

10 March 2003

Delta 2013

## Centrino Takes Center Stage

Web & Collaboration Strategies, Infrastructure Strategies

Steve Kleynhans

**Intel's Centrino marks an inflection point in the PC market as the company takes a new direction in product marketing. Corporate buyers must prepare for the changes Centrino will immediately bring to the notebook market, as well as those it foreshadows for the desktop.**

Centrino Mobile Technology will be Intel's largest branding campaign since the launch of Intel Inside, and it marks a departure from the usual processor-centric market focus. Centrino refers not to a processor, but to a platform that defines many of the basic components (e.g., processor, chipset, drivers, wireless connectivity) that make up a notebook system. Centrino promises to significantly improve the mobile experience for end users by extending battery life, embedding standardized wireless connectivity, and enabling smaller, thinner designs without compromising performance. Initial feedback from PC manufacturers has been very positive, and we expect that, by YE03, Centrino-based systems will account for more than 80% of corporate notebook sales. We believe Intel will extend this platform approach to its other markets, including the desktop, server, and embedded marketplaces. Although Intel will continue to sell raw processors, more than 60% of its processors will be sold as part of a technology platform by 2006. This move will force hardware vendors to create differentiation beyond system hardware, shifting focus to ergonomics, industrial design, product packaging, value-added software, and services. It will also require end users to find new ways to evaluate products and vendors.

Since 2000, PC makers have found it increasingly difficult to drive new upgrades based solely on improved processor performance, because most users see only marginal operational improvements from increased speed (see WCS Delta 1204). In the mobile space, users are drawn to improved battery life, sleek form factors, and improved connectivity options. Although Intel has long produced low-power processors for notebooks, they have been tweaks to existing desktop designs. Transmeta's emergence in 2000 spurred Intel to pursue the notebook market more aggressively, accelerating development on low-power technologies. Intel also realized that matching user desires required extending beyond low-power processors to include other aspects of the system. As a result, Centrino consists of three pieces.

First, at the heart is the new Pentium M processor (formerly code-named Banias), which departs from the Pentium 3 and Pentium 4 cores with a new design that balances low-power consumption with strong performance. Early results show that a Pentium M running at 1.6GHz will perform similarly to a mobile Pentium 4 2.4GHz. At the same time, the processor consumes an average of less than one watt — less than half of what current Mobile Pentium 4 designs consume. Centrino-based notebooks are showing longer battery life, approaching five hours or more. By YE03, Intel will move the Pentium M processor to a new 90-nanometer manufacturing process (from the current 130-nanometer process), enabling it to eke out more performance and introduce even lower-powered versions. Longer term, we expect Intel to position the Pentium M processor into both the server blade and consumer information appliance markets, though we do not see it coming to desktops. Although Pentium M gives Intel an attractive part for higher-end set-top boxes, or potentially even a game console, its price will have to decline to compete with AMD (Athlon), VIA (C3), and National Semiconductor (Geode). However, Intel's large manufacturing capacity needs to be kept busy, and we expect it to leverage cost-efficiencies of its market-leading manufacturing processes to rapidly drop the price and expand its market reach by 2005.

**META Trend: During 2003/04, client standardization and managed build/distribution processes will enable an adaptive and cost-effective end-user computing environment, with focus placed on certification rather than technology homogeneity. Through 2005/06, IT staff will face challenges in managing pervasive client devices. By 2007/08, client computing models centered on IT group device ownership will yield to managed subscription services across corporate and personal devices.**

The second piece of Centrino's new Intel 855 chipset comes in two packages. The first includes a new version of Intel's Extreme Graphics engine, and the second requires an external graphics chip. Both chipsets include USB Version 2.0, support for 2 GB of DDR-266 memory, and integrated 10/100 Ethernet. Furthermore, the chipset has been optimized for power-efficient operation and high performance that contribute to Centrino's overall performance. We expect the majority of corporate systems to select the embedded graphics version, but many consumer systems (where gaming performance is an issue) will choose an external graphics engine from ATI or Nvidia.

The third Centrino component is the Intel Pro/Wireless 2100 network chip (formerly code-named Calexico), which will eliminate the need for add-in wireless cards. Initially, it will support only 802.11b. However, a dual-band (802.11a and b) version will be released by the end of 2Q03. This version will become the standard in 2004. Intel is also embarking on a significant marketing and investment program to encourage the implementation of wireless hot spots and is working with major service providers, hotel chains, and others. As a result, organizations must establish policies (e.g., for usage, security) with respect to wireless networking usage within their corporate environments. More important, they need policies with respect to home, hotel, and hot-spot usage, where corporate standards regarding security will be harder to enforce. We recommend companies implement a policy that includes virtual private networking and additional encryption tools (see GNS Delta 1091).

Intel is also using Centrino to launch a new system consistency standard that guarantees 18 months of hardware stability (at least for the chipset and processor), minimizing the need to frequently update system images. Code-named Granite Peak, this consistency program will appear on desktops with the Springdale chipset in 2Q03. We feel this consistency level, which many PC manufacturers already offer through their own means, raises the bar for Intel competitors (e.g., AMD), which do not control their own chipsets. We expect Centrino to have a positive impact on image management and system qualification costs. However, customers must more closely align their product selection to Intel's road map to obtain the full benefit of Granite Peak, and move quickly to new, stable platforms when they are introduced. We recommend that customers continue pressuring PC manufacturers to extend consistency guarantees throughout the system and apply greater pressure for prerelease evaluation units to enable earlier testing.

Although Centrino system component costs should be competitively priced with similar Pentium 4 M notebooks, we believe vendors will artificially raise prices on new Centrino systems during the first three to six months. By 4Q03, pricing will have stabilized as older products are flushed from the market and competitive pressures drive Centrino prices lower. Furthermore, although we believe Centrino will dominate the corporate market, we feel it will lag somewhat in the consumer market, where vendors are much more pennywise on component costs and may elect to use more stripped-down designs.

## **Bottom Line**

**Centrino will rapidly dominate the corporate mobile market, forcing customers to adjust their notebook purchasing criteria to reflect new metrics (e.g., processor speed requirements, battery life) and establish workable policies toward wireless networking.**

***Business Impact: As corporate productivity and end-user operations costs receive increasing scrutiny, companies must examine how technology changes impact their management and overall cost structures.***