FORSA, developed by Formulus Black, is a software-defined solution that unlocks the power of memory-based storage for all applications, delivering a level of performance that is unmatched by any SSD or other I/O-bound technology. FORSA deploys on commodity hardware and supports both AMD and Intel platforms. It accelerates the performance of I/O-intensive applications by enabling them to run on DRAM or persistent memory-based virtual storage devices.

Because FORSA helps reduce storage latency, users can achieve the same level of application performance with fewer servers and lower-cost CPUs. FORSA combines in-memory access speed with enterprise storage features such as enhanced data protection and lifecycle management via clone, snapshot, BLINK backup and restore, and support for FORSA deployment in both virtualized and bare metal computing environments.

FORSA powers the most demanding application workloads for organizations seeking to minimize latency, maximize throughput, and scale without performance loss, without modification to the existing applications.

**ENTERPRISE STORAGE AT MEMORY SPEED**
Dramatically Increase Performance by Running Applications In-Memory

**FORSA Software Stack**
- Intuitive GUI, RESTful API, Block Interface
- Memory-Based Storage Service Layer
- I/O Memory Driver, Data Algorithm, BLINK

**Open Source OS**
- Linux OS: Ubuntu, CentOS, RHEL

**Commodity Infrastructure**
- Commodity Server Hardware (On-Premise or Bare Metal Cloud)

**All Your Apps and Data — No Modifications Required**

For more information, visit FormulusBlack.com or contact us at 1-877-962-6542.
Why FORSA? Technology Differentiators

**FASTEST BLOCK INTERFACE FOR MEMORY**

FORSA performs best with “write-heavy” or “transactional-heavy” workloads, landing “new” I/O or data in memory media (DRAM or Optane) faster than any other solution. FORSA has been tested and outperforms both competitor persistent memory accelerated solutions as well as Linux native Optane PMem drivers. FORSA provides extreme database performance by reading and writing to memory-based block storage.

**PATENTED BITMARKER IN-LINE DEDUPLICATION**

Formulus Bit Marker (FbM) is innovative software, methods, and algorithms that enable more user data to be effectively stored in memory (DRAM or Intel’s Optane PMem), reduce I/O, and enhance data security, while improving TCO. BitMarker increases the storage capacity in memory without the performance hit associated with traditional data compression and deduplication techniques. Reduce the cost of storing data in memory with BitMarker.

**PATENTED I/O OPTIMIZATION ARCHITECTURE**

Non-Uniform Random Access (NURA) is an advanced I/O management engine based on the concepts of NUMA that is unique to FORSA. It helps to optimize the performance of transactionally intensive applications on systems with multiple CPUs (perfect for OLTP / HTAP database workloads or as high performance compute side storage in HPC).

**BOTH DRAM AND INTEL OPTANE PMEM**

FORSA can use either DRAM or PMem to provision In-Memory Storage. FORSA developed its own I/O and memory management driver that can be used on both AMD and Intel platforms, and works with systems that only have DRAM as well as systems that are configured with Intel Optane PMem. FORSA enables unmodified applications to run on its POSIX-compliant block interface without any configuration or code changes.

**PATENTED BLINK BACKUP AND RESTORE**

Application-consistent memory state capture of the entire system in DRAM or persistent memory to local SSDs for data protection, backup, and recovery. FORSA also provides a real-time bad block detection and replacement algorithm to mitigate data corruption due to DIMM failure.

**WHY IN-MEMORY?**

For I/O-intensive workloads, memory-based storage dramatically improves application performance by shortening the path that data needs to travel between storage and CPU.