presented by

UEFI State of the Union

Ecosystem enabling update

UEFI Summer Plugfest – July 6-9, 2011

Mark Doran

Bailey Cross

Intel Corporation

Agenda

- UEFI Forum Update
- Intel UEFI Ecosystem Enabling Update

About 10 years ago, Intel committed to …

Establish an industry standard framework for platform innovation and delivering interoperable firmware binary modules on Intel platforms

Industry BIOS Transition

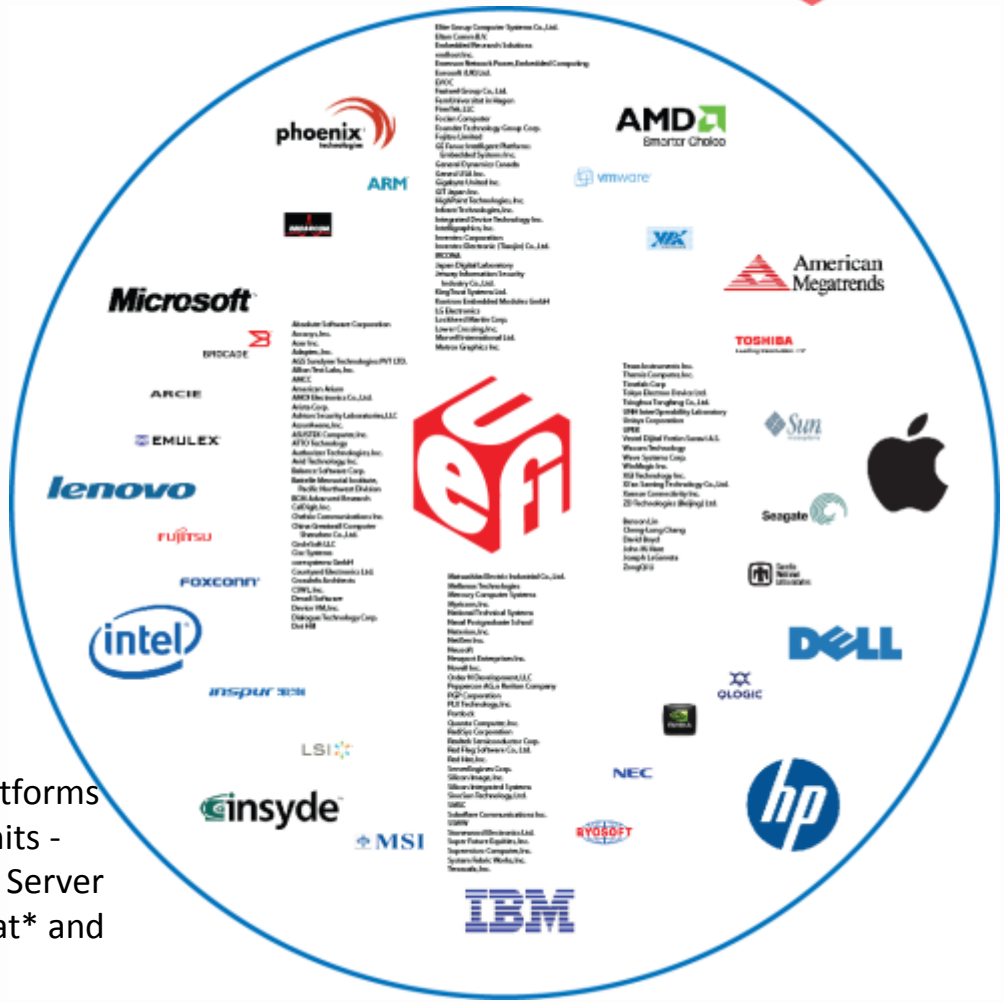
Pre-2000 — All Platforms BIOS were proprietary

2000 — Intel invented the Extensible Firmware Interface (EFI) and provided sample implementation under free BSD terms

2004 — **tianocore.org**, open source EFI community launched

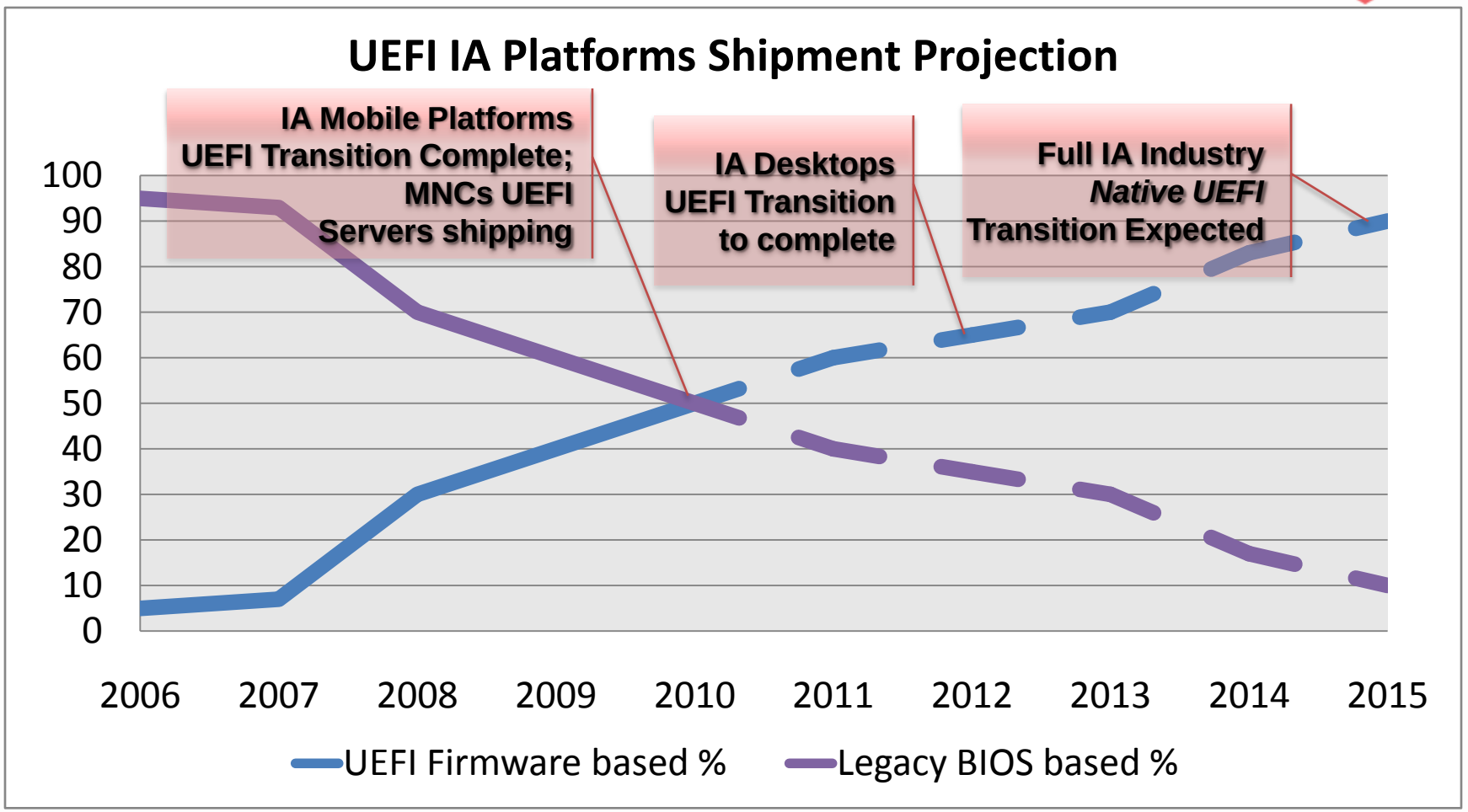
2005 — **Unified EFI (UEFI)** Industry forum, with 11 members, was formed to standardize EFI

2011 — **183** members and growing! Major MNCs shipping - UEFI platforms crossed 50% of IA worldwide units - Microsoft* UEFI x64 support in Server 2008, Vista* and Win7* - RedHat* and Novell* OS support



UEFI Firmware Deployments

Over 50% of worldwide IA units in 2010 and expected to reach 90% by 2015



Source: Various – UEFI Industry Communication Working Group data through 2010;
Intel customers platform UEFI adoption projection data for 2011-2015

UEFI Operating Systems

Windows Server 2008 R2

Microsoft Hyper-V Server 2008 R2

Windows 7

Windows Azure

Windows Storage Server 2008 R2 Enterprise

CANONICAL ubuntu

MeeGo™

redhat.

RED HAT ENTERPRISE LINUX

fedora

suse

SUSE® Linux Enterprise 11

Novell

vmware

Recognition of our accomplishments

"Without UEFI and the common code model it supports, we would not have been able to execute and achieve time to market delivery of multiple server offerings concurrently" -**Akhtar Ali** Vice President, Blades & Modular Software Development for IBM Systems and Technology Group

"Say Bye to BIOS and Hello to PCs that Boot in Seconds With UEFI"
– DailyTech, October 2010

"Change to 'Bios' will make for PCs that boot in seconds…Bios' replacement, known as UEFI, will predominate in new PCs by 2011"
- BBC News Technology, October 2010

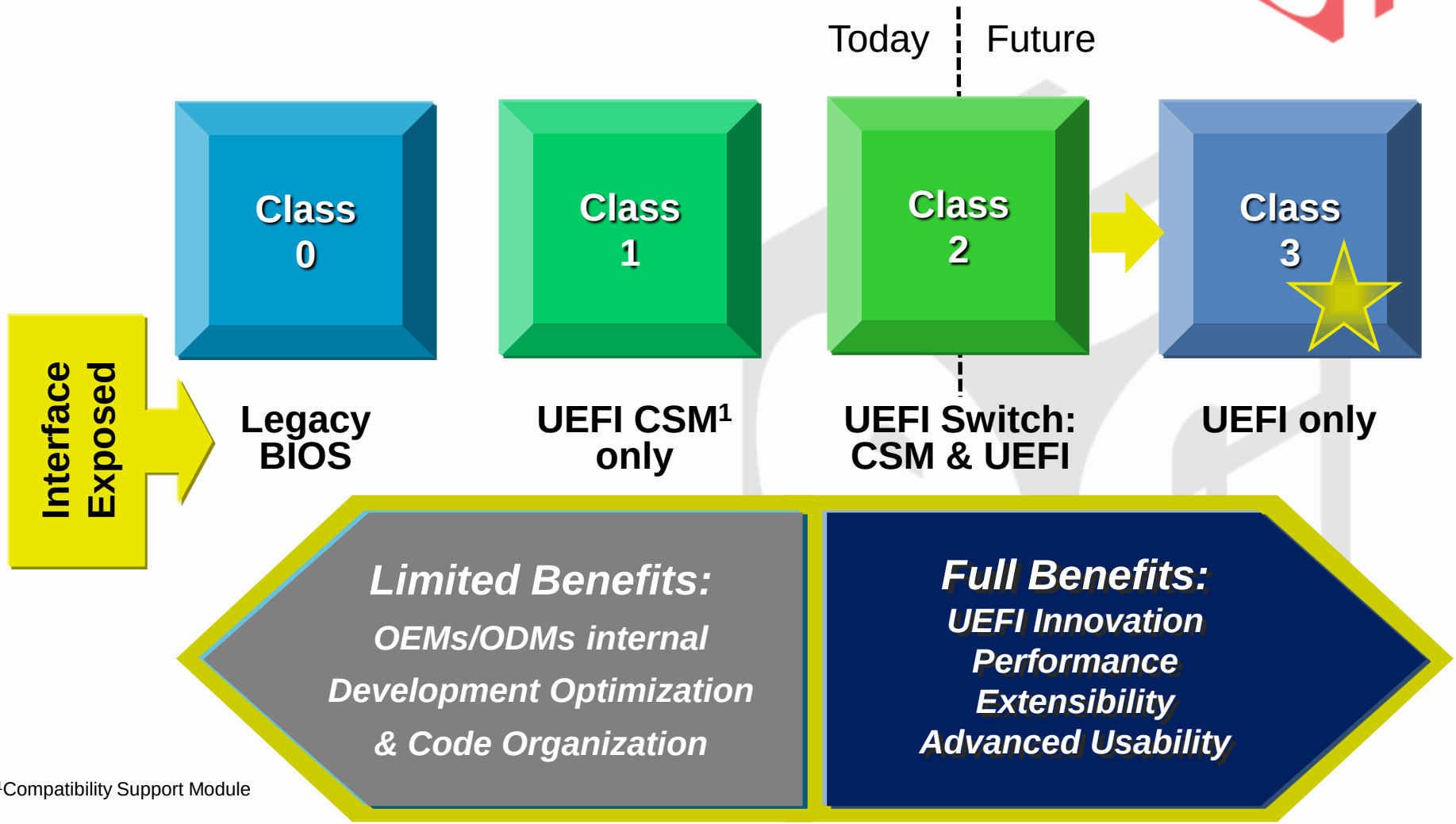
"Seagate: 3TB HDD requires modern 64-bit OS and UEFI"
Dark Vision Hardware, May'10

UEFI Goes Mainstream

- Asus UEFI BIOS Ad

- Asus “EZ Mode” UEFI Setup

UEFI System Classes Based on Firmware I/F



[1]Compatibility Support Module

UEFI Vision Timeline & Progress

2000-2004 **2005-2010** **2011-2015** **2015+**

Technology Creation

Industry Transition

Early Adoption led by MNCs:
Apple, Dell, HP, IBM

Industry Wide Adoption

Key Factors fueling wide UEFI adoption:
- Major OEMs making UEFI a design requirement
- Industry mandate for Fast Boot performance & Support for large hard drives (> 2.2 TB)
- Intel convergence on common UEFI code base; No BIOS legacy support from Intel

- Standard Common Firmware Foundation & Interoperable Packages Technology will free up more OEMs/IBVs resources for differentiation
- Rich pre-boot environment will enable more Optimization and integration of new capabilities

Increased Innovation Differentiation

UEFI-based Value-Add & Innovation

Pre-OS Security & Rich Networking

- IPV6/IPSec; Authenticode signature for firmware modules; protected updates; TPM & S-RTM

Manageability

- Enhanced Diagnostics; Intelligent & efficient platform updates; Flexible OS deployment; Consistent look & feel; Improved UI usability and OOB mgmt capabilities

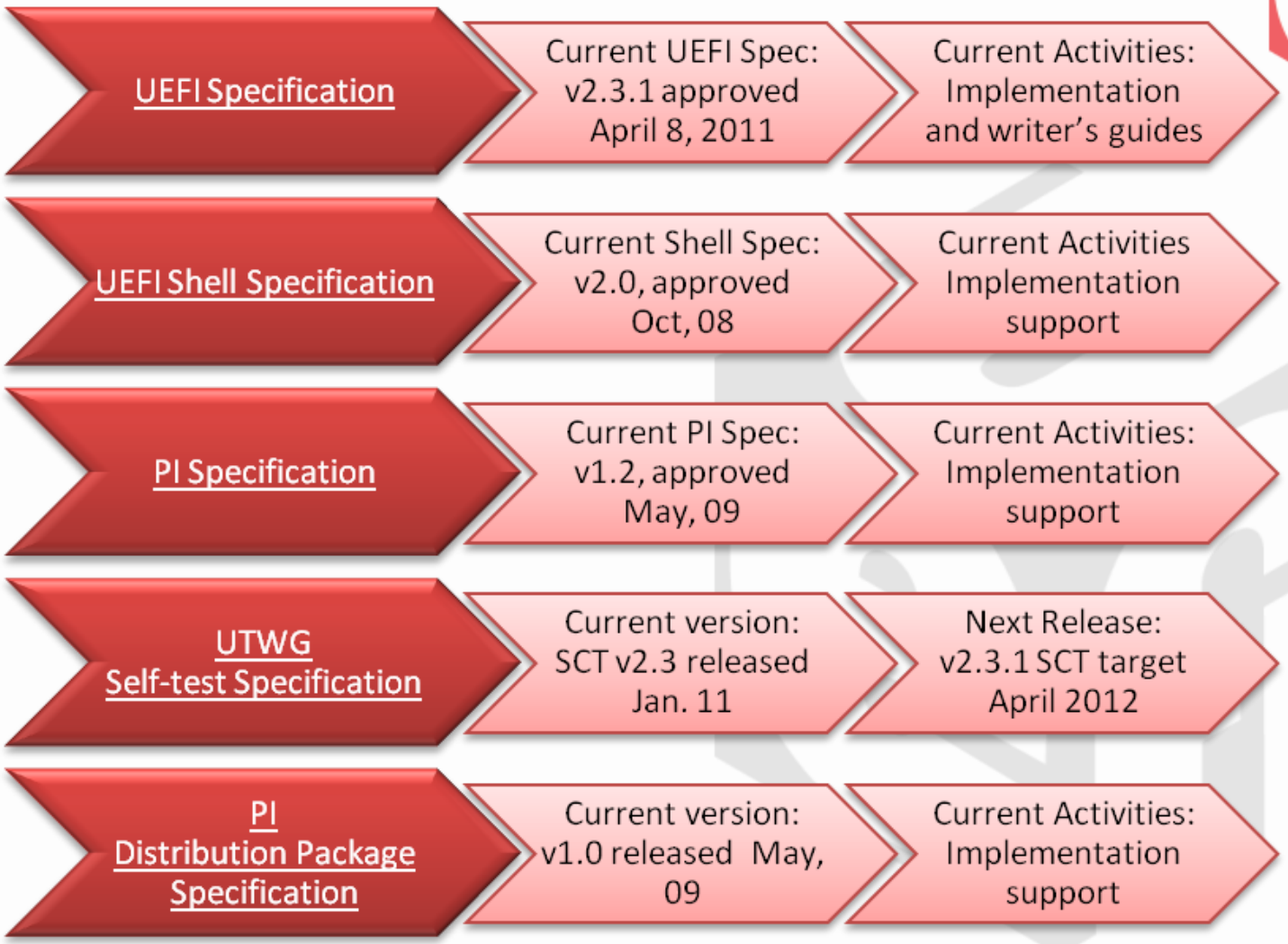
Power Management

- Power metering, power capping, power saving

Optimized Boot & Modern Look

- Fast boot and resume response; High resolution graphics; System boot from large drives >2.2 TB

UEFI Specification Roadmap



UEFI 2.3.1 Specification Update

Security
- Authenticated Variable & Signature Database
- Key Management Service (KMS)
- Storage Security Command Protocol for encrypted HDD

Network
- Netboot6 client use DUID-UUID to report platform identifier

Interoperability
- New FC and SAS Device Path
- FAT32 data region alignment
- HII clarification & update
- HII Modal Form

Performance
- Non-blocking interface for BLOCK oriented devices

Technology
- USB 3.0

Maintenance
- User Identifier, etc.

UEFI 2.3.1 Enables More Security Support

Getting ahead: our imperatives

- Distill: refactor complexity for SoCs
- Expedite: the “shift left” for F/W
- Lead: SoC platform readiness
- Innovate: work with OS ecosystem dynamics
- Verify: strive for better quality
- Enable: port of choice starts with F/W
- Re-use: efficiently leverage our F/W assets

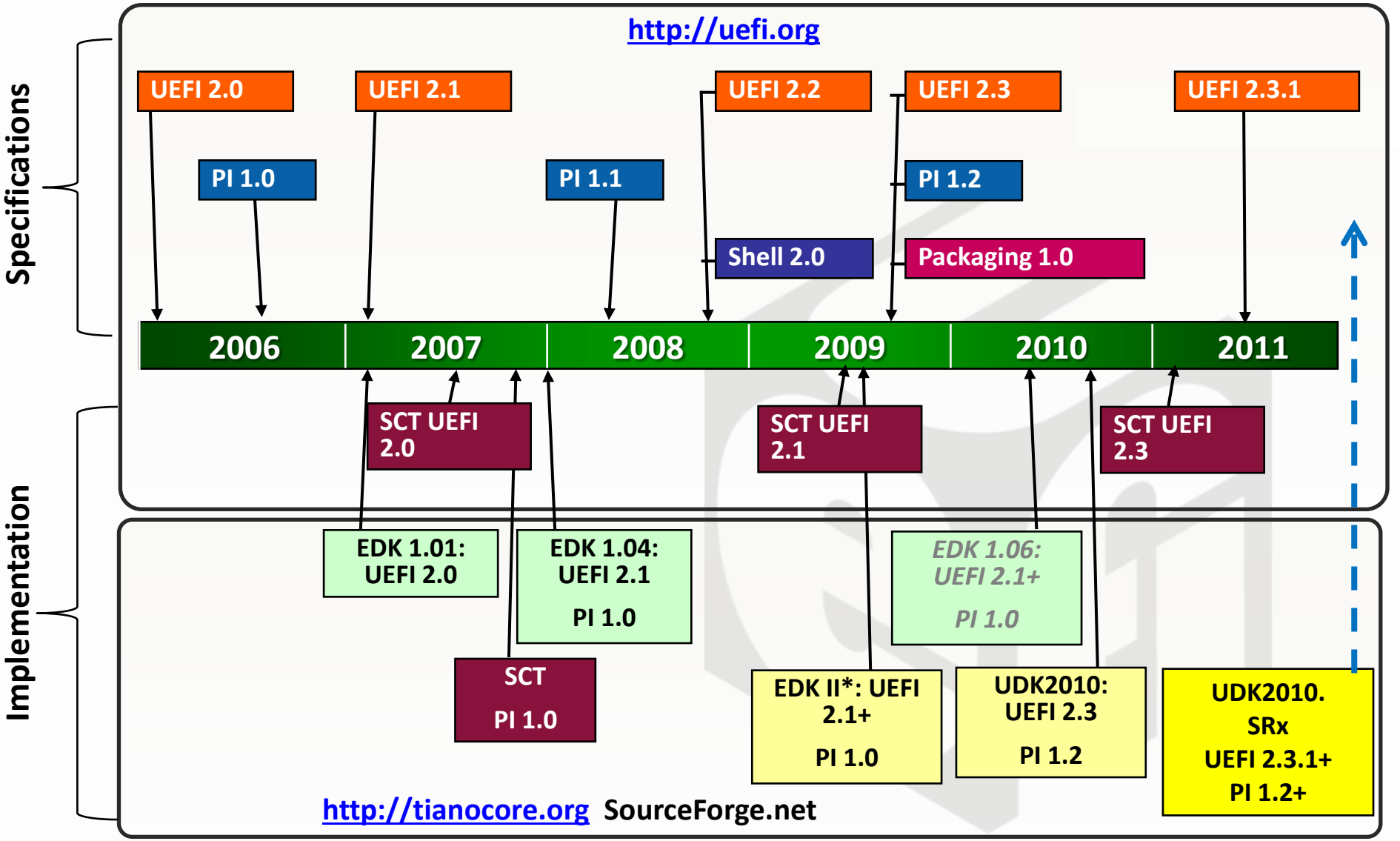
Unprecedented opportunity to DELIVER fundamental building blocks for the Compute Continuum

Intel UEFI Ecosystem Enabling Update

Topics

- Tiano Reference Implementation Timeline
- Intel® UEFI Development Kit 2010 (Intel® UDK2010)
- Intel firmware development platform “Tunnel Mountain”
- Intel UEFI Enabling Calendar
- UEFI Resources

UEFI Specification & Tiano Reference Implementation Timeline



All products, dates, and programs are based on current expectations and subject to change without notice.

*** EDK II is same code base as UDK2010**

Intel® UDK2010 Key Features

Intel® UEFI Development Kit 2010 (Intel® UDK2010)

Industry Standards Compliance
- UEFI 2.0, UEFI 2.1, UEFI 2.2, UEFI 2.3; PI 1.0, PI 1.1, PI 1.2

Extensible Foundation for Advanced Capabilities
- Pre-OS Security
- Rich Networking (IP4/6, UDP4/6, TCP4/6, DHCP4/6, VLAN, IPsec, SAN/Datacenter boot: TCP-based iSCSI)
- Manageability

Support for UEFI Packages
- Import/export modules source/binaries to many build systems

Maximize Re-use of Source Code[1]
- Platform Configuration Database (PCD) provides "knobs" for binaries
- ECP provides for reuse of EDK1117 (EDK I) modules
- Improved modularity, library classes and instances
- Optimize for size or speed

Multiple Development Environments and Tool Chains[1]
- Windows*, Linux*, OSX*
- VS2003, VS2005, WinDDK, Intel, GCC

Fast and Flexible Build Infrastructure[1]
- 4X+ Build Performance Improvement (vs EDKI)
- Targeted Module Build Flexibility

[1] benefit of EDK II codebase

Key Intel® UDK2010 Features

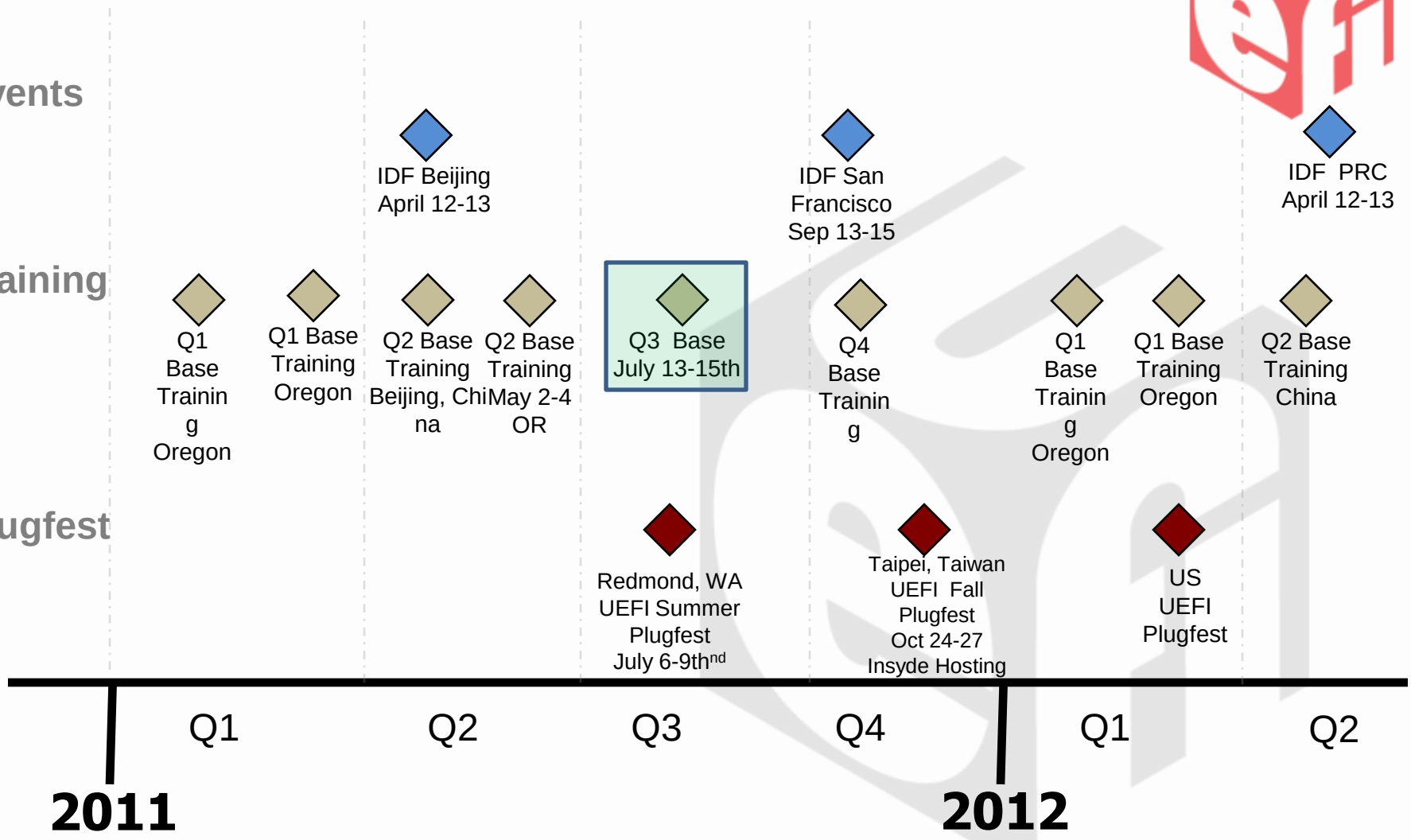
- UEFI Packaging
  - Enabling fast delivery of advanced capabilities to market
- Health and Management
  - Driver Health Protocol allows for self-healing / correcting devices
  - Firmware Management Protocol is a consistent way for driver adapters and system board to allow for updates
- Networking and Security
  - IP4/6, UDP4/6, TCP4/6, DHCP4/6, VLAN, IPsec, SAN/Datacenter boot: TCP-based iSCSI, Cryptographic logon, Multi-path/fail-over
  - Compliance with US Government requirements for IPV6 transition (http://www.antd.nist.gov/usgv6/usgv6-v1.pdf)
  - Compliance: Internet Engineering Task Force IETF RFC 5970, and IPV6 certified logo!
- UEFI Image Signing
  - Adds policy around UEFI and its 3rd party image extensibility
- UEFI User Identity
  - A standard framework for user-authentication devices that ensures the 'right' party applies policy/changes
- UEFI Shell 2.0

Intel® UDK2010 firmware development platform "Tunnel Mountain"

- Enables developers to write, debug, and validate drivers and applications on UEFI 2.3*
- Benefits
  - All H/W commercially available, NDA not required
  - Build platform yourself or purchase an pre-assembled platform
  - UDK2010 Compatible, supports UEFI 2.3+
  - Long lifetime hardware platform support from Intel
- It's easy to build: Purchase Parts from supported H/W list, assemble, download UEFI 2.3. BIOS Image, and flash BIOS to motherboard using a SPI Flash programmer
- Pre-assembled systems available at HDNW, visit http://www.tunnelmountain.net/ or (425) 943-5515 ext 4223

Visit www.intel.com/technology/efi for the latest

Intel UEFI Enabling Calendar



Intel committed to building a strong UEFI ecosystem

UEFI Industry Resources

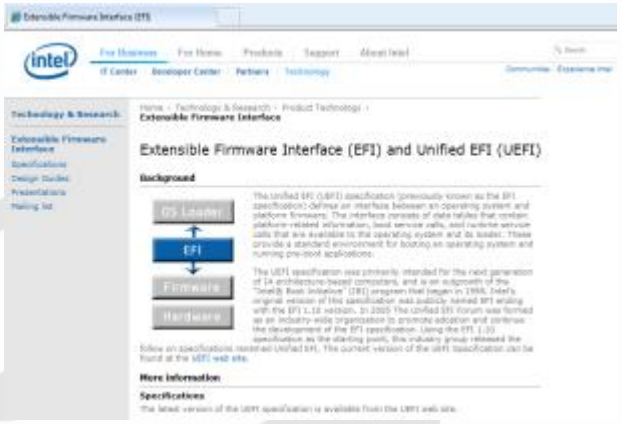
UEFI Forum

www.uefi.org

UEFI Open Source

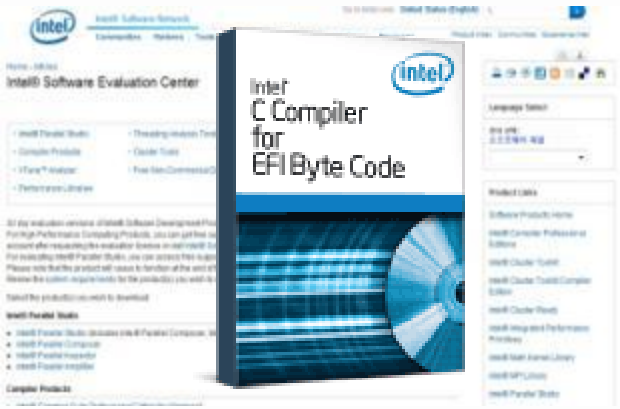
www.tianocore.org

Intel UEFI Resources



http://developer.intel.com/technology/efi

Intel EBC Compiler



http://software.intel.com/en-us/articles/intel-software-evaluation-center/#compilers

UEFI Books

www.intel.com/intelpress

Training/IHVs Contact

Laurie Jarlstrom
- Intel UEFI Training
- Laurie.Jarlstrom@intel.com

Bailey Cross
- Intel IHVs UEFI Support
- Bailey.T.Cross@intel.com

Thanks for attending the
UEFI Summer Plugfest 2011

For more information on
the Unified EFI Forum and
UEFI Specifications, visit
http://www.uefi.org

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But wait, there's more …

Wed (July 6)

- UEFI State of the Union (10:30am, Intel)
- Implementing a Secure Boot Path with UEFI 2.3.1 (1:00pm, Insyde)
- UEFI SCT Overview (2:30pm, HP/Intel)

Thu (July 7)

- Replacing VGA: GOP Implementation in UEFI (10:30am, AMD)
- UEFI prototyping using a Windows-hosted UEFI environment (1:00pm, Phoenix)
- EFI Shell Lab (2:00-4:00pm, "Thunder", Intel)
- GOP Enabling & Testing Lab (4:30—5:30pm, "Thunder", Intel)

Fri (July 8)

- Best Practices for UEFI Option ROM Developers (10:30am, AMI)

Download presentations after the plugfest at www.uefi.org