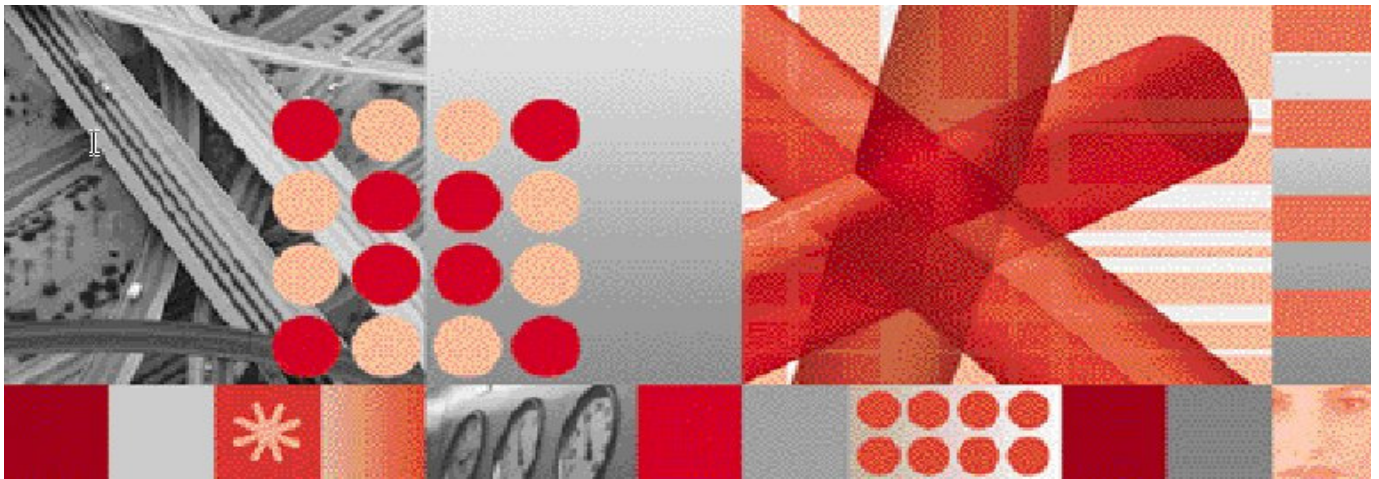


Tivoli Netcool Service Quality Manager 4.1.1.13.73 (LA Interim Fix 0007)

IBM



Technical note for IZ45753 – The Clause Historical Feature

Note: Before using this information and the product it supports, read the information in Appendix A Notices on page 9.

This edition applies to Version 1 Release 1, modification 1 of IBM® Tivoli® Netcool® Service Quality Manager Patch 4.1.1.13.73 (LA IF0007) and to all subsequent releases and modifications until otherwise indicated in new editions.

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1 Problem description

Configuring a SLA may result in the customer defining a set of rules and corresponding thresholds that result in the generation of event notifications. Defining these rules may result in the warning and violation columns in the clause historical feature been filled or unfilled. A lack of understanding regarding the relationship between SLAs and the clause historical feature can result in confusion as to when the violation and warning columns in the historical feature are filled with values.

2 Customer impact

The customer may believe that the warning or violation column is unfilled as a result of a bug in TNSQM. However, it may be that no violation/warning rule is defined or available for computation during that schedule period.

3 Resolution

The purpose of this tech note is to explain how the *Clause Historical Feature* works in *Tivoli Netcool Service Quality Manager (TNSQM)*. With regards to this feature, an explanation is also provided on how a SLA and the definition of rules and schedule periods within an SLA affect the corresponding operation of the *Clause Historical Feature*.

3.1 Definition of terms/concepts used

Within SLAs three schedule periods can be defined – **Peak**, **Off peak** and **Standard**. In each schedule period a number of rules can be specified, which include **static** and **adaptive** rules.

These rules define thresholds associated with violation and warning states of an SLA. In static rules thresholds are defined as single constant values, whereas in adaptive rules the effective threshold is calculated based on the historical performance of the monitored metric thereby enabling operations to focus on deviations from ‘typical’ service performance.

For each schedule period of an SLA it is possible to define static and adaptive rules or a mixture of both, where for each of these rules one rule type can define one state i.e. warning and violation state. This means that for each schedule period a maximum of four rules can be created, one for each possible state: static violation, static warning, adaptive violation and adaptive warning. Different SLA schedule periods may also have different threshold values associated with each rule type.

In the case where the operator defines a mixture of static and adaptive rules it is important to note that the order of precedence for the evaluation of these rules and their associated thresholds is defined as: static violation, static warning, adaptive violation and adaptive warning. The purpose of the clause historical feature in TNSQM is to display how the data which entered the system was evaluated against the rule set to produce the SLA state. With regards to this feature a number of points need to be noted and are further discussed in the following sections.

3.2 Violation and Warning Columns

Within a particular schedule period if two rules are defined, one for each state, then the violation and warning columns of the *Clause Historical Feature* will be filled. In the case of static rules this will be the violation and warning threshold values associated with the rule and will remain static over a schedule period, as shown in Figure 1. With adaptive rules, the values displayed in the columns of the *Clause Historical Feature* will be the computed values and will vary in each time interval that a KQI value was received, as shown in Figure 2.

Start Time	End Time	Value (msec)	Violation (msec)	Warning (msec)
May 21, 13:45 GMT	May 21, 14:00 GMT	1,201	1,100	900
May 21, 14:00 GMT	May 21, 14:15 GMT	1,201	1,100	900
May 21, 14:15 GMT	May 21, 14:30 GMT	1,201	1,100	900
May 21, 14:30 GMT	May 21, 14:45 GMT	2,087	1,100	900

Figure 1 Static rule with Violation and Warning states defined

Start Time	End Time	Value (count)	Violation	Warning
Jan 30, 00:00	Jan 30, 01:00	10	8	9
Jan 30, 01:00	Jan 30, 02:00	13	10.4	11.7
Jan 30, 02:00	Jan 30, 03:00	15	12	13.5
Jan 30, 03:00	Jan 30, 04:00	25	20	22.5

Figure 2 Adaptive Rule with Violation and Warning state defined

If the user only specifies a violation rule and associated threshold then only the violation threshold value will be displayed in the *Violation* column in the *Clause Historical Panel* for that sched-

ule period. An example of this is shown below in Figure 3 for a static rule. Similarly, if only a rule with a warning state were defined then the column *Warning* will display the threshold for this rule state, with the column *Violation* remaining unfilled, as shown in Figure 4.


Figure 3 and Figure 4, also show how the static threshold violation and warning values change from 1100 to 1200 and 900 to 1100 respectively. This change in values is a result of different threshold values having been defined in different schedule periods, with the KQI value on the fourth row representing a change in schedule period.

Start Time	End Time	Value (msec)	Violation (msec)	Warning (msec)
May 21, 13:45 GMT	May 21, 14:00 GMT	1,100	1,100	
May 21, 14:00 GMT	May 21, 14:15 GMT	1,100	1,100	
May 21, 14:15 GMT	May 21, 14:30 GMT	1,100	1,100	
May 21, 23:00 GMT	May 21, 23:15 GMT	1,200	1,200	

Figure 3 Clause Historical Panel with Violation Column filled

Start Time	End Time	Value (msec)	Violation (msec)	Warning (msec)
May 21, 13:45 GMT	May 21, 14:00 GMT	1,101		900
May 21, 14:00 GMT	May 21, 14:15 GMT	1,101		900
May 21, 14:15 GMT	May 21, 14:30 GMT	1,101		900
May 21, 23:00 GMT	May 21, 23:15 GMT	1,100		1,100

Figure 4 Clause Historical Panel with Warning Column filled

If the user wants to remove the *Warning* or *Violation* column from view then they can do this by clicking on the  icon and hiding their chosen column as shown in Figure 5.

Start Time	End Time	Value (msec)	Violation (msec)	Warning (msec)	
May 21, 13:45 GMT	May 21, 14:00 GMT	1,200			Auto resize ▶
May 21, 14:00 GMT	May 21, 14:15 GMT	1,200			Hide ▶
May 21, 14:15 GMT	May 21, 14:30 GMT	1,200			Show ▶
May 21, 23:00 GMT	May 21, 23:15 GMT	137			Save
May 21, 23:15 GMT	May 21, 23:30 GMT	137			

Figure 5 Hide a particular column

3.3 Colour coding

Within a schedule period, if the data that enters the system violates a rule threshold then this violation will be displayed and highlighted by colour coding the data value appropriately. The colour coding deployed in TNSQM uses the colours: **red** to indicate that the value has exceeded its violation threshold; **yellow** to indicate that it has exceeded its warning threshold; **green** to represent that the value is clear and did not exceed any threshold; and **grey** to show that the KQI value and state could not be determined during a particular schedule period.

The main reason why the user might observe the KQI value as grey is usually a result of adaptive rules been used. As the adaptive thresholding feature relies on historical data, if there is insuffi-

cient historical data to compute its violation/warning thresholds then it will process the data but represent the KQI value state as undetermined, and colour code it grey.

An example of this is shown below in Figure 6. In this example a mixture of static and adaptive rules are defined and include: static warning, adaptive violation and adaptive warning rules. As a result of the order or precedence rules, the first KQI value received exceeded the static warning threshold and so resulted in a corresponding state change to warning. However, the fourth KQI value received was below the static warning threshold and so was then evaluated against the adaptive violation rule. However, because there was not enough historical data to compute the violation and warning adaptive thresholds the KQI value and state could not be determined.

These undetermined states are not displayed in the corresponding graph, as shown in Figure 6. In this situation it is important to note that because the violation/warning thresholds could not be computed, the *Violation* and *Warning* columns of the *Clause Historical Feature* are unfilled.

When the TNSQM system has sufficient data to fully enable its computation of adaptive thresholding rules and corresponding states, then these undetermined KQI values will be eliminated, as shown again in Figure 6 on the sixth row. If you are using static rules only, these undetermined KQI value states will not appear.

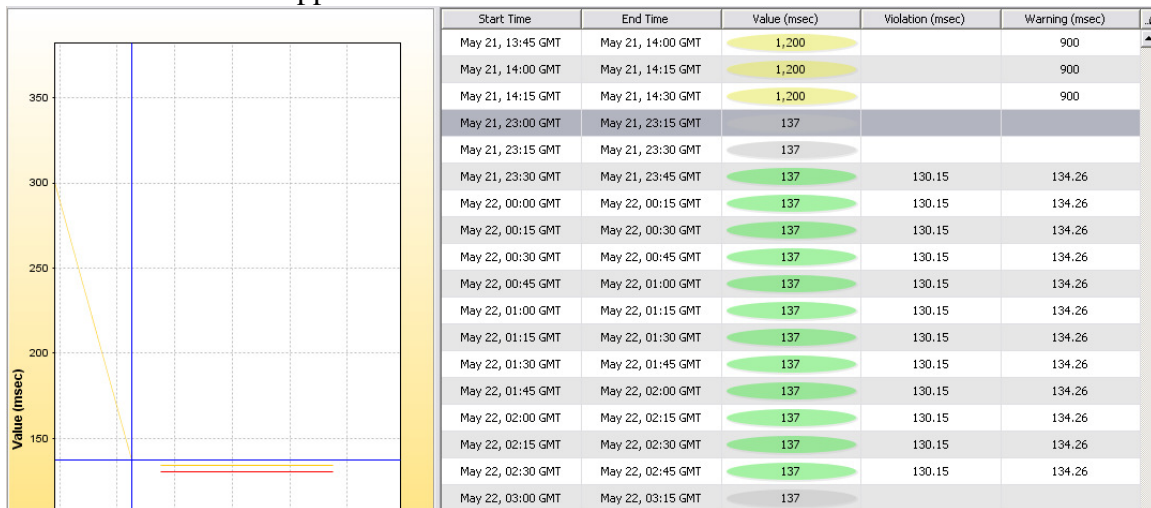


Figure 6 KQI Value undetermined for adaptive rule

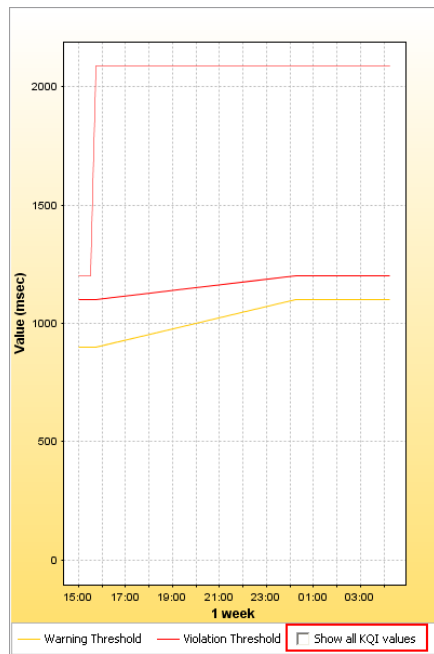


Figure 7 Show all KQI Values

3.4 Display all KQI Values

The *Clause Historical Feature* displays KQI values received from the time when the SLA was activated. With the *Clause Historical Feature*, it is also possible to display and view KQI values received before the SLAs activation, by checking the box – *Display all KQI values*, below the area where the corresponding graph is displayed, as shown in Figure 7.

The values in the graph are represented through the use of a grey line, and the KQI values are displayed and color coded in the corresponding panel also with the grey color. For these un-assessed KQI values, the *Warning* and *Violation* columns will be empty as the SLA was not active when these values were received and so no rule applied to these values, as shown in Figure 8. Un-checking this box will remove all KQIs values that were not assessed by the SLA.

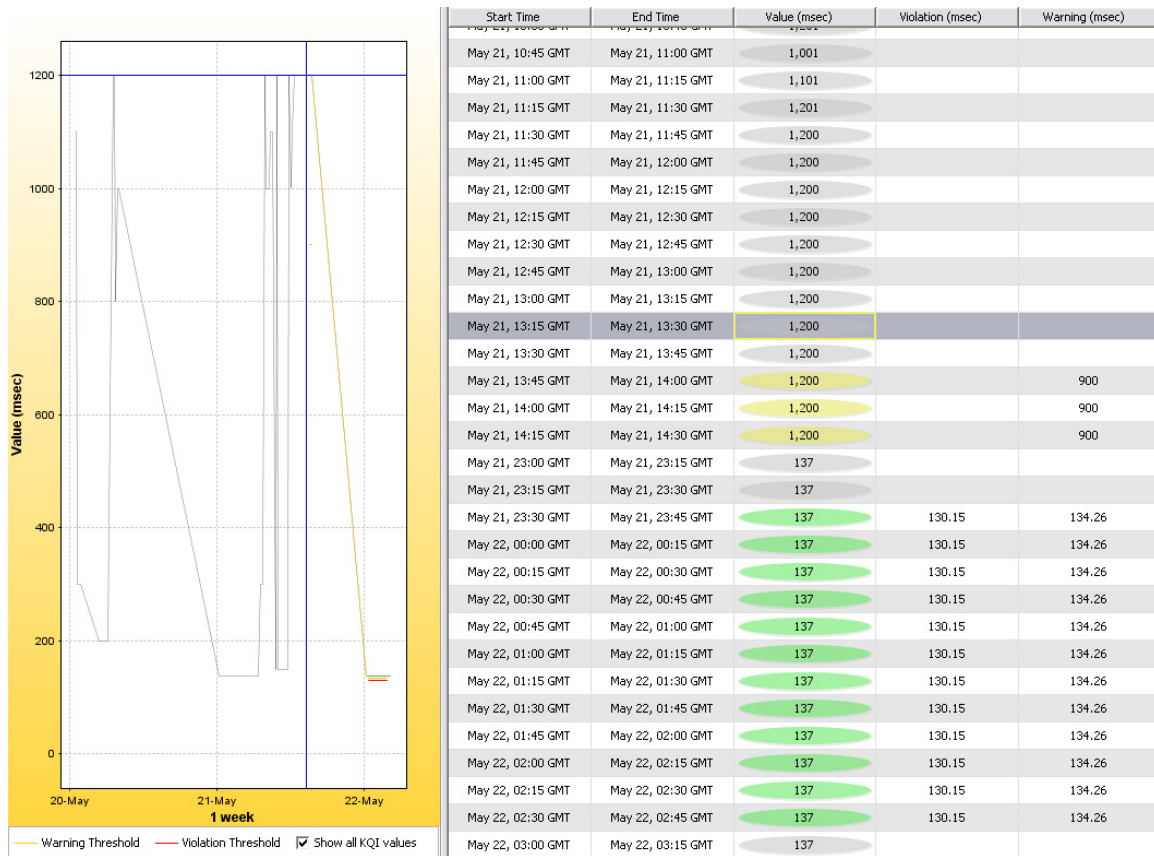


Figure 8 Display all KQI Values - chart and panel

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