

New Technical Notes

Macintosh



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Developer Support

Virtual Memory Q&As

Memory M.ME.VirtualMemory.Q&As

Revised by: Developer Support Center

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This Technical Note contains a collection of Q&As relating to a specific topic—questions you've sent the Developer Support Center (DSC) along with answers from the DSC engineers. While DSC engineers have checked the Q&A content for accuracy, the Q&A Technical Notes don't have the editing and organization of other Technical Notes. The Q&A function is to get new technical information and updates to you quickly, saving the polish for when the information migrates into reference manuals.

Q&As are now included with Technical Notes to make access to technical updates easier for you. If you have comments or suggestions about Q&A content or distribution, please let us know by sending an AppleLink to DEVFEEDBACK. Apple Partners may send technical questions about Q&A content to DEVSUPPORT for resolution.

|New Q&As and Q&As revised this month are marked with a bar in the side margin.

Macintosh Virtual Memory and protecting large buffers

Written: 4/25/91

Last reviewed: 8/1/92

I'm filling a large buffer with one SCSIRead call. What happens if the Macintosh runs under System 7 with virtual memory (VM) and parts of my buffer are swapped out?

Parts of your buffer must not be swapped out. Before calling SCSIGet, you must ensure that all code and buffers accessed while the SCSI bus is busy are held in physical memory. If there isn't enough real memory to allocate a full buffer, the application must request smaller blocks (if possible) from the SCSI device, because it's not possible to swap in and out any buffer space during a single I/O operation. Page faults are not serviced while SCSI I/O is in progress. If SCSI I/O is performed at device driver-level Read or Write calls, VM holds your buffer for you. Otherwise, you are responsible for doing this yourself. If there is insufficient physical memory for VM to hold your buffers for you, the Read or Write call fails with an error result.

In general, I/O buffer space used by drivers must be held in real memory for the duration of the I/O operation. This is especially true for SCSI I/O because VM uses SCSI to swap virtual memory in and out, and encountering another page fault would cause a bus error. Device Manager-level I/O handles this automatically, by holding down the appropriate memory when the driver is entered through a Read or Write call. The Device Manager does not take care of this for you when the driver is entered through a Control or Status call, however. If the SCSIRead call is made from within a device driver as a result of a PBRead, no special action is necessary.

Any other type of code must be very careful not to cause page faults between SCSIGet and SCSIComplete. This requires holding or placing in the system heap any code or data structures referenced during this time.

Macintosh SE and Plus ROMs do not support Virtual Memory

Written: 12/19/90

Last reviewed: 8/1/92

Will a Macintosh SE or Plus upgraded with an 030 accelerator be able use Virtual Memory in the final release of System 7.0? (I understand this isn't possible in 7.0β1.)

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Here is the latest information I have on the subject: Virtual Memory and the Memory 'cdev' no longer allow VM to become active if running on a Macintosh with Plus or SE-level ROMs and an 030 or 020/881 accelerator board. The reason for this is that these ROMs do not support several operating system and toolbox traps needed for the functionality of VM.