UEFI Plugfest – Dupont, WA

Plug-Ins: Added value for PCs

June 22, 2010

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Agenda

- Plug-Ins! Past, Present, and Future
- UEFI is Making BIOS Plug-Ins Possible!
- Plug-In Examples
- Taking Plug-Ins to the Next Level
- Call to Action

Plug-Ins: Added Value for PCs

- Plug-Ins are added value for PCs installed by:
  - The OEM
  - The End User

- What plug-ins do we use today?
  - For MP3 players, it’s earphones, power supplies, etc.
  - For PDAs & Smart Phones, it’s app store software
  - For PCs, plug-ins extend functionality too

Plug-Ins: Added Value for PCs

- OEM Plug-Ins:
  - Likely to exist in source code form
  - Require technical integration into the BIOS in some way (source, adaptation, etc.)
  - Integrated as part of system test
- User Plug-Ins:
  - Need seamless binary installation
  - Lots of issues (security, storage, configuration, compatibility, etc.)
  - Must just work without any “system test” on the user’s part

Plug-Ins: Added Value for PCs

- In the legacy BIOS days, plug-ins made hardware operational– ROM BIOS extensions (OpROMs)
- Today's add value is less about new hardware options, and more about other things:
  - Virus/Malware Protection
  - Enterprise Management
  - OS Installation
  - Geo-Fencing
  - Instant-On environments
  - Diagnostics

Plug-Ins Past and Present

Today's computing is trending towards enclosed systems with limited hardware expansion

1981-1989

Expansion via hardware plug-ins (i.e. LAN, Modem, Graphics)

1990-1999

Expansion via standards (USB, PCI)
Early Notebooks with limited expansion
Connectivity: Network, Internet

2000-2009

Accelerated Transition to Mobility
(Notebooks, Netbooks, PDAs, etc.)
Limited Expansion: Closed Systems

Plug-Ins: Near Future

What forces are driving plug-ins now?

- 2010 : UEFI Notebooks: SW Door Opens
  - 2008-2009: Steady growth in UEFI adoption
  - 2010[*]: Broad adoption of UEFI: ~>50% notebooks shipped

- 2012[**] : Form Factor Mobile UEFI Adoption
  - i.e. PDAs, Mobile Phones, MP3 players, etc.

[*] Source, UEFI Forum
[**] Source, Phoenix Technologies

Plug-Ins: Longer Term Future

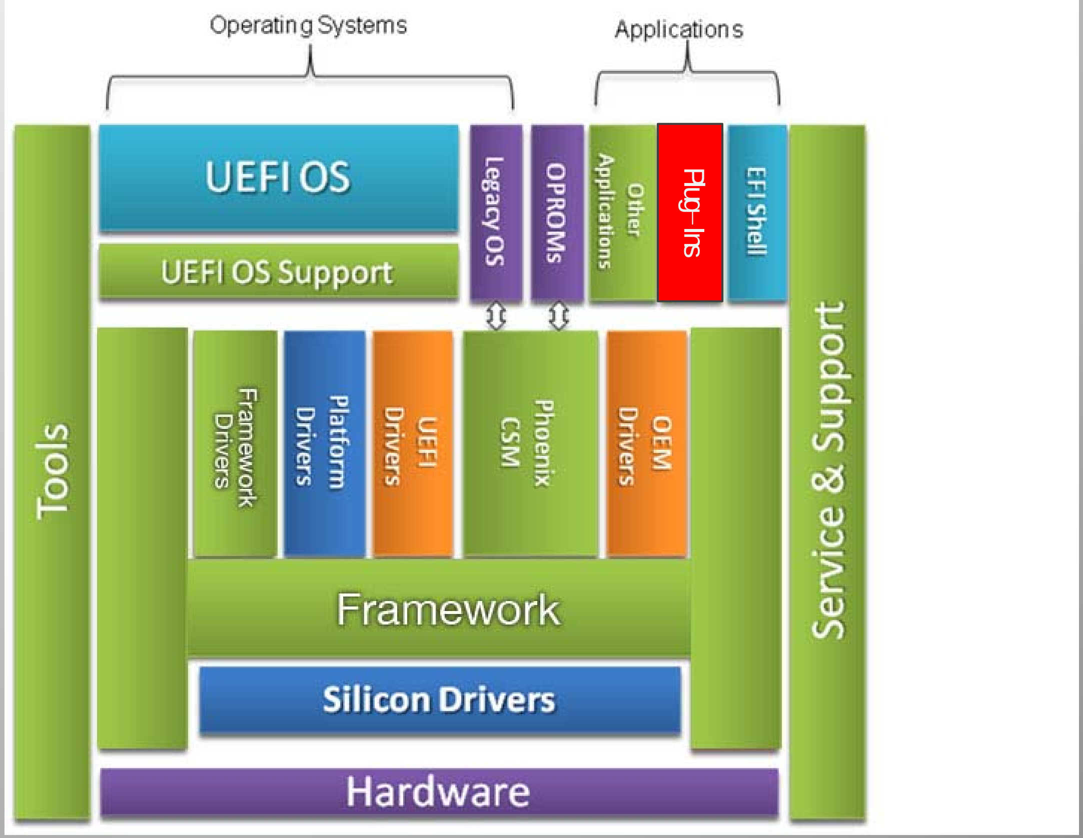
What forces are driving plug-ins down the road?

- 2015*: The Cloud: Unlimited storage and services
- 2015*: The Grid: Unlimited computing power
- 2020*: Shift from “press this to cause the device to do that” to peer interaction with the device

* Source, Phoenix Technologies

UEFI is Making Value-Add Plug-Ins Feasible

- Focus on Mobile Devices
- All new systems shipping with some form of UEFI
- Phoenix creating UEFI solutions for all new silicon solutions
- Green H: Formal packaging of executable entities, run-order, flow control
  - Does away with hooking and patching



Green H/UEFI Transforms Plug-Ins

	Legacy	UEFI
Memory Allocation	☹ BDA Editing ☹ INT 15h	✓ Allocate Pages ✓ Allocate Memory
I/O to Screen	☹ INT 10h/INT 16h ☹ Painting video memory	✓ ConIn/ConOut handles
Hotkeys	☹ Hook INT 09h, INT 08h, INT 1ch	✓ Hotkey protocols
Security	☹ None	✓ Well Defined Protocols
Configuration	☹ ^S to enter special setup program in ROM	✓ Human Interface (HII) Protocols
Packaging	☹ ROM extension on PC card	✓ UEFI DXE Driver ✓ UEFI Application

UEFI offers Standard services & Interfaces vs. ad-hoc legacy implementation

Plug-In Examples

- SecureGuard
  - Plug-in to anchor critical software components to a PC device
  - Provides tamper protection and trust from root
  - BIOS can insert and up-sell after-market solutions (simple as presenting and offer or as complex as download and install of an application)
  - Windows agent works with BIOS plug-in to trigger actions or behaviors
- ServiceMeter
  - Carriers like Verizon, AT&T and Vodafone are offering subsidized netbook and slate PCs with their 2.5G and 3G plans.
  - Carriers need the ability to address account delinquency for PC devices and discontinue the wireless service and disable the system for delinquent accounts
  - ServiceMeter is a BIOS plug-in and Windows service that converts a standard netbook PC or slate PC into a subscription-based metered device

Taking Plug-Ins to the Next Level

- Preparation for transition from OEM "Push" to End User "Pull" in the market
- Solve User-Level problems, not OEM problems
- Make Mobile Systems Plug-In Friendly (OEM/ODMs)
  - Need to create concept vehicles
- Make Tools that are Plug-In Friendly (IBVs)
  - Create SDKs for ODMs and OEMs

  Also

  - Create SDKs for Plug-In Makers
  - Development environment that abstracts the complexities of BIOS from the Plug-In makers

    i.e., You don't need Windows source code to create a Windows application

Taking Plug-Ins to the Next Level

- IBVs to collaborate with UEFI forum and define a path to move to binary distribution (i.e. app store level)
- All IBVs will have their own ideas
- Phoenix is working on:
  - Installation – Installer
  - Discovery – Defining firmware volume assignments for plug-In storage
  - Compatibility – UI form and function
  - Storage – Read/Write firmware volume assignments and QoS for data storage
  - Isolation – Adding protection around apps for security and reliability
  - Performance – One second POST
  - Power Management – Best practices for maximizing battery life
  - Configuration – Best practices to simplify user experience

Call To Action

- Plug-Ins are going to take off, as the role of the BIOS/Pre-Boot is standardized and stabilized
- Importance of Plug-Ins will increase
  - Allows for differentiation and expandability in otherwise closed systems
- IBVs, ODMs, OEMs, and SVs will pave the way for plug-In manufacturers to add value:
  - First at the source code level as they sell to OEMs
  - Finally at the binary level as end users install their own plug-ins

Questions?

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