Acquisition Protocol - Its Impact on Real-time Data Acquisition System Performance

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A fundamental element of real-time mission critical seismic monitoring networks is the data acquisition system, comprising the underlying protocol and the telemetry solution. Selection of the acquisition protocol can have significant impact on the outcomes sought by the seismic network such as data availability and usability as well as operational cost and even station and data center design.

We examine the performance of various acquisition protocols using a set of standard measures of system performance. Primary measures include bandwidth utilization, data latency and robustness (data completeness). In addition, protocol functionality and features, including support for multiple data types and state-of-health, are assessed for system impact on options for station, telemetry, and data center design as well as the overall functionality of the system solution.

Real-world and system generated data are employed and key quantitative measures of system effectiveness are identified and used as the basis of the analysis. Results of the analysis show the real-world impact of low level aspects like protocol selection on system performance.