



# OpenCore

Reference Manual (0.5.~~3~~.4)

[2019.12.04]

**Failsafe:** false

**Description:** Reuse original hibernate memory map.

This option forces XNU kernel to ignore newly supplied memory map and assume that it did not change after waking from hibernation. This behaviour is required to work by Windows, which mandates to preserve runtime memory size and location after S4 wake.

*Note:* This ~~option is deprecated and will be removed in the newer OpenCore releases. There is no known hardware that needs this option, and its entire existence appears to be a programmer error. Please report on if you need this option~~ may be used to workaround buggy memory maps on older hardware, and is now considered rare legacy. Examples of such hardware are Ivy Bridge laptops with Insyde firmware, like Acer V3-571G. Do not use this unless you fully understand the consequences.

6. **EnableSafeModeSlide**

**Type:** plist boolean

**Failsafe:** false

**Description:** Patch bootloader to have KASLR enabled in safe mode.

This option is relevant to the users that have issues booting to safe mode (e.g. by holding **shift** or using **-x** boot argument). By default safe mode forces 0 slide as if the system was launched with **slide=0** boot argument. This quirk tries to patch **boot.efi** to lift that limitation and let some other value (from 1 to 255) be used. This quirk requires **ProvideCustomSlide** to be enabled.

*Note:* The necessity of this quirk is determined by safe mode availability. If booting to safe mode fails, this option can be tried to be enabled.

7. **EnableWriteUnprotector**

**Type:** plist boolean

**Failsafe:** false

**Description:** Permit write access to UEFI runtime services code.

This option bypasses **RX** permissions in code pages of UEFI runtime services by removing write protection (**WP**) bit from **CR0** register during their execution. This quirk requires **OC\_FIRMWARE\_RUNTIME** protocol implemented in **FwRuntimeServices.efi**.

*Note:* The necessity of this quirk is determined by early boot crashes of the firmware.

8. **ForceExitBootServices**

**Type:** plist boolean

**Failsafe:** false

**Description:** Retry **ExitBootServices** with new memory map on failure.

Try to ensure that **ExitBootServices** call succeeds even with outdated **MemoryMap** key argument by obtaining current memory map and retrying **ExitBootServices** call.

*Note:* The necessity of this quirk is determined by early boot crashes of the firmware. Do not use this unless you fully understand the consequences.

9. **ProtectCsmRegion**

**Type:** plist boolean

**Failsafe:** false

**Description:** Protect CSM region areas from relocation.

Ensure that CSM memory regions are marked as **ACPI NVS** to prevent **boot.efi** or **XNU** from relocating or using them.

*Note:* The necessity of this quirk is determined by artifacts and sleep wake issues. As **AvoidRuntimeDefrag** resolves a similar problem, no known firmwares should need this quirk. Do not use this unless you fully understand the consequences.

10. **ProvideCustomSlide**

**Type:** plist boolean

**Failsafe:** false

**Description:** Provide custom KASLR slide on low memory.

**Failsafe:** Empty string

**Description:** Kext bundle identifier (e.g. `com.apple.driver.AppleHDA`) or `kernel` for kernel patch.

7. Limit

**Type:** plist integer

**Failsafe:** 0

**Description:** Maximum number of bytes to search for. Can be set to 0 to look through the whole kext or kernel.

8. Mask

**Type:** plist data

**Failsafe:** Empty data

**Description:** Data bitwise mask used during find comparison. Allows fuzzy search by ignoring not masked (set to zero) bits. Can be set to empty data to be ignored. Must equal to **Replace** in size otherwise.

9. MaxKernel

**Type:** plist string

**Failsafe:** Empty string

**Description:** Patches data on specified macOS version or older.

*Note:* Refer to Add MaxKernel description for matching logic.

10. MinKernel

**Type:** plist string

**Failsafe:** Empty string

**Description:** Patches data on specified macOS version or newer.

*Note:* Refer to Add MaxKernel description for matching logic.

11. Replace

**Type:** plist data

**Failsafe:** Empty data

**Description:** Replacement data of one or more bytes.

12. ReplaceMask

**Type:** plist data

**Failsafe:** Empty data

**Description:** Data bitwise mask used during replacement. Allows fuzzy replacement by updating masked (set to non-zero) bits. Can be set to empty data to be ignored. Must equal to **Replace** in size otherwise.

13. Skip

**Type:** plist integer

**Failsafe:** 0

**Description:** Number of found occurrences to be skipped before replacement is done.

## 7.7 Quirks Properties

1. AppleCpuPmCfgLock

**Type:** plist boolean

**Failsafe:** false

**Description:** Disables `PKG_CST_CONFIG_CONTROL` (0xE2) MSR modification in AppleIntelCPUPowerManagement.kext, commonly causing early kernel panic, when it is locked from writing.

*Note:* This option should [be](#) avoided whenever possible. Modern firmwares provide `CFG Lock` setting, disabling which is much cleaner. More details about the issue can be found in [VerifyMsrE2](#) notes.

2. AppleXcpmCfgLock

**Type:** plist boolean

**Failsafe:** false

**Description:** Disables `PKG_CST_CONFIG_CONTROL` (0xE2) MSR modification in XNU kernel, commonly causing early kernel panic, when it is locked from writing (XCPM power management).

*Note:* This option should [be](#) avoided whenever possible. Modern firmwares provide `CFG Lock` setting, disabling which is much cleaner. More details about the issue can be found in [VerifyMsrE2](#) notes.

3. **AppleXcpmExtraMsrs**  
**Type:** plist boolean  
**Failsafe:** false  
**Description:** Disables multiple MSR access critical for select CPUs, which have no native XCPM support.  
  
This is normally used in conjunction with **Emulate** section on Haswell-E, Broadwell-E, Skylake-X, and similar CPUs. More details on the XCPM patches are outlined in [acidanthera/bugtracker#365](#).  
  
*Note:* Additional not provided patches will be required for Ivy Bridge or Pentium CPUs. It is recommended to use `AppleIntelCpuPowerManagement.kext` for the former.
4. **CustomSMBIOSGuid**  
**Type:** plist boolean  
**Failsafe:** false  
**Description:** Performs GUID patching for `UpdateSMBIOSMode Custom` mode. Usually relevant for Dell laptops.
5. **DisableIoMapper**  
**Type:** plist boolean  
**Failsafe:** false  
**Description:** Disables `IoMapper` support in XNU (VT-d), which may conflict with the firmware implementation.  
  
*Note:* This option is a preferred alternative to dropping `DMAR` ACPI table and disabling VT-d in firmware preferences, which does not break VT-d support in other systems in case they need it.
6. **ExternalDiskIcons**  
**Type:** plist boolean  
**Failsafe:** false  
**Description:** Apply icon type patches to `AppleAHCIPort.kext` to force internal disk icons for all AHCI disks.  
  
*Note:* This option should [be](#) avoided whenever possible. Modern firmwares usually have compatible AHCI controllers.
7. **LapicKernelPanic**  
**Type:** plist boolean  
**Failsafe:** false  
**Description:** Disables kernel panic on LAPIC interrupts.
8. **PanicNoKextDump**  
**Type:** plist boolean  
**Failsafe:** false  
**Description:** Prevent kernel from printing kext dump in the panic log preventing from observing panic details. Affects 10.13 and above.
9. **PowerTimeoutKernelPanic**  
**Type:** plist boolean  
**Failsafe:** false  
**Description:** Disables kernel panic on `setPowerState` timeout.  
  
An additional security measure was added to macOS Catalina (10.15) causing kernel panic on power change timeout for Apple drivers. Sometimes it may cause issues on misconfigured hardware, notably digital audio, which sometimes fails to wake up. For debug kernels `setpowerstate_panic=0` boot argument should be used, which is otherwise equivalent to this quirk.
10. **ThirdPartyDrives**  
**Type:** plist boolean  
**Failsafe:** false  
**Description:** Apply vendor patches to `IOAHCIBlockStorage.kext` to enable native features for third-party drives, such as TRIM on SSDs or hibernation support on 10.15 and newer.  
  
*Note:* This option may be avoided on user preference. NVMe SSDs are compatible without the change. For AHCI SSDs on modern macOS version there is a dedicated built-in utility called `trimforce`. Starting from 10.15 this utility creates `EnableTRIM` variable in `APPLE_BOOT_VARIABLE_GUID` namespace with `01 00 00 00` value.