Capgemini

ABAP Part I

Lesson 07: DDIC - II

Lesson Objectives

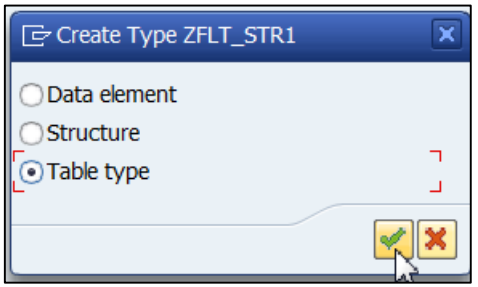
After completing this lesson, participants will be able to work with-

- Table Types
- Structures
- Views
- Search Help
- Lock Objects
- Pool Tables and Cluster Tables

Table Types

Defines the structure of an Internal Table in ABAP

Commonly used in ABAP Programs



Demo

Create a Table Type

Structures

Structures

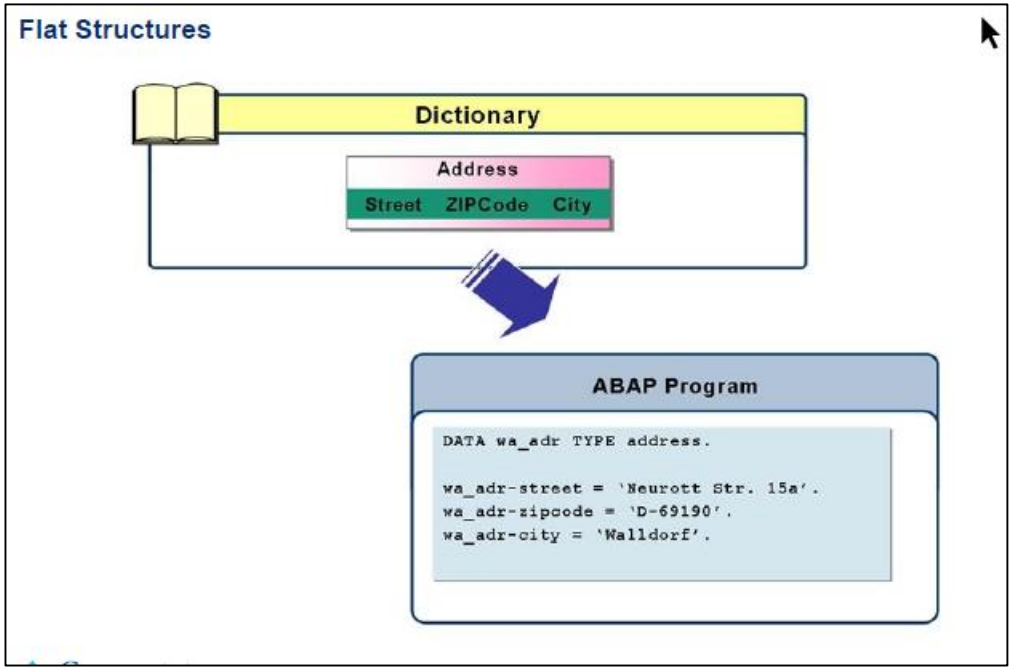
- Contains Fields
- User Defined Data Type
- Fields can refer to
  - An elementary data type
  - Another structure
  - Table type
- Types :
  - Flat Structures
  - Nested Structures
  - Deep Structures

Structures (Contd.).

Flat Structure

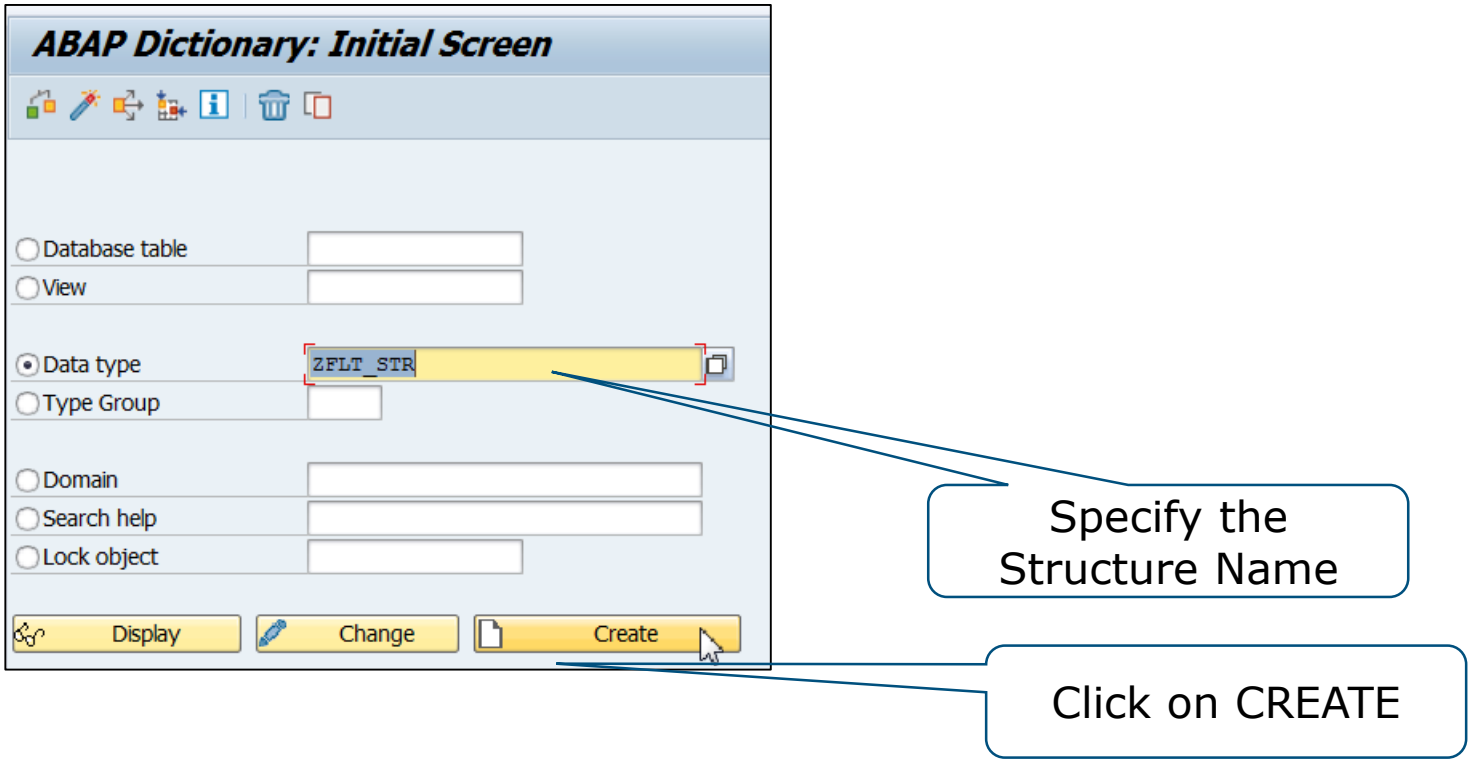
- In database Tables only Flat Structures can be included

Field A	Field B

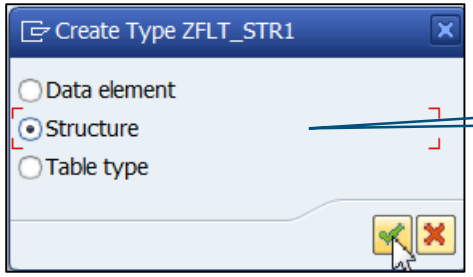


Structures

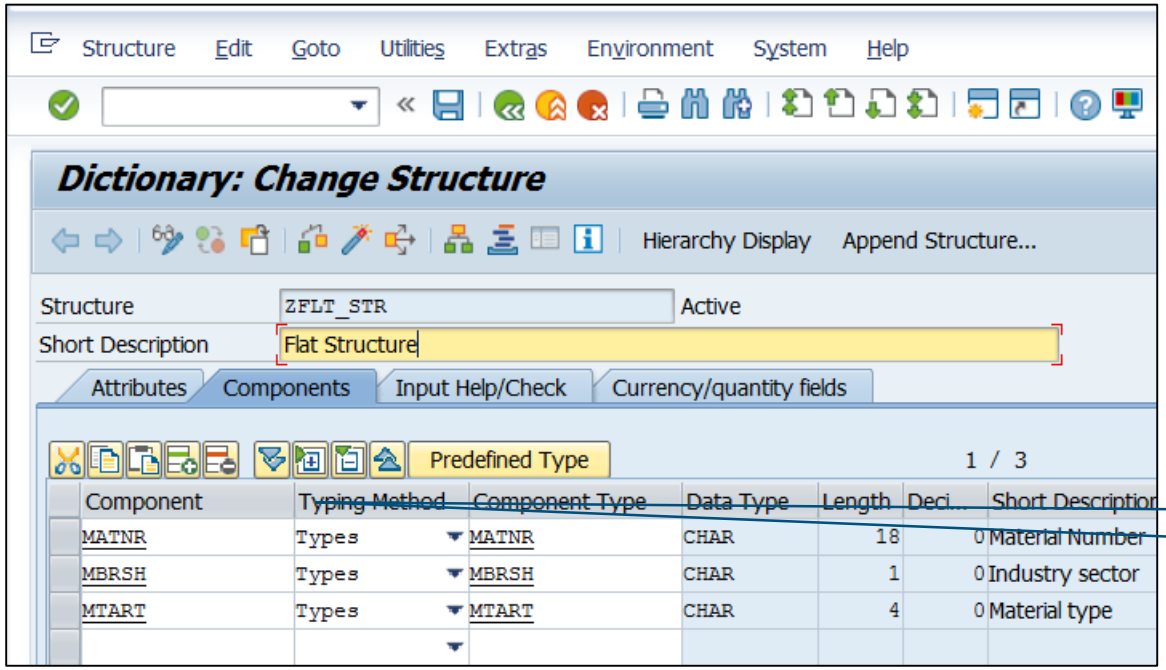
Create a Structure



Structures



Choose Structure



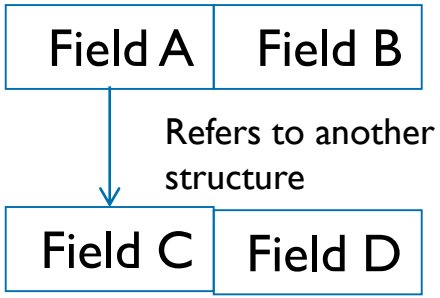
Specify the fields of a Structure

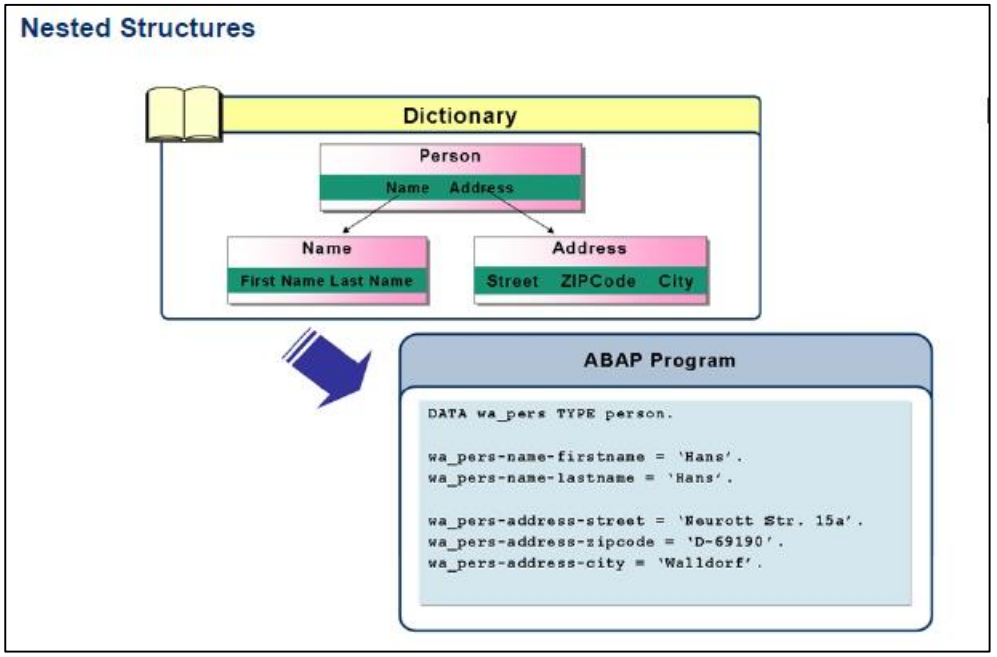
Demo

Create a Flat Structure

Structures (Contd.).

Nested Structure



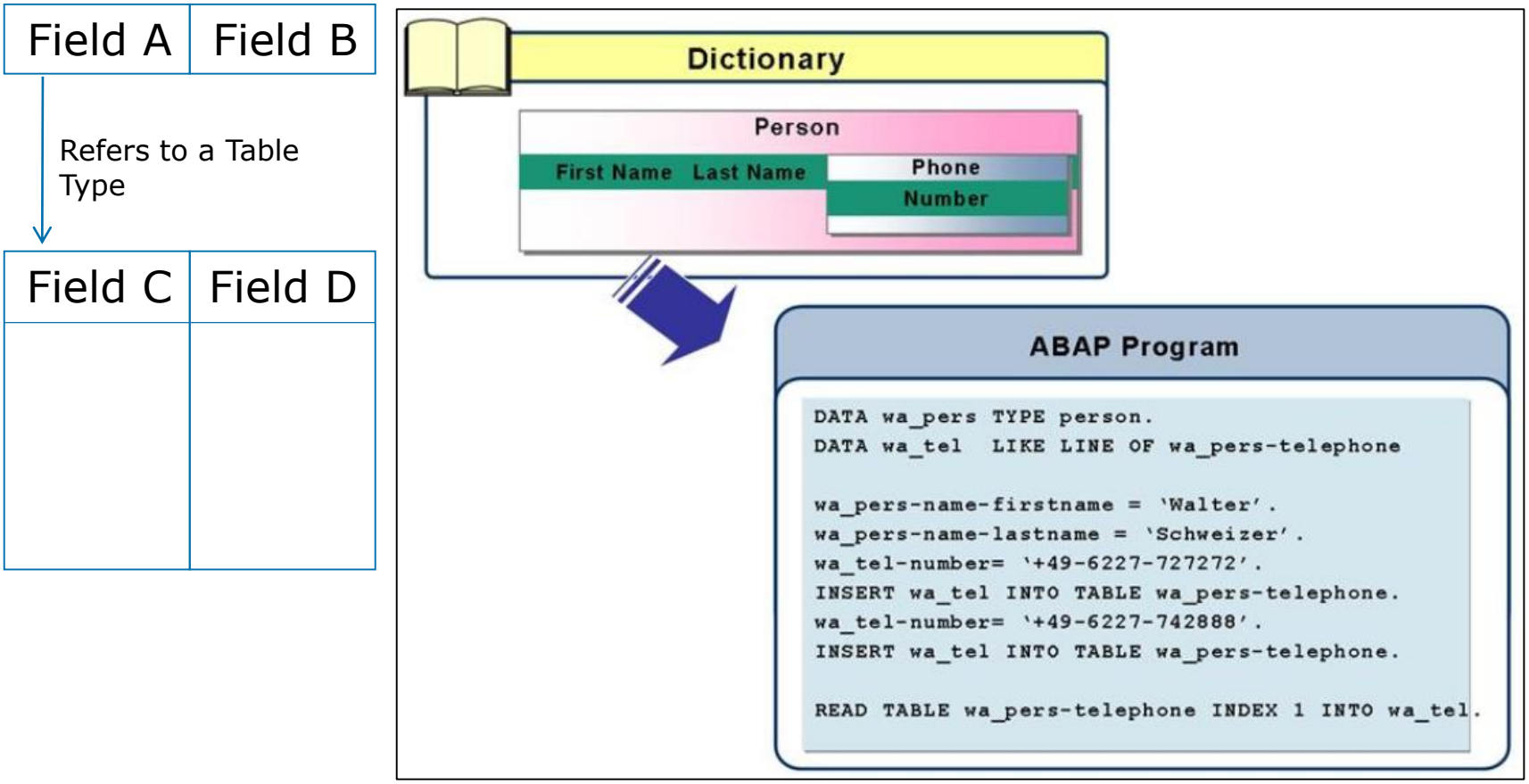


Demo

Create a Nested Structure

Structures (Contd.).

Deep Structure



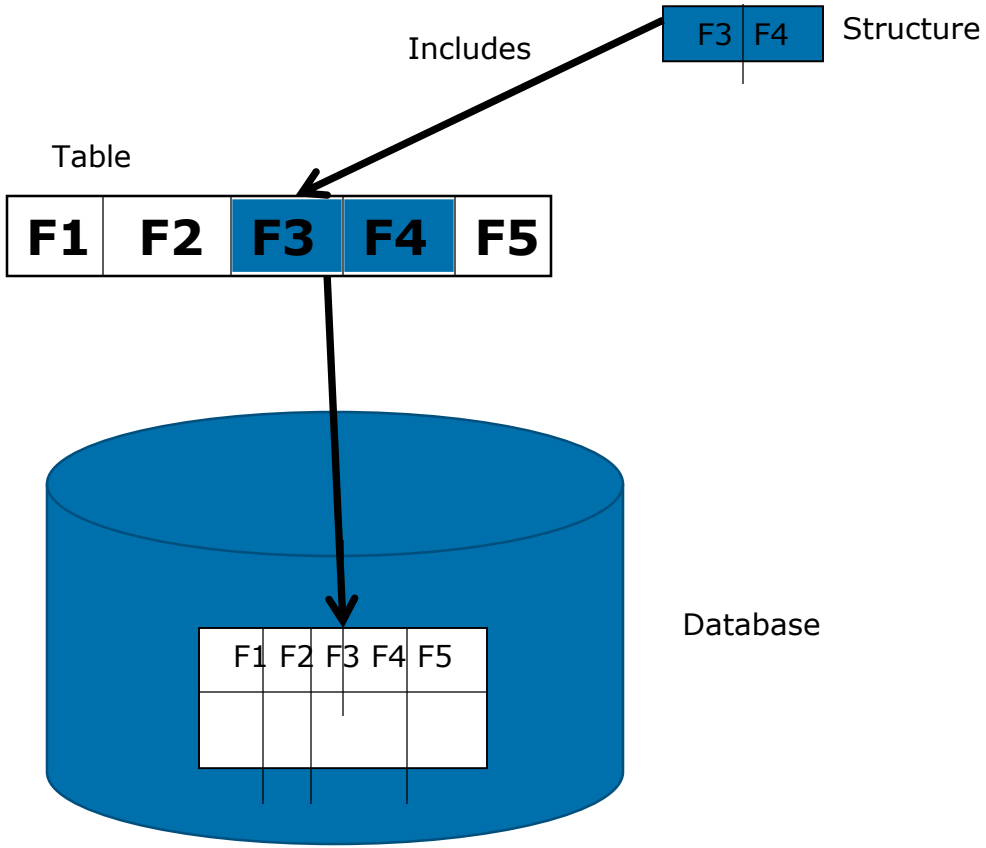
Demo

Create a Deep Structure

Structures (Contd.).

Includes

- To add fields of another structure in Tables or Structures



Structures (Contd.).

Only Flat Structures can be included

A Structure can be included more than once

The field name of the structure should not be longer than 16 places

Modifying Standard Tables

Add fields to Standard Tables Using

- Append Structures
  - Structure included in Single Table
- Customizing includes
  - Structure can be included in multiple Tables
  - Is already integrated into SAP tables by SAP
  - The customer fills it with the desired additional fields

Append Structures

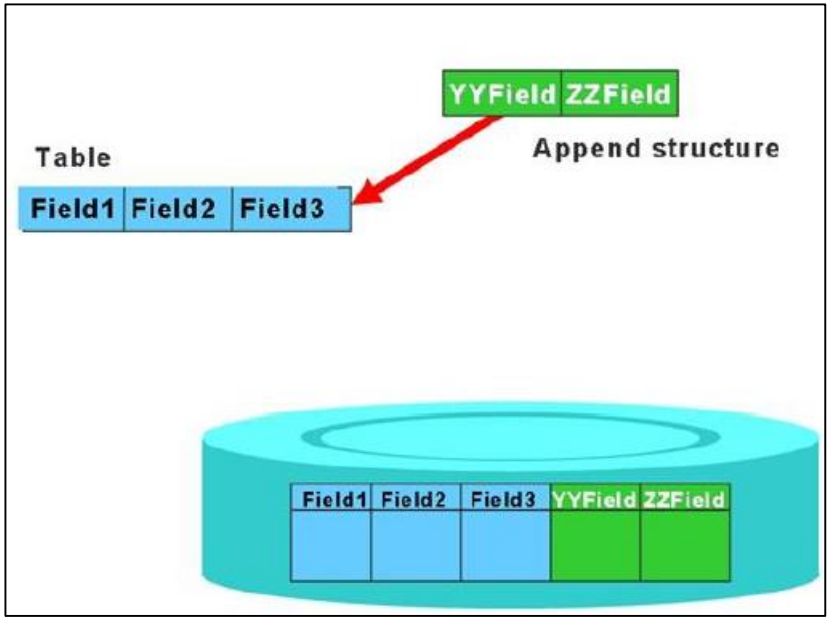
Append Structures

- Used for Table Enhancement
- To Insert New Fields into Tables
- Structure that is assigned to exactly one table
- Created in customer namespace
  - Field Names begin with YY or ZZ
    - Above is Applicable for Standard SAP Tables
- Customers can create an append structure for an SAP table (without SAP preparation)
- Multiple append structures can be used with a single SAP table

Append Structures

Append structures allow you to attach fields to a table without the need to modify the table itself.

If you copy a table that has an append structure attached to it, the fields in the append structure become normal fields in the target table



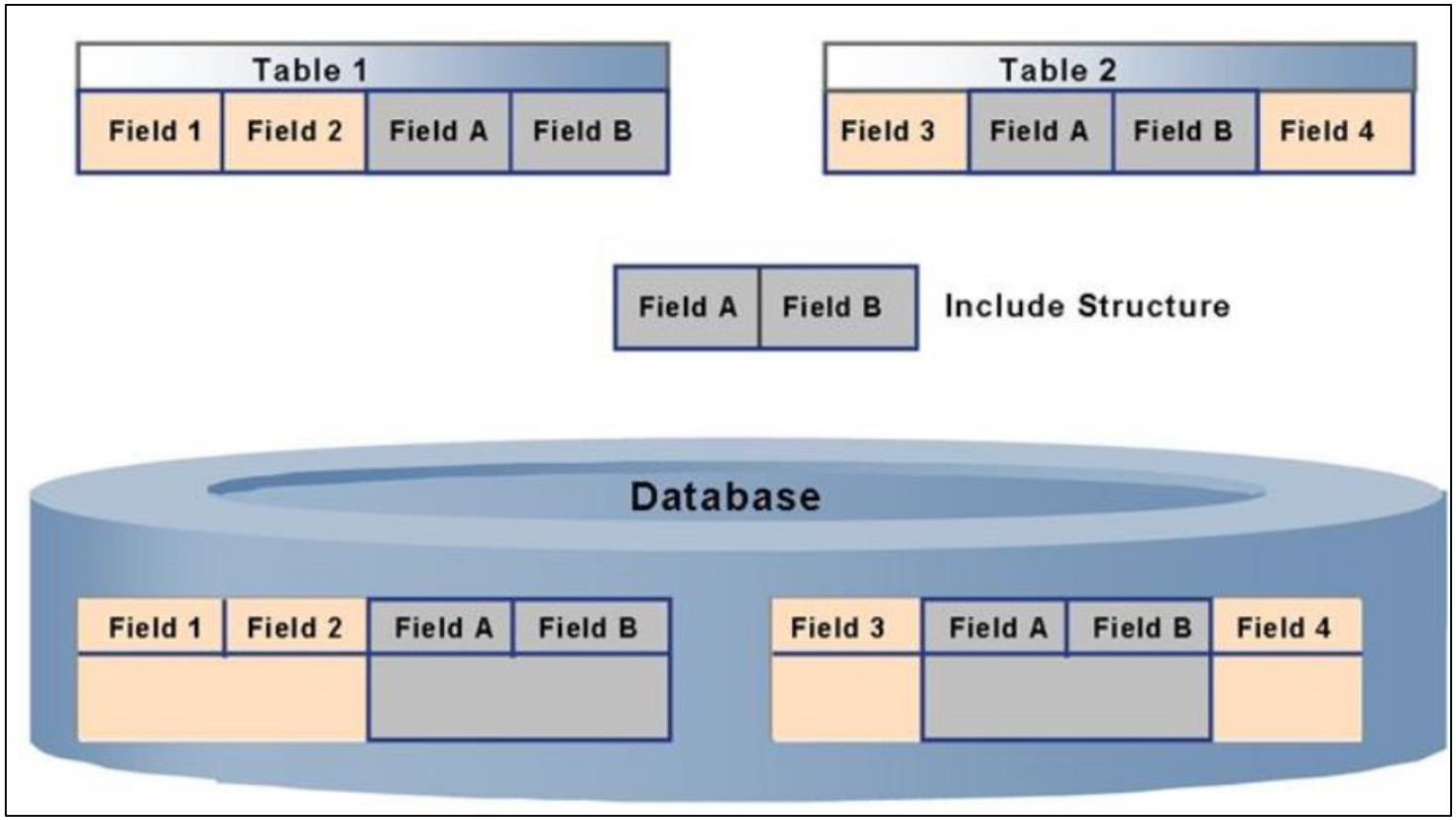
Demo

Create an Append structure on a table created

Customizing Includes

Structure Satisfying a Special Naming Convention CI_

Can be included in Several Tables



Customizing Includes

Some of the tables and structures delivered with the R/3 standard contain special include statements: These are known as **Customizing includes**

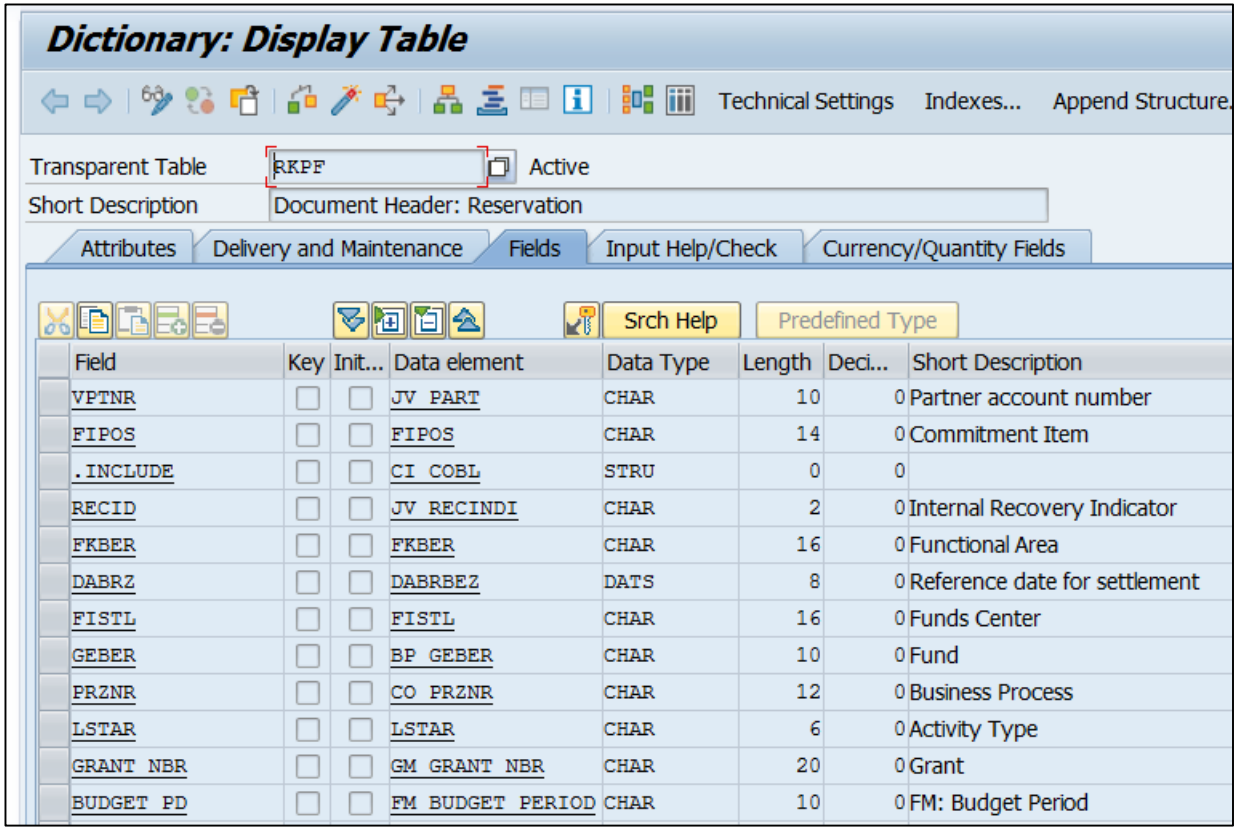
Customizing includes are created by SAP, but the customer supply the fields for the include.

Customizing includes begin with CI_ and is part of the customer namespace

One Customizing include can be inserted into more than one table.

Customizing Includes

Consider the table RKPF which uses the Customizing include. A field can be added to CI_COBL. The field becomes a part of table RKPF after the include is activated.



Field	Key	Init...	Data element	Data Type	Length	Deci...	Short Description
VPTNR	☐	☐	JV_PART	CHAR	10	0	Partner account number
FIPOS	☐	☐	FIPOS	CHAR	14	0	Commitment Item
.INCLUDE	☐	☐	CI_COBL	STRU	0	0	
RECID	☐	☐	JV_RECINDI	CHAR	2	0	Internal Recovery Indicator
FKBER	☐	☐	FKBER	CHAR	16	0	Functional Area
DABRZ	☐	☐	DABRBEZ	DATS	8	0	Reference date for settlement
FISTL	☐	☐	FISTL	CHAR	16	0	Funds Center
GEBER	☐	☐	BP_GEBER	CHAR	10	0	Fund
PRZNR	☐	☐	CO_PRZNR	CHAR	12	0	Business Process
LSTAR	☐	☐	LSTAR	CHAR	6	0	Activity Type
GRANT_NBR	☐	☐	GM_GRANT_NBR	CHAR	20	0	Grant
BUDGET_PD	☐	☐	FM_BUDGET_PERIOD	CHAR	10	0	FM: Budget Period

Demo

Create an Include structure on a table created

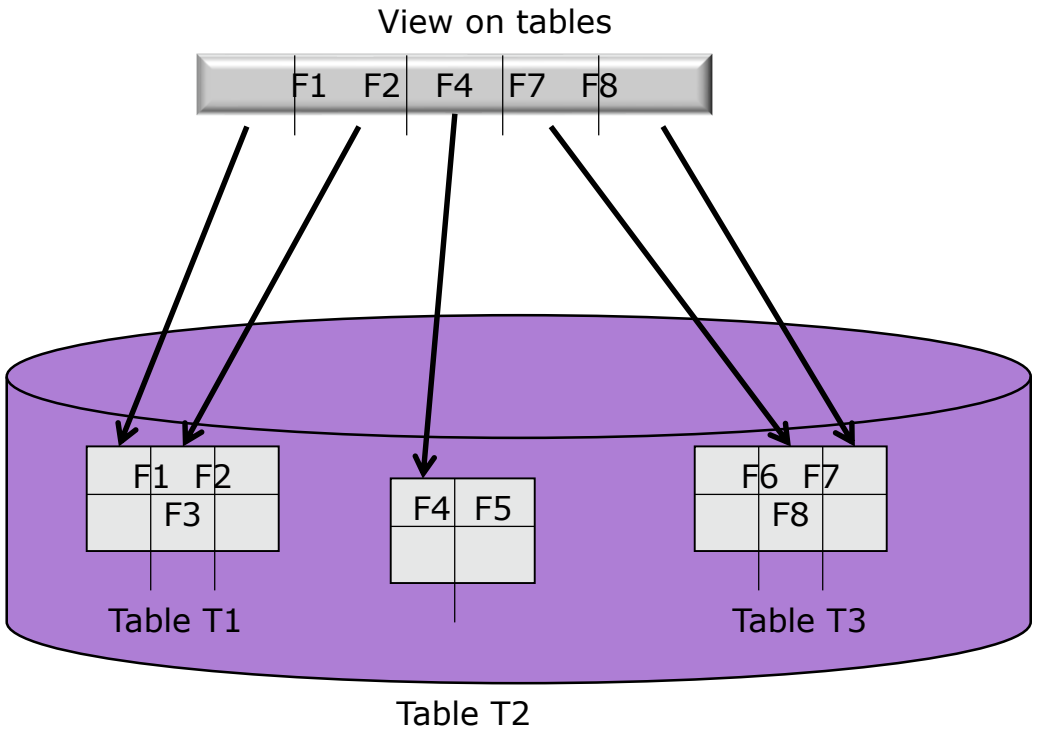
Show a CI Include in a SAP standard table

Views

View is data derived from one or more tables

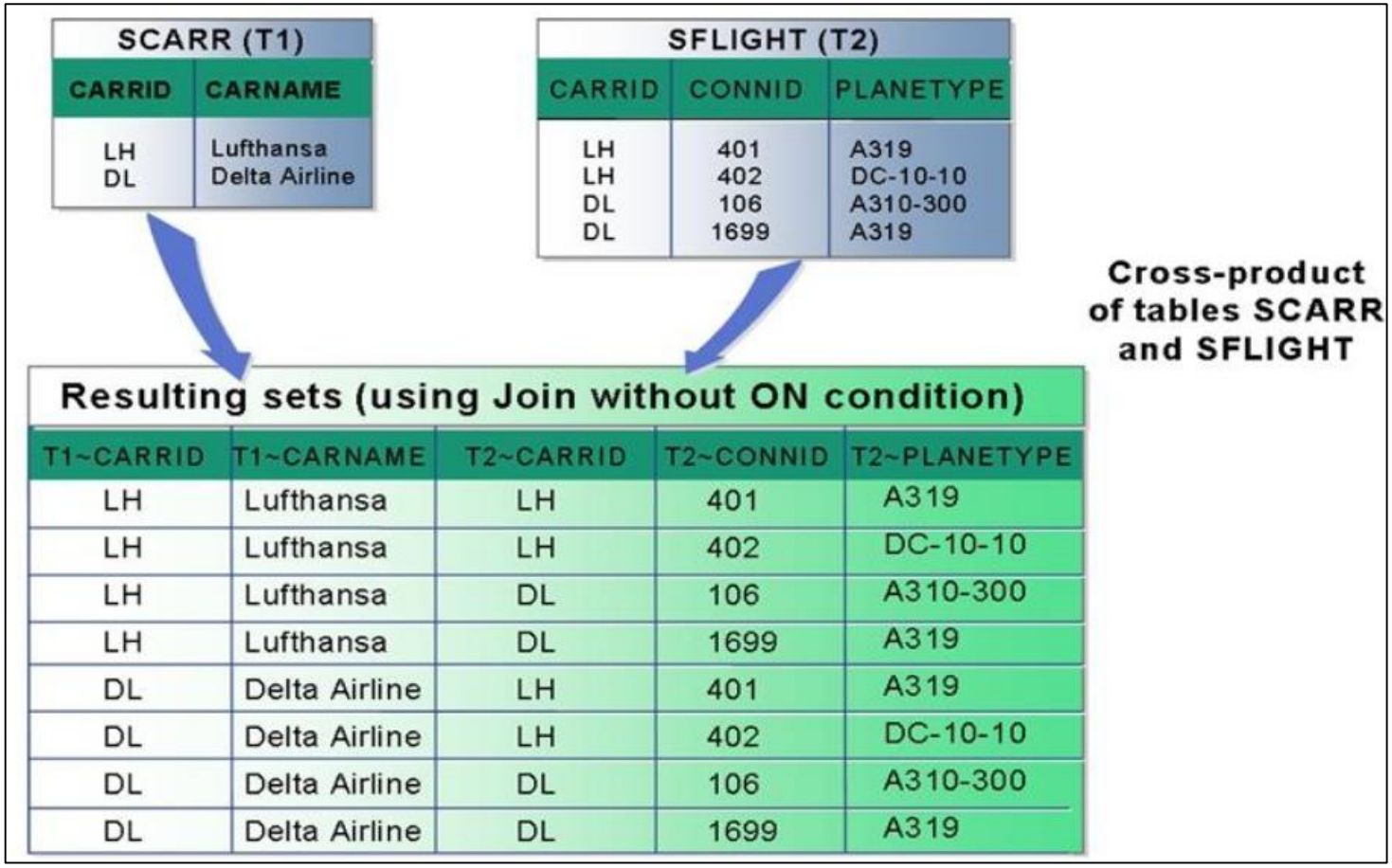
Used in ABAP Program for data selection

Data is not stored physically



Views

Structure of a View - Starting Situation



SCARR (T1)

CARRID	CARNAME
LH	Lufthansa
DL	Delta Airline

SFLIGHT (T2)

CARRID	CONNID	PLANETYPE
LH	401	A319
LH	402	DC-10-10
DL	106	A310-300
DL	1699	A319

Cross-product of tables SCARR and SFLIGHT

Resulting sets (using Join without ON condition)

T1~CARRID	T1~CARNAME	T2~CARRID	T2~CONNID	T2~PLANETYPE
LH	Lufthansa	LH	401	A319
LH	Lufthansa	LH	402	DC-10-10
LH	Lufthansa	DL	106	A310-300
LH	Lufthansa	DL	1699	A319
DL	Delta Airline	LH	401	A319
DL	Delta Airline	LH	402	DC-10-10
DL	Delta Airline	DL	106	A310-300
DL	Delta Airline	DL	1699	A319

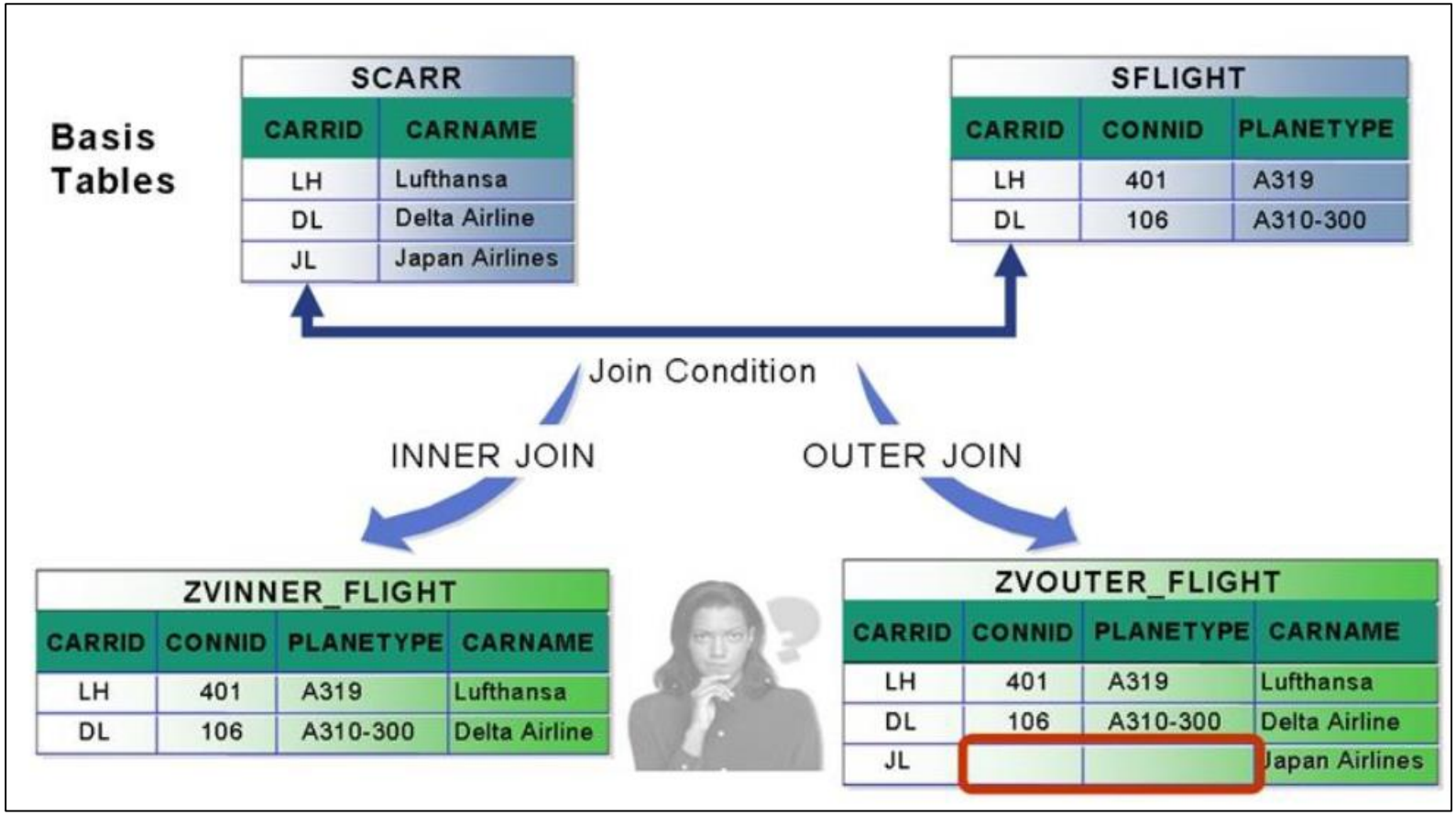
Structure of a View - Join Condition

Reduce the cross-product

Resulting sets (using Join with ON condition)

T1~CARRID	T1~CARNAME	T2~CARRID	T2~CONNID	T2~PLANETYPE
LH	Lufthansa	~~LH~~	401	A319
LH	Lufthansa	~~LH~~	402	DC-10-10
~~LH~~	~~Lufthansa~~	~~DL~~	~~106~~	~~A310-300~~
~~LH~~	~~Lufthansa~~	~~DL~~	~~1699~~	~~A319~~
~~DL~~	~~Delta Airline~~	~~LH~~	~~401~~	~~A319~~
~~DL~~	~~Delta Airline~~	~~LH~~	~~402~~	~~DC-10-10~~
DL	Delta Airline	~~DL~~	106	A310-300
DL	Delta Airline	~~DL~~	1699	A319

Views – Inner and Outer Join



Types of Views

Projection View

Database View

Maintenance View

Help View

Database View

Provides application specific view on data distributed in tables

Created in the database

accessed using Open SQL and Native SQL

If there is only one table in the view , change access is possible

Contains only transparent table

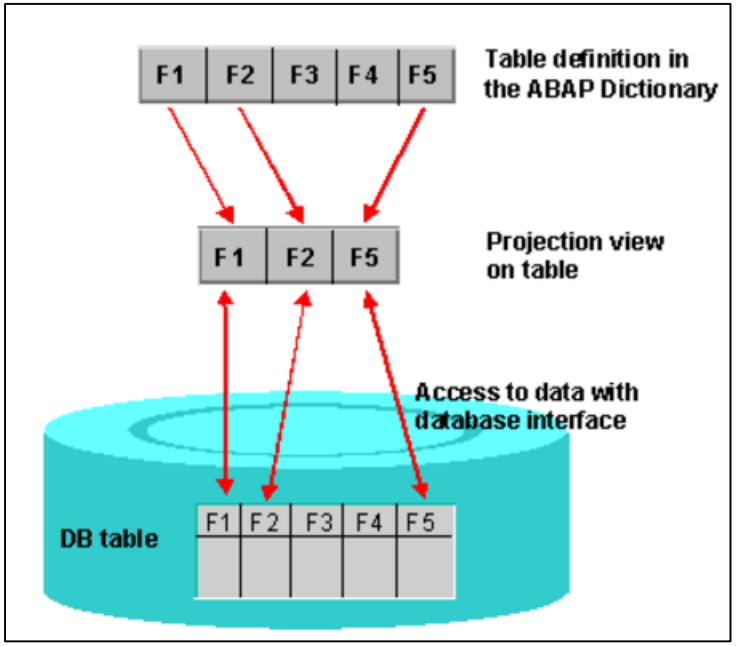
Implements Inner Join

Projection View

Used to hide fields of a table

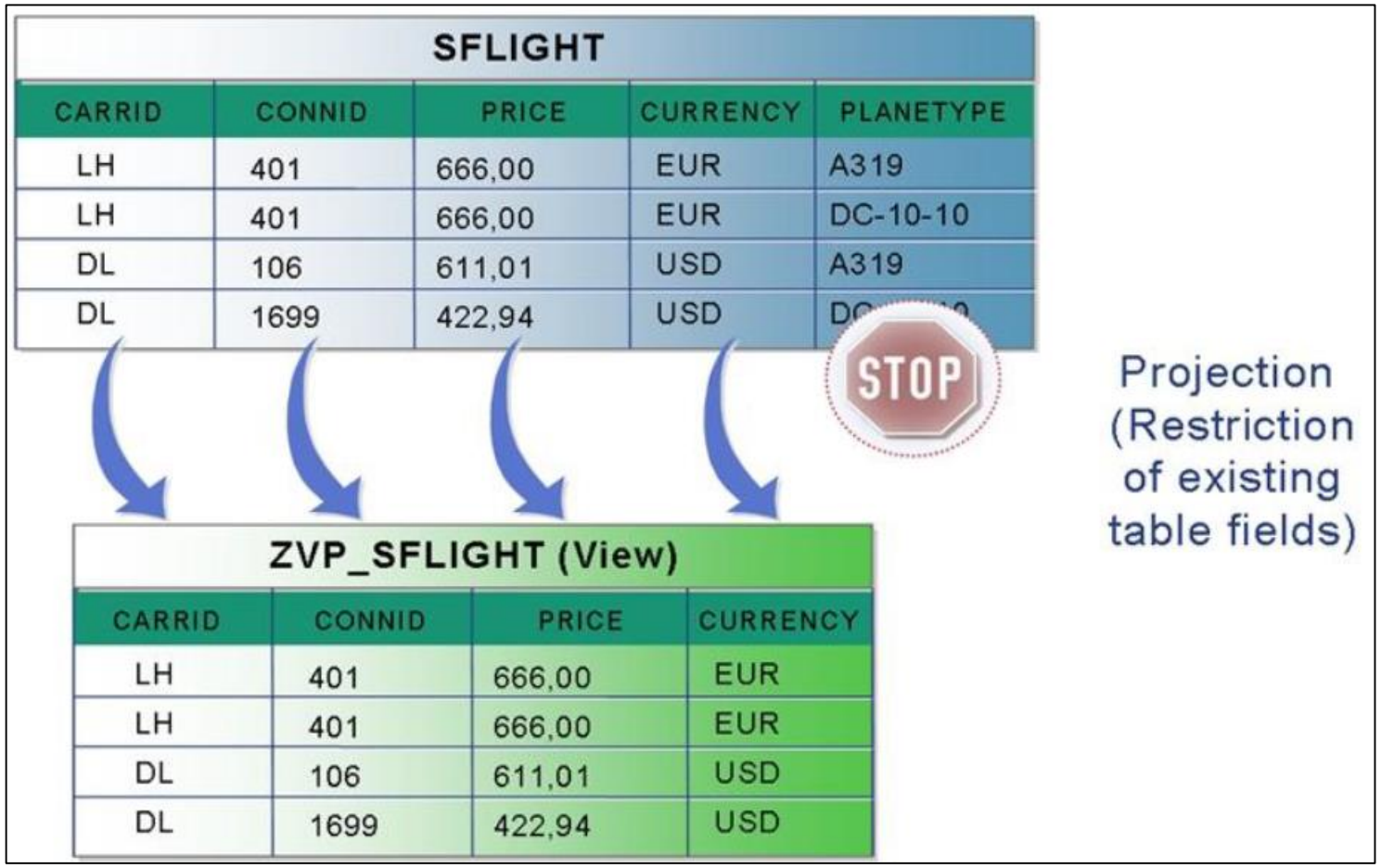
Contains exactly one table

Selection conditions cannot be defined



Projection View

Structure of a View - Field Selection (Projection)



Demo

Create a projection view

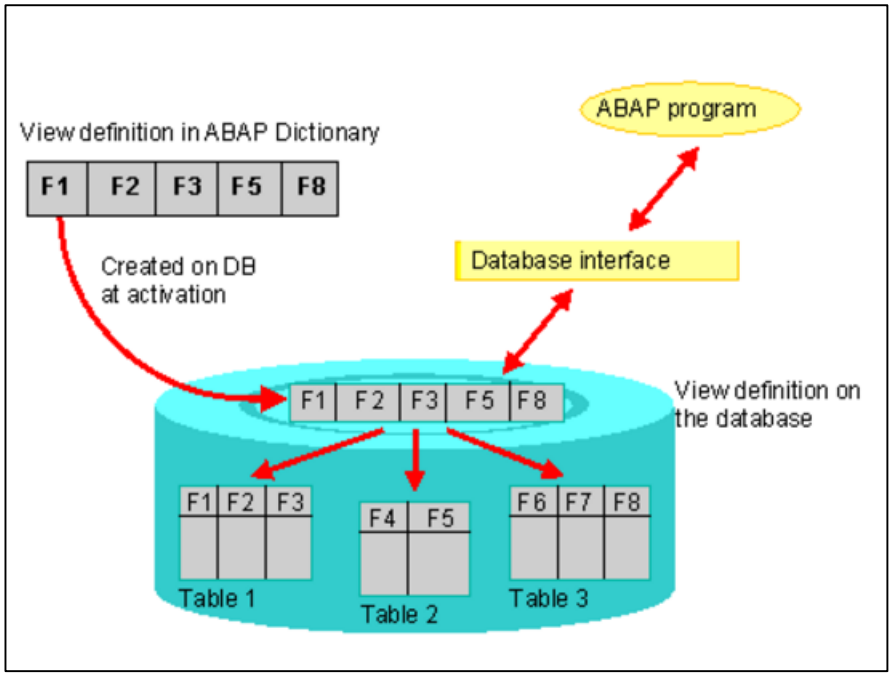
Database View

Data about an application object is often distributed on several database tables.

A database view provides an application-specific view on such distributed data.

Database views are defined in the ABAP Dictionary.

A database view is automatically created in the underlying database when it is activated.



Demo

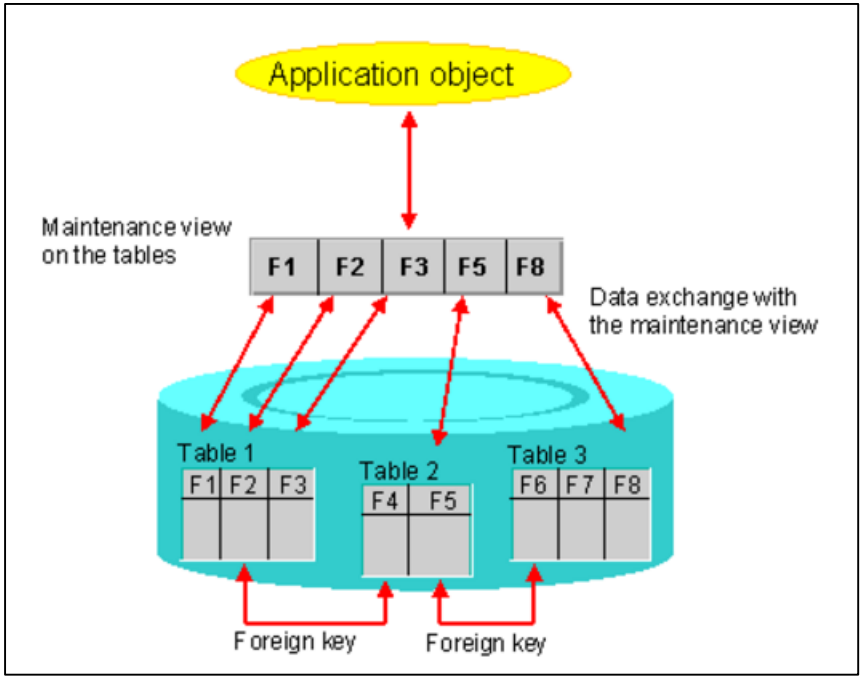
Create a Database View

Maintenance View

Maintenance views offer easy ways to maintain complex application objects.

Data distributed on several tables often forms a logical unit, for example an application object, for the user.

You want to be able to display, modify and create the data of such an application object together



Demo

Create a Maintenance view

Help view

You have to create a help view if a view with outer join is needed as selection method of a search help.

The selection method of a search help is either a table or a view.

If you have to select data from several tables for the search help, you should generally use a database view as selection method.

However, a database view always implements an inner join.

If you need a view with outer join for the data selection, you have to use a help view as selection method.

A help view implements an outer join, i.e. all the contents of the primary table of the help view are always displayed.

Demo

Create a Help view

About Search Help

Used to Display list of all possible input values for a screen field on the press of F4

Useful when the field requires the input of a formal key

Has to be assigned to the screen field

Types of Search Helps

- Elementary
  - Describes a search path
  - Defines where the data of the hitlist should be read from

- Collective
  - Combines several elementary search helps
  - Offers Alternative search paths

Selection Method

Possible input values are determined at runtime by database selection

If the values are from a single table, the corresponding table is selected as selection method

If the values are from multiple tables, they must be linked with a view (Database or Help View) which is selected in the Selection Method

Search Help Parameters

Defines the fields of selection method that should be used in input help

Data element should be assigned to Search Help Parameter

Import and Export Parameters

- Import Parameter – Information from the screen is copied to help process
- Export Parameter – Values from hitlist is returned to input template

Attaching Search Help to Screen Fields

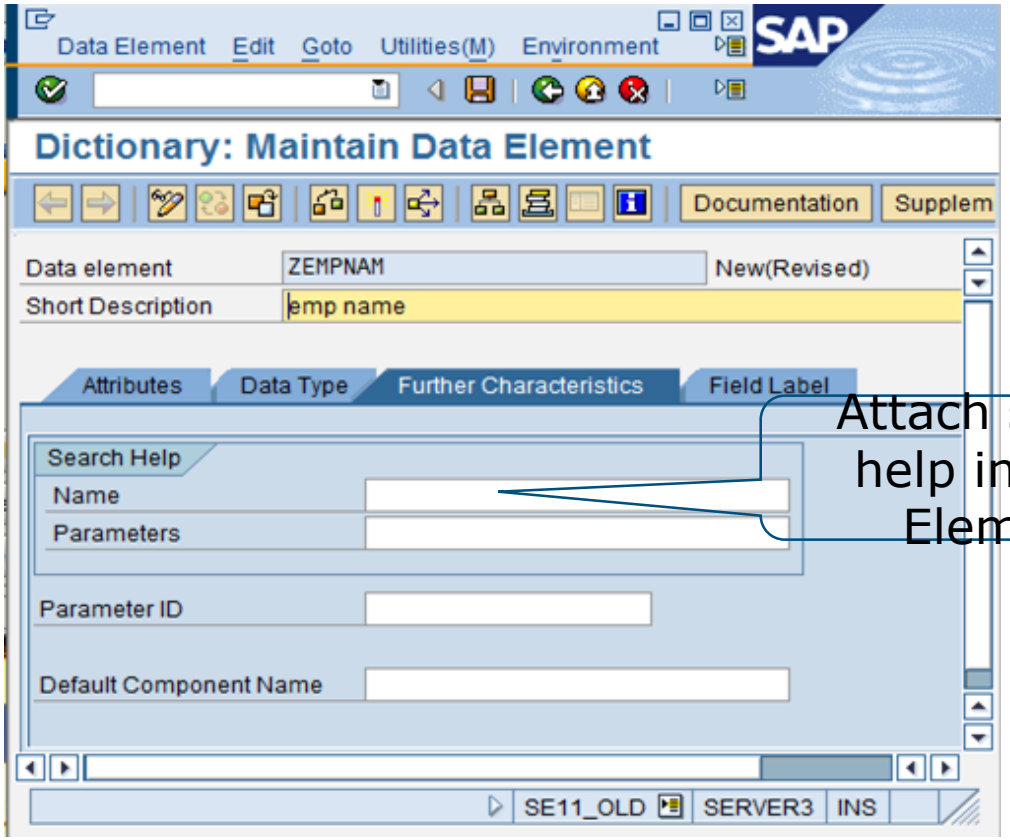
Search helps can be attached to fields by the following ways

- Attaching to Data Element
- Attaching to Check Tables
- Attaching to a table field or Structure Field
- Attaching to Screen Fields

Attaching to Data Element

The search help is used by all screens that refer to this data element

Export parameter of the search help must be assigned to Data Element



Demo

Create an Elementary search help and Collective search help

Attaching to Screen Field

A search help can be directly assigned to Screen field by

- Specifying name of search help in Screen Painter Attributes
- Specifying the name of Search help in ABAP reports in PARAMETERS or SELECT-OPTIONS statement using AS SEARCH PATTERN.

Creating Search Helps (Contd.).

Specify

- Import
- Export
- LPos
- Spos

Save and Activate the search help

What are Lock Objects?

Lock Mechanism is used by R/3 to synchronize simultaneous access to same data by several users

Locks are set and released by calling Function Modules, which are automatically generated from the definition of lock objects

Lock Arguments

- Consists of Key Fields of the Tables
- Used as input parameter in the function module for setting and releasing locks

Lock Mode

A lock mode can be assigned to each table in the lock object

Lock mode

- Defines how the users can access the locked records of the table
- Write Lock
  - Locked Data can be displayed or edited by a single user.
  - Can be requested several times from the same transaction and are processed successively
  - A request for another Exclusive lock or Shared Lock is rejected
- Read Lock
  - More than one user can access the locked data at the same time in display mode
  - A request for another shared lock is accepted
- Exclusive But not Cumulative
  - Can be called only once from the transaction
  - All other lock requests are rejected

Function Modules for Lock Requests

Activating a lock object automatically creates function modules

- ENQUEUE_<lock Object Name> - for setting the lock
- DEQUEUE_<lock Object Name> - for releasing the lock

The above function modules can be called directly from SE37 or an ABAP program created in SE38

The TCode SM12 can be used to check whether a lock has been applied

This can be done after executing the Enqueue function

Tables (Contd.).

Pooled Tables

- Many-to-One Relationship with the table in Database
- SAP Proprietary Construct
- Stored in a Table Pool
  - Table Pools Hold large number of small Tables
- When activated, a single table is created in database
- Define Pooled tables within R/3 and assign them to the table pool

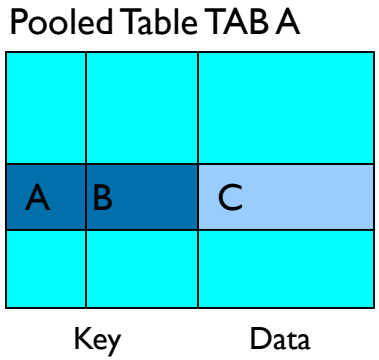
Tables (Contd.).

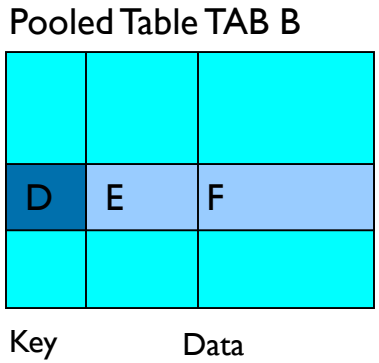
- Holds CUSTOMIZING data
  - Codes, Field Validations, number ranges, parameters
  - Country Code table, Exchange Rate Table, etc..,
- Data in Customizing Table is set by Functional Consultant during the initial Implementation

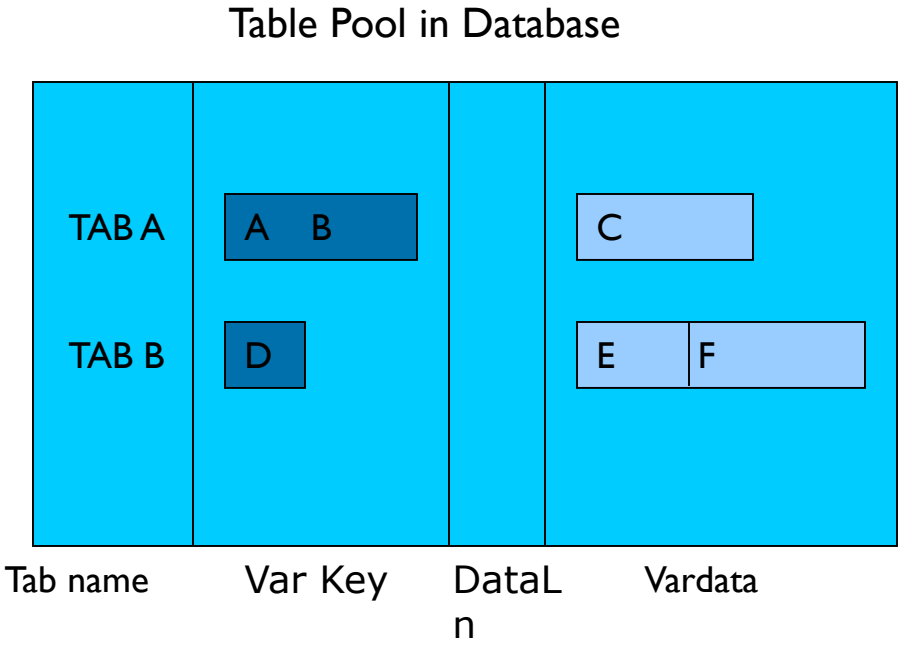
Pooled Tables

Definition of table pool contains 2 Key fields

- Tabname
- Varkey (Contains Entry from all key fields)







Cluster Table

Many-to-One relationship with table in database

Cluster tables are stores in Table Cluster in Database

SAP Proprietary

Used when the tables have a part of Primary Key in common

Data accessed Simultaneously

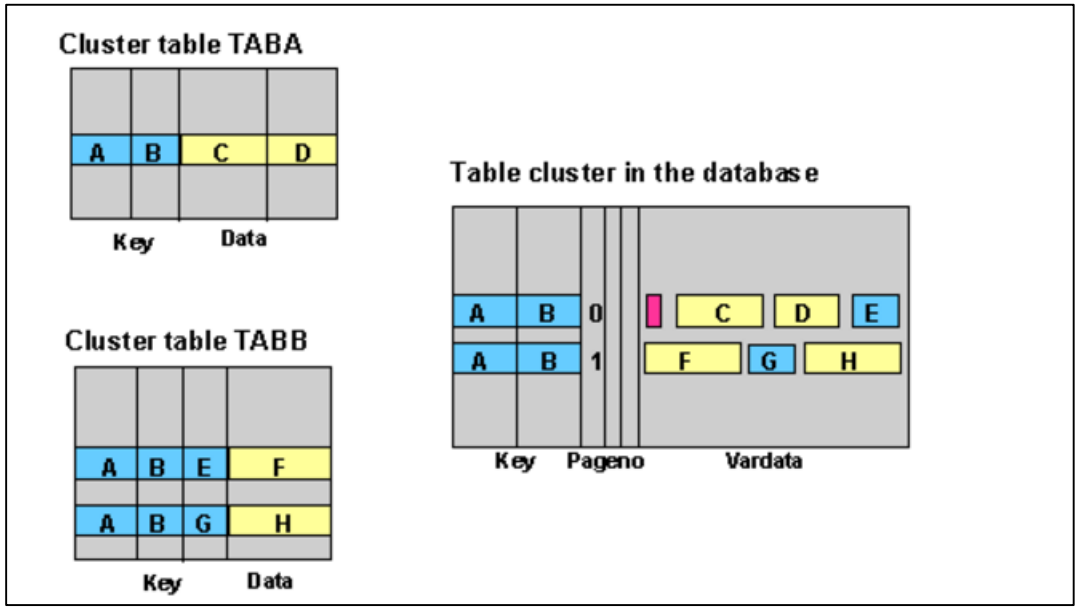
Contain Fewer tables than Pool tables

In a single I/O, all the related rows in a cluster table are retrieved

Reduces the no. of Database reads and improves Performance

Cluster Table

The records of all cluster tables with the same key are stored under one key in the assigned table cluster. The values of the key fields are stored in the corresponding key fields of the table cluster.



Demo

Create Cluster table and Pool table

Pooled and Clustered table

Restrictions

- Secondary Indexes cannot be created
- Cannot Use ABAP/4 Constructs
  - Select DISTINCT
  - GROUP BY
- Cannot Use Native SQL
- Cannot Specify Field names in ORDER BY except for Primary Key

Review Question

Question 1: A _____ in the dictionary has a one to one relationship with a table in the database.

Question 2: The _____ determines the table space that the table is assigned to.

Question 3: An _____ can be used to speed up the selection of data records from a table.

Summary

In this lesson, you have learnt:

- To Work with
  - Structures
  - Views
  - Table Types
  - Search Helps
  - Lock Objects