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Council for Geoscience

PROJECT BRIEF

COUNCIL FOR GEOSCIENCE

JOHANNESBURG, SOUTH AFRICA

PROJECT OBJECTIVE

Locate small (local magnitude less than 1.5), high frequency earthquakes.

PROJECT ACHIEVMENTS

Kinematics Open System & Services designed, installed, configured and trained the client on a custom system that divides the acquisition, real-time processing, and offline processing of data between 3 servers. The data is then integrated into the seismic network database for further event refinement and research purposes.

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In early 2012 the Council for Geoscience, in Johannesburg South Africa, commissioned and installed 35 seismic stations equipped with the Quanterra Q330S+ and Episensor ES-T. Intended to supplement the South African national network, the stations are centered near the mining districts outside Johannesburg, home to some of the deepest mines in the world.

The primary focus of the dense network is to locate small (local magnitude less than 1.5), high frequency earthquakes, taking advantage of the increased sample rates obtainable by the Q330S+, which is capable of acquiring data up to 1000 samples per second in addition to the traditional 200 samples per second and less offered by the standard Q330 family of products. The data is telemetered in real-time at 100 samples per second using the 3G cell-phone data network, as well as archived on-site, utilizing the Q330S+'s integrated bailer at 500 samples per second. The streaming data is incorporated into the Antelope Real-Time Software developed by BRTT as part of the Kinematics Open System & Services ASPEN system. Real-time data from the national seismic network, acquired via a SeedLink server, is also imported in the ASPEN system, and earthquakes are automatically detected and preliminary locations calculated in near real-time. Analysts process the data using Antelope's earthquake location program dbloc2. Waveform segments of the locally stored, higher sample count data are downloaded daily and integrated into the seismic network database for further event refinement and research purposes.

Kinematics Open System & Services configured the system to divide the acquisition, real-time processing, and offline processing between 3 servers. Each server runs one process for efficiency, however, can easily and quickly be reconfigured to duplicate the other servers to provide a redundant system. Data is archived using a Network Attached Storage (NAS) device. Kinematics Open System & Services has provided the Council for Geoscience with training and basic support. Currently, plans are being made to install additional stations and create an expanded network in the region.



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