

Palm OS – Memory Management

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Palm OS is a small embedded OS which runs on the Palm Handheld Devices. It has very limited resources with which to work with. Consequently the memory management system has to be very efficient with space to cope with these restrictions. For instance the first implementation of Palm OS had only 128KB of RAM and 512KB of ROM.

The memory on a Palm is situated on logical constructs known as “cards”. It is split into two parts:

- RAM
- ROM – contains the OS, as well as basic installed applications.

The RAM is further split in to two separate areas:

- Dynamic RAM
- Storage RAM

The Dynamic RAM is equivalent to the RAM inside your Desktop, providing working storage for running processes. Some points about it:

- It is a single heap, which provides temporary allocation of data such as global variables, temporary memory allocations and application stacks.
- The amount reserved for the dynamic RAM is static, and this RAM cannot be used for anything else.

The Storage RAM is used to store user and system data and is analogous to a hard disk on a Desktop computer. This data such as appointment details, user installed applications etc can be stored permanently as a small amount of power is constantly supplied to this RAM. This can contain one or more storage heaps.

All memory is stored in chunks. A chunk can be between 1 byte to 64KB in size. Every chunk resides in a heap, either in a dynamic heap whose allocation is controlled by the Memory Manager or in a storage heap, where each chunk is a record in a database, controlled by the Data Manager. Chunks may also be in ROM (These are non-movable).

The Memory Manager has a very important job in Palm OS because of the scarce resources keeping the memory stored as efficiently as possible is paramount. It maintains the location and size of every chunk in any memory. It provides the way for a programmer to manipulate memory.

The Data Manager stores a record of each chunk in the storage heap. This record can be accessed by applications to find a data record. The Data Manager utilises the Memory Manager to allocate space for its database records, which can be stored in any storage heap.