

PRODUCT OVERVIEW

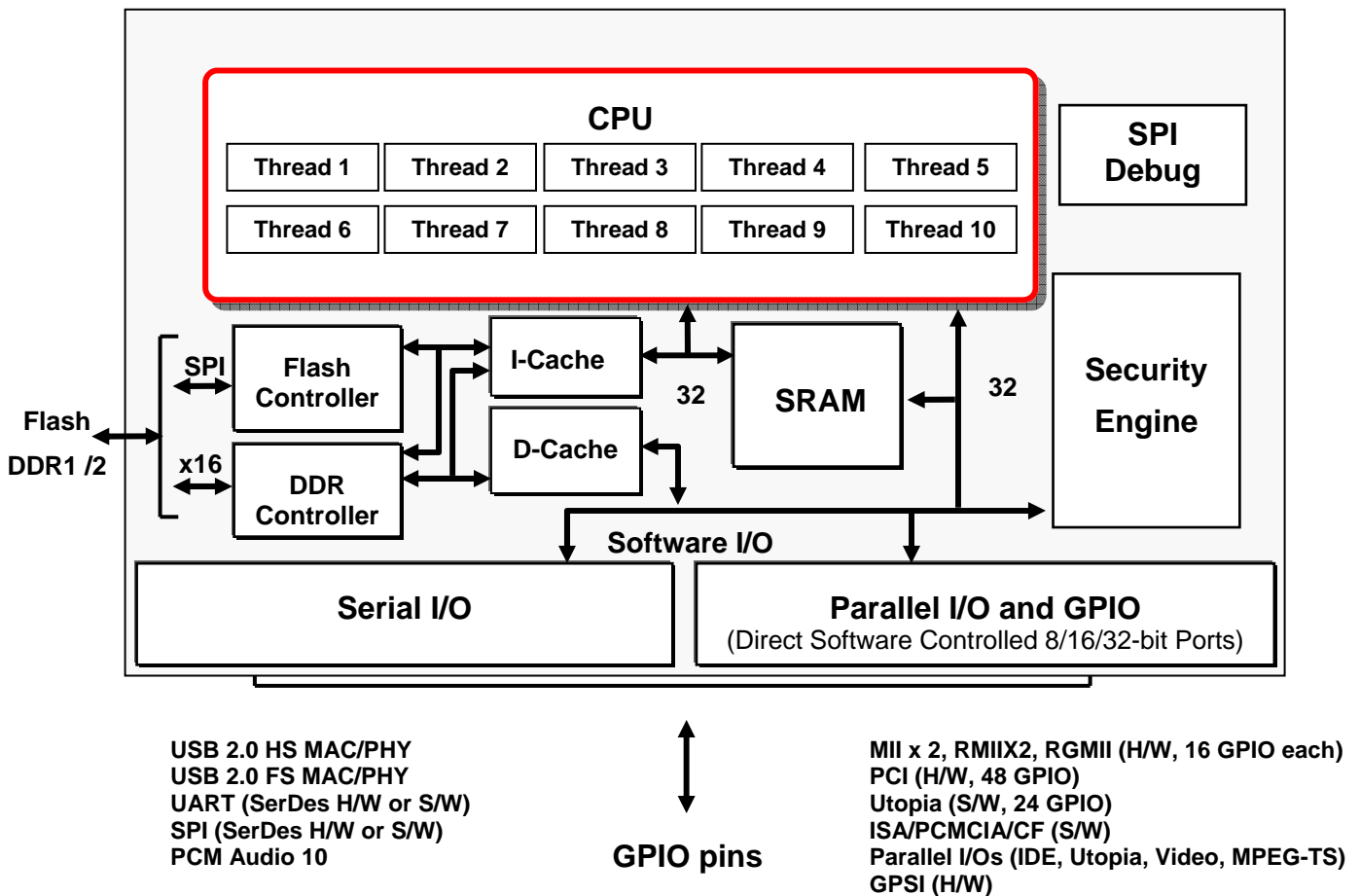
The **StreamEngine® 5000** communications and media processors (CMPs) are a new class of processors specifically designed to meet the stringent requirements for delivering multimedia content to, and within, the digital home. This new generation of processors offers high sustained throughput, deterministic processing, multiple concurrent application management, flexibility, security acceleration, low system and development cost, and fast time-to-market.

The **StreamEngine® 5000 CMP** is a versatile solution for a wide range of applications including media gateways, digital media players, embedded industrial controls, wireless access points, bridges, VoIP phones, and many more.

PRODUCT HIGHLIGHTS

High sustained throughput

In contrast to data applications that are “bursty” in nature (i.e., high burst of throughput followed by quiet time), media applications such as streaming audio and video require continuous high bandwidth packet processing. Traditional processors employ cumbersome context-switching interrupt-driven processes to handle network traffic, but this architectural model breaks down when required to handle continuous high bandwidth traffic. The **StreamEngine® 5000** CMP is architected for sustained high throughput processing. Benefiting from an on-chip memory, packets can stream directly to on-chip memory and be processed to completion by any of the 10 independent threads, each thread can operate independently as a separate processor.



StreamEngine® 5000 Block Diagram

Industry's First Communications and Media Processor

Deterministic processing

Media applications are very sensitive to jitter. Jitter is defined as variation of delay. The **StreamEngine® 5000** CMP provides deterministic processing, which means a fixed time for processing each packet. Combined with ultra low latency of multithreading, it provides the best quality of service for media applications.

Multiple concurrent applications

Today's digital environment is application rich. That means multiple and diverse applications need to be processed in parallel, while maintaining high sustained throughput with ultra low jitter. The **StreamEngine® 5000** multi-threaded architecture supports 10 independent threads that can each run a different application, while still maintaining completely deterministic processing for each thread. This guarantees that no thread will affect another's performance. For example, HDTV streaming or toll-quality VoIP over wired and wireless networks can be supported, even when other applications are running.

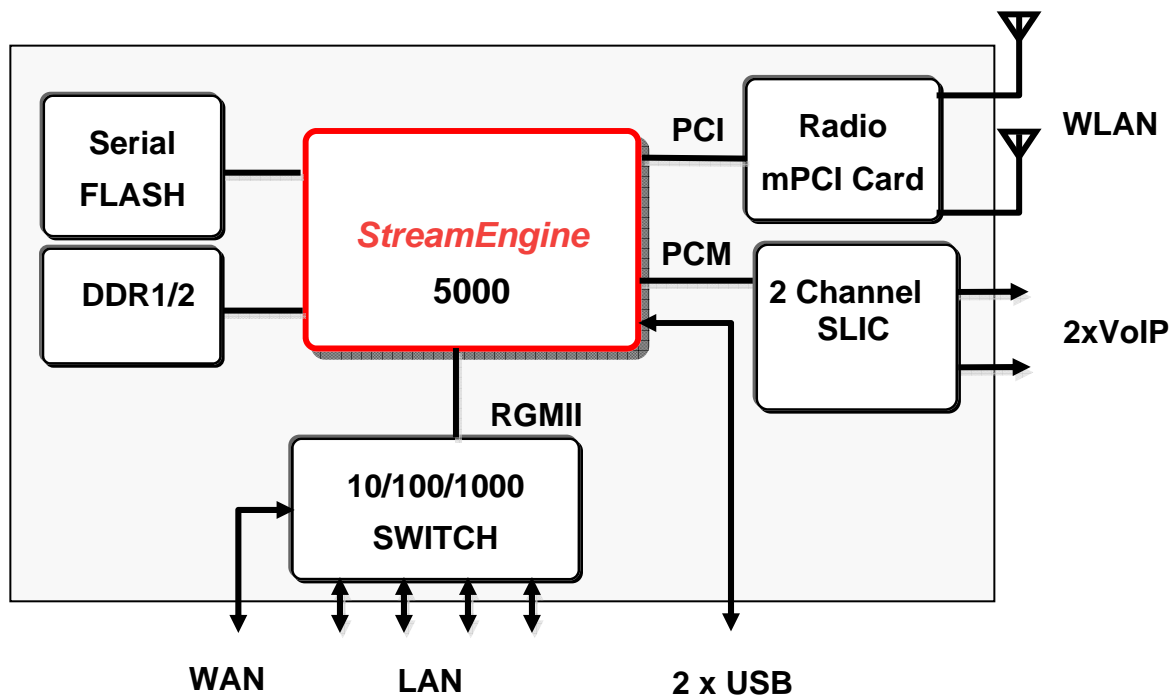
Design flexibility with software I/O

In addition to the deterministic processing and multi-

threading features of the **StreamEngine® 5000**, the architecture also supports a zero-overhead context switch between threads. These three components taken together enable a powerful capability of the processor called Software I/O. This is the ability to have software exercise precise, cycle-by-cycle control of I/O pins, which allows the **StreamEngine® 5000** to interface directly to support chips such as video display drivers or audio processors that require a custom communications protocol. This ability maximizes the choices of the system designer, while minimizing BoM costs by eliminating extraneous interface or "glue" components.

Dedicated security engine for enhanced security

A dedicated hardware engine stops intruders from hacking the network, stops identity theft, and protects digital assets from unauthorized access. **StreamEngine 5000** CMP implements DES, 3DES, and AES data encryption, in addition to SHA-1 and MD5 authentication algorithms. It provides stateful and stateless professional grade firewall for network security. Using a dedicated engine enables security processing to be offloaded from the core for higher performance and enhanced security.



StreamEngine® 5000 Home Router Block Diagram

Native audio processing

Integrated G.711, G.726, G729AB codec combined with echo cancellation, adaptive jitter control, RTP/RTSP, SIP, and Intelligent Stream Handling (ISH) provides low cost and high quality multichannel voice over IP or audio distribution.

Low system and development cost

Advanced design and high level of integration make lower chip and BoM cost possible. For example, it has up to 100% more efficient throughput per clock than existing solutions. In addition, the **StreamEngine® 5000** is optimized for the best cost/performance ratio.

Dedicated Operating System

Ubicom provides an operating system that is designed from the bottom up to optimize the performance of the hardware and remove 90% of the effort in developing an application. Drivers and protocol stacks are provided for all on-chip I/O devices.

Fast Time to Market

Ubicom SDK (software development kit) and reference design hardware board* are powerful tools for development and verification of **StreamEngine® 5000** CMP. Developers can use these flexible tools for rapid chip evaluation, debugging, performance measurement, and product development – reducing time to market.

APPLICATIONS

The **StreamEngine® 5000** CMP is a versatile solution

for a wide range of applications such as wireless home gateways with 802.11n/MIMO and gigabit Ethernet routers, SOHO switches, digital media players, network storage, IPTVs, multi-channel VoIP integration, wireless access points, bridges, embedded industrial controls, and many other applications.

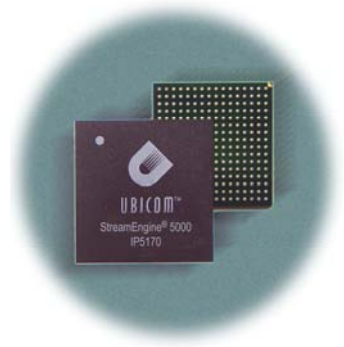
Sample Application

One of the fastest growing markets today is the digital home market. The central hub (heart) of the digital home is the gateway; this is where WAN meets LAN. These new generations of digital home gateways have new roles and stringent requirements. They have to be able to distribute multiple streams of content within the home in real time, intelligently allocate resources to competing applications to avoid degradation of service, act as the gateway to- and from the outside world, validate and authenticate users, protect digital assets from unauthorized intruders, and be low cost, manageable, and easy to use.

StreamEngine® 5000 CMP is the only solution today specifically designed to meet these new challenges on next generation digital home gateways.

A TOP-TO-BOTTOM FAMILY OF PRODUCTS

Each segment of the market has its own cost target, performance, and feature requirements. The **StreamEngine® 5000** family has solutions for each segment of the market: StreamEngine 5160 for main-stream and performance, and StreamEngine 5170 for performance segment (see the next page for details).



StreamEngine® 5000 Reference Design Board

Feature	StreamEngine® 5170	StreamEngine® 5160
Sustained Performance (TCP/IP Throughput)	~325 Mbps +	~250 Mbps +
No. of Independent Threads	10	10
RAM Type	DDR1/2 (16-bit-wide)	DDR1/2 (16-bit-wide)
External RAM	2Gb	2Gb
General I/O	PCI, PLIO, USB2.0 (FS/HS), USB2.0 (HS)	PCI, PLIO, USB2.0 (FS/HS), USB2.0 (HS)
Ethernet (2 Ports)	10/100/1000 10/100	10/100/1000 10/100
Networking I/O	MII (2), RMII (2), RGMII	MII (2), RMII (2), RGMII
Hardware Encryption/ Decryption, Key Management & DRM	DES/3DES, AES, SHA-1, MD5, RSA, (RC4, ECC in SW)	DES/3DES, AES, SHA-1, MD5, RSA, (RC4, ECC in SW)
Media I/O	IDE, AC97, I2S, Utopia, MPG TS, YUV	IDE, AC97, I2S, Utopia, MPG TS, YUV
Voice Over IP (VoIP)	G.711, G.726, G.729AB, Line & Echo Cancellation, Multi Channel	G.711, G.726, G.729AB, Line & Echo Cancellation, Multi Channel
Audio Processing	MP3, AAC, WMA, WMA9	MP3, AAC, WMA, WMA9



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Ubicom, Inc. — Ubicom, Inc. is a leading supplier of embedded processor and software platforms that address the needs of the rapidly evolving digital home. Ubicom's StreamEngine technology enables innovative, high quality, high performance for communications and media applications.

Ubicom's unique multithreaded processor design, real-time operating system, and application-level solutions combine to ensure a high-quality user experience with fast time to market for our customers. Ubicom is a venture-backed, privately held company with corporate headquarters in Mountain View, California. For more information, visit www.ubicom.com

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