HP Service Quality Management Solution V3.2

Service Management Foundation Business Rule Reference Guide

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for Windows 64bit & Linux 64bit Operating System

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Contents

Preface

It is assumed that the reader is familiar with the functionality of HP BSM 9 product and has previous experience of the following:

- System administration and operations
- Service level management.

Intended Audience

This document is intended for the following users:

SQM Solution architect

SQM Solution administrators and integrators

Abbreviations and Acronyms

The following table describes the abbreviations and acronyms used in this document.

Abbreviation	Description
BSM	Business Service Management
CI	Configuration Item
CIT	Configuration Item Type
HI	Health Indicator
KPI	Key Performance Indicator
SMF	Service Management Foundation
SQM	Service Quality Management

Associated documents

The HP Business Service Management documents are available at:
http://support.openview.hp.com/selfsolve/manuals
Additional SQM Solution materials (like the SQM Solution product briefs) and information about SQM Solution updates are available at: http://www.hp.com/cms

Typographic Conventions

This document uses the following conventions to identify special information:

Convention	Information Type/Example
[ ] (square brackets)	Interface components requiring user actions e.g. Buttons. Ex: Click [Finish] to complete the Import wizard.

Convention	Information Type/Example
( ) [round brackets]	Supplementary information Ex: Configuration Item (CI).
Bold type	Fields names, menus, window pane names Ex of menus: Admin → Service Level Management → Repository.
Italic type	Important information and/or concepts. Ex: The output is an *.XMI* file.
Underline type	Rule Parameters or Tooltip Parameters

Symbols Used in this Guide

Symbols	Information
	Note Draws your attention to additional information about a software function/feature.
	Important Draws your attention to important information regarding the proper usage of a software function/feature.
	Caution Draws your attention to an important warning.

Support

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HP Software online software support provides customer self-solving 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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Research and register for software training.

Chapter 1

SQM Business Rules definition

The following provide the complete description of the SQM Business Rules used within SQM predefined value packs. They are sorted per simplicity, aggregation.

3.1. Simple assignment rules

These rules are simple assignment rules (no computation) from HI mainly.

Business Rule	Description	Additional comments
SQM Assign KPI value from HI value	Assign the value of corresponding HI into the KPI value. --**Rule Parameters**— Category = category represents a metric category set on KPI (optional). HI Name = Id of the HI used to calculate the KPI value. LinearityCoefficient and LinearityOffset = indicate how upper level calculation will use them for normalization. Reverse= (false/true) Reverse is KPI indicator that represents positive or negative value. If true then upper level will use the KPI value reversely as follows 100-val. Weight = KPI weight used for upper level calculation. The range is between 0~1.	HI Name: Browse to **Admin->Service Health->Repositories->Indicators** page, Edit selected indicator, and copy the Id in the dialog. Refer figure "*Id of Health Indicator*". Normalization formula is: ([LinearityCoefficient*HI value] + LinearityOffset) = new value for this KPI used at upper level. This capacity is used to normalize a KPI for instance to transform a MOS (0~4) to a rate (0~100) or for the fault to transform alarm severity (0~5) to a rate (0~100). It is the coefficient to multiply your value to get

		range 0~100.
SQM Assign KPI value from HI Status	Assign the KPI value according to the status of the HI --**Rule Parameters**— HI Name= Id of the HI used to calculate the KPI value. Category= category to set for this KPI used for upper level calculation. Reverse= (false/true) indicate how this KPI value is used for upper level calculation. If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation. LinearityOffset and LinearityCoefficient=indicate how upper level calculation will use them for normalization	Normalization formula is: ([LinearityCoefficient*HI value] + LinearityOffset) = new value for this KPI used at upper level. This capacity is used to normalize a KPI for instance to transform a MOS (0~4) to a rate (0~100) or for the fault to transform alarm severity (0~5) to a rate (0~100). It is the coefficient to multiply your value to get range 0~100.
SQM Assign KPI value from HI reverse value	Assign the KPI value as follows: Value = 100 – HI value --**Rule Parameters**— HI Name= uuid of the HI Category= category to set for this KPI used for upper level calculation (possibly). Reverse= (false/true) indicate how this KPI value is used for upper level calculation (possibly). If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation (possibly). LinearityOffset and LinearityCoefficient=indicate how upper level calculation will use them for normalization	Normalization formula is: ([LinearityCoefficient*HI value] + LinearityOffset) = new value for this KPI used at upper level. This capacity is used to normalize a KPI for instance to transform a MOS (0~4) to a rate (0~100) or for the fault to transform alarm severity (0~5) to a rate (0~100). It is the coefficient to multiply your value to get range 0~100.
SQM Set KPI value from HI Value	Set the value of corresponding HI into the KPI value. --Rule Parameters— Category = category represents a metric category set on KPI (possibly). HI Name = the HI name used to calculate the KPI value copy the name from BSM Admin->Service Health->Repositories->Indicators page; LinearityCoefficient and LinearityOffset = indicate how upper level calculation will use them for normalization; Reverse= (false/true) Reverse is KPI indicator that represents positive or negative value. If true then upper level will use the KPI value reversely as follows 100-val. Weight = KPI weight used for upper level calculation between 0~1.	Normalization formula is: ([LinearityCoefficient*HI value] + LinearityOffset) = new value for this KPI used at upper level. This capacity is used to normalize a KPI for instance to transform a MOS (0~4) to a rate (0~100) or for the fault to transform alarm severity (0~5) to a rate (0~100). It is the coefficient to multiply your value to get range 0~100.
SQM Set KPI from One	Set KPI based on selected Child KPI and minimum degradation. -**Rule Parameters**-	

Child KPI	Child KPI = The display ID of chosen Child KPI on BSM GUI, not KPI uuid (by default the ID column is hidden) Minimum Degradation = Minimum Degradation to calculate % of degraded child	

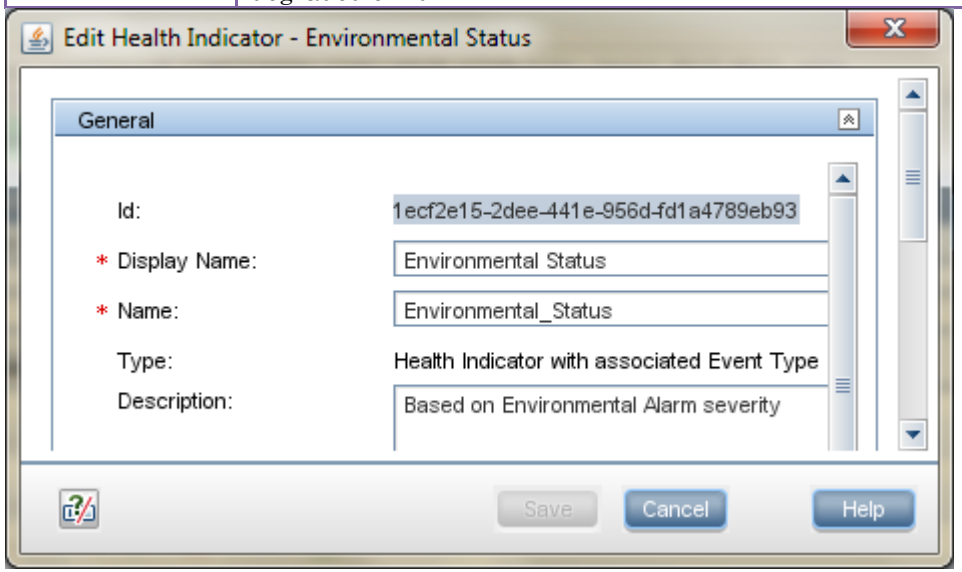


Figure 1: Id of Health Indicator

3.2. Simple 'computation' rules

These rules are simple computation rules such as compute the average value or find the max, the min among a list of KPI associated to children CIs:

Business Rule	Description	Additional comments
SQM % of Degraded Subordinates	Assign the KPI value as the percentage of all degraded (with status CRITICAL, MAJOR, MINOR or WARNING) subordinate HIs and/or children KPIs	For instance, this rule can be used to calculate Failure Ratio: how many children KPIs

Business Rule	Description	Additional comments
	--**Rule Parameters**— calc_method=the method used to calculate the KPI, includes 3 options: "HIs and child KPIs", "HIs" and "HIs; if none, use child KPIs"; hi_list= the HIs used to calculate the KPI.	
SQM % of Normal Subordinates	Assign the KPI value as the percentage of all degraded (with status INFORMATIONAL) subordinate HIs and/or children KPIs --**Rule Parameters**— calc_method=the method used to calculate the KPI, includes 3 options: "HIs and child KPIs", "HIs" and "HIs; if none, use child KPIs"; hi_list= the HIs used to calculate the KPI.	
SQM % of Violated Subordinates	Assign the KPI value as the percentage of all violated (with status CRITICAL) subordinate HIs and/or children KPIs --**Rule Parameters**— calc_method=the method used to calculate the KPI, includes 3 options: "HIs and child KPIs", "HIs" and "HIs; if none, use child KPIs"; hi_list= the HIs used to calculate the KPI.	
SQM Generic Event Sample Rule	Calculate status based a configured field's value of the event type sample and set custom tooltip information from the event. --**Rule Parameters**— Field Name = The name of the sample field with a numeric value which is used to calculate the rule result. No data timeout = indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second. RCA Field Name = the name of field, which contains the RCA value Time Stamp Field = The name of the time stamp field in the external source sample, if its name is not time_stamp.	
SQM Generic Formula Rule	Calculate HIs from samples, using a set of calculation methods (sum, count, average, and so on) --**Rule Parameters**— duration = Service Health calculates CI status based on the samples received during the duration period (defined in seconds). Default: 900 (15 minutes) Formula = The formula to be used to calculate the value or the status of	For example, if a CI has duration as 5 minutes, the HI status is calculated based on the samples received during the past 5 minutes.

Business Rule	Description	Additional comments
	the KPI to which the Generic Formula rule is attached, for the time period specified in the duration parameter. No data timeout = indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second. Time Stamp Field = The name of the time stamp field in the external source sample, if its name is not time_stamp.	
SQM Generic Sample Rule	Calculate HI values, using the value of a selected field from a sample --**Rule Parameters**— Field Name = The name of the sample field with a numeric value which is used to calculate the rule result. No data timeout = indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second. Time Stamp Field = The name of the time stamp field in the external source sample, if its name is not time_stamp.	
SQM Assign HI value from Sample value	Assign the value of corresponding sample onto the HI value --**Rule Parameters**— Field Name = The name of the sample field with a numeric value which is used to calculate the rule result. No data timeout = indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second. Time Stamp Field = The name of the time stamp field in the external source sample, if its name is not time_stamp.	
SQM Average of Values	Calculates the average values of the HIs and KPIs which are used to calculate the KPI. --**Rule Parameters**— calc_method=the method used to calculate the KPI, includes 3 options: "HIs and child KPIs", "HIs" and "HIs; if none, use child KPIs"; hi_list= the HIs used to calculate the KPI.	
SQM Average of Efficiency %	Calculates the average of the values of the HIs and KPIs which are used to calculate the KPI, the unit is %. -**Rule Parameters**- calc_method=the method used to calculate the KPI, includes 3 options:	

Business Rule	Description	Additional comments
	"HIs and child KPIs", "HIs" and "HIs; if none, use child KPIs"; hi_list= the HIs used to calculate the KPI.	
SQM Worst of Siblings	Calculates the SQM Worst of siblings -**Rule Parameters**- calc_method=the method used to calculate the KPI, includes 3 options: "HIs and child KPIs", "HIs" and "HIs; if none, use child KPIs"; hi_list= the HIs used to calculate the KPI.	
SQM Number of Degraded Subordinates	Calculates the Number of degraded (not normal status) subordinate CIs. -**Rule Parameters**- calc_method=the method used to calculate the KPI, includes 3 options: "HIs and child KPIs", "HIs" and "HIs; if none, use child KPIs"; hi_list= the HIs used to calculate the KPI. Minimum Degradation = Minimum Degradation to calculate % of degraded child, this field is case insensitive	For instance, if *Minimum Degradation*="minor", then all subordinated ones with status "Major" or "Minor" are Degraded ones.
SQM Compute MAX(HI, HI2)	Assign the KPI value with the maximum value of 2 specific HIs. -**Rule Parameters**- HI1 = uuid of HI1; HI2 = uuid of HI2, copy the ids from BSM **Admin->Service Health->Repositories->Indicators** page; No data timeout=indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second.	
SQM Compute MIN(HI, HI2)	Assign the KPI value with the minimum value of 2 specific HIs. -**Rule Parameters**- HI1 = uuid of HI1; HI2 = uuid of HI2, copy the ids from BSM **Admin->Service Health->Repositories->Indicators** page; No data timeout =indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second.	
SQM Compute RATE(HI, HI2)	Assign the KPI value with the calculation result of formula: (HI1 / HI2) * 100. -**Rule Parameters**- HI1 = uuid of HI1; HI2 = uuid of HI2, copy the ids from BSM **Admin->Service Health-**	RATE function (A/B)*100 For instance, used to compute a success rate when you have the success and the all:

Business Rule	Description	Additional comments
	>Repositories->Indicators page; No data timeout =indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second. **Note**: if value of HI1 is larger than value of HI2, the result is 100.	Success rate = (success / all)*100
SQM Compute SUM(HI, HI2)	Assign the KPI value with the sum of the 2 specific HI's value. -**Rule Parameters**- HI1 = uuid of HI1; HI2 = uuid of HI2, copy the ids from BSM **Admin->Service Health->Repositories->Indicators** page; No data timeout =indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second.	Sum function for 2 configurable HIs. For instance, used to compute frame numbers when you have BframeCnt and IframeCnt: FrameCnt = BframeCnt + IframeCnt.
SQM Max Value	From a list of KPIs associated to a list of children CIs, the max value is retrieved and set to the KPI value. --**Rule Parameters**— ChildCITId = it's the name of the CIT like defined in the CIT manager (sqm_sgsn for instance for SGSN CIT). Use "all" to specify all CI Type. ChildKPIId = The KPI display id retrieved from the KPI repository (remember tip to visualize it (by default ID attribute is hidden). No data timeout=indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second.	
SQM Min Value	From a list of KPIs associated to a list of children CIs, the min value is retrieved and set to the KPI value. --**Rule Parameters**— ChildCITId = it's the name of the CIT like defined in the CIT manager (sqm_sgsn for instance for SGSN CIT). Use "all" to specify all CI Type. ChildKPIId = The KPI display id retrieved from the KPI repository (remember tip to visualize it (by default ID attribute is hidden). No data timeout=indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second.	
SQM Ratio Above Average	SQM API customized rule to iterate on child KPIs and estimate the % of children with one KPI Above the average of values	

Business Rule	Description	Additional comments
	--**Rule Parameters**— ChildCITId = it's the name of the CIT like defined in the CIT manager (sqm_sgsn for instance for SGSN CIT). Use "all" to specify all CI Type. ChildKPIId = The KPI display id retrieved from the KPI repository (remember tip to visualize it (by default ID attribute is hidden).	
SQM Ratio Below Average	SQM API customized rule to iterate on child KPIs and estimate the % of children with one KPI below the average of values --**Rule Parameters**— ChildCITId = it is the name of the CIT like defined in the CIT manager (sqm_sgsn for instance for SGSN CIT). Use "all" to specify all CI Type. ChildKPIId = The KPI display id retrieved from the KPI repository (remember tip to visualize it (by default ID attribute is hidden).	
TeMIP Event Sample Rule	This rule is used to calculate HI's status based the events collected from TeMIP. In the meanwhile, it sets more tooltip information from event. -**Rule Parameters**- No data timeout = indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second. RCA Field Name = the name of field, which contains the RCA value Time Stamp Field = The name of the time stamp field in the external source sample, if its name is not time_stamp.	
TeMIP Worst Child Rule	Calculates the status based on the lowest status held by any of the child CIs. And join and save the ROC string -**Rule Parameters**- calc_method=the method used to calculate the KPI, includes 3 options: "HIs and child KPIs", "HIs" and "HIs; if none, use child KPIs"; hi_list= the HIs used to calculate the KPI.	
TeMIP EMS Simple Rule	The TeMIP Self-Management rule assigns to a KPI the contents of the events sent by the TeMIP Fault Manager about the health of the TeMIP to SQM communication channel. -**Rule Parameters**- No data timeout=indicate the interval this KPI status will be set as No Data if no new calculation happened. The default value is 900, and the unit is second.	A specified number of samples (specified in the Total Number of Samples parameter) are accumulated. The status of the rule changes to a new status only when, among the accumulated samples, the specified number of samples

Business Rule	Description	Additional comments
	Number of problematic samples= The number of samples that have the required status. Save Last Sample = (true/false) if true save last Sample values, if false do not save. Total number of samples = The total number of samples. See Number of Problematic Samples parameter for more details.	(specified in the Number of Problematic Samples parameter) has the new status. For example, Total Number of Samples=5, Number of Problematic Samples=3; if three samples in the accumulated samples have a red status, the rule status changes to red.
(SLM)TeMIP cumulated outage duration	Calculate the outage duration, the outage duration is the sum duration of the alarm whose severity is worse than the specified severity outage parameter, the unit is second. -**Rule Parameters**- Severity outage value = the value scope for the parameter: UNKNOWN, INFORMATIONAL, WARNING, MINOR, MAJOR, CRITICAL	
(SLM)TeMIP HI availability	This rule is a HI rule to calculate the HI's availability based on the availability duration / calculation cycle. The availability duration is the sum of sample duration whose severity is better than the parameter outage severity value. It is a percent value. -**Rule Parameters**- Severity outage value = the value scope for the parameter: NO_TRIM, UNKNOWN, INFORMATIONAL, WARNING, MINOR, MAJOR, CRITICAL Severity trim = Severity value that is considered failure	
(SLM)TeMIP number of alarms	The Number of the alarm whose severity value is worse that the specified severity threshold parameter. -**Rule Parameters**- Severity threshold = the value scope for the parameter: NO_TRIM, UNKNOWN, INFORMATIONAL, WARNING, MINOR, MAJOR, CRITICAL calc_method =the method used to calculate the KPI, includes 3 options: "HIs and child KPIs", "HIs" and "HIs; if none, use child KPIs"; hi_list = the HIs used to calculate the KPI.	

3.3. Matching category rules

These rules are based on the research of a common tag set on the KPI called 'category'. All KPIs of children CIs that have this 'category' are used in the computation of the value that can be the average, find the max/min, etc.

Business Rule	Description	Additional comments
SQM Matching Category Average Value	From the children CIs (within the model), research all KPIs tagged with a certain category and computed the average value to set to the KPI. --**Rule Parameters**— ParentKPICategory= category to set for this KPI used for upper level calculation ChildKPICategory= category to research, you can use a set of strings separated by comma ',' (ex: "Core Access Accuracy, RAN Access Accuracy"). Reverse= (false/true) indicate how this KPI value is used for upper level calculation (possibly). If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation (possibly). LinearityOffset and LinearityCoefficient=indicate how upper level calculation will use them for normalization	AVERAGE function for one specified category. Normalization formula is: ([LinearityCoefficient*HI value] + LinearityOffset) = new value for this KPI used at upper level. This capacity is used to normalize a KPI for instance to transform a MOS (0~4) to a rate (0~100) or for the fault to transform alarm severity (0~5) to a rate (0~100). It is the coefficient to multiply your value to get range 0~100.
SQM Matching Category Best Status	From the children CIs (within the model), research all KPIs tagged with a certain category and computed the best status to set to the KPI. --**Rule Parameters**— ParentKPICategory= category to set for this KPI used for upper level calculation ChildKPICategory= category to research, you can use a set of strings separated by comma ',' (ex: "Core Access Accuracy, RAN Access Accuracy").	
SQM Matching Category Worst Status	From the children CIs (within the model), research all KPIs tagged with a certain category and computed the worst status to set to the KPI. --**Rule Parameters**— ParentKPICategory= category to set for this KPI used for upper level	

Business Rule	Description	Additional comments
	calculation ChildKPICategory= category to research, you can use a set of strings separated by comma ',' (ex: "Core Access Accuracy, RAN Access Accuracy").	
SQM Matching Category Difference A-B	From the children CIs (within the model), research all KPIs tagged with 2 certain categories and computed the difference KPICategoryA - KPICategoryB --**Rule Parameters**— KPICategoryA= base category KPICategoryB= category to subtract ParentKPICategory= category to set for this KPI used for upper level calculation Reverse= (false/true) indicate how this KPI value is used for upper level calculation (possibly). If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation (possibly). LinearityOffset and LinearityCoefficient=indicate how upper level calculation will use them for normalization	DIFF function for 2 categories For instance, used to compute a fail when you have the attempt and the success: Fail = attempt – success Refer the Normalization formula described in BR "*SQM Matching Category Average Value*".
SQM Matching Category Max Value	From the children CIs (within the model), research all KPIs tagged with a certain category and get the max value to set to the KPI. --Rule Parameters— ParentKPICategory= category to set for this KPI used for upper level calculation ChildKPICategory= category to research, you can use a set of strings separated by comma ',' (ex: "Core Access Accuracy, RAN Access Accuracy"). Reverse= (false/true) indicate how this KPI value is used for upper level calculation (possibly). If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation (possibly). LinearityOffset and LinearityCoefficient = indicate how upper level calculation will use them for normalization	MAX function for one specified category. Refer the Normalization formula described in BR "*SQM Matching Category Average Value*".
SQM Matching Category Min Value	From the children CIs (within the model), research all KPIs tagged with a certain category and get the min value to set to the KPI. --Rule Parameters— ParentKPICategory= category to set for this KPI used for upper level	MIN function for one specified category or one set of specified categories.

Business Rule	Description	Additional comments
	calculation ChildKPICategory= category to research, you can use a set of strings separated by comma ',' (ex: "Core Access Accuracy, RAN Access Accuracy"). Reverse= (false/true) indicate how this KPI value is used for upper level calculation (possibly). If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation (possibly). LinearityOffset and LinearityCoefficient = indicate how upper level calculation will use them for normalization	Refer the Normalization formula described in BR "*SQM Matching Category Average Value*".
SQM Matching Category Sum Value	From the children CIs (within the model), research all KPIs tagged with a certain category and computed the sum value to set to the KPI. --Rule Parameters— ParentKPICategory= category to set for this KPI used for upper level calculation ChildKPICategory= category to research, you can use a set of strings separated by comma ',' (ex: "Core Access Accuracy, RAN Access Accuracy"). Reverse= (false/true) indicate how this KPI value is used for upper level calculation (possibly). If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation (possibly). LinearityOffset and LinearityCoefficient=indicate how upper level calculation will use them for normalization	SUM function for one specified category or one set of specified categories. Refer the Normalization formula described in BR "*SQM Matching Category Average Value*".
SQM Sibling Matching Category Max Value	From the sibling CIs (within the model), research all KPIs tagged with a certain category and computed the max value to set to the KPI. --**Rule Parameters**— ParentKPICategory= category to set for this KPI used for upper level calculation SiblingKPICategory= category to research, you can use a set of strings separated by comma ',' (ex: "Core Access Accuracy, RAN Access Accuracy"). Reverse= (false/true) indicate how this KPI value is used for upper level calculation. If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation.	Refer the Normalization formula described in BR "*SQM Matching Category Average Value*".

Business Rule	Description	Additional comments
	LinearityOffset and LinearityCoefficient=indicate how upper level calculation will use them for normalization.	
SQM Compute Rate Category A vs Category B	From the children CIs (within the model), research all KPIs tagged with 2 certain categories and computed the rate as follows: [KPICategoryA / KPICategoryB]*100 --**Rule Parameters**— KPICategoryA= category to rate KPICategoryB= reference category ParentKPICategory= category to set for this KPI used for upper level calculation Reverse= (false/true) indicate how this KPI value is used for upper level calculation. If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation	RATE function (A/B)*100 For instance, used to compute a rate when you have the success and the attempt: Success rate = [success /attempt]*100 In case of 0 success, rate is 100%
SQM Compute Rate Category A vs Category A+B	From the children CIs (within the model), research all KPIs tagged with 2 certain categories and computed the rate as follows: [KPICategoryA / (KPICategoryA + KPICategoryB)]*100 --**Rule Parameters**— KPICategoryA= category to rate KPICategoryB= category to add ParentKPICategory= category to set for this KPI used for upper level calculation. Reverse= (false/true) indicate how this KPI value is used for upper level calculation. If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation (possibly).	RATE function (A/A+B)*100 For instance, used to compute a rate when you have the success and the fail: Success rate = [success / (success + fail)]*100 In case of 0 success, rate is 100%
SQM Compute Rate Category A vs Constant	From the children CIs (within the model), research all KPIs tagged with a certain category and computed the rate as follows: [KPICategoryA / Constant]*100 --**Rule Parameters**— KPICategoryA= category to rate Constant= constant reference ParentKPICategory= category to set for this KPI used for upper level calculation Reverse= (false/true) indicate how this KPI value is used for upper level calculation (possibly). If true then upper level will use the KPI value	RATE function (A/constant)*100 For instance, used to compute a rate when you have the value/counter and the max authorized: Disk full rate = [disk full /2G]*100 If Category=0 then rate is 0; For tuning aspect, the rate is not

Business Rule	Description	Additional comments
	reversely as follows 100-val. Weight= KPI weight used for upper level calculation (possibly).	'limited' to 100% but corresponds to the computation with the constant value.
SQM Match Cat. Computed Rate From Threshold	From the children CIs (within the model), research all KPIs tagged with a certain category and computed the rate as follows: 0- Get the max value from children matching the ChildKPICategory 1- If the max retrieved value is lower than the specified threshold value, returned value is 100 (because we do consider that there is absolutely no impact) 2- If the max retrieved value is between the specified threshold value and 100, the below formula is applied: a. compute the forwarding interval: (100 - threshold) / nbLevel b. iterate from the threshold to figure out on which interval the max value belongs to (and therefore to figure out the weight to apply) c. compute the rate: 100 - (weight * (100 / nbLevel)) --**Rule Parameters**— ParentKPICategory= category to set for this KPI used for upper level calculation ChildKPICategory= category to research, you can set of strings separated by comma ',' (ex: "Core Access Accuracy, RAN Access Accuracy"). threshold= threshold value from which computation starts level= number of 'levels' identified in term of impact between the 'threshold' and 100% Reverse= (false/true) indicate how this KPI value is used for upper level calculation. If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation.	RATE function from a threshold
SQM Matching Category Rate With Utilization	From the children CIs (within the model), research all KPIs tagged with a certain category and computed the rate as follows: 0- Get the max value from children matching the ChildKPICategory Get the sum of Utilization value from children matching the UtilizationKPICategory 1- If the sum of Utilization value is lower than the specified threshold value, returned value is the max retrieved value. 2- If the sum of Utilization value is between the specified threshold	

Business Rule	Description	Additional comments
	value and 100, the below formula is applied: a. compute the forwarding interval: (100 - threshold) / nbLevel b. iterate from the threshold to figure out on which interval the sum of Utilization value belongs to (and therefore to figure out the weight to apply) c. compute the rate: max value - (weight * (100 / nbLevel)) --**Rule Parameters**— ParentKPICategory= category to set for this KPI used for upper level calculation ChildKPICategory= category to research, you can set of strings separated by comma ',' (ex: "Core Access Accuracy, RAN Access Accuracy"). UtilizationKPICategory= category to research threshold= threshold value from which computation starts level= number of 'levels' identified in term of impact between the 'threshold' and 100% Reverse= (false/true) indicate how this KPI value is used for upper level calculation. If true then upper level will use the KPI value reversely as follows 100-val. Weight= KPI weight used for upper level calculation.	

Chapter2

SQM Business Rule Tooltip

The attached table provide the complete definition of tooltip parameters defined in the SQM Business Rules.

HP_SQM_Solution_SMF_Business_Rules

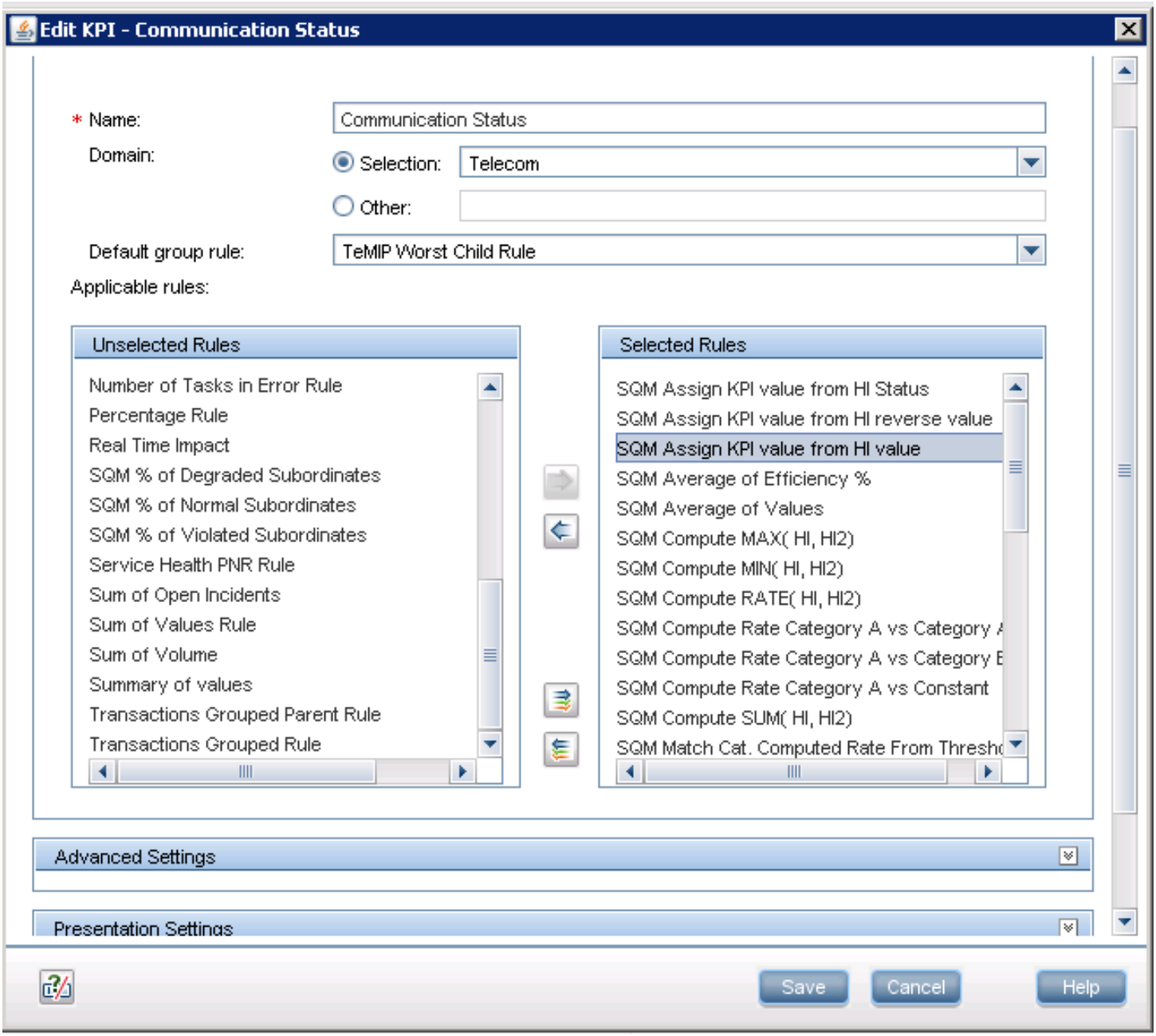
Chapter3

SQM Business Rule Example

3.1. Example of the SQM Assign KPI value from HI value Rule

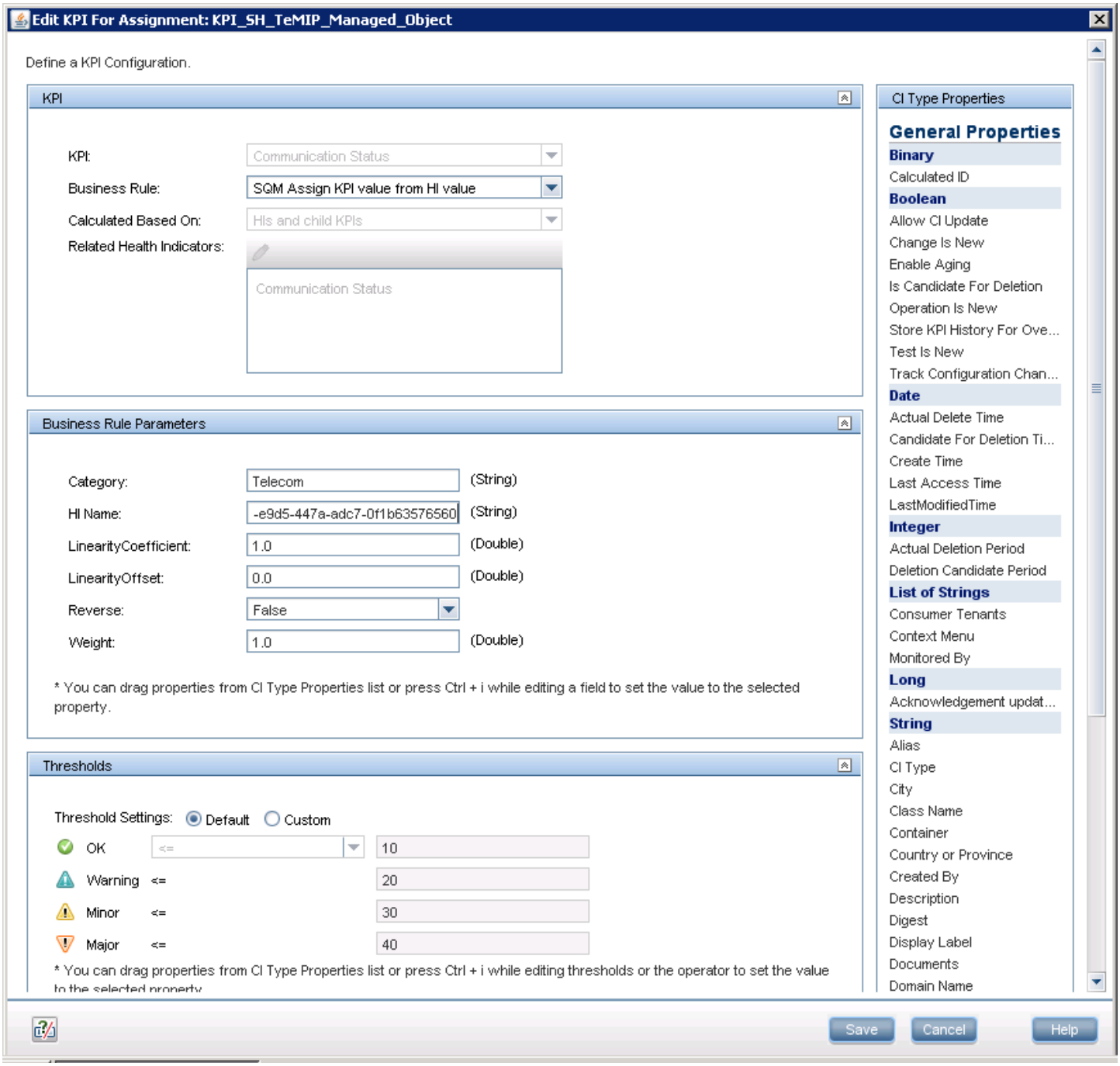
This rule assigns the value of corresponding HI into the KPI value.

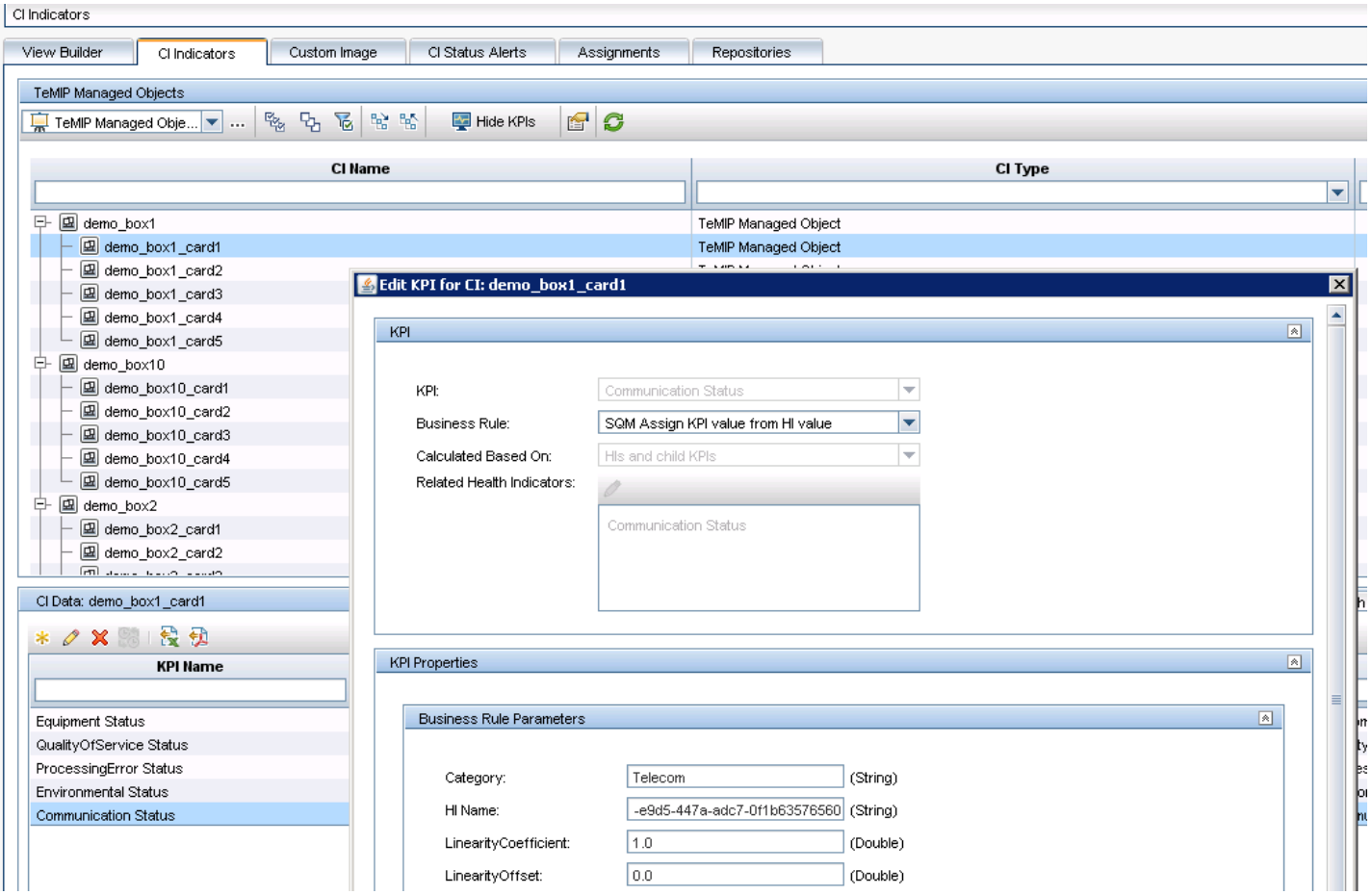
1. Under Admin→Service Health→Repositories→KPI, we use KPI 'Communication Status' to use our Business Rules 'SQM Assign KPI value from HI value', we must make sure the rule is under the right list panel of 'Selected Rules', So when we create the KPI assignment, you can get the Business Rule 'SQM Assign KPI value from HI value' for the KPI 'Communication Status'.



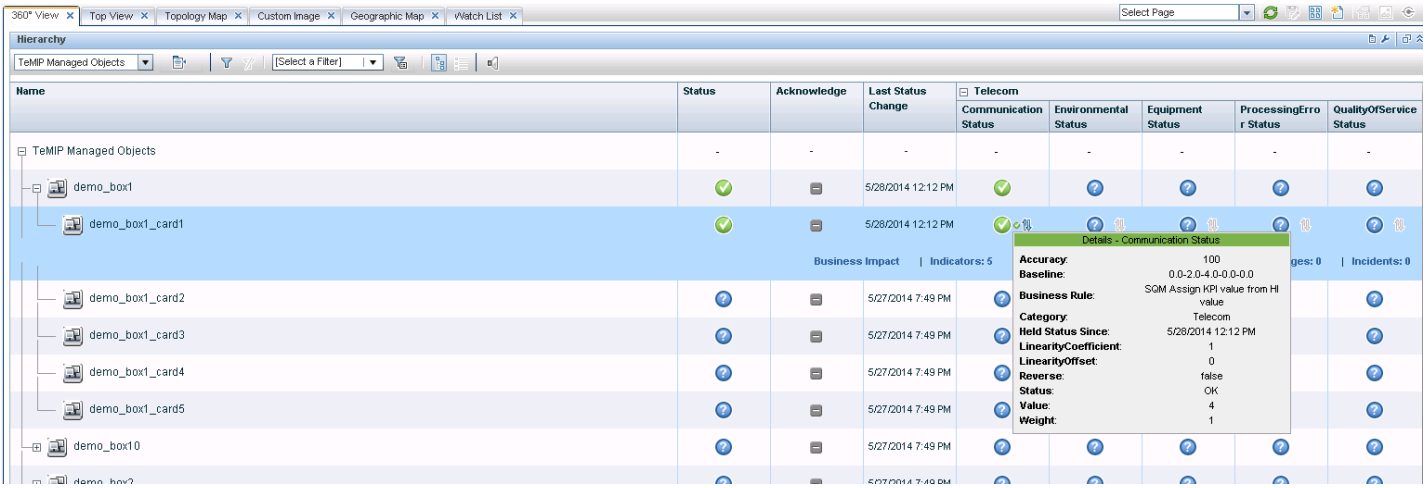
2. Under Admin→Service Health→Assignments→KPI Assignments, we create a KPI Assignment for our CIT and define KPI 'Communication Status' and it's' Business Rule 'SQM Assign KPI value from HI value'. And input the Business Rule Parameters if needed, 'HI Name' is the id of the HI 'Communication Status'.

   If you just want to test some Business Rules, You can simply use the Admin→Service Health→CI Indicators; choose the View which you create for your test, and select the CI, double click the KPI name and you can choose the Business rule which you want to use.


Edit KPI For Assignment: KPI_SH_TeMIP_Managed_Object
Define a KPI Configuration.
KPI
KPI:
Communication Status
Business Rule:
SQM Assign KPI value from HI value
Calculated Based On:
His and child KPIs
Related Health Indicators:
Communication Status
Business Rule Parameters
Category:
Telecom
(String)
HI Name:
-e9d5-447a-adc7-0f1b63576560
(String)
LinearityCoefficient:
1.0
(Double)
LinearityOffset:
0.0
(Double)
Reverse:
False
Weight:
1.0
(Double)
* You can drag properties from CI Type Properties list or press Ctrl + i while editing a field to set the value to the selected property.
Thresholds
Threshold Settings:
Default
Custom
OK
<=
10
Warning
<=
20
Minor
<=
30
Major
<=
40
* You can drag properties from CI Type Properties list or press Ctrl + i while editing thresholds or the operator to set the value to the selected property
CI Type Properties
General Properties
Binary
Calculated ID
Boolean
Allow CI Update
Change Is New
Enable Aging
Is Candidate For Deletion
Operation Is New
Store KPI History For Ove...
Test Is New
Track Configuration Chan...
Date
Actual Delete Time
Candidate For Deletion Ti...
Create Time
Last Access Time
LastModifiedTime
Integer
Actual Deletion Period
Deletion Candidate Period
List of Strings
Consumer Tenants
Context Menu
Monitored By
Long
Acknowledgement updat...
String
Alias
CI Type
City
Class Name
Container
Country or Province
Created By
Description
Digest
Display Label
Documents
Domain Name
Save
Cancel
Help



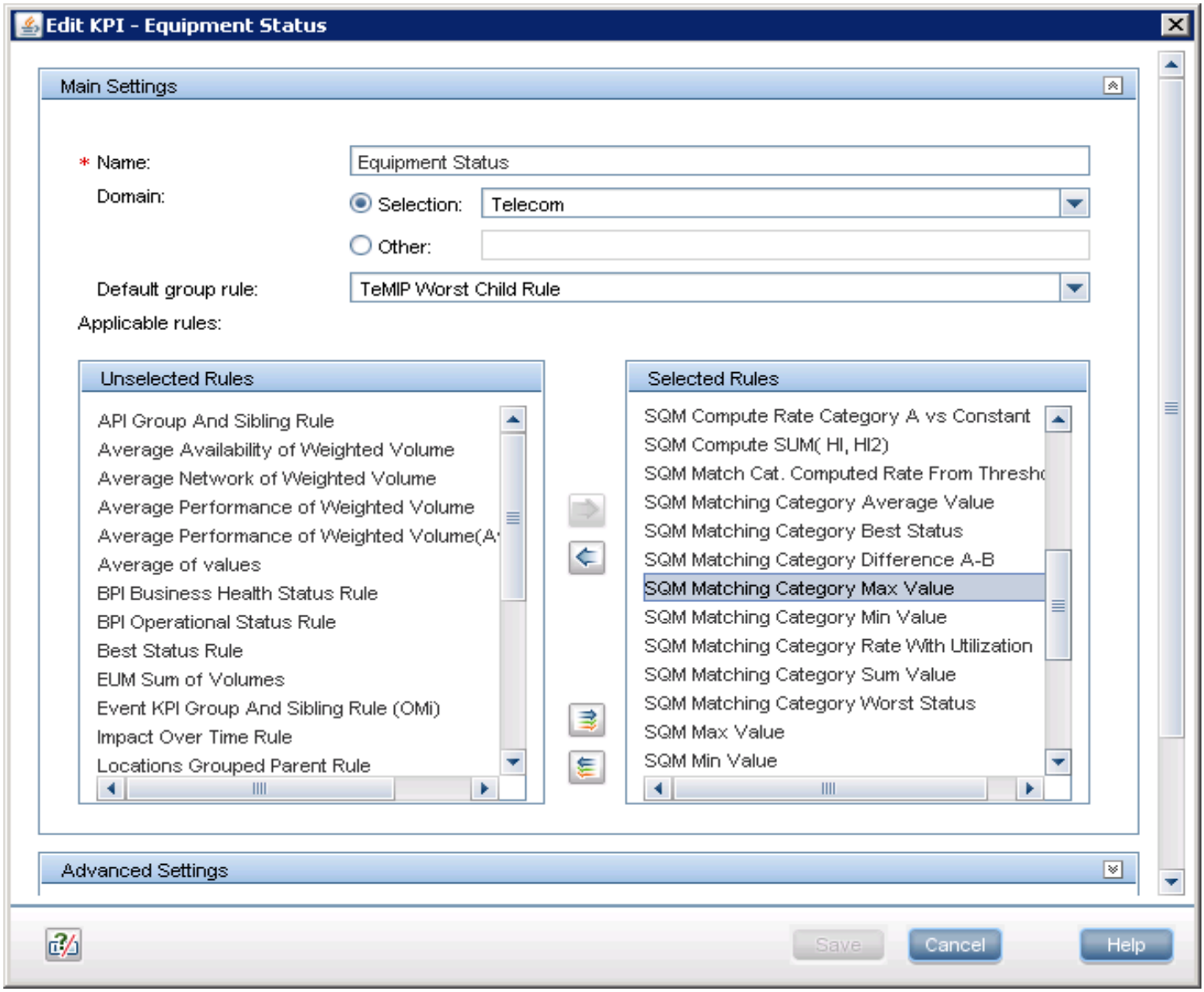
3. We send HI 'Communication Status' value '4' to the CI 'demo_box1_card1'. Under Applications→Service Health→360° View; You can see the KPI 'Communication Status' and its status changed to green. Put your mouse on that KPI, you can see the detail Tooltip information and its value is also '4'.



3.2. Example of the SQM Matching Category Max Value Rule

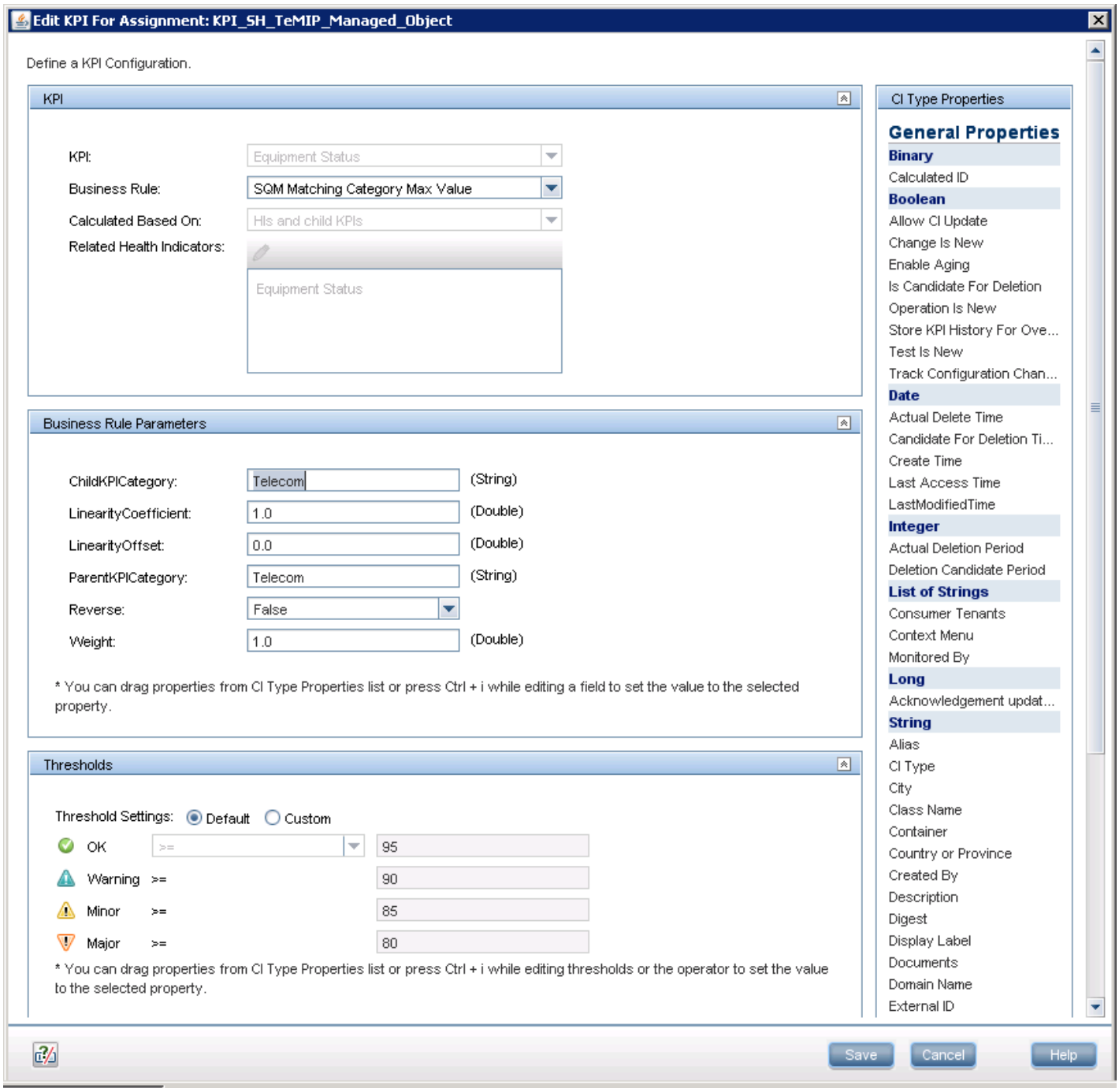
This Rule will get the max value from the children CIs, research all KPIs tagged with a certain child KPI category and set to the max value to the current KPI.

1. Under Admin→Service Health→Repositories→KPI, we use another KPI 'Equipment Status' to use our Business Rules 'SQM Matching Category Max Value'; we must make sure the rule is under the right list panel of 'Selected Rules'.

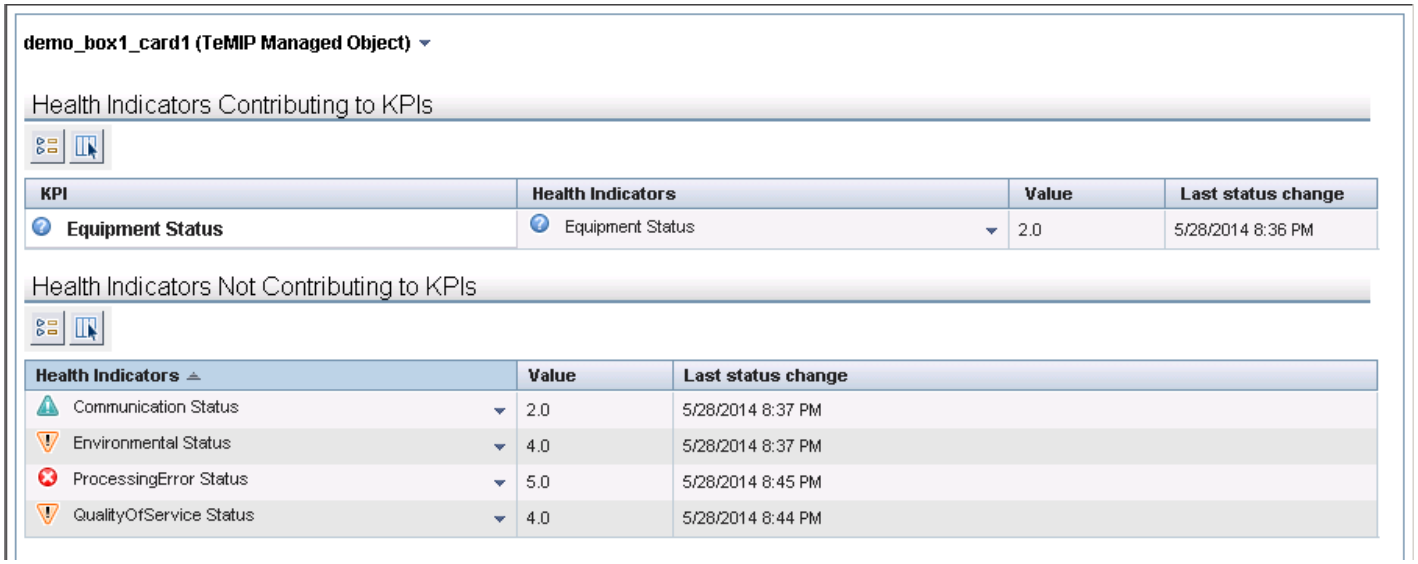


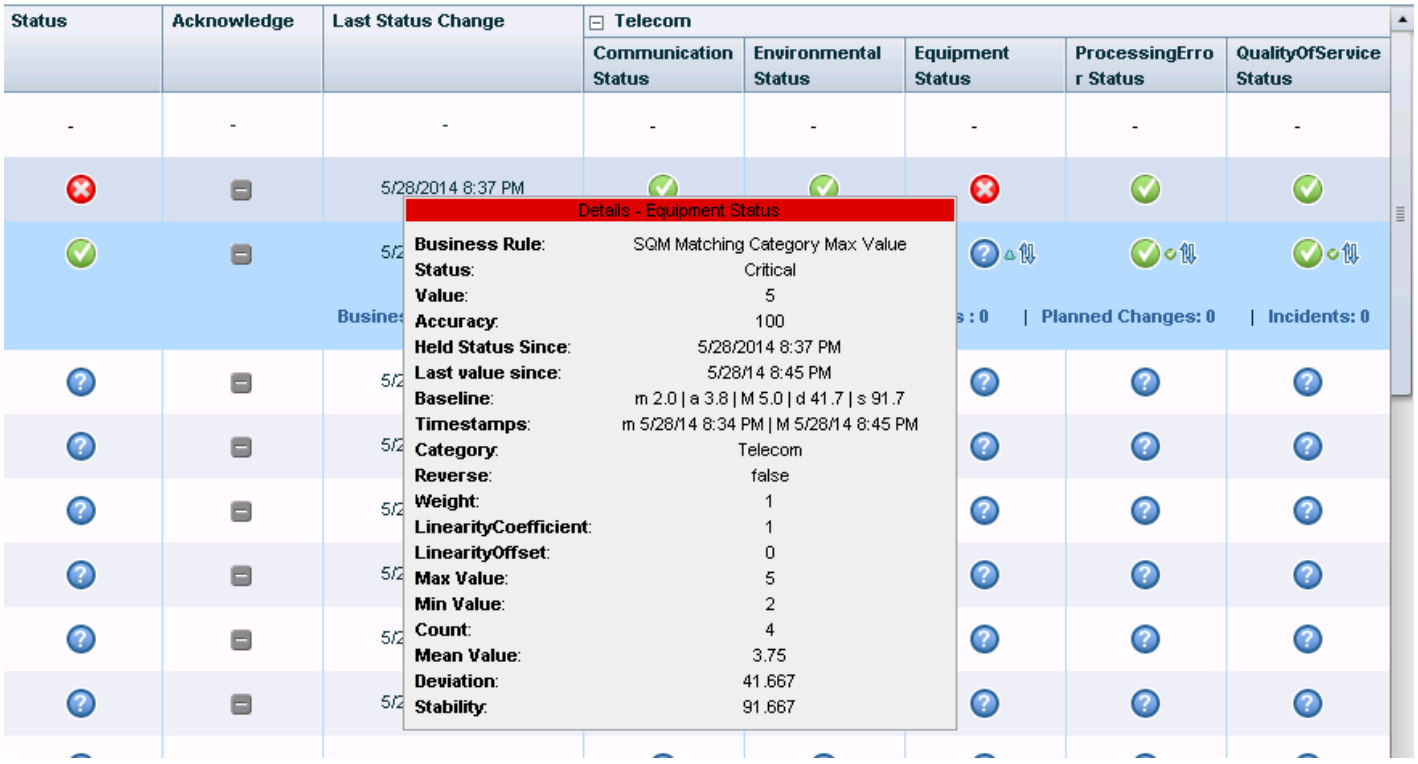
2. Under Admin→Service Health→Assignments→KPI Assignments, we create a KPI Assignment for our CIT and define KPI 'Equipment Status' and its rule 'SQM

Matching Category Max Value'. Input the rule parameter, here ChildKPICategory is 'Telecom'. Or your can simply use the Admin→Service Health→CI Indicators to test your rules.



3. Add another 3 KPIs for test here; use the same 'Telecom' category and 'SQM Assign KPI value from HI value' rule. So here HI value is our KPI value. And the max value is 5. Under our 'SQM Matching Category Max Value' rule, you can see that the value is also 5.


demo_box1_card1 (TeMIP Managed Object)
Health Indicators Contributing to KPIs
KPI
Health Indicators
Value
Last status change
Equipment Status
Equipment Status
2.0
5/28/2014 8:36 PM
Health Indicators Not Contributing to KPIs
Health Indicators
Value
Last status change
Communication Status
2.0
5/28/2014 8:37 PM
Environmental Status
4.0
5/28/2014 8:37 PM
ProcessingError Status
5.0
5/28/2014 8:45 PM
QualityOfService Status
4.0
5/28/2014 8:44 PM


Status
Acknowledge
Last Status Change
Telecom
Communication Status
Environmental Status
Equipment Status
ProcessingError Status
QualityOfService Status
5/28/2014 8:37 PM
Planned Changes: 0
Incidents: 0
Details - Equipment Status
Business Rule: SQM Matching Category Max Value
Status: Critical
Value: 5
Accuracy: 100
Held Status Since: 5/28/2014 8:37 PM
Last value since: 5/28/14 8:45 PM
Baseline: m 2.0 | a 3.8 | M 5.0 | d 41.7 | s 91.7
Timestamps: m 5/28/14 8:34 PM | M 5/28/14 8:45 PM
Category: Telecom
Reverse: false
Weight: 1
LinearityCoefficient: 1
LinearityOffset: 0
Max Value: 5
Min Value: 2
Count: 4
Mean Value: 3.75
Deviation: 41.667
Stability: 91.667