The IBM 3880 Storage Control Model 13
...for high-performance access to application data
The high-performance goal

With the growing number of computer applications available to more and more users, the delivery of effective online service increasingly requires both large-capacity storage devices and fast access to the application and system data stored on those devices.

Increases in storage device capacity and in the number of stored data sets present a challenge to data processing professionals: management of the large DASD capacity, improvement of overall system performance, and enhancement of systems personnel productivity.

All of these needs—and more—are addressed by the new IBM 3890 Storage Control Model 13 which provides fast access to application and system data, with the potential to achieve dramatic increases in the DASD I/O throughput rate.

The 3880 Model 13 combines with 3380 Direct Access Storage units to provide a two-level, dynamically managed storage subsystem. Based on the IBM 3880 Model 3, the Model 13 employs two storage directors to control the 3380s. The difference, however, is that the directors for the Model 13 contain an additional microcode to dynamically control a four- or eight-megabyte electronic cache. In this way, the Model 13 is designed to make most records available from the cache at electronic speeds, which reduces actuator contention and mechanical delays that occur with moving heads and rotating disks.

The cache storage directors share up to eight 3380 units—for a maximum of two full strings of 3380 DASD or 32 actuators per Model 13. In all, the Model 13 can control up to 20.16 billion bytes of direct access storage.

Dynamic management is the key

Dynamic management of the cache contents effectively extends advantages beyond physical cache size. The high-performance characteristics of the 3880 Model 13 result from satisfying most processor data requests from the electronic cache. To accomplish this, the Model 13 reads and stores not only the specified disk record, but also records adjacent to it. These records are retained in the cache until replaced by more active records. Observations show that records are frequently referenced and that subsequent records written or read are very likely to be located in close proximity in both space and time—leading to a high probability of "locality of reference."

Thus, computer applications which exhibit a high degree of persistence to writes, as well as a high degree of persistence to reads, are likely to show substantial improvements in average response time. Where the application appears, the Model 13 can increase throughput more than with the same record access times.
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Thus, computer applications which exhibit a high ratio of reads to writes, as well as a high incidence of "locality of reference," are likely to show substantial improvements in average disk response time. Where no other contention appears, there is a potential to more than double the DASD I/O throughput while maintaining the same response time.

The Model 13 can contribute to both by making the most active records available in the electronic cache when needed, thus reducing delays due to contention.

And since improved systems performance translates into improved service to end users—and the capability to service more of them—the Model 13 can help you get the most from your system.

Enhancing DASD capacity

Considerable time and expertise are expended today to increase system performance. Many systems, for example, are configured with additional controllers and channels, with data distributed across multiple actuators. Though helping to reduce contention and average access times, these practices frequently result in reduced DASD capacity utilization. Because it can enhance the performance of the direct access storage subsystem, the 3880 Model 13 can allow you to utilize a larger percentage of the capacity you already have, while reducing the need for extra controllers and channels.

An advance over fixed head storage

Fixed head disk storage is useful in eliminating the mechanical setup associated with moving heads. The Model 13 represents only the mechanical setup, but the rotational delay is eliminated. In addition, dynamic caching of the cache offers a...

Improving personnel productivity

Manual system tuning demands considerable effort by high-skilled systems personnel. But a data set placement, for example, while not very efficient at any given time, is constantly changing. Since patterns of data access are also constantly changing, the best placement of data on a DASD string, for example, is a period-by-period activity. Perhaps you may need to...
The IBM 3880 Model 13 is the latest evolutionary step in IBM's Total Storage Management approach—a systematic way to satisfy user performance and storage requirements through an integrated set of storage devices, storage management software and planning aids.

As a new element in this approach, the IBM 3880 Model 13 should offer improved systems performance through high-speed access to data stored on IBM 3380s. Think about how it can solve today's performance problems while helping to avoid tomorrow's.

Call your IBM Data Processing representative soon for full particulars of the IBM 3880 Storage Control Model 13 for your installation.
The IBM 3880 Model 13... meeting storage needs in the '80s

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This high-density microprocessor, with 1,486 circuits, is one-tenth the size of a penny, and the basic element of the IBM 3880 storage directors. With the power to execute five million commands per second, the 3860 microprocessor invokes an algorithm to dynamically manage application and systems data in the electronic storage.