

Quartus II Software and Device Support Release Notes Version 14.1

December 2014

RN-01080-14.1.0



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This document provides late-breaking information about the Altera® Quartus® II software release version 14.1.

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

New Features and Enhancements

The Quartus II software release version 14.1 includes the following new features and enhancements:

- Support for Arria® 10 devices:
 - Includes the following Arria 10 devices: GT (10AT090, 10AT115), GX (10AX048, 10AX057, 10AX066, 10AX090, 10AX115) and SX (10AS048, 10AS057, 10AS066)
 - Final pin-outs
 - SoC support
 - Digital signal processing (DSP) hardened floating-point implementation, including three design flows:
 - Model-based design flow with DSP Builder and MathWorks Simulink
 - C-based design flow with the Altera software development kit (SDK) for OpenCL™⁽¹⁾
 - RTL-based design flow with IP cores
 - Smart voltage ID

⁽¹⁾ *OpenCL and the OpenCL logo are trademarks of Apple Inc. used by permission by Khronos.*

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- Support for MAX[®] 10 devices:
 - Final pin-outs
 - Vertical migration support
 - Enhanced Flash MegaWizard[™] support for new modes such as configuration flash memory (CFM) and user flash memory (UFM)
 - New Analog Toolkit for evaluating analog-to-digital converter (ADC) performance and for hardware debug:
 - Helps you understand the performance of the analog signal chain as seen by the on-board ADC hardware
 - GUI displays the performance of the ADC using industry standard metrics
 - Power management controller reference designs
 - Pre-defined MAX 10 design templates available in the Quartus II software's New Project Wizard. The design templates provide faster design creation, as each template has a working framework and the designs are optimized to work with the specific board or development kit you are targeting. The Quartus II software release version 14.1 provides select, built-in MAX 10 FPGA design templates, and more templates are available for download from the Altera Design Store
- Includes the JNEye link analysis tool with new channel analyzer capabilities that support different transmission line models (e.g., stripline and single via). The JNEye link analysis tool also performs new causality and passivity checks, and reports several new measures of noise.
- The Design Space Explorer (DSE) II:
 - Determines the optimal collection of Quartus II software settings for a design
 - Allows you to focus explorations on area, timing, or power
 - Performs explorations on a local PC or remotely on a compute farm
 - Performs a single compilation locally or remotely
 - Performs multiple concurrent remote compilations
 - Includes updated exploration algorithms to help you find a fit for your design
 - Allows you to export the integrated results summary and compilation results to a Comma-Separated Value File (.csv)
 - Integrated with the Altera Notification Center providing real-time updates on your compilation status and displaying your aggregated results on the web
 - Includes a new IP integration flow composed of a migration wizard and a centralized IP catalog to simplify IP selection and migration to new Altera devices.
- Improvements to Qsys, including:
 - Allows the creation of subsystems and the rearranging of components on-the-fly; existing components can be pushed into subsystems, or pulled out
 - A new clock and reset domain visualization tool to enable quick debug of this critical area of system designs
- Improvements to the Altera SDK for OpenCL, including the QoR of the compiler, emulator, and rapid prototyping flow to support Arria 10 FPGAs and SoCs

Related Information

[Altera Design Store](#)

Memory Recommendations

A full installation of the Quartus II software requires up to 24 GB of available disk space.

Altera 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
Arria II GX	EP2AGX45	1.5 GB
	EP2AGX65	2 GB
	EP2AGX95, EP2AGX125, EP2AGX190	4 GB
	EP2AGX260	6 GB
Arria II GZ	EP2AGZ225	4 GB
	EP2AGZ300	6 GB
	EP2AGZ350	8 GB
Arria V	5AGXA1	6 GB
	5AGTC3, 5AGXA3, 5AGXA5	8 GB
	5AGXA7, 5AGTC7	10 GB
	5AGXB1, 5AGXB3, 5AGTD3, 5ASTD3, 5ASXB3	12 GB
	5AGXB5, 5AGTD7, 5AGXB7, 5ASXB5, 5ASTD5	16 GB
Arria V GZ	5AGZE1	8 GB
	5AGZE3, 5AGZE5	12 GB
	5AGZE7	16 GB
Arria 10	10AS048, 10AX048	28 GB
	10AS057, 10AX057	30 GB
	10AS066, 10AX066	32 GB
	10AT090, 10AX090	44 GB
	10AT115, 10AX115	48 GB
Cyclone IV E	EP4CE6, EP4CE10, EP4CE15, EP4CE22, EP4CE30, EP4CE40	512 MB
	EP4CE55, EP4CE75	1 GB
	EP4CE115	1.5 GB
Cyclone IV GX	EP4CGX15, EP4CGX22, EP4CGX30	512 MB
	EP4CGX50, EP4CGX75	1.5 GB
	EP4CGX110, EP4CGX150	2 GB

Family	Device	Recommended Physical RAM
Cyclone V	5CEA2, 5CGXC3, 5CEA4, 5CGXC4, 5CEA5, 5CGTD5, 5CGXC5, 5CSEA5, 5CSTD5, 5CSXC5, 5CSEA6, 5CSXC6, 5CEA7, 5CGTD7, 5CGXC7, 5CSEA2, 5CSEA4, 5CSXC2, 5CSXC4, 5CSTD6	6 GB
	5CEA9, 5CGTD9, 5CGXC9	8 GB
MAX II	All	512 MB
MAX V	All	512 MB
MAX 10	10M02	512 MB
	10M04, 10M08	1 GB
	10M50	2 GB
Stratix IV	EP4SGX70	2 GB
	EP4SE230 EP4SGX110, EP4SGX230, EP4S40G2, EP4S100G2	4 GB
	EP4SGX290	6 GB
	EP4SE360 EP4SGX360, EP4S100G3, EP4S100G4	8 GB
	EP4SGX530, EP4SE530, EP4SE820, EP4S40G5, EP4S100G5	12 GB
Stratix V	5SGSD3	8 GB
	5SGXA3, 5SGSD4, 5SGXA4, 5SGTC5	12 GB
	5SGSD5, 5SGXA5, 5SGXB5, 5SGSD6, 5SGXB6	16 GB
	5SGTC7, 5SGXA7, 5SGSD8	20 GB
	5SGXA9, 5SEE9	24 GB
	5SEEB, 5SGXAB, 5SGXB9, 5SGXBB	28 GB

Changes in Device Support

Table 2: Device Support Not Fixed

Description	Workaround
<p>Cannot Upgrade Outdated IP Core Targeting Obsolete Device Family</p> <p>If your design includes one or more outdated Altera IP cores that specifically target an unsupported legacy device family and you attempt to upgrade the IP cores (Project > Upgrade IP Components), the Quartus II software issues an error and the upgrade fails. This condition can occur if you restore an archived project that contains an IP core that targets an unsupported legacy family.</p>	<p>To use the IP core in the current version of the Quartus II software, click Tools > IP Catalog and define a new instance of the IP core that targets a supported device family.</p>

Table 3: Device Support Fixed

Description	Workaround
<p>Pin-Out File might contain incorrect voltages in Quartus II software release version 13.1 Arria 10 Edition</p> <p>The Pin-Out File (.pin) generated by the Quartus II software might contain incorrect voltages for some Arria 10 ES voltage rails. The voltage rails affected are:</p> <ul style="list-style-type: none"> • VCC • VCCL • VCCERAM • VCCL_HPS • VCCIOREF_HPS • VCCPLL_HPS 	<p>This issue is corrected in Quartus II software release version 14.0 Arria 10 Edition.</p>
<p>Default VCCIO voltage for 10AX115 devices is incorrect in Quartus II software release version 13.1 Arria 10 Edition</p> <p>On the Voltage page of the Quartus II software, the default voltage listed for VCCIO (2.5 V) is incorrect.</p>	<p>This issue is corrected in Quartus II software release version 14.0 Arria 10 Edition.</p>
<p>Netlist viewer does not refresh when the design is recompiled</p> <p>The Netlist Viewer will not update after recompilation if the Netlist Viewer window is open when you modify and recompile the design by double-clicking on Fitter in the Task pane on the left side of the Quartus II software.</p>	<p>This issue is corrected in Quartus II software release version 14.1.</p>

Table 4: Device Support Removed

These device families are no longer supported by the Quartus II software.

Device Family Removed	Support Removed in...	Last Supported in...
Cyclone III	14.0	13.1
Stratix III		

Device Family Removed	Support Removed in...	Last Supported in...
Arria GX	13.1	13.0
Cyclone, Cyclone II		
MAX 3000A, MAX 7000A, MAX 7000AE, MAX 7000B, MAX 7000S		
HardCopy II, HardCopy III, HardCopy IV		
Stratix, Stratix GX, Stratix II, Stratix II GX		

Related Information[Altera Knowledge Base](#)

For more information about known device issues and workarounds.

Changes to Software Behavior

This section documents instances in which the behavior and default settings of the Quartus II software have been changed from earlier releases of the software, and known issues with the software.

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

The Design Space Explorer has been redesigned and updated in the Quartus II software release version 14.1

The newly redesigned Design Space Explorer (DSE) II replaces the existing DSE tool. The new DSE II allows you to perform both a single compilation and design explorations comprised of multiple compilations of a single design. You can perform the compilations on your local machine or on a remote compute farm. The new tool provides updated exploration algorithms to help you find a fit for your design. DSE II provides dynamic, aggregated results reporting in a new integrated interface. The new DSE II provides an interface to allow you to connect with the Altera Notification Center to get real-time updates on your compilation status and view aggregated results on the web.

Device Support and Pin-Out Status

Table 5: 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
MAX 10	10M04, 10M08

Table 6: 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
Arria 10	10AX048F34, 10AX048F35, 10AX057, 10AX066, 10AS048F34, 10AS048F35, 10AS057, 10AS066, 10AX090, 10AX115, 10AT090, 10AT115
MAX 10	10M02, 10M50

Table 7: Initial Information 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
Arria 10	10AX048F29 , 10AS048F29

Timing and Power Models

Table 8: Timing and Power Model Status

Device Family	Device	Timing Model Status	Power Model Status
Arria 10	10AX048, 10AS048	Advance ⁽²⁾	Preliminary
	10AX057, 10AS057	Advance ⁽²⁾	Preliminary
	10AX066, 10AS066	Advance ⁽²⁾	Preliminary
	10AX090, 10AT090	Preliminary	Preliminary
	10AX115, 10AT115	Preliminary	Preliminary
Arria V	5AGXB5, 5AGXB7	Final – 12.1 SP1 ⁽³⁾	Final – 13.1
	5AGTD7		Final – 14.0
	5AGXA1, 5AGXA3, 5AGTC3	Final – 13.0 SP1 ⁽³⁾	Final – 14.0
	5AGXA5, 5AGXA7	Final – 13.1 ⁽³⁾	Final – 14.0
	5AGXB1, 5AGXB3, 5AGTD3	Final – 13.0 ⁽³⁾	Final – 13.1
	5AGTC7	Final – 13.1 ⁽³⁾	Final – 13.1
Arria V GZ	All	Final – 12.1 SP1 ⁽³⁾	Final – 13.0

⁽²⁾ This release contains advance timing models for some Arria 10 devices. These models will change and should not be relied on for production timing. For more information about working with advance timing models, review the *System Design with Advance FPGA Timing Models* white paper, or contact Altera.

⁽³⁾ The timing model is updated in Quartus II software version 13.1.

Device Family	Device	Timing Model Status	Power Model Status
Arria V SoC	5ASXB3, 5ASXB5, 5ASTD3, 5ASTD5	Final – 14.0	Final – 14.0
Cyclone V	5CEA2, 5CEA4, 5CEA7, 5CEA9, 5CGXC7, 5CGXC9, 5CGTD7, 5CGTD9	Final – 13.0 SP1	Final – 13.1
	5CEA5, 5CGXC4, 5CGXC5	Final – 13.1	Final – 13.1
	5CGXC3		Final – 14.0
Cyclone V SoC	5CSEA2, 5CSEA4, 5CSXC2, 5CSXC4	Final – 14.0	Final – 14.1
	5CSEA5, 5CSEA6, 5CSXC5, 5CSXC6, 5CSTD5, 5CSTD6		Final – 14.0
Stratix V	5SGXA7, 5SGXA5, 5SGTC5, 5SGTC7	Final – 12.1 ⁽³⁾	Final – 13.0
	5SGSD3, 5SGSD4, 5SGSD5, 5SGXA3, 5SGXA4, 5SGXB5, 5SGXB6, 5SGXAB, 5SGXA9, 5SEE9, 5SEEB, 5SGXB9, 5SGXBB	Final – 12.1 SP1 ⁽³⁾	Final – 13.0
	5SGSD6, 5SGSD8	Final – 13.0 SP1 ⁽³⁾	Final – 13.0
MAX 10	10M02, 10M04, 10M08, 10M50	Preliminary	Preliminary

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

Related Information

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

IBIS Models

Table 9: IBIS Model Status for the Quartus II Software Release Version 14.1

Device Family	IBIS Model Status
Arria II GX	Correlated with PHY device operation – 11.1
Arria II GZ	Correlated with PHY device operation – 11.1
Arria V	Correlated with PHY device operation – 14.0

Device Family	IBIS Model Status
Arria 10	Preliminary - 14.0
Cyclone® IV E	Correlated with PHY device operation – 11.1
Cyclone IV GX	Correlated with PHY device operation – 11.1
Cyclone V	Correlated with PHY device operation – 14.0
MAX V	Correlated with PHY device operation – 11.1
MAX 10	Preliminary - 14.0
Stratix® IV	Correlated with PHY device operation – 11.1
Stratix V	Correlated with PHY device operation – 13.0 SP1

EDA Interface Information

Table 10: Synthesis Tools Supporting the Quartus II Software Release Version 14.1

Synthesis Tools	Version	NativeLink Support
Mentor Graphics® Precision ⁽⁴⁾	2014a	Yes
Synopsys® Synplify, Synplify Pro, and Synplify Premier	E-2014.03-SP1	Yes

Table 11: Simulation Tools Supporting the Quartus II Software Release Version 14.1

Simulation Tools	Version	NativeLink Support
Aldec Active-HDL	9.3 SP1 (Windows only)	Yes
Aldec Riviera-PRO	2014.06	Yes
Cadence Incisive Enterprise Simulator (IES)	13.20 (Linux only)	Yes
Mentor Graphics ModelSim® PE	10.3c	Yes
Mentor Graphics ModelSim SE	10.3c	Yes
Mentor Graphics ModelSim-Altera	10.3c	Yes
Mentor Graphics Questa®	10.3c	Yes
Synopsys VCS and VCS MX	2014.03-SP1 (Linux only)	Yes

⁽⁴⁾ The Precision synthesis tool option is missing in the Quartus II software **EDA Tool Settings**; you must select this tool with Quartus II software Tcl Script File (.tcl) commands.

Table 12: Formal Verification (Equivalence Checking) Tools Supporting the Quartus II Software Release Version 14.1

Formal Verification Tools	Version	NativeLink Support
Cadence Encounter Conformal	8.1	—

Antivirus Verification

The Quartus II software release version 14.1 has been verified virus free using the following software:

McAfee VirusScan Enterprise + AntiSpyware Enterprise Version: 8.8.0 (8.8.0.1247)
 Scan Engine Version (32 bit): 5600.1067
 Scan Engine Version (64 bit): 5600.1067
 DAT Version: 7632.0000

Software Issues Resolved

Table 13: Issues Resolved in the Quartus II Software Release Version 14.1

Customer Service Request Numbers							
10843330	10989490	11025071	11041714	11053516	11064673	11075700	11086538
10845224	10991326	11025074	11041742	11053643	11064686	11075771	11086555
10848903	10991425	11025077	11041997	11053847	11064712	11075961	11086897
10849310	10991462	11025313	11042010	11053948	11064726	11075996	1086905
10850434	10992041	11025351	11042253	11054176	11065642	11076100	11086958
10852910	10992087	11025546	11042444	11054369	11065707	11076315	11087182
10853829	10993588	11025810	11042562	11054470	11065923	11076397	11087308
10857082	10993772	11025903	11042781	11054776	11066157	11076423	11087976
10859846	10994284	11026142	11043006	11054858	11066168	11076543	11088000
10862068	10994376	11026301	11043175	11055089	11066206	11076745	11088041
10869946	10994397	11026550	11043273	11055206	11066279	11076786	11088291
10875771	10995475	11027084	11043299	11055220	11066412	11077898	11088424
10876201	10995953	11027671	11043394	11055471	11066518	11077928	11088533
10878856	10996028	11028239	11043416	11055602	11066521	11078010	11088579
10879480	10996223	11028361	11043976	11055844	11067075	11078057	11088928
10887573	10996326	11028458	11043990	11056343	11067119	11078379	11089070
10897452	10997258	11028777	11044455	11056359	11067203	11078662	11089208

Customer Service Request Numbers							
10903398	10998182	11029139	11044525	11056375	11067462	11078718	11089292
10908164	11000478	11029665	11044741	11056383	11067539	11078920	11089319
10908672	11000926	11030418	11044822	11056401	11067733	11079045	11089397
10911439	11001597	11030870	11045136	11056609	11067828	11079064	11089411
10918670	11003223	11030927	11045284	11056747	11067897	11079212	11089426
10920594	11003477	11030984	11045314	11056763	11067993	11079293	11089674
10921481	11005319	11031411	11045409	11056816	11068050	11079296	11089800
10922985	11006805	11031745	11045506	11057318	11068053	11079467	11089813
10926522	11007414	11031831	11045513	11057810	11068089	11079535	11089888
10926997	11007852	11031921	11045562	11057839	11068308	11079686	11090193
10932411	11008048	11032307	11045632	11057989	11068453	11079846	11090348
10932416	11008059	11032352	11045646	11058198	11068608	11080000	11090431
10938033	11008361	11032405	11045908	11058272	11068653	11080148	11090452
10938041	11008433	11032490	11045934	11058685	11068820	11080160	11090603
10939272	11008512	11032995	11046293	11059155	11069257	11080433	11090695
10940456	11008561	11033352	11046379	11059182	11069383	11080536	11090822
10941162	11009523	11033798	11046551	11059198	11069864	11080626	11090921
10945954	11009584	11034054	11047071	11059302	11069927	11080665	11091012
10946371	11009988	11034128	11047299	11059327	11070273	11080866	11091350
10948434	11010212	11034400	11047446	11059543	11070697	11080871	11091635
10950277	11010264	11034502	11047781	11059748	11070843	11080999	11091873
10955973	11010382	11034762	11047822	11059924	11070922	11081324	11091918
10961783	11010672	11035195	11048186	11059938	11070967	11081427	11092490
10962031	11010987	11035473	11048203	11059957	11070996	11081502	11092841
10964494	11012462	11035676	11048305	11060071	11071029	11081757	11093414
10967177	11014355	11035707	11048411	11060313	11071298	11081980	11093490
10967714	11014427	11035801	11048656	11060339	11071668	11082056	11093511
10967792	11014819	11036067	11049344	11060764	11071734	11082326	11094526
10967925	11015505	11036191	11049480	11060935	11071969	11082684	11094836
10968162	11015852	11036266	11049826	11061249	11072065	11082883	11095556
10968867	11015899	11036574	11049904	11061251	11072239	11082941	11095635

Customer Service Request Numbers							
10969213	11016064	11036802	11049987	11061344	11072251	11083013	11095999
10970047	11016791	11036832	11050203	11061529	11072273	11083070	11096040
10970551	11017250	11036965	11050276	11061588	11072366	11083175	11096105
10971137	11017292	11037441	11050332	11061962	11072441	11083288	11096385
10971899	11017873	11037482	11050388	11062378	11072443	11083572	11096593
10974584	11019198	11037853	11050696	11062617	11072525	11084027	11096611
10975633	11019335	11038481	11050707	11062689	11072718	11084042	11096616
10977662	11020050	11038631	11050792	11062698	11072721	11084169	11096624
10978039	11020894	11038634	11050871	11062863	11072778	11084377	11096870
10978960	11020920	11038674	11051368	11063047	11072816	11084503	11096956
10978967	11020964	11038686	11051865	11063099	11073061	11085082	11097113
10979904	11021440	11038715	11052034	11063354	11073344	11085344	11097332
10981496	11021623	11038966	11052126	11063393	11073348	11085390	11097678
10981832	11021734	11039007	11052426	11064046	11073409	11085482	11097910
10982241	11021827	11039257	11052439	11064118	11073530	11085571	11098275
10982954	11022095	11039350	11052546	11064141	11073660	11085913	11098883
10983819	11022098	11039475	11052564	11064164	11074428	11085958	11099520
10985708	11022972	11039501	11052676	11064167	11074538	11086009	11099712
10986622	11024004	11039642	11053125	11064290	11074959	11086102	11100141
10986901	11024225	11040018	11053241	11064386	11074987	11086259	11100922
10987063	11024590	11040785	11053263	11064594	11075124	11086426	11101263
10987731	11024952	11041566	11053339	11064609	11075277	11086531	11102047

Software Patches Included in this Release

Table 14: Software Patches included in the Quartus II Software Release Version 14.1

Software Version	Patch	Customer Service Request Number
Quartus II software version 14.0a10s	0.04s	—
Quartus II software version 14.0a10	0.02a	11077898
Quartus II software version 14.0a10	0.01a	11080433
Quartus II software version 14.0.2	2.10	11096021

Software Version	Patch	Customer Service Request Number
Quartus II software version 14.0.2	2.04	—
Quartus II software version 14.0.2	2.03	11064141, 11080626
Quartus II software version 14.0.2	2.01	—
Quartus II software version 14.0.1	1.03	—
Quartus II software version 14.0	0.28	11063130
Quartus II software version 14.0	0.24	11079686
Quartus II software version 14.0	0.22	11083339
Quartus II software version 14.0	0.18	11064141, 11080626
Quartus II software version 14.0	0.16	11081502
Quartus II software version 14.0	0.13	11064141, 11080626
Quartus II software version 14.0	0.11	11068525
SoC EDS version 14.0	0.02soc	—
Quartus II software version 13.1.4	4.50	11066279
Quartus II software version 13.1.4	4.49	—
Quartus II software version 13.1.4	4.16	11047071
Quartus II software version 13.1.3	3.13	11064141, 11080626
Quartus II software version 13.1.3	3.12	—
Quartus II software version 13.1.3	3.11	11080626
Quartus II software version 13.1.2	2.10	11060313
Quartus II software version 13.1.2	2.08	11060313
Quartus II software version 13.1	0.92	—
Quartus II software version 13.1	0.109	11063047
Quartus II software version 13.0sp1	1.dp6a	—
Quartus II software version 13.0sp1	1.dp5z7	11060313
Quartus II software version 13.0sp1	1.dp5z	11031831
Quartus II software version 13.0sp1	1.80	—
Quartus II software version 13.0	0.58	11086028
Quartus II software version 12.1sp1	1.78	11081902
Quartus II software version 12.1sp1	1.75	11032307

Latest Known Quartus II Software Issues

Information about known software issues is available on the Quartus II Software Support webpage.

You can find known issue information for previous versions of the Quartus II software on the Altera Knowledge Database webpage.

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

Related Information

- [Quartus II Software Support](#)
- [Altera Knowledge Database](#)
- [Altera IP Release Notes](#)

Document Revision History

Table 15: Quartus II Software Release Version 14.1 Document Revision History

Date	Version	Changes
December 2014	14.1.0	Initial release.