Start

Start Replica Controller

Start Task Dispatcher

Replica Controller

Start Service with SRN Replicas

Update Variables

SRN++

SRN < MAX — Yes → SRN++ / No

SRN--

SRN >= MAX — Yes / No

UTC * TD > RT — Yes / No

SRN > DTC — Yes / No

RC < SRN — Yes → Add Replica RC++ / No

UTC > 0 — Yes / No

TC == FTC — Yes → Stop Service → END

Task Dispatcher

Task Requested

UTC > 0 — No → DTC > 0 — No → Task = Shutdown RC--

DTC > 0 — Yes → index = 0 count = count(DTCs)

index < count — No → Send / Yes

index++

TS = Time.Now - DTC[index].dispatched_at

TS > XRTD — No / Yes → Task = DTC[index]

Task = Tx

Send

Get Undispatched Task

T1: Done
T2: Dispatched
T3: Dispatched
T4: New
T5: New

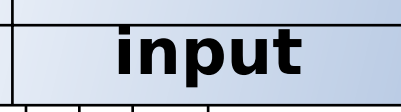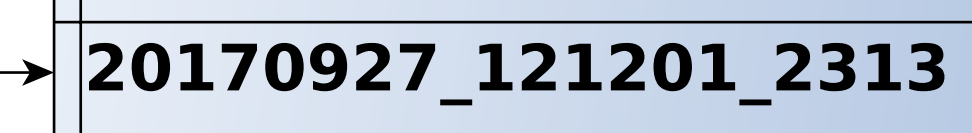Data Received

Replica

Start

Get Task

Process

Send Result

GET Request

GET Response

POST Request

Legend

JDL : JOB_DEADLINE (in seconds)
TD : TASK_DURATION (in seconds)
XRTD: Max Real Task Duration
IRTD: Min Real Task Duration
ARTD: Average Real Task Duration
TC: TASK_COUNT (Total)
UTC: UNDISPATCHED_TASK_COUNT (Only New Tasks)
DTC: DISPATCHED_TASK_COUNT (Only New Tasks)
FTC: FINISHED_TASK_COUNT (Only New Tasks)
JDN : JOB_DUATION_NEEDED = TASK_COUNT * TASK_DURATION
SRN : SIMULTANEOUS_REPLICAS_NEEDED = JOB_DEADLINE / JOB_DUATION_NEEDED
RC   : REPLICA_COUNT (Currently Running, default: 0)
MAX: MAX_NODE_ALLOWED = REPLICAS_PER_WORKER * MAX_WORKER_ALLOWED
ET   : ELAPSED_TIME = NOW - STARTING_TIME (in seconds)
TR   : REMAINING_TIME = JOB_DEADLINE - ELAPSED_TIME

File structure

jobs
20170927_121201_2313
input
  xi_files
  x4.json
  x5.json
  x3.json
  x1.json
  x2.json
output
  job_logs
  job_summary
  results_x1
  results_x2