nx Framework
Low-Latency
Development
Framework

enyx

nxFramework
Low-Latency Development Framework

Hardware and Software Development Platform

The Enyx Development Framework (nxFramework) is a hardware and software development environment designed to efficiently build and maintain ultra-low latency FPGA applications for the financial industry. Based on 10 years of research and development, nxFramework is the foundation for all Enyx off-the-shelf solutions and provides clients with the toolchain to manage a large portfolio of applications.

Developed for building in-house high performance trading engines, order execution systems, pre-trade risk check gateways, and custom projects — any skilled FPGA developer starting a new low latency project, maintaining an existing one, or looking to change platforms can immediately reduce their time-to-production with nxFramework.

key features

| 10G MAC/PCS @ **29ns RTT** | 10G TCP @ **53ns RTT** | Library of **60+ utility cores** |
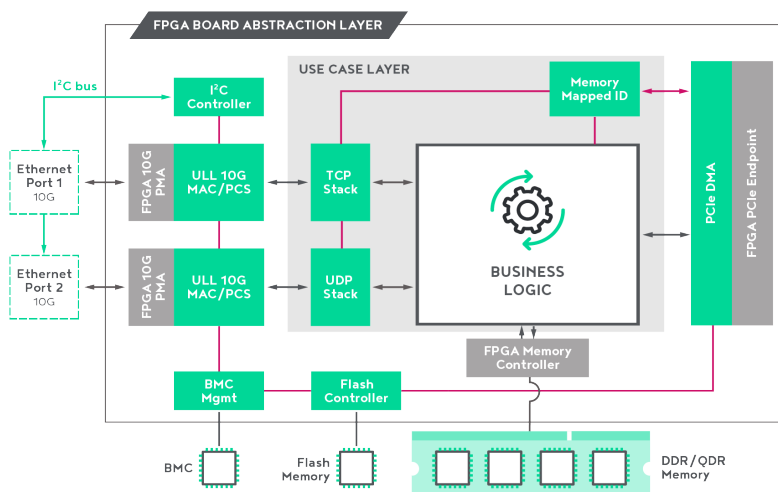
Enyx Development Framework Overview

Features
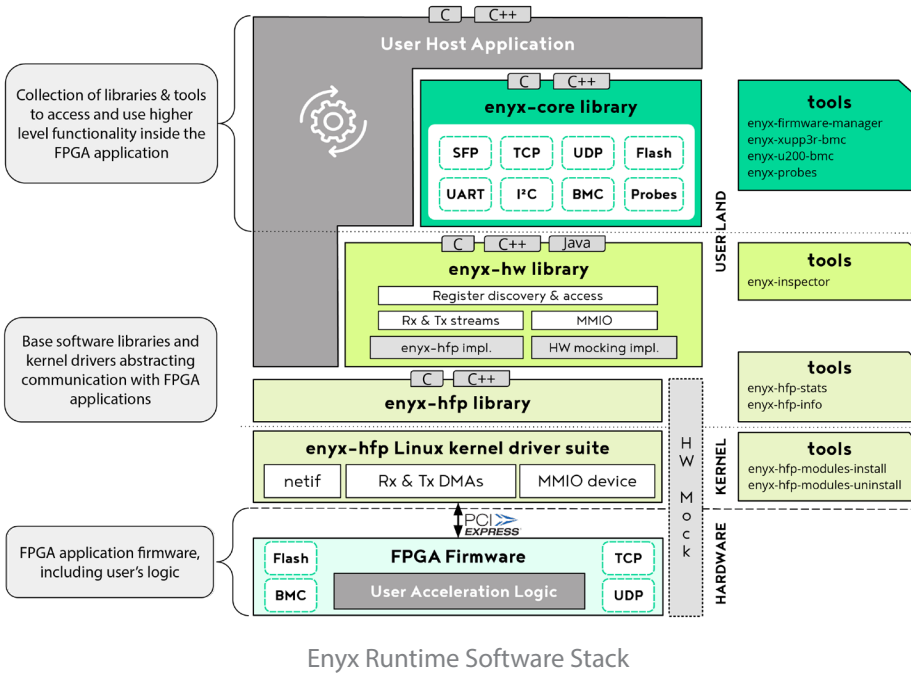
Ultra-low latency connectivity cores

- 10G MAC/PCS - 29ns RTT - SOP to SOF @ 322MHz
- 40G MAC/PCS - 55ns RTT - SOP to SOF @ 322MHz
- 10G TCP stack - 53ns RTT @ 322MHz
- 10G UDP stack - 43ns RTT @ 322MHz
- PCIe streaming DMA - 790ns RTT @ 250MHz

Library of 60+ utility cores

- MMIO core library
- Packet streaming core library
- Memory management core library
- Math core library
- Statistics core library
- Simulation helpers library

Enyx Runtime Software Stack

Collection of libraries & tools to access and use higher level functionality inside the FPGA application

Base software libraries and kernel drivers abstracting communication with FPGA applications

FPGA application firmware, including user's logic

Enyx Runtime Software Stack
Enables simple configuration and monitoring of Enyx connectivity & utility cores, including interaction with the FPGA application via our C/C++ libraries.

Hardware Development Environment
A Python scripted development environment that enables users to simplify their development cycle and accelerate their time-to-production.

The Enyx Inspector: Efficient Debugging
Equipped with a web-based GUI that can configure and monitor the FPGA at runtime, allowing for quick deployment and debug.

Detailed Feature List

- All available Enyx connectivity and utility cores
- Board management cores:
  - Flash controller support for FPGA bitstreams
  - I²C bus controller for SFP/QSFP communication
  - Configurable instantiation of memory controllers (DDR4, QDR II+)
- Additional elements included:
  - The Enyx Inspector: a web-based debugging tool
  - Linux drivers & configuration/communication libraries
  - Off-the-shelf, configurable reference designs
  - Support for widely used FPGA families in the financial sector

Compatible FPGA Cards

- XUP-P3R
- XUP-VV8

Looking for a different card? Ask us about other compatible card options

Reference Examples/Use cases

ULL Tick-to-trade platform

- Standard reference design for ULL tick-to-trade FPGA trading strategies
- nxFramework provides all the required hardware & software modules to assist with development
- Sub 100 ns RTT latency

Pre-trade Risk Check Gateway

- Standard reference design for risk checks gateway acceleration
- Two distinct TCP stacks connect respectively to the users and to the exchange
- Sub 1 µs RTT latency

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