HP OpenView
Service Quality Manager

DataMart Model Description

Edition: 1.4

for the HP-UX Operating System

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Preface

HP OpenView Service Quality Manager **Reporting** is part of the Hewlett Packard solution for Service Quality Management. As the source of reporting data, **DataMart** Production database is the basic of all Reports. This manual describes the data model of DataMart Production database. With this manual user can make full use of the **Reporting** function in the context of the complete HP OpenView Service Quality Manager solution.

Intended Audience

This document is intended for personnel who want to build their own reporting solution or extend the reports delivered with hp OpenView Service Quality Manager Reporting.

Supported Software

The supported software referred to in this document is as follows:

Product Version	Operating Systems
OpenView Service Quality Manager 1.4	HP-UX 11.11

The term UNIX is used as a generic reference to the operating system, unless otherwise specified.

Typographical Conventions

`Courier` Font:

- Source code and examples of file contents.
- Commands that you enter on the screen.
- Pathnames
- Keyboard key names

Italic Text:

- Filenames, programs and parameters.
- The names of other documents referenced in this manual.
- Comments

Bold Text:

- To introduce new terms and to emphasize important words.

Associated Documents

The following documents contain useful reference information:

- *OpenView Service Quality Manager Information Modeling Reference Guide*
- *OpenView Service Quality Manager SLA Monitoring User's Guide*
- *OpenView Service Quality Manager Reporting Installation and Configuration Guide*
- *OpenView Service Quality Manager DataMart User's Guide*

Support

You can visit the HP OpenView support web site at:

http://support.openview.hp.com/support.jsp

This Web site provides contact information and details about the products, services, and support that HP OpenView offers.

HP OpenView online software support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valued support customer, you can benefit by using the support site to:

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- Manage a support contract
- Look up HP support contacts
- Review information about available services
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- Research and register for software training

Chapter 1

Overview

1.1 General Description of OpenView SQM DataMart Model Description

This document describes the detailed database model information in SQM DataMart Production database, which is the basis for SQM Reporting. Knowing these information, user can create more reports in the context of OpenView Service Quality Manager Reporting.

1.2 Dimension Tables

Dimension tables are used to store the structural information, such as SQM model definition information, SQM Service Instance information, and lookup tables...

1.3 Fact Tables

Fact tables store the running status and performance information, such as Service Status, Definition/Instance Updates, Crossed Parameters, and Performance. Especially for performance data, the tables and views are all generated dynamically, their structure are generated and modified with the creation or modification of corresponding Service Definition data in the Dimension table.

There are two types of facts:

- Raw facts: usually such types of facts are intended to be stored for a short time (typically, a month or even less).
- Summarized and/or aggregated data: in order to reduce the necessary storage and accelerate the reporting functions, the raw fact data are summarized/aggregated, and stored in different tables of corresponding time granularity.

1.4 Sub Models

There are hundreds of objects in the SQM DataMart Production database, either Dimension tables or Fact tables, meanwhile each of them has their own different function, but they can be divided into different sub models, and each model will focus on some kind of topics.

Based on different topic, there are following sub models:

- **Customer**

  It contains the customer relative objects in the database, including Customer definition tables and SLA definition tables.

- **Time**

  Time dimension information is very important for both DW and Reporting, which is the basic of the whole system. SQM DataMart provides several timing granularities, including: Hour, Day, Week, Month, Quarter and Year. Also for better performance, the implementation of time dimension in SQM DataMart is the conjunction of Table and View technology.

- **Service Definition**

  It contains the objects which comprise a Service Definition or a Service Component Definition. Including: Parameter, Property, Service Level, Service Level Object and so on.

- **Service Instance**

  It contains the instance objects of Service Definition/Service Component Definition.

- **Label**

  Also known as *Lookup Table*, it contains the objects which provide the values in the drop down list for report query.

- **Status**

  It contains the objects which store the state/status information for certain objects. Including SLO, SCI, Service Instance, SLA

- **Updates**

  This is a statistics functional module, which provides the Definition updating and Instance updating information. It also provides the aggregated data on different timing granularity.

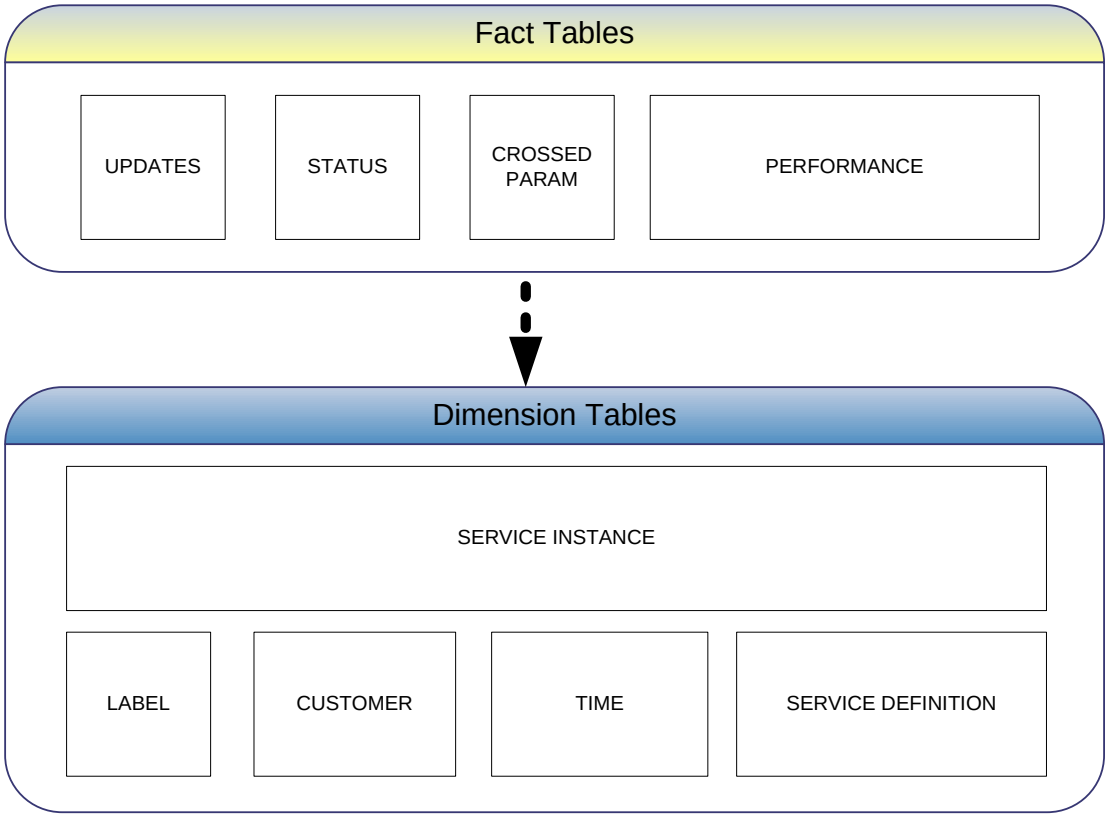
- **Crossed Parameters**

  This is a statistics functional module, which provides the statistical data of Threshold Violation/Threshold Degradation/Threshold Clearance occurrence for certain Parameter/Service Instance/SLA/Customer.

- **Performance**

  It contains the objects to provide the dynamic data for calculation. These dynamically created dimension and fact tables, their names are generated using the Service Definition name field, and if necessary the Service Component Definition name field.

Figure 1 Model Hierarchy Diagram



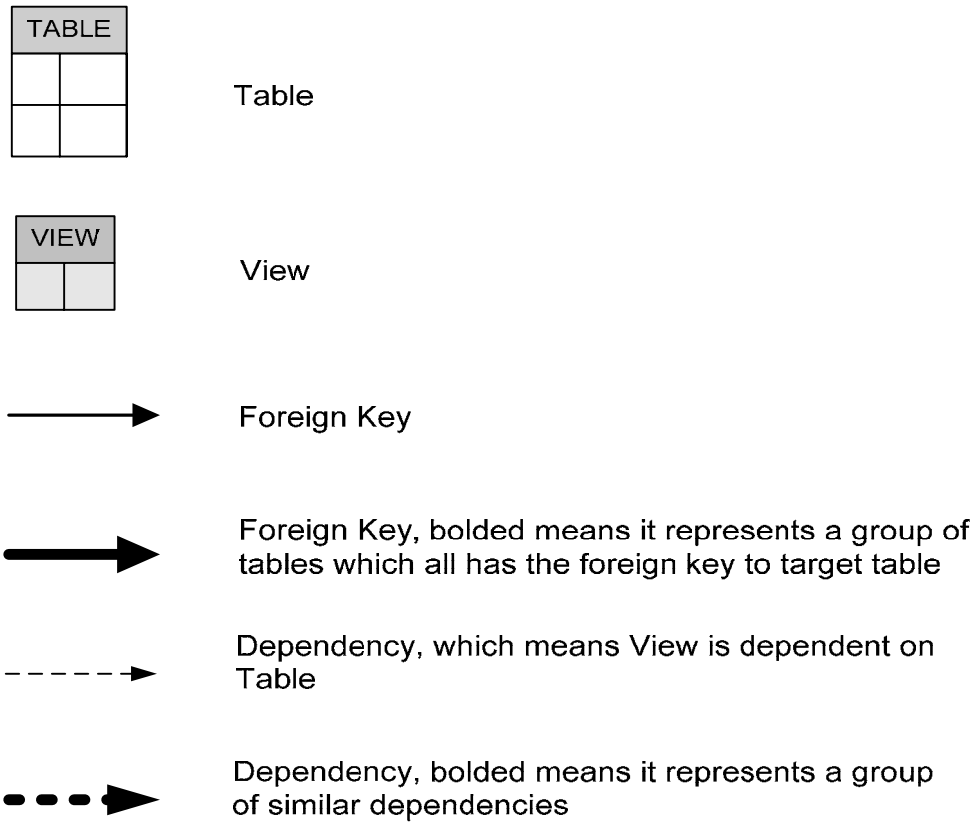
Chapter 2

Conventions

2.1 Naming Conventions

- Prefix `DM$` is reserved for all datamart internal columns in fact tables
- Columns generated dynamically do not have the `DM$` prefix
- Dimension table columns do not have the `DM$` prefix
- Dimension tables have `_DIM` suffix
- Primary Keys : `ID` or `DM$ID` keys
- Foreign Keys : `<table_category>_REF` (`CUSTOMER_REF` or `DM$CUSTOMER_REF`)

2.2 Graphical Conventions



2.3 Columns Description Conversion

Column names in the tables and views are usually meaningful, and they are easy to distinguish and understand their meaning, so only necessary columns are explained in following chapters.

2.3.1 Columns in Dimension Tables

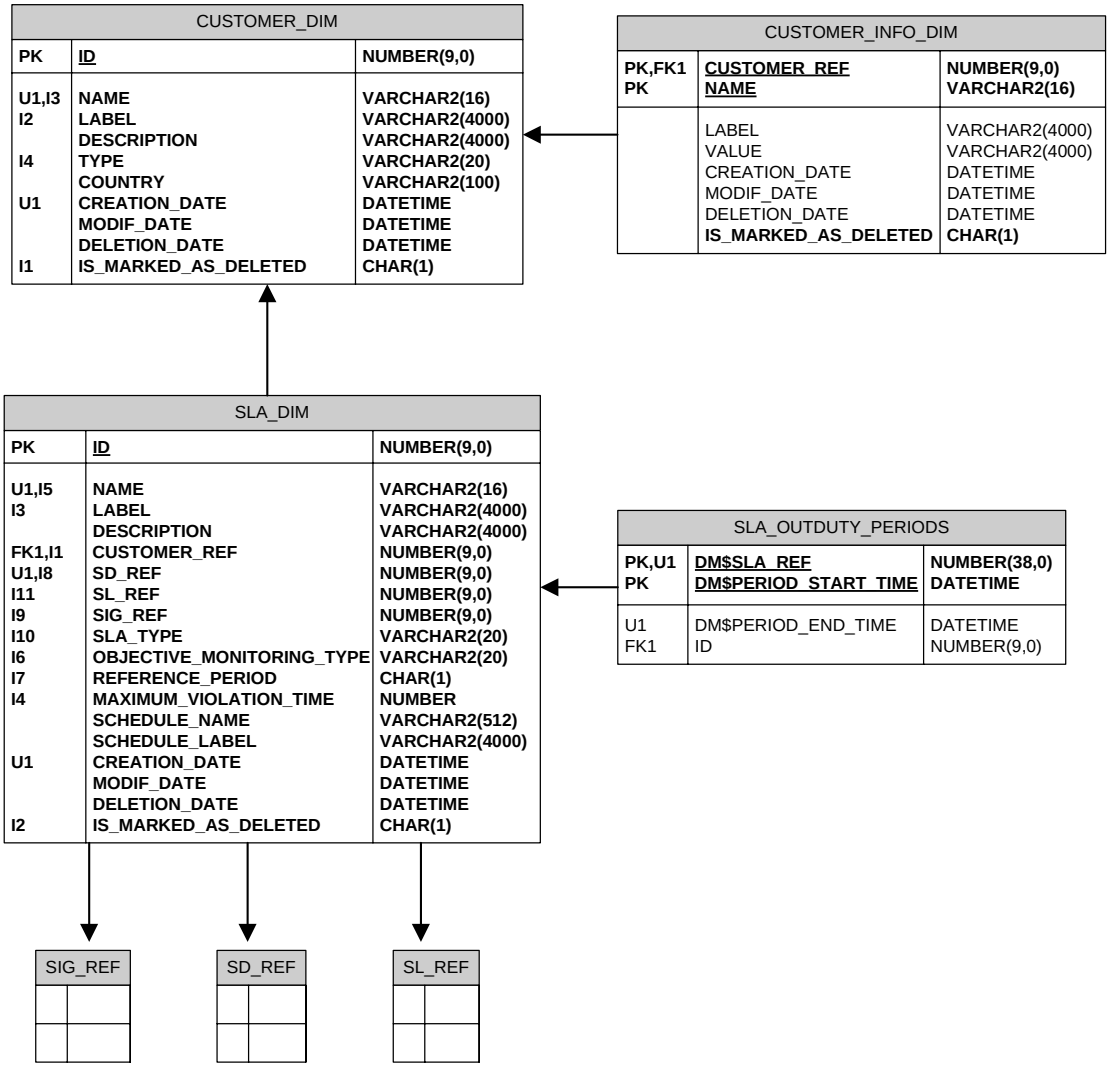
Most of dimension tables all have following columns.

Column Name	Comments
NAME	Name of the dimension object
LABEL	Label of the dimension object
DESCRIPTION	Detailed description of the dimension object
CREATION_DATE	The creation time of the dimension object in SRM database
MODIF_DATE	The modification time of the dimension object in SRM database
DELETION_DATE	The deletion time of the dimension object in SRM database
IS_MARKED_AS_DELETED	Indicating whether the object has been removed from the model. Indeed it cannot be actually removed from the table because of summarized statistics that provide data on formerly used objects. Values are: **'T'**, removed **'F'**, not removed

Chapter 3

Customer Sub Model

Figure 2 Customer Diagram



3.1 CUSTOMER_DIM

This table contains the customer definition data, which is also a dimensional table for reporting

Column Name	Comments
TYPE	Values are: **'Customer'**, refers to real contractual customers **'Operation'**, refers to internal customers created for operational needs
COUNTRY	This column can be filled manually by the user

3.2 CUSTOMER_INFO_DIM

This table is only used in BO Reporting.

3.3 SLA_DIM

This table contains the Service Level Agreement information.

Column Name	Comments
CUSTOMER_REF	ID of Customer/Operation which this SLA belongs to. Notice: Operation object is also stored in CUSTOMER_DIM table, whose type is 'Operation'.
SD_REF	ID of Service Definition which this SLA monitors
SL_REF	ID of Service Level which this SLA associates
SIG_REF	ID of Service Instance Group which this SLA associates
SLA_TYPE	Values are: **'Contractual'**, Customer SLA, which is the contract between a service provider and a customer, which specifies in measurable terms, the quality of service the provider supplies to the customer. **'Operational'**, Operational SLA, which monitors services independent from the customer
OBJECTIVE_MONITORING_TYPE	Values are: **'Instance'** **'AggregationView'**
REFERENCE_PERIOD	Values are: **'Weekly'** **'Monthly'** **'Quarterly'**
MAXIMUM_VIOLATION_TIME	Unit: Min(ute)

3.4 SLA_OUTDUTY_PERIODS

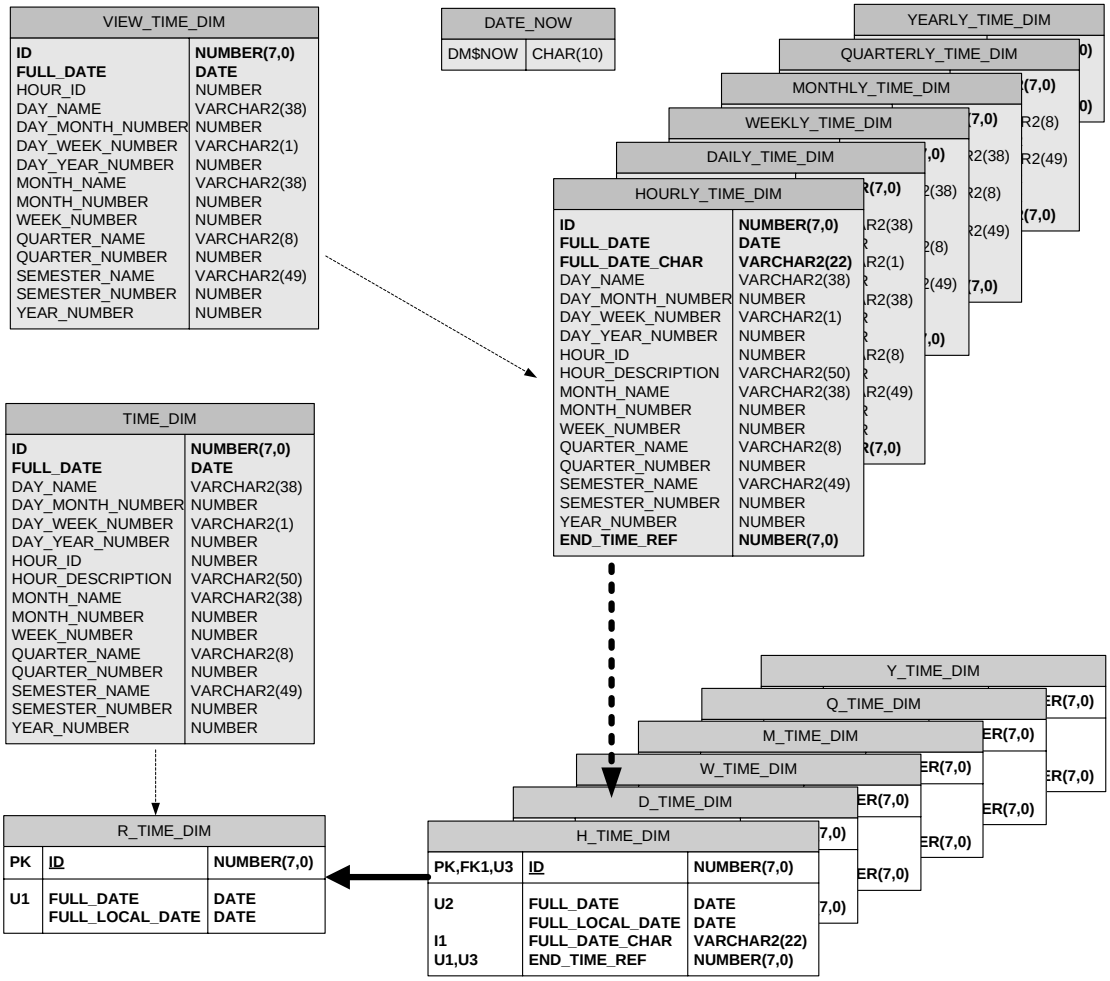
This table contains the SLA out duty period information.

Column Name	Comments
DM$PERIOD_START_TIME	Starting time of the SLA out duty period, it is mandatory and not NULL.
DM$PERIOD_END_TIME	Ending time of the SLA out duty period, before the out duty was not terminated, it should always be NULL

Chapter 4

Time Sub Model

Figure 3 Time Dimension Diagram



4.1 X_TIME_DIM

('X' represents R, H, D, W, M, Q, Y, so 'X_TIME_DIM' represents the time granularity tables)

`R_TIME_DIM` contains the most detailed time dimensional data, which is the basic of all other time granularities. Its data is generated as the interval of "*DataMart Granularity (min)*", this is a TIBCO configuration field and its default value is *5*.

For other time granularity tables, they just extract corresponding data from `R_TIME_DIM` table.

Also for the performance reason, only necessary columns are defined in these time granularity tables, while other descriptive information, they are provide through Views.

These tables are invisible in BO Reporting.

Column Name	Comments
FULL_DATE	GMT date
FULL_LOCAL_DATE	Local date
END_TIME_REF	ID of the end time of corresponding time granularity in R_TIME_DIM

4.2 TIME_DIM and XXXLY_TIME_DIM

('XXX' represents HOUR, DAY, WEEK, MONTH, QUARTER, and YEAR, so 'XXXLY_TIME_DIM represents the time granularity views')

There views are created base on corresponding time granularity tables, as mentioned before, they provide some descriptive columns of corresponding time

They are the time dimensions in BO Reporting, such as Universe file.

Column Name	Comments
DAY_NAME	"Monday", "Tuesday", …
DAY_MONTH_NUMBER	1..12
DAY_WEEK_NUMBER	1..7
DAY_YEAR_NUMBER	1..366
MINUTE_ID	0..59
FIVE_MINUTE_ID	1..12
FIFTEEN_MINUTE_ID	1..4
HOUR_ID	0..23
MONTH_NAME	"January", "February", …
MONTH_NUMBER	1..12
WEEK_NUMBER	1..53
QUARTER_NAME	"Q1", "Q2", "Q3", "Q4"
QUARTER_NUMBER	1..4
SEMESTER_NAME	"S1", "S2"
SEMESTER_NUMBER	1..2
YEAR_NUMBER	The possible values depend on the input data while configuring the Service Quality Manager DataMart. For example: 2003, 2004 …

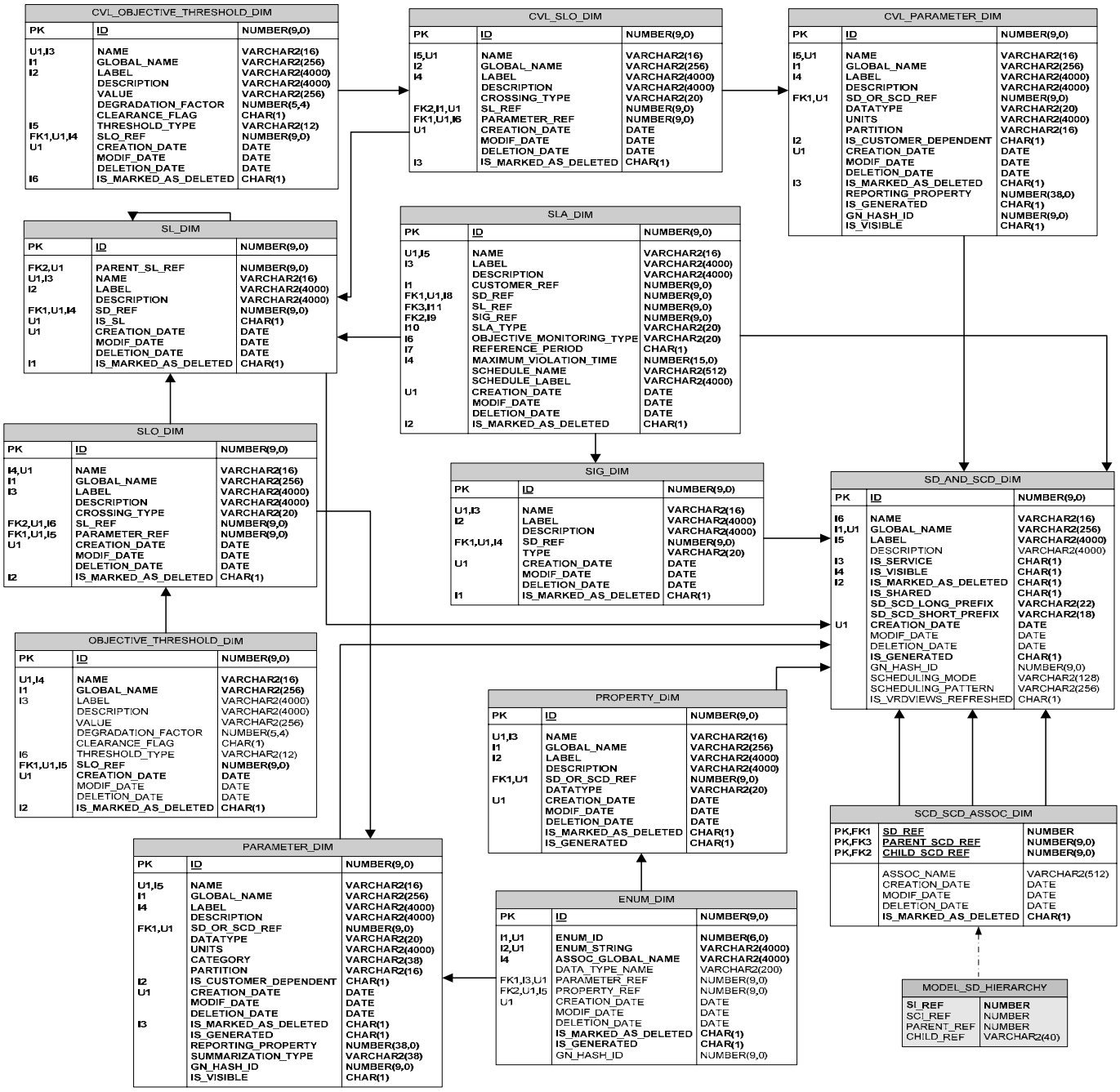
4.3 DATE_NOW

This view provides the current GMT timestamp value.

Chapter 5

Service Definition Sub Model

Figure 4 Service Definition Diagram



5.1 SD_AND_SCD_DIM

This table stores all Service and Service Component Definition information.

Column Name	Comments
IS_SERVICE	Values are: **'T'**, indicates that this is a Service Definition **'F'**, indicates that this is a Service Component Definition
IS_VISIBLE	Values are: **'T'**, indicates that this Service Component Definition is visible to customer **'F'**, indicates that this Service Component Definition is not visible to customer
IS_SHARED	Values are: **'T'**, indicates that this Service Component Definition can be shared by different Service Definition **'F'**, default value, indicates that this Service Component Definition can not be shared by different Service Definition
SD_SCD_LONG_PREFIX	It is for building the related table name where the performance data is stored for the relevant SD / SCD.
SD_SCD_SHORT_PREFIX	Internal using only
IS_GENERATED	Values are: **'T'**, indicates that dynamic fact tables and dimension of this Service/Service Component Definition has been generated. **'F'**, default value, indicates that dynamic fact tables and dimension of this Service/Service Component Definition has not been generated.
SCHEDULING_MODE	This column is only for Service Definition, Values are: **'Sampling'**, indicates this Service Definition is a sampling scheduling definition **NULL**, indicates this Service Definition is a normal definition.
SCHEDULING_PATTERN	This column is only for Service Definition, it describes the sampling value
IS_VRDVIEWS_REFRESHED	Values are: **'T'**, indicates that the corresponding vertical raw data views have been regenerated with a new/updated Service Definition/Service Component Definition **'F'**, indicates that the corresponding vertical raw data views have not been regenerated with a new/updated Service Definition/Service Component Definition
GLOBAL_NAME	Values are: **[name of this SD]**, if this is a Service Definition; **[name of parent SD]+'.'+[name of this SCD]**, if this is a Service

	Component Definition **'ND$.'+[name of parent SD]**, if this is a shared Service Component
GN_HASH_ID	Hash value of the GLOBAL_NAME of this SD/SCD, which is used to generated the name of the Performance Views of this SD/SCD.

5.2 SCD_SCD_ASSOC_DIM

This table stores the relationships between Service Definition and Service Component Definition or between Service Component Definition and Service Component Definition.

Column Name	Comments
ASSOC_NAME	The name of the association. It is composed of [name of parent SD/SCD]+[name of child SCD]

5.3 PARAMETER_DIM

This table contains the definition information of all parameters (except Compliance Parameters).

Column Name	Comments
SD_OR_SCD_REF	ID of Service Definition/Service Component Definition which this parameter belongs to.
DATATYPE	Values are: **'AbsTime'**, The time, given in GMT notation **'Float'**, a signed float. **'Int'**, a signed, 64-byte integer. **'RelativeTime'**, number of milliseconds. **'String'**, a printable string. **'Enum'**, Any Enumeration defined in the model.
UNITS	Parameter Units (e.g.: Packets/s, ºF, etc.)
CATEGORY	Category is the type of measure. It determines how the measured parameter is presented graphically in the user interfaces. Values are: **'Counter'**, Measures in figures between pre-defined levels. **'Gauge'**, Shows the measurement as a gauge. **'Other'**, Any measurement type that is not specified in the options offered. **'Percent'**, Measurement shown as a percentage **'Rate'**, A quantity (such as speed) measured with respect to another measured quantity (such as time). **'Compliance'**

PARTITION	Partition is the fundamental type of the measure represented by the parameter. Values are: **'QoS'**, Quality of Service **'Char'**, The Parameter describes the characteristics of the Service or Service Component, (for example: the location or the address). **'Other'**, Any category not covered by the options offered. **'State'**, The Parameter describes a state of the Service or Service Component. **'Usage'**, The Parameter describes how the Service or Service Component is used, (for example: the number of hits).
IS_CUSTOMER_DEPENDENT	Values are: **'T'**, Indicates that this is a customer parameter **'F'**, Indicates that this is a global parameter
IS_GENERATED	Values are: **'T'**, indicates that dynamic fact tables which this parameter belongs to have been generated. **'F'**, indicates that dynamic fact tables which this parameter belongs to have not been generated.
REPORTING_PROPERTY	Reporting Property is only relevant for Service Component Parameters. This Parameter characteristic defines the behavior of the reporting tools against this parameter. Values are: **'0'**, Never Reported: reporting tools ignore the parameter. This is useful for intermediary type parameters or parameters for which only the instantaneous value is meaningful. **'1'**, Disabled When Late: this identifies components for which measures are only meaningful when published in short delays. Those kinds of components/measures are outdated quickly and are bad candidate for a real reporting. The monitoring should be the preferred tool. The parameter is taken into account by the reporting but dropped when machine load is heavy. **'2'**, Always Reported: this parameter is staged/summarized by reporting tools in all cases.
SUMMARIZATION_TYPE	Values are: **'Min,Max,Avg'** **'Sum'**
IS_VISIBLE	Values are: **'T'**, default value, indicates that this parameter is visible to customer **'F'**, indicates that this parameter is not visible to customer

GLOBAL_NAME	[global_name of parent SD/SCD]+'.'+[name of this parameter]
GN_HASH_ID	Hash value of the GLOBAL_NAME of this Parameter, which is used to generated the column name of the Performance Views of its parent SD/SCD.

5.4 CVL_PARAMTER_DIM

This table contains the definition information of Compliance Parameters

Column Name	Comments
SD_OR_SCD_REF	ID of Service Definition/Service Component Definition which this parameter belongs to.
DATATYPE	Values are: **'AbsTime'**, The time, given in GMT notation **'Float'**, a signed float. **'Int'**, a signed, 64-byte integer. **'RelativeTime'**, number of milliseconds. **'String'**, a printable string. **'Enum'**, Any Enumeration defined in the model.
UNITS	Parameter Units (e.g.: Packets/s, ºF, etc.)
CATEGORY	Category is the type of measure. It determines how the measured parameter is presented graphically in the user interfaces. Values are: **'Counter'**, Measures in figures between pre-defined levels. **'Gauge'**, Shows the measurement as a gauge. **'Other'**, Any measurement type that is not specified in the options offered. **'Percent'**, Measurement shown as a percentage **'Rate'**, A quantity (such as speed) measured with respect to another measured quantity (such as time). **'Compliance'**
PARTITION	Partition is the fundamental type of the measure represented by the parameter. Values are: **'QoS'**, Quality of Service **'Char'**, The Parameter describes the characteristics of the Service or Service Component, (for example: the location or the address). **'Other'**, Any category not covered by the options offered. **'State'**, The Parameter describes a state of the Service or Service Component.

	'Usage', The Parameter describes how the Service or Service Component is used, (for example: the number of hits).
IS_CUSTOMER_DEPENDENT	Values are: **'T'**, Indicates that this is a customer parameter **'F'**, Indicates that this is a global parameter
IS_GENERATED	Values are: **'T'**, indicates that dynamic fact tables which this parameter belongs to have been generated. **'F'**, indicates that dynamic fact tables which this parameter belongs to have not been generated.
REPORTING_PROPERTY	Reporting Property is only relevant for Service Component Parameters. This Parameter characteristic defines the behavior of the reporting tools against this parameter. Values are: **'0'**, Never Reported: reporting tools ignore the parameter. This is useful for intermediary type parameters or parameters for which only the instantaneous value is meaningful. **'1'**, Disabled When Late: this identifies components for which measures are only meaningful when published in short delays. Those kinds of components/measures are outdated quickly and are bad candidate for a real reporting. The monitoring should be the preferred tool. The parameter is taken into account by the reporting but dropped when machine load is heavy. **'2'**, Always Reported: this parameter is staged/summarized by reporting tools in all cases.
IS_VISIBLE	Values are: **'T'**, default value, indicates that this parameter is visible to customer **'F'**, indicates that this parameter is not visible to customer
GLOBAL_NAME	[global_name of parent SD/SCD]+'.'+[name of this Parameter]
GN_HASH_ID	Hash value of the GLOBAL_NAME of this Parameter, which is used to generated the column name of the Performance Views of its' parent SD/SCD.

5.5 PROPERTY_DIM

This table contains the definition of Service Properties.

Column Name	Comments
SD_OR_SCD_REF	ID of Service Definition/Service Component Definition which this property belongs to
DATATYPE	Values are:

	'AbsTime', The time, given in GMT notation **'Float'**, a signed float. **'Int'**, a signed, 64-byte integer. **'RelativeTime'**, number of milliseconds. **'String'**, a printable string. **'Enum'**, Any Enumeration defined in the model.
GLOBAL_NAME	[global_name of parent SD/SCD]+'.'+[name of this Property]

5.6 ENUM_DIM

This table contains the Enumeration definition information.

Column Name	Comments
ENUM_ID	ID of Enumeration definition
ENUM_STRING	Name of the element in this Enumeration definition
ASSOC_GLOBAL_NAME	Global_name of the parameter or property which this Enumeration definition belongs to
DATA_TYPE_NAME	Name of this Enumeration definition
PARAMETER_REF	ID of the parameter which this Enumeration definition belongs to
PROPERTY_REF	ID of the property which this Enumeration definition belongs to

Note

One Enumeration definition can only belong to one parameter or one property at the same time, so only one of the two columns should have a value in the each record.

5.7 SL_DIM

This table contains the Service Level definition information

Column Name	Comments
PARENT_SL_REF	ID of Parent Service Level. Because one service level is usually composed of one or more component service levels, so there is the parent and children relationship between them.
SD_REF	ID of Service Definition/Service Component Definition which this Service Level belongs to
IS_SL	Is Service Level or Component Service Level. Values are: **'T'**, indicates that this is a Service Level **'F'**, indicates that this is a Component Service Level

5.8 SLO_DIM

This table contains the Service Level Object definition information.

Column Name	Comments
CROSSING_TYPE	An objective is not met when the parameter value crosses the critical threshold. Values are: **'Up'** **'Down'** **'Equal'** **'Not Equal'** **'Is Valued'**
SL_REF	ID of Service Level which this Service Level Object belongs to
PARAMETER_REF	ID of Parameter which this Service Level Object belongs to
GLOBAL_NAME	[name of the corresponding Service Level]+'.'+[name of this SLO]

5.9 OBJECTIVE_THRESHOLD_DIM

This table contains the Threshold definition in Service Level Object

Column Name	Comments
VALUE	Value for reference
DEGRADATION_FACTOR	A service degradation factor (SDF) that varies from zero (no degradation) to 100% (service failure). Intermediate values characterize a degraded objective.
CLEARANCE_FLAG	Values are: **'T'**, indicates that this is a clearance threshold, considering with THRESHOLD_TYPE column, they can tell this is a Violation Clearance or Degradation Clearance **'F'**, indicates that this is not a clearance threshold
THRESHOLD_TYPE	Values are: **'Violation'** **'Degradation'**
SLO_REF	ID of Service Level Object which this Threshold definition belongs to.
GLOBAL_NAME	[global_name of the corresponding SLO]+'.'+[name of this OT]

5.10 CVL_SLO_DIM

This table contains the Service Level Object definition information. These Service Level Objects are all associated with Compliance Parameter.

Column Name	Comments
CROSSING_TYPE	An objective is not met when the parameter value crosses the critical threshold. Values are: **'Up'** **'Down'** **'Equal'** **'Not Equal'** **'Is Valued'**
SL_REF	ID of Service Level which this Service Level Object belongs to
PARAMETER_REF	ID of Compliance Parameter which this Service Level Object belongs to
GLOBAL_NAME	[name of the corresponding Service Level]+'.'+[name of this SLO]

5.11 CVL_OBJECTIVE_THRESHOLD_DIM

This table contains the Threshold definition in Service Level Object which is associated with Compliance Parameter

Column Name	Comments
VALUE	Value for reference
DEGRADATION_FACTOR	A service degradation factor (SDF) that varies from zero (no degradation) to 100% (service failure). Intermediate values characterize a degraded objective.
CLEARANCE_FLAG	Values are: **'T'**, indicates that this is a clearance threshold, considering with 'THRESHOLD_TYPE' column, they can tell this is a Violation Clearance or Degradation Clearance **'F'**, indicates that this is not a clearance threshold
THRESHOLD_TYPE	Values are: **'Violation'** **'Degradation'**
SLO_REF	ID of Service Level Object which this Threshold definition belongs to
GLOBAL_NAME	[global_name of the corresponding SLO]+'.'+[name of this OT]

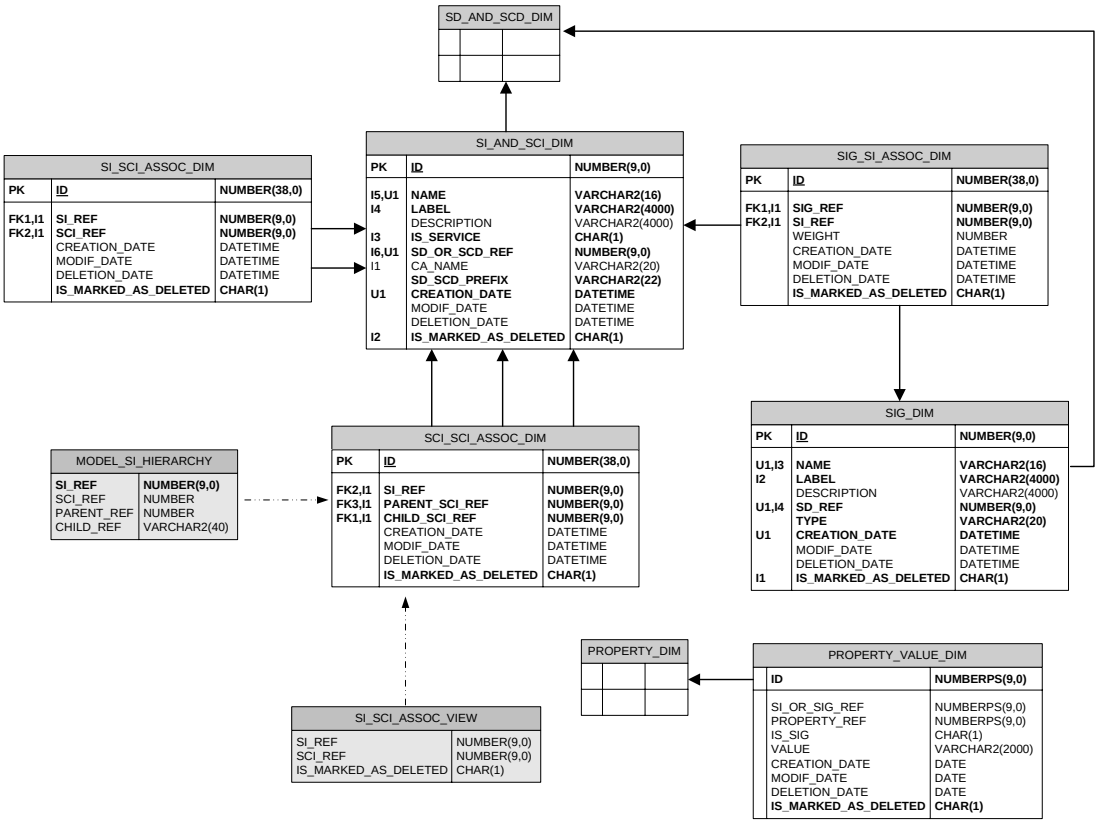
5.12 MODEL_SD_HIERARCHY

This view contains the parent and child hierarchy information of Service Defining and Service Component Definition

Chapter 6

Service Instance Sub Model

Figure 5 Service Instance Diagram



6.1 SI_AND_SCI_DIM

This table contains the Service Instance and Service Component Instance information.

Column Name	Comments
IS_SERVICE	Values are: **'T'**, indicates that this is a instance of Service **'F'**, indicates that this is a instance of Service Component
SD_OR_SCD_REF	ID of corresponding Service Definition or Service Component Definition
CA_NAME	Same as 'NAME' value for Service, and **'NULL'** for Service Component

SD_SCD_PREFIX	'SD_SCD_LONG_PREFIX' column value of corresponding Service Definition or Service Component Definition

6.2 SIG_DIM

This table contains the Service Instance Group information.

Column Name	Comments
SD_REF	ID of corresponding Service Defection, which this Service Instance Group belongs to
TYPE	Values are: **'Automatic'** **'Manual'**

6.3 SIG_SI_ASSOC_DIM

This table contains the relationship between the SIG and the Service Instances. Each service instance belongs to one or more Service Instance Groups and each SIG contains at least one Service Instance.

Column Name	Comments
SIG_REF	ID of Service Instance Group
SI_REF	ID of Service Instance
WEIGHT	Weight of the Service Instance within the Service Instance Group. Value is between 0 and 1

6.4 PROPERTY_VALUE_DIM

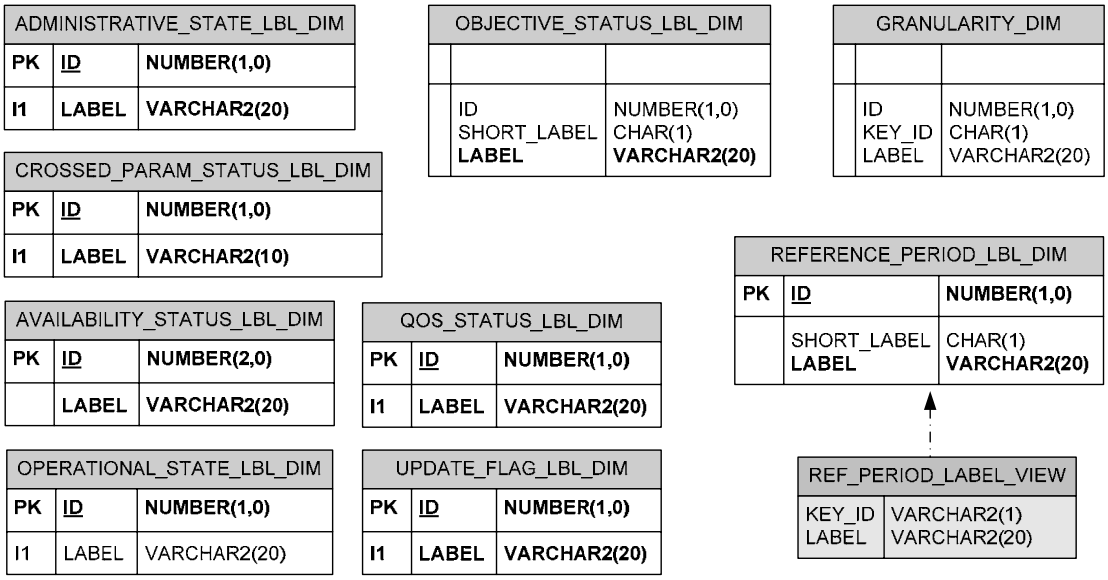
This is contains the values for certain Property.

Column Name	Comments
IS_SIG	Values are: **'T'**, indicates that this is a Property value for Service Instance Group **'F'**, indicates that this is a Property value for Service Instance
SI_OR_SIG_REF	ID of corresponding Service Instance Group or Service Instance
PROPERTY_REF	ID of Property, which this value belongs to
VALUE	Property Value

Chapter 7

Label Sub Model

Figure 6 Label Diagram



7.1 ADMINISTRATIVE_STATE_LBL_DIM

This table contains the Enumeration string labels for the Administrative State.

The possible values for the LABEL are:

- **Locked**
- **Unlocked**

7.2 AVAILABILITY_STATUS_LBL_DIM

This table contains the Enumeration string labels for the Availability Status.

The possible values for the LABEL are:

- **Available**
- **InTest**
- **Failed**
- **PowerOff**
- **OffLine**

- **OffDuty**
- **Dependency**
- **Degraded**
- **NotInstalled**
- **Logfull**
- **Unknown**

7.3 CROSSED_PARAM_STATUS_LBL_DIM

This table contains the possible values for the Crossed Parameter (used in the crossed parameter fact tables).

The possible values for the LABEL are:

- **Start**
- **End**

7.4 OPERATIONAL_STATE_LBL_DIM

This table contains the Enumeration string labels for the Operational State.

The possible values for the LABEL are:

- **Disabled**
- **Enabled**
- **Unknown**

7.5 QOS_STATUS_LBL_DIM

This table contains the possible values for the SLO Quality of Service.

The possible values for the LABEL are:

- **Increasing**
- **Decreasing**
- **Deleted**
- **None**

7.6 UPDATE_FLAG_LBL_DIM

This table contains the possible string values for an update event.

The possible values for the LABEL are:

- **Added**
- **Updated**
- **Deleted**
- **None**

7.7 OBJECT_STATUS_LBL_DIM

This table contains the possible string values for the objects.

The possible values are:

- **Normal**
- **Degradation**
- **Violation**

7.8 REFERENCE_PERIOD_LBL_DIM

This table contains the possible values for the reference period.

The possible values are:

`Short Label  Label`

- **W Weekly**
- **M Monthly**
- **Q Quarterly**

7.9 REFERENCE_PERIOD_LABEL_VIEW

This view contains the possible values for reference period, it is created base on REFERENCE_PERIOD_LBL_DIM, but it has one more value.

The possible values are:

`Key_Id  Label`

- **W Weekly**
- **M Monthly**
- **Q Quarterly**
- **O NoPeriod**

7.10 GRANULARITY_DIM

This table contains the time granularity values, which is used in BO Reporting.

The possible values are:

`Key_Id  Label`

- **H Hour**
- **D Day**
- **W Week**
- **M Month**
- **Q Quarter**
- **Y Year**
- **R Raw**

Chapter 8

Status Sub Model

Figure 7 Service Parameter Objective Status Diagram

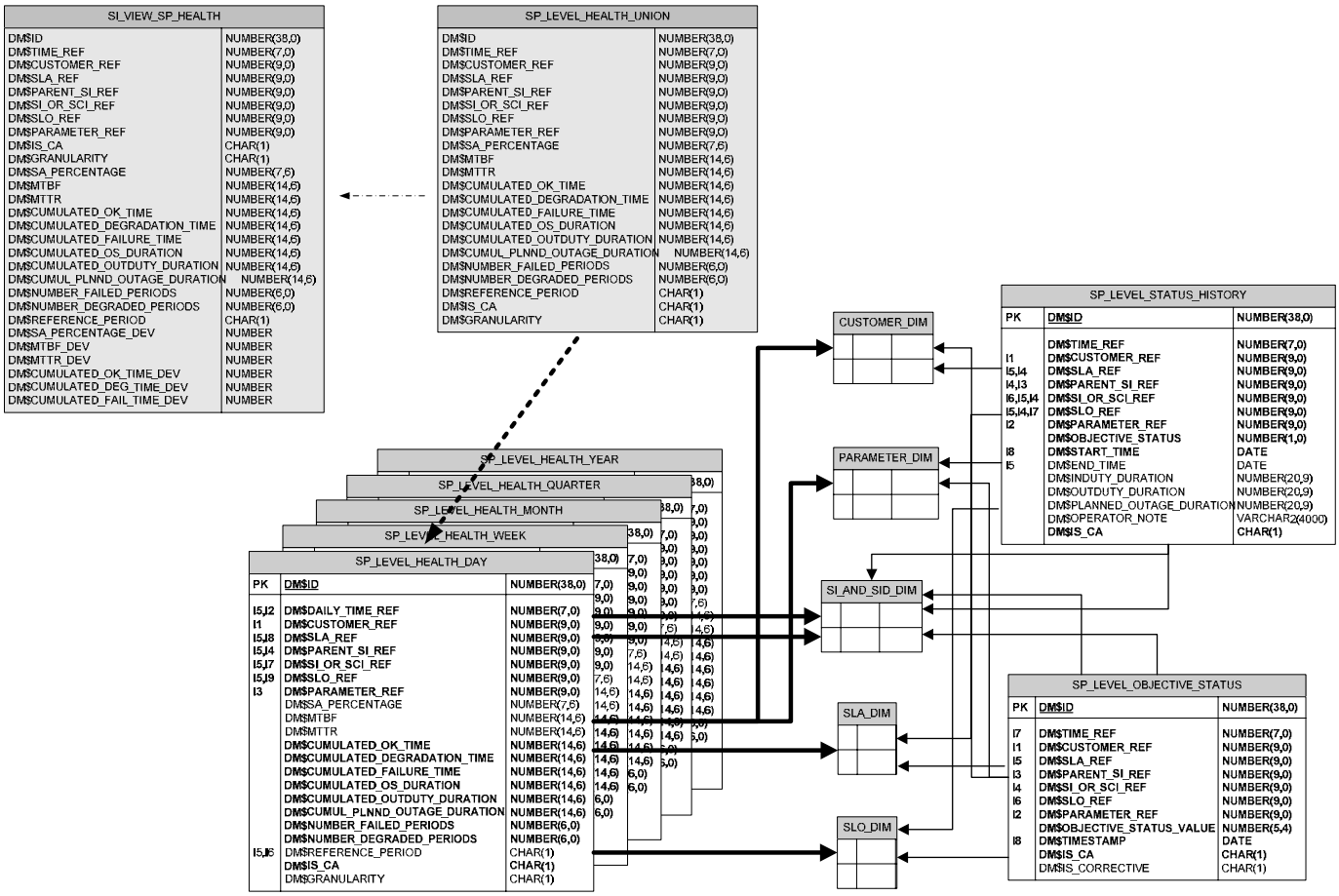


Figure 8 SCI Objective Status Diagram

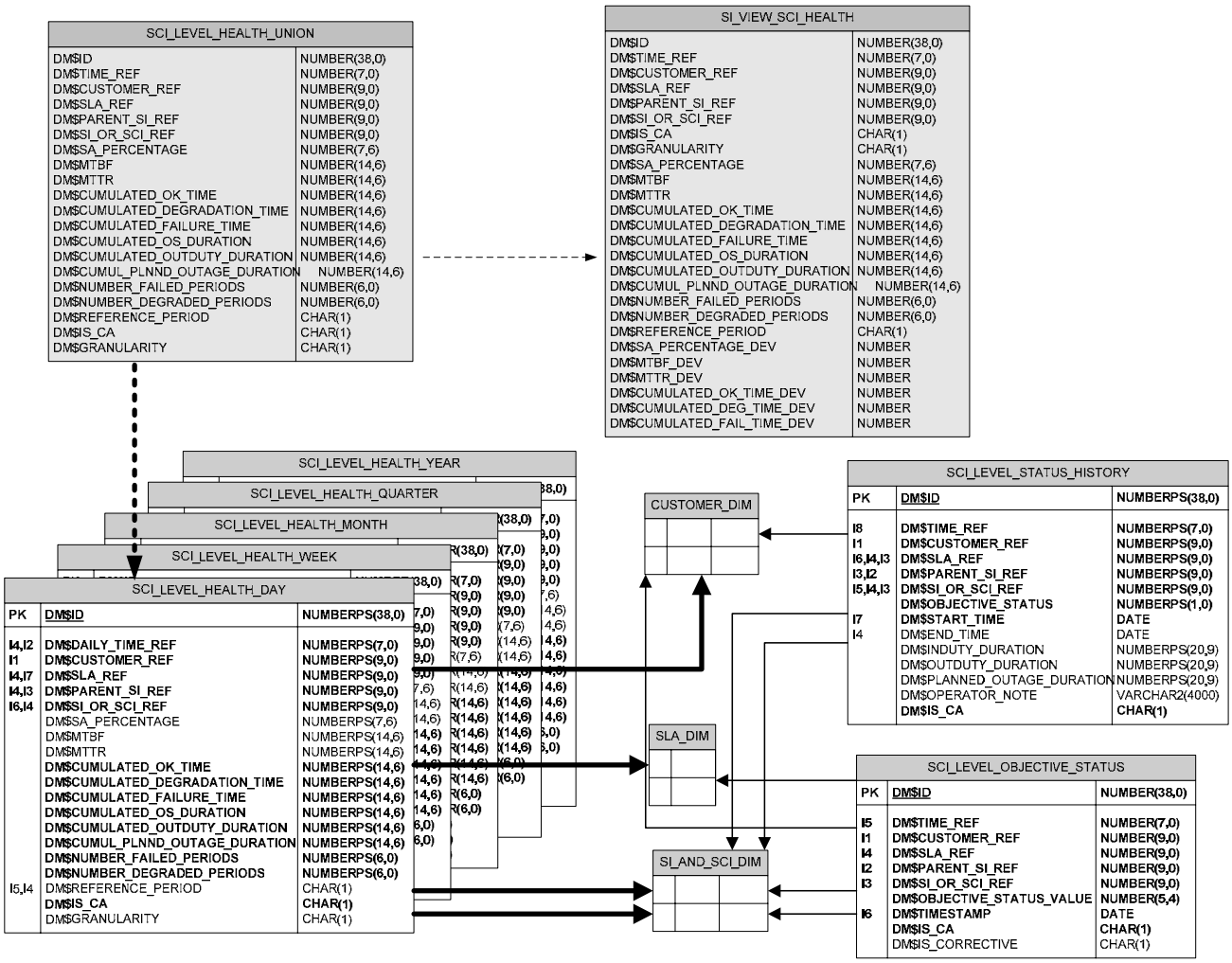
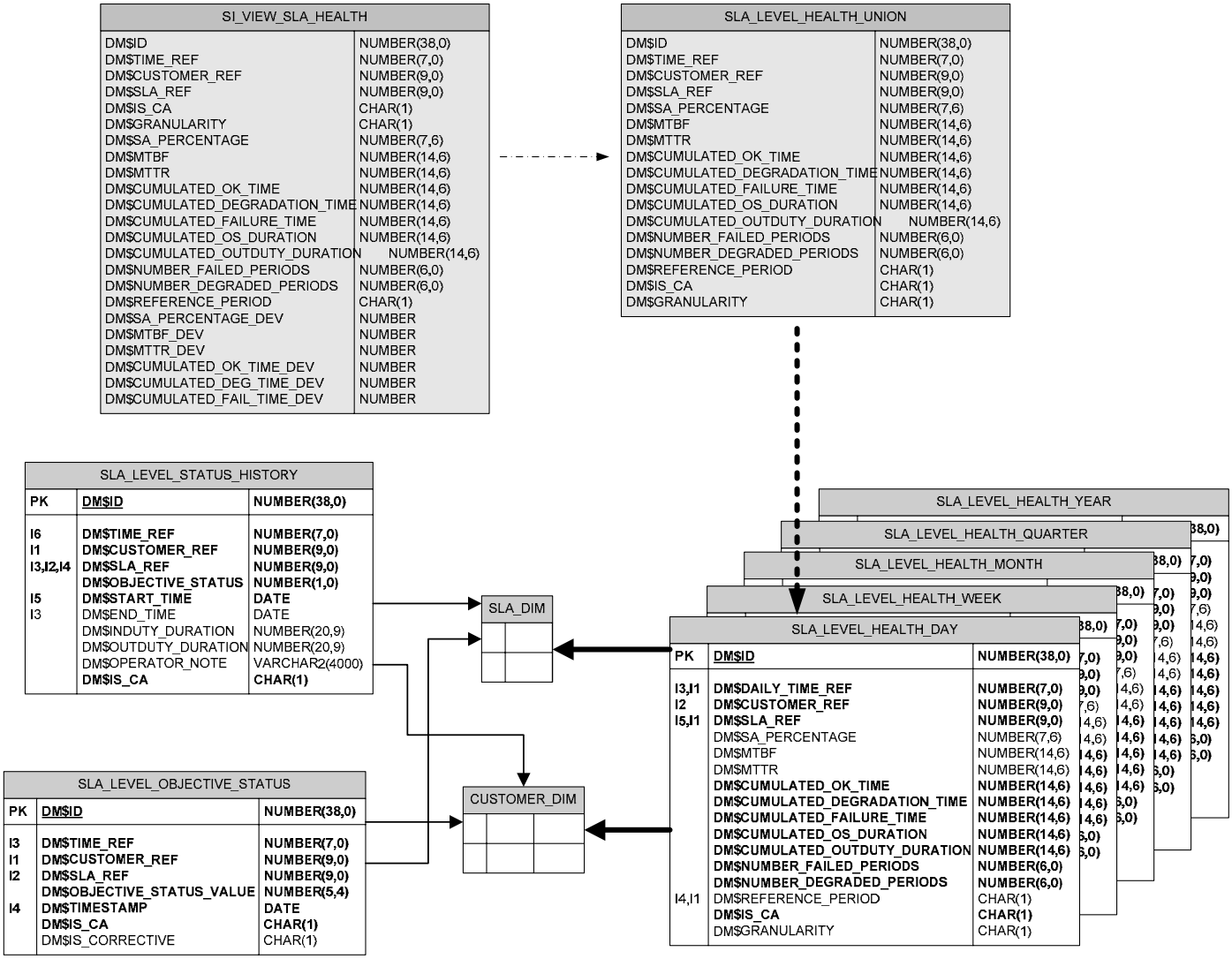


Figure 9 SLA Objective Status Diagram



8.1 XXX_LEVEL_OBJECTIVE_STATUS

(XXX represents SP, SCI, SLA)

This is contains the raw fact status data for certain objects.

Column Name	Comments
DM$IS_SA	Values are: **'T'**, indicates that this value belongs to a CAView **'F'**, indicates that this value belongs to a Instance
DM$IS_CORRECTIVE	Values are: **'T'**, indicates that this value comes from late calculation **'F'**, indicates that this value does not come from late calculation

8.2 XXX_LEVEL_STATUS_HISTORY

(XXX represents SP, SCI, SLA)

These tables contain the raw fact status duration data for certain objects.

8.3 XXX_LEVEL_HEALTH_YYY

(XXX represents SP, SCI, SLA, YYY represents DAY, WEEK, MONTH, QUARTER, and YEAR)

These tables contain the aggregated fact status data for certain objects based on different time granularities.

Column Name	Comments
DM$SA_PERCENTAGE	Service Health Indicator: SA%
DM$MTBF	Service Health Indicator: MBTF
DM$MTTR	Service Health Indicator: MTTR

8.4 XXX_LEVEL_HEALTH_UNION

(XXX represents SP, SCI, SLA)

These views are created on the aggregated status tables. They are used in BO Reporting.

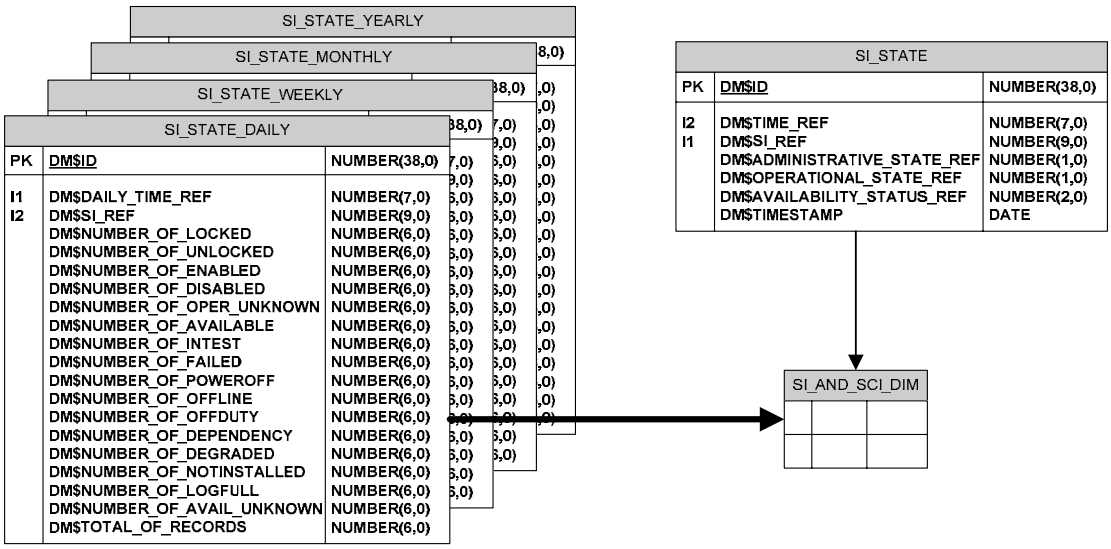
8.5 SI_VIEW_XXX_HEALTH

(XXX represents SP, SCI, SLA)

These views are created on XXX_LEVEL_HEALTH_UNION views. They are used in BO Reporting.

Comparing with XXX_LEVEL_HEALTH_UNION, they provide more '%_DEV' columns, these columns contains the variance value between the current value and the last value (at last timestamp) for certain objects.

Figure 10 Service Instance State Diagram



8.6 SI_STATE

This table contains the raw fact status data of Service Instance.

8.7 SI_STATE_YYY

(YYY represents DAILY, WEEKLY, MONTHLY, YEARLY)

These tables contain the aggregated fact status data of Service Instance on corresponding time granularities.

Chapter 9

Updates Sub Model

Figure 11 Customer Updates Diagram

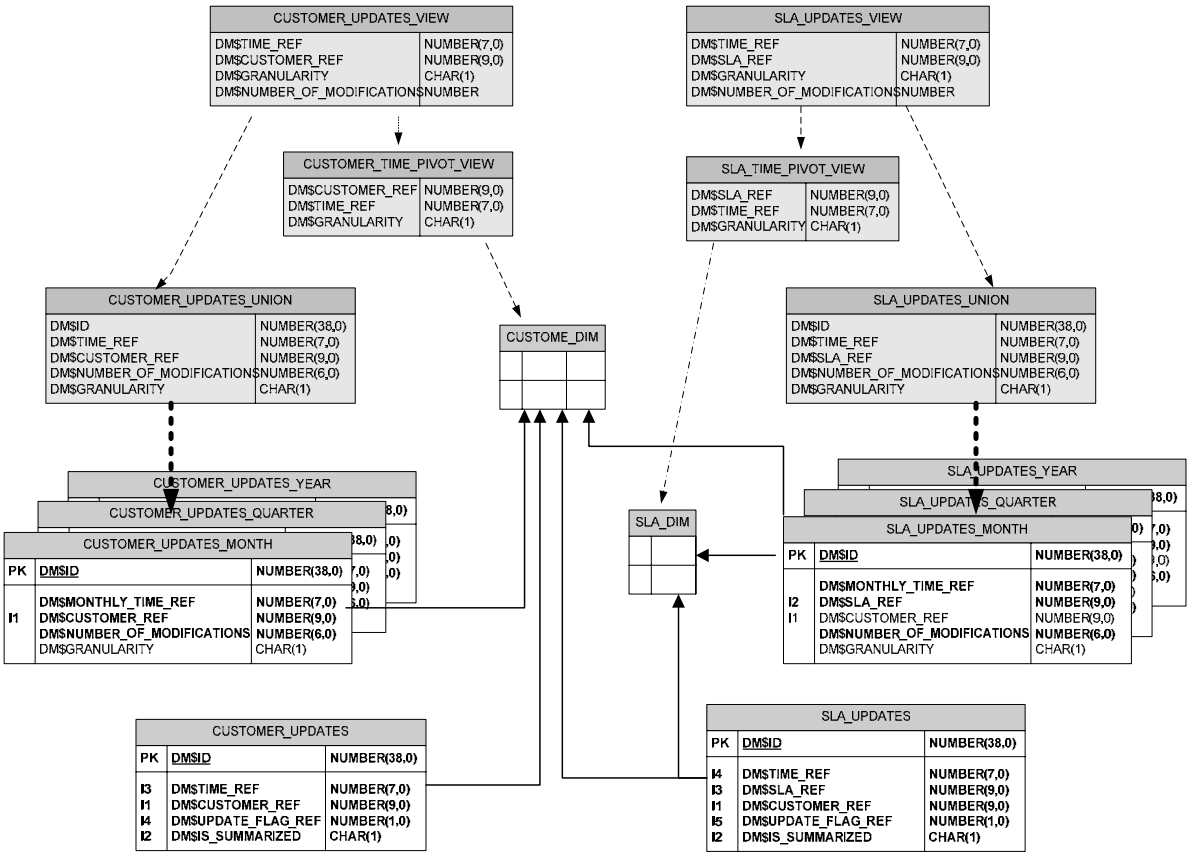


Figure 12 Service Definition Updates Diagram

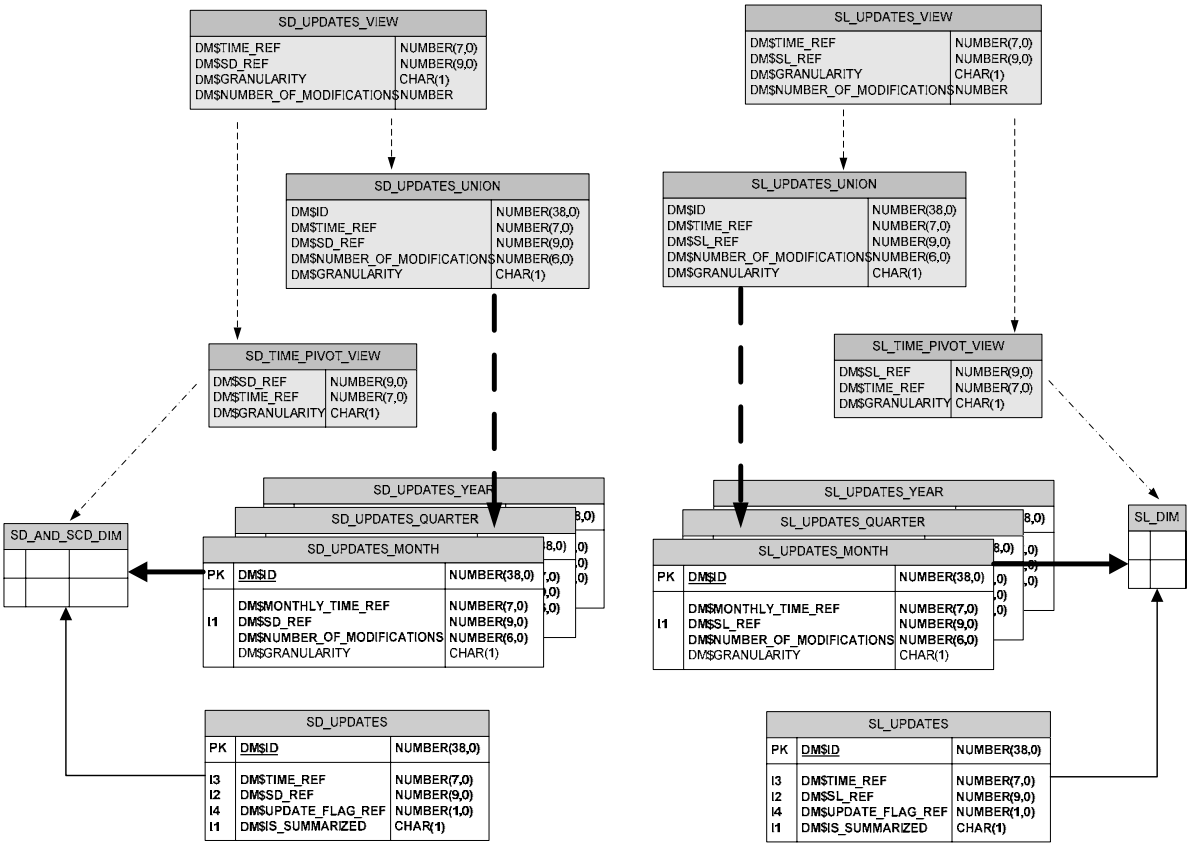
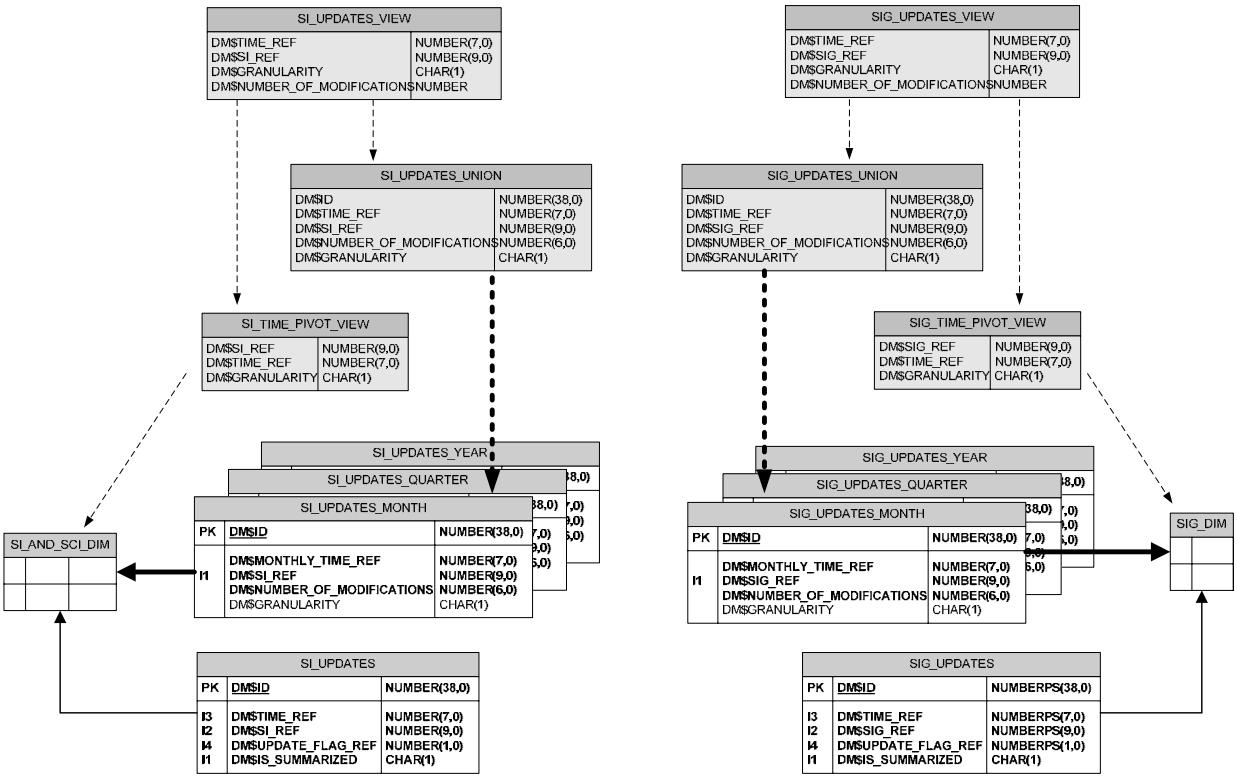


Figure 13 Service Instance Updates Diagram



9.1 XXX_UPDATES

(XXX represents CUSTOMER, SLA, SD, SL, SI, SIG)

These tables contain the raw updates information for certain objects.

Column Name	Comments
DM$UPDATE_FLAG_REF	ID of corresponding update flag in label table 'UPDATE_FLAG_LBL_DIM'
DM$IS_SUMMARIZED	Values are: **'T'**, indicates this data has been summarized **'F'**, indicates this data has not been summarized.

9.2 XXX_UPDATES_YYY

(XXX represents CUSTOMER, SLA, SD, SL, SI, SIG, YYY represents MONTH, QUARTER, YEAR)

There tables contain the aggregated updates data for certain objects on corresponding granularity.

Column Name	Comments
DM$NUMBER_OF_MODIFICATIONS	The statistical value for the updates in that time period
DM$GRANULARITY	Values are: **'M'**, Month **'Q'**, Quarter **'Y'**, Year

9.3 XXX_TIME_PIVOT_VIEW

These views are used in BO Reporting. They provide the effective time for certain objects **(effective means from create_time to delete_time for corresponding object**).

9.4 XXX_UPDATES_UNION

These views are used in BO Reporting. They are created on the aggregated tables, and which can provide all aggregated data in one view.

9.5 XXX_UPDATES_VIEW

These views are used in BO Reporting. They provide the effective updates data.

Chapter 10

Crossed Param Sub Model

Figure 14 Crossed Parameter Diagram

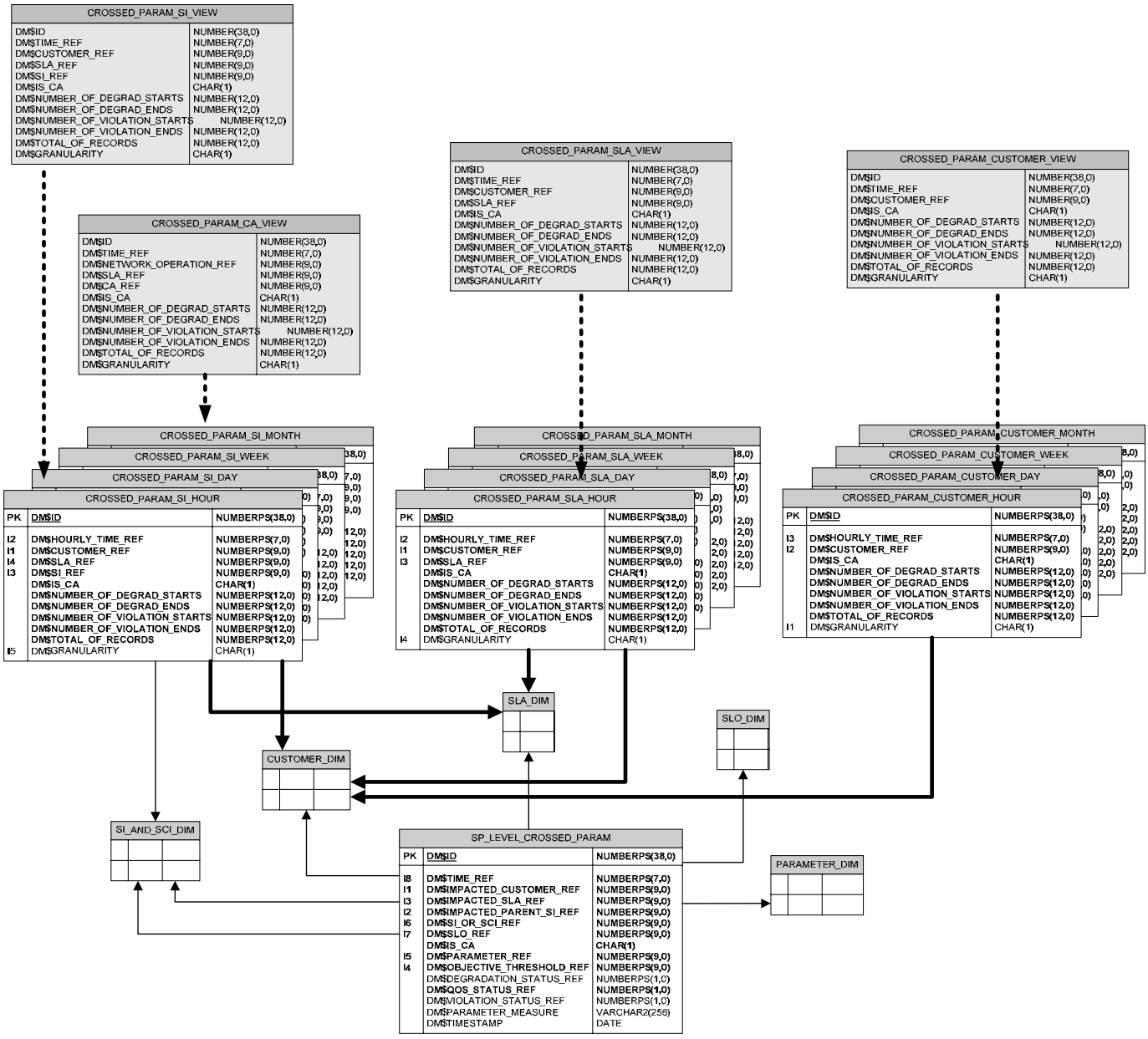
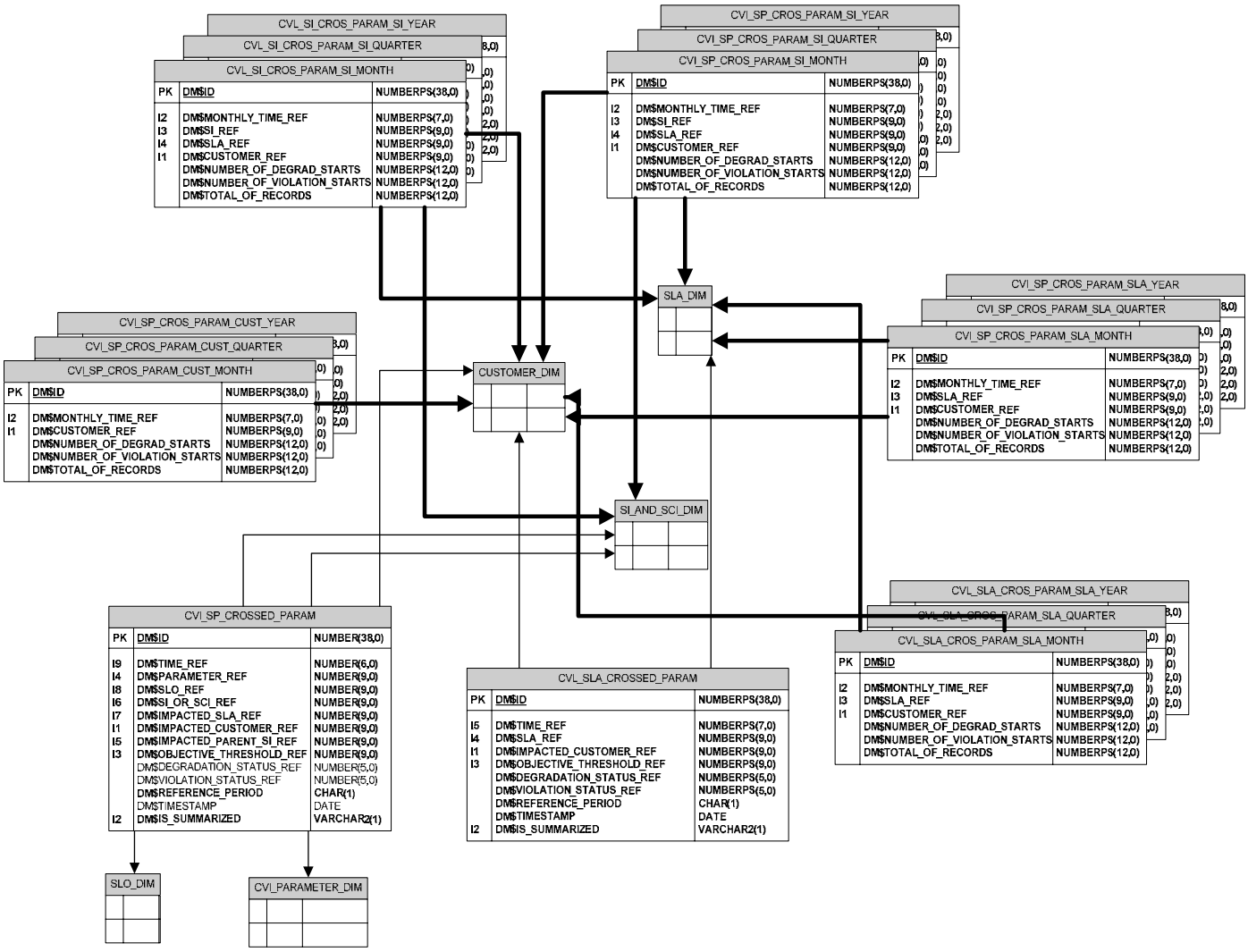


Figure 15 CVL Crossed Parameter Diagram



Chapter 11

Performance Sub Model

Objects in Performance sub model are generated and modified dynamically as new definitions (SD/SCD) are created or updated.

- SD/SCD ⇔ Database Tables
- Parameters ⇔ Table columns

Each SD/SCD has three series of tables identified by a `<root_name>`.

- `SCI_#########_CI` is used to store performance data related to Customer Independent parameters (CI).
- `SCI_#########_CD` is used to store performance data related to Customer Dependent parameters (CD).
- `CVI_#########_CD` is used to store performance data related to compliance parameters. By nature, those parameters are customer dependent so they have the `CD` suffix.

Where:

- `#########` stands for the ID of the SD/SCD (cf `SD_AND_SCD_DIM` table) left padded with 0 with a length of 9 digits
- `SCI` stands for Service Component Indicators
- `CVI` stands for Compliance Value Indicator
- `CD` stands for Customer Dependent
- `CI` stands for Customer Independent

Within each serie, there are three categories of tables identified with a suffix:

- VRD Vertical Raw Data
- HRD Horizontal Raw Data
- H, D, W, M, Q, Y Aggregated tables

11.1 Vertical Raw Data tables (VRD)

These are the real fact tables of the DataMart. Each new parameter value published by the SPDM leads to a new row in the VRD tables. Unlike the other tables, their structure is static and does not change when new parameters are created or destroyed.

They are named `<root_name>_VRD.`

Column Name	Comments
DM#SCI_REF	
DM$CUSTOMER_REF	This columns is only present in Customer Dependent tables
DM$PARAMETER_REF	
DM$TIMESTAMP	Start time of the parameter to get a new value(different with previous one)
DM$END_TIMESTAMP	This column keeps a NULL value until the new value is received for the parameter.
DM$VALUE	
DM$NO_VALUE	It matches the noValue flag contained in the XML messages published by the SDPM. Values are: **'T',** indicates this is a concrete value, not a NULL value **'F,** indicates this is a NULL value
DM$DISCARD_ID	This column is filled when the datamart receives a value with a timestamp lower than the previous one. These rows are excluded from the summarization process, and the column carries the value of the fact that caused the discard.

11.2 Horizontal Raw Data tables (HRD)

These tables can be assimilated to a cross table pivoted on the parameter ID. The following figure illustrates this process.

VRD

Time	Param	Val
T1	1	11
T1	2	52
T2	1	23
T2	3	2
T2	4	782
T3	2	25
T4	1	122
T4	2	12
T4	3	23

HRD

Time	P_1	P_2	P_3	P_4
T1	11	52		
T2	23		2	782
T3		25		
T4	122	12	23	

HRD

Time	P_1	P_2	P_3	P_4
T1	11	52		
T2	23	52	2	782
T3	23	25	2	782
T4	122	12	23	782

As shown on the figure one column is created for each parameter in the HRD table. These columns use the following naming schema: `P_$$$$$$$$$`.

`$$$$$$$$$` is the parameter id left padded with zeros on nine digits.

Column Name	Comments
DM#SCI_REF	
DM$CUSTOMER_REF	This columns is only present in Customer Dependent tables
DM$TIMESTAMP	
P_n	The value of parameter with id n

11.3 Aggregated tables (H, D, W, M, Q, Y)

These tables contain the aggregations of the parameter values over predefined time periods:

- `H` for hourly aggregation
- `D` for daily aggregation
- `W` for weekly aggregation
- `M` for monthly aggregation
- `Q` for quarterly aggregation
- `Y` for yearly aggregation

Depending on their characteristics (category, datatypes and partition), several indicators are computed in these aggregated tables. Each indicator is identified using a suffix:

- `_MIN` the minimum value taken by the parameter during the time period
- `_MAX` the maximum value taken by the parameter during the time period
- `_AVG` the average of the parameter values during the time period. Of course this average takes intyo account the duration of the value.
- `_DOF` the duration when the parameter was valued during the period.
- `_NVD` the duration when the parameter value was not valued due to a collection failure.
- `_SUM` the sum of the parameter values during the period
- `_<enum_id>` duration when the enum_parameter had the value determined by `<enum_id>` (cf ENUM_DIM).

Note

Parameters of enum datatype have a different naming schema:

`E_#########_DOF_$$$$$$$$$`

Where:

- `#########` is the parameter ID left padded with zeros on nine digits.
- `$$$$$$$$$` is the enum ID left padded with zeros on ine digits

The following matrix shows which indicator is computed depending on the parameter characteristics:

	MIN	MAX	AVG	SUM	DOF	NVD	<enum>
Category ∈ {Counter, Gauge} Datatype ∈ {Int,Float,RelativeTime} Partition ≠ Compliance				X	X	X	
Category ∈ {Rate,Percent,Other} Datatype ∈ {Int,Float,RelativeTime} Partition ≠ Compliance	X	X	X		X	X	
Category ∈ {Rate,Percent,Other} Datatype = Enum Partition ≠ Compliance					X	X	X
Partition = Compliance	X	X			X	X	
Datatype ∈ {AbsTime,String}							

Here we use an example to illustrate the Performance model.

Figure 16 Compliance Level Diagram

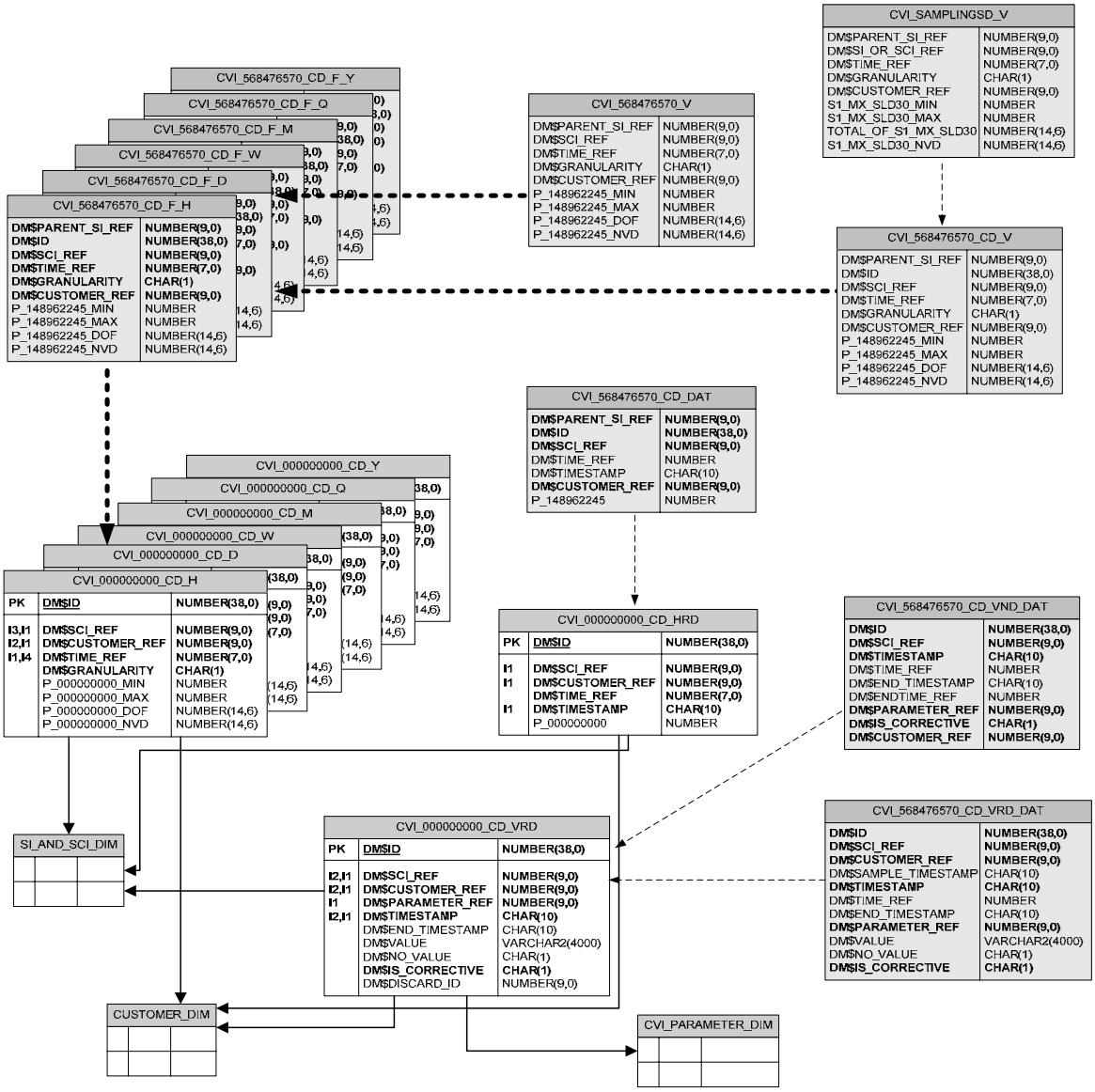
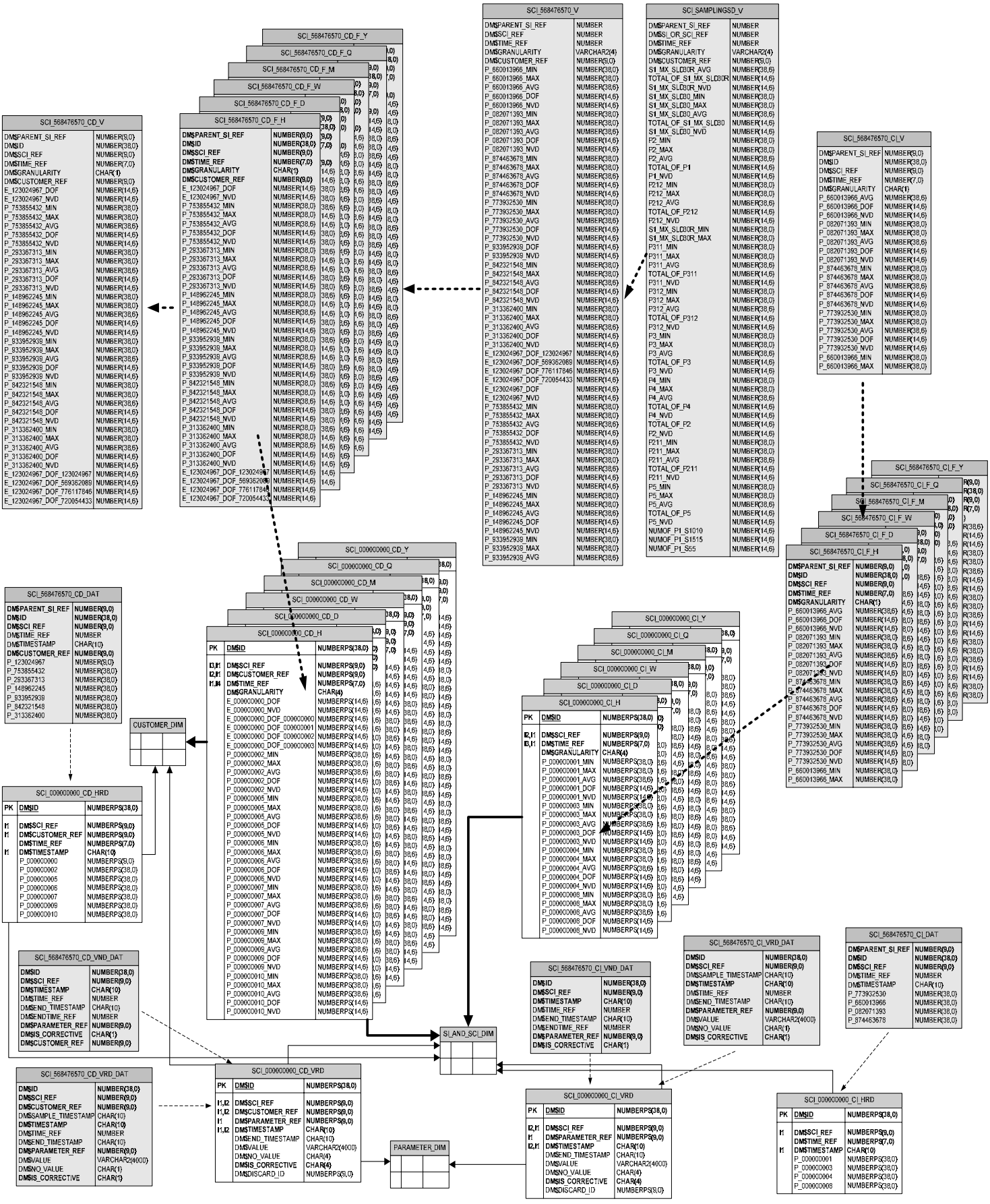


Figure 17 SCI Level Diagram



Glossary

This glossary defines the terminology commonly used in OpenView Service Quality Manager.

BI

See business intelligence.

Business Intelligence (BI)

A broad category of applications and technologies for gathering, storing, analyzing, and providing access to data that helps users make better business decisions.

Customer

Companies or organizations that make use of the *services* offered by a *service provider*, based on a contractual relationship.

Data collection interval

The interval of time over which performance parameters are retrieved from the monitored service resources. This interval does **not** have to be the same as the *measurement interval* because *service adapters* or service resources may buffer statistics.

Degraded service

The presence of anomalies or defects that cause degradation of the *quality of service*, but do not result in the total failure of the *service*.

Parameter

A value or set of values that are periodically updated and that help determine the quality of service.

Parameter objective

A set of objectives for the parameters belonging to a service.

Property

Special static parameters that are given a value only when an instance of an OpenView Service Quality Manager **Object** is created. For example, a Service Component can have a property called "location".

QoS

See Quality of Service.

Quality of Service (QoS)

The ITU-T has defined quality of service as "the collective effect of service performances that determine the degree of satisfaction of a user of the service".

Service

A Service is a set of independent functions (Service Components) that consist of hardware and software elements and an underlying communications medium. A Service can include anything from a single leased-line service, to a complex application, such as vision conferencing.

Service availability

A measurement made in the context of a *service level agreement* that is expressed as a percentage. This percentage indicates the time during which the *service* is operational at the respective *service access points*.

Service Quality Manager Repository

The SQM Repository is the storage center for all Service Quality Manager data. It receives data from the various Service Quality Manager interfaces and each interface can request information from the Repository.

Service component

An independent function that is part of a *service*, such as a hardware or software element, or the underlying communications medium.

Service component instance

The instance of a Service Component Definition that is active in the network, such as an instance of the IPAccess Service Component definition called "pop".

Service Level (SL)

Defines Service Parameters and operational data enforced by the Service Level Agreement (for example, Max Jitter < 10 ms).

Service Level Agreement (SLA)

There are two type of Service Level Agreement, the **Customer** Agreement: a contract between a *service provider* and a *customer*, which specifies in measurable terms what the service provider supplies to its customers, and the Operational Service Level Agreement, which specifies in measurable terms the operational levels of the Service. A *service level agreement* is composed of individual objectives.

Service Level Objective (SLO)

The set of objectives for the parameters belonging to a Service or Service Component.

Service parameter

See *parameter*.

Service Instance (SI)

The instantiated service definition that is active in the network.

Service Instance Group (SIG)

A **group** of *service instances* against which the *service availability* must be reported. Each *service instance* belongs to one or more Service Instance Groups and each SIG contains at least one Service Instance. The relationship between the SIG and the Service Instances is defined in their *service level agreement*.

Service quality parameters

They represent *computed* and *collected* parameters

SI

See Service Instance.

SIG

See Service Instance Group.

SL

See Service Level

SLA

See Service Level Agreement.

SLO

See Service Level Objective.

Subscriber

The entity responsible for the payment of charges incurred by one or more users.

User

An entity designated by a customer to use the services of a telecommunication network, such as a person using a UMTS mobile station as a portable telephone.

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