



Intel[®] Quartus[®] Prime Pro Edition

Version 19.1 Software and Device Support Release Notes



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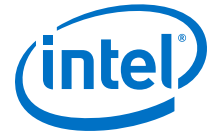
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1. Intel® Quartus® Prime Pro Edition Version 19.1 Software and Device Support Release Notes

This document provides late-breaking information about the Intel® Quartus® Prime Pro Edition software release version 19.1 .

For information about operating system support, refer to the `readme.txt` file in your `intelFPGA_pro/<version number>/quartus` directory.

Related Information

[Intel Quartus Prime Standard Edition Software and Device Support Release Notes](#)

1.1. New Features and Enhancements

The Intel Quartus Prime Pro Edition Software Version 19.1 includes the following new features and enhancements:

- Intel Quartus Prime Pro Edition Software Version 19.1 has been updated with Curl 7.64.0, CygWin 3.0.3, expat 2.2.6, flexnet_publisher 11.16.2.1, glib 2.56.1, gstreamer 1.14.0, guava 27.0.1, jre (Oracle Java) 1.8.0u202, libicu 61.0, libpng 1.6.36, openssl 1.0.2r, perl 5.28.1, python 3.6.8, qt 5.11.3, ccl_sqlite3 3.26.0, sqlite3 (python) 3.26.0, sqlite3 (qt) 3.27.2, xerces-c++ 3.2.2, and zlib 1.2.11, which include functional and security updates. Update to the latest version of Intel Quartus Prime Design Software as soon as possible.
- Added Design Assistant tool.
- Added Global Router Congestion Reports to show which nets contribute to routing congestions or no-routes.
- Added Global Signal Visualization Heatmap to show the clock tree construction with 3D visualization.
- Enhanced Platform Designer:
 - Added Domains tools to Platform Designer, which displays a list of all the memory mapped domains in the system and allows you to specify interconnect parameters.
 - Enhanced Platform Designer Address Map Tool with visualization to help you view address map from selected master. In addition, you can now export address map information in a `.csv` file.
 - Added Parallel IP Generation option to improve IP generation time.
- Enhanced Intel Advanced Link Analyzer:
 - Added full end-to-end mixed-mode simulation support.
 - Enhanced Channel Viewer to show effective return loss (ERL).
 - Enhanced Channel Designer to add support for both far-end (FEXT) and near-end (NEXT) crosstalk extractions.

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*Other names and brands may be claimed as the property of others.



- Enhanced Ethernet Link Inspector:
 - Integrated Ethernet Link Inspector - Link Monitor and Link Analyzer into the System Console.
 - Enhanced support for various Intel Stratix® 10 Ethernet IP cores.
- Added new Quartus Settings File assignments:
 - DUPLICATE_HIERARCHY_DEPTH
Controls register duplication across hierarchies.
 - DUPLICATE_REGISTER
Enables duplication for registers that fan out to a number of spread out areas in a design.
- Enhance Fractal Synthesis to improve fractal synthesis of adder trees.
- Improved dot-product synthesis.
- Updated the FlexLM version.
This license server update requires you download new license daemons from the following URL:
<https://www.intel.com/content/www/us/en/programmable/support/support-resources/download/licensing/daemons.html>
The required license daemon files to download start with "lic_daemon_".
- The Intel HLS Compiler can be installed separately from Intel Quartus Prime.

1.2. Operating System Support

Information about OS support for the Intel Quartus Prime Design Suite is available on the Operating System Support page of the Intel FPGA website.

Related Information

[Operating System Support](#)

1.3. Memory Recommendations

A full installation of the Intel Quartus Prime Pro Edition software requires up to 75 GB of available disk space.

Intel recommends that your system be configured to provide virtual memory equal to the recommended physical RAM that is required to process your design.

Note: Peak virtual memory might exceed these recommendations. These recommendations are based on the amount of physical memory required to achieve runtime within 10% of that achieved on hardware with an infinite amount of RAM.

Table 1. Memory Requirements for Processing Designs

These requirements are the same for both Windows and Linux installations.

Family	Device	Recommended Physical RAM
Intel Arria® 10	10AT115, 10AX115	48 GB
	10AX090	44 GB

continued...



Family	Device	Recommended Physical RAM
	10AS066, 10AX066	32 GB
	10AS057, 10AX057	30 GB
	10AS048, 10AX048	28 GB
	10AX032, 10AS032	24 GB
	10AX027, 10AS027	22 GB
	10AX022, 10AS022	20 GB
	10AX016, 10AS016	18 GB
Intel Cyclone® 10 GX	10CX85, 10CX105, 10CX150, 10CX220	18 GB
Intel Stratix 10	1SG280L, 1SX280L, 1SG280H, 1SX280H, 1ST280E 1SG250L, 1SX250L, 1SG250H, 1SX250H, 1ST250E 1SG210H, 1SX210H, 1SM21BH, 1SM21CH, 1SM21BE 1SM21CE, 1ST210E	64 GB
	1SG165H, 1SX165H, 1SM16BH, 1SM16CH, 1SM16BE, 1SM16CE, 1ST165E	48 GB
	1SG110H, 1SX110H 1SG085H, 1SX085H	32 GB

1.4. Changes in Device Support

For information about known device issues and workarounds, see the [Intel FPGA Knowledge Base](#).

1.5. Changes to Software Behavior

This section documents instances in which the behavior and default settings of the Intel Quartus Prime Pro Edition software have been changed from earlier releases of the Intel Quartus Prime Pro Edition software.

- Quartus Prime does not generate programming files as part of the Quartus compilation process. Depending on your FPGA device, you must use one of the following tools to generate programming files:
 - For Intel Stratix 10 devices, use the Programming File Generator tool.
 - For other devices, use the Convert Programming File tool.

Refer to the Intel Quartus Prime Default Settings File (.qdf), *<Quartus Prime installation directory>/quartus/bin/assignment_defaults.qdf*, for a list of all the default assignment settings for the latest version of the Intel Quartus Prime software.



1.6. Device Support and Pin-Out Status

Table 2. Full Device Support

Full compilation, simulation, timing analysis, and programming support is now available for the new devices listed in this table.

Device Family	Devices
Intel Arria 10	10AS016, 10AS022, 10AS027, 10AS032, 10AS048, 10AS057, 10AS066, 10AT090, 10AT115, 10AX016, 10AX022, 10AX027, 10AX032, 10AX048, 10AX057, 10AX066, 10AX090, 10AX115
Intel Cyclone 10 GX	10CX085, 10CX105, 10CX150, 10CX220
Intel Stratix 10	1SG085H, 1SG110H, 1SG110H-S1, 1SG165H, 1SG210H, 1SG210H-S1, 1SG250H, 1SG250L, 1SG280H, 1SG280H-S1, 1SG280H-S2, 1SG280H-S3, 1SG280L, 1SG280L-S2, 1SG280L-S3, 1SM16BE-S1, 1SM16BH(*), 1SM16BH-S1, 1SM16CH(*), 1SM16CH-S1, 1SM21BE-S1, 1SM21BH(*), 1SM21BH-S1, 1SM21CH(*), 1SM21CH-S1, 1ST165E, 1ST210E, 1ST210E-S1, 1ST250EY, 1ST280EY, 1ST280EY-S1, 1SX085H, 1SX110H, 1SX110H-S1, 1SX165H, 1SX210H, 1SX250H, 1SX250L, 1SX280H, 1SX280H-S1, 1SX280H-S3, 1SX280L, 1SX280L-S1, 1SX280L-S2

Table 3. Advance Device Support

Compilation, simulation, and timing analysis support is provided for these devices. The Compiler generates pinout information for these devices in this release, but does not generate programming files.

Device Family	Devices
Intel Stratix 10	1SG166H, 1SG211H, 1SM16BE, 1SM21BE, 1ST085EN, 1ST110EN, 1ST250E, 1ST280E, 1ST280E-S1

Table 4. Initial Device Support

Compilation, simulation, and timing analysis support is provided for these devices. Programming files and pinout information are not generated for these devices in this release.

Device Family	Devices
Intel Stratix 10	1ST085ES, 1ST110ES

(*) For Intel Stratix 10 MX 2100 H-tile devices (1SM21BH, 1SM21CH) and Intel Stratix 10 MX 1650 H-tile devices (1SM16BH, 1SM16CH) devices, bias temperature instability (BTI) protection to preserve the CMU PLL mode performance of unused transceiver channels is not final. If the unused transceiver channels will not be used in the CMU PLL mode in the future, no action is needed. If the unused transceiver channels will be used in the CMU PLL mode in future, you will need to upgrade your Intel Quartus Prime Pro Edition software.



1.7. Timing and Power Models

Table 5. Timing and Power Model Status

Device Family	Device	Timing Model Status	Power Model Status
Intel Arria 10	10AX016, 10AS016, 10AX022, 10AS022, 10AX027, 10AS027, 10AX032, 10AS032,	Final – 16.1 ⁽¹⁾ ⁽²⁾	Final – 17.0
	10AX048, 10AS048	Final – 16.0.2 ⁽²⁾	
	10AX057, 10AS057, 10AX066, 10AS066, 10AX090	Final – 16.0.1 ⁽²⁾	Final – 16.0.1
	10AX115, 10AT115	Final – 16.0 ⁽²⁾	Final – 16.0
Intel Cyclone 10 GX	10CX085, 10CX105, 10CX150, 10CX220	Final – 17.0	Final – 18.0
Intel Stratix 10	1ST210E, 1SM21BE, 1ST165E, 1SM16BE	Preliminary	Preliminary
	1SG280L, 1SX280L, 1SG250L, 1SX250L	Final – 18.0.1	Final – 18.1.1
	1ST280E, 1ST250E	Final – 18.1.1	Preliminary
	1SG280H, 1SX280H, 1SG250H, 1SX250H, 1SG210H, 1SX210H, 1SG165H, 1SX165H, 1SG110H, 1SX110H, 1SG085H, 1SX085H	Final – 18.1.1	Final – 18.1.1
	1SM21BH, 1SM21CH, 1SM16BH, 1SM16CH	Final – 19.1	Final – 19.1

Related Information

[System Design with Advance FPGA Timing Models](#)

1.8. IBIS Models

Table 6. IBIS Model Status for the Intel Quartus Prime Pro Edition Software Release Version 19.1

Device families have IBIS model statuses that are either Advance, Preliminary, or Final.

Device Family	IBIS Model Status
Intel Arria 10	Final – 16.1.2
Intel Cyclone 10 GX	Final – 17.0
Intel Stratix 10	Final – 18.1

⁽¹⁾ Devices with a -1 speed grade were finalized in Intel Quartus Prime software version 17.0

⁽²⁾ All automotive and military grade devices are preliminary.



1.9. EDA Interface Information

Table 7. Synthesis Tools Supporting the Intel Quartus Prime Pro Edition Software Release Version 19.1

Synthesis Tools	Version
Mentor Graphics* Precision	Mentor Graphics Precision versions that support the Intel Quartus Prime software are typically released after the release of the Intel Quartus Prime software. Contact Mentor Graphics for versions of Mentor Graphics* Precision that support Intel Quartus Prime Pro Edition Software Release Version 19.1.
Synopsys* Synplify, Synplify Pro, and Synplify Premier	Synopsys Synplify, Synplify Pro, and Synplify Premier versions that support the Intel Quartus Prime software are typically released after the release of the Intel Quartus Prime software. Contact Synopsys for versions of Synopsys Synplify, Synplify Pro, and Synplify Premier Precision that support Intel Quartus Prime Pro Edition Software Release Version 19.1.

Table 8. Simulation Tools Supporting the Intel Quartus Prime Pro Edition Software Release Version 19.1

Simulation Tools	Version	Gate-Level Simulation Support
Aldec Active-HDL	10.5 (Windows 32-bit only)	Yes
Aldec Riviera-PRO	2018.10 (64-bit only)	Yes
Cadence Incisive Enterprise Simulator (IES)	15.20 (64-bit Linux only)	Yes
Cadence Xcelium Parallel Logic Simulation	18.03 (64-bit Linux only)	Yes
Mentor Graphics ModelSim* PE	10.6d (Windows 32-bit only)	Yes
Mentor Graphics ModelSim SE	10.6d (64-bit only)	Yes
Mentor Graphics ModelSim-Intel FPGA Edition	10.6d (32-bit only)	Yes
Mentor Graphics Questa*	10.6d (64-bit only)	Yes
Synopsys VCS and VCS MX	N-2017.12-SP2-4 (64-bit Linux only)	Yes

1.10. Antivirus Verification

The Intel Quartus Prime software release version 19.1 has been verified virus free with the following software:

Antivirus Verification Software

Windows McAfee Endpoint Security 10.5 Version: 10.5.3.3197

Hotfix number: 1219192

Patch: 3

McAfee Agent Version: 5.5.1.342

Adaptive Threat Protection Version: 10.5.3.3119

Threat Protection Version: 10.5.3.3271



1.11. Software Issues Resolved

Table 9. Issues Resolved in the Intel Quartus Prime Pro Edition Version 19.1

Customer Service Request Numbers							
00268805	00282536	00284790	00285365	00285440	00285886	00288588	00288935
00289287	00289521	00289940	00290184	00291205	00299614	00299883	00325187
00325267	00325459	00325596	00333840	00342522	00342739	00342954	00368821
00368951	00386955	00387150	00387966	00389059	00389135	00389262	00389361
00389785	00389785	00389853	00389949	00390910	00390910	00390935	00390946
00391002	00391720	00392897	00392962	00393619	00394187	00394229	00394383
00394512	00394788	00394818	00395375	00395631	00396124	00397514	00398387
00398837	00400051	00400618	00400640	00400863	00401537	00402607	00402868
00402868	00403971	00406354	00407615	00407819	00408513	00409113	00412640
00415384	00416511	00416940	00421584	00422062	00422693	00574585	10870276
11134203	11156909	11172886	11176773	11198103	11214848	11219576	11257604
11285245	11292778	11298778	11298846	11301206	11305785	11308792	11317353
11319062	11319571	11323487	11335209	11345379	11356274	11361181	11363064
11364116	11364838	11375765	11375885	11380953	11382556	11386705	11390436
11394678	11394678	11395015	11397342	11399886	11399890	11400441	11401439
11401476	11402576	11402903	11404697	11406453	11407074	11407549	11409432
11409593	11410948	11410981	11410991	11411334	11411573	11411901	11412752
11412773	11413677	11413932	11414110	11415177	11416167	11416948	11417569

1.12. Software Patches Included in this Release

Table 10. Software Patches included in Intel Quartus Prime Pro Edition Version 19.1

Software Version	Patch	Customer Service Request Number
Intel Quartus Prime software version 18.1.2	2.03	-
Intel Quartus Prime software version 18.1.2	2.01	-
Intel Quartus Prime software version 18.1.1	1.19	00396588
Intel Quartus Prime software version 18.1.1	1.08	-
Intel Quartus Prime software version 18.1.1	1.05	1408832559
Intel Quartus Prime software version 18.1.1	1.03	-
Intel Quartus Prime software version 18.1.1	1.01	00285440

continued...



Software Version	Patch	Customer Service Request Number
Intel Quartus Prime software version 18.1	0.23	00392897
Intel Quartus Prime software version 18.1	0.10	-
Intel Quartus Prime software version 18.1	0.02dp1	00390910
Intel Quartus Prime software version 18.0.1	1.47	-
Intel Quartus Prime software version 18.0.1	1.34	-
Intel Quartus Prime software version 18.0.1	1.29	-
Intel Quartus Prime software version 18.0.1	1.22	-
Intel Quartus Prime software version 17.1.1	1.40	00289378
Intel Quartus Prime software version 17.1.1	1.36	-

1.13. Latest Known Intel Quartus Prime Software Issues

Information about known issues that affect the Intel Quartus Prime software version 19.1 is available in the Intel Programmable Solutions Knowledge Base.

Table 11. Important Known Issues Affecting the Intel Quartus Prime Pro Edition Version 19.1

Description	Workaround
<p>If your LC_ALL environment variable does not match the locale settings (such as LANG), a Perl warning might be generated during IP generation:</p> <pre>perl: warning: Setting locale failed.</pre> <p>This warning also results in IP generation failure.</p>	<p>Ensure that your operating system locale is set up correctly. In particular, the locale specified with the LC_ALL environment variable must match the locale settings (such as LANG).</p>
<p>When using Intel Quartus Prime Pro Edition Version 19.1 with Intel FPGA Download Cable II (formerly USB- Blaster II) or an on-board implementation of the Intel FPGA Download Cable II IP solution (formerly on-board USB-Blaster II solution), a USB device enumeration error might occur when plugging in the download cable to the computer hosting Quartus software.</p>	<p>Use Intel Quartus Prime Pro Edition Version 19.1 with an alternative download cable:</p> <ul style="list-style-type: none"> Intel FPGA Download Cable (formerly USB-Blaster) Intel FPGA Ethernet Cable (formerly EthernetBlaster II)
<p>Intel Quartus Prime Pro Edition Software Version 19.1 fails to generate a SOF when compiling a design with a Nios® II/e Processor Core.</p>	<p>Apply the patch available in the following Intel FPGA Knowledge Base document:</p> <p>Why does my Nios II/e processor design not generate programming files in the Intel Quartus Prime Pro Edition software version 19.1?</p>

You can find known issue information for previous versions of the Quartus Prime software on the Knowledge Base webpage.

Information about known software issues that affect previous versions of the Quartus II software is available on the Intel Quartus Prime and Quartus II Software Support webpage.



Information about issues affecting the Intel FPGA IP Library is available in the *Intel FPGA IP Release Notes*.

Related Information

- [Intel Programmable Solutions Knowledge Base](#)
- [Intel Quartus Prime and Quartus II Software Support](#)
- [Intel FPGA IP Release Notes](#)

1.14. Intel Quartus Prime Pro Edition Version 19.1 Software and Device Support Release Notes Archives

Intel Quartus Prime Pro Edition	User Guide
18.1	Intel Quartus Prime Pro Edition Version 18.1 Software and Device Support Release Notes
18.0	Intel Quartus Prime Pro Edition Software and Devices Support Release Notes
17.1	Intel Quartus Prime Pro Edition Software and Devices Support Release Notes
17.0	Intel Quartus Prime Pro Edition Software and Devices Support Release Notes

1.15. Document Revision History

Table 12. The Intel Quartus Prime Pro Edition Software Release Version 19.1 Document Revision History

Document Version	Intel Quartus Prime Version	Changes
2019.04.17	19.1	Revised the workaround for the known issue that affects designs that use a Nios II/e processor core. The previously documented workaround was incorrect.
2019.04.05	19.1	Updated the Intel FPGA Knowledge Base link in the known issue that affects designs that use a Nios II/e processor core.
2019.04.01	19.1	Initial release.