Universal NVM Express Controller (UNEX)

Overview

Mobiveil's Universal NVM Express Controller (UNEX) is highly flexible and configurable design targeted for both Enterprise and client class solutions that unlock the current and future potential of PCIe-based SSDs. The UNEX controller core efficiently supports multi-core architectures ensuring thread(s) may run on each core with their own queue and interrupt without any locks required. It provides support for end-to-end data protection, security and encryption as well as robust error reporting and management capabilities. The controller architecture is carefully tailored to optimize link and throughput utilization, latency, reliability, power consumption, and silicon footprint.

Mobiveil's UNEX controller can be used along with its PCI Express controller (GPEX), DDR4/3 and Flash controller (IFC) IPs for a complete NVMe implementation.

The UNEX controller comes with 2 flavors:
- Native UNEX Controller with proprietary control and Data path interfaces
- UNEX Controller with AXI Control and Data path interfaces for easy adoption in an SoC implementation

UNEX Controller design is independent of implementation tools and target technology. Mobiveil solution allows the licensees to easily migrate among FPGA, Gate array and Standard cell technologies optimally.

Features

- Compliant to NVM Express 1.2 specification
- Support for configurable number of IO Queues
- Support for configurable Queue depth
- Support for Round Robin or Weighted Round Robin with urgent priority arbitration mechanism
- Host memory page size support of 128MB
- Efficient and streamlined command handling
- Supports Fused Operations
- Supports All Optional Admin Commands
- Supports All Optional NVMe Commands
- Supports Multi-Path IO and Namespace Sharing capabilities
- Supports Reservations
- Supports multiple name spaces
- Optional AXI interfaces for NVMe implementation in SoC
- Well defined Command Interface for local CPU to perform subsystem initialization and to handle all non-hardware accelerated commands
Specifications

Configurable Options
- Inclusion/Exclusion of AXI interface modules
- Number of IO Queues
- IO Queue Depth
- Number of DMA Engines
- Data Path Widths (64, 128)
- Data Buffer Size

Design Attributes
- Highly modular and configurable design
- Layered architecture
- Fully synchronous design
- Supports both sync and async reset
- Software control for key features
- Multiple loop backs for debug

Product Package
- RTL Code
- HVL based test bench and behavioral models
- Test cases
- Protocol checkers, bus watchers and performance monitors
- Configurable synthesis shell
- NVM SW Stack

Documentation
- Design Guide
- Verification Guide
- Synthesis Guide
- NVM SW API User Guide

Licensing Options
- NVMe Controller (UNEX)
- PCI Express (GPEX) + NVMe (UNEX) - Integrated Solution

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About Mobiveil

Mobiveil is a fast growing Technology company that specializes in creation of Intellectual Properties, Frameworks and Solutions for the Networking, Enterprise and Device Mobility markets. The Mobiveil team leverages decades of experience in delivering high-quality, production-proven, high-speed serial interconnect Silicon IP cores to the leading customers worldwide. With a highly motivated engineering team, dedicated integration support, flexible business models, strong industry presence through strategic alliances and key partnerships, Mobiveil solutions have added tremendous value to the customers in executing their marketing and engineering goals within budget and on time.

Mobiveil is headquartered in the Silicon Valley with engineering development centers located in Milpitas, CA, Chennai and Bangalore, India, and sales offices and representatives located in US, Europe, Israel, Japan, Taiwan and Peoples Republic of China.