

# Client Profile

## HP Introduces Revolutionary New PC Enterprise Technology Based On Transmeta Processors



*Hewlett-Packard (HP) is a technology solutions provider to consumers, businesses and institutions globally. The company's offerings span IT infrastructure, personal computing and access devices, global services, imaging and printing for consumers, enterprises, small and medium business. HP (NYSE, Nasdaq:HPQ) employs 142,000 people in 170 countries who conduct business in more than 40 countries and 10 languages.*

*Headquartered in Palo Alto, California, Hewlett-Packard delivers vital technology for business and life. The company consists of four core business groups: Customer Solutions Group, Imaging and Printing Group, Technology Solutions Group, and HP Labs, which provides a central research function and is focused on inventing new technologies.*

*HP's mission is to invent, engineer and deliver technology solutions that drive business value, create social value and improve the lives of its customers. For the last four fiscal quarters, HP revenue totaled \$74.7 billion. The company's \$4 billion annual R&D investment fuels the invention of products, solutions and technologies, enabling Hewlett-Packard to enter new markets and better serve its customers.*

### A New Solution For Enterprise PCs

The Personal Systems Group (PSG) focuses on supplying simple, reliable and affordable personal-computing solutions and devices for home and business use, including desktop PCs, notebooks, workstations, thin clients, smart handhelds and personal devices. Bob Taylor is Manager of New Product Strategies for HP's Business PCs (BPC) marketing organization within PSG. He defines and develops leading edge products and technologies that solve customer problems, then brings those new technologies and products to market. Based in Houston, BPC has 70 employees working on products from desktops to thin clients -- and it was this group that identified thin clients as a market opportunity for HP five years ago.



**Bob Taylor** — Sr. Product Marketing Manager, CCI and Thin Clients, HP Personal Systems Group

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In line with market demands to dramatically lower the cost of ownership for desktops, Hewlett-Packard defined an initiative known as Consolidated Client Infrastructure (CCI). The focus of this initiative is to centralize desktop computing and storage resources into easily managed and highly secure data centers, while still providing end users with the convenience and familiarity of a traditional desktop environment. While delivering a predictable user experience, the patent-pending

solution also ensures greater integrity and security for the end user's data. Built on a three tiered architecture (that starts with an access tier using thin clients, includes a compute tier with racks of blade PCs inside a datacenter, and culminates with a storage pool of network printers, application servers, and other networked resources), CCI enables the 'adaptive enterprise' where business and IT are synchronized to capitalize on change.

In the process of evolving and developing solutions that address customer problems, Taylor's enterprise customers began to evaluate transitioning from desktop PCs to server-based computing. They experienced two major challenges: 1) The more users accessed any given server, the greater the performance degradation they experienced. Since it was not unusual to have 50 to 100 users accessing the same applications on one server, users sometimes experienced poor performance and, 2) cost was another major concern. Migrating applications to a server-based computing environment meant rewriting code that would allow multiple users to access the same applications simultaneously. Since the typical enterprise has both home-grown and third party applications, additional time and expense were required to develop and integrate systems to

ensure a successful migration of many to these applications servers.

Tom Flynn, Director of Advanced Technology, and his team developed an alternative solution that they believed would be the perfect answer to these customer issues. This team realized that a more efficient and cost effective solution would be to design PCs to work with easily managed, highly secure blades. Blades hold multiple components

including processors, memory, and network connections on a single circuit board. While server-based computing today mostly exists in a hybrid sense, in that users access some applications via the server and some directly on the user's desktop, the CCI solution would have a blade dedicated to individual users and all applications would reside on the blade. "This approach would enable users to have a dedicated desktop while logged onto the network, but there would be no need for every PC to have a dedicated hard drive, processor, and memory," Taylor observed. He reasoned that with greater computing performance and a simplified client environment, support, maintenance, and management would be easier – and further analysis showed that customers could anticipate saving 25 to 50% on their operating expenses.



HP bc1000 blade PC

## Identifying The Criteria

Taylor and his team identified the challenge: take the desktop and move it onto a server. They envisioned a product that would match or exceed desktop performance with a CPU of at least one gigahertz – and that would offer what would be known as the first true blade PC.

In 2002, the team defined the criteria it was seeking and entertained several CPU vendors. As Taylor's team defined their product, they honed in on the components, features, limitations and parameters – and developed four main criteria for their solution.

The first criteria was "power." While maximum performance was the goal, low thermal and power requirements were vital. Taylor looked at blades from Sun, IBM, Clearcube, and Dell, but none of their blades were designed as a true desktop replacement – and all required too many kilowatts of power. Too much power would require additional energy output for "cooling," Taylor's second criteria. Because blades produce a great amount of heat, minimizing the thermal requirements on each blade was critical to keep the amount of required cooling as low as possible.



HP bc1000 blade PC

Third on the list of criteria was the "footprint." Maximizing the density of the blades while dealing with the power and cooling issues was crucial. Taylor set a minimum of 280 blades for each rack. Since server blades are smaller and consume less power than traditional box-based servers, the thermal environment on each blade would improve its power.

The fourth criteria was "cost." This new PC would require companies to purchase hardware that was more expensive than a traditional desktop. To offset this cost, Taylor wanted to minimize the total cost of ownership (TCO) and increase the return on investment (ROI) – so that customers would see a payback within their first year. "The right solution had to not only meet the footprint, power, and cooling requirements – but had to be priced low enough to allow us to deliver a product consisting of a thin client and blade at the same cost as today's desktop," Taylor explained.

*"Transmeta fully met the criteria of a one gigahertz processor inside a low thermal environment and allowed us to be where we wanted to be," stated Taylor, "where the blade and a Thin Client were at cost parity with a desktop PC."*

## In Search Of The Ideal CPU

Over a three-month period, the team evaluated vendors, rationalized their differences and examined the cost benefit of each vendor's approach. Based on the strength of its unique architecture and the company's ability to meet stringent power and thermal requirements (that others processors could not match), Taylor and his team unanimously selected Transmeta.

Taylor's expectation was that Transmeta's Efficion processor technology would enable him to provide a 'better together' solution with a Transmeta-based blade PC linked to a Transmeta-based thin client. His

subsequent experience with the company validated Taylor's expectations.

Transmeta's Crusoe™ and Efficion™ processors are highly efficient x86-compatible software-based microprocessors that deliver a compelling balance of low power consumption, high performance, low cost and small size. The Efficion processor is designed to provide power efficiency, design flexibility, performance-on-demand cost to meet the need of the next generation of mobile, wireless and embedded devices. It includes three new high performance bus interfaces: an on-chip HyperTransport™ bus interface for increased input/output efficiency, an on-chip Double Data Rate (DDR) SDRAM memory interface for increased throughput, and an on-chip AGP graphics interface for high performance graphics solutions. These new interfaces allow the Efficion processor to achieve more work per clock, which results in greater energy efficiency and longer battery

life for mobile computer users. The Transmeta Efficion processor's enhanced dynamic LongRun® power management features and integrated architecture are designed to give system designers and marketers a wide range of choices in creating products that deliver added value, functionality, security, comfort, reliability, and cost savings to end users.

Transmeta's unique architecture dramatically reduces the number of power hungry logic transistors, requiring far fewer transistors than conventional processors equating to less heat dissipation and a cooler running processor. The other deciding factor was the company's pricing. "Transmeta fully met the criteria of a one gigahertz processor inside a low thermal environment and allowed us to be where we wanted to be," stated Taylor, "where the blade and a Thin Client were at cost parity with a desktop PC."

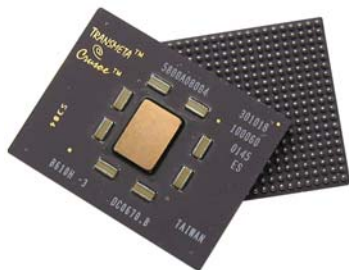
## Transmeta Helps Launch The Blade PC

During product development, Transmeta's onsite engineers worked daily with HP's design engineers to identify bugs and deploy the resources necessary to assist in successfully launching the CCI initiative. CCI became synonymous with an HP thin client, powered by Transmeta's Crusoe processor, connecting with the HP Blade PC, powered by Transmeta's Efficeon processor running Microsoft Windows® XP Professional and located in a centralized data center. Taylor found that the Efficeon processor delivered desktop-like performance, while the Crusoe processor was good for the client side, provided lots of performance and worked perfectly for embedded applications like a thin client.

It was now time to face the challenge of bringing a new product to market. Job one was convincing customers to give up Intel or AMD-based PCs for the more efficient but lesser known Transmeta-based PCs. "While Transmeta doesn't have the same name recognition as the other companies, we were really looking for more than that. We wanted a vendor that would go to market with us, not just sell us parts," remarked Taylor. According to Taylor, the Transmeta team went out of its way to help HP market CCI, using their resources, time and effort to qualify ISV products ranging from SAP, Cerner and PeopleSoft to run on the new platform.

*"Our customers have completely embraced the Transmeta architecture as an enterprise platform and have eagerly accepted CCI as the solution for their company."*

In addition, Transmeta supported HP's thin client technology by joining the Thin Client Consortium and becoming a major player in that space. Taylor appreciated Transmeta's involvement at tradeshow and other marketing events and the team's willingness to share product and training costs. "Transmeta did everything that I would expect from a true go-to-market partner. They went to great lengths to be sure all of their efforts were aligned with our strategy," observed Taylor.



Transmeta Crusoe™ TM5800 Processor

## Customers Experience Tremendous Cost Savings

The Efficeon processor-based HP Blade PC cuts costs in several critical ways, one of which is through power efficiency. Not only does Efficeon reduce power consumption compared to many existing server designs, but the reduced thermal profile also allows more processors to be deployed in a blade rack. According to recent market research, companies may spend as much as \$8,000 to maintain a traditional PC throughout its lifecycle. CCI can cut that IT expenditure in half for large enterprise customers, and save up to \$1,200 alone in support costs per user per year, versus a traditional desktop PC. HP anticipates that the new architectural design could reduce a company's TCO by as much as 50 percent.

As he talks to customers about the Transmeta solution, Taylor also talks about power leakage and Moore's Law. "While it is true that we keep expanding performance, our processors are getting hotter and hotter – and half of the performance is lost due to heat. Because of Transmeta's Long Run technology, our performance is now a constant," Taylor commented. The result is a cooler running enterprise solution. "Our customers also benefit from the stability of the blade PC's longer lifecycle. On blades

we expect the product lifecycle to be 18-24 months. The lifecycle of a typical PC is 9-12 months," remarked Taylor.

Transmeta is committed to ever expanding the performance of its products. Hewlett-Packard is committed to delivering more performance to its customers, along with a better user experience. Together the two companies have provided a solution that also enables the extended enterprise to safeguard data for all its users, while also complying with new laws. "Transmeta's processors allowed us to integrate, improve performance and security, and deliver a better end user experience," stated Taylor. "Our customers have completely embraced the Transmeta architecture as an enterprise platform and have eagerly accepted CCI as the solution for their company," Taylor observed.



HP bc1000 blade PC

Based on what appears to be a successful relationship, Taylor's experience has led other groups within HP to begin using Transmeta processors. And while the real measure is how many units he ultimately can sell, Taylor has found Transmeta's eagerness to deliver new innovations and performance enhancements unique among CPU vendors. "I believe that we'll continue to work with Transmeta because they continue to perform in a way that is rewarding for both parties and deliver unique features and benefits. In addition, they are very easy to work with," Taylor concluded. ■



Transmeta Efficéon™ TM8600 Processor

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**i n v e n t**

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