When acquiring seismic data, there are several key challenges that must be addressed in order to ensure the quality of and timeliness of delivery of a dataset from which drilling decisions can be made: 1) acquisition problems and hardware failures can result in positioning errors and incomplete datasets, 2) field seismic data can suffer from incorrect information in the trace headers, and lastly, 3) slow delivery time of the data after acquisition ends can delay seismic processing.

THE SOLUTION
Rio is an integrated service and software solution that helps to ensure that a timely and accurate seismic dataset is produced from an acquisition project. It can be applied on any land or ocean bottom fixed receiver seismic survey to reduce the time typically required for QC and geometry correction. Rio offers these three key benefits:

→ Assurance of data integrity based on thorough field-level quality controls and analysis,
→ Fast delivery of the field dataset with correct trace headers and statics,
→ Shortened cycle time for data processing.

ASSURANCE OF DATA QUALITY
Source and receiver positioning errors, shooting template and data quality errors are among the many common issues encountered during acquisition. Using Rio, quality controls are implemented by a trained technician with the aid of specialized software and field equipment. The analyst is deployed at various intervals of the project as needed to ensure ongoing data QC. Problems with the original field data are detected early and corrected. Additional software modules calculate trace attributes that can be used to identify noisy data, misfires, or other issues that could affect the quality of data acquired. Preliminary first breaks can be used for refraction and tomographic statics. Bin analysis can verify coverage requirements. Rio improves the overall quality of raw seismic data coming out of the field by delivering a dataset that matches the actual acquisition.

FAST DELIVERY OF FIELD DATA
One of the most time consuming and labor intensive aspects of processing seismic data is verifying that the geometry is correct, particularly with wireless nodes which are prone to positioning issues. Depending on the size of a project, 20-30% of the total processing time may be spent on geometry corrections alone. This can take several weeks on large projects, and is often done post-acquisition. With Rio, the data is QC’d in the field during acquisition and corrections can be made immediately. As data are acquired, partial datasets can be generated and sent to processing. This feature helps enable fast track seismic images to be prepared at various intervals during acquisition for making timely drilling decisions. Also, having the data QC’d and corrected prior to the completion of the acquisition can save weeks of time waiting for data to be shipped, loaded, and analyzed for errors at the processing center.
REDUCED CYCLE TIME FOR PROCESSING
Using Rio, a final seismic dataset with corrected geometry and static times in the trace headers in any desired sort order is produced, which eases importing of that data into processing systems. Ensuring the delivery of accurate data to processing centers saves critical time, which can ultimately help to speed up the turnaround time for generating the final processed seismic volume. Even if not used during acquisition, Rio provides an improved workflow for accelerating front-end QC work in the office. Its flexible software database can easily merge multiple datasets even in cases where data may be incomplete.

Highlighted advantages of using Rio:

→ Effective quality control
  - Trace header coordinates compared against SPS, shot logs, pre-plots, etc.
  - Difference vector displays combined with GIS imagery help to solve coordinate mismatches in station locations
  - Field data problems such as duplicate files, corrupted/incomplete tracers and headers are identified and corrected

→ Advanced analysis
  - Near surface modeling
  - Attributes calculated for individual traces and averaged for shot and receiver gathers
  - Attributes include:
    + Centroid of amplitudes
    + Average frequency
    + Dominant frequency
    + Signal to noise ratios, first break picks, RMS and more

→ Robust database
  - Fast and accurate data sorting of large data volumes
  - Support data (SPS, shot logs, drilling logs, etc.) are consolidated into a singular database
  - Spreadsheet access to all geometry attributes

→ Flexible data output
  - SEGY and ProMAX™ dataset creation
    + Interactive data selection
    + Dataset creation with corrected headers
    + Sorting routine can be used directly in flows
  - Other export options include SPS, GMG MESA project, KMZ, custom database exports

To inquire about Rio, contact GMG via e-mail at gmgsupport@iongeo.com or call +1 303 625 2253.
More information can also be found by visiting our website at www.iongeo.com/GMG