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Stat Server User's Guide

Overload Protection

12/20/2025

Overload Protection

Starting with release 8.5.108, Stat Server supports overload protection.

Introduction

When and why to use overload protection?

The number of opened statistics depends on the client demands. The more statistics are opened or the more incoming events are received, the higher Stat Server CPU consumption. Stat Server application is not scalable and, in certain circumstances, it may start behaving unreliably (disconnect clients, get disconnected from servers, delay computations).

Stat Server load is %CPU, consumed by its main thread. It depends on the rate of incoming events and number (and parameters) of open statistics. Overload protection is a method of reducing CPU consumption as a response to Stat Server overload. The load range is defined as [min,max]. The cooldown is a predefined duration of time, when the load is less then min. Stat Server is in overload, if the load exceeded max, and no cooldown happened since then. Stat Server is in recovery, if it is in overload, and current load is less then min.

Overload protection consists of the following load reducing measures:

- Measure 1. Cut debug logging, controlled by the settings of the cut-debug-log option.
- Measure 2. Stat Server cannot skip incoming events and always processes them. However, it can lower the quality of service for some statistics in order to reduce CPU consumption. Also, it can skip some operations in the pipeline above: for some statistics, it may stop recalculating values and sending them.
- Measure 3. For some statistics Stat Server may stop updating aggregate. Please note, that measure 3 includes measure 2.

As soon as Stat Server hits the predefined high CPU threshold, it enters the state of overload. To leave that state, CPU should remain below predefined low threshold for predefined cooldown period.

The goal of the overload protection is to skip minimal amount of operations of statistical sends and updates to reduce CPU consumption to the acceptable level.

Tip

The following statistical categories are not affected by overload protection:

- CurrentTargetState
- CurrentState
- CurrentStateReasons

Configuration Options

The following new configuration options are added to Stat Server starting with release 8.5.108:

Option	Summary
allow-new-connections-during-overload	Allows new clients to connect during overload.
allow-new-requests-during-overload	Allows opening new statistics during overload.
cpu-cooldown-cycles	The number of cpu-pool-timeout cycles in a cooldown period (Cooldown period / cpu-poll-timeout).
cpu-poll-timeout	Timeout of polling main thread CPU, in seconds.
cpu-threshold-high	The higher boundary of the load range.
cpu-threshold-low	The lower boundary of the CPU range.
cut-debug-log	Controls the debug log in overload.
protection	Enables/disables protection.
qos-default-overload-policy	Default overload policy.
qos-recovery-enable-lms-messages	Enables recovery-related LMS messages.

The above options are configured in the **[overload]** section of the Stat Server application.

The overload policy may vary from statistic to statistic, depending on the end-user preferences. The default overload policy, defined by the qos-default-overload-policy option settings, can be overridden on the **stat type** level by the DynamicOverloadPolicy option in the **[<stat type>]** section:

Option	Values	Description
DynamicOverloadPolicy	• 0 (default) - sends and updates for requested statistics can be cut • 1 - only sends of statistics to Stat Server clients can be cut • 2 - nothing can be cut, Stat Server updates and sends all requested statistics.	Defines actions that Stat Server may apply to a given statistic to reduce the overload

Important

It is recommended to keep default low and high thresholds (60-80) and not raising them as it may make overload protection less effective.

LMS Messages

New LMS messages, associated with overload protection, are listed below:

- 10070|STANDARD|GCTI_SS_OVERLOAD_DETECT|Overload detected on %s (%d current CPU usage)
- 10071|STANDARD|GCTI_SS_OVERLOAD_END|Overload ended on %s (%d current CPU usage)
- 10072|STANDARD|GCTI_SS_OVERLOAD_RECOVERY_STARTED|Overload recovery started on %s (%d current CPU usage)
- 10073|STANDARD|GCTI_SS_OVERLOAD_RECOVERY_FAILED|Overload recovery failed on %s (%d current CPU usage)
- 10074|STANDARD|GCTI_SS_OVERLOAD_PROTECTION_ACTIVATED|Overload protection on %s activated
- 10075|STANDARD|GCTI_SS_OVERLOAD_PROTECTION_DEACTIVATED|Overload protection on %s deactivated

Important

- Messages 10070 and 10071 are recommended for operations monitoring.
- Messages 10072 and 10073 are for debugging purposes only, they are disabled by default.
- Messages 10074 and 10075 are generated when the protection configuration option changes its value (or at startup). We need this information in the standard log because the debug logging is cut, when Stat Server is in overload. These messages are for troubleshooting only.

See also [Stat Server Deployment Guide](#) for more information on LMS messages.

Performance Counters

The following table includes new performance counters:

Counter	Description
cpu	Main-thread CPU percentage (% of single processor)
pcpu	Process CPU percentage (% of total)
shc	stats hit count
shcs	stats hit count suppressed
clens	client events not sent
opc	overload periods count
opd	overload periods duration sec

Counter	Description
osn	overload stats normal
osns	overload stats not sent
osnu	overload stats not updated