

Cisco Nexus FDK

Cisco's intelligent development framework for Field-Programmable Gate Array (FPGA)

The Cisco Nexus FDK (Firmware Development Kit) is a powerful development framework for adding application-specific intelligence to FPGA-based Cisco Nexus SmartNICs and Cisco Nexus 3550 Programmable Platforms.

The framework lowers the barrier to utilizing FPGA-based devices for custom network offload and acceleration applications. Users no longer have to start with a blank FPGA development card and electronic schematic; instead, users can start with a cost-effective, production-quality, fully supported Cisco Nexus SmartNIC and Cisco Nexus 3550 Programmable Platforms.

Users can add intelligent network-application acceleration to Cisco Nexus FPGA-based devices, utilizing a well-defined and documented Cisco Nexus FDK framework. Use cases include deep packet inspection, advanced packet filtering, full line-rate packet processing, AI/ML acceleration, 5G processing, and future FPGA innovations.

Benefits

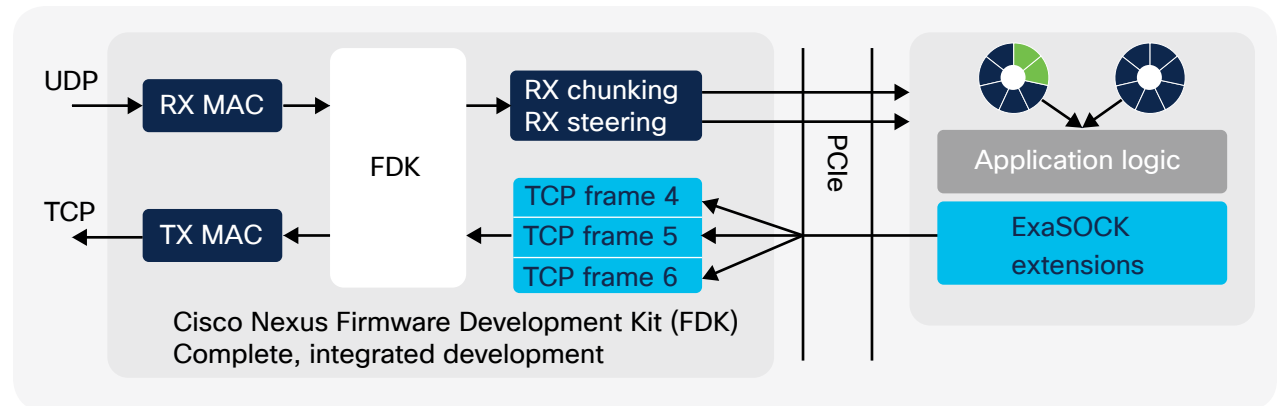
- Reduce network latency to support the increasing demands of financial trading solutions
- Employ application-specific intelligence and functionality for FPGA-based Cisco Nexus® programmable platforms and Cisco Nexus SmartNICs
- Get quick implementation of deep packet inspection, advanced packet filtering, full line-rate packet processing, AI/ML acceleration, and 5G processing
- Create long-term value from programmable custom network offload, application acceleration, enhancements, upgrades, and maintenance updates

Components of Cisco Nexus FDK

The Cisco Nexus FDK is shipped as a complete package with everything required to build, run, and maintain FPGA-accelerated network applications. FDK includes:

- PCS/MAC component for interfacing Ethernet networks to FPGA logic
- PCIe engine for interfacing the FPGA logic to a host X86 CPU
- Linux network driver for seamless network integration
- Linux kernel bypass drivers, libraries, tools, and examples for high-performance software
- Makefile-based build system for easy generation of new images
- Image flashing and hot-reloading tool to load images onto devices with minimal disruption
- Complete documentation for all of these components

Figure 1. Components of the Nexus FDK



Cisco Nexus platform support

The Cisco Nexus FDK is supported on the following Cisco® platforms:

- Nexus 3550-T Programmable Network Platform
- Nexus 3550-F Programmable Layer 2 Application Platform
- Nexus SmartNICs

The Cisco Nexus FDK is fully integrated with Cisco's existing libexanic and exaSOCK software libraries. These libraries provide direct access to network drivers and kernel bypass sockets that allow users to progressively offload software functionality onto the FPGA, providing a clear and maintainable path toward FPGA network acceleration.

Cisco Nexus FDK packaging and licensing

Cisco Nexus FDK comes in two packages: the Free Edition (FDK-FE) includes components for PCS/MAC, PCIe DMA, drives, tools, and timestamping, with no latency optimization capabilities for ultra-low-latency applications. The Professional Edition (FDK-PE) includes components for ATE, PCS/MAC, PCIe DMA, drives, tools, timestamping, and ultra-low latency optimization capabilities for applications. The Professional edition can be licensed as a Full version or an Evaluation version for use on a test system.

Learn more

<https://www.cisco.com/go/nexusfdk>.

Ultra-low latency network solutions

The Cisco Nexus next-generation ultra-low latency programmable platforms, switches, smart network interface cards (SmartNIC), and Firmware Development Kits (FDK) are specifically designed to address the needs of latency-sensitive applications in data center networking, High-Frequency Trading (HFT), financial services, and service provider networks.

- [Cisco Nexus 3550 Series Platforms and Switches](#)
Ultra-low latency FPGA application programming, switching, multiplexing and precision timestamping to facilitate your mission-critical network applications.
- [Cisco Nexus SmartNIC adapters](#)
Programmable Cisco Nexus SmartNIC (smart network interface cards) are next-generation FPGA-based ultra-low latency and high-resolution timestamping adapters to program your network and accelerate application offloads.
- [Cisco Nexus FDK \(firmware development kits\)](#)
Provide a powerful software development framework to add application-specific intelligence and functionality to FPGA-based Cisco Nexus 3550 Programmable Platforms and Cisco Nexus SmartNICs.