

## VIA Isaiah Architecture Announcement

### FAQ

#### **Q1.) What is VIA Announcing?**

A1.) VIA is announcing its next generation VIA Isaiah Architecture. This is a completely new x86 processor architecture that has been designed from the ground up to deliver 2-to-4x higher performance while remaining within the same power envelope of the VIA C7™ processor. Future processors based on the VIA Isaiah Architecture will deliver significant boosts to the functionality and performance of desktop, mobile and ultra mobile PCs while minimizing power requirements, saving on battery life, and enabling ultra-compact system designs.

#### **Q2.) What are the key features of the new VIA Isaiah Architecture?**

A2.)The VIA Isaiah Architecture combines all the latest advances in x86 processor technology, including a 64-bit superscalar, speculative, out-of-order microarchitecture with high-performance multimedia computation and a new virtual machine architecture. The main highlights can be summarized as follows:

##### a.) 64-bit Superscalar, Speculative, Out-Of-Order Microarchitecture

The VIA Isaiah Architecture achieves high performance by implementing a next-generation superscalar and out-of-order architecture that is tuned to deliver the highest performance per watt while minimizing the number of transistors to keep the die size small. The architecture makes heavy use of macro-fusion and micro-fusion to increase the instruction throughput, while sophisticated branch prediction significantly improves processor efficiency and performance.

The 64-bit instruction set of the VIA Isaiah architecture has no special cases that restrict flexibility, providing system designers with 64-bit instruction set with ample headroom for 64-bit operating systems and applications. The VIA Isaiah Architecture also supports a modern virtual machine architecture for running systems more securely and efficiently in virtual environments.

### b.) High-Performance Computation and Media Processing

The VIA Isaiah Architecture comes with a comprehensive set of advanced computation and media processing features that significantly boost performance for even the most intensive media applications such as high-resolution video, 3D gaming, and 3D virtual worlds.

These features include:

- World's fastest x86 Floating-Point Unit (FPU) with the ability to execute four floating-point adds and four multiplies per clock, featuring a new algorithm that minimizes latency
- Support for new SSE instructions in a 128-bit, single-cycle SIMD engine to further boost multimedia performance
- Support for clock speeds of up to 2GHz with a high-speed, low-power Front Side Bus scalable up to 1333MHz (in the introductory products)
- Highly-efficient cache subsystem with dual 64KB L1 caches and 1MB exclusive L2 cache. All caches are implemented with 16-way associativity for more effective memory optimization (higher hit rate).
- Smart data pre-fetching system to improve L2 cache effectiveness and increase data throughput

### c.) Advanced Power and Thermal Management

The VIA Isaiah Architecture utilizes new, low-power, circuit design techniques that allow aggressive management of active power to minimize power consumption and heat.

Other advanced power and thermal management features supported in the VIA Isaiah Architecture include support for the new "C6" power state, in which power is turned off to the caches. VIA has taken advantage of its unique TwinTurbo™ dual-PLL implementation to deliver Adaptive PowerSaver™, which includes features to reduce power consumption and improve response time during transitions between processor activity states (P-States). Adaptive PowerSaver™ also introduces several new mechanisms for managing die temperature.

### d.) Scalable Upgrade to VIA C7™ Processor

Products based on the VIA Isaiah Architecture are pin-to-pin compatible with the current VIA C7™ processor family, enabling OEMs and motherboard makers to benefit from the new architecture right away and fulfill a wider range of market segments with a single board or system design. Since Isaiah represents a product line extension to offer high-end features in the same package and power envelope, VIA C7™ and VIA Eden™ products are not being phased out and will continue to serve the market.

e.) VIA PadLock™ Hardware Security Features

The VIA Isaiah Architecture incorporates industry-leading, on-die hardware cryptographic acceleration features within the VIA PadLock Security Engine. These features include the world's best random number generator (RNG), an AES Encryption Engine, SHA-1 and SHA-256 hashing for secure message digests for data integrity, as well as a new specialized "secure execution mode" that features a secure on-chip memory area and encrypted instruction fetching.

**Q3.) What is the expected performance of processors incorporating the VIA Isaiah Architecture?**

A3.) While it is too early to give out exact performance benchmark numbers, performance measurements with early silicon show that processors incorporating the VIA Isaiah Architecture will deliver between two- and four- times the performance of the VIA C7 processor.

**Q4.) What is the expected power consumption of processors incorporating the VIA Isaiah Architecture?**

A4.) As with performance, it is too early to provide exact power consumption numbers. However, it is expected that processors incorporating the VIA Isaiah Architecture will be in the same power envelope as the VIA C7 processor. Depending on their implementation, system vendors will likely not require any changes to their power and thermal design.

**Q5.) Does the VIA Isaiah Architecture support multicore?**

A5.) Yes. The architecture was designed to efficiently scale with the number of cores, but the first products will be delivered as single-core devices. This is primarily a market demand issue, since VIA primarily serves markets that can not tolerate the higher power consumption of multiple cores. The initial goal is to introduce the best power/performance in a single core, but future products may support multiple cores.

**Q6.) What manufacturing process will be used to build processors incorporating the VIA Isaiah Architecture?**

A6.) Initial processors incorporating the VIA Isaiah Architecture will be built using a low-power 65 nanometer manufacturing process.

**Q7.) Which foundry will be used to build processors incorporating the VIA Isaiah Architecture?**

A7.) VIA will announce this information at a later date.

**Q8.) When are processors incorporating the VIA Isaiah Architecture going to enter the market?**

A8.) It is expected that processors incorporating the VIA Isaiah Architecture will go into production during the second quarter of 2008.

**Q9.) What brand name will processors incorporating the VIA Isaiah Architecture be sold under?**

A9.) VIA will announce this information at a later date.

**Q10.) What are the target markets for processors featuring the VIA Isaiah Architecture?**

A10.) Processors featuring the VIA Isaiah Architecture will initially be targeted at slim and light notebooks and Small Form Factor Green PCs and Digital Media Centers.

**Q11.) Will the VIA Isaiah Architecture replace the current VIA C7™ processor family?**

A11.) No. The VIA Isaiah architecture has been designed to complement - not to replace - the VIA C7™ processor family. In fact, with demand rising strongly for low power, small form factor Ultra Mobile Devices and UMPCs as well as Green PCs, VIA expects market penetration of the VIA C7™ processor family to continue to grow over the next few years.

**Q12.) Does VIA have any design wins with the VIA Isaiah Architecture?**

A12.) This is an architectural announcement; VIA will announce design wins at a later date.