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Operating Systems

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Boot Process

### Boot Process

The computer boot process can be initiated with a hardware button or startup command. After that the computer can only read the section of storage called Read-Only memory. This Read-Only memory points to the firmware (usually UEFI or BIOS) burned into the motherboard chip which will run system checks before it continues the start up process and then allows for access to other parts of memory. A boot manager is then run to allow the user to select the operating system the user wishes to use. The boot manager or firmware then loads the boot loader into memory and runs it. The boot loader is able to load a kernel (Windows, Linux, etc.) so that the user can log into the system. To find the operating system the MBR looks for a partition that is marked as bootable in the partition table (it's the one with the active flag set). It then loads the boot sector code from the partition, called the Volume Boot Record, and then executes it. The Volume Boot Record is specific for the operating system that is loaded onto the machine. If there are no partitions marked as active, then the MBR loads a secondary boot loader, which will select a partition and load a secondary system kernel. Often this can be a USB drive or remote network boot. If the MBR still fails to find an active flag, then it will turn over the control back to the BIOS.