| Title: | The Sun Stone Scheduler Workload Format (2016_SStoneSch_Workload_Format.pdf) | | |
|---|---|---|---|
| **Version** | **Issue** | **Date** | **Comment** |
| 1 | 1 | 4 October 2016 | First draft. |

The scheduler workload format is based on Dror Feitelson Standard Workload Format (SWF). SWF files are 18 fields long. In order to support workflow type jobs, we extended the format by adding four new fields namely: job type, composite job id, successors set, and predecessors set. The former two fields are comma separated job ids. Fields 17 and 18 must be set to -1 when non-independent jobs are included in the workload. Sun Stone Scheduler workload format consists of 22 fields; these are summarized in Table I.

Two classes of jobs are distinguished namely: independent and prec. Jobs in the independent class must be labeled INDEPENDENT in field 19 whereas non-independent jobs must be set to DAG, TREE, or LINE classes. In the future it would be desirable to add other classes of precedence constraint classes. See examples at the end of this file.

**TABLE I**
SUN STONE SCHEDULER SWF TRACE FILE FORMAT

| ID | SWF | Type | metric | Description |
|---|---|---|---|---|
| 1 | Job number | integer | | A counter field staring from 1. |
| 2 | Submit time | float | s | The earliest time the log refers to is zero. Lines are sorted by ascending submittal times. |
| 3 | Wait time | float | s | Difference between a job submit time and the time it actually began to run. |
| 4 | Run time | float | s | End time minus start time (wall clock time), SWF uses wait time and run time. |
| 5 | Number of allocated processors | integer | | Number of processors the Job uses. Sometimes this information is not available when process creation is dynamic. |
| 6 | Average CPU time | | s | Includes user + system time. Average over all processors used by a Job. |
| 7 | Used memory | integer | kb | Average over all processors. |
| 8 | Requested number of processors | integer | | |
| 9 | Requested time | float | s | Either runtime (wall clock time) or average CPU time per processor. |
| 10 | Requested memory | integer | kb | |

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|---|---|---|---|---|
| 11 | Status | integer | | Job status ∈ { -1 ≡ not relevant, 0 ≡ failed , 1 ≡ completed, 2 ≡ partial execution will be continued, 3 ≡ last partial execution job completed, 4 ≡ last partial execution, job failed , 5 ≡ cancelled}. |
| 12 | User id | | | SWF: uuid integer ∈ { 1 … max users}<br>GWF: string. E.g., H.Carbajal |
| 13 | Group id | | | SWF: integer ∈ {1 … max groups}. uuid.<br>GWF: string. E.g., PDS. |
| 14 | Executable number | | | SWF: integer ∈ {1 … number of different applications appearing in the workload}.<br>GWF: string. A tentative string format is executable name, executable version, or executable parameters. |
| 15 | Queue number | | | SWF: integer ∈ {1 … number of different queues in the system }. Queue nature should be explained in header.<br>GWF: string. |
| 16 | Partition number | | | SWF: integer ∈ {1 … number of different partitions in the systems}. Partition information should be explained in header.<br>GWF: string. |
| 17 | Preceding job | integer | | SWF: Number of the preceding job. This job cannot execute until the preceding job completes. |
| 18 | Think time from preceding job | float | s | SWF: Number of seconds that should elapse between the termination of the preceding job and the submittal of this one. |
| 19 | Job class | string | | Two classes: independent (INDEPENDENT) and composite (TREE, LINE, and DAG). |
| 20 | Composite job id | integer | | The composite job id. Starting from 1 |
| 21 | Successors | string | | Comma separated list of successor job numbers. If no successors are present, then set to -1. |

| | | | |
|---|---|---|---|
| 22 | Predecessors | string | Comma separated list of predecessor jobs. If no successors are present, then set to -1. |

Tree independent job workloads, used for validation purposes, are included in the workload directory, namely:

- indpPUnitarioZUnitario.swf
- indpPVariableZUnitario.swf
- indpPVariableZVariable.swf

Tree composite job workload are also included in the workload subdirectory

- compuestos1.swf
- compuestos3.swf
- compuestos10.swf

The following is an example of a workload that includes both composite and independent jobs.

| job number | | think time | job type | composite id | successors | predecessors |
|---|---|---|---|---|---|---|
| 0 | ... | -1 | DAG | 0 | 1 | -1 |
| 1 | ... | -1 | DAG | 0 | -1 | 0 |
| 2 | ... | -1 | INDEPENDENT | -1 | -1 | -1 |
| 3 | ... | -1 | INDEPENDENT | -1 | -1 | -1 |
| 4 | ... | -1 | DAG | 1 | 7 | -1 |
| 5 | ... | -1 | DAG | 1 | 6,7 | -1 |
| 6 | ... | -1 | DAG | 1 | -1 | 5 |
| 7 | ... | -1 | DAG | 1 | -1 | 4,5 |
| 8 | ... | -1 | INDEPENDENT | -1 | -1 | -1 |
| 9 | ... | -1 | TREE | 2 | 10,11 | -1 |
| 10 | ... | -1 | TREE | 2 | -1 | 9 |
| 11 | ... | -1 | TREE | 2 | -1 | 9 |
| 12 | ... | -1 | INDEPENDENT | -1 | -1 | -1 |