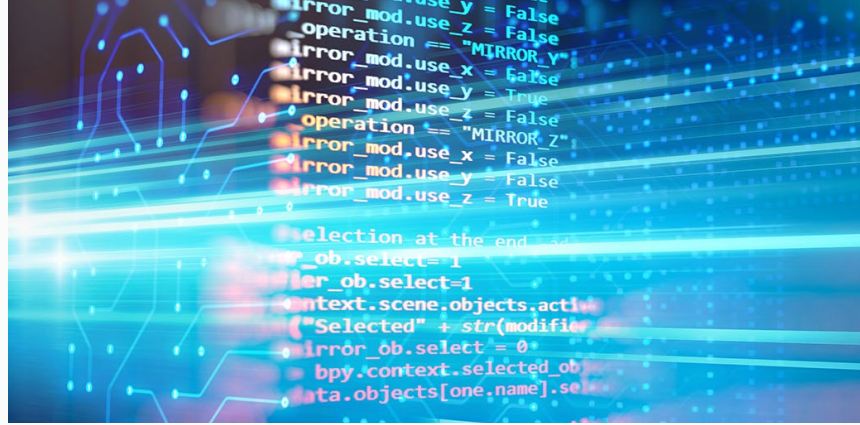


GPU Toolkit with GPU Direct can accelerate Vantage[®] System data transfer by:

- 1) Increasing memory copy speed, which reduces latency and improves frame rate.
- 2) Providing programming tools and capabilities that reduce overall development time.

This product is packaged as a bundle that includes an NVIDIA GPU card*, software licenses and a Verasonics Host Controller. This option includes the following features:



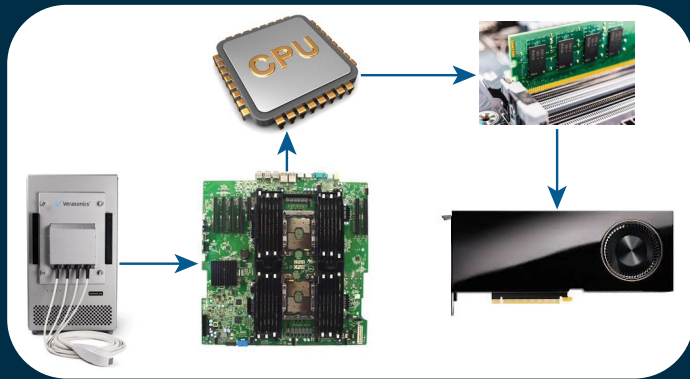
- 1) User selected memory allocation of the Vantage / Vantage *NXT* buffers utilized in the image reconstruction process. The current default for the system is the CPU, new choices include:
 - a. CUDA allocated host memory – enabling up to 2X faster asynchronous memory copies between the host computer and the GPU device
 - b. CUDA allocated unified memory – simplifying CUDA programming by utilizing NVIDIA's unified memory architecture
- 2) An Event Profiling Tool that allows users to see timing information for each operation in the event sequence. This provides users with the information needed to identify bottlenecks in data processing pipelines; this can help focus optimization efforts most efficiently.
- 3) A 1-step compilation of CUDA source code into .mex files that does not require the MATLAB[®] Parallel Computing Toolbox.
- 4) Example scripts illustrating implementation of RF or IQ data processing externally with either MATLAB scripts, MATLAB Parallel Computing Toolbox, compiled .mex functions including multi-threading, or CUDA programming.

These examples can be tested to run synchronously or asynchronously with different memory allocation methods for comparison, including GPU Toolkit with GPU Direct implementations.

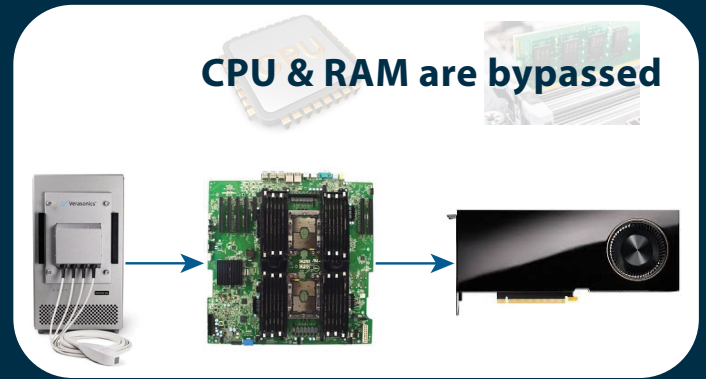
Verasonics understands that many researchers have already invested time and money in their own GPU hardware. A GPU diagnostic tool, available on the Vantage 4.7.6 release and after, can be used by existing Vantage users to determine if their GPU card(s) are compatible with Verasonics' GPU option features.¹

Direct Data Transfer

For users performing their own reconstructions on the GPU, GPU Toolkit with GPU Direct allows researchers to move data directly from the Vantage System to the graphics card.



Standard process flow



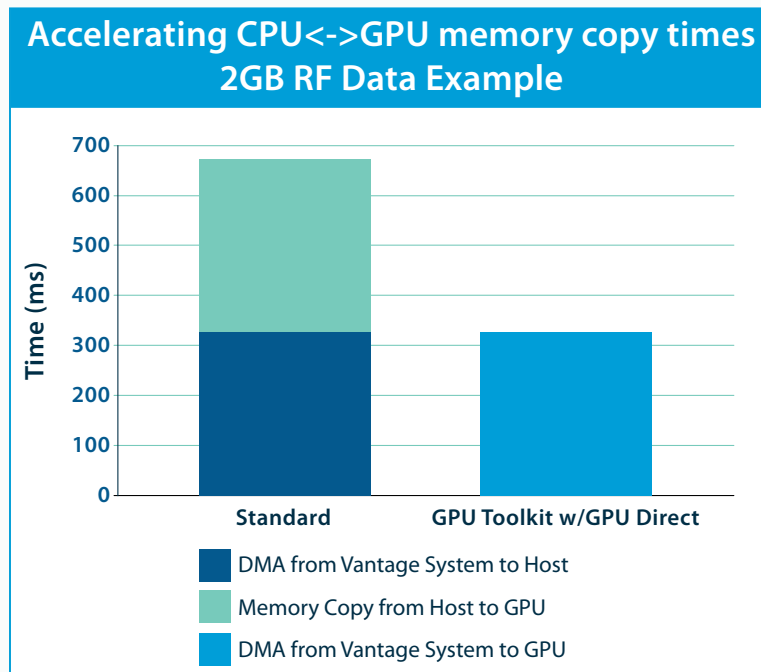
GPU Toolkit with GPU Direct process flow

Researchers accelerating their processing by using a GPU may receive benefits by taking advantage of this Verasonics technology.

GPU Toolkit with GPU Direct - only available in a Linux OS environment - allows Vantage hardware to DMA (Direct Memory Access) the acquired RF data directly to the GPU's memory, bypassing the CPU and host RAM.

This will benefit applications by:

- Reducing latency
- Increasing throughput
- Freeing up the CPU for other tasks



* NVIDIA RTX A6000 Graphics Card. Verasonics reserves the right to change products or specifications without notice.

1 Support for Verasonics customers will be offered to GPU Toolkit with GPU Direct Package customers. Verasonics cannot guarantee functionality with GPU cards we have not tested by the organization and will not offer support to GPU Toolkit with GPU Direct License only customers.

