# YARN-1051 Usage Example

The purpose of this document is to show how to use the new YARN-1051 ReservationSystem. The current version of YARN-1051 works with the CapacityScheduler, while as part of YARN-2574 we are tracking follow-up work to add compatibility with FairScheduler (by design it should be easy).

# Configuration

To “turn on” the reservation system one should set in **yarn-site.xml** by adding:

<property>

<name>yarn.resourcemanager.reservation-system.enable</name>

<value>true</value>

</property>

<property>

<name>yarn.resourcemanager.scheduler.class</name>

<value>org.apache.hadoop.yarn.server.resourcemanager.scheduler.capacity.CapacityScheduler</value>

</property>

In **capcity-scheduler.xml** we configure a queue (“dedicated” in our example) to be reservable by setting:

<property>

<name>yarn.scheduler.capacity.root.dedicated.reservable</name>

<value>true</value>

<description>When true, it allows reservation to be submitted to this</description>

</property>

<property>

<name>yarn.scheduler.capacity.root.dedicated.show-reservations-as-queues</name>

<value>true</value>

<description>

When true, reservations are visible as sub-queues of the plan in the scheduler GUI.

</description>

</property>

# Submitting a reservation and a job in it

The patch in YARN-2601, extends the existing set of example to include a simple way to exercise reservation. By running:

$HADOOP\_YARN\_HOME/bin/hadoop jar $HADOOP\_YARN\_HOME/share/hadoop/mapreduce/hadoop-mapreduce-examples-${VER}.jar reservation \

-Dmapreduce.framework.name=yarn \

-Dmapreduce.job.queuename=dedicated \

$MAPS $ROUNDS 2>&1

We trigger a client that submit a reservation to the "dedicated" queue, which is a plan with the following characteristics:

\* start time: now

\* deadline: now + 80sec

\* resources requested: $MAPS containers of <1GB, 1vcore>, plus <2GB,2vcores> for the AM.

\* duration: 60 sec (this fits fine $ROUNDS = 100000000)

Upon acceptance the client submit a Pi job (QuasiMontecarlo.java) within the reservation.

# Observing effects

The client console output looks something like this:

14/09/26 17:16:55 INFO client.RMProxy: Connecting to ResourceManager at vnectar-29.redmond.corp.microsoft.com/10.218.237.143:8032

Response from ReservationSystem: reservation\_1411776076016\_0002

Number of Maps = 10

Samples per Map = 100000000

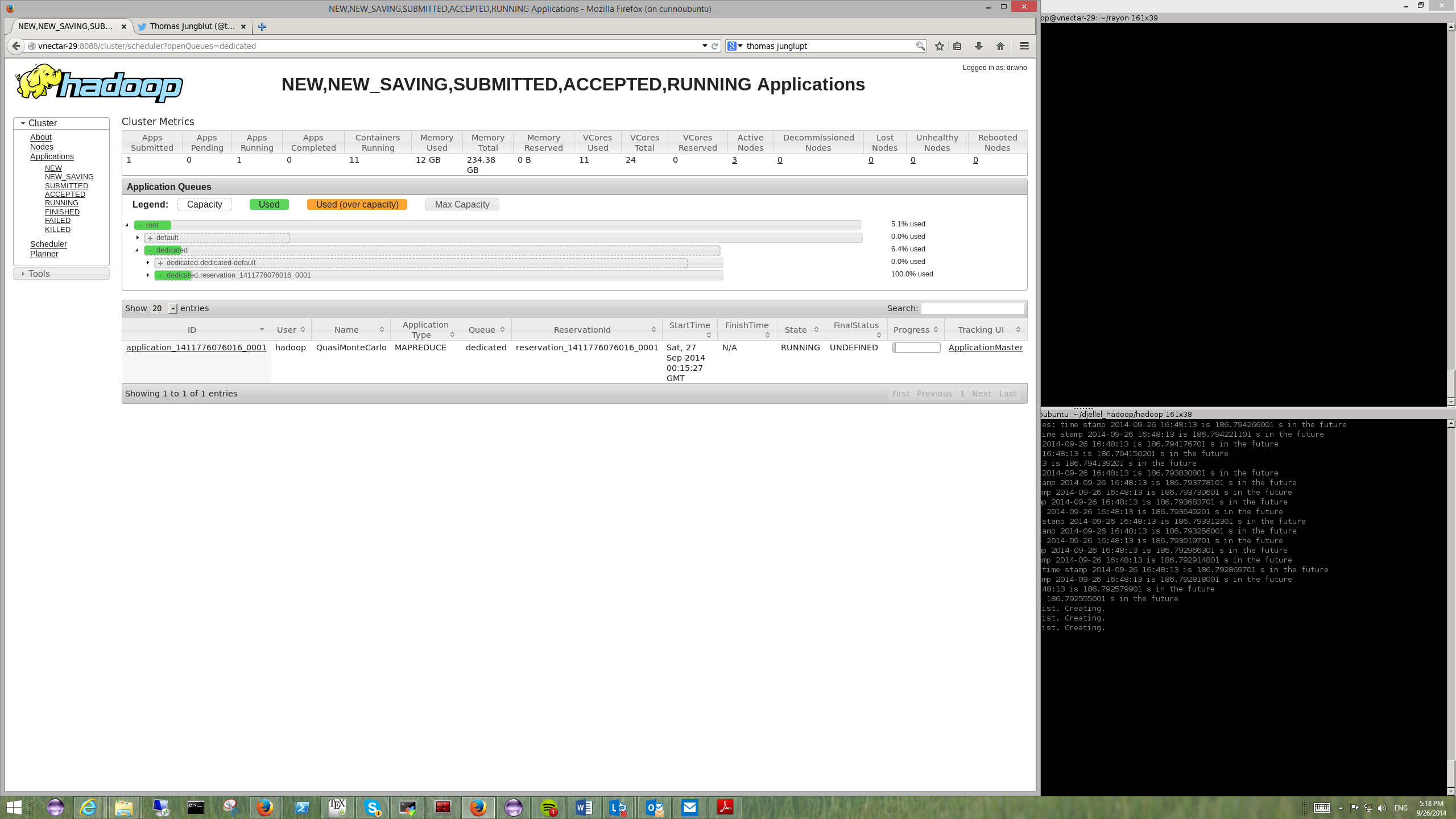
Wrote input for Map #0

Wrote input for Map #1

…

To see the effect, we configured the Scheduler GUI to show the reservations as queues (this is done by the show-reservations-as-queues parameter in capacity-scheduler.xml and is off by default).

The screenshot below shows what happens (we have a couple of extra changes to the GUI reporting the reservation ID, and a Planner tab which are not polished/released yet).



From the resource manager log we observe the following info being logged:

2014-09-26 17:20:16,371 INFO org.apache.hadoop.yarn.server.resourcemanager.reservation.AbstractReservationSystem: Allocated new reservationId: reservation\_1411776076016\_0003

2014-09-26 17:20:16,372 INFO org.apache.hadoop.yarn.server.resourcemanager.reservation.GreedyReservationAgent: placing the following ReservationRequest: {Arrival: 1411777215314, Deadline: 1411777287314, Reservation Name: null, Resources: {Reservation Resources: [{Capability: <memory:1024, vCores:1>, # Containers: 12, Concurrency: 1, Lease Duration: 60000}], Reservation Type: R\_ALL}}

2014-09-26 17:20:16,511 INFO org.apache.hadoop.yarn.server.resourcemanager.reservation.InMemoryPlan: Sucessfully added reservation: reservation\_1411776076016\_0003 to plan.

2014-09-26 17:20:16,511 INFO org.apache.hadoop.yarn.server.resourcemanager.scheduler.capacity.CapacityScheduler: Set entitlement for ReservationQueue dedicated-default to 0.0 request was (0.0)

2014-09-26 17:20:16,515 INFO org.apache.hadoop.yarn.server.resourcemanager.scheduler.capacity.LeafQueue: Initializing reservation\_1411776076016\_0003