

# BOPF Alternative Keys

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# Agenda

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Introduction

Definition

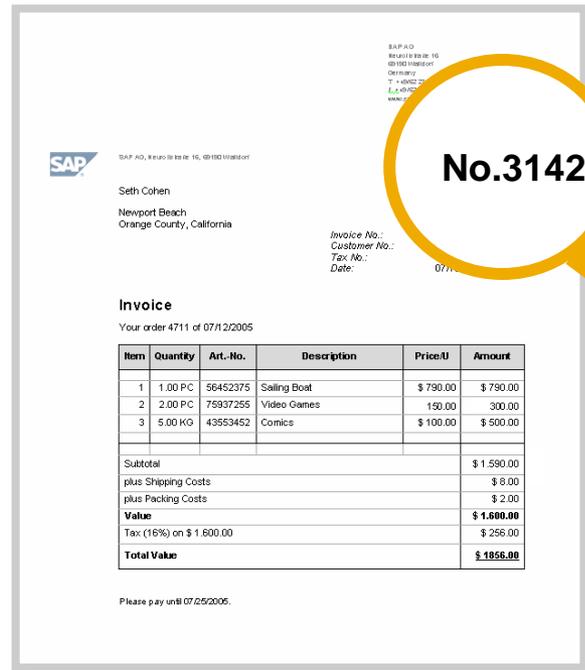
Creating an Alternative Key

Converting an Alternative Key



# Introduction

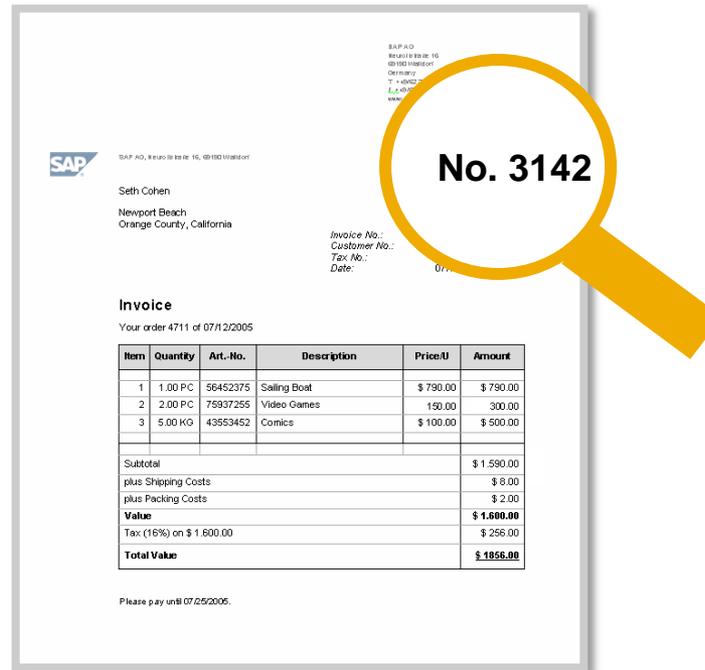
# Introduction



## Motivation

- Each invoice must be identified using a human-readable invoice number (e.g. 3142).
- The technical key of the corresponding root instance of the invoice (for example, 0050562501281DDF97848577AF34366C) obviously does not fulfill this criterion.

# Introduction



- Therefore, an attribute like `INVOICE_NUMBER` is included in the `ROOT` node.
- Since this attribute is intended to identify instances, an alternative key is created in this attribute. Consumers can query the technical key of an instance with a certain invoice number.



# Definition

# Definition

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- Alternative keys are combinations of node attributes that identify an instance of a node and have some kind of business semantics (in contrast to the technical node ID).
- Both queries and alternative keys are usually used as an entry point for the consumer to get keys of node instances.
- Unlike queries, alternative key calls can also be made on the transactional image  
**Example:** If a customer invoice instance has been created during the current transaction, it is not possible to get the key of this instance using a query but only using an alternative key.
- The core service `convert_alternative_key` allows to map alternative key values  
**Example:** It is possible to map the alternative key value 342 of alternative key `INVOICE_NUMBER` to the alternative key value of another alternative key on the same node.

# Classification of Alternative Keys

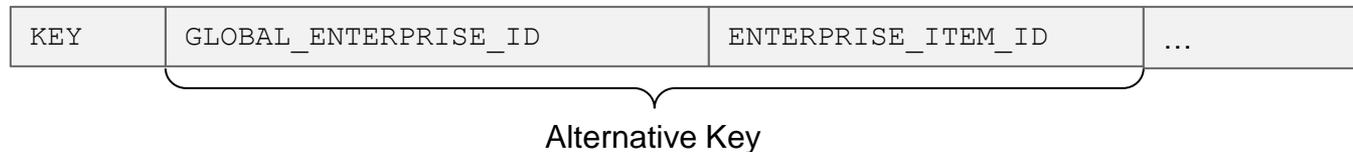
## Structured and Unstructured

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(a) Unstructured Alternative Key



(b) Structured Alternative Key



Alternative keys can be related to a single attribute (unstructured alternative key) or to multiple node attributes (structured alternative key) of the same node.

# Classification of Alternative Keys

## Uniqueness

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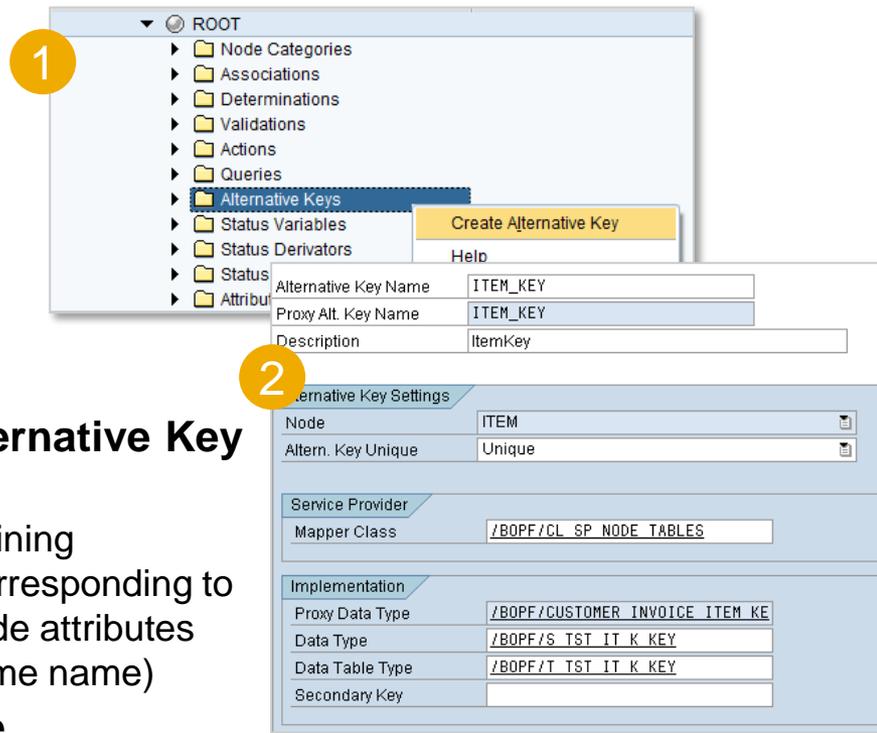
Alternative keys can also be classified by the uniqueness of their values.

- **Unique**  
Each alternative key value is always unique (e.g. there can be only one invoice root node instance with the invoice number 1231).
- **Unique** (internal allocation of numbers)  
Each alternative key value is always unique and filled using a number range (these alternative keys must not be validated with respect to uniqueness).
- **Unique** (if not initial)  
Each alternative key value that is not initial is always unique, but there can be some initial alternative keys too. (In the case of structured alternative keys, an alternative key value is only initial if all of its fields are initial.)
- **Unique** (if none of the attributes is initial)  
For unstructured alternative keys, the same as “Unique (if not initial)”.  
Structured alternative key values must be unique if all of their fields are filled.
- **Not Unique**  
There can be more than one instance with identical alternative key values.



# Creating an Alternative Key

# Creating an Alternative Key



## Structured Alternative Key

- **Data type**  
Structure containing components corresponding to the relevant node attributes (same type, same name)
- **Data table type**  
Table type of this structure

## Unstructured Alternative Key

- **Data type**  
Same as the corresponding node attribute
- **Data table type**  
Table type of this node attribute

# Creating an Alternative Key

## Creating a Database Index

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Dictionary: Display Table

sp. Table ZTI\_C1XX\_D\_ROOT Active

Short Description Root Node

Ind Ext Short text Status Unique Au Create Index x name D

Create Extension Index

Dictionary: Change Index

Index Name ZTI\_C1XX\_D\_ROOT ID

Short description Index for alternative key ID

Last changed KOPPTI 22.06.2010 Original language EN English

Status New Not saved Package STHP

Index does not exist in database system MSSQL

Non-unique index

Index on all database systems

For selected database systems

No database index

Unique index (database index required)

Field name	Short Description	DTyp	Length
MANDT	Client	CLNT	3
ID		CHAR	10

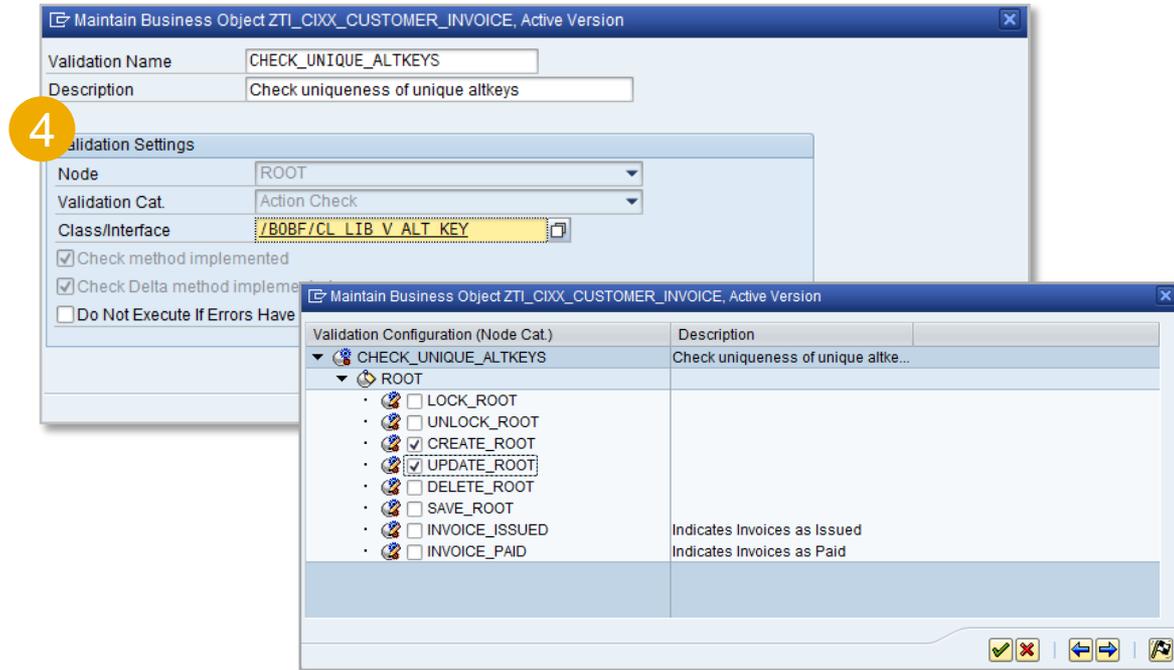
Create a corresponding database index on the node's database table to ensure a fast alternative key conversion.

**Hint:** Multiple (structured) alternative keys can share the same index, if their prefix is the same (e.g. altkey [A,B,C] and altkey [A,B] and altkey [A] share index on ABC).

**Hint for database system Hana DB:** please compare to DB guidelines, if creation of DB Index makes sense at all. E.g. when more than 500k entries are expected and when Index shall only be generated for a single column.

# Creating an Alternative Key

## Defining a Validation to Ensure Unique Values



To check the uniqueness of a new or updated alternative key value, the library validation /BOBF/CL\_LIB\_V\_ALT\_KEY must be used.

# Hints

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- Alternative keys must not be used in templates because each projection has its own database table set and own alternative key index.
- The field “ Secondary Key” enables a secondary key related to the data table type to be defined. This information can be used by the buffer to improve performance.  
`/BOBF/CL_BUF_SIMPLE` does not use this information; **keep the field empty in this case.**
- The `KEY` attribute of a node is implicitly an alternative key and can be used in the “convert alternative key” statement using the constant  
`/BOBF/IF_CONF_C=>SC_ALTERNATIVE_KEY_KEY.`
- Alternative keys are only supported on persistent nodes (without separate buffer implementations).



# Converting an Alternative Key

# Converting an Alternative Key

**methods** CONVERT\_ALTERN\_KEY

**importing**

IV\_NODE\_KEY

**type** /BOBF/OBM\_NODE\_KEY

IV\_ALTKEY\_KEY

**type** /BOBF/OBM\_ALTKEY\_KEY

IV\_TARGET\_ALTKEY\_KEY

**type** /BOBF/OBM\_ALTKEY\_KEY

**default** /BOBF/IF\_FRW\_C=>SC\_ALTERNATIVE\_KEY\_KEY

IT\_KEY

**type** INDEX TABLE **optional**

IV\_BEFORE\_IMAGE

**type** BOOLE\_D **default** ABAP\_FALSE

IV\_INVALIDATE\_CACHE

**type** BOOLE\_D **default** ABAP\_FALSE

**exporting**

ET\_RESULT

**type** /BOBF/T\_FRW\_KEYINDEX

ET\_KEY

**type** INDEX TABLE .

- CONVERT\_ALTERNATIVE\_KEY is a core service that is used to convert a set of alternative keys of a node to a corresponding alternative key (or key).
- The target alternative key is the key of the node instance by default.



**Thank you**

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