Importing and Exporting Data

Module Overview

- Introduction to Transferring Data
- Importing and Exporting Data
- Copying or Moving a Database

Transferring Data

- Overview of Data Transfer
- Available Tools for Data Transfer
- Improving the Performance of Data Transfers
- Disabling and Rebuilding Indexes
- Disabling and Enabling Constraints

Overview of Data Transfer

ETL:

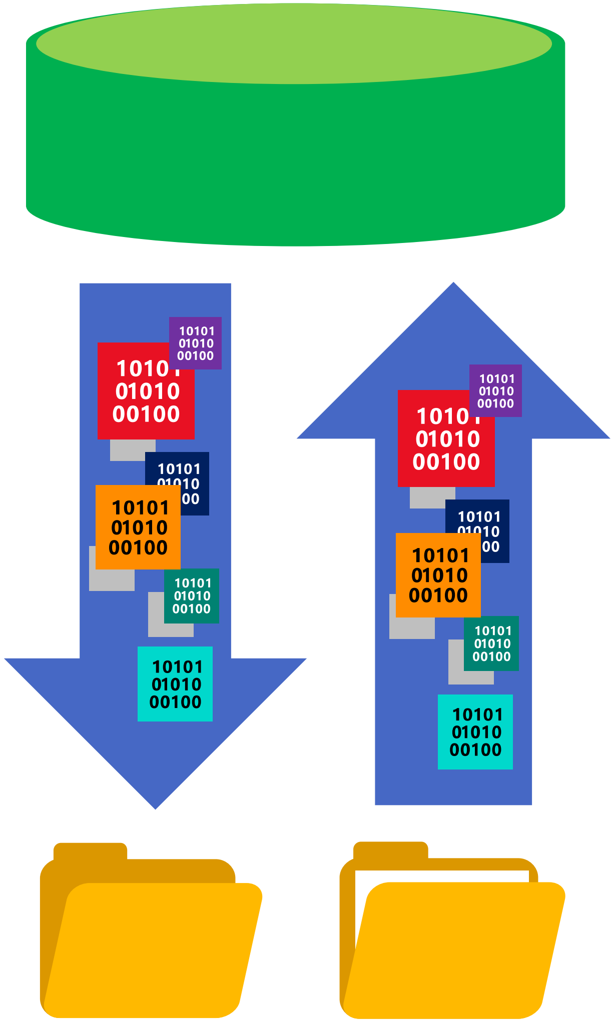
Extract > **T**ransform > **L**oad

Scenarios:

- Copying or moving between servers
- Exporting query data to a file
- Importing table data from a file
- Transforming and restructuring data

Available Tools for Data Transfer

- Import and Export Wizard
  - SQL Server Integration Services
- Bulk Copy Program
- BULK INSERT
- OPENROWSET(BULK)



Improving the Performance of Data Transfers

- Disable constraints, indexes, and triggers:
  - No need to check constraints as each row is loaded
  - Indexes don’t need to be maintained during import
  - Important to check business requirements before disabling triggers
- Minimizing locking:
  - Consider the use of TABLOCK to speed up the import
- Minimizing logging:
  - Database must be in BULK_LOGGED or SIMPLE model
  - Additional requirements on table structure and locking

Disabling and Rebuilding Indexes

- Disabling an index:
  - Prevents user access to the index
  - Prevents access to the data if it is a clustered index
  - Keeps index definition in metadata
  - Speeds up data import in tables

- Enabling an index:
  - Rebuilds the index entirely
  - Is easy to automate because the metadata is still present

- Enabling and disabling indexes is an alternative to dropping and recreating indexes for bulk imports

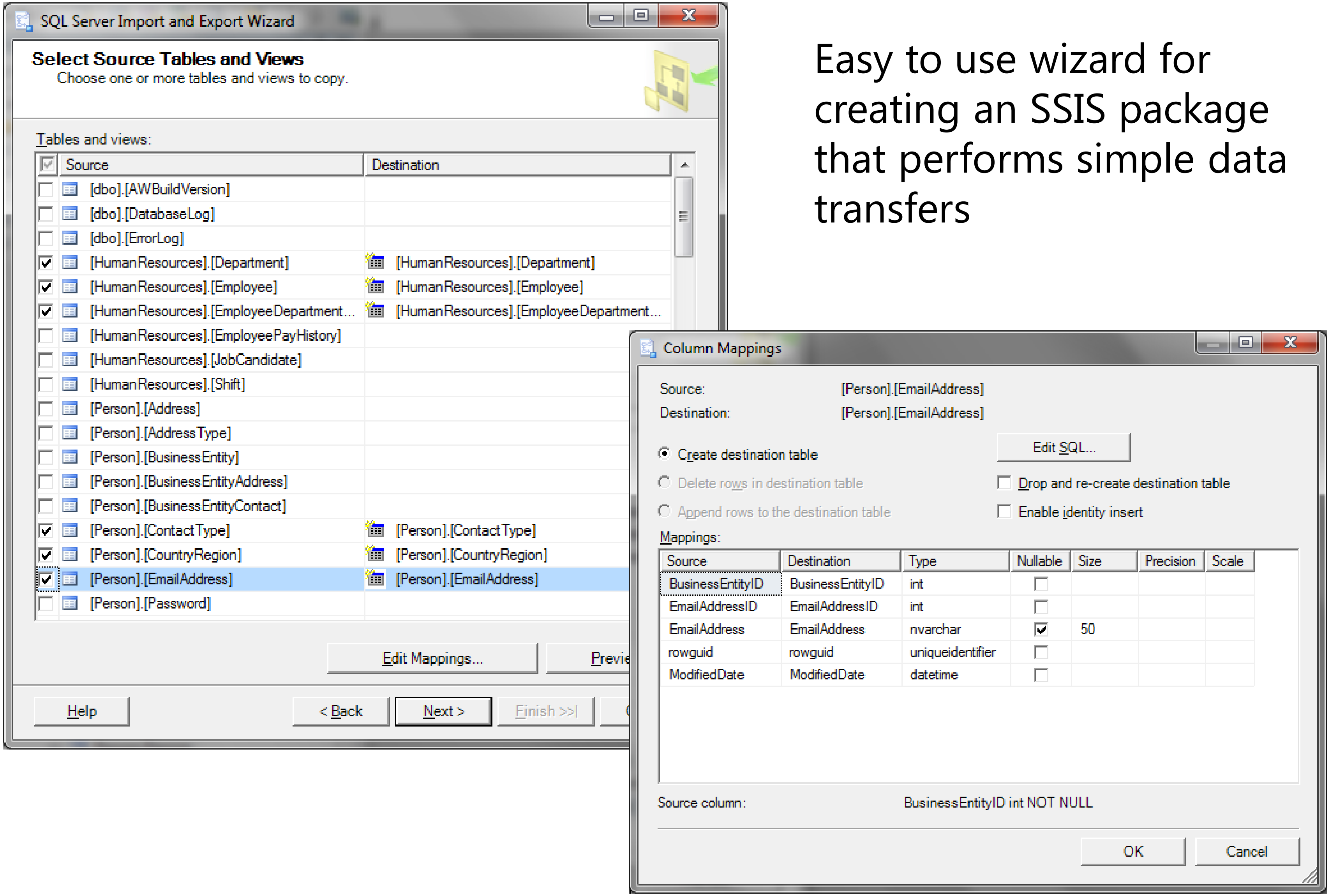
Disabling and Enabling Constraints

- Disabling PRIMARY KEY and UNIQUE constraints:
  - Achieved by disabling the associated index
  - Causes associated indexes to be rebuilt when enabled
  - Can cause failures during re-enabling if duplicate values exist
  - Causes associated foreign key constraints to be disabled
- Disabling FOREIGN KEY and CHECK constraints:
  - Performed directly on the constraint
  - Causes existing data to be unverified when re-enabled

Importing and Exporting Data

- The SQL Server Import and Export Wizard
- Demonstration: Using the Import and Export Wizard
- The bcp Utility
- Demonstration: Using the bcp Utility
- The BULK INSERT Statement
- Demonstration: Using the BULK INSERT Statement
- The OPENROWSET Function
- Demonstration: Using the OPENROWSET Function

SQL Server Import and Export Wizard



SQL Server Import and Export Wizard

Select Source Tables and Views

Choose one or more tables and views to copy.

Tables and views:

☑	Source	Destination
□	[dbo].[AWBuildVersion]	
□	[dbo].[DatabaseLog]	
□	[dbo].[ErrorLog]	
☑	[HumanResources].[Department]	[HumanResources].[Department]
☑	[HumanResources].[Employee]	[HumanResources].[Employee]
☑	[HumanResources].[EmployeeDepartment...	[HumanResources].[EmployeeDepartment...
□	[HumanResources].[EmployeePayHistory]	
□	[HumanResources].[JobCandidate]	
□	[HumanResources].[Shift]	
□	[Person].[Address]	
□	[Person].[AddressType]	
□	[Person].[BusinessEntity]	
□	[Person].[BusinessEntityAddress]	
□	[Person].[BusinessEntityContact]	
☑	[Person].[ContactType]	[Person].[ContactType]
☑	[Person].[CountryRegion]	[Person].[CountryRegion]
☑	[Person].[EmailAddress]	[Person].[EmailAddress]
□	[Person].[Password]	

Column Mappings

Source: [Person].[EmailAddress]

Destination: [Person].[EmailAddress]

● Create destination table

○ Delete rows in destination table

○ Append rows to the destination table

□ Drop and re-create destination table

□ Enable identity insert

Mappings:

Source	Destination	Type	Nullable	Size	Precision	Scale
BusinessEntityID	BusinessEntityID	int	□			
EmailAddressID	EmailAddressID	int	□			
EmailAddress	EmailAddress	nvarchar	☑	50		
rowguid	rowguid	uniqueidentifier	□			
ModifiedDate	ModifiedDate	datetime	□			

Source column: BusinessEntityID int NOT NULL

Easy to use wizard for creating an SSIS package that performs simple data transfers

Demonstration: Using the Import and Export Wizard

In this demonstration, you will see how to:

- Use Import and Export Wizard to export data

The bcp Utility

- Command line tool to import and export data

```
bcp AdventureWorks.Sales.Currency out
        D:\Currency.csv –S MIA–SQL –T –c –t , –r \n
```

- Use format files to define data schema
  - Create a format file:

```
bcp AdventureWorks.Sales.Currency format nul
        –S MIA–SQL –T –c –t , –r \n –x –f D:\CurrencyFmt.xml
```

  - Use a format file:

```
bcp Finance.dbo.Currency in
        D:\Currency.csv –S MIA–SQL –T –f D:\CurrencyFmt.xml
```

Demonstration: Using the bcp Utility

In this demonstration, you will see how to:

- Use bcp to create a format file
- Use bcp to export data

The BULK INSERT Statement

- Provides options similar to bcp
- Runs in the SQL Server process
- Has CHECK_CONSTRAINTS and FIRE_TRIGGERS options
- Can be executed in a user-defined transaction

```
BULK INSERT AdventureWorks.Sales.OrderDetail
   FROM 'F:\orders\neworders.txt'
   WITH
      (
         FIELDTERMINATOR =',',
         ROWTERMINATOR ='\n'
      );
GO
```

Using the BULK INSERT Statement

In this demonstration, you will see how to:

- Use the BULK INSERT statement to import data

The OPENROWSET Function

- Import rows from a data file based on a format file

```
INSERT INTO dbo.Accounts
  SELECT * FROM OPENROWSET (BULK 'D:\Accounts.csv',
  FORMATFILE = 'D:\AccountsFmt.xml') AS rows;
```

- Import a file as a BLOB into a single column/row

```
INSERT INTO dbo.AccountsDocuments
            (FiscalYear, Document)
  SELECT 2013 AS FiscalYear,
       * FROM OPENROWSET(BULK
                       'D:\SignedAccounts.pdf',SINGLE_BLOB)
                                   AS Document;
```

Using the OPENROWSET Function

In this demonstration, you will see how to:

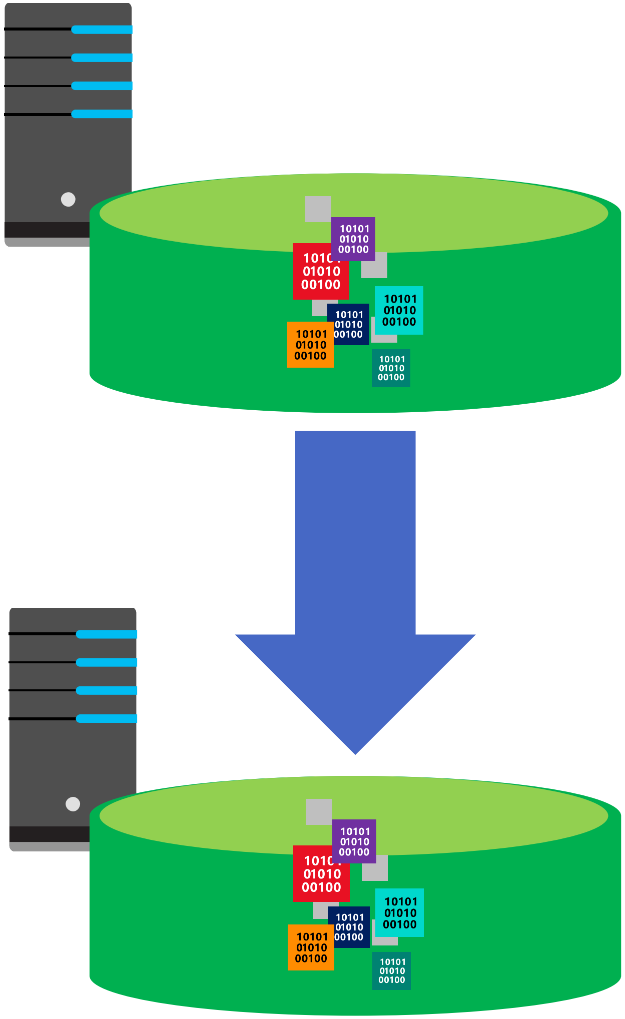
- Use the OPENROWSET function to import data

Copying or Moving a Database

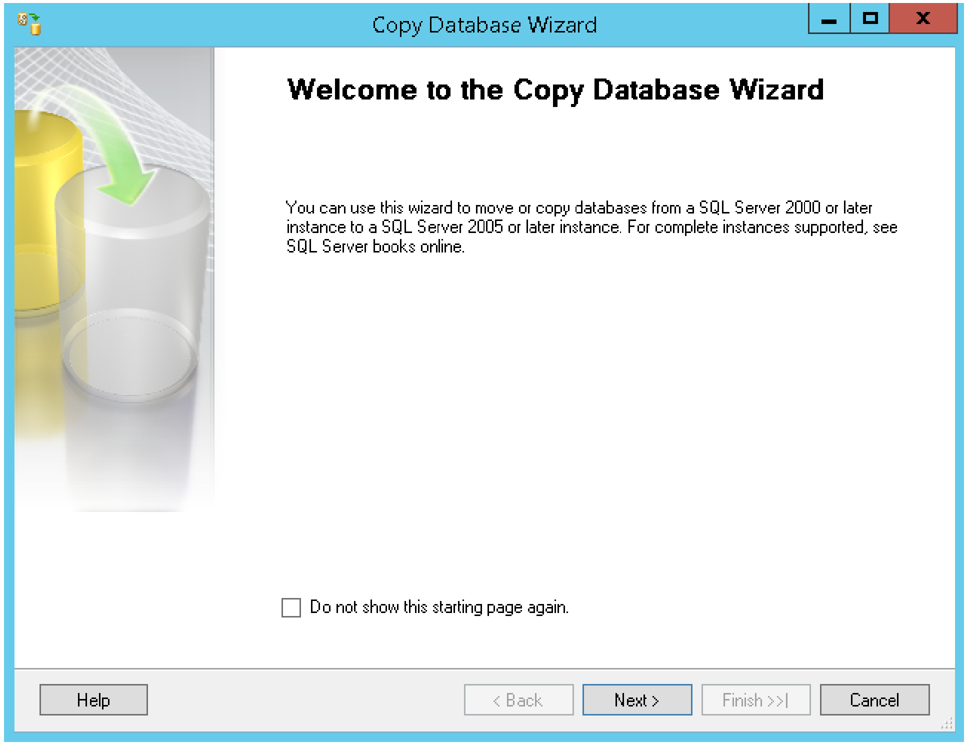
- Options for Copying or Moving Databases
- The Copy Database Wizard
- Demonstration: Using the Copy Database Wizard
- Data-Tier Applications
- Demonstration: Exporting and Importing a Data-tier Application

Options for Copying or Moving Databases

- Detach and attach
- Backup and restore
- The Copy Database Wizard
- Data-tier applications



The Copy Database Wizard


Copy Database Wizard

Welcome to the Copy Database Wizard

You can use this wizard to move or copy databases from a SQL Server 2000 or later instance to a SQL Server 2005 or later instance. For complete instances supported, see SQL Server books online.

☐ Do not show this starting page again.

- Copies the database and all dependent objects
- Two options for copy:
  - Detach and attach
  - Script new objects transfer

Demonstration: Using the Copy Database Wizard

In this demonstration, you will see how to:

- Use the Copy Database Wizard

Data-Tier Applications

- Data-Tier Applications (DACs) are a unit of deployment and management
  - Database
  - Dependent server objects
- Developers can create DACs in Visual Studio
  - Packaged as a .dacpac file
- DBAs can create DACs from an existing database
  - Extract a database to a .dacpac file
  - Export a database and its data to a .bacpac file
- DBAs can create databases and dependent objects from DACs
  - Deploy .dacpac files
  - Import .bacpac files

Demonstration: Exporting and Importing a Data-tier Application

In this demonstration, you will see how to:

- Export a data-tier application
- Import a data-tier application

Lab: Importing and Exporting Data

- Exercise 1: Using the SQL Server Import and Export Wizard
- Exercise 2: Using the bcp Utility
- Exercise 3: Using the BULK INSERT Statement
- Exercise 4: Using the OPENROWSET Function

SQL Server DBA Exercises-4

Export & Import Data

1. Using the export and import wizard, export the Products table to a csv file in c:\Data\Prod.CSV

2. Using the export and import wizard, export the orders table to a tab separated text file called c:\Data\Orders.TXT

3. Create a new and empty database called TEST_IMP

4. Create two empty tables: Products and Orders in the database by using the SELECT INTO command and the NORTHWIND tables.

5. Using BCP utility, import from Prod.CSV to the Products table in TEST_IMP database

6. Using BULK INSERT, import Orders.txt to Orders table in TEST_IMP database

7. Open Paint application and draw a flower. Save it as flower.bmp
Create a table with a VARBINARY (max) column in TEST_IMP database
Using the OPERROWSET function, upload the flower.bmp to this table.