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The Intel P6 Processor
Executive Summary for Software Developers

Purpose: This document highlights the key points in the IAL *Special Edition P6 processor* Developer CD and is intended to facilitate communication within software vendor organizations.

Summary: The P6 processor is arriving in desktops and servers in 1995, delivering about twice the performance of the 100MHz Pentium® processor. This new performance represents an opportunity for software vendors. It is time to emphasize the P6 in software development plans.

Recommendations: The P6 is fully binary compatible with all previous Intel Architecture processors. No recompilation is required for an application to benefit from P6 performance. Still, there are steps to be taken to get full advantage of the P6:

- Use a modern blended compiler and consider the trade-offs of processor-specific tuning
- Write 32-bit code where possible
- Make your code as predictable as possible
- Target P6 performance, or write 'scalable' applications that do more when running on a P6

Background: The Pentium processor has reached the mainstream and is today's processor of choice. But power users continue to demand more and more performance. While the latest Pentium processors meet these needs today, the P6 will provide the new level of performance power users will demand to run their advanced 3D, multimedia authoring, financial, scientific & other applications. Many P6-based desktops will even be dual-processor ready.

Beyond power users, a much broader audience of users are looking for new capabilities. For them, the P6 delivers the performance to enable software-only video conferencing, continuous real-time speech recognition, expanded use of 3D, and other capabilities.

In the business environment, the P6 adds new reliability features (such as error checking and correction) and improves system scalability (enabling glueless multiprocessing with up to 4 processors), so that both desktops and servers in the business environment will be moving to P6.

In addition to these solid user benefits, Intel will be driving the P6's rapid adoption through the same proven marketing strategies that accelerated the Pentium processor's widespread use. The P6 represents a tremendous business opportunity for software developers, and opens up new possibilities for applications that take advantage of P6 performance.

Technology: The key to the P6's performance is its Dynamic Execution architecture. This enables the P6 to maintain compatibility while extracting maximum parallelism out of Intel Architecture code. Dynamic Execution is a unique combination of Multiple Branch Prediction (making more instructions available to be processed), Data Flow Analysis (determining the best order in which to execute instructions based on data dependencies, etc.), and Speculative Execution (the ability to execute instructions in the preferred order without retiring them to machine state until ensuring branch predictions are correct). These techniques combine to keep the P6's superscalar core as busy as possible. Detailed explanations and coding techniques are provided in the CD.