

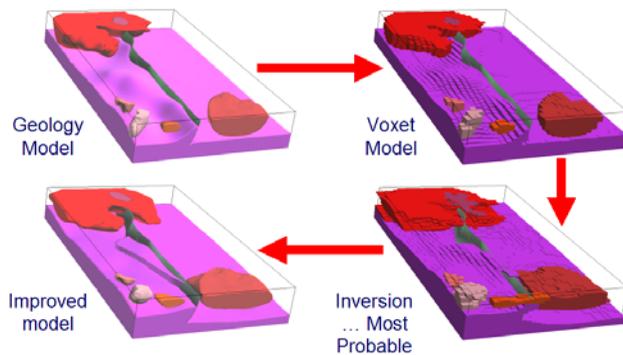
Geophysical Inversion on Aneka Enterprise Clouds



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Geophysical Inversion



Process

3D GeoModeller calculates a forward model by first discretising the 3D geological model to a voxet. Each cell is given the appropriate mean property for its geology, and a summation of all the contributions to the required components of the observed field is carried out.

Problems

- Long running time of application
- Mix and match nature of the process
- A single run can practically take a day or two to run, depending upon the number of iteration and voxet cellsize.
- Has to be run many time with varying inputs and parameter to get the best fit.
- Harvest unused machines on the network.

Solution

- Use the Aneka Design Explorer to schedule jobs on Aneka Cloud.
- Aneka Design Explorer gives you a one window solution to schedule and monitor Parameter Sweeping applications.
- The whole process of migrating and getting the result back is transparent to the user.
- Aneka run seamlessly with Windows based clouds.

How it works

Geophysical Inversion comprises preparing set of cases, a case represent an instance of geology model where as Run dictates the input data and parameters to the process.

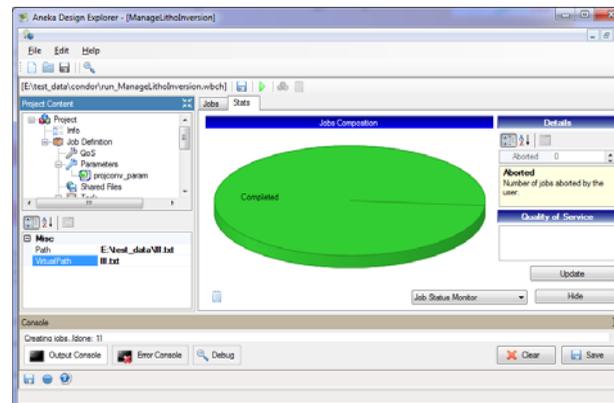
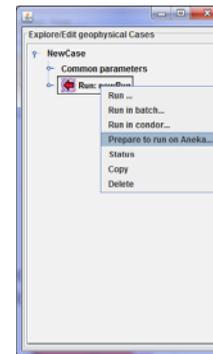
- GUI will prepare the job to be scheduled on Aneka

- Inversion requires a license to run on each node.

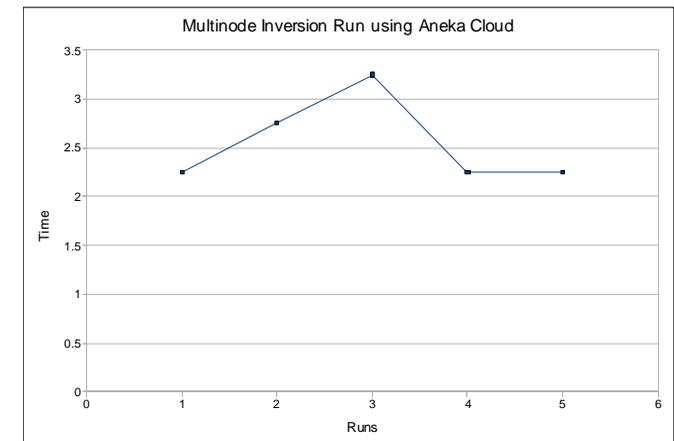
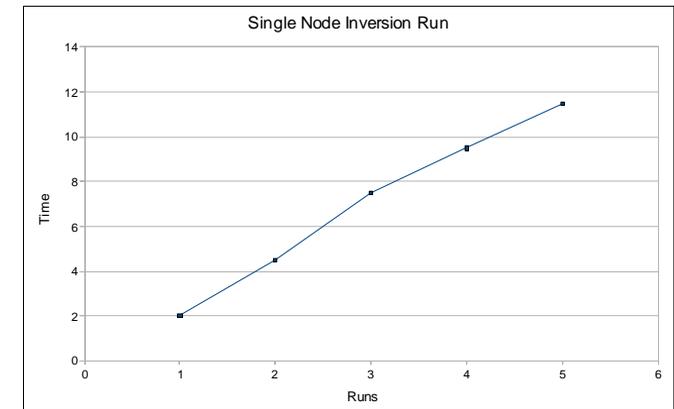
- The master node needs to be licensed. The master node will create the tickets which allow slave machine to run the application.

- The master node then prepare the Design Explorer workbench file which can opened using Design Explorer to schedule the job.

- The master node zips up the data, software and license tickets. The zip file is then unzip on the slave node. The process is run and the results are sent back to the master node.



Comparison of Single and Multinode Inversion Run



Conclusion

The obtained results showed that the Aneka framework gives user opportunity to enhance their geology model by trying out numerous runs with varying inputs and parameters. This result in a shorter run-time of the application and also allow the user get the optimum revised geology model. In short the Aneka framework allow users to run their application more efficiently by utilizing idle machines on the network.