GenesisII – Queue as BES resource
Author: Vanamala Venkataswamy
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In this document, we will discuss how one can setup Queue resource to behave like a BES when linked into another Queue resource so that we can have hierarchy of Queue resources with each sub-queue associated to a particular type/kind of BES resources. For instance, we can have a main Queue (hereafter MainQueue) that consists of multiple sub-queues (hereafter sub-queue1, sub-queue2...) with each sub-queue holding a different kind of BES resources ex. sub-queue1 has only fork-exec BESs, sub-queue2 has BESs running on virtual machines etc.

At this point we assume that you have access to some grid (XCG or bootstrap grid) and you have logged into grid with valid credentials. We also assume that you have access to container(s) on which you would create Queue and BES resources. For simplicity, all the grid commands below will be on Bootstrap grid and that all Queue and BES resources are being created on one container main-container as grid user vana.

Setup

1. Create a simple fork-exec BES (bes1) and give +r permissions to everyone on BES.
```
    > grid create-resource /resources/xsede.org/containers/main-
container/Services/GeniiBESPortType /home/xsede.org/vana/bes1
    > grid chmod /home/xsede.org/vana/bes1 +r --everyone
```
2. Create a Queue resource sub-queue1, link bes1 (LINUX, x86) to this queue resource. Set slots on bes1 say 2 slots. Also give +r permissions to everyone on queue.
```
    > grid create-resource /resources/xsede.org/containers/main-
container/Services/QueuePortType /home/xsede.org/vana/sub-queue1
    > grid chmod /home/xsede.org/vana/sub-queue1 +r --everyone
```
3. Copy sub-queue1's construction-properties file to local disk. The text in the construction-properties file should look similar to this

```
    > grid cp /home/xsede.org/vana/sub-queue1/construction-properties
local:queue-cons-props
```

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<construction-parameters xmlns="http://vcgr.cs.virginia.edu/construction-parameters"
xmlns:ns2="http://vcgr.cs.virginia.edu/construction-parameters/bes"
xmlns:ns3="http://vcgr.cs.virginia.edu/construction-parameters/queue">
    <ns3:resource-overrides/>
</construction-parameters>
```

4. Edit the construction-properties file from above step, specifically resource-overrides element adding a few sub-elements that are needed to make sub-queue1 act like a BES resource. The resulting construction-properties file should look like this.

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<construction-parameters xmlns="http://vcgr.cs.virginia.edu/construction-
parameters" xmlns:ns2="http://vcgr.cs.virginia.edu/construction-parameters/bes"
xmlns:ns3="http://vcgr.cs.virginia.edu/construction-parameters/queue">
    <ns3:resource-overrides>
        <ns2:operating-system-name>LINUX</ns2:operating-system-name>
```

```
            <ns2:cpu-architecture-name>x86</ns2:cpu-architecture-name>
            <ns2:cpu-count>4</ns2:cpu-count>
            <ns2:physical-memory>49500000000.000000 B</ns2:physical-memory>
            <ns2:wallclock-time-limit>168 hours</ns2:wallclock-time-limit>
        </ns3:resource-overrides>
</construction-parameters>
```

5. Save the changes and copy the construction-properties file back to grid name space.

```
    > grid cp local:queue-cons-props /home/xsede.org/vana/sub-
queue1/construction-properties
```

6. Create another BES resource bes2 (LINUX, x86) and give +x permissions to everyone. Create another Queue resource main-queue. Link bes2 to main-queue. Now, link sub-queue1 to main-queue.

```
    > grid create-resource /resources/xsede.org/containers/main-
container/Services/GeniiBESPortType /home/xsede.org/vana/bes2
    > grid chmod /home/xsede.org/vana/bes2 +r –everyone

    > grid create-resource /resources/xsede.org/containers/main-
container/Services/QueuePortType /home/xsede.org/vana/main-queue
    > grid chmod /home/xsede.org/vana/main-queue +r --everyone
```

Example structure:

main-queue->bes2
            ->sub-queue1

sub-queue1->bes1

This will make the sub-queue1 behave like bes accepting jobs from main-queue.

Note: Make sue you have the right namespace (xmlns:ns3="http://vcgr.cs.virginia.edu/construction-parameters/queue") for adding resource-overrides elements. If these overrides are added to BES namespace (xmlns:ns2="http://vcgr.cs.virginia.edu/construction-parameters/bes") on queue resource, it will not work.