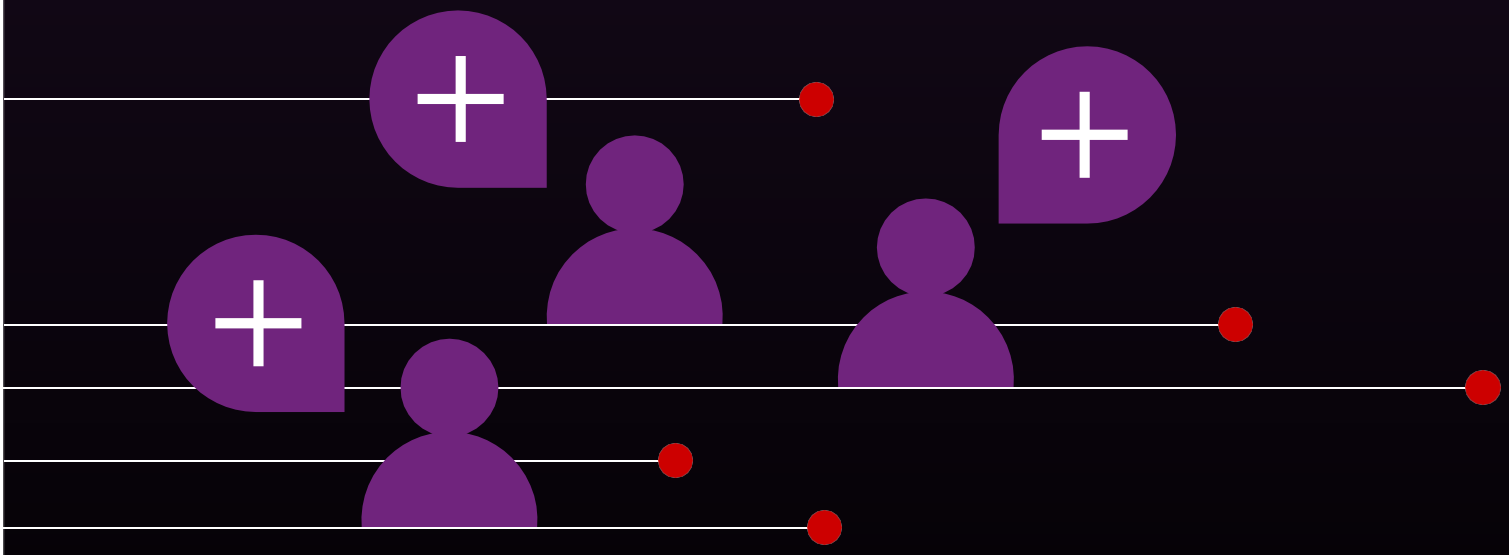
VAULTSPEED

VaultSpeed Studio

SCD2 dimension on a BRIDGE



USE CASE FOR THIS TEMPLATE

This document describes how a user can configure a template in the VaultSpeed Studio to generate an SCD Type 2 dimension based on an insert-only RDV by using a bridge table with multiple HUB's. In the setup there is the possibility to limit the fields which should show up in the dimension. The generated query will also remove unnecessary records (no changes in the combination of selected fields).

Before you explore and use this example template, ensure that you understand the example SQL attached to understand what the template does and that it covers your needs.

This template is designed for:

- DIMENSION creation based on a BRIDGE
- The BRIDGE represents 1 hierarchy in a dimension with max 5 levels (eg product → product type → product segment). With the outer ends of the bridge being the lowest and highest level of that hierarchy
- Slowly Changing Type 2 Dimension
- Versions in the dimension will be compressed
- PIT tables must exist on EACH entry table on the BRIDGE
- MAIN_HUB must be defined
- Only the change date of the indicated LNK tables with the SO DIM_ON_BRIDGE_LNK_TIME_SELECTION will be used in defining the SCD2 time slices
- Dimension_hkey will be calculated based on the BK's of the MAIN_HUB in combination with the date

Example

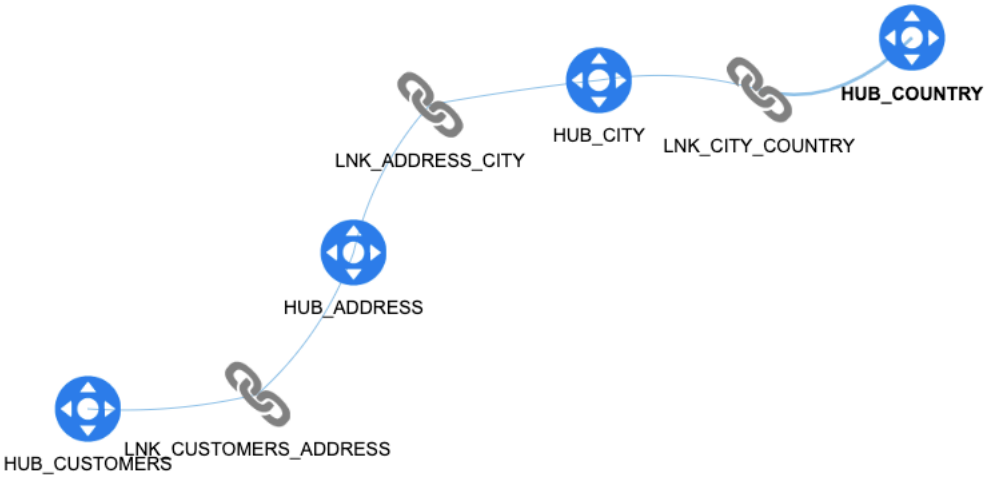
The example that is used in this document is based on a customer and its address information. In the Raw Data Vault model this is a HUB_CUSTOMER with a Link to the HUB_ADDRESSES, country and city.

Components of the implementation

- Standard business vault BRIDGE table
- PIT table on all HUB and LNK objects that exist in the BRIDGE
- Signature objects
- Assign Signature objects to the correct tables
- Create Signature attribute type and assigned in the requested fields
- Create the Template
- Create Target definition
- Fill in the Dependency

Implement a Standard business vault BRIDGE table

In the open release of the Business Vault, create the bridge table. For use within the template, this bridge doesn't need to have the hash key created or the Business keys of the HUBs added.



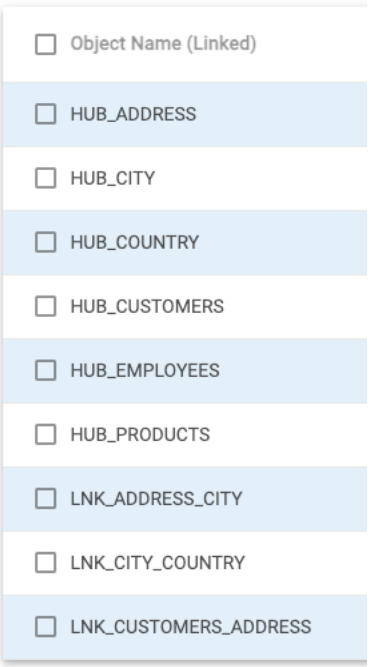
PIT table is created on all HUB and LNK objects that exist in the BRIDGE.

The Dimension is a SCD2 type dimension, for this we need to have a detailed PIT implementation on all HUBs and LNKs that exist in the BRIDGE that has been created.

The PIT setup is like the following:

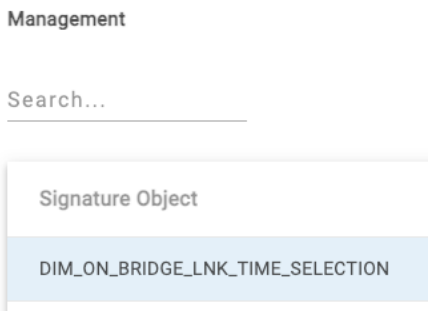
PIT Name	PIT Type ↑	Snapshot Interval	Interval Unit	Timestamp Signature Attribute
DETAIL_TRANS	detail			TRANS_TIMESTAMP

After that, the PIT is applied on the HUBs and LNKs of the example:


Object Name (Linked)
HUB_ADDRESS
HUB_CITY
HUB_COUNTRY
HUB_CUSTOMERS
HUB_EMPLOYEES
HUB_PRODUCTS
LNK_ADDRESS_CITY
LNK_CITY_COUNTRY
LNK_CUSTOMERS_ADDRESS

Create Signature objects

In order for the template to know which tables to use for which purpose we need to create some specific Signature Objects.



Signature objects are assigned

MAIN_HUB Indicate the driving table of the dimension. Meaning the lowest level of your multi-level dimension setup

Object Name	Object Type	Signature Object
Filter...	Filter...	Filter... MAIN_HUB
HUB_CUSTOMERS	Hubs	HUB, MAIN_HUB

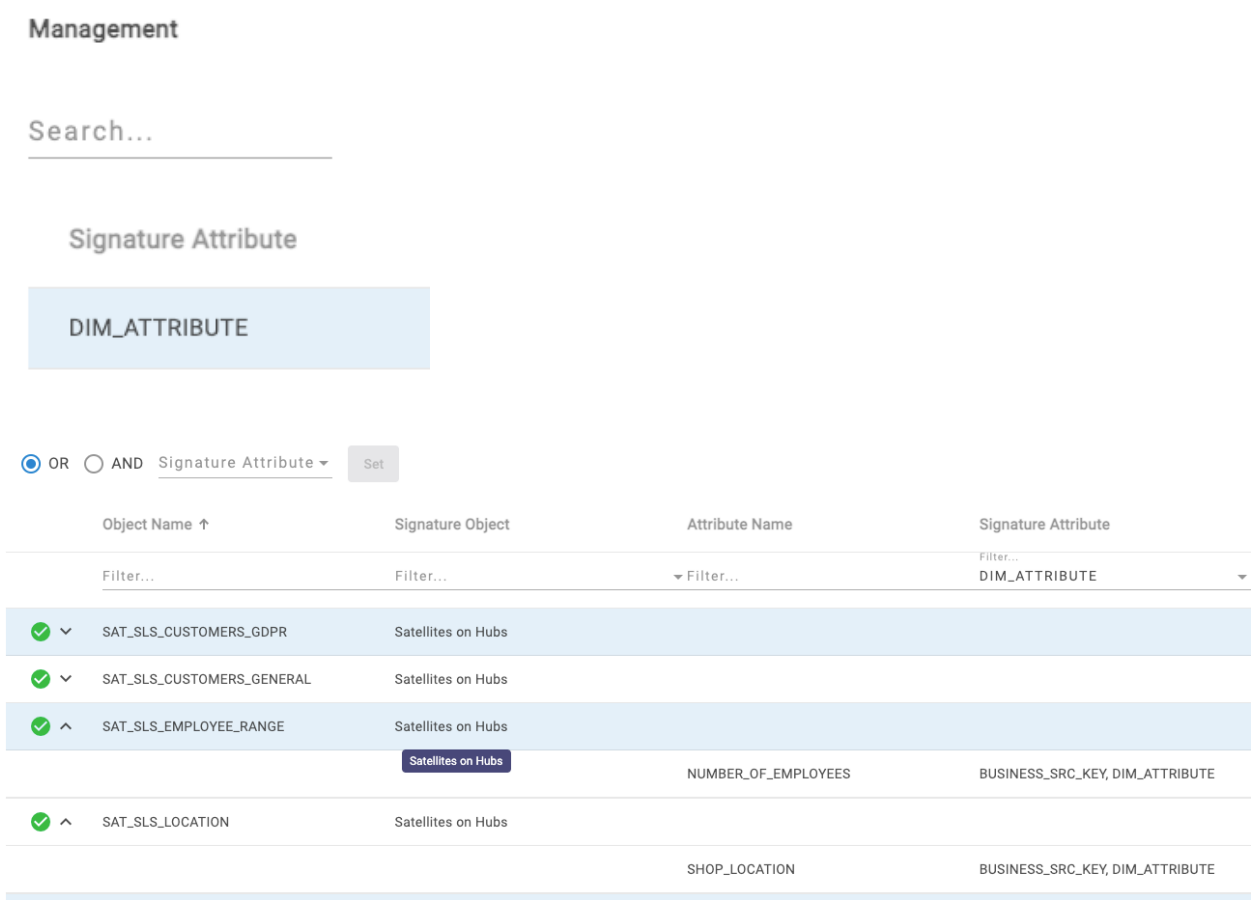
PIT_DETAIL_TRANS Indicating which PIT tables must be used in the setup of the date ranges

PIT_DETAIL_TRANS_CUSTOMERS	Point in Time table	PIT, PIT_DETAIL_TRANS
PIT_DETAIL_TRANS_ADDRESS	Point in Time table	PIT, PIT_DETAIL_TRANS
PIT_DETAIL_TRANS_CITY	Point in Time table	PIT, PIT_DETAIL_TRANS
PIT_DETAIL_TRANS_ADDRESS_CITY	Point in Time table	PIT, PIT_DETAIL_TRANS
PIT_DETAIL_TRANS_COUNTRY	Point in Time table	PIT, PIT_DETAIL_TRANS
PIT_DETAIL_TRANS_CUSTOMERS_ADDRESS	Point in Time table	PIT, PIT_DETAIL_TRANS
PIT_DETAIL_TRANS_CITY_COUNTRY	Point in Time table	PIT, PIT_DETAIL_TRANS

DIM_ON_BRIDGE_LNK_TIME_SELECTION Indicating from which LNK table that is directly connected with the main_hub we want to take the time slices for the SCD2

Object Name ↓	Object Type	Signature Object
Filter... shops	Filter... Relationship Based Links ×	Filter...
LNK_SHOPS_LOCATION	Relationship Based Links	LNK, DIM_ON_BRIDGE_LNK_TIME_SELECTION
LNK_SHOPS_EMPLOYEERANGE	Relationship Based Links	LNK, DIM_ON_BRIDGE_LNK_TIME_SELECTION

Create Signature attribute type and flag the usage in the requested fields



Create the template

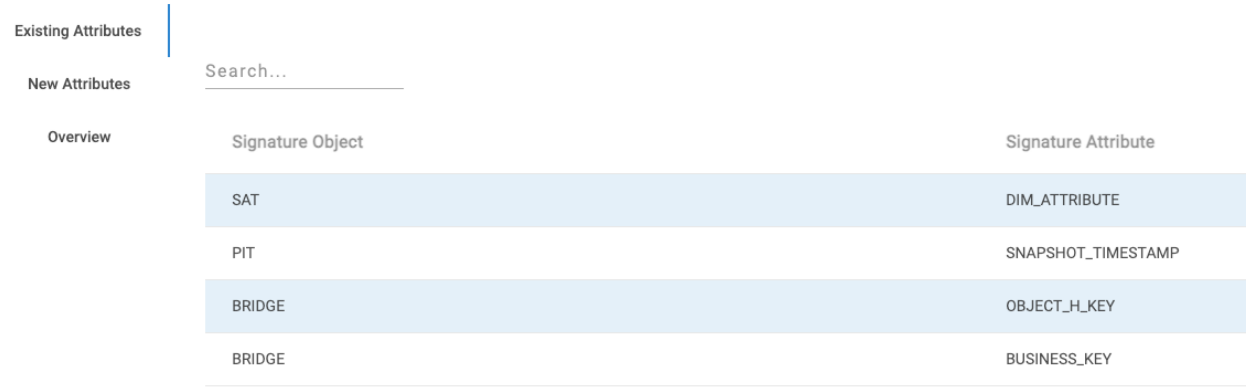
Template definition, according to the standard that you want to use. Important element here is the Signature Object naming. That name comes back in the .dvt file that contains the definition of the dimension template. If you have multiple implementations, you might want to go for a different name. But then you will need to adapt the template file accordingly and replace all the DIMB references with your chosen name.

Name	Description	Signature Object	Prefix	Suffix ↑	Object Type	Load Type	Signature Schema	Database Type	Folder Name	Base Type
DIM_ON_BRIDGE	Dimension on Bridge table	DIMB	DIM		VIEW	ALL	INFORMATION_MARTS	Snowflake		Bridge table

Take the dimension_view_on_bridge_multi_etl.dvt file and upload it for the ETL template of this view.

Fill in the Target Definition

The target definition is very specific to the template:

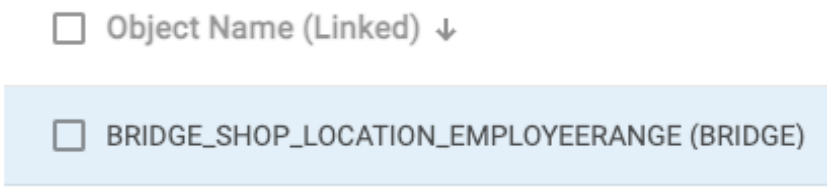


Add new attribute for the calculated snapshot and end snapshot. Attention, to avoid overlap with the existing snapshot_timestamp there is a double _!

Unique	Name	Prefix	Suffix	Signature Object	Signature Attribute	Data Type
	snapshot__timestamp					TIMESTAMP_TZ
	end_snapshot__timestamp					TIMESTAMP_TZ

Fill in the Dependency

Define on which BRIDGE table this template must be implemented.



```
Template DIMENSION
//Start building the subselects for each HUB and LNK from the BRIDGE table
    comp_group_start $ DVO_BASE_GROUP$ INL_V_GRP
    componentGroupRepeatedByComponent DVO

        //For each table take the specific attributes
        consists of target inline_view DVO_BASE$
        componentrepeatedbycomponent DIMB

            Artifact BASE_OBJECT_H_KEY
                expressedBy DVO_SRC$.OBJECT_H_KEY
                    expressionRepeatedByColumn DVO_SRC$.OBJECT_H_KEY

            Artifact BASE_OBJECT_L_H_KEY
                expressedBy DVO_SRC$.OBJECT_L_H_KEY
                    expressionRepeatedByColumn DVO_SRC$.OBJECT_L_H_KEY

            Artifact BASE_OBJECT_F_H_KEY
                expressedBy DVO_SRC$.OBJECT_F_H_KEY
                    expressionRepeatedByColumn DVO_SRC$.OBJECT_F_H_KEY

            Attribute BUSINESS_KEY
                expressedBy DVO_SRC$.BUSINESS_KEY
                    expressionRepeatedByColumn DVO_SRC$.BUSINESS_KEY

            Attribute CONCAT_BUSINESS_KEY
                expressedBy DVO_SRC$.CONCAT_BUSINESS_KEY
                    expressionRepeatedByColumn DVO_SRC$.CONCAT_BUSINESS_KEY

            //The date from the PIT that is linked to the driving table of this
subselect
            Attribute $ SNAPSHOT__TIMESTAMP
            Attributerepeatedbycomponent PIT$
                expressedBy PIT_SRC$$.SNAPSHOT_TIMESTAMP
                    expressionRepeatedByColumn PIT_SRC$$.SNAPSHOT_TIMESTAMP

            //Take only the attributes from the SAT that have been flagged by the
signature attribute
            Attribute $ DIM_ATTRIBUTE
            Attributerepeatedbycomponent PITSAT$
                expressedBy SAT_SRC$$$.DIM_ATTRIBUTE
                    expressionRepeatedByColumn SAT_SRC$$$.DIM_ATTRIBUTE

        consists of source table DVO_SRC$
        componentrepeatedbycomponent DVO$

        //Join the PIT table
        comp_subgroup_start $ pit_join_sub
        componentGroupConditionedBy [(TAB PIT$$ : SIGNATURE_OBJECT =
PIT_DETAIL_TRANS)]
        componentrepeatedbycomponent PIT$
```

```
            consists of inner join JOIN_PIT_SRC$$
            componentrepeatedbycomponent PIT$$

                        Artifact GENERAL_EXPRESSION
                            expressedBy DVO_SRC$.OBJECT_H_KEY =
PIT_SRC$$.OBJECT_L_H_KEY
                            expressionconditionedby [(TAB DVO$ : DV_TYPE = HUB)]
                            expressionRepeatedByColumn PIT_SRC$$.OBJECT_L_H_KEY

                            expressedBy DVO_SRC$.OBJECT_L_H_KEY =
PIT_SRC$$.OBJECT_L_H_KEY
                            expressionconditionedby [(TAB DVO$ : DV_TYPE = LNK)]
                            expressionRepeatedByColumn PIT_SRC$$.OBJECT_L_H_KEY

            consists of joined table PIT_SRC$$
            componentrepeatedbycomponent PIT$$

            comp_subgroup_start $ SAT_SRC_SUBGROUP
            componentsubgrouprepeatedbycomponent PITSAT$$


                //Join the SATs linked to that PIT table
                consists of inner join JOIN_SAT_SRC$$$
                componentrepeatedbycomponent PITSAT$$$

                            Artifact GENERAL_EXPRESSION
                                GROUP_1 expressedBy PIT_SRC$$.OBJECT_F_H_KEY =
SAT_SRC$$$.OBJECT_H_KEY
                                    expressionconditionedby [(TAB DVO$ : DV_TYPE =
HUB)]
                                    expressionRepeatedByColumn SAT_SRC$$$.OBJECT_H_KEY
                                GROUP_1 expressedBy PIT_SRC$$.OBJECT_F_H_KEY =
SAT_SRC$$$.OBJECT_L_H_KEY
                                    expressionconditionedby [(TAB DVO$ : DV_TYPE =
LNK)]
                                    expressionRepeatedByColumn
SAT_SRC$$$.OBJECT_L_H_KEY
                                GROUP_2 expressedBy AND PIT_SRC$$.SAT_LOAD_TIMESTAMP =
SAT_SRC$$$.TRANS_INDICATOR
                                    expressionRepeatedByColumn
SAT_SRC$$$.TRANS_INDICATOR

                consists of joined table SAT_SRC$$$
                componentrepeatedbycomponent PITSAT$$$

            comp_subgroup_end

        comp_subgroup_end

    comp_group_end
```

```
    //Create the complete dataset of SNAPSHOT_DATES that must be taken into account
for handling the SCD2 dimension
    comp_group_start COMBINE_SNAPSHOTS_GROUP INL_V_GRP
    RepeatedByObject DIMB

        consists of union set COMBINE_SNAPSHOTS
        componentrepeatedbycomponent DIMB

        comp_subgroup_start $ union_snaps
        componentconditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)(TAB DVO$ :
DV_TYPE = HUB)]
        componentconditionedby [(TAB DVO$ : SIGNATURE_OBJECT =
DIM_ON_BRIDGE_LNK_TIME_SELECTION)(TAB DVO$ : DV_TYPE = LNK)]
        RepeatedByObject DVO

            consists of union set COMBINE_SNAPSHOTS
            componentrepeatedbycomponent DIMB

                Artifact BASE_OBJECT_H_KEY
                    expressedBy DVO_BASE$.BASE_OBJECT_H_KEY
                    expressionconditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
                    expressionconditionedby [(TAB DVO$ : SIGNATURE_OBJECT =
DIM_ON_BRIDGE_LNK_TIME_SELECTION)(TAB DVO$ : DV_TYPE = LNK)]

                Attribute SNAPSHOT__TIMESTAMP
                    expressedBy DVO_BASE$.SNAPSHOT__TIMESTAMP
                        expressionRepeatedByColumn DVO_BASE$.SNAPSHOT__TIMESTAMP

            consists of source inline_view DVO_BASE$
            componentrepeatedbycomponent DIMB

        comp_subgroup_end

    comp_group_end

    //Create the end_snapshot_timestamp based on the full snapshot data set
    comp_group_start SNAPSHOT_DATES_GROUP INL_V_GRP
    RepeatedByObject DIMB

        consists of target inline_view SNAPSHOT_DATES
        componentrepeatedbycomponent DIMB

            Artifact BASE_OBJECT_H_KEY
                expressedBy COMBINE_SNAPSHOTS.BASE_OBJECT_H_KEY

            Attribute SNAPSHOT__TIMESTAMP
                expressedBy COMBINE_SNAPSHOTS.SNAPSHOT__TIMESTAMP
                    expressionRepeatedByColumn COMBINE_SNAPSHOTS.SNAPSHOT__TIMESTAMP

            Attribute END_SNAPSHOT__TIMESTAMP
```

```
                expressedBy COALESCE(LEAD(COMBINE_SNAPSHOTS.SNAPSHOT__TIMESTAMP) OVER
(PARTITION BY COMBINE_SNAPSHOTS.BASE_OBJECT_H_KEY ORDER BY
COMBINE_SNAPSHOTS.SNAPSHOT__TIMESTAMP),GTIMECAST[@#CURRENT_RECORD_LOAD_END_DATE#])

        consists of source inline_view COMBINE_SNAPSHOTS
        componentrepeatedbycomponent DIMB

    comp_group_end

    //Build the DATA_SET CTE which will contain the full dataset based on the selected
fields with a HASH_DIFF field calculated which will be used later to filter out all
unnecesary records
    comp_group_start DATA_SET_GROUP INL_V_GRP
    componentgrouprepeatedbycomponent DIMB

        consists of target inline_view DATA_SET
        RepeatedByObject DIMB

            Artifact $ BASE_OBJECT_H_KEY
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy DVO_BASE$.BASE_OBJECT_H_KEY
                expressionRepeatedByColumn DVO_SRC$.OBJECT_H_KEY

            Attribute $ BUSINESS_KEY
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy DVO_BASE$.BUSINESS_KEY
                    expressionRepeatedByColumn DVO_SRC$.BUSINESS_KEY

            Attribute CONCAT_BUSINESS_KEY
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy DVO_BASE$.CONCAT_BUSINESS_KEY
                    expressionRepeatedByColumn DVO_SRC$.CONCAT_BUSINESS_KEY

            Attribute $ SNAPSHOT__TIMESTAMP
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy DVO_BASE$.SNAPSHOT__TIMESTAMP
                    expressionRepeatedByColumn DVO_BASE$.SNAPSHOT__TIMESTAMP

            Attribute END_SNAPSHOT__TIMESTAMP

                expressedBy SNAPSHOT_DATES.END_SNAPSHOT__TIMESTAMP
                    expressionRepeatedByColumn SNAPSHOT_DATES.END_SNAPSHOT__TIMESTAMP
```

```
            Attribute $ DIM_ATTRIBUTE
            Attributerepeatedbycomponent PITSAT

                expressedBy DVO_BASE$.DIM_ATTRIBUTE
                    expressionRepeatedByColumn SAT_SRC$$$.DIM_ATTRIBUTE


            //Create the HASH_DIFF field, a contatenation of all content fields that
have been selected for usage in the implementation of the template on a certain BRIDGE
            ArtifactPart DIM_HASH_DIFF

                GROUP_1 expressedBy HASHFUNC[

            ArtifactPart $ DIM_HASH_DIFF
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                GROUP_2 expressedBy
UPPER(REPLACE(COALESCE(TRIM(CHARCASTFRMT[DVO_BASE$.BASE_OBJECT_H_KEY]),
@#HASHDIFF_NULL_REPLACEMENT#) , @#HASHKEY_DELIMITER# , @#HASHKEY_ESCAPE_CHARACTER# ||
@#HASHKEY_DELIMITER#)) || @#HASHKEY_DELIMITER#
                    expressionRepeatedByColumn DVO_SRC$.OBJECT_H_KEY VERTICAL

            ArtifactPart $ DIM_HASH_DIFF
            Attributerepeatedbycomponent PITSAT

                GROUP_3 expressedBy
UPPER(REPLACE(COALESCE(TRIM(CHARCASTFRMT[DVO_BASE$.DIM_ATTRIBUTE]),
@#HASHDIFF_NULL_REPLACEMENT#) , @#HASHKEY_DELIMITER# , @#HASHKEY_ESCAPE_CHARACTER# ||
@#HASHKEY_DELIMITER#)) || @#HASHKEY_DELIMITER#
                    expressionRepeatedByColumn SAT_SRC$$$.DIM_ATTRIBUTE VERTICAL

            ArtifactPart DIM_HASH_DIFF

                GROUP_4 expressedBy HASHFUNC]

        consists of source table BRIDGE_SRC
        RepeatedByObject BRIDGE

        comp_subgroup_start $ JOIN_DVO_BASE_SUBGROUP
        expressionconditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
        componentsubgrouprepeatedbycomponent DVO

            consists of inner join JOIN_SNAPSHOT_DATES
            componentrepeatedbycomponent DIMB

                Artifact GENERAL_EXPRESSION
                    expressedBy BRIDGE_SRC.OBJECT_H_KEY$ =
SNAPSHOT_DATES.BASE_OBJECT_H_KEY
                    expressionRepeatedByColumn BRIDGE_SRC.OBJECT_H_KEY$
```

```
            consists of joined inline_view SNAPSHOT_DATES
            componentrepeatedbycomponent DIMB

        comp_subgroup_end

        comp_subgroup_start $ JOIN_DVO_BASE_SUBGROUP
        componentsubgrouprepeatedbycomponent DVO

            consists of inner join JOIN_DVO_BASE$
            componentrepeatedbycomponent DVO$

                Artifact GENERAL_EXPRESSION
                    GROUP_1 expressedBy BRIDGE_SRC.OBJECT_H_KEY$ =
DVO_BASE$.BASE_OBJECT_H_KEY
                    expressionconditionedby [(TAB DVO$ : DV_TYPE = HUB)]
                    expressionRepeatedByColumn BRIDGE_SRC.OBJECT_H_KEY$
                    GROUP_1 expressedBy BRIDGE_SRC.OBJECT_L_H_KEY$ =
DVO_BASE$.BASE_OBJECT_L_H_KEY
                    expressionconditionedby [(TAB DVO$ : DV_TYPE = LNK LND NHL LNA)]
                    expressionRepeatedByColumn BRIDGE_SRC.OBJECT_L_H_KEY$
                    GROUP_2 expressedBy AND DVO_BASE$.SNAPSHOT__TIMESTAMP =
SNAPSHOT_DATES.SNAPSHOT__TIMESTAMP
                    expressionconditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
                    expressionRepeatedByColumn DVO_BASE$.SNAPSHOT__TIMESTAMP
                    GROUP_2 expressedBy AND DVO_BASE$.SNAPSHOT__TIMESTAMP >=
SNAPSHOT_DATES.SNAPSHOT__TIMESTAMP AND DVO_BASE$.SNAPSHOT__TIMESTAMP <
SNAPSHOT_DATES.END_SNAPSHOT__TIMESTAMP
                    expressionconditionedby [(TAB DVO$ : SIGNATURE_OBJECT !=
MAIN_HUB)]
                    expressionRepeatedByColumn DVO_BASE$.SNAPSHOT__TIMESTAMP

            consists of joined inline_view DVO_BASE$
            componentrepeatedbycomponent DVO$

        comp_subgroup_end

    comp_group_end

    //A subselect, created to flag those records that should be filtered
    comp_group_start HASH_DIFF_DATA_SET_GROUP INL_V_GRP
    componentgrouprepeatedbycomponent DIMB

        consists of target inline_view HASH_DIFF_DATA_SET
        RepeatedByObject DIMB

            Artifact BASE_OBJECT_H_KEY

                expressedBy DATA_SET.BASE_OBJECT_H_KEY

            Attribute $ BUSINESS_KEY
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
```

```
            RepeatedByObject DVO

                expressedBy DATA_SET.BUSINESS_KEY
                    expressionRepeatedByColumn DVO_SRC$.BUSINESS_KEY

            Attribute CONCAT_BUSINESS_KEY
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy DATA_SET.CONCAT_BUSINESS_KEY
                    expressionRepeatedByColumn DVO_SRC$.CONCAT_BUSINESS_KEY

            Attribute SNAPSHOT__TIMESTAMP
                expressedBy DATA_SET.SNAPSHOT__TIMESTAMP
                    expressionRepeatedByColumn DATA_SET.SNAPSHOT__TIMESTAMP

            Attribute END_SNAPSHOT__TIMESTAMP
                expressedBy DATA_SET.END_SNAPSHOT__TIMESTAMP
                    expressionRepeatedByColumn DATA_SET.END_SNAPSHOT__TIMESTAMP

            Attribute $ DIM_ATTRIBUTE
            Attributerepeatedbycomponent PITSAT
                expressedBy DATA_SET.DIM_ATTRIBUTE
                    expressionRepeatedByColumn SAT_SRC$$$.DIM_ATTRIBUTE

            Artifact CHANGE_FLAG
                expressedBy CASE WHEN COALESCE(LEAD( DATA_SET.DIM_HASH_DIFF )OVER(
PARTITION BY DATA_SET.BASE_OBJECT_H_KEY ORDER BY DATA_SET.SNAPSHOT__TIMESTAMP),#XXX#)
!= DATA_SET.DIM_HASH_DIFF THEN 1 ELSE 0 END

        consists of source inline_view DATA_SET
        RepeatedByObject DIMB

    comp_group_end


    //A subselect, created to filter out those records
    comp_group_start FILTERED_DATA_SET_GROUP INL_V_GRP
    componentgrouprepeatedbycomponent DIMB

        consists of target inline_view FILTERED_DATA_SET
        RepeatedByObject DIMB

            Attribute $ OBJECT_H_KEY$
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy HASH_DIFF_DATA_SET.BASE_OBJECT_H_KEY
                    expressionRepeatedByColumn DVO_SRC$.OBJECT_H_KEY

            Attribute $ BUSINESS_KEY
```

```
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy HASH_DIFF_DATA_SET.BUSINESS_KEY
                    expressionRepeatedByColumn DVO_SRC$.BUSINESS_KEY

            Attribute CONCAT_BUSINESS_KEY
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy HASH_DIFF_DATA_SET.CONCAT_BUSINESS_KEY
                    expressionRepeatedByColumn DVO_SRC$.CONCAT_BUSINESS_KEY

            Attribute SNAPSHOT__TIMESTAMP
                expressedBy HASH_DIFF_DATA_SET.SNAPSHOT__TIMESTAMP
                    expressionRepeatedByColumn HASH_DIFF_DATA_SET.SNAPSHOT__TIMESTAMP

            Attribute END_SNAPSHOT__TIMESTAMP
                expressedBy HASH_DIFF_DATA_SET.END_SNAPSHOT__TIMESTAMP
                    expressionRepeatedByColumn
HASH_DIFF_DATA_SET.END_SNAPSHOT__TIMESTAMP

            Attribute $ DIM_ATTRIBUTE
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            Attributerepeatedbycomponent PITSAT
                expressedBy HASH_DIFF_DATA_SET.DIM_ATTRIBUTE
                    expressionRepeatedByColumn SAT_SRC$$$.DIM_ATTRIBUTE

            Attribute $ DIM_ATTRIBUTE
            Attributerepeatedbycomponent PITSAT
                expressedBy HASH_DIFF_DATA_SET.DIM_ATTRIBUTE
                    expressionRepeatedByColumn SAT_SRC$$$.DIM_ATTRIBUTE

        consists of source inline_view HASH_DIFF_DATA_SET
        RepeatedByObject DIMB

        consists of filter FILTER_HASH_DIFF_DATA_SET

                Artifact GENERAL_EXPRESSION
                    expressedBy HASH_DIFF_DATA_SET.CHANGE_FLAG = 1

    comp_group_end

    //The final select for the view with a recalculation of the end_timestamp to
ensure matching records for the filtered out records
    comp_group_start INS_GROUP INS_GRP
    componentgrouprepeatedbycomponent DIMB

        consists of target table DIM_TGT
        RepeatedByObject DIMB
```

```
            //Create the dimension_KEY field, a HASH based on a concatenation of the
MAIN_HUB-hkey and the timestamp of the record
            ArtifactPart DIMENSION_KEY

                GROUP_1 expressedBy HASHFUNC[

            ArtifactPart $ DIMENSION_KEY
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                GROUP_2 expressedBy
UPPER(REPLACE(COALESCE(TRIM(CHARCASTFRMT[FILTERED_DATA_SET.BUSINESS_KEY]),
@#HASHDIFF_NULL_REPLACEMENT#) , @#HASHKEY_DELIMITER# , @#HASHKEY_ESCAPE_CHARACTER# ||
@#HASHKEY_DELIMITER#)) || @#HASHKEY_DELIMITER#
                    expressionRepeatedByColumn DVO_SRC$.BUSINESS_KEY VERTICAL

            ArtifactPart $ DIMENSION_KEY

                GROUP_3 expressedBy
UPPER(REPLACE(COALESCE(TRIM(CHARCASTFRMT[FILTERED_DATA_SET.SNAPSHOT__TIMESTAMP]),
@#HASHDIFF_NULL_REPLACEMENT#) , @#HASHKEY_DELIMITER# , @#HASHKEY_ESCAPE_CHARACTER# ||
@#HASHKEY_DELIMITER#)) || @#HASHKEY_DELIMITER#
                    expressionRepeatedByColumn HASH_DIFF_DATA_SET.SNAPSHOT__TIMESTAMP
VERTICAL


            ArtifactPart DIMENSION_KEY

                GROUP_4 expressedBy HASHFUNC]

            Attribute $ OBJECT_H_KEY$
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy FILTERED_DATA_SET.OBJECT_H_KEY
                    expressionRepeatedByColumn DVO_SRC$.OBJECT_H_KEY

            Attribute $ BUSINESS_KEY
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy FILTERED_DATA_SET.BUSINESS_KEY
                    expressionRepeatedByColumn DVO_SRC$.BUSINESS_KEY

            Attribute CONCAT_BUSINESS_KEY
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            RepeatedByObject DVO

                expressedBy FILTERED_DATA_SET.CONCAT_BUSINESS_KEY
                    expressionRepeatedByColumn DVO_SRC$.CONCAT_BUSINESS_KEY
```

```
            Attribute SNAPSHOT__TIMESTAMP
                expressedBy FILTERED_DATA_SET.SNAPSHOT__TIMESTAMP
                    expressionRepeatedByColumn HASH_DIFF_DATA_SET.SNAPSHOT__TIMESTAMP

            Attribute END_SNAPSHOT__TIMESTAMP
                expressedBy COALESCE(LEAD(FILTERED_DATA_SET.SNAPSHOT__TIMESTAMP) OVER
(PARTITION BY FILTERED_DATA_SET.OBJECT_H_KEY  ORDER BY
FILTERED_DATA_SET.SNAPSHOT__TIMESTAMP),GTIMECAST[@#CURRENT_RECORD_LOAD_END_DATE#])

            Attribute $ DIM_ATTRIBUTE
            AttributeConditionedby [(TAB DVO$ : SIGNATURE_OBJECT = MAIN_HUB)]
            Attributerepeatedbycomponent PITSAT
                expressedBy FILTERED_DATA_SET.DIM_ATTRIBUTE
                    expressionRepeatedByColumn SAT_SRC$$$.DIM_ATTRIBUTE

            Attribute $ DIM_ATTRIBUTE
            Attributerepeatedbycomponent PITSAT
                expressedBy FILTERED_DATA_SET.DIM_ATTRIBUTE
                    expressionRepeatedByColumn SAT_SRC$$$.DIM_ATTRIBUTE

        consists of source inline_view FILTERED_DATA_SET
        RepeatedByObject DIMB


    comp_group_end
```

```
DROP VIEW IF EXISTS "INFORMATION_MARTS"."DIM_SHOP_LOCATION_EMPLOYEERANGE";
CREATE  VIEW "INFORMATION_MARTS"."DIM_SHOP_LOCATION_EMPLOYEERANGE"  AS
    WITH "DVO_BASE1" AS
    (
        SELECT
              "DVO_SRC1"."EMPLOYEE_RANGE_HKEY" AS "BASE_OBJECT_H_KEY"
            , "DVO_SRC1"."NUMBER_OF_EMPLOYEES_BK" AS "NUMBER_OF_EMPLOYEES_BK"
        FROM "VS_DEMO_DV_SNW_FL"."HUB_EMPLOYEE_RANGE" "DVO_SRC1"
    )
    , "DVO_BASE3" AS
    (
        SELECT
              "DVO_SRC3"."SHOPS_HKEY" AS "BASE_OBJECT_H_KEY"
            , "DVO_SRC3"."SHOP_CODE_BK" AS "SHOP_CODE_BK"
            , "DVO_SRC3"."SHOP_NAME_BK" AS "SHOP_NAME_BK"
            , "DVO_SRC3"."SHOPPING_CENTER_ID_BK" AS "SHOPPING_CENTER_ID_BK"
            , "PIT_SRC3_2"."SNAPSHOT_TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
            , "SAT_SRC3_2_2"."HAS_PARKING" AS "HAS_PARKING"
            , "SAT_SRC3_2_2"."SHOP_SIZE" AS "SHOP_SIZE"
        FROM "VS_DEMO_DV_SNW_FL"."HUB_SHOPS" "DVO_SRC3"
        INNER JOIN "VS_DEMO_DV_SNW_BV"."PIT_DETAIL_TRANS_SHOPS" "PIT_SRC3_2" ON
"DVO_SRC3"."SHOPS_HKEY" = "PIT_SRC3_2"."SHOPS_HKEY"
        INNER JOIN "VS_DEMO_DV_SNW_FL"."SAT_PRD_SHOPS" "SAT_SRC3_2_1" ON
"PIT_SRC3_2"."SAT_PRD_SHOPS_HKEY" = "SAT_SRC3_2_1"."SHOPS_HKEY"
        INNER JOIN "VS_DEMO_DV_SNW_FL"."SAT_SLS_SHOPS" "SAT_SRC3_2_2" ON
"PIT_SRC3_2"."SAT_SLS_SHOPS_HKEY" = "SAT_SRC3_2_2"."SHOPS_HKEY"
        INNER JOIN "VS_DEMO_DV_SNW_FL"."SAT_VST_SHOPS" "SAT_SRC3_2_3" ON
"PIT_SRC3_2"."SAT_VST_SHOPS_HKEY" = "SAT_SRC3_2_3"."SHOPS_HKEY"
    )
    , "DVO_BASE5" AS
    (
        SELECT
              "DVO_SRC5"."LOCATION_HKEY" AS "BASE_OBJECT_H_KEY"
            , "DVO_SRC5"."SHOP_LOCATION_BK" AS "SHOP_LOCATION_BK"
        FROM "VS_DEMO_DV_SNW_FL"."HUB_LOCATION" "DVO_SRC5"
    )
    , "DVO_BASE2" AS
    (
        SELECT
              "DVO_SRC2"."SHOPS_HKEY" AS "BASE_OBJECT_H_KEY"
            , "DVO_SRC2"."LNK_SHOPS_EMPLOYEERANGE_HKEY" AS "BASE_OBJECT_L_H_KEY"
            , "DVO_SRC2"."EMPLOYEE_RANGE_HKEY" AS "BASE_OBJECT_F_H_KEY"
            , "PIT_SRC2_1"."SNAPSHOT_TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
        FROM "VS_DEMO_DV_SNW_FL"."LNK_SHOPS_EMPLOYEERANGE" "DVO_SRC2"
        INNER JOIN "VS_DEMO_DV_SNW_BV"."PIT_DETAIL_TRANS_SHOPS_EMPLOYEERANGE"
"PIT_SRC2_1" ON  "DVO_SRC2"."LNK_SHOPS_EMPLOYEERANGE_HKEY" =
"PIT_SRC2_1"."LNK_SHOPS_EMPLOYEERANGE_HKEY"
        INNER JOIN "VS_DEMO_DV_SNW_FL"."LKS_SLS_SHOPS_EMPLOYEERANGE" "SAT_SRC2_1_1" ON
"PIT_SRC2_1"."LKS_SLS_SHOPS_EMPLOYEERANGE_HKEY" =
"SAT_SRC2_1_1"."LNK_SHOPS_EMPLOYEERANGE_HKEY"
    )
```

```
    , "DVO_BASE4" AS
    (
        SELECT
              "DVO_SRC4"."SHOPS_HKEY" AS "BASE_OBJECT_H_KEY"
            , "DVO_SRC4"."LNK_SHOPS_LOCATION_HKEY" AS "BASE_OBJECT_L_H_KEY"
            , "DVO_SRC4"."LOCATION_HKEY" AS "BASE_OBJECT_F_H_KEY"
            , "PIT_SRC4_1"."SNAPSHOT_TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
        FROM "VS_DEMO_DV_SNW_FL"."LNK_SHOPS_LOCATION" "DVO_SRC4"
        INNER JOIN "VS_DEMO_DV_SNW_BV"."PIT_DETAIL_TRANS_SHOPS_LOCATION" "PIT_SRC4_1"
ON  "DVO_SRC4"."LNK_SHOPS_LOCATION_HKEY" = "PIT_SRC4_1"."LNK_SHOPS_LOCATION_HKEY"
        INNER JOIN "VS_DEMO_DV_SNW_FL"."LKS_SLS_SHOPS_LOCATION" "SAT_SRC4_1_1" ON
"PIT_SRC4_1"."LKS_SLS_SHOPS_LOCATION_HKEY" = "SAT_SRC4_1_1"."LNK_SHOPS_LOCATION_HKEY"
    )
    , "COMBINE_SNAPSHOTS" AS
    (
        SELECT
              "DVO_BASE2"."BASE_OBJECT_H_KEY" AS "BASE_OBJECT_H_KEY"
            , "DVO_BASE2"."SNAPSHOT__TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
        FROM "DVO_BASE2" "DVO_BASE2"
        UNION
        SELECT
              "DVO_BASE3"."BASE_OBJECT_H_KEY" AS "BASE_OBJECT_H_KEY"
            , "DVO_BASE3"."SNAPSHOT__TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
        FROM "DVO_BASE3" "DVO_BASE3"
        UNION
        SELECT
              "DVO_BASE4"."BASE_OBJECT_H_KEY" AS "BASE_OBJECT_H_KEY"
            , "DVO_BASE4"."SNAPSHOT__TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
        FROM "DVO_BASE4" "DVO_BASE4"
    )
    , "SNAPSHOT_DATES" AS
    (
        SELECT
              "COMBINE_SNAPSHOTS"."BASE_OBJECT_H_KEY" AS "BASE_OBJECT_H_KEY"
            , "COMBINE_SNAPSHOTS"."SNAPSHOT__TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
            , COALESCE(LEAD("COMBINE_SNAPSHOTS"."SNAPSHOT__TIMESTAMP")OVER(PARTITION
BY "COMBINE_SNAPSHOTS"."BASE_OBJECT_H_KEY" ORDER BY
"COMBINE_SNAPSHOTS"."SNAPSHOT__TIMESTAMP")
                , TO_TIMESTAMP('31/12/2999 23:59:59' , 'DD/MM/YYYY HH24:MI:SS')) AS
"END_SNAPSHOT__TIMESTAMP"
        FROM "COMBINE_SNAPSHOTS" "COMBINE_SNAPSHOTS"
    )
    , "DATA_SET" AS
    (
        SELECT
              "DVO_BASE3"."BASE_OBJECT_H_KEY" AS "BASE_OBJECT_H_KEY"
            , "DVO_BASE3"."SHOP_CODE_BK" AS "SHOP_CODE_BK"
            , "DVO_BASE3"."SHOP_NAME_BK" AS "SHOP_NAME_BK"
            , "DVO_BASE3"."SHOPPING_CENTER_ID_BK" AS "SHOPPING_CENTER_ID_BK"
            , "DVO_BASE3"."SNAPSHOT__TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
            , "SNAPSHOT_DATES"."END_SNAPSHOT__TIMESTAMP" AS "END_SNAPSHOT__TIMESTAMP"
```

```
            , "DVO_BASE3"."HAS_PARKING" AS "HAS_PARKING"
            , "DVO_BASE3"."SHOP_SIZE" AS "SHOP_SIZE"
            , UPPER(SHA1_HEX(  UPPER(REPLACE(COALESCE(TRIM(
"DVO_BASE3"."BASE_OBJECT_H_KEY"),'~'),'\#','\\' || '\#'))||
                '\#'           || UPPER(REPLACE(COALESCE(TRIM(
TO_CHAR("DVO_BASE3"."HAS_PARKING")),'~'),'\#','\\' || '\#'))|| '\#' ||
UPPER(REPLACE(COALESCE(TRIM( "DVO_BASE3"."SHOP_SIZE"),'~'),'\#','\\' || '\#'))|| '\#'
)) AS "DIM_HASH_DIFF"
        FROM "VS_DEMO_DV_SNW_BV"."BRIDGE_SHOP_LOCATION_EMPLOYEERANGE" "BRIDGE_SRC"
        INNER JOIN "SNAPSHOT_DATES" "SNAPSHOT_DATES" ON  "BRIDGE_SRC"."SHOPS_HKEY" =
"SNAPSHOT_DATES"."BASE_OBJECT_H_KEY"
        INNER JOIN "DVO_BASE1" "DVO_BASE1" ON  "BRIDGE_SRC"."EMPLOYEE_RANGE_HKEY" =
"DVO_BASE1"."BASE_OBJECT_H_KEY" AND "DVO_BASE1"."SNAPSHOT__TIMESTAMP" >=
            "SNAPSHOT_DATES"."SNAPSHOT__TIMESTAMP" AND
"DVO_BASE1"."SNAPSHOT__TIMESTAMP" < "SNAPSHOT_DATES"."END_SNAPSHOT__TIMESTAMP"
        INNER JOIN "DVO_BASE2" "DVO_BASE2" ON
"BRIDGE_SRC"."LNK_SHOPS_EMPLOYEERANGE_HKEY" = "DVO_BASE2"."BASE_OBJECT_L_H_KEY" AND
"DVO_BASE2"."SNAPSHOT__TIMESTAMP" >=
             "SNAPSHOT_DATES"."SNAPSHOT__TIMESTAMP" AND
"DVO_BASE2"."SNAPSHOT__TIMESTAMP" < "SNAPSHOT_DATES"."END_SNAPSHOT__TIMESTAMP"
        INNER JOIN "DVO_BASE3" "DVO_BASE3" ON  "BRIDGE_SRC"."SHOPS_HKEY" =
"DVO_BASE3"."BASE_OBJECT_H_KEY" AND "DVO_BASE3"."SNAPSHOT__TIMESTAMP" =
            "SNAPSHOT_DATES"."SNAPSHOT__TIMESTAMP"
        INNER JOIN "DVO_BASE4" "DVO_BASE4" ON  "BRIDGE_SRC"."LNK_SHOPS_LOCATION_HKEY"
= "DVO_BASE4"."BASE_OBJECT_L_H_KEY" AND "DVO_BASE4"."SNAPSHOT__TIMESTAMP" >=
             "SNAPSHOT_DATES"."SNAPSHOT__TIMESTAMP" AND
"DVO_BASE4"."SNAPSHOT__TIMESTAMP" < "SNAPSHOT_DATES"."END_SNAPSHOT__TIMESTAMP"
        INNER JOIN "DVO_BASE5" "DVO_BASE5" ON  "BRIDGE_SRC"."LOCATION_HKEY" =
"DVO_BASE5"."BASE_OBJECT_H_KEY" AND "DVO_BASE5"."SNAPSHOT__TIMESTAMP" >=
            "SNAPSHOT_DATES"."SNAPSHOT__TIMESTAMP" AND
"DVO_BASE5"."SNAPSHOT__TIMESTAMP" < "SNAPSHOT_DATES"."END_SNAPSHOT__TIMESTAMP"
    )
    , "HASH_DIFF_DATA_SET" AS
    (
        SELECT
              "DATA_SET"."BASE_OBJECT_H_KEY" AS "BASE_OBJECT_H_KEY"
            , "DATA_SET"."SHOP_CODE_BK" AS "SHOP_CODE_BK"
            , "DATA_SET"."SHOP_NAME_BK" AS "SHOP_NAME_BK"
            , "DATA_SET"."SHOPPING_CENTER_ID_BK" AS "SHOPPING_CENTER_ID_BK"
            , "DATA_SET"."SNAPSHOT__TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
            , "DATA_SET"."END_SNAPSHOT__TIMESTAMP" AS "END_SNAPSHOT__TIMESTAMP"
            , "DATA_SET"."HAS_PARKING" AS "HAS_PARKING"
            , "DATA_SET"."SHOP_SIZE" AS "SHOP_SIZE"
            , CASE WHEN COALESCE(LEAD("DATA_SET"."DIM_HASH_DIFF")OVER(PARTITION BY
"DATA_SET"."BASE_OBJECT_H_KEY" ORDER BY "DATA_SET"."SNAPSHOT__TIMESTAMP")
                ,'XXX')!= "DATA_SET"."DIM_HASH_DIFF" THEN 1 ELSE 0 END AS
"CHANGE_FLAG"
        FROM "DATA_SET" "DATA_SET"
    )
    , "FILTERED_DATA_SET" AS
    (
```

```
        SELECT
              "HASH_DIFF_DATA_SET"."BASE_OBJECT_H_KEY" AS "SHOPS_HKEY"
            , "HASH_DIFF_DATA_SET"."SHOP_CODE_BK" AS "SHOP_CODE_BK"
            , "HASH_DIFF_DATA_SET"."SHOP_NAME_BK" AS "SHOP_NAME_BK"
            , "HASH_DIFF_DATA_SET"."SHOPPING_CENTER_ID_BK" AS "SHOPPING_CENTER_ID_BK"
            , "HASH_DIFF_DATA_SET"."SNAPSHOT__TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
            , "HASH_DIFF_DATA_SET"."END_SNAPSHOT__TIMESTAMP" AS
"END_SNAPSHOT__TIMESTAMP"
            , "HASH_DIFF_DATA_SET"."HAS_PARKING" AS "HAS_PARKING"
            , "HASH_DIFF_DATA_SET"."SHOP_SIZE" AS "SHOP_SIZE"
        FROM "HASH_DIFF_DATA_SET" "HASH_DIFF_DATA_SET"
        WHERE  "HASH_DIFF_DATA_SET"."CHANGE_FLAG" = 1
    )
    SELECT
          UPPER(SHA1_HEX(  UPPER(REPLACE(COALESCE(TRIM(
"FILTERED_DATA_SET"."SHOP_CODE_BK"),'~'),'\#','\\' || '\#'))||
            '\#' ||  UPPER(REPLACE(COALESCE(TRIM(
"FILTERED_DATA_SET"."SHOP_NAME_BK"),'~'),'\#','\\' || '\#'))|| '\#' ||
UPPER(REPLACE(COALESCE(TRIM(
"FILTERED_DATA_SET"."SHOPPING_CENTER_ID_BK"),'~'),'\#','\\' || '\#'))|| '\#' ||
UPPER(REPLACE(COALESCE(TRIM( TO_CHAR("FILTERED_DATA_SET"."SNAPSHOT__TIMESTAMP",
'DD/MM/YYYY HH24:MI:SS')),'~'),'\#','\\' || '\#'))|| '\#'  )) AS "DIMENSION_KEY"
        , "FILTERED_DATA_SET"."SHOPS_HKEY" AS "SHOPS_HKEY"
        , "FILTERED_DATA_SET"."SHOP_CODE_BK" AS "SHOP_CODE_BK"
        , "FILTERED_DATA_SET"."SHOP_NAME_BK" AS "SHOP_NAME_BK"
        , "FILTERED_DATA_SET"."SHOPPING_CENTER_ID_BK" AS "SHOPPING_CENTER_ID_BK"
        , "FILTERED_DATA_SET"."SNAPSHOT__TIMESTAMP" AS "SNAPSHOT__TIMESTAMP"
        , COALESCE(LEAD("FILTERED_DATA_SET"."SNAPSHOT__TIMESTAMP")OVER(PARTITION BY
"FILTERED_DATA_SET"."SHOPS_HKEY" ORDER BY "FILTERED_DATA_SET"."SNAPSHOT__TIMESTAMP")
            , TO_TIMESTAMP('31/12/2999 23:59:59' , 'DD/MM/YYYY HH24:MI:SS')) AS
"END_SNAPSHOT__TIMESTAMP"
        , "FILTERED_DATA_SET"."HAS_PARKING" AS "HAS_PARKING"
        , "FILTERED_DATA_SET"."SHOP_SIZE" AS "SHOP_SIZE"
    FROM "FILTERED_DATA_SET" "FILTERED_DATA_SET"
    ;
```