

WORLD FIRST, IN-MEMORY COMPUTATION MODULES

MEMORY MODULES

- Historically Memory modules are used to provide one or more array of Volatile Memories (i.e. DRAM, SRAM, etc.) to directly connected into host Central Processing Unit(s) (CPUs) via host memory controller.
- These Memory modules are designed to provide a mean for host memory controller to access one or more array of Volatile Memory components as hosts main memory for Random Access. Such as Random Access Memory (RAM).
- Volatile RAM comes in many flavors such as DRAM, SRAM, and DDRx,
- These modules are come in many different shape and forms such as: UDIMM, SO-DIMM, RDIMM, LR-DIMM, VLP, etc.

IVDIMM

- ❖ Adding one or more Co-processor (micro controller, Finite State Machine (FSM), Processor, or CPUs) to host main memory module will allow host main CPUs to off load any processing and moving data back and forth from host main memory modules into CPUs internal registers and cache levels to perform required task(s).
- ❖ This architecture will drastically reduce host main CPUs stalling (i.e. Wait States) for data movement, while it off-load host main CPUs from performing repetitive task on large data presiding in main memory modules.
- ❖ The array of Co-processors in each memory module would receive a single instruction to apply one or more built-in algorithm(s) on one or more segment of local volatile and/or non-volatile memory array of that specific main memory module. Hence the in-memory computation (iVDIMM)
- ❖ Adding an in-memory computation to Persistent Memory (PM), Storage Class Memory (SCM), or NVDIMM would be a game changer.

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