

Boot Option Infrastructure Guide

Introduction to Boot Options



Allowing a flexible booting process through customized Aptio® boot option maintenance

INTRODUCTION TO BOOT OPTIONS

Boot options are devices a system can boot from. Boot Option data is an infrastructure that identifies devices and software interfaces used during the boot process. The boot option list outlines the boot options available during a given system boot process and the list is prioritized according to platform policies and/or user selections. The prioritized boot option list is preserved across system reboots to maintain the requested boot order.

COMPONENTS INVOLVED

Aptio V is developed in a modular fashion with multiple components capable of handling boot options. There are three main components that comprise the Boot Option infrastructure: the Boot Device Selection Driver, the Boot Manager and the Setup Engine.

The Boot Device Selection Driver (BDS) provides maintenance of the boot option list by reading, modifying and saving the boot option list.

The Boot Manager is the component that reads the boot options and boots the system based on the information in the boot options. The Boot Manager works as a part of AMI's graphical Text Setup Engine (TSE).

The Setup Engine is the component that takes user input and updates the boot option list based on configurable aspects of the boot option maintenance. The Setup Engine works as a part of the larger AMI Text Setup Engine (TSE) component and unlike BDS and Boot Manager, the setup engine is launched only when requested.

SPECIFICATIONS INVOLVED

The boot options and the order of the boot options are defined by the UEFI specification using non-volatile (NV) variables.

Boot options are initially created by BDS to form a boot device list, detecting system devices that can potentially boot. Once the boot devices are identified, boot options can be created for the devices and saved to the non-volatile storage space. Once the execution of BDS is complete, the Boot Manager and Setup Engine can read the boot options directly from the non-volatile storage.

HIGH LEVEL STEPS

The high level steps of the boot option maintenance process are:

- Previous boot order list is read from non-volatile storage
- Currently available boot devices are collected
- Collected boot devices are filtered
- Collected boot devices are matched to options in previous boot order
- New boot options are created and missing ones are purged
- Boot options in list are processed based upon OEM needs
- Boot option list is stored back to non-volatile storage

FLEXIBILITY

The control flow of the Aptio BDS phase is an eLink list of functions. This eLink list effectively is a function dispatch table. A function dispatch table offers OEMs immense flexibility because it allows OEMs to:

- Implement their own features and add them to the function dispatch table
- Disable unwanted function calls from the original table
- Replace unwanted function calls from the original table with their own implementations

All OEM customizations can be implemented as a separate component that can be easily transferred from project to project as well.

HIGHLIGHTS:

- Non-standard boot option maintenance scenarios
- Outlines boot options during system boot
- Component-based technology
 - Boot Device Selection Driver (BDS)
 - Boot Manager
 - Setup Engine
- Compliant with UEFI Specification
- Non-volatile variable storage mechanism
- Aptio distinguishes between firmware and non-firmware boot options



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