

Annapolis Micro Systems, Inc.

***Heterogeneous Processing Solutions
for the IBM BladeCenter™***

Patrick Stover, Paul Letourneau

High Performance Embedded Computing (HPEC) Workshop

23 September 2009



Annapolis Micro Systems, Inc.

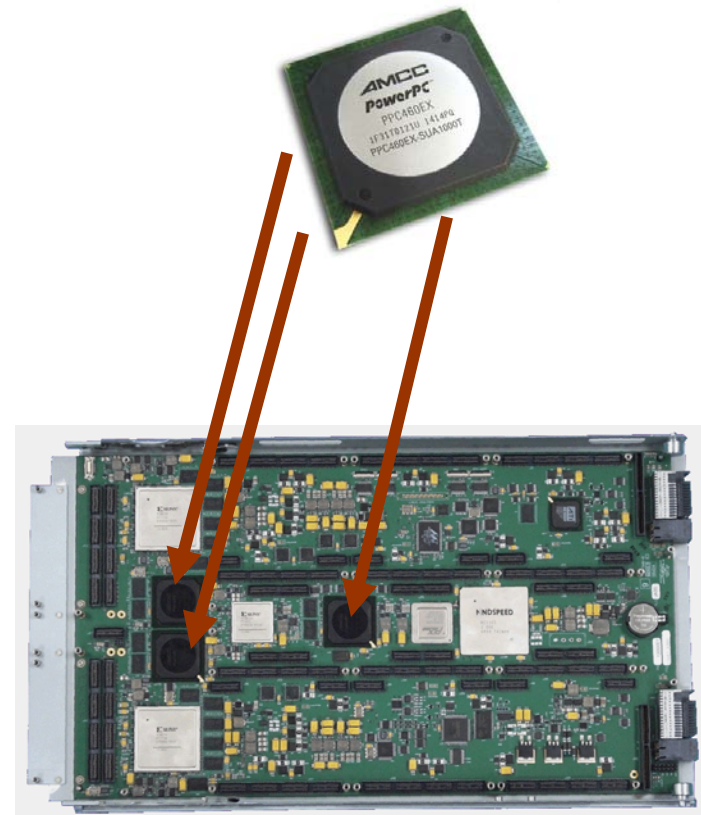
190 Admiral Cochrane Dr., Ste 130, Annapolis, MD 21401

Web: <http://www.annapmicro.com> HQ Phone: (410) 841-2514 HQ Fax: (410) 841-2518

Processor Flexibility

AMCC PowerPC 460EX

- AMCC PowerPC 460EX Embedded Processor
 - 32kB I-/D-cache, 32 MB flash, plus 512 MB DDRII SDRAM
 - Floating-Point Unit, capable of single-/double-precision with 2MFlops/MHz
 - 2 Gigabit Ethernet ports with hardware acceleration for TCP/IP (connected to on-board Gigabit Ethernet switch)
 - 4x PCIe connection to 12-port PCIe Gen 2 switch
 - Optional SATA-II HD (double-wide blade only)
 - Cryptographic Engine (AES/DES/3-DES/ARC4 encryption; MD-5/SHA; Public Key Accelerator)



Annapolis Micro Systems, Inc.

190 Admiral Cochrane Dr., Ste 130, Annapolis, MD 21401

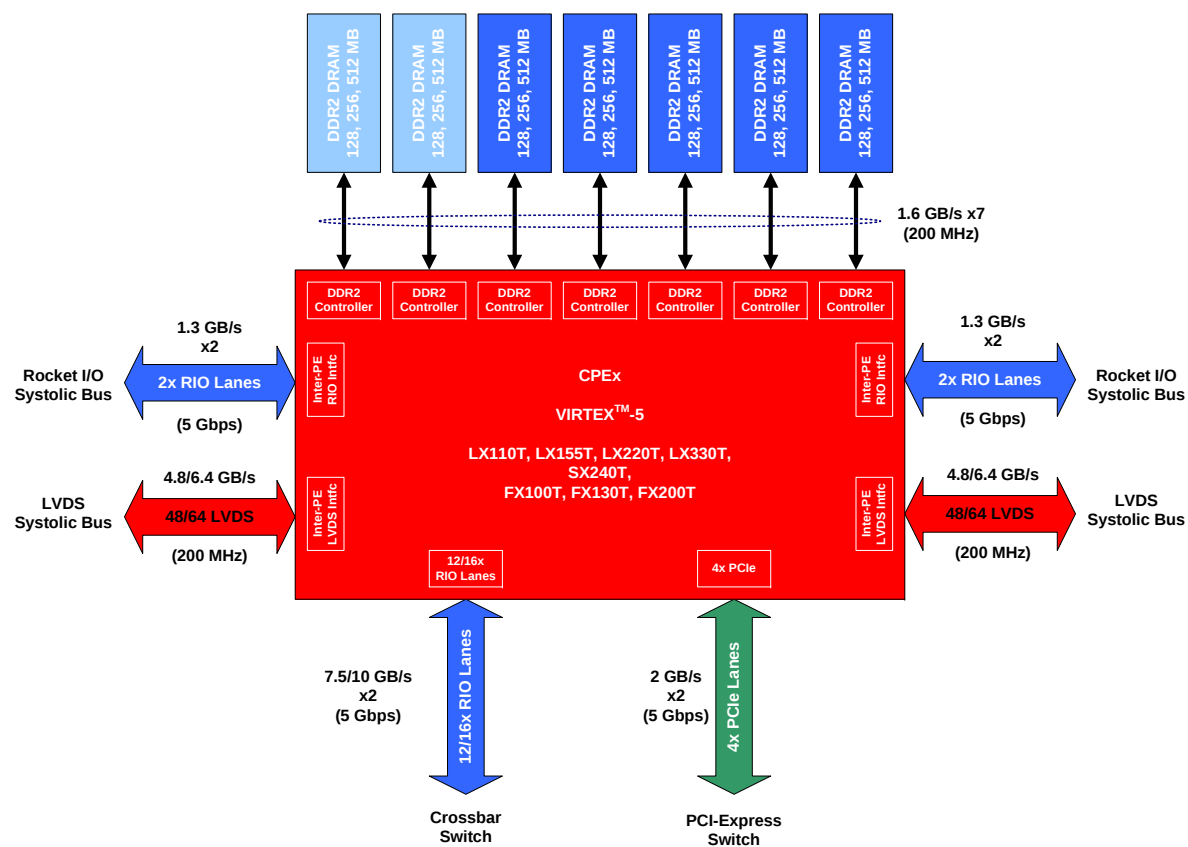
Web: <http://www.annapmicro.com> HQ Phone: (410) 841-2514 HQ Fax: (410) 841-2518

FPGA Processing Elements

Xilinx Virtex-5 LXT, SXT, FXT



**FPGA CPE
Module**



Annapolis Micro Systems, Inc.

190 Admiral Cochrane Dr., Ste 130, Annapolis, MD 21401

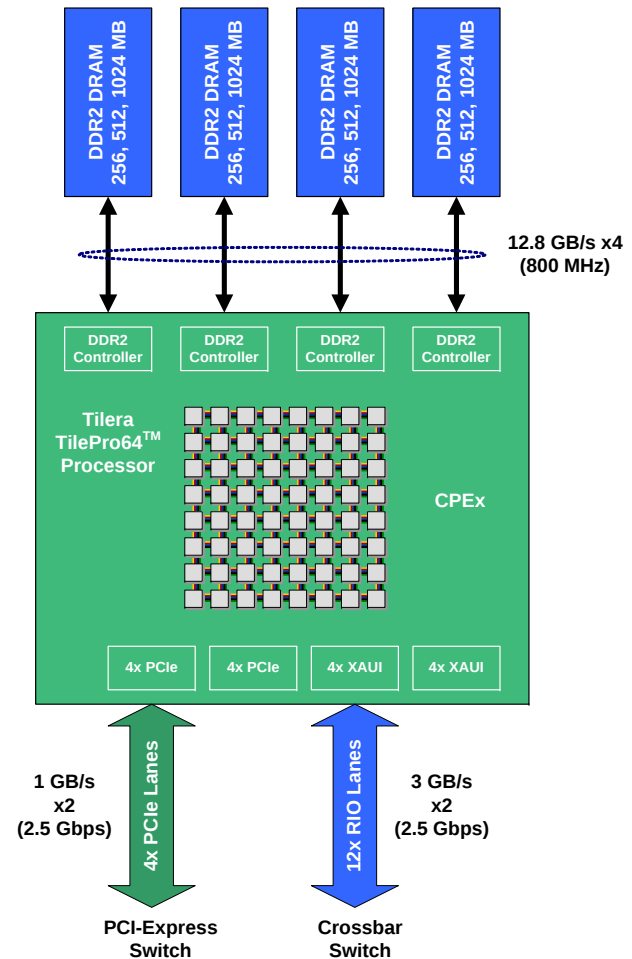
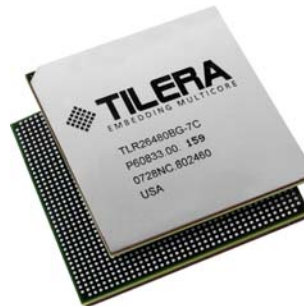
Web: <http://www.annapmicro.com> HQ Phone: (410) 841-2514 HQ Fax: (410) 841-2518



Tilera Multicore CPE Module



- **Massively Scalable Performance**
 - 8 x 8 grid of identical, general purpose processor cores (tiles)
 - 3-way VLIW pipeline for instruction level parallelism
 - 5 Mbytes of on-chip Cache
 - Up to 443 billion operations per second (BOPS)
 - 31 Tbps of on-chip mesh interconnect
 - Up to 50 Gbps of I/O bandwidth



Annapolis Micro Systems, Inc.

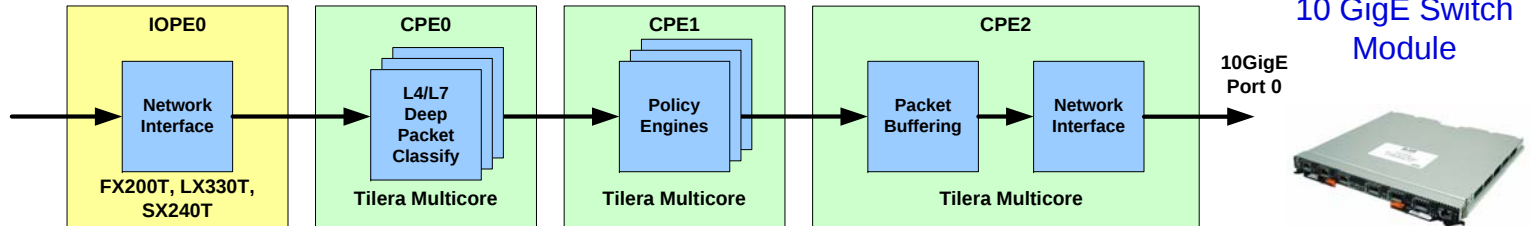
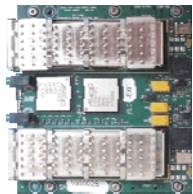
190 Admiral Cochrane Dr., Ste 130, Annapolis, MD 21401

Web: <http://www.annapmicro.com> HQ Phone: (410) 841-2514 HQ Fax: (410) 841-2518



Networking Services Application

Dual XFP
10G Fiber Optic

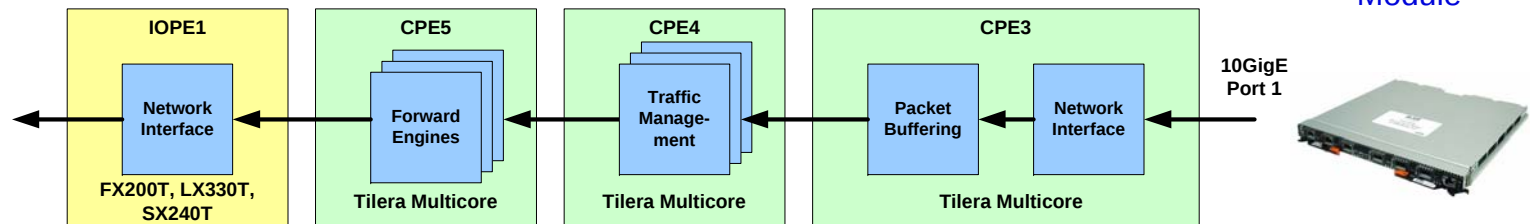
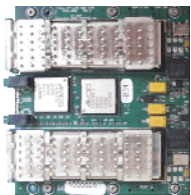


WILDSTAR 5 for IBM Blade



Tileria
Multicore
CPEs

Dual XFP
10G Fiber Optic



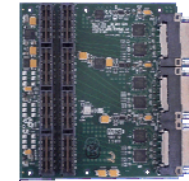
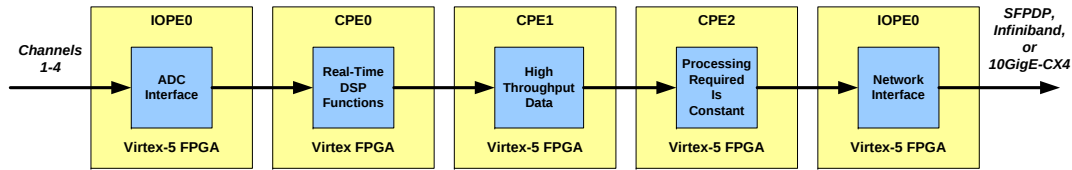
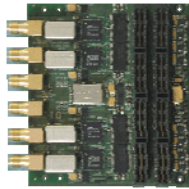
Annapolis Micro Systems, Inc.

190 Admiral Cochrane Dr., Ste 130, Annapolis, MD 21401

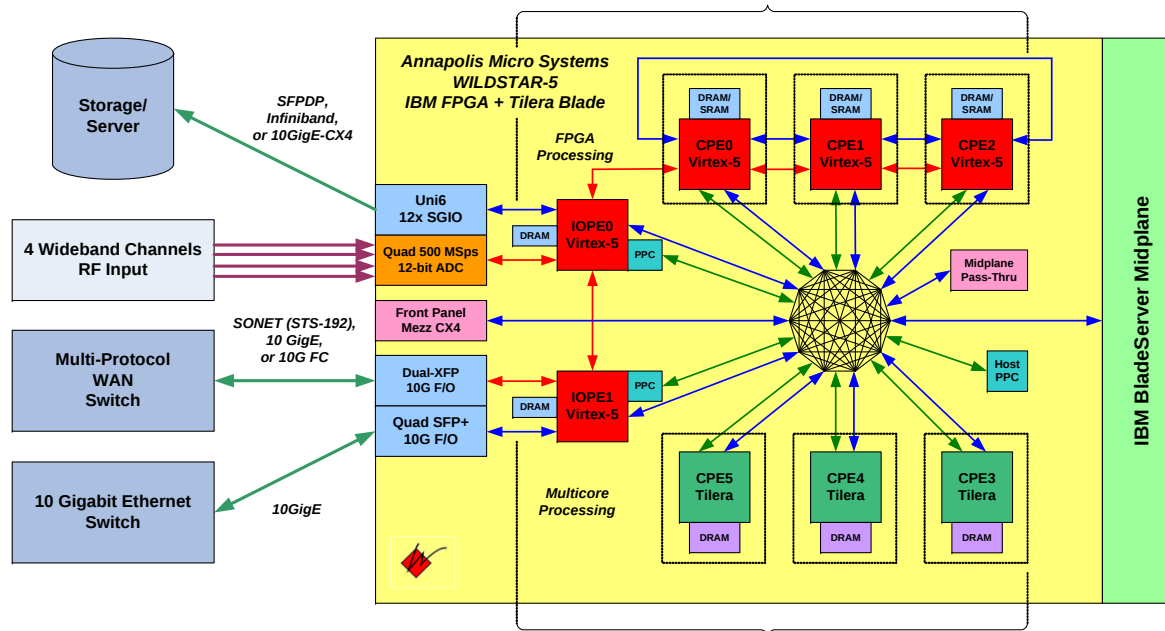
Web: <http://www.annapmicro.com> HQ Phone: (410) 841-2514 HQ Fax: (410) 841-2518

Heterogeneous Processing Application

Quad
500 MSps
12-Bit ADC



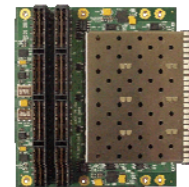
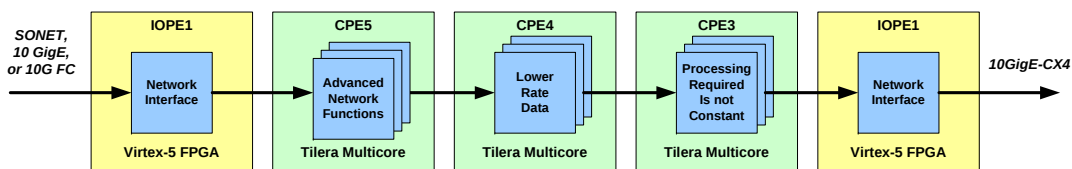
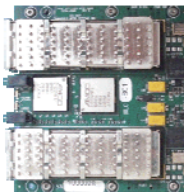
Uni6
CX-4



FPGA + Tlera
CPEs



Dual XFP
10G
Fiber Optic



Quad
SFP+

Annapolis Micro Systems, Inc.

190 Admiral Cochrane Dr., Ste 130, Annapolis, MD 21401

Web: <http://www.annapmicro.com> HQ Phone: (410) 841-2514 HQ Fax: (410) 841-2518

