

Overload Control User Guide

Ericsson Service-Aware Policy Controller

USER GUIDE

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Abstract

The purpose of this document is to provide a guideline to manage overload control in the SAPC.



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1 Configuration Prerequisites

Before configuring the SAPC in an operational network, assure that:

- CBA Components are installed.
- The SAPC product software is installed.
- To have a detailed understanding of the function.





2 Overload Control Configuration

2.1 Load Regulation Mechanism

It is possible to monitor and modify values for CPU and memory load thresholds.

Load regulation thresholds are defined with following parameters:

Table 1 Load Regulation Parameters

Parameter	Description	Range(%)	Memory Default Values(%)	CPU Default Values(%)
utilizationLimit	Utilization limit for a resource (CPU or memory)	[0-100]	80	75
histOnLimit	Load regulation starts when the resource utilization rises above utilizationLimit - histOnLimit.	[0-utilizationLimit]	0	0
histOffLimit	Load regulation stops when the resource utilization falls below utilizationLimit - histOffLimit.	[0-utilizationLimit]	5	5

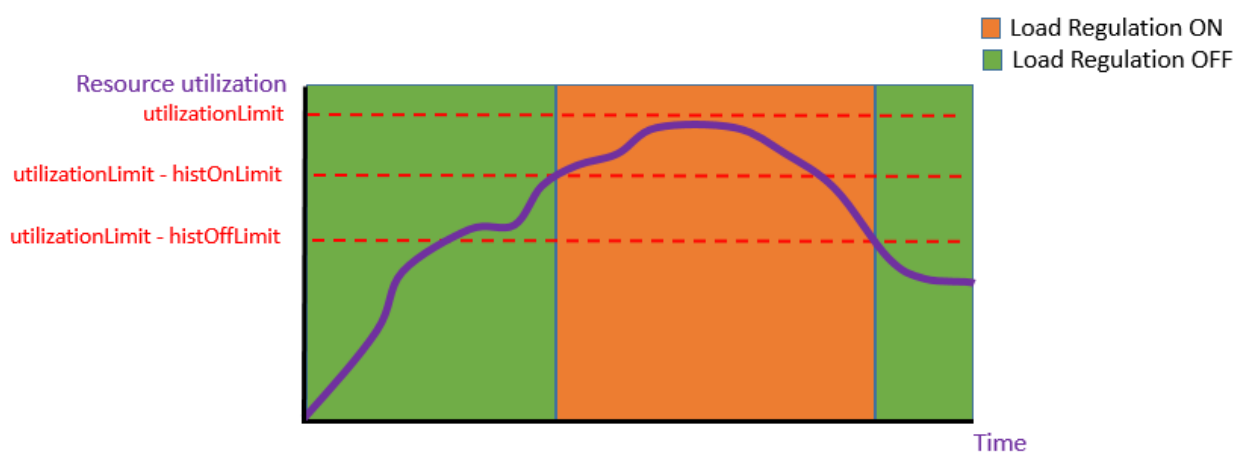


Figure 1 Load Regulation Thresholds Parameters

Note: To prevent load regulation incorrect behavior, it is not possible to configure histOffLimit and histOnLimit in a way that the value for histOffLimit is lower than the value for histOnLimit.



```

----- Regulation Constraint for Memory -----
utilizationLimit 75
histOnLimit 5
histOffLimit 10

```

Example 1 Load Regulation Parameters values

In previous example, load regulation starts when memory utilization reaches 70% ($\text{utilizationLimit} - \text{histOnLimit}$) and stops when memory utilization falls below 65% ($\text{utilizationLimit} - \text{histOffLimit}$).

2.1.1 Check Load Regulation Thresholds

To check load regulation thresholds, do the following:

1. Execute following command to access the SAPC:

```
ssh sapcadmin@<OAM_VIP>
```

2. Execute following command to check load regulation thresholds:

```
sapcadmin@SC-X> loadRegulationManager -l
```

```

-----
Load Regulation Manager
-----

----- Regulation constraint for CPU -----

utilizationLimit 75

histOnLimit 0

histOffLimit 5

----- Regulation constraint for Memory -----

utilizationLimit 80

histOnLimit 0

histOffLimit 5

Done !

```

- CPU threshold indicates not to use more than 75% of the available resource. The SAPC starts load regulation when CPU utilization is above 75%, and stops load regulation when it is below 70%.



- Memory threshold indicates not to use more than 80% of the available resource. The SAPC starts load regulation when memory utilization is above 80%, and stops load regulation when it is below 75%.

3. Check displayed values for load regulation thresholds parameters.

2.1.2 Modify CPU Threshold for Load Regulation

To modify CPU threshold for load regulation, do the following:

1. Execute following command to access the SAPC:

```
ssh sapcadmin@<OAM_VIP>
```

2. Execute the following command with desired values for CPU threshold parameters:

```
sapcadmin@SC-X> loadRegulationManager --cpu-rc [h0ff <val>][h0n <val>][uLim <val>]
```

Note: For details related to the syntax of the command, execute:

```
sapcadmin@SC-X> loadRegulationManager -h
```

3. Check in the console output that the changes have been applied.

See following examples configuring CPU threshold:

```
loadRegulationManager --cpu-rc uLim 68
```

Example 2 For CPU, utilizationLimit is set to 68% without modifying values for histOnLimit and histOffLimit.

```
loadRegulationManager --cpu-rc uLim 72 h0n 8 h0ff 15
```

Example 3 CPU threshold indicates not to use more than 72% of the available resource. The SAPC starts load regulation when CPU utilization is above 64%, and stops load regulation when is below 57%.

```
loadRegulationManager --cpu-rc h0n 3
```

Example 4 For CPU, histOnLimit is set to 3% without modifying values for utilizationLimit and histOffLimit.



Warning!

It is possible to modify `histOnLimit` and `histOffLimit` for CPU resource limit. Ericsson recommends keeping default values.

2.1.3 Modify Memory Threshold for Load Regulation

To modify memory threshold for load regulation, do the following:

1. Execute following command to access the SAPC:

```
ssh sapcadmin@<OAM_VIP>
```

2. Execute the following command with desired values for memory threshold parameters:

```
sapcadmin@SC-X> loadRegulationManager --mem-rc [hOff <val>][hOn  
<val>][uLim <val>]
```

Note: For details related to the syntax of the command, execute:

```
sapcadmin@SC-X> loadRegulationManager -h
```

3. Check in the console output that the changes have been applied.

Warning!

Ericsson recommends not to use a value higher than 80% for memory `utilizationLimit`. If the SAPC reaches memory utilization higher than 85%, some processes are restarted.

```
loadRegulationManager --mem-rc uLim 74
```

Example 5 For memory, `utilizationLimit` is set to 74% without modifying values for `histOnLimit` and `histOffLimit`.



```
loadRegulationManager --mem-rc h0ff 6 uLim 71 h0n 3
```

Example 6 Memory threshold indicates not to use more than 71% of the available resource. The SAPC starts load regulation when memory utilization is above 68%, and stops load regulation when is below 65%.

```
loadRegulationManager --mem-rc h0n 4
```

Example 7 For memory, histOnLimit is set to 4% without modifying values for utilizationLimit and histOffLimit.

Warning!

It is possible to modify histOnLimit and histOffLimit for memory resource limit. Ericsson recommends keeping default values.

2.2 Massive Reauthorizations Mechanisms

2.2.1 Disable Massive Reauthorizations Based on Subscriber Update or Removal

To prevent the SAPC overload in case of massive reauthorizations messages based on subscriber profile change or removal, set enableReauthsOnSubsChange attribute in class AppConfig MOC to false. Once the massive provisioning operations are finished, set the attribute to true.

2.2.2 Disable Massive Reauthorizations Associated to Time Conditions

To prevent the SAPC overload in case of massive reauthorization messages associated to time conditions, set enableReauthsOnToD attribute in class AppConfig MOC to false.

2.2.3 Disperse Reauthorizations due to Fair Usage Reset on Specific Dates

To avoid a high amount of reauthorization messages at the same resetPeriod, configure it using the time [hh:mm] part. Messages (reauthorization messages and the corresponding reception of IP session update) are dispersed in following ranges:



Table 2 Configuration for reauthorizations dispersion using time part in resetPeriod

Time part	Dispersion range
Do not specify [hh:mm]	Random number from 0 to the number of seconds in 23 hours, 59 minutes, and 59 seconds
hh:??	Random number from 0 to the number of seconds in 59 minutes and 59 seconds.

For more details, refer to Configuration Guide for Fair Usage.



3 Overload Control Performance Management

Following performance measurements are provided related to **Overload Control**:

- The number of Gx CCAs initial sent indicating too busy (Result-Code AVP set to 3004).
- The number of Gx CCAs initial for emergency services sent indicating too busy (Result-Code AVP set to 3004).
- The number of Gx CCAs update sent indicating too busy (Result-Code AVP set to 3004).
- The number of Gx CCAs update for emergency services sent indicating too busy (Result-Code AVP set to 3004).
- The number of Gx CCAs terminate sent indicating too busy (Result-Code AVP set to 3004).
- The number of Rx AAAs initial sent indicating too busy (Result-Code AVP set to 3004).
- The number of Rx AAAs initial for emergency services sent indicating too busy (Result-Code AVP set to 3004).
- The number of Rx AAAs update sent indicating too busy (Result-Code AVP set to 3004).
- The number of Rx AAAs update for emergency services sent indicating too busy (Result-Code AVP set to 3004).
- The number of Rx STAs sent indicating too busy (Result-Code AVP set to 3004).
- The number of Smp CCAs initial sent indicating too busy (Result-Code AVP set to 3004).
- The number of Sy SNAs update sent indicating too busy (Result-Code AVP set to 3004).
- The number of SOAP notifications not processed due to overload protection.
- The number of REST provisioning messages indicating too busy (HTTP status code set to 503).
- The number of Time of Day reauthorizations not processed due to overload protection.

For more details, refer to [Measurements](#).





Reference List

Ericsson Documents

- [1] Configuration Guide for Fair Usage
- [2] Measurements