

# Access global cloud data at local memory speed

Zebware's ZebClient® optimizes the use of Intel® Optane™ technologies to provide hyper-speed application data access from edge to core



Organizations that want the high performance of the latest memory technologies and the flexibility of cloud storage, to power data-intensive workloads such as analytics and edge computing applications, face complex challenges.

- **Data access bottlenecks** – performance of applications accessing remote storage is limited by the speed of internet lines and cloud services.
- **Complex data management** – connecting applications to multiple, decentralized file and object stores, and maintaining data security and governance, is difficult and resource-intensive.
- **Loss of performance at scale** – it is difficult to globally scale and access storage while meeting cost efficiency and performance requirements.

ZebClient provides a solution to these challenges, with high-performance data access software that leverages Intel® Optane™ persistent memory and Intel® Optane™ SSDs to bring cloud data to memory. ZebClient disaggregates cloud storage and applies automatic memory tiering and metadata, to serve advanced applications with high-performance, global access to data.

At the core of ZebClient is a proprietary data placement mechanism, which determines which data should reside on its high-performance persistent memory cache and which should be moved to low-cost external storage. Because hot data is stored locally, acceleration benefits are not lost as the solution scales. As well as boosting performance, ZebClient builds in data redundancy and security, simplifies data access, and is fully scalable.

## Optimized for Intel® Optane™

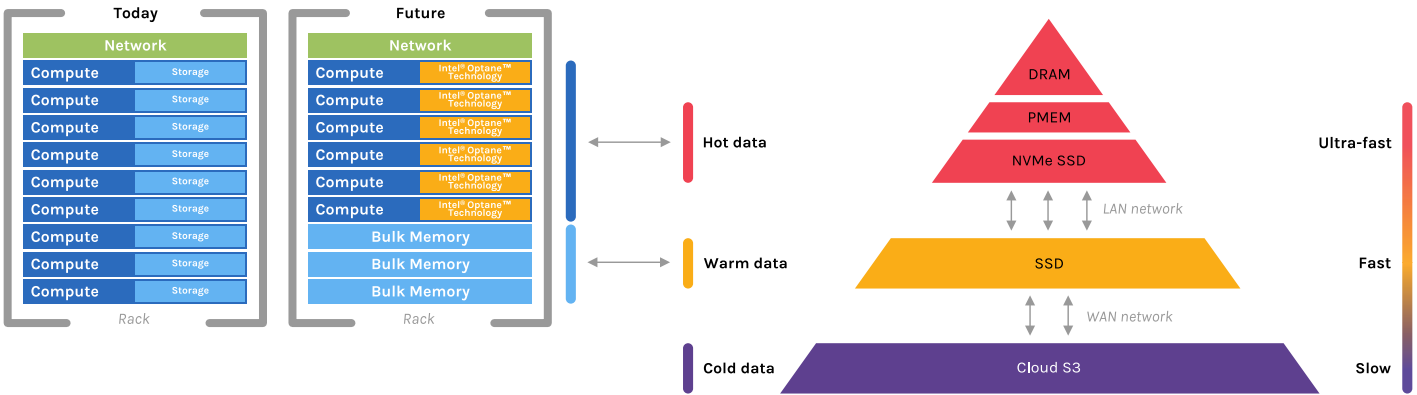
Zebware ZebClient is optimized to use the full capabilities of Intel® Optane™ persistent memory (PMem) for hot data and Intel® Optane™ SSDs for warm data. Intel® Optane™ PMem provides large capacity memory with data persistence, enabling high-speed processing of large amounts of data.

## Built for expansive applications

ZebClient provides the performance, scale, and efficiency to enable key business goals and use cases.

### In-memory performance, no local storage

Intel® Optane™ technologies accelerate applications by reducing bottlenecks and data latency. ZebClient uses automated data tiering to identify “hot” and “warm” data, which applications access most frequently, and place it in-memory or on Intel® Optane™ SSDs. This allows local storage to be replaced by high-performance memory on premises and cost-efficient cloud storage.



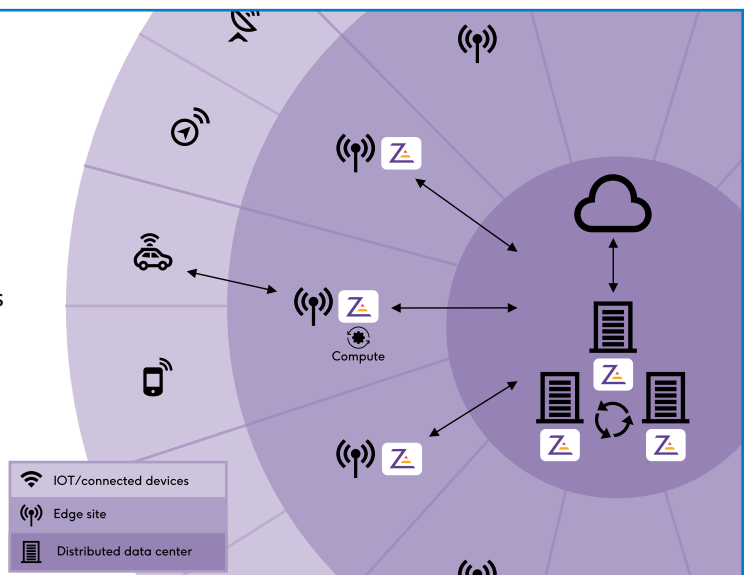
### Enhanced analytics

ZebClient accelerates analytics use cases where massive volumes of data are used by:

- **Disaggregating compute and storage** – providing high-speed access for applications such as Apache Spark and Apache Iceberg, and enabling organizations to reduce costs and management complexity.
- **Unifying file and object data** – allowing a broad range of analytics applications to read and write in either type.
- **Augmenting data with metadata** – enabling search and discovery, data life cycle management, and use of security policies within data lakes.

### Edge compute enablement

With the flexible ZebClient Agent running on a highly scalable array of edge devices, such as connected cars, ZebClient provides fast data serving and enables insights to be returned to latency-sensitive endpoint services. ZebClient also provides data tiering capabilities for edge devices, enabling organizations to achieve cost efficiencies and improve hardware utilization by evicting cold data to low-cost cloud storage.



## Test result: up to 500 times faster data access

Tests performed in April 2021 at Intel® Stockholm verified that ZebClient provides applications with significantly faster access to hot (most-used) data, compared to public cloud storage over a 1Gbps internet line.\*

Test servers featured 4 x Intel® Xeon® Gold 6238M CPUs at 2.10GHz (176 cores total, Scaling Governor in performance mode), 4 x Intel® Optane™ PMem DIMMs (in AppDirect mode), and 6 x Intel® Optane™ SSDs. Servers were running Ubuntu 20.04 LTS, with XFS as the underlying file system, and 4 x NUMA-aligned hot-tier processes running in parallel. In the Cluster Mode test, warm tiers were also configured. The Linux FIO tool was used for performance benchmarking; tests ran against all 4 hot-tier processes in parallel, with each process exposed to 32 parallel jobs.

Standalone Mode 4 agents, no shared services			Cluster Mode 4 agents, 4 shared services		
Write (GB/s)	Read (GB/s)	Acceleration	Write (GB/s)	Read (GB/s)	Acceleration
3.7	55.4	~500 times	3.7	13.4	~100 times

**FIO read test parameters:** ioengine=libaio, rw=read, bs=64k, fallocate=none, numjobs=32, size=2G, iodepth=1 and direct=1.  
**FIO write test parameters:** ioengine=libaio, rw=write, bs=64k, fallocate=none, numjobs=32, size=2G, iodepth=1, end\_fsync=1, fsync\_on\_close=1, fsync=32768, direct=1.

### Virtual Intel® 5G Innovation Center

ZebClient is one of many innovative solutions that Intel® and our partners are testing and optimizing at the Intel® 5G Innovation Center (5GIC) in Stockholm, Sweden. You can tour the virtual 5GIC showcase in your browser now, to discover the opportunities Intel® partner solutions are creating in your industry.

[Visit the 5GIC](#)

### Next steps

Zebware ZebClient and Intel® Optane™ technologies combine to leverage cloud storage in a transformational way: boosting data access with automated tiering, simplifying data management, and enabling scalability, cost efficiency, and data security.

Take a virtual tour of this solution at the virtual Intel® 5G Innovation Center at [5gic.intel.com](https://5gic.intel.com).

Learn more about how to leverage Intel® Optane™ technologies with ZebClient at [www.zebware.com/products/zebclient](https://www.zebware.com/products/zebclient).



Performance varies by use, configuration and other factors.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates.

See backup for configuration details. No product or component can be absolutely secure.

Your costs and results may vary.

Intel technologies may require enabled hardware, software or service activation.

\*Tests performed in April 2021 at Intel Stockholm. Baseline: Same system (without PMEM) connected to external cloud service with maximum speed of 1 Gbps from Intel lab in Stockholm. Machine configuration - Inspur 2U 2.5in Quad Xeon SP Server /NF8260M5-IDD/: MEMORY MODE VIRTUAL [2-2-2 Mode, 24x DDR4 Max and 24x AEP Max per system], Qty 1, Installed; KNOCK DOWN KIT [KDK - Inspur 2U4S NF8260M5\_6NVME\_L6\_BB SKU\_8260M5\_A1 Bios 4.1.12], Qty 1, Installed; CPU [Xeon Cascade Lake Gold 6238M 2.1 GHz 30.25 MB 140W 22 cores CD8069504284604], Qty 4, Installed; HEATSINK [Included], Qty 4, Installed; MEMORY [Optane - 128GB Apache Pass Intel 3D XPoint Persistent Memory DIMM NMA1XXD128GPSU4], Qty 24, Installed; MEMORY [32GB 2933 Reg ECC 1.2V DDR4 RDIMM Micron MTA36ASF4G72PZ-2G9E2 Dual Rank], Qty 24, Installed; ATA HARD DRIVE [480GB SSD M.2 SATA 6Gb/s Intel Youngsville Refresh SE Data Center SSDSCCKB480G801 D3-S4510], Qty 2, Installed; ATA HARD DRIVE [480GB SSD 2.5" SATA 6Gb/s Intel SSDSC2KB480G801 D3-S4510 Series (External)], Qty 18, Installed; NETWORK ADAPTER [NIC - RJ45 PCIe x4 (10G) Inspur V02201L000000000 X550-T2 Dual Port XR], Qty 1, Installed; NETWORK ADAPTER [NIC - 100G Dual Port PCIe x16 INTEL E810-CQDA2 QSFP28 Dual Port], Qty 1, Installed; RAID COMPONENT [Raid Cntrlr - PCIe x8 SAS3/SATA3 8 port Low Profile MD2 Dark Canyon Intel RS3DC080], Qty 1, Installed; CHASSIS COMPONENT [On Board], Qty 1, Installed; CHASSIS COMPONENT [Included], Qty 1, Installed; POWER SUPPLY [Included], Qty 2, Installed; MOUNTING KIT [Included], Qty 2, Installed; PCIe HARD DRIVE [Intel® Optane™ SSD DC P4800X Series 750GB, 2.5in PCIe x4, 3D XPoint™], Qty 6, Installed;

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