



Background

CONTACT: Claudine Mangano
408-765-0146
claudine.a.mangano@intel.com

Intel's Next-Generation Handheld Platform (codenamed "Moorestown")

Intel Corporation's next-generation handheld platform, codenamed "Moorestown," is scheduled to launch by 2010 and will target the MID and smartphone market segments.

Moorestown consists of a System on Chip (SoC), codenamed "Lincroft," that integrates a 45nm¹,² Intel® Atom™ processor core, graphics and video engines, as well as memory and display controllers. The platform also includes an input/output Platform Controller Hub (I/O-PCH), codenamed "Langwell," which supports a range of I/O connectivity blocks to connect with wireless communications, camera and storage, in addition to incorporating several board level functions. This hub combines I/O from both the PC and handheld market segments – such as CE-ATA, MIPI@-CSI, SDIO ports, USB controller, NAND controller and audio codec – contributing to high performance for a rich user experience while at the same time reducing power to enable long battery life and enabling pocketable form factors.

The Lincroft SoC architecture is partitioned to maximize performance while reducing platform idle power by up to 50x and reducing board size by 2x compared to Intel's first-generation "Menlow" platform. At the 2009 Hot Chips 21 conference in Palo Alto, Calif., Intel disclosed unique innovations behind these advances in high performance and low power.

Architected to Deliver High Performance for a Rich Internet Experience

Intel provided a sneak peek into some of the "Lincroft" innovations:

- Lincroft SoC architecture is designed to deliver a wide range of *scalable frequencies* for multimedia blocks (graphics, video encode, video decode), thus making it possible to fit across a broad spectrum of form factor designs and meet varied performance needs.
- **Bus Turbo Mode** increases bus bandwidth and reduces CPU-to-memory bus latency when the CPU is operating at higher frequencies, thus increasing the overall system performance.
- **Intel® Burst Performance Technology** (Intel® BPT) enables the processor to burst to higher performance for very short intervals of time, making it possible to provide on-demand, higher performance in smaller form factors without impacting thermal design power.

These technologies, combined with support for Intel® Hyperthreading³ technology, will make it possible for the Moorestown platform to deliver high performance to run the rich, interactive PC-like Internet.

Designed for Low Power Consumption

On the low power front, the Lincroft SoC includes architecture features such as MIPI-DSI, LP-DDR1, enhanced Intel® SpeedStep Technology, and distributed power gating.

- Lincroft supports the *MIPI display interface*, in addition to LVDS. This MIPI implementation meets the unique needs of devices with handheld screen resolution while requiring lower power consumption.
- Support for *Low-Power DDR1* and *DDR2* memory technologies to meet the varied needs of smartphones and other mobile devices.
- Intel SpeedStep® Technology makes it possible to provide a wide and dynamic range of CPU frequency options while maintaining low power. The enhanced *Intel SpeedStep Technology* implementation in Lincroft is creating a new dynamic range for lower power.
- Aggressive use of *Distributed Power Gating* across power islands makes it possible to achieve new thresholds in platform idle power by shutting off parts of the Lincroft SoC not in active use.
- The Langwell I/O-PCH interfaces with a dedicated *PMIC* (Power Management IC), codenamed "*Briertown*," and is designed to efficiently manage power delivery at the system level. Intel is working with industry leading companies including Freescale*, Maxim* and NEC* to develop this PMIC solution.

Enabling an Always Connected⁴ Experience

Intel is working with industry leaders to provide consumers with an always connected experience with devices based on the Moorestown platform. Moorestown-based devices will feature 3G/HSPA modules from Option* and Ericsson*. Moorestown will also support Intel's next-generation WiMAX or 4G technology codenamed "Evans Peak."

A Complete Platform and Solution

Moorestown represents a complete hardware and software platform, making it easier for customers to deliver compelling handheld devices. In addition to the Lincroft SoC, Langwell I/O-PCH, PMIC, and wireless connectivity options, Moorestown will be accompanied by a newer Moblin software version, Moblin v2.1.

Moblin is an optimized open source Linux operating system project that delivers visually rich Internet media experiences on Intel® Atom™ processor-based devices including smartphones, MIDs, netbooks, nettops, in-vehicle infotainment (IVI) and embedded systems. The main features of the Moblin project include a full, PC-like Internet and multimedia experience; advanced power management features to enable energy-efficient systems with longer battery life; a reduced foot print that lowers manufacturing costs and creates smaller mobile device designs; and a user interface for developing visually rich 3-D experiences. For more information, go to www.moblin.org.

Intel is currently working on next-generation "Moorestown" designs with leading system manufacturers, including Aava Mobile*, Compal Communications*, Compal Electronics*, EB*, Inventec*, LG Electronics* and Quanta*.

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- 1** Intel 45nm product is manufactured on a lead-free process. Lead-free per EU RoHS Directive (2002/95/EC, Annex A). Some RoHS exemptions may apply to other components used in the product package.
- 2** Applies to components containing flame retardants & PVC only. Halogens are below 900 PPM bromine, 900 PPM chlorine, and 1500 PPM combined bromine and chlorine.
- 3** Intel® Hyper-Threading Technology requires a computer system with an Intel processor supporting Hyper-Threading Technology and an HT Technology enabled platform controller hub, firmware and operating system.
- 4** Always Connected experience is dependent on a number of factors including wireless component integration, infrastructure availability, and user activation.