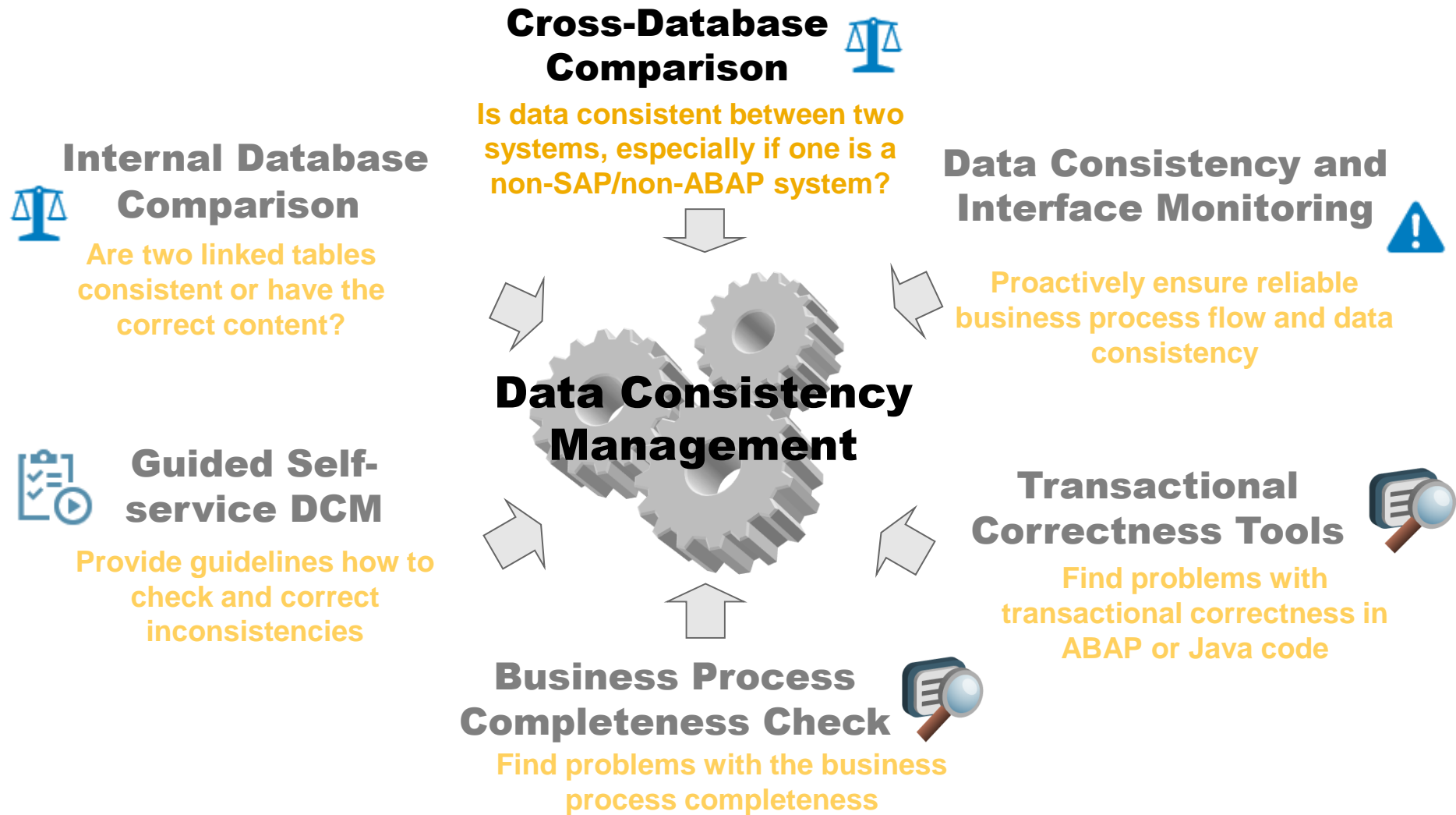


# Data Consistency Management with SAP Solution Manager Cross-Database Comparison Tool (CDC)

March 2020

CUSTOMER

# Overview – Data Consistency Management Tools

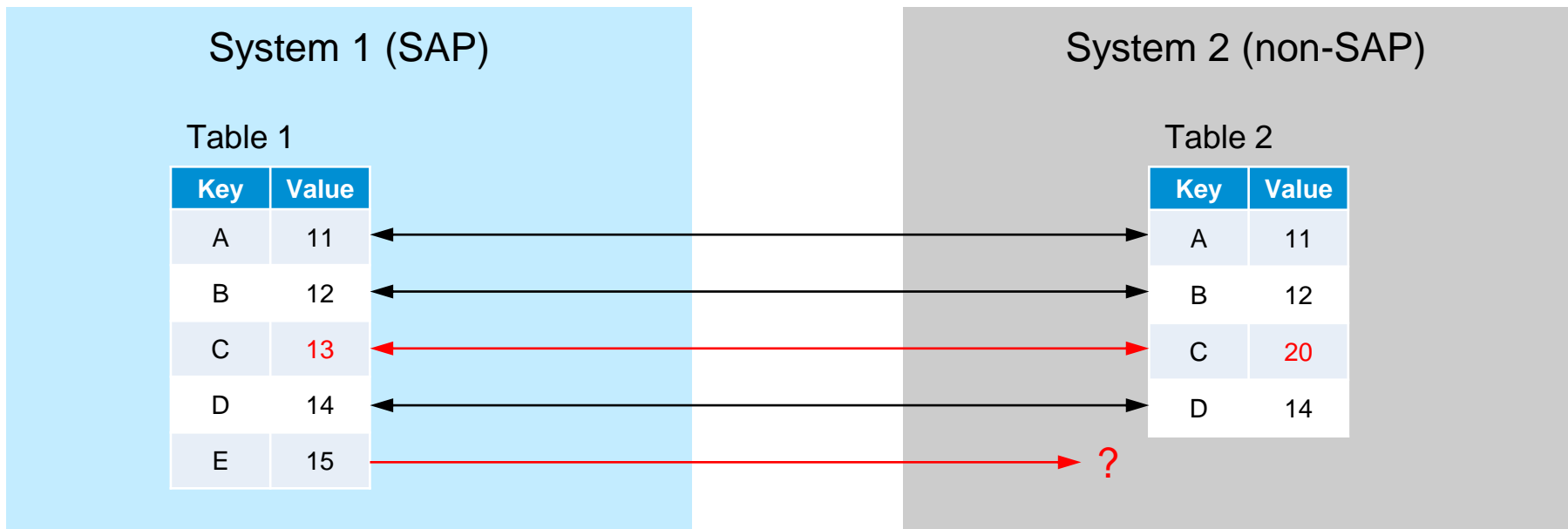


# Cross-Database Comparison: Motivation

Data in **different systems**, including **non-SAP systems**, needs to be checked for consistency

Typical situations include **interface errors** or **hardware failures** in a distributed system landscape

Not all data inconsistencies can be detected by application-specific consistency check programs (for example involving custom tables or non-ABAP / 3<sup>rd</sup>-party systems)



# Cross-Database Comparison: Goal and Deliverable

## Goal:

Comparison of two data sources to detect **missing entries** or **inconsistent fields** without the need to write additional coding

## Deliverable:

A generic infrastructure that facilitates

- **data modeling** and **extractor generation**
- scheduled or manual **execution of comparisons**
- **saves** and **displays** comparison results for later reference
- integration into **monitoring** and **dashboards**

# Cross-Database Comparison: Features

- Delivered within **SAP Solution Manager**
- Supports **multiple source types**
  - For SAP ABAP-based systems and non-ABAP / 3<sup>rd</sup>-party systems
  - For On-premise and Cloud systems
  - Can be enhanced by custom-build source types
- Offers comparison of **multiple tables between two source systems**
  - Several tables can be joined to build complex application data models
  - Offers easy-to-use **graphical UI** to enter the data model
  - Offers possibility to re-use a comparison data model for several comparison instances
- Extracts data from source systems and executes comparison in SAP Solution Manager
  - The comparison can be executed **ad-hoc** as well as **periodically in background**
  - Allows splitting of the comparison data into multiple blocks of configurable size
  - Offers functionality to save and display comparison results
- Supports **integration into Business Process Monitoring**
  - Create alerts and notifications based on identified inconsistencies

# Cross-Database Comparison: Terminology

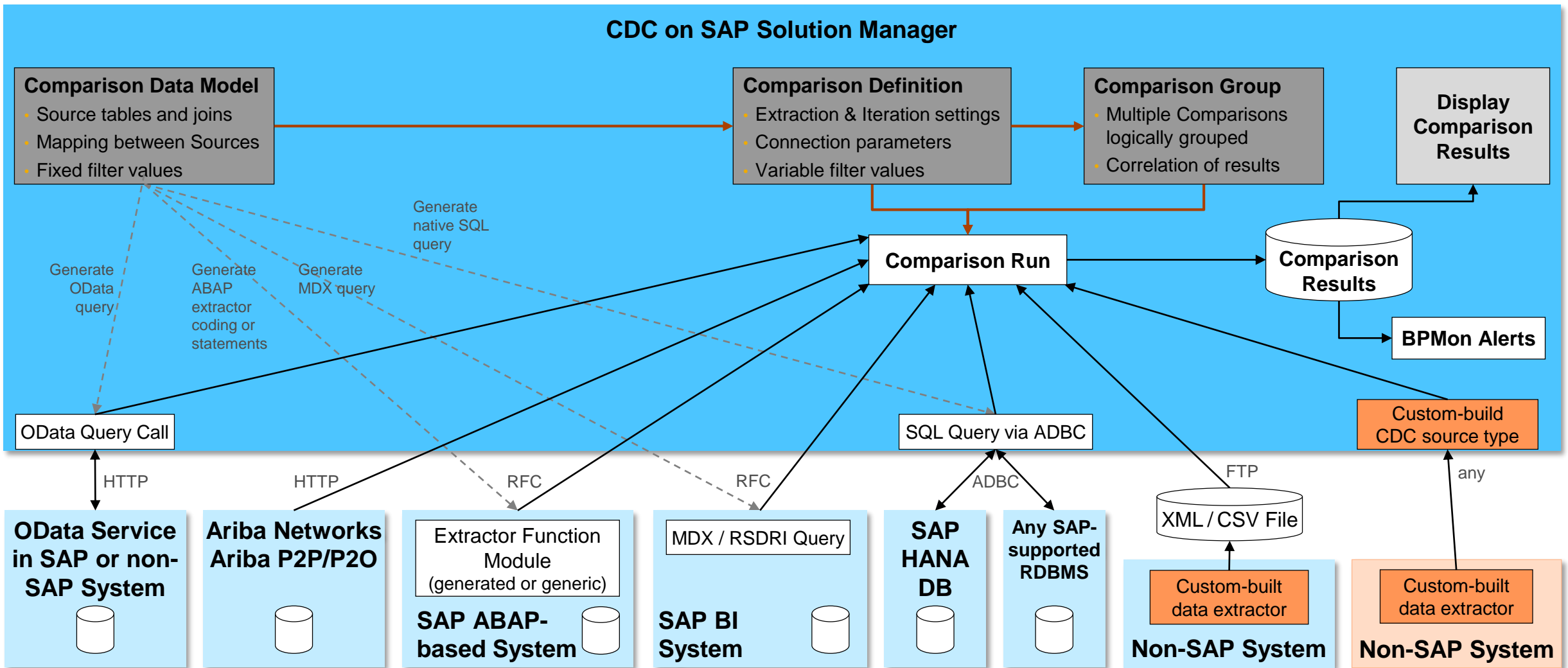
- **Source System**
  - A data source from which data should be extracted for comparison. CDC uses two (different) Source Systems.
- **Source Type**
  - Contains the implementation of how a source system is technically accessed
- **Data Model** (fka. Comparison Object)
  - Defines the data model and fixed filters for each source system, as well as the mapping between the two data sources
- **Comparison** (fka. Comparison Instance)
  - Defines the runtime options for a Comparison
    - Connectivity Details for Source System 1 and 2
    - Variable application filters for partial data extraction
  - Each comparison execution creates a new “**Comparison Run ID**” to keep a history of results
    - Compare status, Compare result (counts only), error messages, admin info, ...
- **Comparison Result**
  - Stores the complete detailed comparison results per Comparison Run ID
    - Keys of inconsistent rows / Data of inconsistent fields / Data of additional context fields (display-only fields)

# Cross-Database Comparison: Source Types

**CDC supports multiple Source Types, which can be freely combined with each other**

- **SAP ABAP-based systems** using RFC (Remote Function Call)
  - „**ABDY**“ with a generic extractor function module (dynamic SQL execution, no individual generation and transport required)
  - „**ABAP**“ with generated extractor function modules (individual and extensible code in custom namespace)
  - „**IDC**“ with a generic extractor function module to determine inconsistent entries in one system (like “Internal Database Comparison”)
  - „**BIQY**“ / „**BWRI**“ extract data from a BI system using MDX Queries or Data Manager Read Interface
- **Non-ABAP systems**
  - „**ADBC**“ (ABAP Database Connectivity) for a direct remote database access to all SAP-supported RDBMS including HANA
  - „**HANA**“ for a direct comparison of HANA data with a connected other database using „Smart Data Access“ (running in HANA itself)
  - „**ODAT**“ extracts data using OData Services (Open Data Protocol) HTTP calls
  - „**ARIB**“ / „**ARIP**“ extract data from Ariba P2P/P2O and Ariba Networks using the Operational Reporting API / Transaction Monitoring API
- **Files** (created by native non-SAP application)
  - „**FIXS**“ for XML-files available on Application Server of SAP Solution Manager
  - „**FIXL**“ for XML-files available for upload from local frontend
  - „**CSV**“ for comma-separated files on Application Server

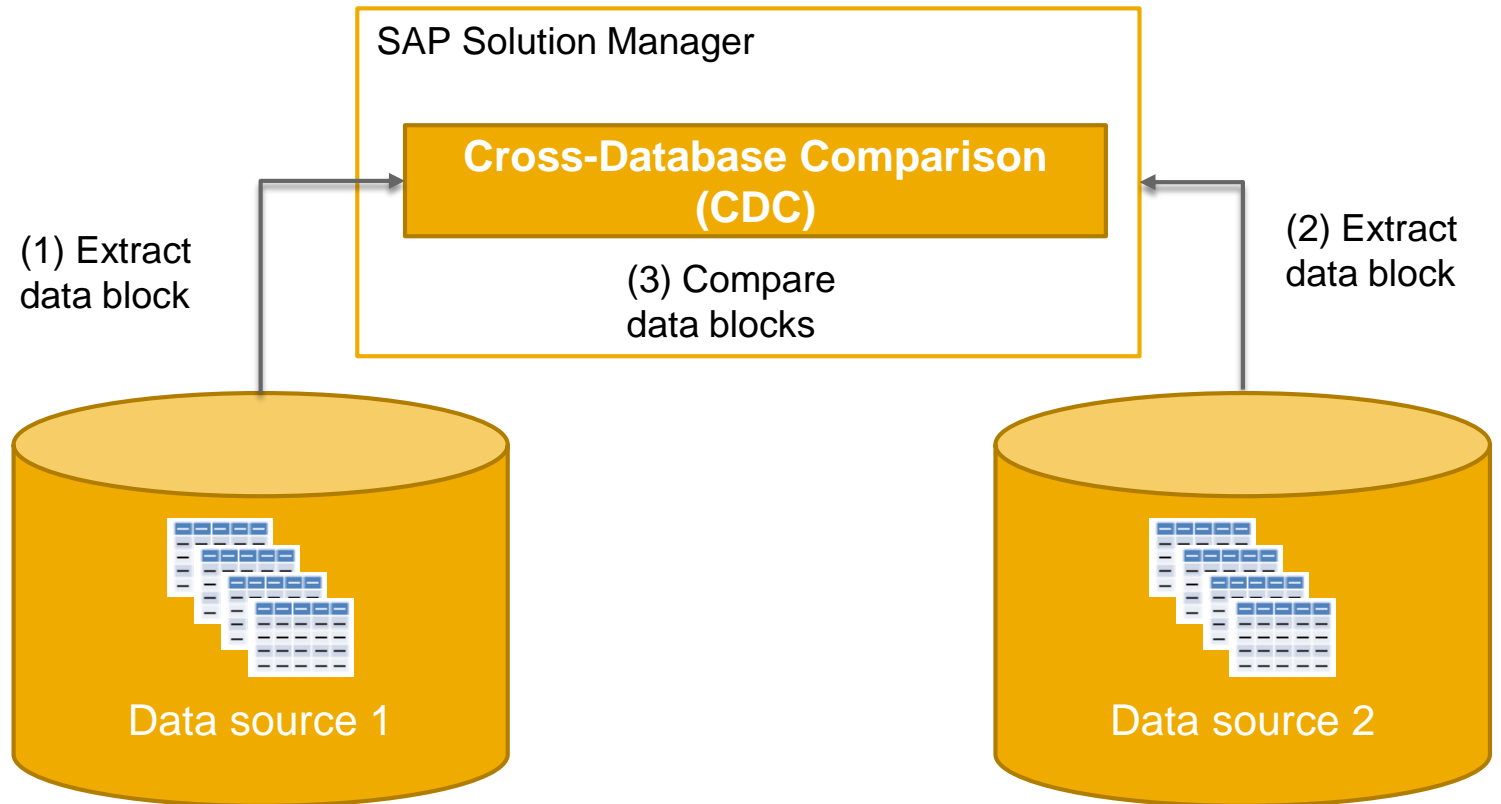
# Cross-Database Comparison: Technical Overview





# Classic Comparison of two source systems

The CDC application **extracts data from both data sources** and **compares them centrally** in SAP Solution Manager

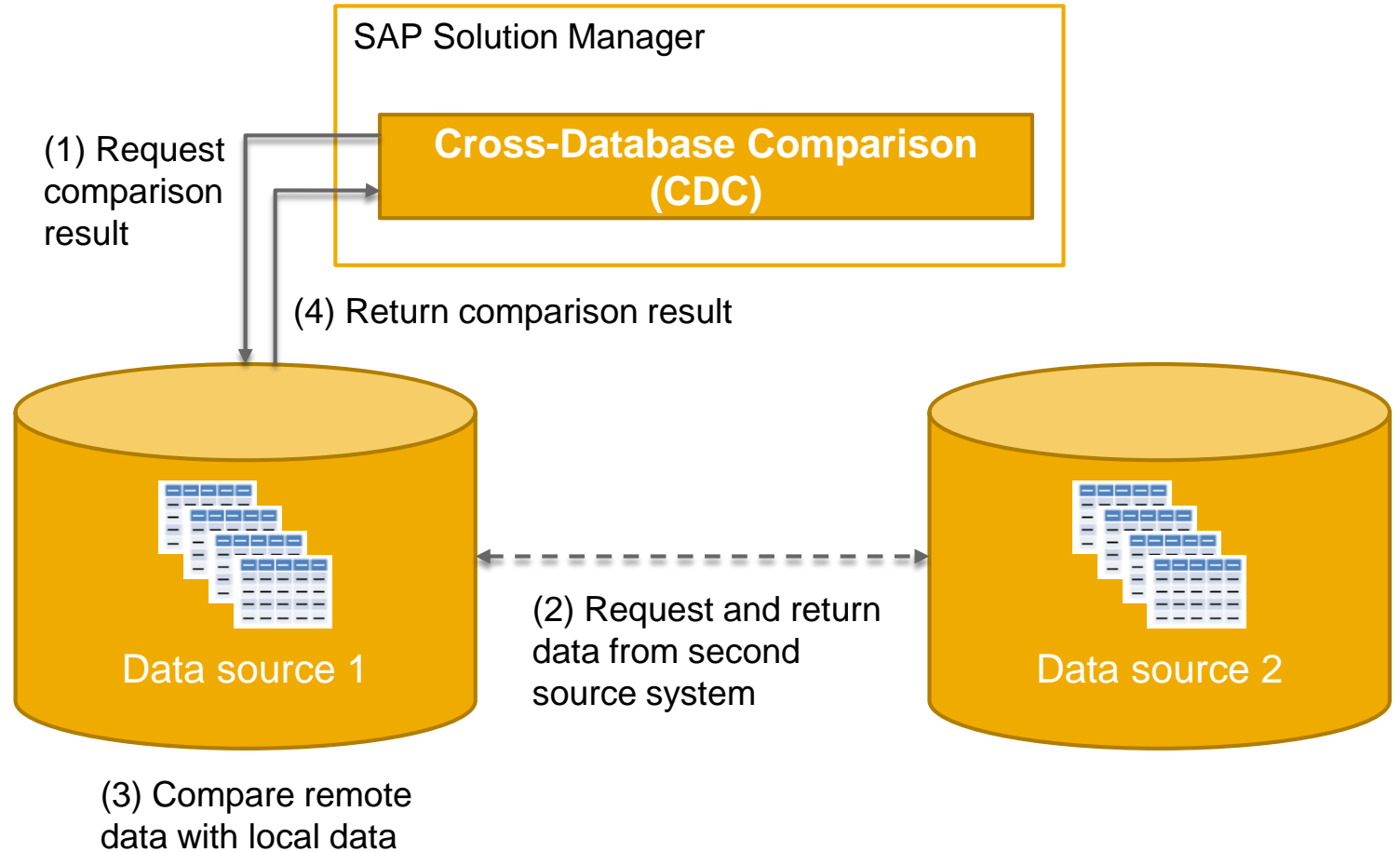


# Comparison in one single system

Alternatively the CDC application can **compare data in one system** and **send only the result back** to SAP Solution Manager

Choose Extraction Strategy ***Execute comparison in one system*** for the following source types:

- *Determine inconsistent entries in one system (IDC)*
- *Comparison in one HANA database*
  - Technical realization with “[SAP HANA Smart Data Access](#)” (SDA)
  - Remote database tables can be directly joined with local tables



# Operational procedure of Cross-Database Comparison

## 1. Create a Data Model

- In 7.2 the Data Model maintenance is no longer isolated but already embedded in a Comparison definition

## 2. Create Comparison(s) based on a Data Model

- Choose Source Types → Define connection parameters to the involved source systems
- Choose/Define a Data Model → Generate Extractors
- Create additional application filters or time-dependent filters for partial extractions

## 3. Optionally assign the Comparisons to a Comparison Group

## 4. Execute a Comparison Run

- Manually or as periodic job

## 5. Display Comparison Result

- For single Comparison or correlated Group Result



# Cross-Database Comparison: Create Comparison

## Basic Attributes

- Name and Description of the Comparison
- Extraction Strategy, Comparison Block Size, Max Number of Differences

**Source Types** for both Source Systems and their source type specific **Parameters**

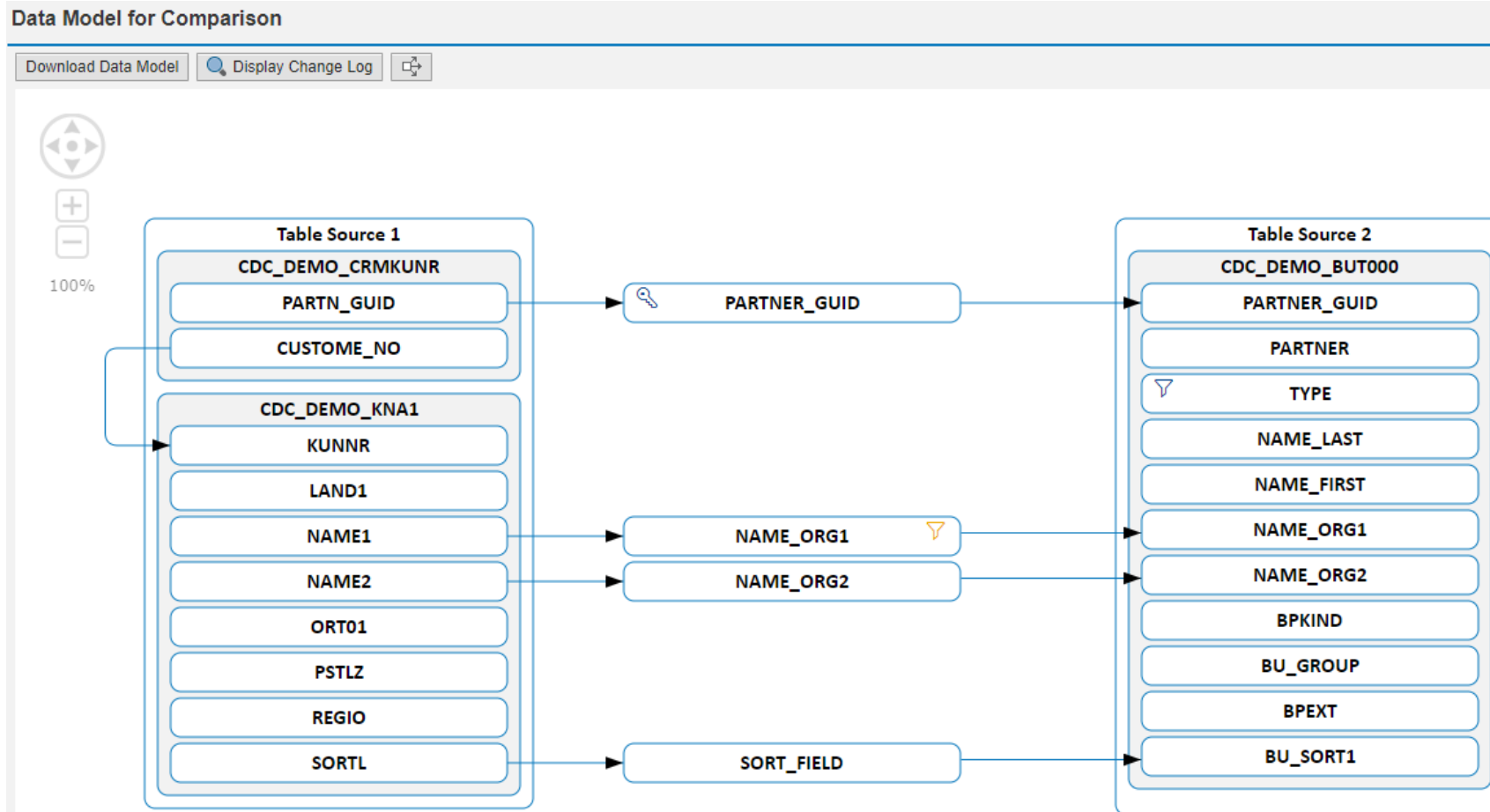
## Iteration Parameters

## Variable Filter Criteria

- For the same Data Model multiple Comparisons can be created, which use different source systems, e.g. Dev/QA/Prod landscape, or use different filter values

## Embedded Data Model

# Cross-Database Comparison: Create Data Model



## Data Model

- **Select Data Source** (typically database tables and selected columns)
  - Foreign key relationships (join conditions between several tables to build complex models)
  - Fixed filter values
  - Variable filter fields
- **Mapping connections** between the Source Systems
  - Comparison Keys
  - Data Fields
  - Context Fields
  - Conversion Rules
- **Generate Extractors**

# Starting a Comparison Run – Scheduling Options

Comparison Overview

Comparison Group: All Comparisons

View: \* [Standard View] Print Version Export

| Run Status | Incon... | Comparison Name              | Run ID | Progress | Model Name / Version (Run ID)    | Objects Identical | Objects Exist Only in Source 1 | Objects Exist Only in Source 2 | Objects Exist with Differences |
|------------|----------|------------------------------|--------|----------|----------------------------------|-------------------|--------------------------------|--------------------------------|--------------------------------|
|            |          | CDC_DEMO_BUSINESS_PARTNER    | 5      | 100,00 % | CDC_DEMO_BUSINESS_PARTNER / 0001 | 14                | 2                              | 4                              | 6                              |
|            |          | CDC_DEMO_BUSINESS_PARTNER_72 | 11     | 100,00 % | CDC_DEMO_BUSINESS_PARTNER / 0002 | 14                | 2                              | 4                              | 6                              |
|            |          | CDC_DEMO_BUT000              | 18     | 100,00 % | ZCDC_DEMO_BUT000 / 0000          | 12                | 12                             | 0                              | 0                              |

You **start a new Comparison Run** by selecting a Comparison in the Comparison Overview and pressing “Start”

- Create job only (will not be released automatically)
- Create job and start immediately
- Start Comparison Run immediately in dialogue

Each start creates a new **Run ID** for the Comparison

Select Execution Mode

Schedule: Create Job and Start Immediately

**Special**

- Create Job and Start Immediately
- Create Job Only
- Start Comparison Run Immediately in Dialog

OK Cancel

# Starting a Comparison Run – Run Status and Inconsistency Status

The **Comparison Overview** gives an overview about the execution of **Comparisons**

Comparison Overview

Comparison Group: All Comparisons

View: \* [Standard View] | Print Version | Export

| Run Status | Incon.... | Comparison Name              | Run ID | Progress | Model Name / Version (Run ID)    | Objects Identical | Objects Exist Only in Source 1 | Objects Exist Only in Source 2 | Objects Exist with Differences |
|------------|-----------|------------------------------|--------|----------|----------------------------------|-------------------|--------------------------------|--------------------------------|--------------------------------|
|            |           | CDC_DEMO_BUSINESS_PARTNER    | 5      | 100,00 % | CDC_DEMO_BUSINESS_PARTNER / 0001 | 14                | 2                              | 4                              | 6                              |
|            |           | CDC_DEMO_BUSINESS_PARTNER_72 | 11     | 100,00 % | CDC_DEMO_BUSINESS_PARTNER / 0002 | 14                | 2                              | 4                              | 6                              |
|            |           | CDC_DEMO_BUT000              | 18     | 100,00 % | ZCDC_DEMO_BUT000 / 0000          | 12                | 12                             | 0                              | 0                              |

The column “**Run Status**” shows the current Comparison Run execution status

- Grey – not started yet
- Yellow – currently running
- Green – finished successfully
- Green tick – result confirmed by user
- Red – aborted due to a system error

The column “**Inconsistency Status**” shows whether a Comparison Run has detected an inconsistency

- Grey – no result yet
- Yellow – still running, but already inconsistencies found
- Green – no inconsistencies found
- Red – inconsistencies were found

# Comparison Run Detail screen: Overview

Comparison   Comparison Group   **Comparison Overview**

Show Comparison Definition   Refresh   Confirm   Guided Procedures   Result History Graphics   Create Incident   Technical Names <-> Descriptions   Back   Preferences

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**Global Result Parameters**

Comparison: CDC\_DEMO\_BUSINESS\_PARTNER\_72   Comparison Description:   Comparison Version: 0001  
 Data Model: CDC\_DEMO\_BUSINESS\_PARTNER   Data Model Description: Compare ERP Customer with CRM Business   Version: 0002  
 Run ID: 0000000011   Start Date: 29.09.2016 14:42:33   End Date: 29.09.2016 14:42:34  
 Iteration ID: 0   Start Date: 29.09.2016 14:42:33   End Date: 29.09.2016 14:42:34  
 Objects Expected from Source 1: 22   Objects Expected from Source 2: 24  
 Objects Processed: 26   Progress: 100,00 %  
 Comparison Status: Finished   Confirmed at/by:   Comparison Scenario: Std Comparison with Detailed Results up to "  
 Message Text: Comparison run 11 finished   Source Type 1: SAP ABAP System (RFC to Generic Extractor)   Source Type 2: SAP ABAP System (RFC to Generic Extractor)

**Parameters for Source Type 1**   **Parameters for Source Type 2**

RFC Destination: NONE   RFC Destination: NONE

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**Result Overview**

View: [Standard View]   Print Version   Export   Rename Inconsistency Types

| Type of Inconsistency          | Number of Objects | Percentage | Number of Objects (Iteration) | Percentage (Iteration) |
|--------------------------------|-------------------|------------|-------------------------------|------------------------|
| Objects Compared               | 26                | 100,00 %   | 26                            | 100,00 %               |
| Objects Identical              | 14                | 53,85 %    | 14                            | 53,85 %                |
| Objects Exist Only in Source 1 | 2                 | 7,69 %     | 2                             | 7,69 %                 |
| Objects Exist Only in Source 2 | 4                 | 15,38 %    | 4                             | 15,38 %                |
| Objects Exist with Differences | 6                 | 23,08 %    | 6                             | 23,08 %                |

**Type of Inconsistency**  
Hide Identical Objects

- Objects Exist Only in Source 1
- Objects Exist Only in Source 2
- Objects Exist with Differences
- Objects Identical

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**Result Details**

**Comparison Runtime Statistics**

The **Comparison Run Detail screen** is structured into a layout of four areas

- **Global Result Parameters**
  - Switch between Run IDs
  - Objects Expected from Source 1 and 2
  - Objects Processed (Progress)
- **Result Overview**
  - Basic Key Figures
- **Result Details** (See next slide)
- **Comparison Runtime Statistics**



# Comparison Run Detail screen: Result Details per Type

**Result Overview**

View: [Standard View] | Print Version | Export | Rename Inconsistency Types

| Type of Inconsistency          | Number of Objects | Percentage | Number of Objects (Iteration) | Percentage (Iteration) |
|--------------------------------|-------------------|------------|-------------------------------|------------------------|
| Objects Compared               | 26                | 100,00 %   | 26                            | 100,00 %               |
| Objects Identical              | 14                | 53,85 %    | 14                            | 53,85 %                |
| Objects Exist Only in Source 1 | 2                 | 7,69 %     | 2                             | 7,69 %                 |
| Objects Exist Only in Source 2 | 4                 | 15,38 %    | 4                             | 15,38 %                |
| Objects Exist with Differences | 6                 | 23,08 %    | 6                             | 23,08 %                |

**Type of Inconsistency**  
Hide Identical Objects

Legend:

- Objects Exist Only in Source 1
- Objects Exist Only in Source 2
- Objects Exist with Differences
- Objects Identical

**Result Overview** shows the comparison key figures (**Types of Inconsistencies**)

**Result Details**

View: [Standard View] | Print Version | Export | Show Field Distribution | Hide Context Fields | Show Context Field Distribution

| Comparison Key (PARTNER_GUID)   | Tag Name   | Table Field         | Table Field               | Value in Source 1                  | Value in Source 2                       |
|---------------------------------|------------|---------------------|---------------------------|------------------------------------|-----------------------------------------|
| 134E3749149F4B11E1000000A42442C | NAME_ORG2  | CDC_DEMO_KNA1~NAME2 | CDC_DEMO_BUT000~NAME_ORG2 | Walldorf                           |                                         |
| 194E3749149F4B11E1000000A42442C | NAME_ORG1  | CDC_DEMO_KNA1~NAME1 | CDC_DEMO_BUT000~NAME_ORG1 | Californian Multi Chemical Company | Californian Multi Chemical Co. - Mexico |
| 72503749149F4B11E1000000A42442C | SORT_FIELD | CDC_DEMO_KNA1~SORTL | CDC_DEMO_BUT000~BU_SORT1  | BILL2FSCM                          | BILL2FSCM MYERS                         |

**Result Details** shows the list of affected objects per **Type of Inconsistency**

- For **Objects existing in System 1 / 2** only, the result of the existence check shows comparison keys only
- For **Objects with Differences**, the result shows the comparison keys and the detailed data value differences

**Thank you.**

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