OSS Fault Analytics and Statistics

User Guide

Version 1.2.0

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Hewlett Packard
Enterprise

Notices

Legal notice

Printed in the US

Trademarks

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Preface

About this guide

This guide describes the default reports that are packaged within the HPE OSS Fault Analytics and Statistics product.

Product name: HPE OSS Fault Analytics and Statistics
Product version: 1.2.0

Audience

This guide is for anyone who is using HPE OSS Fault Analytics and Statistics default reports.
The readers are assumed to understand HPE TeMIP alarms concepts.

Software versions

The terms Unix and Linux are used as a generic reference to the operating system, unless otherwise specified. The software versions referred to in this document are as follows:

Table 1: Software versions

Product version	Supported operating systems
HPE OSS Analytics Foundation version 1.1.4	Red Hat Enterprise Linux Server release 6.8
HPE OSS Fault Analytics and Statistics version 1.2	Red Hat Enterprise Linux Server release 6.8
HPE Vertica version 7.2.3	Red Hat Enterprise Linux Server release 6.8
HPE UMB Server version 1.1	Red Hat Enterprise Linux Server release 6.8
HPE Unified OSS Console 2.3	Red Hat Enterprise Linux Server release 6.8
HPE TeMIP 6.2	Red Hat Enterprise Linux Server release 6.8

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.

Bold Text:

- To introduce new terms and to emphasize important words.

Associated Documents

The following documents contain useful reference information:

HPE OSS Analytics Foundation Release Notes
HPE OSS Analytics Foundation Integration Guide
HPE OSS Fault Analytics and Statistics Release Notes
HPE OSS Fault Analytics and Statistics Install and Admin Guide
HPE OSS Fault Analytics and Statistics Customization Guide

Support

Please visit our HPE Software Support Online Web site at https://softwaresupport.hpe.com for contact information, and details about HPE Software products, services, and support.

The Software support area of the web site includes the following:

- Downloadable documentation
- Troubleshooting information
- Patches and updates
- Problem reporting
- Training information
- Support program information

Chapter 1
Product overview

1.1 Introduction

Please refer to the *HPE OSS Fault Analytics and Statistics Install and Admin Guide* for an introduction to OSS Fault Analytics and Statistics.

1.2 Architecture

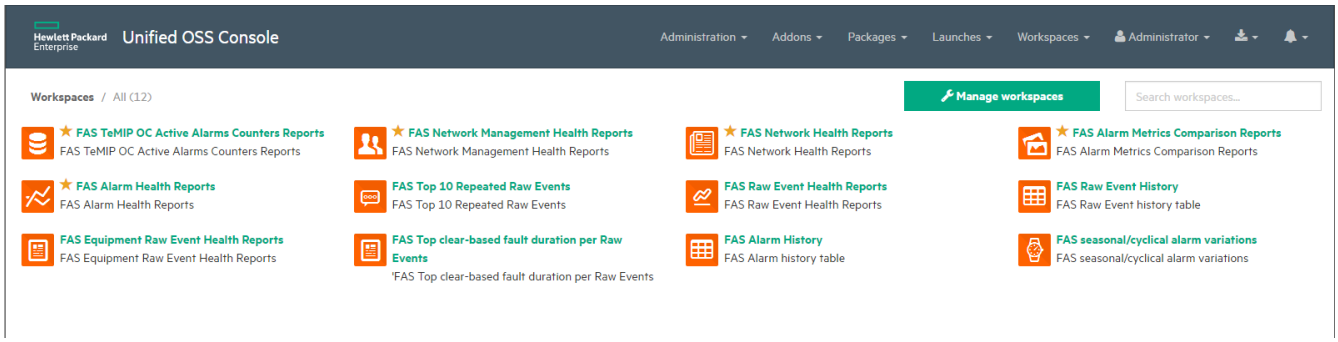
Please refer to the *HPE OSS Fault Analytics and Statistics Install and Admin Guide* for a description of the architecture of OSS Fault Analytics and Statistics.

Chapter 2
Fault Analytics and Statistics reports

The Fault Analytics and Statistics reports rely on the **FAS metadata** which is the abstraction layer, representing the structure of the data stored in the **FAS datamart**. For more information on the FAS metadata and datamart, please refer to the *HPE Fault Analytics and Statistics Customization guide*.

The Fault Analytics and Statistics reports are implemented as JSON files that use a specific grammar defined by the UOCv2 product. Once loaded into the OSSA server, UOCv2 will be able to display the FAS workspaces/views.
To better understand the UOCv2 concepts, please refer to the **UOCv2 documentation** quoted in the references section.

The FAS kit is delivered with a set of default reports that are explained hereunder.



2.1 Network health reports

The Network Health reports give you visibility into how your network behaves overtime through a number of indicators and formulas.

2.1.1 Network health indicators

2.1.1.1 Description

This report lists some metrics (a.k.a indicators) that help to analyze the health of the network layer from a fault perspective. Each indicator is calculated and displayed in a dedicated table for both a considered and a reference time periods.

The time periods are easily configurable from time selectors to compare any period of time together.
The variation (in %) between the periods is automatically calculated and displayed as well in a dedicated table.

Comparing time periods helps to better understand the trend and therefore to better plan any network activity.

2.1.1.2 Metrics

Table 2: Network health indicators table

Indicators	Description	Metadata identifiers used in the considered period and reference tables	Formulas defined in the Deviation table
Alarm Objects (AO)	Number of AOs collected during the time period	ALARM_OBJECTS_COUNTER_SUM	["percent", ["variation", ["/" , "ALARM_OBJECTS_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_OBJECTS_COUNTER_SUM_1", "refPeriodSize"]]]
Alarm Occurrences (AO + SA)	Number of AOs and similar alarms collected during the time period	ALARM_COUNTER_SUM	["percent", ["variation", ["/" , "ALARM_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_COUNTER_SUM_1", "refPeriodSize"]]]
Alarm Reduction Ratio (SA / AO)	Ratio of SAs vs AOs during the time period	["percent" , ["/" , "SIMILAR_ALARM_COUNTER_SUM" , "ALARM_OBJECTS_COUNTER_SUM"]]	["variation", ["/" , "SIMILAR_ALARM_COUNTER_SUM" , "ALARM_OBJECTS_COUNTER_SUM"], ["/" , "SIMILAR_ALARM_COUNTER_SUM_1" , "ALARM_OBJECTS_COUNTER_SUM_1"]]
Managed Objects (MO)	Number of equipments that have emitted alarms during the time period	MO_COUNT	["percent", ["/", ["-", "MO_COUNT", "MO_COUNT_1"], "MO_COUNT_1"]]
Cumulated In Fault Duration (CIFD)	The absolute time in hours between the clearance (or the termination if no clear) and the original event time for all the AOs collected during the time period.	IN_FAULT_DURATION_HR_SUM	["percent", ["variation", ["/" , "IN_FAULT_DURATION_HR_SUM", "consPeriodSize"], ["/" , "IN_FAULT_DURATION_HR_SUM_1", "refPeriodSize"]]]
Average In Fault Duration (AIFD)	The average time in minutes between the clearance (or the termination if no clear) and the original event time for all the AOs collected during the time period.	IN_FAULT_DURATION_MIN_AVG	["percent", ["variation", ["/" , "IN_FAULT_DURATION_MIN_AVG", "consPeriodSize"], ["/" , "IN_FAULT_DURATION_MIN_AVG_1", "refPeriodSize"]]]

2.1.1.3 Screenshot

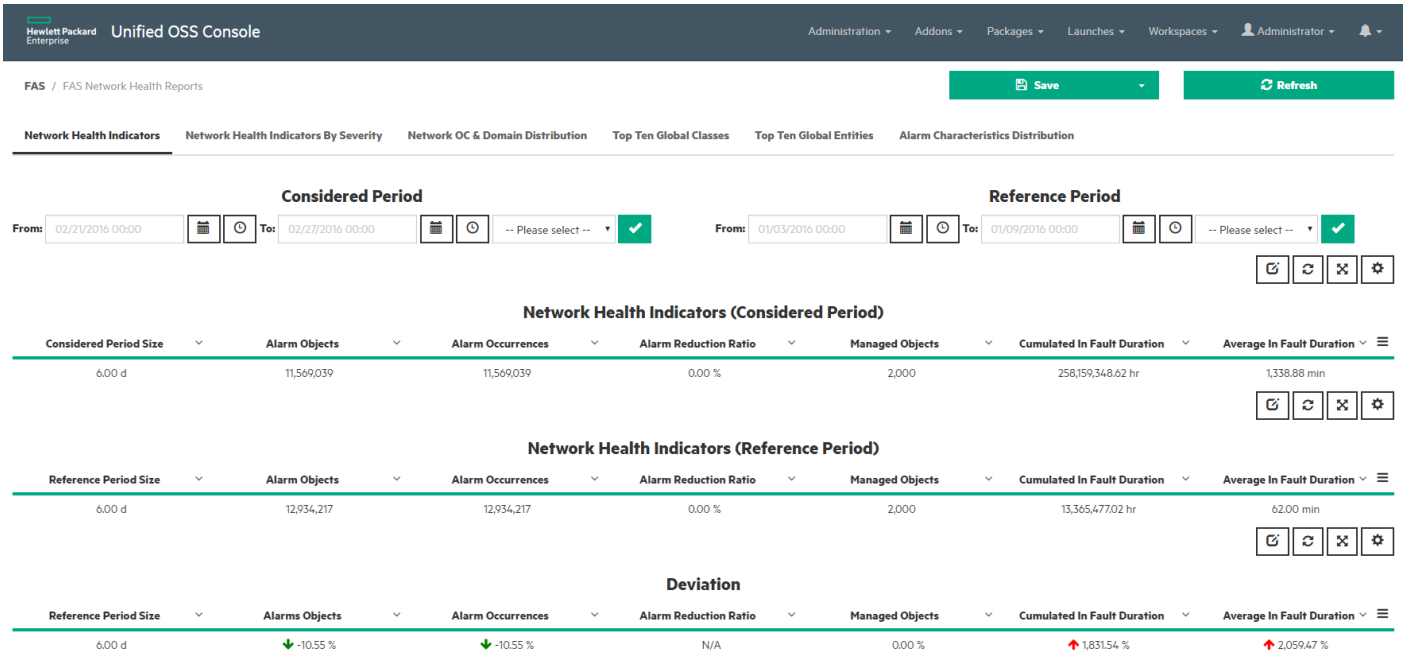


Figure 1: Network Health Indicators report

In the above screenshot, we have chosen to compare a week from 21st February 2016 to 27th February 2016 (the considered time period) with a week of January, from 3rd January 2016 to Friday 9th January 2015 (the reference time period).

The considered time period is composed of 6 days, and the reference time period is a 6 days period also.

As stressed by the tables, the number of faulty equipments (a.k.a MOs) is the same for both weeks (2000) and the number of alarms (a.k.a AOs) collected in the considered time period is 10.55% less than the reference period. This fact is highlighted with green arrow icons associated to the calculated variation percentages in the Deviation table.

There are no similar alarms in this configuration as the Alarm Reduction Ratio is equal to zero percent.

The average time for the collected alarms to be cleared or terminated (Cumulated In Fault Duration) is higher of 2059 %, meaning that their related failures have been solved with much longer time. This fact is highlighted with the red arrow icon.

2.1.2 Network health indicators by severity

2.1.2.1 Description

This report lists the same metrics (a.k.a indicators) as the Network Health Indicator report described above but segregated by Perceived Severity to provide a more complete analysis of the health of the Network.

Please refer to the previous chapter (Network Health Indicators) for a complete description of the report.

2.1.2.2 Metrics

Table 3: Network health indicators by severity table

Indicators	Description	Metadata identifiers used in the considered period and reference tables	Formulas defined in the Deviation table
Severity	AO Severity when AO is originally received (Critical, Major, Minor, Warning or Indeterminate)	SEVERITYNAME (Dimension)	SEVERITYNAME (Dimension)
Alarm Objects (AO)	Number of AOs collected during the time period segregated by perceived severity	ALARM_OBJECTS_COUNTER_SUM	["percent", ["variation", ["/" , "ALARM_OBJECTS_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_OBJECTS_COUNTER_SUM_1", "refPeriodSize"]]]
Alarm Occurrences (AO + SA)	Number of AOs and similar alarms collected during the time period segregated by perceived severity	ALARM_COUNTER_SUM	["percent", ["variation", ["/" , "ALARM_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_COUNTER_SUM_1", "refPeriodSize"]]]
Alarm Reduction Ratio (SA / AO)	Ratio of SAs vs AOs during the time period segregated by perceived severity	["percent" , ["/" , "SIMILAR_ALARM_COUNTER_SUM" , "ALARM_OBJECTS_COUNTER_SUM"]]	["variation", ["/" , "SIMILAR_ALARM_COUNTER_SUM" , "ALARM_OBJECTS_COUNTER_SUM"], ["/" , "SIMILAR_ALARM_COUNTER_SUM_1" , "ALARM_OBJECTS_COUNTER_SUM_1"]]
Managed Objects (MO)	Number of equipments that have emitted alarms during the time period segregated by perceived severity	MO_COUNT	["percent", ["/", ["-", "MO_COUNT", "MO_COUNT_1"], "MO_COUNT_1"]]
Cumulated In Fault Duration (CIFD)	The absolute time in hours between the clearance (or the termination if no clear) and the original event time for all the AOs collected during the time period segregated by perceived severity	IN_FAULT_DURATION_HR_SUM	["percent", ["variation", ["/" , "IN_FAULT_DURATION_HR_SUM", "consPeriodSize"], ["/" , "IN_FAULT_DURATION_HR_SUM_1", "refPeriodSize"]]]
Average In Fault Duration (AIFD)	The average time in minutes between the clearance (or the termination if no clear) and the original event time for all the AOs collected during the time period segregated by perceived severity	IN_FAULT_DURATION_MIN_AVG	["percent", ["variation", ["/" , "IN_FAULT_DURATION_MIN_AVG", "consPeriodSize"], ["/" , "IN_FAULT_DURATION_MIN_AVG_1", "refPeriodSize"]]]

2.1.2.3 Screenshot

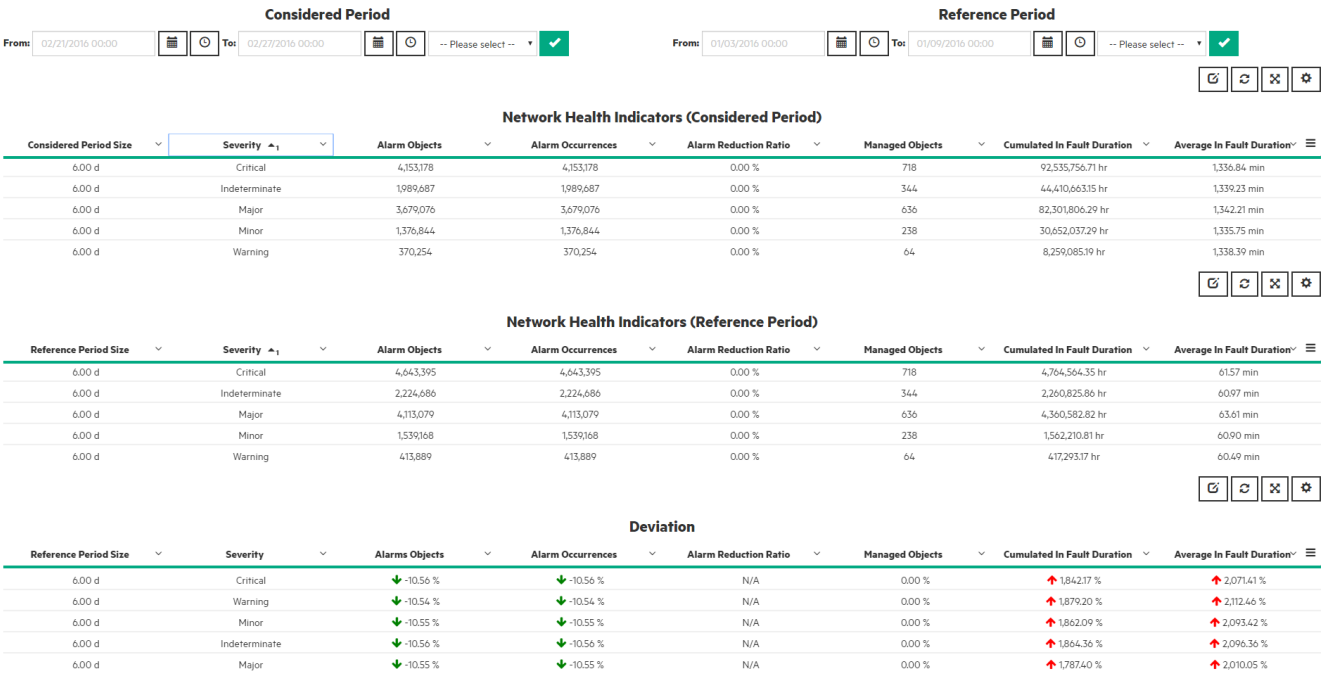


Figure 2: Network Health Indicators by severity report

In the above screenshot, we have chosen to compare a week from 21st February 2016 to 27th February 2016 (the considered time period) with a week of January, from 3rd January 2016 to Friday 9th January 2015 (the reference time period).

The considered time period is composed of 6 days and the reference time period is also a 6 days period.

The computed metrics are the same than the Network Health Indicator report but they are now segregated by perceived severity.

As stressed by the tables, the number of faulty equipments (a.k.a MOs) is the same for both weeks whatever the severity but the number of alarms (a.k.a AOs) collected in the considered time period is 10% less than the reference period. This fact is highlighted with green arrow icons associated to the calculated variation percentages in the Deviation table.

There are no similar alarms in this configuration as the Alarm Reduction Ratio is equal to zero percent.

The average time for the collected alarms to be cleared or terminated is higher of 2000% whatever the alarms severity meaning that their related failures has been solved in much longer time.

2.1.3 Network Operation Context and Domain Distribution

2.1.3.1 Description

This report highlights for each OC and for each Domain:

- The number of Alarm Objects (AOs) collected during a time period
- The cumulated number of hours (CIFD) where the AOs were/are considered as not fixed (meaning neither terminated nor cleared)
- And the variation (a.k.a Deviation) in percentage of the two above quoted metrics compare to the selected reference time period.

This content helps to better understand the trends by profiles of collection (e.g. by type of equipment, by technology, etc. depending on the meaning given to the OCs and the Domains) and therefore to better plan future network activities.

2.1.3.2 Operation context Distribution metrics

Table 4: Network OC Distribution indicators table

Indicators	Description	Metadata identifiers used in the considered period and reference tables
Operation Context (OC)	Name of the OC	OPERATIONCONTEXTNAME (Dimension)
Alarm Objects (AO)	Number of AOs collected during the time period segregated by OC	ALARM_OBJECTS_COUNTER_SUM
AOs Deviation (%)	Variation in % of AOs between the reference and the considered time periods segregated by OC	["percent", ["variation", ["/" , "ALARM_OBJECTS_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_OBJECTS_COUNTER_SUM_1", "refPeriodSize"]]]
Cumulated In Fault Duration (CFID)	The absolute time in hours between the clearance (or the termination if no clear) and the original event time for all the AOs collected during the considered time period segregated by OC	IN_FAULT_DURATION_HR_SUM
CFID Deviation (CFID)	Variation in % of CIFD between the reference and the considered time periods segregated by OC	["percent", ["variation", ["/" , " IN_FAULT_DURATION_HR_SUM ", "consPeriodSize"], ["/" , " IN_FAULT_DURATION_HR_SUM _1", "refPeriodSize"]]]

2.1.3.3 Domain Distribution metrics

Table 5: Network Domain Distribution indicators table

Indicators	Description	Metadata identifiers used in the considered period and reference tables
Domain	Name of the Domain	DOMAINNAME (Dimension)
Alarm Objects (AO)	Number of AOs collected during the time period segregated by Domain	ALARM_OBJECTS_COUNTER_SUM
AOs Deviation (%)	Variation in % of AOs between the reference and the considered time periods segregated by Domain	["percent", ["variation", ["/" , "ALARM_OBJECTS_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_OBJECTS_COUNTER_SUM_1", "refPeriodSize"]]]
Cumulated In Fault Duration (CFID)	The absolute time in hours between the clearance (or the termination if no clear) and the original event time for all the AOs collected during the considered time period segregated by Domain	IN_FAULT_DURATION_HR_SUM
CFID Deviation (CFID)	Variation in % of CIFD between the reference and the considered time periods segregated by Domain	["percent", ["variation", ["/" , " IN_FAULT_DURATION_HR_SUM ", "consPeriodSize"], ["/" , " IN_FAULT_DURATION_HR_SUM _1", "refPeriodSize"]]]

2.1.3.4 Screenshot

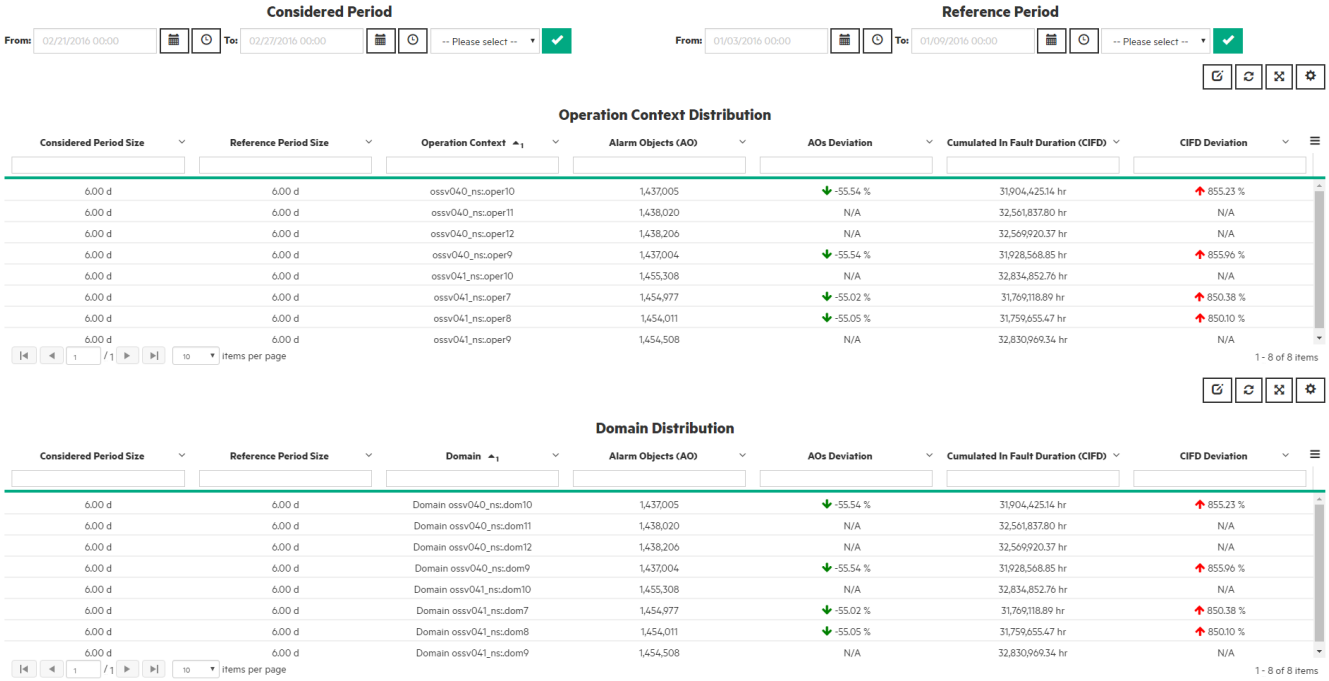


Figure 3: Operation Context and Domain distribution report

In the above screenshot, we have chosen to compare a week from 21st February 2016 to 27th February 2016 (the considered time period) with a week of January, from 3rd January 2016 to Friday 9th January 2015 (the reference time period).

The considered time period is composed of 6 days and the reference time period is also a 6 days period.

Unlike the previous tables, in this one, both the considered period data and the reference period data are handled in the same line of the table.
The first table deals with **operation context distribution**, and the second table deals with **domain distribution**.

Some of the *AOs Deviation* are not available for some OCs and Domains. This means that there were no alarm objects on the reference period for those OCs and Domains.

When values are available within the tables, they highlight in this example that the number of alarms (a.k.a AOs) collected in the considered time period is lower than the reference period, 55% less whatever the OCs or Domains we considered. This is highlighted with green arrow icons associated to the calculated variation percentages of the deviation indicators. But, the *Cumulated In Fault Duration* are worse (red arrows) meaning that much longer time was taken for repairing the fault.

2.1.4 Top N Global Classes

2.1.4.1 Description

This report highlights:

- The Top N Managed Object Global Classes for all the alarms collected during the considered time period. Default value for N is equal to 10

- The Top N Managed Object Global Classes in term of cumulated in fault duration period (cumulated absolute time differences between the clearance or the termination alarms timestamps and their original event timestamps) for the alarms collected during the considered time period.
  Default value for N is equal to 10

Note that all the alarm objects related to a type of network equipment (a.k.a Managed Object (MO) Global Class) are taken into consideration.

2.1.4.2 Top N Global Classes metrics

Table 6: Top N Global Classes Indicators table

Indicators	Description	Metadata identifiers used in the charts
Global Classes (OC)	Name of the Managed Object Global Class	GLOBALCLASSNAME (Dimension)
Number of Alarms (AO)	Number of AOs collected during the time period segregated by Managed Object Global Class	ALARM_OBJECTS_COUNTER_SUM
Cumulated In Fault Duration (CIFD)	The absolute time in **days** between the clearance (or the termination if no clear) and the original event time for all the AOs collected during the time period segregated by Managed Object Global Class	IN_FAULT_DURATION_DAY_SUM

2.1.4.3 Screenshot

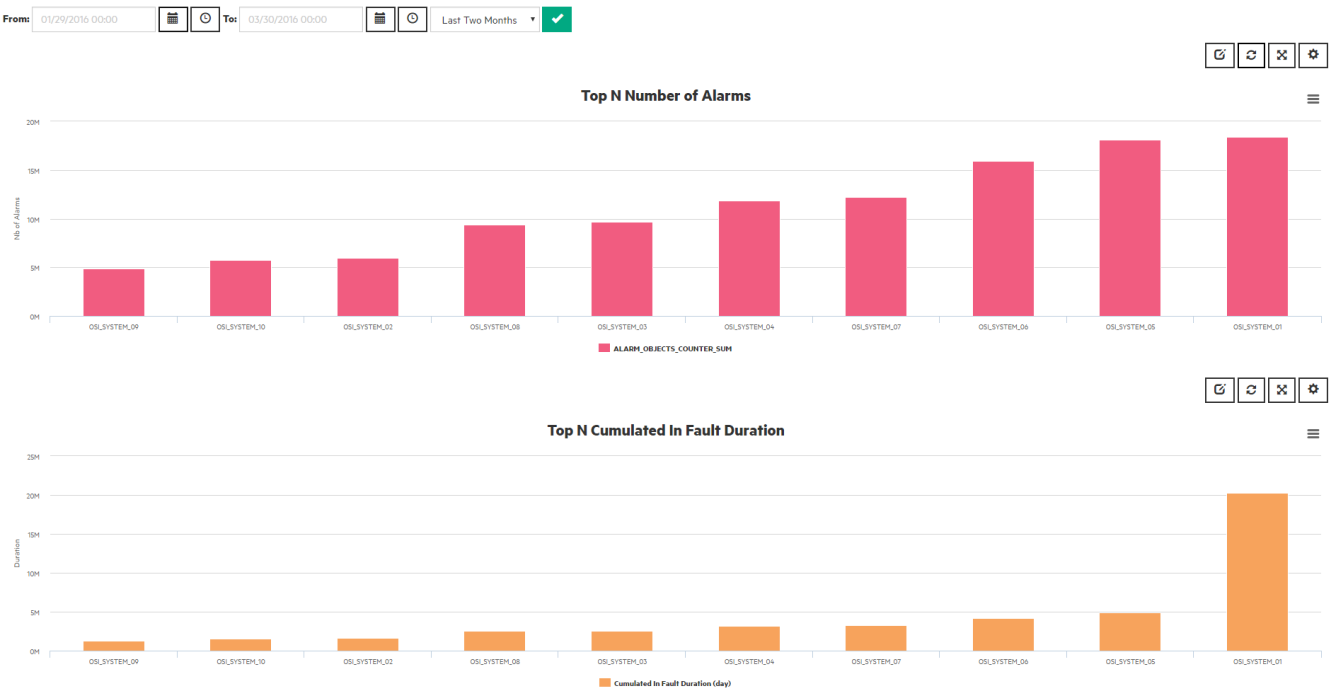


Figure 4: Top N Global Classes report

By highlighting the Network Equipment types (a.k.a Managed Object Global Classes) that are the most in fault, both in terms of number of alarms and fault duration, this report allows you to determine the type of equipments that are the likeliest candidates to attention and maintenance.

Note that you can easily choose the Top 'N' value from the Analysis tool.

For details on the usage of the Top Filter please refer to the Unified OSS Console User Guide at section: *Widgets Management / Analysis tools / Top Filter* section.

2.1.5 Top N Global Entities

2.1.5.1 Description

This report highlights:

- The Top N Managed Object Global Entities (a.k.a instances) for all alarms collected during the considered time period.
  Default value for N is equal to 10
- The Top N Managed Object Global Entities (a.k.a instances) in term of cumulated in fault duration (cumulated absolute time differences between the clearance or the termination alarms timestamps and their original event timestamps) for all the alarms (a.k.a AOs) collected during the considered time period.
  Default value for N is equal to 10

Note that all the alarm objects related to a network equipment (a.k.a Managed Object Global Entity) are taken into consideration.

2.1.5.2 Top N Global Entities metrics

Table 7: Top N Global Entities Indicators table

Indicators	Description	Metadata identifiers used in the charts
Global Entities (OC)	Name of the Managed Object Global Entity	GLOBALMONAME (Dimension)
Number of Alarms (AO)	Number of AOs collected during the time period segregated by Managed Object Global Entity	ALARM_OBJECTS_COUNTER_SUM
Cumulated In Fault Duration (CIFD)	The absolute time in **hours** between the clearance (or the termination if no clear) and the original event time for all the AOs collected during the time period segregated by Managed Object Global Entity	IN_FAULT_DURATION_HR_SUM

2.1.5.3 Screenshot

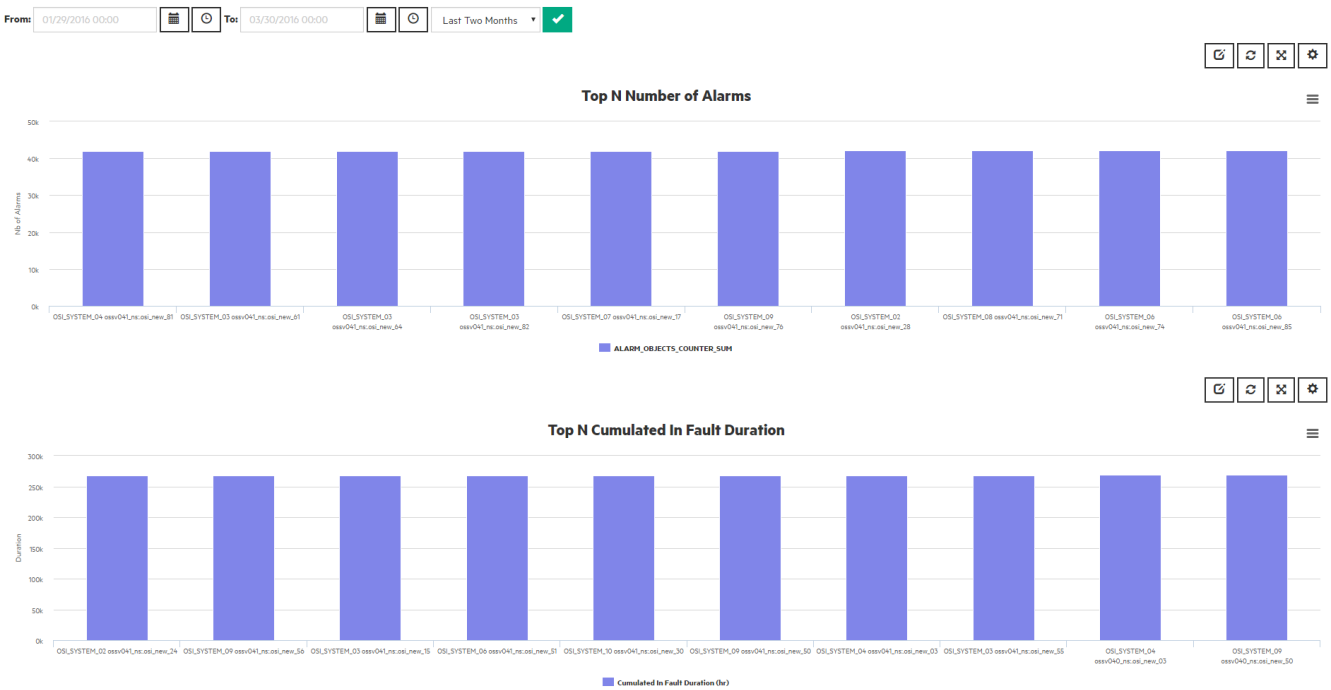


Figure 5: Top N Global Entities report

By highlighting the Network Elements (a.k.a Managed Object Global Entities) that are the most in fault, both in terms of number of alarms and fault duration, this report allows you to determine the set of resources that are the likeliest candidates to maintenance and preventive root cause analysis.

2.1.6 Alarm Characteristics Distribution Report

2.1.6.1 Description

This report highlights:

- The alarm **severity** distribution in percentage for all the alarms collected during the considered time period
- The alarm **type** distribution in percentage for all the alarms collected during the considered time period
- The **Top N Probable Causes** for all the alarms collected during the considered time period.
  Default value for N is equal to 10

Note that all the alarms (a.k.a AOs) are taken into consideration.

2.1.6.2 Alarm Severity Distribution metrics

Table 8: Alarm Severity Distribution Indicators table

Indicators	Description	Metadata identifiers used in the chart
Alarm Severity	Name of the Alarm Severity and its related distribution percentage (ratio between the number of alarms with such a severity and the total number of alarms)	SEVERITYNAME (Dimension)
Number of Alarms	Number of AOs collected during the time period segregated by Alarm Severity	ALARM_OBJECTS_COUNTER_SUM

2.1.6.3 Alarm Type Distribution metrics

Table 9: Alarm Type Distribution Indicators table

Indicators	Description	Metadata identifiers used in the chart
Alarm Type	Name of the Alarm Severity and its related distribution percentage (ratio between the number of alarms with such alarm type and the total number of alarms)	ALARMTYPENAME (Dimension)
Number of Alarms	Number of AOs collected during the time period segregated by Alarm Type	ALARM_OBJECTS_COUNTER_SUM

2.1.6.4 Top N Probable Causes metrics

Table 10: Top N Probable Causes Indicators table

Indicators	Description	Metadata identifiers used in the chart
Probable Cause	Name of the Probable Cause	PROBABLECAUSENAME (Dimension)
Number of Alarms	Number of AOs collected during the time period segregated by Probable Cause	ALARM_OBJECTS_COUNTER_SUM

2.1.6.5 Screenshot

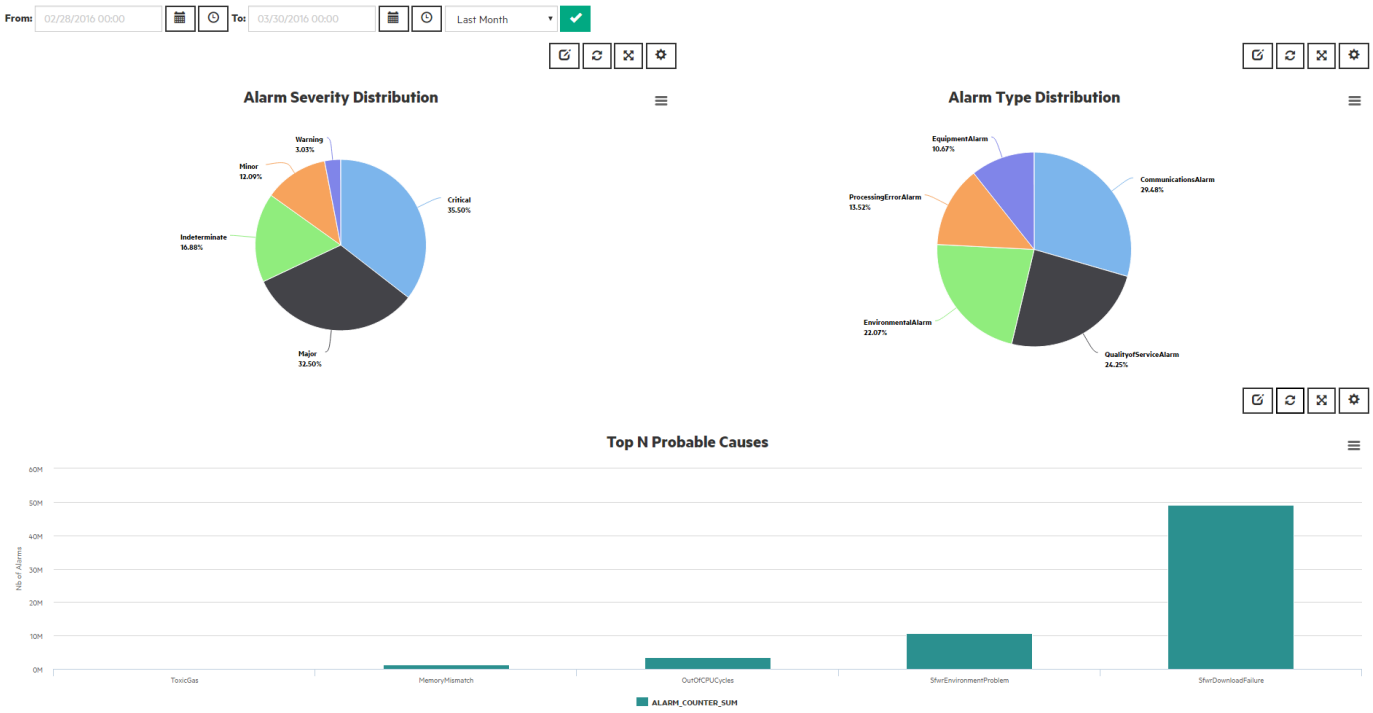


Figure 6: Alarm characteristics distribution report

This report highlights at-a-glance the overall network state. In the above example, you can quickly notice you received a majority of Critical and Major alarms mainly split into 3 types: CommunicationsAlarm (29%), QoSAlarm (24%) and EnvironmentalAlarm (22%). Looking at the top N probable causes help then to relate the type of problems to the type of alarms and therefore support the Network planning team.

2.2 Network Management health reports

The Network Management Health reports give you visibility into how do the Operations manage the Network faults overtime.

2.2.1 Network Management health indicators

2.2.1.1 Description

This report lists some metrics (a.k.a indicators) that help to analyze the overall network management activity.
Each indicator is calculated and displayed in a dedicated table for both a considered and a reference time periods.
The time periods are easily configurable from time selectors to compare any period of time together.
The variation (in %) between the periods is automatically calculated and displayed as well in a dedicated table.
Comparing time periods helps to better understand the trend and therefore to better plan any network activity.

2.2.1.2 Metrics

Table 11: Network Management health indicators table

Indicators	Description	Metadata identifiers used in the considered period and reference tables	Formulas defined in the Deviation table
Alarm Objects (AO)	Number of alarms (a.k.a AOs) collected during the time period	ALARM_OBJECTS_COUNTER_SUM	["percent", ["variation", ["/" , "ALARM_OBJECTS_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_OBJECTS_COUNTER_SUM_1", "refPeriodSize"]]]
Average Acknowledge Duration (minutes)	How long in average did it take to acknowledge alarms during the time period	["/" , "ACK_DURATION_AVG" , 60000]	["percent",["/" , ["-" , "ACK_DURATION_AVG", "ACK_DURATION_AVG_1"], "ACK_DURATION_AVG_1"]]
Average Handle Duration (minutes)	How long in average did it take to handle created alarms during the time period	["/" , "HANDLE_DURATION_AVG" , 60000]	["percent",["/" , ["-" , "HANDLE_DURATION_AVG", "HANDLE_DURATION_AVG_1"], "HANDLE_DURATION_AVG_1"]]
Average Close Duration (minutes)	How long in average did it take to close handled alarms during the time period	["/" , "CLOSE_DURATION_AVG" , 60000]	["percent",["/" , ["-" , "CLOSE_DURATION_AVG", "CLOSE_DURATION_AVG_1"], "CLOSE_DURATION_AVG_1"]]
Average Termination Duration (minutes)	How long in average did it take to terminate created alarms during the time period	["/" , "TERM_DURATION_AVG" , 60000]	["percent",["/" , ["-" , "TERM_DURATION_AVG", "TERM_DURATION_AVG_1"], "TERM_DURATION_AVG_1"]]
Average In Management Duration (minutes)	How long in average did it take to clear (or close) created alarms	IN_MANAGEMENT_DURATION_MIN_AVG	["percent",["/" , ["-" , "IN_MANAGEMENT_DURATION_MIN_AVG", "IN_MANAGEMENT_DURATION_MIN_AVG_1"], "IN_MANAGEMENT_DURATION_MIN_AVG_1"]]
Number of escalated alarms	How many alarms have been escalated during the time period	ESCALATED_COUNTER_SUM	["percent", ["variation", ["/", "ESCALATED_COUNTER_SUM" , "consPeriodSize"], ["/", "ESCALATED_COUNTER_SUM_1" , "refPeriodSize"]]]

2.2.1.3 Screenshot

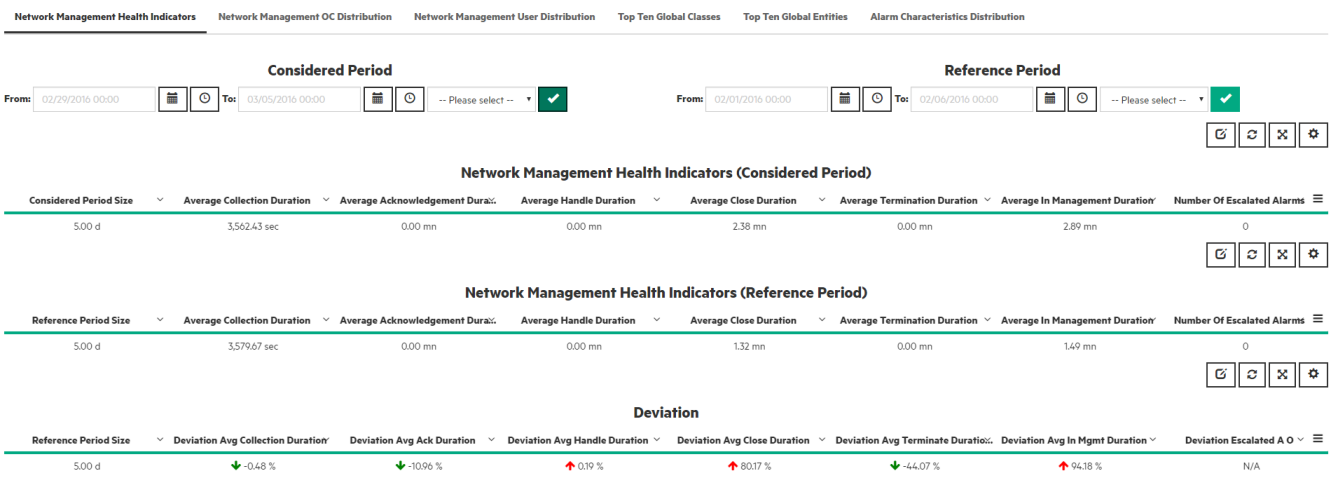


Figure 7: Network Management Health Indicators report

The report highlights durations increases **from a management perspective** between first week of February and first week of March.

Indeed, the mean time to close the alarms (*Average Close Duration*) has increased from 1.32 mn to 2.38 mn (which gives a deviation of 80%) stressing that in average it took longer to solve the network failures (i.e. terminate the alarms) once acknowledged.

2.2.1 Network Management Operation Context distribution

2.2.1.1 Description

This report highlights for all Operation Contexts:

- The proportion of managed AOs compare to the total AOs segregated by management action for a considered time period
- And a set of counters that reflects the average duration of each alarm management action and their variation in percentage from the reference period.

2.2.1.2 Operation context counters distribution metrics

Table 12: Network Management OC Counters Distribution indicators table

Indicators	Description	Metadata identifiers used in the considered period and reference tables
Operation Context (AO)	Name of the OC	OPERATIONCONTEXTNAME (Dimension)
Alarm Objects (AO)	Number of alarms collected during the considered time period segregated by OC	ALARM_OBJECTS_COUNTER_SUM
AOs Deviation (%)	Variation in % of AOs between the reference and the considered time periods segregated by OC	["percent", ["variation", ["/" , "ALARM_OBJECTS_COUNTER_SUM", "consPeriodSize"], ["/" ,

		"ALARM_OBJECTS_COUNTER_SUM_1", "refPeriodSize"]]]
Acknowledged	Proportion of acknowledged AOs compare to the total number of AOs for the considered time period	["percent", ["/", "ACK_COUNTER_SUM", "ALARM_OBJECTS_COUNTER_SUM"]]
Handled	Proportion of handled AOs compare to the total number of AOs for the considered time period	["percent", ["/", "HANDLED_COUNTER_SUM", "ALARM_OBJECTS_COUNTER_SUM"]]
Closed	Proportion of closed AOs compare to the total number of AOs for the considered time period	["percent", ["/", "CLOSED_COUNTER_SUM", "ALARM_OBJECTS_COUNTER_SUM"]]
Terminated	Proportion of terminated AOs compare to the total number of AOs for the considered time period	["percent", ["/", "TERMINATED_FLAG_SUM", "ALARM_OBJECTS_COUNTER_SUM"]]

2.2.1.3 Operation context average duration distribution metrics

Table 13: Network Management OC Average Duration Distribution indicators table

Indicators	Description	Metadata identifiers used in the considered period and reference tables
Operation Context (AO)	Name of the OC	OPERATIONCONTEXTNAME (Dimension)
Alarm Objects (AO)	Number of alarms (a.k.a AOs) collected during the considered time period segregated by OC	ALARM_OBJECTS_COUNTER_SUM
Average Acknowledge Duration (minutes)	How long in average did it take to acknowledge alarms during the time period segregated by OC	["/" , "ACK_DURATION_AVG" , 60000]
Acknowledged Average Duration Deviation (%)	Variation in % of Average Acknowledge Duration between the reference and the considered time periods segregated by OC	["percent", ["variation", ["/" , "["/" , "ACK_DURATION_AVG" , 60000]", "consPeriodSize"], ["/" , "["/" , "ACK_DURATION_AVG_1" , 60000]", "refPeriodSize"]]]
Average Handle Duration (minutes)	How long in average did it take to handle created alarms during the time period segregated by OC	["/" , "HANDLE_DURATION_AVG" , 60000]
Handled Average Duration Deviation (%)	Variation in % of of Average Handle Duration between the reference and the considered time periods segregated by OC	["percent", ["variation", ["/" , "["/" , "HANDLE_DURATION_AVG" , 60000]", "consPeriodSize"], ["/" , "["/" , "HANDLE_DURATION_AVG_1" , 60000]", "refPeriodSize"]]]
Average Close Duration (minutes)	How long in average did it take to close handled alarms during the time period	["/" , "CLOSE_DURATION_AVG" , 60000]
Closed Average Duration Deviation (%)	Variation in % of of Average Close Duration between the reference and the considered time periods segregated by OC	["percent", ["variation", ["/" , "["/" , "CLOSE_DURATION_AVG" , 60000]", "consPeriodSize"], ["/" , "["/" , "CLOSE_DURATION_AVG_1" , 60000]", "refPeriodSize"]]]
Average Termination Duration (minutes)	How long in average did it take to terminate created alarms during the time period	["/" , "TERM_DURATION_AVG" , 60000]
Terminated Average Duration Deviation (%)	Variation in % of of Average Terminate Duration between the reference and the considered time periods segregated by OC	["percent", ["variation", ["/" , "["/" , "TERM_DURATION_AVG" , 60000]", "consPeriodSize"], ["/" , "["/" , "TERM_DURATION_AVG_1" , 60000]", "refPeriodSize"]]]

2.2.1.4 Screenshot

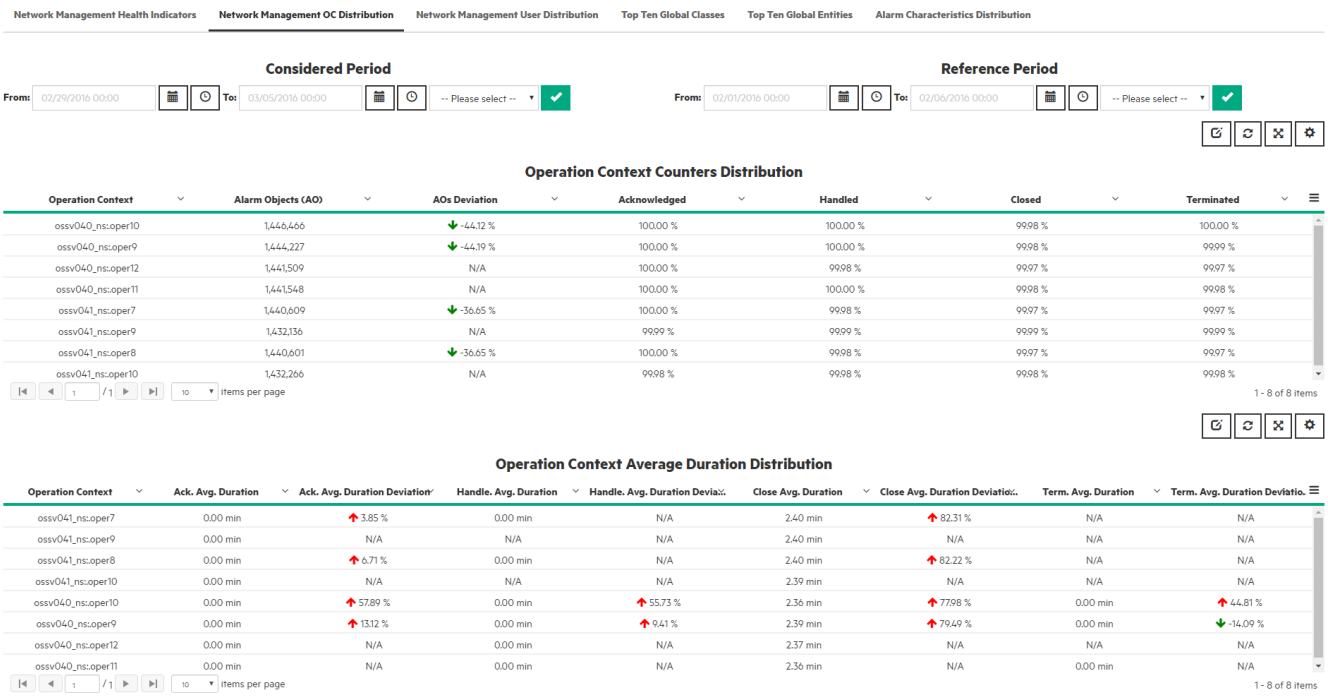


Figure 8: Network Management Operation Context distribution report

2.2.2 Network Management User distribution

2.2.2.1 Description

This report highlights important statistics on the alarm management actions that have been taken by the Operations' users. The aim of the analysis of this report is to **enhance the management processes** overtime.

There are four tables displayed, each of them is related to specific type of alarm management action: **Acknowledge** an alarm, **Terminate** an alarm, **Handle** an alarm, **Close** an alarm.

For each type of management action, some indicators per user are displayed for the considered time period and the variation in percentage from the reference time period.

This allows to easily understand the trend of management actions on alarms.

2.2.2.2 'Acknowledge' users counters distribution metrics

Table 14: Network Management 'Acknowledge' User Distribution indicators table

Indicators	Description	Metadata identifiers used in the considered period and reference tables
User Name	Name of the user who acknowledged the alarms	ackusername (Dimension)
Alarm Objects Acknowledged (AOs)	Number of AOs acknowledged by the user during the considered time period	ALARM_OBJECTS_COUNTER_SUM
Proportion of Acknowledged alarms (% Ack.)	Among those alarms, the percentage of acknowledged alarms	["percent", ["/", "ACK_BY_COUNT", "ALARM_OBJECTS_COUNTER_SUM"]]

Proportion of Handled alarms (% Handled)	Among those alarms, the percentage of handled alarms	["percent", ["/", "HANDLED_BY_COUNT", "ALARM_OBJECTS_COUNTER_SUM"]]
AOs Deviation (%)	Variation in % of AOs between the reference and the considered time periods for the user acknowledging alarms	["percent", ["variation", ["/" , "ALARM_OBJECTS_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_OBJECTS_COUNTER_SUM_1", "refPeriodSize"]]]
Average Acknowledge Duration (in mn) (Avg. Ack)	How long in average did it take to acknowledge created alarms during the time period for those alarms	["/", "ACK_DURATION_AVG", 60000]
Acknowledged Average Duration Deviation (Variation Avg. Ack. %)	Variation in % of of Average Acknowledge Duration between the reference and the considered time periods for those alarms	["percent", ["variation", ["/" , "AckAvgDurationMin", "consPeriodSize"], ["/" , "AckAvgDurationMinRefPeriod", "refPeriodSize"]]]
Average Termination Duration (Avg. Term. in mn)	How long in average did it take to terminate created alarms during the time period for those alarms	["/" , "TERM_DURATION_AVG" , 60000]
Terminated Average Duration Deviation (Variation Avg. Term. %)	Variation in % of of Average Terminate Duration between the reference and the considered time periods for those alarms	["percent", ["variation", ["/" , "["/" , "TERM_DURATION_AVG" , 60000]", "consPeriodSize"], ["/" , "["/" , "TERM_DURATION_AVG_1" , 60000]", "refPeriodSize"]]]

2.2.2.3 'Terminate' Users counters distribution metrics

Table 15: Network Management 'Terminate' User Distribution indicators table

Indicators	Description	Metadata identifiers used in the considered period and reference tables
User Name	Name of the user who terminated the alarms	termusername (Dimension)
Alarm Objects Terminated (AOs)	Number of AOs terminated by the user during the considered time period	ALARM_OBJECTS_COUNTER_SUM
Proportion of Acknowledged alarms (% Ack.)	Among those alarms, the percentage of acknowledged alarms	["percent", ["/", "ACK_BY_COUNT", "ALARM_OBJECTS_COUNTER_SUM"]]
Proportion of Handled alarms (% Handled)	Among those alarms, the percentage of handled alarms	["percent", ["/", "HANDLED_BY_COUNT", "ALARM_OBJECTS_COUNTER_SUM"]]
AOs Deviation (%)	Variation in % of AOs between the reference and the considered time periods for the user terminating alarms	["percent", ["variation", ["/" , "ALARM_OBJECTS_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_OBJECTS_COUNTER_SUM_1", "refPeriodSize"]]]
Average Acknowledge Duration (in mn) (Avg. Ack)	How long in average did it take to acknowledge created alarms during the time period for those alarms	["/", "ACK_DURATION_AVG", 60000]

Acknowledged Average Duration Deviation (Variation Avg. Ack. %)	Variation in % of of Average Acknowledge Duration between the reference and the considered time periods for those alarms	["percent", ["variation", ["/" , "AckAvgDurationMin", "consPeriodSize"], ["/" , "AckAvgDurationMinRefPeriod", "refPeriodSize"]]]
Average Termination Duration (Avg. Term. in mn)	How long in average did it take to terminate created alarms during the time period for those alarms	["/" , "TERM_DURATION_AVG" , 60000]
Terminated Average Duration Deviation (Variation Avg. Term. %)	Variation in % of Average Terminate Duration between the reference and the considered time periods for those alarms	["percent", ["variation", ["/" , "["/" , "TERM_DURATION_AVG" , 60000]", "consPeriodSize"], ["/" , "["/" , "TERM_DURATION_AVG_1" , 60000]", "refPeriodSize"]]]

2.2.2.4 'Handle' Users counters distribution metrics

Table 16: Network Management 'Handle' Users Distribution indicators table

Indicators	Description	Metadata identifiers used in the considered period and reference tables
User Name	Name of the user who handled the alarms	handleusername (Dimension)
Alarm Objects Handled (AOs)	Number of AOs handled by the user during the considered time period	ALARM_OBJECTS_COUNTER_SUM
Proportion of Acknowledged alarms (% Ack.)	Among those alarms, the percentage of acknowledged alarms	["percent", ["/", "ACK_BY_COUNT", "ALARM_OBJECTS_COUNTER_SUM"]]
Proportion of Handled alarms (% Handled)	Among those alarms, the percentage of handled alarms	["percent", ["/", "HANDLED_BY_COUNT", "ALARM_OBJECTS_COUNTER_SUM"]]
AOs Deviation (%)	Variation in % of AOs between the reference and the considered time periods for the user terminating alarms	["percent", ["variation", ["/" , "ALARM_OBJECTS_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_OBJECTS_COUNTER_SUM_1", "refPeriodSize"]]]
Average Acknowledge Duration (in mn) (Avg. Ack)	How long in average did it take to acknowledge created alarms during the time period for those alarms	["/", "ACK_DURATION_AVG", 60000]
Acknowledged Average Duration Deviation (Variation Avg. Ack. %)	Variation in % of of Average Acknowledge Duration between the reference and the considered time periods for those alarms	["percent", ["variation", ["/" , "AckAvgDurationMin", "consPeriodSize"], ["/" , "AckAvgDurationMinRefPeriod", "refPeriodSize"]]]
Average Termination Duration (Avg. Term. in mn)	How long in average did it take to terminate created alarms during the time period for those alarms	["/" , "TERM_DURATION_AVG" , 60000]
Terminated Average Duration Deviation	Variation in % of Average Terminate Duration between the reference and the considered time periods for those alarms	["percent", ["variation", ["/" , "["/" , "TERM_DURATION_AVG" , 60000]", "consPeriodSize"], ["/" , "["/" , "TERM_DURATION_AVG_1" , 60000]", "refPeriodSize"]]]

(Variation Avg. Term. %)		

2.2.2.5 'Close' Users counters distribution metrics

Table 17: Network Management 'Close' Users Distribution indicators table

Indicators	Description	Metadata identifiers used in the considered period and reference tables
User Name	Name of the user who closed the alarms	closeusername (Dimension)
Alarm Objects Closed (AOs)	Number of AOs closed by the user during the considered time period	ALARM_OBJECTS_COUNTER_SUM
Proportion of Acknowledged alarms (% Ack.)	Among those alarms, the percentage of acknowledged alarms	["percent", ["/", "ACK_BY_COUNT", "ALARM_OBJECTS_COUNTER_SUM"]]
Proportion of Handled alarms (% Handled)	Among those alarms, the percentage of handled alarms	["percent", ["/", "HANDLED_BY_COUNT", "ALARM_OBJECTS_COUNTER_SUM"]]
AOs Deviation (%)	Variation in % of AOs between the reference and the considered time periods for the user terminating alarms	["percent", ["variation", ["/" , "ALARM_OBJECTS_COUNTER_SUM", "consPeriodSize"], ["/" , "ALARM_OBJECTS_COUNTER_SUM_1", "refPeriodSize"]]]
Average Acknowledge Duration (in mn) (Avg. Ack)	How long in average did it take to acknowledge created alarms during the time period for those alarms	["/", "ACK_DURATION_AVG", 60000]
Acknowledged Average Duration Deviation (Variation Avg. Ack. %)	Variation in % of of Average Acknowledge Duration between the reference and the considered time periods for those alarms	["percent", ["variation", ["/" , "AckAvgDurationMin", "consPeriodSize"], ["/" , "AckAvgDurationMinRefPeriod", "refPeriodSize"]]]
Average Termination Duration (Avg. Term. in mn)	How long in average did it take to terminate created alarms during the time period for those alarms	["/" , "TERM_DURATION_AVG" , 60000]
Terminated Average Duration Deviation (Variation Avg. Term. %)	Variation in % of Average Terminate Duration between the reference and the considered time periods for those alarms	["percent", ["variation", ["/" , "["/" , "TERM_DURATION_AVG" , 60000]", "consPeriodSize"], ["/" , "["/" , "TERM_DURATION_AVG_1" , 60000]", "refPeriodSize"]]]

2.2.2.6 Screenshot

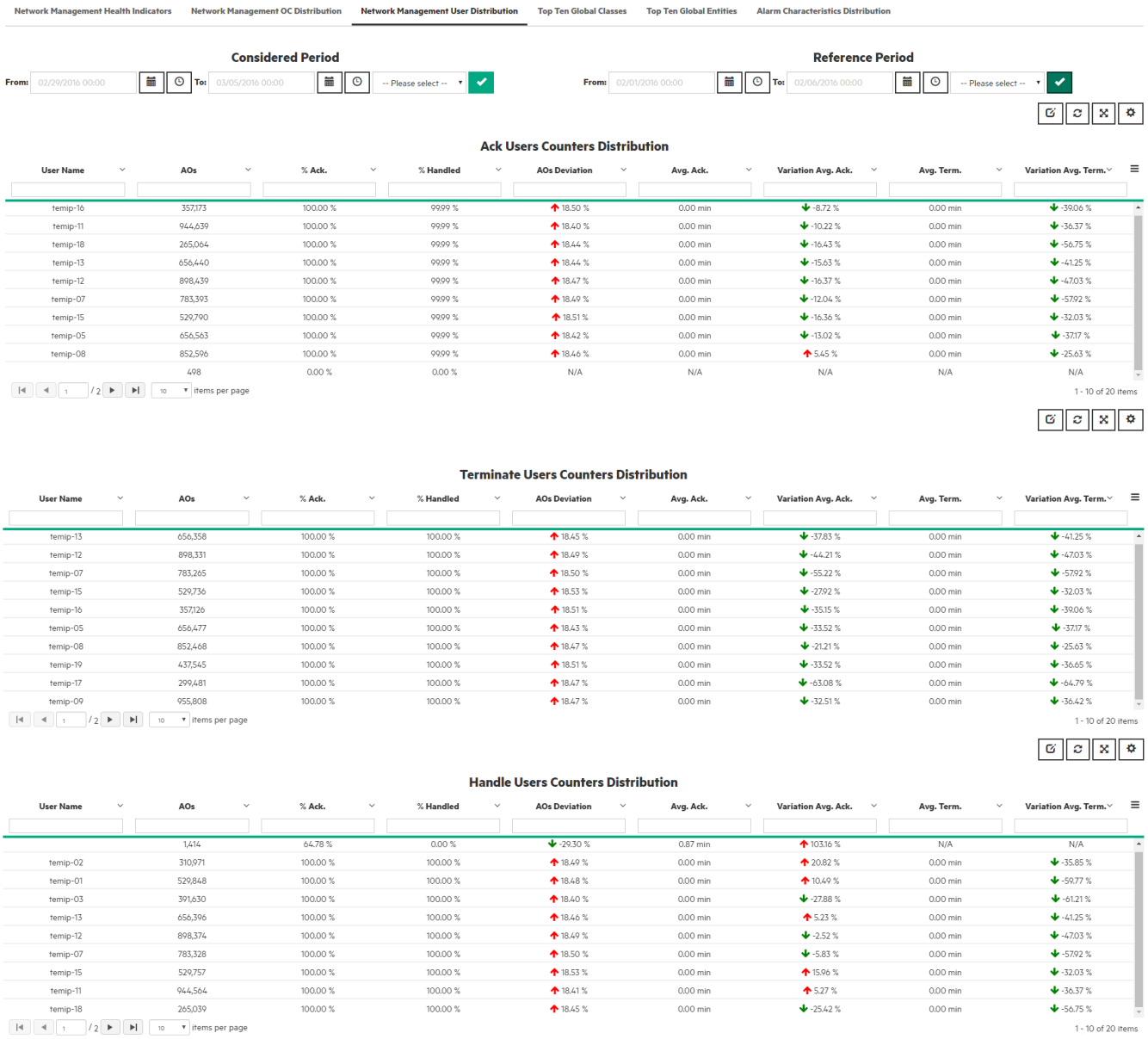


Figure 9: Network Management User Distribution report

2.2.3 Network management Top N Global Classes

2.2.3.1 Description

This report highlights:

- The Top N Managed Object Global Classes in term of cumulated in management duration period (cumulated absolute time difference between the close (or clear) timestamp and the creation timestamp of an alarm) for the alarms collected during the considered time period.
  Default value for N is equal to 10
- The Top N Managed Object Global Classes in term of average in management duration period (average time difference between the close (or clear) timestamp and the creation timestamp of an alarm) for the alarms collected during the considered time period.
  Default value for N is equal to 10

Note that all the alarm objects related to a type of network equipment (a.k.a Managed Object (MO) Global Class) are taken into consideration.

2.2.3.2 Top N Global Classes metrics

Table 18: Network Management Top N Global Classes Indicators table

Indicators	Description	Metadata identifiers used in the charts
Global Classes (OC)	Name of the Managed Object Global Class	GLOBALCLASSNAME (Dimension)
Cumulated in Management Duration	The cumulated absolute time in **days** between the creation and the clear (or close) timestamps for all the AOs collected during the considered time period segregated by Managed Object Global Class	IN_MANAGEMENT_DURATION_DAY_SUM
Average in Management Duration	The mean time in **minutes** between the creation and the clear (or close) timestamps for all the AOs collected during the considered time period segregated by Managed Object (MO) Global Class	IN_MANAGEMENT_DURATION_MIN_AVG

2.2.3.3 Screenshot

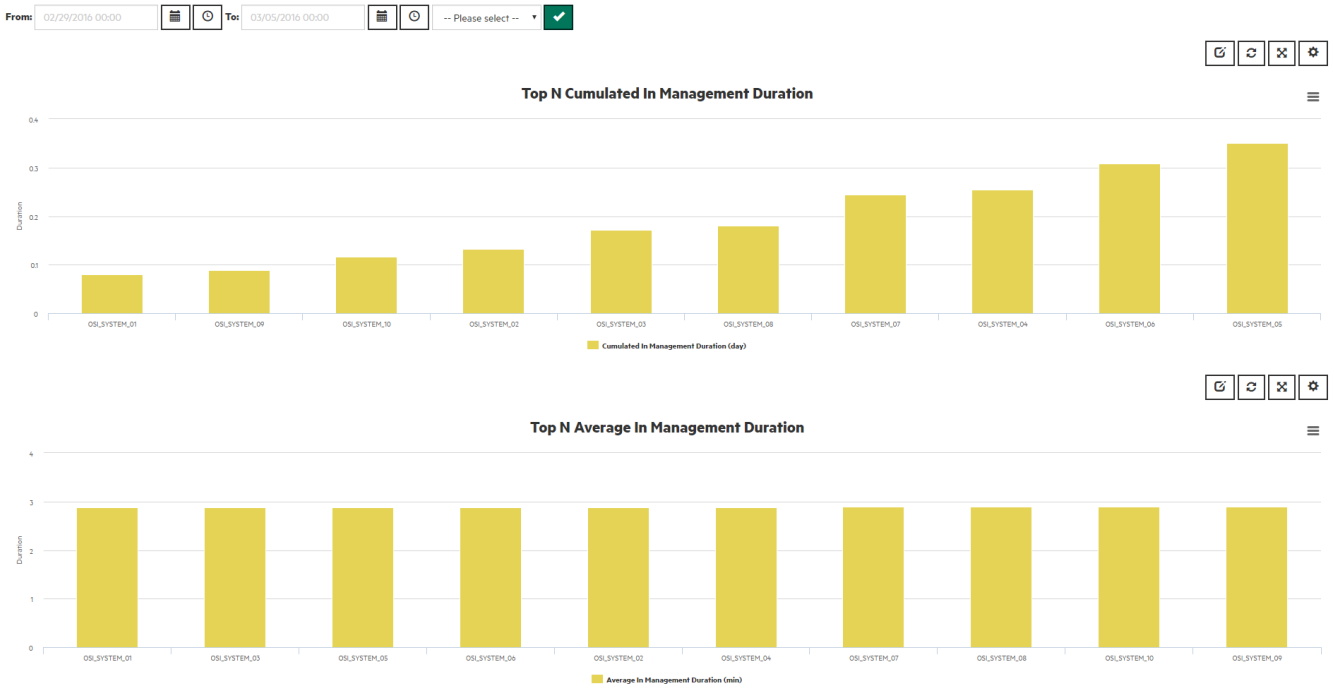


Figure 10: Network Management Top N Global Classes report

This report highlights which Network Equipment types (a.k.a Managed Object Global Classes) are the most demanding in term of alarms management.

2.2.4 Network management Top N Global Entities

2.2.4.1 Description

This report highlights:

- The Top N Managed Object Global Entities (a.k.a instances) in term of cumulated in management duration period (cumulated absolute time difference between the close (or clear) timestamp and the creation timestamp

of an alarm) for the alarms collected during the considered time period.
Default value for N is equal to 10

- The Top N Managed Object Global Entities (a.k.a instances) in term of average in management duration (average time difference between the close (or clear) timestamp and the creation timestamp of an alarm) for all the alarms collected during the considered time period.
  Default value for N is equal to 10

Note that all the alarm objects related to a network equipment (a.k.a Managed Object (MO) Global Entity) are taken into consideration.

2.2.4.2 Top N Global Entities metrics

Table 19: Network Management Top N Global Entities Indicators table

Indicators	Description	Metadata identifiers used in the charts
Global Classes (OC)	Name of the Managed Object Global Entity	GLOBALMONAME (Dimension)
Cumulated in Management Duration	The cumulated absolute time in **hours** between the creation and the clear (or close) timestamps for all the AOs collected during the considered time period segregated by Managed Object Global Entity	IN_MANAGEMENT_DURATION_HR_SUM
Average in Management Duration	The mean time in **minutes** between the creation and the clear (or close) timestamps for all the AOs collected during the considered time period segregated by Managed Object (MO) Global Entity	IN_MANAGEMENT_DURATION_MIN_AVG

2.2.4.3 Screenshot

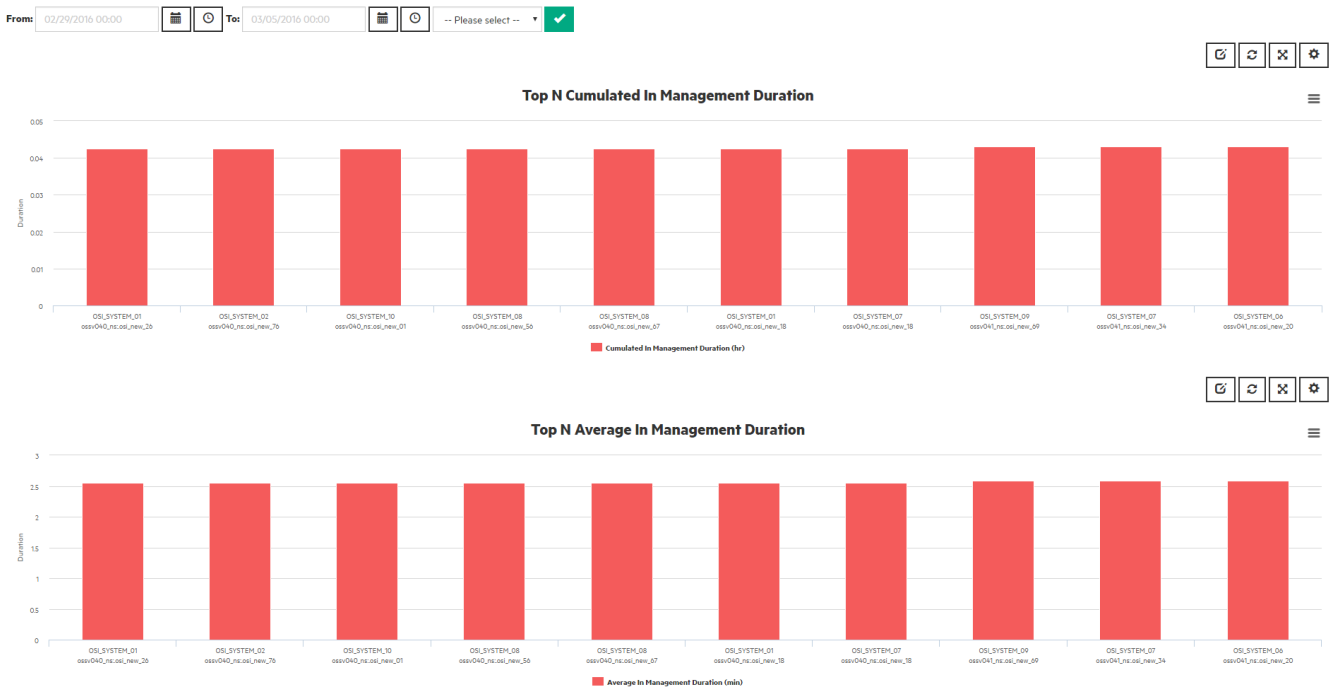


Figure 11: Network Management Top N Global Entities report

This report highlights which Network Elements (a.k.a Managed Object Global Entities) are the most demanding in term of alarms management.

2.2.5 Network management Alarm Characteristics distribution repors

2.2.5.1 Description

This report highlights:

- The alarm state distribution in percentage for all the alarms collected during the considered time period
- The problem status distribution in percentage for all the alarms collected during the considered time period
- The alarms distribution overtime based on the selected granularity (for instance, by day) for the considered time period

Note that all managed alarms (a.k.a AOs) are taken into consideration.

2.2.5.2 Alarm State Distribution metrics

Table 20: Alarm State Distribution Indicators table

Indicators	Description	Metadata identifiers used in the charts
Alarm State	Name of the Alarm State and its related distribution percentage (ratio between the number of managed alarms with such a state and the total number of managed alarms)	STATENAME (Dimension)
Number of Alarms	Number of managed alarms collected during the considered time period segregated by Alarm State	ALARM_COUNTER_SUM

2.2.5.3 Problem Status Distribution metrics

Table 21: Problem Status Distribution Indicators table

Indicators	Description	Metadata identifiers used in the charts
Problem Status	Name of the Problem Status and its related distribution percentage (ratio between the number of managed alarms with such a problem status and the total number of managed alarms)	PROBLEMSTATUSNAME (Dimension)
Number of Alarms	Number of managed alarms collected during the considered time period segregated by Problem Status	ALARM_COUNTER_SUM

2.2.5.4 Alarms Distribution overtime metrics

Table 22: Alarms Distribution overtime Indicators table

Indicators	Description	Metadata identifiers used in the charts
Number of Alarms	Number of alarms collected during the considered time period	ALARM_COUNTER_SUM

2.2.5.5 Screenshot

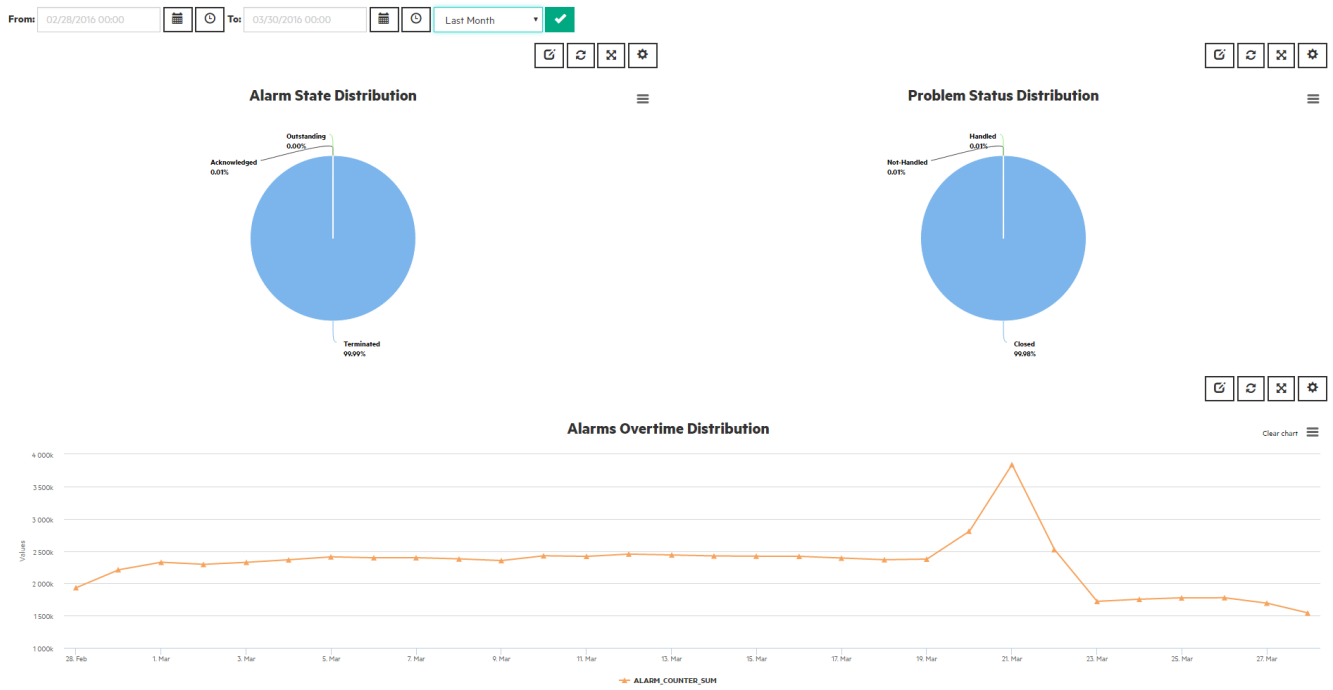


Figure 12: Network Management Top N Global Entities report

This report highlights at-a-glance the overall network state from a management perspective.

2.3 Alarm Health reports

The standard FAS Alarm Health Reports gives you visibility about the evolution of the number of alarms overtime. Two types of graphs are displayed in order to show the information differently: a table and a chart line.

2.3.1 Standard report

2.3.1.1 Description and screenshots

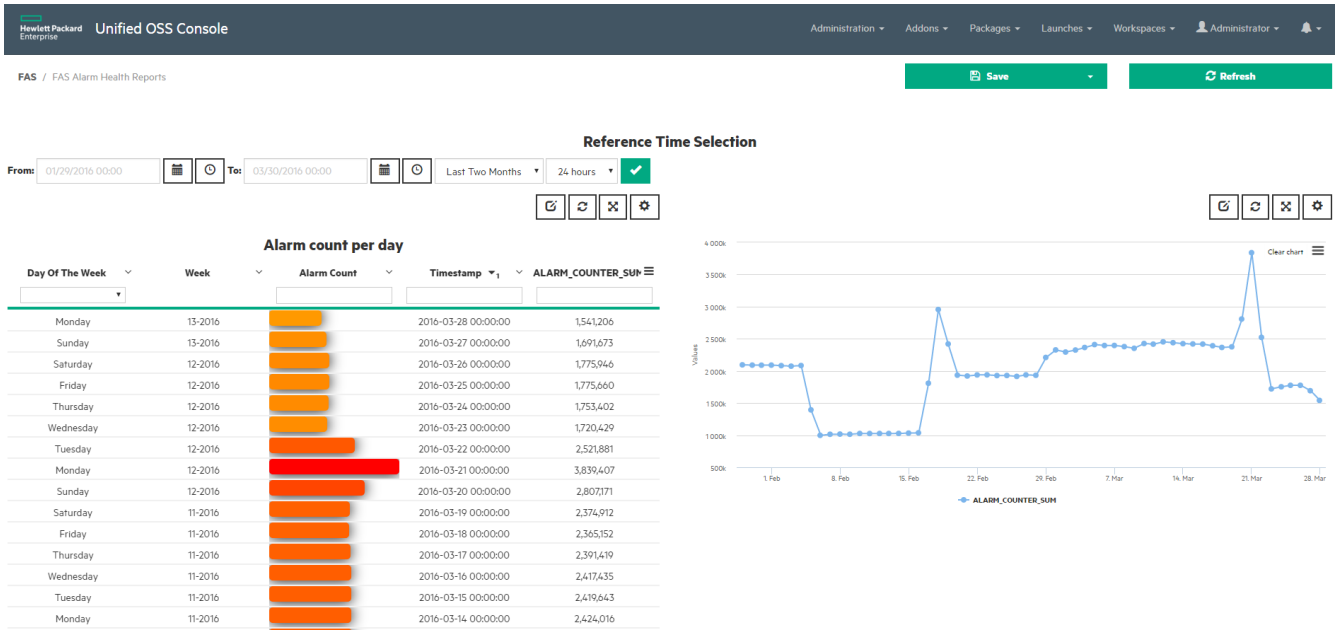


Figure 13: Alarm Health report

The time period is easily configurable from the time selector combobox and affects both the table and the chart line. You can choose to analyze the evolution of alarms from '*Last 2 Months*', '*Last Month*', '*Last two weeks*', '*Last week*', '*Yesterday*' or '*Today*'.

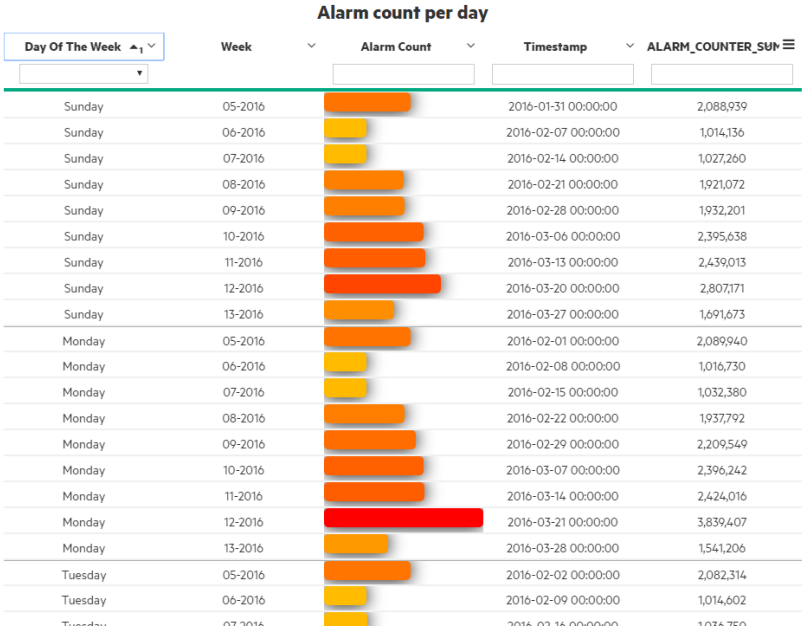
From the combobox which is at the right of the time selector, you can also choose the **granularity** of the information that is displayed within the chart line: 24 hours or 1 hour (default is 24 hours).

In the chart line (at the right), you can clearly see the evolution of the number of alarms during the time period you have chosen (see figure above)

In the table (at the left), each row represents a day with its corresponding total number of alarms as a number (*ALARM_COUNTER_SUM* column) and as a bar (*Alarm Count* column). This allows to clearly see the evolution of the number of alarms during a week for example.

Moreover, the rows can be filtered thanks to the filter fields below the header of the columns.
For example you might want to see what occurred during all the past Fridays: for doing this, you just have to choose '*Friday*' from the *Day Of The Week* combobox.

Furthermore, you can do this kind of 'day-comparison' for all the days of the week by ordering the display of the lines by "*Day Of The Week*". This gives you the following:



Alarm count per day

Day Of The Week	Week	Alarm Count	Timestamp	ALARM_COUNTER_SUM
Sunday	05-2016		2016-01-31 00:00:00	2,088,939
Sunday	06-2016		2016-02-07 00:00:00	1,014,136
Sunday	07-2016		2016-02-14 00:00:00	1,027,260
Sunday	08-2016		2016-02-21 00:00:00	1,921,072
Sunday	09-2016		2016-02-28 00:00:00	1,932,201
Sunday	10-2016		2016-03-06 00:00:00	2,395,638
Sunday	11-2016		2016-03-13 00:00:00	2,439,013
Sunday	12-2016		2016-03-20 00:00:00	2,807,171
Sunday	13-2016		2016-03-27 00:00:00	1,691,673
Monday	05-2016		2016-02-01 00:00:00	2,089,940
Monday	06-2016		2016-02-08 00:00:00	1,016,730
Monday	07-2016		2016-02-15 00:00:00	1,032,380
Monday	08-2016		2016-02-22 00:00:00	1,937,792
Monday	09-2016		2016-02-29 00:00:00	2,209,549
Monday	10-2016		2016-03-07 00:00:00	2,396,242
Monday	11-2016		2016-03-14 00:00:00	2,424,016
Monday	12-2016		2016-03-21 00:00:00	3,839,407
Monday	13-2016		2016-03-28 00:00:00	1,541,206
Tuesday	05-2016		2016-02-02 00:00:00	2,082,314
Tuesday	06-2016		2016-02-09 00:00:00	1,014,602

Figure 14: Alarm Health report: day of the week comparisons

2.3.1.2 Metrics

For both widgets the only Fact Id used is: ALARM_COUNTER_SUM.
All other indicators displayed in the widgets are declared within the json views thanks to formulas relying on this fact and on the time.

2.3.2 Enhanced usage of standard FAS Alarm Health reports / configuration of a report

Here are some examples of possible dynamic configurations of those graphs.

2.3.2.1 Evolution of critical alarm number overtime

In this example, one can configure the table in order to display alarm numbers only for the critical alarms.
As shown below, this can be done by adding the *SeverityName* dimension to the '*Data Selection*', and then apply a '*Dimension Filter*' for the *Critical* severity:

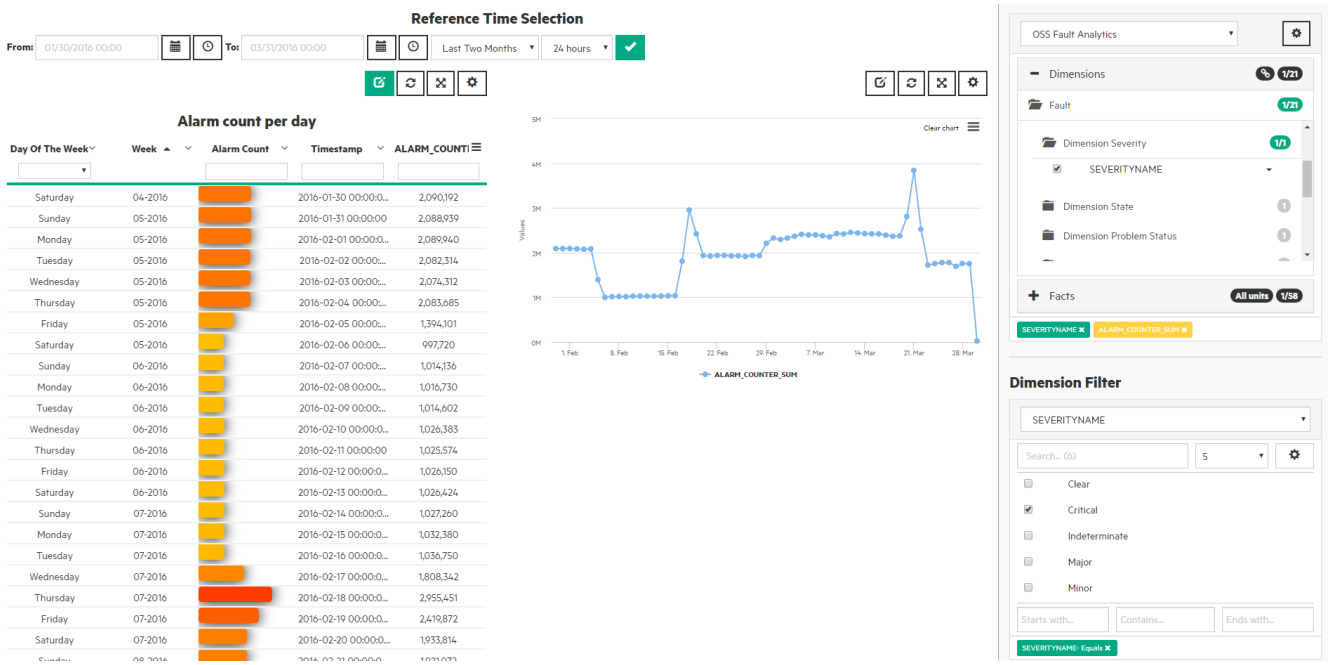


Figure 15: Data selection: add a dimension

Then, refresh the table, and thus, you will get information for the critical alarms only:

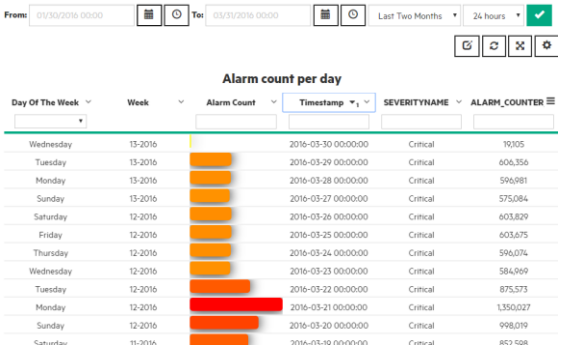


Figure 16: Evolution of critical alarm number overtime

2.3.2.1 Evolution of critical and major alarms compared to the total number of alarms

In this example, as shown below, you can first configure the chart line by adding to the 'Data Selection' new facts: *major_occurrences_sum*, *critical_occurrences_sum* (in addition to the already selected fact *alarm_counter_sum*).

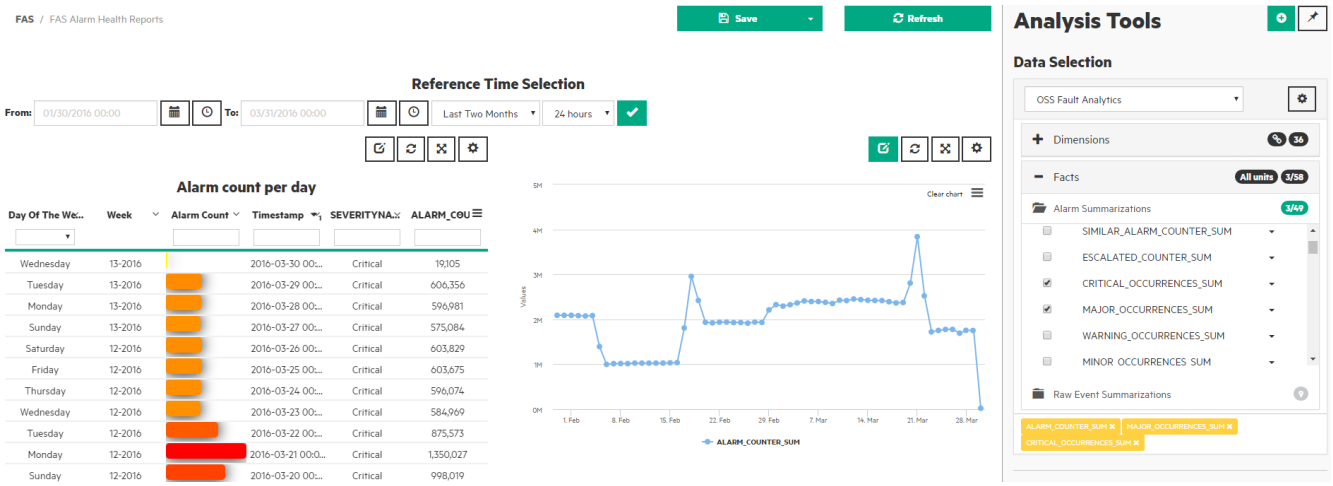


Figure 17: Data selection: add facts

After refreshing the chart, you will get the evolution of the three facts: number of alarms, number of critical alarms and number of major alarms into one single graph, as shown below:

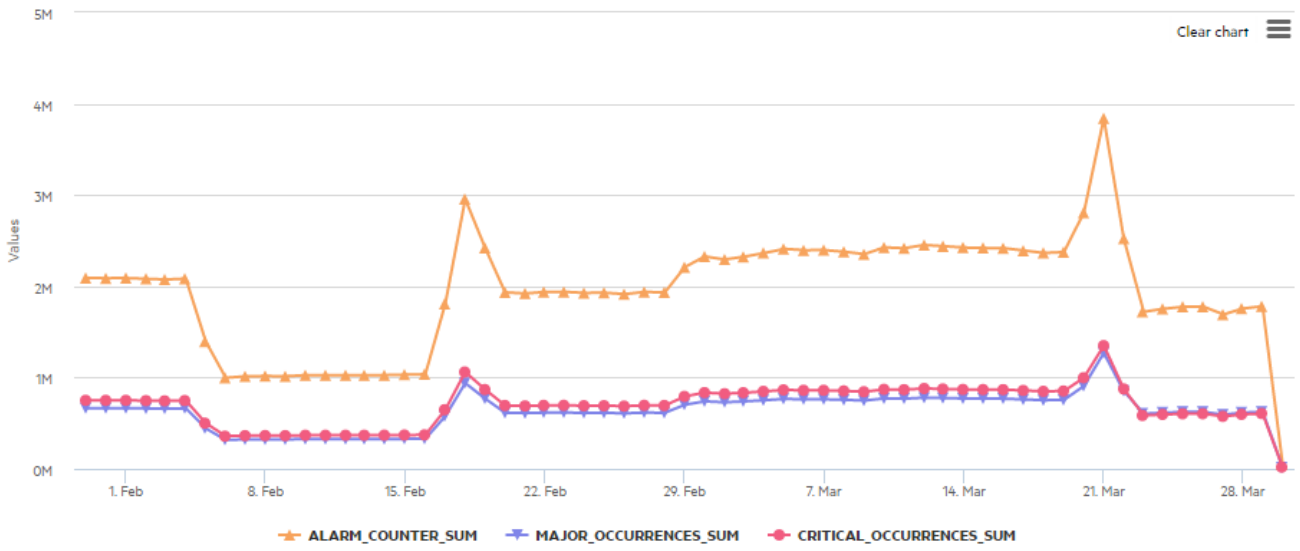


Figure 18: Evolution of critical and major alarms compared to the total number of alarms

This gives the evolution of the number of Major and Critical alarms compared to the total number of alarms during the past days.

In this example, we clearly see that the evolution is nearly the same and that the major and critical alarms are the main ones compared to the total number of alarms.

2.4 Fault Management Capacity Seasonality Reports

The Alarm Seasonality Reports give you visibility about the distribution and alarm flow of the number of alarms over the specific times. Two types of graphs are displayed in order to show the different information: a pie chart for displaying the distribution and a column chart for displaying the alarm flow evolution.

2.4.1 Alarm distribution per weekday / weekend report

The pie charts present the distribution of alarms occurrences (%) for each type of period.

- Period Type: Weekday / Weekend Days
- Real Distribution: The percentage in terms of number of alarm occurrences.
- A Uniform Distribution: As a reference, the proportion distribution, as it would be if the number of alarm occurrences had been the same for week and weekend days.

The column chart presents the daily alarm flow indicating weekday / weekend days.

Figure 19: Alarm distribution per weekday / weekend

2.4.2 Alarm distribution per working /non-working hours report

The pie charts present the distribution of alarms occurrences (%) for each type of period.

- Period Type: Working / Non-Working Hours
- Real Distribution: The percentage in terms of number of alarm occurrences.
- A Uniform Distribution: As a reference, the proportion distribution, as it would be if the number of alarm occurrences had been the same for working and non-working hours.

The column chart presents the daily alarm flow indicating working and non-working hours.

For how to configure working and non-working hours, please refer to the section 5.2.2 of the customization guide.

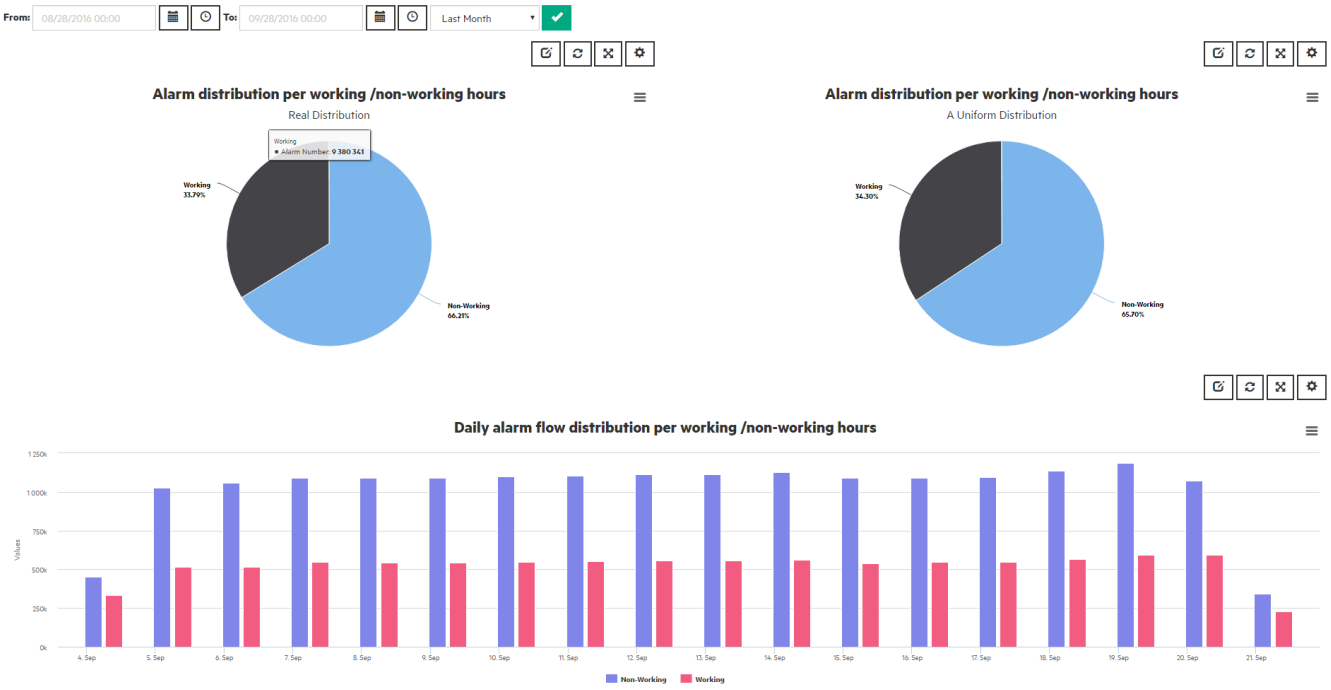


Figure 20: Alarm distribution per working /non-working hours

2.4.3 Alarm distribution per (non) holiday/ (non) event day report

The pie charts present the distribution of alarms occurrences (%) for each type of period.

- Period Type: Holiday / Non-Holiday and Event / Non-Event Days.
- Real Distribution: The percentage in terms of number of alarm occurrences.
- A Uniform Distribution: As a reference, the uniform distribution, as it would be if the number of alarm occurrences had been the same for Holiday / Non-Holiday and Event / Non-Event Days.

The column chart presents the daily alarm flow indicating Holiday / Non-Holiday and Event / Non-Event Days.

For how to configure holidays and event days, please refer to the section 5.2.2 of the customization guide.

Figure 21: Alarm distribution per (non) holiday/ (non) event day

2.4.4 Alarm distribution per operator shift report

The pie charts present the distribution of alarms occurrences (%) for each type of period.

- Period Type: Shift Name
- Real Distribution: The percentage in terms of number of alarm occurrences.
- A Uniform Distribution: As a reference, the uniform distribution, as it would be if the number of alarm occurrences had been the same for each shift.

The column chart presents the daily alarm flow for each shift.

For how to configure shifts, please refer to the section 5.2.2 of the customization guide.

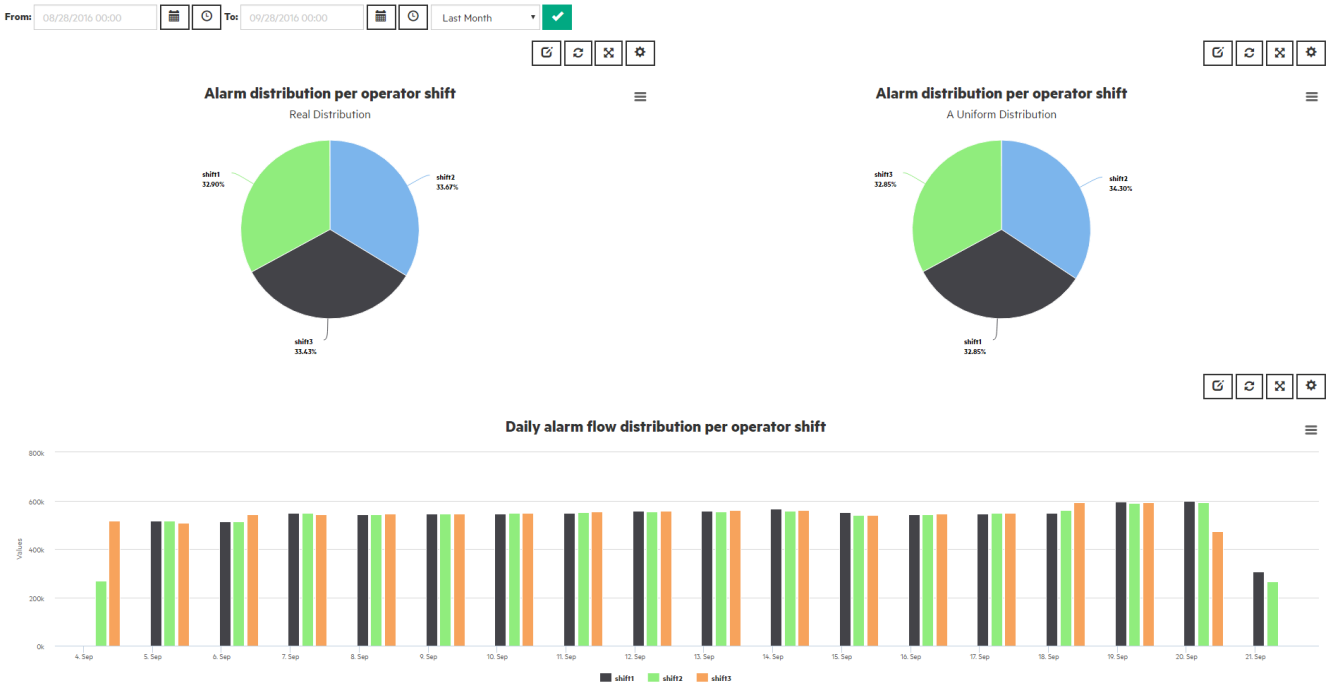


Figure 22: Alarm distribution per operator

2.4.5 Capacity trend (number of operators needed)

The line chart presents an average number of operators needed to process the alarms in each hour of a particular week day or weekend day.

- Number of operators needed: total number of alarms / operator processing rate
- Operator processing rate: the average number of alarms handled per operators, can be set by command, please refer to chapter 5.2.2.5 of customization guide.

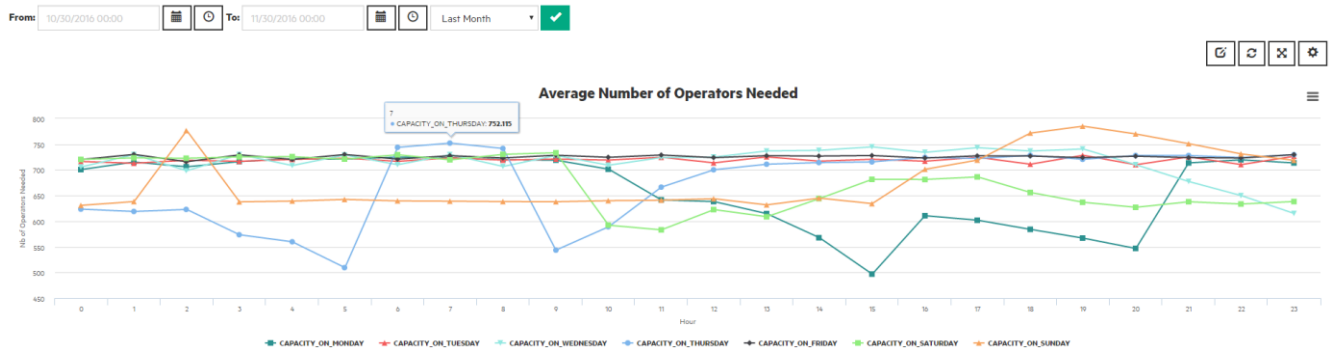


Figure 23: Capacity trend (number of operators needed)

2.4.6 Capacity trend (number of operators needed) for OC

The report shows a trend of an average number of operators needed to process the alarms for a specific OC in each hour of week day or week end day. The table column lists all the OCs to choose. Once an OC was selected, the related capacity trend line chart shows accordingly.

- Number of operators needed: total number of alarms / operator processing rate
- Operator processing rate: the average number of alarms handled per operators, can be set by command, please refer to chapter 5.2.2.5 of customization guide.

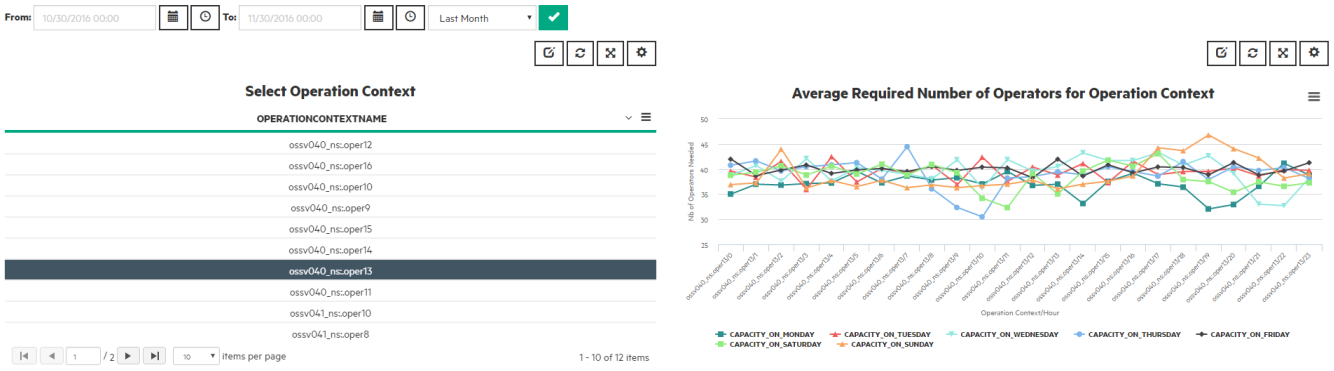


Figure 24: Capacity trend (number of operators needed) for OC

2.5 FAS Alarm Metrics Comparison Reports

This type of reports allows us to compare different metrics over 2 selected periods of time. We provide the reports for Alarm Counters, Acknowledged User Counters and for Selected OC Alarm Counters. Also we provide the comparison of alarm count over selected periods of time for all Users and for all OCs. The reports based on Time granularity. We have alarm metrics comparison over selected periods of time based on hourly, daily, weekly and monthly granularity.

2.5.1 Alarm Count Comparison (by hours, days, weeks and months)

This type of Reports allows get comparison of overall alarm counts over 2 selected periods of time on hourly, daily, weekly and monthly basis

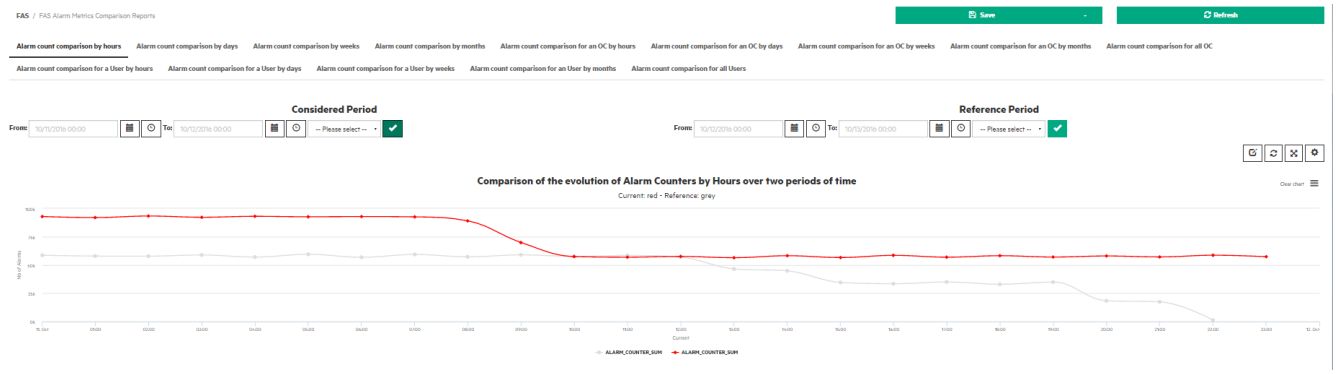


Figure 25: Alarm count comparison by hours

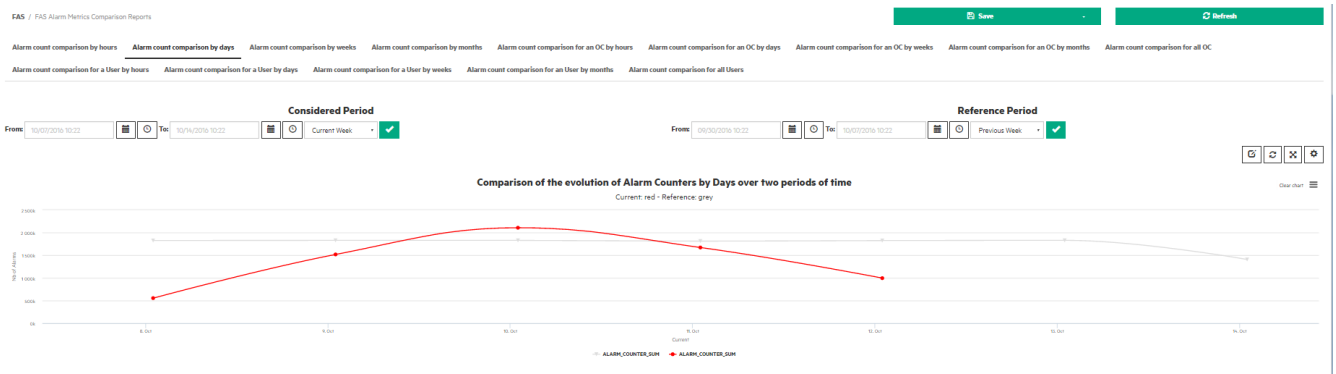


Figure 26: Alarm count comparison by days

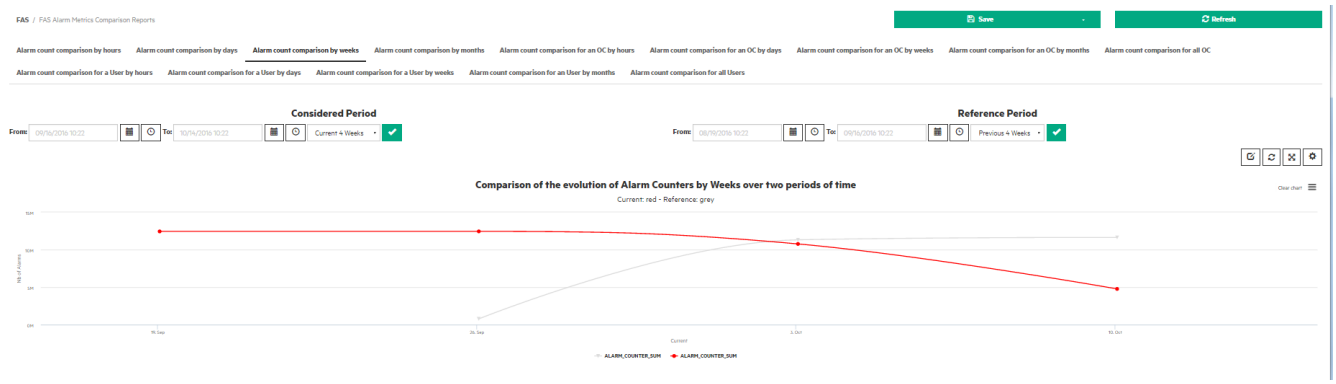


Figure 27: Alarm count comparison by weeks

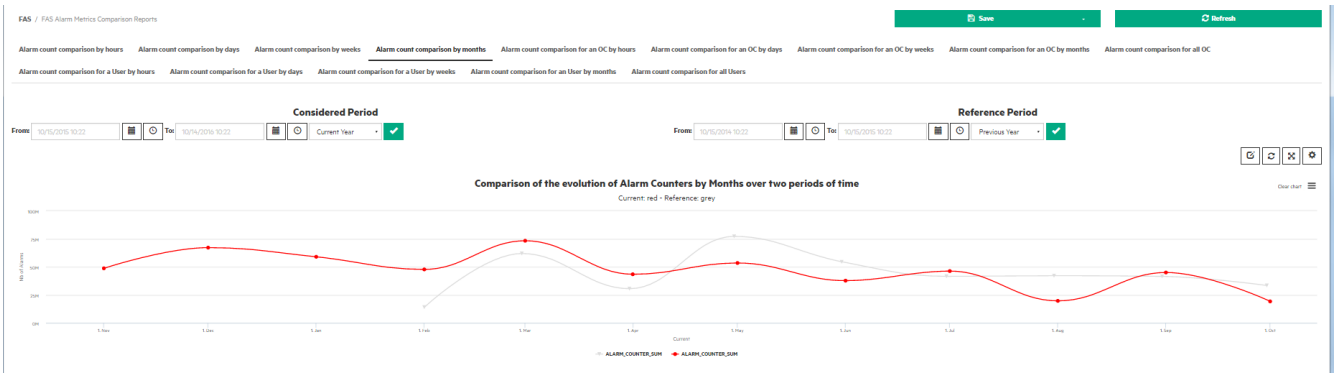


Figure 28: Alarm count comparison by months

2.5.2 Alarm Count Comparison for an OC (by hours, days, weeks and months)

This type of report gives us the Alarm Count Comaprison over two selected periods of type for selected OC on hourly, daily, weekly and monthly basis.

Figure 29: Alarm count comparison for an OC by hours

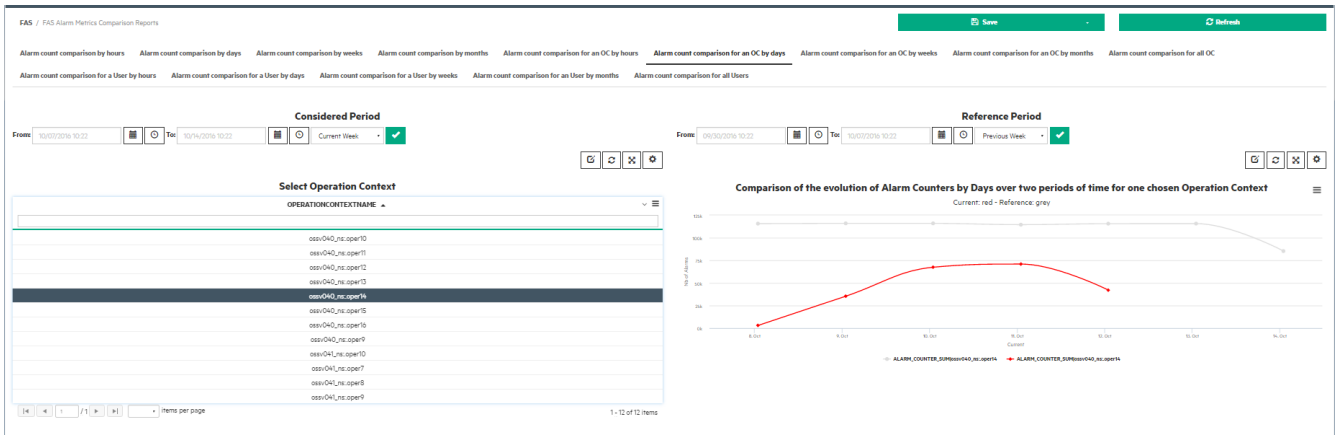


Figure 30: Alarm count comparison for an OC by days

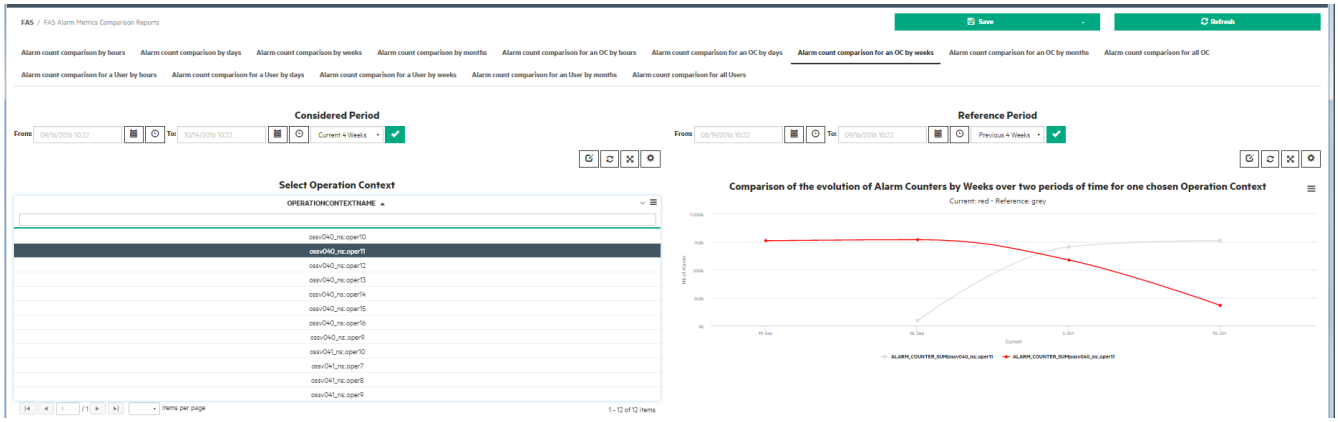


Figure 31: Alarm count comparison for an OC by weeks

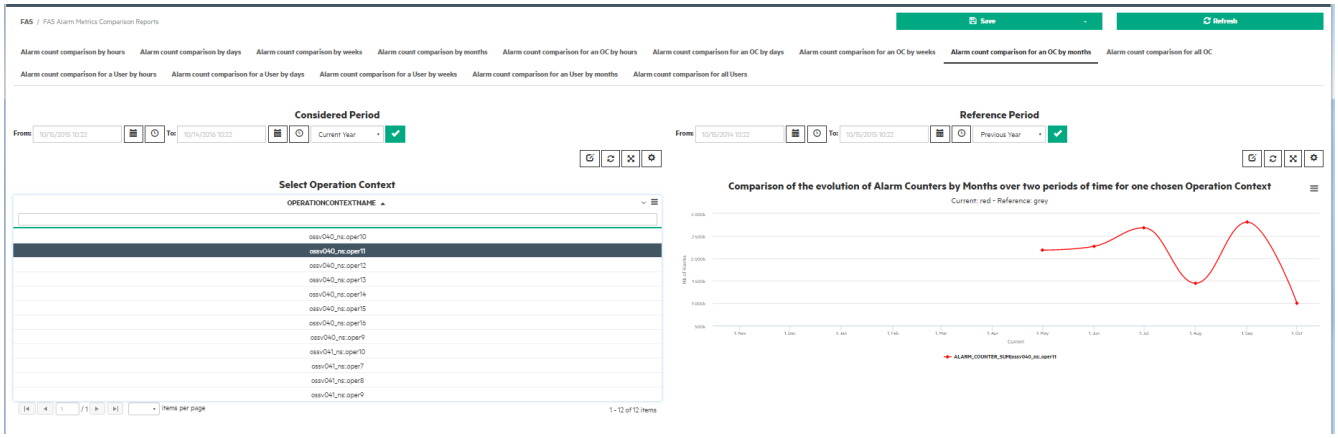


Figure 32: Alarm count comparison for an OC by months

2.5.3 Alarm Count Comparison for a User (by hours, days, weeks and months)

This type of reports allows us to get comparison for a selected User over two periods of time on number of acknowledged alarms.

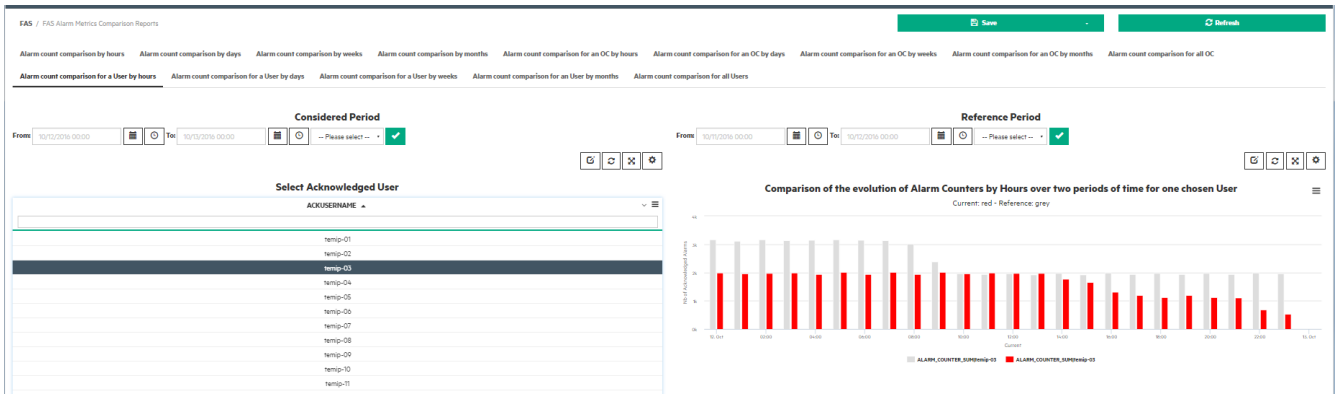


Figure 33: Alarm count comparison for a User by hours

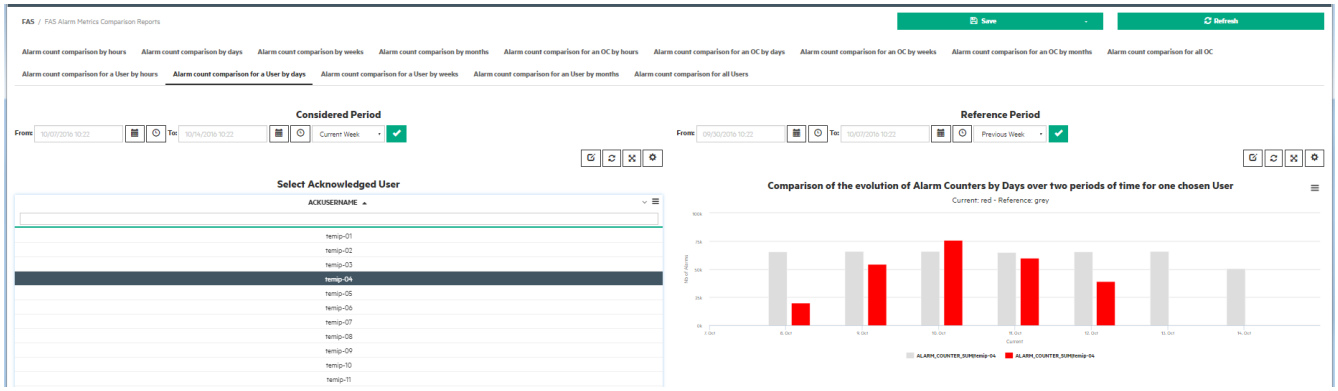


Figure 34: Alarm count comparison for a User by days

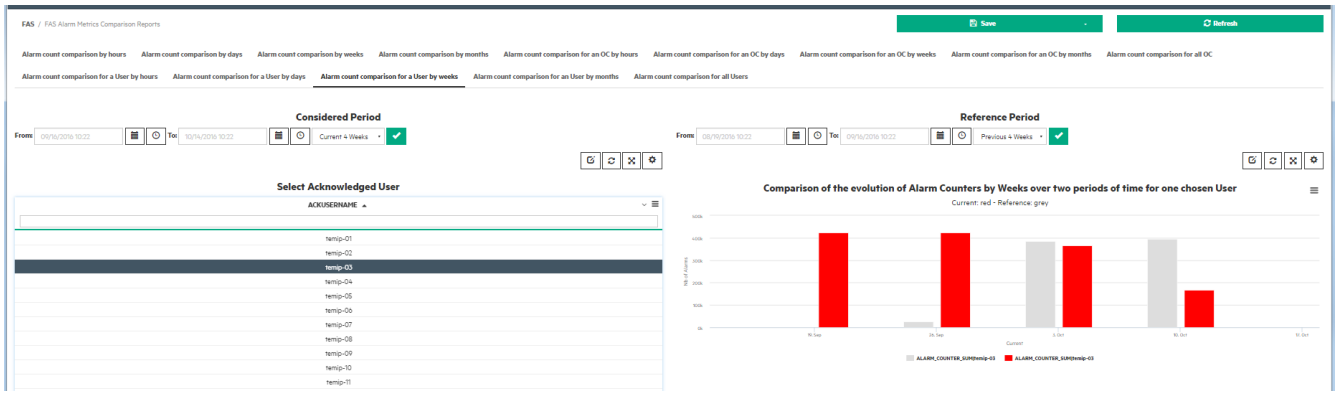


Figure 35: Alarm count comparison for a User by weeks

Figure 36: Alarm count comparison for a User by months

2.5.4 Alarm count comparison for all OCs and all Users

This type of Report allows us to comapre the all OCs on number of alarms and all Users on number of acknowledged alarms over selected period of time on selected granularity.

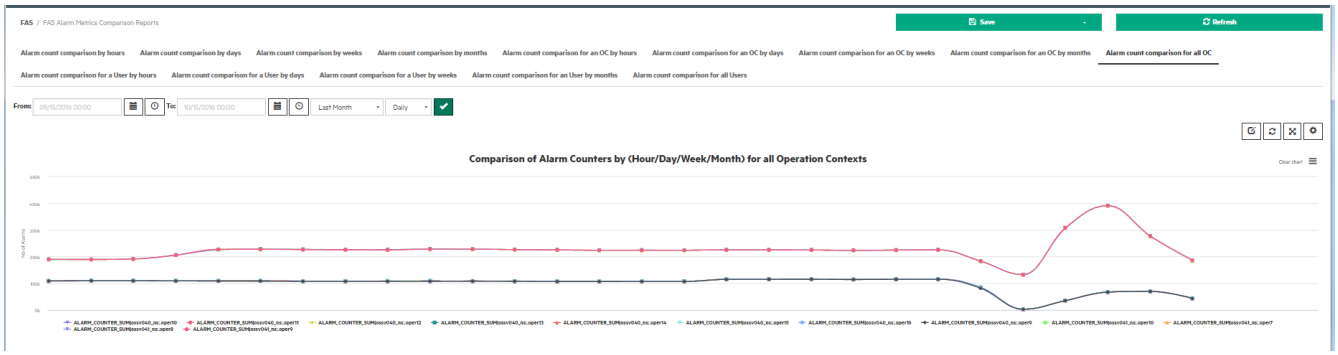


Figure 37: Alarm count comparison for all OCs

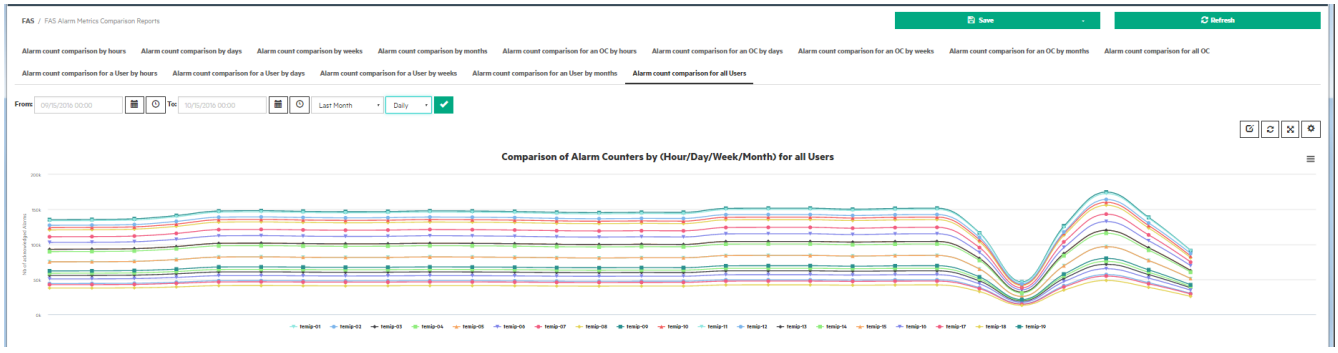
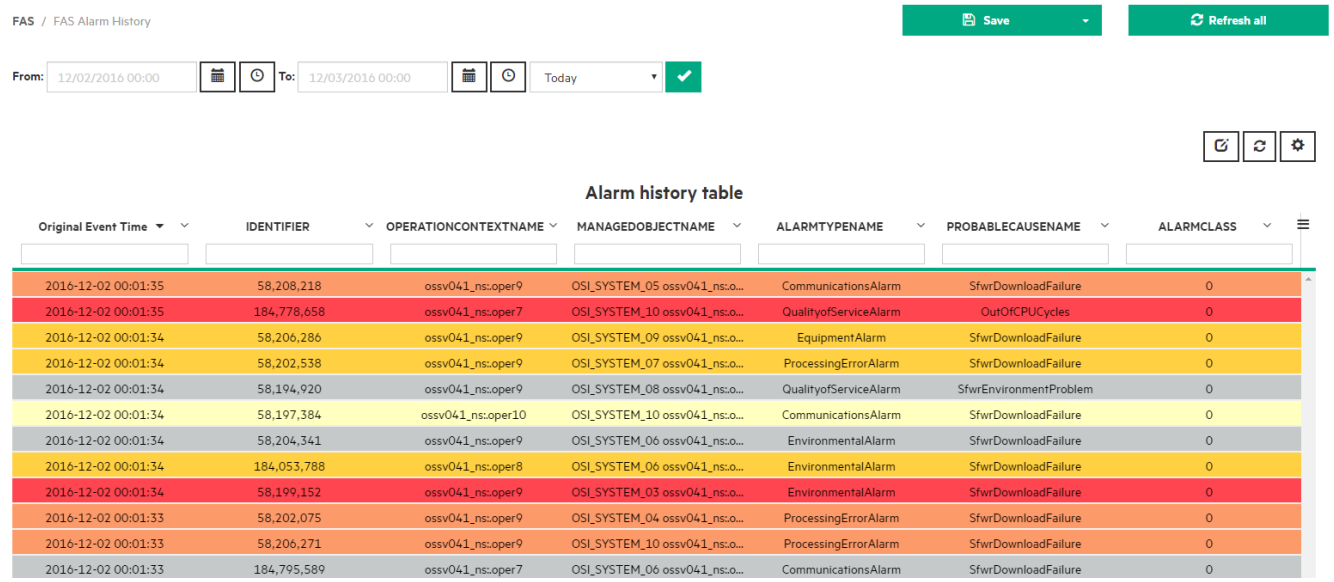


Figure 38: Alarm count comparison for all Users

2.6 Alarm history table

This reports simply displays the list of alarms received during a time period choosen by the user:



Original Event Time	IDENTIFIER	OPERATIONCONTEXTNAME	MANAGEDOBJECTNAME	ALARMTYPENAME	PROBABLECAUSENAME	ALARMCLASS
2016-12-02 00:01:35	58,208,218	ossv041_ns:.oper9	OSI_SYSTEM_05 ossv041_ns:.o...	CommunicationsAlarm	SfwrDownloadFailure	0
2016-12-02 00:01:35	184,778,658	ossv041_ns:.oper7	OSI_SYSTEM_10 ossv041_ns:.o...	QualityofServiceAlarm	OutOfCPUCycles	0
2016-12-02 00:01:34	58,206,286	ossv041_ns:.oper9	OSI_SYSTEM_09 ossv041_ns:.o...	EquipmentAlarm	SfwrDownloadFailure	0
2016-12-02 00:01:34	58,202,538	ossv041_ns:.oper9	OSI_SYSTEM_07 ossv041_ns:.o...	ProcessingErrorAlarm	SfwrDownloadFailure	0
2016-12-02 00:01:34	58,194,920	ossv041_ns:.oper9	OSI_SYSTEM_08 ossv041_ns:.o...	QualityofServiceAlarm	SfwrEnvironmentProblem	0
2016-12-02 00:01:34	58,197,384	ossv041_ns:.oper10	OSI_SYSTEM_10 ossv041_ns:.o...	CommunicationsAlarm	SfwrDownloadFailure	0
2016-12-02 00:01:34	58,204,341	ossv041_ns:.oper9	OSI_SYSTEM_06 ossv041_ns:.o...	EnvironmentalAlarm	SfwrDownloadFailure	0
2016-12-02 00:01:34	184,053,788	ossv041_ns:.oper8	OSI_SYSTEM_06 ossv041_ns:.o...	EnvironmentalAlarm	SfwrDownloadFailure	0
2016-12-02 00:01:34	58,199,152	ossv041_ns:.oper9	OSI_SYSTEM_03 ossv041_ns:.o...	EnvironmentalAlarm	SfwrDownloadFailure	0
2016-12-02 00:01:33	58,202,075	ossv041_ns:.oper9	OSI_SYSTEM_04 ossv041_ns:.o...	ProcessingErrorAlarm	SfwrDownloadFailure	0
2016-12-02 00:01:33	58,206,271	ossv041_ns:.oper9	OSI_SYSTEM_10 ossv041_ns:.o...	ProcessingErrorAlarm	SfwrDownloadFailure	0
2016-12-02 00:01:33	184,795,589	ossv041_ns:.oper7	OSI_SYSTEM_06 ossv041_ns:.o...	CommunicationsAlarm	SfwrDownloadFailure	0

2.7 TeMIP OC Active Alarms Counters Reports

This set of reports allow to do analysis of active alarms in TeMIP Operation Contexts.

NOTE: The reports previously described are based on the ORIGINAL EVENT TIME of the alarm unlike those ones which are based on the date of the presence of the alarm in the operation context: the data time, here, is the time of 'snapshots' of operation contexts.

Regular snapshots will store in the datamart, the ACTIVE counters:
- count of Outstanding alarms
- count of Acknowledged alarms
- count of Handled alarms
- count of Not Handled alarms

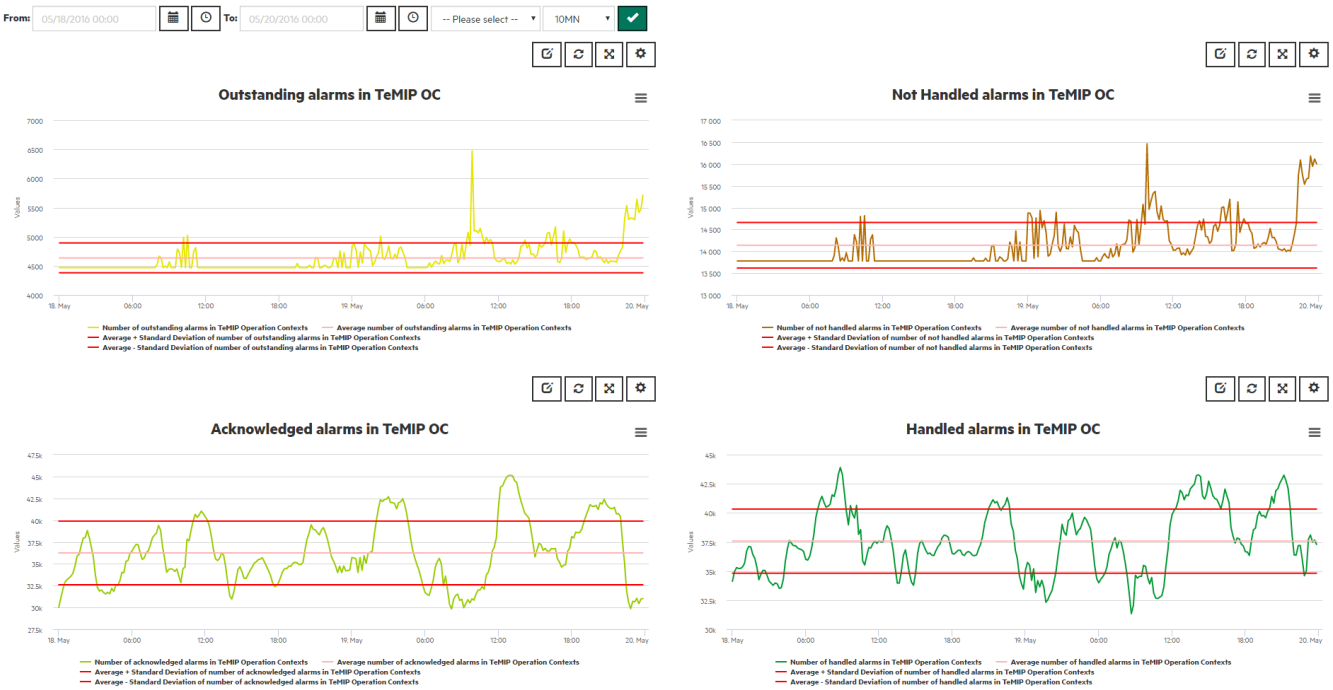
for each:
- each 10 mn
- each hours
- each days
- each weeks
- each months

Here are the views provided for analysis of active alarms in TeMIP Operation Contexts:
- Evolution of Active Alarms Counters per alarm state and problem status
- Active Alarms Counters Evolution analysis
- Evolution of Active Alarms Counters per OC

2.7.1 Evolution of Active Alarms Counters per alarm state and problem status

The aim of this report is to visualize the evolution of counters of Outstanding, Acknowledged, Handled, Not Handled alarms in TeMIP Operation Contexts.

It shows the:
- evolution of the counters
and in order to identify quickly which are the 'abnormal' periods:
- the average value during the timewindow selected
- the average + standard deviation
- the average - standard deviation

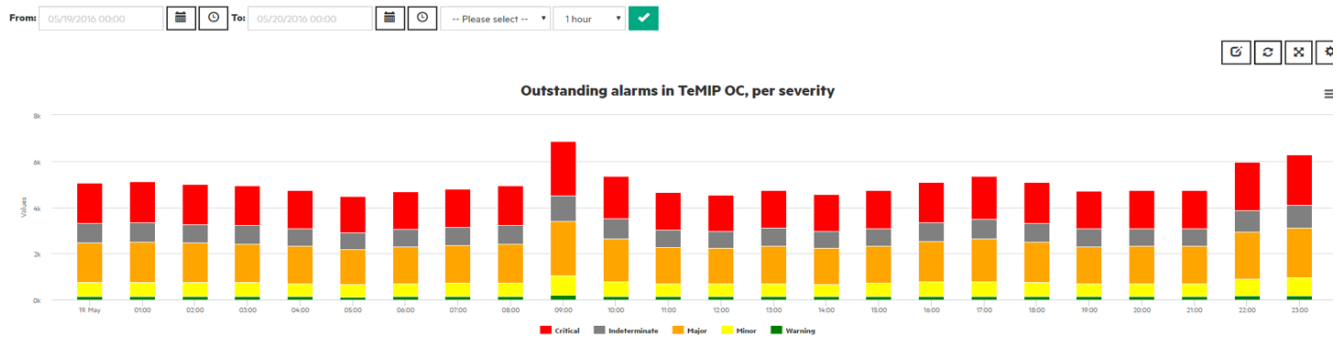


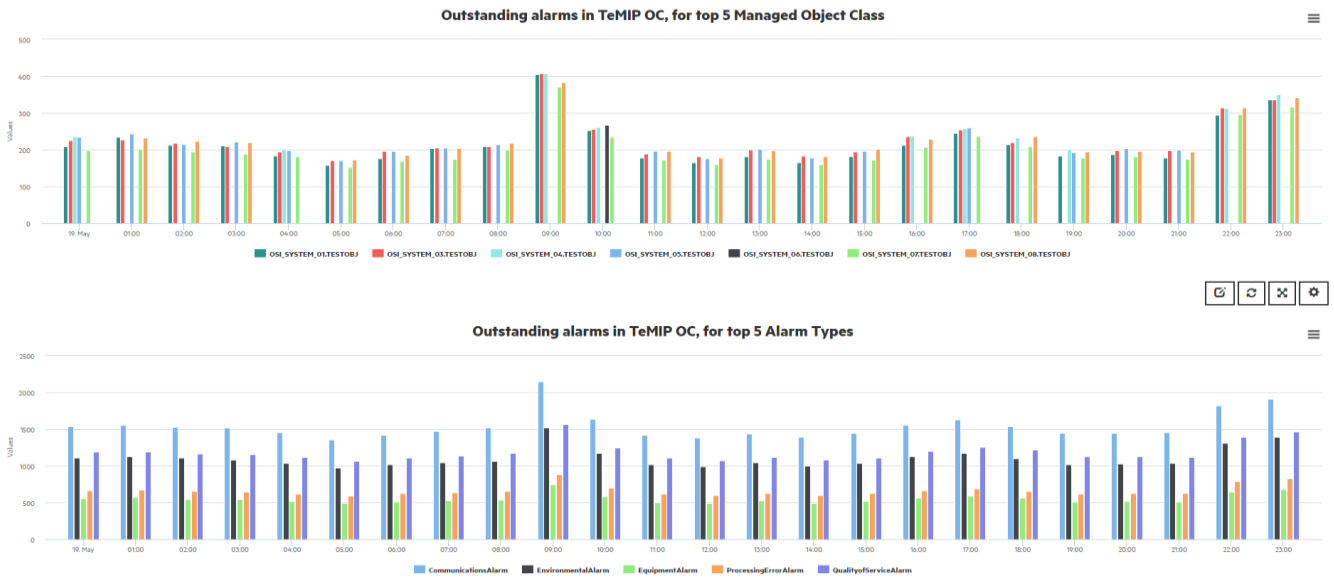
This report allows to detect during which period, the Operations need to pay attention to the management of alarms.

2.7.2 Active Alarms Counters Evolution analysis

The aim of this report is to visualize the evolution of number of Outstanding, Acknowledged, Handled, Not Handled alarms in TeMIP Operation Contexts:

- per Severity: this allows to check if critical alarms are correctly managed
- per Managed Object: this allows to identify which Managed Objects the Operations need to pay attention to
- per Alarm Type: this allows to identify which Alarm Types the Operations need to pay attention to

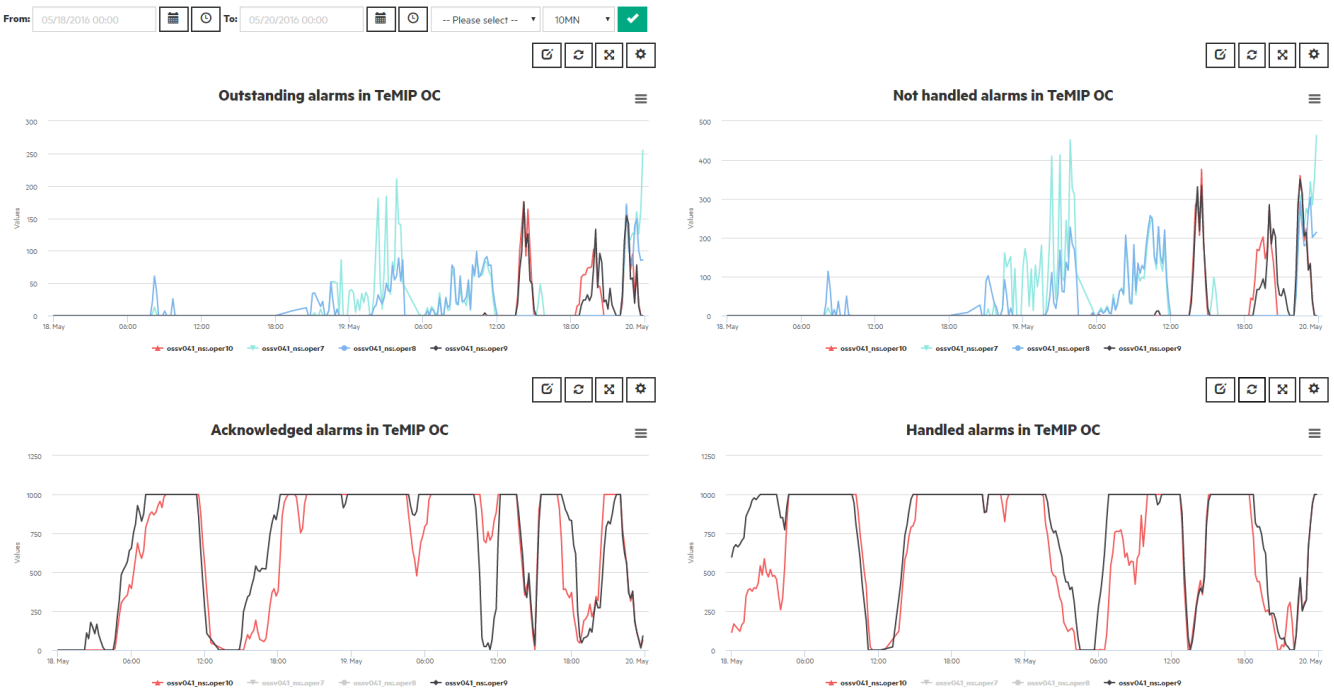




2.7.3 Evolution of active alarms counters per OC

The aim of this report is to visualize the evolution of number of Outstanding, Acknowledged, Handled, Not Handled alarms per TeMIP Operation Contexts.

This allows to identify which OCs the Operations need to pay attention to, and on which period.



2.8 Raw Events reports

FAS embeds not only reports concerning alarms but also reports concerning Raw Events.
They are not much detailed here, but note that they have the same structure than the reports concerning Alarms (reports which are detailed in section above).

Anyway, here are just some screenshots about Raw Events reports:

2.8.1 Raw Events Health report

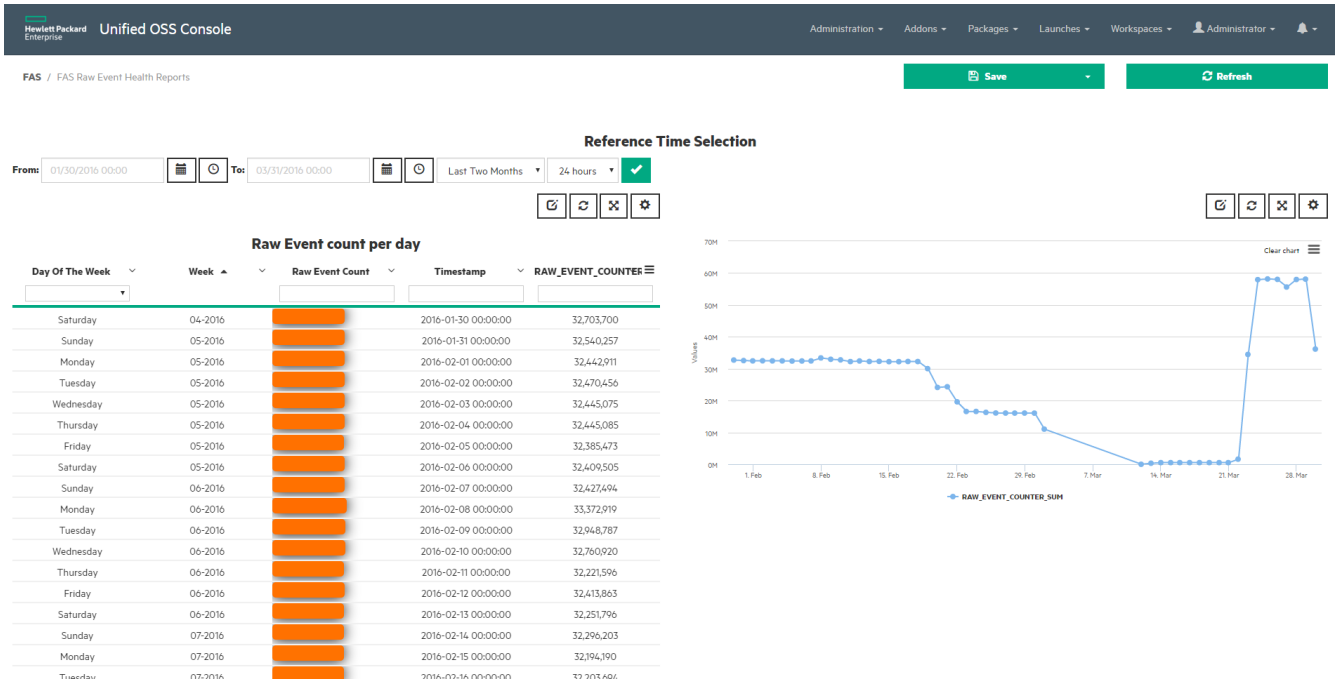


Figure 39: Raw Events Health reports

2.8.2 Equipment Raw Events Health reports

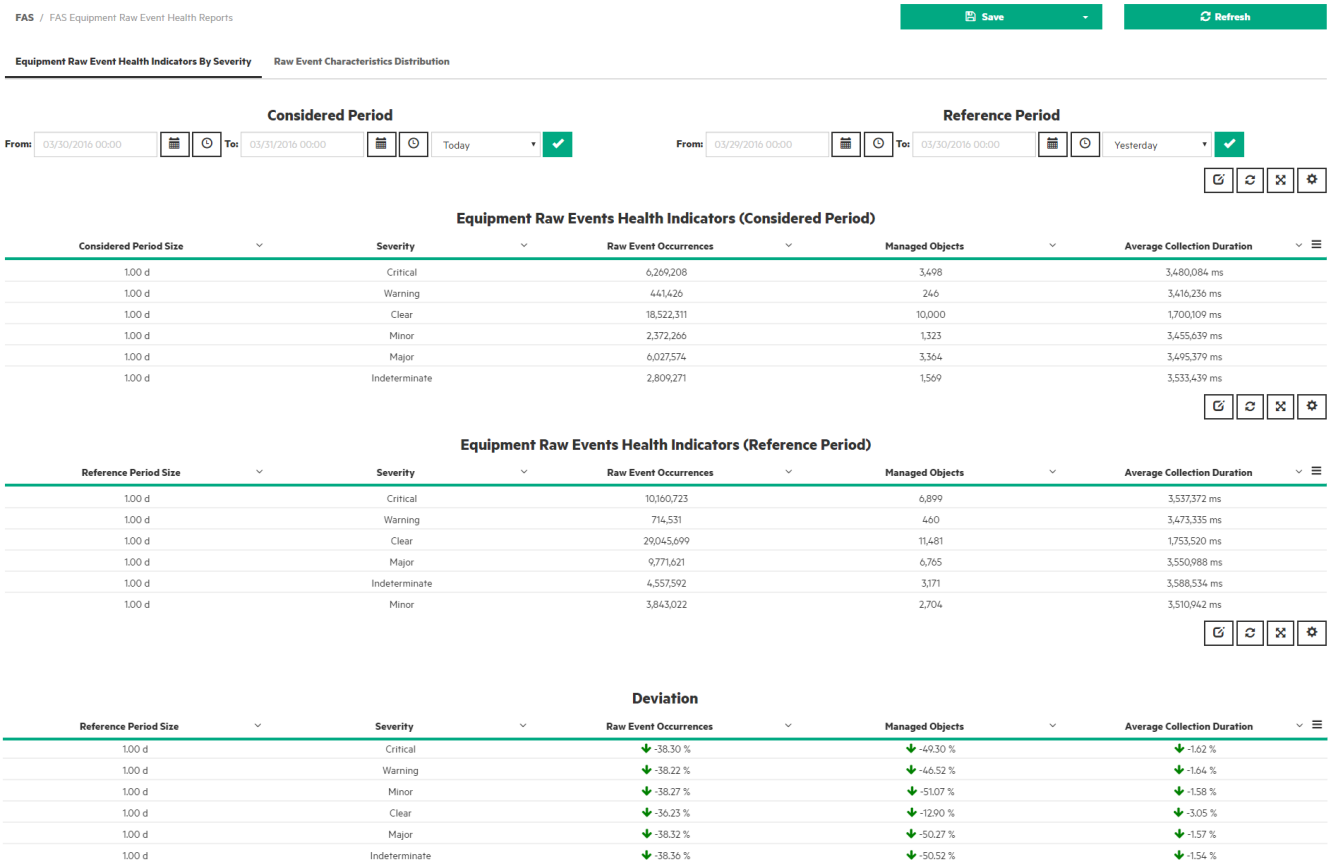


Figure 40: Equipment Raw Events Health Indicators by severity report

Figure 41: Raw Events characteristics distribution report

2.8.3 Equipment Raw Event Top N Advanced Comparison Chart

This report is drill down report showing the Top-10 Global Classes in Number of events. In one report you can see as the Current period and Referenced Period. On the Clicking of one Global Class you will see the Top-10 Managed Objects in number of events belonging to the selected Global Class. Also you can see the Deviation of number of events (comparing current and referenced period) for the Top-10 Global Classes and corresponding to selected Global Class Top-10 Managed Objects.

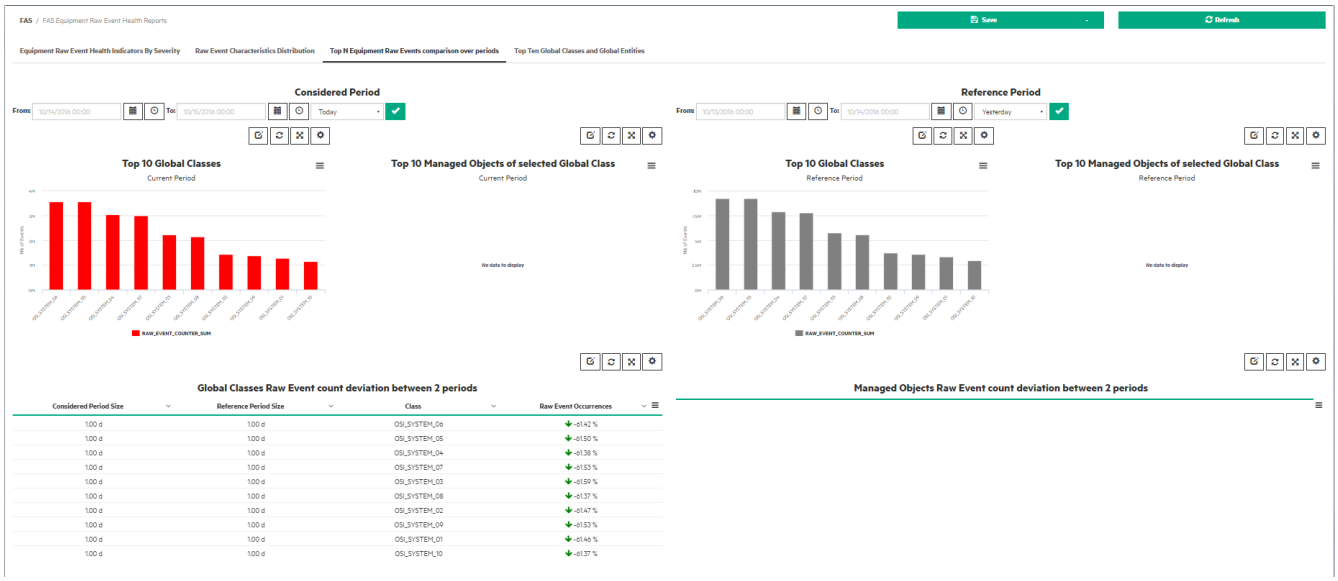


Figure 42: Raw Event Top N Advanced Comparison Chart (no Global Class selected)

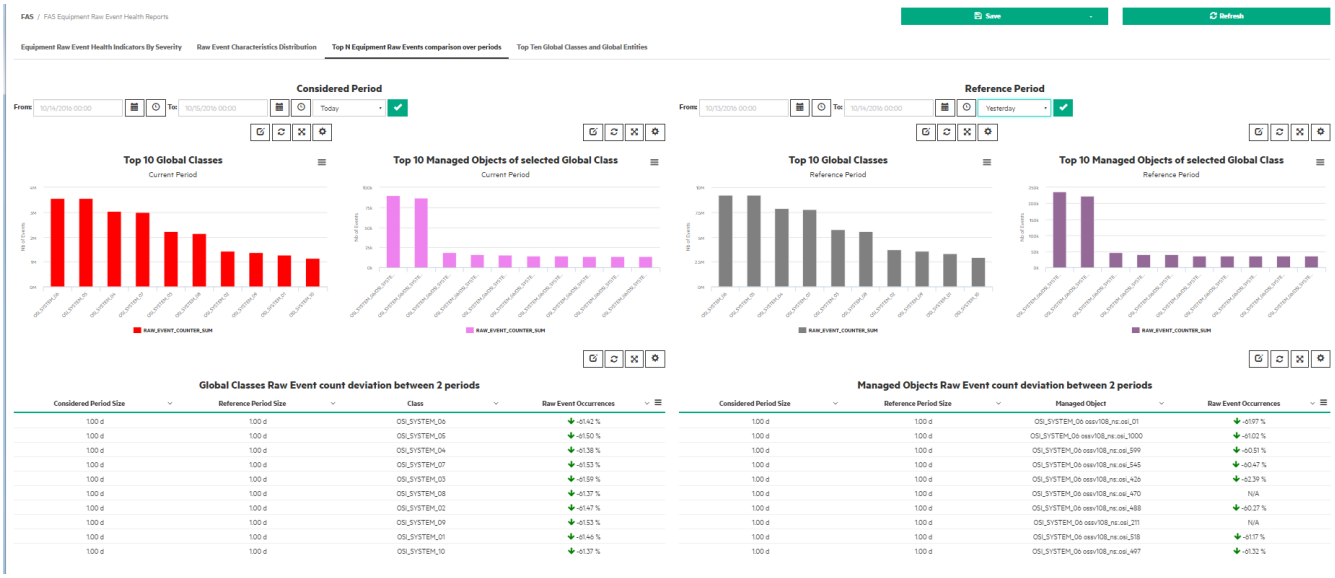


Figure 43: Raw Event Top N Advanced Comparison Chart (after selecting of Global Class)

2.8.4 Top Ten Global Classes and Global Entities

This report shows the Top-10 Global Classes and Global Entities in Number of Events over the selected period of time.

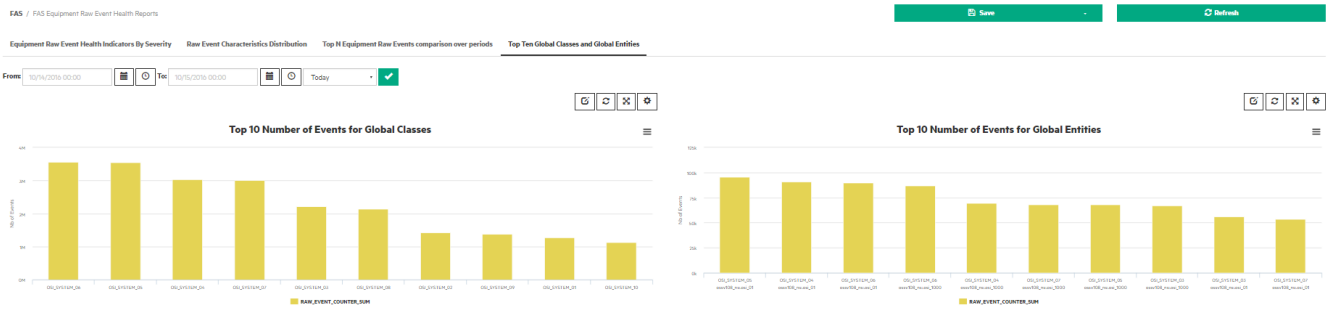


Figure 44: Raw Event Top Ten Global Classes and Global Entities

2.8.5 Equipment Top 10 Repeated Raw Events report

This report displays a top-N of repeated raw events over user-specified time period. Value deviation regarding a reference time period is also presented. Raw events that repeat frequently e.g. link up then link down raw events that are cleared or filtered may hide growing problems. This report allows proactive search of problems.

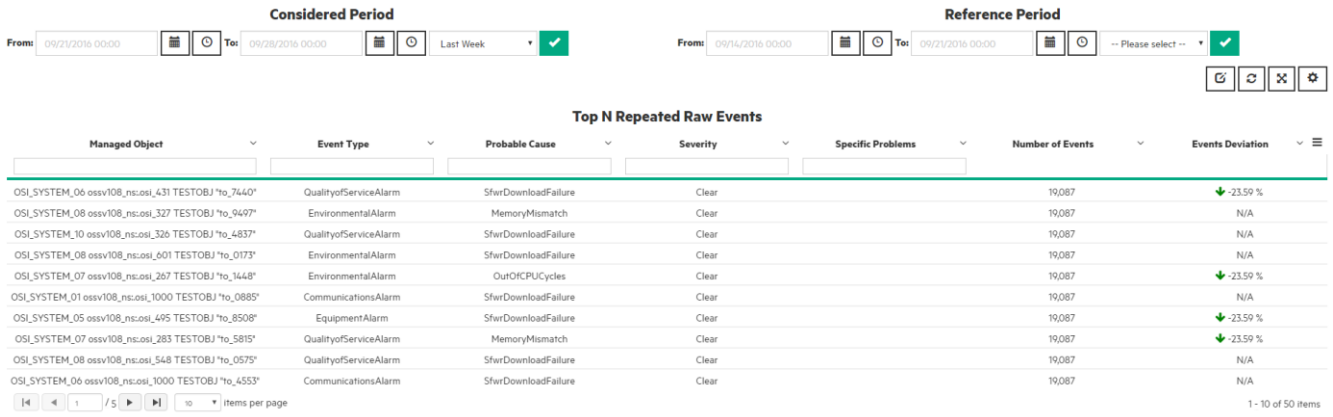


Figure 45: FAS Top N Repeated Raw Events

2.9 FAS Top clear based fault duration per Raw Events

This type of reports allows us to compare cumulative fault duration for raw events based on clearance. over 2 selected periods of time. We assume that raw event is cleared if ithere is the event with severity = “clear” with the same alarm type, accessmodule, managedobject, probable cause and specific problems and eventtime of clearance event greater than eventtime of raw event and difference between clearance eventtime and raw event eventtime is minimal. If we have several raw events with the same clearance event we take in account only the event with the maximal fault duration.

2.9.1 Top clear-based fault duration per Raw Event

This report allows us to compare the Top raw events in terms of fault duration for the current and reference periods of time.

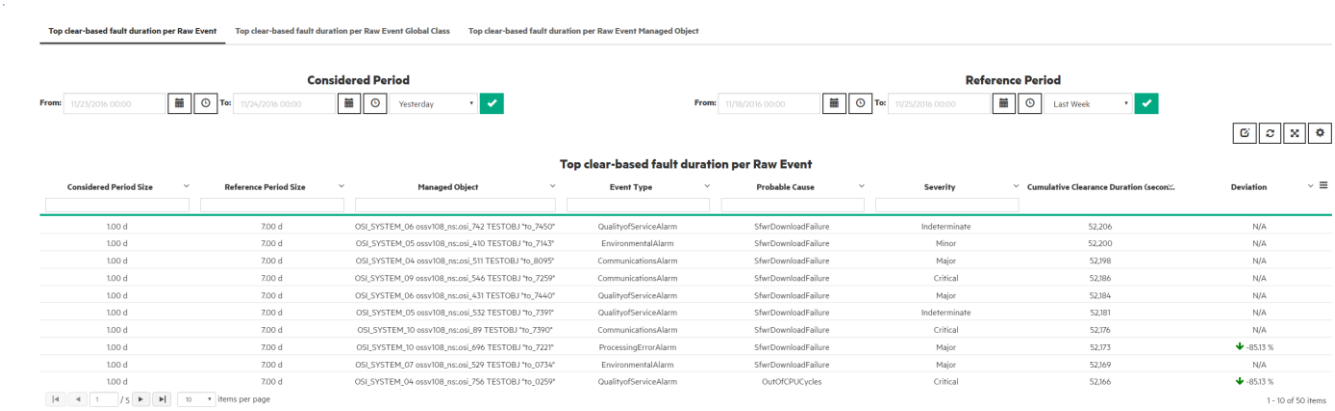


Figure 46: Top clear-based fault duration per Raw event

2.9.2 Top clear-based fault duration per Raw Event Global Class

This report shows us the Top Global Classes in term of fault duration for raw events for the current period of time and deviation from reference period of time.

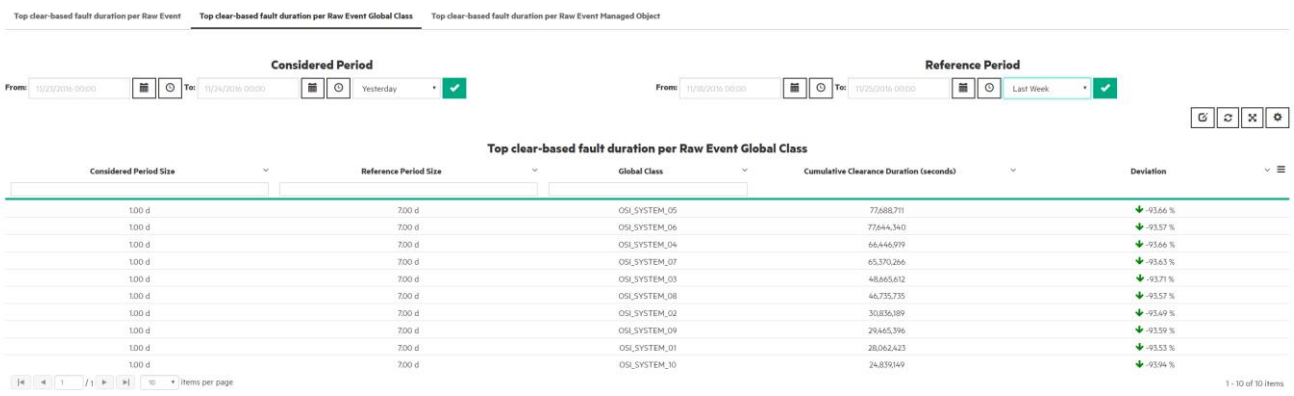


Figure 47: Top clear-based fault duration per Raw event Global Class

2.9.3 Top clear-based fault duration per Raw Event Managed Object

This report shows us the Top Managed Objects in term of fault duration for raw events for the current period of time and deviation from reference period of time.

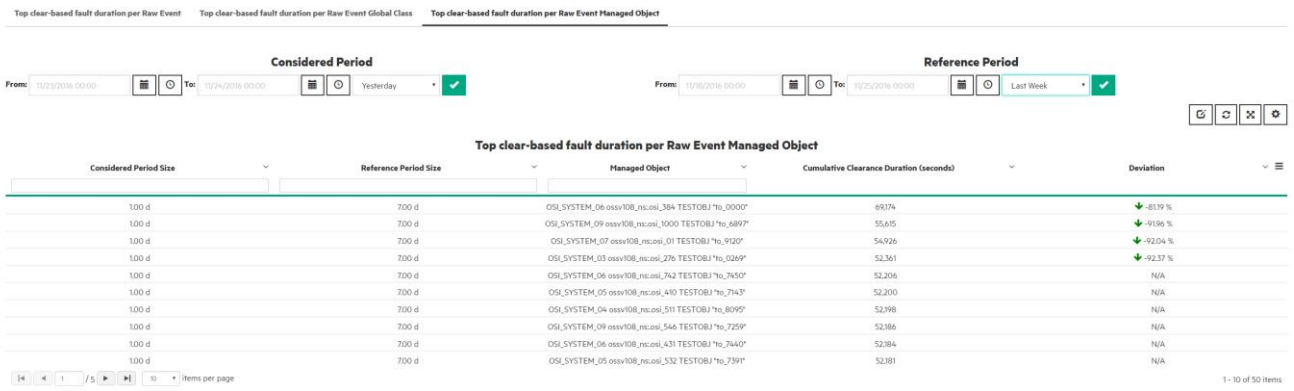
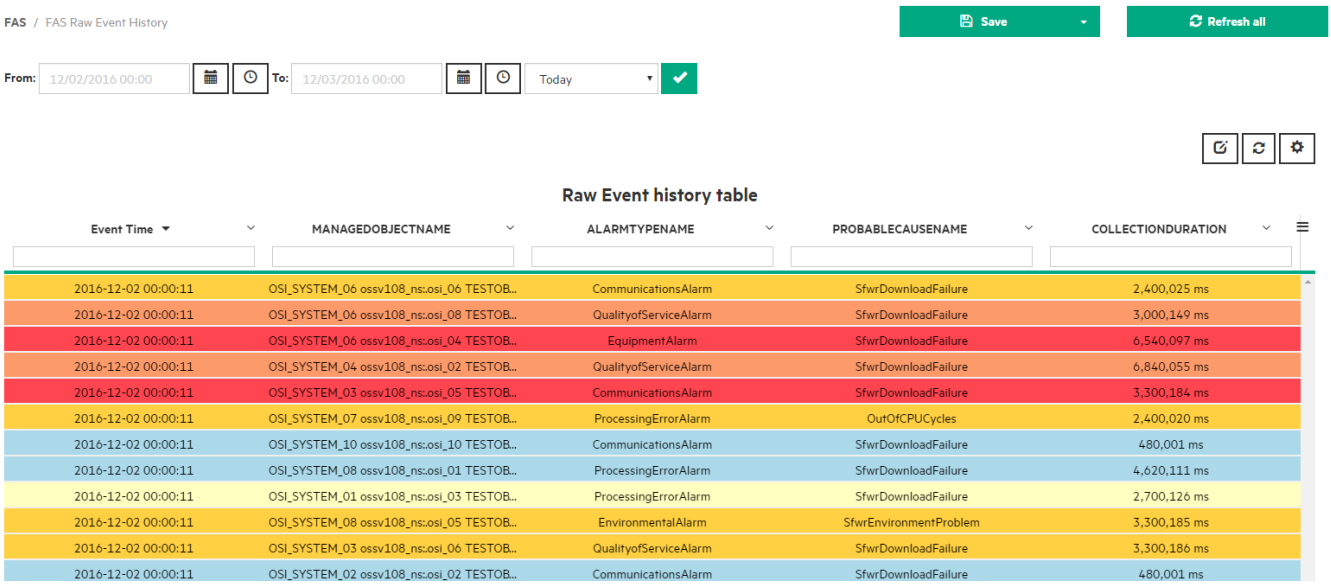


Figure 48: Top clear-based fault duration per Raw event Managed Object

2.10 Raw Event history table

This reports simply displays the list of raw events received during a time period chosen by the user:



2.11 How to schedule reports

The FAS solution can be customized in order to schedule standard or user specific reports.

For details, please refer to the *HPE Fault Analytics and Statistics - Customization Guide* at section *FAS Customization / Reports scheduling.*