

Data Reorganization Interface

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Abstract:

This presentation will update the HPEC community on the latest status of the standard Data Reorganization Interface (DRI). DRI is a software interface for performing data-parallel distribution and reorganization operations (e.g., transpose, reshape) that are frequently required in scalable HPEC applications. DRI provides increased ease of use compared to point-to-point middleware by providing abstractions for multi-dimensional datasets, partitioning and distribution methods (e.g., block, block-cyclic, overlapped elements), and a high-level interface that frees applications from having to orchestrate the multitude of individual transfers required in a single data reorganization. A planned transfer approach in DRI enables high performance data transfers, and its multi-buffering semantics enable (with hardware support) time overlap of an application's communication and computation operations. DRI is designed to enhance existing standard and proprietary middleware by adding a standard, easy to use interface without compromising high performance.

The DRI-1.0 API was ratified and published in September 2002 by the Data Reorganization Forum, and was announced at the HPEC 2002 workshop. DRI-related activities since that announcement will be discussed in this presentation, including current vendor implementation status, a summary of results from the first use of DRI in a realistic application demonstration (SAR image formation), and candidate features that could be added to an enhanced DRI standard. The DRI-1.0 document can be accessed on the World Wide Web at URL <http://www.data-re.org>.