

ElectricAccelerator Release Notes

Version 10.1

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ElectricAccelerator version 10.1

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Product Description

ElectricAccelerator® is a software build accelerator that dramatically reduces build times by distributing the build over a large cluster of inexpensive servers. ElectricAccelerator (“Accelerator”) uses a patented dependency-management system to identify and fix problems in real time that break traditional parallel builds. Accelerator plugs seamlessly into existing software development environments and includes web-based management and reporting tools.

Accelerator includes the following components:

- Electric Make® (“eMake”)
- Electric File System (EFS)
- ElectricAccelerator Agents (“Agents”)
- Cluster Manager
- Electrify

What’s New or Modified

New Features and Functionality

Test Acceleration

The `--emake-test-case-mode=<0|1>` eMake option is introduced. This option enables an execution mode specifically for test acceleration. Test case mode is disabled by default.

In test case mode, file system (and registry for Windows) updates from each job are discarded to disable conflict detection, history, and file-level annotation. This mode discards intermediate test results to restore agents to a pristine file system state after each test to ensure that each job runs as if no other tests ran. Results on `stdout` and `stderr` as well as the exit code are preserved.

You must create a makefile specifically for this mode. If you have already written test automation using makefiles, you can use this mode immediately. You can use this mode with eMake in any emulation mode.

eMake Options for Android Builds

Using eMake for Android builds is simplified with the introduction of two eMake options, which you must use to specify your Android version and the location of your Android source files. eMake uses these options to configure the build automatically for the best performance and compatibility with Android:

- `--emake-android-version=<version>` where `<version>` is 7.0.0, 8.0.0, or 9.0.0
- `--emake-android-root=<path>` where `<path>` is the path to your source files

For more information about these options, see the [KBEA-00165 - Best Practices for Android Builds Using ElectricAccelerator 10.1 and Newer Versions](#) KB article. (EC-12636)

Directory-Read Conflict Checking on Specific Targets

The `#pragma readdirconflicts` pragma is introduced. This pragma enables directory-read conflicts (“readdir-conflicts”) on a per-job basis. You can apply it to targets or rules in your makefiles. This feature has less overhead than the `--emake-readdir-conflicts=1` eMake option (which activates directory-read conflicts for an entire build). This pragma can be used in pragma addendum files as well as in standard makefiles.

For details about directory-read conflicts and `--emake-readdir-conflicts`, see the “Managing the History Data File” section in the “Dependency Management” chapter of the *ElectricAccelerator 10.1 Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-12743 and EC-12575)

Order Preservation of eMake Root Directories

The `--emake-sort-roots=<0|1>` eMake option is introduced. `--emake-sort-roots=0` disables the default (alphabetical) sorting of the eMake root directories in a history file so that it follows the order specified via the `--emake-root` eMake option.

For more information, see the “List of Command-Line Options” section in the “Electric Make Basics” chapter of the *ElectricAccelerator 10.1 Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-12694)

remaphist Utility

The `-s <0|1>` option is added to the `remaphist` utility. `-s 0` disables the default (alphabetical) sorting of the eMake root directories in a history file so that it follows the order specified via the `--emake-root` eMake option when you remap the file.

For details about the `remaphist` utility, see the “Using the remaphist Utility to Relocate a History File” section in the “Dependency Management” chapter of the *ElectricAccelerator 10.1 Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-12694)

ElectricInsight Update

ElectricInsight (which is bundled with Accelerator) is upgraded to version 5.4. The 32- and 64-bit executables for ElectricInsight are installed.

ElectricInsight is licensed separately from Accelerator. An ElectricInsight license file is required to run reports. All other functionality (view-only mode) is available without a license.

For information about the 32- and 64-bit executables for ElectricInsight and about using ElectricInsight, see the *ElectricInsight 5.4 User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.

Visual Studio Integration Update

The Visual Studio integration (which is bundled with Accelerator) is upgraded to version 5.2.5. For the list of new features and resolved issues, see the “What's New” section in the *ElectricAccelerator 5.2.5 Visual Studio Integration Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.

Other New Features and Functionality

- (Windows platforms only) The Electric Agent installer is enhanced with an option for initializing Visual Studio automatically for the “ECloudInternalUser” accounts on your agent hosts. For details about this option, see the “Installing Electric Agent/EFS on Windows” section in the “Installing ElectricAccelerator” chapter of the *ElectricAccelerator 10.1 Installation and Configuration Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-12802)
- The supported use case for running Accelerator in Docker containers is now defined as a single agent per container and multiple containers per host. (It was previously defined as multiple agents per container and a single container per host.) For more information, see the [KBEA-00163 Configuring ElectricAccelerator to Run in Docker Containers](#) KB article. (EC-12736)

- Accelerator no longer sets the `Name` tag on Amazon EC2 instances. It now sets the `EA-Name` tag instead, which lets you set `Name` to a custom name. (EC-12712)
- You can now pass custom tags to be used when Amazon EC2 instances are created. For details, see the “About the Amazon EC2 Resource Manager Integration Scripts” section in the “Configuring ElectricAccelerator” chapter of the *ElectricAccelerator 10.1 Installation and Configuration Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-12711)
- The `OutputHistoryMD5` metric is added to annotation. This is the MD5 checksum of the history file that was generated by a build. (EC-12706)
- The **Instance Idle Timeout** setting is added to the **Server Settings** page in the Cluster Manager web UI. This setting lets you specify the timeout interval for Amazon EC2 instances. For details, see the:
 - “Configuring Agents to Run on Amazon EC2” section in the “Configuring ElectricAccelerator” chapter of the *ElectricAccelerator 10.1 Installation and Configuration Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.
 - “Amazon EC2” section in the “Server Settings” topic of the *ElectricAccelerator 10.1 Help* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-12620)
- (Linux platforms only) The Electric Agent enterprise installer is enhanced with an option to let you skip installation of the Electric File System (EFS) and LOFS when you install agents. For details, see the “Installing Electric Agent/EFS on Linux or Solaris” section and the “Installing ElectricAccelerator Silently” section in the “Installing ElectricAccelerator” chapter of the *ElectricAccelerator 10.1 Installation and Configuration Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-12519)

Resolved Issues

- (Linux platforms only) An Accelerator upgrade now always uses your previous nondefault installation directory instead of the default installation directory (`/opt/ecloud`) when you select the **Express - Use the default values...** installer mode. (EC-12817)
- An issue in which upgrading the Cluster Manager from version 8.2.0 or earlier to versions 8.2.1 through 10.0.3 installed a schema update that was incompatible with the Oracle database is fixed. (EC-12784)
- (Linux platforms only) An issue where specifying an external database during Cluster Manager installation failed to start the HTTP server daemon because of a missing `libncursesw.so` file is fixed. (EC-12780)
- (Windows platforms only) An issue with the Accelerator Visual Studio Integration that caused eMake to crash and caused Visual Studio fatal error C1083 is fixed. (EC-12771)
- eMake no longer crashes when it encounters a communication error while sending symbolic link data to agents. (EC-12770)
- Conflicts that were caused by multi-output pattern rules where one output was marked intermediate no longer occur. (EC-12767)
- An issue that caused significantly slower builds because the eMake history collapse feature (enabled by default) mistakenly discarded some history data is fixed. (EC-12722)

- Annotation now shows the resolved makefile name instead of the original makefile name when combined with makefile "include" path searching for included makefiles. For example, for an included makefile whose actual path is `sub/sub.mk`, annotation showed the makefile as `sub.mk` (as specified in the makefile) rather than `sub/sub.mk`:

```
<job id="J0000000002a1e190" thread="7f217abdabc0" start="5" type="rule"
name="other" file="sub.mk" line="2" neededby="J0000000002a1e0c0">
```

Annotation now shows `sub/sub.mk` to make it clear what file actually provided the definition for that rule:

```
<job id="J0000000002a1e190" thread="7f217abdabc0" start="5" type="rule"
name="other" file="sub/sub.mk" line="2" neededby="J0000000002a1e0c0">
```

(EC-12705)

- eMake no longer over-serializes jobs when dependency optimization (`--emake-optimize-deps=1`) is used with Ninja depfiles. (EC-12693)
- If agents fail to connect to the Cluster Manager after an Amazon EC2 instance has run for four minutes, they are now considered to be stalled and therefore terminated automatically. When a subsequent agent request is made, if the instance is terminated the agent request will return an error, which kills the build. (However, if you kill a build manually and the agents fail to connect, you must terminate the instance manually.) (EC-12656)
- The Cluster Manager web UI no longer becomes unresponsive indefinitely if `electric-cloud.com` is not reachable. (EC-12628)
- An issue where a pattern rule with multiple targets and an explicit rule that matched a file created by the pattern rule caused a conflict that was never resolved is resolved. (EC-5325)

Platform Support

Support is added for the following platforms.

- RHEL 7.5 (kernel 3.10.0-862) (64-bit)
- Ubuntu Linux 18.04 (kernel 4.15) (64-bit)

Installation and Upgrade Notes

Hardware Requirements

- Accelerator 7.2 and newer versions require a Pentium 4 or newer processor when running in a 32-bit Solaris x86 environment.
- The recommended total amount of RAM for an agent host is 2 GB *per agent* plus the amount of RAM normally needed to execute your build. For example, if you are running four agents, and your build normally needs 16 GB, you will need $((2 * 4) + 16) = 24$ GB.

Backing Up Before You Upgrade

- The upgrade process does not preserve the existing files. Back up the `/opt/ecloud/<arch>/cloud` directory for Linux and Solaris or the `C:\ECloud\<arch>` folder for Windows to a safe location.
- For additional security, back up the database by following the recommended procedure from your database vendor.

Installing JDBC Drivers for MySQL or Oracle Databases

Electric Cloud no longer distributes the JDBC drivers for MySQL or Oracle databases. To use one of these databases, you must download its driver directly from the Oracle website, then copy it to the appropriate directory on the Cluster Manager server, and then restart the Cluster Manager service. For details, see the "Installing JDBC Database Drivers" section in the "Installing ElectricAccelerator" chapter of the *ElectricAccelerator 10.1 Installation and Configuration Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.

Copying the execserver Executable to a New Location if You Relocate eMake

If you copy the `emake` executable to a new location, you must also copy the `execserver` executable to that location. By default, the path to the `execserver` executable is `/opt/ecloud/i686_Linux/32/bin/execserver` (for 32-bit eMake) or `/opt/ecloud/i686_Linux/64/bin/execserver` (for 64-bit eMake).

Regenerating History Files After an Upgrade

The identifier that is used to find certain types of jobs in the eMake history file changed in version 8.0. After an upgrade from version 7.2.2 or older versions to version 8.0 or newer versions, users should regenerate their history files by running their first build with the `--emake-history=create` option to avoid unnecessary serializations. This build might have more conflicts than normal (but subsequent builds should return to normal).

Concurrent Build Licensing

As of version 9.1, for new Accelerator subscription licenses, the number of builds that you can run concurrently is license-limited. The `noLicenseWaitTime` performance metric indicates the amount of time that a build spent waiting for a concurrent build license because the number of concurrent builds reached the license limit. Also, as of version 9.1, JobCache is not separately licensed and is now included with the concurrent build license.

Customers using pre-9.1 Accelerator licenses may continue to use those licenses, including the licenses for the JobCache add-on.

For details about licensing for concurrent builds, see the *ElectricAccelerator 10.1 Installation and Configuration Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-12095)

Updating the Resource Manager Type If You Are Using LSF

During a Cluster Manager upgrade to Accelerator 10.0 or later, the installer changes the "cloud" resource manager type to "none." This means that if you are using LSF, you must move the scripts from the `<InstallDir>/<arch>/cloud/` directory to the `<InstallDir>/<arch>/cloud/lsf` directory.

`<InstallDir>` is `/opt/ecloud` by default on Linux and `C:\ECloud` by default on Windows. `<arch>` is either `i686_Linux` or `i686_win32`.

Also, you must specify LSF as the resource manager to be used by the Cluster Manager. To do so, open the Cluster Manager web UI, then click **Administration > Server Settings**, then choose **LSF** from the **Resource Manager Type** menu, and then click **OK**. (EC-12579)

Known Issues

Linux Kernel Issue That Affects Accelerator Performance

Affected Kernel Versions

- RHEL kernel versions later than 2.6.18-194.32 and earlier than 2.6.32-131
- Ubuntu Linux kernel versions 2.6.31, 2.6.32, 2.6.33, and 2.6.34

Symptoms

Affected systems might encounter reduced performance on both ext3 and ext4 file systems. Symptoms might include

- `hung_task_timeout_secs` messages in system `dmesg` logs
- Widely variable agent availability (entering and exiting agent “penalty” status frequently)
- Contention over the `ecagent.state` file
- Slower builds (with unexplained variances)

To help determine if this issue exists, run the `dmesg | grep hung_task_timeout` command. `hung_task_timeout` errors show that this issue is present. Contact your kernel provider for another version of the precompiled kernel.

Fixes for Systems Running RHEL 5.6, 5.7, 5.8, and 6.0

You should consider upgrading to 2.6.32-131 (RHEL 6.1) or downgrading to 2.6.18-194.32 (RHEL 5.5).

Other Known Issues

- If you kill a build manually, and the agents running on an Amazon EC2 instance fail to connect, the instance will continue to run. You must kill the instance manually.
- The `cmtool importData` command does not import license properties (such as `maxAgents`). To work around this issue, re-import the license after using `importData`. (EC-12371)
- (Windows 10 only) `eMake.exe` might crash when trying to upload an annotation file to the Cluster Manager. (EC-12339)
- You cannot control breakpoints from the Cluster Manager. (EC-12322)
- Options in the `emake.conf` configuration file override options that are set using Accelerator environment variables (such as `EMAKE_CM`). (EC-10272)
- If Apache fails to start properly after a new Cluster Manager installation, reboot the system.

Documentation

Product Documentation

Accelerator documentation is available at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html as follows:

- *ElectricAccelerator Installation and Configuration Guide*
- *ElectricAccelerator Electric Make User Guide*
- *ElectricAccelerator cmtool Reference Guide*
- *ElectricAccelerator Error Messages Guide*
- *ElectricAccelerator Visual Studio Integration Guide*
- *ElectricAccelerator Release Notes* (this document)
- PDF, HTML, and mobile-optimized HTML versions of the online help that is also accessible from the Cluster Manager **Help** button.

Documentation on the website is updated periodically.

Cluster Manager Online Help and Tooltips

Built into the Cluster Manager are

- A complete, robust, context-sensitive online help system (click the **Help** button in any page of the Cluster Manager web UI). See the documentation website as described above for the latest updates to this information.
- Tooltips with information to help fill in form fields.

Troubleshooting and Getting Help

Technical Support

Contact Electric Cloud technical support:

- +1 408.419.4300, option 2. Hours are 9 A.M.–5 P.M. PT Monday–Friday (except holidays)
- support@electric-cloud.com
- <https://helpcenter.electric-cloud.com/> and then click **Submit a request** to submit or see your support tickets

Be prepared to provide your:

- Name, title, company name, phone number, and email address
- Operating system and version number
- Product name and release version
- Problem description

Electric Cloud “Ask” Website

Go to <http://ask.electric-cloud.com>—a member-moderated community forum where you can:

- Ask and answer questions as well as comment on (and vote for) the questions of others and their answers
- Get help with installation and configuration
- Submit feedback

ElectricAccelerator Knowledge Base

Go to <https://helpcenter.electric-cloud.com/hc/en-us/sections/200516893-Accelerator-KB> to find in-depth explanations of specific topics and solutions for specific problems.