

Persistent Memory

Persistent memory is a type of memory technology residing on the memory bus, which allows it to access the computer data. It has the same speed and latency of DRAM and the non volatility of NAND flash. One of its benefits is that It can not be modified or erased and not affected by power outages.

Applications of Persistent Memory :

1. Databases: Persistent memory accelerates database operations by enabling faster data storage and retrieval.
2. High-Performance Computing (HPC): Persistent memory enhances HPC applications by reducing data transfer times, enabling faster checkpointing, and facilitating efficient data sharing among compute nodes.
3. Data Analytics: Persistent memory accelerates data analytics workloads by enabling faster data ingestion, processing, and querying.

How Persistent Memory Will Change Computing :

Persistent memory is more similar to DRAM performance than flash performance. Opposite to the past where the gap between disk storage and DRAM was large, persistent memory made changes, and the gap between disk storage and persistent memory became highly large. This technology will change the hierarchy of data storage.

Persistent Memory Benefits :

1. Provides access latencies better than flash SSDs
2. Increases throughput more than flash storage.
3. Cheaper than DRAM.
4. It is cacheable, which is the best thing in it, opposite to the PCIe interconnect, which cannot be cached in the CPU.
5. Real-time access to data; provides ultra-fast access to large datasets.
6. Data persists in memory even after a power interruption, as with flash.

Persistent Memory Use Case :

Persistent memory can be used in different ways to reduce applications latency, such as:

- **Fraud detection:** Persistent memory improves the speed with which financial institutions and insurance companies can perform data analysis on large numbers of records to detect fraudulent transactions, preventing financial loss and impact on brand name.
- **Cyberthreat analysis:** Persistent memory enables companies to move quickly to detect and defend against increasing cyberthreats.
- **Web-scale personalization:** Persistent memory allows companies to tailor online experiences to the user by showing relevant content and advertisements to the user, resulting in higher click-through rates and more revenue on e-commerce.
- **Financial trading:** Financial trading applications can use persistent memory to quickly process and execute financial transactions, giving them a competitive advantage and opening up higher revenue opportunities.
- **Internet of Things (IoT):** Faster processing of large datasets reduces time to value.

Features of Persistent Memory :

1. Large

Currently, a single persistent memory module can hold up to 512 GB of data, whereas a single DRAM module can hold up to 64 GB.

2. Fast

Persistent memory outperforms hard disks in terms of latency performance by a factor of 1-2 orders of magnitude compared to conventional SSDs.

3. Persistence

Hard disks and persistent memory both have similar properties. The data in memory remains accessible even after a restart or power outage.