P4080PCIe Integrated Multicore Communications Processor Development System

Overview

The P4080 PCI Express® development system (P4080PCIe) is an ideal hardware and software development platform for high-performance networking and embedded computing applications. It incorporates Freescale's highly integrated QorIQ P4080 processor and leading-edge external components. Fabricated in a half length x8 PCI Express form factor, and powered from an external power supply, the P4080PCIe adds flexibility for developers to integrate into a hosted development environment or as a stand-alone bench-top embedded system. With the integration of dual 10 GbE interfaces on the back plate of the card, and Freescale's Linux® development software, implementing your newest computing innovations are a snap right out of the box.

The P4080PCIe development system incorporates the hardware and software building blocks for developing a networking platform that supports the growing demand for intelligent network acceleration and application offload for converged datacenter applications, such as storage, security, deep packet inspection (DPI), firewall, wide area network (WAN) optimization and application delivery (ADC) computing.

QorIQ P4080 Multicore Processor

The QorIQ P4080 multicore processor delivers industry-leading performance in the under 30-watt power category. It combines eight e500mc cores, built on Power Architecture® technology, operating at frequencies up to 1.5 GHz with high-performance data path acceleration (DPAA) logic, as well as networking I/O and other peripheral bus interfaces. The DPAA is ideal for applications that are highly compute intensive, I/O intensive or both. The high level of integration in the P4080 processor helps to lower system costs, improve performance and simplify board design.

P4080PCIe Development System

The P4080PCIe development system provides a rich network of interconnect capabilities for implementing some of the most demanding 10 GB networking applications. A board support package (BSP) is pre-installed on the system. This BSP consists of a boot loader (u-boot) and a generic Power Architecture technology system based on the Linux kernel. The u-boot binary and the Linux kernel reside in the on-board flash memory with a file system preinstalled, which can be expanded on the miniSD card socket. The P4080PCIe BSP generation takes advantage of the Linux Target Image Builder (LTIB), a suite of tools that leverages existing open source configuration scripts and source code packages, packing them all into a single BSP generation bundle. The source code packages include boot loader and Linux kernel sources as well as many user-space source code packages to build a complete BSP. The LTIB also provides compiler packages required to build the BSP.
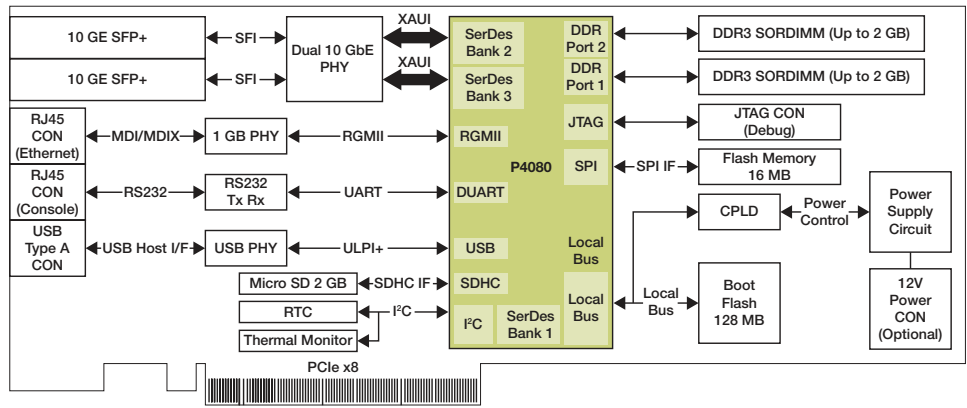
Features

- P4080 QorIQ multicore communications processor, built on Power Architecture technology
  - 1.3 GHz e500mc core operation
- Memory
  - Dual 1GB DDR3 SoDIMM (upgradeable up to 8 GB per socket)
  - 128 MB NOR flash memory (banked)
  - 16 MB SPI ROM
- Dual SPF+ cage supporting 1 GB and 10 GB single/multi mode fiber (network modules not included)
- Single 1000Base-TX with RJ45 connector
- MiniSD/MMC card slot
- USB Type A connector
- UART RJ45 connector
- Battery-backed RTC
- Power supply via PCI Express bus and optional via external power connector
- Documentation
  - Reference manual
  - Schematics
  - Bill of materials
  - Board errata
  - Configuration guide
- Software tools
  - P4080PCIe software
- U-boot
- Linux 2.6.35 or later kernel and standard root FS
- USDPAA packet driver enabling host access to P4080 engines
- Host interface tools
- Cross compile and native GNU tool chain
- CodeWarrior USB TAP (sold separately)
  - PCI Express tools

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- Memory access over PCI Express interface
- Debug utilities
- Host software
  - PCIe packet driver: Optimized driver providing access to I/O adapter DPAA functionality
  - Sample Linux NIC driver
    - Running over the PCI Express packet driver
    - IP/TCP/UDP Tx and Rx checksum verification and generation
    - Link state management and reporting
    - Customary statistics
    - ethtool support
    - Promiscuous mode option
    - Multicast filtering
    - Jumbo frame support, 9600 KB max frame size
    - Support for multiple rings for multicore and virtualization environments
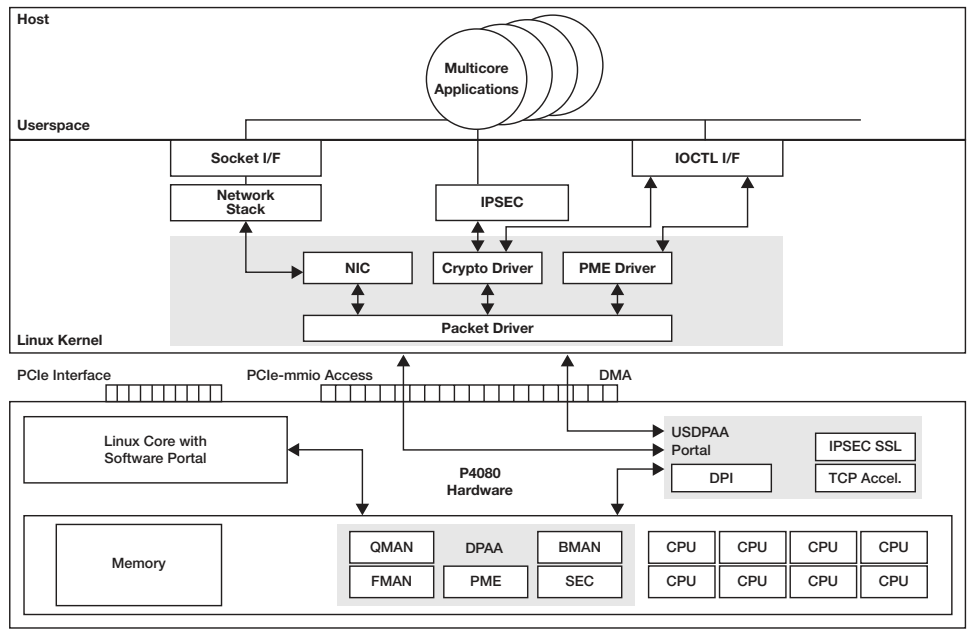
P4080PCIe Development System Partners

The P4080PCIe development system was co-developed with Interface Masters and One Convergence.

Interface Masters offers the equivalent P4080 processor-based system for production purchase under the name of Niagara 710. Contact sales@interfacemasters.com for more information.

One Convergence, Inc. offers a complete software solution for the P4080PCIe development system that provides system vendors with an streamlined path for taking advantage of the powerful capabilities of the system. One Convergence provides software components for the host and Linux data path enhancements for the P4080 processor that include functionality for packet processing/classification, security/crypto and intelligent in-line processing for implementing a smart 10 GB acceleration for network equipment, servers and storage systems. One Convergence also offers a virtualization solution for sharing of all the capabilities of the P4080PCIe development system across multiple virtual machines for multi-tenancy and multi-function application scenarios

P4080PCIe Development System

■ Freescale Technology

Software Block Diagram

for the emerging data center and cloud infrastructure. Contact One Convergence at sales@oneconvergence.com for more information.

Price and Availability

The P4080PCIe development system is offered from Freescale and Freescale's distribution network for $995 USD.

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