



Building a Terabyte Memory Bandwidth Compute Node with Four Consumer Electronics GPUs

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GPUs released for consumer electronics are generally built with the same chip architectures as the GPUs released for professional usage. With regards to scientific computing, there are no obvious important differences in functionality or performance between the two types of releases, yet the price can differ up to one order of magnitude. For example, the consumer electronics release of the most recent NVIDIA Kepler architecture (GK110), named GeForce GTX TITAN, performed equally well in conducted memory bandwidth tests as the professional release, named Tesla K20; the consumer electronics release costs about one third of the professional release.

We explain how to design and assemble a well adjusted computer with four high-end consumer electronics GPUs (GeForce GTX TITAN) combining more than 1 terabyte/s memory bandwidth. We compare the system's performance and precision with the one of hardware released for professional usage. The system can be used as a powerful workstation for scientific computing or as a compute node in a home-built GPU cluster.