



Monitoring Metrics

Kingdee Apusic Application Server V10 Standard Edition

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1 Prometheus Monitoring

After Prometheus monitoring is enabled, access `/aas-console/metrics` to view the Prometheus monitoring metrics. Minor differences may exist across different JDK versions.

Item	Value
Total metrics	110
Type	All of Gauge type
Data format	Prometheus Text Format
Example data source	127.0.0.1

1.1 JVM Buffer Pools

Contains 3 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
jvm_buffer_pool_used_bytes	Bytes used by JVM buffer pool	host="127.0.0.1", jvm_buffer_pool="direct"	1001345.0	Bytes
jvm_buffer_pool_capacity_bytes	Total capacity of JVM buffer pool (bytes)	host="127.0.0.1", jvm_buffer_pool="direct"	1001345.0	Bytes
jvm_buffer_pool_used_buffers	Number of buffers used in JVM buffer pool	host="127.0.0.1", jvm_buffer_pool="direct"	29.0	—

1.2 JVM Class Loading

Contains 3 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
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jvm_classes_total_loaded	Total number of classes loaded since JVM startup	host="127.0.0.1"	15204.0	count
jvm_classes_loaded	Number of classes currently loaded in JVM	host="127.0.0.1"	15204.0	count
jvm_classes_unloaded	Total number of classes unloaded in JVM	host="127.0.0.1"	0.0	count

1.3 JVM Threads

Contains 4 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
jvm_threads_current	Current number of active threads in JVM	host="127.0.0.1"	80.0	—
jvm_threads_daemon	Current number of daemon threads in JVM	host="127.0.0.1"	73.0	—
jvm_threads_peak	Historical peak number of threads in JVM	host="127.0.0.1"	80.0	—
jvm_threads_total_started	Total number of threads started in JVM	host="127.0.0.1"	83.0	—

1.4 JVM GC

Contains 4 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
jvm_gc_collection_number	Total number of JVM garbage collections	gc_type="PS Scavenge", host="127.0.0.1"	10.0	—
jvm_gc_collection_time_seconds	Cumulative time spent in JVM garbage collection (seconds)	gc_type="PS Scavenge", host="127.0.0.1"	0.334	seconds

full_gc_mount	Number of Full GCs in the last minute	time="60s", host="127.0.0.1"	0.0	—
longest_full_gc	Longest Full GC duration in the last minute (seconds)	time="60s", host="127.0.0.1"	0.0	—

1.5 JVM Memory

Contains 5 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
jvm_memory_bytes_used	Bytes used in JVM memory area	area="heap", host="127.0.0.1"	7.27379392E8	Bytes
jvm_memory_bytes_committed	Bytes committed in JVM memory area	area="heap", host="127.0.0.1"	2.197815296E9	Bytes
jvm_memory_bytes_max	Maximum available bytes in JVM memory area	area="heap", host="127.0.0.1"	3.817865216E9	Bytes
jvm_memory_bytes_init	Initial bytes of JVM memory area	area="heap", host="127.0.0.1"	1.073741824E9	Bytes
jvm_memory_bytes_usage	JVM memory usage ratio (used/max)	area="heap", host="127.0.0.1"	0.19051992431573572	%

1.6 JVM Memory Pools

Contains 4 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
jvm_memory_pool_bytes_used	Bytes used in JVM memory pool	jvm_memory_pool="Metaspace", host="127.0.0.1"	8.8256296E7	Bytes
jvm_memory_pool_bytes_committed	Bytes committed in JVM memory pool	jvm_memory_pool="Metaspace", host="127.0.0.1"	9.2798976E7	Bytes

jvm_memory_pool_bytes_max	Maximum available bytes in JVM memory pool	jvm_memory_pool="Metaspace", host="127.0.0.1"	-1.0	Bytes
jvm_memory_pool_bytes_init	Initial bytes of JVM memory pool	jvm_memory_pool="Metaspace", host="127.0.0.1"	0.0	Bytes

1.7 JVM Compiler

Contains 4 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
jvm_compiler_name	JVM compiler name	name="HotSpot 64-Bit Tiered Compilers"	0.0	—
jvm_compile_time	Maximum increment of JIT compilation time	host="127.0.0.1"	0.0	seconds
jvm_total_cpu_time	Cumulative CPU time used by JVM	host="127.0.0.1"	114625.0	—
jvm_compile_cpu_usage	Maximum JIT compilation CPU usage (%)	host="127.0.0.1"	0.0	%

1.8 JVM Runtime Information

Contains 1 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
jvm_info	JVM runtime information	version="1.8", vendor="Oracle Corporation", class_path="C:\\apusic\\AAS\\bin\\bootstrap.jar;C:\\apusic\\AAS\\bin\\aas-juli.jar", library_path	1.0	—

```
= "D:\\tools\\jdk8u312-b07\\bin;C:\\WINDOWS\\System32\\Windows;D:\\tools\\jdk8u312-b07\\bin;D:\\tools\\jdk8u312-b07\\bin;D:\\tools\\Git\\bin;D:\\tools\\jdk-21.0.3+9\\bin;D:\\java_software\\apache-ant-1.10.5\\bin;C:\\WINDOWS\\system32;C:\\WINDOWS\\System32\\Wbem;C:\\WINDOWS\\System32\\WindowsPowerShell\\v1.0\\;D:\\java_software\\maven\\apache-maven-3.6.0\\bin;C:\\Program Files\\TortoiseSVN\\bin;C:\\Program Files\\MySQL\\MySQL Server 5.5\\bin;C:\\Program Files (x86)\\Microsoft SQL Server\\80\\Tools\\Binn\\;C:\\Program Files\\Microsoft SQL Server\\90\\Tools\\binn\\;C:\\Program Files (x86)\\Microsoft SQL Server\\90\\Tools\\binn\\;D:\\tools\\putty\\;D:\\tools\\Git\\cmd;C:\\W
```

		INDOWS\\System 32\\OpenSSH\\; D:\\tools\\nodejs \\;D:\\tools\\pyth on\\Scripts\\;D:\\t ools\\python\\; C:\\Users\\test\\A ppData\\Local\\Pr ograms\\Python \\Launcher\\;C:\\P rogram Files (x86) \\Nmap;C:\\Users \\test\\AppData \\Local\\Pandoc\\; C:\\Users\\test\\A ppData\\Local\\M icrosoft\\Windows Apps;C:\\Users\\t est\\AppData\\Ro aming\\npm;."		
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1.9 Process and System Resources

Contains 11 metrics, all of Gauge type.

Metric	Description	Labels (with exam ple values)	Example Value	Unit
system_cpu_load	System CPU usage (%)	host="127.0.0.1"	11.0170232696751 3	%
process_cpu_load	Process CPU usage (%)	host="127.0.0.1"	0.8264974947206 318	%
committed_virtual_memo ry_size_bytes	Committed virtual mem ory in bytes	host="127.0.0.1"	2.677968896E9	Bytes
physical_memory_total_ size_bytes	Total physical memory i n bytes	host="127.0.0.1"	3.4359201792E10	Bytes
free_physical_memory_s ize_bytes	Free physical memory i n bytes	host="127.0.0.1"	1.3653409792E10	Bytes

swap_space_total_size_bytes	Total swap space in bytes	host="127.0.0.1"	4.2949136384E10	Bytes
free_swap_space_size_bytes	Free swap space in bytes	host="127.0.0.1"	1.2342001664E10	Bytes
system_cpu_core_num	Number of CPU cores	host="127.0.0.1"	16.0	—
system_open_file_descriptor_count	Number of open file descriptors	host="127.0.0.1"	0.0	count
system_start_runtime_seconds	System start time (millisecond timestamp)	host="127.0.0.1"	1.787215459261E12	seconds
process_start_time_seconds	Process start time (seconds since Unix epoch)	—		seconds

1.10 HTTP Thread Pool

Contains 19 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
thread_pool_max_queue_size	Maximum queue capacity; -1 means unlimited	host="127.0.0.1", service_name="admin-service", thread_pool_name="admin-thread-pool"	5000.0	—
thread_pool_queue_size	Used queue capacity	host="127.0.0.1", service_name="admin-service", thread_pool_name="admin-thread-pool"	0.0	—
thread_pool_idle_thread_timeout_seconds	Maximum time (milliseconds) a thread can remain idle in the pool before being removed	host="127.0.0.1", service_name="admin-service", thread_pool_name="admin-thread-pool"	60000.0	milliseconds
thread_pool_min_thread_pool_size	Minimum number of threads in the thread pool	host="127.0.0.1", service_name="ad	25.0	—

		min-service", thread_pool_name="admin-thread-pool"		
thread_pool_max_thread_pool_size	Maximum number of threads in the thread pool	host="127.0.0.1", service_name="admin-service", thread_pool_name="admin-thread-pool"	100.0	—
thread_pool_active_count	Current number of active threads	host="127.0.0.1", service_name="admin-service", thread_pool_name="admin-thread-pool"	1.0	count
thread_pool_blocked_count	Current number of blocked threads	host="127.0.0.1", service_name="admin-service", thread_pool_name="admin-thread-pool"	0.0	count
thread_pool_pool_size	Current total number of threads in the thread pool	host="127.0.0.1", service_name="admin-service", thread_pool_name="admin-thread-pool"	25.0	—
thread_pool_pool_usage	Thread pool usage (active threads/max threads)	host="127.0.0.1", service_name="admin-service", thread_pool_name="admin-thread-pool"	0.01	%
thread_pool_step_reclaim	Whether stepped thread reclamation is enabled (0: disabled, 1: enabled)	host="127.0.0.1", service_name="admin-service", thread_pool_name="admin-thread-pool"	0.0	—
thread_pool_step_time	Time interval of stepped thread reclamation	host="127.0.0.1", service_name="admin-service", thread	10000.0	—

		ad_pool_name="ad min-thread-pool"		
thread_pool_step_size	Number of threads reclaimed per step in stepped thread reclamation	host="127.0.0.1", service_name="admin-service", thread_pool_name="admin-thread-pool"	20.0	—
thread_pool_connection_count	Number of HTTP connections	host="127.0.0.1", service_name="admin-service", http_connection_pool="\https-jsse-nio-6848\"	2.0	count
thread_pool_connection_max_connections	Maximum number of HTTP connections	host="127.0.0.1", service_name="admin-service", http_connection_pool="\https-jsse-nio-6848\"	10000.0	—
thread_pool_connection_usage	HTTP connection usage	host="127.0.0.1", service_name="admin-service", http_connection_pool="\https-jsse-nio-6848\"	2.0E-4	%
thread_pool_connection_keepalive_count	Number of keep-alive HTTP connections	host="127.0.0.1", service_name="admin-service", http_connection_pool="\https-jsse-nio-6848\"	1.0	count
thread_pool_connection_max_keepalive_requests	Maximum number of keep-alive HTTP requests	host="127.0.0.1", service_name="admin-service", http_connection_pool="\https-jsse-nio-6848\"	100.0	—

thread_pool_connection _current_thread_count	Current number of threads	host="127.0.0.1", service_name="admin-service", http_connection_pool="\https-jsse-nio-6848\"	25.0	count
thread_pool_connection _current_thread_busy	Current number of threads processing requests	host="127.0.0.1", service_name="admin-service", http_connection_pool="\https-jsse-nio-6848\"	1.0	—

1.11 JDBC Connection Pool

Contains 16 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
jdbc_resource_connection_leak_timeout_in_seconds	Connection leak timeout; -1 means no connection leak detection	jdbcpool="test", host="127.0.0.1"	60000.0	seconds
jdbc_resource_idle_timeout_in_seconds	Idle timeout; the maximum time a connection can remain idle in the pool. -1 means idle connections are not validated	jdbcpool="test", host="127.0.0.1"	60000.0	seconds
jdbc_resource_max_pool_size	Maximum pool size	jdbcpool="test", host="127.0.0.1"	20.0	—
jdbc_resource_max_idle_size	Maximum number of idle connections in the pool	jdbcpool="test", host="127.0.0.1"	10.0	—
jdbc_resource_max_wait_time_in_millis	Maximum wait time, in milliseconds	jdbcpool="test", host="127.0.0.1"	15000.0	—
jdbc_resource_steady_pool_size	Initial and minimum pool size	jdbcpool="test", host="127.0.0.1"	10.0	—

jdbc_resource_min_idle_size	Minimum number of idle connections in the pool	jdbc_pool="test", host="127.0.0.1"	4.0	—
jdbc_resource_validate_atmost_once_period_in_seconds	Connection validation interval; specifies the time interval (seconds) between consecutive connection validations (at most once). Default value is -1, meaning this property is not enabled	jdbc_pool="test", host="127.0.0.1"	3.0	seconds
jdbc_resource_num_conn_free	Number of available connections	jdbc_pool="test", host="127.0.0.1"	20.0	—
jdbc_resource_num_conn_active	Number of active connections	jdbc_pool="test", host="127.0.0.1"	0.0	—
jdbc_resource_num_conn_free_usage	Connection availability ratio	jdbc_pool="test", host="127.0.0.1"	1.0	%
jdbc_resource_num_conn_usage	Connection usage ratio	jdbc_pool="test", host="127.0.0.1"	0.0	%
jdbc_resource_num_conn_total	Current number of connections	jdbc_pool="test", host="127.0.0.1"	4.0	—
jdbc_resource_num_conn_detect	Number of detection connections	jdbc_pool="test", host="127.0.0.1"	0.0	—
jdbc_resource_num_conn_wait	Number of waiting connections	jdbc_pool="test", host="127.0.0.1"	0.0	—
jdbc_resource_num_conn_suspend_leak	Number of suspected leaks	jdbc_pool="test", host="127.0.0.1"	0.0	—

1.12 Web Service - Servlet

Contains 8 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
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web_service_servlet_available	Date and time when the Servlet is available (milliseconds); 0 means available, Long.MAX_VALUE means permanently unavailable	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	0.0	—
web_service_servlet_class_load_time	Time spent loading the class (ms)	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	3.0	ms
web_service_servlet_error_count	Error count (cumulative number of response codes ≥ 400)	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	0.0	count
web_service_servlet_load_time	Time spent loading and initializing the Servlet (ms)	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	4.0	ms
web_service_servlet_max_time	Longest request response time (ms)	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	0.0	—
web_service_servlet_min_time	Shortest request response time (ms)	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	0.0	—

web_service_servlet_processing_time	Cumulative Servlet processing time (ms)	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	0.0	—
web_service_servlet_request_time	Cumulative number of requests processed so far	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	0.0	—

1.13 Web Service - Requests

Contains 14 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
slow_requests_in_the_last_ten_minutes	Number of slow requests in the last ten minutes	processor="http-nio-6888"	0.0	—
long_request_count	Slow request (long thread) statistics	processor="http-nio-6888"	0.0	count
request_count	Request count statistics	processor="http-nio-6888"	0.0	count
error_count	Request error statistics	processor="http-nio-6888"	0.0	count
max_time	Longest request processing time statistics	processor="http-nio-6888"	0.0	—
slow_query_count	Slow SQL request statistics	—		count
web_service_request_count	Cumulative number of requests processed so far	host="127.0.0.1", service_name="ams-service", endpoint_name="http-nio-6888"	0.0	count

web_service_request_error_count	Cumulative error count (response codes ≥ 400)	host="127.0.0.1", service_name="ams-service", endpoint_name="http-nio-6888"	0.0	count
web_service_processing_time	Cumulative request processing time (milliseconds)	host="127.0.0.1", service_name="ams-service", endpoint_name="http-nio-6888"	0.0	—
web_service_request_max_time	Longest request response time (milliseconds)	host="127.0.0.1", service_name="ams-service", endpoint_name="http-nio-6888"	0.0	—
web_service_request_slow_request_count	Current number of slow requests	host="127.0.0.1", service_name="ams-service", endpoint_name="http-nio-6888"	0.0	count
web_service_request_slow_request_total_count	Total number of slow requests historically occurred	host="127.0.0.1", service_name="ams-service", endpoint_name="http-nio-6888"	0.0	count
web_service_request_bytes_send	Number of bytes sent in requests	host="127.0.0.1", service_name="ams-service", endpoint_name="http-nio-6888"	0.0	—
web_service_request_bytes_received	Number of bytes received in requests	host="127.0.0.1", service_name="ams-service", endpoint_name="http-nio-6888"	0.0	—

1.14 Web Service - Session

Contains 9 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
<code>web_service_session_active</code>	Current number of active Sessions	<code>host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"</code>	0.0	—
<code>web_service_session_expired_total</code>	Total number of expired Sessions	<code>host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"</code>	0.0	—
<code>web_service_session_rejected_total</code>	Total number of Sessions rejected from creation	<code>host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"</code>	0.0	—
<code>web_service_session_passivated_sessions</code>	Total number of passivated Sessions	<code>host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"</code>	0.0	—
<code>web_service_session_create_rate</code>	Session creation rate (sessions/second)	<code>host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"</code>	0.0	—
<code>web_service_session_expire_rate</code>	Session expiration rate (sessions/second)	<code>host="127.0.0.1", service_name="admin-service", virtual_host_name="a</code>	0.0	—

		dmin", context_path="aas-console"		
web_service_session_max_active	Historical maximum number of active Sessions	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	0.0	—
web_service_session_processing_time	Session processing time (milliseconds)	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	0.0	—
web_service_session_session_counter	Cumulative number of Sessions so far	host="127.0.0.1", service_name="admin-service", virtual_host_name="admin", context_path="aas-console"	0.0	count

1.15 Web Service - JSP

Contains 4 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
web_service_jsp_count	Total number of loaded JSP pages	host="127.0.0.1", virtual_host_name="admin", context_path="aas-console"	0.0	count
web_service_jsp_queue_length	JSP compilation queue length	host="127.0.0.1", virtual_host_name="admin", context_path="aas-console"	-1.0	—

<code>web_service_jsp_reload_count</code>	Total number of reloaded JSP pages	<code>host="127.0.0.1", virtual_host_name="admin", context_path="aas-console"</code>	0.0	count
<code>web_service_jsp_unload_count</code>	Total number of unloaded JSP pages	<code>host="127.0.0.1", virtual_host_name="admin", context_path="aas-console"</code>	0.0	count

1.16 Slow SQL Count

Contains 1 metric, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
<code>slow_query_count</code>	Slow SQL request statistics	<code>host="127.0.0.1", jdbc_pool_name="test"</code>	0.0	—

1.17 Exporter Status

Contains 2 metrics, all of Gauge type.

Metric	Description	Labels (with example values)	Example Value	Unit
<code>exporter_running_status</code>	Exporter running status (1: running, 0: stopped)	<code>host="127.0.0.1"</code>	1.0	—
<code>jmx_connection_status</code>	JMX connection status (1: connected, 0: connection refused)	<code>host="127.0.0.1"</code>	1.0	—

2 RESTful Monitoring

The RESTful monitoring interface retrieves monitoring data via `https://127.0.0.1:6848/` + the access URLs listed below, and returns a unified JSON structure: `timestamp` (collection timestamp), `category` (category), `collectors` (collectors), `rows` (data rows, each row contains a set of metrics and labels).

2.1 JVM GC

- URL: `aas-console/metrics/data/gc`

Sample response (first 2 rows):

```
{
  "timestamp": 1787556235,
  "category": "gc",
  "collectors": [
    "gc"
  ],
  "rows": [
    {
      "gc_type": "PS MarkSweep",
      "host": "127.0.0.1",
      "jvm_gc_collection_number": 4.0,
      "jvm_gc_collection_time_seconds": 0.483
    },
    {
      "gc_type": "PS Scavenge",
      "host": "127.0.0.1",
      "jvm_gc_collection_number": 21.0,
      "jvm_gc_collection_time_seconds": 0.988
    }
  ]
}
```

Metric description:

Metric	Description	Example Value	Unit
gc_type	GC type	PS MarkSweep	—
host	Current host IP	127.0.0.1	—
time	Occurrence time	60s	—
full_gc_mount	Number of Full GCs in the last minute	0.0	—
jvm_gc_collection_number	Total number of JVM garbage collections	4.0	—
jvm_gc_collection_time_seconds	Cumulative JVM garbage collection time (seconds)	0.483	seconds
longest_full_gc	Longest Full GC time in the last minute (seconds)	0.0	seconds

2.2 JVM Buffer Pools

- URL: `aas-console/metrics/data/memory/buffer-pool`

Sample response (first 2 rows):

```
{
  "timestamp": 1787556235,
  "category": "memory",
  "collectors": [
    "buffer-pool"
  ],
  "rows": [
    {
      "host": "127.0.0.1",
      "jvm_buffer_pool": "direct",
      "jvm_buffer_pool_capacity_bytes": 1001345.0,
      "jvm_buffer_pool_used_buffers": 29.0,
      "jvm_buffer_pool_used_bytes": 1001345.0
    },
    {
      "host": "127.0.0.1",
```

```

    "jvm_buffer_pool": "mapped",
    "jvm_buffer_pool_capacity_bytes": 0.0,
    "jvm_buffer_pool_used_buffers": 0.0,
    "jvm_buffer_pool_used_bytes": 0.0
  }
]
}

```

Metric description:

Metric	Description	Example Value	Unit
host	Current host IP	127.0.0.1	—
jvm_buffer_pool	Memory pool name	direct	—
jvm_buffer_pool_capacity_bytes	Total capacity of the JVM buffer pool (bytes)	1001345.0	Bytes
jvm_buffer_pool_used_buffers	Number of used buffers in the JVM buffer pool	29.0	—
jvm_buffer_pool_used_bytes	Number of used bytes in the JVM buffer pool	1001345.0	Bytes

2.3 JVM Class Loading

- URL: `aas-console/metrics/data/jvm/classloading`

Sample response (first 1 row):

```

{
  "timestamp": 1787556235,
  "category": "jvm",
  "collectors": [
    "classloading"
  ],
  "rows": [
    {
      "host": "127.0.0.1",

```

```

    "jvm_classes_loaded": 15204.0,
    "jvm_classes_total_loaded": 15204.0,
    "jvm_classes_unloaded": 0.0
  }
]
}

```

Metric description:

Metric	Description	Example Value	Unit
host	Current host IP	127.0.0.1	—
jvm_classes_loaded	Number of classes currently loaded by the JVM	15204.0	—
jvm_classes_total_loaded	Total number of classes loaded since JVM startup	15204.0	—
jvm_classes_unloaded	Number of classes unloaded by the JVM	0.0	—

2.4 JVM Threads

- URL: `aas-console/metrics/data/thread/threads`

Sample response (first 1 row):

```

{
  "timestamp": 1787556235,
  "category": "thread",
  "collectors": [
    "threads"
  ],
  "rows": [
    {
      "host": "127.0.0.1",
      "jvm_threads_current": 80.0,
      "jvm_threads_daemon": 73.0,
      "jvm_threads_peak": 80.0,
      "jvm_threads_total_started": 83.0
    }
  ]
}

```

```
]
}
```

Metric description:

Metric	Description	Example Value	Unit
host	Current host IP	127.0.0.1	—
jvm_threads_current	Number of currently active JVM threads	80.0	—
jvm_threads_daemon	Number of current JVM daemon threads	73.0	—
jvm_threads_peak	Historical peak number of JVM threads	80.0	—
jvm_threads_total_started	Total number of JVM threads started	83.0	—

2.5 JVM Memory

- URL: `aas-console/metrics/data/memory/memory`

Sample response (first 2 rows):

```
{
  "timestamp": 1787556235,
  "category": "memory",
  "collectors": [
    "memory"
  ],
  "rows": [
    {
      "area": "heap",
      "host": "127.0.0.1",
      "jvm_memory_bytes_committed": 2197815296.0,
      "jvm_memory_bytes_init": 1073741824.0,
      "jvm_memory_bytes_max": 3817865216.0,
      "jvm_memory_bytes_usage": 0.19051992431573572,
      "jvm_memory_bytes_used": 727379392.0
    },
    {
```

```

    "area": "nonheap",
    "host": "127.0.0.1",
    "jvm_memory_bytes_committed": 146604032.0,
    "jvm_memory_bytes_init": 2555904.0,
    "jvm_memory_bytes_max": -1.0,
    "jvm_memory_bytes_usage": 0.0,
    "jvm_memory_bytes_used": 140169920.0
  }
]
}

```

Metric description:

Metric	Description	Example Value	Unit
area	Memory area	heap	—
host	Current host IP	127.0.0.1	—
jvm_memory_bytes_committed	Committed bytes of the JVM memory area	2197815296.0	Bytes
jvm_memory_bytes_init	Initial bytes of the JVM memory area	1073741824.0	Bytes
jvm_memory_bytes_max	Maximum available bytes of the JVM memory area	3817865216.0	Bytes
jvm_memory_bytes_usage	JVM memory usage (used/max)	0.19051992431573572	—
jvm_memory_bytes_used	Used bytes of the JVM memory area	727379392.0	Bytes

2.6 JVM Memory Pools

- URL: `aas-console/metrics/data/memory/memory-pool`

Sample response (first 2 rows):

```

{
  "timestamp": 1787556235,
  "category": "memory",
  "collectors": [
    "memory-pool"
  ]
}

```

```

],
"rows": [
  {
    "host": "127.0.0.1",
    "jvm_memory_pool": "Metaspace",
    "jvm_memory_pool_bytes_committed": 92798976.0,
    "jvm_memory_pool_bytes_init": 0.0,
    "jvm_memory_pool_bytes_max": -1.0,
    "jvm_memory_pool_bytes_used": 88256296.0
  },
  {
    "host": "127.0.0.1",
    "jvm_memory_pool": "PS Old Gen",
    "jvm_memory_pool_bytes_committed": 835190784.0,
    "jvm_memory_pool_bytes_init": 716177408.0,
    "jvm_memory_pool_bytes_max": 2863661056.0,
    "jvm_memory_pool_bytes_used": 37628688.0
  }
]
}

```

Metric description:

Metric	Description	Example Value	Unit
host	Current host IP	127.0.0.1	—
jvm_memory_pool	Memory pool name	Metaspace	—
jvm_memory_pool_bytes_committed	Committed bytes of the JVM memory pool	92798976.0	Bytes
jvm_memory_pool_bytes_init	Initial bytes of the JVM memory pool	0.0	Bytes
jvm_memory_pool_bytes_max	Maximum available bytes of the JVM memory pool	-1.0	Bytes
jvm_memory_pool_bytes_used	Used bytes of the JVM memory pool	88256296.0	Bytes

2.7 JVM Runtime Information

- URL: `aas-console/metrics/data/jvm/run-time`

Sample response (first 1 row):

```
{
  "timestamp": 1787556235,
  "category": "jvm",
  "collectors": [
    "run-time"
  ],
  "rows": [
    {
      "class_path":
"C:\\apusic\\AAS\\bin\\bootstrap.jar;C:\\apusic\\AAS\\bin\\aas-
juli.jar",
      "jvm_info": 1.0,
      "library_path": "D:\\tools\\jdk8u312-
b07\\bin;C:\\WINDOWS\\Sun\\Java\\bin;C:\\WINDOWS\\system32;C:\\WINDOWS;
b07\\bin;D:\\tools\\jdk8u312-
b07\\bin;D:\\tools\\Git\\bin;D:\\tools\\jdk-
21.0.3+9\\bin;D:\\java_software\\apache-ant-
1.10.5\\bin;C:\\WINDOWS\\system32;C:\\WINDOWS;C:\\WINDOWS\\System32\\W
maven-3.6.0\\bin;C:\\Program Files\\TortoiseSVN\\bin;C:\\Program
Files\\MySQL\\MySQL Server 5.5\\bin;C:\\Program Files
(x86)\\Microsoft SQL Server\\80\\Tools\\Binn\\;C:\\Program
Files\\Microsoft SQL Server\\90\\Tools\\binn\\;C:\\Program Files
(x86)\\Microsoft SQL
Server\\90\\Tools\\binn\\;D:\\tools\\putty\\;D:\\tools\\Git\\cmd;C:\\W
Files
(x86)\\Nmap;C:\\Users\\test\\AppData\\Local\\Pandoc\\;C:\\Users\\test\\
      "vendor": "Oracle Corporation",
      "version": "1.8"
    }
  ]
}
```

```
]
}
```

Metric description:

Metric	Description	Example Value	Unit
class_path	Class path	C:\\apusic\\AAS\\bin\\bootstrap.jar;C:\\apusic\\AAS\\bin\\aas-juli.jar	—
jvm_info	JVM runtime information	1.0	—
library_path	JVM native library path	D:\\tools\\jdk8u312-b07\\bin;...	—
vendor	JVM vendor	Oracle Corporation	—
version	JVM version	1.8	—

2.8 Process and System Resources

- URL: `aas-console/metrics/data/os`

Sample response (first 1 row):

```
{
  "timestamp": 1787556235,
  "category": "os",
  "collectors": [
    "operating-system"
  ],
  "rows": [
    {
      "committed_virtual_memory_size_bytes": 2677968896.0,
      "free_physical_memory_size_bytes": 13653409792.0,
      "free_swap_space_size_bytes": 12342001664.0,
      "host": "127.0.0.1",
      "physical_memory_total_size_bytes": 34359201792.0,
```

```

    "process_cpu_load": 0.8264974947206318,
    "process_start_time_seconds": 1787215459.261,
    "swap_space_total_size_bytes": 42949136384.0,
    "system_cpu_core_num": 16.0,
    "system_cpu_load": 11.01702326967513,
    "system_open_file_descriptor_count": 0.0,
    "system_start_runtime_seconds": 1787215459261.0
  }
]
}

```

Metric description:

Metric	Description	Example Value	Unit
committed_virtual_memory_size_bytes	Committed virtual memory bytes	2677968896.0	Bytes
free_physical_memory_size_bytes	Free physical memory bytes	13653409792.0	Bytes
free_swap_space_size_bytes	Free swap space bytes	12342001664.0	Bytes
host	Current host IP	127.0.0.1	—
physical_memory_total_size_bytes	Total physical memory bytes	34359201792.0	Bytes
process_cpu_load	Process CPU usage (%)	0.8264974947206318	%
process_start_time_seconds	Process start time (seconds since the Unix epoch)	1787215459.261	seconds
swap_space_total_size_bytes	Total swap space bytes	42949136384.0	Bytes
system_cpu_core_num	Number of CPU cores	16.0	—
system_cpu_load	System CPU usage (%)	11.01702326967513	%
system_open_file_descriptor_count	Number of open file descriptors	0.0	—
system_start_runtime_seconds	System start time (millisecond timestamp)	1787215459261.0	seconds

2.9 HTTP Thread Pool

- URL: `aas-console/metrics/data/thread/thread-pool`

Sample response (first 2 rows):

```
{
  "timestamp": 1787556235,
  "category": "thread",
  "collectors": [
    "thread-pool"
  ],
  "rows": [
    {
      "host": "127.0.0.1",
      "service_name": "admin-service",
      "thread_pool_active_count": 1.0,
      "thread_pool_blocked_count": 0.0,
      "thread_pool_idle_thread_timeout_seconds": 60000.0,
      "thread_pool_max_queue_size": 5000.0,
      "thread_pool_max_thread_pool_size": 100.0,
      "thread_pool_min_thread_pool_size": 25.0,
      "thread_pool_name": "admin-thread-pool",
      "thread_pool_pool_size": 25.0,
      "thread_pool_pool_usage": 0.01,
      "thread_pool_queue_size": 0.0,
      "thread_pool_step_reclaim": 0.0,
      "thread_pool_step_size": 20.0,
      "thread_pool_step_time": 10000.0
    },
    {
      "host": "127.0.0.1",
      "service_name": "ams-service",
      "thread_pool_active_count": 0.0,
      "thread_pool_blocked_count": 0.0,
      "thread_pool_idle_thread_timeout_seconds": 60000.0,
      "thread_pool_max_queue_size": 5000.0,
      "thread_pool_max_thread_pool_size": 200.0,
```

```

    "thread_pool_min_thread_pool_size": 25.0,
    "thread_pool_name": "http-thread-pool",
    "thread_pool_pool_size": 25.0,
    "thread_pool_pool_usage": 0.0,
    "thread_pool_queue_size": 0.0,
    "thread_pool_step_reclaim": 0.0,
    "thread_pool_step_size": 20.0,
    "thread_pool_step_time": 10000.0
  }
]
}

```

Metric description:

Metric	Description	Example Value	Unit
host	Current host IP	127.0.0.1	—
service_name	Service name	admin-service	—
thread_pool_name	Thread pool name	admin-thread-pool	—
thread_pool_active_count	Number of currently active threads	1.0	—
thread_pool_blocked_count	Number of currently blocked threads	0.0	—
thread_pool_idle_thread_timeout_seconds	Maximum time (milliseconds) a thread can remain idle in the pool before being removed	60000.0	milliseconds
thread_pool_max_queue_size	Maximum queue capacity; -1 means unlimited	5000.0	—
thread_pool_max_thread_pool_size	Maximum number of threads in the thread pool	100.0	—

thread_pool_min_thread_pool_size	Minimum number of threads in the thread pool	25.0	—
thread_pool_pool_size	Current total number of threads in the thread pool	25.0	—
thread_pool_pool_usage	Thread pool usage (active threads/max threads)	0.01	%
thread_pool_queue_size	Used queue capacity	0.0	—
thread_pool_step_reclaim	Whether stepped thread reclaim is enabled (0: disabled, 1: enabled)	0.0	—
thread_pool_step_size	Number of threads reclaimed per step in stepped thread reclaim	20.0	—
thread_pool_step_time	Time interval for stepped thread reclaim	10000.0	—

2.10 JDBC Connection Pool

- URL: `aas-console/metrics/data/jdbc`

Sample response (first 2 rows):

```
{
  "timestamp": 1787556235,
  "category": "jdbc",
  "collectors": [
    "jdbc-pool"
  ],
  "rows": [
    {
      "host": "127.0.0.1",
      "jdbc_pool": "test",
      "jdbc_resource_connection_leak_timeout_in_seconds": 60000.0,
      "jdbc_resource_idle_timeout_in_seconds": 60000.0,
      "jdbc_resource_max_idle_size": 10.0,
```

```

    "jdbc_resource_max_pool_size": 20.0,
    "jdbc_resource_max_wait_time_in_millis": 15000.0,
    "jdbc_resource_min_idle_size": 4.0,
    "jdbc_resource_num_conn_active": 0.0,
    "jdbc_resource_num_conn_detect": 0.0,
    "jdbc_resource_num_conn_free": 20.0,
    "jdbc_resource_num_conn_free_usage": 1.0,
    "jdbc_resource_num_conn_total": 4.0,
    "jdbc_resource_num_conn_usage": 0.0,
    "jdbc_resource_steady_pool_size": 10.0,
    "jdbc_resource_validate_atmost_once_period_in_seconds": 3.0,
    "jdbc_resource_num_conn_wait": 0.0,
    "jdbc_resource_num_conn_suspend_leak": 0.0
  },
  {
    "host": "127.0.0.1",
    "jdbc_pool": "test2",
    "jdbc_resource_connection_leak_timeout_in_seconds": 60000.0,
    "jdbc_resource_idle_timeout_in_seconds": 60000.0,
    "jdbc_resource_max_idle_size": 10.0,
    "jdbc_resource_max_pool_size": 20.0,
    "jdbc_resource_max_wait_time_in_millis": 15000.0,
    "jdbc_resource_min_idle_size": 4.0,
    "jdbc_resource_num_conn_active": 0.0,
    "jdbc_resource_num_conn_detect": 0.0,
    "jdbc_resource_num_conn_free": 20.0,
    "jdbc_resource_num_conn_free_usage": 1.0,
    "jdbc_resource_num_conn_total": 4.0,
    "jdbc_resource_num_conn_usage": 0.0,
    "jdbc_resource_steady_pool_size": 10.0,
    "jdbc_resource_validate_atmost_once_period_in_seconds": 3.0,
    "jdbc_resource_num_conn_wait": 0.0,
    "jdbc_resource_num_conn_suspend_leak": 0.0
  }
}

```

```
]
}
```

Metric description:

Metric	Description	Example Value	Unit
host	Current host IP	127.0.0.1	—
jdbc_pool	Connection pool name	test	—
jdbc_resource_connection_leak_timeout_in_seconds	Connection leak timeout; -1 means no connection leak detection	60000.0	seconds
jdbc_resource_idle_timeout_in_seconds	Idle timeout; the maximum time a connection can remain idle in the pool. -1 means idle connections are not validated	60000.0	seconds
jdbc_resource_max_idle_size	Maximum number of idle connections in the pool	10.0	—
jdbc_resource_max_pool_size	Maximum pool size	20.0	—
jdbc_resource_max_wait_time_in_millis	Maximum wait time, in milliseconds	15000.0	—
jdbc_resource_min_idle_size	Minimum number of idle connections in the pool	4.0	—
jdbc_resource_num_conn_active	Number of active connections	0.0	—
jdbc_resource_num_conn_detect	Number of connection validation probes	0.0	—
jdbc_resource_num_conn_free	Number of available connections	20.0	—

<code>jdbc_resource_num_conn_free_usage</code>	Connection availability rate	1.0	%
<code>jdbc_resource_num_conn_total</code>	Current number of connections	4.0	—
<code>jdbc_resource_num_conn_usage</code>	Connection usage rate	0.0	%
<code>jdbc_resource_steady_pool_size</code>	Initial and minimum pool size	10.0	—
<code>jdbc_resource_validate_atmost_once_period_in_seconds</code>	Connection validation interval; specifies the time interval (seconds) between consecutive requests to validate a connection (at most once). Default value is -1, meaning this property is not enabled	3.0	seconds
<code>jdbc_resource_num_conn_wait</code>	Number of waiting connections	0.0	—
<code>jdbc_resource_num_conn_suspend_leak</code>	Number of suspected leaks	0.0	—

2.11 Web Service

- URL: `aas-console/metrics/data/web/web-service`

Sample response (first 2 rows):

```
{
  "timestamp": 1787556235,
  "category": "web",
  "collectors": [
    "web-service"
  ],
  "rows": [
    {
```

```

    "context_path": "aas-console",
    "host": "127.0.0.1",
    "service_name": "admin-service",
    "servlet_name": "dispatcherServlet",
    "virtual_host_name": "admin",
    "web_service_servlet_available": 0.0,
    "web_service_servlet_class_load_time": 0.0,
    "web_service_servlet_error_count": 0.0,
    "web_service_servlet_load_time": 0.0,
    "web_service_servlet_max_time": 351.0,
    "web_service_servlet_min_time": 5.0,
    "web_service_servlet_processing_time": 1021.0,
    "web_service_servlet_request_time": 14.0
  },
  {
    "endpoint_name": "https-jsse-nio-6848",
    "host": "127.0.0.1",
    "service_name": "admin-service",
    "web_service_request_byte_received": 0.0,
    "web_service_request_byte_send": 4152779.0,
    "web_service_request_count": 13.0,
    "web_service_request_error_count": 1.0,
    "web_service_request_long_request_count": 0.0,
    "web_service_request_long_request_total_count": 0.0,
    "web_service_request_max_time": 407.0,
    "web_service_processing_time": 1093.0
  }
]
}

```

Metric description:

Metric	Description	Example Value	Unit
context_path	Application context	aas-console	—

endpoint_name	HTTP connection name	https-jsse-nio-6848	—
host	Current host IP	127.0.0.1	—
service_name	Service name	admin-service	—
servlet_name	Servlet name	dispatcherServlet	—
virtual_host_name	Virtual host name	admin	—
web_service_processing_time	Cumulative request processing time (milliseconds)	1093.0	—
web_service_request_byte_received	Number of bytes received in requests	0.0	Bytes
web_service_request_byte_send	Number of bytes sent in responses	4152779.0	Bytes
web_service_request_count	Cumulative number of requests processed so far	13.0	—
web_service_request_error_count	Cumulative error count (response code ≥ 400)	1.0	—
web_service_request_long_request_count	Current number of slow requests	0.0	—
web_service_request_long_request_total_count	Total number of slow requests in history	0.0	—
web_service_request_max_time	Longest request response time (milliseconds)	407.0	—
web_service_servlet_available	Date and time the Servlet became available (milliseconds); 0 means available, Long.MAX_VALUE means permanently unavailable	0.0	—
web_service_servlet_class_load_time	Time spent loading the class (ms)	0.0	ms

web_service_servlet_error_count	Error count (cumulative number of responses with response code ≥ 400)	0.0	—
web_service_servlet_load_time	Time spent loading and initializing the Servlet (ms)	0.0	ms
web_service_servlet_max_time	Longest request response time (ms)	351.0	ms
web_service_servlet_min_time	Shortest request response time (ms)	5.0	ms
web_service_servlet_processing_time	Cumulative Servlet processing time (ms)	1021.0	ms
web_service_servlet_request_time	Cumulative number of requests processed so far	14.0	—
web_service_session_active	Current number of active Sessions	0.0	—
web_service_session_create_rate	Session creation rate (per second)	0.0	/s
web_service_session_expire_rate	Session expiration rate (per second)	0.0	/s
web_service_session_expired_total	Total number of expired Sessions	0.0	—
web_service_session_max_active	Historical maximum number of active Sessions	0.0	—
web_service_session_passivated_sessions	Total number of passivated Sessions	0.0	—
web_service_session_processing_time	Session processing time (milliseconds)	0.0	ms
web_service_session_rejected_total	Total number of Sessions rejected for creation	0.0	—

web_service_session_session_counter	Cumulative number of Sessions so far	0.0	—
web_service_jsp_count	Total number of loaded JSP pages	0.0	—
web_service_jsp_queue_length	JSP compilation queue length	-1.0	—
web_service_jsp_reload_count	Total number of reloaded JSP pages	0.0	—
web_service_jsp_unload_count	Total number of unloaded JSP pages	0.0	—

2.12 HTTP Connections

- URL: `aas-console/metrics/data/http/connect`

Sample response (first 2 rows):

```
{
  "timestamp": 1787556235,
  "category": "http",
  "collectors": [
    "connect"
  ],
  "rows": [
    {
      "host": "127.0.0.1",
      "http_connection_pool": "\"https-jsse-nio-6848\"",
      "service_name": "admin-service",
      "thread_pool_connection_count": 2.0,
      "thread_pool_connection_current_thread_busy": 1.0,
      "thread_pool_connection_current_thread_count": 25.0,
      "thread_pool_connection_keepalive_count": 1.0,
      "thread_pool_connection_max_connections": 10000.0,
      "thread_pool_connection_max_keepalive_requests": 100.0,
      "thread_pool_connection_usage": 2.0E-4
    },
  ]
}
```

```

{
  "host": "127.0.0.1",
  "http_connection_pool": "\"http-nio-6888\"",
  "service_name": "ams-service",
  "thread_pool_connection_count": 1.0,
  "thread_pool_connection_current_thread_busy": 0.0,
  "thread_pool_connection_current_thread_count": 25.0,
  "thread_pool_connection_keepalive_count": 0.0,
  "thread_pool_connection_max_connections": 10000.0,
  "thread_pool_connection_max_keepalive_requests": 100.0,
  "thread_pool_connection_usage": 1.0E-4
}
]
}

```

Metric description:

Metric	Description	Example Value	Unit
host	Current host IP	127.0.0.1	—
http_connection_pool	HTTP connection name	"https-jsse-nio-6848"	—
service_name	Service name	admin-service	—
thread_pool_connection_count	Number of HTTP connections	2.0	—
thread_pool_connection_current_thread_busy	Number of threads currently processing requests	1.0	—
thread_pool_connection_current_thread_count	Current number of threads	25.0	—
thread_pool_connection_keepalive_count	Number of keep-alive HTTP connections	1.0	—
thread_pool_connection_max_connections	Maximum number of HTTP connections	10000.0	—
thread_pool_connection_max_keepalive_requests	Maximum number of keep-alive HTTP connections	100.0	—

thread_pool_connection_usage	HTTP connection usage	2.0E-4	%
------------------------------	-----------------------	--------	---

2.13 HTTP Requests

- URL: `aas-console/metrics/data/request`

Sample response (first 2 rows):

```
{
  "timestamp": 1787556235,
  "category": "request",
  "collectors": [
    "request"
  ],
  "rows": [
    {
      "error_count": 0.0,
      "long_request_count": 0.0,
      "max_time": 0.0,
      "processor": "http-nio-6888",
      "request_count": 0.0,
      "slow_requests_in_the_last_ten_minutes": 0.0
    },
    {
      "error_count": 1.0,
      "long_request_count": 0.0,
      "max_time": 407.0,
      "processor": "https-jsse-nio-6848",
      "request_count": 13.0,
      "slow_requests_in_the_last_ten_minutes": 0.0
    }
  ]
}
```

Metric description:

Metric	Description	Example Value	Unit
processor	HTTP channel name	https-jsse-nio-6848	—
error_count	Request error count	1.0	—
long_request_count	Slow request (long thread) count	0.0	—
max_time	Longest request processing time	407.0	—
request_count	Request count	13.0	—
slow_requests_in_the_last_ten_minutes	Number of slow requests in the last ten minutes	0.0	—

2.14 Slow SQL Count

- URL: `aas-console/metrics/data/slow-query`

Sample response (first 1 row):

```
{
  "timestamp": 1787556235,
  "category": "slow-query",
  "collectors": [
    "slow-query"
  ],
  "rows": [
    {
      "host": "127.0.0.1",
      "jdbc_pool_name": "test",
      "slow_query_count": 0.0
    }
  ]
}
```

Metric description:

Metric	Description	Example Value	Unit
--------	-------------	---------------	------

slow_query_count	Slow SQL request count	0.0	—
jdbc_pool_name	Database connection pool name	test	—

2.15 Exporter

- URL: `aas-console/metrics/data/exporter`

Sample response (first 1 row):

```
{
  "timestamp": 1787556235,
  "category": "exporter",
  "collectors": [
    "exporter-status"
  ],
  "rows": [
    {
      "exporter_running_status": 1.0,
      "host": "127.0.0.1",
      "jmx_connection_status": 1.0
    }
  ]
}
```

Metric description:

Metric	Description	Example Value	Unit
exporter_running_status	Exporter running status (1: running, 0: stopped)	1.0	—
host	Current host IP	127.0.0.1	—
jmx_connection_status	JMX connection status (1: connected, 0: connection refused)	1.0	—

3 JMX Monitoring

3.1 JVM Memory

- MBean ObjectName: `java.lang:type=Memory`
- Implementation class: `sun.management.MemoryImpl`

Attribute	Type	Description	Field Meaning / Unit
HeapMemoryUsage	CompositeData (MemoryUsage)	Heap memory usage	init/used/committed/max → Bytes; used/max derived as usage (ratio)
NonHeapMemoryUsage	CompositeData (MemoryUsage)	Non-heap memory usage	Same as above
ObjectPendingFinalizationCount	int	Number of objects pending finalization	count
Verbose	boolean	Whether GC verbose logging is enabled	—

3.2 JVM GC

- MBean ObjectName pattern: `java.lang:type=GarbageCollector,name=*`
- Typical instances: `name=PS Scavenge`, `name=PS MarkSweep`, `name=G1 Young Generation`, `name=G1 Old Generation`, `name=ZGC`, `name=Shenandoah Cycles`

Attribute	Type	Description	Unit
Name	String	GC collector name (also used as the <code>name</code> label of the ObjectName)	—
CollectionCount	long	Cumulative GC count since JVM startup	times
CollectionTime	long	Cumulative GC time since JVM startup	milliseconds
LastGcInfo	CompositeData (GcInfo)	Details of the most recent GC, including <code>id</code> , <code>startTime</code> , <code>endTime</code> , <code>duration</code> (milliseconds),	—

		memoryUsageBeforeGc, memoryUsageAfterGc, GcThreadCount	
MemoryPoolNames	String[]	Memory pools managed by this GC	—
Valid	boolean	Whether the MBean is still valid	—

3.3 JVM Memory Pools

- MBean ObjectName pattern: `java.lang:type=MemoryPool,name=*`
- Typical instances: `PS Eden Space`, `PS Survivor Space`, `PS Old Gen`, `Metaspace`, `Compressed Class Space`, `Code Cache`, `G1 Eden`, `G1 Survivor`, `G1 Old Gen`, etc.

Attribute	Type	Description	Unit
Name	String	Memory pool name (also used as the <code>name</code> label of the ObjectName)	—
Type	String	HEAP OR NON_HEAP	—
Usage	CompositeData (MemoryUsage)	Current usage	init/used/committed/max → Bytes
PeakUsage	CompositeData (MemoryUsage)	Peak usage since last reset	Bytes
CollectionUsage	CompositeData (MemoryUsage)	Usage after GC collection	Bytes
UsageThreshold	long	Usage alarm threshold	Bytes
UsageThresholdCount	long	Number of times the threshold was exceeded	times
UsageThresholdSupported	boolean	Whether threshold alarms are supported	—
CollectionUsageThreshold / ...Count / ...Supported	long / boolean	Collection threshold	Bytes / times / —

		related	
MemoryManagerNames	String[]	Associated GC collectors	—

3.4 Operating System

- MBean ObjectName: `java.lang:type=OperatingSystem`
- Implementation class: `sun.management.OperatingSystemImpl`

Attribute	Type	Description	Unit
Name / Version / Arch	String	System name / version / architecture	—
AvailableProcessors	int	Number of available CPU cores	count
SystemCpuLoad	double	Overall system CPU usage (last 1s sample)	ratio (0~1)
ProcessCpuLoad	double	Current process CPU usage (last 1s sample)	ratio (0~1)
ProcessCpuTime	long	Cumulative process CPU time	nanoseconds
CommittedVirtualMemorySize	long	Committed virtual memory	Bytes
TotalPhysicalMemorySize	long	Total physical memory size	Bytes
FreePhysicalMemorySize	long	Free physical memory	Bytes
TotalSwapSpaceSize	long	Total swap space size	Bytes
FreeSwapSpaceSize	long	Free swap space	Bytes
OpenFileDescriptorCount	long	Number of open file descriptors (Unix only)	count
SystemLoadAverage	double	System 1-minute load average (-1 means unsupported)	—

3.5 JVM Process

- MBean ObjectName: `java.lang:type=Runtime`
- Implementation class: `sun.management.RuntimeImpl`

Attribute	Type	Description	Unit
Name	String	Runtime name (<pid>@<host>)	—

<code>VmName / VmVendor / VmVersion</code>	String	JVM implementation information	—
<code>SpecName / SpecVendor / SpecVersion</code>	String	Java specification information	—
<code>ManagementSpecVersion</code>	String	Management specification version	—
<code>ClassPath</code>	String	Application class path	—
<code>BootClassPath</code>	String	Boot class path	—
<code>LibraryPath</code>	String	Library loading path	—
<code>StartTime</code>	long	JVM start time	millisecond timestamp
<code>Uptime</code>	long	JVM elapsed uptime	milliseconds
<code>InputArguments</code>	String[]	Startup arguments	—
<code>SystemProperties</code>	TabularData	Collection of system properties	—
<code>BootClassPathSupported</code>	boolean	Whether boot class path is supported	—

3.6 JVM Threads

- MBean ObjectName: `java.lang:type=Threading`

Attribute	Type	Description	Unit
<code>ThreadCount</code>	int	Current active thread count	count
<code>DaemonThreadCount</code>	int	Current daemon thread count	count
<code>PeakThreadCount</code>	int	Historical peak thread count	count
<code>TotalStartedThreadCount</code>	long	Cumulative started thread count	count
<code>ThreadCpuTimeSupported / ThreadCpuTimeEnabled</code>	boolean	Whether CPU time measurement is supported/enabled	—
<code>ThreadContentionMonitoringSupported / ...Enabled</code>	boolean	Whether thread contention monitoring is	—

		supported/enabled	
ThreadAllocatedMemorySupported / ...Enabled	boolean	Whether thread memory allocation monitoring is supported/enabled	—
ObjectMonitorUsageSupported / SynchronizerUsageSupported	boolean	Whether Monitor/Synchronizer queries are supported	—
CurrentThreadCpuTime / CurrentThreadUserTime	long	Current thread CPU/user-mode time	nanoseconds
CurrentThreadAllocatedBytes	long	Bytes allocated by the current thread	Bytes
AllThreadIds	long[]	All thread IDs	—

3.7 JIT Compiler

- MBean ObjectName: `java.lang:type=Compilation`

Attribute	Type	Description	Unit
Name	String	Compiler name (e.g. HotSpot 64-Bit Tiered Compilers)	—
TotalCompilationTime	long	Cumulative compilation time since startup	ms
CompilationTimeMonitoringSupported	boolean	Whether compilation time monitoring is supported	ms

3.8 JVM Class Loading

- MBean ObjectName: `java.lang:type=ClassLoading` (accessed by code via the `ClassLoadingMXBean` proxy)

Attribute	Type	Description	Unit
LoadedClassCount	int	Current number of loaded classes	count
TotalLoadedClassCount	long	Total number of classes loaded	count
UnloadedClassCount	long	Total number of classes unloaded	count
Verbose	boolean	Whether class loading verbose logging is enabled	—

3.9 JVM Buffer Pools

- MBean ObjectName pattern: `java.nio:type=BufferPool,name=*`
- Typical instances: `name=direct` , `name=mapped` , `name=mapped - 'non-volatile memory'` (JDK 14+ NVM)

Attribute	Type	Description	Unit
Name	String	Buffer name (<code>direct</code> / <code>mapped</code> / <code>mapped-nvm</code> , also used as the <code>name</code> label of the ObjectName)	—
Count	long	Number of allocated DirectByteBuffers	count
TotalCapacity	long	Total buffer capacity	Bytes
MemoryUsed	long	Bytes used	Bytes

3.10 JVM Internal Threads

- MBean ObjectName: `sun.management:type=HotspotThread` (HotSpot private, obtained via `sun.management.ManagementFactoryHelper.getHotspotThreadMBean()`)

Method	Return Type	Description
<code>getInternalThreadCpuTimes()</code>	<code>Map<String, Long></code>	Returns a map of CPU times for JVM internal threads (including C1/C2 compiler threads, GC threads, etc.) (key = thread name, value = nanoseconds)

3.11 HTTP Thread Pool

- MBean ObjectName pattern: `*:type=Executor,name=*`
- Actual examples: `admin-service:name=admin-thread-pool,type=Executor` , `ams-service:name=http-thread-pool,type=Executor`
- Implementation class: `com.apusic.ams.core.StandardThreadExecutor` (modelerType)

Attribute	Type	Description	Unit
<code>name</code> (ObjectName key)	String	Thread pool name	—
<code>domain</code> (ObjectName key)	String	Service domain name	—
<code>stateName</code>	String	State (e.g. <code>STARTED</code>)	—
<code>corePoolSize</code>	int	Core thread count	count

maxThreads	int	Maximum thread count	count
minSpareThreads	int	Minimum spare thread count	count
poolSize	int	Current thread pool size	count
largestPoolSize	int	Historical maximum thread count	count
activeCount	int	Current active thread count	count
blockedCount	int	Current blocked thread count	count
queueSize	int	Current task queue size	count
maxQueueSize	int	Queue capacity limit (-1 = unlimited)	count
maxIdleTime	int	Idle thread timeout	milliseconds
threadStepReclaim	boolean	Whether stepped thread reclamation is enabled	—
threadStepTime	long	Stepped reclamation interval	milliseconds
threadStepSize	int	Number of threads reclaimed per step	count
threadRenewalDelay	long	Thread renewal delay	milliseconds
namePrefix	String	Generated thread name prefix	—
threadPriority	int	Thread priority	—
daemon	boolean	Whether threads are daemon	—
completedTaskCount	long	Cumulative completed task count	count
prestartminSpareThreads	boolean	Whether to prestart core threads	—
modelerType	String	Fully qualified implementation class name	—

3.12 HTTP Connection Channel

- MBean ObjectName pattern: `*:type=ThreadPool,name=*`
- Actual examples: `admin-service:name="https-jsse-nio-6848",type=ThreadPool` , `ams-service:name="http-nio-6888",type=ThreadPool`
- Implementation class: `com.apusic.aas.util.net.NioEndpoint` (modelerType)

Attribute	Type	Description	Unit
-----------	------	-------------	------

name (ObjectName key)	String	Endpoint name (e.g. https-jsse-nio-6848, http-nio-6888)	—
domain (ObjectName key)	String	Service domain name	—
port / portWithOffset / localPort	int	Listening port	—
connectionCount	long	Current HTTP connection count	count
maxConnections	int	Maximum HTTP connections	count
keepAliveCount	int	Keep-alive connection count	count
maxKeepAliveRequests	int	Maximum keep-alive requests per connection	count
keepAliveTimeout	int	Keep-alive timeout	milliseconds
currentThreadCount	int	Current thread count	count
currentThreadsBusy	int	Threads currently processing requests	count
maxThreads	int	Maximum thread count (-1 = unlimited)	count
minSpareThreads	int	Minimum spare thread count (-1)	count
acceptCount	int	Accept queue length	count
connectionTimeout	int	Connection timeout	milliseconds
connectionLinger	int	Linger time after close (-1 = disabled)	seconds
tcpNoDelay	boolean	Whether Nagle is disabled	—
deferAccept	boolean	Whether accept is deferred	—
useSendfile	boolean	Whether sendfile is enabled	—
ssLEnabled	boolean	Whether TLS is enabled	—
paused	boolean	Whether paused	—
running	boolean	Whether running	—
selectorTimeout	long	NIO Selector timeout	milliseconds

<code>executorTerminationTimeoutMillis</code>	long	Thread pool termination timeout	milliseconds
<code>acceptorThreadCount / pollerThreadCount</code>	int	accept/poller thread counts	count
<code>acceptorThreadPriority / pollerThreadPriority</code>	int	accept/poller thread priorities	—
<code>threadPriority</code>	int	Worker thread priority (-1)	—
<code>bindOnInit</code>	boolean	Whether to bind the port immediately at startup	—
<code>useInheritedChannel</code>	boolean	Whether to inherit the channel	—
<code>alpnSupported</code>	boolean	Whether ALPN is supported	—
<code>sniParseLimit</code>	int	SNI parsing length limit	—
<code>sslImplementationName</code>	String	TLS implementation class name	—
<code>defaultSSLHostConfigName</code>	String	Default SSL HostConfig name	—
<code>modelerType</code>	String	Fully qualified implementation class name	—
<code>daemon</code>	boolean	Whether daemon	—

3.13 HTTP Requests

- MBean ObjectName pattern: `*:type=GlobalRequestProcessor,name=*`

Attribute	Type	Description	Unit
<code>requestCount</code>	int	Cumulative request count	count
<code>errorCount</code>	int	Cumulative error count (response code $\geq$ 400)	count
<code>processingTime</code>	long	Cumulative processing time	milliseconds
<code>maxTime</code>	long	Longest single processing time	milliseconds
<code>bytesReceived</code>	long	Cumulative bytes received	Bytes
<code>bytesSent</code>	long	Cumulative bytes sent	Bytes
<code>longRequestCount</code>	int	Current in-progress slow request count	count

longRequestTotalCount	int	Historical cumulative slow request count	count
modelerType	String	Implementation class (com.apusic.connector.RequestGroupInfo)	—

3.14 Session Monitoring

- MBean ObjectName pattern: `*:type=Manager,host=*,context=*`
- Actual examples: `admin-service:context=/aas-console,host=admin,type=Manager` , `ams-service:context=/ROOT,host=localhost,type=Manager`
- Implementation class: `com.apusic.ams.session.StandardManager`

Attribute	Type	Description	Unit
activeSessions	int	Current active Session count	count
expiredSessions	long	Total expired Session count	count
rejectedSessions	int	Number of Sessions rejected for creation	count
passivatedSessions	long	Number of passivated Sessions	count
sessionCreateRate	int	Session creation rate	count/second
sessionExpireRate	int	Session expiration rate	count/second
sessionCounter	long	Cumulative Session creation count	count
maxActive	int	Historical maximum active Session count	count
maxActiveSessions	int	Maximum concurrent Sessions (-1 = unlimited)	count
processingTime	long	Total Session processing time	milliseconds
sessionAverageAliveTime	int	Average Session alive time	seconds

<code>sessionMaxAliveTime</code>	int	Maximum Session alive time	seconds
<code>duplicates</code>	int	Number of duplicate Session IDs	count
<code>processExpiresFrequency</code>	int	Expiration scan interval	seconds
<code>stateName</code>	String	State name	—
<code>pathname</code>	String	Persistence file path	—
<code>sessionAttributeNameFilter</code> / <code>sessionAttributeValueClassNameFilter</code>	String	Attribute filters	—
<code>warnOnSessionAttributeFilterFailure</code>	boolean	Warn on filter failure	—
<code>secureRandomAlgorithm</code> / <code>secureRandomClass</code> / <code>secureRandomProvider</code>	String	Random number source	—
<code>jvmRoute</code>	String	Cluster session affinity ID	—
<code>persistAuthentication</code>	boolean	Whether to retain login state across restarts	—
<code>modelerType</code> / <code>className</code>	String	Implementation class name	—

3.15 JSP Monitoring

- MBean ObjectName pattern: `*:type=JspMonitor,*name=jsp`

Attribute	Type	Description	Unit
<code>jspCount</code>	int	Number of loaded JSPs	count
<code>jspReloadCount</code>	int	Number of reloads	count
<code>jspUnloadCount</code>	int	Number of unloads	count
<code>jspQueueLength</code>	int	JSP compilation queue length (-1 = disabled)	count

3.16 Servlet Monitoring

- MBean ObjectName pattern: `*:j2eeType=Servlet,*` (typical example: `admin-service:J2EEApplication=none,J2EEServer=none,WebModule=//admin/aas-`

```
console, j2eeType=Servlet, name=dispatcherServlet )
```

Attribute	Type	Description	Unit
name (ObjectName key)	String	Servlet name (e.g. dispatcherServlet, jsp, default)	—
webModule (ObjectName key)	String	Web module path (e.g. //admin/aas-console), split into virtual_host_name/context_path labels	—
servletClass	String	Servlet implementation class name	—
available	long	Availability time (0 = available, Long.MAX_VALUE = permanently unavailable)	millisecond timestamp
stateName	String	State (e.g. STARTED)	—
loadOnStartup	int	Load-on-startup priority (-1 = on demand)	—
loadTime	long	Initialization time	milliseconds
classLoadTime	int	Class loading time	milliseconds
processingTime	long	Cumulative processing time	milliseconds
maxTime	long	Longest single processing time	milliseconds
minTime	long	Shortest single processing time (Long.MAX_VALUE treated as 0)	milliseconds
requestCount	int	Cumulative request count	count
errorCount	int	Error count (response code $\geq$ 400)	count
countAllocated	int	Currently allocated instance count	count
maxInstances	int	Maximum instance count	count
singleThreadModel	boolean	Whether single-thread model	—
asyncSupported	boolean	Whether async is supported	—
backgroundProcessorDelay	int	Background scheduling delay (-1 = disabled)	seconds
runAs	String	run-as role	—
modelerType	String	Implementation class (com.apusic.ams.core.StandardWrapper)	—

3.17 JDBC Data Source

- MBean ObjectName pattern: `*:type=DataSource,*`
- Actual examples: `admin-service: class=javax.sql.DataSource, name="test", type=DataSource`
- Implementation class: `com.apusic.aas.jdbc.pool.DataSource` (modelerType)

Attribute	Type	Description
name (ObjectName key)	String	Pool name (e.g. <code>test</code> ; surrounding quotes are stripped)
driverClassName / driverPath	String	Driver class / driver JAR path
url	String	JDBC URL
username / password	String	credentials (password masked)
numActive	int	Current active connection count
numIdle	int	Current idle connection count
size	int	Current total pool connection count
idle / active	int	Another idle/active view
maxActive / maxTotal	int	Maximum pool size
maxIdle	int	Maximum idle connection count
minIdle	int	Minimum idle connection count
initialSize	int	Initial pool size
maxWait / maxWaitMillis	int	Maximum wait time
timeBetweenEvictionRunsMillis	int	eviction scan interval (leak detection period)
minEvictableIdleTimeMillis	int	Idle timeout
validationQueryTimeout	int	Validation timeout
numTestsPerEvictionRun	int	Number of tests per eviction run
testWhileIdle / testOnBorrow / testOnReturn / testOnConnect	boolean	Whether to validate at each phase
removeAbandoned / removeAbandonedTimeout /	boolean / int /	leak reclaim configuration

logAbandoned	boolean	
abandonWhenPercentageFull	int	Occupancy threshold that triggers leak reclaim
defaultCatalog	String	Default catalog
defaultTransactionIsolation	int	Default transaction isolation level
defaultAutoCommit / defaultReadOnly	Boolean	Default auto-commit/read-only
jdbcInterceptors	String	Interceptor chain (e.g. com.apusic.aas.jdbc.pool.interceptor.SqlTraceIntercept
validatorClassName / validationQuery	String	Validator / validation SQL
initSQL / connectionProperties	String	Initialization SQL / connection properties
useDisposableConnectionFacade / useStatementFacade / accessToUnderlyingConnectionAllowed	boolean	Various switches
alternateUsernameAllowed / commitOnReturn / rollbackOnReturn / ignoreExceptionOnPreLoad	boolean	Connection behavior switches
jmxEnabled / fairQueue / useLock / useEquals / propagateInterruptState	boolean	Pool behavior switches
poolSweeperEnabled / validationInterval / maxAge	boolean / long / long	Scan and lifetime control
loginTimeout	int	Login timeout
waitCount / borrowedCount / returnedCount / createdCount / releasedCount / reconnectedCount / releasedIdleCount / removeAbandonedCount / suspectCount	int / long	Various cumulative counters
dataSourceJNDI / dataSource	String / Object	JNDI name / underlying DataSource
className / modelerType	String	Implementation class name

ResourceName	String	Resource name
--------------	--------	---------------

3.18 Slow SQL Count

- MBean ObjectName pattern: `com.apusic.aas.jdbc.pool:type=SqlTraceConfig`

Attribute	Type	Description	Unit
slowQueryCount	Map<String, AtomicLong>	Cumulative slow SQL count for all data sources; key is the data source name, value is the slow SQL count	count

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