

# Load and resource usage information

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Information on load and resources of the WCS server is available via the port 8081 at this URL

```
http://test.flashphoner.com:8081/?action=stat
```

wheretest.flashphoner.com- is the actual address of the WCS server.

The information includes data on published and played streams, SIP calls and server specifications.

## Statistics parameters

| connections_stats           | Connections to the WCS server                      |
|-----------------------------|----------------------------------------------------|
| connections                 | Overall number of connections                      |
| connections_rtmfp           | Number of RTMFP connections (Flash)                |
| connections_websocket       | Number of WebSocket connections                    |
| port_stats                  | Ports listened by the WCS server                   |
| ports_media_free            | Free media ports                                   |
| ports_media_busy            | Busy media ports                                   |
| ports_media_quarantine      | Media ports in quarantine                          |
| ports_wcs_agents_free       | Free CDN used ports                                |
| ports_wcs_agents_busy       | Busy CDN used ports                                |
| ports_wcs_agents_quarantine | CDN used ports in quarantine                       |
| streams_stats               | Audio and video stream sessions on the WCS server  |
| streams_rtsp_in             | Number of active RTSP sessions sending traffic     |
| streams_rtsp_out            | Number of active RTSP sessions receiving traffic   |
| streams_websocket_out       | Number of active streams played by WebSocket       |
| streams_rtmp_out            | Number of active RTMP streams                      |
| streams_webrtc_in           | Number of active streams published via WebRTC      |
| streams_webrtc_out          | Number of active streams played via WebRTC         |
| streams_rtmfp_in            | Number of active streams published via RTMFP       |
| streams_rtmfp_out           | Number of active streams played via RTMFP          |
| streams_viewers             | Number of active clients playing published streams |

|                                   |                                                                                         |
|-----------------------------------|-----------------------------------------------------------------------------------------|
| streams_synchronization           | Streams published synchronization                                                       |
| <b>native_resources</b>           | <b>Information about resource usage</b>                                                 |
| native_resources                  | Information about encoding/decoding of the media stream                                 |
| <b>core_stats</b>                 | <b>System parameters (obtained using Java methods) and parameters of the WCS server</b> |
| core_threads                      | Number of active threads of the WCS server process                                      |
| core_java_threads                 | Current number of live threads                                                          |
| core_java_threads_blocked         | Current number of blocked threads                                                       |
| core_java_committedMemory         | Amount of guaranteed available virtual memory, in bytes                                 |
| core_java_freePhysicalMemorySize  | Amount of free physical memory, in bytes                                                |
| core_java_arch                    | Operating system architecture                                                           |
| core_java_availableProcessors     | Number of processors available for the Java virtual machine                             |
| core_java_freeSwapSpaceSize       | Amount of free swap space, in bytes                                                     |
| core_java_maxFileDescriptorCount  | Maximum number of file descriptors                                                      |
| core_java_open_file_descriptors   | Number of file descriptors opened in the Java virtual machine                           |
| core_java_cpu_usage               | "Recent CPU usage" for a process in the Java virtual machine                            |
| core_java_totalPhysicalMemorySize | Amount of physical memory, in bytes                                                     |
| core_java_totalSwapSpaceSize      | Amount of swap space, in bytes                                                          |
| core_java_uptime                  | Uptime since Java virtual machine started, in milliseconds                              |
| core_heap_memory_used             | Heap memory usage                                                                       |
| core_rss_memory                   | Memory usage                                                                            |
| core_open_file_descriptors        | Number of opened file descriptors                                                       |
| core_cpu_usage                    | CPU time percentage used by processes                                                   |
| core_gc                           | Information about "garbage collecting"                                                  |
| core_gc_manager                   | Information about "garbage collecting" in the Manager                                   |
| core_heap_memory_used             | Heap memory used                                                                        |
| core_java_version                 | Java version                                                                            |
| core_java_nio_memory_buffer_count | TCP NIObuffers used count                                                               |
| core_java_nio_memory_used         | Memory used by TCP NIO buffers                                                          |
| core_java_nio_memory_capacity     | TCP NIO buffers memory capacity                                                         |
| <b>call_stats</b>                 | <b>SIP calls on the WCS server</b>                                                      |
| sip_calls                         | Number of SIP calls                                                                     |
| sip_calls_established             | Number of active SIP calls                                                              |
| sip_calls_in                      | Number of incoming SIP calls                                                            |
| sip_calls_out                     | Number of outgoing SIP calls                                                            |
| sip_calls_per_second (cps)        | Number of SIP calls per minute                                                          |
| <b>sip_stats</b>                  | <b>SIP clients</b>                                                                      |
| sip_registered                    | Number of client in the REGISTERED state                                                |
| <b>recording_stats</b>            | <b>Audio and video file recording</b>                                                   |
| recording_sessions                | Number of active recording sessions                                                     |
| recording_threads                 | Recording threads count                                                                 |
| recording_thread_min_writers      | Minimal writers count per one thread                                                    |

|                                                               |                                                                        |
|---------------------------------------------------------------|------------------------------------------------------------------------|
| recording_thread_max_writers                                  | Maximal writers count per one thread                                   |
| recording_thread_average_writers                              | Average writers count per one thread                                   |
| recording_writers_list                                        | Active writers list                                                    |
| recording_writers_with_max_queue                              | Writers with maximum recording data queue size                         |
| recording_writers_with_min_queue                              | Writers with minimum recording data queue size                         |
| recording_min_writers_queue                                   | Minimal recording data queue size                                      |
| recording_average_writers_queue                               | Average recording data queue size                                      |
| recording_max_writers_queue                                   | Maximal recording data queue size                                      |
| <b>system_stats</b>                                           | <b>System parameters</b>                                               |
| system_java_cpu_usage                                         | "Recent CPU usage" for the entire system (obtained using Java methods) |
| system_java_load_average                                      | Average system load for the last minute (obtained using Java methods)  |
| system_uptime                                                 | Uptime since starting of the Linux server                              |
| system_memory_total                                           | Available RAM, in kilobytes                                            |
| system_memory_free                                            | Amount of physical RAM not used by the system, in kilobytes            |
| system_cpu_usage                                              | CPU time percentage used by the processes of the core                  |
| <b>network_stats</b>                                          | <b>Network traffic statistics</b>                                      |
| global_bandwidth_in                                           | Incoming connection channel bandwidth                                  |
| global_bandwidth_out                                          | Outgoing connection channel bandwidth                                  |
| <b>version_stats</b>                                          | <b>WCS version information</b>                                         |
| wcs_version                                                   | Current version of the WCS server                                      |
| wcs_client_version                                            | Current version of the Web SDK                                         |
| <b>gc_stats</b>                                               | <b>Last GC cycle information</b>                                       |
| gc_last_pause_ms                                              | Last GC pause, in milliseconds                                         |
| gc_last_duration_ms                                           | Last GC cycle duration, in milliseconds                                |
| gc_last_heap_before_mb                                        | Last heap used before GC                                               |
| gc_last_heap_after_mb                                         | Last heap used after GC                                                |
| <b>errors_info</b>                                            | <b>Error information (obtained based on caught Java exceptions)</b>    |
| <a href="#">java.io.IOException</a>                           | Number of IO errors                                                    |
| <a href="#">java.lang.ArrayIndexOutOfBoundsException</a>      | Number of array out of bounds errors                                   |
| <a href="#">java.lang.IllegalArgumentException</a>            | Number of invalid function argument errors                             |
| <a href="#">com.flashphoner.server.license.activation.A.C</a> | Number of errors while activating the license                          |
| <a href="#">java.lang.NullPointerException</a>                | Number of null pointer jump errors                                     |
| <a href="#">java.lang.OutOfMemoryError</a>                    | Number of memory allocation errors (server must be restarted)          |
| <b>degraded_streams_stats</b>                                 | <b>Degraded streams information</b>                                    |
| degraded_streams                                              | Degraded streams quantity                                              |
| degraded_streams_percent                                      | Degraded streams percentage of total number of streams on server       |
| <b>transcoding_stats</b>                                      | <b>Streams transcoding information</b>                                 |
| transcoding_video_decoding_resolutions                        | List of resolutions decoded in "resolution/streams count" form         |
| transcoding_video_decoding_average_time                       | Average decoding time in "resolution/time, ms" form                    |
| transcoding_video_decoding_max_time                           | Maximum decoding time in "resolution/time, ms" form                    |
| transcoding_video_decoding_average_queue_size                 | Average decoding queue size in "resolution/queue size" form            |

|                                               |                                                                                                       |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------|
| transcoding_video_decoding_max_queue_size     | Maximum decoding queue size in "resolution/queue size" form                                           |
| transcoding_video_encoding_resolutions        | List of resolutions encoded in "resolution/streams count" form                                        |
| transcoding_video_encoding_average_time       | Average encoding time in "resolution/time, ms" form                                                   |
| transcoding_video_encoding_max_time           | Maximum encoding time in "resolution/time, ms" form                                                   |
| transcoding_video_encoding_average_queue_size | Average encoding queue size in "resolution/queue size" form                                           |
| transcoding_video_encoding_max_queue_size     | Maximum encoding queue size in "resolution/queue size" form                                           |
| transcoding_video_decoding_load               | Integral decoding load value                                                                          |
| transcoding_video_encoding_load               | Integral encoding load value                                                                          |
| <b>buffer_output_stats</b>                    | <b>Pacer buffer usage information (JSON format only)</b>                                              |
| <b>cdn_stats</b>                              | <b>CDN information</b>                                                                                |
| cdn_version                                   | CDN version supported by server                                                                       |
| cdn_role                                      | Server role in CDN                                                                                    |
| cdn_group                                     | CDN group server belongs to                                                                           |
| <b>log_stats</b>                              | <b>Logging stats</b>                                                                                  |
| log_msg_per_sec                               | Logging messages written per second                                                                   |
| log_mbit_per_sec                              | Logging volume in megabits per second                                                                 |
| <b>tcp_channel_stats</b>                      | <b>TCP channel stats</b>                                                                              |
| channels_not_writable                         | TCP channels not writable events count, per stream                                                    |
| <b>jitter_buffer_stats</b>                    | <b>Jitter buffer stats for incoming media streams</b>                                                 |
| decodable_drops_old                           | H264 decodable frames dropped count, per stream                                                       |
| incomplete_drops_old                          | H264 incomplete frames dropped count, per stream                                                      |
| decodable_drops_reset                         | H264 decodable frames dropped before a new decoding point count, per stream                           |
| incomplete_drops_reset                        | H264 incomplete frames dropped before a new decoding point count, per stream                          |
| decodable_drops_pli                           | H264 decodable frames dropped on PLI receiving count, per stream                                      |
| incomplete_drops_pli                          | H264 incomplete frames dropped on PLI receiving count, per stream                                     |
| data_packets_with_empty_payload               | Data packets with empty payload sent to test a channel quality when TWCC is enabled count, per stream |
| <b>h264_depaketizer_stats</b>                 | <b>H264 depaketizer stats</b>                                                                         |
| missed_h264_units                             | Missed H264 units count, per stream                                                                   |
| <b>rtp_audio_player_stats</b>                 | <b>RTP audio player stats</b>                                                                         |
| dropped_audio_data_packets                    | Audio packets dropped before passing them to server engine, per stream                                |
| <b>custom_stats</b>                           | <b>Parameters collected with custom script</b>                                                        |

Every parameter can be requested separately, for example:

```
http://test.flashphoner.com:8081/?action=stat&params=native_resources
```

Load and resources usage information of the WCS server, combined by groups, can be requested by the group name (connections\_stats, streams\_stats, port\_stats, call\_stats, degraded\_streams\_stats, system\_stats, core\_stats are available)

```
http://test.flashphoner.com:8081/?action=stat&groups=call_stats
```

You can include several group names in the request

```
http://test.flashphoner.com:8081/?action=stat&groups=call_stats,connections_stats
```

System parameters can be excluded from full report using the following parameter in [flashphoner.properties](#) file:

```
parse_system_stats=false
```

## Statistics output formats

By default, statistics is shown as plain text

### Plain text statistics example

```
-----Connection Stats-----
connections=1
connections_rtmfp=0
connections_websocket=1
-----Port Stats-----
ports_media_free=495
ports_media_busy=4
ports_media_quarantine=0
-----Stream Stats-----
streams_webrtc_in=1
streams_webrtc_out=1
streams_websocket_out=0
streams_rtmfp_in=0
streams_rtmfp_out=0
streams_rtmp_in=0
streams_rtmp_out=0
streams_viewers=test/1
streams_rtsp_in=0
streams_rtsp_out=0
streams_rtmp_client_out=0
streams_play_rate=0
streams_stop_rate=0
-----Native Resources-----
native_resources=140537376620832, NENC:H264/FFMPEG, 1859;140537236444800, FFDecoderNative:H264/FFMPEG, 39404417
native_resources.audio_codecs=0
native_resources.audio_resamplers=0
native_resources.video_transcoders=0
native_resources.video_decoders=1
native_resources.video_encoders=1
native_resources.writers=0
-----Core Stats-----
core_java_threads=71
core_java_committedMemory=3127017472
core_java_freePhysicalMemorySize=69820416
core_java_arch=amd64
core_java_availableProcessors=2
core_java_freeSwapSpaceSize=1044369408
core_java_maxFileDescriptorCount=20000
core_java_open_file_descriptors=206
core_java_cpu_usage=39.88
core_java_totalPhysicalMemorySize=1927303168
core_java_totalSwapSpaceSize=1073737728
core_java_uptime=102191
-----Call Stats-----
sip_processed_calls=0
sip_calls_state=established/0;trying/0;ringing/0;ring/0;ring_media/0;hold/0;busy/0;finish/0;session_progress/0;
pending/0;failed/0
sip_calls=0
sip_calls_established=0
sip_calls_in=0
sip_calls_out=0
sip_calls_per_second=0.00
-----Sip Stats-----
sip_registered=0
-----Recording Stats-----
recording_sessions=0
-----System Stats-----
system_java_cpu_usage=75.00
system_java_load_average=0.87
-----Network Stats (Mbit/s)-----
global_bandwidth_in=0.000
global_bandwidth_out=0.000
-----Version info-----
wcs_version=5.2.416-32aab7dc90527bfe2ffb4711090fe75c6613a2bb
wcs_client_version=0.5.28.2753-9ba78705727d3ee9d75c1c10f488d21cd00a601c
-----Errors info-----
-----Degraded streams-----
degraded_streams=
degraded_streams_percent=0
```

Since build [5.2.416](#), JSON and Prometheus formats are supported. To get JSON statistics, set the format in request URI

```
curl -s 'http://localhost:8081/?action=stat&format=json'
```

#### Formatted JSON statistics example

```
{
  "connections_stats": {
    "connections": "1",
    "connections_rtmfp": "0",
    "connections_websocket": "1"
  },
  "port_stats": {
    "ports_media_free": "495",
    "ports_media_busy": "4",
    "ports_media_quarantine": "0"
  },
  "streams_stats": {
    "streams_webrtc_in": "1",
    "streams_webrtc_out": "1",
    "streams_websocket_out": "0",
    "streams_rtmfp_in": "0",
    "streams_rtmfp_out": "0",
    "streams_rtmp_in": "0",
    "streams_rtmp_out": "0",
    "streams_viewers": [
      "test/1"
    ],
    "streams_rtsp_in": "0",
    "streams_rtsp_out": "0",
    "streams_rtmp_client_out": "0",
    "streams_play_rate": "0",
    "streams_stop_rate": "0"
  },
  "native_resources": {
    "native_resources": [
      "140537376620832, NENC:H264/FFMPEG, 9819",
      "140537236444800, FFDecoderNative:H264/FFMPEG, 209561611"
    ],
    "native_resources.audio_codecs": "0",
    "native_resources.audio_resamplers": "0",
    "native_resources.video_transcoders": "0",
    "native_resources.video_decoders": "1",
    "native_resources.video_encoders": "1",
    "native_resources.writers": "0"
  },
  "core_stats": {
    "core_java_threads": "67",
    "core_java_committedMemory": "3127017472",
    "core_java_freePhysicalMemorySize": "73224192",
    "core_java_arch": "amd64",
    "core_java_availableProcessors": "2",
    "core_java_freeSwapSpaceSize": "1044107264",
    "core_java_maxFileDescriptorCount": "20000",
    "core_java_open_file_descriptors": "188",
    "core_java_cpu_usage": "37.19",
    "core_java_totalPhysicalMemorySize": "1927303168",
    "core_java_totalSwapSpaceSize": "1073737728",
    "core_java_uptime": "358833"
  },
  "call_stats": {
    "sip_processed_calls": "0",
    "sip_calls_state": [
      "established/0",
      "trying/0",
      "ringing/0",
      "ring/0",
      "ring_media/0",

```

```

    "hold/0",
    "busy/0",
    "finish/0",
    "session_progress/0",
    "pending/0",
    "failed/0"
  ],
  "sip_calls": "0",
  "sip_calls_established": "0",
  "sip_calls_in": "0",
  "sip_calls_out": "0",
  "sip_calls_per_second": "0.00"
},
"sip_stats": {
  "sip_registered": "0"
},
"recording_stats": {
  "recording_sessions": "0"
},
"system_stats": {
  "system_java_cpu_usage": "50.00",
  "system_java_load_average": "0.73"
},
"network_stats": {
  "global_bandwidth_in": "0.000",
  "global_bandwidth_out": "0.000"
},
"version_stats": {
  "wcs_version": "5.2.416-32aab7dc90527bfe2ffb4711090fe75c6613a2bb",
  "wcs_client_version": "0.5.28.2753-9ba78705727d3ee9d75c1c10f488d21cd00a601c"
},
"errors_info": {},
"degraded_streams_stats": {
  "degraded_streams": [],
  "degraded_streams_percent": "0"
}
}

```

To get Prometheus statistics, set the format in request URI

```
curl -s 'http://localhost:8081/?action=stat&format=prometheus'
```



## Prometheus statistics example

```
connections_stats{param="connections"} 1
connections_stats{param="connections_rtmfp"} 0
connections_stats{param="connections_websocket"} 1
port_stats{param="ports_media_free"} 495
port_stats{param="ports_media_busy"} 4
port_stats{param="ports_media_quarantine"} 0
streams_stats{param="streams_webrtc_in"} 1
streams_stats{param="streams_webrtc_out"} 1
streams_stats{param="streams_websocket_out"} 0
streams_stats{param="streams_rtmfp_in"} 0
streams_stats{param="streams_rtmfp_out"} 0
streams_stats{param="streams_rtmp_in"} 0
streams_stats{param="streams_rtmp_out"} 0
streams_stats{param="streams_viewers",name="test"} 1
streams_stats{param="streams_rtsp_in"} 0
streams_stats{param="streams_rtsp_out"} 0
streams_stats{param="streams_rtmp_client_out"} 0
streams_stats{param="streams_play_rate"} 0
streams_stats{param="streams_stop_rate"} 0
native_resources{param="native_resources",id="140537376620832",name="NENC:H264/FFMPEG"} 11129
native_resources{param="native_resources",id="140537236444800",name="FFDecoderNative:H264/FFMPEG"} 239113192
native_resources{param="native_resources.audio_codecs"} 0
native_resources{param="native_resources.audio_resamplers"} 0
native_resources{param="native_resources.video_transcoders"} 0
native_resources{param="native_resources.video_decoders"} 1
native_resources{param="native_resources.video_encoders"} 1
native_resources{param="native_resources.writers"} 0
core_stats{param="core_java_threads"} 63
core_stats{param="core_java_committedMemory"} 3127017472
core_stats{param="core_java_freePhysicalMemorySize"} 67538944
core_stats{param="core_java_arch="amd64"} 1
core_stats{param="core_java_availableProcessors"} 2
core_stats{param="core_java_freeSwapSpaceSize"} 1043853312
core_stats{param="core_java_maxFileDescriptorCount"} 20000
core_stats{param="core_java_open_file_descriptors"} 188
core_stats{param="core_java_cpu_usage"} 37.02
core_stats{param="core_java_totalPhysicalMemorySize"} 1927303168
core_stats{param="core_java_totalSwapSpaceSize"} 1073737728
core_stats{param="core_java_uptime"} 401113
call_stats{param="sip_processed_calls"} 0
call_stats{param="sip_calls_state",name="established"} 0
call_stats{param="sip_calls_state",name="trying"} 0
call_stats{param="sip_calls_state",name="ringing"} 0
call_stats{param="sip_calls_state",name="ring"} 0
call_stats{param="sip_calls_state",name="ring_media"} 0
call_stats{param="sip_calls_state",name="hold"} 0
call_stats{param="sip_calls_state",name="busy"} 0
call_stats{param="sip_calls_state",name="finish"} 0
call_stats{param="sip_calls_state",name="session_progress"} 0
call_stats{param="sip_calls_state",name="pending"} 0
call_stats{param="sip_calls_state",name="failed"} 0
call_stats{param="sip_calls"} 0
call_stats{param="sip_calls_established"} 0
call_stats{param="sip_calls_in"} 0
call_stats{param="sip_calls_out"} 0
call_stats{param="sip_calls_per_second"} 0.00
sip_stats{param="sip_registered"} 0
recording_stats{param="recording_sessions"} 0
system_stats{param="system_java_cpu_usage"} 66.67
system_stats{param="system_java_load_average"} 0.84
network_stats{param="global_bandwidth_in"} 0.000
network_stats{param="global_bandwidth_out"} 0.000
version_stats{wcs_version="5.2.416-32aab7dc90527bfe2ffb4711090fe75c6613a2bb"} 1
version_stats{wcs_client_version="0.5.28.2753-9ba78705727d3ee9d75c1c10f488d21cd00a601c"} 1
degraded_streams_stats{param="degraded_streams"} 0
degraded_streams_stats{param="degraded_streams_percent"} 0
```

# Stream transcoding statistics

Since build [5.2.443](#) brief or detailed stream transcoding statistics can be shown. The brief stream transcoding information is grouped by stream resolutions and is available in all the formats, for example:

```
-----Transcoding info-----
transcoding_video_decoding_resolutions=640x360/1
transcoding_video_decoding_average_time=640x360/2.0
transcoding_video_decoding_max_time=640x360/2
transcoding_video_decoding_average_queue_size=640x360/0.0
transcoding_video_decoding_max_queue_size=640x360/0
transcoding_video_encoding_resolutions=426x240/1;640x360/1;852x480/1
transcoding_video_encoding_average_time=426x240/2.0;640x360/2.0;852x480/6.0
transcoding_video_encoding_max_time=426x240/2;640x360/2;852x480/6
transcoding_video_encoding_average_queue_size=426x240/0.0;640x360/0.0;852x480/0.0
transcoding_video_encoding_max_queue_size=426x240/0;640x360/0;852x480/0
```

Here the following parameters are shown:

- resolution of decoded and encoded streams and their count
- average and maximum time of decoding and encoding per resolution
- average and maximum decoding and encoding queue size per resolution

The detailed stream transcoding information is available in JSON format only

```
curl -s 'http://localhost:8081/?action=stat&format=json&groups=transcoding_stats' | jq
```

and is grouped by streams published

```
{
  "transcoding_video_full_info": {
    "test1": {
      "codec": "H264",
      "queueSize": 0,
      "distributors": [
        {
          "codec": "H264",
          "queueSize": 0,
          "resolution": "426x240",
          "averageProcessingTime": 3
        },
        {
          "codec": "H264",
          "queueSize": 0,
          "resolution": "640x360",
          "averageProcessingTime": 5
        },
        {
          "codec": "H264",
          "queueSize": 0,
          "resolution": "852x480",
          "averageProcessingTime": 10
        }
      ],
      "resolution": "640x360",
      "averageProcessingTime": 3
    }
  }
}
```

Where:

- codec - stream codec
- queueSize - stream queue size
- resolution - stream resolution
- averageProcessingTime - average decoding or encoding time
- distributors - streams encoding parameters (for output streams)

# Integral transcoding load values

Since build [5.2.570](#) the integral values of transcoding load were added to transcoding statistics section

```
-----Transcoding info-----
...
transcoding_video_decoding_load=22118400
...
transcoding_video_encoding_load=7983360
```

The decoding integral load is calculated as follows

```
transcoding_video_decoding_load = width * height * fps
```

Where

- width - incoming stream width
- height - incoming stream height
- fps - incoming stream FPS

The encoding integral load is calculated as follows

```
transcoding_video_encoding_load = width * height * fps
```

Where

- width - encoding stream width according to profile
- height - encoding stream height according to profile
- fps - stream FPS set by transcoding profile, or incoming (source) stream FPS

## CDN information

Since build [5.2.471](#) CDN statistics output was added for server participating in CDN

```
curl -s 'http://localhost:8081/?action=stat&groups=cdn_stats'
```

```
-----CDN info-----
cdn_version=2.3
cdn_role=ORIGIN
cdn_group=
```

Where:

- cdn\_version - CDN version supported by server
- cdn\_role - server role in CDN
- cdn\_group - CDN group the server belongs to, or empty string if server is not belong to any group

## Streams published synchronization

Since build [5.2.508](#) audio and video synchronization information for streams published is added to stream statistics:

```
-----Stream Stats-----
streams_synchronization=stream1/90,stream2/-11
```

Synchronization metric value is calculated as difference between current audio and video synchronization values:

```
var metric = lastAudioSync - lastVideoSync;
```

Therefore, a positive metric value means audio is currently ahead of video, and negative means audio is currently behind video.

This metric normally changes within small limits. If synchronization metric for the stream remains high with constant sign, it means some problem with stream publishing.

## Published streams metrics

Since build [5.2.518](#), [metrics](#) of published streams can be requested in Prometheus format by the following query

```
curl -s 'http://localhost:8081/?action=stat&format=prometheus&groups=publish_streams'
```

The query returns a list of metrics per every stream published on server

```
publish_streams{param="AUDIO_SYNC",name="test"} 3834464913756
publish_streams{param="AUDIO_CODEC",name="test"} 111
publish_streams{param="AUDIO_RATE",name="test"} 19192
publish_streams{param="AUDIO_LOST",name="test"} 0
publish_streams{param="VIDEO_SYNC",name="test"} 3834464913764
publish_streams{param="VIDEO_K_FRAMES",name="test"} 6
publish_streams{param="VIDEO_NACK",name="test"} 0
publish_streams{param="VIDEO_LOST",name="test"} 0
publish_streams{param="VIDEO_CODEC",name="test"} 119
publish_streams{param="VIDEO_B_FRAMES",name="test"} 0
publish_streams{param="VIDEO_PLI",name="test"} 0
publish_streams{param="VIDEO_RATE",name="test"} 377952
publish_streams{param="VIDEO_WIDTH",name="test"} 640
publish_streams{param="VIDEO_GOP_SIZE",name="test"} 60
publish_streams{param="VIDEO_HEIGHT",name="test"} 360
publish_streams{param="VIDEO_FPS",name="test"} 27
publish_streams{param="VIDEO_P_FRAMES",name="test"} 342
```

If there are no publications on server, the query returns an empty page.

## Pacer buffer usage information

Since build [5.2.543](#) pacer buffer usage information for transcoder output streams is added. The information is available by the following query in JSON format only

```
curl -s 'http://localhost:8081/?action=stat&format=json&groups=buffer_stats'
```

Statistics data are grouped by streams transcoded and subscribers

```
{
  "buffer_stats": {
    "buffer_output_info": {
      "test": {
        "buffer_output_video_average": "0.0",
        "subscribers": {
          "25b94cd0-5eaf-11ea-a9b7-abda8d208547": {
            "overflows": 0,
            "buffer_output_audio": 4,
            "buffer_output_video": 0
          },
          ...
        },
        "buffer_output_audio_average": "4.0"
      }
    }
  }
}
```

Where

- `buffer_output_audio_average` - audio frames in buffer average count by all subscribers
- `buffer_output_video_average` - videoframes in buffer average count by all subscribers

- `buffer_output_audio` - audio frames in buffer count for the subscriber
- `buffer_output_video` - video frames in buffer count for the subscriber
- `overflows` - buffer overflows count, the buffer is cleared after each overflow

## Parameters collected with custom script

Since build [5.2.579](#) it is possible to collect statistics data unavailable from within JVM using an external custom script.

Script name should be set by the following parameter

```
custom_stats_script=/path/to/custom_stats.sh
```

By default, if script name only is specified, the script should be placed to `/usr/local/FlashphonerWebCallServer/bin` folder

The script should return parameters as follows

```
key1=value1
key2=value2
...
```

The script example returning Java version and last line from GC log

```
#!/bin/bash

ver=$(java -version 2>&1 | grep "version" | cut -d" " -f 3 | sed 's/\\/g')
echo "java_ver=$ver"
gc_log=$(ls -t /usr/local/FlashphonerWebCallServer/logs/gc-core* | head -1)
echo "gc=$(tail -n1 $gc_log)"

exit 0
```

This script will add to the statistics page the following data

```
-----Custom info-----
java_ver=1.8.0_222
gc=2020-04-23T15:20:56.138+0700: 1546.835: [GC (Allocation Failure) 2020-04-23T15:20:56.138+0700: 1546.835:
[ParNew: 8978K->325K(9216K), 0.0103299 secs] 26379K->18056K(36172K), 0.0104582 secs] [Times: user
```

Parameters returned by the script are available in all statistics formats. In Prometheus format, key and value will be converted to label:

```
custom_stats{java_ver="1.8.0_222"} 1
custom_stats{gc="2020-04-23T15:11:11.235+0700: 961.933: [GC (Allocation Failure) 2020-04-23T15:11:11.235+0700:
961.933: [ParNew: 9216K->793K(9216K), 0.0042971 secs] 26617K->18195K(36172K), 0.0044029 secs] [Times: user"] 1
```

## Known limits

1. It is not allowed to use pauses, long or high load operations in the script because this adds more latency to statistics output.
2. It is not allowed to use any quotes in keys and values to conform to Prometheus format. For example, the following value may not be used

```
java_ver=openjdk version "1.8.0_222"
```

and following may

```
java_ver=1.8.0_222
```

## Java VM errors information receiving

Since build [5.2.769](#) it is possible to get information about certain Java VM errors (exceptions) count with the following query

```
http://localhost:8081/?action=stat&params=wcs_errors,<exception class name>
```

For example, the following query should be periodically made to control physical memory lack

```
http://localhost:8081/?action=stat&params=wcs_errors,java.lang.OutOfMemoryError
```

If response contains the exception, and the count is equal or more than 1

```
-----Errors info-----  
java.lang.OutOfMemoryError=4
```

all the clients should be immediately disconnected and the server must be restarted.

## Garbage collector (GC) statistics

Since build [5.2.897](#) it is possible to get garbage collector statistics

```
http://localhost:8081/?action=stat&groups=gc_stats
```

The statistics data include the following last GC cycle parameters at the request moment:

```
-----Gc info-----  
gc_last_pause_ms=62  
gc_last_duration_ms=62  
gc_last_heap_before_mb=315  
gc_last_heap_after_mb=78
```

Where:

- gc\_last\_pause\_ms - GC pause in milliseconds
- gc\_last\_duration\_ms - GC cycle duration in milliseconds
- gc\_last\_heap\_before\_mb - heap size before GC in Mb
- gc\_last\_heap\_after\_mb - heap size after GC in Mb

The data are collected from corresponding Java MX Beans.

## ZGC statistics collection

For ZGC, GC statistics data are collected from GC logs because Java MX Beans may return incorrect information. Therefore the following parameter should be set if ZGC is used

```
zgc_log_parser_enable=true
```

It is also may be necessary to set timestamps format in logs. By default, the full format with date is used

```
zgc_log_time_format=yyyy-MM-dd'T'HH:mm:ss.SSSZ
```

If only seconds from JVM start is used, the format should be set as

```
zgc_log_time_format=ss.SSS
```

If necessary, a template to find ZGC logs may be defined. By default, a file name supposed to include date and time

```
zgc_log_parser_path=logs/gc-core-[0-9]{4}-[0-9]{2}-[0-9]{2}-[0-9]{2}-[0-9]{2}.log
```

# Video recording statistics

Since build [5.2.992](#) it is possible to get video recording statistics, for example

```
-----Recording Stats-----
recording_sessions=10
recording_threads=8
recording_thread_min_writers=1
recording_thread_max_writers=2
recording_thread_average_writers=1
recording_writers_list=95c8f5d3/1;3881dab6/1;545e59b8/1;54e7a01c/1;06de077d/1;b71fa871/1;193aa3bb/1;91219b12/1;
c314201c/1;6f5241be/1
recording_writers_with_max_queue=95c8f5d3/3;545e59b8/3;06de077d/4;b71fa871/5;193aa3bb/5;91219b12/1;c314201c/7;
6f5241be/3
recording_writers_with_min_queue=95c8f5d3/3;545e59b8/3;06de077d/4;b71fa871/5;193aa3bb/5;91219b12/1;c314201c/7;
6f5241be/3
recording_min_writers_queue=1
recording_average_writers_queue=4
recording_max_writers_queue=7
```

The following are displayed:

- CPU threads count used to write data to disk
- active writers count
- writers count per CPU thread
- recording data queue sizes

For exampl, if recording data queue sizes monotonically grow, and CPU load is relatively low (below 25%), this means the data cannot be flushed to disk. If CPU load is high, and queues grow, this means CPU capabilities are not enough to transcode audio or video for recording.

The detailed recording statistics can be received in JSON format

```
http://localhost:8081/?action=stat&format=json&groups=recording_stats
```

```
{
  "recording_stats": {
    "recording_sessions": "10",
    "recording_threads": "8",
    "recording_thread_min_writers": "1",
    "recording_thread_max_writers": "2",
    "recording_thread_average_writers": "1",
    "recording_writers_list": [
      "95c8f5d3",
      "3881dab6",
      "545e59b8",
      "54e7a01c",
      "06de077d",
      "b71fa871",
      "193aa3bb",
      "91219b12",
      "c314201c",
      "6f5241be"
    ],
    ...
  },
  "recording_full_info": [
    {
      "threadId": 109,
      "writersCount": 2,
      "usageCounter": 2,
      "writersInfo": [
        {
          "queueSize": 0,
          "streams": [
            "95c8f5d3"
          ]
        },
        {
          "queueSize": 0,
          "streams": [
            "3881dab6"
          ]
        }
      ]
    },
    ...
  ]
}
```

Where:

- queueSize - current recording data queue size
- streams - recording streams list
- threadId - CPU thread Id which is writing data to disk
- writersCount - writers count per CPU thread
- usageCounter - CPU thread usages count

## Logging statistics

Since build [5.2.1210](#) it is possible to get logging statistics, that may be useful on the server under high load

```
curl -s 'http://localhost:8081/?action=stat&groups=log_stats'
```

Logging statistics collection may increase CPU load if there are many media streams on the server. Therefore since build [5.2.1252](#) logging statistics collection is disabled by default, and may be enabled with the following parameter

```
log_metrics_stats=true
```

The following parameters are measured



```
-----Logger info-----
log_msg_per_sec=0.30
log_mbit_per_sec=0.00
```

- log\_msg\_per\_sec - logging messages count (all logs) per second
- log\_mbit\_per\_sec - logging volume (all logs) in megabits per second

For example, statistics is buffered on 10 seconds interval. If there is no any message logged during this interval, the statistic values are cleaned. The interval can be set by the following parameter

```
log_metrics_time_buffer=10000
```

The interval cannot be set less than 1 second, the default value will be used in such case.

## Incoming stream statistics

Since build [5.2.1257](#) a certain incoming stream statistics can be collected

```
curl -s "http://localhost:8081/?action=stat&format=json&groups=transcoding_stats" | jq '.[].transcoding_video_full_info'
```

The statistics is available in JSON format only and includes the following parameters

```
{
  "test": {
    "codec": "H264",
    "queueSize": 0,
    "distributors": {
      ...
    },
    "minDeltaArrivalTime": 1,
    "maxDeltaArrivalTime": 62,
    ...,
    "streamDelay": 38
  }
}
```

- stream name
- codec - publishing codec
- queueSize - decoding queue size
- distributors - subscribers statistics
- minDeltaArrivalTime - a minimal time between two subsequent packets receiving, ms
- maxDeltaArrivalTime - a maximal time between two subsequent packets receiving, ms
- streamDelay - stream delay, ms

Packets receiving time statistics is collected on time interval set by the following parameter in milliseconds

```
media_processor_incoming_stat_window=30000
```

## TCP channel statistics

Since build [5.2.1883](#) a TCP channel level statistics may be collected

```
curl -s "http://localhost:8081/?action=stat&groups=tcp_channel_stats"
```

The statistics contains the following parameters

```
-----Tcp channel info-----
channels_not_writable=
```

- `channels_not_writable` - TCP channels not writable events count, per mediasession

The statistics is displayed for currently published streams only.

## Jitter buffer stats for incoming media streams

Since build [5.2.1883](#) a jitter buffer statistics may be collected

```
curl -s "http://localhost:8081/?action=stat&groups=jitter_buffer_stats"
```

The statistics contains the following parameters

```
-----JitterBuffer info-----
decodable_drops_old=
incomplete_drops_old=f49f8cb0-dc52-11ee-81df-51ad589334c0/7;
decodable_drops_reset=
incomplete_drops_reset=
decodable_drops_pli=
incomplete_drops_pli=f49f8cb0-dc52-11ee-81df-51ad589334c0/10;
data_packets_with_empty_payload=
```

- `decodable_drops_old` - H264 decodable frames dropped count, per mediasession
- `incomplete_drops_old` - H264 incomplete frames dropped count, per mediasession
- `decodable_drops_reset` - H264 decodable frames dropped before a new decoding point count, per mediasession
- `incomplete_drops_reset` - H264 incomplete frames dropped before a new decoding point count, per mediasession
- `decodable_drops_pli` - H264 decodable frames dropped on PLI receiving count, per mediasession
- `incomplete_drops_pli` - H264 incomplete frames dropped on PLI receiving count, per mediasession
- `data_packets_with_empty_payload` - data packets with empty payload sent to test a channel quality when TWCC is enabled count, per mediasession

The statistics is displayed for currently published streams only.

## H264 depacketizer statistics

Since build [5.2.1883](#) an H264 depacketizer statistics may be collected

```
curl -s "http://localhost:8081/?action=stat&groups=h264_depacketizer_stats"
```

The statistics contains the following parameters

```
-----H264 RTPDepacketizer info-----
missed_h264_units=f49f8cb0-dc52-11ee-81df-51ad589334c0/443;
```

- `missed_h264_units` - missed H264 units count, per mediasession

The statistics is displayed for currently published streams only.

## RTP audio player statistics

Since build [5.2.1923](#) an RTP audio player statistics may be collected

```
curl -s "http://localhost:8081/?action=stat&groups=rtp_audio_player_stats"
```

The statistics contains the following parameters

```
-----RtpAudioPlayer info-----
dropped_audio_data_packets=
```

- `dropped_audio_data_packets` - audio packets dropped before passing them to server engine, per mediasession

The statistics is displayed for currently published streams only.