STEP 4: Click on the columns tab to verify the columns. In this tab, we can uncheck the unwanted columns also. To use the OLE DB Source data, Please Drag & drop the blue arrow from the OLE DB Source to Slowly Changing Dimension Transformation to connect the data. SCD 2 STEP 5: Double-click the SSIS Slowly Changing Dimension transformation to work with SCD Type 2. Once you click on it, It will open Slowly Changing Dimension Wizard. The first page is a welcome page. If you dont want to see this page again, Please tick the checkbox Do not show this page again. For now, click Next. STEP 6: Select a Dimension Table and Keys: This page configures the Dimensional table information. Connection Manager: This option provides a connection to the Dimension table. Here we use the already created OLE DB Connection Manager, which connects to the database. You can change the connection manager settings by clicking the New button. Table or View: This option is useful for selecting the Data Warehouse Dimension table or View on which you want to operate. Here we are choosing the Employees table. Input Columns: Columns that are coming from the OLE DB Source. Dimension Columns: Columns that are available in the Employees Dimension table. Key Type: To perform SSIS Slowly Changing Dimension 2 or SCD 2, we need at least one Business key. Here, we know the Employee Alternative Key is the key column. Please change the Key type from Not a Key Column to Business key. STEP 7 Columns: This is the main page in this wizard to create SSIS SCD 2 or Slowly Changing Dimension type 2. Here we have Dimension Columns: All the columns in the Dimension table will be available in this section. Here you have to select the columns you want to choose for Change Type. From the below screenshot, you can observe that we are selecting the Birthdate, Login ID, and Department Name columns. Change Type: Select the change type. In this example, we keep the default Fixed attribute as the change type for the Birthdate and Login ID columns. We want to maintain the historical data for the Department Name. So we selected this as a Historical attribute. By default, the wizard assigns the Fixed attribute as the Change Type. But you can change them. STEP 8 Fixed and Changing Attribute Options: This page has two options, and we already explained the first option in the Type 0 article. We will disclose the second option in the next section. STEP 9 SSIS Slowly Changing Dimension Historical Attribute Options: We have to configure the following option to maintain the historical data. First, we will show you the configuration setting of the second option, and later we will show the other option. SSIS Slowly Changing Dimension or SCD Type 2 using Start Date and End Date: Please use the Use start and end dates to identify current and expired records option to use the Start and End dates. Start Date Column: Here, you must select the records starting date. For example, Employee Joining date or Production start date, etc. End Date Column: Here, you have to select the end date of the current record. From the below screenshot, you can observe that we selected the StartDate as the Start Date Column and EndDate as the End Date Column. The container starting time is the Starting date of the newly inserted record. Variable to set date values: Please specify the value that will appear for the expired records. Click OK to finish the SCD 2 or SSIS Slowly Changing Dimension Type 2 package design and let us run the package. Lets open the Management Studio and check the results. If you observe the below records, our SSIS Slowly Changing Dimension Type 2 package Added New record of Employee Alternative key 253022870. Set the End date Employee Alternative key 253022876 and Added New record for Employee Alternative key 253022876 with updated department name. Let us see what will happen when we check the Use a single column to show current and expired records option for SSIS Slowly Changing Dimension Type 2: Column to indicate current record: Please specify the column name for current and expired records. Here we are selecting the Status column Value when Current: Here, you must specify the value that will appear for the current records. End Date Column: Here, you have to specify the value that will appear for the expired records. Click OK to finish the SCD 2 or SSIS Slowly Changing Dimension Type 2 package design and let us run the package. Lets open the Management Studio and check the results. If you observe the below records, our SSIS Slowly Changing Dimension Type 2 package Added New record of Employee Alternative key 253022870. Set the Status as Expired for the Employee Alternative key 253022876 and Added New record for Employee Alternative key 253022876 with updated department name and set the status as Current. Introduction Hello Folks, Hope you are doing good, welcome you to our #MSBI tutorial site where you will get all msbi resouces, like videos, self-learning training materials, articles and so on. Little Introduction : . I'm Gurunatha Dogi a trainer @Questpond, #Questpond is an e-learning firm since 2004 founded by Mr. ShivPrasad Koirala and his team. This site is authorized or run by Questpond. Our vision is simple just to spread technical knowledge. We take offline and Online tranings, we also provide self-learning materials like Source code, step by step learning Videos (Recorded by ShivPrasad and his team). For more information log on to questpond website or feel free to contact us in below mentioned details. In todays article we will learn SCD - Slowly Changing Dimension with an example in SSIS. What is Dimension Table Before we straight away go and understand SCD let's first understand word "Dimension" or "Dimension Table". Dimension Table is a simple master table (master table can be country master, city master, currency master, language master, product master and so on). So when we say Dimension Table then is it known as Master Table. Or it can also defined as a Table which does not frequently updated are known as Dimension Table. "Dimension Table" a word widely used in OLAP (Online Analytical Programming) techniques i.e in Star Schema or in Snowflakes but for understanding it is nothing a simple master table which does not changes frequently. So hey folks hope you understood. Now let's understand SCD What is SCD - Slowly Changing Dimension SCD or Slowly Changing Dimension is one of the component of SSIS toolbox. This component is used if you want insert or update data records in dimension tables. Simplest explanation can be it compares incoming source data with existing destination dimension table data using a Business Key (Unique Key). If no record matches then it will treat as New Record or If record matches then it compares attributes for changed attributes if data looks updated then it updates record or if not then it leaves as it is unchanged. Slowly Changing Dimension checks attributes for three scenarios New, Changed or UnChanged records as we just discussed above. Why Name is Slowly Changing Dimension It means we have to use this component only on those tables which are not frequently updated. This was reason why i have explained you about Dimension Table at start of this article. As name says we have to use this component only to Dimension Table which are not updated frequently. Note : Do not apply this component on to the table which changes frequently because this component get slow on frequently changes table. As name says we need to apply this component only on those dimension tables which changes slowly. Let's do this slowly changing component to it So let's do this example step by step Step 1 Create a new SSIS Integration Service Project -> On control flow tab drag and drop Data Flow Task. All these steps are very similar what we in our third article. Step 2 Open up SQL Server Management Studio and create a new table and some data to it why because we want to update existing matching data with source data as shown in below image. Step 3 We will create a simple TXT file as a source with currency data with same fields as shown in below image. Step 4In this step we will match our both source and Dim Table data just to know which data will be updated, inserted and unchanged as shown below image. As you see we have one row i.e. Business Key 1 which will be unchanged and Business Key 2,3,4 will be updated as currency values and finally rest remaining business keys will be inserted. Step 5 So folks now you all know which data will be updated, inserted and updated now the same let's implement in practical way.Go to our data flow tab and drag and drop Flat File Source and configure our txt file as shown in below image. Step 6 Since data coming from TXT source we will need to conversion why because our destination data warehouse columns have data-types like money, INT so to apply same data-type we will use SSIS data conversion component. After configuring Flat source file now drag and drop data conversion component and configure it with their respective data-types as shown in below image. Step 7 Now its time to drag and drop SCD component from SSIS toolbox so just drag and drop SCD and attach it with data conversion component as shown in below image. Now right click and do edit on SCD and configure the moment you right click a wizard will prompt so we need to follow that steps. Do next to go to next step. Now click on New Button to create new connect manager. The moment you click on new button it show you your SQL Server Server name as shown in below image. Click on OK button and now below there is a drop down on Table view just select DimCurrency Table. The moment you select DimCurrency Table below it will display column names this DimCurrency Table wherein you need to match these columns with Incoming Source columns (Flat File Source Columns) i.e in Input columns and in the key type for one column in our case CurrencyID need to choose key-type as business key. For reference please check below image. Finally if all done then click on Next button. Step 8 Here in this step you need to select any one attribute if you think that any particular column will be fixed (It will not update any time) then choose Fixed attribute for that column OR if any column data will change periodically then choose either Changing Attribute or Historical Attribute if you want to maintain history of previous changed records then only choose Historical Attribute but most of the cases choose Changing Attribute (No history is maintained). With the use of Changing Attribute we can update any column data any time. So select that an move to next step. In next step do not any thing just click on next button. In next step just un-check (Enable inferred member support) click on next button and finish it. Step 9 The moment you click on finish button wizard will automatically updates our data flow tab with two new component i.e OLEDB Insert destination and OLEDB command. if you want to know more about OLEDB command then refer our previous article. OLEDB Insert destination : To insert new records..OLEDB command : To update existing records. If you these both components were configured automatically you don't need to do it. Thanks to SCD wizard. If you want to know more steps to configure OLEDS command then refer our previous article and Update Data Table using Merge Join in SSIS Step 10 Finally we all done now its time to run this project. So hey guys if you see we have updated records and inserted new records successfully. As you saw above images we have successfully executed the project. I hope you have understood this article if you have doubts feel free to contact us. Thank you...! There are three types of SCD: Type 1 Fixed attribute. (can return error, if is updated)Type 2 Changing attribute. (overwrites an old record)Type 3 Historical attribute. (previous values are saved and marked as outdated) In this example I'll be using tblEmployees as a OLTP / source table. This table will be updated and the updates will be sent to DimEmployees. This table is a part of the Data Warehouse. code to create the tables:IF EXISTS (SELECT * FROM dbo.sysobjects WHERE id = OBJECT_ID(N'tblEmployees') AND OBJECTPROPERTY(id, N'IsUserTable') = 1)CREATE TABLE tblEmployees(EmpId int, FirstName varchar(50), LastName varchar(50), JobTitle varchar(50))insert into tblEmployees values(100, 'Thomas', 'Allbutt', 'Software Engineer')insert into tblEmployees values(101, 'Carl', 'Bigfoot', 'Junior DBA')insert into tblEmployees values(102, 'Shayma', 'Cupper', 'BI Developer')insert into tblEmployees values(103, 'Radim', 'Koller', 'Sales Representative')insert into tblEmployees values(104, 'Adam', 'Klein', 'Marketing Manager')IF EXISTS (SELECT * FROM dbo.sysobjects WHERE id = OBJECT_ID(N'DimEmployee') AND OBJECTPROPERTY(id, N'IsUserTable') = 1)CREATE TABLE DimEmployees(Id identity, EmpId int, FirstName varchar(50), LastName varchar(50), JobTitle varchar(50), StartDate datetime, tblEmployees (EmpId) serves as a Business key and can be link to DimEmployees (EmpId).LastName column will be set up as Changing Attribute. (changes will be overwritten.)JobTitle column will be a Historical Attribute. (changes will be saved and marked using EndDate column to identify outdated records)As a source table I am using tblEmployees (OLE DB Source). Next task will be Slowly Changing Dimension from Common. Double click on SCD to configure it. Add a destination / target table DimEmployees. Select a dimension table to load and map columns in the dimension table. All we need to do here is mark the Business key. Select a change type for slowly changing dimension columnsFirstName will be fixed attribute, means this record should not change at all.LastName is a Changing attribute, when tblEmployees will be updated, DimEmpoyees record will be updated. JobTitle is a Historical attribute, if any change occurs, after the Package execution there will be a record about it in the EndDate column.Using StartDate and EndDate columns to identify current and expired records.Variable to set date values: using system variable StartTime to set the values in the StartDate col.Finish the configuration and execute the package. It will insert all the records for source table tblEmployees to destination DimEmployees.Updating record with Changing Attribute. I am going to update record EmpId 101, to change the LastName to "von Banhoff" in tblEmployees table. Then I will run the package and record in DimEmployees will be automatically updated.set LastName = 'von Banhoff'Updating Historical Attribute JobTitle. First I run the update statement in SQL server.set JobTitle = 'Senior DBA'After that I will run the SSIS package. New record will be loaded and the expired record will be marked with a date time entry.

Ssis slow change dimension. Ssis slowly changing dimension. Ssis slowly changing dimension type 1 example.