STAR’s Cloud/VM Adventures

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The STAR Experiment has been exploring various aspects of cloud computing and virtualization of grid computing. This exploration has ranged from running in early 2009, scientific production computations on Amazon EC2 to trying different models of VM-grid integration at Open Science Grid sites. In the Amazon case, STAR instantiated an OSG Compute Element as gatekeeper on one node and OSG worker-node images that included the full STAR software worker nodes. The contextualization was handled by Nimbus so the STAR workload was handled just as running on other persistent grid sites. Another model tested at Clemson U. has a persistent gatekeeper and the worker-node instances are launched on demand, register with the local resource manager and can then accept grid jobs. A third model tested at U. Wisconsin launches worker-node images as part of the single job workflow using Condor-VM. A fourth model, tested on EC2 was to have images that boot up, run a single job, and then shutdown. These experiences have illustrated aspects of the models which are important to understand when considering how to utilize them for the overall workflow of the computing task being carried out. We are currently discussing additional cloud models to test with the Magellan project at NERSC and will present our results and comparisons of the diverse approaches.