■ **T H E E D I T O R I A L V I E W**

Intel's Slippery Pricing Slope

## *Price Discounts Not the Same As Better Performance*

As the dominant microprocessor vendor, Intel makes its competitors' work difficult in many ways. One of the less obvious is its pricing curve: the steep slope makes it difficult for competitors to find purchase. This curve has tripped up PowerPC and is blocking incursions by AMD *(see* 110401.PDF*)* and Digital *(see* 110402.PDF*)*.

Intel's current list pricing for desktop Pentium processors is shown below. This curve is representative of Intel's pricing; every quarter, the names change, but the prices remain essentially the same. In the past, the top of the curve has been higher than $600, but the shape is fairly constant: there is always a steep premium for the faster parts, and the last step up is usually the biggest.

When PowerPC first appeared, its backers claimed it would offer twice the performance of Intel processors at the same price point. Had PowerPC delivered on this claim, it might well be in a much stronger position today. By the time the first PowerPC chips actually appeared, however, their lackluster performance forced a minor adjustment to this theme: the same performance at half the price.

Many people assumed this was just a different way of stating the same thing, but a glance at the figure shows there is a huge difference. The heavy black line shows a pricing structure exactly half that of Intel's. When viewed on the performance axis, however, this line offers an improvement of
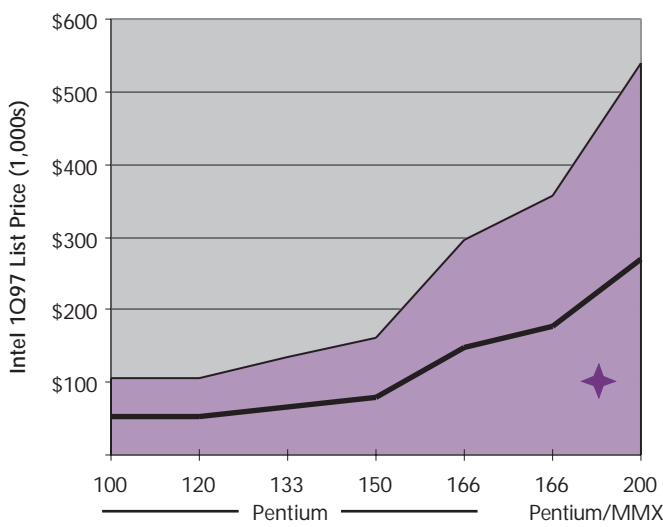
only one or two speed grades at any given price. This speed increase is far less than twice the performance.

The star in the figure shows a hypothetical product that offers roughly twice the performance of Intel's entry-level product. If the vendor of this hypothetical product wanted to offer twice the performance at the same price as Intel, it would have to price the part at about $100, matching Intel's entry-level price. Note that this performance is similar to that of Intel's best processors, as Intel typically maintains a 2:1 performance range for its product line. As the figure shows, the new chip would sell for 70–80% less than a high-end Intel processor with comparable performance.

Offering twice the performance of an Intel processor at the same price is a daunting proposition unless a competitor has a line of products that significantly exceeds the performance of Intel's fastest chips. In this case, the competitor's price curve could be similar to Intel's but shifted to the right.

To date, no vendor has been able to achieve such a performance advantage over Intel for mainstream PC applications. If the star represented the high point of a competitor's product line, that vendor's slower products would have extremely low prices, hardly a viable strategy.

Instead, AMD and Cyrix offer discounts of 40–50% off Intel's prices for products that are compatible with Intel's in nearly every way and offer similar performance. From a PC maker's perspective, these alternatives offer a relatively small performance gain over Intel's offerings.

I expect the total market available to Intel's competitors under this pricing structure is 20–30%, including the bottom 10% of the market that demands processors at prices below what Intel chooses to offer. The other PC makers would like to see a bigger performance increase before taking the risk of a non-Intel solution. Unless an x86 vendor develops much faster processors than Intel's, this effect limits the total market share of Intel's x86 competitors.

For non-x86 vendors, the barriers are more severe. With PowerPC and Alpha offering, at best, a performance increase of perhaps 10–20% on mainstream PC software, no major PC vendor has been willing to sign up for these architectures. If a RISC processor could truly offer something close to twice the performance of an Intel chip at the same system price, it would probably attract the attention of top PC makers. There are, however, no signs of this performance breakthrough happening in the near future. Ⓜ

The heavy line shows a competitive position of half the price for the same performance. The purple star shows the price discount required to offer twice the performance for the same price.