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(54) Title: DATA TRANSFER TO A NON–VOLATILE STORAGE MEDIUM

(57) Abstract

To improve the speed of transition to the zero–volt suspend state, system context is saved from volatile random access memory to non–volatile memory, such as a hard disk, using a compression algorithm which speeds the transfer of data to non–volatile memory by recognizing data pages having bytes of a single value. The system context in extended memory of RAM consists of a number of system context memory blocks, and between these memory blocks are memory holes containing information which does not require storage. Initially, the entirety of data in a buffer region of RAM is stored directly to disk. Then, successive pages from each system context memory block are transferred to the buffer, where the page size corresponds to the memory management unit page size. When testing locates a region of heterogeneous entries, then a heterogeneous data flag, the length of the heterogeneous region, and the heterogeneous data region are transferred to the buffer. When testing determines that a page contains bytes of a single value, then a compression flag representing that value is substituted for that page. When a memory hole is reached, a memory hole flag and the size of the memory hole are transferred to the buffer. On each transfer of a byte of data to the buffer it is determined whether the buffer is full, and when it is full then a write–to–disk is performed. To transition from the zero–volt suspend state back to an operational state, bytes are transferred from the hard disk to the buffer whenever all the bytes currently in the buffer have been transferred to extended memory. When testing of the buffer entries locates a heterogeneous data flag, the value immediately following the flag is determined, and a data region having a length of that value is transferred to extended memory. When a compression flag is found, a 4 kilobyte page of the corresponding byte value is transferred to extended memory. When a memory hole flag is found, a memory hole with a length of the value immediately following the memory hole flag is created in extended memory.