

- ▶ 800 GB, 1.6 TB, and 3.2 TB drives for High-Performance Flash requirements
- ▶ 1.92 TB (DS8910F only), 3.84 TB, 7.68 TB, and 15.36 TB drives for various High-Capacity Flash requirements.

Flash drives provide up to 100 times the throughput and 10 times lower response time than 15K RPM spinning drives. They also use less power than traditional spinning drives. For more information, see Chapter 7, “IBM DS8900F physical planning and installation” on page 179.

All flash drives in the DS8900F are encryption-capable. Enabling encryption is optional. It requires at least two key servers with the IBM Security Key Lifecycle Manager software, or the Gemalto Safenet, OASIS Key Management Interoperability Protocol (KMIP) compatible software.

IBM Easy Tier

Easy Tier enables the DS8000 to automatically balance I/O access to disk drives to avoid hot spots on disk or flash arrays. Easy Tier can place data in the storage tier that best suits the access frequency of the data. Highly accessed data can be moved nondisruptively to a higher tier, for example, to 1.6-TB Flash Tier 0 drives. Cold data or data that is primarily accessed sequentially is moved to a lower tier of high-capacity drives. Easy Tier includes additional components:

- ▶ Easy Tier Application is an application-aware storage utility to help deploy storage more efficiently by enabling applications and middleware to direct more optimal placement of the data by communicating important information about current workload activity and application performance requirements. It is possible for Db2 applications in z/OS environments to give hints of data placement to Easy Tier at the data set level.
- ▶ Easy Tier Heat Map Transfer (HMT) can take the data placement algorithm on the Metro Mirror/Global Copy/Global Mirror (MM/GC/GM) primary site and reapply it to the MM/GC/GM secondary site when failover occurs by using the Easy Tier Heat Map Transfer Utility (HMTU). With this capability, the DS8000 systems can maintain application-level performance. The Easy Tier HMT functions support Metro/Global Mirror (MGM) to transfer a heat map automatically to a tertiary site.

Note: Easy Tier Server has been removed from marketing support. It is replaced with the Flash Cache option of IBM AIX® 7.2.

The following Easy Tier controls are also available:

- ▶ For Easy Tier to function effectively, it needs some free extents in each extent pool to be able to move extents around. Rather than having the storage administrator monitor capacity, the system can reserve some space for Easy Tier extent movements. You can enable space reservation for Easy Tier by staying with **chsi -etsrmode enable** (is enabled by default).
- ▶ Another control is the allocation policy for new volumes. You can control the allocation policy according to your needs with the **chsi** command and the **-ettierorder highutil** or **highperf**:
The data allocation order for All-Flash systems can be changed between the settings
High-Utilization: Tiers Flash Tier 1 → Flash Tier 2 → Flash Tier 0, or the default
High-Performance: Tiers Flash Tier 0 → Flash Tier 1 → Flash Tier 2.

For more information about the Easy Tier features, see the following resources:

- ▶ *IBM DS8000 Easy Tier (for DS8000 R9.0)*, REDP-4667
- ▶ *DS8870 Easy Tier Application*, REDP-5014
- ▶ *IBM DS8870 Easy Tier Heat Map Transfer*, REDP-5015