

# Intel<sup>®</sup> Quartus<sup>®</sup> Prime Pro Edition Software and Device Support Release Notes



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# 1 Intel® Quartus® Prime Pro Edition Software and Device Support Release Notes Version 17.1

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This document provides late-breaking information about the Intel® Quartus® Prime Pro Edition software release version 17.1.

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

## Related Links

[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 17.1 includes the following new features and enhancements:

- Some Intel Quartus Prime tools and components have new names:
  - Blueprint is now Interface Planner.
  - Qsys is now Platform Designer.
  - EyeQ is now Eye Viewer.
  - JNEye is now Advanced Link Analyzer.
  - LogicLock is now Logic Lock Region.
  - TimeQuest is now Timing Analyzer.
- New partial reconfiguration support for Intel Stratix® 10 device families including the following features:
  - Hierarchical partial reconfiguration support
  - Simultaneous debugging of static and partial reconfiguration regions.
  - Simulation support for partial reconfiguration operation.
- New HyperFlex optimizations for Intel Stratix 10 device families.
- New HyperFlex architecture optimization logic equivalency checking support in the OneSpin 360 EC-FPGA tool for Intel Stratix 10 device families.
- New Intel High Level Synthesis Compiler.
- Improved physical synthesis with physical delay analysis and optimization.
- New Fast Forward Compile software analysis tool to provide design performance recommendations with specific design changes.
- Faster debug iterations with incremental Signal Tap routing
- Improved GUI for IP upgrades.

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- Improved block-based design flows, including Signal Tap debug support for block-based flows, incremental block-based compilation, and design block reuse.
- New Design Partition Planner tool to view design connectivity.
- New Timing Analyzer Reports based on snapshots and viewable during compilation flow.
- Faster debug iterations for Intel Stratix 10 device families with post-fit Signal Tap with incremental routing.
- New support in Platform Designer (formerly Qsys) for System Verilog Interfaces and files from the Intel High Level Synthesis Compiler.
- Enhanced Logic Lock Regions now allow user-name regions, and the ability to create a region in the Logic Lock Region window.
- Enhancements for DSP Builder and DSP IP:
  - New advanced tool parameters for improving QoR on Intel Stratix 10 device families.
  - FIR Filter now supports Dynamic Interpolate and provides WYSIWYG support for Intel Stratix 10 HyperFlex architecture.
  - FFT has improved performance and provides WYSIWYG support for Intel Stratix 10 HyperFlex architecture.
- New Advanced Link Analyzer (formerly JNEye) features:
  - New support for Intel Stratix 10 and Intel Cyclone® 10 GX device families.
  - Improved IBIS-AMI Wrapper features beyond standalone IBIS-AMI models:
    - Joint RX and TX optimization
    - Reference clock and TX link optimization
  - IEEE 802.3bj/by/bs/cd RS(528, 514) and RS(544, 514) FEC
  - IEEE 802.3bs/cd & CEI-56G-MR-PAM4/CEI-56G-LR-PAM4 COM Support
- New support for EPCQ-A configuration devices.

## 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 Links

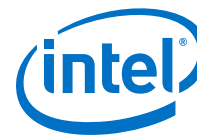
[Operating System Support](#)

## 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 may 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	1SG280, 1SX280	128 GB
	1SG250, 1SX250	112 GB
	1SG210, 1SX210, 1SM21	96 GB
	1SG165, 1SX165, 1SM16	80 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.

## 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,
<i>continued...</i>	



Device Family	Devices
	10AX090, 10AX115, 10AT115, 10AX016, 10AS016, 10AX022, 10AS022, 10AX027, 10AS027, 10AX032, 10AS032
Intel Cyclone 10 GX	10CX085, 10CX105 10CX150, 10CX220
Intel Stratix 10	1SG280-S1 1SG280-S2 1SG210-S1

**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	1SG280, 1SX280 1SG250, 1SX250 1SG210, 1SX210, 1SM21B 1SG165, 1SX165, 1SM16B

**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	1SM21C 1SM16C

## 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 <sup>(1)</sup> <sup>(2)</sup>	Final – 17.0
	10AX048, 10AS048	Final – 16.0.2 <sup>(2)</sup>	
	10AX057, 10AS057, 10AX066, 10AS066, 10AX090	Final – 16.0.1 <sup>(2)</sup>	Final – 16.0.1
	10AX115, 10AT115	Final – 16.0 <sup>(2)</sup>	Final – 16.0
Intel Cyclone 10 GX	10CX085, 10CX105, 10CX150, 10CX220	Final – 17.0	Preliminary
Intel Stratix 10	1SG280, 1SX280, 1SG250, 1SX250, 1SG210, 1SX210, 1SM21, 1SG165, 1SX165, 1SM16	Preliminary	Preliminary

(1) -1 devices were finalized in Intel Quartus Prime software version 17.0

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



## Related Links

[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 17.1**

Beginning in the Intel Quartus Prime Pro Edition software version 17.1, device families will 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	Advance - 17.1

## 1.9 EDA Interface Information

**Table 7. Synthesis Tools Supporting the Intel Quartus Prime Pro Edition Software Release Version 17.1**

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 17.1
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 Pro Edition Software Release Version 17.1

**Table 8. Simulation Tools Supporting the Intel Quartus Prime Pro Edition Software Release Version 17.1**

Simulation Tools	Version	Gate-Level Simulation Support
Aldec Active-HDL	10.3(Windows only)	Yes
Aldec Riviera-PRO	2017.02	Yes
Cadence Incisive Enterprise Simulator (IES)	15.20 (Linux only)	Yes
Mentor Graphics ModelSim* PE	10.5c	Yes
Mentor Graphics ModelSim SE	10.5c	Yes
Mentor Graphics ModelSim-Intel FPGA Edition	10.5c	Yes
Mentor Graphics Questa*	10.5c	Yes
Synopsys VCS and VCS MX	2016.06-SP2-1 (Linux only)	Yes

## 1.10 Antivirus Verification

The Intel Quartus Prime software release version 17.1 has been verified virus free with the following software:



**Antivirus Verification Software for Windows**

Windows McAfee Agent  
 McAfee VirusScan Enterprise + AntiSpyware Enterprise 8.8  
 Scan engine version (32-bit): 5900.7806  
 Scan engine version (64-bit): 5900.7806  
 DAT version: 8691.000  
 DAT created on: 10/21/2017

**Antivirus Verification Calm Software for Linux**

ClamAV 0.99.2/23982

**1.11 Software Issues Resolved**

**Table 9. Issues Resolved in the Intel Quartus Prime Pro Edition Version 17.1**

Customer Service Request Numbers							
10874732	10906694	10934490	11035424	11044806	11092037	11108600	11111559
11119345	11122418	11142369	11161631	11163168	11167641	11176481	11189332
11190099	11192812	11193251	11193539	11204906	11206940	11209015	11216245
11222203	11227348	11232066	11232762	11233458	11236166	11238953	11239361
11240568	11244055	11247437	11247598	11249294	11251260	11254274	11255363
11258637	11260906	11261250	11261271	11261681	11261947	11262628	11262641
11263949	11264210	11265293	11270402	11273497	11274233	11274243	11275564
11277072	11277831	11279539	11279947	11280186	11280895	11281679	11282245
11284528	11285169	11285620	11286017	11286186	11286285	11286769	11287023
11287635	11288014	11288041	11288213	11289452	11289521	11289751	11290708
11291210	11291667	11292144	11292241	11292326	11292743	11292759	11292928
11293073	11293809	11294562	11295504	11296364	11296661	11296797	11297425
11297561	11298357	11298883	11298963	11299126	11299382	11299456	11299522
11300172	11300214	11300527	11300696	11301033	11301487	11301716	11301910
11302934	11302963	11303079	11303185	11303198	11303204	11303349	11303688
11304073	11304077	11304181	11304272	11304508	11304809	11304919	11305279
11305705	11305719	11305923	11306047	11306150	11306517	11307214	11307296
11307581	11307817	11307965	11308250	11308310	11308453	11308574	11308701
11309860	11310175	11310219	11311321	11311585	11311770	11311773	11311898
11312080	11312187	11312283	11312475	11312817	11313341	11313388	11313713
11313872	11314116	11314126	11314184	11314799	11315294	11315634	11315667
11316925	11317065	11317436	11317583	11317815	11317889	11317929	11317999
11318255	11318355	11318661	11318715	11318919	11319036	11319103	11319195
11319234	11319261	11319473	11319527	11319545	11319762	11320100	11320126
11320190	11320548	11320603	11320806	11320830	11320866	11320869	11321157
<i>continued...</i>							





Customer Service Request Numbers							
11321237	11321667	11321803	11321882	11322014	11322165	11322197	11322232
11322249	11322274	11322542	11322586	11322676	11322780	11322845	11322870
11323078	11323201	11323330	11323337	11323492	11323577	11323592	11323613
11323689	11323968	11324020	11324081	11324191	11324300	11324310	11324372
11324438	11324481	11324592	11325215	11325284	11325285	11325385	11325498
11325711	11325832	11326022	11326152	11326175	11326246	11326533	11326637
11326731	11326813	11326863	11326874	11327364	11327400	11328059	11328073
11328330	11328425	11328569	11328639	11328697	11328711	11328961	11328978
11329325	11329543	11329696	11329726	11329930	11329990	11330092	11330141
11330420	11330453	11330494	11330676	11330730	11330756	11330757	11331055
11331151	11331375	11331471	11331649	11331670	11332253	11332803	11332956
11333243	11333339	11333453	11333533	11333557	11334141	11334368	11334596
11334800	11334835	11334841	11334849	11334884	11335141	11335375	11335457
11335465	11335542	11335605	11335607	11335950	11336030	11336332	11337100
11337427	11337640	11337712	11337794	11337988	11338073	11338141	11338964
11339282	11339522	11340183	11340255	11340787	11340861	11340955	11341014
11341289	11341572	11341908	11341999	11342347	11342496	11342808	11342895
11342940	11343223	11343327	11343437	11343582	11343591	11344582	11344604
11344701	11344736	11344906	11345121	11345779	11346030	11346085	11346133
11346233	11346373	11346555	11346575	11346703	11346948	11347209	11347556
11347609	11347771	11347986	11348351	11348384	11348405	11349061	11349302

## 1.12 Software Patches Included in this Release

**Table 10. Software Patches included in Intel Quartus Prime Pro Edition Version 17.0**

Software Version	Patch	Customer Service Request Number
Intel Quartus Prime software version 17.0.2	2.04	11341999
Intel Quartus Prime software version 17.0.2	2.03	-
Intel Quartus Prime software version 17.0.2	2.01	11326022
Intel Quartus Prime software version 17.0.1	1.01	11307817
Intel Quartus Prime software version 17.0	0.11	11286283
Intel Quartus Prime software version 17.0	0.06r	-
Intel Quartus Prime software version 17.0	0.05	-

*continued...*



Software Version	Patch	Customer Service Request Number
Intel Quartus Prime software version 16.1.2	2.23	11311019
Intel Quartus Prime software version 16.1.2	2.20	-
Intel Quartus Prime software version 16.1.2	2.19	11311019
Intel Quartus Prime software version 16.1.2	2.18	11305279
Intel Quartus Prime software version 16.1.2	2.07	11275270
Intel Quartus Prime software version 16.1	0.23	-
Intel Quartus Prime software version 16.1	0.22	11308283
Intel Quartus Prime software version 16.0.2	2.35cl	11303204
Intel Quartus Prime software version 15.1.2	2.47	11334115
Intel Quartus Prime software version 15.1.2	2.41	11247437, 11092037, 11111559
Quartus II software version 15.0	0.40	11308283
Quartus II software version 13.1	0.126	11255208

### 1.13 Latest Known Intel Quartus Prime Software Issues

Information about known issues that affect the Intel Quartus Prime software version 17.0 is available in the Knowledge Base:

[Known Software Issues Affecting the Quartus Prime Software Version 17.1](#)

**Table 11. Important Known Issues Affecting the Intel Quartus Prime Pro Edition Version 17.1**

Description	Workaround
<p>If you do hierarchical partial reconfiguration (PR) for Intel Stratix 10 device families, you might encounter the following error:</p> <pre> Error detected in quartus_fit: Internal Error: Sub-system: QHD, File: /quartus/comp/qhd/ qhd_database_model_utils.cpp, Line: 816 Routing preservation failure! CRF ok, BLC failed, FCD ok QHD_DATABASE_MODEL_UTILS::split_routing_into_models(Q HD_PARTITION&amp;, QDB_PATH const&amp;, QHD_RE_NETWORK_SPLITTER*, QHD_ENUM_IMPL&lt;QHD_STATE::TYPE_BASE&gt;, CDB_CHIP_DB_ENTRY*, bool) + (comp_qhd) QHD_DATABASE_UTILS::IMPL::commit_partition(QHD_PARTIT ION&amp;, QHD_RE_NETWORK_SPLITTER*, QHD_ENUM_IMPL&lt;QHD_STATE::TYPE_BASE&gt;) + (comp_qhd) QHD_DATABASE_UTILS::IMPL::commit_partition_tree(QHD_P ARTITION&amp;, QHD_RE_NETWORK_SPLITTER*, QHD_ENUM_IMPL&lt;QHD_STATE::TYPE_BASE&gt;) + (comp_qhd) QHD_DATABASE_UTILS::IMPL::commit_partition_tree(QHD_P                     </pre>	<p>If you see this error, contact your Intel FPGA representative or file a mySupport request.</p>

*continued...*



Description	Workaround
<pre> ARTITION&amp;, QHD_RE_NETWORK_SPLITTER*, QHD_ENUM_IMPL&lt;QHD_STATE::TYPE_BASE&gt; + (comp_qhd) QHD_DATABASE_UTILS::IMPL::commit_partition_tree(QHD_E NUM_IMPL&lt;QHD_STATE::TYPE_BASE&gt;) + (comp_qhd) QHD_DATABASE_UTILS::commit_design(QHD_ENUM_IMPL&lt;QHD_S TATE::TYPE_BASE&gt;) + (comp_qhd) FIT2_DATABASE_EXPERT_Q ... WARNING: details were shortened to conserve storage space </pre>	
Stratix 10 Post-fit VHDL simulation is not supported in Intel Quartus Prime Pro Edition Version 17.1.	N/A
If you do not specify the <code>--part</code> option of the <code>qsys-generate</code> command, the testbench with bus functional models (BFMs) is generated for the default Intel Arria 10 device family, regardless of the target device family your Platform Designer (formerly Qsys) system has.	When you issue the <code>qsys-generate</code> command, always specify the <code>--part</code> option for your target device family to ensure that the BFMs target the correct device part.
Partial reconfiguration bitstream generation is disabled for Intel Stratix 10 device families.	Subject to certain restrictions, partial reconfiguration bitstream generation could be enabled for your design. To have your design evaluated to see whether partial reconfiguration bitstream generation can be enabled for your design, contact your Intel FPGA representative or file a mySupport request.
When you use the multiple reconfiguration profiles feature in the Intel Stratix 10 Native PHY IP (both L-tile and H-tile layouts), you might see timing violations on maximum skew constraints for your designs.	If you see timing violations in this situation, contact your Intel FPGA representative or file a mySupport request.

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 Links

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

## 1.14 Document Revision History

**Table 12. Intel Quartus Prime Software Release Version 17.1 Document Revision History**

Date	Version	Changes
November 2017	17.1	Initial release.