



ElectricAccelerator Release Notes

Version 9.0

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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

Shared JobCache

Accelerator 9.0 extends the JobCache feature to teams of developers via a shared job cache. As with the non-shared JobCache feature, Shared JobCache accelerates builds by reusing build outputs from one build to the next, which avoids costly redundant work across builds. Shared JobCache builds on this concept by giving developers read-only access to a job cache that was previously populated by another user or process (such as in a nightly build). With this feature enabled, only one user must actually run the compilations; other team members simply reuse the output from that “golden” build.

For details, see the *ElectricAccelerator 9.0 Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-11912)

Ninja Build System Support

To allow Android version 7 (“Nougat”) and Chromium builds, eMake now supports the Ninja build system. eMake can now emulate Ninja in addition to the standard Accelerator make-based builds such as gmake and NMAKE. eMake supports Ninja version 1.6 and newer.

eMake with Ninja emulation supports schedule optimization, JobCache, parse avoidance, Ledger, eDepend (autodep), and pragmas. Dependency optimization is not supported.

Ninja emulation works only with builds using Agents (local mode is not supported). Ninja emulation is available only on Linux platforms.

For details about using Ninja with Accelerator, see the *ElectricAccelerator 9.0 Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-11864)

Coverity Support

You can now integrate Coverity Analysis for C/C++ into makefile-based Accelerator builds. For information about integrating and using Coverity with Accelerator, see the [KBEA-00162 Integrating Coverity Analysis for C/C++ into an ElectricAccelerator Build](#) KB article. (EC-11861)

Jack Support

Support is added for the Android 7 (“Nougat”) version of the Java Android Compiler Kit (Jack). For details about using Jack with Accelerator, see the *ElectricAccelerator 9.0 Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-11944)

JobCache Support for Jack, javac, and kati

JobCache support is extended to the Jack and javac tools. JobCache support is also extended to kati, which is a GNU make clone whose main goal is to speed up incremental Android builds. kati is used for Android 7 builds to convert makefiles to Ninja files. For more information about kati, see <https://github.com/google/kati>. For details about using JobCache with Jack, javac, and kati, see the *ElectricAccelerator 9.0 Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-11846, EC-11781, and EC-11965)

eDepend Improvements

eDepend ("autodep") improvements provide better compatibility for ClearCase clearmake migration. When using automatic dependency generation (`--emake-autodepend=1`), eMake now considers a rule to be out of date when an implicit dependency is removed. This causes eMake to rebuild the target, matching `clearmake`. For details about eDepend, see the *ElectricAccelerator 9.0 Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html. (EC-11834)

Troubleshooting Improvements

Annotation files now contain additional annotation to help you debug build problems by identifying performance issues and determining any reasons for rebuilding.

- The `<job>` tag now includes a `<why>` tag, which contains a reason for rebuilding as well as a `prereq` attribute if applicable. The `<why>` tag reports why a job was run, which lets you differentiate between eMake-only reasons (for example, eDepend or Ledger) and make-related reasons (for example, the job target is absent or out of date). (EC-7321)
- Annotation files now include profiling metrics. These are the same metrics that are already in the debug log file when the `--emake-debug=g` option is used. These metrics appear in annotation whether or not `--emake-debug=g` is used. These metrics are intended for use by Electric Cloud engineering and technical support staff. (EC-11897)

The metrics appear in the `<profile>` tag of the annotation file and appear exactly as they do in the debug log file.

- Annotation files now include per-job performance metrics. These metrics track a variety of details about the performance of each job in the build. For example, metrics with the `A2E_` prefix reflect low-level details of the eMake/agent protocol, such as file data and metadata requests made by the agent on behalf of the commands run during the job. Not all metrics are for use by end users, but Electric Cloud technical support and engineering staff might use them for certain performance analyses.

The metrics appear in the `<jobMetrics>` tag of the annotation file. (EC-11977)

For details about troubleshooting, see the *ElectricAccelerator 9.0 Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.

Pragma Addendum Files

A pragma addendum file lets you easily add pragmas (using `#pragma`) to a build without modifying makefiles. A pragma addendum file uses a subset of make syntax to declare pragmas on targets within the build. This syntax lets you use existing addendum makefiles unmodified while avoiding inconvenient makefile syntax such as tabs versus spaces, dollar-sign escapes, and `eval`.

Using pragmas for builds with the eMake Ninja emulation mode enabled (`--emake-emulation=ninja`) requires an addendum file that contains the pragmas for Ninja targets. Pragma addendum files are optional with any other emulation mode.

Other New Features and Functionality

- When JobCache is used, user and group IDs are remapped, so that you can get a cache hit for an entry that was populated by a different user ID. (EC-10914)
- `--emake-jobcache=clang` is added as an alias for `--emake-jobcache=gcc`. (EC-11929)
- The **ElectricAccelerator Developer Edition** option in the installer GUI is renamed to **ElectricAccelerator Hybrid Agent**, and the hybrid agent installation process is improved. (EC-11928)
- eMake now supports multibyte characters (such as Chinese or Korean characters) in inline makefiles. (EC-11973)
- eMake now supports multibyte characters in paths in the `EMAKE_ROOT` and `EMAKE_FLAGS` environment variables and in the `emake.conf` file. (EC-11964)
- (Windows platforms) NMAKE emulation now supports the `#pragma multi pragma`. (EC-11859)
- (Windows platforms) NMAKE emulation now supports the `NMAKE /Q` option, which checks target timestamps but does not run the build. (EC-11837)
- When you download a build log (annotation) file from the Cluster Manager in .zip format, the name of the file inside the .zip file now includes the build ID. (EC-11431)
- Timestamps in agent logs are changed from raw epoch timestamps to human-readable timestamps. (EC-11844)

Visual Studio Integration

For the list of new features and functionality as well as resolved issues in the Visual Studio Integration, see the “What’s New” chapter in the *Visual Studio 5.0.1 Integration Guide*.

Resolved Issues

- The installer no longer hangs if you click the **Next** button multiple times on the **Choose the user accounts to use for running the agents** screen. (EC-11982)
- Fixed the 86477 Apache Web Server ETag Header Information Disclosure Weakness Qualys error on the Cluster Manager. (EC-11974)
- Fixed a sporadic error with command line parsing when an expanded command starts with a newline. (EC-11960)
- Fixed a target mismatch error when a cached job creates a symlink in a created subdirectory. (EC-11903)
- Fixed a crash associated with the following eMake assertion failure: `Job.cpp:124: bool Job::doesRuntimeExceed(size_t): Assertion 'mData' failed.` (EC-11896)
- (Windows XP) Fixed an issue with builds running out of memory. (EC-11887)
- (Windows platforms) 64-bit eMake no longer performs unnecessary low-memory throttling when JobCache was enabled for large builds, which caused slow builds. (EC-11871)
- (Windows platforms) cl JobCache no longer produces EC2137 warnings about failing to delete temporary files when the `cl` command contained inline files. (EC-11848)
- (Windows platforms) An error no longer appears when building with different versions of Visual Studio on the same agent host: `fatal error C1902: Program database manager mismatch.` (EC-11836)

- (Windows platforms) Fixed an issue with the Windows batch file wrapper for the remaphist script, which did not propagate command-line arguments. (EC-11817)
- (Windows platforms) The uninstaller now removes internal users when uninstalling Agents. (EC-10208)

Platform Support

Support is added for the following platforms:

- Debian 8 (3.16 series kernel) (64-bit) (EC-11900)
- Debian 7 (3.2 series kernel) (64-bit) (EC-11900)
- RHEL 6.8 (kernel 2.6.32-642) (32- and 64-bit) (EC-11947)

Support is ended for the following platforms:

- Windows XP SP3 (32-bit)
- Windows Server 2003 (32-bit)
- SLES 10 SP4
- Ubuntu 13.04
- Ubuntu 13.10
- Ubuntu 11.10
- Ubuntu 11.04

Database Support

Support is added for Oracle Database 12c. (EC-11429)

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/eccloud/<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 9.0 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` (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` 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 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

- The following installer message might appear during an upgrade of the Cluster Manager or agent machines from version 7.2.2, 8.0, or 8.0.1 to 8.0.2 or newer versions:

Attention! You have chosen to install Cluster Manager, but this system has already been installed as Huddle Server. If you wish to change the type of ElectricAccelerator installation you must first uninstall the previous installation, then install using the new type. If you did not intend to change the installation type, back up and choose the correct type of installation.

You can ignore this message and can continue with the upgrade. (EC-12529)

- Results in the Cluster Usage report in the Cluster Manager might not appear in Internet Explorer 10. To work around this issue, choose **Tools > Compatibility View** from the browser menu and then re-run the report. (EC-11608)
- 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:

- 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
- Annotation file for the build involved

Electric Cloud “Ask” Website

Go to <http://ask.electric-cloud.com> to:

- Ask questions or read answers to questions from other users
- 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.

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