



Lattice Propel 2024.2.1

Release Notes

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This document was created consistent with Lattice Semiconductor's inclusive language policy. In some cases, the language in underlying tools and other items may not yet have been updated. Please refer to Lattice's inclusive language [FAQ 6878](#) for a cross reference of terms. Note in some cases such as register names and state names it has been necessary to continue to utilize older terminology for compatibility.

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About Lattice Propel™ 2024.2.1

Welcome to the Lattice Propel 2024.2.1 design environment for Lattice FPGA system design. Lattice Propel is a complete set of graphical and command-line tools to create, analyze, compile, and debug both FPGA-based hardware and software processor systems.

What's New in Lattice Propel 2024.2.1

Tools and Enhancements

- Updates IP AHB Lite Interconnect from v1.3.2 to v1.3.3
- Updates IP System Memory from v2.3.0 to v2.3.1
- Fixes IP Packager issue on address space reference of AHB-Lite Interface
- Fixes automatic 4k memory allocation to peripherals when AXI interconnect is added without connection
- Supports installation in FIPS mode
- Synchronized device, IP, and Questa Sim libraries to Radiant ng2024_2p.321

Key Features

Device Family Support

- Lattice LAV-AT (Avant™)
- Lattice LFMXO5 (MachXO5™-NX)
- Lattice LIFCL (CrossLink™-NX)
- Lattice LFCPNX (CertusPro™-NX)
- Lattice LFMNX (Mach™-NX)
- Lattice LFD2NX (Certus™-NX)
- Lattice MachXO3D™
- Lattice MachXO2™
- Lattice MachXO3L™
- Lattice MachXO3LF™
- Lattice ECP5U™
- Lattice ECP5UM™
- Lattice ECP5UM5G™
- Lattice ECP3™
- Lattice ICE40UP™
- LN2-CT (Certus-N2)™

Processor Support

- RISC-V Micro Controller (MC)
- RISC-V State Machine (SM)
- RISC-V Real Time OS (RX)
- RISC-V NANO (NANO)
- Dual processors

Operating System Support

- Microsoft Windows 11 Pro (64-bit)
- Microsoft Windows 10 Enterprise (64-bit)
- Red Hat Enterprise Linux 7.9 (64-bit)
- Red Hat Enterprise Linux 8.8 (64-bit)
- Ubuntu 20.04 LTS (64-bit)
- Ubuntu 22.04 LTS (64-bit)

Lattice Propel SDK

- Integrated picolibc as the default standard C library to support three levels of printf.
- Built-in industry standard components and tools for embedded software development and debugging.
- Optimized project management flow for Lattice FPGA platform.
- Supports creating both C and C++ software projects based on Lattice SoC platform.
- Supports Lattice Diamond®, Lattice Radiant™, and Propel Builder bridges.
- Integrated GNU Debugger (GDB) and Open On-Chip-Debugging (OCD) with chained JTAG.
- Supports peripherals view with register description during debug session.
- Supports syntax highlighting for various development languages.
- Supports semihosting for On-Chip-Debugging and QEMU Virtual Platform.
- Supports multiple channels for On-Chip-Debugging.
- Supports “Attach to running target” for On-Chip-Debugging.
- Supports user custom application templates.
- Supports QEMU Virtual Platform.

Lattice Propel Builder

- Supports adding some Lattice Radiant foundation IP.
- Supports creating SoC and SoC verification project in project wizard Graphic User Interface (GUI).
- Supports Lattice Diamond, Lattice Radiant, QuestaSim, and Propel SDK bridges.
- Supports generating simulation environment, testbench, and script.
- Integrated QuestaSim Original Equipment Manufacturer (OEM).
- Supports creating more flexible AXI-based SoC.
- Supports reference IP RTL from user-specified library in IP Packager.
- Supports generation and reconfiguration of IP from centralized IP repository.
- Improves customized templates with constraint file included.
- Optimizes warnings and disables modifying Propel IP in Radiant software.
- Supports TCL in IP Packager.
- Supports GUI color customization options for schematic.
- Supports a new entry to distinguish SoC creation from custom templates or built-in templates.
- Supports generating default value in top RTL file for AMBA4 interface dangling input ports.
- Supports DRC of cacheable address range on SoC including RISC-V RX processor.
- Supports DRC of connection compatibility between RISC-V RX processor and TCM.
- Supports Verilog/VHDL for RTL module of glue logic.
- Supports friendlier interface names in IP Packager GUI Display.
- Supports license debugger tool.
- Supports Tcl mode entry for Builder and IP Packager.

IP Support

For IP support, refer to related IP user guides for detailed information.

SoC Template Design and System Simulation

- Provides Scalable RISC-V RX/MC/SM/Nano SoC template design on the following devices: LAV-AT, LFCPNX, LFD2NX, LFMXO5, LIFCL, LN2-CT, LN2-MH, LatticeECP3, ECP5U, ECP5UM, ECP5UM5G, ICE40UP, MachXO2, MachXO3D, MachXO3L, and MachXO3LF.
Note: Scalable RISC-V SoC template design creating is an update of the legacy multiple template design creation. All the previous design creating is included into this new scalable RISC-V SoC flow.
- Provides CertusPro-NX template design, the RISC-V MC Dual Processor Project.
- Provides CertusPro-NX template design, the RISC-V RX SHA-3 CXU Project.
- Provides MachXO3D template design Lattice Sentry RoT Project.
- Provides Mach-NX template design, the Lattice Sentry RoT Project (484) and Lattice Sentry RoT Project (256).
- Provides Empty Project on all devices to build from scratch.
- Supports functional verification using system-level simulation environment for templates.
- Supports DUT with one-level sub SBX in verification project.
- Simulation Tool Update.

Application Template Design

- Provides template design Hello World Project.
- Provides template design FreeRTOS-LTS PMP-Blinky Project.
- Provides template design RISC-V RX Demo Project.
- Provides template design QEMU_helloworld Project.
- Provides template design Timing Profiling Project.
- Provides template design Code Coverage Project.
- Provides template design FreeRTOS-LTS minimal Project.

Release Contents

- Propel_2024.2.1.exe (Windows 10/11 64-bit Operating System)
- Propel_2024.2.1_lin.run (Red Hat Enterprise Linux 64-bit & Ubuntu LTS Operating System)
- Propel_2024.2.1_lin.md5 (Red Hat Enterprise Linux 64-bit & Ubuntu LTS Operating System)

Validated Boards in This Release

- AVANT-AT-E Evaluation Board (REV D P/N: LAV-E70-EVN)
- CertusPro-NX Evaluation Board (REV A P/N: LFCPNX-EVN)
- LatticeECP3 Versa Evaluation Board (REV B P/N: LFE3-35EA-VERSA-EVN)
- ECP5 Versa Development Kit (Rev B LFE5UM-45F-VERSA-EVN)

System Requirements

The basic system requirements for Lattice Propel 2024.2.1 on Microsoft Windows and Linux Operating System (OS):

- Windows 10/11 64-bit OS
- Red Hat Enterprise Linux 64-bit OS (RHEL7.9/8.8)
- Ubuntu 20.04/22.04 LTS OS
- Free Disk Space: approximately 11 GB
- Network adapter and network connectivity for IP server access

Known Limitations

This release of Lattice Propel 2024.2.1 has the following limitations:

- DUT with one-level sub SBX is with limited support in verification project.
- Encrypted VHDL IP is only supported in Lattice Radiant flow, but not in Lattice Diamond flow.
- The MAX_PATH inside Windows file I/O API is restricted to 260 characters, but the usable path is even more constrained. The MAX_PATH must contain the drive letter and the NULL character to terminate the string correctly.
- Current OpenOCD cannot read Float Point Unit (FPU) registers, which makes Propel SDK unable to show FPU related register values.
- Lattice Propel software does not support HW-USBN-2A cable.

Known Issues

This release of Lattice Propel 2024.2.1 has the following known issues:

- An invalid read error occurs during the QEMU launch, but it does not actually affect functionality.
- Questa Sim vendor hasn't officially supported Ubuntu OS.

Note

It is recommended to use the same version of Lattice Radiant and Lattice Propel for best compatibility.

Technical Support

- For assistance, submit a technical support case at www.latticesemi.com/techsupport.
- For frequently asked questions, refer to the Lattice Answer Database at www.latticesemi.com/en/Support/AnswerDatabase.
- Previous Lattice Propel software versions are available on Software Archive page on Company Public website: <https://www.latticesemi.com/Support/SoftwareArchive>

Revision History

Revision 1.0, April 2025

Section	Change Summary
All	Production release.



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