Intel® Quartus® Prime Pro Edition

Version 18.1 Software and Device Support Release Notes

Contents

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1. Intel® Quartus® Prime Pro Edition Version 18.1 Software and Device Support Release Notes

This document provides late-breaking information about the Intel® Quartus® Prime Pro Edition software release version 18.1.

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 release version 18.1 includes the following new features and enhancements:

- Expanded support for Intel Stratix® 10 devices:
  - — Added support for Intel Stratix 10 H-Tile devices.

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- Added Auto Pipelining option.
- Added Fractal Synthesis Optimization.
- Added new compilation strategies that you can use to help improve QoR.
- Enhanced optimization modes.
- Enhanced Intel Quartus Prime GUI:
  — Added .qdb file metadata viewer accessible from Project Navigator.
  — Added export file specification to the Design Partitions windows during flow execution.
  — Added Clock Usage Heatmap view, with the following features:
    - Shows utilization of routing and sectors.
    - Highlights the feature of a single clock.
    - Inspect a single layer with clocks distinguished by color.
  — Enhanced Chip Planner:
    - Updated element highlighting.
    - Added a "bird's eye" view.
    - Added ability to show or hide Logic Lock regions.
    - Added a new **Route Reserved** column.
    - Added Report Registered Connections task.
    - Added Report Clock Sector Utilization task.
    - For Intel Stratix 10 devices, added 50G and 100G Ethernet MAC Hard IP Block.
  — Enhanced Design Space Explorer:
    - Added graphical display of results to help you interpret results.
    - Added ability to sweep over various compilation strategies.
- Enhanced Interface Planner:
  — Improved Intel Quartus Prime integration.

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- Enhanced Platform Designer:
  - Added System View tool to replace System Contents tool.
  - Reduced the time required to complete Quartus IP upgrades.
  - Added automatic system information synchronization.
  - Added limited support for ACE-Lite.
  - Enhanced support for Intel Stratix 10 design flows:
    - Introduced Ready Allowance for Avalon®-ST interfaces.
    - Introduced Waitrequest Allowance for Avalon-MM interfaces.
  - Enabled the use of Verilog syntax to connect ports:
    - You can specify the port-to-port connectivity with the full breadth of Verilog operators.
    - Gives you full control over how ports are connected in the generated HDL.
    - Enables the use of arbitrary RTL and all IP in Platform Designer.
  - Added support for IP that uses System Verilog Interfaces.
- Enhanced Advanced Link Analyzer:
  - Added Transceiver Toolkit integration.
  - Added ICN-based crosstalk simulations.
- For Intel Stratix 10 devices, enhanced Rapid Recompile for the post-fit Signal Tap flow.

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
	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.

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.

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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	10AX115E3, 10AX016, 10AS016, 10AX022, 10AS022, 10AX027, 10AS027, 10AX032, 10AS032, 10AX048, 10AS048, 10AX057, 10AS057, 10AX066, 10AS066, 10AX090, 10AX115, 10AT115, 10AX016, 10AS016, 10AX022, 10AS022, 10AX027, 10AS027, 10AX032, 10AS032
Intel Cyclone 10 GX	10CX085, 10CX105 10CX150, 10CX220
Intel Stratix 10	1SG110H-S1, 1SG210H-S1, 1SG250L, 1SG280H-S1, 1SG280H-S2, 1SG280H-S3, 1SG280L, 1SG280L-S2, 1SG280L-S3, 1SM16E-S1, 1SM16H-S1, 1SM21E-S1, 1SM21H-S1, 1ST210E-S1, 1ST280E-S1, 1SX110H-S1, 1SX250L, 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	1SG085H, 1SG110H, 1SG165H, 1SG210H, 1SG250H, 1SG280H, 1SM16E, 1SM16H, 1SM21E, 1SM21H, 1ST165E, 1ST210E, 1ST250E, 1ST280E, 1SX085H, 1SX110H, 1SX165H, 1SX210H, 1SX250H, 1SX280H

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
none	none

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]	
			continued...

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[1] -1 devices were finalized in Intel Quartus Prime software version 17.0

[2] All automotive and military grade devices are preliminary.

Device Family	Device	Timing Model Status	Power Model Status
	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	1SG280H, 1SX280H, 1SG250H, 1SX250H, 1ST280, 1ST250, 1SG210, 1SX210, 1ST210, 1SM21, 1SG165, 1SX165, 1ST165, 1SM16, 1SG110, 1SX110, 1SG085, 1SX085	Preliminary	Preliminary
	1SG280L, 1SX280L, 1SG250L, 1SX250L	Final – 18.0.1	

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 18.1**

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

1.9. EDA Interface Information

Table 7.   **Synthesis Tools Supporting the Intel Quartus Prime Pro Edition Software Release Version 18.1**

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 18.1.
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 18.1.

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Table 8.   Simulation Tools Supporting the Intel Quartus Prime Pro Edition Software Release Version 18.1

Simulation Tools	Version	Gate-Level Simulation Support
Aldec Active-HDL	10.4a (Windows 32-bit only)	Yes
Aldec Riviera-PRO	2017.10.67.6735 (64-bit only)	Yes
Cadence Incisive Enterprise Simulator (IES)	15.20 (64-bit Linux only)	Yes
Cadence Xcelium Parallel Logic Simulation	17.04 (64-bit Linux only)	Yes
Mentor Graphics ModelSim* PE	10.6c (Windows 32-bit only)	Yes
Mentor Graphics ModelSim SE	10.6c (64-bit only)	Yes
Mentor Graphics ModelSim-Intel FPGA Edition	10.6c (32-bit only)	Yes
Mentor Graphics Questa*	10.6c (64-bit only)	Yes
Synopsys VCS and VCS MX	2017.03-SP2-1 (64-bit Linux only)	Yes

1.10. Antivirus Verification

The Intel Quartus Prime software release version 18.1 has been verified virus free with the following software:

Antivirus Verification Software for Windows

Windows McAfee Endpoint Security 10.5 Version : 10.5.3.3197
Hotfix number: 1219192
Patch: 3
McAfee Agent Version : 5.0.6.220
Adaptive Threat Protection Version : 10.5.3.3119
Threat Protection Version : 10.5.3.3271

Antivirus Verification Calm Software for Linux

ClamAV 0.99.2/24187

1.11. Software Issues Resolved

Table 9.   Issues Resolved in the Intel Quartus Prime Pro Edition Version 18.1

Customer Service Request Numbers							
10370277	10843408	10858493	10990428	11048691	11064555	11087628	11132052
11140897	11179632	11186512	11195040	11202184	11208259	11209336	11214109
11215061	11217249	11223791	11234788	11235114	11235682	11239466	11243028
11245646	11247780	11257990	11260173	11262884	11265611	11265726	11266810
11274587	11277838	11278473	11281750	11283078	11284000	11284237	11285713
11286553	11287632	11287719	11288058	11288204	11291076	11291933	11292151
11292206	11293747	11293954	11296834	11297286	11297805	11298953	11299762
11300018	11300180	11300408	11300545	11301565	11305066	11305121	11305719
							continued...

Customer Service Request Numbers							
11307241	11307486	11307778	11307848	11308826	11309217	11310879	11310933
11311411	11311517	11311916	11314231	11317473	11319865	11320155	11321803
11322153	11323358	11323592	11323928	11324426	11324701	11324959	11327420
11327866	11328052	11329238	11329525	11329550	11329704	11329935	11330092
11330914	11332051	11332184	11333334	11333355	11334095	11334467	11335061
11335599	11335721	11335914	11336654	11336725	11337784	11337931	11339291
11340240	11341406	11341569	11342215	11342926	11343244	11343271	11345236
11345294	11346606	11346788	11346929	11347253	11347544	11347597	11347771
11348390	11348520	11348700	11349098	11349164	11349424	11349876	11350154
11350917	11350920	11351181	11351265	11351655	11351880	11352014	11353578
11353628	11354267	11354397	11354614	11355014	11355400	11355969	11356220
11357387	11357880	11357952	11358219	11358219	11358433	11358488	11358737
11359134	11359386	11359480	11360299	11360345	11360506	11361256	11361314
11362138	11362329	11362947	11363300	11363704	11363723	11363755	11364361
11364504	11364679	11364820	11364886	11365978	11366731	11366915	11367172
11367401	11367664	11367902	11368551	11369072	11369688	11369688	11370360
11370483	11370677	11370827	11371160	11371333	11371567	11371583	11371626
11371821	11371905	11371937	11372177	11372637	11373525	11373971	11374259
11374320	11374519	11375233	11375395	11375490	11375558	11375575	11375690
11375705	11375757	11375832	11375875	11375953	11376007	11376062	11376104
11376247	11376268	11376363	11376449	11376524	11376633	11376752	11376905
11376918	11376934	11377006	11377138	11377511	11377627	11377892	11377941
11378700	11378713	11379002	11379095	11379162	11379218	11379363	11379448
11379525	11379582	11379700	11379751	11380036	11380118	11380125	11380402
11380683	11380734	11380833	11380881	11380937	11381042	11381109	11381273
11381321	11381328	11381402	11381700	11381710	11381774	11381877	11381995
11382363	11382606	11382860	11383035	11383035	11383245	11383264	11383372
11383386	11383457	11383555	11383799	11383868	11383876	11383876	11384101
11384111	11384155	11384244	11384567	11385137	11385479	11385826	11385857
11386155	11386159	11386213	11386231	11386343	11386608	11386675	11386675
11386706	11386723	11386778	11387009	11387024	11387505	11387662	11387745
11387985	11388141	11388283	11388377	11388430	11388801	11389402	11389679
11389756	11390010	11390436	11390446	11390509	11390666	11390723	11390788
11390830	11391004	11391266	11391286	11391333	11391366	11391658	11391828
11391909	11391984	11392210	11392267	11392285	11392327	11392430	11392549
11392556	11392590	11392709	11392717	11393110	11393231	11393242	11393251
							continued...

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Customer Service Request Numbers							
11393420	11393420	11393431	11393493	11393611	11393761	11393810	11393891
11394301	11394524	11394728	11394808	11394948	11395181	11395277	11395403
11395403	11395802	11395902	11396115	11396252	11396305	11396432	11396593
11396613	11396747	11397377	11397409	11398006	11398012	11398346	11398403
11398453	11398470	11398559	11398659	11398760	11398821	11399218	11399372
11399405	11399658	11399853	11399853	11399882	11399882	11399893	11399928
11400358	11400448	11400576	11400655	11400696	11400923	11400931	11401041
11401106	11401256	11401439	11401773	11402536	11402568	11402584	11402639
11402890	11402920	11402930	11403295	11403310	11403418	11403474	11403488
11403692	11403759	11403902	11404117	11404298	11404491	11404677	11404745
11405590	11405974	11406025	11406448	11406781	11406936	11407622	11407652
11407790	11408173	11408921	11408957	11408961	11408978	11409070	11409389
11409509	11409894	11409920	11409960	11409982	11410003	11410114	11410184
11410248	11410346	11410403	11410438	11410663	11410755	11410806	11410812
11410887	11410952	11410991	11411048	11411238	11411275	11411303	11411327
11411327	11411592	11411592	11411769	11411799	11411852	11411901	11411908
11411990	11412041	11412154	11412154	11412171	11412247	11412348	11412434
11412529	11412627	11412674	11412708	11412992	11413003	11413010	11413510
11413734	11413923	11414252	11414257	11414257	11414276	11414316	11414319
11414667	11414832	11414858	11414997	11415074	11415168	11415214	11415226
11415233	11415611	11415653	11415656	11415696	11415787	11415787	11415791
11415803	11416066	11416104	11416184	11416336	11416491	11416822	11417250
11417494							

1.12. Software Patches Included in this Release

Table 10.   Software Patches included in Intel Quartus Prime Pro Edition Version 18.1

Software Version	Patch	Customer Service Request Number
Intel Quartus Prime software version 18.0.1	1.30	11407574
Intel Quartus Prime software version 18.0.1	1.28	-
Intel Quartus Prime software version 18.0.1	1.26	11415696
Intel Quartus Prime software version 18.0.1	1.25	-
Intel Quartus Prime software version 18.0.1	1.24	-
		continued...

Software Version	Patch	Customer Service Request Number
Intel Quartus Prime software version 18.0.1	1.19	-
Intel Quartus Prime software version 18.0.1	1.18	11345294
Intel Quartus Prime software version 18.0.1	1.16	11388283
Intel Quartus Prime software version 18.0.1	1.15	-
Intel Quartus Prime software version 18.0.1	1.11	-
Intel Quartus Prime software version 18.0.1	1.10	-
Intel Quartus Prime software version 18.0.1	1.09	-
Intel Quartus Prime software version 18.0.1	1.07	11410438
Intel Quartus Prime software version 18.0.1	1.06p	11412708
Intel Quartus Prime software version 18.0.1	1.06	11412708
Intel Quartus Prime software version 18.0.1	1.04	11234788, 11320155
Intel Quartus Prime software version 18.0.1	1.02	11386723
Intel Quartus Prime software version 18.0.1	1.01	11403310
Intel Quartus Prime software version 18.0	0.32	11407574
Intel Quartus Prime software version 18.0	0.31	-
Intel Quartus Prime software version 18.0	0.27	11388283
Intel Quartus Prime software version 18.0	0.26r	-
Intel Quartus Prime software version 18.0	0.25	-
Intel Quartus Prime software version 18.0	0.15	11386723
Intel Quartus Prime software version 18.0	0.11	11404172
Intel Quartus Prime software version 18.0	0.07	11345294
Intel Quartus Prime software version 17.1.2	2.20	11386723
Intel Quartus Prime software version 17.1.2	2.13	11376247

continued...

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Software Version	Patch	Customer Service Request Number
Intel Quartus Prime software version 17.1.1	1.37	-
Intel Quartus Prime software version 17.1.1	1.27	-
Intel Quartus Prime software version 17.1.1	1.23	-
Intel Quartus Prime software version 17.1.1	1.13	11362329
Intel Quartus Prime software version 17.1	0.28	11307241
Intel Quartus Prime software version 17.0.1	1.03	-
Intel Quartus Prime software version 16.1.2	2.32	11373390

1.13. Latest Known Intel Quartus Prime Software Issues

Information about known issues that affect the Intel Quartus Prime software version 18.1 is available in the Intel Programmable Solutions Knowledge Base.

Table 11.   Important Known Issues Affecting the Intel Quartus Prime Pro Edition Version 18.1

Description	Workaround
The Intel HLS Compiler is not included in the Windows* release of Intel Quartus Prime Design Suite Version 18.1. The Intel Quartus Prime Design Suite Version 18.1 HLS Compiler is available on all supported Linux distributions.	For details about the availability of the Intel HLS Compiler on Windows*, see Where is the Intel HLS Compiler version 18.1 for Windows? in the Intel FPGA 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 Programmable Solutions Knowledge Base
- Intel Quartus Prime and Quartus II Software Support
- Intel FPGA IP Release Notes

1.14. Document Revision History

Table 12. **The Intel Quartus Prime Pro Edition Software Release Version 18.1 Document Revision History**

Document Version	Intel Quartus Prime Version	Changes
2018.09.24	18.1	Initial release.

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