



ElectricAccelerator Release Notes

Version 8.0

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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

JobCache Feature

The JobCache feature is introduced. This feature lets a build avoid recompiling object files that it previously built, if their inputs have not changed. JobCache works even after you clean the build output tree (for example, using “make clean”). JobCache is an add-on option. It is available only on Linux and Solaris platforms and requires separately-purchased licensing.

JobCache has the following benefits:

- Speeds long, full builds (for example, when you do a “make clean” and then a “make,” or when you run a build in a new workspace)
- Builds faster than ccache
- Avoids certain false cache hits that might occur when you use ccache
- Complements existing Accelerator performance enhancements such as schedule optimization and dependency optimization

JobCache is allowed or disallowed on a build-class basis. You use the Cluster Manager web UI or `cmtool` to allow or disallow JobCache for a build class. For the default build class and for build classes that exist when you upgrade to Accelerator 8.0, JobCache is allowed by default. For a build class that you create, JobCache is disallowed by default.

For information about JobCache, see the *ElectricAccelerator 8.0 Electric Make User Guide*. For information about supported platforms, installation, configuration, and licensing for JobCache, see the *ElectricAccelerator 8.0 Installation and Configuration Guide*. For information about administering JobCache, see the *ElectricAccelerator 8.0 cmtool Reference Guide* and the Cluster Manager online Help (click the Help link in any page of the Cluster Manager web UI). (EC-11006)

Other New Features and Functionality

- Speeds are increased up to five times for some builds that are run with no history file (compared to the same builds run with no history file using the prior release). (EC-11363)
- The interface of the `remaphist` utility is simplified, so that the `-r` option is not required when the number of roots has not changed. (Note that the `remaphist` utility is not officially supported.) (EC-11341)

- (Linux platforms) Parse speed in Android builds is substantially improved. (EC-11231)
- The `--emake-emulation=gmake3.82` eMake option now emulates the behavior introduced in gmake 3.82 in which pattern rule searches prefer the most-specific matching pattern, rather than the first matching pattern. For example, for a target `{{foo.o}}` and patterns `{{%.o}}` and `{{f%.o}}`, in that order, gmake 3.81 uses the `{{%.o}}` pattern, because it is the first match, but gmake 3.82 uses the `{{f%.o}}` pattern, because it is a more specific match. (EC-11184)
- (Linux and Solaris platforms) A `status` option is added to `/etc/init.d/erunner`. You can use this option to check whether the eRunner daemon is running. (EC-11139)
- (Linux and Solaris platforms) The parse avoidance feature now ignores certain ElectricCommander `COMMANDER_*` environment variables and certain Jenkins `CI_JENKINS_*` and `BUILD_*` environment variables by default. For a list of these environment variables, see the *ElectricAccelerator 8.0 Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-11108 and EC-10252)
- (Linux platforms) The EFS now supports writeback, which improves performance for I/O-heavy jobs on Linux systems using kernel 3.0 or newer. (EC-10975)
- (Linux platforms) Several optimizations are introduced in the EFS that improve performance (particularly for I/O-heavy jobs). (EC-10785)
- (Windows platforms) Any Accelerator component (the Cluster Manager, Agent/EFS, or eMake) now includes all Electric Cloud Visual Studio Integration components (the IDE add-in, the converter add-in, and the `ecdevenv` utility). (EC-10083)

Behavior Changes

- The syntax for the `--emake-hide-warning` eMake option is modified to let you optionally include an EC prefix when specifying warning numbers. (EC-11158)
- The parse avoidance pragma is changed from `#pragma cache parse` to `#pragma jobcache parse`. The Javadoc caching pragma is changed from `#pragma cache javadoc` to `#pragma jobcache javadoc`. (EC-10919)
- (Linux platforms) The `agent.state` file and the individual agent lock files are now written to the `/var/lib` directory rather than the Electric Cloud installation directory. (EC-10604)

Resolved Issues

Third-Party Technology Stack Update for the Cluster Manager

For improved security, performance, and compatibility, the Cluster Manager's third-party technology stack is updated:

- (Linux platforms) PHP is upgraded from version 5.3.26 to version 5.6.5.
- SSLv2 and SSLv3 are disabled.
- OpenSSL is upgraded from version 1.0.1g to version 1.0.1l.
- Apache is upgraded from version 2.2.24 to version 2.2.29.
- The key size of the self-signed certificate is increased from 1024 to 2048 bits.
- Ciphers that do not support forward secrecy are no longer supported.

This update fixes the following Common Vulnerabilities and Exposures (CVEs):

- CVE-2014-3566
- CVE-2012-4929
- CVE-2011-3389

You can find more information about these CVEs at <https://cve.mitre.org/cve/>. (EC-11287, EC-11286, EC-11202, EC-11193, and EC-11147)

Other Resolved Issues

- Fixed an issue where the GNU Make `$(wildcard)` function returned an empty string when the referenced path was on an automounted file system that was not yet mounted when the makefile was parsed. (EC-11311)
- Fixed an issue where the Cluster Manager web UI became unresponsive and produced numerous `Java IDLE` exceptions after a single job ran for 72 hours. (EC-11275)
- Fixed a regression issue in applying pattern-specific variables to targets. (EC-11258)
- (Ubuntu 64-bit Linux platforms) Fixed an issue where the Cluster Manager installer erroneously checked for the existence of the `libstdc++6:i386` library and displayed a warning if it was missing. (This library is not required, unless you are using a MySQL database as an alternative to the default database (MariaDB) that is included with Accelerator. The installer now installs this library automatically.) (EC-11256)
- Fixed an EFS issue where a race condition caused intermittent kernel crashes under rare circumstances. (EC-11156)
- (Linux platforms) Fixed an EFS issue that could cause “missed” file usage data for reads of symbolic links. (EC-11116)
- (Linux platforms) Fixed an issue where the Cluster Manager installer erroneously checked for the existence of the 32-bit `libaio` library and displayed a warning if it was missing. (This library is not required, unless you are using a MySQL database as an alternative to the default database (MariaDB) that is included with Accelerator.) (EC-11106)
- (Linux platforms) Fixed a TCP listener socket issue that occurred when multiple eMake instances using the ledger feature began at precisely the same time. (EC-10943)
- (Windows platforms) Fixed the issue where inadequate permissions on the `C:\Windows\Temp` folder caused eMake to fail when Visual Studio builds were not run as an administrator. (EC-10881)
- (Linux platforms) Fixed the issue where the installer erroneously displayed a warning that stated that Red Hat Enterprise Linux (RHEL) 6.4 was unsupported. (EC-10661)
- (Linux platforms) Fixed a potential deadlock in the EFS implementation. (EC-10583)
- Fixed an issue in which eMake sometimes did not honor explicit prerequisites that were added for a target after dependency optimization was enabled. (EC-10582)

New Platforms

Support is added for the following platforms:

- RHEL 7.0 (kernel 3.10.0-123) (64-bit)
- RHEL 6.6 (kernel 2.6.32-504) (32- and 64-bit)
- Ubuntu Linux 13.10 (kernel 3.11) (32- and 64-bit)
- Microsoft Windows Server 2012 (64-bit)

Updated Browser Support

The list of supported web browsers is updated as follows.

Desktop Browsers

- Chrome 40 or newer
- Firefox 31 ESR or newer
- Internet Explorer 10 or newer
- Safari 7 or newer

Mobile Browsers

- Chrome on Android 4.4 (KitKat) or newer
- Internet Explorer Mobile 11 or newer
- iOS 7 or newer

Installation and Upgrade Notes

MariaDB Replaces MySQL as the Default Local Database

Electric Cloud no longer bundles MySQL as the default local database for Accelerator on the Cluster Manager. Electric Cloud now bundles MariaDB and installs it as the default local database. When you upgrade the Cluster Manager, MariaDB replaces the local MySQL database (if applicable) and migrates all information from it.

MariaDB is an open-source database that is fully compatible with MySQL. You can alternatively use the MySQL, Oracle, or SQL Server databases. See the Cluster Manager online help topic “Database Configuration” for information about configuring Accelerator to use an external database.

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

- Back up the `/opt/ecloud/<arch>/cloud` directory for Linux and Solaris or `C:\ECloud\<arch>` for Windows to a safe location. The upgrade process does not preserve the existing files.
- For additional security, perform a database backup 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. If you want to use one of these databases, you must download its driver directly from the Oracle website, copy it to the appropriate directory on the Cluster Manager server, and restart the Cluster Manager service. For more information, see the “Installing JDBC Database Drivers” section in Chapter 3 of the *ElectricAccelerator 8.0 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/bin/execserver` (or `/opt/ecloud/i686_Linux/64/bin/execserver`, if you are running 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 is changed in version 8.0. After an upgrade to version 8.0, users should regenerate their history files by running their first build with the `--emake-history=create` eMake option to avoid unnecessary serializations. This build might have more conflicts than normal (but subsequent builds should return to normal).

Known Issues

Linux Kernel Issue That Affects ElectricAccelerator 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).

Fixes for Systems Running Ubuntu 10.04

You should consider upgrading to kernel 2.6.35 or newer. To install the upstream kernel, follow the example below (replace * with the version that you want to install):

```
sudo add-apt-repository ppa:kernel-ppa/ppa
sudo aptitude update
sudo apt-get install linux-image-2.6.35-*--generic
sudo apt-get install linux-headers-2.6.35-*--generic
sudo apt-get install linux-maverick-source-2.6.35 linux-maverick-headers-2.6 (optional)
```

A kernel upgrade might require you to reinstall kernel modules such as video drivers, efs, and vm-tools. You can do so by running `apt-get dist-upgrade` and then rebooting.

Other Known Issues

- Options in the `emake.conf` configuration file override options that are set using Accelerator environment variables (such as `EMAKE_CM`). (EC-10272)
- Because of a Linux kernel compatibility issue with LOFS, Accelerator agents cannot be installed on Ubuntu 12.10.
- For Visual Studio 2012, if project dependencies are not fully defined, the project build order under eMake might be different to Visual Studio. If a build fails because a prerequisite project was not built, you can work around this issue by adding an explicit project dependency to the solution.
- 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 Visual Studio Integration Guide*
- *ElectricAccelerator Release Notes* (this document)
- PDF, HTML, and mobile-optimized HTML versions of the online help that is also built into the Cluster Manager

Documentation on the website is updated periodically.

Cluster Manager Online Help and Tooltips

Built into the Cluster Manager are the following:

- A complete, robust, context-sensitive online help system (click the Help link 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:

- 408.419.4300, option 2. Hours are 9 A.M.–5 P.M. PT Monday–Friday (except holidays)
- support@electric-cloud.com

You will be asked to provide the following information:

- 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>:

- Ask questions or read answers to questions from other users
- Get help with installation and configuration
- Submit feedback

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