



OpenCore

Reference Manual (0.6.~~4~~.5)

[2020.12.23]

16. HashServices
Type: plist boolean
Failsafe: false
Description: Forcibly reinstalls Hash Services protocols with builtin versions. Should be set to **true** to ensure File Vault 2 compatibility on platforms providing broken SHA-1 hashing. Can be diagnosed by invalid cursor size with UIScale set to 02, in general platforms prior to APTIO V (Haswell and older) are affected.
17. OSInfo
Type: plist boolean
Failsafe: false
Description: Forcibly reinstalls OS Info protocol with builtin versions. This protocol is generally used to receive notifications from macOS bootloader, by the firmware or by other applications.
18. UnicodeCollation
Type: plist boolean
Failsafe: false
Description: Forcibly reinstalls unicode collation services with builtin version. Should be set to **true** to ensure UEFI Shell compatibility on platforms providing broken unicode collation. In general legacy Insyde and APTIO platforms on Ivy Bridge and earlier are affected.

11.12 Quirks Properties

1. ~~DeduplicateBootOrder~~
Type: ~~plist boolean~~
Failsafe: ~~false~~
Description: ~~Remove duplicate entries in BootOrder variable in EFI_GLOBAL_VARIABLE_GUID.~~

~~This quirk requires RequestBootVarRouting to be enabled and therefore OC_FIRMWARE_RUNTIME protocol implemented in OpenRuntime.efi.~~

~~By redirecting Boot prefixed variables to a separate GUID namespace with the help of RequestBootVarRouting quirk we achieve multiple goals:~~

- ~~• Operating systems are jailed and only controlled by OpenCore boot environment to enhance security.~~
- ~~• Operating systems do not mess with OpenCore boot priority, and guarantee fluent updates and hibernation wakes for cases that require reboots with OpenCore in the middle.~~
- ~~• Potentially incompatible boot entries, such as macOS entries, are not deleted or anyhow corrupted.~~

~~However, some types of firmware do their own boot option scanning on startup by checking for file presence on the available disks. This scanning often includes non-standard locations such as Windows Bootloader paths. This is typically not an issue but some firmware, such as ASUS firmware on the APTIO V, have bugs. On such, scanning is implemented improperly and firmware preferences may get accidentally corrupted due to BootOrder entry duplication (each option will be added twice) making it impossible to boot without resetting NVRAM.~~

~~To trigger the bug, some valid boot options (e.g. OpenCore) are required. Then install Windows with RequestBootVarRouting enabled. As the Windows bootloader option will not be created by the Windows installer, the firmware will attempt to create this itself, leading to a corruption of its boot option list.~~

~~This quirk removes all duplicates in BootOrder variable attempting to resolve the consequences of the bugs upon OpenCore loading. It is recommended to use this key along with BootProtect option.~~

2. ExitBootServicesDelay
Type: plist integer
Failsafe: 0
Description: Adds delay in microseconds after EXIT_BOOT_SERVICES event.

This is a very rough workaround to circumvent the **Still waiting for root device** message on some APTIO IV firmware (ASUS Z87-Pro) particularly when using FileVault 2. It appears that for some reason, they execute code in parallel to EXIT_BOOT_SERVICES, which results in the SATA controller being inaccessible from macOS. A better approach should be found in some future. Expect 3 to 5 seconds to be adequate when this quirk is needed.

3. IgnoreInvalidFlexRatio
Type: plist boolean
Failsafe: false

Description: Some types of firmware (such as APTIO IV) may contain invalid values in the MSR_FLEX_RATIO (0x194) MSR register. These values may cause macOS boot failures on Intel platforms.

Note: While the option is not expected to harm unaffected firmware, its use is only recommended when it is specifically required.

4. ReleaseUsbOwnership

Type: plist boolean

Failsafe: false

Description: Attempt to detach USB controller ownership from the firmware driver. While most types of firmware manage to do that properly, or at least have an option for this, some do not. As a result, the operating system may freeze upon boot. Not recommended unless required.

5. RequestBootVarRouting

Type: plist boolean

Failsafe: false

Description: Request redirect of all Boot prefixed variables from EFI_GLOBAL_VARIABLE_GUID to OC_VENDOR_VARIABLE_GUID.

This quirk requires OC_FIRMWARE_RUNTIME protocol implemented in `OpenRuntime.efi`. The quirk lets default boot entry preservation at times when the firmware deletes incompatible boot entries. In summary, this quirk is required to reliably use the Startup Disk preference pane in firmware that is not compatible with macOS boot entries by design.

By redirecting Boot prefixed variables to a separate GUID namespace with the help of RequestBootVarRouting quirk we achieve multiple goals:

- Operating systems are jailed and only controlled by OpenCore boot environment to enhance security.
- Operating systems do not mess with OpenCore boot priority, and guarantee fluent updates and hibernation wakes for cases that require reboots with OpenCore in the middle.
- Potentially incompatible boot entries, such as macOS entries, are not deleted or anyhow corrupted.

6. TscSyncTimeout

Type: plist integer

Failsafe: 0

Description: Attempts to perform TSC synchronisation with a specified timeout.

The primary purpose of this quirk is to enable early bootstrap TSC synchronisation on some server and laptop models when running a debug XNU kernel. For the debug kernel the TSC needs to be kept in sync across the cores before any kext could kick in rendering all other solutions problematic. The timeout is specified in microseconds and depends on the amount of cores present on the platform, the recommended starting value is 500000.

This is an experimental quirk, which should only be used for the aforementioned problem. In all other cases the quirk may render the operating system unstable and is not recommended. The recommended solution in the other cases is to install a kernel driver such as VoodooTSCSync, TSCAdjustReset, or CpuTscSync (a more specialised variant of VoodooTSCSync for newer laptops).

Note: The reason this quirk cannot replace the kernel driver is because it cannot operate in ACPI S3 mode (sleep wake) and because the UEFI firmware provides very limited multicore support preventing the precise update of the MSR registers.

7. UnblockFsConnect

Type: plist boolean

Failsafe: false

Description: Some types of firmware block partition handles by opening them in By Driver mode, resulting in being unable to install File System protocols.

Note: The quirk is mostly relevant for select HP laptops with no drives listed.

11.13 ReservedMemory Properties

1. Address

Type: plist integer

Failsafe: 0