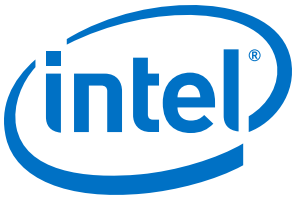

Intel® Quartus® Prime Standard Edition

Version 19.1 Software and Device Support Release Notes

Updated for Intel® Quartus® Prime Design Suite: **19.1**

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

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

For additional information about this software release, see the Intel Quartus Prime Standard Edition README file in the following location:`<installation directory>/quartus/readme.txt`

For information about operating system support, see the following web page: Intel FPGA Operating System Support.

Important: Intel Quartus Prime Standard Edition Version 19.1 for Microsoft* Windows* requires a patch. For patch details, see the following solution in the Intel FPGA Knowledge Base: *FATAL: Cannot generate IP in a Windows environment!*.

Related Information

Intel Quartus Prime Pro Edition Software and Device Support Release Notes

1.1. New Features and Enhancements

Intel Quartus Prime Standard Edition Software Version 19.1 includes functional and security updates. Keep your software up-to-date and follow the technical recommendations that help improve the security of your Intel Quartus Prime installation. Additional security updates are planned and will be provided as they become available. You should promptly install the latest version when it is released.

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

- On Microsoft Windows systems, Intel Quartus Prime Standard Edition Software transitioned from using Cygwin to using Ubuntu 18.04 LTS running on Windows Subsystem for Linux (WSL).

  This transition improves the performance, robustness, and security of Intel Quartus Prime Standard Edition software.

  For instructions on installing WSL, see Installing Windows Subsystem for Linux* (WSL) on Windows in *Intel FPGA Software Installation and Licensing*.

1.2. Changes in Device Support

For information about known device issues and workarounds, see the Intel FPGA Knowledge Base.

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1.3. Changes to Software Behavior

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

- Changed hierarchy name for VHDL to remove the "\" escaping of generated hierarchies. If you use VHDL generations, you must update your QSF and SDC assignments.
- Starting with Intel Quartus Prime Standard Edition software version 19.1, the Nios® II Embedded Design Suite requires you to install an Eclipse IDE manually.

  For details, see Installing Eclipse IDE into Nios II EDS in *Nios II Software Developer's Handbook*.
- Support for Microsoft Windows 7 is removed.
- Support for the following device and IP combinations has been removed in this release:
  - All devices:
    - SerialLite
    - SerialLite II
    - RapidIO
    - Control Synchronizer
  - Arria® II GX devices:
    - DDR2
    - DDR3
  - Cyclone® IV devices:
    - DDR
    - DDR2
  - Stratix® V devices:
    - EMIF On-Chip Debug Port
- For Arria II, Arria V, Cyclone IV, Cyclone V, Stratix IV, and Stratix V devices, support for the Serial Digital Interface Intel FPGA IP is removed.

  Use Serial Digital Interface II Intel FPGA IP instead.
- For all devices earlier than Intel Arria 10, support for the following IP cores is removed:
  - Clocked Video Input Intel FPGA IP

    Use Clocked Video Input II Intel FPGA IP instead.
  - Clocked Video Output Intel FPGA IP

    Use Clocked Video Output II Intel FPGA IP instead.

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.

1.4. Operating System Support

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

To use Intel Quartus Prime Standard Edition Version 19.1 on Microsoft Windows, you must download and install a patch. For patch details, see the following solution in the Intel FPGA Knowledge Base: *FATAL: Cannot generate IP in a Windows environment!*.

Starting with Intel Quartus Prime Standard Edition Version 19.1, support for Microsoft Windows 7 in Intel Quartus Prime Standard Edition is removed.

Related Information

- Intel FPGA Knowledge Base
- Operating System Support
- Download Center for FPGAs

1.5. Memory Recommendations

A full installation of the Intel Quartus Prime Standard Edition software requires up to 40 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
	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
Arria V	5AGXB5, 5AGTD7, 5AGXB7, 5ASXB5, 5ASTD5	16 GB
	5AGXB1, 5AGXB3, 5AGTD3, 5ASTD3, 5ASXB3	12 GB
	5AGXA7, 5AGTC7	10 GB
	5AGTC3, 5AGXA3, 5AGXA5	8 GB

continued...

Family	Device	Recommended Physical RAM
	5AGXA1	6 GB
Arria V GZ	5AGZE7	16 GB
	5AGZE3, 5AGZE5	12 GB
	5AGZE1	8 GB
Arria II GX	EP2AGX260	6 GB
	EP2AGX95, EP2AGX125, EP2AGX190	4 GB
	EP2AGX65	2 GB
	EP2AGX45	1.5 GB
Arria II GZ	EP2AGZ350	8 GB
	EP2AGZ300	6 GB
	EP2AGZ225	4 GB
Intel Cyclone 10 LP	10CL120	1.5 GB
	10CL080, 10CL055	1 GB
	10CL006, 10CL010, 10CL016, 10CL025, 10CL040	512 MB
Cyclone V	5CEA9, 5CGTD9, 5CGXC9	8 GB
	5CEA2, 5CGXC3, 5CEA4, 5CGXC4, 5CEA5, 5CGTD5, 5CGXC5, 5CSEA5, 5CSTD5, 5CSXC5, 5CSEA6, 5CSXC6, 5CEA7, 5CGTD7, 5CGXC7, 5CSEA2, 5CSEA4, 5CSXC2, 5CSXC4, 5CSTD6	6 GB
Cyclone IV GX	EP4CGX110, EP4CGX150	2 GB
	EP4CGX50, EP4CGX75	1.5 GB
	EP4CGX15, EP4CGX22, EP4CGX30	512 MB
Cyclone IV E	EP4CE115	1.5 GB
	EP4CE55, EP4CE75	1 GB
	EP4CE6, EP4CE10, EP4CE15, EP4CE22, EP4CE30, EP4CE40	512 MB
Intel MAX® 10	10M50	2 GB
	10M16	2 GB
	10M25	2 GB
	10M40	2 GB
	10M04, 10M08	1 GB
	10M02	512 MB
MAX V	All	512 MB
MAX II	All	512 MB
Stratix V	5SEEB, 5SGXAB, 5SGXB9, 5SGXBB	28 GB
	5SGXA9, 5SEE9	24 GB
	5SGTC7, 5SGXA7, 5SGSD8	20 GB
	5SGSD5, 5SGXA5, 5SGXB5, 5SGSD6, 5SGXB6	16 GB

continued...

Family	Device	Recommended Physical RAM
	5SGXA3, 5SGSD4, 5SGXA4, 5SGTC5	12 GB
	5SGSD3	8 GB
Stratix IV	EP4SGX530, EP4SE530, EP4SE820, EP4S40G5, EP4S100G5	12 GB
	EP4SE360 EP4SGX360, EP4S100G3, EP4S100G4	8 GB
	EP4SGX290	6 GB
	EP4SE230 EP4SGX110, EP4SGX230, EP4S40G2, EP4S100G2	4 GB
	EP4SGX70	2 GB

1.6. Device Support and Pin-Out Status

All production devices currently have full compilation, simulation, timing analysis, and programming support.

1.7. Timing and Power Models

Table 2. 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 LP	10CL006, 10CL010, 10CL016, 10CL025, 10CL040, 10CL055, 10CL080, 10CL120	Final – 17.0	Final – 17.1
Intel MAX 10	10M02, 10M04, 10M08	Final – 15.1(3)	Final – 15.1
	10M16, 10M25, 10M40, 10M50	Final – 15.1.2	Final – 15.1

The current version of the Intel Quartus Prime software also includes final timing and power models for the Arria II GX, Arria II GZ, Arria V, Arria V GZ, Arria V SoC, Cyclone IV E, Cyclone IV GX, Cyclone V, Cyclone V SoC, MAX II, MAX II Z, MAX V, Stratix IV, and Stratix V device families. Timing models for these device families became final in the Intel Quartus Prime software versions 11.1 or earlier.

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

(2) All military grade devices were finalized in Intel Quartus Prime software version 18.0.1.

(3) Timing model statuses for MAX 10 A6 speed grade parts remain as Preliminary.

1.8. IBIS Models

Table 3. IBIS Model Status for the Intel Quartus Prime Standard Edition Software Release Version 19.1

Beginning in the Intel Quartus Prime Standard Edition software version 16.0, 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
Arria V	Correlated with PHY device operation – 14.0
Arria II GX	Correlated with PHY device operation – 11.1
Arria II GZ	Correlated with PHY device operation – 11.1
Intel Cyclone 10 LP	Final – 17.0
Cyclone V	Correlated with PHY device operation – 14.0
Cyclone IV E	Correlated with PHY device operation – 11.1
Cyclone IV GX	Correlated with PHY device operation – 11.1
Intel MAX 10	Final – 16.0
MAX V	Correlated with PHY device operation – 11.1
Stratix V	Correlated with PHY device operation – 13.0 SP1
Stratix IV	Correlated with PHY device operation – 11.1

1.9. EDA Interface Information

Table 4. Synthesis Tools Supporting the Intel Quartus Prime Standard 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 Standard 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 that support Intel Quartus Prime Standard Edition Software Release Version 19.1.

Table 5. Simulation Tools Supporting the Intel Quartus Prime Standard Edition Software Release Version 19.1

The following simulation tools provide RTL and functional gate-level simulation.

Simulation Tools	Version	NativeLink Support
Aldec Active-HDL	10.3 (32-bit Windows only)	Yes
Aldec Riviera-PRO	2015.10 (64-bit only)	Yes
Cadence Incisive Enterprise Simulator (IES)	14.20 (64-bit Linux only)	Yes
Mentor Graphics ModelSim* PE	10.4d (32-bit Windows only)	Yes

continued...

Simulation Tools	Version	NativeLink Support
Mentor Graphics ModelSim SE	10.4d (64-bit only)	Yes
Mentor Graphics ModelSim-Intel FPGA Edition	10.5b (32-bit only)	Yes
Mentor Graphics Questa* Advanced Simulator	10.4d (64-bit only)	Yes
Synopsys VCS and VCS MX	2014.12-SP1 (64-bit Linux only)	Yes

OS support for Mentor Graphics ModelSim-Intel FPGA Edition version 10.5b (requires 32-bit libraries)

- Windows 7 SP1 (64-bit)
- Windows 8.0 (64-bit)
- Windows 10 (64-bit)
- Windows Server 2008 R2 SP1(64-bit)
- Red Hat Enterprise Linux 5.10 (64-bit)
- Red Hat Enterprise Linux 6.5 (64-bit)
- Red Hat Enterprise Linux 7.2 (64-bit)

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 : 10.5.5.5253
Hotfix number: 190108,190514,190515
Patch: 5
McAfee Agent Version : 5.6.1.157
Adaptive Threat Protection Version : 10.5.5.5160
Threat Protection Version : 10.5.5.5245

1.11. Software Issues Resolved

The following customer service requests were fixed or otherwise resolved in Intel Quartus Prime Standard Edition Version 19.1:

Table 6. Issues Resolved in the Intel Quartus Prime Standard Edition Version 19.1

Customer Service Request Numbers							
00279317	00282536	00342609	00342954	00379732	00389785	00389785	00392435
00402607	00406354	00407615	00408513	00409113	00412414	00416511	00428251
00429622	00430330	00438155	00439195	00442439	00451006	00459850	11172886
11214848	11280338	11288370	11288486	11399886	11399890	11400321	11409979
11412132							

1.12. Software Patches Included in this Release

Intel Quartus Prime Standard Edition Version 19.1 contains the following patches for previous versions of Intel Quartus Prime Standard Edition software:

Table 7. Software Patches included in Intel Quartus Prime Standard Edition Version 19.1

Software Version	Patch	Customer Service Request Number
Intel Quartus Prime software version 18.1.1	1.03std	–
Intel Quartus Prime software version 18.1.1	1.01std	–
Intel Quartus Prime software version 18.1	0.11	00282536
Intel Quartus Prime software version 18.1	0.09std	00395920
Intel Quartus Prime software version 18.1	0.08std	00406354
Intel Quartus Prime software version 18.1	0.04std	–
Intel Quartus Prime software version 18.1	0.03std	00391701
Intel Quartus Prime software version 18.1	0.02std	11412132
Intel Quartus Prime software version 18.0	0.11std	–
Intel Quartus Prime software version 18.0	0.02std	11412132
Intel Quartus Prime software version 17.1.1	1.18std	–
Intel Quartus Prime software version 17.1	0.13std	00386788
Intel Quartus Prime software version 17.1	0.11std	11289751
Intel Quartus Prime software version 17.0.2	2.12std	–

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.

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 FPGA Knowledge Base
- Intel Quartus Prime and Quartus II Software Support
- Intel FPGA IP Release Notes

1.14. Document Revision History

Table 8. The Intel Quartus Prime Standard Edition Software Release Version 19.1 Document Revision History

Document Version	Intel Quartus Prime Version	Changes
2019.02.07	19.1	• Updated Operating System Support on page 5 to show that Intel Quartus Prime Standard Edition Version 19.1 for Microsoft Windows requires a patch. For patch details, see the following solution in the Intel FPGA Knowledge Base: *FATAL: Cannot generate IP in a Windows environment!*. • Changed the order of some sections in this publication.
2019.09.30	19.1	• Initial release.