

Overview

SPM supports monitoring of both **MRv1** (0.22 and earlier, 1.0, 1.1) and **YARN** (0.23, 2.*) based Hadoop versions. Since the architecture is different, SPM uses different application types for them and different reports are available.

Common reports for all Hadoop types:

- Overview
- NameNode
- DataNode
- CPU & Mem
- Disk
- Network
- JVM
- GC

In addition to that, MRv1 versions also get the following reports:

- JobTracker
- JobTracker Queues
- TaskTracker

While reports specific for YARN versions are:

- ResourceManager
- ResourceManager Queues
- NodeManager

In some cases, some reports will be empty because particular Hadoop version doesn't expose some metrics over JMX. For instance, 0.20, 0.21, 0.22 **MRv1** versions of Hadoop will not have data in **JobTracker**, **JobTracker Queues** and **TaskTracker** reports (while 1.0 and 1.1 will have all reports populated). **NOTE:** regardless of this, you can monitor JVM stats of **JobTracker** and **TaskTracker** processes under JVM report for all **MRv1** versions (0.20, 0.21, 0.22 included). Also, since **SecondaryNameNode** doesn't expose specific metrics, it doesn't have a special report, but it can also be monitored under JVM report (for instance, you can create an alert to notify you when its heap size reaches some limit or drops to 0, meaning the process likely died).

All **YARN** versions (0.23, 2.*) will display all available reports and we expect all new Hadoop versions to continue behaving like that.

YARN versions don't have separate reports for the following components (since they don't expose specific metrics):

- **HistoryServer**
- **WebAppProxy**

However, you can still monitor these processes under JVM report, in the same way as **SecondaryNameNode** can be monitored in **MRv1** setups. You can

also define any alerts which are based on JVM metrics which should be good enough for most situations.

Metrics

| Metric | | | | |
|---|--------|-----|-----------|--------------------------------|
| Name | Key | Agg | Type | Description |
| num allo- cated con- tain- ers | hadoop | Avg | Container | Containers allocated |
| containers launched | hadoop | Sum | Container | Containers launched |
| containers killed | hadoop | Sum | Container | Containers killed |
| containers com- pleted | hadoop | Sum | Shuffle | Shuffle output bytes completed |
| containers com- pleted | hadoop | Sum | Container | Containers completed |
| available GB | hadoop | Avg | Variable | Available |
| shuffle con- nec- tions | hadoop | Sum | Shuffle | Shuffle connections |
| shuffle out- puts failed | hadoop | Sum | Shuffle | Shuffle output failed |

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| Metric | | | | |
| Name | Key | Agg | Type | Description |
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| containers-running | hadoopcontainers | Avg | Double | Containers running |
| containers-failed | hadoopcontainers | Sum | Double | Containers failed |
| containers-initiated | hadoopcontainers | Avg | Double | Containers initiating |
| shuffle-output-ok | hadoopshuffle | Sum | Double | Shuffle output ok |
| allocated-GB | hadoop | Avg | Double | Allocated GB |
| applications-killed | hadoop | Sum | Double | Applications killed |
| running-300 | hadoop | Avg | Double | Running 300 |
| available-MB | hadoop | Avg | Double | Available MB |
| applications-failed | hadoop | Sum | Double | Applications failed |
| applications-submitted | hadoop | Sum | Double | Applications submitted |
| running-60 | hadoop | Avg | Double | Running 60 |
| pending-MB | hadoop | Avg | Double | Pending MB |

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| Metric | | | | |
| Name | Key | Agg | Type | Description |
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| application pending | hadoop | App | Double | pending |
| active hadoop applications | hadoop | App | Double | active |
| containers allocated | hadoop | Container | Double | containers.alloc |
| running hadoop containers | hadoop | Container | Double | containers.running |
| containers pending | hadoop | Container | Double | containers.pending |
| application completed | hadoop | App | Double | completed |
| allocated hadoop MB | hadoop | Memory | Double | memory.alloc |
| containers reserved | hadoop | Container | Double | containers.reserved |
| active hadoop users | hadoop | User | Double | active |
| containers released | hadoop | Container | Double | containers.released |
| reserved hadoop MB | hadoop | Memory | Double | memory.reserved |

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| Metric | | | | |
| Name | Key | Agg | Type | Description |
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| application-running | hadoop | Avg.app | Double | Number of applications running |
| running | hadoop | Avg.ru | Double | Number of running daemons |
| active NMs | hadoop | Avg.nn | Double | Number of active NameNodes |
| decom NMs | hadoop | Avg.nn | Double | Number of decommissioning NameNodes |
| rebooted NMs | hadoop | Avg.nn | Double | Number of rebooted NameNodes |
| lost NMs | hadoop | Avg.nn | Double | Number of lost NameNodes |
| unhealthy NMs | hadoop | Avg.nn | Double | Number of unhealthy NameNodes |
| blocks replicated | hadoop | Sum.blocks | Long | Number of blocks replicated |
| blocks read | hadoop | Sum.blocks | Long | Number of blocks read |
| writes from local client | hadoop | Sum.io.write | Long | Number of bytes written from local client |
| copy block op avg time | hadoop | Avg.block | Double | Average time to copy a block |

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| Metric | | | | |
| Name | Key | Agg | Type | Description |
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| heartbeats num ops | hadoop-hdfs | Sum | Long | hadoop.hdfs.heartbeats |
| reads from re-mote client | hadoop-hdfs | Sum | Long | hadoop.hdfs.remote |
| read from lo-cal client | hadoop-hdfs | Sum | Long | hadoop.hdfs.local |
| write block num ops | hadoop-hdfs | Sum | Long | hadoop.hdfs.writes |
| blocks re-moved | hadoop-hdfs | Sum | Long | hadoop.hdfs.removed |
| blocks ver-i-fied | hadoop-hdfs | Sum | Long | hadoop.hdfs.verified |
| replace block op avg time | hadoop-hdfs | Avg | Double | hadoop.hdfs.replaces.time |
| writes from re-mote client | hadoop-hdfs | Sum | Long | hadoop.hdfs.remote |

| Metric | | | | |
|---------------------|--------|-----|----------|----------------------------|
| Name | Key | Agg | Type | Description |
| replaceblocknumops | hadoop | Sum | BlockOps | hadoop.replaceblocknumops |
| copyblocknumops | hadoop | Sum | BlockOps | hadoop.copyblocknumops |
| writeblockopavgtime | hadoop | Avg | BlockOp | hadoop.writeblockopavgtime |
| blocks writet | hadoop | Sum | BlockOps | hadoop.blocks writet |
| readblockopavgtime | hadoop | Avg | BlockOp | hadoop.readblockopavgtime |
| heartbeats | hadoop | Avg | IO | hadoop.heartbeats |
| bytes read | hadoop | Sum | IO | hadoop.bytes read |
| readblocknumops | hadoop | Sum | BlockOps | hadoop.readblocknumops |
| bytes writet | hadoop | Sum | IO | hadoop.bytes writet |

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| Metric | | | | |
| Name | Key | Agg | Type | Description |
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| map task slots | hadoop-mapreduce-job | avg | double | Map task slots |
| reduce run-ning | hadoop-mapreduce-job | avg | double | Reduce run-ning |
| tasks failed time-out | hadoop-mapreduce-job | sum | long | Tasks failed time-out |
| tasks failed ping | hadoop-mapreduce-job | sum | long | Tasks failed ping |
| tasks completed | hadoop-mapreduce-job | sum | long | Tasks completed |
| reduce task slots | hadoop-mapreduce-job | avg | double | Reduce task slots |
| maps run-ning | hadoop-mapreduce-job | avg | double | Maps run-ning |
| waiting re-duces | hadoop-mapreduce-job | avg | double | Waiting re-duces |
| waiting maps | hadoop-mapreduce-job | avg | double | Waiting maps |
| jobs killed | hadoop-mapreduce-job | sum | long | Jobs killed |

| Metric | | | | |
|---------------------------|--------|-----|--------|-------------------|
| Name | Key | Agg | Type | Description |
| jobs sub- mit- ted | hadoop | Sum | Long | Submitted jobs |
| maps failed | hadoop | Sum | Long | Maps failed |
| running | hadoop | Avg | Double | Running time |
| 300 | | | | |
| maps kil- lled | hadoop | Sum | Long | Maps killed |
| reduce slots | hadoop | Avg | Double | Reduce slots |
| running | hadoop | Avg | Double | Running time |
| 60 | | | | |
| maps launched | hadoop | Sum | Long | Maps launched |
| jobs prepar- ing | hadoop | Avg | Double | Jobs preparing |
| reduces com- pleted | hadoop | Sum | Long | Reduces completed |
| jobs failed | hadoop | Sum | Long | Jobs failed |
| running | hadoop | Avg | Double | Running time |
| 1440 | | | | |
| reduces launched | hadoop | Sum | Long | Reduces launched |

| Metric | | | | |
|-------------------------|--------|-----|--------|-------------------------|
| Name | Key | Agg | Type | Description |
| map slots | hadoop | Avg | Double | map slots |
| reduces killed | hadoop | Sum | Long | reduces killed |
| maps completed | hadoop | Sum | Long | maps completed |
| jobs running | hadoop | Avg | Double | jobs running |
| reduces failed | hadoop | Sum | Long | reduces failed |
| jobs completed | hadoop | Sum | Long | jobs completed |
| running | hadoop | Avg | Double | running |
| get list- ing ops | hadoop | Sum | Long | get list- ing ops |
| renamed files | hadoop | Sum | Long | renamed files |
| decom nodes | hadoop | Avg | Double | decom nodes |
| dead nodes | hadoop | Avg | Double | dead nodes |
| create file ops | hadoop | Sum | Long | create file ops |

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| Metric | | | | |
| Name | Key | Agg | Type | Description |
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| blocks pending replication | hadoop | Avg | blocks | pending.replication |
| missing blocks | hadoop | Avg | blocks | missing |
| under replicated blocks | hadoop | Avg | blocks | underreplicated |
| file info ops | hadoop | Sum | file | ops.info |
| blocks total | hadoop | Avg | blocks | |
| blocks pending deletion | hadoop | Avg | blocks | pending.deletion |
| corrupted blocks | hadoop | Avg | blocks | corrupt |
| capacity remaining | hadoop | Avg | capacity | remaining |
| total files | hadoop | Avg | file | total |

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| Metric | | | | |
| Name | Key | Agg | Type | Description |
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| append files | hadoop | Sum | files | append files |
| excess blocks | hadoop | Avg | blocks | excess blocks |
| capacity used | hadoop | Avg | capacity | used |
| deleted files | hadoop | Sum | files | deleted files |
| delete ops | hadoop | Sum | ops | delete ops |
| capacity to- tal | hadoop | Avg | capacity | |
| created files | hadoop | Sum | files | created files |
| live nodes | hadoop | Avg | nodes | |
| scheduled repli- ca- tion blocks | hadoop | Avg | blocks | scheduled.replication |
| heartbeats | hadoop | Sum | beats | |
| blacklisted track- ers | hadoop | Sum | trackers | blacklisted |
| running re- duces | hadoop | Avg | reduces | |

| Metric | | | | |
|-------------------------|--------|-----|------------|-------------------------|
| Name | Key | Agg | Type | Description |
| occupiedmap slots | hadoop | avg | slotDouble | occupied |
| runningmaps | hadoop | avg | mapDouble | running |
| blacklistedmaps | hadoop | sum | long | blacklisted |
| blacklistedreduces | hadoop | sum | long | blacklisted |
| occupiedreduces slots | hadoop | avg | slotDouble | occupied |
| decommissioned trackers | hadoop | sum | long | trackers.decommissioned |
| tracker | hadoop | sum | long | trackers |
| waitingreduces | hadoop | avg | long | reduces |
| waitingmaps | hadoop | avg | long | maps |
| map slots | hadoop | avg | slotDouble | map |
| graylisted trackers | hadoop | sum | long | trackers.graylisted |
| reduce slots | hadoop | avg | slotDouble | reduce |

| Metric | | | | |
|--------|-----|-----|------|-------------|
| Name | Key | Agg | Type | Description |