

Foreword

A little more than two and half years ago, I helped introduced the book *Beyond BIOS*. In 2008, the industry has seen significant movements in this direction for the x64 systems. Microsoft shipped both the Windows Vista SP1 and Windows Server 2008 with the support of the UEFI boot process. System vendors are beginning to include the option to boot UEFI applications (including operating systems). For example, HP has made the transition for all its newly-designed Elitebook and Compaq commercial notebooks. MSI also enabled the option with the UEFI-based motherboards and netbooks. This trend will continue. As we estimate that 50% of the PCs shipping by the beginning of 2010 would be based on UEFI technology, we expect more and more of these systems would include this option. Eventually, traditional BIOS boot process would become an after market option. However, before removing its support, we need to enable the industry to move *Beyond DOS*.

DOS was a dominant operating system for the x86 market before 1995. With the introduction of Windows and Linux, the role of DOS has significantly diminished as an operating system. Its single-user, single-task, non-reentrant environment makes it no longer viable. Its memory addressability and hard disk access limitations also plague its use. However, its ability for shell scripting and hardware access, its simplicity and familiarity, still makes it an attractive pre-OS environment for manufacturing and diagnostics.

With the ubiquitous availability of the x64 processors, the viability of DOS as a pre-OS environment for diagnostics is challenged. DOS-based diagnostics cannot perform memory testing for memory not accessible in the DOS environment. DOS is also heavily dependent on the BIOS interfaces. As we move beyond BIOS, we will need a 64-bit pre-OS environ-

ment that takes advantage of the UEFI environment while offering shell scripting ability, hardware access, simplicity and familiarity.

Let me introduce the UEFI Shell. Actually, a shell environment was provided in the original EFI Sample Implementation and later on TianoCore.org open source project from Intel. Intel designed the shell to support the features that are normally available in DOS or the UNIX shells such as Bourne, Korn, or C shells, but made it distinguishable from these other shells. That shell has in fact been found very useful. HP Integrity Servers and MSI Click BIOS motherboards, for example, embedded this shell in the ROM. Others such as the HP commercial notebooks and Apple iMacs do not include the shell in the ROM, but these systems can launch the shell from other storage space. Intel left it out of the EFI Specification originally thinking this pre-OS environment is likely a vendor value differentiation. Although true that the vendors are likely to differentiate, the UEFI Forum collectively decided that we need a baseline that is standardized so we can expect interoperability. There comes the UEFI Shell Specification 2.0 published in October last year. Standardizing the shell also gives us the anchor to run the UEFI Self-Certified Test.

This book is a perfect sequel to the *Beyond BIOS* book. If you are still using or shipping DOS-based solutions, this book is definitely a must-read for you. It provides an important bridge between the normative specifications and the informative details of the development and the insights.

We are fortunate to have the same authors to offer their insights again: Michael Rothman chairs the UEFI Shell Subteam that owns the standardization of the UEFI Shell. He also chairs the Configuration Subteam that owns the Human Interface Infrastructure (HII) that the shell can use for configuration purposes. Vincent Zimmer chairs the Networking Subteam owning the UEFI network stack and the IPv6 support. He has also been very involved in the Trusted Computing Group, defining security related extensions for UEFI. Robert Hale has been working in many of these areas for a long time and is a driving force behind many of the shell and HII development. This time we also have Tim Lewis, the Chief BIOS Architect from Phoenix, covering the batch scripting and shell application programming. Tim chairs the UEFI Security Subteam and is one of the leading contributors in the UEFI Shell and Configuration Subteams. I cannot think of any better dream team to teach on this subject matter.

Using this book along with the code on the TianoCore.org open source Shell project would be the excellent tutorial for the engineers to

develop UEFI Shell based solutions to move beyond DOS. I am very pleased to recommend this new book.

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