



Supermicro SATA DOM (SuperDOM) Endurance Use Cases

Introduction

The Supermicro SATA DOM (Disk on Module), the SuperDOM, is a small SATA3 (6Gb/s) NAND flash memory module designed to be conveniently inserted into a serverboard SATA connector to provide high performance solid state drive storage (SSD) capacity. SSDs are different in how they wear in comparison to hard disk drives (HDDs). Due to the characteristics of NAND flash, SSDs have a finite lifetime dictated by the number of write operations known as program/erase (P/E) cycles the NAND flash can endure. The objective of SSD endurance measures is to capture this consumable nature of flash storage into quantifiable numbers to provide end users with guidance on the anticipated lifespans for the drives in operation. SSDs come in a variety of endurance points matched against their intended work patterns. Obviously, SSDs intended for a single user such as a consumer will differ greatly from data center-grade SSDs that are rated to withstand the demands of thousands or millions of users. It's important to procure the right SSD for your workload and budget needs.

Best Use Cases for Supermicro SuperDOMs

The current Supermicro SuperDOM SKUs are designed for use as boot drives, backup recovery devices, license drives, OS installation devices (replacing CD/DVD-ROMs), embedded system storage elements (to be deployed into very harsh environments where mechanical hard disk drives would fail), or in thin clients due to their small size and power requirements.

In summary, suitable use cases include:

1. Read-intensive applications
 - a. Operating System (OS) installation device (replacing CD/DVD)
 - b. Backup images.
2. Operating System (read-centric)
 - a. OS images for booting up.
 - b. Excluding virtual memory, swap files, etc.
3. Operating System Recovery
 - a. Restoring OS backup image
 - b. Not recommend to configured as a RAID 1 or any other form of mirroring RAIDs.

Use Cases Not Recommended for Supermicro SuperDOMs

SSDs come in a variety of endurance points matched against their intended work pattern. Obviously, SSDs intended for a single user such as a consumer will differ greatly from data center-grade SSDs that are rated to withstand the demands of thousands or millions of users. It's important to procure the right SSD for your workload and budget needs. .

In summary, it is not recommended to use Supermicro SuperDOMs in the following scenarios:

1. Write-intensive applications
 - a. More than 1 DWPD amount of data per day
 - b. High random write access
2. Virtual memory
 - a. Swap space or swap files on Linux/Unix
 - b. Page files on Windows
 - c. Excessive writes
 - d. Small file writes
3. RAID
 - a. RAID 1 – disk mirroring
 - b. RAID mirroring.
4. Excessive logging
 - a. Writing small log files every few seconds

Supermicro SuperDOM SKUs

- SSD-DM016-PHI
- SSD-DM032-PHI
- SSD-DM064-PHI
- SSD-DM128-SMVMVN1

Definitions

DWPD – Drive Write Per Day

SSD endurance is commonly described in terms of full Drive Writes Per Day (DWPD) for a certain warranty period (typically 3 or 5 years). In other words, if a 100GB SSD is specified for 1 DWPD, it can withstand 100GB of data written to it every day for the warranty period. .

Endurance – measured in TBW (Terabyte Write)

Another metric that is used for SSD write endurance is Terabytes Written (TBW), which is used to describe how much data can be written to the SSD over the life of the drive.

Single-Level Cell (SLC)-based NAND flash

Single-Level Cell (SLC) NAND Flash, which uses a single cell to store one bit of data, provides high endurance to meet the needs of the most write-intensive applications.

Multiple Level Cell (MLC)-based SSDs

Multiple Level Cell (MLC)-based SSDs use multiple bits per cell to store more bits cost less, but they also have far lower endurance.

Supermicro SuperDOM Specifications

| Capacity | | 16GB | 32GB | 64GB | 128GB |
|----------------------------|-----------------------------|-------|-------|-------|-------|
| Performance | Max Sequential Read (MB/s) | 285 | 520 | 520 | 520 |
| | Max Sequential Write (MB/s) | 75 | 145 | 180 | 180 |
| Power Consumption | Typical Read (W) | 1.0 | 1.4 | 1.4 | 1.4 |
| | Typical Write (W) | 0.9 | 1.2 | 1.6 | 1.6 |
| | Idle (W) | 0.253 | 0.266 | 0.269 | 0.245 |
| Drive Write Per Day (DWPD) | | 1 | 1 | 1 | 1 |
| Endurance (TBW) | | 17 | 34 | 68 | 158 |

Supermicro SuperDOM Compared to Intel Enterprises SSDs

| Model | Intel S3710 | Intel S3610 | SMC SATADOM | Intel S3510 |
|----------------------------|-----------------|-------------|-------------|----------------|
| Drive Write Per Day (DWPD) | 10 | 3 | 1 | 0.3 |
| Purpose | Write Intensive | Mix Use | | Read Intensive |